

**Ruelicon**<sup>®</sup>

瑞之林

铝 电 解 电 容 器

深圳市瑞之林电子有限公司  
Shenzhen Ruizhilin Electronic Co., Ltd.





## 企业白皮书

借势于高端铝电解电容器军工技术的研究、开发平台，历经二十载的创新、开拓，深圳市瑞之林电子有限公司在各界同仁、朋友的鼎力支持下于2002年成立。

公司自成立始，专心致力于铝电解、特别是中、高压高端铝电解开发与生产。至目前止，所提供的产品遍布开关电源、UPS电源、变频电源、焊机、直流屏电源、逆变器及光伏储能等多个应用领域。同时可根据客户的自定义需求研制和开发不同种类新产品，为各界提供最新的技术支持和设计方案，追随新技术的发展。

公司拥有一支在铝电解电容器技术方面具有丰富研发和生产工艺经验，并与客户能够积极互动，提供全方位技术和服务的团队。公司拥有良好的研发和生产条件，配备有从来料把关、生产控制及产品试验等设备和手段，为质量控制、生产管理、销售服务提供有效保障。

公司秉承“诚信、共赢、创新、卓越”的经营理念，以“业精于勤”的实干作风，以“观海听涛”的对电容器的深入感悟和理解，将行业的先进思维与企业自身的实际相结合，以客户价值为导向，奉献瑞之林人的理想和追求。

瑞之林作为一家集研发、生产和销售为一体的专业生产铝电容器企业，用自身对电容器的深入理解和对客户的独到把握，在行业内心无旁骛地耕耘，以期树立良好的品牌形象和良好的客户信赖。

**愿瑞之林成为您真挚的合作伙伴，实现您、我的共同腾飞！**

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		Series 型号	Feature 特性	load life time 耐负荷寿命	Terminal Type 引出方式	Rated Voltage Range 标称电压范围 (V)	Nominal Capacitance Range 标称容量范围 (uf)	Operating Temperature Range 工作温度范围 (C)
	一般用途	RNK	Bi-polarized, general, 105 C 双极性, 一般品, 105 C	105 C 2000h	Radial 引线式	6.3-100	0.47-6800	-40~+105
		RKM	Standard, radial type, 105 C 引线式标准品105 C	105 C 2000h	Radial 引线式	6.3-500	0.1-22000	-40~+105
		RKC	Super long life, for input filtering 超长寿命, 输入滤波用	105 C 3000~ 5000h	Radial 引线式	6.3-500	1-15000	-40~+105
		RKH	Long life, for input filtering 长寿命, 输入滤波用	105 C 3000~ 10000h	Radial 引线式	6.3-500	1-15000	-40~+105
	高可靠性	LFM	Slim type, for input filtering 细长型, 输入滤波用	105 C 2000~ 5000h	Radial 引线式	200-500	18-220	-40~+105
		LFN	Slim type, long life, for input filtering 细长型, 长寿命, 输入滤波用	105 C 5000~ 10000h	Radial 引线式	400-450	33-220	-40~+105
		RXB	125 C, high ripple current, for ballast 125度, 大纹波电流, 节能灯, 电子整流器用	125 C 5000h	Radial 引线式	10-450	1-4700	-40~+125
		RXA	125 C, for automotive and industrial power supply 125度, 汽车电子, 工业电源	125 C 2000h	Radial 引线式	10-450	1-4700	-40~+125
		RNZ	135 C, for automotive and industrial power supply 135度, 汽车电子, 工业电源	135 C 4000h	Radial 引线式	10-63	10-4700	-40~+135
		小型电容器	高频低阻	RKZ	Ultra low impedance, long life, wide temperature 超低阻抗, 长寿命 宽温	105 C 2000~ 5000h	Radial 引线式	6.3-500
RLZ	Ultra low impedance, longest life 超低阻抗, 长寿命			105 C 5000~ 10000h	Radial 引线式	6.3-500	10-18000	-40~+105
RKA	low impedance, long life 超低阻抗, 长寿命			105 C 3000~ 5000h	Radial 引线式	6.3-450	5.6-15000	-40~+105
RKS	low impedance 超低阻抗			105 C 2000h	Radial 引线式	6.3-500	0.1-22000	-40~+105
特殊用途	RLL		Low leakage current 低漏电流	105 C 5000h	Radial 引线式	6.3-100	0.1-10000	-40~+105
	RFA		For Hi-Fi audio 高保真音响	85 C 2000h	Radial 引线式	6.3-100	0.47-15000	-40~+85
	一般用途	CD293	Standard, snap-in terminal 焊针式标准品	85 C 2000h	Snap-in 焊针式	10-500	68-82000	-40~+85
		CD293L	Standard, snap-in terminal 焊针式标准品	85 C 2000h	Snap-in 焊针式	350-500	68-1000	-40~+85
		CD294A	Standard, snap-in terminal 焊针式标准品	105 C 2000h	Snap-in 焊针式	16-500	39-47000	-40~+105
		CD294S	Super Downsized, general 超级缩体, 一般品	105 C 3000h	Snap-in 焊针式	200-450	100-2700	-40~+105

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变频 逆变 性 可靠 高	CD294	Long life, downsized, High ripple current 长寿命 缩体, 高纹波	105 C 3000h	Snap-in 焊针式	16-550	39-47000	-40~+105	
	CD294L	Long life high CV value, High ripple current 长寿命 高纹波	105 C 3000~4000h	Snap-in 焊针式	16-500	390-120000	-40~+105	
	CD295S	Long life, downsized 长寿命 缩体	85 C 3000~5000h	Snap-in 焊针式	160-450	47-2200	-40~+85	
	CD295	Long life 长寿命	85 C 5000h	Snap-in 焊针式	10-500	68-22000	-40~+85	
	CD295L	Long life, High ripple current 长寿命, 高纹波	85 C 5000h	Snap-in 焊针式	160-500	390-4700	-40~+85	
	CD296	Long life, downsized, High ripple current 长寿命 缩体, 高纹波	105 C 4000~5000h	Snap-in 焊针式	16-550	56-47000	-40~+105	
	CD296H	Longest life, high ripple current 长寿命, 耐大纹波电流	105 C 4000h	Snap-in 焊针式	450-550	120-820	-40~+105	
	CD296K	125 C, Snap-in, for automotive, hightem perator 125度, 焊针式, 高温	125 C 3000~5000h	Snap-in 焊针式	160-500	47-5600	-40~+125	
	CD296L	Long life, high ripple current 长寿命, 耐大纹波电流	105 C 4000~5000h	Snap-in 焊针式	350-500	390-3300	-40~+105	
	CD297L	Long life, higher ripple current 超长寿命, 耐大纹波电流	105 C 6000h	Snap-in 焊针式	160-500	39-2200	-40~+105	
	CD297	Long life, downsized, High ripple current 长寿命 缩体, 高纹波	105 C 5000h	Snap-in 焊针式	10-550	47-56000	-40~+105	
	CD299	Long life, higher ripple current 超长寿命, 耐大纹波电流	105 C 7000h	Snap-in 焊针式	160-550	100-3300	-40~+105	
	CD293G	No sparks with DC over voltage 耐过压品	85 C 2000h	Snap-in 焊针式	575-600	150-1500	-25~+85	
	CD294AG	No sparks with DC over voltage 耐过压品	105 C 2000h	Snap-in 焊针式	575-600	56-390	-25~+105	
	特殊用途	CD291SS	20mm height, for laminated electrical devices 20mm高, 用于薄型电子产品	105 C 2000h	Snap-in 焊针式	10-450	33-10000	-40~+105
		CD294F	wide temperature, Long life, High ripple current 宽温 长寿命 高纹波	105 C 3000~5000h	Snap-in 焊针式	10-550	68-22000	-55~+105
CD292KG		series hightem peratore 超高温	135 C 2000h	Snap-in 焊针式	160-450	47-2200	-25~+135	
CD11Y		For Hi-Fi audio 高保真音响	85 C 2000h	Snap-in 焊针式	10-100	680-22000	-40~+85	
逆变变频 用途 螺栓式	CD135	Standard, screw terminql 螺柱式标准品	85 C 2000h	Screw 螺栓式	10-500	470-820000	-40~+85	
	CD136	Standard, screw terminql 螺柱式标准品	105 C 2000h	Screw 螺栓式	25-450	220-330000	-40~+105	
	CD136H	Standard, screw terminql 螺柱式标准品	105 C 2000h	Screw 螺栓式	350-500	5600-39000	-40~+105	
	CD137	Long life, high reliability 长寿命, 高可靠性	85 C 5000h	Screw 螺栓式	400-550	1000-22000	-40~+85	
	CD137H	Ultra long life, high reliability 特长寿命, 高可靠性	85 C 12000h	Screw 螺栓式	350-500	1000-22000	-40~+85	
	CD138	Long life, high reliability 长寿命, 高可靠性	85 C 5000h	Screw 螺栓式	350-450	1000-18000	-40~+85	
	CD138H	Ultra long life, high reliability 特长寿命, 高可靠性	85 C 10000h	Screw 螺栓式	350-500	1500-12000	-40~+85	
	CD139	long life, high reliability 长寿命, 高可靠性	105 C 5000h	Screw 螺栓式	350-450	1000-15000	-40~+105	
CD139H	ultra long life for inverter, High reliability 特长寿命 高可靠性	105 C 5000h	Screw 螺栓式	350-450	1000-12000	-40~+105		
CD135G	600V working voltage, high reliability 600v工作电压, 高可靠性	85 C 2000h	Screw 螺栓式	600	1200-4700	-25~+85		

## 铝电解电容应用指南

### Application Guidelines For Aluminum Electrolytic Capacitors

#### 1. 电路设计 Circuit Design

- 1.1 请明确铝电解电容器所处的环境和安装条件应符合本说明书中规定的情况, Please make sure the environmental and mounting condition to which the capacitor will be exposed to are within the condition specified in this catalog (or alternate specifications, such as series drawings)
- 1.2 工作温度和纹波电流应小于本说明书中的规定, Operating temperature and applied ripple current must be within the specification
  - 电容器不能用于超过规定的环境温度。The capacitor must not be used in an ambient temperature which exceeds the operating temperature specified in this catalog
  - 电容器不能用于超过规定的纹波电流, Do not apply excessive current which exceeds the applied ripple current
- 1.3 设计电路时请选择满足产品寿命的电容器, Appropriate capacitors which comply with the life requirement of the products should be selected when designing the circuit
- 1.4 铝电解电容器是有极性的, 不要施加反向电压或交流电。在可能出现电压极性相反的电路中, 请使用无极性电容器, 注意: 即使无极性电容器也不能在交流电情况下使用, Aluminum electrolytic capacitors are polarized. Do not apply reverse voltage or AC voltage please use non-polarized capacitors for a circuit that can possibly see reversed polarity. Note, Even non-polarized capacitors can not use for AC voltage application.
- 1.5 在需要快速和频繁充/放电的电路中, 请不要使用铝电解电容器, 他需要使用具有长寿命特征的特别设计的电容器, Do not use aluminum electrolytic capacitors in a circuit that requires rapid and very frequent charge/discharge, In this type of circuit, it is necessary to use a special design capacitor with extended life characteristics.
- 1.6 不要施加过高的电压, Do not apply excess voltage.
  - 请注意直流电压上叠加纹波电流时的峰值电压不要超过额定电压, Please pay attention so that the peak voltage, which is DC voltage overlapped by ripple current, will not exceed the rated voltage.
  - 在使用2个以上的铝电解电容串联时, 请注意施加的电压应低于额定电压。应在每只电容并联一只平衡电阻, 使每只电容器承受的电压相等。In the case where more than 2 aluminum electrolytic capacitors are used in series, please make sure that Applied voltage will be lower than rated voltage and the voltage will be Applied to each capacitor equally using a balancing resistor in parallel with the capacitor.
- 1.7. 电容器外面的套管不能保证是电的绝缘体, 不要使用标准套管的电容器在需要电绝缘的场合。当需要特别的绝缘时, 请与我们的业务部联系, Outer sleeve of the capacitor is not guaranteed as an electrical insulator. Do not use a standard sleeve on a capacitor in applications that require the electrical insulation, When the application requires special insulation, please contact our sales office for details.
  - 不要将具有多端子(三或四端子)的自立式产品的空端子(加围端子)连接到其他电路, 这样可能引起短路。Do not connect the blank terminal (reinforcing terminal) of a multi-terminal (three- or four-terminal) product of the snap-in type to another circuit it may cause a short circuit.
- 1.8 电容器避免用在下面的情况: Capacitors must not be used under the following conditions
  - 暴露于水(包括露水), 盐水或油, Capacitors must not be exposed to water (including condensation), brine or oil.
    - 在环境中含有有害气体, 像硫化氢、亚硫酸、亚硝酸、氯、铵等等, Ambient conditions that include toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonium etc.
  - 使电容暴露在臭氧, 紫外线和放射线的环境, Ambient conditions that expose the capacitor to ozone, ultraviolet ray and radiation
  - 超过本说明书的剧烈振动和物理冲击, Severe vibration and physical shock conditions that exceed the specifications.

## 铝电解电容应用指南

### Application Guidelines For Aluminum Electrolytic Capacitors

1.9 设计电路板时，请注意以下，When designing a circuit board, please pay attention to following

- 线路板上的孔，要与电容器的引线相应。Make the hole spacing on the PC board match the lead space of the capacitor.
- 在容器安全孔的上面不应有器件或电线。There should not be any circuit pattern or circuit wire above the capacitors are type vent.
- 除非品有规定的压力释放口上面的间隙应大于下表。Unless otherwise specified, following clearance should be made above the pressure relief vent.

铝壳直径 Case Diameter	需要的间隙 Gap Required
Ø6.3~16	2mm or more
Ø18~35	3mm or more
Ø40 or more	5mm or more

- 假如压力释放口面向线路板(例如端面密封型)，在线路板上的相应位置打一个孔以释放气体。In case the vent side is placed toward PC board (such as end seal vented parts), make a corresponding hole on the PC board to release the gas when vent is operated. The hole should be made to match the capacitor vent position.
  - 不要将端盖型端子的电容器的密封端向下安装。当水平安装时，正极端一定要在较上的位置，Do not install screw terminal capacitor with end seal down. When you install screw terminal capacitor in a horizontal mount, the positive terminal must be in the upper position.
- 1.10 用于电容器的主要化学成分电解液和隔离纸是易燃的。电解液是导电的，当它与电路板接触时，可能造成腐蚀或短路甚至会起火。因此不能在电容器密封端的下面布置任何线条。The main chemical solution of the electrolyte and the separator paper used in the capacitors are combustible, The electrolyte is conductive, when it comes in contact with the PC board, there is a possibility of partial corrosion or short circuit between the circuit pattern which could in result of smoking or catching fire. Do not locate any circuit pattern beneath the capacitor end seal.
- 1.11 设计电路板时，不要在电容器的旁边或下面(PCB板的另一面) 放置发热量较大的元器件，如电阻、变压器等。Do not design a circuit board so that heat generating components such as resistor and transistors are replaced near an aluminum capacitor or reverse side of PC board (under the capacitor) .
- 1.12 铝电容器的电特性随温度和频率而变化。设计电路时请考虑这些变化。Electrical characteristics may vary depending on changes in temperature and frequency. Please consider this variation when you design circuits.
- 1.13 当设计半双面PCB板时，避免在电容器下面布置线条或通孔。When you are designing capacitors for use on double-side SPCB, avoid circuit patterns or through holes (such as to connect both sides), that are replaced under the capacitor.
- 1.14 螺丝安装型的铝电解电容器接线柱螺丝或支架螺丝的力矩必须在规定的范围。The torque for terminal screw or brackets screws must be within the specified value on drawings.
- 1.15 当用2个以上电容器并联时，请考虑电容器电流的平衡。When you install more than 2 capacitors in parallel, consider the balance of current flowing into the capacitors.

## 铝电解电容应用指南

### Application Guidelines For Aluminum Electrolytic Capacitors

#### 2. 安装 Mounting

- 2.1 一旦一个电容器已用在设备中并加上电压，不要尝试再将它使用在别的电路。Once a capacitor has been assembled in the set and power applied, do not attempt to reuse the capacitor in other circuits or application
- 2.2 在正负极之间可能存在电动势，请使用一只1KΩ电阻放电。Electric potential between positive and negative terminal may exist as a result of returned electromotive force, so please discharge the capacitor using a 1KΩ resistor.
- 2.3 贮藏6个月以上，漏电流可能增加当漏电流已增加时，请使用1KΩ电阻做一次电压修复。Leakage current of the parts that have been stored for more than 6 months may increase. When leakage current has increased please perform a voltage treatment using a 1KΩ resistor
- 2.4 在将电容器安装到PCB板之前注意核实其额定值。Please confirm ratings before installing capacitors on the PCB board
- 2.5 在将电容器安装到PCB板之前注意核实其极性，Please confirm polarity before installing capacitors on the PCB board
- 2.6 不要将电容器掉到地板上，也不要使用已掉于地板上的电容器，Do not drop capacitor on the floor, nor use a capacitor that was dropped.
- 2.7 安装时注意不要再改变已成型的电容器的引线。Be careful not to deform the capacitor during installation.
- 2.8 请核实电容器的脚距符合PCB板的孔距，Please confirm that the lead spacing of the capacitor matches the hole spacing of the PCB board prior to installation
- 2.9 自立式电容器(外形如 JIS 692, 693, 694和695) 安装时，要紧贴PCB板(在PCB板与电容器底部不允许有间隙) Snap-in can type capacitor such as JIS configuration 692, 693, 695 type should be installed tightly to the PCB board (no gap between the PCB board and bottom of the capacitor)
- 2.10 注意自动插件机的夹力不要太强(=2.5Kg)，Please pay attention that the clamping force is not too strong when capacitors are placed and fixed by an automatic insertion machine(=2.5kg)
- 2.11 请注意自动插件机等机械设备不要对电容器产生机械冲击。Please pay attention to that the mechanical shock to the capacitor by suction nozzle of the automatic insertion machine or automatic mounter or by product checker or by center in mechanism.
- 2.12 焊接条件要满足本说明书的有关规定。Soldering condition must be confirmed to be within the specification
- 2.13 将电容器焊接到PCB板后，请不要扳倒或转动电容器。Do not tilt down or twist the capacitor body after the capacitors are soldered to the PCB board.
- 2.14 请不要靠拿住焊好的电容器移动PCB板。Do not carry the PCB board by grasping the soldered capacitor
- 2.15 请不要允许任何东西接触焊接好的电容器，如果PCB板存放在货架，请保证PCB板或其他器件不要接触电容器。Please do not allow anything to touch the capacitor after soldering. If PCB board is stored in stack, please make sure PCB board or the other components do not touch the capacitor.
- 电容器不能受刚焊接好的PCB板或其他器件的热辐射的影响，The capacitors shall not be affected by radiation heat from the soldered PCB board or other component after soldering,
- 2.16 不要用卤化物清洁电容器，Do not clean capacitor with halogenated cleaning agent
- 2.17 固定材料和涂覆材料，Fixing materials and coating materials.
- 不要使用任何含有卤素成分的材料。Do not use any ingredients which contain halogen
  - 请在涂覆前，清除电容器密封端面与PCB板空隙中的焊剂与杂物。Please pay attention remove flux and contamination which remains in the gap between the end seal and PCB board and dry that part on well before coating
  - 只能部分的而不是全部包住电容器。Please do not apply any material all around the capacitor body but apply it partially.
  - 了解有关涂覆材料造成的不良影响，请与我们联系，Please contact our sales office to make sure whether the condition of coating material would cause any problem.

## 铝电解电容应用指南

### Application Guidelines For Aluminum Electrolytic Capacitors

#### 3. 贮存 Storage

当铝电解电容器经过长期静态贮存时,其性能会降低。变化的比率依温度、湿度而变化。The characteristics of aluminum electrolytic capacitor degrade when stored in a static condition for long periods of time, The rate of deterioration depends upon temperature and humidity

电容器应当在温度5°C-35°C湿度小于75%,无直接日光照射的环境贮存。Capacitors should be stored at the temperature of 5°C to 35°C, the humidity of less than 75% RH and out of direct sunlight.

电容器经贮存一年以上在使用前应进行“电压老化”,以再形成和修复氧化膜。Capacitors that have been stored for long periods normally over one year should be subjected to a "voltage aging" treatment before use, This will reform and repair the oxide dielectric.

建议老化过程中监控漏电流不要超过规定值的情况下,逐渐的给电容器加压直到电容器的额定电压。当到达额定电压后保持30-60分钟。Suggest aging procedure is gradually apply the rated voltage to the capacitors while monitoring the leakage current.

Do not exceed the specified leakage current value. When rated voltage has been reached maintain for 30 to 60 minutes.

#### 4. 印制板的清洁 Printed Circuit Board Cleaning

##### 4.1 前言 Foreword

现在大家普遍都认为卤类溶剂对铝电解电容器是有危害的。这是因为溶液能渗透电容器密封。然后,溶解和释放氯离子(Cl<sup>-</sup>离子)可腐蚀铝电极。It had been generally accepted that halogen type organic solvents were hazardous to aluminum electrolytic capacitors, This is because an organic solvent can permeate the capacitor through the end seal. Then, the solvent dissolves and free chlorine ions (Cl<sup>-</sup>ion), which can corrode the aluminum electrodes.

下面的方法是唯一可以预先避免这个现象的途径。The following measures were previously the only way to avoid this phenomenon.

使用对电容器无害的清洁剂,如水或酒精。Use of cleaning agents, not hazardous to capacitors such as water or alcohol.

将电容器安装在已事先经过卤类溶剂清洗过的印制板上。Mount capacitors on PC boards cleaned with a halogen type solvent before hand.

端口使用环氧密封。Use of epoxy end seals.

这些方法在工作效率、清洁能力、成本等方面有缺点。因此,耐卤类清洗剂的铝电解电容器是大家所希望的。These measure has disadvantages with respect to working efficiency, cleaning capability, cost etc, therefore, aluminum electrolytic capacitors which can withstand halogen type cleaning agents are desirable.

##### 4.2 清洗剂的类型 Types of cleaning agents

一般地有三种类型清洗剂。Generally there are three types of cleaning agents.

- 水类 water type.
- 酒精类 alcohol type
- 卤素类 halogen type

三类中,水和酒精使之渗进铝电解电容器也仅有很微弱的影响。然而,卤素能引起铝箔和引线的腐蚀。普通卤素类清洗剂列在表:Of these, water and alcohol will have little effect even if they permeate the capacitor, However, halogens can cause corrosion of aluminum foil and tab, common types of halogen cleaning agents are listed in table below:

化学名称	结构方式	表性商标名
三氯三氟代乙烷 Trichlorotrifluoroethane	C <sub>2</sub> Cl <sub>3</sub> F <sub>3</sub>	Freon TF, Daiflon S-3
氟代三氯甲烷 Fluorotrichloromethane	CCl <sub>3</sub> F <sub>3</sub>	Freon-11, Daiflon S-1
三氯甲烷(氯仿) Trichloroethane	C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub>	Chloroethane
三氯乙烯 Trichloroethylene	C <sub>2</sub> HCl <sub>3</sub>	Trichlene
甲基氯化物 Methyl Chloride	CH <sub>3</sub> Cl	MC



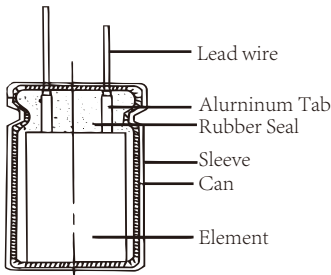
铝电解电容应用指南

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上表所列后四个溶剂可显著地腐蚀铝,不推荐使用这些清洗剂。The last four solvents listed above are particularly corrosive to aluminum and are not recommended to use as cleaning solvents.

4.3溶剂渗透通道和腐蚀机制 Penetration channel of solvent and corrosion mechanism

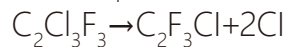
下图给出溶剂渗入电容器的三条通道。The three channels by which solvents can penetrate into the capacitor are illustrated.



- ①通过密封胶粒和铝壳(曲线部分)之间的空隙渗入。Penetration through a clearance between the rubber and the aluminum case (curled section)
- ②通过密封胶粒和导线之间的空隙渗入。 Penetration through a clearance between the rubber and the lead wires.
- ③通过密封胶粒渗入。 Permeation through the rubber end seal.

为减少溶剂进入电容器的可能性,加强密封以减少胶粒和铝壳/导线间的空隙。需要使用抗溶剂渗透的密封胶粒。To reduce the possibility of solvents entering a capacitor, tight sealing is required to eliminate clearances between the rubber and the aluminum case/lead wires, A solvent resistant rubber material is also a necessity

当一溶剂,例如三氯三氟代乙烷,渗入不抗溶剂渗透的电容器,其氯离子是自由的,如下面的反应公式。When a solvent, for example, trichlorotrifluoroethane gets inside a non anti solvent capacitor ion is free as shown by the following reaction formula,



氯离子与铝起反应如下: This chlorine ion reacts with aluminum as follows;



溶液在水里反应为: Then AlCl<sub>3</sub> resolves in water, and it becomes:



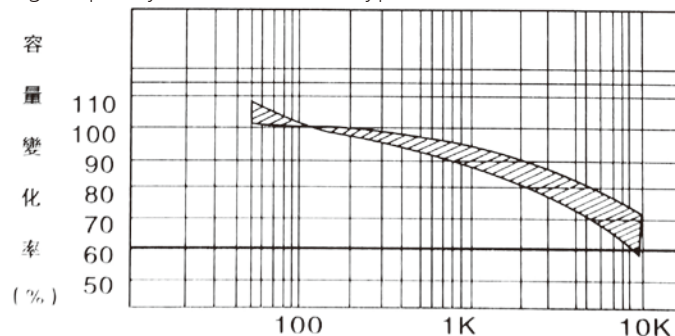
如此,氯离子再一次自由并重复腐蚀铝。这个反应的度,依溶液的量,使用时电容的周围温度,施加的电压和时间等等。Thus, the Cl<sup>-</sup> ion is free again and repeats the corrosion of aluminum, The degree of this reaction depends on the volume of solvent, the ambient temperature of the capacitor in service, the applied voltage and time etc.

电容量 Capacitance:

电容器的电容量可通过测量他的阻抗来确定其交流电容量。其交流电容量依赖于频率、电压和测量方法。JIS C 5102规定一个串联等效电路(○—|—□—○)的串联电容分量,是在频率120HZ,交流电压0.5Vrms加直流偏置电压1.5-2.0V条件下测量出电容量。

The capacitance of capacitor is determined as AC capacitance by measuring methods, JIS C 5102prescribes that the series capacitive component of an equivalent series circuit (○—|—□—○) shall be considered as the capacitance by measuring it at a frequency of 120HZ and a maximum AC voltage of 0.5vrms with a DC bias voltage of 1.5 to 2.0V applied for aluminum electrolytic capacitors

铝电解电容器的电容量在测量频率增加时变小。如下图所示。The capacitance of an aluminum electrolytic capacitor shows smaller values as a measuring frequency increase, See the typical behavior shown below:

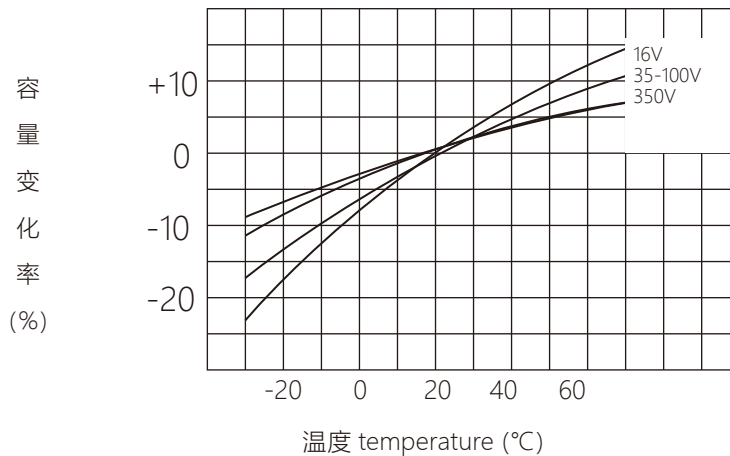


电容量与温度的关系 capacitance vs frequency

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测量的温度和频率一样同样影响电容量。当温度降低时电容量变小。如下图所示。Measuring temperature as well as frequency effects the capacitance, As the measuring temperature decreases. The capacitance shows smaller values. See the typical behavior shown below:

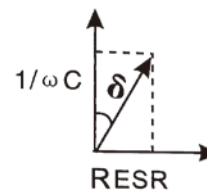
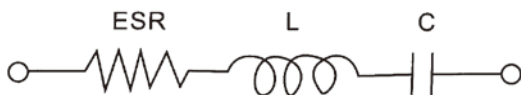


电容量与温度的关系 capacitance vs.temperature

另一方面, 直流电容量可以在施加一直流电压时来测量改变来确定, 在正常温度下它比交流电容量稍大, 而超过这个温度范围有较平的特性。On one hand,DC capacitance,which can be determined by measuring the change when a DC voltage is applied,shows a slightly larger value than the AC capacitance at a normal temperature and has the flatter characteristic over the temperature range.

Tanδ(损失角的正切或损失因子) :

Tanδ 是串联等效电路的电阻分量 (ESR) 与容抗分量 (1/ωc)之比, 它的测量条件与电容量测量相同。The Tanδ is the ratio of the resistive component(ESR)to the capacitive reactance(1/ωc)in the equivalent series circuit,and its measuring conditions are the same as the capacitance.



$$\text{Tan}\delta = \text{ESR} / (1/\omega c) = \omega c \cdot \text{ESR}$$

这里: ESR=串联等效电路在120Hz时的电阻

Where: ESR=equivalent series resistor at 120Hz

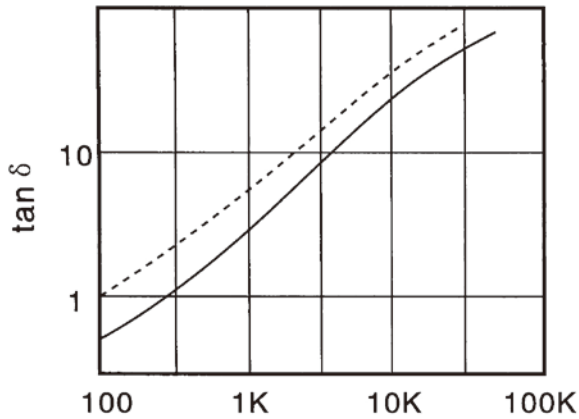
$$\omega = 2\pi f$$

$$f = 120\text{Hz}$$

Tanδ随测量频率的增加和测量温度的减少而变大,如下图所示: The Tanδ show higher values as a measuring frequency increase and a measuring temperature decreases, as follows

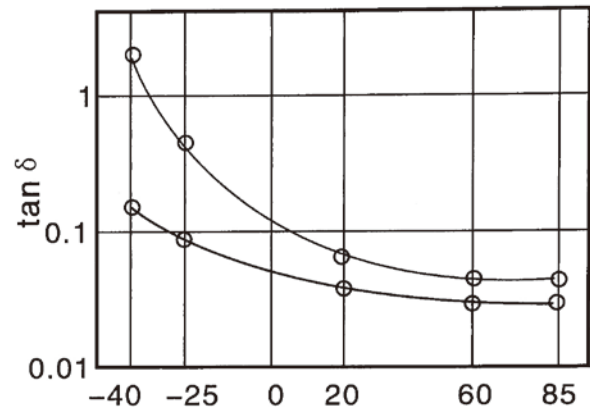
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频率 frequency (Hz)

Tanδ 与频率之间的关系 Tanδ vs frequency



温度 temperature (C)

Tanδ 的温度特性 temperature characteristics of Tanδ

等效串联电阻Equivalent Series Resistance (ESR)

ESR是由铝化膜、电解液、电解纸及其它受铝箔长度、面积等影响产生的电阻。ESR值依赖于温度。减小温度使电解液的电阻率增加: 结果是ESR增加。当测量频率增加, ESR减少并到达一个几乎恒定的值, 主要是由于电解液、电解纸独立于频率的电阻, The ESR is comprised of the resistance due to aluminum oxide layer, electrolyte, separator combination and other resistance effected with foil length, foil surface area, etc., the ESR value depends on the temperature. Decreasing the temperature makes the resistivity of the electrolyte increase with the result of the ESR increasing. As the measuring frequency increases, the ESR decreases and reaches an almost constant value that is mainly the frequency-independent resistance due to electrolyte/separator combination.

阻抗Impedance(z) :

阻抗是在一指定的频率下阻碍交变电流流动的阻力。The impedance is the resistance which oppose the flow of alternating current at a specific frequency.

它与由容(C)的容抗和电感(L)的感抗, 也和ESR有关。表达式如下。It is related capacitance(C) and inductance(L) in terms of capacitive and inductive reactance, and also related to the ESR. It is expressed as follows:

$$Z = \sqrt{ESR^2 + (XL - XC)^2}$$

while:  $Xc = 1/\omega C = 1/2\pi fC$

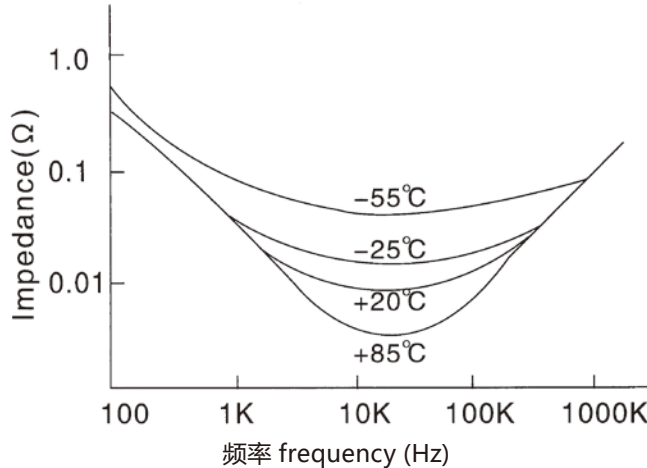
$XL = \omega L = 2\pi fL$

容抗(XC) 统治低频率范围, 阻抗随频率增加而减少, 直到达到中间的频率范围的ESR。在更高的频率的范围, 感抗成为统治者, 阻抗随频率增加而增加。As shown below, the capacitive reactance(XC) predominates at the range of low frequencies, and the impedance decreases with increasing frequency until it reaches the ESR in the middle frequency range. At the range of the higher frequencies the inductive reactance(XL) comes to predominate, so that the impedance increases with increasing the measuring frequency.

铝电解电容应用指南

Application Guidelines For Aluminum Electrolytic Capacitors

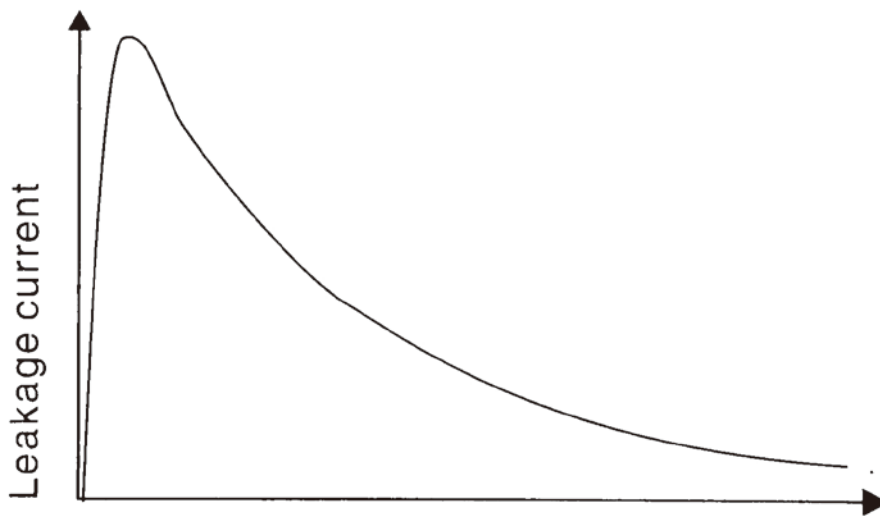
如下图所示,因为电解液的电导随温度而变化,阻抗也随温度而变化。As shown below , the impedance value varies with temperature, because the resistance of the electrolyte strongly changes with temperature.



典型的阻抗温度特性 temperature characteristics of impedance

漏电流 Leakage Current

电容器的绝缘有很高的电阻,阻止直流电流的流动。然而,由于铝氧化膜作为与电解液接触的绝缘体,有一个小的电流叫漏电流。当施加电压时电流修复和再化成氧化膜。如下图所示,当施加给电容器电压前几分钟,有较高的漏电流,然后漏电流随时间减小,并到达一个几乎稳当的值。The dielectric of a capacitor has a very high resistance which prevents the flow of DC current. However, due to the characteristics of the aluminum oxide layer that functions as a dielectric in contact with electrolyte, a



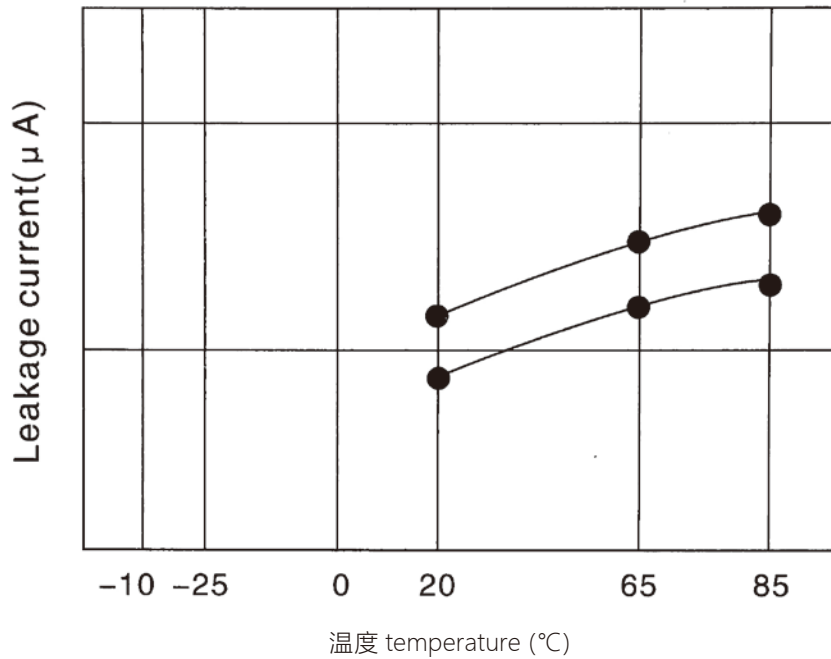
时间time (分minute)

漏电流和时时间的关系 leakage current vs.time

测量时的温度和电压影响漏电流。漏电流当温度和电压增大时变大。Measuring temperature and voltage effect the leakage current, The leakage current shows higher values as the temperature and voltage increase.

铝电解电容应用指南

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典型的温度特性 typical temperature characteristics

一般地,漏电流的测量是在20°C施加标准电压,与电容器连一个1000Ω的电阻,当电容器的电压到达额定电压几分钟后进行测量。本目录描述了测量温度和时间。In general,the leakage current is measured at 20°C by applying the rated voltage,which is applied through a resistor of 1,000 connected in series with series with the capacitor,and several minutes after the capacitor reached the rated voltage。The catalog prescribes the measuring temperature and time.

6. 电容器承受最大纹波电流侧向力他

Max ripple current(mA r.m.s)

$$I_{\sim} = \sqrt{\frac{(P_{有})_{\sim} \omega C}{\text{tag } \delta}}$$

$$(P_{有})_{\sim} = a \cdot A \cdot \Delta t$$

其中a:散热系数,一般可取a=2\*10<sup>-3</sup>

A:铝外壳尺寸, A≈π\*D\*H D:为外壳直径 (CM) H: 外壳本身的高度 (CM)

Δt:电容器在极限温度下的容许温升 (一般为5-10°C)

备注: 如产品的实际体积小于各系列的规定体积,则产品实际承受纹波电流I (实际) 的大小应在各系列I (规定) 的数值上乘以K值

即: I (实际) =K\*I (规定)

$$K = \sqrt{\frac{D_1 \cdot H_1}{D \cdot H}}$$

K值一般取0.8-0.9

D\*H: 为各系列电容表列的尺寸

D\*H1: 产品实际尺寸

7. 电容器使用频率

常规品电容器使用频率在10KHz以下,如频率超过10KHz,或线路上有较大的纹波电压或纹波电流,应选用高频低阻系列电容。

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8温度与寿命(Load life):

Expected Load life(预期高温负荷寿命):

if the capacitor's Max operating temperature is at 105 C(85°C) , then after applying capacitor's rated voltage(WV) of Lo hours at 105 °C(85 °C), the capacitor shall meet the requirements in detail specification.

$$Lx=Lo*B^{(10-Lx)/10}$$

Lx:实际温度下的预期寿命时间

Expected life period (hrs) at actual operating temperature

Lo:在期限温度下实际寿命时间

Expected life period(hrs) at maximum operating temperature allowed

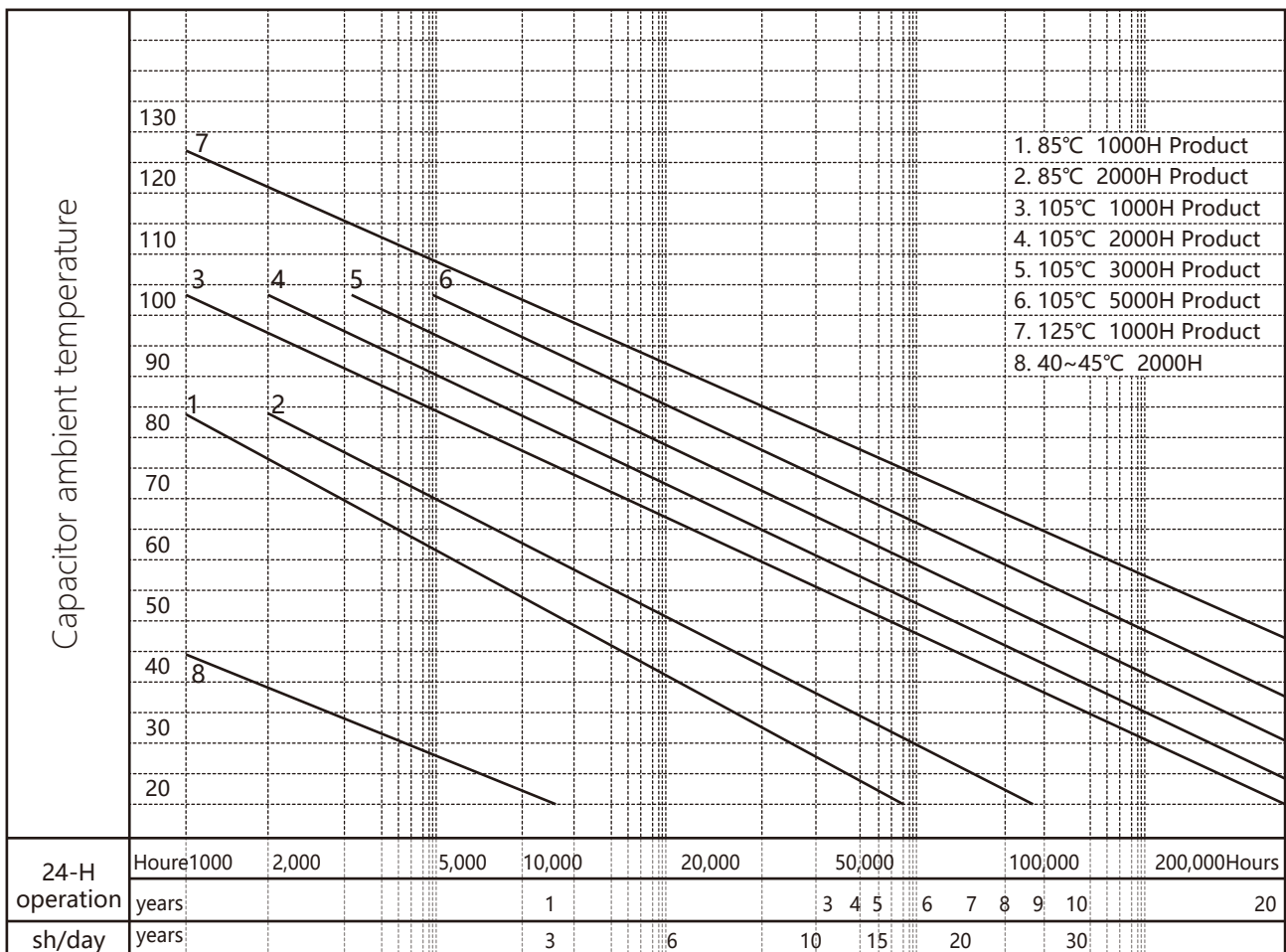
To:允许期限温度

Maximum operating temperature (°C)allowed

Tx: 实际环境温度Actual operating ambient temperature (°C)

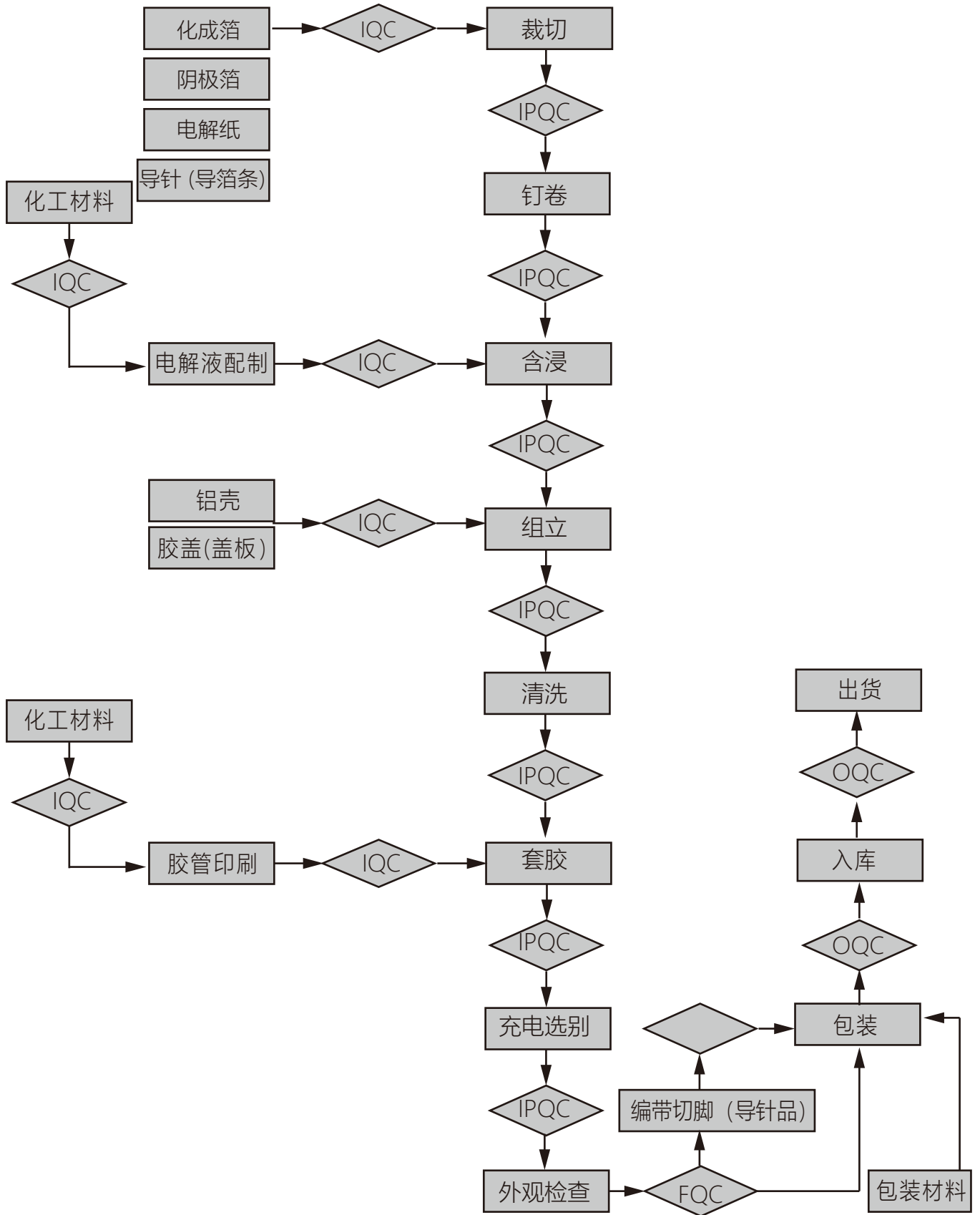
B:温度系数Accelerate Coefficient of temperature(°C)(=2)

寿命预期图 Life estimation chart



铝电解电容器生产流程图

Aluminum electrolytic capacitor production flow chart

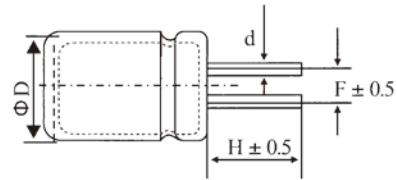


成型产品规格

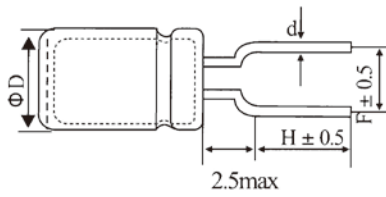
Lead Forming specification

引线成型和切脚

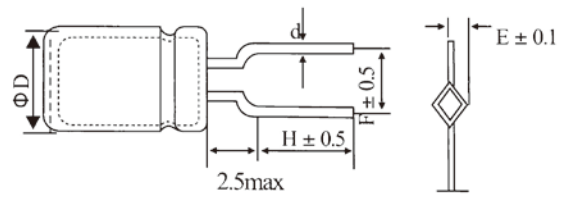
Diagram of Lead Cutting and Forming



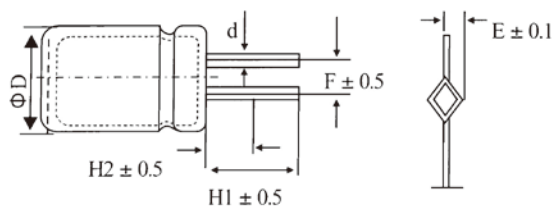
SHAPE(A)



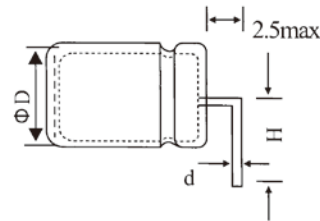
SHAPE(B)



SHAPE(C)



SHAPE(D)



SHAPE(E)

SPECIFICATION INFORMATION

Shape NO.	Cutting & Forming Methods	DØ	4Ø	5Ø	6.3Ø	8Ø	10Ø	12.5Ø	13Ø	16Ø	18Ø	18Ø
A	引线直切 Lead Cut Only	F	1.5	2.0	2.5	3.5	5.0	5.0	5.0	7.5	7.5	10.0
		H	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
		d	0.45	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.8	0.8
B	引线弯切脚成型 Lead Cut and Form	F	5.0	5.0	5.0	5.0	-	-	-	-	-	-
		H	4.0	5.0	5.0	5.0	-	-	-	-	-	-
		d	0.45	0.5	0.5	0.5	-	-	-	-	-	-
C	引线弯切脚“K”成型 Lead Cut, Crimp and Form	F	5.0	5.0	5.0	5.0	-	-	-	-	-	-
		H1	4.0	5.0	5.0	5.0	-	-	-	-	-	-
		H2	1.8	1.8	1.8	1.8	-	-	-	-	-	-
D	引线直切脚“K”成型 Lead Cut and Crimp	F	-	-	-	-	5.0	5.0	5.0	7.5	7.5	10
		H1	-	-	-	-	5.0	5.0	5.0	5.0	5.0	5.0
		H2	-	-	-	-	1.8	1.8	1.8	1.8	1.8	1.8
E	引线切脚折曲成型 Lead Cutting and Bending	F	1.5	2.0	2.5	3.5	-	-	-	-	-	-
		H	6.0	7.0	8.0	9.0	-	-	-	-	-	-
		d	0.45	0.5	0.5	0.5	-	-	-	-	-	-



自动插件的编带电容

Taping capacitors for automatic insertion

应用:  
Applications

Φ4 — Φ16规格电容用于自动化插件的电容编带成型  
These specifications include taped single-ended electrolytic capacitors with the body diameters from 4.0 to 16mm. suitable to be used in automatic lead preparation and insertion machines

说明:  
Description

编带见图1~6  
Body tape requirements are shown from Fig.1to Fig .6.  
电容器的两极按一个方向定向编带。  
Polarity of capacitors shall be oriented in one direction.  
备用电容编在最后。  
Leader tapes shall not be provided before the first and after the last capacitor on tape.  
在编带时允许有连续三个电容位空位，但总数量不变。  
Up to 3capacitor consecutively missing on tape is permitted but a designed quantity of capacitors shall be packed in each case.  
编带有缺陷的电容，请从纸带上剔除，或将产品移动到不超过纸带边2mm处。  
removal faulty capacitors from the tape shall be by pulling out or by cutting offleads. Cut off leads remaining on tape shall not protrude more than 2.0mm from tape edge.

编带尺寸  
Fig 1(Ø3- Ø8)

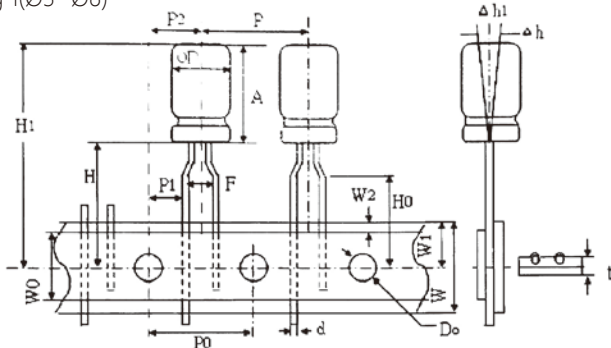


Fig 2(Ø3- Ø5)

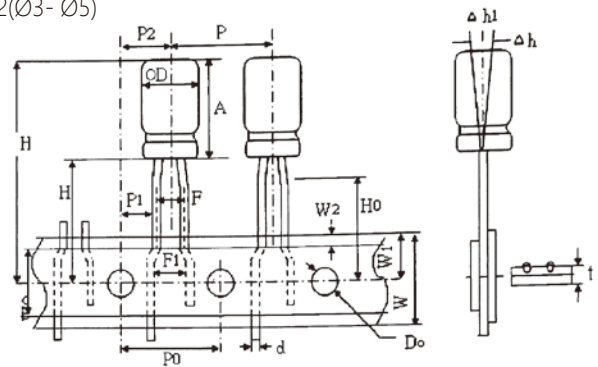


Fig 3(Ø5- Ø8)

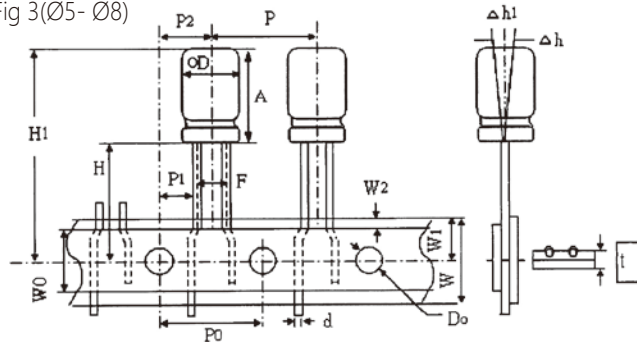


Fig 4(Ø10)

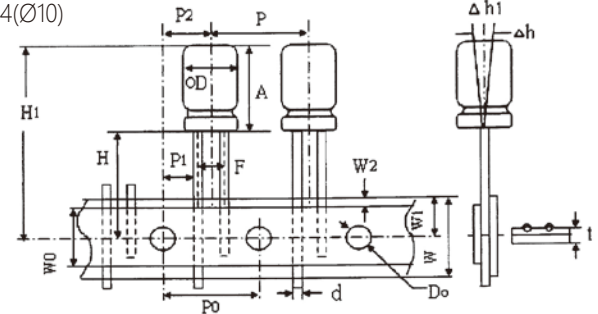


Fig 5(Ø12~13)

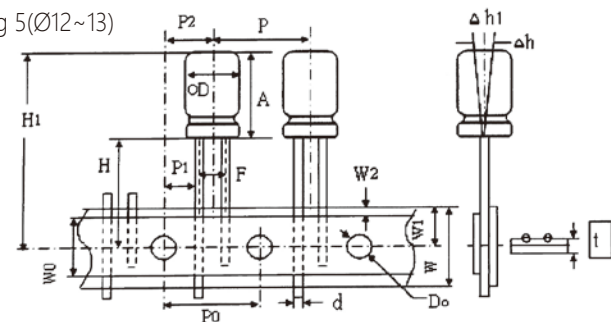
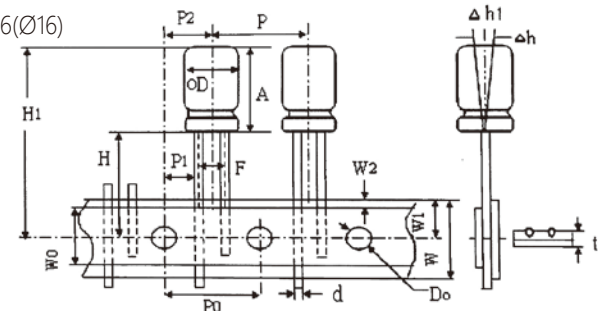


Fig 6(Ø16)



## 铝电解电容应用指南

### Application Guidelines For Aluminum Electrolytic Capacitors

#### 规格Dimensions

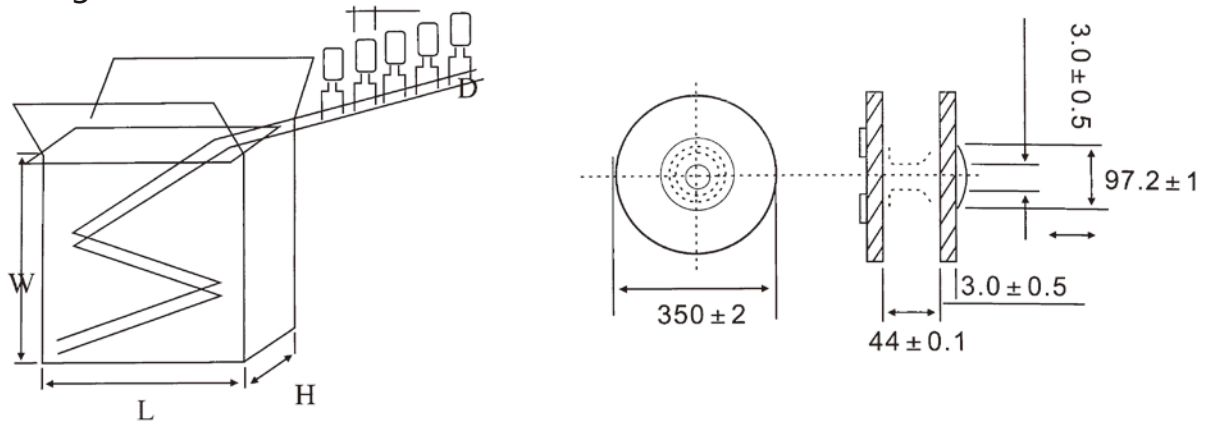
项目 Item	Symbol	尺寸 Case Size										Tolerance	Remark Page08	
		4×5	5×5	6.3×5	8×5	5×11	6.3×11	8×12	10×13	10×16	10×20			
		4×7	5×7	6.3×7	8×7									
线经 Lead Wire diameter	d	0.5	0.45				0.5			0.6			±0.6	
	0.5													
本体高度 Body height	A	8.5				12.5			15	18	23	MAX		
中心距 Intervals of bodies	P	12.7										±1.0		
纸孔距离 Intervals of punched holes	P0	12.7										±0.2		
送孔位置 Distance between holes and lead wire	P1	3.85										±0.7	Fig	
		5.35	5.10			5.10							Fig 2	
			5.35	5.10	5.10	5.35	5.10	5.10					Fig3	
送孔位置 Distance between holes and lead wire	P2	6.35										±1.0		
引线距离 Distance between lead and lead	F	5.00										+0.8 -0.2	Fig	
		2.5	2.5		2.5	2.5							Fig 2	
		2.0	2.0	2.5	$\frac{2.5}{3.5}$	2.0	2.5	3.5					Fig3	
纸幅 Base tape width	W	18.0										±0.5		
粘带幅 Adhesive tape width	W0	12.0										min		
送孔位置 Distance between holes and lead wire	W1	9.0										±0.5		
粘带位置 Deviation between adhesive and base tape	W2	1.5										max		
本体下边至纸空高度 Deviation between body bottom and tape center		17.5				19	20	18.5			±0.75	Fig		
		17.5				19	18.5					Fig		
引线高度 Lead wire clinched height	H0	16.0										±0.5		
本体下边至纸空高度 Deviation between body bottom and tape center	H1	27.5				32.5			33	36.0	41.0	max		
纸孔直径 Punched hole diameter	D0	4.0										±0.3		
引线伸出 Lead wire protusion	l	1.0										max		
厚度 Base and adhesive tape thickness	t	0.7										±0.3		
本体偏移 Deviation of body alignment	Δh	0										±0.2		
本体偏移 Deviation of body alignment	Δh1	0										±1.0		

铝电解电容应用指南

Application Guidelines For Aluminum Electrolytic Capacitors

Item	Symbol	Case Size							Tolerance	Remark
		12.5×21	13×21	13×25	13×30	16×26	16×32	16×36		
线径 Lead Wire diameter	d	0.6			1				±0.05	
本体高度 Body height	A	23.0	23.0	28.0	33.0	27.0	34.0	37.0	max	
中心距 Intervals of bodies	P	15.0			30.0				±1.0	Fig5.Fig6
纸孔距离 Intervals of punched holes	P0	15.0							±0.2	
送孔位置 Distance between holes and bodies	P1	5.0			4				±0.7	
送孔位置 Distance between holes and bodies	P2	7.5								
引线距离 Distance between lead and lead	F	5.0			7.5					
纸幅 Base tape width	W	18.0								
粘带幅 Adhesive tape width	W0	12.5								
送孔位置 Deviation between adhesive and base tape	W1	9.0								
粘带位置 Deviation between adhesive and base tape	W2	1.5								
本体下边至纸空高度 Deviation between body bottom and tape center	H									
本体下边至纸空高度 Deviation between body bottom and tape center	H1	41	41	46	51	47	54	57	max	
纸孔直径 Punched hole diameter	D0	4.0							±0.3	
引线伸出 Lead wire protrusion	l	1							max	
厚度 Base and adhesive tape thickness	t	1							±0.3	
本体偏移 Deviation of body alianment	Δh	0							±2.0	
本体偏移 Deviation of body alianment	Δh1	0							±1.0	

Packing information



ØD(mm)	W±5(mm)	L±5(mm)	H±5(mm)	Quantity(pcs)
4	267	336	48	2500
5	267	336	48	2000
6.3	267	336	48	1500
8	267	336	48	1000
10(L≤16)	235	330	55	600
10(L≤20)	235	330	55	600
12.5(L≤21)	275	320	65	400
13(L≤21)	275	320	65	400
13(L≤25)	275	320	65	400
13(L≤30)	275	320	65	400
16(L≤26)	275	320	65	250
16(L≤32)	275	320	65	250
16(L≤36)	275	320	70	250

ØD(mm)	Quantity(pcs)
4	1,800
5	1,200
6.3	1,000
8	800
10	600
13	400

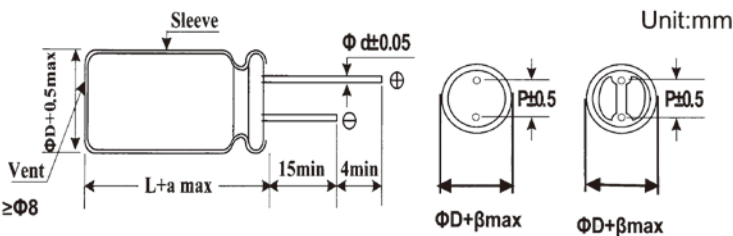
**RNK Series(2000h at +105°C, nonpolar 无极性)**

- 2000h at +105°C Nonpolar, high temperature 无极性, 耐高温
- Suit for use in polarity and change circuits 适用于极性转变和改变电路
- ◆SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能																											
Operating temperature range 温度范围	-40 to +105°C																											
Rated Working Voltage Range 电压范围	6.3 to 100V																											
Nominal Capacitance Range 容量范围	0.47 to 6800μF																											
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																											
Leakage Current 泄漏电流	I≤0.03CV or 3(μA) after 5 minutes application of rated working voltage at +20°C 两者取较大值, 5分钟测试																											
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.26</td> <td>0.24</td> <td>0.22</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> </tr> </table>	Working Voltage(V)	6.3	10	16	25	35	50	63	100	Tan δ(max)	0.26	0.24	0.22	0.20	0.16	0.14	0.12	0.10									
Working Voltage(V)	6.3	10	16	25	35	50	63	100																				
Tan δ(max)	0.26	0.24	0.22	0.20	0.16	0.14	0.12	0.10																				
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Working Voltage(V)	6.3	10	16	25	35	50	63	100	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	Z-40°C/Z+20°C	8	6	4	4	3	3	3	3
Working Voltage(V)	6.3	10	16	25	35	50	63	100																				
Z-25°C/Z+20°C	4	3	2	2	2	2	2	2																				
Z-40°C/Z+20°C	8	6	4	4	3	3	3	3																				
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 105°C(The polarity shall be reversed every 250 hrs.) the capacitors sheall meet he following requirements. 在105°C环境下施加额定电压2000小时后(每250小时极性应逆转), 电容符合以下标准: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值																					
Capacitance Change容量	Within ±20% of initial value 在初始值的±20%																											
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Leakage Current 泄露电流	initial specified value or less 不超过标准值																											
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 500 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置500小时后电性能同耐久性要求																											

◆CASE SIZE TABLE(外形尺寸)



ØD	5	6.3	8	10	13	16
P	2.0	2.5	3.5	5.0	5.0	7.5
Ød	0.5	0.5	0.5	0.6	0.6	0.8
a	(L<20)1.5 (L≥20)2.0					
β	(D<20)0.5 (D≥20)1.0					

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	50	120	300	1k	10k~
≤47		0.75	1.00	1.35	1.57	2.00
56~470		0.80	1.00	1.23	1.34	1.50
≥560		0.85	1.00	1.10	1.13	1.15

(2) Temperature Coefficient (温度系数)

Temperature (°C)	55	65	70	85	105
Factor	2.23	2.17	2.00	1.75	1.00

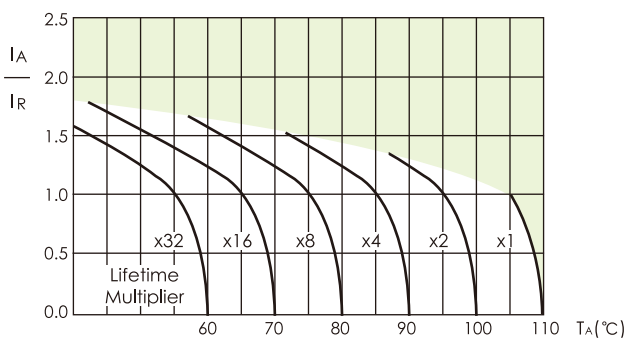
Ratings for RNK Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C,120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
6.3 (7.2)	33	9.7	45	5×11.5	
	47	6.8	54	5×11.5	
	100	3.2	90	6.3×11.5	
	220	1.5	150	8×11.5	
	330	0.97	185	8×11.5	
	470	0.68	260	10×12.5	
	1000	0.32	460	10×20	
	2200	0.16	820	12.5×25	
	3300	0.11	1110	16×25	
	4700	0.09	1430	16×31.5	
6800	0.07	1830	18×35.5		
10 (13)	22	15	37	5×11.5	
	33	9.7	45	5×11.5	
	47	6.8	54	5×11.5	
	100	3.2	90	6.3×11.5	
	220	1.5	150	8×11.5	
	330	0.97	240	10×16	
	470	0.68	290	10×16	
	1000	0.32	510	12.5×20	
	2200	0.16	910	16×25	
	3300	0.11	1200	16×31.5	
4700	0.09	1520	18×35.5		
16 (20)	10	27	27	5×11.5	
	22	12	40	5×11.5	
	33	8.0	49	5×11.5	
	47	5.7	67	6.3×11.5	
	100	2.7	110	8×11.5	
	220	1.2	195	10×12.5	
	330	0.80	265	10×16	
	470	0.57	345	10×20	
	1000	0.27	605	12.5×25	
	2200	0.13	1070	16×31.5	
3300	0.10	1400	18×35.5		
25 (32)	10	27	27	5×11.5	
	22	12	46	6.3×11.5	
	33	8.0	56	6.3×11.5	
	47	5.7	67	6.3×11.5	
	100	2.7	110	8×11.5	
	220	1.2	215	10×16	
	330	0.80	320	12.5×20	
	470	0.57	380	12.5×20	
	1000	0.27	670	16×25	
	2200	0.13	1140	18×35.5	
35 (44)	4.7	45	21	5×11.5	
	10	21	30	5×11.5	
	22	9.7	51	6.3×11.5	
	33	6.4	72	8×11.5	
	47	4.5	86	8×11.5	
	100	2.1	160	10×12.5	
	220	0.97	290	10×20	
	330	0.64	350	12.5×25	
	470	0.45	465	16×25	
	1000	0.21	805	16×31.5	

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C,120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)		
50 (63)	0.47	395	7	5×11.5		
	1	186	10	5×11.5		
	2.2	84	15	5×11.5		
	3.3	56	18	5×11.5		
	4.7	40	22	5×11.5		
	10	19	37	6.3×11.5		
	22	8.4	63	8×11.5		
	33	5.6	77	8×11.5		
	47	4.0	105	10×12.5		
	100	1.9	190	10×20		
	220	0.84	340	12.5×25		
	330	0.56	460	16×25		
	470	0.40	590	16×31.5		
	63 (79)	3.3	48	20	5×11.5	
		4.7	34	24	6.3×11.5	
10		16	40	6.3×11.5		
22		7.2	68	8×11.5		
33		4.8	98	10×12.5		
47		3.4	130	10×16		
100		1.6	225	12.5×20		
220		0.72	405	16×25		
330		0.48	535	16×31.5		
470		0.34	680	18×35.5		
100 (125)		0.47	282	8	5×11.5	
		1	133	12	5×11.5	
		2.2	60	20	6.3×11.5	
		3.3	40	25	6.3×11.5	
		4.7	28	30	6.3×11.5	
	10	13	50	8×11.5		
	22	6.0	97	10×16		
	33	4.0	140	12.5×20		
	47	2.8	170	12.5×20		
	100	1.3	300	16×25		
	220	0.60	510	18×35.5		

Customer products are available on request.

Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

**RKM Series +105°C (标准品)**

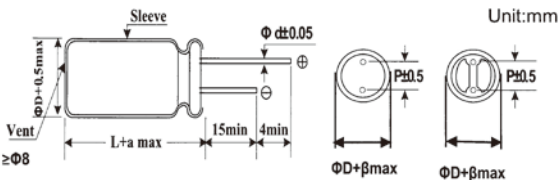
- For general purpose, -40°C to +105°C. 应用条件, -40°C +105°C 2000H
- This series is for communication equipments, swiching power supply, industrial measuring instruments, etc. 适用于通讯设备, 信号电源, 工业测量仪器等。



◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能									
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C								
Rated Working Voltage Range 电压范围	6.3 to 100V	160 to 500V								
Nominal Capacitance Range 容量范围	0.1 to 15000μF									
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)									
Leakage Current 泄漏电流	I≤0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试	I≤0.03CV or 3(μA) after 2 minutes application of rated working vlotage at +20°C 两者取较大值, 2分钟测试								
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V) 6.3 10 16 25 35 50 63 100 160~250 350~500									
	Tan δ(max) 0.26 0.22 0.18 0.16 0.1 0.12 0.10 0.08 0.20 0.24									
Capacitance > 1000μF, add 0.02 per another 1000μF, 容量大于1000μF每增加1000μF损耗角增加0.02。										
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz									
	Working Voltage(V) 6.3 10 16 25 35 50 63 100									
	Z-25°C/Z+20°C 4 3 2 2 2 2 2 2									
	Z-40°C/Z+20°C 8 6 4 4 3 3 3 3									
Working Voltage(V) 160 200 250 350 400 420 450 500										
Z-25°C/Z+20°C 3 3 4 4 6 6 6 6										
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 105°C(The polarity shall be reversed every 250 hrs.) the capacitors sheall meet he following requirements. 在105°C环境下施加额定电压2000小时后(每250小时极性应逆转), 电容符合以下标准:									
	Capacitance Change 容量		Within ±20% of initial value 在初始值的±20%							
	Dissipation Factor 损耗角		Not more than 200% of the specified value 不超过标准值的200%							
Leakage Current 泄露电流		initial specified value or less 标准值内								
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求									

◆CASE SIZE TABLE(外形尺寸)



ØD	5	6.3	8	10	12.5	16	18	22
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	7.5
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
a	(L<20)1.5		(L≥20)2.0					
β	(D<20)0.5		(D≥20)1.0					

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

Rated Voltage(V)	cap(μf)	freq. (Hz)				
		50	120	300	1k	10k~
6.3~100	≤47	0.75	1.00	1.35	1.57	2.00
	56~470	0.80	1.00	1.23	1.34	1.50
	≥560	0.85	1.00	1.10	1.13	1.15
160~500	0.47~220	0.80	1.00	1.25	1.40	1.60
	>220	0.90	1.00	1.10	1.13	1.15

(2) Temperature Coefficient (温度系数)

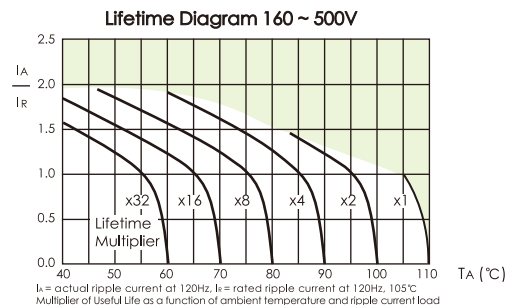
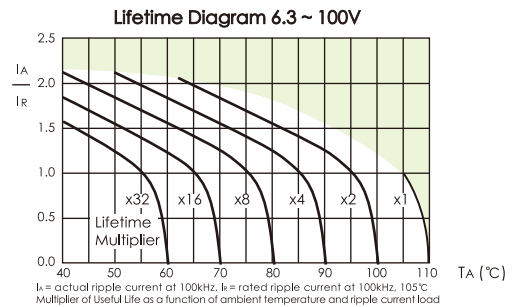
Temperature (°C)	-40	40	70	85	105
Factor	2.23	2.17	2.00	1.8	1.00

Ratings for RKM Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	
6.3 (7.2)	33	8.8	2.5	105	5×11.5	
	47	6.2	1.5	120	5×11.5	
	100	2.9	1.2	130	5×11.5	
	220	1.3	0.87	180	6.3×11.5	
	330	0.9	0.58	220	6.3×11.5	
	470	0.6	0.39	315	8×11.5	
	1000	0.29	0.23	500	10×12.5	
	2200	0.14	0.095	765	10×20	
	3300	0.105	0.09	1050	12.5×20	
	4700	0.079	0.061	1670	16×25	
	6800	0.062	0.056	1740	16×25	
	10000	0.053	0.045	2110	16×31.5	
	15000	0.044	0.036	2580	18×35.5	
	10 (13)	22	11.5	2.5	92	5×11.5
33		7.6	1.9	105	5×11.5	
47		5.4	1.5	120	5×11.5	
100		2.5	1.2	130	5×11.5	
220		1.1	0.58	220	6.3×11.5	
330		0.76	0.47	265	8×11.5	
470		0.54	0.39	315	8×11.5	
1000		0.25	0.18	615	10×16	
2200		0.13	0.09	1050	12.5×20	
3300		0.09	0.068	1300	12.5×25	
4700		0.07	0.056	1740	16×25	
6800		0.06	0.045	2110	16×31.5	
10000		0.05	0.036	2580	18×35.5	
16 (20)		10	21.2	2.5	92	5×11.5
	22	9.7	1.9	105	5×11.5	
	33	6.4	1.5	120	5×11.5	
	47	4.5	1.2	130	5×11.5	
	100	2.1	0.58	220	6.3×11.5	
	220	0.97	0.47	290	8×11.5	
	330	0.64	0.39	315	8×11.5	
	470	0.45	0.23	500	10×12.5	
	1000	0.21	0.12	825	10×20	
	2200	0.11	0.068	1300	12.5×25	
	3300	0.08	0.056	1740	16×25	
	4700	0.06	0.045	2110	16×31.5	
	6800	0.05	0.036	2580	18×35.5	
	25 (32)	4.7	39.5	3	85	5×11.5
10		18.6	2.5	92	5×11.5	
22		8.4	1.9	105	5×11.5	
33		5.6	1.5	120	5×11.5	
47		4.0	1.2	130	5×11.5	
100		1.9	0.58	220	6.3×11.5	
220		0.84	0.39	315	8×11.5	
330		0.56	0.23	500	10×12.5	
470		0.40	0.18	615	10×16	
1000		0.19	0.09	1050	12.5×20	
2200		0.10	0.056	1740	16×25	
3300		0.07	0.045	2110	16×31.5	
4700		0.06	0.036	2580	18×35.5	
35 (44)		4.7	33.9	2.5	92	5×11.5
	10	15.9	1.8	105	5×11.5	
	22	7.2	1.5	120	5×11.5	
	33	4.8	1.5	130	5×11.5	
	47	3.4	0.58	220	6.3×11.5	
	100	1.6	0.39	315	8×11.5	
	220	0.72	0.23	500	10×12.5	
	330	0.48	0.18	615	10×16	
	470	0.34	0.12	825	10×20	
	1000	0.16	0.068	1300	12.5×25	
	2200	0.08	0.045	2110	16×31.5	
	3300	0.06	0.036	2580	18×35.5	

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)		
50 (63)	0.1	1327	18	10	5×11.5		
	0.22	603	13	15	5×11.5		
	0.33	402	10	18	5×11.5		
	0.47	282	7	23	5×11.5		
	1	133	4.9	35	5×11.5		
	2.2	60	4.2	53	5×11.5		
	3.3	40	3.9	65	5×11.5		
	4.7	28	3.6	82	5×11.5		
	10	13	2.7	100	5×11.5		
	22	6	1.9	125	5×11.5		
	33	4	1.1	195	6.3×11.5		
	47	2.8	0.9	245	6.3×11.5		
	100	1.3	0.5	385	8×11.5		
	220	0.60	0.27	505	10×16		
	330	0.40	0.18	675	10×20		
	470	0.28	0.12	895	12.5×20		
	1000	0.13	0.076	1495	16×25		
	63 (79)	2200	0.07	0.05	2190	18×35.5	
4.7		25	5.8	74	5×11.5		
10		12	3.6	95	5×11.5		
22		5	2.1	130	6.3×11.5		
33		4	1.7	160	6.3×11.5		
47		2.5	1.2	305	8×11.5		
100		1.2	0.65	395	10×12.5		
220		0.54	0.32	505	10×20		
330		0.36	0.22	660	12.5×20		
470		0.25	0.16	850	12.5×25		
1000		0.12	0.098	1430	16×31.5		
100 (125)		0.47	226	13	30	5×11.5	
		1	106	11	45	5×11.5	
		2.2	48	9.2	60	5×11.5	
		3.3	32	7.2	67	5×11.5	
		4.7	23	6.3	75	5×11.5	
		10	11	3.3	110	6.3×11.5	
		22	5	1.4	165	8×11.5	
	33	3.2	0.94	305	10×12.5		
	47	2.3	0.68	320	10×16		
	100	1.1	0.28	585	12.5×20		
	220	0.48	0.16	1120	16×25		
	330	0.32	0.13	1290	16×25		
	470	0.23	0.11	1350	16×31.5		

Lifetime Diagram



Ratings for RKM Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA rms)	(mm)	
160 (200)	0.47	423.5	12	6.3×11.5	
	1	199.0	18	6.3×11.5	
	2.2	90.5	26	6.3×11.5	
	3.3	60.3	37	8×11.5	
	4.7	42.3	44	8×11.5	
	10	19.9	75	10×12.5	
	22	9.0	135	10×16	
	33	6.0	175	10×20	
	47	4.2	230	12.5×20	
	100	2.0	330	16×25.5	
200 (250)	0.47	423.5	12	6.3×11.5	
	1	199.0	18	6.3×11.5	
	2.2	90.5	26	6.3×11.5	
	3.3	60.3	37	8×11.5	
	4.7	42.3	50	10×12.5	
	10	19.9	80	10×16	
	22	9.0	135	10×20	
	33	6.0	190	12.5×20	
	47	4.0	230	12.5×25	
	100	2.0	360	16×25.5	
250 (300)	0.47	423.5	12	6.3×11.5	
	1	199.0	18	6.3×11.5	
	2.2	90.5	30	8×11.5	
	3.3	60.3	43	8×11.5	
	4.7	42.3	50	10×12.5	
	10	19.9	90	10×16	
	22	9.0	155	12.5×20	
	33	6.0	190	12.5×25	
	47	4.2	225	16×25.5	
	100	2.0	340	16×31.5	
350 (400)	0.47	564.6	11	6.3×11.5	
	1	265.4	18	8×11.5	
	2.2	120.6	30	10×12.5	
	3.3	80.4	36	10×12.5	
	4.7	56.5	47	10×16	
	10	26.5	95	10×20	
	22	12.1	130	12.5×20	
	33	8.0	180	12.5×25	
	47	5.6	330	16×25.5	
	100	2.7	620	18×31.5	
400 (450)	1	265.4	18	8×11.5	
	2.2	120.6	25	8×11.5	
	3.3	120.6	30	10×12.5	
		80.4	35	10×12.5	
	4.7	80.4	40	10×16	
		56.5	47	10×12.5	
	10	56.5	52	10×16	
		26.5	80	10×16	
	22	26.5	95	10×20	
		12.1	150	12.5×20	
33	8.0	180	12.5×25		
	8.0	180	16×20		
47	8.0	215	16×25.5		
	5.6	360	16×25.5		
68	3.9	470	18×25.5		
82	3.2	575	18×31.5		
100	2.7	675	18×36		
120	2.2	735	18×40		
150	1.8	825	20×41		
420 (470)	1	265.4	16	8×11.5	
	2.2	265.4	19	10×12.5	
		120.6	24	8×11.5	
		120.6	29	10×12.5	
	3.3	80.4	34	10×12.5	
		80.4	38	10×16	
4.7	56.5	46	10×16		
	56.5	52	10×20		

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA rms)	(mm)	
420 (470)	10	26.5	100	10×20	
		26.5	116	12.5×20	
	22	12.1	162	12.5×25	
		8.0	204	16×20	
	33	8.0	228	16×25.5	
		5.6	380	16×31.5	
	47	4.7	420	16×31.5	
		4.7	420	18×25.5	
	68	3.9	542	18×31.5	
		3.9	542	16×36	
82	3.2	608	18×31.5		
	3.2	608	16×40		
	2.7	713	18×36		
	2.7	713	16×45		
120	2.2	779	18×40		
	2.2	779	16×50		
	1.8	874	20×41		
	1.8	874	16×60		
450 (500)	1	265.4	16	8×11.5	
		265.4	19	10×12.5	
	2.2	120.6	26	10×12.5	
		120.6	29	10×16	
	3.3	80.4	38	10×16	
		80.4	42	10×20	
	4.7	56.5	49	10×16	
		56.5	54	10×20	
	10	26.5	122	10×20	
		26.5	122	12.5×20	
22	12.1	170	12.5×25		
	8.0	240	16×25.5		
47	5.6	400	16×31.5		
	4.7	440	18×25.5		
56	4.7	440	16×31.5		
	3.9	570	18×31.5		
68	3.9	570	16×36		
	3.2	640	18×31.5		
82	3.2	640	18×36		
	3.2	640	16×40		
100	2.7	750	18×36		
	2.7	750	16×45		
120	2.2	820	18×40		
	2.2	820	16×50		
150	1.8	920	18×46		
	1.8	920	20×41		
180	1.8	920	16×60		
	1.5	1100	22×41		
500 (550)	1	265.4	21	10×12.5	
	2.2	120.6	35	10×16	
	3.3	80.4	48	10×20	
	4.7	56.5	63	12.5×20	
	10	26.5	120	12.5×25	
	22	12.1	180	16×25.5	
	33	8.0	240	16×31.5	
	47	5.6	405	18×31.5	
	56	4.7	450	16×40	
		4.7	450	18×31.5	
68	3.9	560	18×36		
	3.9	560	18×40		
82	3.9	560	16×45		
	3.2	640	16×55		
100	3.2	640	18×40		
	2.7	800	20×41		
120	2.7	800	18×46		
	2.7	800	16×60		
150	2.2	840	22×45		
	1.8	890	22×45		

Customer products are available on request.



**RKC Series Long Life Assurance(长寿命), High Righ Current(高纹波)**

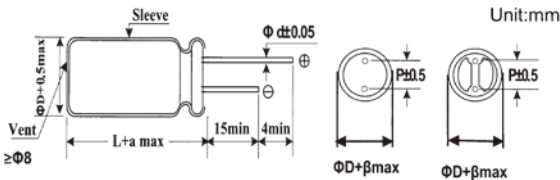
- High ripple current at high frequency, Load Life of 3000~5000 Hours at 105°C.  
高频率高纹波电流, 寿命105°C 3000~5000小时
- For electronic ballast, Power supply input circuit  
适用于电子镇流器, 电源输入电路。



◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能												
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C											
Rated Working Voltage Range 电压范围	6.3 to 100V	160 to 500V											
Nominal Capacitance Range 容量范围	0.1 to 15000µF												
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)												
Leakage Current 泄漏电流	≤0.01CV or 3(µA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试	≤0.03CV max afre 2miuntes at +20°C 2分钟测试											
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	6.3 10 16 25 35 50 63 100 160~250 400~500											
	Tan δ(max)	0.22 0.19 0.16 0.14 0.12 0.10 0.09 0.08 0.15 0.20											
Capacitance > 1000µF, add 0.02per another1000µF, 容量大于1000µF每增加1000µF损耗角增加0.02。													
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz												
	Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	400	450	500
	Z-25°C/Z+20°C	4	3	3	3	3	3	3	2	3	5	6	6
Z-40°C/Z+20°C	8	6	4	4	3	3	3	3	-	-	-	-	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 3000~5000 hours at 105°C The capacitors shall meet the following requirements.在105°C环境下施加额定电压3000~5000小时后符合以下标准:												
	Capacitance Change容量	Within ±20% of initial value 在初始值的±35%											
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%											
	Leakage Current 泄露电流	initial specified value or less 标准值内											
	Life Time: 试验时间												
∅D (mm)	5~6.3	8~10	>12.5										
Life(H)	5000	8000	10000										
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求												
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%											
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%											
	Leakage Current 泄露电流	initial specified value or less 标准值内											

◆CASE SIZE TABLE(外形尺寸)



∅D	5	6.3	8	10	12.5	16	18	22
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
∅d	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
a	(L<20)1.5		(L≥20)2.0					
β	(D<20)0.5		(D≥20)1.0					

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(µf) \ freq. (Hz)	120	1k	10k	100k
1~5.6	0.20	0.4	0.9	1.00
6.8~180	0.40	0.75	0.90	1.00
220~560	0.50	0.85	0.94	1.00
680~1800	0.60	0.87	0.95	1.00
2200~3900	0.75	0.90	0.95	1.00
4700~15000	0.85	0.95	0.98	1.00

(2) Tmperature Coefficient (温度系数)

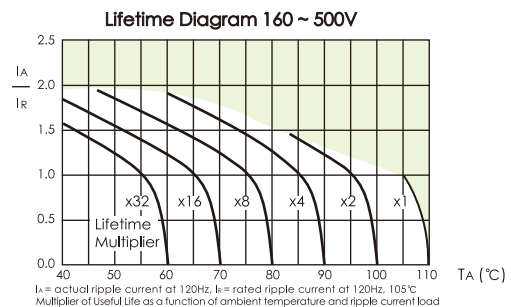
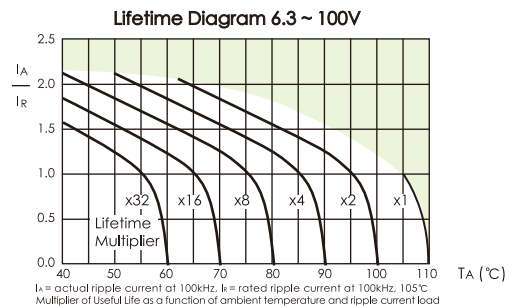
Temperature (°C)	-55	60	70	85	105
Factor	2.33	2.17	2.00	1.75	1.00

Ratings for RKC Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
6.3 (7.2)	33	8.8	2.5	105	5×11.5	
	47	6.2	1.5	120	5×11.5	
	100	2.9	1.2	130	5×11.5	
	220	1.3	0.87	180	6.3×11.5	
	330	0.9	0.58	220	6.3×11.5	
	470	0.6	0.39	315	8×11.5	
	1000	0.29	0.23	500	10×12.5	
	2200	0.14	0.095	765	10×20	
	3300	0.105	0.09	1050	12.5×20	
	4700	0.079	0.061	1670	16×25	
	6800	0.062	0.056	1740	16×25	
	10000	0.053	0.045	2110	16×31.5	
	15000	0.044	0.036	2580	18×35.5	
10 (13)	22	11.5	2.5	92	5×11.5	
	33	7.6	1.9	105	5×11.5	
	47	5.4	1.5	120	5×11.5	
	100	2.5	1.2	130	5×11.5	
	220	1.1	0.58	220	6.3×11.5	
	330	0.76	0.47	265	8×11.5	
	470	0.54	0.39	315	8×11.5	
	1000	0.25	0.18	615	10×16	
	2200	0.13	0.09	1050	12.5×20	
	3300	0.09	0.068	1300	12.5×25	
	4700	0.07	0.056	1740	16×25	
	6800	0.06	0.045	2110	16×31.5	
	10000	0.05	0.036	2580	18×35.5	
16 (20)	10	21.2	2.5	92	5×11.5	
	22	9.7	1.9	105	5×11.5	
	33	6.4	1.5	120	5×11.5	
	47	4.5	1.2	130	5×11.5	
	100	2.1	0.58	220	6.3×11.5	
	220	0.97	0.47	290	8×11.5	
	330	0.64	0.39	315	8×11.5	
	470	0.45	0.23	500	10×12.5	
	1000	0.21	0.12	825	10×20	
	2200	0.11	0.068	1300	12.5×25	
	3300	0.08	0.056	1740	16×25	
	4700	0.06	0.045	2110	16×31.5	
	6800	0.05	0.036	2580	18×35.5	
25 (32)	4.7	39.5	3	85	5×11.5	
	10	18.6	2.5	92	5×11.5	
	22	8.4	1.9	105	5×11.5	
	33	5.6	1.5	120	5×11.5	
	47	4.0	1.2	130	5×11.5	
	100	1.9	0.58	220	6.3×11.5	
	220	0.84	0.39	315	8×11.5	
	330	0.56	0.23	500	10×12.5	
	470	0.40	0.18	615	10×16	
	1000	0.19	0.09	1050	12.5×20	
	2200	0.10	0.056	1740	16×25	
	3300	0.07	0.045	2110	16×31.5	
	4700	0.06	0.036	2580	18×35.5	
35 (44)	4.7	33.9	2.5	92	5×11.5	
	10	15.9	1.8	105	5×11.5	
	22	7.2	1.5	120	5×11.5	
	33	4.8	1.5	130	5×11.5	
	47	3.4	0.58	220	6.3×11.5	
	100	1.6	0.39	315	8×11.5	
	220	0.72	0.23	500	10×12.5	
	330	0.48	0.18	615	10×16	
	470	0.34	0.12	825	10×20	
	1000	0.16	0.068	1300	12.5×25	
	2200	0.08	0.045	2110	16×31.5	
	3300	0.06	0.036	2580	18×35.5	

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
50 (63)	0.1	1327	18	10	5×11.5	
	0.22	603	13	15	5×11.5	
	0.33	402	10	18	5×11.5	
	0.47	282	7	23	5×11.5	
	1	133	4.9	35	5×11.5	
	2.2	60	4.2	53	5×11.5	
	3.3	40	3.9	65	5×11.5	
	4.7	28	3.6	82	5×11.5	
	10	13	2.7	100	5×11.5	
	22	6	1.9	125	5×11.5	
	33	4	1.1	195	6.3×11.5	
	47	2.8	0.9	245	6.3×11.5	
	100	1.3	0.5	385	8×11.5	
	220	0.60	0.27	505	10×16	
	330	0.40	0.18	675	10×20	
	470	0.28	0.12	895	12.5×20	
	1000	0.13	0.076	1495	16×25	
2200	0.07	0.05	2190	18×35.5		
63 (79)	4.7	25	5.8	74	5×11.5	
	10	12	3.6	95	5×11.5	
	22	5	2.1	130	6.3×11.5	
	33	4	1.7	160	6.3×11.5	
	47	2.5	1.2	305	8×11.5	
	100	1.2	0.65	395	10×12.5	
	220	0.54	0.32	505	10×20	
	330	0.36	0.22	660	12.5×20	
	470	0.25	0.16	850	12.5×25	
	1000	0.12	0.098	1430	16×31.5	
	4.7	226	13	30	5×11.5	
	1	106	11	45	5×11.5	
	2.2	48	9.2	60	5×11.5	
3.3	32	7.2	67	5×11.5		
4.7	23	6.3	75	5×11.5		
10	11	3.3	110	6.3×11.5		
22	5	1.4	165	8×11.5		
33	3.2	0.94	305	10×12.5		
47	2.3	0.68	320	10×16		
100	1.1	0.28	585	12.5×20		
220	0.48	0.16	1120	16×25		
330	0.32	0.13	1290	16×25		
470	0.23	0.11	1350	16×31.5		

Lifetime Diagram



Ratings for RKC Series

U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	
160 (200)	10	15.9	5.3	95	10×12.5	
	22	7.2	2.4	145	10×16	
	33	4.8	1.6	190	10×20	
	47	3.4	1.1	280	12.5×20	
	100	1.6	0.5	380	18×20	
	220	0.7	0.2	630	16×35.5	
200 (250)	4.7	33.9	11.2	60	10×12.5	
	10	15.9	5.3	95	10×16	
	22	7.2	2.4	145	10×20	
	33	4.8	1.6	190	12.5×20	
	47	3.4	1.1	280	12.5×25	
	100	1.6	0.5	410	16×25.5	
250 (300)	4.7	33.9	11.2	60	10×12.5	
	10	15.9	5.3	105	10×16	
	22	7.2	2.4	180	12.5×20	
	33	4.8	1.6	250	12.5×25	
	47	3.4	1.1	300	16×25.5	
	100	1.6	0.5	410	18×25.5	
350 (400)	3.3	60.3	19.9	50	8×11.5	
	4.7	42.3	14	65	10×16	
	10	19.9	6.6	120	10×20	
	22	9	3	180	12.5×20	
	33	6	2	210	12.5×25	
	47	4.2	1.4	350	16×25.5	
400 (450)	4.7	42.3	14	350	18×20	
	100	2	0.7	650	18×31.5	
	2.2	90.5	29.9	40	10×12.5	
	3.3	60.3	19.9	43	10×12.5	
	4.7	42.3	14	64	10×16	
	10	19.9	6.3	100	10×20	
	22	9	3	200	12.5×25	
	33	6	2	245	18×20	
	47	4.2	1.4	365	16×25.5	
	68	2.9	1	500	18×25.5	
	82	2.4	0.8	610	18×31.5	
	420 (470)	100	2	0.7	700	18×36
120		1.7	0.6	785	18×40	
150		1.3	0.4	840	20×41	
1		265.4	87.6	23	10×12.5	
2.2		120.6	40	33	10×12.5	
3.3		80.4	26.5	40	10×16	
4.7		56.5	18.6	54	10×16	
10		26.5	8.8	95	10×20	
22		12.1	4	170	12.5×25	
33		8	2.7	230	16×25.5	
47		5.6	2.3	350	16×31.5	
56		4.7	1.9	425	16×31.5	
68		3.9	1.6	510	18×31.5	
82		3.2	1.3	625	18×31.5	
100		2.7	1.1	720	18×36	
120		2.2	0.9	800	16×45	
150		1.8	0.7	850	16×50	
450 (500)		1	265.4	87.6	30	10×12.5
	2.2	120.6	39.8	36	10×12.5	
	3.3	80.4	26.5	50	10×16	
	4.7	56.5	18.6	65	10×20	
	10	26.5	8.8	95	10×20	
	22	12.1	4	170	12.5×25	

U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)		
450 (500)	10	26.5	8.8	110	12.5×20		
	22	12.1	4	175	12.5×25		
	33	8	2.7	245	16×25.5		
	47	5.6	1.9	280	16×31.5		
	56	4.7	1.7	420	16×31.5		
	68	3.9	1.3	450	18×25.5		
	82	3.2	1.1	590	18×31.5		
	100	2.7	0.9	650	16×36		
	120	2.2	0.7	760	16×45		
	150	1.8	0.6	830	18×40		
	180	1.5	0.5	920	16×50		
	500 (550)	1	265.4	106.2	32	10×12.5	
		2.2	120.6	48.3	49	10×16	
		3.3	80.4	32.2	68	10×20	
		4.7	56.5	22.6	84	12.5×20	
		10	26.5	10.6	145	12.5×25	
		22	12.1	4.8	230	16×25.5	
		33	8	3.2	295	16×31.5	
47		5.6	2.3	415	18×31.5		
56		4.7	1.9	460	16×36		
68		3.9	1.6	580	18×31.5		
82		3.2	1.3	650	18×40		
100		2.7	1.1	820	16×45		
120		2.2	0.9	860	18×40		
150		1.8	0.7	930	16×60		

Customer products are available on request.

**RKH Series Long Life Assurance(长寿命) , High Righ Current(高纹波)**

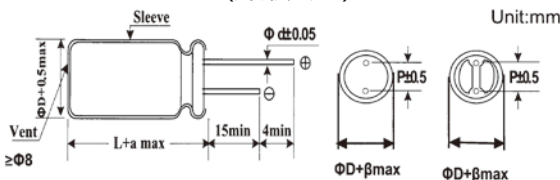
- High ripple current at high frequency, Load Life of 5000~10000 Hours at 105°C.  
高频率高纹波电流, 寿命105°C ~10000小时
- For electronic ballast, Power supply input circuit  
适用于电子镇流器, 电源输入电路。



◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能										
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C									
Rated Working Voltage Range 电压范围	6.3 to 100V	160 to 500V									
Nominal Capacitance Range 容量范围	0.1 to 15000μF										
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)										
Leakage Current 泄漏电流	l≤0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试	l≤0.03CV max after 2miuntes at +20°C 2分钟测试									
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V) 6.3 10 16 25 35 50 63 100 160~250 400~500										
	Tan δ(max) 0.22 0.19 0.16 0.12 0.12 0.10 0.09 0.08 0.15 0.20										
	Capacitance>1000μF,add 0.02per another1000μF,容量大于1000μF每增加1000μF损耗角增加0.02。										
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz										
	Working Voltage(V) 6.3 10 16 25 35 50 63 100 160~250 400 450 500										
	Z-25°C/Z+20°C 4 3 3 3 3 3 3 2 3 5 6 6 Z-40°C/Z+20°C 8 6 4 4 3 3 3 3 - - - -										
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000~10000 hours at 105°C The capacitors shall meet the following requirements.在105°C环境下施加额定电压5000~10000小时后符合以下标准:										
	Capacitance Change容量		Within ±20% of initial value 在初始值的±35%								
	Dissipation Factor 损耗角		Not more than 200% of the specified value 不超过标准值 的200%								
	Leakage Current 泄露电流		initial specified value or less 标准值内								
	Life Time:试验时间										
∅D (mm)		5~6.3		8~10		>12.5					
Life(H)		5000		8000		10000					
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求										
	Capacitance Change容量		Within ±20% of initial value 在初始值的±20%								
	Dissipation Factor 损耗角		Not more than 200% of the specified value 不超过标准值 的200%								
	Leakage Current 泄露电流		initial specified value or less 标准值内								

◆CASE SIZE TABLE(外形尺寸)



∅D	5	6.3	8	10	12.5	16	18	22
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0
∅d	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
a	(L<20)1.5		(L≥20)2.0					
β	(D<20)0.5		(D≥20)1.0					

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(μf) \ freq. (Hz)	120	1k	10k	100k
1~5.6	0.20	0.4	0.9	1.00
6.8~180	0.40	0.75	0.90	1.00
220~560	0.50	0.85	0.94	1.00
680~1800	0.60	0.87	0.95	1.00
2200~3900	0.75	0.90	0.95	1.00
4700~15000	0.85	0.95	0.98	1.00

(2) Tmperature Coefficient (温度系数)

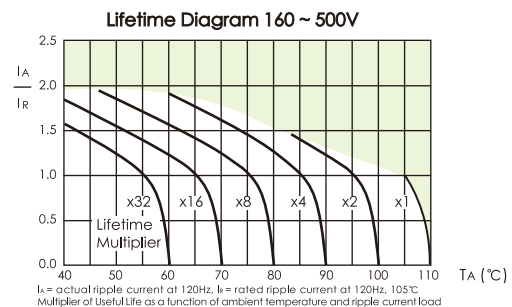
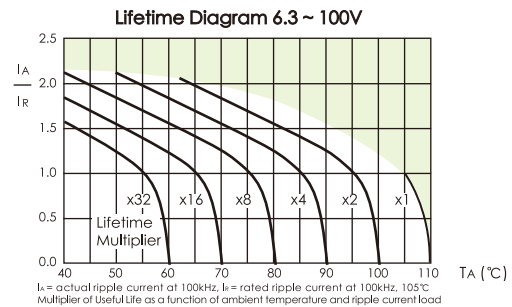
Temperature (°C)	-55	60	70	85	105
Factor	2.33	2.17	2.00	1.75	1.00

Ratings for RKH Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
6.3 (7.2)	33	8.8	2.5	105	5×11.5	
	47	6.2	1.5	120	5×11.5	
	100	2.9	1.2	130	5×11.5	
	220	1.3	0.87	180	6.3×11.5	
	330	0.9	0.58	220	6.3×11.5	
	470	0.6	0.39	315	8×11.5	
	1000	0.29	0.23	500	10×12.5	
	2200	0.14	0.095	765	10×20	
	3300	0.105	0.09	1050	12.5×20	
	4700	0.079	0.061	1670	16×25	
	6800	0.062	0.056	1740	16×25	
	10000	0.053	0.045	2110	16×31.5	
15000	0.044	0.036	2580	18×35.5		
10 (13)	22	11.5	2.5	92	5×11.5	
	33	7.6	1.9	105	5×11.5	
	47	5.4	1.5	120	5×11.5	
	100	2.5	1.2	130	5×11.5	
	220	1.1	0.58	220	6.3×11.5	
	330	0.76	0.47	265	8×11.5	
	470	0.54	0.39	315	8×11.5	
	1000	0.25	0.18	615	10×16	
	2200	0.13	0.09	1050	12.5×20	
	3300	0.09	0.068	1300	12.5×25	
	4700	0.07	0.056	1740	16×25	
	6800	0.06	0.045	2110	16×31.5	
10000	0.05	0.036	2580	18×35.5		
16 (20)	10	21.2	2.5	92	5×11.5	
	22	9.7	1.9	105	5×11.5	
	33	6.4	1.5	120	5×11.5	
	47	4.5	1.2	130	5×11.5	
	100	2.1	0.58	220	6.3×11.5	
	220	0.97	0.47	290	8×11.5	
	330	0.64	0.39	315	8×11.5	
	470	0.45	0.23	500	10×12.5	
	1000	0.21	0.12	825	10×20	
	2200	0.11	0.068	1300	12.5×25	
	3300	0.08	0.056	1740	16×25	
	4700	0.06	0.045	2110	16×31.5	
6800	0.05	0.036	2580	18×35.5		
25 (32)	4.7	39.5	3	85	5×11.5	
	10	18.6	2.5	92	5×11.5	
	22	8.4	1.9	105	5×11.5	
	33	5.6	1.5	120	5×11.5	
	47	4.0	1.2	130	5×11.5	
	100	1.9	0.58	220	6.3×11.5	
	220	0.84	0.39	315	8×11.5	
	330	0.56	0.23	500	10×12.5	
	470	0.40	0.18	615	10×16	
	1000	0.19	0.09	1050	12.5×20	
	2200	0.10	0.056	1740	16×25	
	3300	0.07	0.045	2110	16×31.5	
4700	0.06	0.036	2580	18×35.5		
35 (44)	4.7	33.9	2.5	92	5×11.5	
	10	15.9	1.8	105	5×11.5	
	22	7.2	1.5	120	5×11.5	
	33	4.8	1.5	130	5×11.5	
	47	3.4	0.58	220	6.3×11.5	
	100	1.6	0.39	315	8×11.5	
	220	0.72	0.23	500	10×12.5	
	330	0.48	0.18	615	10×16	
	470	0.34	0.12	825	10×20	
	1000	0.16	0.068	1300	12.5×25	
	2200	0.08	0.045	2110	16×31.5	
	3300	0.06	0.036	2580	18×35.5	

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)		
50 (63)	0.1	1327	18	10	5×11.5		
	0.22	603	13	15	5×11.5		
	0.33	402	10	18	5×11.5		
	0.47	282	7	23	5×11.5		
	1	133	4.9	35	5×11.5		
	2.2	60	4.2	53	5×11.5		
	3.3	40	3.9	65	5×11.5		
	4.7	28	3.6	82	5×11.5		
	10	13	2.7	100	5×11.5		
	22	6	1.9	125	5×11.5		
	33	4	1.1	195	6.3×11.5		
	47	2.8	0.9	245	6.3×11.5		
	100	1.3	0.5	385	8×11.5		
	220	0.60	0.27	505	10×16		
	330	0.40	0.18	675	10×20		
	470	0.28	0.12	895	12.5×20		
	1000	0.13	0.076	1495	16×25		
	2200	0.07	0.05	2190	18×35.5		
	63 (79)	4.7	25	5.8	74	5×11.5	
		10	12	3.6	95	5×11.5	
		22	5	2.1	130	6.3×11.5	
		33	4	1.7	160	6.3×11.5	
47		2.5	1.2	305	8×11.5		
100		1.2	0.65	395	10×12.5		
220		0.54	0.32	505	10×20		
330		0.36	0.22	660	12.5×20		
470		0.25	0.16	850	12.5×25		
1000		0.12	0.098	1430	16×31.5		
100 (125)		0.47	226	13	30	5×11.5	
		1	106	11	45	5×11.5	
	2.2	48	9.2	60	5×11.5		
	3.3	32	7.2	67	5×11.5		
	4.7	23	6.3	75	5×11.5		
	10	11	3.3	110	6.3×11.5		
	22	5	1.4	165	8×11.5		
	33	3.2	0.94	305	10×12.5		
	47	2.3	0.68	320	10×16		
	100	1.1	0.28	585	12.5×20		
	220	0.48	0.16	1120	16×25		
	330	0.32	0.13	1290	16×25		
470	0.23	0.11	1350	16×31.5			

Lifetime Diagram



Ratings for RKH Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA rms)	(mm)	
160 (200)	10	15.9	7	95	10×12.5	
	22	7.2	3.5	145	10×16	
	33	4.8	2.2	190	10×20	
	47	3.4	1.5	280	12.5×20	
	100	1.6	0.7	380	18×20	
		1.6	0.7	380	16×25.5	
	220	0.7	0.3	630	16×35.5	
200 (250)	4.7	33.9	14	60	10×12.5	
	10	15.9	7	95	10×16	
	22	7.2	3.5	145	10×20	
	33	4.8	2.2	190	12.5×20	
	47	3.4	1.5	280	12.5×25	
		3.4	1.5	280	16×20	
	100	1.6	0.7	410	16×25.5	
250 (300)	4.7	33.9	14	60	10×12.5	
		15.9	7	105	10×16	
	22	7.2	3.5	180	12.5×20	
	33	4.8	2.2	250	12.5×25	
		4.8	2.2	250	16×20	
	47	3.4	1.5	300	16×25.5	
		3.4	1.5	300	18×20	
	100	1.6	0.7	410	16×31.5	
		1.6	0.7	410	18×25.5	
	150	1.1	0.5	500	18×25.5	
220	0.7	0.3	700	18×36		
350 (400)	3.3	60.3	28	50	8×11.5	
	4.7	42.3	19	65	10×16	
	10	19.9	10	120	10×20	
	22	9.0	4	180	12.5×20	
	33	6.0	2.5	210	12.5×25	
		4.2	1.8	300	16×25.5	
	47	4.2	1.8	300	18×20	
100	2.0	0.8	528	18×31.5		
400 (450)	2.2	90.5	40	33	8×11.5	
		90.5	40	40	10×12.5	
		60.3	28	43	10×12.5	
	3.3	60.3	28	50	10×16	
		42.3	19	64	10×16	
	4.7	42.3	19	70	10×20	
		19.9	10	100	10×20	
	10	19.9	10	120	12.5×20	
		9.0	4	200	12.5×25	
	22	6.0	2.5	245	18×20	
		6.0	2.5	245	16×25.5	
	47	4.2	1.8	365	16×25.5	
		4.2	1.8	380	16×31.5	
	47	4.2	1.8	380	18×25.5	
		2.9	1.2	500	18×31.5	
	82	2.4	1	610	18×31.5	
	100	2.0	0.8	700	18×36	
120	1.7	0.6	785	18×40		
150	1.3	0.5	840	20×41		
420 (470)	1	265.4	80	17	6.3×11.5	
	2.2	120.6	40	30	8×11.5	
		80.4	24	36	10×12.5	
	3.3	80.4	24	40	10×16	
		56.5	17	56	10×16	
	4.7	56.5	17	65	10×20	
		26.5	8	95	10×20	
	10	26.5	8	118	12.5×20	
		17.7	7.1	130	12.5×20	
	22	12.1	3.8	175	12.5×25	
	33	8	3.2	232	12.5×30	
	47	5.6	2.3	324	16×31.5	
	56	4.7	1.9	434	16×31.5	
		4.7	1.9	434	18×25.5	
	68	3.9	1.6	529	18×31.5	
		3.9	1.6	529	16×36	
	82	3.2	1.3	645	18×31.5	
		3.2	1.3	645	16×40	
	100	2.7	1.1	760	18×36	
		2.7	1.1	760	16×45	
120	2.2	0.9	830	18×40		
	2.2	0.9	830	16×50		
150	1.8	0.7	880	20×41		
	1.8	0.7	880	16×60		
450 (500)	1	265.4	80	18	6.3×11.5	
	2.2	120.6	40	38	10×12.5	
		120.6	40	38	10×12.5	
	3.3	80.4	24	50	10×16	
80.4	24	65	10×20			

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA rms)	(mm)	
450 (500)	4.7	56.5	17	65	10×20	
		56.5	17	80	12.5×20	
	10	26.5	8	110	12.5×20	
		26.5	8	140	12.5×25	
	22	12.1	3.5	175	12.5×25	
		12.1	3.5	220	16×25.5	
	33	8	2.5	245	16×25.5	
		8	2.5	280	16×31.5	
	47	5.6	2	420	16×31.5	
	56	4.7	1.7	520	16×31.5	
		4.7	1.7	470	18×25.5	
	68	3.9	1.4	610	16×36	
		3.9	1.4	610	18×31.5	
	82	3.2	1.1	680	18×31.5	
		3.2	1.1	680	18×36	
	82	3.2	1.1	680	16×40	
		2.7	0.9	800	18×36	
100	2.7	0.9	800	16×45		
	2.2	0.8	875	18×40		
120	2.2	0.8	875	16×50		
	1.8	0.6	935	20×41		
150	1.8	0.6	935	16×60		
	1.5	0.5	1100	22×41		
500 (550)	1	265.4	106	24	8×11.5	
		265.4	106	32	10×12.5	
	2.2	120.6	48	40	8×16	
		120.6	48	49	10×16	
	3.3	80.4	32	68	10×20	
	4.7	56.5	22.6	84	12.5×20	
	10	26.5	10.6	145	12.5×25	
	22	12.1	4.8	230	16×25.5	
	33	8.0	3.2	295	16×31.5	
	47	5.6	2.3	415	18×31.5	
		5.6	2.3	415	16×36	
	56	4.7	1.9	470	18×31.5	
		4.7	1.9	470	16×40	
	68	3.9	1.6	620	16×45	
		3.9	1.6	620	18×36	
82	3.2	1.3	680	18×40		
	3.2	1.3	680	16×55		
100	2.7	1.1	860	18×46		
	2.7	1.1	860	20×41		
100	2.7	1.1	860	16×60		
	2.2	0.9	900	22×45		
150	1.8	0.7	980	22×45		

Customer products are available on request.

**LFM Series Long Life Assurance(长寿命) , High Righ Current(高纹波) Slendertype(细长型)**

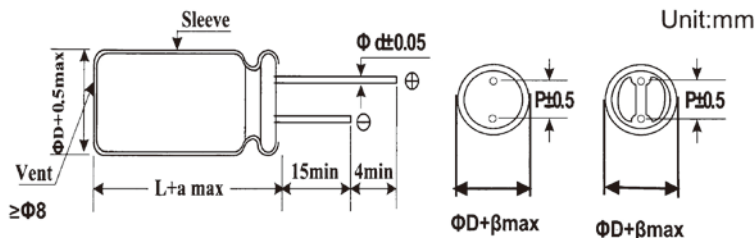
- High ripple current at high frequency, Load Life of 2000~5000 Hours at 105°C.  
高频率高纹波电流, 寿命105°C 2000~5000小时
- For electronic ballast, Power supply input circuit  
适用于电子镇流器, 电源输入电路。



◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能		
Operating temperature range 温度范围	-40 to +105°C		
Rated Working Voltage Range 电压范围	200 to 500V		
Nominal Capacitance Range 容量范围	18 to 220μF		
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)		
Leakage Current 泄漏电流	l≤0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试	l≤0.03CV max afre 2miuntes at +20°C 2分钟测试	
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	200~250 400~500	
	Tan δ(max)	0.15 0.20	
Capacitance>1000μF,add 0.02per another1000μF,容量大于1000μF每增加1000μF损耗角增加0.02.			
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz		
	Working Voltage(V)	200~250	400 500
	Z-25°C/Z+20°C	3	5 6
Z-40°C/Z+20°C	-	- -	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000~5000 hours at 105°C The capacitors shall meet the following requirements.在105°C环境下施加额定电压2000~5000小时后符合以下标准:		
	Capacitance Change容量	Within ±20% of initial value 在初始值的±35%	
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	
	Leakage Current 泄露电流	initial specified value or less 标准值内	
	Life Time:试验时间		
∅D (mm)	8~10	>12.5	
Life(H)	5000	8000	
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求		
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%	
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	
	Leakage Current 泄露电流	initial specified value or less 标准值内	

◆CASE SIZE TABLE(外形尺寸)



∅D	8	10	12.5	16	18	22
P	3.5	5.0	5.0	7.5	7.5	10.0
∅d	0.5	0.6	0.6	0.8	0.8	0.8
a	(L<20)1.5		(L≥20)2.0			
β	(D<20)0.5		(D≥20)1.0			

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	120	1k	10k	100k
18~100		0.40	0.75	0.90	1.00
120~220		0.50	0.85	0.94	1.00

(2) Temperature Coefficient (温度系数)

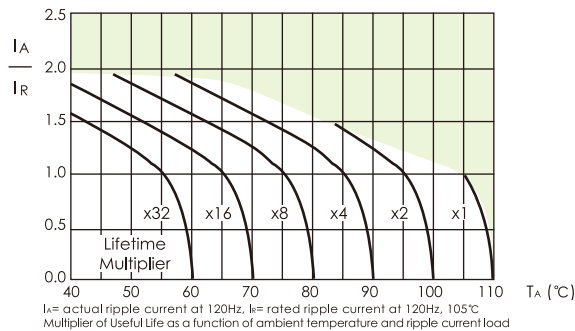
Temperature (°C)	-55	60	70	85	105
Factor	2.33	2.17	2.00	1.75	1.00

Ratings for LFM Series

$U_p$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
200 (250)	82	1.9	1.2	400	10×30	
	100	1.6	1	460	10×36	
	120	1.3	0.8	530	10×40	
	150	1.1	0.6	620	12.5×30	
	180	0.9	0.5	700	12.5×36	
250 (300)	220	0.7	0.4	800	12.5×40	
	47	4.2	2.5	295	8×50	
	68	2.9	1.8	330	10×36	
	82	2.4	1.5	420	10×40	
	100	2	1.2	480	10×50	
	120	1.7	1	560	12.5×36	
400 (450)		1.7	1	630	10×60	
	150	1.3	0.8	650	12.5×40	
	27	9.8	4.4	240	10×30	
	33	8.0	3.6	280	10×36	
	39	6.8	3.1	320	10×40	
	47	5.6	2.5	370	12.5×30	
		5.6	2.5	370	10×50	
	56	4.7	2.1	420	12.5×36	
420 (470)	68	3.9	1.8	480	12.5×45	
	82	3.2	1.5	520	12.5×50	
	100	2.7	1.2	580	12.5×50	
	22	12	7.2	200	10×30	
	27	9.8	5.9	230	10×36	
	33	8	4.8	270	10×40	
	39	6.8	4.1	310	12.5×30	
	47	5.6	3.4	360	12.5×36	
450 (500)		5.6	3.4	360	10×50	
	56	4.7	2.8	430	12.5×40	
	68	3.9	2.3	490	12.5×45	
	82	3.2	1.9	550	12.5×50	
	18	14.7	8.8	180	8×50	
	21	12.6	7.5	210	8×50	
	27	9.8	5.9	250	10×40	
	33	8.0	4.8	280	12.5×30	
	39	6.8	4.1	320	12.5×36	
		6.8	4.1	320	10×50	
	47	5.7	3.4	380	12.5×40	
		5.7	3.4	380	10×50	
500 (550)	53	5.0	3.0	410	10×50	
	56	4.7	2.8	440	12.5×50	
		4.7	2.8	440	10×60	
	60	4.4	2.6	470	10×60	
	68	3.9	2.3	550	12.5×50	
	82	3.2	1.9	667	12.5×50	
	100	2.7	1.6	800	12.5×61	
	47	5.7	3.4	400	12.5×50	
500 (550)	53	5	3.0	420	12.5×61	
	56	4.7	2.8	450	12.5×61	

Lifetime Diagram

Customer products are available on request.





## LFN Series Long Life Assurance(长寿命), High Righ Current(高纹波) Slendertype(细长型)

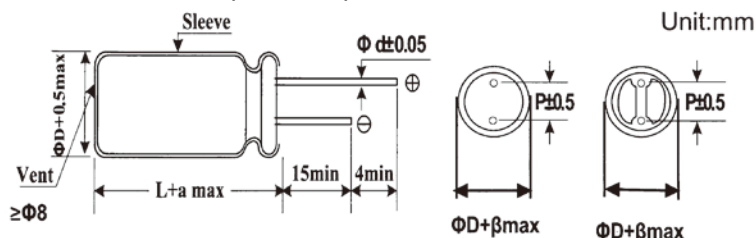
- High ripple current at high frequency, Load Life of 5000~10000 Hours at 105°C.  
高频率高纹波电流, 寿命105°C 5000~10000小时
- For electronic ballast, Power supply input circuit  
适用于电子镇流器, 电源输入电路。



### ◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能	
Operating temperature range 温度范围	-40 to +105°C	
Rated Working Voltage Range 电压范围	400 to 450V	
Nominal Capacitance Range 容量范围	33 to 220μF	
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)	
Leakage Current 泄漏电流	$I \leq 0.01CV$ or $3(\mu A)$ after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试	$I \leq 0.03CV$ max afre 2miuntes at +20°C 2分钟测试
Dissipation Factor $\tan \delta(120Hz, +20^\circ C)$ 损耗角正切值	Working Voltage(V)	400~500
	Tan $\delta(\max)$	0.20
Capacitance > 1000μF, add 0.02per another1000μF, 容量大于1000μF每增加1000μF损耗角增加0.02.		
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz	
	Working Voltage(V)	400 420 450
	Z-25°C/Z+20°C	5 6 6
Z-40°C/Z+20°C	- - -	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000~10000 hours at 105°C The capacitors shall meet the following requirements.在105°C环境下施加额定电压5000~10000小时后电性能应符合以下标准:	
	Capacitance Change容量	Within ±20% of initial value 在初始值的±35%
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%
	Leakage Current 泄露电流	initial specified value or less 标准值内
Life Time:试验时间		
∅D (mm)	8~10	>12.5
Life(H)	8000	10000
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求	
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%
	Leakage Current 泄露电流	initial specified value or less 标准值内

### ◆CASE SIZE TABLE(外形尺寸)



∅D	8	10	12.5	16	18	22
P	3.5	5.0	5.0	7.5	7.5	10.0
∅d	0.5	0.6	0.6	0.8	0.8	0.8
a	(L < 20) 1.5		(L ≥ 20) 2.0			
β	(D < 20) 0.5		(D ≥ 20) 1.0			

### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	120	1k	10k	100k
33~100		0.40	0.75	0.90	1.00
120~220		0.50	0.85	0.94	1.00

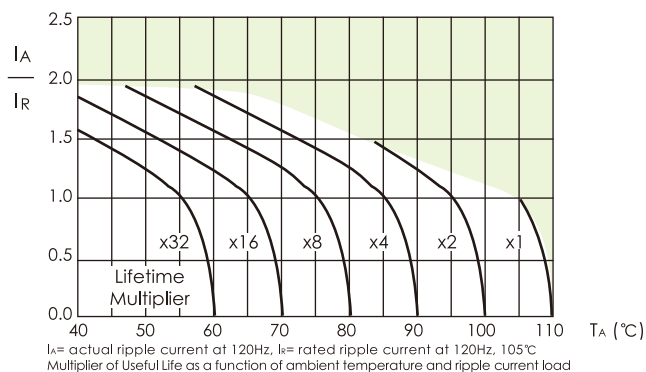
(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	60	70	85	105
Factor	2.33	2.17	2.00	1.75	1.00

Ratings for LFN Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
400 (450)	39	5.1	370	10x40	
	47	4.2	420	10x45	
	56	3.6	470	10x50	
	68	2.9	540	12.5x40	
	82	2.4	610	12.5x45	
	100	2.0	680	12.5x50	
	100	2.0	710	16x31.5	
	120	1.7	800	16x36	
	150	1.3	920	16x40	
	150	1.3	890	18x31.5	
	180	1.1	1080	16x50	
180	1.1	1060	18x40		
220	0.9	1200	18x46		
420 (470)	39	5.1	360	10x40	
	47	4.2	430	10x50	
	56	3.6	480	12.5x40	
	68	2.9	520	12.5x40	
	82	2.4	590	12.5x45	
	100	2.0	690	16x31.5	
	120	1.7	780	16x36	
	120	1.7	800	18x31.5	
	150	1.3	940	16x45	
	150	1.3	920	18x36	
	180	1.1	1050	16x50	
180	1.1	1040	18x40		
220	0.9	1220	18x50		
450 (500)	33	4.8	340	10x40	
	39	4.1	380	10x45	
	47	3.4	440	12.5x40	
	56	2.8	490	12.5x40	
	68	2.3	550	12.5x45	
	82	1.9	620	12.5x50	
	82	1.9	640	16x31.5	
	100	1.6	730	16x36	
	120	1.3	820	16x40	
	120	1.3	800	18x31.5	
	150	1.1	980	16x50	
	150	1.1	970	18x40	
	180	0.9	1090	18x46	
220	0.7	1220	18x50		

Lifetime Diagram



**RXB Series High temperature(耐高温) Long Life Assurance(长寿命), High Righ Current(高纹波)**

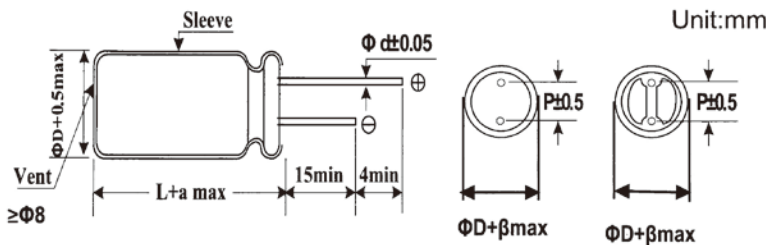
- High ripple current at high frequency, Load Life of 5000 Hours at 125°C.  
(Load Life of 10000 Hours at 105°C)  
高频高纹波电流, 寿命125°C 5000小时(105°C 10000小时)
- For electronic ballast, Power supply input circuit  
适用于汽车电器, LED照明、高温设备。



◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能																																			
Operating temperature range 温度范围	-40 to +125°C	-25 to +125°C																																		
Rated Working Voltage Range 电压范围	10 to 100V	160 to 450V																																		
Nominal Capacitance Range 容量范围	1.0 to 4700μF																																			
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																																			
Leakage Current 泄漏电流	≤0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试	≤0.03CV (μA) after 2 minutes application of rated working vltogae 2分钟测试																																		
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>160~250</td> <td>400~450</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.2</td> <td>0.16</td> <td>0.1</td> <td>0.12</td> <td>0.10</td> <td>0.09</td> <td>0.15</td> <td>0.20</td> </tr> </table>								Working Voltage(V)	10	16	25	35	50	63	160~250	400~450	Tan δ(max)	0.2	0.16	0.1	0.12	0.10	0.09	0.15	0.20										
	Working Voltage(V)	10	16	25	35	50	63	160~250	400~450																											
Tan δ(max)	0.2	0.16	0.1	0.12	0.10	0.09	0.15	0.20																												
Capacitance>1000μF,add 0.02per another1000μF,容量大于1000μF每增加1000μF损耗角增加0.02。																																				
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz																																			
	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>160~250</td> <td>400~450</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>-</td> <td>-</td> </tr> </table>									Working Voltage(V)	10	16	25	35	50	63	160~250	400~450	Z-25°C/Z+20°C	2	2	2	2	2	2	3	6	Z-40°C/Z+20°C	4	4	4	4	4	4	-	-
	Working Voltage(V)	10	16	25	35	50	63	160~250	400~450																											
Z-25°C/Z+20°C	2	2	2	2	2	2	3	6																												
Z-40°C/Z+20°C	4	4	4	4	4	4	-	-																												
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 125°C (10000 hours at 105°C). the capacitors shall meet the following requirements.在125°C环境下连续施加额定电压5000小时后 (105°C 10000小时后)。符合以下要求:																																			
	Capacitance Change容量		Within ±20% of initial value 在初始值的±35%																																	
	Dissipation Factor 损耗角		Not more than 200% of the specified value 不超过标准值的200%																																	
	Leakage Current 泄露电流		initial specified value or less 标准值内																																	
Life Time:试验时间																																				
<table border="1"> <tr> <td>∅D (mm)</td> <td colspan="3">5-6.3</td> <td colspan="5">8-22</td> </tr> <tr> <td>Ambient temp</td> <td>125°C</td> <td>105°C</td> <td>125°C</td> <td>105°C</td> <td colspan="4"></td> </tr> <tr> <td>Life(H)</td> <td>5000</td> <td>10000</td> <td>5000</td> <td>10000</td> <td colspan="4"></td> </tr> </table>									∅D (mm)	5-6.3			8-22					Ambient temp	125°C	105°C	125°C	105°C					Life(H)	5000	10000	5000	10000					
∅D (mm)	5-6.3			8-22																																
Ambient temp	125°C	105°C	125°C	105°C																																
Life(H)	5000	10000	5000	10000																																
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 125°C for 500 hours (at 105°C for 1000 hours). the capacitors shall meet the same requirement as Endurance.在125°C环境下不加负载放置500小时后(105°C 1000小时后) 电性能同耐久性要求。																																			

◆CASE SIZE TABLE(外形尺寸)



∅D	8	10	12.5	16	18	20	22
P	3.5	5.0	5.0	7.5	7.5	7.5	10.0
∅d	0.6	0.6	0.6	0.8	0.8	0.8	0.8
a	(L<20)1.5		(L≥20)2.0				
β	(D<20)0.5		(D≥20)1.0				

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	120	300	1k	10k~	100k~
<100		0.30	0.55	0.70	0.90	1.00
≥100		0.40	0.60	0.75	0.90	1.00

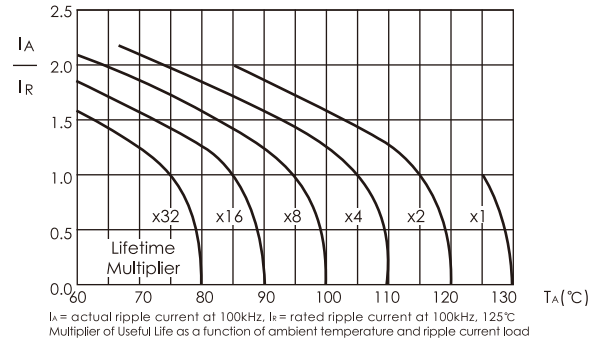
(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	65	85	105	125
Factor	2.4	2.10	1.78	1.65	1.00

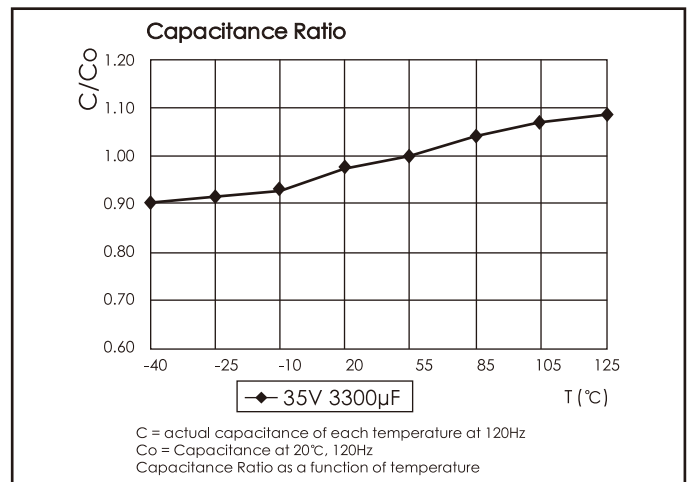
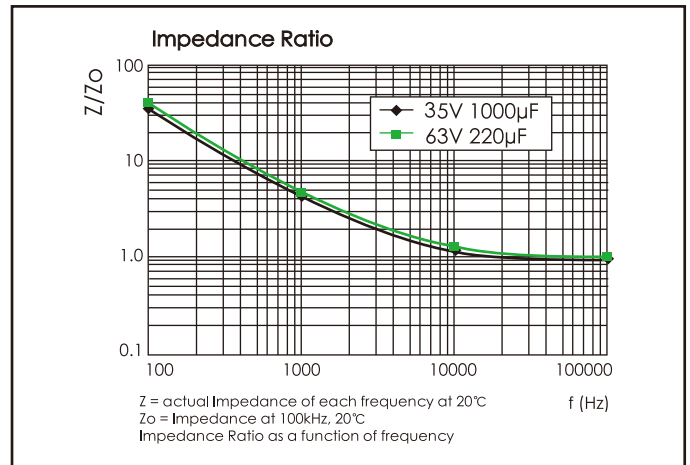
Ratings for RXB Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Impedance 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Size $\Phi D \times L$	Remarks 备注
(V)	( $\mu F$ )	( $\Omega$ )	( $\Omega$ )	(mA <sub>rms</sub> )	(mm)	
10 (13)	330	0.804	0.22	360	8×11.5	
	470	0.565	0.15	620	10×12.5	
	1000	0.265	0.073	960	10×20	
	2200	0.133	0.040	1430	12.5×25	
	3300	0.097	0.038	1900	16×25	
	4700	0.073	0.034	2300	16×31.5	
16 (20)	330	0.643	0.22	360	8×11.5	
	470	0.452	0.15	620	10×12.5	
	1000	0.212	0.073	960	10×20	
	2200	0.109	0.040	1430	12.5×25	
	3300	0.080	0.034	2300	16×31.5	
	4700	0.062	0.031	2550	16×35.5	
25 (32)	220	0.844	0.22	360	8×11.5	
	330	0.563	0.15	620	10×12.5	
	470	0.395	0.10	800	10×16	
	1000	0.186	0.055	1100	12.5×20	
	2200	0.097	0.034	2300	16×31.5	
	3300	0.072	0.031	2550	16×35.5	
35 (44)	100	1.592	0.22	360	8×11.5	
	220	0.724	0.15	620	10×12.5	
	330	0.483	0.10	800	10×16	
	470	0.339	0.073	960	10×20	
	1000	0.159	0.040	1430	12.5×25	
	2200	0.084	0.031	2550	16×35.5	
50 (63)	3300	0.064	0.028	2800	18×36	
	1	132.6	2.5	35	8×11.5	
	2.2	60.31	1.8	50	8×11.5	
	3.3	40.21	1.3	70	8×11.5	
	4.7	28.23	0.85	100	8×11.5	
	10	13.27	0.60	200	8×11.5	
	22	6.032	0.35	260	8×11.5	
	33	4.021	0.28	300	8×11.5	
	47	2.823	0.28	300	8×11.5	
	100	1.327	0.18	520	10×12.5	
	220	0.603	0.082	890	10×20	
	330	0.402	0.065	1000	12.5×20	
	470	0.282	0.051	1200	12.5×25	
	1000	0.133	0.037	2180	16×31.5	
2200	0.072	0.029	2800	18×40		
63 (79)	33	3.619	0.40	250	8×11.5	
	47	2.541	0.27	400	10×12.5	
	100	1.194	0.20	450	10×16	
	220	0.543	0.10	820	12.5×20	
	330	0.362	0.072	1000	12.5×25	
	470	0.254	0.069	1500	16×25	
	1000	0.119	0.056	1850	16×31.5	
	1500	0.080	0.043	2350	18×40	
100 (125)	4.7	22.58	1.3	100	8×11.5	
	10	10.61	1.0	200	8×11.5	
	22	4.825	0.67	220	8×11.5	
	33	3.217	0.45	260	10×12.5	
	47	2.259	0.33	330	10×16	
	100	1.062	0.17	670	12.5×20	
	220	0.483	0.13	1100	16×25	
	330	0.322	0.10	1300	16×31.5	
470	0.226	0.092	1600	18×31.5		

Lifetime Diagram



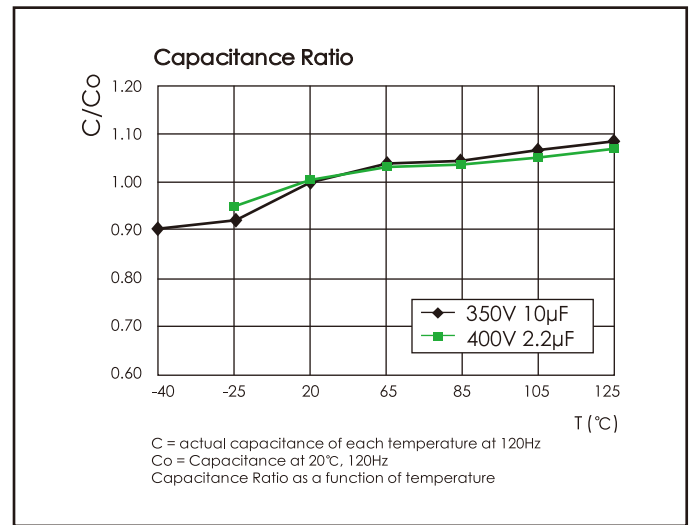
Typical Curves



Ratings for RXB Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 125°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	
160 (200)	10	15.9	8.0	62	10×16	
	22	7.2	3.6	101	10×20	
	33	4.8	2.4	139	12.5×20	
	47	3.4	1.7	165	12.5×20	
	100	1.6	0.8	302	16×25	
	220	0.7	0.4	514	18×31.5	
	330	0.5	0.2	673	18×36	
200 (250)	10	15.9	8.0	62	10×16	
	22	7.2	3.6	101	10×20	
	33	4.8	2.4	139	12.5×20	
	47	3.4	1.7	165	12.5×20	
	100	1.6	0.8	302	16×25	
	220	0.7	0.4	514	18×31.5	
	330	0.5	0.2	673	18×36	
250 (300)	4.7	33.9	16.9	42	10×16	
	6.8	23.4	11.7	51	10×16	
	10	15.9	8.0	68	10×20	
	22	7.2	3.6	113	12.5×20	
	33	4.8	2.4	153	12.5×25	
	47	3.4	1.7	207	16×25	
	100	1.6	0.8	346	18×31.5	
220	0.7	0.4	550	18×36		
350 (400)	2.2	90.5	36.2	26	10×16	
	3.3	60.3	24.1	32	10×16	
	4.7	42.3	16.9	42	10×20	
	5.6	35.5	14.2	46	10×20	
	6.8	29.3	11.7	56	12.5×20	
	10	19.9	8.0	68	12.5×20	
	22	9.0	3.6	112	12.5×25	
	33	6.0	2.4	155	16×25	
47	4.2	1.7	201	16×31.5		
400 (450)	2.2	90.5	36.2	26	10×16	
	3.3	60.3	24.1	32	10×16	
	4.7	42.3	16.9	42	10×20	
	5.6	35.5	14.2	46	10×20	
	6.8	29.3	11.7	56	12.5×20	
	10	19.9	8.0	68	12.5×20	
	22	9.0	3.6	112	12.5×25	
	33	6.0	2.4	155	16×25	
47	4.2	1.7	201	16×31.5		
450 (500)	2.2	90.5	36.2	26	10×16	
	3.3	60.3	24.1	32	10×16	
	4.7	42.3	16.9	42	10×20	
	5.6	35.5	14.2	51	12.5×20	
	6.8	29.3	11.7	56	12.5×20	
	10	19.9	8.0	75	12.5×25	
	22	9.0	3.6	127	16×25	
	33	6.0	2.4	168	16×31.5	
47	4.2	1.7	212	18×31.5		

Typical Curves



Customer products are available on request.

## RXA Series High temperature(耐高温) Long Life Assurance(长寿命), High Righ Current(高纹波)

- High ripple current at high frequency, Load Life of 2000 Hours at 125°C.  
(Load Life of 5000 Hours at 105°C)  
高频高纹波电流, 寿命125°C 2000小时(105°C 5000小时)

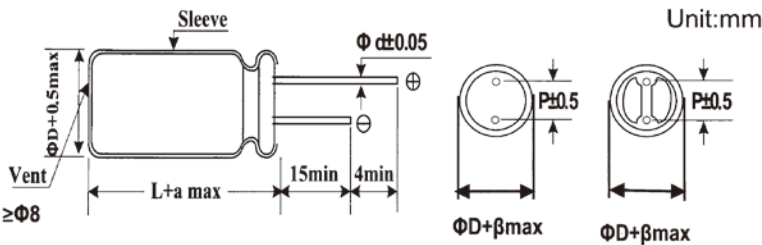
- For electronic ballast, Power supply input circuit  
适用于汽车电器, LED照明、高温设备。



### ◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能																																			
Operating temperature range 温度范围	-40 to +125°C	-25 to +125°C																																		
Rated Working Voltage Range 电压范围	10 to 100V	160 to 450V																																		
Nominal Capacitance Range 容量范围	1.0 to 4700μF																																			
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																																			
Leakage Current 泄漏电流	≤0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试	≤0.03CV (μA) after 2 minutes application of rated working vltogae 2分钟测试																																		
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>160~250</td> <td>400~450</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.2</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.15</td> <td>0.20</td> </tr> </table>								Working Voltage(V)	10	16	25	35	50	63	160~250	400~450	Tan δ(max)	0.2	0.16	0.14	0.12	0.10	0.10	0.15	0.20										
	Working Voltage(V)	10	16	25	35	50	63	160~250	400~450																											
Tan δ(max)	0.2	0.16	0.14	0.12	0.10	0.10	0.15	0.20																												
Capacitance>1000μF,add 0.02per another1000μF,容量大于1000μF每增加1000μF损耗角增加0.02。																																				
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz																																			
	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>160~250</td> <td>400~450</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>-</td> <td>-</td> </tr> </table>									Working Voltage(V)	10	16	25	35	50	63	160~250	400~450	Z-25°C/Z+20°C	3	2	2	2	2	2	3	6	Z-40°C/Z+20°C	6	4	4	4	4	4	-	-
	Working Voltage(V)	10	16	25	35	50	63	160~250	400~450																											
Z-25°C/Z+20°C	3	2	2	2	2	2	3	6																												
Z-40°C/Z+20°C	6	4	4	4	4	4	-	-																												
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 125°C (5000 hours at 105°C), the capacitors shall meet the following requirements.在125°C环境下连续施加额定电压2000小时后 (105°C 5000小时后)。符合以下要求:																																			
	Capacitance Change容量		Within ±30% of initial value 在初始值的±30%																																	
	Dissipation Factor 损耗角		Not more than 300% of the specified value 不超过标准值的300%																																	
	Leakage Current 泄露电流		initial specified value or less 标准值内																																	
Life Time:试验时间																																				
Ambient temp		125°C	105°C																																	
Life(H)		2000	5000																																	
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 125°C for 500 hours (at 105°C for 1000 hours), the capacitors shall meet the same requirement as Endurance. 在125°C环境下不加负载放置500小时后(105°C 1000小时后) 电性能同耐久性要求。																																			

### ◆CASE SIZE TABLE(外形尺寸)



ØD	8	10	12.5	16	18	20	22
P	3.5	5.0	5.0	7.5	7.5	7.5	10.0
Ød	0.6	0.6	0.6	0.8	0.8	0.8	0.8
a	(L<20)1.5		(L≥20)2.0				
β	(D<20)0.5		(D≥20)1.0				

### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	120	300	1k	10k~	100k~
<100		0.30	0.55	0.70	0.90	1.00
≥100		0.40	0.60	0.75	0.90	1.00

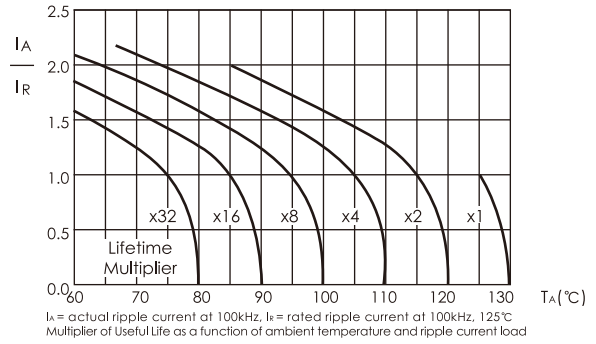
(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	65	85	105	125
Factor	2.4	2.10	1.78	1.65	1.00

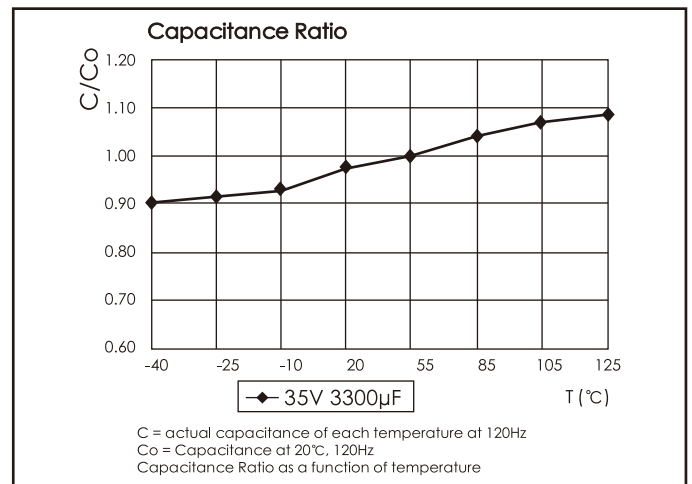
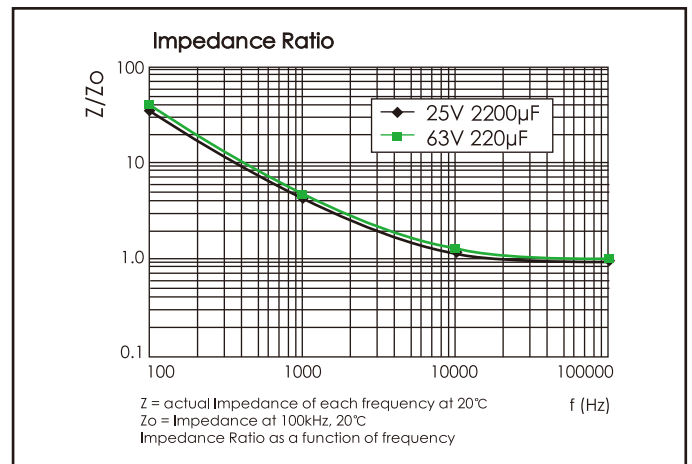
Ratings for RXA Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Impedance 20°C, 100kHz	Rated Ripple Current 125°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mAmps)	(mm)	
10 (13)	330	0.804	0.22	360	8×11.5	
	470	0.565	0.15	620	10×12.5	
	1000	0.265	0.073	960	10×20	
	2200	0.133	0.040	1430	12.5×25	
	3300	0.097	0.038	1900	16×25	
	4700	0.073	0.034	2300	16×31.5	
16 (20)	330	0.643	0.22	360	8×11.5	
	470	0.452	0.15	620	10×12.5	
	1000	0.212	0.073	960	10×20	
	2200	0.109	0.040	1430	12.5×25	
	3300	0.080	0.034	2300	16×31.5	
	4700	0.062	0.031	2550	16×35.5	
25 (32)	220	0.844	0.22	360	8×11.5	
	330	0.563	0.15	620	10×12.5	
	470	0.395	0.10	800	10×16	
	1000	0.186	0.055	1100	12.5×20	
	2200	0.097	0.034	2300	16×31.5	
	3300	0.072	0.031	2550	16×35.5	
35 (44)	100	1.592	0.22	360	8×11.5	
	220	0.724	0.15	620	10×12.5	
	330	0.483	0.10	800	10×16	
	470	0.339	0.073	960	10×20	
	1000	0.159	0.040	1430	12.5×25	
	2200	0.084	0.031	2550	16×35.5	
50 (63)	3300	0.064	0.028	2800	18×36	
	1	132.6	2.5	35	8×11.5	
	2.2	60.31	1.8	50	8×11.5	
	3.3	40.21	1.3	70	8×11.5	
	4.7	28.23	0.85	100	8×11.5	
	10	13.27	0.60	200	8×11.5	
	22	6.032	0.35	260	8×11.5	
	33	4.021	0.28	300	8×11.5	
	47	2.823	0.28	300	8×11.5	
	100	1.327	0.18	520	10×12.5	
	220	0.603	0.082	890	10×20	
	330	0.402	0.065	1000	12.5×20	
	470	0.282	0.051	1200	12.5×25	
	1000	0.133	0.037	2180	16×31.5	
2200	0.072	0.029	2800	18×40		
63 (79)	33	3.619	0.40	250	8×11.5	
	47	2.541	0.27	400	10×12.5	
	100	1.194	0.20	450	10×16	
	220	0.543	0.10	820	12.5×20	
	330	0.362	0.072	1000	12.5×25	
	470	0.254	0.069	1500	16×25	
100 (125)	1000	0.119	0.056	1850	16×31.5	
	1500	0.080	0.043	2350	18×40	
	4.7	22.58	1.3	100	8×11.5	
	10	10.61	1.0	200	8×11.5	
	22	4.825	0.67	220	8×11.5	
	33	3.217	0.45	260	10×12.5	
47	2.259	0.33	330	10×16		
100	1.062	0.17	670	12.5×20		
220	0.483	0.13	1100	16×25		
330	0.322	0.10	1300	16×31.5		
470	0.226	0.092	1600	18×31.5		

Lifetime Diagram



Typical Curves

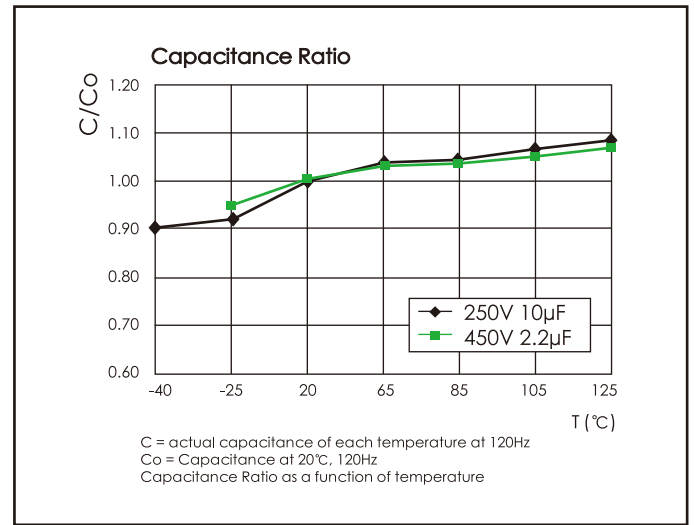


Customer products are available on request.

Ratings for RXA Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 125°C, 120Hz	Size $\Phi D \times L$	Remarks 备注
(V)	( $\mu F$ )	( $\Omega$ )	( $\Omega$ )	(mA rms)	(mm)	
160 (200)	6.8	23.4	10.2	45	10×12.5	
	10	15.9	6.9	62	10×16	
	22	7.2	3.2	101	10×20	
	33	4.8	2.1	139	12.5×20	
	47	3.4	1.5	165	12.5×20	
	100	1.6	0.7	302	16×25	
	220	0.7	0.31	514	18×31.5	
200 (250)	6.8	23.4	11	45	10×12.5	
	10	15.9	7.5	62	10×16	
	22	7.2	3.5	101	10×20	
	33	4.8	2.3	139	12.5×20	
	47	3.4	1.6	165	12.5×20	
	100	1.6	0.75	302	16×25	
	220	0.7	0.34	514	18×31.5	
250 (300)	330	0.5	0.23	673	18×36	
	2.2	72.4	31	26	10×12.5	
	3.3	48.3	21	31	10×12.5	
	4.7	33.9	14.5	42	10×16	
	6.8	23.4	10	51	10×16	
	10	15.9	7	68	10×20	
	22	7.2	3.2	113	12.5×20	
	33	4.8	2.1	153	12.5×25	
350 (400)	47	3.4	1.5	207	16×25	
	100	1.6	0.7	346	18×31.5	
	220	0.7	0.31	550	18×36	
	2.2	90.5	32	26	10×16	
	3.3	60.3	21	32	10×16	
	4.7	42.3	15	42	10×20	
	5.6	35.5	12.5	46	10×20	
	6.8	29.3	10.5	56	12.5×20	
400 (450)	10	19.9	7	68	12.5×20	
	22	9.0	3.2	112	12.5×25	
	33	6.0	2.1	155	16×25	
	47	4.2	1.5	201	16×31.5	
	1.0	199.0	60	16	10×12.5	
	2.2	90.5	27	26	10×16	
	3.3	60.3	18	32	10×16	
	4.7	42.3	12.8	42	10×20	
450 (500)	5.6	35.5	10.8	46	10×20	
	6.8	29.3	8.9	56	12.5×20	
	10	19.9	6	68	12.5×20	
	22	9.0	2.7	112	12.5×25	
	33	6.0	1.8	155	16×25	
	47	4.2	1.3	201	16×31.5	
	1.0	199.0	60	16	10×12.5	
	2.2	90.5	27	26	10×16	
450 (500)	3.3	60.3	18	32	10×16	
	4.7	42.3	12.8	42	10×20	
	5.6	35.5	10.8	51	12.5×20	
	6.8	29.3	8.9	56	12.5×20	
	10	19.9	6	75	12.5×25	
	22	9.0	2.7	127	16×25	
	33	6.0	1.8	168	16×31.5	
	47	4.2	1.3	212	18×31.5	

Typical Curves



Customer products are available on request.



**RNZ Series High temperature(耐高温) Long Life Assurance(长寿命), High Righ Current(高纹波)**

- High ripple current at high frequency, Load Life of 4000 Hours at 135°C.  
(Load Life of 10000~12000 Hours at 105°C)  
高频高纹波电流, 寿命135°C 4000小时(105°C 10000~12000小时)

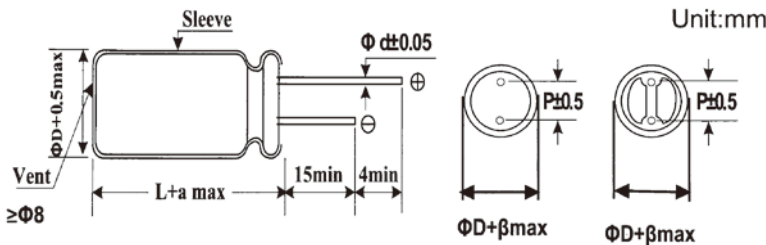


- For electronic ballast, Power supply input circuit  
适用于汽车电器, LED照明、高温设备。

◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能																										
Operating temperature range 温度范围	-40 to +135°C																										
Rated Working Voltage Range 电压范围	10 to 63V																										
Nominal Capacitance Range 容量范围	4.7 to 4700μF																										
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																										
Leakage Current 泄漏电流	I ≤ 0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C 两者取较大值, 2分钟测试	I ≤ 0.03CV (μA) after 2 minutes application of rated working vltogae 2分钟测试																									
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.2</td> <td>0.16</td> <td>0.1</td> <td>0.10</td> <td>0.10</td> <td>0.10</td> </tr> </table>						Working Voltage(V)	10	16	25	35	50	63	Tan δ(max)	0.2	0.16	0.1	0.10	0.10	0.10							
	Working Voltage(V)	10	16	25	35	50	63																				
Tan δ(max)	0.2	0.16	0.1	0.10	0.10	0.10																					
Capacitance > 1000μF, add 0.02 per another 1000μF, 容量大于1000μF每增加1000μF损耗角增加0.02。																											
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz																										
	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> </tr> </table>						Working Voltage(V)	10	16	25	35	50	63	Z-25°C/Z+20°C	3	2	2	2	2	2	Z-40°C/Z+20°C	6	4	4	4	4	4
	Working Voltage(V)	10	16	25	35	50	63																				
Z-25°C/Z+20°C	3	2	2	2	2	2																					
Z-40°C/Z+20°C	6	4	4	4	4	4																					
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 4000 hours at 135°C (10000~12000 hours at 105°C). the capacitor shall meet the following requirements. 在135°C环境下连续施加额定电压4000小时后(105°C 10000~12000小时后)符合以下要求:																										
	Capacitance Change 容量		Within ±30% of initial value 在初始值的±30%																								
	Dissipation Factor 损耗角		Not more than 300% of the specified value 不超过标准值的300%																								
	Leakage Current 泄露电流		initial specified value or less 标准值内																								
Life Time: 试验时间																											
∅D (mm)		5-6.3		8-22																							
Ambient temp		135°C	105°C	135°C	105°C																						
Life(H)		2000	8000	3000	8000																						
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 135°C for 500 hours (at 105°C for 1000 hours). the capacitors shall meet the same requirement as Endurance. 在135°C环境下不加负载放置500小时后(105°C 1000小时后) 电性能同耐久性要求。																										

◆CASE SIZE TABLE(外形尺寸)



∅D	8	10	12.5	16	18	20	22
P	3.5	5.0	5.0	7.5	7.5	7.5	10.0
∅d	0.6	0.6	0.6	0.8	0.8	0.8	0.8
a	(L < 20) 1.5		(L ≥ 20) 2.0				
β	(D < 20) 0.5		(D ≥ 20) 1.0				

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	120	300	1k	10k~	100k~
<63		0.30	0.55	0.70	0.90	1.00

(2) Temperature Coefficient (温度系数)

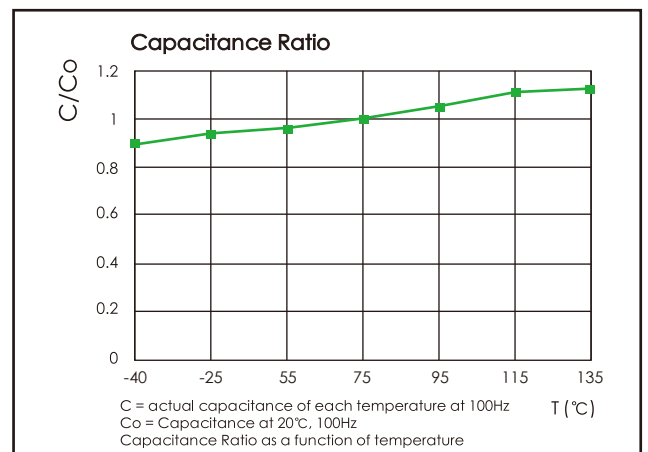
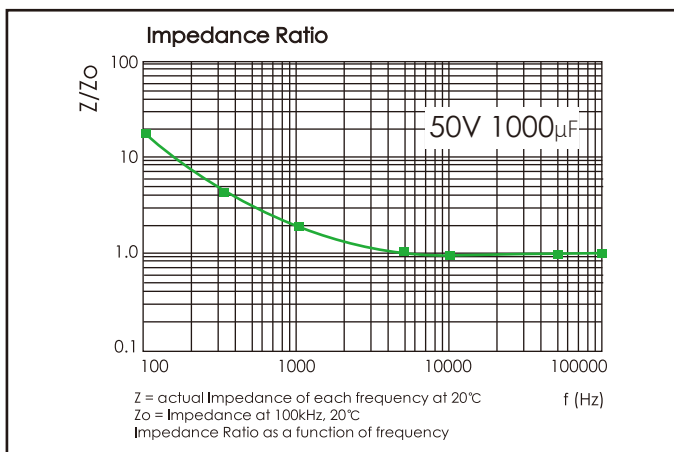
Temperature (°C)	-55	65	85	105	135
Factor	2.4	2.10	1.78	1.65	1.00

Ratings for RNZ Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max Impedance 20°C, 100KHz	Rated Ripple Current 135°C, 100KHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mArms)	(mm)	
10 (13)	220	0.26	340	8×11.5	
	330	0.15	620	10×12.5	
	470	0.10	680	10×12.5	
	1000	0.057	1100	10×20	
	2200	0.061	1750	12.5×25	
	3300	0.024	2300	16×25	
16 (20)	4700	0.020	2710	16×31.5	
	100	0.32	340	8×11.5	
	220	0.15	620	10×12.5	
	330	0.10	680	10×12.5	
	470	0.075	945	10×16	
	1000	0.042	1490	12.5×20	
25 (32)	2200	0.024	2300	16×25	
	3300	0.020	2710	16×31.5	
	100	0.13	500	8×11.5	
	220	0.10	680	10×12.5	
	330	0.075	945	10×16	
	470	0.057	1100	10×20	
35 (44)	1000	0.033	1750	12.5×25	
	2200	0.020	2710	16×31.5	
	100	0.15	620	10×12.5	
	220	0.094	790	10×16	
	330	0.075	950	10×20	
	470	0.058	1330	12.5×20	
50 (63)	1000	0.031	2010	16×25	
	4.7	1.15	85	8×11.5	
	10	0.75	180	8×11.5	
	22	0.50	250	8×11.5	
	33	0.45	300	8×11.5	
	47	0.35	440	8×11.5	
	100	0.18	555	10×12.5	
	220	0.098	930	10×20	
	330	0.07	1330	12.5×20	
	470	0.055	1650	12.5×25	
63 (79)	1000	0.031	2430	16×31.5	
	22	2.00	130	8×11.5	
	33	1.50	150	8×11.5	
	47	0.59	530	10×12.5	
	100	0.41	690	10×16	
	220	0.16	1050	12.5×20	
	330	0.12	1290	12.5×25	
470	0.097	1460	12.5×31.5		
1000	0.055	1900	16×31.5		

Customer products are available on request.

Typical Curves



**RKZ Series -55°C ~ +105°C (宽温品) Low Impedance(低阻抗品)**

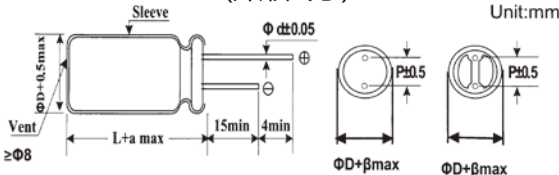
•For general purpose, -55°C to +105°C. 2000 to 5000 hours  
应用条件, -55°C ~ +105°C ,2000H~5000小时寿命



◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能																																												
Operating temperature range 温度范围	-55 to +105°C	-40 to +105°C																																											
Rated Working Voltage Range 电压范围	6.3 to 100V	160 to 500V																																											
Nominal Capacitance Range 容量范围	0.1 to 15000μF																																												
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																																												
Leakage Current 泄漏电流	≤0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试	≤0.03CV +10(μA) after 2 minutes application of rated working voltage at +20°C两者取较大值, 2分钟测试																																											
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160~250</td><td>350~500</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.28</td><td>0.24</td><td>0.2</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.10</td><td>0.20</td><td>0.24</td> </tr> </table>											Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	350~500	Tan δ(max)	0.28	0.24	0.2	0.16	0.14	0.12	0.10	0.10	0.20	0.24												
	Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	350~500																																		
Tan δ(max)	0.28	0.24	0.2	0.16	0.14	0.12	0.10	0.10	0.20	0.24																																			
Capacitance>1000μF,add 0.02per another1000μF,容量大于1000μF每增加1000μF损耗角增加0.02.																																													
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz																																												
	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td> </tr> <tr> <td>Z-55°C/Z+20°C</td> <td>10</td><td>8</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td> </tr> </table>											Working Voltage(V)	6.3	10	16	25	35	50	63	100	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	Z-55°C/Z+20°C	10	8	6	4	3	3	3	3							
	Working Voltage(V)	6.3	10	16	25	35	50	63	100																																				
	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2																																				
Z-55°C/Z+20°C	10	8	6	4	3	3	3	3																																					
<table border="1"> <tr> <td>Working Voltage(V)</td> <td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>420</td><td>450</td><td>500</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>6</td><td>6</td><td>6</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td> </tr> </table>											Working Voltage(V)	160	200	250	350	400	420	450	500	Z-40°C/Z+20°C	6	6	6	10	10	10	10	10																	
Working Voltage(V)	160	200	250	350	400	420	450	500																																					
Z-40°C/Z+20°C	6	6	6	10	10	10	10	10																																					
After applying rated voltage for 2000 hours at 105°C(The polarity shall be reversed every 250 hrs.) the capacitors shall meet the following requirements. 在105°C环境下施加额定电压2000小时后(每250小时极性应逆转), 电容符合以下标准:																																													
High Temperature Load Life 高温负载耐久性	Capacitance Change容量		Within ±20% of initial value 在初始值的±20%																																										
	Dissipation Factor 损耗角		Not more than 200% of the specified value 不超过标准值的200%																																										
	Leakage Current 泄露电流		initial specified value or less 标准值内																																										
	Life Time:试验时间																																												
<table border="1"> <tr> <td>WV</td> <td colspan="10">6.3~500</td> </tr> <tr> <td>∅D (mm)</td> <td>5~6.3</td><td>8~10</td><td>12.5~22</td> <td colspan="8"></td> </tr> <tr> <td>Life(H)</td> <td>2000</td><td>4000</td><td>5000</td> <td colspan="8"></td> </tr> </table>											WV	6.3~500										∅D (mm)	5~6.3	8~10	12.5~22									Life(H)	2000	4000	5000								
WV	6.3~500																																												
∅D (mm)	5~6.3	8~10	12.5~22																																										
Life(H)	2000	4000	5000																																										
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求																																												

◆CASE SIZE TABLE(外形尺寸)



∅D	5	6.3	8	10	13	16	18	22
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10
∅d	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8
a	(L<20)1.5 (L≥20)2.0							
β	(D<20)0.5 (D≥20)1.0							

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

Rated Voltage(V)	freq. (Hz)		60	120	300	1k	10k~
	cap(μf)						
6.3~100	≤47		0.75	1.00	1.35	1.57	2.00
	56~470		0.80	1.00	1.23	1.34	1.50
	≥560		0.85	1.00	1.10	1.13	1.15
160~500	0.47~220		0.80	1.00	1.25	1.40	1.60
	>220		0.90	1.00	1.10	1.13	1.15

(2) Temperature Coefficient (温度系数)

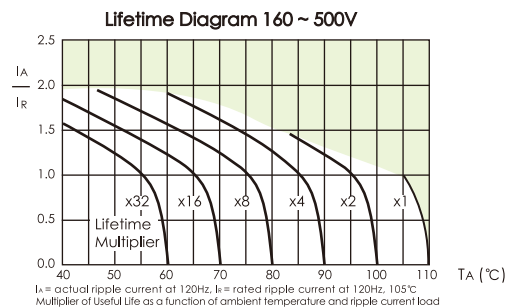
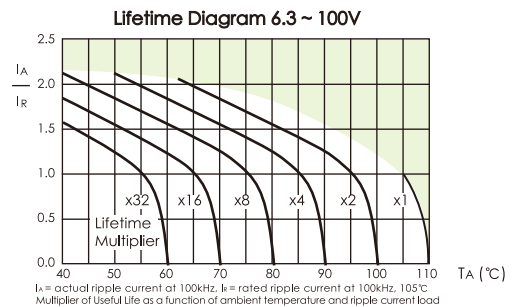
Temperature (°C)	-55	60	70	85	105
Factor	2.2	2.2	2.00	1.75	1.00

Ratings for RKZ Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA rms)	(mm)	
6.3 (7.2)	33	8.8	2.5	105	5×11.5	
	47	6.2	1.5	120	5×11.5	
	100	2.9	1.2	130	5×11.5	
	220	1.3	0.87	180	6.3×11.5	
	330	0.9	0.58	220	6.3×11.5	
	470	0.6	0.39	315	8×11.5	
	1000	0.29	0.23	500	10×12.5	
	2200	0.14	0.095	765	10×20	
	3300	0.105	0.09	1050	12.5×20	
	4700	0.079	0.061	1670	16×25	
	6800	0.062	0.056	1740	16×25	
	10000	0.053	0.045	2110	16×31.5	
15000	0.044	0.036	2580	18×35.5		
10 (13)	22	11.5	2.5	92	5×11.5	
	33	7.6	1.9	105	5×11.5	
	47	5.4	1.5	120	5×11.5	
	100	2.5	1.2	130	5×11.5	
	220	1.1	0.58	220	6.3×11.5	
	330	0.76	0.47	265	8×11.5	
	470	0.54	0.39	315	8×11.5	
	1000	0.25	0.18	615	10×16	
	2200	0.13	0.09	1050	12.5×20	
	3300	0.09	0.068	1300	12.5×25	
	4700	0.07	0.056	1740	16×25	
	6800	0.06	0.045	2110	16×31.5	
10000	0.05	0.036	2580	18×35.5		
16 (20)	10	21.2	2.5	92	5×11.5	
	22	9.7	1.9	105	5×11.5	
	33	6.4	1.5	120	5×11.5	
	47	4.5	1.2	130	5×11.5	
	100	2.1	0.58	220	6.3×11.5	
	220	0.97	0.47	290	8×11.5	
	330	0.64	0.39	315	8×11.5	
	470	0.45	0.23	500	10×12.5	
	1000	0.21	0.12	825	10×20	
	2200	0.11	0.068	1300	12.5×25	
	3300	0.08	0.056	1740	16×25	
	4700	0.06	0.045	2110	16×31.5	
6800	0.05	0.036	2580	18×35.5		
25 (32)	4.7	39.5	3	85	5×11.5	
	10	18.6	2.5	92	5×11.5	
	22	8.4	1.9	105	5×11.5	
	33	5.6	1.5	120	5×11.5	
	47	4.0	1.2	130	5×11.5	
	100	1.9	0.58	220	6.3×11.5	
	220	0.84	0.39	315	8×11.5	
	330	0.56	0.23	500	10×12.5	
	470	0.40	0.18	615	10×16	
	1000	0.19	0.09	1050	12.5×20	
	2200	0.10	0.056	1740	16×25	
	3300	0.07	0.045	2110	16×31.5	
4700	0.06	0.036	2580	18×35.5		
35 (44)	4.7	33.9	2.5	92	5×11.5	
	10	15.9	1.8	105	5×11.5	
	22	7.2	1.5	120	5×11.5	
	33	4.8	1.5	130	5×11.5	
	47	3.4	0.58	220	6.3×11.5	
	100	1.6	0.39	315	8×11.5	
	220	0.72	0.23	500	10×12.5	
	330	0.48	0.18	615	10×16	
	470	0.34	0.12	825	10×20	
	1000	0.16	0.068	1300	12.5×25	
	2200	0.08	0.045	2110	16×31.5	
	3300	0.06	0.036	2580	18×35.5	

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA rms)	(mm)	
50 (63)	0.1	1327	18	10	5×11.5	
	0.22	603	13	15	5×11.5	
	0.33	402	10	18	5×11.5	
	0.47	282	7	23	5×11.5	
	1	133	4.9	35	5×11.5	
	2.2	60	4.2	53	5×11.5	
	3.3	40	3.9	65	5×11.5	
	4.7	28	3.6	82	5×11.5	
	10	13	2.7	100	5×11.5	
	22	6	1.9	125	5×11.5	
	33	4	1.1	195	6.3×11.5	
	47	2.8	0.9	245	6.3×11.5	
	100	1.3	0.5	385	8×11.5	
	220	0.60	0.27	505	10×16	
	330	0.40	0.18	675	10×20	
	470	0.28	0.12	895	12.5×20	
	1000	0.13	0.076	1495	16×25	
	63 (79)	2200	0.07	0.05	2190	18×35.5
4.7		25	5.8	74	5×11.5	
10		12	3.6	95	5×11.5	
22		5	2.1	130	6.3×11.5	
33		4	1.7	160	6.3×11.5	
47		2.5	1.2	305	8×11.5	
100		1.2	0.65	395	10×12.5	
220		0.54	0.32	505	10×20	
330		0.36	0.22	660	12.5×20	
470		0.25	0.16	850	12.5×25	
1000		0.12	0.098	1430	16×31.5	
100 (125)		0.47	226	13	30	5×11.5
	1	106	11	45	5×11.5	
	2.2	48	9.2	60	5×11.5	
	3.3	32	7.2	67	5×11.5	
	4.7	23	6.3	75	5×11.5	
	10	11	3.3	110	6.3×11.5	
	22	5	1.4	165	8×11.5	
	33	3.2	0.94	305	10×12.5	
	47	2.3	0.68	320	10×16	
	100	1.1	0.28	585	12.5×20	
	220	0.48	0.16	1120	16×25	
	330	0.32	0.13	1290	16×25	
470	0.23	0.11	1350	16×31.5		

Lifetime Diagram



Ratings for RKZ Series

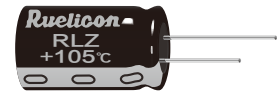
U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
160 (200)	0.47	423.5	12	6.3×11.5	
	1	199.0	18	6.3×11.5	
	2.2	90.5	26	6.3×11.5	
	3.3	60.3	37	8×11.5	
	4.7	42.3	44	8×11.5	
	10	19.9	75	10×12.5	
	22	9.0	135	10×16	
	33	6.0	175	10×20	
	47	4.2	230	12.5×20	
	100	2.0	330	16×25.5	
220	0.9	500	16×35.5		
200 (250)	0.47	423.5	12	6.3×11.5	
	1	199.0	18	6.3×11.5	
	2.2	90.5	26	6.3×11.5	
	3.3	60.3	37	8×11.5	
	4.7	42.3	50	10×12.5	
	10	19.9	80	10×16	
	22	9.0	135	10×20	
	33	6.0	190	12.5×20	
	47	4.0	230	12.5×25	
	100	2.0	360	16×25.5	
220	0.9	525	18×31.5		
250 (300)	0.47	423.5	12	6.3×11.5	
	1	199.0	18	6.3×11.5	
	2.2	90.5	30	8×11.5	
	3.3	60.3	43	8×11.5	
	4.7	42.3	50	10×12.5	
	10	19.9	90	10×16	
	22	9.0	155	12.5×20	
	33	6.0	190	12.5×25	
	47	4.2	225	16×25.5	
	100	2.0	340	16×31.5	
150	1.3	405	18×25.5		
220	0.9	570	18×36		
350 (400)	0.47	564.6	11	6.3×11.5	
	1	265.4	18	8×11.5	
	2.2	120.6	30	10×12.5	
	3.3	80.4	36	10×12.5	
	4.7	56.5	47	10×16	
	10	26.5	95	10×20	
	22	12.1	130	12.5×20	
	33	8.0	180	12.5×25	
	47	5.6	330	16×25.5	
	100	2.7	620	18×31.5	
400 (450)	1	265.4	18	8×11.5	
	2.2	120.6	25	8×11.5	
		120.6	30	10×12.5	
	3.3	80.4	35	10×12.5	
		80.4	40	10×16	
	4.7	56.5	47	10×12.5	
		56.5	52	10×16	
	10	26.5	80	10×16	
		26.5	95	10×20	
		26.5	120	12.5×20	
22	12.1	150	12.5×25		
420 (470)	1	265.4	16	8×11.5	
		265.4	19	10×12.5	
	2.2	120.6	24	8×11.5	
		120.6	29	10×12.5	
	3.3	80.4	34	10×12.5	
		80.4	38	10×16	
	4.7	56.5	46	10×16	
		56.5	52	10×20	

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
420 (470)	10	26.5	100	10×20	
		26.5	116	12.5×20	
	22	12.1	162	12.5×25	
	33	8.0	204	16×20	
		8.0	228	16×25.5	
	47	5.6	380	16×31.5	
	56	4.7	420	16×31.5	
		4.7	420	18×25.5	
	68	3.9	542	18×31.5	
		3.9	542	16×36	
82	3.2	608	18×31.5		
	3.2	608	16×40		
100	2.7	713	18×36		
	2.7	713	16×45		
120	2.2	779	18×40		
	2.2	779	16×50		
150	1.8	874	20×41		
	1.8	874	16×60		
450 (500)	1	265.4	16	8×11.5	
		265.4	19	10×12.5	
	2.2	120.6	26	10×12.5	
		120.6	29	10×16	
	3.3	80.4	38	10×16	
		80.4	42	10×20	
	4.7	56.5	49	10×16	
		56.5	54	10×20	
	10	26.5	122	10×20	
		26.5	122	12.5×20	
22	12.1	170	12.5×25		
33	8.0	240	16×25.5		
47	5.6	400	16×31.5		
56	4.7	440	18×25.5		
	4.7	440	16×31.5		
68	3.9	570	18×31.5		
	3.9	570	16×36		
82	3.2	640	18×31.5		
	3.2	640	16×40		
100	2.7	750	18×36		
	2.7	750	16×45		
120	2.2	820	18×40		
	2.2	820	16×50		
150	1.8	920	18×46		
	1.8	920	20×41		
180	1.8	920	16×60		
	1.5	1100	22×41		
500 (550)	1	265.4	21	10×12.5	
	2.2	120.6	35	10×16	
	3.3	80.4	48	10×20	
	4.7	56.5	63	12.5×20	
	10	26.5	120	12.5×25	
	22	12.1	180	16×25.5	
	33	8.0	240	16×31.5	
	47	5.6	405	18×31.5	
	56	4.7	450	16×40	
		4.7	450	18×31.5	
68	3.9	560	18×36		
	3.9	560	18×40		
82	3.9	560	16×45		
	3.2	640	16×55		
100	3.2	640	18×40		
	2.7	800	20×41		
120	2.7	800	18×46		
	2.7	800	16×60		
150	2.2	840	22×45		
	1.8	890	22×45		

Customer products are available on request.

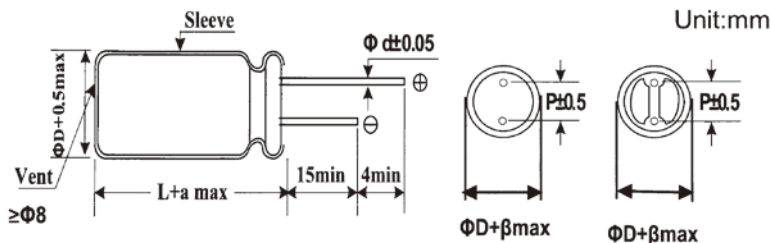
**RLZ Series (+105°C, High Ripple Current高纹波, Super Low Impedance 超低阻抗品)**

- Super Low Impedance for high frequency.  
高频超低阻抗
- Life time: 5000~10000 hours at 105°C  
寿命: 105°C 5000~10000小时
- ◆ SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能											
Operating temperature range 温度范围	-40 to +105°C											
Rated Working Voltage Range 电压范围	6.3 to 500V											
Nominal Capacitance Range 容量范围	1 to 18000μF											
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)											
Leakage Current 泄漏电流	I≤0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C两者取较大值, 2分钟测试											
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	250~500	
	Tan δ(max)	0.22	0.19	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.08	
	Capacitance>1000μF,add 0.02per another1000μF;容量大于1000μF每增加1000μF损耗角增加0.02。											
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz											
	Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	250~500	
	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	2	2	
Z-55°C/Z+20°C	8	6	4	3	3	3	2	2	-	-		
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 3000~10000 hours at 105°C. The capacitors shall meet the following requirements.在105°C环境下连续施加额定电压3000-10000小时后符合以下要求:											
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%										
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%										
	Leakage Current 泄露电流	initial specified value or less 标准值内										
	Life Time:试验时间											
∅D (mm)	5~6.3	8~22										
Life(H)	3000	10000										
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求											

◆ CASE SIZE TABLE(外形尺寸)



∅D	5	6.3	12.5	16	18
P	2.0	2.5	5.0	7.5	7.5
∅d	0.5	0.5	0.6	0.8	0.8
a	(L<20)1.5		(L≥20)2.0		
β	(D<20)0.5		(D≥20)1.0		

◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	120	1k	10k	100k
1~470	120	0.60	0.85	0.94	1.00
	1000	0.60	0.87	0.95	1.00
680~1800	120	0.60	0.87	0.95	1.00
2200~18000	120	0.60	0.90	0.95	1.00
	1000	0.60	0.90	0.95	1.00

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	60	70	85	105
Factor	2.33	2.17	2.00	1.75	1.00

Ratings for RLZ Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
6.3 (7.2)	150	0.58	2.3	210	5×11.5	
	330	0.22	0.87	340	6.3×11.5	
	680	0.13	0.52	640	8×11.5	
	820	0.080	0.32	865	10×12.5	
	1000	0.087	0.35	840	8×16	
	1200	0.069	0.27	1050	8×20	
		0.060	0.24	1210	10×16	
	1500	0.046	0.18	1400	10×20	
	1800	0.049	0.16	1450	12.5×16	
	2200	0.042	0.17	1650	10×25	
	2700	0.031	0.12	1910	10×30	
		0.042	0.12	1940	16×16	
	3300	0.035	0.12	1900	12.5×20	
	3900	0.027	0.089	2230	12.5×25	
		0.043	0.11	2210	18×16	
	4700	0.024	0.078	2650	12.5×30	
	5600	0.020	0.065	2880	12.5×35	
		0.027	0.078	2530	16×20	
	6800	0.017	0.056	3350	12.5×40	
		0.021	0.060	2930	16×25	
0.026		0.067	2860	18×20		
8200	0.017	0.050	3450	16×31.5		
10000	0.015	0.044	3610	16×35.5		
	0.019	0.049	3140	18×25		
12000	0.013	0.038	4080	16×40		
	0.015	0.040	4170	18×31.5		
15000	0.014	0.038	4220	18×35.5		
18000	0.012	0.032	4280	18×40		
10 (13)	100	0.58	2.3	210	5×11.5	
	220	0.22	0.87	340	6.3×11.5	
	470	0.13	0.52	640	8×11.5	
	680	0.087	0.35	840	8×16	
		0.080	0.32	865	10×12.5	
	1000	0.069	0.27	1050	8×20	
	1200	0.060	0.24	1210	10×16	
	1500	0.046	0.18	1400	10×20	
	1500	0.042	0.17	1650	10×25	
		0.049	0.16	1450	12.5×16	
	2200	0.031	0.12	1910	10×30	
		0.035	0.12	1900	12.5×20	
		0.042	0.12	1940	16×16	
	2700	0.043	0.11	2210	18×16	
	3300	0.027	0.089	2230	12.5×25	
	3900	0.024	0.078	2650	12.5×30	
		0.027	0.078	2530	16×20	
	4700	0.020	0.065	2880	12.5×35	
	5600	0.017	0.056	3350	12.5×40	
		0.021	0.060	2930	16×25	
0.026		0.067	2860	18×20		
6800	0.017	0.050	3450	16×31.5		
	0.019	0.049	3140	18×25		
8200	0.015	0.044	3610	16×35.5		
	0.015	0.040	4170	18×31.5		
10000	0.013	0.038	4080	16×40		
	0.014	0.038	4220	18×35.5		
12000	0.012	0.032	4280	18×40		

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
16 (20)	56	0.58	2.3	210	5×11.5	
	120	0.22	0.87	340	6.3×11.5	
	330	0.13	0.52	640	8×11.5	
	470	0.087	0.35	840	8×16	
		0.080	0.32	865	10×12.5	
	680	0.069	0.27	1050	8×20	
		0.060	0.24	1210	10×16	
	1000	0.046	0.18	1400	10×20	
		0.049	0.16	1450	12.5×16	
	1200	0.042	0.17	1650	10×25	
	1500	0.031	0.12	1910	10×30	
		0.035	0.12	1900	12.5×20	
		0.042	0.12	1940	16×16	
	2200	0.027	0.089	2230	12.5×25	
		0.043	0.11	2210	18×16	
	2700	0.024	0.078	2650	12.5×30	
		0.027	0.078	2530	16×20	
	3300	0.020	0.065	2880	12.5×35	
	3900	0.017	0.056	3350	12.5×40	
		0.021	0.060	2930	16×25	
0.026		0.067	2860	18×20		
4700	0.017	0.050	3450	16×31.5		
	0.019	0.049	3140	18×25		
5600	0.015	0.044	3610	16×35.5		
	0.015	0.040	4170	18×31.5		
6800	0.013	0.038	4080	16×40		
8200	0.014	0.038	4220	18×35.5		
10000	0.012	0.032	4280	18×40		
25 (32)	47	0.58	2.3	210	5×11.5	
	100	0.22	0.87	340	6.3×11.5	
	220	0.13	0.52	640	8×11.5	
	330	0.087	0.35	840	8×16	
		0.080	0.32	865	10×12.5	
	470	0.069	0.27	1050	8×20	
		0.060	0.24	1210	10×16	
	680	0.046	0.18	1400	10×20	
	680	0.049	0.16	1450	12.5×16	
		0.042	0.17	1650	10×25	
	1000	0.031	0.12	1910	10×30	
		0.035	0.12	1900	12.5×20	
		0.042	0.12	1940	16×16	
	1200	0.043	0.11	2210	18×16	
	1500	0.027	0.089	2230	12.5×25	
	1800	0.024	0.078	2650	12.5×30	
		0.027	0.078	2530	16×20	
	2200	0.020	0.065	2880	12.5×35	
		0.026	0.067	2860	18×20	
	2700	0.017	0.056	3350	12.5×40	
0.021		0.060	2930	16×25		
0.026		0.067	2860	18×20		
3300	0.017	0.050	3450	16×31.5		
	0.019	0.049	3140	18×25		
3900	0.015	0.044	3610	16×35.5		
	0.015	0.040	4170	18×31.5		
4700	0.013	0.038	4080	16×40		
	0.014	0.038	4220	18×35.5		
5600	0.012	0.032	4280	18×40		

Ratings for RLZ Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
35 (44)	33	0.58	2.3	210	5×11.5	
	56	0.22	0.87	340	6.3×11.5	
	150	0.13	0.52	640	8×11.5	
	220	0.087	0.35	840	8×16	
		0.080	0.32	865	10×12.5	
	270	0.069	0.27	1050	8×20	
	330	0.060	0.24	1210	10×16	
	470	0.046	0.18	1400	10×20	
		0.049	0.16	1450	12.5×16	
	560	0.042	0.17	1650	10×25	
	680	0.031	0.12	1910	10×30	
		0.035	0.12	1900	12.5×20	
		0.042	0.12	1940	16×16	
	1000	0.027	0.089	2230	12.5×25	
		0.043	0.11	2210	18×16	
	1200	0.024	0.078	2650	12.5×30	
		0.027	0.078	2530	16×20	
	1500	0.020	0.065	2880	12.5×35	
		0.017	0.056	3350	12.5×40	
	1800	0.021	0.060	2930	16×25	
		0.026	0.067	2860	18×20	
	2200	0.017	0.050	3450	16×31.5	
		0.019	0.049	3140	18×25	
	2700	0.015	0.044	3610	16×35.5	
		0.015	0.040	4170	18×31.5	
	3300	0.013	0.038	4080	16×40	
		0.014	0.038	4220	18×35.5	
	3900	0.012	0.032	4280	18×40	
50 (63)	22	0.70	2.8	180	5×11.5	
	56	0.30	1.2	295	6.3×11.5	
	100	0.17	0.68	555	8×11.5	
	120	0.12	0.48	730	8×16	
	150	0.12	0.48	760	10×12.5	
	180	0.091	0.36	910	8×20	
	220	0.084	0.34	1050	10×16	
	270	0.060	0.24	1220	10×20	
		0.061	0.20	1260	12.5×16	
	330	0.055	0.22	1440	10×25	
	470	0.043	0.17	1690	10×30	
		0.045	0.15	1660	12.5×20	
		0.055	0.17	1690	16×16	
	560	0.034	0.11	1950	12.5×25	
		0.054	0.15	1930	18×16	
	680	0.030	0.10	2310	12.5×30	
	820	0.025	0.083	2510	12.5×35	
		0.034	0.10	2210	16×20	
	1000	0.021	0.069	2920	12.5×40	
		0.025	0.075	2555	16×25	
		0.036	0.097	2490	18×20	
	1200	0.022	0.066	3010	16×31.5	
		0.026	0.070	2740	18×25	
	1500	0.019	0.057	3150	16×35.5	
	1800	0.016	0.048	3710	16×40	
		0.021	0.057	3635	18×31.5	
	2200	0.017	0.046	3680	18×35.5	
	2700	0.014	0.038	3800	18×40	
3300	0.014	0.038	3800	18×40		

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
63 (79)	15	1.8	7.3	62	5×11.5	
	33	1.0	4.1	126	6.3×11.5	
	56	0.50	2.2	260	8×11.5	
	82	0.36	1.7	335	8×16	
		0.34	1.4	325	10×12.5	
	120	0.26	1.3	408	8×20	
		0.25	1.2	400	10×16	
	180	0.17	0.76	518	10×20	
		0.18	0.86	527	12.5×16	
	220	0.16	0.67	595	10×25	
	270	0.12	0.57	740	10×30	
		0.13	0.52	765	12.5×20	
		0.11	0.52	895	16×16	
	330	0.096	0.36	875	12.5×25	
	390	0.096	0.40	1030	18×16	
	470	0.080	0.34	1010	12.5×30	
		0.077	0.32	1130	16×20	
	560	0.070	0.30	1140	12.5×35	
	680	0.062	0.23	1350	16×25	
		0.060	0.25	1280	12.5×40	
		0.072	0.27	1300	18×20	
	820	0.049	0.18	1650	16×31.5	
		0.052	0.19	1560	18×25	
	1000	0.040	0.15	1900	16×35.5	
		0.042	0.15	1720	18×31.5	
	1200	0.036	0.13	2130	16×40	
		0.036	0.13	1890	18×35.5	
	1500	0.032	0.12	2470	18×40	
100 (125)	6.8	1.8	7.3	62	5×11.5	
	15	1.0	4.1	126	6.3×11.5	
	27	0.50	2.2	260	8×11.5	
	39	0.36	1.7	335	8×16	
	47	0.34	1.4	325	10×12.5	
	56	0.26	1.3	408	8×20	
	68	0.25	1.2	400	10×16	
	82	0.17	0.76	518	10×20	
		0.18	0.86	527	12.5×16	
	100	0.16	0.67	595	10×25	
	120	0.12	0.57	740	10×30	
		0.13	0.52	765	12.5×20	
	150	0.11	0.52	895	16×16	
	180	0.096	0.36	875	12.5×25	
		0.096	0.40	1030	18×16	
	220	0.080	0.34	1010	12.5×30	
		0.077	0.32	1130	16×20	
	270	0.070	0.30	1140	12.5×35	
		0.062	0.23	1350	16×25	
	330	0.060	0.25	1280	12.5×40	
		0.072	0.27	1300	18×20	
	390	0.049	0.18	1650	16×31.5	
		0.052	0.19	1560	18×25	
	470	0.040	0.15	1900	16×35.5	
		0.042	0.15	1720	18×31.5	
	560	0.036	0.13	2130	16×40	
	680	0.036	0.13	1890	18×35.5	
	820	0.032	0.12	2470	18×40	

Customer products are available on request.



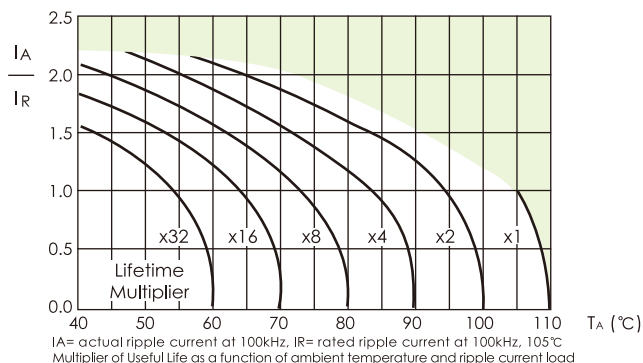
Ratings for RLZ Series

U <sub>s</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
160 (200)	10	19.9	8	320	10×16	
	22	9	3.6	500	10×20	
	33	6	2.4	650	10×20	
	47	4.2	1.7	750	10×20	
	68	2.9	1.2	1180	12.5×20	
		2.9	1.2	1180	16×20	
	100	2	0.8	1420	12.5×25	
		2	0.8	1420	16×20	
150	1.3	0.5	1890	16×25.5		
220	0.9	0.4	2370	18×25.5		
200 (250)	4.7	42.3	16.9	160	8×11.5	
		42.3	16.9	200	10×12.5	
	6.8	29.3	11.7	220	10×16	
	10	19.9	8	320	10×16	
	22	9	3.6	500	10×20	
	33	6	2.4	650	10×20	
	47	4.2	1.7	980	12.5×20	
	68	2.9	1.2	1300	12.5×25	
		2.9	1.2	1300	16×20	
	100	2	0.8	1420	16×20	
150	1.3	0.5	1890	16×25.5		
250 (300)	4.7	42.3	16.9	160	8×11.5	
		42.3	16.9	200	10×12.5	
	6.8	29.3	11.7	250	10×12.5	
	10	19.9	8	320	10×16	
	22	9	3.6	470	10×16	
		9	3.6	500	10×20	
	33	6	2.4	760	12.5×16	
		6	2.4	800	12.5×20	
	47	4.2	1.7	980	12.5×20	
	68	2.9	1.2	1300	16×20	
		2.9	1.2	1300	12.5×25	
	100	2	0.8	1530	16×25.5	
		2	0.8	1440	18×20.5	
	150	1.3	0.5	1960	18×25.5	
350 (400)	1.5	176.9	53.1	80	6.3×11.5	
		176.9	53.1	90	8×11.5	
	2.2	120.6	36.2	120	8×11.5	
		120.6	36.2	140	10×12.5	
	3.3	80.4	24.1	150	8×11.5	
		80.4	24.1	180	10×12.5	
	4.7	56.5	16.9	150	10×12.5	
	5.6	47.4	14.2	180	10×12.5	
	6.8	39	11.7	280	10×16	
	10	26.5	8	350	10×20	
	22	12.1	3.6	650	12.5×20	
	33	8	2.4	900	16×20	
	47	5.6	1.7	1080	16×20	
	68	3.9	1.2	1470	18×25.5	
82	3.2	0.97	1530	18×25.5		
400 (450)	1	265.4	79.6	50	6.3×11.5	
		265.4	79.6	60	8×11.5	
	1.5	176.9	53.1	70	6.3×11.5	
		176.9	53.1	80	8×11.5	
	2.2	120.6	36.2	95	8×11.5	
		120.6	36.2	140	10×12.5	
	3.3	80.4	24.1	150	10×12.5	
		80.4	24.1	180	10×16	
	4.7	56.5	16.9	220	10×16	
	5.6	47.4	14.2	250	10×20	
	6.8	39	11.7	280	10×20	
	10	26.5	8	350	10×20	
	15	17.7	5.3	550	12.5×20	
	22	12.1	3.6	760	12.5×25	
12.1		3.6	760	16×20		
33	8	2.4	900	16×20		

U <sub>s</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)	
400 (450)	47	5.6	1.7	1180	16×25.5	
		5.6	1.7	1180	18×20.5	
	68	3.9	1.2	1470	18×25.5	
		3.2	1	1600	18×31.5	
	100	2.7	0.8	1778	18×36	
	450 (500)	2.2	120.6	36.2	90	8×11.5
120.6			36.2	150	10×12.5	
3.3		80.4	24.1	180	10×12.5	
		80.4	24.1	190	10×16	
4.7		56.5	16.9	212	10×16	
		56.5	16.9	220	10×20	
5.6		47.4	14.2	200	10×16	
		47.4	14.2	250	10×20	
6.8		39	11.7	230	10×16	
		39	11.7	280	10×20	
10	26.5	8	330	10×20		
15	17.7	5.3	450	12.5×20		
500 (550)	22	12.1	3.6	730	16×20	
		12.1	3.6	600	12.5×25	
	33	8	2.4	980	16×25.5	
	47	5.6	1.7	1200	18×25.5	
	68	3.9	1.2	1575	18×31.5	
	82	3.2	1	1675	18×36	
	100	2.7	0.8	1730	18×36	
	120	2.2	0.7	1820	18×40	
	10	26.5	9.3	360	12.5×20	
	15	17.7	6.2	480	12.5×25	
	22	12.1	4.2	580	16×25.5	
	33	8	2.8	720	16×31.5	
	47	5.6	2	900	18×31.5	
	68	3.9	1.4	1250	18×36	
82	3.2	1.1	1380	20×41		
100	2.7	0.9	1450	20×41		

Customer products are available on request.

Lifetime Diagram



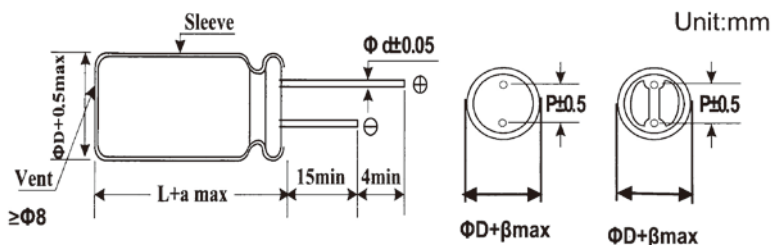
## RKA Series (+105°C, High Ripple Current, High Frequency, Low Impedance, Ultra-Low Impedance)

- Super Low Impedance for high frequency.  
高频超低阻抗
- Life time: 3000~5000 hours at 105°C  
寿命: 105°C 3000~5000小时
- ◆ SPECIFICATIONS (技术性能)



Item 项目	Performance Characteristics 性能																																														
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C																																													
Rated Working Voltage Range 电压范围	6.3 to 100V	160 to 450V																																													
Nominal Capacitance Range 容量范围	5.6 to 15000µF																																														
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																																														
Leakage Current 泄漏电流	$I \leq 0.01CV$ or $3(\mu A)$ after 2 minutes whichever is greater measured with rated working voltage applied at +20°C 两者取较大值, 2分钟测试	$I \leq 0.03CV$ ( $\mu A$ ) after 2 minutes application of rated working voltage 2分钟测试																																													
Dissipation Factor $\tan \delta$ (120Hz, +20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160~250</td><td>400~450</td> </tr> <tr> <td>Tan <math>\delta</math>(max)</td> <td>0.22</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td><td>0.08</td><td>0.15</td><td>0.20</td> </tr> </table>											Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	400~450	Tan $\delta$ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20														
	Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	400~450																																				
Tan $\delta$ (max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20																																					
Capacitance > 1000µF, add 0.02 per another 1000µF, 容量大于1000µF每增加1000µF损耗角增加0.02.																																															
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz																																														
	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160~250</td><td>400</td><td>450</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>3</td><td>5</td><td>6</td> </tr> <tr> <td>Z-55°C/Z+20°C</td> <td>8</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>-</td><td>-</td><td>-</td> </tr> </table>											Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	400	450	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	3	5	6	Z-55°C/Z+20°C	8	6	4	3	3	3	3	3	-	-	-
	Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	400	450																																			
Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	3	5	6																																				
Z-55°C/Z+20°C	8	6	4	3	3	3	3	3	-	-	-																																				
After applying rated voltage for 3000~5000 hours at 105°C. The capacitors shall meet the following requirements. 在105°C环境下连续施加额定电压3000-5000小时后符合以下要求:																																															
High Temperature Load Life 高温负载耐久性	Capacitance Change 容量		Within ±20% of initial value 在初始值的±20%																																												
	Dissipation Factor 损耗角		Not more than 200% of the specified value 不超过标准值的200%																																												
	Leakage Current 泄露电流		initial specified value or less 标准值内																																												
	Life Time: 试验时间																																														
	<table border="1"> <tr> <td>∅D (mm)</td> <td>5~6.3</td><td>8~10</td><td>&gt;12.5</td> </tr> <tr> <td>Life(H)</td> <td>2000</td><td>3000</td><td>5000</td> </tr> </table>											∅D (mm)	5~6.3	8~10	>12.5	Life(H)	2000	3000	5000																												
∅D (mm)	5~6.3	8~10	>12.5																																												
Life(H)	2000	3000	5000																																												
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours, the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求																																														

### ◆ CASE SIZE TABLE (外形尺寸)



∅D	5	6.3	8	10	13	16	18	22	25
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	12.5
∅d	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8	1.0
a	(L < 20) 1.5		(L ≥ 20) 2.0						
β	(D < 20) 0.5		(D ≥ 20) 1.0						

### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	120	1k	10k	100k
5.6		0.50	0.60	0.90	1.00
6.8~180		0.50	0.75	0.90	1.00
220~560		0.50	0.85	0.94	1.00
680~18000		0.60	0.87	0.95	1.00
2200~3900		0.75	0.90	0.95	1.00
4700~15000		0.85	0.95	0.98	1.00

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	60	70	85	105
Factor	2.33	2.17	2.00	1.75	1.00

Ratings for RKA Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)		
6.3 (7.2)	100	2.919	0.65	1.3	175	5×11.5		
	150	1.946	0.46	0.92	235	5×15		
	220	1.327	0.3	0.6	290	6.3×11.5		
	330	0.885	0.2	0.4	400	6.3×15		
	470	0.621	0.17	0.34	488	8×11.5		
	680	0.429	0.13	0.26	617	8×16		
		0.429	0.12	0.24	613	10×12.5		
	820	0.356	0.095	0.19	734	10×16		
	1000	0.292	0.095	0.19	800	8×20		
	1200	0.243	0.065	0.13	1010	10×20		
		0.243	0.065	0.13	1010	12.5×15		
	1500	0.195	0.055	0.11	1190	10×25		
	2200	0.145	0.045	0.09	1440	10×30		
		0.145	0.042	0.084	1400	12.5×20		
	2700	0.118	0.038	0.076	1690	12.5×25		
		0.118	0.046	0.092	1310	16×15		
	3300	0.105	0.043	0.086	1460	18×15		
	3900	0.088	0.032	0.064	1950	12.5×30		
	4700	0.079	0.028	0.056	2220	12.5×35		
		0.079	0.034	0.068	1660	16×20		
	5600	0.071	0.026	0.052	2390	12.5×40		
		0.071	0.028	0.056	2070	16×25		
		0.071	0.03	0.06	1850	18×20		
	6800	0.062	0.025	0.05	2350	16×31.5		
0.062		0.027	0.054	2120	18×25			
8200	0.058	0.022	0.044	2550	16×35.5			
10000	0.053	0.023	0.046	2410	18×31.5			
12000	0.049	0.02	0.04	2970	16×40			
	0.049	0.02	0.04	2680	18×35.5			
15000	0.044	0.019	0.038	3010	18×40			
10 (13)	82	3.075	0.65	1.3	175	5×11.5		
	100	2.521	0.46	0.92	235	5×15		
	180	1.401	0.3	0.6	290	6.3×11.5		
	220	1.146	0.2	0.4	400	6.3×15		
	330	0.764	0.17	0.34	488	8×11.5		
	470	0.536	0.13	0.26	617	8×16		
		0.536	0.12	0.24	613	10×12.5		
	560	0.45	0.095	0.19	734	10×16		
	680	0.371	0.095	0.19	800	8×20		
	1000	0.252	0.065	0.13	1010	10×20		
		0.252	0.065	0.13	1010	12.5×15		
	1200	0.21	0.055	0.11	1190	10×25		
	1500	0.168	0.045	0.09	1440	10×30		
	1800	0.14	0.042	0.084	1400	12.5×20		
		0.14	0.046	0.092	1310	16×15		
	2200	0.127	0.038	0.076	1690	12.5×25		
		0.127	0.043	0.086	1460	18×15		
	2700	0.103	0.032	0.064	1950	12.5×30		
	3300	0.092	0.028	0.056	2220	12.5×35		
		0.092	0.034	0.068	1660	16×20		
	3900	0.078	0.026	0.052	2390	12.5×40		
		0.078	0.028	0.056	2070	16×25		
		0.078	0.03	0.06	1850	18×20		
	4700	0.071	0.027	0.054	2120	18×25		
	5600	0.064	0.025	0.05	2350	16×31.5		
	6800	0.057	0.022	0.044	2550	16×35.5		
		0.057	0.023	0.046	2410	18×31.5		
	8200	0.053	0.02	0.04	2970	16×40		
		0.053	0.02	0.04	2680	18×35.5		
	10000	0.049	0.019	0.038	3010	18×40		
	16 (20)	56	3.791	0.65	1.3	175	5×11.5	
		82	2.589	0.46	0.92	235	5×15	
		120	1.769	0.3	0.6	290	6.3×11.5	
		180	1.180	0.2	0.4	400	6.3×15	
270		0.786	0.17	0.34	501	8×11.5		
330		0.643	0.13	0.26	575	8×16		
		0.643	0.12	0.24	625	10×12.5		
390		0.544	0.095	0.19	795	10×16		
470		0.452	0.095	0.19	760	8×20		
680		0.312	0.065	0.13	1010	10×20		
		0.312	0.065	0.13	1010	12.5×15		
820		0.259	0.055	0.11	1190	10×25		

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)	
16 (20)	1200	0.177	0.045	0.09	1430	10×30	
		0.177	0.042	0.084	1400	12.5×20	
	1500	0.142	0.038	0.076	1690	12.5×25	
		0.142	0.046	0.092	1340	16×15	
		0.142	0.043	0.086	1490	18×15	
	2200	0.109	0.032	0.064	1950	12.5×30	
		0.109	0.034	0.068	1730	16×20	
	2700	0.088	0.028	0.056	2200	12.5×35	
		0.088	0.028	0.056	2070	16×25	
		0.088	0.03	0.06	1870	18×20	
	3300	0.08	0.026	0.052	2390	12.5×40	
		0.068	0.025	0.05	2350	16×31.5	
	3900	0.068	0.027	0.054	2160	18×25	
		0.062	0.022	0.044	2550	16×35.5	
	4700	0.062	0.023	0.046	2450	18×31.5	
		0.057	0.02	0.04	2900	16×40	
6800	0.051	0.02	0.04	2730	18×35.5		
8200	0.049	0.019	0.038	3060	18×40		
25 (32)	39	4.763	0.65	1.3	175	5×11.5	
	56	3.317	0.46	0.92	235	5×15	
	82	2.266	0.3	0.6	290	6.3×11.5	
	120	1.548	0.2	0.4	400	6.3×15	
	180	1.032	0.17	0.34	503	8×11.5	
	220	0.844	0.13	0.26	575	8×16	
		0.844	0.12	0.24	629	10×12.5	
	270	0.688	0.095	0.19	795	10×16	
	330	0.563	0.095	0.19	751	8×20	
	470	0.395	0.065	0.13	1010	10×20	
		0.395	0.065	0.13	1010	12.5×15	
	560	0.332	0.055	0.11	1190	10×25	
		0.227	0.045	0.09	1440	10×30	
	820	0.227	0.042	0.084	1400	12.5×20	
		0.227	0.046	0.092	1360	16×15	
	1000	0.186	0.038	0.076	1690	12.5×25	
1200	0.155	0.043	0.086	1500	18×15		
	0.124	0.032	0.064	1950	12.5×30		
1500	0.124	0.034	0.068	1730	16×20		
	0.103	0.028	0.056	2200	12.5×35		
1800	0.103	0.028	0.056	2070	16×25		
	0.103	0.03	0.06	1890	18×20		
2200	0.097	0.026	0.052	2390	12.5×40		
2700	0.079	0.025	0.05	2350	16×31.5		
	0.079	0.027	0.054	2180	18×25		
3300	0.072	0.022	0.044	2550	16×35.5		
	0.072	0.023	0.046	2470	18×31.5		
3900	0.061	0.02	0.04	2900	16×40		
	0.061	0.02	0.04	2740	18×35.5		
4700	0.056	0.019	0.038	3070	18×40		
35 (44)	27	5.898	0.65	1.3	175	5×11.5	
	39	4.083	0.46	0.92	235	5×15	
	56	2.843	0.3	0.6	290	6.3×11.5	
	82	1.942	0.2	0.4	400	6.3×15	
	120	1.327	0.17	0.34	501	8×11.5	
	150	1.062	0.12	0.24	625	10×12.5	
	180	0.885	0.13	0.26	575	8×16	
		0.885	0.095	0.19	795	10×16	
	220	0.724	0.095	0.19	760	8×20	
	330	0.483	0.065	0.13	1010	10×20	
		0.483	0.065	0.13	1010	12.5×15	
	390	0.408	0.055	0.11	1190	10×25	
		0.284	0.045	0.09	1450	10×30	
	560	0.284	0.042	0.084	1400	12.5×20	
		0.284	0.046	0.092	1360	16×15	
	680	0.234	0.038	0.076	1690	12.5×25	
0.234		0.043	0.086	1520	18×15		
1000	0.159	0.032	0.064	1950	12.5×30		
	0.159	0.034	0.068	1730	16×20		
1200	0.133	0.028	0.056	2200	12.5×35		
	0.133	0.028	0.056	2070	16×25		
1500	0.133	0.03	0.06	1900	18×20		
	0.106	0.026	0.052	2390	12.5×40		

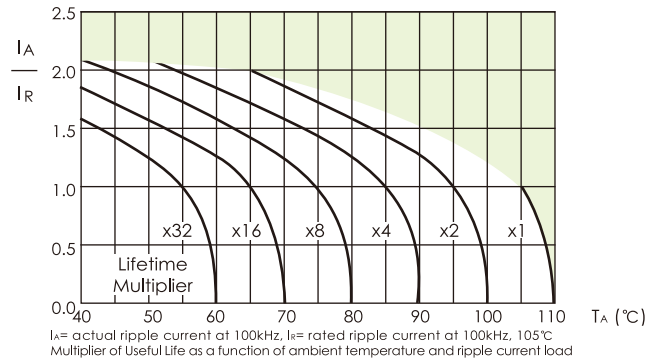
Ratings for RKA Series

U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)	
35 (44)	1800	0.088	0.025	0.050	2350	16x31.5	
		0.088	0.027	0.054	2200	18x25	
	2200	0.084	0.022	0.044	2550	16x35.5	
		0.084	0.023	0.046	2490	18x31.5	
	2700	0.069	0.020	0.040	2900	16x40	
		0.069	0.020	0.040	2770	18x35.5	
3300	0.064	0.019	0.038	3110	18x40		
50 (63)	0.47	282.333	3.9	7.8	22	5x11.5	
	1	132.696	3.5	7.0	36	5x11.5	
	2.2	60.317	3.0	6.0	54	5x11.5	
	3.3	40.211	2.6	5.2	63	5x11.5	
	4.7	28.233	2.2	4.4	75	5x11.5	
	10	13.270	1.4	2.8	110	5x11.5	
	18	7.372	0.95	1.9	120	5x11.5	
	27	4.915	0.55	1.1	135	5x15	
	39	3.402	0.36	0.72	148	6.3x11.5	
	56	2.370	0.28	0.56	153	6.3x15	
	68	1.951	0.20	0.40	360	8x11.5	
	82	1.618	0.18	0.36	460	8x16	
		1.618	0.18	0.36	443	10x12.5	
	100	1.327	0.15	0.30	553	10x16	
	120	1.106	0.13	0.26	670	8x20	
	180	0.737	0.095	0.19	676	10x20	
		0.737	0.105	0.21	745	12.5x15	
	220	0.603	0.080	0.16	876	10x25	
	330	0.402	0.065	0.13	1010	10x30	
		0.402	0.070	0.14	979	12.5x20	
	470	0.402	0.075	0.15	982	16x15	
		0.282	0.054	0.108	1180	12.5x25	
	560	0.282	0.058	0.116	1180	18x15	
		0.237	0.050	0.1	1310	12.5x30	
	680	0.195	0.046	0.092	1470	12.5x35	
0.195		0.050	0.1	1210	16x20		
820	0.162	0.044	0.088	1590	12.5x40		
	0.162	0.048	0.096	1490	16x25		
1000	0.162	0.046	0.092	1450	18x20		
	0.133	0.040	0.08	1890	16x31.5		
1200	0.133	0.040	0.08	1720	18x25		
	0.111	0.032	0.064	2140	16x35.5		
1500	0.088	0.026	0.052	2410	16x40		
	0.088	0.026	0.052	1970	18x31.5		
1800	0.074	0.025	0.050	2310	18x35.5		
2200	0.072	0.024	0.048	2530	18x40		
63 (79)	12	9.952	1.2	3.6	120	5x11.5	
	18	6.635	0.85	2.6	135	5x15	
	27	4.423	0.55	1.7	148	6.3x11.5	
	39	3.062	0.38	1.1	153	6.3x15	
	47	2.541	0.32	0.96	360	8x11.5	
	56	2.133	0.23	0.69	448	10x12.5	
	68	1.756	0.24	0.72	469	8x16	
		1.756	0.17	0.51	553	10x16	
	82	1.456	0.17	0.51	682	8x20	
	120	0.995	0.12	0.36	676	10x20	
	150	0.796	0.10	0.30	876	10x25	
		0.796	0.11	0.33	745	12.5x15	
	180	0.663	0.085	0.26	1020	10x30	
	220	0.543	0.075	0.23	979	12.5x20	
		0.543	0.080	0.24	928	16x15	
	270	0.442	0.065	0.20	1180	12.5x25	
	330	0.362	0.065	0.20	1200	18x15	
	390	0.306	0.055	0.17	1310	12.5x30	
		0.306	0.057	0.17	1210	16x20	
	470	0.254	0.048	0.14	1470	12.5x35	
		0.254	0.052	0.16	1490	16x25	
	560	0.254	0.058	0.17	1460	18x20	
		0.213	0.042	0.13	1590	12.5x40	
	680	0.176	0.042	0.13	1890	16x31.5	
		0.176	0.050	0.15	1740	18x25	
820	0.146	0.036	0.11	2140	16x35.5		
	0.146	0.042	0.13	1990	18x31.5		
1000	0.119	0.032	0.096	2410	16x40		
	0.119	0.035	0.11	2340	18x35.5		
1200	0.100	0.032	0.096	2560	18x40		

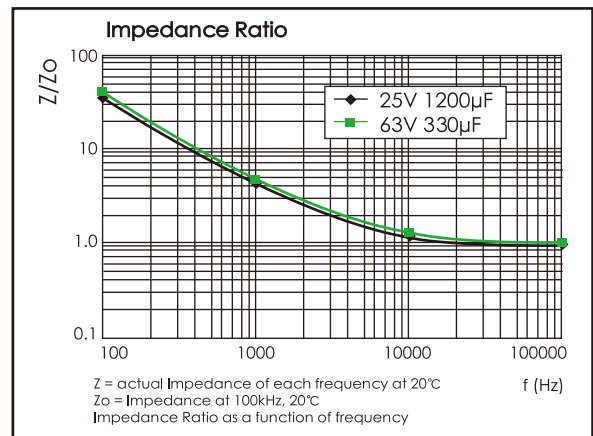
U <sub>s</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Max Imp 20°C, 100kHz	Max Imp -10°C, 100kHz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(Ω)	(Ω)	(mAmps)	(mm)	
100 (125)	5.6	18.957	1.9	7.6	57	5x11.5	
		12.946	1.3	5.2	74	5x15	
	12	8.846	1.1	4.4	78	6.3x11.5	
		5.898	0.62	2.5	85	6.3x15	
	22	4.825	0.53	2.1	275	8x11.5	
		3.932	0.47	1.9	319	10x12.5	
	33	3.217	0.35	1.4	360	8x16	
		3.217	0.32	1.3	424	10x16	
	39	2.722	0.27	1.1	490	8x20	
		1.896	0.25	1.0	499	10x20	
	68	1.561	0.18	0.72	634	10x25	
		1.561	0.20	0.80	613	12.5x15	
	100	1.062	0.15	0.60	739	10x30	
		1.062	0.13	0.52	805	12.5x20	
	120	0.885	0.11	0.44	857	12.5x25	
		0.885	0.13	0.50	706	16x15	
	150	0.708	0.12	0.48	871	18x15	
		0.590	0.090	0.36	1120	12.5x30	
180	0.590	0.11	0.44	916	16x20		
	0.483	0.075	0.30	1240	12.5x35		
220	0.483	0.081	0.32	1290	16x25		
	0.393	0.060	0.24	1330	12.5x40		
270	0.393	0.085	0.34	1170	18x20		
	0.322	0.059	0.23	1630	16x31.5		
330	0.322	0.071	0.28	1500	18x25		
	0.272	0.052	0.21	1750	16x35.5		
390	0.272	0.058	0.23	1630	18x31.5		
	0.226	0.045	0.18	1920	16x40		
560	0.190	0.054	0.22	1920	18x35.5		
680	0.156	0.041	0.16	2100	18x40		

Customer products are available on request.

Lifetime Diagram



Typical Curves



Ratings for RKA Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)		
160 (200)	10	19.9	7.3	250	10×16		
	22	9.0	3.3	500	10×20		
	33	6.0	2.2	500	10×20		
	47	4.2	1.6	660	12.5×20		
		4.2	1.6	660	10×30		
	68	2.9	1.1	760	12.5×25		
		2.9	1.1	760	10×35		
		2.9	1.1	760	16×20		
	100	2.0	0.7	1120	16×25.5		
		2.0	0.7	1120	18×20.5		
		2.0	0.7	1080	10×40		
		2.0	0.7	1080	12.5×30		
	150	1.3	0.5	1360	16×31.5		
		1.3	0.5	1360	18×25.5		
		1.3	0.5	1360	12.5×40		
	220	0.9	0.3	1400	16×31.5		
		0.9	0.3	1400	18×25.5		
		0.9	0.3	1400	12.5×50		
	200 (250)	10	19.9	7.3	250	10×16	
		22	9.0	3.3	500	10×20	
33		6.0	2.2	600	10×20		
47		4.2	1.6	660	12.5×20		
		4.2	1.6	660	10×30		
68		2.9	1.1	760	12.5×25		
		2.9	1.1	760	16×20		
		2.9	1.1	760	10×40		
100		2.0	0.7	1120	16×25.5		
		2.0	0.7	1120	18×20.5		
		2.0	0.7	1120	10×45		
		2.0	0.7	1120	12.5×36		
150		1.3	0.5	1360	16×31.5		
		1.3	0.5	1360	18×25.5		
		1.3	0.5	1360	12.5×45		
220		0.9	0.3	1700	18×31.5		
		0.9	0.3	1700	16×40		
		0.9	0.3	1700	16×40		
250 (300)		10	19.9	7.3	280	10×20	
		22	9.0	3.3	600	12.5×20	
	33	6.0	2.2	600	12.5×20		
	47	4.2	1.6	720	12.5×25		
		4.2	1.6	720	16×20		
		4.2	1.6	720	10×35		
	68	2.9	1.1	920	16×25.5		
		2.9	1.1	920	18×20.5		
		2.9	1.1	920	12.5×36		
		2.9	1.1	920	10×45		
	100	2.0	0.7	1200	16×31.5		
		2.0	0.7	1200	18×25.5		
		2.0	0.7	1200	12.5×45		
		2.0	0.7	1200	16×40		
	150	1.3	0.5	1500	18×31.5		

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 100kHz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(Ω)	(Ω)	(mA <sub>rms</sub> )	(mm)		
350 (400)	6.8	39.0	10.7	220	10×16		
	10	26.5	7.3	280	10×20		
	22	12.1	3.3	350	12.5×20		
	33	8.0	2.2	500	16×20		
		8.0	2.2	500	10×35		
		8.0	2.2	500	12.5×25		
	47	5.6	1.6	660	16×25.5		
		5.6	1.6	660	18×20.5		
		5.6	1.6	660	10×45		
		5.6	1.6	660	12.5×36		
	68	3.9	1.1	850	16×31.5		
		3.9	1.1	850	18×25.5		
		3.9	1.1	850	12.5×45		
	400 (450)	6.8	39.0	10.7	220	10×16	
		10	26.5	7.3	280	10×20	
22		12.1	3.3	430	12.5×25		
		12.1	3.3	430	16×20		
		12.1	3.3	430	10×35		
33		8.0	2.2	640	16×25.5		
		8.0	2.2	640	18×20.5		
		8.0	2.2	640	10×45		
		8.0	2.2	640	12.5×36		
47		5.6	1.6	840	16×31.5		
		5.6	1.6	840	12.5×40		
68		3.9	1.1	1000	18×25.5		
		3.9	1.1	1000	12.5×50		
82		3.2	0.9	1100	18×31.5		
		3.2	0.9	1100	12.5×61		
100	2.7	0.7	1280	18×36			
120	2.2	0.6	1480	18×40			
150	1.8	0.5	1770	20×41			
450 (500)	6.8	39.0	12.9	150	10×20		
	10	26.5	8.8	320	12.5×20		
		26.5	8.8	320	10×30		
	22	12.1	4.0	430	12.5×25		
		12.1	4.0	560	16×25.5		
	22	12.1	4.0	560	10×40		
		33	8.0	2.7	700	16×25.5	
	8.0		2.7	700	10×50		
	47	5.6	1.9	880	16×31.5		
		5.6	1.9	880	12.5×45		
	68	3.9	1.3	1130	18×31.5		
		3.9	1.3	1130	12.5×50		
	82	3.2	1.1	1160	18×36		
		3.2	1.1	1160	12.5×61		
	100	2.7	0.9	1360	18×40		
120	2.2	0.75	1560	18×46			
150	1.8	0.6	1880	22×41			

Customer products are available on request.

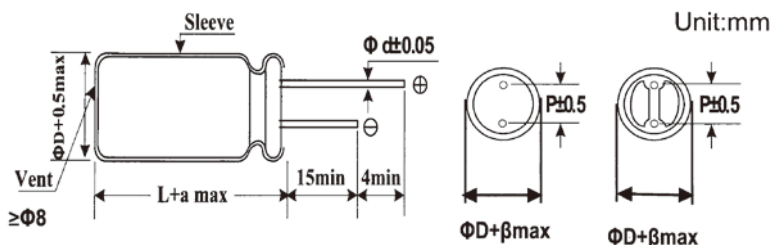
**RKSeries (+105°C, High Ripple Current高纹波, Low Impedance 超低阻抗品)**

- Super Low Impedance for high frequency.  
高频超低阻抗
- Life time: 2000 hours at 105°C  
寿命: 105°C 2000小时
- ◆ SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能																																										
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C																																									
Rated Working Voltage Range 电压范围	6.3 to 250V	315 to 500V																																									
Nominal Capacitance Range 容量范围	0.1~22000μF																																										
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																																										
Leakage Current 泄漏电流	I≤0.01CV or 3(μA) after 2 minutes whichever is greater measured with rated working voltage applied at +20°C 两者取较大值, 2分钟测试	I≤0.03CV (μA) after 2 minutes whichever after 2 minute at +20°C 2分钟测试																																									
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160~250</td><td>315~500</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.22</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td><td>0.08</td><td>0.15</td><td>0.20</td> </tr> </table>										Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	315~500	Tan δ(max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20											
	Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	315~500																																
Tan δ(max)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.15	0.20																																	
Capacitance>1000μF,add 0.02per another1000μF,容量大于1000μF每增加1000μF损耗角增加0.02。																																											
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz																																										
	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160~250</td><td>315~500</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>3</td><td>6</td> </tr> <tr> <td>Z-55°C/Z+20°C</td> <td>8</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>-</td><td>-</td> </tr> </table>										Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	315~500	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	3	6	Z-55°C/Z+20°C	8	6	4	3	3	3	3	3	-	-
	Working Voltage(V)	6.3	10	16	25	35	50	63	100	160~250	315~500																																
Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	3	6																																	
Z-55°C/Z+20°C	8	6	4	3	3	3	3	3	-	-																																	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 105°C. The capacitors shall meet the following requirements.在105°C环境下连续施加额定电压2000小时后符合以下要求:																																										
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%																																									
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%																																									
	Leakage Current 泄露电流	initial specified value or less 标准值内																																									
	Life Time:试验时间																																										
∅D (mm)		5~6.3	8~10	>12.5																																							
Life(H)		2000	3000	4000																																							
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求																																										

◆ CASE SIZE TABLE(外形尺寸)



∅D	5	6.3	8	10	13	16	18	22	25
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10.0	12.5
∅d	0.5	0.5	0.5	0.6	0.6	0.8	0.8	0.8	1.0
a	(L<20)1.5		(L≥20)2.0						
β	(D<20)0.5		(D≥20)1.0						

◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	120	1k	10k	100k
0.1~5.6	0.1~5.6	0.50	0.60	0.90	1.00
	6.8~180	0.50	0.75	0.90	1.00
	220~560	0.50	0.85	0.94	1.00
	680~18000	0.60	0.87	0.95	1.00
	2200~3900	0.75	0.90	0.95	1.00
4700~22000	0.85	0.95	0.98	1.00	

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	60	70	85	105
Factor	2.33	2.17	2.00	1.75	1.00

Ratings for RKS Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>RMS</sub> )	(mm)	
6.3 (7.2)	220	1.33	200	5×11.5	
	330	0.88	270	6.3×11.5	
	470	0.62	322	6.3×11.5	
	1000	0.29	546	8×11.5	
	2200	0.14	1010	10×20	
	3300	0.10	1230	10×20	
	4700	0.08	1710	12.5×20	
	6800	0.06	1930	12.5×25	
	10000	0.05	2450	16×25	
	15000	0.04	2860	16×35.5	
	22000	0.04	3340	18×40	
10 (13)	47	5.36	99	5×11.5	
	100	2.52	146	5×11.5	
	220	1.15	240	6.3×11.5	
	330	0.76	290	6.3×11.5	
	470	0.54	417	8×11.5	
	1000	0.25	650	10×12.5	
	2200	0.13	1080	10×20	
	3300	0.09	1430	12.5×20	
	4700	0.07	1780	12.5×25	
	6800	0.06	2220	16×25	
	10000	0.05	2700	16×35.5	
15000	0.04	3100	18×35.5		
16 (20)	10	21.2	50	5×11.5	
	22	9.65	75	5×11.5	
	33	6.43	92	5×11.5	
	47	4.52	110	5×11.5	
	100	2.12	160	5×11.5	
	220	0.97	264	6.3×11.5	
	330	0.64	383	8×11.5	
	470	0.45	457	8×11.5	
	1000	0.21	791	10×16	
	2200	0.11	1350	12.5×20	
	3300	0.08	1690	12.5×25	
4700	0.06	2100	16×25		
6800	0.05	2580	16×35.5		
10000	0.05	3130	18×35.5		
25 (32)	4.7	39.5	38	5×11.5	
	10	18.6	55	5×11.5	
	22	8.44	82	5×11.5	
	33	5.63	100	5×11.5	
	47	3.95	118	5×11.5	
	100	1.86	199	6.3×11.5	
	220	0.84	349	8×11.5	
	330	0.56	510	10×12.5	
	470	0.40	545	10×12.5	
	1000	0.19	996	10×20	
	2200	0.10	1660	12.5×25	
3300	0.07	2030	16×25		
4700	0.06	2650	16×31.5		
6800	0.05	3290	18×35.5		
35 (44)	4.7	33.9	40	5×11.5	
	10	15.9	59	5×11.5	
	22	7.24	87	5×11.5	
	33	4.83	107	5×11.5	
	47	3.39	130	5×11.5	
	100	1.59	214	6.3×11.5	
	220	0.72	443	8×11.5	
	330	0.48	542	10×12.5	
	470	0.34	664	10×16	
	1000	0.16	1210	12.5×20	
	2200	0.08	1950	16×25	
3300	0.06	2510	16×35.5		
4700	0.05	2990	18×35.5		

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>RMS</sub> )	(mm)	
50 (63)	0.1	1327	3	5×11.5	
	0.22	603	6	5×11.5	
	0.33	402	9	5×11.5	
	0.47	282	13	5×11.5	
	1	133	21	5×11.5	
	2.2	60.3	31	5×11.5	
	3.3	40.2	38	5×11.5	
	4.7	28.2	45	5×11.5	
	10	13.3	66	5×11.5	
	22	6.03	98	5×11.5	
	33	4.02	126	5×11.5	
	47	2.82	155	6.3×11.5	
	100	1.33	260	8×11.5	
	220	0.60	443	10×12.5	
	330	0.40	595	10×16	
	470	0.28	887	12.5×20	
	63 (79)	4.7	25.4	45	5×11.5
10		11.9	66	5×11.5	
22		5.43	100	5×11.5	
33		3.62	140	6.3×11.5	
47		2.54	170	6.3×11.5	
100		1.19	300	10×12.5	
220		0.54	470	10×16	
330		0.36	710	10×20	
470		0.25	900	12.5×20	
1000		0.12	1300	16×25	
100 (125)	0.1	1062	2.1	5×11.5	
	0.22	483	4.7	5×11.5	
	0.33	322	7	5×11.5	
	0.47	226	10	5×11.5	
	1	106.2	21	5×11.5	
	2.2	48.3	30	5×11.5	
	3.3	32.2	40	5×11.5	
	4.7	22.6	45	5×11.5	
	10	10.6	75	6.3×11.5	
	22	4.83	130	6.3×11.5	
	33	3.22	180	8×11.5	
	47	2.26	230	10×12.5	
	100	1.06	370	10×20	
220	0.48	620	12.5×25		
330	0.32	760	16×25		
470	0.23	1000	16×25		
1000	0.11	1380	18×40		
160 (200)	0.47	339	15	6.3×11.5	
	1	159	22	6.3×11.5	
	2.2	72.4	32	6.3×11.5	
	3.3	48.3	40	6.3×11.5	
	4.7	33.9	48	6.3×11.5	
	10	15.9	81	8×11.5	
	22	7.24	151	10×16	
	33	4.83	202	10×20	
	47	3.39	266	12.5×20	
	100	1.59	422	12.5×25	
	220	0.72	783	16×31.5	
330	0.48	1080	18×31.5		

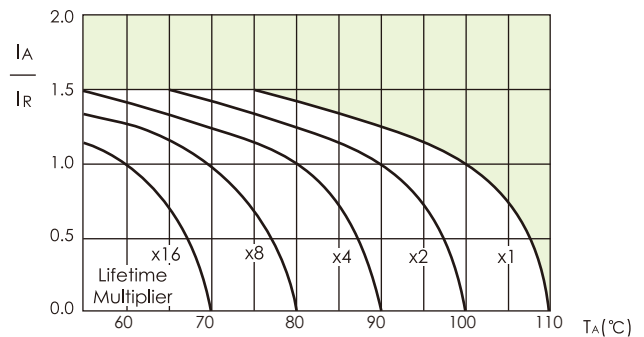
Ratings for RKS Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
200 (250)	0.47	339	15	6.3×11.5	
	1	159	22	6.3×11.5	
	2.2	72.4	32	6.3×11.5	
	3.3	48.3	40	6.3×11.5	
	4.7	33.9	56	8×11.5	
	10	15.9	94	8×11.5	
	22	7.24	170	10×20	
	33	4.83	223	12.5×20	
	47	3.39	265	12.5×20	
	100	1.59	483	16×25.5	
250 (300)	0.47	423	15	6.3×11.5	
	1	199	22	6.3×11.5	
	2.2	90.5	32	6.3×11.5	
	3.3	60.3	48	8×11.5	
	4.7	42.3	56	8×11.5	
	10	19.9	101	10×12.5	
	22	9.05	182	10×20	
	33	6.03	243	12.5×20	
	47	4.23	295	12.5×25	
	100	1.99	528	16×31.5	
315 (350)	0.47	423	15	6.3×11.5	
	1	199	22	6.3×11.5	
	2.2	90.5	38	8×11.5	
	3.3	60.3	53	10×12.5	
	4.7	42.3	65	10×12.5	
	10	19.9	115	10×16	
	22	9.05	182	12.5×20	
	33	6.03	277	16×25.5	
	47	4.23	330	16×25.5	
	100	1.99	567	18×31.5	
350 (400)	0.47	423.5	15	6.3×11.5	
	1	199	22	6.3×11.5	
	2.2	90.5	38	6.3×11.5	
	3.3	60.3	53	8×11.5	
	4.7	42.3	65	10×12.5	
	10	19.9	115	10×20	
	22	9.05	197	12.5×20	
	33	6.03	277	12.5×25	
	47	4.23	330	16×25.5	
	100	1.99	507	18×31.5	

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
400 (450)	0.47	565	15	6.3×11.5	
	1	265	22	6.3×11.5	
	2.2	121	38	8×11.5	
	3.3	80.4	54	10×12.5	
	4.7	56.5	71	10×12.5	
	10	26.5	123	10×20	
	22	12.1	197	12.5×25	
	33	8.04	277	16×25.5	
	47	5.65	361	16×25.5	
	68	3.9	423	18×25.5	
450 (500)	82	3.2	509	18×31.5	
	100	2.7	595	18×36	
	0.47	649	18	6.3×11.5	
	1	305	25	6.3×11.5	
	2.2	139	43	8×11.5	
	3.3	92.5	59	10×12.5	
	4.7	64.9	76	10×16	
	10	30.5	123	10×20	
	22	13.9	226	12.5×25	
	33	9.2	304	16×25.5	
500 (550)	47	6.5	380	16×31.5	
	68	4.5	436	18×25.5	
	82	3.7	530	18×31.5	
	100	2.6	610	18×36	
	1	305	35	10×12.5	
	2.2	139	45	10×16	
	3.3	92.5	75	10×20	
	4.7	64.9	100	12.5×20	
	10	30.5	165	12.5×25	

Customer products are available on request.

Lifetime Diagram

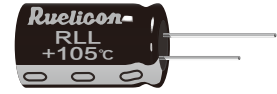


I<sub>A</sub> = actual ripple current at 120Hz, I<sub>R</sub> = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



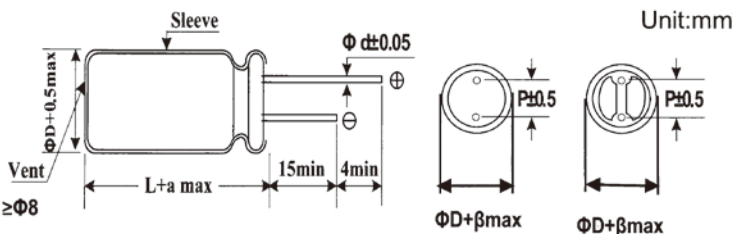
**RLL Series(3000h at 105°C Low Leakage Current低漏电)**

- 5000h at 105°C  
在105°C下工作5000小时
- Extremely low and stable leakage current characteristics.  
极低和稳定的泄漏电流特性
- ◆SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能																											
Operating temperature range 温度范围	-40 to +105°C																											
Rated Working Voltage Range 电压范围	6.3 to 100V																											
Nominal Capacitance Range 容量范围	0.1 to 10000μF																											
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																											
Leakage Current 泄漏电流	$I \leq 0.02CV$ or $0.8(\mu A)$ whichever is greater measured after 2minutes application of with rated working voltage at +20°C 两者取较大值, 施加额定电压2分钟测试																											
Dissipation Factor $\tan \delta(120Hz, +20^\circ C)$ 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Tan <math>\delta(\max)</math></td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> </tr> </table>	Working Voltage(V)	6.3	10	16	25	35	50	63	100	Tan $\delta(\max)$	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08									
Working Voltage(V)	6.3	10	16	25	35	50	63	100																				
Tan $\delta(\max)$	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08																				
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>12</td> <td>10</td> <td>8</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Working Voltage(V)	6.3	10	16	25	35	50	63	100	Z-25°C/Z+20°C	5	4	3	2	2	2	2	2	Z-40°C/Z+20°C	12	10	8	5	4	3	3	3
Working Voltage(V)	6.3	10	16	25	35	50	63	100																				
Z-25°C/Z+20°C	5	4	3	2	2	2	2	2																				
Z-40°C/Z+20°C	12	10	8	5	4	3	3	3																				
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压5000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值																					
Capacitance Change容量	Within ±20% of initial value 在初始值的±20%																											
Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%																											
Leakage Current 泄露电流	initial specified value or less 不超过标准值																											
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 500 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置500小时后电性能同耐久性要求																											

◆CASE SIZE TABLE(外形尺寸)



∅D	5	6.3	8	10	12.5	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
∅d	0.5	0.5	0.5	0.6	0.6	0.8	0.8
a	(L<20)1.5 (L≥20)2.0						
β	(D<20)0.5 (D≥20)1.0						

◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	50	120	300	1k	30k~
≤47		0.75	1.00	1.35	1.57	2.00
56~470		0.80	1.00	1.23	1.34	1.50
680~3300		0.80	1.00	1.10	1.13	1.50
4700~10000		0.90	1.00	1.00	1.05	1.30

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	65	70	85	105
Factor	2.23	2.17	2.00	1.75	1.00

Ratings for RLL Series

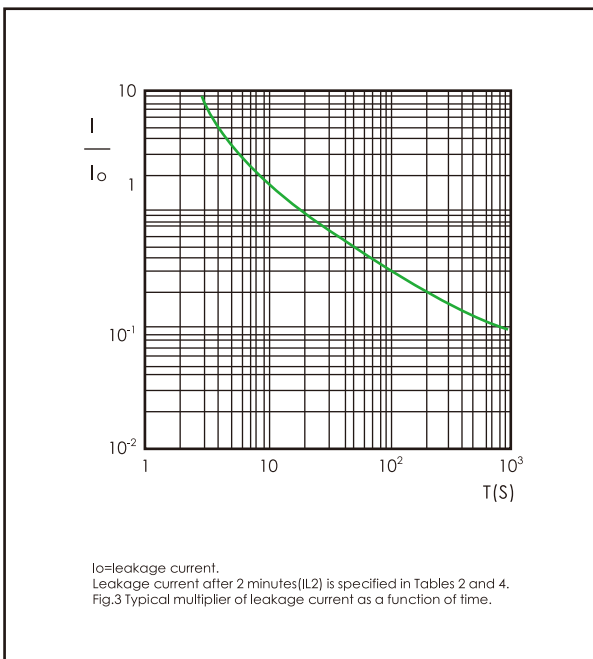
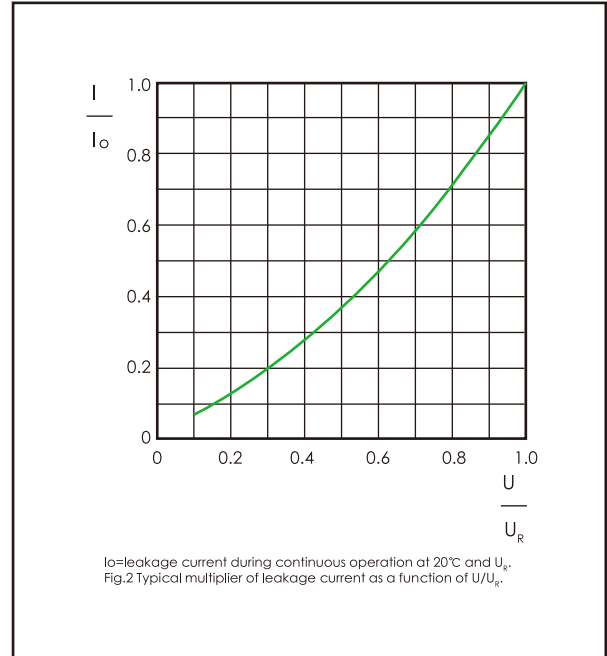
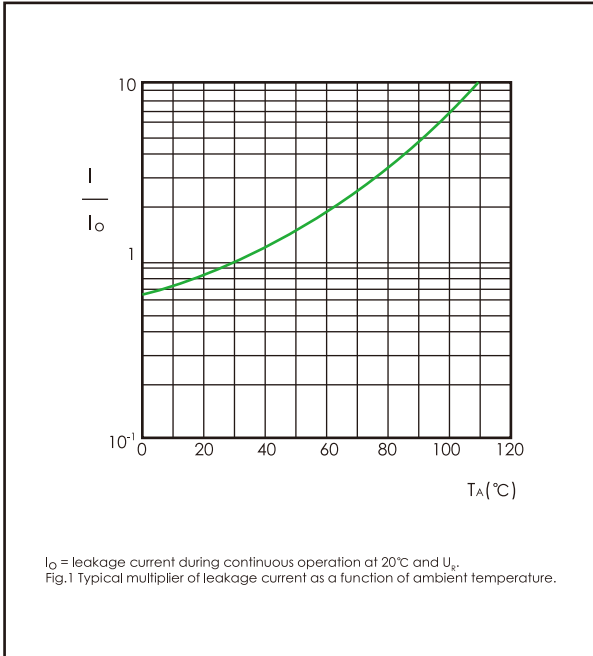
U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
6.3 (7.2)	470	0.51	390	10×12.5	
	680	0.41	480	10×16	
	1000	0.28	650	10×20	
	1500	0.19	910	12.5×25	
	2200	0.13	1060	12.5×25	
	3300	0.08	1270	16×25	
	4700	0.06	1500	16×31.5	
	6800	0.04	1760	18×35.5	
10000	0.03	1900	18×40		
10 (13)	47	4.23	110	5×11.5	
	68	2.93	150	6.3×11.5	
	100	1.99	180	6.3×11.5	
	150	1.33	250	8×11.5	
	220	0.90	310	8×11.5	
	330	0.60	400	10×12.5	
	470	0.48	530	10×16	
	680	0.33	600	10×20	
	1000	0.23	810	12.5×20	
	1500	0.15	1020	12.5×25	
	2200	0.10	1200	16×25	
	3300	0.07	1420	16×31.5	
	4700	0.05	1650	16×35.5	
	6800	0.03	1890	18×35.5	
16 (20)	10	15.92	55	5×11.5	
	15	10.62	70	5×11.5	
	22	7.24	85	5×11.5	
	33	4.83	100	5×11.5	
	47	3.39	140	6.3×11.5	
	68	2.34	160	6.3×11.5	
	100	1.59	230	8×11.5	
	150	1.06	280	8×11.5	
	220	0.72	370	10×12.5	
	330	0.56	420	10×16	
	470	0.40	550	10×20	
	680	0.27	730	12.5×20	
	1000	0.19	910	12.5×25	
	1500	0.12	1150	16×25	
	2200	0.08	1300	16×25	
	3300	0.06	1550	16×35.5	
4700	0.04	1820	16×35.5		
25 (32)	4.7	22.59	45	5×11.5	
	6.8	15.61	55	5×11.5	
	10	10.62	70	5×11.5	
	15	7.08	85	5×11.5	
	22	4.83	100	5×11.5	
	33	3.22	140	6.3×11.5	
	47	2.26	170	6.3×11.5	
	68	1.56	230	8×11.5	
	100	1.06	280	8×11.5	
	150	0.71	370	10×12.5	
	220	0.72	400	10×16	
	330	0.48	490	10×20	
	470	0.34	600	12.5×20	
	680	0.23	810	12.5×25	
1000	0.16	1010	16×25		
1500	0.11	1270	16×31.5		
2200	0.07	1440	16×35.5		
3300	0.05	1720	18×40		
35 (44)	15	7.08	85	5×11.5	
	22	4.83	110	6.3×11.5	
	33	3.22	140	6.3×11.5	
	47	2.26	190	8×11.5	
	68	1.56	230	8×11.5	
	100	1.06	300	10×12.5	
	150	1.06	400	10×16	
	220	0.72	440	10×20	
	330	0.48	550	12.5×20	
	470	0.34	680	12.5×25	
	680	0.23	840	16×25	
	1000	0.16	1100	16×25	
	1500	0.11	1390	16×35.5	
	2200	0.07	1580	16×35.5	

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
50 (63)	0.1	1061.57	1.1	5×11.5	
	0.15	707.71	1.6	5×11.5	
	0.22	482.53	2.3	5×11.5	
	0.33	321.69	3.5	5×11.5	
	0.47	225.87	5.0	5×11.5	
	0.68	156.11	7.3	5×11.5	
	1	106.16	10.7	5×11.5	
	1.5	70.77	16	5×11.5	
	2.2	48.25	23	5×11.5	
	3.3	32.17	40	5×11.5	
	4.7	22.59	45	5×11.5	
	6.8	15.61	55	5×11.5	
	10	10.62	70	5×11.5	
	15	7.08	85	6.3×11.5	
	22	4.83	110	6.3×11.5	
	33	3.22	165	8×11.5	
	47	2.26	190	8×11.5	
	68	1.56	250	10×12.5	
	100	1.33	320	10×16	
	63 (79)	150	0.88	420	10×20
220		0.60	490	12.5×20	
330		0.40	600	12.5×20	
470		0.28	760	16×25	
680		0.20	910	16×25	
1000		0.13	1140	16×31.5	
1500		0.09	1480	18×40	
6.8		13.66	59	5×11.5	
10		9.29	75	6.3×11.5	
15		6.19	100	6.3×11.5	
22		4.22	115	8×11.5	
33		2.81	170	8×11.5	
47		1.98	200	10×12.5	
68		1.56	270	10×16	
100 (125)	100	1.06	330	10×20	
	150	0.71	450	12.5×20	
	220	0.48	550	12.5×20	
	330	0.32	710	12.5×25	
	470	0.23	850	16×25	
	680	0.16	1050	16×31.5	
	1000	0.11	1330	18×35.5	
	0.1	928.87	2.1	5×11.5	
	0.15	619.25	3.2	5×11.5	
	0.22	422.22	4.7	5×11.5	
	0.33	281.48	7.0	5×11.5	
	0.47	197.63	10.1	5×11.5	
	0.68	136.60	14.5	5×11.5	
	1	92.89	19	5×11.5	
1.5	61.92	23	5×11.5		
2.2	42.22	28	5×11.5		
3.3	28.15	45	5×11.5		
4.7	19.76	50	5×11.5		
6.8	13.66	65	6.3×11.5		
10	9.29	90	8×11.5		
15	6.19	110	8×11.5		
22	4.22	136	10×12.5		
33	3.22	180	10×16		
47	2.26	220	10×20		
68	1.56	290	10×20		
100	1.06	370	12.5×20		
150	0.71	470	12.5×25		
220	0.48	580	16×25		
330	0.32	730	16×31.5		
470	0.23	910	16×35.5		

Customer products are available on request.

Ratings for RLL Series

Typical Curves



## RFA Series(2000h at 85°C For Audio 音响电容)

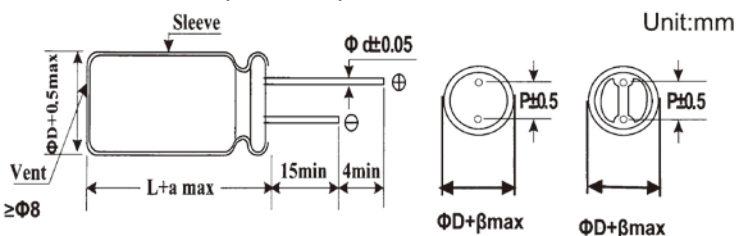
- Standard, for audio equipment  
音频设备标准品
- Low distortion ratio ensured with anti-vibration structures.  
低失真率与减振结构保证



### ◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能																											
Operating temperature range 温度范围	-40 to +85°C																											
Rated Working Voltage Range 电压范围	6.3 to 100V																											
Nominal Capacitance Range 容量范围	0.47 to 15000μF																											
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																											
Leakage Current 泄漏电流	$I \leq 0.005CV$ or $2(\mu A)$ whichever is greater measured after 2minutes application of rated working voltage at +20°C 两者取较大值, 施加额定电压2分钟测试																											
Dissipation Factor $\tan \delta(120Hz, +20^\circ C)$ 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Tan <math>\delta(\max)</math></td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.09</td> <td>0.08</td> </tr> </table>	Working Voltage(V)	6.3	10	16	25	35	50	63	100	Tan $\delta(\max)$	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08									
Working Voltage(V)	6.3	10	16	25	35	50	63	100																				
Tan $\delta(\max)$	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08																				
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>	Working Voltage(V)	6.3	10	16	25	35	50	63	100	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2	Z-40°C/Z+20°C	8	6	4	4	3	3	3	3
Working Voltage(V)	6.3	10	16	25	35	50	63	100																				
Z-25°C/Z+20°C	4	3	2	2	2	2	2	2																				
Z-40°C/Z+20°C	8	6	4	4	3	3	3	3																				
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压2000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 150% of the specified value 不超过标准值的150%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%	Leakage Current 泄露电流	initial specified value or less 不超过标准值																					
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Leakage Current 泄露电流	initial specified value or less 不超过标准值																											
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求																											

### ◆CASE SIZE TABLE(外形尺寸)



ØD	5	6.3	8	10	13	16	18
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8
a	(L<20)1.5 (L≥20)2.0						
β	(D<20)0.5 (D≥20)1.0						

### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	50	120	300	1k	30k~
≤47		0.75	1.00	1.35	1.57	2.00
56~470		0.80	1.00	1.23	1.34	1.50
≥560		0.85	1.00	1.10	1.13	1.15

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	65	70	85
Factor	1.65	1.50	1.30	1.00

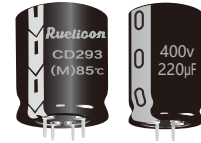
Ratings for RFA Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)	
6.3 (7.2)	100	3.98	85	5×11.5	
	220	1.81	150	6.3×11.5	
	330	1.21	180	6.3×11.5	
	470	0.85	260	8×11.5	
	1000	0.40	450	10×12.5	
	2200	0.19	890	12.5×20	
	3300	0.14	1050	12.5×20	
	4700	0.10	1550	16×25	
	6800	0.08	1750	16×25	
	10000	0.06	2150	16×31.5	
15000	0.05	2700	18×35.5		
10 (13)	33	10.05	55	5×11.5	
	47	7.06	65	5×11.5	
	100	3.32	95	5×11.5	
	220	1.51	165	6.3×11.5	
	330	1.01	240	8×11.5	
	470	0.71	280	8×11.5	
	1000	0.33	540	10×16	
	2200	0.16	970	12.5×20	
	3300	0.12	1250	12.5×25	
	4700	0.09	1650	16×25	
6800	0.07	2050	16×31.5		
10000	0.06	2550	18×35.5		
16 (20)	22	11.46	50	5×11.5	
	33	7.64	60	5×11.5	
	47	5.36	75	5×11.5	
	100	2.52	120	6.3×11.5	
	220	1.15	220	8×11.5	
	330	0.76	270	8×11.5	
	470	0.54	390	10×12.5	
	1000	0.25	680	10×20	
	2200	0.13	1200	12.5×25	
	3300	0.10	1600	16×25	
4700	0.07	2050	16×31.5		
6800	0.06	2550	18×35.5		
25 (32)	22	9.65	55	5×11.5	
	33	6.43	70	5×11.5	
	47	4.52	80	5×11.5	
	100	2.12	140	6.3×11.5	
	220	0.97	240	8×11.5	
	330	0.64	350	10×12.5	
	470	0.45	460	10×16	
	1000	0.21	850	12.5×20	
	2200	0.11	1500	16×25	
	3300	0.08	1900	16×31.5	
4700	0.06	2450	18×35.5		
35 (44)	4.7	39.53	25	5×11.5	
	10	18.58	40	5×11.5	
	22	8.44	60	5×11.5	
	33	5.63	75	5×11.5	

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(Ω)	(mA <sub>rms</sub> )	(mm)		
35 (44)	47	3.95	100	6.3×11.5		
	100	1.86	170	8×11.5		
	220	0.84	310	10×12.5		
	330	0.56	420	10×16		
	470	0.40	540	10×20		
	1000	0.19	990	12.5×20		
	2200	0.10	1750	16×31.5		
	3300	0.07	2250	18×35.5		
	50 (63)	0.47	338.80	9	5×11.5	
		1	159.24	14	5×11.5	
2.2		72.38	20	5×11.5		
3.3		48.25	25	5×11.5		
4.7		33.88	30	5×11.5		
10		15.92	40	5×11.5		
22		7.24	65	5×11.5		
33		4.83	90	6.3×11.5		
47		3.39	110	6.3×11.5		
100		1.59	190	8×11.5		
63 (79)	220	0.72	370	10×16		
	330	0.48	490	10×20		
	470	0.34	670	12.5×20		
	1000	0.16	1250	16×25		
	2200	0.08	2100	18×35.5		
	4.7	28.23	30	5×11.5		
	10	13.27	45	5×11.5		
	22	6.03	80	6.3×11.5		
	33	4.02	100	6.3×11.5		
	47	2.82	140	8×11.5		
100 (125)	100	1.33	250	10×12.5		
	220	0.60	440	10×20		
	330	0.40	620	12.5×20		
	470	0.28	810	12.5×25		
	1000	0.13	1500	16×31.5		
	0.47	282.33	10	5×11.5		
	1	132.70	15	5×11.5		
	2.2	60.32	20	5×11.5		
	3.3	40.21	25	5×11.5		
	4.7	28.23	30	5×11.5		
100 (125)	10	13.27	55	6.3×11.5		
	22	6.03	95	8×11.5		
	33	4.02	140	10×12.5		
	47	2.82	180	10×16		
	100	1.33	340	12.5×20		
	220	0.60	640	16×25		
	330	0.40	780	16×25		
	470	0.28	1000	16×31.5		

Customer products are available on request.

## CD293 Series (Lug/Snap Terminal Type插入/自立型, 标准品)



•2000h at 85°C

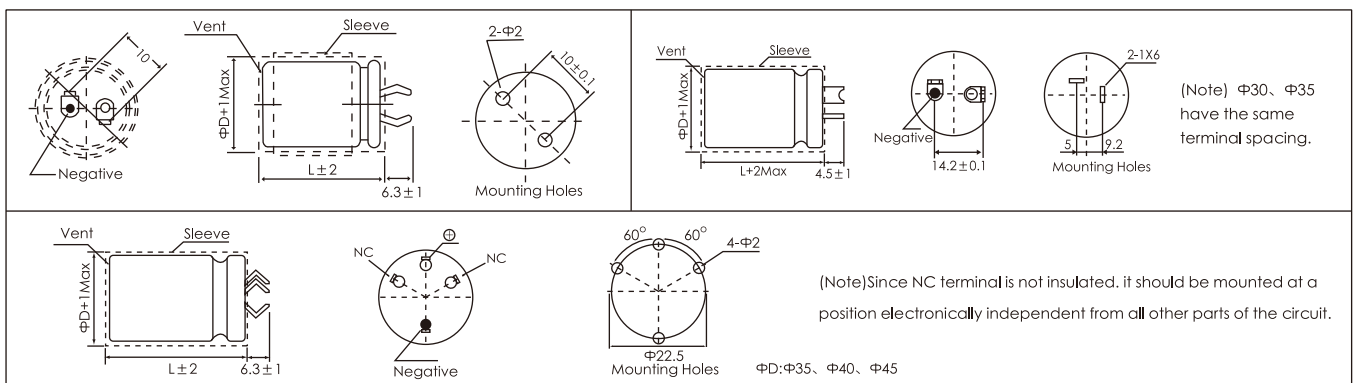
2000小时85°C

### ◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能				
Operating temperature range 温度范围	-40 to +85°C	-25 to +85°C			
Rated Working Voltage Range 电压范围	10 to 100V	160 to 500V			
Nominal Capacitance Range 容量范围	68 to 82000µF				
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)				
Leakage Current 泄漏电流	I ≤ 0.01CV or 3(µA) whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试				
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315-500			
	Tan δ(max)	0.6 0.5 0.45 0.4 0.4 0.3 0.25 0.20 0.15 0.20			
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz				
	Working Voltage(V)	10~100	160~250	315~385	400~500
	Z-25°C/Z+20°C	4	3	5	8
	Z-40°C/Z+20°C	12	12	-	-
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压2000小时后, 符合以下要求:				
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%			
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%			
	Leakage Current 泄露电流	initial specified value or less 不超过标准值			
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求				

### Dimensions

mm



### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
10~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.15	1.47
315~500V		0.8	1	1.15	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	60	70	85
Factor	1.37	1.3	1.18	1.00

Ratings for CD293 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
10 (13)	10000	54	43	2.5	22×25		
	12000	45	36	2.9	22×25		
	15000	36	29	3.2	22×30		
		36	29	3.1	25×25		
	18000	30	24	3.6	22×35		
		30	24	3.6	25×30		
	22000	25	20	4	22×40		
		25	20	4.1	25×35		
		25	20	4.1	30×25		
		17	13	4.6	25×40		
	33000	17	13	4.8	30×30		
		17	13	4.8	35×25		
		14	10.9	5.2	25×45		
	39000	14	10.9	5.3	30×35		
		12	9.1	5.8	25×50		
	47000	12	9.1	6	30×40		
		12	9.1	6	35×30		
		9.5	7.6	6.7	30×45		
	56000	9.5	7.6	6.8	35×35		
		7.9	6.3	7.5	30×50		
	82000	7.9	6.3	7.7	35×40		
	82000	6.5	5.2	8.7	35×45		
	16 (20)	8200	65	52	2.2	22×25	
		10000	54	43	2.6	22×30	
54			43	2.6	25×25		
12000		45	36	2.9	22×35		
		36	29	3.3	22×40		
15000		36	29	3.3	25×30		
		36	29	3.4	30×25		
18000		30	24	3.8	22×45		
		30	24	3.7	25×35		
22000		25	20	4.2	22×50		
		25	20	4.2	25×40		
27000		20	16	5	25×45		
		20	16	5	30×35		
33000		17	13	5.6	30×40		
		17	13	5.6	35×30		
39000		14	11	6.2	30×45		
		14	11	6.3	35×35		
47000		12	9.1	7	30×50		
		12	9.1	7.2	35×40		
56000		9.5	7.6	8	35×45		
25 (32)		5600	83	67	2	22×25	
		6800	69	55	2.3	22×30	
		6800	69	55	2.3	25×25	
		8200	57	46	2.6	22×35	
	10000	47	38	2.9	22×40		
		47	38	2.8	25×30		
	12000	47	38	3	30×25		
		39	31	3.3	22×45		
		39	31	3.2	25×35		
	15000	39	31	3.4	30×30		
		31	25	3.7	25×40		
	18000	31	25	3.9	35×25		
		26	21	4.3	25×50		
	22000	26	21	4.2	30×35		
		26	21	4.4	35×30		
	33000	22	17	4.8	30×40		
		22	17	5	35×35		
	39000	15	12	6.5	35×40		
	47000	12	10	7.5	35×45		
	35 (44)	47000	10	8	8.8	35×50	
		3300	100	81	1.8	22×25	
		3900	86	69	2.1	22×30	
		4700	71	57	2.2	25×25	
		5600	72	57	2.3	22×35	
72			57	2.3	25×30		
6800		59	47	2.9	22×40		
		59	47	2.6	25×35		
		59	47	2.7	30×25		
8200		57	46	2.8	22×50		
		57	46	2.8	25×40		
		57	46	2.8	30×30		
10000		47	38	3.1	25×45		
		47	38	3.2	30×35		
12000		39	31	3.5	25×50		
		39	31	3.5	30×40		
		39	31	3.6	35×30		
15000		31	25	4.1	30×45		
		31	25	4.1	35×35		
18000		26	21	4.6	30×50		
		26	21	4.7	35×40		
22000		22	17	5.3	35×45		
27000		18	14	7	35×50		

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
50 (63)	2200	120	97	1.7	22×25		
	2700	100	79	1.9	22×30		
		100	79	1.9	25×25		
	3300	100	81	2	22×35		
	3900	86	69	2.1	22×35		
		86	69	2.1	25×30		
	4700	71	57	2.4	22×40		
		71	57	2.4	25×35		
	5600	72	57	2.5	22×50		
		72	57	2.5	25×40		
		72	57	2.5	30×30		
	6800	59	47	2.8	25×45		
		59	47	2.8	30×35		
	8200	57	46	3.2	25×50		
		57	46	3	30×40		
		57	46	3	35×30		
	10000	47	38	3.4	30×45		
		47	38	3.4	35×35		
	12000	39	31	3.8	30×50		
		39	31	3.8	35×40		
	15000	31	25	4.5	35×50		
	63 (79)	1500	135	107	1.6	22×25	
		1800	110	89	1.8	22×30	
			91	73	2	22×30	
2200		91	73	2	25×25		
		74	59	2.2	22×35		
2700		74	59	2.3	25×30		
		81	65	2.3	22×40		
		81	65	2.3	25×35		
3300		81	65	2.3	30×25		
		69	55	2.6	25×40		
		69	55	2.6	30×30		
3900		69	55	2.7	35×25		
		56	45	3.0	25×45		
		56	45	3.0	30×30		
4700		48	38	3.1	25×45		
		48	38	3.2	30×35		
		48	38	3.3	35×30		
5600		40	32	3.6	30×40		
		40	32	3.7	35×35		
		41	33	3.7	30×50		
6800		41	33	3.8	35×40		
		34	27	4.3	35×45		
8200		28	23	4.8	35×50		
		200	160	1.3	22×25		
80 (100)	1200	165	133	1.5	22×30		
	1500	133	107	1.7	25×25		
	1800	111	89	1.9	22×35		
		111	89	1.9	25×30		
	2200	91	73	2.1	22×40		
		91	73	2.2	25×35		
		91	73	2.2	30×25		
	2700	74	59	2.5	22×50		
		74	59	2.5	25×40		
		74	59	2.5	30×30		
		74	59	2.5	35×25		
	3300	61	49	2.8	25×45		
		61	49	2.8	30×35		
	3900	52	41	3.1	25×50		
		52	41	3.2	30×40		
		52	41	3.2	35×30		
	4700	43	34	3.6	30×45		
		43	34	3.6	35×35		
	5600	48	38	3.8	30×50		
		48	38	3.8	35×40		
	6800	40	32	4.1	35×45		
	8200	41	33	4.7	35×50		
	10000	34	27	5.2	35×50		
	12000	28	23	5.8	35×55		
100 (125)	680	293	235	1.1	22×25		
	820	243	195	1.2	22×30		
	1000	200	160	1.4	25×25		
	1200	166	133	1.6	22×35		
		166	133	1.6	25×30		
		133	107	1.8	22×40		
	1500	133	107	1.7	25×35		
		133	107	1.8	30×25		
		111	89	2.1	22×50		
	1800	111	89	2	25×40		
		111	89	2.1	30×30		
		111	89	2.2	35×25		

Ratings for CD293 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
100 (125)	2200	91	73	2.2	25 x 45	
		91	73	2.3	30 x 35	
		91	73	2.5	35 x 30	
	2700	74	59	2.6	25 x 50	
		74	59	2.7	30 x 40	
	3300	61	49	3	30 x 45	
		61	49	3.1	35 x 35	
	3900	52	41	3.4	30 x 50	
		52	41	3.4	35 x 40	
	4700	43	34	4	35 x 50	
160 (200)	220	600	483	1.1	22 x 25	
	270	490	393	1.2	22 x 25	
	330	400	322	1.3	22 x 25	
	390	341	273	1.5	22 x 30	
		341	273	1.5	25 x 25	
	470	283	226	1.6	25 x 30	
		237	190	1.9	22 x 35	
	560	237	190	1.9	25 x 30	
		237	190	2	30 x 25	
	680	196	157	2.1	22 x 40	
		196	157	2.2	25 x 35	
	820	162	130	2.5	22 x 50	
		162	130	2.4	25 x 40	
		162	130	2.5	30 x 30	
		195	156	2.4	35 x 25	
	1000	133	107	2.7	25 x 45	
		133	107	2.8	30 x 35	
		160	128	2.7	35 x 30	
	1200	111	89	3.1	25 x 50	
		111	89	3.2	30 x 40	
133		107	3.0	35 x 35		
1500	89	71	3.7	30 x 45		
	107	85	3.5	35 x 40		
1800	89	71	3.9	35 x 45		
2200	73	58	4.5	35 x 50		
180 (225)	270	495	393	1.2	22 x 25	
	330	400	322	1.4	22 x 30	
	390	340	273	1.5	25 x 25	
	470	283	226	1.7	22 x 35	
		283	226	1.7	25 x 30	
		283	226	1.8	30 x 25	
	560	237	190	1.9	22 x 40	
		237	190	2.0	25 x 35	
	680	196	157	2.3	22 x 50	
		196	157	2.2	25 x 40	
		196	157	2.3	30 x 30	
	820	235	188	2.2	35 x 25	
		162	130	2.5	25 x 45	
		162	130	2.6	30 x 35	
	1000	195	156	2.5	35 x 30	
		133	107	2.9	25 x 50	
		133	107	2.9	30 x 40	
	1200	111	89	3.3	30 x 45	
		133	107	3.1	35 x 35	
		1500	107	85	3.6	35 x 45
1800	89	71	4.1	35 x 50		
200 (250)	220	600	483	1.1	22 x 25	
	270	492	393	1.2	22 x 30	
	330	402	322	1.4	22 x 30	
		402	322	1.4	25 x 25	
	390	341	273	1.6	22 x 35	
		341	273	1.6	25 x 30	
	470	283	226	1.8	22 x 40	
		283	226	1.9	30 x 25	
	560	237	190	2.0	22 x 45	
		237	190	2.0	25 x 35	
		237	190	2.1	30 x 30	
		285	228	2.0	35 x 25	
	680	196	157	2.3	25 x 40	
		196	157	2.4	30 x 35	
	820	162	130	2.6	25 x 50	
		162	130	2.7	30 x 40	
		195	156	2.5	35 x 30	
	1000	133	107	3.1	30 x 45	
		160	128	2.8	35 x 35	
	1200	111	89	3.4	30 x 50	
1500	133	107	3.2	35 x 40		
1500	107	85	3.8	35 x 50		

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
250 (300)	100	1990	1592	0.68	22 x 25	
	180	1106	885	0.94	22 x 25	
	220	905	724	1.1	22 x 30	
		905	724	1.1	25 x 25	
	270	737	590	1.2	22 x 35	
	330	603	483	1.4	22 x 40	
		603	483	1.4	25 x 30	
		603	483	1.5	30 x 25	
	390	511	409	1.6	22 x 45	
		511	409	1.6	25 x 35	
	470	424	339	1.8	22 x 50	
		424	339	1.8	25 x 40	
		424	339	1.8	30 x 30	
		424	339	2.4	35 x 25	
	560	356	285	2.0	25 x 45	
		356	285	2.0	30 x 35	
	680	293	235	2.3	30 x 40	
		293	235	2.6	35 x 30	
	820	243	195	2.6	30 x 45	
		243	195	2.6	35 x 35	
1000	199	160	3.0	35 x 40		
1200	166	133	3.4	35 x 45		
315 (365)	100	1990	1592	0.67	22 x 25	
	150	1327	1062	0.85	22 x 30	
		1327	1062	0.85	25 x 25	
	180	1106	885	0.96	22 x 35	
		1106	885	0.96	25 x 30	
	220	905	724	1.1	22 x 40	
		905	724	1.1	25 x 35	
		905	724	1.1	30 x 25	
	270	737	590	1.2	22 x 45	
		737	590	1.3	25 x 40	
737		590	1.3	30 x 30		
737		590	1.3	35 x 25		
330	603	483	1.4	25 x 45		
	603	483	1.4	30 x 35		
390	511	409	1.6	25 x 50		
	511	409	1.6	30 x 40		
	511	409	1.6	35 x 30		
470	424	339	1.8	30 x 45		
	424	339	1.8	35 x 35		
560	356	285	2.0	30 x 50		
	356	285	2.0	35 x 40		
680	293	235	2.3	35 x 45		
82	2427	1941	0.64	22 x 25		
100	1990	1592	0.80	22 x 25		
120	1658	1327	0.82	22 x 30		
	1658	1327	0.81	25 x 25		
150	1327	1062	0.94	22 x 35		
	1327	1062	0.94	25 x 30		
180	1106	885	1.1	22 x 40		
	1106	885	1.1	30 x 25		
	905	724	1.2	22 x 45		
	905	724	1.2	25 x 35		
220	905	724	1.2	30 x 30		
	905	724	1.3	35 x 25		
	905	724	1.3	35 x 25		
270	737	590	1.4	25 x 45		
	737	590	1.4	30 x 35		
330	603	483	1.6	25 x 50		
	603	483	1.6	35 x 30		
390	511	409	1.7	30 x 40		
	511	409	1.8	35 x 35		
470	424	339	2.0	30 x 45		
	424	339	2.0	35 x 40		
560	356	285	2.3	35 x 45		
680	293	535	2.6	35 x 50		
820	243	195	2.8	35 x 60		
68	2926	2341	0.55	22 x 25		
82	2427	1941	0.65	22 x 25		
100	1990	1592	0.70	22 x 30		
	1990	1592	0.70	25 x 25		
	1658	1327	0.79	22 x 30		
120	1327	1062	0.90	22 x 35		
	1327	1062	0.89	25 x 30		
150	1106	885	1.0	22 x 40		
	1106	885	1.0	25 x 30		
180	905	724	1.1	22 x 50		
	905	724	1.2	25 x 40		
220	737	590	1.3	25 x 45		
	737	590	1.5	30 x 30		



Ratings for CD293 Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
400 (450)	330	603	483	1.6	25×45	
		603	483	1.7	30×35	
	390	511	409	1.8	35×30	
		511	409	1.9	30×40	
	470	424	339	2.1	35×35	
	560	356	285	2.3	35×40	
	680	293	235	2.7	35×45	
	820	242	194	3.1	35×50	
1000	199	107	3.7	35×60		
420 (470)	100	1990	1592	0.71	22×30	
		1990	1592	0.72	25×25	
	120	1658	1327	0.81	22×35	
		1658	1327	0.82	25×30	
	150	1327	1062	0.96	25×30	
		1106	885	1.1	25×35	
	180	1106	885	1.2	30×30	
		905	724	1.2	25×40	
	220	905	724	1.3	30×30	
		737	590	1.3	25×45	
	270	737	590	1.4	30×35	
		603	483	1.7	30×40	
	390	511	409	1.8	30×45	
		511	409	1.9	35×35	
	470	424	339	2.1	30×50	
		424	339	2.2	35×40	
	560	356	285	2.4	35×45	
	680	293	235	2.8	35×50	
	820	242	194	3.2	35×60	
	1000	199	107	4.0	40×60	

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
450 (500)	68	2926	2341	0.57	22×25		
		82	2427	1941	0.68	22×30	
		100	1990	1592	0.73	25×25	
	120	1658	1327	0.80	22×35		
		1658	1327	0.83	25×30		
	150	1327	1062	0.95	22×45		
		1327	1062	0.95	25×35		
	180	1106	885	1.1	25×40		
		1106	885	1.1	30×30		
	220	905	724	1.2	25×45		
		905	724	1.3	30×35		
	270	737	590	1.5	30×40		
	330	603	480	1.7	30×45		
	390	511	409	1.9	35×40		
	470	424	339	2.2	30×50		
	560	356	285	2.4	35×50		
	680	293	235	2.8	35×55		
	820	242	194	3.2	35×60		
1000	199	107	4.2	35×70			
500 (550)	100	1990	1592	0.9	25×30		
		120	1658	1327	1.0	25×35	
	150	1327	1062	1.2	30×30		
		1106	885	1.4	25×45		
	180	1106	885	1.3	30×35		
		905	724	1.6	25×50		
	220	905	724	1.5	30×40		
		737	590	1.8	30×45		
	330	603	483	2.0	35×35		
	390	511	409	2.3	35×40		
	470	424	339	2.6	35×50		
	560	356	285	2.9	35×55		
680	293	235	3.2	35×65			

Customer products are available on request.

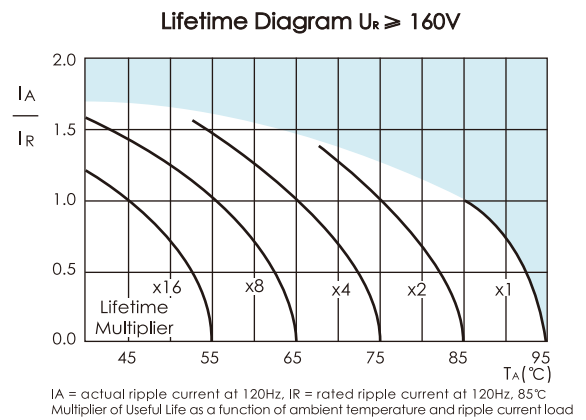
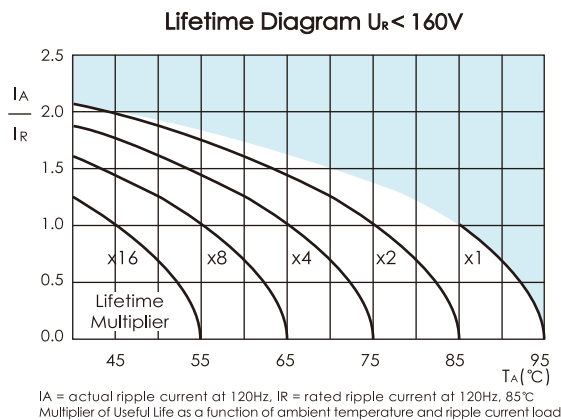
Frequency Coefficient

Voltage (V)	Frequency					
	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥50kHz
≤ 50	0.88	1.00	1.07	1.15	1.15	1.15
63 ~ 100	0.80	1.00	1.17	1.32	1.45	1.50
≥ 160	0.80	1.00	1.16	1.30	1.41	1.43

Temperature Coefficient

Rated Voltage (V)	Temperature (°C)			
	+40	+55	+70	+85
< 160	2.1	1.8	1.5	1.0
≥ 160	1.7	1.5	1.3	1.0

Lifetime Diagram



## CD293L Series (Lug/Snap Terminal Type插入/自立型, 标准品)

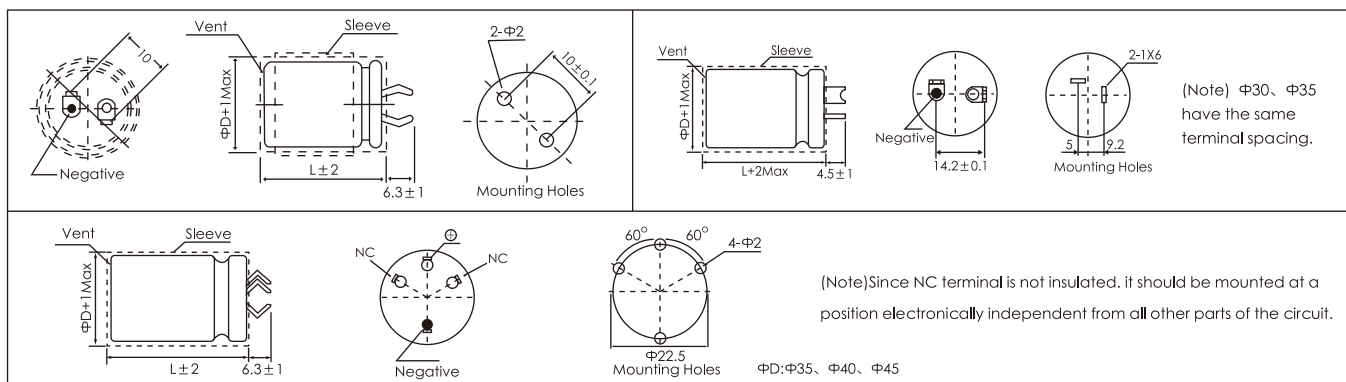
- 2000h at 85°C
- Larger Size Components, Long Useful Life, High Ripple Current, Industrial Power Supplies  
大尺寸, 长寿命, 高纹波电流, 工业电源
- ◆ SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能
Operating temperature range 温度范围	-40 to +85°C
Rated Working Voltage Range 电压范围	350 to 500V
Nominal Capacitance Range 容量范围	68 to 1000µF
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)
Leakage Current 泄漏电流	I ≤ 0.01CV or 3mA whichever is smaller after 5 minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试
Dissipation Factor tan δ(120Hz, +20°C) 损耗角正切值	Working Voltage(V) 350~500
	Tan δ(max) 0.15
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz
	Working Voltage(V) 350~500 Z-40°C/Z+20°C 4
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压2000小时后, 符合以下要求:
	Capacitance Change容量 Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角 Not more than 200% of the specified value 不超过标准值的200%
High Temperature Shelf Life 高温贮存	Leakage Current 泄露电流 initial specified value or less 不超过标准值
	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求

## Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
350~400V		0.9	1	1.15	1.25
450V		0.8	1	1.15	1.47
500V		0.8	1	1.15	1.47

(2) Temperature Coefficient (温度系数)

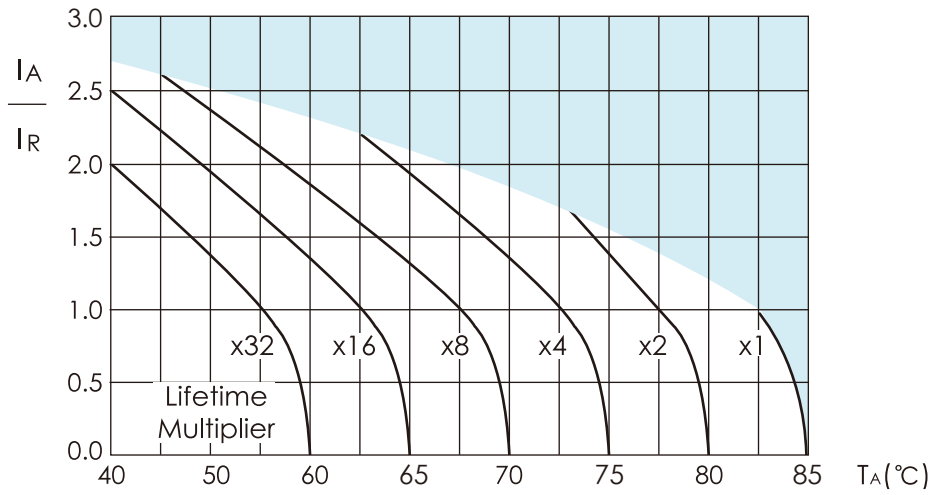
Temperature (°C)	-55	60	70	85
Factor	1.37	1.3	1.18	1.00

Ratings for CD293L Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capaci- tance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
350 (400)	82	2427	1941	0.64	22×25	
	100	1990	1592	0.80	22×25	
	120	1658	1327	0.82	22×30	
		1658	1327	0.81	25×25	
	150	1327	1062	0.94	22×35	
		1327	1062	0.94	25×30	
	180	1106	885	1.1	22×40	
		1106	885	1.1	30×25	
	220	905	724	1.2	22×45	
		905	724	1.2	25×35	
		905	724	1.2	30×30	
		905	724	1.3	35×25	
	270	737	590	1.4	25×45	
		737	590	1.4	30×35	
	330	603	483	1.6	25×50	
		603	483	1.6	35×30	
	390	511	409	1.7	30×40	
		511	409	1.8	35×35	
470	424	339	2.0	30×45		
	424	339	2.0	35×40		
560	356	285	2.3	35×45		
680	293	535	2.6	35×50		
820	243	195	2.8	35×60		
400 (450)	68	2926	2341	0.55	22×25	
	82	2427	1941	0.65	22×25	
	100	1990	1592	0.70	22×30	
	100	1990	1592	0.70	25×25	
	120	1658	1327	0.79	22×30	
		1327	1062	0.90	22×35	
	150	1327	1062	0.89	25×30	
		1106	885	1.0	22×40	
	180	1106	885	1.0	25×30	
		905	724	1.1	22×50	
	220	905	724	1.2	25×40	
		737	590	1.3	25×45	
	270	737	590	1.5	30×30	
		603	483	1.6	25×45	
	330	603	483	1.7	30×35	
		511	409	1.8	35×30	
	390	511	409	1.9	30×40	
		424	339	2.1	35×35	
560	356	285	2.3	35×40		
680	293	235	2.7	35×45		
820	242	194	3.1	35×50		
1000	133	107	3.7	35×65		
450 (500)	100	1990	1592	0.71	22×30	
	100	1990	1592	0.72	25×25	
	120	1658	1327	0.81	22×35	
		1658	1327	0.82	25×30	
	150	1327	1062	0.96	25×30	
		1106	885	1.1	25×35	
	180	1106	885	1.2	30×30	
		905	724	1.2	25×40	
	220	905	724	1.3	30×30	
		737	590	1.3	25×45	
	270	737	590	1.4	30×35	
		603	483	1.7	30×40	
	390	511	409	1.8	30×45	
		511	409	1.9	35×35	
	470	424	339	2.1	30×50	
		424	339	2.2	35×40	
	560	356	285	2.4	35×45	
	680	293	235	2.8	35×50	
820	242	194	3.2	35×60		
1000	133	107	4.0	40×60		
500 (550)	68	2926	2341	0.57	22×25	
	82	2427	1941	0.68	22×30	
	100	1990	1592	0.73	25×25	
	120	1658	1327	0.80	22×35	
		1658	1327	0.83	25×30	
	150	1327	1062	0.95	22×45	
		1327	1062	0.95	25×35	
	180	1106	885	1.1	25×40	
		1106	885	1.1	30×30	
	220	905	724	1.2	25×45	
		905	724	1.3	30×35	
	270	737	590	1.5	30×40	
	330	603	480	1.7	30×45	
	390	511	409	1.9	35×40	
	470	424	339	2.2	30×50	
	560	356	285	2.4	35×50	
	680	293	235	2.8	35×55	
	820	242	194	3.2	35×60	
1000	133	107	4.2	35×80		
	133	107	4.1	40×65		

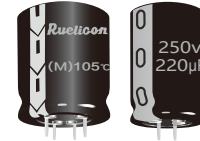
Ratings for CD293L Series

Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD294A Series (Lug/Snap Terminal Type插入/自立型, 标准品)



•2000h at 105°C

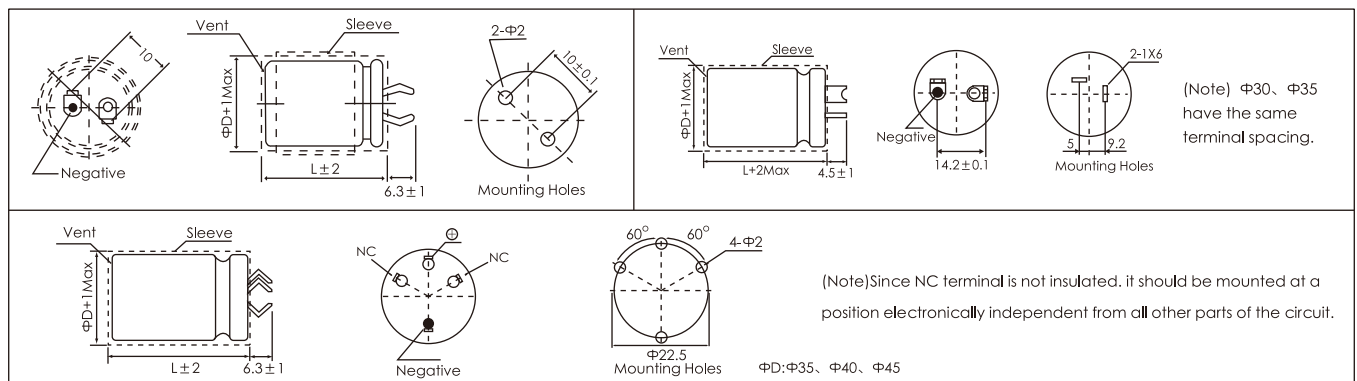
2000小时105°C

### ◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能				
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C			
Rated Working Voltage Range 电压范围	10 to 100V	160 to 500V			
Nominal Capacitance Range 容量范围	68 to 82000µF				
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)				
Leakage Current 泄漏电流	I≤0.01CV or 3(µA) whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试				
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315-500			
	Tan δ(max)	0.6 0.5 0.45 0.4 0.4 0.3 0.25 0.20 0.15 0.20			
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz				
	Working Voltage(V)	10~100	160~250	315~385	400~500
	Z-25°C/Z+20°C	4	3	5	8
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压2000小时后, 符合以下要求:				
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%			
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%			
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求				
	Leakage Current 泄露电流	initial specified value or less 不超过标准值			

### Dimensions

mm



### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
10~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.15	1.47
315~500V		0.8	1	1.15	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	60	70	105
Factor	1.37	1.3	1.18	1.00

Ratings for CD294A Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
10 (13)	10000	54	43	2.5	22×25		
	12000	45	36	2.9	22×25		
	15000	36	29	3.2	22×30		
		36	29	3.1	25×25		
	18000	30	24	3.6	22×35		
		30	24	3.6	25×30		
	22000	25	20	4	22×40		
		25	20	4.1	25×35		
		25	20	4.1	30×25		
	33000	17	13	4.6	25×40		
		17	13	4.8	30×30		
		17	13	4.8	35×25		
	39000	14	10.9	5.2	25×45		
		14	10.9	5.3	30×35		
	47000	12	9.1	5.8	25×50		
		12	9.1	6	30×40		
		12	9.1	6	35×30		
	56000	9.5	7.6	6.7	30×45		
		9.5	7.6	6.8	35×35		
	68000	7.9	6.3	7.5	30×50		
		7.9	6.3	7.7	35×40		
	82000	6.5	5.2	8.7	35×45		
	8200	65	52	2.2	22×25		
	16 (20)	54	43	2.6	22×30		
10000		54	43	2.6	25×25		
12000		45	36	2.9	22×35		
15000		36	29	3.3	22×40		
		36	29	3.3	25×30		
18000		30	24	3.8	22×45		
		30	24	3.7	25×35		
22000		25	20	4.2	22×50		
		25	20	4.2	25×40		
27000		20	16	5	25×45		
		20	16	5	30×35		
33000		17	13	5.6	30×40		
		17	13	5.6	35×30		
39000		14	11	6.2	30×45		
		14	11	6.3	35×35		
47000		12	9.1	7	30×50		
		12	9.1	7.2	35×40		
56000		9.5	7.6	8	35×45		
25 (32)		5600	83	67	2	22×25	
		6800	69	55	2.3	22×30	
		8200	69	55	2.3	25×25	
		8200	57	46	2.6	22×35	
		10000	47	38	2.9	22×40	
			47	38	2.8	25×30	
	47		38	3	30×25		
	12000	39	31	3.3	22×45		
		39	31	3.2	25×35		
	15000	31	25	3.7	25×40		
		31	25	3.9	35×25		
	18000	26	21	4.3	25×50		
		26	21	4.2	30×35		
		26	21	4.4	35×30		
	22000	22	17	4.8	30×40		
		22	17	5	35×35		
	33000	15	12	6.5	35×40		
	39000	12	10	7.5	35×45		
	47000	10	8	8.8	35×50		
	35 (44)	3300	100	81	1.8	22×25	
		3900	86	69	2.1	22×30	
		4700	71	57	2.2	25×25	
		5600	72	57	2.3	22×35	
			72	57	2.3	25×30	
6800		59	47	2.9	22×40		
		59	47	2.6	25×35		
		59	47	2.7	30×25		
8200		57	46	2.8	22×50		
		57	46	2.8	25×40		
		57	46	2.8	30×30		
10000		47	38	3.1	25×45		
		47	38	3.2	30×35		
12000		39	31	3.5	25×50		
		39	31	3.5	30×40		
		39	31	3.6	35×30		
15000		31	25	4.1	30×45		
		31	25	4.1	35×35		
18000		26	21	4.6	30×50		
		26	21	4.7	35×40		
22000		22	17	5.3	35×45		
27000		18	14	7	35×50		

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
50 (63)	2200	120	97	1.7	22×25	
	2700	100	79	1.9	22×30	
		100	79	1.9	25×25	
	3300	100	81	2	22×35	
	3900	86	69	2.1	22×35	
		86	69	2.1	25×30	
	4700	71	57	2.4	22×40	
		71	57	2.4	25×35	
		72	57	2.5	22×50	
	5600	72	57	2.5	25×40	
		72	57	2.5	30×30	
		59	47	2.8	25×45	
	6800	59	47	2.8	30×35	
		57	46	3.2	25×50	
	8200	57	46	3	30×40	
		57	46	3	35×30	
		47	38	3.4	30×45	
	10000	47	38	3.4	35×35	
		39	31	3.8	30×50	
	12000	39	31	3.8	35×40	
	15000	31	25	4.5	35×50	
	1500	135	107	1.6	22×25	
	1800	110	89	1.8	22×30	
	2200	91	73	2	22×30	
91		73	2	25×25		
2700	74	59	2.2	22×35		
	74	59	2.3	25×30		
	81	65	2.3	22×40		
3300	81	65	2.3	25×35		
	81	65	2.3	30×25		
	69	55	2.6	25×40		
3900	69	55	2.6	30×30		
	69	55	2.7	35×25		
	56	45	3.0	25×45		
4700	56	45	3.0	30×30		
	48	38	3.1	25×45		
5600	48	38	3.2	30×35		
	48	38	3.3	35×30		
	40	32	3.6	30×40		
6800	40	32	3.7	35×35		
	41	33	3.7	30×50		
8200	41	33	3.8	35×40		
	34	27	4.3	35×45		
10000	28	23	4.8	35×50		
12000	200	160	1.3	22×25		
1200	165	133	1.5	22×30		
1500	133	107	1.7	25×25		
1800	111	89	1.9	22×35		
	111	89	1.9	25×30		
	91	73	2.1	22×40		
2200	91	73	2.2	25×35		
	91	73	2.2	30×25		
	74	59	2.5	22×50		
2700	74	59	2.5	25×40		
	74	59	2.5	30×30		
	74	59	2.5	35×25		
3300	61	49	2.8	25×45		
	61	49	2.8	30×35		
	52	41	3.1	25×50		
3900	52	41	3.2	30×40		
	52	41	3.2	35×30		
4700	43	34	3.6	30×45		
	43	34	3.6	35×35		
5600	48	38	3.8	30×50		
	48	38	3.8	35×40		
6800	40	32	4.1	35×45		
8200	41	33	4.7	35×50		
10000	34	27	5.2	35×50		
12000	28	23	5.8	35×55		
680	293	235	1.1	22×25		
820	243	195	1.2	22×30		
1000	200	160	1.4	25×25		
1200	166	133	1.6	22×35		
	166	133	1.6	25×30		
	133	107	1.8	22×40		
1500	133	107	1.7	25×35		
	133	107	1.8	30×25		
	111	89	2.1	22×50		
1800	111	89	2	25×40		
	111	89	2.1	30×30		
	111	89	2.2	35×25		

Ratings for CD294A Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注		
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)			
100 (125)	2200	91	73	2.2	25 × 45			
		91	73	2.3	30 × 35			
		91	73	2.5	35 × 30			
	2700	74	59	2.6	25 × 50			
		74	59	2.7	30 × 40			
	3300	61	49	3	30 × 45			
		61	49	3.1	35 × 35			
	3900	52	41	3.4	30 × 50			
		52	41	3.4	35 × 40			
	4700	43	34	4	35 × 50			
	160 (200)	220	600	483	1.1	22 × 25		
			270	490	393	1.2	22 × 25	
330			400	322	1.3	22 × 25		
390		341	273	1.5	22 × 30			
		341	273	1.5	25 × 25			
470		283	226	1.6	25 × 30			
		237	190	1.9	22 × 35			
560		237	190	1.9	25 × 30			
		237	190	2	30 × 25			
680		196	157	2.1	22 × 40			
		196	157	2.2	25 × 35			
820		162	130	2.5	22 × 50			
		162	130	2.4	25 × 40			
		162	130	2.5	30 × 30			
		195	156	2.4	35 × 25			
1000		133	107	2.7	25 × 45			
		133	107	2.8	30 × 35			
		160	128	2.7	35 × 30			
1200		111	89	3.1	25 × 50			
		111	89	3.2	30 × 40			
		133	107	3.0	35 × 35			
1500		89	71	3.7	30 × 45			
		107	85	3.5	35 × 40			
1800		89	71	3.9	35 × 45			
2200		73	58	4.5	35 × 50			
180 (225)		270	495	393	1.2	22 × 25		
			330	400	322	1.4	22 × 30	
			390	340	273	1.5	25 × 25	
		470	283	226	1.7	22 × 35		
			283	226	1.7	25 × 30		
	283		226	1.8	30 × 25			
	560	237	190	1.9	22 × 40			
		237	190	2.0	25 × 35			
	680	196	157	2.3	22 × 50			
		196	157	2.2	25 × 40			
		196	157	2.3	30 × 30			
	820	235	188	2.2	35 × 25			
		162	130	2.5	25 × 45			
		162	130	2.6	30 × 35			
	1000	195	156	2.5	35 × 30			
		133	107	2.9	25 × 50			
		133	107	2.9	30 × 40			
	1200	111	89	3.3	30 × 45			
		133	107	3.1	35 × 35			
		1500	107	85	3.6	35 × 45		
	1800	89	71	4.1	35 × 50			
	200 (250)	220	600	483	1.1	22 × 25		
			270	492	393	1.2	22 × 30	
		330	402	322	1.4	22 × 30		
402			322	1.4	25 × 25			
390		341	273	1.6	22 × 35			
		341	273	1.6	25 × 30			
470		283	226	1.8	22 × 40			
		283	226	1.9	30 × 25			
		237	190	2.0	22 × 45			
560		237	190	2.0	25 × 35			
		237	190	2.1	30 × 30			
		285	228	2.0	35 × 25			
680		196	157	2.3	25 × 40			
		196	157	2.4	30 × 35			
		162	130	2.6	25 × 50			
820		162	130	2.7	30 × 40			
		195	156	2.5	35 × 30			
		133	107	3.1	30 × 45			
1000		160	128	2.8	35 × 35			
		111	89	3.4	30 × 50			
		133	107	3.2	35 × 40			
1500		107	85	3.8	35 × 50			

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
250 (300)	100	1990	1592	0.68	22 × 25		
		180	1106	885	0.94	22 × 25	
	220	905	724	1.1	22 × 30		
		905	724	1.1	25 × 25		
	270	737	590	1.2	22 × 35		
		603	483	1.4	22 × 40		
		603	483	1.4	25 × 30		
	330	603	483	1.5	30 × 25		
		511	409	1.6	22 × 45		
		511	409	1.6	25 × 35		
	470	424	339	1.8	22 × 50		
		424	339	1.8	25 × 40		
		424	339	1.8	30 × 30		
		424	339	2.4	35 × 25		
	560	356	285	2.0	25 × 45		
		356	285	2.0	30 × 35		
	680	293	235	2.3	30 × 40		
		293	235	2.6	35 × 30		
	820	243	195	2.6	30 × 45		
		243	195	2.6	35 × 35		
	1000	199	160	3.0	35 × 40		
	1200	166	133	3.4	35 × 45		
	315 (365)	100	1990	1592	0.67	22 × 25	
			1327	1062	0.85	22 × 30	
1327			1062	0.85	25 × 25		
180		1106	885	0.96	22 × 35		
		1106	885	0.96	25 × 30		
220		905	724	1.1	22 × 40		
		905	724	1.1	25 × 35		
		905	724	1.1	30 × 25		
270		737	590	1.2	22 × 45		
		737	590	1.3	25 × 40		
		737	590	1.3	30 × 30		
		737	590	1.3	35 × 25		
330		603	483	1.4	25 × 45		
		603	483	1.4	30 × 35		
		511	409	1.6	25 × 50		
390		511	409	1.6	30 × 40		
		511	409	1.6	35 × 30		
		424	339	1.8	30 × 45		
470		424	339	1.8	35 × 35		
		356	285	2.0	30 × 50		
		356	285	2.0	35 × 40		
680		293	235	2.3	35 × 45		
82		2427	1941	0.64	22 × 25		
350 (400)		100	1990	1592	0.80	22 × 25	
	1658		1327	0.82	22 × 30		
	1658		1327	0.81	25 × 25		
	120	1327	1062	0.94	22 × 35		
		1327	1062	0.94	25 × 30		
		1106	885	1.1	22 × 40		
	180	1106	885	1.1	30 × 25		
		905	724	1.2	22 × 45		
		905	724	1.2	25 × 35		
	220	905	724	1.2	30 × 30		
		905	724	1.3	35 × 25		
		737	590	1.4	25 × 45		
737		590	1.4	30 × 35			
330	603	483	1.6	25 × 50			
	603	483	1.6	35 × 30			
	511	409	1.7	30 × 40			
390	511	409	1.8	35 × 35			
	424	339	2.0	30 × 45			
470	424	339	2.0	35 × 40			
	560	356	2.3	35 × 45			
680	293	535	2.6	35 × 50			
820	243	195	2.8	35 × 60			
400 (450)	68	2926	2341	0.55	22 × 25		
		2427	1941	0.65	22 × 25		
	100	1990	1592	0.70	22 × 30		
		1990	1592	0.70	25 × 25		
	120	1658	1327	0.79	22 × 30		
		1327	1062	0.90	22 × 35		
	150	1327	1062	0.89	25 × 30		
		1106	885	1.0	22 × 40		
		1106	885	1.0	25 × 30		
	180	905	724	1.1	22 × 50		
		905	724	1.2	25 × 40		
	220	737	590	1.3	25 × 45		
		737	590	1.5	30 × 30		

Ratings for CD294A Series

$U_s$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
400 (450)	330	603	483	1.6	25 x 45	
		603	483	1.7	30 x 35	
	390	511	409	1.8	35 x 30	
		511	409	1.9	30 x 40	
	470	424	339	2.1	35 x 35	
	560	356	285	2.3	35 x 40	
	680	293	235	2.7	35 x 45	
	820	242	194	3.1	35 x 50	
1000	199	107	3.7	35 x 60		
420 (470)	100	1990	1592	0.71	22 x 30	
		1990	1592	0.72	25 x 25	
	120	1658	1327	0.81	22 x 35	
		1658	1327	0.82	25 x 30	
	150	1327	1062	0.96	25 x 30	
	180	1106	885	1.1	25 x 35	
		1106	885	1.2	30 x 30	
	220	905	724	1.2	25 x 40	
		905	724	1.3	30 x 30	
	270	737	590	1.3	25 x 45	
		737	590	1.4	30 x 35	
	330	603	483	1.7	30 x 40	
	390	511	409	1.8	30 x 45	
		511	409	1.9	35 x 35	
	470	424	339	2.1	30 x 50	
		424	339	2.2	35 x 40	
	560	356	285	2.4	35 x 45	
	680	293	235	2.8	35 x 50	
	820	242	194	3.2	35 x 60	
	1000	199	107	4.0	40 x 60	

$U_s$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
450 (500)	68	2926	2341	0.57	22 x 25	
		82	2427	1941	0.68	22 x 30
	100	1990	1592	0.73	25 x 25	
		1658	1327	0.80	22 x 35	
	120	1658	1327	0.83	25 x 30	
		1327	1062	0.95	22 x 45	
	150	1327	1062	0.95	25 x 35	
		1106	885	1.1	25 x 40	
	180	1106	885	1.1	30 x 30	
		905	724	1.2	25 x 45	
	220	905	724	1.3	30 x 35	
		737	590	1.5	30 x 40	
	270	737	590	1.7	30 x 45	
	330	603	480	1.9	35 x 40	
	390	511	409	2.2	30 x 50	
	470	424	339	2.4	35 x 50	
560	356	285	2.8	35 x 55		
680	293	235	3.2	35 x 60		
820	242	194	3.2	35 x 60		
1000	199	107	4.2	35 x 70		
500 (550)	100	1990	1592	0.9	25 x 30	
	120	1658	1327	1.0	25 x 35	
	150	1327	1062	1.2	30 x 30	
	180	1106	885	1.4	25 x 45	
		1106	885	1.3	30 x 35	
	220	905	724	1.6	25 x 50	
		905	724	1.5	30 x 40	
	270	737	590	1.8	30 x 45	
	330	603	483	2.0	35 x 35	
	390	511	409	2.3	35 x 40	
	470	424	339	2.6	35 x 50	
	560	356	285	2.9	35 x 55	
	680	293	235	3.2	35 x 65	

Customer products are available on request.

Frequency Coefficient

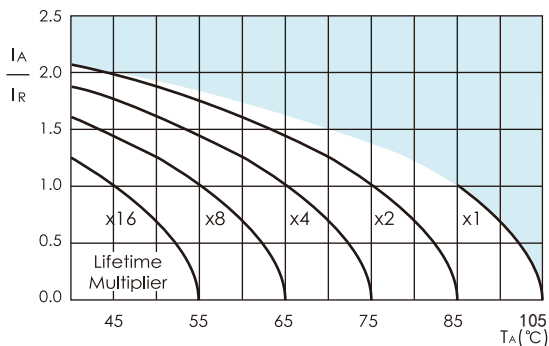
Frequency Voltage (V)	50/60Hz	120Hz	300Hz	1kHz	10kHz	≥ 50kHz
< 50	0.88	1.00	1.07	1.15	1.15	1.15
63 ~ 100	0.80	1.00	1.17	1.32	1.45	1.50
≥ 160	0.80	1.00	1.16	1.30	1.41	1.43

Temperature Coefficient

Temperature (°C)	+40	+55	+70	+105
Rated Voltage (V)				
< 160	2.1	1.8	1.5	1.0
≥ 160	1.7	1.5	1.3	1.0

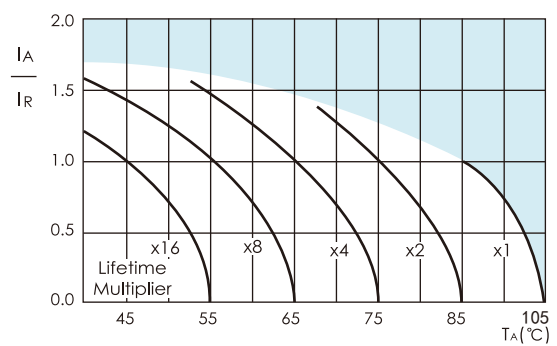
Lifetime Diagram

Lifetime Diagram  $U_R < 160V$



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Lifetime Diagram  $U_R \geq 160V$

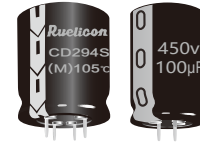


$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



## CD294S Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

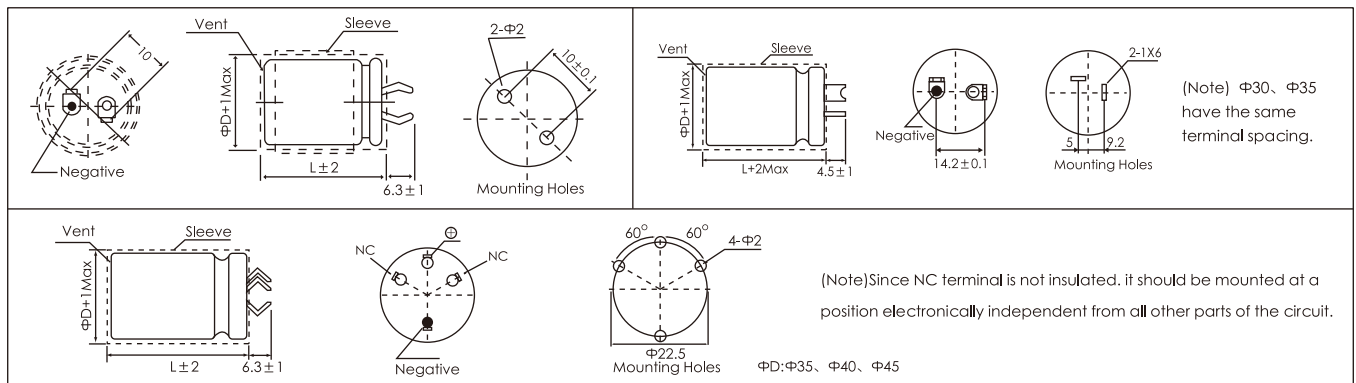
- 3000h at 105°C
- High ripple current 高纹波电流
- Downsized from CD294 小型
- PCB Mounting, General industrial electronics 普通PCB使用
- ◆SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能											
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C										
Rated Working Voltage Range 电压范围	200 to 250V	400 to 450V										
Nominal Capacitance Range 容量范围	100 to 2700µF											
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)											
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试											
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>200</td> <td>250</td> <td>400</td> <td>450</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> </tr> </table>		Working Voltage(V)	200	250	400	450	Tan δ(max)	0.15	0.15	0.15	0.20
Working Voltage(V)	200	250	400	450								
Tan δ(max)	0.15	0.15	0.15	0.20								
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>200~250</td> <td>400~450</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>12</td> <td>-</td> </tr> </table>		Working Voltage(V)	200~250	400~450	Z-25°C/Z+20°C	3	8	Z-40°C/Z+20°C	12	-	
Working Voltage(V)	200~250	400~450										
Z-25°C/Z+20°C	3	8										
Z-40°C/Z+20°C	12	-										
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 3000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压3000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±25% of initial value 在初始值的±25%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 250% of the specified value 不超过标准值的250%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>		Capacitance Change容量	Within ±25% of initial value 在初始值的±25%	Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%	Leakage Current 泄露电流	initial specified value or less 不超过标准值				
Capacitance Change容量	Within ±25% of initial value 在初始值的±25%											
Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%											
Leakage Current 泄露电流	initial specified value or less 不超过标准值											
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求 <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±15% of initial value 在初始值的±15%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 150% of the specified value 不超过标准值的150%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>		Capacitance Change容量	Within ±15% of initial value 在初始值的±15%	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%	Leakage Current 泄露电流	initial specified value or less 不超过标准值				
Capacitance Change容量	Within ±15% of initial value 在初始值的±15%											
Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%											
Leakage Current 泄露电流	initial specified value or less 不超过标准值											

### Dimensions

mm



### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
200~250V		0.8	1	1.25	1.47
400~450V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	60	70	105
Factor	2.00	1.3	1.18	1.00

Ratings for CD294S Series

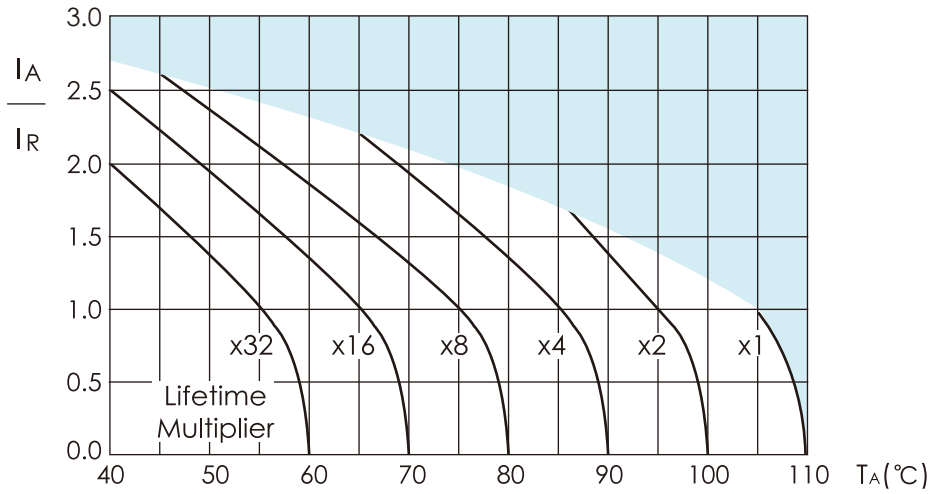
U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
200 2 )	330	603	422	1.01	22×25	
	390	510	357	1.10	22×30	
	470	423	296	1.20	22×30	
		423	296	1.20	25×25	
	560	355	248	1.48	22×35	
		355	248	1.48	25×30	
	680	292	204	1.62	22×40	
		292	204	1.60	25×30	
		292	204	1.60	30×25	
	820	242	169	1.75	22×45	
		242	169	1.75	25×35	
		242	169	1.75	30×30	
	1000	199	139	2.04	22×50	
		199	139	2.04	25×40	
		199	139	2.04	30×35	
		199	139	2.04	35×25	
	1200	165	116	2.30	25×45	
		165	116	2.30	30×35	
	1500	132	92	2.57	30×40	
		132	92	2.57	35×30	
1800	110	77	2.68	30×50		
	110	77	2.68	35×35		
2200	90	63	2.92	35×45		
2700	73	51	3.30	35×50		
250 (300)	220	904	633	0.95	22×25	
	270	737	516	1.12	22×25	
	330	603	422	1.21	22×30	
		603	422	1.21	25×25	
	390	510	357	1.38	22×35	
		510	357	1.38	25×25	
	470	423	296	1.56	22×40	
		423	296	1.56	25×30	
	560	355	248	1.74	22×45	
		355	248	1.74	25×35	
	680	292	204	1.92	22×50	
		292	204	1.92	25×40	
		292	204	1.92	30×30	
	820	242	169	2.13	25×45	
		242	169	2.13	30×35	
	1000	199	139	2.40	25×50	
		199	139	2.40	30×40	
		199	139	2.40	35×30	
	1200	165	116	2.55	30×40	
	1500	132	92	2.73	30×50	
132		92	2.73	35×40		
1800	110	77	2.82	35×45		
2200	90	63	2.95	35×50		

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
400 (450)	120	1658	1161	0.65	22×25	
	150	1327	774	0.73	22×30	
	180	1105	774	0.73	25×25	
	220	904	633	0.82	22×35	
		904	633	0.87	25×30	
	270	737	516	0.93	22×40	
		737	516	1.05	25×35	
		737	516	1.02	30×25	
	330	603	422	1.16	22×50	
		603	422	1.14	25×40	
		603	422	1.14	30×30	
		603	422	1.13	35×25	
	390	510	357	1.45	25×45	
		510	357	1.47	30×35	
		510	357	1.50	35×30	
	470	423	296	1.54	25×50	
		423	296	1.61	30×40	
		423	296	1.50	35×30	
	560	355	248	1.70	30×45	
		355	248	1.67	35×35	
680	292	204	1.82	30×50		
	292	204	1.87	35×40		
820	242	169	2.08	35×45		
	242	169	2.14	30×60		
450 (500)	100	2653	1393	0.67	22×25	
	120	2212	1161	0.71	22×30	
		2212	1161	0.72	25×25	
	150	1206	928	0.75	22×30	
		1206	928	0.77	22×45	
	180	1474	774	0.79	22×40	
		1474	774	0.79	25×30	
	220	1206	633	0.85	22×45	
		1206	633	0.87	25×35	
		1206	633	0.89	30×30	
	270	983	516	1.00	22×50	
		983	516	1.10	25×40	
		983	516	1.01	30×30	
		983	516	1.00	35×25	
	330	804	422	1.28	25×50	
		804	422	1.31	30×35	
		804	422	1.25	35×30	
	390	680	357	1.41	30×40	
		680	357	1.45	35×35	
	470	565	296	1.61	35×40	
565		296	1.52	30×45		
560	474	248	1.75	35×45		
680	390	204	1.93	35×50		

Customer products are available on request.

Ratings for CD294S Series

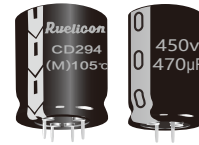
Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD294 Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

- 3000h at 105°C
- Load life at High Temperature, High ripple current 高温负载长寿命, 高纹波电流
- Suit for high frequency regenerative voltage for AC servomotor, general inverter. 适用于高频电机, 变频器, 逆变器

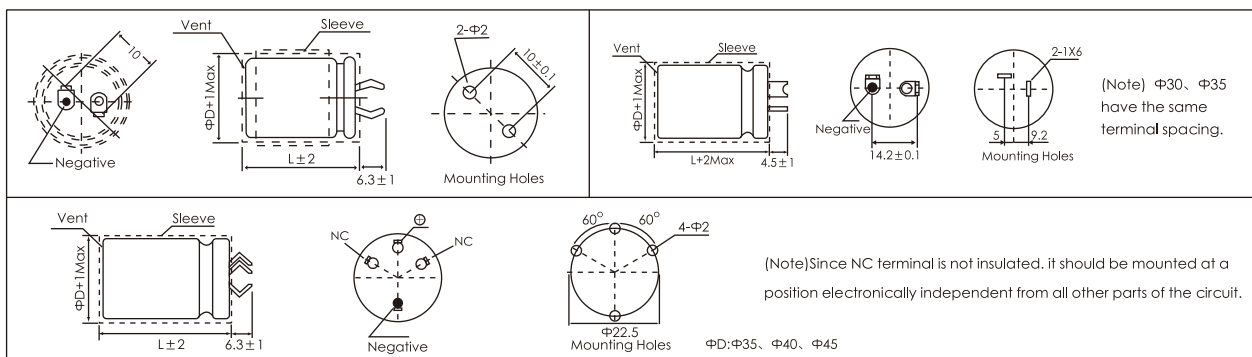


### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能	
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C
Rated Working Voltage Range 电压范围	16 to 250V	160 to 550V
Nominal Capacitance Range 容量范围	39 to 47000µF	
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)	
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5 minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试	
Dissipation Factor tan δ(120Hz, +20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~550
	Tan δ(max)	0.55 0.50 0.45 0.4 0.35 0.30 0.25 0.20 0.15 0.25
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz	
	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~550
	Z-25°C/Z+20°C	6 6 6 6 4 3 3 3 8 8
Z-40°C/Z+20°C	12 12 12 12 12 12 12 12 - -	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 3000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压3000小时后, 符合以下要求:	
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求	
	Capacitance Change容量	Within ±15% of initial value 在初始值的±15%
	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
16~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.25	1.47
315~550V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	65	85	105
Factor	2.00	1.89	1.52	1.00

Ratings for CD294 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
16 (20)	6800	98	68	1.6	22×25	
	10000	66	46	1.99	22×30	
		66	46	1.99	25×25	
	12000	55	39	2.28	22×35	
		55	39	2.3	25×30	
	15000	55	39	2.38	30×25	
		44	31	2.64	22×40	
	18000	44	31	2.68	25×35	
		37	26	2.98	22×45	
		37	26	3.04	25×40	
		37	26	3	30×30	
	22000	37	26	3.1	35×25	
		30	21	3.4	25×45	
		30	21	3.39	30×35	
		25	17	3.81	25×50	
	27000	25	17	3.83	30×40	
		25	17	3.74	35×30	
	33000	20	14	4.3	30×45	
		20	14	4.24	35×35	
	39000	17	12	4.74	30×50	
17		12	4.72	35×40		
47000	14	10	5.27	35×45		
25 (32)	4700	113	79	1.55	22×25	
	6800	78	55	1.91	22×30	
		78	55	1.91	25×25	
	8200	65	45	2.14	22×35	
		65	45	2.16	25×30	
	10000	65	45	2.25	30×25	
		53	37	2.4	22×40	
	12000	53	37	2.44	25×35	
		44	31	2.69	22×45	
		44	31	2.74	25×40	
		44	31	2.7	30×30	
	15000	44	31	2.8	35×25	
		35	25	3.15	25×45	
		35	25	3.13	30×35	
		35	25	3.22	35×30	
	18000	30	21	3.54	25×50	
		30	21	3.54	30×40	
	22000	24	17	4.24	30×45	
		24	17	3.96	35×35	
	27000	20	14	4.75	35×45	
33000	16	11	5.39	35×50		
35 (44)	3300	141	99	1.43	22×25	
	3900	119	83	1.65	22×30	
		119	83	1.65	25×25	
	4700	99	69	1.78	25×25	
		99	69	1.78	25×30	
	5600	83	58	2.02	22×35	
		83	58	2.04	25×30	
	6800	83	58	2.12	30×25	
		68	48	2.28	22×40	
	8200	68	48	2.31	25×35	
		57	40	2.67	22×50	
		57	40	2.6	25×40	
		57	40	2.56	30×30	
	10000	57	40	2.78	35×25	
		46	33	2.92	25×45	
		46	33	2.92	30×35	
		39	27	3.26	25×50	
	12000	39	27	3.28	30×40	
		39	27	3.2	35×30	
	15000	31	22	3.74	30×45	
31		22	3.69	35×35		
18000	26	18	4.16	35×40		
22000	21	15	4.92	35×50		
50 (63)	1800	221	155	1.31	22×25	
	2200	181	127	1.45	22×30	
	2700	147	103	1.7	22×30	
		147	103	1.7	25×25	
	3300	121	84	1.98	22×35	
		121	84	2	25×30	
	3900	102	72	2.25	22×40	
		102	72	2.28	25×35	
	4700	102	72	2.22	30×25	
		85	59	2.56	22×45	
		85	59	2.58	30×30	
		85	59	2.67	35×25	
	5600	71	50	2.89	22×50	
		71	50	2.81	25×40	
		71	50	2.95	30×35	
	6800	59	41	3.37	25×50	
		59	41	3.39	30×40	
		59	41	3.31	35×30	

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
50 (63)	8200	49	34	3.71	30×45	
		49	34	3.66	35×35	
	10000	40	28	4.09	30×50	
		40	28	4.07	35×40	
63 (79)	12000	33	23	4.5	35×45	
	1200	221	155	1.25	22×25	
	1800	147	103	1.52	22×30	
		147	103	1.52	25×25	
	2200	121	84	1.73	22×35	
		121	84	1.75	25×30	
	2700	98	69	1.97	22×40	
		98	69	1.99	25×35	
	3300	98	69	1.93	30×25	
		80	56	2.32	22×50	
		80	56	2.27	25×40	
		80	56	2.24	30×30	
3900	80	56	2.41	35×25		
	68	48	2.54	25×45		
	68	48	2.55	30×35		
	57	40	2.88	25×50		
4700	57	40	2.9	30×40		
	57	40	2.83	35×30		
5600	47	33	3.28	30×45		
	47	33	3.24	35×35		
80 (100)	6800	39	27	3.73	30×50	
	8200	39	27	3.71	35×40	
		32	23	4.16	35×45	
	10000	27	19	4.69	35×50	
	820	324	227	1.11	22×25	
	1000	266	186	1.25	22×25	
	1200	221	155	1.39	22×30	
		221	155	1.39	25×25	
	1500	177	124	1.61	22×35	
		177	124	1.62	25×30	
	1800	147	103	1.83	22×40	
		147	103	1.81	30×25	
2200	121	84	2.09	22×45		
	121	84	2.01	25×35		
	121	84	2.1	30×30		
	121	84	2.17	35×25		
2700	98	69	2.43	25×45		
	98	69	2.43	30×35		
3300	80	56	2.76	25×50		
	80	56	2.78	30×40		
3900	80	56	2.71	35×30		
	68	48	3.12	30×45		
4700	68	48	3.07	35×35		
	57	40	3.56	30×50		
5600	57	40	3.5	35×40		
	47	33	3.87	35×45		
6800	39	27	4.19	35×50		
100 (125)	560	474	332	1.07	22×25	
	820	324	227	1.35	22×30	
		324	227	1.35	25×25	
	1000	265	186	1.54	22×35	
		265	186	1.56	25×30	
	1200	221	155	1.74	22×40	
		221	155	1.76	25×35	
	1500	221	155	1.71	30×25	
		177	124	1.99	22×45	
	1800	177	124	2.03	25×40	
		177	124	2	30×30	
		177	124	2.07	35×25	
147		103	2.28	25×45		
2200	147	103	2.27	30×35		
	121	84	2.57	25×50		
	121	84	2.59	30×40		
	121	84	2.52	35×30		
2700	98	69	2.94	30×45		
	98	69	2.9	35×35		
3300	80	56	3.32	30×50		
	80	56	3.31	35×40		
3900	68	48	3.69	35×45		
	4700	57	40	4.14	35×50	
160 (200)	330	603	422	1.16	22×25	
	390	510	357	1.43	22×30	
560	424	296	1.52	22×35		
	424	296	1.55	25×25		
	355	249	1.62	22×40		
		355	249	1.73	25×30	

Ratings for CD294 Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
160 (200)	680	293	205	1.7	22 x 45		
		293	205	1.81	25 x 35		
		293	205	1.82	30 x 25		
	820	243	170	1.81	22 x 50		
		243	170	1.98	25 x 40		
		243	170	1.98	30 x 30		
		243	170	1.93	35 x 25		
	1000	199	139	2.04	25 x 45		
		199	139	2.14	30 x 35		
	1200	166	116	2.12	25 x 50		
		166	116	2.22	30 x 40		
		166	116	2.4	35 x 30		
	1500	133	93	2.46	30 x 45		
		133	93	2.53	35 x 35		
	1800	111	77	2.98	35 x 45		
	2200	91	63	3.1	35 x 50		
	2700	74	51	3.77	35 x 55		
	3300	60	42	4.33	35 x 60		
	180 (225)	270	737	516	1.08	22 x 25	
		330	603	422	1.3	22 x 30	
390		510	357	1.35	25 x 25		
470		424	296	1.5	22 x 35		
		424	296	1.62	25 x 30		
560		355	249	1.62	22 x 40		
		355	249	1.69	25 x 35		
680		293	205	1.76	22 x 50		
		293	205	1.72	25 x 40		
820		293	205	1.74	30 x 30		
		293	205	1.92	35 x 25		
1000		243	170	1.78	25 x 45		
		243	170	1.85	30 x 35		
1200		199	139	1.91	25 x 50		
		199	139	2.01	30 x 40		
1500		199	139	2.16	35 x 30		
		166	116	2.19	30 x 45		
1800		166	116	2.34	35 x 35		
		133	93	2.36	30 x 50		
200 (250)		1500	133	93	2.56	35 x 40	
	133		93	2.56	35 x 40		
	1800	111	77	2.67	35 x 45		
	2200	91	63	3.27	35 x 50		
	2700	74	52	3.92	35 x 60		
	220	905	633	1.08	22 x 25		
		737	516	1.20	22 x 30		
	330	603	422	1.3	22 x 30		
		603	422	1.35	25 x 25		
	390	510	357	1.41	22 x 35		
		424	296	1.5	22 x 40		
	470	424	296	1.47	25 x 30		
		424	296	1.56	30 x 25		
	560	355	249	1.58	22 x 45		
		355	249	1.65	25 x 35		
	680	293	205	1.68	22 x 50		
		293	205	1.8	25 x 40		
	820	293	205	1.82	30 x 30		
		293	205	1.96	35 x 25		
	1000	243	170	1.87	25 x 50		
243		170	1.99	30 x 35			
1200	243	170	2.07	35 x 30			
	199	139	2.17	30 x 45			
1500	199	139	2.22	35 x 35			
	166	116	2.22	30 x 50			
1800	166	116	2.42	35 x 40			
	133	93	2.59	35 x 45			
250 (300)	1800	111	77	2.7	35 x 50		
		2200	91	63	3.23	35 x 60	
	220	1106	774	0.94	22 x 25		
		905	633	1.1	22 x 30		
	330	905	633	1.15	25 x 25		
		737	516	1.13	22 x 35		
	390	603	422	1.2	22 x 40		
		603	422	1.3	25 x 30		
	470	603	422	1.35	30 x 25		
		510	357	1.26	22 x 45		
	560	510	357	1.41	25 x 35		
		424	296	1.37	22 x 50		
	680	424	296	1.34	25 x 40		
		424	296	1.36	30 x 30		
	820	424	296	1.4	35 x 25		
		355	249	1.59	25 x 45		
	1000	355	249	1.57	30 x 35		
		355	249	1.56	35 x 30		
	1200	293	205	1.66	25 x 50		
		293	205	1.76	30 x 40		

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
250 (300)	820	243	170	1.83	30 x 45		
		243	170	1.82	35 x 35		
	1000	199	139	1.87	30 x 50		
		199	139	1.99	35 x 40		
	1200	166	116	2.1	35 x 45		
		1500	133	93	2.7	35 x 50	
	1800	111	77	2.92	35 x 60		
		100	1990	1095	0.61	22 x 25	
	315 (365)	120	1659	912	0.68	22 x 30	
			1327	730	0.76	22 x 35	
150		1327	730	0.78	25 x 25		
		1106	608	0.78	22 x 40		
180		1106	608	0.85	25 x 30		
		905	498	0.91	22 x 45		
220		905	498	0.94	25 x 35		
		905	498	0.95	30 x 30		
270		737	406	0.98	22 x 50		
		737	406	1.00	25 x 40		
330		737	406	0.98	30 x 35		
		603	332	1.13	25 x 45		
390		603	332	1.13	30 x 40		
		510	281	1.20	30 x 45		
470		510	281	1.20	35 x 30		
		470	424	233	1.28	35 x 35	
560		560	355	1.96	1.46	35 x 40	
		680	293	1.61	1.85	35 x 45	
820		820	242	133	2.1	35 x 50	
		1000	199	109	2.42	35 x 55	
350 (400)	68	2927	1610	0.56	22 x 25		
		82	2427	1262	0.56	22 x 25	
	100	1990	1095	0.7	22 x 30		
		1990	1095	0.7	25 x 25		
	120	1659	912	0.73	22 x 35		
		1327	730	0.79	22 x 40		
	150	1327	730	0.82	25 x 30		
		1327	730	0.82	30 x 25		
	180	1106	608	0.81	22 x 45		
		1106	608	0.89	25 x 35		
	220	1106	608	0.9	30 x 30		
		905	498	0.93	22 x 50		
	270	905	498	0.97	25 x 40		
		905	498	0.98	35 x 25		
	330	737	406	1.01	25 x 50		
		737	406	1.05	30 x 35		
	390	737	406	1.01	35 x 30		
		603	332	1.16	30 x 45		
	470	603	332	1.16	35 x 35		
		510	281	1.26	30 x 50		
560	510	281	1.26	35 x 40			
	470	424	233	1.35	35 x 45		
680	560	355	1.96	1.51	35 x 50		
	680	293	1.61	1.92	35 x 55		
820	820	242	133	2.25	35 x 60		
	1000	199	109	2.5	35 x 60		
400 (450)	68	2927	1522	0.47	22 x 25		
		82	2427	1262	0.56	22 x 25	
	100	1990	1035	0.60	22 x 30		
		1659	863	0.64	22 x 35		
	120	1659	863	0.7	25 x 25		
		1327	690	0.7	22 x 40		
	150	1327	690	0.73	25 x 30		
		1106	575	0.78	22 x 45		
	180	1106	575	0.82	25 x 35		
		905	471	0.87	25 x 40		
	220	905	471	0.96	30 x 30		
		737	383	0.94	25 x 45		
	270	737	383	0.95	30 x 35		
		603	314	1.11	30 x 40		
	330	603	314	1.13	35 x 30		
		510	265	1.15	30 x 45		
	390	510	265	1.26	35 x 35		
		470	424	220	1.31	35 x 40	
	470	560	355	1.85	1.5	35 x 45	
		680	293	1.53	1.9	35 x 50	
420 (470)	820	242	126	2.2	35 x 60		
		242	126	2.2	40 x 50		
	1000	199	109	2.6	35 x 65		
		68	3903	1951	0.5	22 x 25	
	120	82	3237	1618	0.6	22 x 30	
		100	2654	1327	0.65	22 x 35	
	150	2212	1106	0.7	22 x 40		
		2212	1106	0.72	25 x 30		
	180	1769	885	0.75	22 x 45		
		1769	885	0.8	25 x 35		
	220	1475	737	0.85	25 x 40		
		1475	737	0.85	30 x 30		
	270	1206	603	0.9	25 x 45		
		1206	603	0.96	30 x 35		
	330	983	492	1.05	25 x 50		
		983	492	1.06	30 x 40		
	390	804	402	1.14	30 x 45		
		804	402	1.2	35 x 35		
	470	681	340	1.25	30 x 50		
		681	340	1.26	35 x 40		
560	565	282	1.31	35 x 45			
	560	473	237	1.5	35 x 50		
680	391	196	1.9	35 x 55			
	820	324	162	2.2	35 x 60		

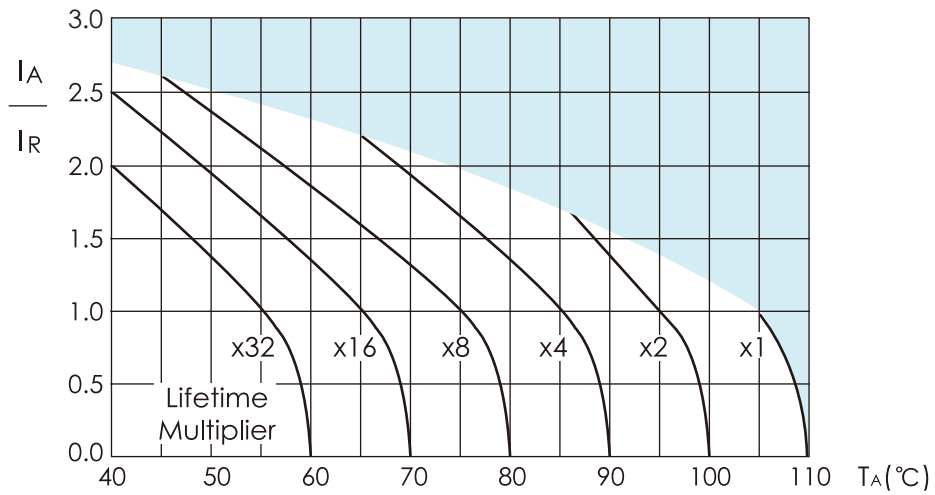
## Ratings for CD294 Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
450 (500)	56	4739	2370	0.47	22×25	
	68	3903	1951	0.56	22×30	
		3903	1951	0.56	25×25	
	82	3237	1618	0.65	22×35	
	100	2654	1327	0.7	22×40	
		2654	1327	0.7	25×30	
	120	2212	1106	0.73	22×45	
		2212	1106	0.73	25×35	
	150	1769	885	0.78	22×50	
		1769	885	0.82	25×40	
		1769	885	0.83	30×30	
	180	1474	737	0.87	25×45	
		1474	737	0.86	30×35	
	220	1206	603	0.94	25×50	
		1206	603	0.95	30×40	
		1206	603	0.91	35×30	
	270	983	492	1.11	30×45	
		983	492	1.13	35×35	
	330	804	402	1.15	30×50	
		804	402	1.26	35×40	
390	681	340	1.31	35×45		
470	565	282	1.5	35×50		
560	473	237	1.7	35×55		
680	391	196	2	35×60		
	391	196	2	40×50		
820	324	162	2.2	35×65		
	324	162	2.3	40×60		
1000	265	139	2.6	35×70		
500 (550)	39	6805	3403	0.35	22×25	
	47	5647	2823	0.41	22×30	
	56	4739	2370	0.47	22×35	
	68	3903	1951	0.54	22×40	
	82	3237	1618	0.62	25×30	
	100	2654	1327	0.67	25×35	
	120	2212	1106	0.77	25×40	
		2212	1106	0.72	30×30	
	150	1769	885	0.85	30×40	
	180	1474	737	1.01	30×45	
	220	1206	603	1.12	35×35	
	270	983	492	1.29	35×40	
	330	804	402	1.4	35×45	
	390	681	340	1.6	35×50	
	470	565	282	1.8	35×60	
	560	473	237	1.9	35×65	
680	391	196	2.2	35×70		
550 (600)	180	1474	737	1.06	30×50	
		1474	737	1.06	35×35	
	220	1206	603	1.18	30×55	
		1206	603	1.18	35×40	
	270	983	492	1.31	35×45	
	330	804	402	1.5	35×50	
	390	681	340	1.67	35×60	
	470	565	282	1.95	35×70	
560	473	237	2.1	35×80		
	473	237	2.1	40×70		

Customer products are available on request.

Ratings for CD294 Series

Lifetime Diagram

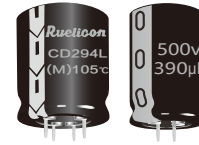


$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
 Multiplier of Useful Life as a function of ambient temperature and ripple current load



## CD294L Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

- 3000-4000h at 105°C
- Load life at High Temperature ,Long Useful life 高温负载长寿命, 使用寿命长
- High ripple current, Industrial power supplies 高频纹波电流, 工业电源, 逆变器

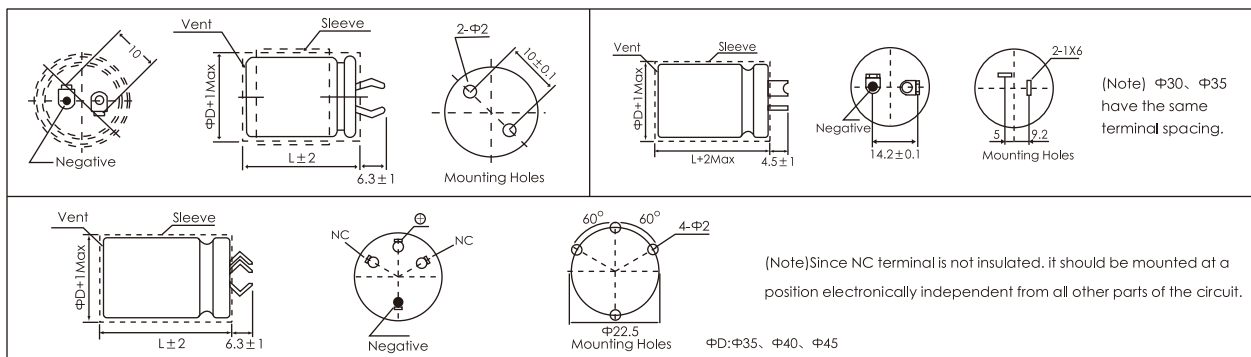


### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能	
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C
Rated Working Voltage Range 电压范围	16 to 100V	160 to 500V
Nominal Capacitance Range 容量范围	390 to 120000µF	
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)	
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试	
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~500
	Tan δ(max)	0.55 0.50 0.45 0.4 0.35 0.30 0.25 0.20 0.15 0.25
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz	
	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~500
	Z-25°C/Z+20°C	6 6 6 6 4 3 3 3 8 8
	Z-40°C/Z+20°C	12 12 12 12 12 12 12 12 - -
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 3000-4000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压3000-4000小时后, 符合以下要求:	
	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求	
	Capacitance Change 容量	Within ±15% of initial value 在初始值的±15%
	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
16~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.25	1.47
315~500V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	65	85	105
Factor	2.00	1.89	1.52	1.00

Ratings for CD294L Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
16 (20)	56000	14	10	10.4	30×45	
		14	10	9.8	40×40	
	68000	12	8	10.8	35×50	
		12	8	11.5	40×50	
	82000	10	7	11.8	35×60	
		10	7	11.8	40×50	
	100000	8	6	13.2	35×80	
		8	6	13.5	40×60	
	120000	7	5	15.3	35×105	
		7	5	14.8	40×80	
25 (32)	33000	20	14	8.1	35×40	
		20	14	8.7	40×40	
	39000	17	12	9.0	35×45	
		17	12	9.6	40×40	
	47000	14	10	9.6	35×50	
		12	8	10.3	35×60	
	56000	12	8	10.8	40×50	
		10	7	11.3	35×80	
	68000	10	7	11.8	40×60	
		8	6	13.5	40×80	
35 (44)	27000	20	14	8.2	35×45	
		20	14	8.0	40×40	
	33000	16	11	8.7	35×50	
		14	10	10.3	35×60	
	39000	14	10	9.6	40×50	
		11	8	11.4	35×80	
	47000	11	8	10.8	40×60	
		10	7	12.1	40×70	
56000	8	6	14.2	40×80		
	50 (63)	15000	27	19	7.7	35×40
27			19	8.1	40×40	
18000		22	16	8.3	35×45	
		22	16	8.3	40×40	
22000		18	13	9.1	35×50	
		18	13	9.4	40×50	
27000		15	10	11.2	35×80	
		15	10	10.8	40×60	
33000	12	8	13.4	35×80		
	12	8	13.4	40×70		
	10	7	15.5	40×80		
	63 (79)	12000	22	16	8.7	35×50
22			16	8.6	40×40	
15000		18	12	10.2	35×70	
		18	12	9.5	40×50	
18000		15	10	11.2	35×80	
		15	10	10.7	40×60	
27000	10	7	12.7	40×80		
	80 (100)	8200	32	23	6.9	35×50
10000		27	19	8.7	35×60	
12000		22	16	9.7	35×70	
		22	16	9.0	40×50	
15000		18	12	10.5	35×80	
		18	12	10.2	40×60	
18000	15	10	12.3	40×80		
	100 (125)	5600	47	33	7.0	35×45
47			33	7.4	40×40	
6800		39	27	8.0	35×50	
		39	27	8.9	40×50	
8200		32	23	9.6	35×70	
		32	23	9.6	40×60	
10000		27	19	10.4	35×80	
		27	19	10.2	40×60	
12000		22	16	12.3	40×80	

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
160 (200)	2200	91	63	4.9	35×45	
	2700	74	52	5.3	35×50	
	3300	60	42	5.5	35×70	
		60	42	5.5	40×60	
	3900	51	36	5.9	35×80	
	4700	42	30	7.3	40×80	
200 (250)	1500	133	93	4.3	35×40	
	1800	111	77	4.7	35×45	
	2200	91	63	5.4	35×50	
		91	63	5.4	40×40	
	2700	74	52	5.9	35×60	
		74	52	5.9	40×50	
	3300	60	42	6.5	35×80	
		60	42	6.5	40×60	
	3900	51	36	7.0	40×80	
	4700	42	30	9.2	40×90	
250 (300)	1000	199	139	3.7	35×40	
	1200	166	116	3.8	35×45	
	1500	133	93	4.4	35×50	
		133	93	4.5	40×40	
	1800	111	77	5.0	35×70	
		111	77	5.0	40×50	
	2200	91	63	5.4	35×70	
	2700	74	52	6.9	40×80	
350 (400)	680	293	205	3.6	35×45	
		293	205	3.6	40×40	
	820	243	170	4.5	35×60	
		243	170	4.3	40×50	
	1000	199	139	5.2	35×70	
		199	139	4.9	40×60	
	1200	166	116	5.5	35×80	
		166	116	5.6	40×70	
	1500	133	93	6.5	40×80	
		133	93	6.2	45×70	
	1800	111	77	7.9	40×100	
		111	77	7.1	45×70	
2200	91	63	8.7	40×100		
400 (450)	560	355	249	3.2	35×50	
		355	249	2.8	40×40	
	680	293	205	3.7	35×60	
		293	205	3.8	40×50	
	820	243	170	4.2	35×60	
		243	170	4.1	40×50	
	1000	199	139	4.9	35×70	
		199	139	4.8	40×60	
	1200	166	116	5.8	35×80	
		166	116	5.5	40×60	
	1500	133	93	6.9	40×90	
		133	93	6.6	45×70	
1800	111	77	7.9	40×100		
	111	77	7.3	45×80		
450 (500)	470	424	296	3.0	35×50	
		424	296	3.0	40×40	
	560	355	249	3.1	35×50	
		355	249	3.3	35×60	
	680	293	205	3.4	40×50	
		293	205	3.5	35×60	
820	243	170	4.6	35×70		
	243	170	4.4	40×60		

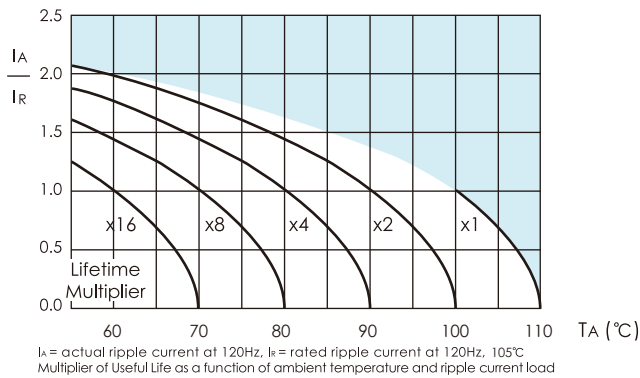
Ratings for CD294L Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size $\Phi D \times L$	Remarks 备注
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	
450 (500)	1000	199	139	5.7	35×80	
		199	139	5.2	40×60	
	1200	166	116	5.9	40×70	
		166	116	6.2	45×70	
	1500	133	93	7.3	40×100	
133		93	7.0	45×80		
500 (550)	1800	111	77	7.9	45×100	
	390	510	357	1.9	35×50	
		424	296	2.3	35×60	
	560	355	249	2.5	35×60	
		355	249	2.7	40×60	
	680	293	205	3.1	35×80	
		293	205	2.8	40×70	
	820	243	170	3.4	35×90	
		243	170	3.3	40×70	
	1000	199	139	3.9	40×80	
		199	139	3.9	45×70	
	1200	166	116	4.3	40×90	
	1500	133	93	4.8	40×100	

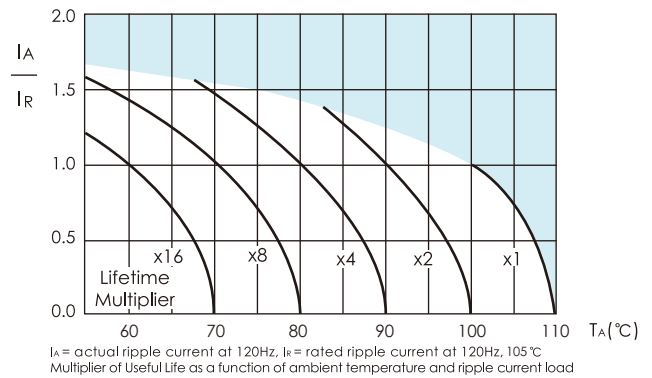
Customer products are available on request.

Lifetime Diagram

Lifetime Diagram  $U_R < 160V$

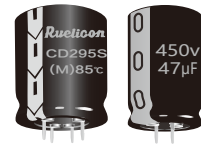


Lifetime Diagram  $U_R \geq 160V$



## CD295S Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

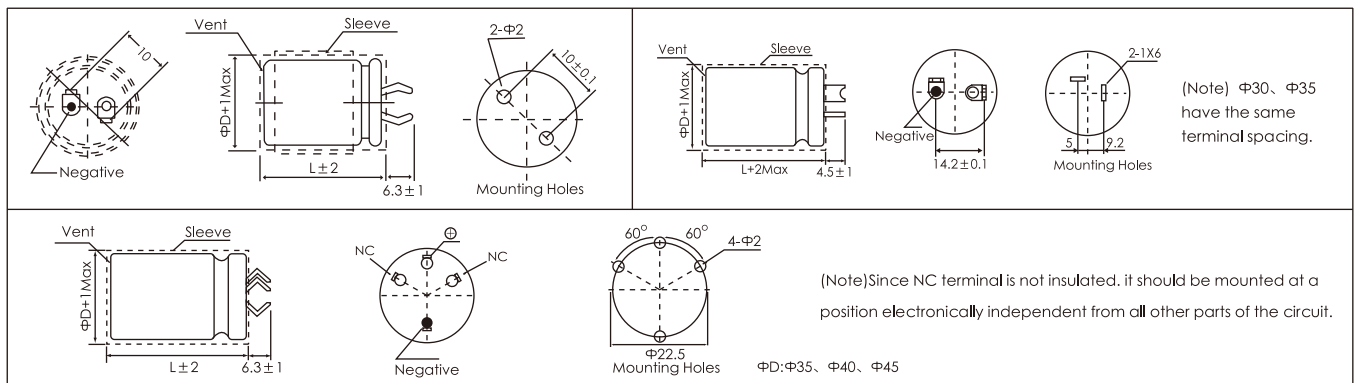
- 5000h at 85°C
- Long Useful life 长使用寿命
- High Ripple Current 高纹波电流
- Industrial power supplies and Inverters 适用于工业电源和变频器
- ◆ SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能	
Operating temperature range 温度范围	-40 to +85°C	-25 to +85°C
Rated Working Voltage Range 电压范围	160 to 250V	400 to 450V
Nominal Capacitance Range 容量范围	47 to 2200µF	
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)	
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试	
Dissipation Factor tan δ(120Hz, +20°C) 损耗角正切值	Working Voltage(V)	160 200 250 400 450
	Tan δ(max)	0.15 0.15 0.15 0.15 0.20
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz	
	Working Voltage(V)	160~250 400~450
	Z-25°C/Z+20°C	3 8
Z-40°C/Z+20°C	12 -	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压5000小时后, 符合以下要求:	
	Capacitance Change容量	Within ±25% of initial value 在初始值的±25%
	Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求	
	Capacitance Change容量	Within ±15% of initial value 在初始值的±15%
	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%
Leakage Current 泄露电流	initial specified value or less 不超过标准值	

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
160~250V		0.8	1	1.25	1.47
400~450V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	65	85
Factor	2.00	1.89	1.52

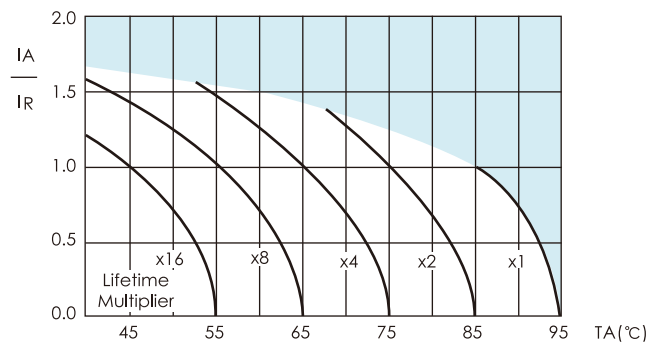
Ratings for CD295S Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
160 (200)	330	603	355	1.5	22×25	
	390	510	300	1.6	25×25	
	470	424	245	1.8	22×35	
		355	215	2.1	22×35	
	560	355	215	2.2	25×30	
		355	215	2.1	30×25	
	680	293	178	2.6	22×40	
		293	178	2.5	25×35	
	820	243	145	2.8	22×50	
		243	145	2.7	25×40	
		243	145	2.9	30×30	
		243	145	2.8	35×25	
	1000	199	115	3.3	25×45	
		199	115	3.4	30×35	
		199	115	3.3	35×30	
	1200	166	95	3.7	25×50	
		166	95	3.8	30×40	
		166	95	3.6	35×35	
	1500	133	75	4.4	30×45	
		133	75	4.3	35×40	
1800	111	75	4.4	35×45		
2200	91	58	4.9	35×50		
200 (250)	220	905	375	1.2	22×25	
	330	603	258	1.5	22×30	
		603	258	1.6	25×25	
	390	510	221	1.8	22×35	
		510	221	1.8	25×30	
	470	424	175	2	22×40	
		424	175	2.1	30×25	
	560	355	150	2.2	22×45	
		355	150	2.2	25×35	
		355	150	2.3	30×30	
	680	293	128	2.6	25×40	
		293	128	2.4	30×30	
		243	105	2.7	25×50	
	820	243	105	2.8	30×40	
		243	105	2.6	35×30	
		199	80	3.4	30×40	
	1000	199	80	3.6	35×35	
		166	70	3.8	30×50	
		166	70	3.7	35×40	
	1500	133	55	4.2	35×50	
250 (300)	150	1327	550	0.92	22×25	
	180	1106	470	0.98	22×25	
	220	905	370	1.25	22×30	
		905	370	1.25	25×25	
	270	737	370	1.25	22×35	
	330	603	250	1.64	22×40	
		603	255	1.64	25×30	
		603	255	1.64	30×25	
	390	510	250	1.9	22×45	
		510	250	1.9	25×35	
	470	424	175	2.2	22×50	
		424	175	2.2	25×40	
		424	175	2.2	30×30	
		424	175	2.2	35×25	
	560	355	150	2.4	25×45	
		355	150	2.4	30×35	
	680	293	123	2.8	30×40	
		293	123	2.8	35×30	
	820	243	105	3.2	30×45	
		243	105	3.2	35×35	
1000	199	80	3.7	35×40		
1200	166	70	4.1	35×45		
1500	133	60	4.6	35×50		

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
400 (450)	68	2342	960	0.62	22×25	
	100	1592	600	0.81	22×30	
		1592	600	0.83	25×25	
	120	1327	550	0.93	22×35	
	150	1062	440	1.2	22×40	
		1062	440	1.2	25×30	
		1062	440	1.2	30×25	
	180	885	360	1.3	22×45	
		885	360	1.3	25×35	
		885	360	1.3	30×30	
		885	180	1.3	35×25	
	220	724	300	1.5	22×50	
		724	300	1.5	25×40	
		724	300	1.5	30×35	
	270	590	240	1.7	25×45	
		590	240	1.7	30×40	
		590	240	1.7	35×30	
	330	483	200	2.1	30×45	
		483	200	2.1	35×35	
	390	408	170	2.3	30×50	
408		170	2.3	35×40		
470	339	140	2.7	35×45		
560	284	110	3	35×50		
450 (500)	47	3388	2800	0.52	22×25	
	68	2342	1940	0.66	22×30	
		2342	1940	0.66	25×25	
	100	1592	1310	0.9	22×35	
		1592	1310	0.9	25×30	
		1592	1310	0.9	30×25	
	120	1327	910	1.1	22×40	
		1327	910	1.1	25×35	
	150	1062	880	1.3	25×40	
		1062	880	1.3	30×30	
		885	740	1.4	25×45	
	180	885	740	1.4	30×35	
		885	740	1.4	35×25	
		724	590	1.6	25×50	
	220	724	590	1.6	30×40	
		724	590	1.6	35×30	
		590	490	1.9	30×45	
	270	590	490	1.9	35×35	
		483	395	2.2	35×40	
		408	300	2.4	35×45	
470	339	280	2.8	35×50		

Customer products are available on request.

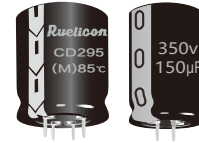
Lifetime Diagram



IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD295 Series (Lug/Snap Terminal Type插入/自立型, 标准品)

- 5000h at 85°C
- Highripple Current, Long Life Generat Industrial Electronics  
高纹波, 长寿命, 适用电机和工业设备

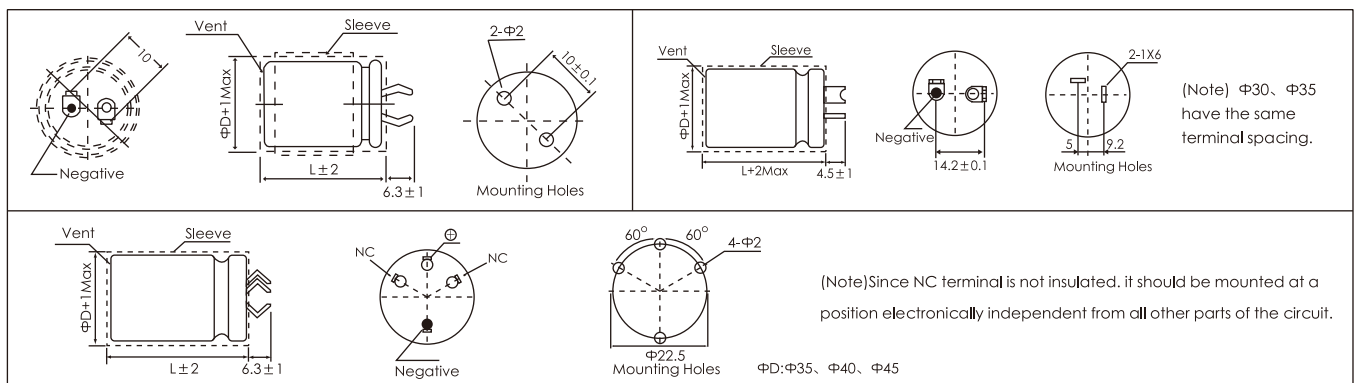


### ◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能				
Operating temperature range 温度范围	-40 to +85°C	-25 to +85°C			
Rated Working Voltage Range 电压范围	10 to 100V	160 to 500V			
Nominal Capacitance Range 容量范围	68 to 22000µF				
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)				
Leakage Current 泄漏电流	I ≤ 0.01CV or 3(µA) whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试				
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315-500			
	Tan δ(max)	0.6 0.5 0.45 0.4 0.4 0.3 0.25 0.20 0.15 0.20			
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz				
	Working Voltage(V)	10~100	160~250	315~385	400~500
	Z-25°C/Z+20°C	4	3	5	8
Z-40°C/Z+20°C	12	12	-	-	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压5000小时后, 符合以下要求:				
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%			
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%			
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求				
	Leakage Current 泄露电流	initial specified value or less 不超过标准值			

### Dimensions

mm



### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
10~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.15	1.47
315~500V		0.8	1	1.15	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	60	70	85
Factor	1.37	1.3	1.18	1.00

Ratings for CD295 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capaci- tance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
10 (13)	10000	106	74	2.5	22×25	
	12000	89	62	2.7	22×25	
	15000	71	50	3.2	22×30	
		71	50	3.1	25×25	
	18000	59	41	3.6	22×35	
		59	41	3.6	25×30	
	22000	48	34	4	22×40	
		48	34	4.1	25×35	
		48	34	4.1	30×25	
	16 (20)	8200	97	68	2.2	22×25
10000		80	56	2.6	22×30	
		80	56	2.6	25×25	
12000		66	46	2.9	22×35	
		53	37	3.3	22×40	
15000		53	37	3.3	25×30	
		53	37	3.4	30×25	
18000		44	31	3.8	22×45	
		44	31	3.7	25×35	
22000		36	25	4.2	22×50	
	36	25	4.2	25×40		
	36	25	4.2	30×30		
	36	25	4.4	35×25		
	36	25	4.4	22×25		
	36	25	4.4	25×30		
25 (32)	5600	119	83	2	22×25	
	6800	98	68	2.3	22×30	
		98	68	2.3	25×25	
	8200	81	57	2.6	22×35	
	10000	66	46	2.9	22×40	
		66	46	2.8	25×30	
		66	46	3	30×25	
	12000	55	39	3.3	22×45	
		55	39	3.2	25×35	
		55	39	3.4	30×30	
15000	44	31	3.7	25×40		
	44	31	3.9	35×25		
18000	37	26	4.3	25×50		
	37	26	4.2	30×35		
	37	26	4.4	35×30		
22000	30	21	4.8	30×40		
	30	21	5	35×35		
35 (44)	3300	161	113	1.8	22×25	
	3900	136	95	2.1	22×30	
	4700	113	79	2.2	25×25	
	5600	95	66	2.3	22×35	
		95	66	2.3	25×30	
	6800	78	55	2.9	22×40	
		78	55	2.6	25×35	
		78	55	2.7	30×25	
	8200	65	45	2.8	22×50	
		65	45	2.8	25×40	
65		45	2.8	30×30		
65		45	2.9	35×25		
10000	53	37	3.1	25×45		
	53	37	3.2	30×35		
12000	44	31	3.5	25×50		
	44	31	3.5	30×40		
15000	44	31	3.6	35×30		
	35	25	4.1	30×45		
18000	35	25	4.1	35×35		
	30	21	4.6	30×50		
22000	30	21	4.7	35×40		
	24	17	5.3	35×45		
50 (63)	2200	181	127	1.7	22×25	
	2700	147	103	1.9	22×30	
		147	103	1.9	25×25	
	3300	121	85	2.0	22×30	
		102	72	2.1	22×35	
	3900	102	72	2.1	25×30	
		102	72	2.1	25×30	
	4700	85	59	2.4	22×40	
		85	59	2.4	25×35	
	5600	71	50	2.5	22×50	
71		50	2.5	25×40		
71		50	2.5	30×30		
6800	71	50	2.6	35×25		
	59	41	2.8	25×45		
	59	41	2.8	30×35		
8200	49	34	3.2	25×50		
	49	34	3	30×40		
	49	34	3	35×30		
10000	40	28	3.4	30×45		
	40	28	3.4	35×35		
12000	33	23	3.8	30×50		
	33	23	3.8	35×40		
15000	27	19	4.5	35×50		

U <sub>r</sub> (Surge Voltage) Code	Rated Capaci- tance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
63 (79)	1500	177	124	1.6	22×25	
	1800	147	103	1.8	22×25	
		121	84	2	22×30	
	2200	121	84	2	25×25	
		98	69	2.2	22×35	
	2700	98	69	2.3	25×30	
		80	56	2.3	22×40	
	3300	80	56	2.3	25×35	
		80	56	2.3	30×25	
		68	48	2.5	22×45	
68		48	2.6	25×40		
3900	68	48	2.6	30×30		
	68	48	2.7	35×25		
	4700	57	40	2.9	30×30	
	47	33	3.1	25×45		
5600	47	33	3.2	30×35		
	47	33	3.3	35×30		
6800	39	27	3.6	30×40		
	39	27	3.7	35×35		
8200	32	23	3.7	30×50		
	32	23	3.8	35×40		
10000	27	19	4.3	35×45		
12000	22	16	4.8	35×50		
1000	265	186	1.3	22×25		
1200	221	155	1.5	22×30		
1500	177	124	1.7	25×25		
1800	147	103	1.9	22×35		
	147	103	1.9	25×30		
2200	121	84	2.1	22×40		
	121	84	2.2	25×35		
	121	84	2.2	30×25		
	98	69	2.5	22×50		
2700	98	69	2.5	25×40		
	98	69	2.5	30×30		
	98	69	2.5	35×25		
3300	80	56	2.8	25×45		
	80	56	2.8	30×35		
3900	68	48	3.1	25×50		
	68	48	3.2	30×40		
4700	68	48	3.2	35×30		
	57	40	3.6	30×45		
5600	57	40	3.6	35×35		
	47	33	3.8	30×50		
6800	47	33	3.8	35×40		
	39	27	4.1	35×50		
680	390	273	1.1	22×25		
820	324	227	1.2	22×30		
1000	265	186	1.4	25×25		
1200	221	155	1.6	22×35		
	221	155	1.6	25×30		
	177	124	1.8	22×40		
1500	177	124	1.7	25×35		
	177	124	1.8	30×25		
1800	147	103	2.1	22×50		
	147	103	2	25×40		
	147	103	2.1	30×30		
	147	103	2.2	35×25		
2200	121	84	2.2	25×45		
	121	84	2.3	30×35		
	121	84	2.5	35×30		
2700	98	69	2.6	25×50		
	98	69	2.7	30×40		
3300	80	56	3	30×45		
	80	56	3.1	35×35		
3900	68	48	3.4	30×50		
	68	48	3.4	35×40		
4700	57	40	4	35×50		
220	905	633	1.0	22×25		
270	737	516	1.1	22×25		
330	603	422	1.3	22×25		
390	510	357	1.5	22×30		
	510	357	1.5	25×25		
470	424	297	1.7	25×25		
	355	249	1.9	22×35		
560	355	249	1.9	25×30		
	355	249	2	30×25		
	293	205	2.1	22×40		
680	293	205	2.2	25×35		
	243	170	2.5	22×50		
820	243	170	2.4	25×40		
	243	170	2.5	30×30		
	243	170	2.4	35×25		
1000	199	139	2.7	25×45		
	199	139	2.8	30×35		
	199	139	2.7	35×30		

Ratings for CD295 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注		
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)			
160 (200)	1200	166	116	3.1	25 x 50			
		166	116	3.2	30 x 40			
		166	116	3	35 x 35			
	1500	133	93	3.7	30 x 45			
		133	93	3.5	35 x 40			
		1800	111	77	3.9	35 x 45		
2200	91	63	4.5	35 x 50				
180 (225)	270	737	516	1.2	22 x 25			
		330	603	422	1.4	22 x 30		
		390	510	357	1.5	25 x 25		
	470	424	296	1.7	22 x 35			
		424	296	1.7	25 x 30			
		424	296	1.8	30 x 25			
	560	355	249	1.9	22 x 40			
		355	249	2	25 x 35			
		293	205	2.3	22 x 50			
	680	293	205	2.2	25 x 40			
		293	205	2.3	30 x 30			
		293	205	2.2	35 x 25			
	820	243	170	2.5	25 x 45			
		243	170	2.6	30 x 35			
		243	170	2.5	35 x 30			
	1000	199	139	2.9	25 x 50			
		199	139	2.9	30 x 40			
	1200	166	116	3.3	30 x 45			
		166	116	3.1	35 x 35			
	200 (250)	1500	133	93	3.6	35 x 45		
			1800	111	77	4.1	35 x 50	
			220	905	633	1.1	22 x 25	
		270	737	516	1.2	22 x 25		
			330	603	422	1.4	22 x 30	
390			510	357	1.6	22 x 35		
470		510	357	1.6	25 x 30			
		424	296	1.8	22 x 40			
		424	296	1.9	30 x 25			
560		355	249	2	22 x 45			
		355	249	2	25 x 35			
		355	249	2.1	30 x 30			
680		355	249	2	35 x 25			
		293	205	2.3	25 x 40			
		293	205	2.4	30 x 35			
820		243	170	2.6	25 x 50			
		243	170	2.7	30 x 40			
		243	170	2.5	35 x 30			
1000		199	139	3.1	30 x 45			
		199	139	2.8	35 x 35			
1200		166	116	3.4	30 x 50			
		166	116	3.2	35 x 40			
250 (300)		1500	133	93	3.8	35 x 50		
			180	1106	774	0.94	22 x 25	
	220		905	633	1.1	22 x 30		
	270	905	633	1.1	25 x 25			
		737	516	1.2	22 x 35			
		603	422	1.4	22 x 40			
	330	603	422	1.4	25 x 30			
		603	422	1.5	30 x 25			
		510	357	1.6	22 x 45			
	390	510	357	1.6	25 x 35			
		424	296	1.8	22 x 50			
		424	296	1.8	25 x 40			
	470	424	296	1.8	30 x 30			
		424	296	1.9	35 x 25			
		355	249	2	25 x 45			
	560	355	249	2	30 x 35			
		293	205	2.3	30 x 40			
		293	205	2.4	35 x 30			
	820	243	170	2.6	30 x 45			
		243	170	2.6	35 x 35			
		1000	199	139	3	35 x 40		
	1200	166	116	3.4	35 x 45			
		100	1990	1393	0.67	22 x 25		
	315 (365)	120	1659	1161	0.75	22 x 30		
150			1327	929	0.85	22 x 30		
1327			929	0.85	25 x 25			
180		1106	774	0.96	22 x 35			
		1106	774	0.96	25 x 30			
		905	633	1.1	22 x 40			
220		905	633	1.1	25 x 35			
		905	633	1.1	30 x 25			
		737	516	1.2	22 x 45			
270		737	516	1.3	25 x 40			
		737	516	1.3	30 x 30			
		737	516	1.3	35 x 25			

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
315 (365)	330	603	422	1.4	25 x 45		
		603	422	1.4	30 x 35		
		510	357	1.6	25 x 50		
	390	510	357	1.6	30 x 40		
		510	357	1.6	35 x 30		
		470	424	296	1.8	30 x 45	
	470	424	296	1.8	35 x 35		
		355	249	2	30 x 50		
		355	249	2	35 x 40		
	560	680	293	205	2.3	35 x 45	
		82	2427	1699	0.64	22 x 25	
		100	1990	1393	0.72	22 x 25	
350 (400)	120	1659	1161	0.82	22 x 30		
		1659	1161	0.81	25 x 25		
		150	1327	929	0.94	22 x 35	
	150	1327	929	0.94	25 x 30		
		180	1106	774	1.1	22 x 40	
		1106	774	1.1	30 x 25		
	220	905	633	1.2	22 x 45		
		905	633	1.2	25 x 35		
		905	633	1.2	30 x 30		
	220	905	633	1.3	35 x 25		
		270	737	516	1.4	25 x 45	
		737	516	1.4	30 x 35		
330	603	422	1.6	25 x 50			
	603	422	1.6	35 x 30			
	390	510	357	1.7	30 x 40		
390	510	357	1.8	35 x 35			
	470	424	296	2	30 x 45		
	424	296	2	35 x 40			
560	355	249	2.3	35 x 45			
	680	293	205	2.6	35 x 50		
	68	2927	2049	0.55	22 x 25		
400 (450)	82	2427	1699	0.6	22 x 25		
		100	1990	1393	0.7	22 x 30	
		1990	1393	0.7	25 x 25		
	120	1659	1161	0.79	22x35		
		1327	929	0.9	22 x 40		
		1327	929	0.89	25 x 30		
	150	1327	929	0.95	30 x 25		
		180	1106	774	1	22 x 45	
		1106	774	1	25 x 35		
	180	1106	774	1.1	30 x 30		
		1106	774	1.2	35 x 25		
		220	905	633	1.1	22 x 50	
220	905	633	1.2	25 x 40			
	905	633	1.2	30 x 35			
	737	516	1.3	25 x 45			
270	737	516	1.4	30 x 40			
	737	516	1.6	35 x 30			
	330	603	422	1.6	30 x 45		
330	603	422	1.7	35 x 35			
	390	510	357	1.8	30 x 50		
	510	357	1.8	35 x 40			
470	424	296	2.1	35 x 45			
	560	355	249	2.3	35 x 50		
	680	293	235	2.7	35 x 55		
820	242	194	3.1	35 x 60			
	242	194	3.1	40 x 50			
	1000	199	139	3.8	35 x 70		
420 (470)	68	2927	1522	0.56	22 x 25		
		82	2427	1262	0.62	22 x 30	
		100	1990	1035	0.71	22 x 35	
	120	1659	863	0.80	22 x 40		
		1659	863	0.81	25 x 30		
		150	1327	690	0.92	22 x 45	
	150	1327	690	0.93	25 x 35		
		180	1106	575	1.1	25 x 40	
		1106	575	1.1	30 x 30		
	220	905	471	1.2	25 x 45		
		905	471	1.3	30 x 35		
		270	737	383	1.3	25 x 50	
270	737	383	1.4	30 x 40			
	330	603	314	1.6	30 x 45		
	603	314	1.6	35 x 35			
390	510	265	1.9	30 x 50			
	470	424	220	2.2	35 x 45		
	560	355	185	2.4	35 x 50		
680	293	153	2.8	35 x 55			
	820	242	126	3.2	35 x 60		



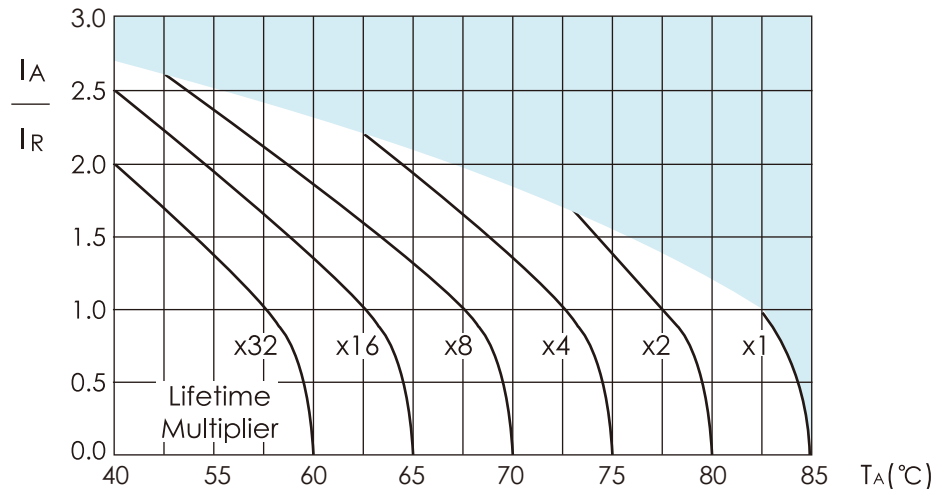
## Ratings for CD295 Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size $\Phi D \times L$	Remarks 备注
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	
450 (500)	68	2927	2049	0.57	22 × 30	
	82	2427	1699	0.64	22 × 35	
	100	1990	1393	0.72	22 × 35	
		1990	1393	0.73	25 × 30	
	120	1659	1161	0.8	22 × 40	
		1659	1161	0.83	25 × 35	
	150	1327	929	0.95	22 × 50	
		1327	929	0.95	25 × 40	
		1327	929	0.98	30 × 30	
	180	1106	774	1.1	25 × 45	
		1106	774	1.1	30 × 35	
		1106	774	1.2	35 × 25	
	220	905	633	1.2	25 × 50	
		905	633	1.3	30 × 40	
		905	633	1.3	35 × 30	
	270	737	516	1.4	30 × 45	
		737	516	1.5	35 × 35	
	330	603	423	1.7	30 × 50	
	390	510	357	1.9	35 × 45	
	470	424	296	2.2	35 × 50	
560	356	285	2.4	35 × 55		
680	293	235	2.8	35 × 60		
	293	235	2.8	40 × 50		
820	242	194	3.2	35 × 65		
	242	194	3.3	40 × 60		
1000	199	139	3.9	35 × 75		
500 (550)	100	1990	1592	0.90	25 × 30	
		1990	1592	0.88	30 × 25	
	120	1658	1327	1.0	25 × 35	
		1658	1327	1.0	30 × 30	
		1658	1327	0.95	35 × 25	
	150	1327	1062	1.2	25 × 40	
		1327	1062	1.2	30 × 35	
	180	1106	885	1.4	30 × 40	
		1106	885	1.3	35 × 30	
	220	905	724	1.6	30 × 45	
		905	724	1.5	35 × 35	
	270	737	590	1.8	30 × 50	
		737	590	1.7	35 × 40	
	330	603	483	2.0	30 × 50	
		603	483	1.9	35 × 45	
	390	511	409	2.3	35 × 50	
470	424	339	2.5	35 × 60		
560	356	285	2.8	35 × 65		
680	293	235	3.2	35 × 70		

Customer products are available on request.

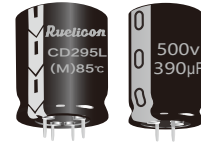
Ratings for CD295 Series

Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
 Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD295L Series (Lug/Snap Terminal Type插入/自立型, Long Life长寿命)

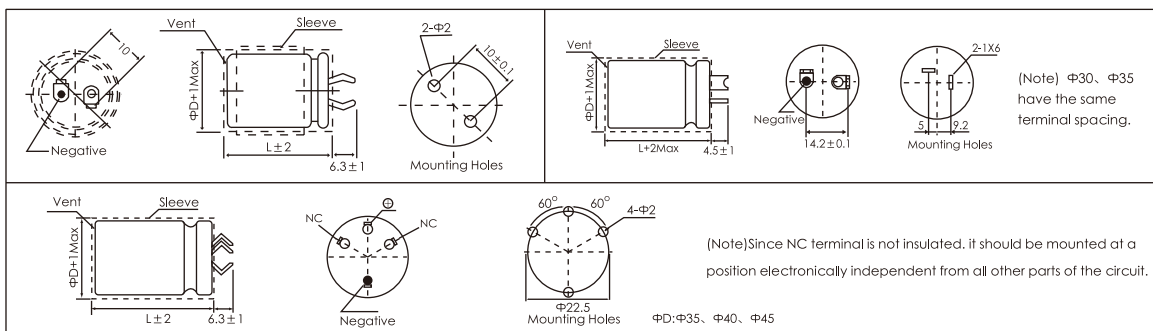


- 5000h at 85°C
- Larger Size Components, Long Useful Life, High Ripple Current, Industrial Power Supplies  
大尺寸, 长寿命, 高纹波电流, 工业电源
- ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能												
Operating temperature range 温度范围	-40 to +85°C												
Rated Working Voltage Range 电压范围	160 to 500V												
Nominal Capacitance Range 容量范围	390 to 4700µF												
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)												
Leakage Current 泄漏电流	$I \leq 0.03CV$ or 3mA whichever is smaller after 5 minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试												
Dissipation Factor $\tan \delta$ (120Hz, +20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>160~500</td> </tr> <tr> <td>Tan <math>\delta</math>(max)</td> <td>0.15</td> </tr> </table>	Working Voltage(V)	160~500	Tan $\delta$ (max)	0.15								
Working Voltage(V)	160~500												
Tan $\delta$ (max)	0.15												
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>160~200</td> <td>250~400</td> <td>450~500</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>4</td> <td></td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>6</td> <td>8</td> <td>-</td> </tr> </table>	Working Voltage(V)	160~200	250~400	450~500	Z-25°C/Z+20°C	3	4		Z-40°C/Z+20°C	6	8	-
Working Voltage(V)	160~200	250~400	450~500										
Z-25°C/Z+20°C	3	4											
Z-40°C/Z+20°C	6	8	-										
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压2000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change 容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值						
Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%												
Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%												
Leakage Current 泄露电流	initial specified value or less 不超过标准值												
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours, the capacitors shall meet the following requirement.. 在85°C环境下不加负载放置1000小时后, 符合以下要求 <table border="1"> <tr> <td>Capacitance Change 容量</td> <td>Within ±15% of initial value 在初始值的±15%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 150% of the specified value 不超过标准值的150%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change 容量	Within ±15% of initial value 在初始值的±15%	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%	Leakage Current 泄露电流	initial specified value or less 不超过标准值						
Capacitance Change 容量	Within ±15% of initial value 在初始值的±15%												
Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%												
Leakage Current 泄露电流	initial specified value or less 不超过标准值												

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
160~250V		0.8	1	1.15	1.47
315~500V		0.8	1	1.15	1.47

(2) Temperature Coefficient (温度系数)

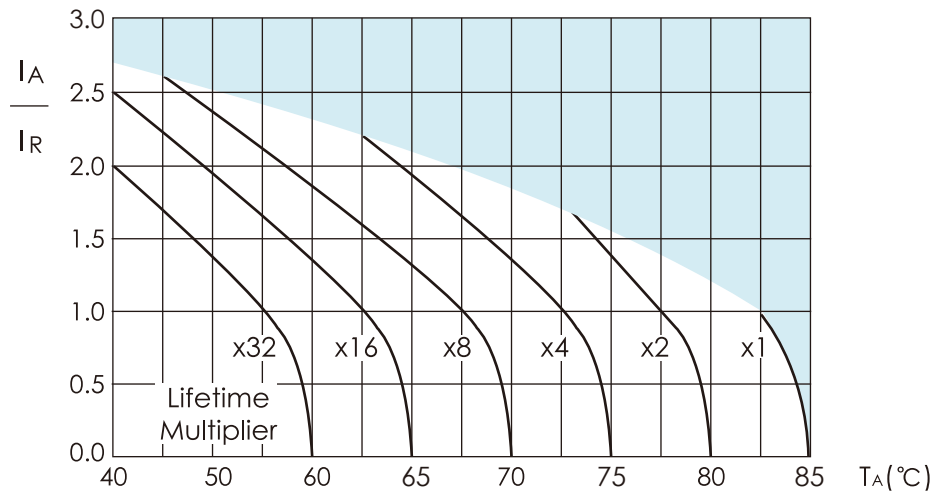
Temperature (°C)	20	45	65	85
Factor	2.00	1.89	1.52	1.00

Ratings for CD295L Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
160 (200)	2200	91	63	4.9	35 x 45	
	2700	74	52	5.3	35 x 50	
	3300	60	42	5.5	35 x 70	
		60	42	5.5	40 x 60	
	3900	51	36	5.9	35 x 80	
	4700	42	30	7.3	40 x 80	
200 (250)	1500	133	93	4.3	35 x 40	
	1800	111	77	4.7	35 x 45	
	2200	91	63	5.4	35 x 50	
		91	63	5.4	40 x 40	
	2700	74	52	5.9	35 x 60	
		74	52	5.9	40 x 50	
	3300	60	42	6.5	35 x 80	
		60	42	6.5	40 x 60	
	3900	51	36	7.0	40 x 80	
	4700	42	30	9.2	40 x 90	
250 (300)	1000	199	139	3.7	35 x 40	
	1200	166	116	3.8	35 x 45	
	1500	133	93	4.4	35 x 50	
		133	93	4.5	40 x 40	
	1800	111	77	5.0	35 x 70	
		111	77	5.0	40 x 50	
	2200	91	63	5.4	35 x 70	
	2700	74	52	6.9	40 x 80	
350 (400)	680	293	205	3.6	35 x 45	
		293	205	3.6	40 x 40	
	820	243	170	4.5	35 x 60	
		243	170	4.5	40 x 50	
	1000	199	139	5.2	35 x 70	
		199	139	4.9	40 x 60	
	1200	166	116	5.5	35 x 80	
		166	116	5.6	40 x 70	
	1500	133	93	6.5	40 x 80	
		133	93	6.2	45 x 70	
1800	111	77	7.9	40 x 100		
	111	77	7.1	45 x 70		
	2200	91	63	8.7	40 x 100	
400 (450)	560	355	249	3.2	35 x 50	
		355	249	2.8	40 x 40	
	680	293	205	3.7	35 x 60	
		293	205	3.8	40 x 50	
	820	243	170	4.2	35 x 60	
		243	170	4.1	40 x 50	
	1000	199	139	4.9	35 x 70	
		199	139	4.8	40 x 60	
		199	139	4.6	45 x 50	
	1200	166	116	5.8	35 x 80	
		166	116	5.5	40 x 70	
	1500	133	93	6.9	40 x 80	
		133	93	6.6	45 x 70	
	133	93	6.8	45 x 80		
1800	111	77	7.9	40 x 90		
	111	77	7.3	45 x 80		
450 (500)	470	424	296	3.0	35 x 50	
		424	296	3.0	40 x 40	
	560	355	249	3.1	35 x 50	
		355	249	3.3	35 x 60	
		355	249	3.4	40 x 50	
	680	293	205	3.5	35 x 60	
		293	205	3.8	35 x 70	
		293	205	3.8	40 x 60	
	820	243	170	4.6	35 x 80	
		243	170	4.4	40 x 60	
	1000	199	139	5.7	35 x 80	
		199	139	5.2	40 x 60	
	1200	166	116	5.9	40 x 70	
		166	116	6.2	45 x 70	
	1500	133	93	7.3	40 x 100	
		133	93	7.0	45 x 80	
1800	111	77	7.9	45 x 100		
500 (550)	390	510	357	1.9	35 x 50	
	470	424	296	2.3	35 x 60	
	560	355	249	2.5	35 x 60	
		355	249	2.7	40 x 60	
	680	293	205	3.1	35 x 80	
		293	205	2.8	40 x 70	
	820	243	170	3.4	35 x 90	
		243	170	3.3	40 x 70	
	1000	199	139	3.9	40 x 80	
		199	139	3.9	45 x 70	
	1200	166	116	4.3	40 x 90	
1500	133	93	4.8	45 x 100		

Ratings for CD295L Series

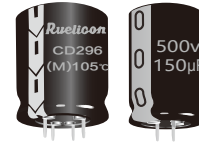
Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85 °C  
 Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD296 Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

- 4000h at 105°C
- Load life at High Temperature High ripple current 高温负载长寿命, 高纹波电流
- Suit for high frequency regenerative voltage for AC servomotor, general inverter. 适用于高频电机, 变频器

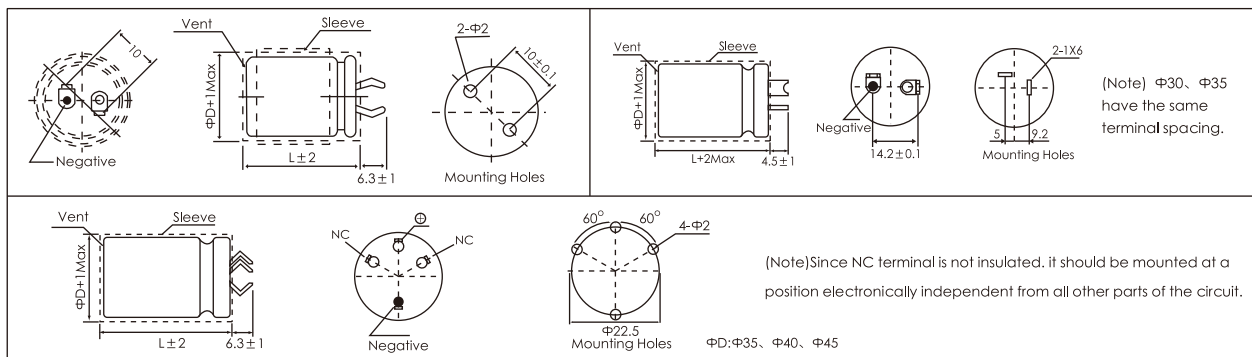


### ◆ SPECIFICATIONS (技术性能)

Item 项目	Performance Characteristics 性能	
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C
Rated Working Voltage Range 电压范围	16 to 250V	160 to 550V
Nominal Capacitance Range 容量范围	56 to 47000µF	
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)	
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5 minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试	
Dissipation Factor tan δ(120Hz, +20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~550
	Tan δ(max)	0.55 0.50 0.45 0.40 0.35 0.30 0.25 0.20 0.15 0.25
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz	
	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~550
	Z-25°C/Z+20°C	6 6 6 6 4 3 3 3 8 8
Z-40°C/Z+20°C	12 12 12 12 12 12 12 12 - -	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 4000~5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压4000-5000小时后, 符合以下要求:	
	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求	
	Capacitance Change 容量	Within ±15% of initial value 在初始值的±15%
	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
16~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.25	1.47
315~550V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	65	85	105
Factor	2.00	1.89	1.52	1.00

Ratings for CD296 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
16 (20)	6800	98	68	1.6	22×25	
	8200	81	57	1.80	25×25	
	10000	66	46	1.99	22×30	
		66	46	1.99	25×25	
	12000	55	39	2.28	22×35	
		55	39	2.3	25×30	
	15000	55	39	2.38	30×25	
		44	31	2.64	22×40	
	18000	44	31	2.68	25×35	
		37	26	2.98	22×45	
		37	26	3.04	25×40	
		37	26	3	30×30	
	22000	37	26	3.1	35×25	
		30	21	3.4	25×45	
	27000	30	21	3.39	30×35	
		25	17	3.81	25×50	
		25	17	3.83	30×40	
	33000	25	17	3.74	35×30	
		20	14	4.3	30×45	
	39000	20	14	4.24	35×35	
17		12	4.74	30×50		
47000	17	12	4.72	35×40		
	14	10	5.27	35×45		
25 (32)	4700	113	79	1.55	22×25	
	5600	95	66	1.70	25×25	
	6800	78	55	1.91	22×30	
		78	55	1.91	25×25	
	8200	65	45	2.14	22×35	
		65	45	2.16	25×30	
		65	45	2.25	30×25	
	10000	53	37	2.4	22×40	
		53	37	2.44	25×35	
	12000	44	31	2.69	22×45	
		44	31	2.74	25×40	
		44	31	2.7	30×30	
		44	31	2.8	35×25	
	15000	35	25	3.15	25×45	
		35	25	3.13	30×35	
		35	25	3.22	35×30	
	18000	30	21	3.54	25×50	
		30	21	3.54	30×40	
	22000	24	17	4.24	30×45	
		24	17	3.96	35×35	
27000	20	14	4.75	35×45		
	33000	16	11	5.39	35×50	
35 (44)	3300	141	99	1.43	22×25	
	3900	119	83	1.65	22×30	
	4700	99	69	1.78	25×25	
	5600	83	58	2.02	22×35	
		83	58	2.04	25×30	
		83	58	2.12	30×25	
	6800	68	48	2.28	22×40	
		68	48	2.31	25×35	
		57	40	2.67	22×50	
	8200	57	40	2.6	25×40	
		57	40	2.56	30×30	
		57	40	2.78	35×25	
	10000	46	33	2.92	25×45	
		46	33	2.92	30×35	
	12000	39	27	3.26	25×50	
		39	27	3.28	30×40	
		39	27	3.2	35×30	
	15000	31	22	3.74	30×45	
		31	22	3.69	35×35	
	18000	26	18	4.16	35×40	
22000	21	15	4.92	35×50		
50 (63)	1800	221	155	1.31	22×25	
	2200	181	127	1.45	22×30	
	2700	147	103	1.7	22×30	
		147	103	1.7	25×25	
	3300	121	84	1.98	22×35	
		121	84	2	25×30	
	3900	102	72	2.25	22×40	
		102	72	2.28	25×35	
		102	72	2.22	30×25	
	4700	85	59	2.56	22×45	
		85	59	2.58	30×30	
		85	59	2.67	35×25	
	5600	71	50	2.89	22×50	
		71	50	2.81	25×40	
		71	50	2.95	30×35	
	6800	59	41	3.37	25×50	
		59	41	3.39	30×40	
		59	41	3.31	35×30	

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
50 (63)	8200	49	34	3.71	30×45	
		49	34	3.66	35×35	
	10000	40	28	4.09	30×50	
		40	28	4.07	35×40	
	12000	33	23	4.5	35×45	
		1200	221	155	1.25	22×25
63 (79)	1500	177	124	1.39	22×25	
		147	103	1.52	22×30	
	1800	147	103	1.52	25×25	
		121	84	1.73	22×35	
	2200	121	84	1.75	25×30	
		98	69	1.97	22×40	
	2700	98	69	1.99	25×35	
		98	69	1.93	30×25	
		80	56	2.32	22×50	
	3300	80	56	2.27	25×40	
		80	56	2.24	30×30	
		80	56	2.41	35×25	
	3900	68	48	2.54	25×45	
		68	48	2.55	30×35	
	4700	57	40	2.88	25×50	
		57	40	2.9	30×40	
		57	40	2.83	35×30	
	5600	47	33	3.28	30×45	
		47	33	3.24	35×35	
	6800	39	27	3.73	30×50	
39		27	3.71	35×40		
8200	32	23	4.16	35×45		
	10000	27	19	4.69	35×50	
80 (100)	820	324	227	1.11	22×25	
	1000	265	186	1.25	22×25	
	1200	221	155	1.39	22×30	
		221	155	1.39	25×25	
	1500	177	124	1.61	22×35	
		177	124	1.62	25×30	
	1800	147	103	1.83	22×40	
		147	103	1.81	30×25	
	2200	121	84	2.09	22×45	
		121	84	2.01	25×35	
		121	84	2.1	30×30	
		121	84	2.17	35×25	
	2700	98	69	2.43	25×45	
		98	69	2.43	30×35	
	3300	80	56	2.76	25×50	
		80	56	2.78	30×40	
		80	56	2.71	35×30	
	3900	68	48	3.12	30×45	
		68	48	3.07	35×35	
	4700	57	40	3.56	30×50	
57		40	3.5	35×40		
5600	47	33	3.87	35×45		
	6800	39	27	4.19	35×50	
100 (125)	560	474	332	1.07	22×25	
	680	391	274	1.20	22×30	
	820	324	227	1.35	22×30	
		324	227	1.35	25×25	
	1000	265	186	1.54	22×35	
		265	186	1.56	25×30	
	1200	221	155	1.74	22×40	
		221	155	1.76	25×35	
		221	155	1.71	30×25	
	1500	177	124	1.99	22×45	
		177	124	2.03	25×40	
		177	124	2	30×30	
		177	124	2.07	35×25	
	1800	147	103	2.28	25×45	
		147	103	2.27	30×35	
	2200	121	84	2.57	25×50	
		121	84	2.59	30×40	
		121	84	2.52	35×30	
	2700	98	69	2.94	30×45	
		98	69	2.9	35×35	
3300	80	56	3.32	30×50		
	80	56	3.31	35×40		
3900	68	48	3.69	35×45		
	4700	57	40	4.14	35×50	
160 (200)	330	603	422	1.16	22×25	
	390	510	357	1.43	22×30	
470	424	296	1.52	22×35		
	424	296	1.55	25×25		
560	355	249	1.62	22×40		
	355	249	1.73	25×30		

Ratings for CD296 Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
160 (200)	680	293	205	1.7	22 x 45		
		293	205	1.81	25 x 35		
		293	205	1.82	30 x 25		
	820	243	170	1.91	22 x 50		
		243	170	1.98	25 x 40		
		243	170	1.98	30 x 30		
		243	170	1.93	35 x 25		
	1000	199	139	2.04	25 x 45		
		199	139	2.14	30 x 35		
	1200	166	116	2.12	25 x 50		
		166	116	2.22	30 x 40		
		166	116	2.4	35 x 30		
	1500	133	93	2.46	30 x 45		
		133	93	2.53	35 x 35		
	1800	111	77	2.98	35 x 45		
	2200	91	63	3.1	35 x 50		
	2700	74	51	3.92	35 x 60		
	3300	60	42	4.63	35 x 70		
	180 (225)	270	737	516	1.08	22 x 25	
			603	422	1.3	22 x 30	
		390	510	357	1.35	25 x 25	
424			296	1.5	22 x 35		
470		424	296	1.62	25 x 30		
		355	249	1.62	22 x 40		
		355	249	1.69	25 x 35		
560		355	249	1.67	30 x 25		
		293	205	1.76	22 x 50		
		293	205	1.72	25 x 40		
680		293	205	1.74	30 x 30		
		293	205	1.92	35 x 25		
		243	170	1.78	25 x 45		
820		243	170	1.85	30 x 35		
		199	139	1.91	25 x 50		
		199	139	2.01	30 x 40		
1000		199	139	2.16	35 x 30		
		166	116	2.19	30 x 45		
		166	116	2.34	35 x 35		
1500		133	93	2.36	30 x 50		
		133	93	2.56	35 x 40		
1800	111	77	2.67	35 x 45			
2200	91	63	3.4	35 x 55			
2700	74	52	4	35 x 65			
200 (250)	220	905	633	1.08	22 x 25		
		603	422	1.3	22 x 30		
	330	603	422	1.35	25 x 25		
		510	357	1.41	22 x 35		
	470	424	296	1.5	22 x 40		
		424	296	1.47	25 x 30		
		424	296	1.56	30 x 25		
	560	355	249	1.58	22 x 45		
		355	249	1.60	25 x 35		
		293	205	1.78	22 x 50		
	680	293	205	1.8	25 x 40		
		293	205	1.82	30 x 30		
		293	205	1.86	35 x 25		
	820	243	170	1.97	25 x 50		
		243	170	1.99	30 x 35		
		243	170	2.07	35 x 30		
	1000	199	139	2.17	30 x 45		
		199	139	2.22	35 x 35		
		166	116	2.32	30 x 50		
	1200	166	116	2.42	35 x 40		
		1500	133	93	2.59	35 x 45	
1800	111	77	2.7	35 x 50			
2200	91	63	3.23	35 x 60			
2700	74	52	4	35 x 65			
250 (300)	180	1106	774	0.94	22 x 25		
		905	633	1.1	22 x 30		
	220	905	633	1.15	25 x 25		
		737	516	1.13	22 x 35		
	330	603	422	1.2	22 x 40		
		603	422	1.3	25 x 30		
		603	422	1.3	30 x 25		
	390	510	357	1.41	22 x 45		
		510	357	1.42	25 x 35		
	470	424	296	1.48	22 x 50		
		424	296	1.47	25 x 40		
		424	296	1.51	30 x 30		
	560	424	296	1.50	35 x 25		
		355	249	1.59	25 x 45		
		355	249	1.57	30 x 35		
	680	355	249	1.56	35 x 30		
		293	205	1.66	25 x 50		
		293	205	1.68	30 x 40		
	820	243	170	1.83	30 x 45		
		243	170	1.82	35 x 35		
		199	139	1.87	30 x 50		
1000	199	139	1.99	35 x 40			
	1200	166	116	2.1	35 x 45		
1500	133	93	2.7	35 x 50			
1800	111	77	2.92	35 x 60			

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
315 (365)	100	1990	1095	0.61	22 x 25		
		1659	912	0.68	22 x 30		
	150	1327	730	0.76	22 x 35		
		1327	730	0.78	25 x 25		
	180	1106	608	0.78	22 x 40		
		1106	608	0.85	25 x 30		
	220	905	498	0.91	22 x 45		
		905	498	0.94	25 x 35		
		905	498	0.95	30 x 30		
	270	737	406	0.98	22 x 50		
		737	406	1.00	25 x 40		
		737	406	0.98	30 x 35		
	330	603	332	1.13	25 x 45		
		603	332	1.13	30 x 40		
	390	510	281	1.20	30 x 45		
		510	281	1.20	35 x 30		
	470	424	233	1.28	35 x 35		
		560	355	1.96	1.46	35 x 40	
		680	293	1.61	1.85	35 x 45	
	820	242	133	2.1	35 x 50		
		1000	199	109	2.42	35 x 55	
350 (400)	68	2927	1610	0.56	22 x 25		
		82	2427	1262	0.56	22 x 25	
	100	1990	1095	0.7	22 x 30		
		1990	1095	0.7	25 x 25		
	120	1659	912	0.73	22 x 35		
		1327	730	0.79	22 x 40		
	150	1327	730	0.82	25 x 30		
		1327	730	0.82	30 x 25		
		1106	608	0.81	22 x 45		
	180	1106	608	0.89	25 x 35		
		1106	608	0.9	30 x 30		
		905	498	0.93	22 x 50		
	220	905	498	0.97	25 x 40		
		905	498	0.98	35 x 25		
		737	406	1.01	25 x 50		
	270	737	406	1.05	30 x 35		
		737	406	1.01	35 x 30		
		603	332	1.16	30 x 45		
	330	603	332	1.16	35 x 35		
		510	281	1.26	30 x 50		
	390	510	281	1.26	35 x 40		
470		424	233	1.35	35 x 45		
560	355	196	1.51	35 x 50			
	680	293	1.61	1.92	35 x 55		
	820	242	133	2.25	35 x 60		
1000	199	109	2.5	35 x 60			
400 (450)	68	2927	1522	0.47	22 x 25		
		82	2427	1262	0.56	22 x 30	
	82	2427	1262	0.56	25 x 25		
		1990	1035	0.62	22 x 30		
	120	1659	863	0.66	22 x 35		
		1659	863	0.68	25 x 30		
	150	1659	863	0.70	30 x 25		
		1327	690	0.73	22 x 40		
		1327	690	0.73	25 x 35		
	180	1106	575	0.78	22 x 45		
		1106	575	0.82	25 x 40		
		1106	575	0.83	30 x 30		
	220	905	471	0.87	25 x 45		
		905	471	0.96	30 x 35		
	270	737	383	0.94	25 x 50		
		737	383	0.95	30 x 40		
		737	383	0.91	35 x 30		
	330	603	314	1.11	30 x 45		
		603	314	1.13	35 x 35		
	390	510	265	1.15	30 x 50		
		510	265	1.26	35 x 40		
470	424	220	1.31	35 x 45			
	560	355	1.85	1.5	35 x 50		
	680	293	1.53	1.9	35 x 55		
820	242	126	2.2	35 x 60			
	242	126	2.2	40 x 50			
1000	199	109	2.6	35 x 75			
	199	109	2.6	40 x 60			
420 (470)	68	3903	1951	0.5	22 x 25		
		82	3237	1618	0.6	22 x 30	
	100	2654	1327	0.65	22 x 35		
		2212	1106	0.7	22 x 40		
	120	2212	1106	0.72	25 x 30		
		1769	885	0.75	22 x 45		
	150	1769	885	0.8	25 x 35		
		1474	737	0.85	25 x 40		
	180	1474	737	0.85	30 x 30		
		1206	603	0.9	25 x 45		
	220	1206	603	0.96	30 x 35		
		983	492	1.05	25 x 50		
	270	983	492	1.06	30 x 40		
		804	402	1.14	30 x 45		
	330	804	402	1.2	35 x 35		
		681	340	1.25	30 x 50		
	390	681	340	1.26	35 x 40		



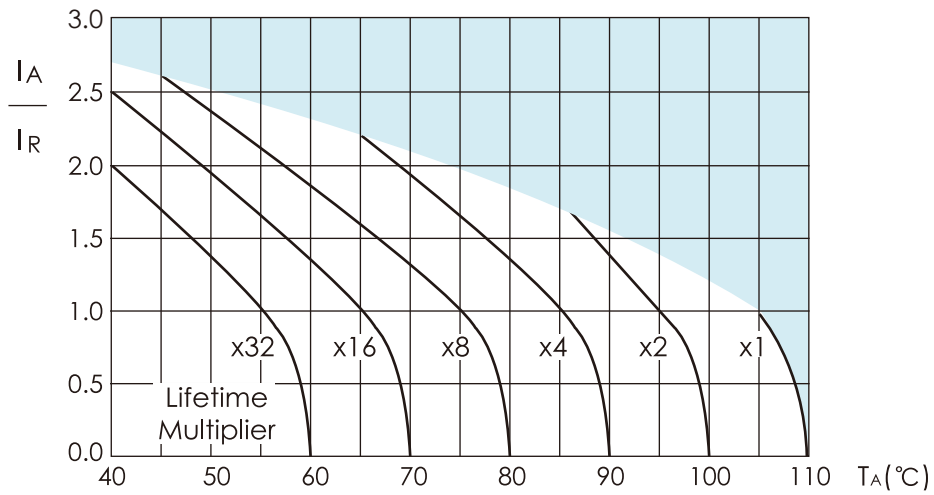
Ratings for CD296 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C,120Hz	Typ ESR 20°C,120Hz	Rated Ripple Current 105°C,120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
420 (470)	470	565	282	1.31	35×45		
	560	473	237	1.5	35×50		
	680	391	196	1.9	35×55		
	820	324	162	2.2	35×60		
450 (500)	56	4739	2370	0.47	22×25		
	68	3903	1951	0.56	22×30		
		3903	1951	0.56	25×25		
	82	3237	1618	0.64	22×35		
	100	2654	1327	0.7	22×40		
		2654	1327	0.7	25×30		
	120	2212	1106	0.73	22×45		
		2212	1106	0.73	25×35		
	150	1769	885	0.80	22×50		
		1769	885	0.82	25×40		
		1769	885	0.83	30×30		
	180	1474	737	0.87	25×45		
		1474	737	0.86	30×35		
	220	1206	603	0.94	25×50		
		1206	603	0.95	30×40		
		1206	603	0.91	35×30		
	270	983	492	1.11	30×45		
		983	492	1.13	35×35		
	330	804	402	1.15	30×50		
		804	402	1.26	35×40		
	390	681	340	1.31	35×45		
	470	565	282	1.5	35×50		
	560	473	237	1.7	35×55		
	680	391	196	2.0	35×60		
		391	196	2.0	40×50		
	820	324	162	2.2	35×65		
324		162	2.3	40×60			
1000	265	139	2.6	35×75			
500 (550)	47	5647	2823	0.41	22×30		
	56	4739	2370	0.47	22×30		
	68	3903	1951	0.54	22×35		
	82	3237	1618	0.62	22×40		
		3237	1618	0.62	25×30		
	100	2654	1327	0.67	22×45		
		2654	1327	0.67	25×35		
	120	2212	1106	0.77	22×50		
		2212	1106	0.74	25×40		
		2212	1106	0.77	30×30		
	150	1769	885	0.82	25×45		
		1769	885	0.85	30×40		
		1769	885	0.85	35×35		
	180	1474	737	0.98	25×50		
		1474	737	1.01	30×45		
	220	1206	603	1.12	30×50		
		1206	603	1.12	35×35		
	270	983	492	1.25	30×50		
		983	492	1.25	35×40		
	330	804	402	1.36	35×45		
	390	681	340	1.54	35×50		
	470	565	282	1.69	35×60		
	560	473	237	1.9	35×65		
	680	391	196	2.2	35×70		
	550 (600)	180	1474	737	1.06	30×50	
			1474	737	1.06	35×35	
220		1206	603	1.18	30×55		
		1206	603	1.18	35×40		
270		983	492	1.31	35×45		
330		804	402	1.5	35×50		
390		681	340	1.67	35×60		
470		565	282	1.95	35×70		
560	473	237	2.1	35×80			
	473	237	2.1	40×70			

Customer products are available on request.

Ratings for CD296 Series

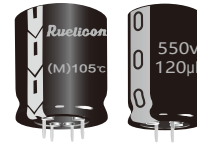
Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
 Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD296H Series (Lug/Snap Terminal Type插入/自立型, Wide Temperature 宽温度)

- 4000-5000h at 105°C
- Long Life at High Temperature ,High Ripple Current 耐高温长使用寿命, 高纹波电流
- Suit for high frequency regenerative Voltage for AC servomotor, general inverter. 适用于高频电机, 逆变器、工业电源和变频器。

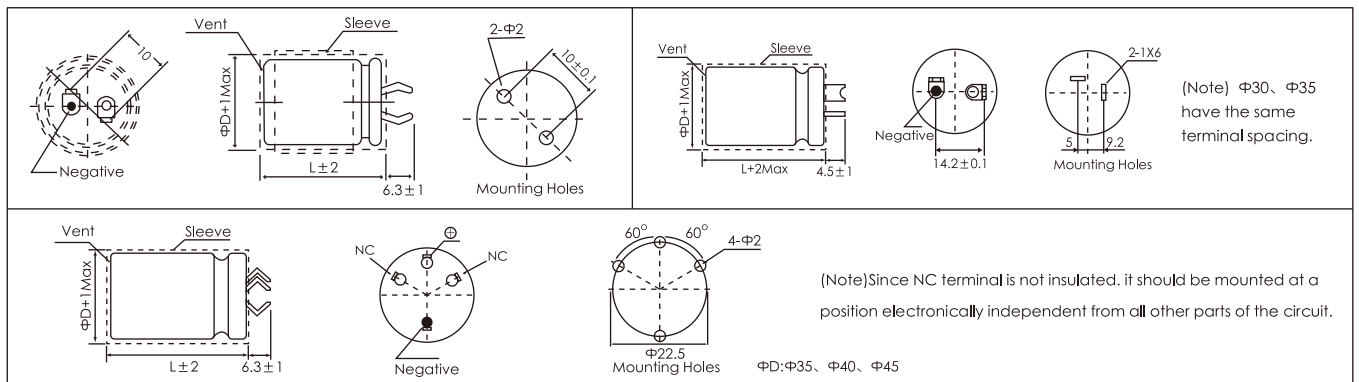


### ◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能								
Operating temperature range 温度范围	-40 to +105°C								
Rated Working Voltage Range 电压范围	450 to 550V								
Nominal Capacitance Range 容量范围	120 to 820µF								
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)								
Leakage Current 泄漏电流	$I \leq 0.03CV$ or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试								
Dissipation Factor $\tan \delta(120\text{Hz}, +20^\circ\text{C})$ 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>450</td> <td>500</td> <td>550</td> </tr> <tr> <td>Tan <math>\delta(\text{max})</math></td> <td>0.15</td> <td>0.15</td> <td>0.15</td> </tr> </table>	Working Voltage(V)	450	500	550	Tan $\delta(\text{max})$	0.15	0.15	0.15
Working Voltage(V)	450	500	550						
Tan $\delta(\text{max})$	0.15	0.15	0.15						
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>450~550</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>8</td> </tr> </table>	Working Voltage(V)	450~550	Z-40°C/Z+20°C	8				
Working Voltage(V)	450~550								
Z-40°C/Z+20°C	8								
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 4000-5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压4000-5000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change 容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值		
Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%								
Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%								
Leakage Current 泄露电流	initial specified value or less 不超过标准值								
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求 <table border="1"> <tr> <td>Capacitance Change 容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 150% of the specified value 不超过标准值的150%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%	Leakage Current 泄露电流	initial specified value or less 不超过标准值		
Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%								
Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%								
Leakage Current 泄露电流	initial specified value or less 不超过标准值								

### Dimensions

mm



### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~30k
450V		0.9	1.0	1.15	1.25
500V		0.8	1.0	1.25	1.47
550V		0.8	1.0	1.30	1.47

(2) Temperature Coefficient (温度系数)

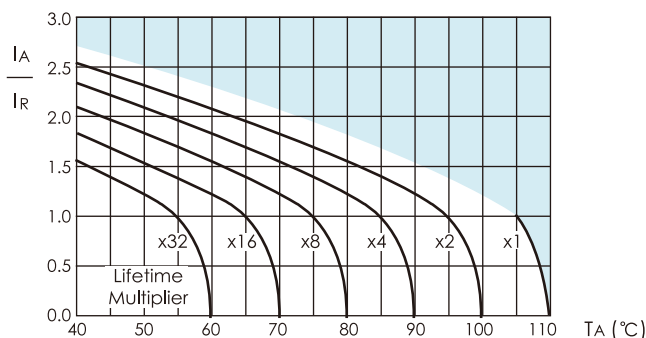
Temperature (°C)	45	65	85	105
Factor	2	1.89	1.52	1.00

Ratings for CD296H Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
450 (500)	150	1327	487	0.89	22×35	
		1327	487	0.89	25×30	
	180	1106	405	0.92	22×35	
		1106	405	0.92	25×30	
	220	905	332	1.05	22×40	
		905	332	1.05	25×35	
		905	332	1.05	30×30	
	270	737	270	1.10	22×45	
		737	270	1.10	25×40	
		737	270	1.10	30×30	
	330	603	221	1.21	22×50	
		603	221	1.21	25×45	
		603	221	1.21	30×40	
	390	510	177	1.32	25×50	
		510	177	1.32	30×45	
		510	177	1.32	35×35	
470	423	147	1.40	30×45		
	423	147	1.40	35×40		
560	355	123	1.50	30×50		
	355	123	1.50	35×45		
680	293	101	1.72	35×45		
	243	89	1.95	35×50		
500 (550)	150	1327	487	0.85	22×35	
	180	1106	405	0.95	22×40	
		905	332	1.05	22×45	
	220	905	332	1.05	25×40	
		737	270	1.22	22×50	
	270	737	270	1.22	25×45	
		737	270	1.22	30×40	
		603	201	1.45	25×50	
	330	603	201	1.45	30×40	
		510	170	1.55	30×45	
	390	510	170	1.55	35×40	
		423	136	1.75	30×50	
	470	423	136	1.75	35×45	
		355	114	1.92	35×45	
	680	293	88	2.12	35×50	
		120	1659	608	0.72	22×35
550 (600)	150	1327	487	0.79	22×40	
	180	1106	405	0.88	22×45	
		1106	405	0.88	25×40	
	220	905	332	1.04	25×45	
		905	332	1.04	30×40	
	270	737	270	1.25	25×50	
		737	270	1.25	30×45	
	330	603	201	1.37	30×45	
	390	510	170	1.60	35×40	
	470	423	136	1.80	30×50	
		423	136	1.80	35×45	
	560	355	114	2.00	35×50	

Customer products are available on request.

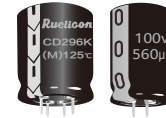
Lifetime Diagram



IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

**CD296K Series High temperature(耐高温) Long Life Assurance(长寿命),High Righ Current(高纹波)**

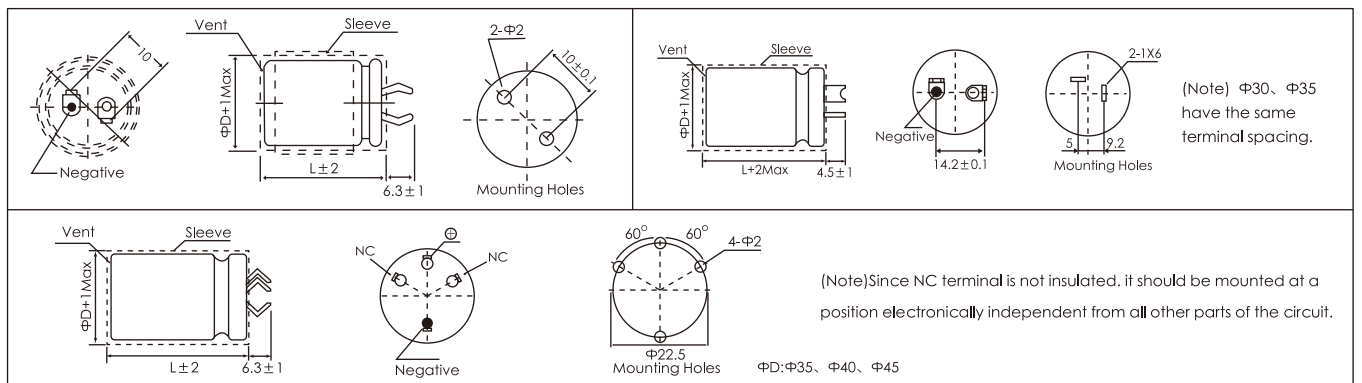
- 3000-5000h at 125°C
- High ripple current at high frequency,Load Life (Load Life of 8000 Hours at 105°C)  
高频高纹波电流, 寿命125°C 3000-5000小时 (105°C 8000小时)
- For automotive electrical equipment, LED lighting,High temperature service  
适用于汽车电器, LED照明, 高温设备



Item项目	Performance Characteristics 性能																																		
Operating temperature range 温度范围	-40 to +125°C	-25 to +125°C																																	
Rated Working Voltage Range 电压范围	10 to 100V	160 to 500V																																	
Nominal Capacitance Range 容量范围	47 to 5600µF																																		
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																																		
Leakage Current 泄漏电流	$I \leq 0.01CV$ or $3(\mu A)$ after 2minutes whichever is greater measured with rated working voltage applied at +20 °C两者取较大值, 2分钟测试	$I \leq 0.03CV$ ( $\mu A$ ) after 2minutes application of rated working vlotage at +20 °C 2分钟测试																																	
Dissipation Factor $\tan \delta$ (120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>160~250</td> <td>400~500</td> </tr> <tr> <td>Tan <math>\delta</math>(max)</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.15</td> <td>0.20</td> </tr> </table> Capacitance > 1000µF, add 0.02 per another1000µF. 容量大于1000µ每增加1000µF损耗角增加0.02.		Working Voltage(V)	10	16	25	35	50	63	160~250	400~500	Tan $\delta$ (max)	0.20	0.16	0.14	0.12	0.10	0.10	0.15	0.20															
Working Voltage(V)	10	16	25	35	50	63	160~250	400~500																											
Tan $\delta$ (max)	0.20	0.16	0.14	0.12	0.10	0.10	0.15	0.20																											
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>160~250</td> <td>400</td> <td>450</td> <td>500</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>3</td> <td>6</td> <td>6</td> <td>6</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> </table>		Working Voltage(V)	10	16	25	35	50	63	160~250	400	450	500	Z-25°C/Z+20°C	3	2	2	2	2	2	3	6	6	6	Z-40°C/Z+20°C	6	4	4	4	4	4	-	-	-	-
Working Voltage(V)	10	16	25	35	50	63	160~250	400	450	500																									
Z-25°C/Z+20°C	3	2	2	2	2	2	3	6	6	6																									
Z-40°C/Z+20°C	6	4	4	4	4	4	-	-	-	-																									
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 3000-5000 hours at 125°C (8000 hours at 105°C) the capacitors shall meet. the following requirements in 125°C环境下连续施加额定电压3000-5000小时后 (105°C 8000小时), 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±30% of initial value 在初始值的±30%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 300% of the specified value 不超过标准值的300%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table> Life Time: 试验时间 <table border="1"> <tr> <td>Ambient temp</td> <td>125°C</td> <td>105°C</td> </tr> <tr> <td>Life(H)</td> <td>3000</td> <td>8000</td> </tr> </table>		Capacitance Change容量	Within ±30% of initial value 在初始值的±30%	Dissipation Factor 损耗角	Not more than 300% of the specified value 不超过标准值的300%	Leakage Current 泄露电流	initial specified value or less 不超过标准值	Ambient temp	125°C	105°C	Life(H)	3000	8000																					
Capacitance Change容量	Within ±30% of initial value 在初始值的±30%																																		
Dissipation Factor 损耗角	Not more than 300% of the specified value 不超过标准值的300%																																		
Leakage Current 泄露电流	initial specified value or less 不超过标准值																																		
Ambient temp	125°C	105°C																																	
Life(H)	3000	8000																																	
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 125°C for 500 hours(at 105°C for 1000 hours), the capacitors shall meet the same requirement as Endurance. 在125°C环境下不加负载放置500小时后 (105°C 1000小时后) 电性能同耐久性要求																																		

Dimensions

mm



◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	120	300	1k	10k~	100k~
<100		0.30	0.55	0.7	0.90	1.00
≥100		0.40	0.60	0.75	0.90	1.00

(2) Tmperature Coefficient (温度系数)

Temperature (°C)	-55	65	85	105	125
Factor	2.4	2.10	1.78	1.65	1.00

Ratings for CD296K Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
10 (13)	8200	89	62	1.36	22 x 25		
	10000	73	51	1.65	22 x 30		
	12000	61	43	1.85	22 x 35		
		61	43	1.82	25 x 25		
	15000	49	34	2.12	22 x 40		
		49	34	2.11	25 x 30		
	18000	49	34	2.14	30 x 25		
		41	28	2.4	22 x 45		
	22000	41	28	2.32	25 x 35		
		33	23	2.59	25 x 40		
	27000	33	23	2.73	30 x 30		
		27	19	3.01	25 x 45		
		27	19	3.13	30 x 35		
		27	19	3.05	35 x 30		
	33000	22	16	3.43	25 x 50		
		22	16	3.53	30 x 40		
		22	16	3.49	35 x 35		
		19	13	3.78	30 x 45		
	39000	19	13	3.96	35 x 40		
		16	11	4.58	30 x 50		
47000	16	11	4.6	35 x 45			
	13	9	5.06	35 x 50			
16 (20)	5600	119	83	1.44	22 x 25		
	6800	98	68	1.66	22 x 30		
	8200	81	57	1.67	25 x 25		
	10000	66	46	2.08	22 x 35		
		66	46	2.07	25 x 30		
	12000	55	39	2.36	22 x 40		
		55	39	2.37	25 x 35		
	15000	55	39	2.33	30 x 25		
		44	31	2.69	22 x 45		
		44	31	2.72	25 x 40		
		44	31	2.54	30 x 30		
	18000	37	26	3.06	25 x 45		
		37	26	3.02	30 x 35		
	22000	37	26	3.09	35 x 30		
		30	21	3.39	25 x 50		
	27000	30	21	3.46	30 x 40		
		25	17	3.88	30 x 45		
	33000	25	17	3.85	35 x 35		
		20	14	4.33	30 x 50		
		20	14	4.33	35 x 40		
17		12	4.96	35 x 45			
39000	17	12	4.96	35 x 45			
47000	14	10	5.49	35 x 50			
25 (32)	3900	153	107	1.31	22 x 25		
	4700	127	89	1.55	22 x 30		
	5600	107	75	1.77	22 x 35		
		107	75	1.76	25 x 25		
	6800	88	62	2.02	22 x 40		
		88	62	1.88	25 x 30		
	8200	73	51	2.27	22 x 45		
		73	51	2.18	25 x 35		
	10000	73	51	2.19	30 x 25		
		60	42	2.56	22 x 50		
		60	42	2.53	25 x 40		
		60	42	2.38	30 x 30		
	12000	50	35	2.79	25 x 45		
		50	35	2.7	30 x 35		
	15000	50	35	2.76	35 x 30		
		40	28	3.13	30 x 40		
		18000	33	23	3.52	30 x 45	
			33	23	3.5	35 x 35	
	22000	27	19	3.92	30 x 50		
		27	19	3.95	35 x 40		
27000	22	16	4.72	35 x 50			
35 (44)	2700	197	138	1.29	22 x 25		
	3300	161	113	1.54	22 x 30		
	3900	136	95	1.77	22 x 35		
		136	95	1.75	25 x 25		
	4700	113	79	2.01	22 x 40		
		113	79	1.97	25 x 30		
	5600	95	66	2.25	22 x 45		
		95	66	2.18	25 x 35		
		95	66	2.08	30 x 25		
		78	55	2.49	22 x 50		
	6800	78	55	2.45	25 x 40		
		78	55	2.28	30 x 30		
	8200	65	45	2.8	25 x 45		
		65	45	2.69	30 x 35		
	10000	53	37	3.04	30 x 40		
		53	37	2.78	35 x 30		
	12000	44	31	3.38	30 x 45		
		44	31	3.3	35 x 35		
	15000	35	25	3.98	35 x 40		
	18000	30	21	4.4	35 x 45		

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
50 (63)	1500	310	217	1.21	22 x 25	
	2200	211	148	1.52	22 x 30	
		211	148	1.46	25 x 25	
	2700	172	120	1.77	22 x 35	
		172	120	1.76	25 x 30	
	3300	141	99	2.02	22 x 40	
		141	99	1.92	30 x 25	
	3900	119	83	2.27	22 x 45	
		119	83	2.2	25 x 35	
		119	83	2.19	30 x 30	
	4700	99	69	2.43	25 x 40	
		5600	83	58	2.72	25 x 45
	83		58	2.58	30 x 35	
	83		58	2.35	35 x 30	
	6800	68	48	3.01	30 x 40	
		68	48	2.91	35 x 35	
	8200	57	40	3.63	30 x 50	
		57	40	3.36	35 x 40	
	10000	46	33	3.79	35 x 45	
	12000	39	27	4.06	35 x 50	
63 (79)	1000	398	279	1.1	22 x 25	
	1500	265	186	1.41	22 x 30	
		265	186	1.38	25 x 25	
	1800	221	155	1.62	22 x 35	
		221	155	1.63	25 x 30	
	2200	181	127	1.85	22 x 40	
		181	127	1.80	30 x 25	
	2700	147	103	2.1	22 x 45	
		147	103	2.03	25 x 35	
	3300	147	103	2.01	30 x 30	
		121	84	2.33	25 x 40	
	3900	102	72	2.58	25 x 45	
		102	72	2.46	30 x 35	
		102	72	2.31	35 x 30	
	4700	85	59	2.82	30 x 40	
		85	59	2.77	35 x 35	
	5600	71	50	3.22	30 x 45	
		71	50	3.2	35 x 40	
	6800	59	41	3.61	35 x 45	
	8200	49	34	3.94	35 x 50	
820	405	283	1.09	22 x 25		
1000	332	232	1.29	22 x 30		
1200	277	194	1.48	22 x 35		
80 (100)	1200	277	194	1.38	25 x 25	
	1500	221	155	1.7	22 x 40	
		221	155	1.74	25 x 30	
	1800	221	155	1.75	30 x 25	
		184	129	1.91	22 x 45	
	2200	184	129	1.86	25 x 35	
		151	106	2.22	25 x 45	
	2700	151	106	2.02	30 x 30	
		123	86	2.50	30 x 35	
	3300	123	86	2.45	35 x 30	
		101	70	2.69	30 x 40	
		101	70	2.6	35 x 35	
		85	60	2.94	30 x 45	
	3900	85	60	3	35 x 40	
		71	49	3.44	35 x 45	
	4700	59	42	3.72	35 x 50	
	5600	47	33	4.01	35 x 50	
	560	474	332	1.01	22 x 25	
	680	390	273	1.19	22 x 30	
	820	324	227	1.33	22 x 35	
324		227	1.26	25 x 25		
1000	265	186	1.56	22 x 40		
	265	186	1.52	25 x 30		
	265	186	1.47	30 x 25		
	221	155	1.76	22 x 45		
1200	221	155	1.76	25 x 35		
	221	155	1.76	30 x 30		
	177	124	2	22 x 50		
	177	124	2.03	25 x 40		
1500	147	103	2.29	25 x 45		
	147	103	2.19	30 x 35		
1800	147	103	2.15	35 x 30		
	121	84	2.52	30 x 40		
2200	121	84	2.48	35 x 35		
	98	69	2.86	30 x 45		
2700	98	69	2.87	35 x 40		
	80	56	3.25	35 x 45		
3300	68	48	3.56	35 x 50		
3900	68	48	3.56	35 x 50		
160 (200)	220	905	633	0.63	22 x 25	
	270	737	516	0.76	22 x 30	
330	603	422	0.9	22 x 35		
	603	422	0.84	25 x 25		

Ratings for CD296K Series

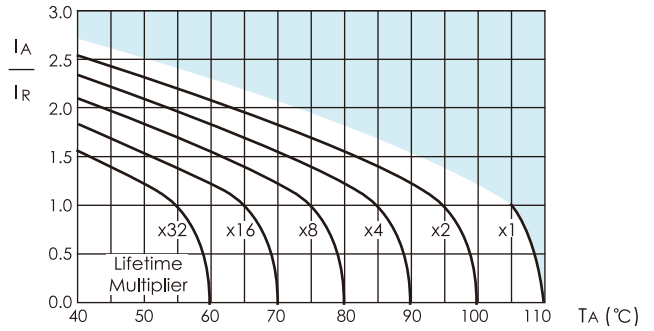
U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
160 (200)	390	510	357	0.97	25×30	
		510	357	1	30×25	
	470	424	296	1.11	22×40	
		424	296	1.14	25×35	
		424	296	1.17	30×30	
	560	355	249	1.26	22×45	
	680	293	205	1.44	22×50	
		293	205	1.43	25×40	
		293	205	1.5	30×35	
	820	243	170	1.63	25×45	
		243	170	1.66	30×40	
		243	170	1.63	35×30	
	1000	199	139	1.89	30×45	
		199	139	1.89	35×35	
	1200	166	116	2.16	30×50	
		166	116	2.23	35×40	
	1500	133	93	2.61	35×45	
	1800	111	77	2.97	35×50	
180 (225)	220	905	633	0.63	22×25	
		737	516	0.76	22×30	
	270	737	516	0.76	25×25	
		603	422	0.9	22×35	
	330	603	422	0.9	25×30	
		510	357	1.03	22×40	
	390	510	357	1.06	25×35	
		510	357	1.02	30×25	
		424	296	1.17	22×45	
	470	424	296	1.17	30×30	
		355	249	1.32	22×50	
	560	355	249	1.32	25×40	
		355	249	1.33	30×35	
		293	205	1.51	25×45	
	680	293	205	1.49	35×30	
		243	170	1.71	25×50	
	820	243	170	1.74	30×40	
		243	170	1.75	35×35	
		199	139	2.01	30×45	
	1000	199	139	2.07	35×40	
		166	116	2.25	30×50	
	1200	166	116	2.23	35×45	
1500		133	93	2.76	35×50	
200 (250)	180	1106	774	0.57	22×25	
	220	905	633	0.7	22×30	
	270	737	516	0.83	22×35	
		737	516	0.76	25×25	
	330	603	422	0.96	22×40	
		603	422	0.9	25×30	
	390	510	357	1.06	25×35	
		510	357	1.02	30×25	
	470	424	296	1.17	22×45	
		424	296	1.22	25×40	
	560	424	296	1.17	30×30	
		355	249	1.39	25×45	
	680	355	249	1.38	30×35	
		293	205	1.58	25×50	
	820	293	205	1.61	30×40	
		293	205	1.49	35×30	
		243	170	1.85	30×45	
	1000	243	170	1.75	35×35	
		199	139	2.11	30×50	
	1200	199	139	2.07	35×40	
		166	116	2.38	35×45	
	1500	133	93	2.76	35×50	

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
250 (300)	150	1327	929	0.52	22×25	
	180	1106	774	0.64	22×30	
		1106	774	0.62	25×25	
	220	905	633	0.76	22×35	
		905	633	0.76	25×30	
	270	737	516	0.88	22×40	
		737	516	0.9	25×35	
		737	516	0.85	30×25	
	330	603	422	1.01	22×45	
		603	422	1	30×30	
	390	510	357	1.13	22×50	
		510	357	1.13	25×40	
		510	357	1.15	30×35	
	470	424	296	1.29	25×45	
		424	296	1.24	35×30	
	560	355	249	1.45	25×50	
		355	249	1.48	30×40	
		355	249	1.49	35×35	
	680	293	205	1.71	30×45	
		293	205	1.74	35×40	
	820	243	170	1.94	30×50	
	1000	199	139	2.2	35×45	
315 (365)	68	2927	1610	0.32	22×25	
	82	2427	1334	0.38	22×30	
	100	1990	1095	0.41	25×25	
	120	1659	912	0.48	22×35	
		1659	912	0.49	25×30	
	150	1327	730	0.56	22×40	
		1327	730	0.51	30×25	
	180	1106	608	0.63	22×45	
		1106	608	0.62	25×35	
		1106	608	0.63	30×30	
	220	905	498	0.72	22×50	
		905	498	0.71	25×40	
905		498	0.74	30×35		
737		406	0.81	25×45		
270	737	406	0.85	30×40		
	737	406	0.82	35×30		
330	603	332	0.92	25×50		
	693	332	0.9	35×35		
390	510	281	1.04	30×45		
	510	281	1.05	35×40		
470	424	233	1.15	30×50		
	424	233	1.18	35×45		
560	355	196	1.34	35×50		
350 (400)	68	2927	1610	0.34	22×25	
	82	2427	1334	0.4	22×30	
	100	1990	1095	0.47	25×25	
	120	1659	912	0.52	22×35	
		1659	912	0.53	25×30	
		1659	912	0.53	30×25	
	150	1327	730	0.59	22×40	
		1327	730	0.6	25×35	
	180	1106	608	0.68	22×45	
		1106	608	0.7	25×40	
		1106	608	0.71	30×30	
	220	905	498	0.78	22×50	
		905	498	0.82	25×45	
		905	498	0.82	30×35	
	270	737	406	0.94	25×50	
		737	406	0.93	30×40	
		737	406	0.9	35×30	
	330	603	332	1.05	30×45	
		603	332	1.01	35×35	

Ratings for CD296K Series

U <sub>s</sub> (Surge Voltage) Code	Rated Capaci- tance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
350 (400)	390	6510	281	1.18	30 x 50		
		510	281	1.13	35 x 40		
	470	424	233	1.26	35 x 45		
	560	355	196	1.39	35 x 50		
400 (450)	68	2927	1522	0.38	22 x 30		
		82	2427	1262	0.41	25 x 25	
	100	1990	1035	0.46	22 x 35		
		1990	1035	0.48	25 x 30		
		1990	1035	0.48	30 x 25		
	120	1659	863	0.53	22 x 40		
		1659	863	0.55	25 x 35		
		1659	863	0.56	30 x 30		
	150	1327	690	0.63	22 x 50		
		1327	690	0.65	25 x 40		
		1106	575	0.72	25 x 45		
	180	1106	575	0.74	30 x 35		
		905	471	0.79	25 x 50		
	220	905	471	0.85	30 x 40		
		905	471	0.89	35 x 30		
		737	383	0.98	30 x 45		
	270	737	383	0.96	35 x 35		
		603	314	1.12	30 x 50		
	330	603	314	1.12	35 x 40		
		390	510	265	1.27	35 x 45	
	470	424	220	1.33	35 x 50		
	450 (500)	68	3903	1951	0.38	22 x 30	
			3237	1618	0.44	22 x 35	
			3237	1618	0.45	25 x 30	
82		3237	1618	0.46	30 x 25		
		2654	1327	0.5	22 x 40		
		2654	1327	0.52	25 x 35		
100		2212	1106	0.58	22 x 50		
		2212	1106	0.58	25 x 40		
		2212	1106	0.58	30 x 30		
120		1769	884	0.66	25 x 45		
		1769	884	0.68	30 x 35		
		1474	737	0.74	25 x 50		
180		1474	737	0.77	30 x 40		
		1474	737	0.77	35 x 30		
		1206	603	0.88	30 x 45		
220		1206	603	0.88	35 x 35		
		983	491	0.99	30 x 50		
270		983	491	1.01	35 x 40		
		330	804	402	1.15	35 x 45	
390		681	340	1.28	35 x 50		
470	565	282	1.50	35 x 55			
500 (550)	47	5647	2823	0.41	22 x 30		
	56	4739	2370	0.47	22 x 30		
	68	3903	1951	0.54	22 x 35		
		3903	1951	0.54	25 x 30		
	82	3237	1618	0.62	22 x 40		
		3237	1618	0.62	25 x 35		
	100	2654	1327	0.67	22 x 45		
		2654	1327	0.67	25 x 40		
		2654	1327	0.67	30 x 30		
	120	2212	1106	0.77	22 x 50		
		2212	1106	0.74	25 x 40		
		2212	1106	0.77	30 x 35		
		2212	1106	0.80	35 x 30		
	150	1769	885	0.82	25 x 45		
		1769	885	0.85	30 x 40		
		1769	885	0.67	35 x 30		
		1769	885	0.85	35 x 35		
	180	1474	737	0.98	25 x 50		
		1474	737	1.01	30 x 45		
	220	1206	603	1.12	30 x 50		
		1206	603	0.94	35 x 35		
		1206	603	1.12	35 x 40		
	270	983	492	1.25	30 x 50		
		983	492	1.25	35 x 40		
	330	804	402	1.36	35 x 45		
	390	681	340	1.54	35 x 50		
	470	565	282	1.69	35 x 60		

Lifetime Diagram

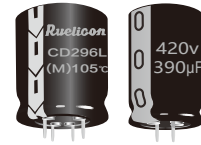


I<sub>A</sub> = actual ripple current at 120Hz. I<sub>R</sub> = rated ripple current at 120Hz, 105°C.  
Multiplier of Useful Life as a function of ambient temperature and ripple current load



## CD296L Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

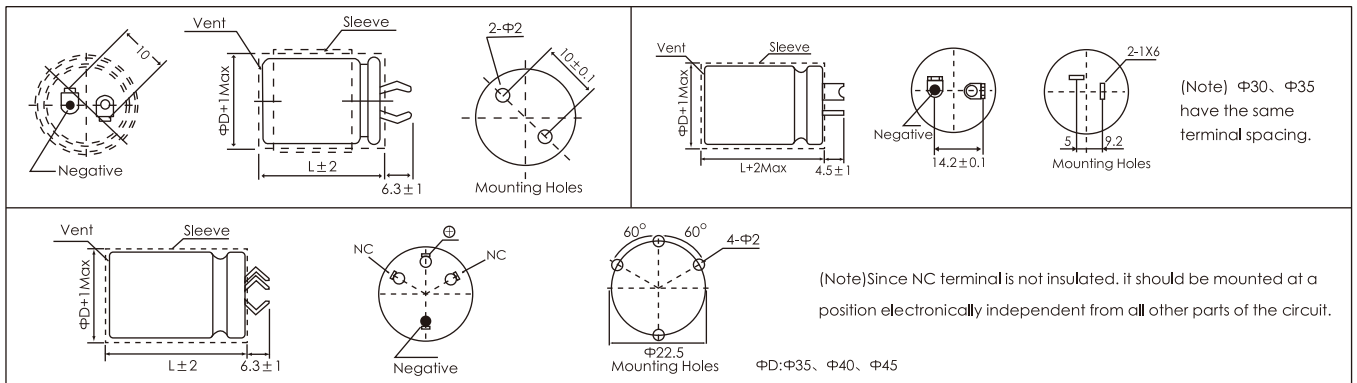
- 4000~5000h at 105°C
- Extended Lifetime at 105°C 长寿命105°C
- High Ripple Current 高纹波电流
- High Professional Switch Mode Power Supplies 高级专业开关电源模式
- ◆ SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能																			
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C																		
Rated Working Voltage Range 电压范围	350 to 420V	450 to 500V																		
Nominal Capacitance Range 容量范围	390 to 3300µF																			
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																			
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5 minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试																			
Dissipation Factor tan δ(120Hz, +20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>160</td> <td>180</td> <td>200</td> <td>250</td> <td>315</td> <td>400</td> <td>450</td> <td>500</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> <td>0.20</td> </tr> </table>		Working Voltage(V)	160	180	200	250	315	400	450	500	Tan δ(max)	0.15	0.15	0.15	0.15	0.15	0.15	0.20	0.20
Working Voltage(V)	160	180	200	250	315	400	450	500												
Tan δ(max)	0.15	0.15	0.15	0.15	0.15	0.15	0.20	0.20												
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>350~500</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>-</td> </tr> </table>		Working Voltage(V)	350~500	Z-25°C/Z+20°C	8	Z-40°C/Z+20°C	-												
Working Voltage(V)	350~500																			
Z-25°C/Z+20°C	8																			
Z-40°C/Z+20°C	-																			
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 4000-5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压4000-5000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±25% of initial value 在初始值的±25%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 250% of the specified value 不超过标准值的250%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>		Capacitance Change容量	Within ±25% of initial value 在初始值的±25%	Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%	Leakage Current 泄露电流	initial specified value or less 不超过标准值												
Capacitance Change容量	Within ±25% of initial value 在初始值的±25%																			
Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%																			
Leakage Current 泄露电流	initial specified value or less 不超过标准值																			
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours, the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求 <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±15% of initial value 在初始值的±15%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 150% of the specified value 不超过标准值的150%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>		Capacitance Change容量	Within ±15% of initial value 在初始值的±15%	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%	Leakage Current 泄露电流	initial specified value or less 不超过标准值												
Capacitance Change容量	Within ±15% of initial value 在初始值的±15%																			
Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%																			
Leakage Current 泄露电流	initial specified value or less 不超过标准值																			

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
350~420V		0.8	1	1.25	1.47
450~500V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	65	85	105
Factor	2.00	1.89	1.52	1.00

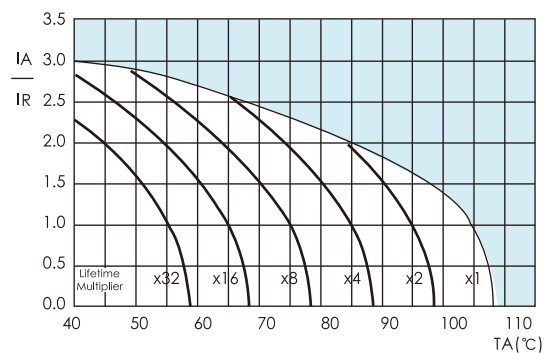
Ratings for CD296L Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capaci- tance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
350 (400)	560	355	178	2.30	30×55	
		355	178	2.33	35×40	
	680	293	146	2.73	35×50	
		293	146	2.68	40×40	
	820	243	121	2.99	35×60	
		243	121	3.05	40×45	
		243	121	2.85	45×40	
	1000	199	100	3.50	35×65	
		199	100	3.37	40×55	
		199	100	3.06	45×45	
	1200	166	83	3.81	35×75	
		166	83	3.81	40×65	
		166	83	3.47	45×50	
	1500	133	66	4.62	40×80	
		133	66	4.27	45×65	
	1800	111	55	5.43	40×95	
		111	55	5.10	45×75	
	2200	90	45	5.86	45×90	
		90	45	5.86	50×75	
	2700	74	37	6.77	45×100	
74		37	6.77	50×90		
3300	60	30	6.77	50×105		
400 (450)	470	423	169	2.11	35×45	
		423	169	2.14	40×40	
	560	355	142	2.48	35×50	
		355	142	2.43	40×45	
		355	142	2.35	45×40	
	680	293	117	2.73	35×60	
		293	117	2.78	40×50	
		293	117	2.59	45×40	
	820	243	97	3.17	35×65	
		243	97	3.05	40×55	
		243	97	2.90	45×45	
	1000	199	80	3.48	35×80	
		199	80	3.48	40×65	
		199	80	3.17	45×55	
	1200	166	66	4.13	35×90	
		166	66	4.13	40×80	
		166	66	4.00	45×60	
	1500	133	53	4.39	40×90	
		133	53	4.39	45×75	
		133	53	4.39	50×70	
1800	111	44	5.30	45×90		
	111	44	5.30	50×80		
2200	90	36	5.90	50×90		
2700	74	29	6.50	50×105		
420 (470)	390	510	203	1.92	35×40	
		510	203	1.95	40×35	
	470	423	169	2.27	35×45	
		423	169	2.23	40×40	
	560	355	142	2.56	35×50	
		355	142	2.52	40×45	
		355	142	2.35	45×40	
	680	293	117	2.81	35×60	
		293	117	2.78	40×50	
		293	117	2.52	45×45	
	820	243	97	3.26	35×70	
		243	97	3.05	40×60	
		243	97	2.87	45×50	
	1000	199	80	3.67	35×80	
		199	80	3.67	40×70	
		199	80	3.38	45×60	
	1200	166	66	4.33	40×80	
		166	66	3.92	45×65	
	1500	133	53	4.62	45×80	
		133	53	4.62	50×75	
1800	111	44	5.42	45×95		
	111	44	5.42	50×85		
2200	90	36	6.00	50×100		

U <sub>R</sub> (Surge Voltage) Code	Rated Capaci- tance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
450 (500)	390	510	225	2.00	35×40	
		423	186	2.27	35×45	
	470	423	186	2.23	40×40	
		423	186	2.15	45×35	
	560	355	156	2.47	35×55	
		355	186	2.52	40×50	
		355	186	2.35	45×40	
	680	293	129	2.89	35×65	
		293	129	2.78	40×60	
		293	129	2.61	45×50	
	820	243	107	3.24	35×75	
		243	107	3.24	40×65	
		243	107	3.10	45×50	
	1000	199	88	3.77	35×90	
		199	88	3.77	40×80	
		199	88	3.68	45×65	
	1200	166	73	4.43	40×95	
		166	73	4.23	45×75	
	1500	133	58	4.84	40×100	
		133	58	4.84	45×90	
133		58	4.84	50×80		
1800	111	49	5.30	45×105		
	111	49	5.30	50×95		
500 (550)	390	510	225	1.80	35×50	
		510	225	1.80	40×45	
	470	423	186	2.00	35×55	
		423	186	2.00	40×50	
	560	423	186	2.00	45×40	
		355	156	2.25	35×65	
		355	156	2.25	40×55	
	680	355	156	2.25	45×50	
		293	129	2.60	35×75	
		293	129	2.60	40×70	
	820	293	129	2.60	45×55	
		243	107	2.85	40×75	
		243	107	2.85	45×60	
	1000	199	88	3.30	40×90	
		199	88	3.30	45×75	
	1200	166	73	4.00	40×100	
		166	73	4.00	45×85	
		166	73	4.00	50×80	
	1500	133	58	4.45	45×100	
		133	58	4.45	50×95	
1800	111	49	4.85	50×105		

Customer products are available on request.

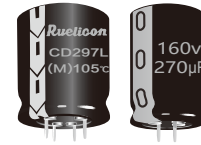
Lifetime Diagram



IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD297L Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

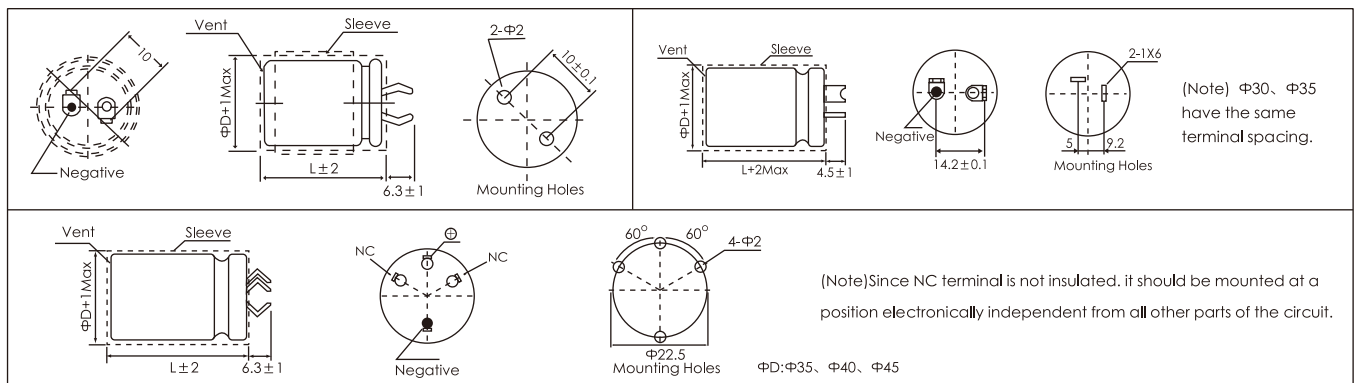
- 6000h at 105°C
- Long Life,High reliability,High Ripple Current,Sola inverter  
长寿命, 高可靠性, 高纹波电流, 太阳能逆变器
- Excellent airtightness, adoption of special sealing process
- ◆SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能																					
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C																				
Rated Working Voltage Range 电压范围	160 to 250V	215 to 500V																				
Nominal Capacitance Range 容量范围	39 to 2200µF																					
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																					
Leakage Current 泄漏电流	I≤0.03CV or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试																					
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>160</td> <td>180</td> <td>200</td> <td>250</td> <td>315</td> <td>350</td> <td>400</td> <td>450</td> <td>500</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> <td>0.20</td> </tr> </table>		Working Voltage(V)	160	180	200	250	315	350	400	450	500	Tan δ(max)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.20	0.20
Working Voltage(V)	160	180	200	250	315	350	400	450	500													
Tan δ(max)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.20	0.20													
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>160~250</td> <td>315~500</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>12</td> <td>-</td> </tr> </table>		Working Voltage(V)	160~250	315~500	Z-25°C/Z+20°C	3	8	Z-40°C/Z+20°C	12	-											
Working Voltage(V)	160~250	315~500																				
Z-25°C/Z+20°C	3	8																				
Z-40°C/Z+20°C	12	-																				
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 6000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压6000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±25% of initial value 在初始值的±25%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 250% of the specified value 不超过标准值的250%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>		Capacitance Change容量	Within ±25% of initial value 在初始值的±25%	Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%	Leakage Current 泄露电流	initial specified value or less 不超过标准值														
Capacitance Change容量	Within ±25% of initial value 在初始值的±25%																					
Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%																					
Leakage Current 泄露电流	initial specified value or less 不超过标准值																					
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求 <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±15% of initial value 在初始值的±15%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 150% of the specified value 不超过标准值的150%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>		Capacitance Change容量	Within ±15% of initial value 在初始值的±15%	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%	Leakage Current 泄露电流	initial specified value or less 不超过标准值														
Capacitance Change容量	Within ±15% of initial value 在初始值的±15%																					
Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%																					
Leakage Current 泄露电流	initial specified value or less 不超过标准值																					

### Dimensions

mm



### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
160~250V		0.8	1	1.25	1.47
315~500V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	65	85	105
Factor	2.00	1.89	1.52	1.00

Ratings for CD297L Series

U <sub>k</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
160 (200)	270	737	516	1.1	22×25	
	330	603	422	1.2	22×30	
	390	510	357	1.3	25×25	
	470	424	296	1.4	22×35	
		424	296	1.4	25×30	
	560	355	249	1.5	22×40	
		355	249	1.5	30×25	
	680	293	205	1.7	22×45	
		293	205	1.7	25×35	
		293	205	1.7	30×30	
	820	243	170	2	25×40	
	1000	199	139	2.2	25×45	
		199	139	2.2	30×35	
	1200	166	116	2.3	25×50	
		166	116	2.3	30×40	
		166	116	2.3	35×35	
	1500	133	93	2.5	30×45	
		133	93	2.5	35×40	
	1800	111	77	2.7	30×50	
		111	77	2.7	35×45	
2200	91	63	2.9	35×50		
180 (225)	220	905	633	1	22×25	
	330	603	422	1.2	22×30	
		603	422	1.2	25×25	
	470	424	296	1.4	22×35	
		424	296	1.4	25×30	
	560	424	296	1.4	30×25	
		355	249	1.5	22×40	
	680	355	249	1.5	25×35	
		293	205	1.7	22×50	
	820	293	205	1.7	25×40	
		293	205	1.7	30×30	
		243	170	2	25×45	
	1000	243	170	2	30×35	
		243	170	2	35×30	
		199	139	2.2	30×40	
	1200	166	116	2.3	30×45	
		166	116	2.2	35×35	
	1500	133	93	2.5	30×50	
		133	93	2.5	35×40	
	1800	111	77	2.7	35×45	
2200	91	63	2.9	35×50		
200 (250)	220	905	633	1	22×25	
	270	737	516	1.1	22×30	
		737	516	1.1	25×25	
	390	510	357	1.3	22×35	
		510	357	1.3	25×30	
	470	510	357	1.3	30×25	
		424	296	1.4	22×40	
	560	424	296	1.4	25×35	
		424	296	1.4	30×30	
	680	355	249	1.5	22×45	
		293	205	1.7	25×40	
		293	205	1.7	30×35	
	820	243	170	2	25×50	
		243	170	2	30×40	
		243	170	2	35×30	
	1000	199	139	2.2	30×45	
		199	139	2.2	35×35	
	1200	166	116	2.3	30×50	
		166	116	2.3	35×40	
	1500	133	93	2.5	35×50	
180	1106	774	0.9	22×30		
250 (300)	220	905	633	1	25×25	
	270	737	516	1.1	22×35	
		737	516	1.1	25×30	
		737	516	1.1	30×25	
	330	603	422	1.2	22×40	
		603	422	1.2	25×35	
	390	510	357	1.3	22×45	
		510	357	1.3	25×40	
		510	357	1.3	30×30	
	470	424	296	1.4	25×45	
		424	296	1.4	30×35	
	560	424	296	1.4	35×30	
		355	249	1.5	25×50	
	680	293	205	1.7	30×45	
		293	205	1.7	35×35	
	820	243	170	2	30×50	
		243	170	2	35×40	
	1000	199	139	2.2	35×45	
	1200	166	116	2.3	35×50	
	1500	133	93	2.5	35×50	
315 (365)	82	2427	1335	0.64	22×25	
	100	1990	1095	0.69	22×30	
120	1659	912	0.75	25×25		

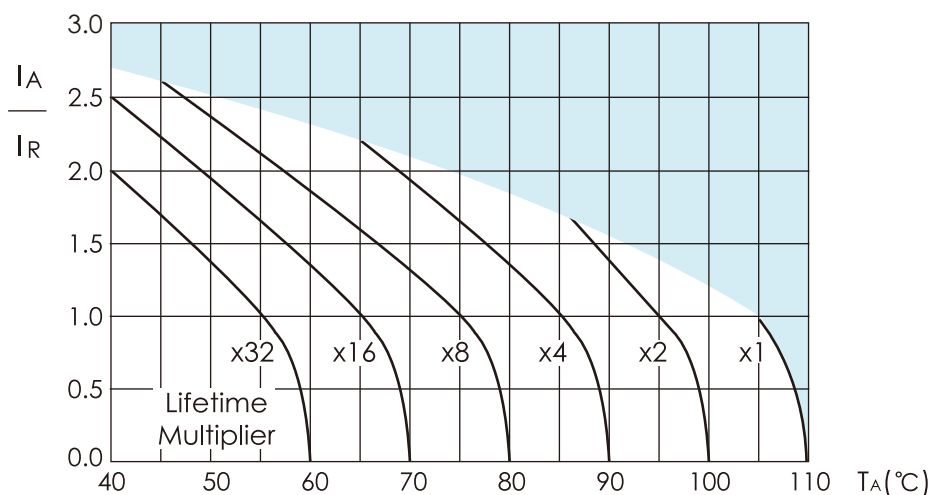
U <sub>k</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
315 (365)	150	1327	730	0.82	22×35		
		1327	730	0.82	25×30		
		1327	730	0.82	30×25		
	180	1106	608	0.9	22×40		
		1106	608	0.9	25×35		
	220	905	498	1	22×45		
		905	498	1	25×40		
		905	498	1	30×30		
	270	737	406	1.1	25×45		
		737	406	1.1	30×30		
	330	603	332	1.2	25×50		
		603	332	1.2	30×40		
	390	510	281	1.3	30×45		
		510	281	1.3	35×35		
	470	424	233	1.4	30×50		
		424	233	1.4	35×40		
	560	355	196	1.5	35×45		
	680	293	161	1.7	35×50		
	350 (400)	82	2427	1335	0.64	22×25	
		100	1990	1095	0.69	22×30	
1990			1095	0.69	25×25		
120		1659	912	0.75	22×35		
		1659	912	0.75	25×30		
150		1327	730	0.82	22×40		
		1327	730	0.82	30×25		
180		1106	608	0.9	22×45		
		1106	608	0.9	25×35		
		1106	608	0.9	30×30		
220		905	498	1	22×50		
		905	498	1	25×40		
270		737	406	1.1	25×50		
		737	406	1.1	30×35		
		737	406	1.1	35×30		
330		603	332	1.2	30×45		
		603	332	1.2	35×35		
390		510	281	1.3	30×50		
		510	281	1.3	35×40		
560		355	196	1.5	35×50		
400 (450)	56	3554	1955	0.51	22×25		
	68	2927	1610	0.56	22×30		
		2927	1610	0.56	25×25		
	82	2427	1335	0.64	22×35		
		2427	1335	0.64	25×30		
	100	1990	1095	0.69	25×30		
		1659	912	0.75	22×40		
	120	1659	912	0.75	25×35		
		1659	912	0.75	30×25		
		1327	730	0.82	22×50		
	150	1327	730	0.82	25×40		
		1327	730	0.82	30×30		
	180	1106	608	0.9	25×45		
		1106	608	0.9	30×35		
		1106	608	0.9	35×25		
	220	905	498	1	25×50		
		905	498	1	30×40		
		905	498	1	35×30		
	270	737	406	1.1	30×45		
		737	406	1.1	35×35		
330	603	332	1.2	30×50			
	603	332	1.2	35×40			
390	510	281	1.3	35×45			
	510	281	1.3	35×40			
470	424	233	1.4	35×50			
450 (500)	39	6805	3062	0.37	22×25		
	47	5647	2541	0.4	22×30		
		4739	2133	0.47	22×35		
	56	4739	2133	0.47	25×25		
		3903	1756	0.53	22×40		
	68	3903	1756	0.53	25×30		
		3237	1456	0.56	22×45		
	82	3237	1456	0.56	25×35		
		3237	1456	0.56	30×25		
		2654	1194	0.64	22×50		
	100	2654	1194	0.64	25×40		
		2654	1194	0.64	30×30		
	120	2212	995	0.72	25×45		
		1769	796	0.79	25×50		
	150	1769	796	0.79	30×40		
		1769	796	0.79	35×30		
	180	1474	664	0.87	30×45		
		1474	664	0.87	35×35		
	220	1206	543	1	30×50		
		1206	543	1	35×40		
270	983	442	1.19	35×45			
330	804	362	1.38	35×50			

Ratings for CD297L Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
500 (550)	47	5647	2823	0.41	22 x 30	
	56	4739	2370	0.47	22 x 30	
	68	3903	1951	0.54	22 x 35	
		3903	1951	0.54	25 x 30	
	82	3237	1618	0.62	22 x 40	
		3237	1618	0.62	25 x 35	
	100	2654	1327	0.67	22 x 45	
		2654	1327	0.67	25 x 40	
		2654	1327	0.67	30 x 30	
	120	2212	1106	0.77	22 x 50	
		2212	1106	0.74	25 x 40	
		2212	1106	0.77	30 x 35	
		2212	1106	0.80	35 x 30	
	150	1769	885	0.82	25 x 45	
		1769	885	0.85	30 x 40	
		1769	885	0.85	35 x 35	
	180	1474	737	0.98	25 x 50	
		1474	737	1.01	30 x 45	
	220	1206	603	1.12	30 x 50	
		1206	603	1.12	35 x 40	
270	983	492	1.25	30 x 50		
	983	492	1.25	35 x 45		
330	804	402	1.36	35 x 50		
470	565	282	1.69	35 x 60		

Customer products are available on request.

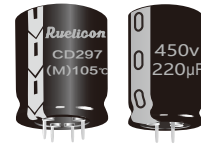
Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD297 Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

- 5000h at 105°C
- Load life at High Temperature, High ripple current 高温负载长寿命, 高纹波电流
- Solar inverter Excellent airtightness, adoption of special sealing process 太阳能逆变器, 高密封, 特殊密封工艺

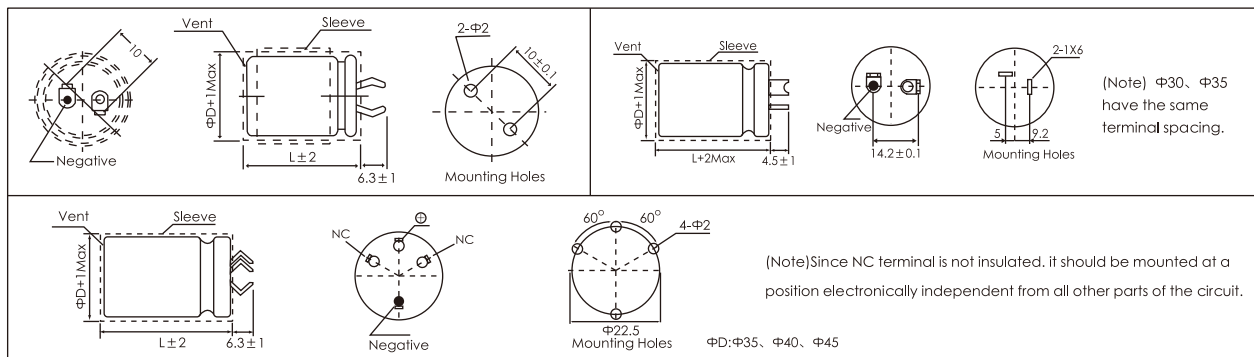


### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能	
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C
Rated Working Voltage Range 电压范围	10 to 100V	160 to 550V
Nominal Capacitance Range 容量范围	47 to 56000μF	
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)	
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试	
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~550
	Tan δ(max)	0.55 0.50 0.45 0.40 0.35 0.30 0.25 0.20 0.15 0.25
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz	
	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~550
	Z-25°C/Z+20°C	6 6 6 6 4 3 3 3 8 8
Z-40°C/Z+20°C	12 12 12 12 12 12 12 12 - -	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压 5000小时后, 符合以下要求:	
	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求	
	Capacitance Change 容量	Within ±15% of initial value 在初始值的±15%
	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(μf)	freq. (Hz)	60	120	1k	10~50k
10~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.25	1.47
315~550V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	65	85	105
Factor	2.00	1.89	1.52	1.00

Ratings for CD297 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD × L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
10 (13)	8200	89	62	1.36	22×25	
	10000	73	51	1.65	22×30	
	12000	61	43	1.85	22×35	
		61	43	1.82	25×25	
	15000	49	34	2.12	22×40	
		49	34	2.11	25×30	
	18000	49	34	2.14	30×25	
		41	28	2.4	22×45	
	22000	41	28	2.32	25×35	
		33	23	2.59	25×40	
	27000	33	23	2.73	30×30	
		27	19	3.01	25×45	
		27	19	3.13	30×35	
33000	27	19	3.05	35×30		
	22	16	3.43	25×50		
	22	16	3.53	30×40		
39000	22	16	3.49	35×35		
	19	13	3.78	30×45		
	19	13	3.96	35×40		
47000	16	11	4.58	30×50		
	16	11	4.6	35×45		
16 (20)	56000	13	9	5.06	35×50	
	56000	119	83	1.44	22×25	
	68000	98	68	1.66	22×30	
	82000	81	57	1.67	25×25	
	10000	66	46	2.08	22×35	
		66	46	2.07	25×30	
	12000	55	39	2.36	22×40	
		55	39	2.37	25×35	
	15000	55	39	2.33	30×25	
		44	31	2.69	22×45	
		44	31	2.72	25×40	
	18000	44	31	2.54	30×30	
		37	26	3.06	25×45	
	22000	37	26	3.02	30×35	
		37	26	3.09	35×30	
	27000	30	21	3.39	25×50	
30		21	3.46	30×40		
33000	25	17	3.88	30×45		
	25	17	3.85	35×35		
39000	20	14	4.33	30×50		
	20	14	4.33	35×40		
47000	17	12	4.96	35×45		
47000	14	10	5.49	35×50		
25 (32)	3900	153	107	1.31	22×25	
	4700	127	89	1.55	22×30	
	5600	107	75	1.77	22×35	
		107	75	1.76	25×25	
	6800	88	62	2.02	22×40	
		88	62	1.88	25×30	
	8200	73	51	2.27	22×45	
		73	51	2.18	25×35	
	10000	73	51	2.19	30×25	
		60	42	2.56	22×50	
	12000	60	42	2.53	25×40	
		60	42	2.38	30×30	
	15000	50	35	2.79	25×45	
		50	35	2.7	30×35	
	18000	50	35	2.76	35×30	
40		28	3.13	30×40		
22000	33	23	3.52	30×45		
	33	23	3.5	35×35		
35 (44)	27000	27	19	3.92	30×50	
	27000	27	19	3.95	35×40	
		22	16	4.72	35×50	
	3300	197	138	1.29	22×25	
		161	113	1.54	22×30	
	3900	136	95	1.77	22×35	
		136	95	1.75	25×25	
	4700	113	79	2.01	22×40	
		113	79	1.97	25×30	
	5600	95	66	2.25	22×45	
		95	66	2.18	25×35	
		95	66	2.08	30×25	
6800	78	55	2.49	22×50		
	78	55	2.45	25×40		
	78	55	2.28	30×30		
8200	65	45	2.8	25×45		
	65	45	2.69	30×35		
10000	53	37	3.04	30×40		
	53	37	2.78	35×30		
12000	44	31	3.38	30×45		
	44	31	3.3	35×35		
15000	35	25	3.98	35×40		
18000	30	21	4.4	35×45		

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD × L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
50 (63)	1500	310	217	1.21	22×25	
	2200	211	148	1.52	22×30	
		211	148	1.46	25×25	
	2700	172	120	1.77	22×35	
		172	120	1.76	25×30	
	3300	141	99	2.02	22×40	
		141	99	1.92	30×25	
	3900	119	83	2.27	22×45	
		119	83	2.2	25×35	
		119	83	2.19	30×30	
	4700	99	69	2.43	25×40	
		83	58	2.72	25×45	
	5600	83	58	2.58	30×35	
		83	58	2.35	35×30	
		68	48	3.01	30×40	
6800	68	48	2.91	35×35		
	57	40	3.63	30×50		
8200	57	40	3.36	35×40		
	46	33	3.79	35×45		
10000	39	27	4.06	35×50		
63 (79)	1000	398	279	1.1	22×25	
	1500	265	186	1.41	22×30	
		265	186	1.38	25×25	
	1800	221	155	1.62	22×35	
		221	155	1.63	25×30	
	2200	181	127	1.85	22×40	
		181	127	1.80	30×25	
	2700	147	103	2.1	22×45	
		147	103	2.03	25×35	
	3300	147	103	2.01	30×30	
		121	84	2.33	25×40	
	3900	102	72	2.58	25×45	
		102	72	2.46	30×35	
		102	72	2.31	35×30	
	4700	85	59	2.82	30×40	
85		59	2.77	35×35		
5600	71	50	3.22	30×45		
	71	50	3.2	35×40		
6800	59	41	3.61	35×45		
8200	49	34	3.94	35×50		
820	405	283	1.09	22×25		
1000	332	232	1.29	22×30		
1200	277	194	1.48	22×35		
	277	194	1.38	25×25		
80 (100)	1500	221	155	1.7	22×40	
		221	155	1.74	25×30	
		221	155	1.75	30×25	
	1800	184	129	1.91	22×45	
		184	129	1.86	25×35	
	2200	151	106	2.22	25×45	
151		106	2.02	30×30		
2700	123	86	2.50	30×35		
	123	86	2.45	35×30		
3300	101	70	2.69	30×40		
	101	70	2.6	35×35		
	85	60	2.94	30×45		
3900	85	60	3	35×40		
	71	49	3.44	35×45		
5600	59	42	3.72	35×50		
560	474	332	1.01	22×25		
680	390	273	1.19	22×30		
820	324	227	1.33	22×35		
	324	227	1.26	25×25		
100 (125)	1000	265	186	1.56	22×40	
		265	186	1.52	25×30	
	1200	265	186	1.47	30×25	
		221	155	1.76	22×45	
1500	221	155	1.76	25×35		
	221	155	1.76	30×30		
	177	124	2	22×50		
1800	177	124	2.03	25×40		
	147	103	2.29	25×45		
2200	147	103	2.19	30×35		
	147	103	2.15	35×30		
2700	121	84	2.52	30×40		
	121	84	2.48	35×35		
3300	98	69	2.86	30×45		
	98	69	2.87	35×40		
3900	80	56	3.25	35×45		
3900	68	48	3.56	35×50		
160 (200)	220	905	633	0.63	22×25	
	270	737	516	0.76	22×30	
	603	422	0.9	22×35		
603	422	0.84	25×25			

Ratings for CD297 Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
160 (200)	390	510	357	0.97	25 x 30	
		510	357	1	30 x 25	
	470	424	296	1.11	22 x 40	
		424	296	1.14	25 x 35	
	560	424	296	1.17	30 x 30	
		355	249	1.26	22 x 45	
	680	293	205	1.44	22 x 50	
		293	205	1.43	25 x 40	
	820	293	205	1.5	30 x 35	
		243	170	1.63	25 x 45	
		243	170	1.66	30 x 40	
	1000	243	170	1.63	35 x 30	
		199	139	1.89	30 x 45	
	1200	199	139	1.89	35 x 35	
		166	116	2.16	30 x 50	
	1500	166	116	2.23	35 x 40	
		133	93	2.61	35 x 45	
	180 (225)	220	111	77	2.97	35 x 50
905			633	0.63	22 x 25	
270		737	516	0.76	22 x 30	
		737	516	0.76	25 x 25	
330		603	422	0.9	22 x 35	
		603	422	0.9	25 x 30	
390		510	357	1.03	22 x 40	
		510	357	1.06	25 x 35	
		510	357	1.02	30 x 25	
470		424	296	1.17	22 x 45	
		424	296	1.17	30 x 30	
560		355	249	1.32	22 x 50	
		355	249	1.32	25 x 40	
		355	249	1.33	30 x 35	
680		293	205	1.51	25 x 45	
		293	205	1.49	35 x 30	
820		243	170	1.71	25 x 50	
		243	170	1.74	30 x 40	
	243	170	1.75	35 x 35		
1000	199	139	2.01	30 x 45		
	199	139	2.07	35 x 40		
1200	166	116	2.25	30 x 50		
	166	116	2.23	35 x 45		
1500	133	93	2.76	35 x 50		
	180	1106	774	0.57	22 x 25	
220		905	633	0.7	22 x 30	
	270	737	516	0.83	22 x 35	
737		516	0.76	25 x 25		
330	603	422	0.96	22 x 40		
	603	422	0.9	25 x 30		
390	510	357	1.06	25 x 35		
	510	357	1.02	30 x 25		
470	424	296	1.17	22 x 45		
	424	296	1.22	25 x 40		
560	424	296	1.17	30 x 30		
	355	249	1.39	25 x 45		
680	355	249	1.38	30 x 35		
	293	205	1.58	25 x 50		
820	293	205	1.61	30 x 40		
	293	205	1.49	35 x 30		
	243	170	1.85	30 x 45		
1000	243	170	1.75	35 x 35		
	199	139	2.11	30 x 50		
1200	199	139	2.07	35 x 40		
	166	116	2.38	35 x 45		
1500	133	93	2.76	35 x 50		

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
250 (300)	150	1327	929	0.52	22 x 25	
		1106	774	0.64	22 x 30	
	180	1106	774	0.62	25 x 25	
		905	633	0.76	22 x 35	
	220	905	633	0.76	25 x 30	
		737	516	0.88	22 x 40	
	270	737	516	0.9	25 x 35	
		737	516	0.85	30 x 25	
		603	422	1.01	22 x 45	
	330	603	422	1	30 x 30	
		510	357	1.13	22 x 50	
	390	510	357	1.13	25 x 40	
		510	357	1.15	30 x 35	
	470	424	296	1.29	25 x 45	
		424	296	1.24	35 x 30	
	560	355	249	1.45	25 x 50	
		355	249	1.48	30 x 40	
		355	249	1.49	35 x 35	
680	293	205	1.71	30 x 45		
	293	205	1.74	35 x 40		
820	243	170	1.94	30 x 50		
	199	139	2.2	35 x 45		
315 (365)	68	2927	1610	0.32	22 x 25	
		82	2427	1334	0.38	22 x 30
	100	1990	1095	0.41	25 x 25	
		1659	912	0.48	22 x 35	
	120	1659	912	0.49	25 x 30	
		1327	730	0.56	22 x 40	
	150	1327	730	0.51	30 x 25	
		1106	608	0.63	22 x 45	
	180	1106	608	0.62	25 x 35	
		1106	608	0.63	30 x 30	
	220	905	498	0.72	22 x 50	
		905	498	0.71	25 x 40	
		905	498	0.74	30 x 35	
	270	737	406	0.81	25 x 45	
		737	406	0.85	30 x 40	
	330	737	406	0.82	35 x 30	
		603	332	0.92	25 x 50	
	390	693	332	0.9	35 x 35	
510		281	1.04	30 x 45		
470	510	281	1.05	35 x 40		
	424	233	1.15	30 x 50		
560	424	233	1.18	35 x 45		
	355	196	1.34	35 x 50		
350 (400)	68	2927	1610	0.34	22 x 25	
		82	2427	1334	0.4	22 x 30
	100	1990	1095	0.47	25 x 25	
		1659	912	0.52	22 x 35	
	120	1659	912	0.53	25 x 30	
		1659	912	0.53	30 x 25	
	150	1327	730	0.59	22 x 40	
		1327	730	0.6	25 x 35	
	180	1106	608	0.68	22 x 45	
		1106	608	0.7	25 x 40	
	220	1106	608	0.71	30 x 30	
		905	498	0.78	22 x 50	
	270	905	498	0.82	25 x 45	
		905	498	0.82	30 x 35	
		737	406	0.94	25 x 50	
	330	737	406	0.93	30 x 40	
		737	406	0.9	35 x 30	
	390	603	332	1.05	30 x 45	
603		332	1.01	35 x 35		



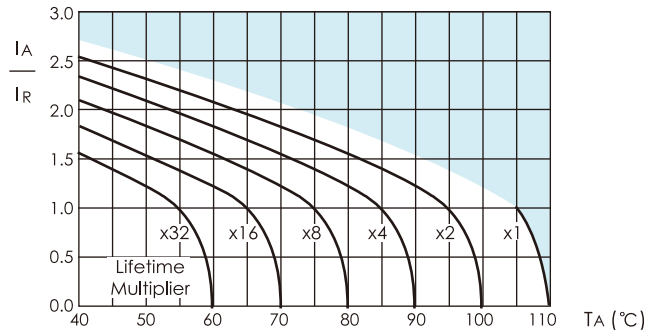
Ratings for CD297 Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
350 (400)	390	6510	281	1.18	30×50		
		510	281	1.13	35×40		
	470	424	233	1.26	35×45		
		560	355	196	1.39	35×50	
400 (450)	68	2927	1522	0.38	22×30		
		2427	1262	0.41	25×25		
	100	1990	1035	0.46	22×35		
		1990	1035	0.48	25×30		
		1990	1035	0.48	30×25		
	120	1659	863	0.53	22×40		
		1659	863	0.55	25×35		
		1659	863	0.56	30×30		
		150	1327	690	0.63	22×50	
	1327		690	0.65	25×40		
	180	1106	575	0.72	25×45		
		1106	575	0.74	30×35		
		905	471	0.79	25×50		
		220	905	471	0.85	30×40	
			905	471	0.89	35×30	
	270	737	383	0.98	30×45		
		737	383	0.96	35×35		
	330	603	314	1.12	30×50		
		603	314	1.12	35×40		
	390	510	265	1.27	35×45		
	470	424	220	1.33	35×50		
	450 (500)	68	3903	1951	0.38	22×30	
			3237	1618	0.44	22×35	
			3237	1618	0.45	25×30	
82		3237	1618	0.46	30×25		
		2654	1327	0.5	22×40		
		2654	1327	0.52	25×35		
100		2212	1106	0.58	22×50		
		2212	1106	0.58	25×40		
		2212	1106	0.58	30×30		
120		1769	884	0.66	25×45		
		1769	884	0.68	30×35		
150		1474	737	0.74	25×50		
		1474	737	0.77	30×40		
		1474	737	0.77	35×30		
180		1206	603	0.88	30×45		
		1206	603	0.88	35×35		
220		983	491	0.99	30×50		
		983	491	1.01	35×40		
270		804	402	1.15	35×45		
330		681	340	1.28	35×50		
390		565	282	1.50	35×55		
500 (550)		47	5647	2823	0.41	22×30	
			4739	2370	0.47	22×30	
		68	3903	1951	0.54	22×35	
	3903		1951	0.54	25×30		
	82	3237	1618	0.62	22×40		
		3237	1618	0.62	25×35		
	100	2654	1327	0.67	22×45		
		2654	1327	0.67	25×40		
		2654	1327	0.67	30×30		
	120	2212	1106	0.77	22×50		
		2212	1106	0.74	25×40		
		2212	1106	0.77	30×35		
		2212	1106	0.80	35×30		
	150	1769	885	0.82	25×45		
		1769	885	0.85	30×40		
		1769	885	0.67	35×30		
		1769	885	0.85	35×35		
	180	1474	737	0.98	25×50		
		1474	737	1.01	30×45		
	220	1206	603	1.12	30×50		
		1206	603	0.94	35×35		
		1206	603	1.12	35×40		
	270	983	492	1.25	30×50		
		983	492	1.25	35×40		
330	804	402	1.36	35×45			
390	681	340	1.54	35×50			
470	565	282	1.69	35×60			

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
550 (600)	150	1769	885	0.92	30×40	
		1474	737	1.03	30×50	
	180	1474	737	1.03	35×35	
		1206	603	1.15	30×55	
	220	1206	603	1.15	35×40	
		270	983	492	1.30	35×45
	330	804	402	1.48	35×50	
		390	681	340	1.65	35×60
	470	565	282	1.92	35×70	
		560	473	237	2.05	35×80
			473	237	2.05	40×70

Customer products are available on request.

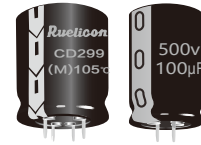
Lifetime Diagram



I<sub>A</sub> = actual ripple current at 120Hz, I<sub>R</sub> = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD299 Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

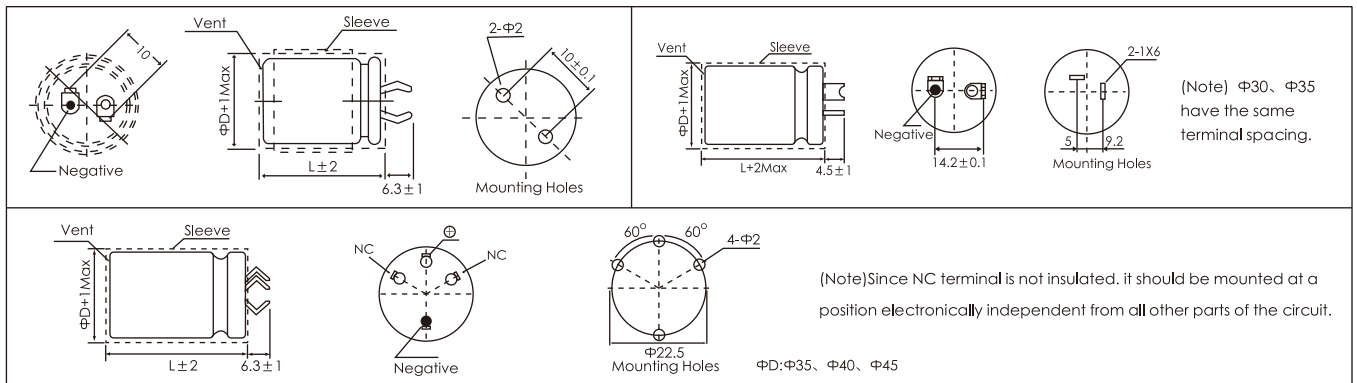
- 7000h at 105°C
- Extended Lifetime at 105°C
- High Ripple Current 高纹波电流
- High Professional Industrial Power Supplies 高级专业工业电源, 光伏逆变器
- ◆SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能																							
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C																						
Rated Working Voltage Range 电压范围	160 to 250V	315 to 550V																						
Nominal Capacitance Range 容量范围	100 to 3300µF																							
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)																							
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5 minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试																							
Dissipation Factor tan δ(120Hz, +20°C) 损耗角正切值	<table border="1"> <tr> <td>Working Voltage(V)</td> <td>160</td> <td>180</td> <td>200</td> <td>250</td> <td>315</td> <td>350</td> <td>400</td> <td>450</td> <td>500</td> <td>550</td> </tr> <tr> <td>Tan δ(max)</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> <td>0.20</td> <td>0.20</td> </tr> </table>		Working Voltage(V)	160	180	200	250	315	350	400	450	500	550	Tan δ(max)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.20	0.20	0.20
Working Voltage(V)	160	180	200	250	315	350	400	450	500	550														
Tan δ(max)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.20	0.20	0.20														
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>160~250</td> <td>315~550</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>12</td> <td>-</td> </tr> </table>		Working Voltage(V)	160~250	315~550	Z-25°C/Z+20°C	3	8	Z-40°C/Z+20°C	12	-													
Working Voltage(V)	160~250	315~550																						
Z-25°C/Z+20°C	3	8																						
Z-40°C/Z+20°C	12	-																						
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 7000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压7000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±25% of initial value 在初始值的±25%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 250% of the specified value 不超过标准值的250%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>		Capacitance Change容量	Within ±25% of initial value 在初始值的±25%	Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%	Leakage Current 泄露电流	initial specified value or less 不超过标准值																
Capacitance Change容量	Within ±25% of initial value 在初始值的±25%																							
Dissipation Factor 损耗角	Not more than 250% of the specified value 不超过标准值的250%																							
Leakage Current 泄露电流	initial specified value or less 不超过标准值																							
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours, the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求 <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±15% of initial value 在初始值的±15%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 150% of the specified value 不超过标准值的150%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>		Capacitance Change容量	Within ±15% of initial value 在初始值的±15%	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%	Leakage Current 泄露电流	initial specified value or less 不超过标准值																
Capacitance Change容量	Within ±15% of initial value 在初始值的±15%																							
Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%																							
Leakage Current 泄露电流	initial specified value or less 不超过标准值																							

### Dimensions

mm



### ◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
160~250V		0.8	1	1.25	1.47
315~550V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	20~45	65	85	105
Factor	2.00	1.89	1.52	1.00

Ratings for CD299 Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citanace	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
160 (200)	470	423	254	1.5	22 x 25		
	560	355	213	1.7	22 x 30		
	680	293	176	1.9	22 x 30		
	680	293	176	1.8	25 x 25		
		243	146	2.1	22 x 35		
	820	243	146	2.1	25 x 30		
		199	119	2.4	22 x 40		
	1000	199	119	2.4	25 x 35		
		199	119	2.5	30 x 25		
		166	100	2.8	25 x 40		
	1200	166	100	2.8	30 x 30		
		166	100	2.8	35 x 25		
		133	80	3.1	25 x 45		
	1500	133	80	3.1	25 x 50		
		133	80	3.2	30 x 35		
		111	66	3.6	25 x 50		
	1800	111	66	3.6	30 x 40		
		111	66	3.5	35 x 30		
		90	54	4.1	30 x 45		
	2200	90	54	4.1	30 x 50		
		90	54	4.0	35 x 35		
		90	54	4.0	35 x 50		
	2700	74	44	4.6	35 x 40		
		74	44	4.8	35 x 45		
		3300	60	36	5.4	35 x 50	
	200 (250)	390	510	306	1.3	22 x 25	
		470	423	254	1.5	22 x 30	
		560	355	213	1.7	22 x 35	
		560	355	213	1.6	25 x 25	
			293	176	1.9	22 x 40	
			293	176	1.9	25 x 30	
		680	293	176	1.9	30 x 25	
			243	146	2.2	22 x 45	
243			146	2.2	25 x 35		
820		199	119	2.5	25 x 40		
		199	119	2.5	30 x 30		
		199	119	2.7	35 x 25		
		199	119	2.7	35 x 30		
1000		166	100	2.7	25 x 45		
		166	100	2.8	30 x 35		
		166	100	2.8	30 x 50		
		166	100	3.0	35 x 30		
1200		133	80	3.3	30 x 40		
		133	80	3.3	30 x 45		
		133	80	3.4	35 x 35		
1500		111	66	3.7	30 x 50		
		111	66	3.8	35 x 40		
		111	66	3.8	35 x 45		
1800		90	54	4.3	35 x 45		
		90	54	4.3	35 x 50		
		2700	74	44	4.9	35 x 50	
250 (300)		270	737	442	1.1	22 x 25	
		330	603	362	1.3	22 x 30	
		390	510	306	1.4	22 x 35	
		390	510	306	1.4	25 x 25	
			423	254	1.6	22 x 40	
			423	254	1.6	25 x 30	
		470	355	213	1.8	22 x 45	
	355		213	1.8	25 x 35		
	355		213	1.8	30 x 25		
	560	293	176	2.0	25 x 40		
		293	176	2.1	30 x 30		
		293	176	2.2	35 x 25		
	680	243	146	2.3	25 x 45		
		243	146	2.4	30 x 35		
		243	146	2.5	35 x 30		
		199	119	2.7	30 x 40		
	820	166	100	3.0	30 x 45		
		166	100	3.0	35 x 35		
		166	100	3.2	35 x 40		
	1000	133	80	3.6	35 x 45		
		133	80	3.6	35 x 45		
		1800	111	66	4.0	35 x 50	

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citanace	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
315 (365)	180	1106	663	1.0	22 x 25		
	220	905	543	1.1	22 x 30		
	270	737	442	1.2	22 x 35		
		737	442	1.2	25 x 30		
	330	603	362	1.4	22 x 40		
		510	306	1.6	22 x 45		
		510	306	1.6	22 x 50		
	390	510	306	1.6	25 x 35		
		423	254	1.8	25 x 40		
		423	254	1.8	30 x 30		
	470	355	213	2.0	25 x 50		
		355	213	1.9	30 x 35		
		355	213	2.0	35 x 30		
	560	293	176	2.2	30 x 40		
		293	176	2.3	30 x 45		
		293	176	2.2	35 x 35		
	680	243	146	2.5	30 x 50		
		243	146	2.6	35 x 40		
		199	119	2.9	35 x 45		
	820	166	100	3.3	35 x 50		
		166	100	3.3	35 x 55		
		1200	166	100	3.3	35 x 55	
	350 (400)	120	1659	995	0.7	22 x 25	
		150	1327	796	0.8	22 x 30	
		180	1106	663	0.9	22 x 35	
			1106	663	0.9	25 x 25	
		220	905	543	1.0	22 x 40	
			905	543	1.0	25 x 30	
			905	543	1.0	30 x 25	
		270	737	442	1.3	22 x 45	
			737	442	1.3	22 x 50	
			737	442	1.3	25 x 35	
		330	737	442	1.3	30 x 30	
603			362	1.4	22 x 50		
603			362	1.4	25 x 40		
390		603	362	1.4	30 x 30		
		510	306	1.6	25 x 40		
		510	306	1.6	25 x 45		
470		510	306	1.6	30 x 35		
		423	254	1.8	25 x 45		
		423	254	1.8	30 x 35		
560		423	254	1.8	35 x 35		
		355	213	2.0	30 x 45		
		355	213	2.0	35 x 35		
680		293	176	2.4	30 x 50		
		293	176	2.4	35 x 40		
		243	146	2.6	35 x 45		
820		243	146	2.6	35 x 50		
		243	146	2.6	35 x 50		
		1000	199	119	2.8	35 x 50	
400 (450)		150	1327	708	0.9	22 x 30	
		180	1327	708	0.9	25 x 25	
		180	1106	590	1.0	22 x 35	
			1106	590	1.0	25 x 25	
		220	905	483	1.1	22 x 40	
	905		483	1.1	25 x 30		
	905		483	1.2	30 x 25		
	270	737	393	1.3	22 x 50		
		737	393	1.3	25 x 35		
		737	393	1.3	30 x 30		
	330	603	322	1.5	25 x 40		
		603	322	1.4	30 x 30		
		603	322	1.5	35 x 25		
	390	510	272	1.6	25 x 45		
		510	357	1.6	30 x 35		
		510	272	1.7	35 x 30		
	470	423	226	1.8	30 x 45		
		423	226	1.9	35 x 35		
		355	190	2.1	30 x 50		
	560	355	190	2.1	35 x 40		
		293	156	2.4	35 x 45		
		293	156	2.4	35 x 45		
	680	243	170	2.7	35 x 50		
		243	170	2.7	35 x 50		
		1000	199	106	3.2	35 x 60	
	1200	166	88	3.7	35 x 70		

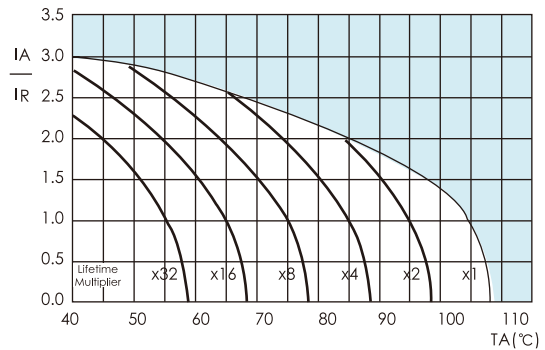
Ratings for CD299 Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
420 (470)	100	1990	1128	0.7	22 x 25	
	120	1659	940	0.8	22 x 30	
		1659	940	0.8	25 x 25	
	150	1327	752	0.9	22 x 35	
	180	1106	627	1.0	22 x 40	
		1106	627	1.0	25 x 30	
		1106	627	1.1	30 x 25	
	220	905	513	1.2	22 x 45	
		905	513	1.2	22 x 50	
		905	513	1.2	25 x 35	
		905	513	1.2	30 x 30	
	270	737	418	1.3	25 x 40	
		737	418	1.3	30 x 30	
		737	418	1.4	35 x 25	
	330	603	342	1.5	25 x 50	
		603	342	1.5	30 x 35	
		603	342	1.6	35 x 30	
	390	510	289	1.7	30 x 40	
		510	289	1.7	35 x 30	
		510	289	1.7	35 x 35	
	470	423	240	1.9	30 x 50	
		423	240	2.0	35 x 40	
	560	355	201	2.2	35 x 40	
	680	293	166	2.5	35 x 50	
820	243	138	3.0	35 x 55		
1000	199	113	3.4	35 x 65		
1200	166	94	3.8	35 x 75		
450 (500)	100	2654	1062	0.7	22 x 30	
	120	2212	885	0.8	22 x 30	
		2212	885	0.8	22 x 35	
		2212	885	0.8	25 x 25	
	150	1769	708	0.9	22 x 40	
		1769	708	0.9	25 x 30	
	180	1474	590	1.1	22 x 45	
		1474	590	1.1	25 x 35	
		1474	590	1.1	30 x 25	
	220	1206	483	1.2	22 x 50	
		1206	483	1.2	25 x 40	
		1206	483	1.2	30 x 30	
	270	983	393	1.3	25 x 45	
		983	393	1.3	30 x 35	
		983	393	1.4	35 x 30	
	330	804	322	1.5	30 x 40	
		680	272	1.7	30 x 45	
	390	680	272	1.7	35 x 35	
		680	272	1.7	35 x 40	
	470	565	226	2.0	35 x 40	
		565	226	2.0	35 x 45	
		565	226	2.0	35 x 50	
	560	474	190	2.2	35 x 50	
	680	390	156	2.6	35 x 55	
390		156	2.6	35 x 60		
820	324	129	3.0	35 x 65		
1000	265	106	3.4	35 x 75		
	265	106	3.4	40 x 65		
1200	221	88	3.7	40 x 75		

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
500 (550)	100	2654	1062	0.8	25 x 30		
	120	2212	885	0.9	25 x 35		
		2212	885	0.9	30 x 30		
	150	1769	708	1.0	30 x 30		
	180	1474	590	1.2	30 x 35		
		1206	483	1.3	25 x 50		
	220	1206	483	1.3	30 x 40		
		1206	483	1.2	35 x 35		
	270	983	393	1.5	30 x 50		
		983	393	1.5	35 x 40		
	330	804	322	1.6	35 x 45		
	390	680	272	1.8	35 x 50		
		565	226	2.0	35 x 55		
	470	565	226	2.0	35 x 60		
		474	190	2.2	35 x 65		
	560	474	190	2.2	40 x 50		
		390	156	2.4	35 x 70		
	680	390	156	2.4	40 x 60		
		820	324	129	2.6	40 x 70	
	1000	265	106	2.8	45 x 70		
	1200	221	88	3.2	45 x 80		
	550 (600)	270	1229	590	1.3	35 x 50	
		330	1005	483	1.4	35 x 60	
		390	851	408	1.6	35 x 65	
470		706	339	1.8	35 x 70		
		706	339	1.8	40 x 65		
560		592	284	2.0	35 x 80		
		592	284	2.0	40 x 70		
680		488	234	2.3	40 x 80		
		488	234	2.3	45 x 70		

Customer products are available on request.

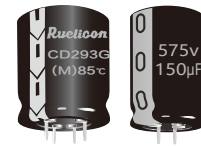
Lifetime Diagram



IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

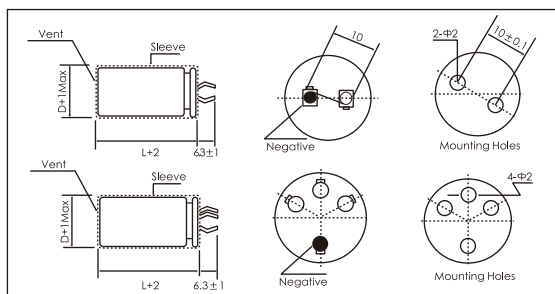
## CD293G Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

- 2000h at 85°C
- Ultrahigh Voltage
- High Ripple Current 高纹波电流, 耐过压
- Suit for use in industrial power supplies for inverter, etc. 适用于变频器等工业电源
- ◆SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能
Operating temperature range 温度范围	-25 to +85°C
Rated Working Voltage Range 电压范围	575 to 600V
Nominal Capacitance Range 容量范围	150 to 1500µF
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)
Leakage Current 泄漏电流	$I \leq 0.03CV$ or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试
Dissipation Factor $\tan \delta(120\text{Hz}, +20^\circ\text{C})$ 损耗角正切值	Rated Voltage(V)   575   600
	Tan $\delta(\text{max})$   0.20
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz
	Rated Voltage(V)   575   600 Z-25°C/Z+20°C   8
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压2000小时后, 符合以下要求:
	Capacitance Change容量   Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角   Not more than 200% of the specified value 不超过标准值的200%
High Temperature Shelf Life 高温贮存	Leakage Current 泄露电流   initial specified value or less 不超过标准值
	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求
	Capacitance Change容量   Within ±15% of initial value 在初始值的±15%
	Dissipation Factor 损耗角   Not more than 150% of the specified value 不超过标准值的150%
Leakage Current 泄露电流   initial specified value or less 不超过标准值	

### Dimensions



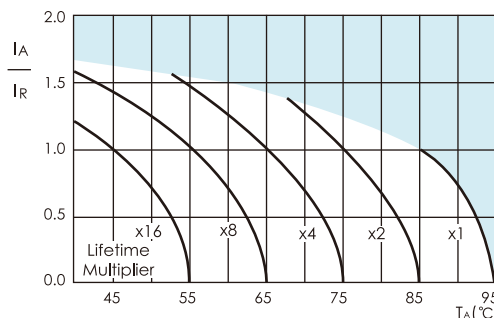
### mm Frequency Coefficient

Frequency(Hz)	50/60	120	300	1K	10K	>50K
Factor	0.80	1.00	1.16	1.30	1.41	1.45

### Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85
Factor	1.7	1.5	1.3	1.0

### Lifetime Diagram



IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

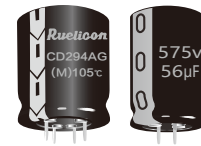
## Ratings for CD293G Series

U <sub>k</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
575 (625)	180	1106	627	1.15	30 × 45	
	220	905	513	1.30	30 × 50	
	270	737	418	1.55	30 × 60	
		737	418	1.55	35 × 45	
	330	603	342	1.75	30 × 70	
		603	342	1.75	35 × 50	
		603	342	1.75	40 × 45	
	390	510	289	1.95	30 × 85	
		510	289	1.95	35 × 60	
		510	289	1.95	40 × 55	
	470	423	240	2.15	35 × 70	
		423	240	2.15	40 × 60	
		423	240	2.15	45 × 50	
	560	355	201	2.40	35 × 80	
		355	201	2.40	40 × 70	
		355	201	2.40	45 × 55	
	680	293	166	2.72	35 × 95	
		293	166	2.72	40 × 80	
		293	166	2.72	45 × 65	
	820	243	138	3.05	40 × 100	
243		138	3.05	45 × 75		
1000	199	113	3.20	45 × 90		
	199	113	3.20	50 × 75		
1200	166	94	3.35	45 × 105		
	166	94	3.35	50 × 85		
1500	133	75	3.50	50 × 100		
600 (650)	150	1327	752	0.95	30 × 45	
	180	1106	627	1.10	30 × 50	
	220	905	495	1.22	30 × 60	
	270	737	403	1.25	30 × 70	
	330	603	330	1.35	30 × 80	
		603	330	1.35	40 × 50	
	390	510	279	1.48	40 × 60	
	470	423	232	1.65	40 × 70	
		423	232	1.65	45 × 55	
	560	355	194	1.75	40 × 80	
		355	194	1.75	45 × 60	
	680	293	160	1.83	40 × 90	
		293	160	1.83	45 × 70	
	820	243	133	2.00	45 × 85	
		243	133	2.00	50 × 70	
	1000	199	109	2.25	45 × 100	
199		109	2.25	50 × 80		
1200	166	91	2.45	50 × 95		

Customer products are available on request.

## CD294AG Series (Lug/Snap Terminal Type插入/自立型, Long Life 长寿命)

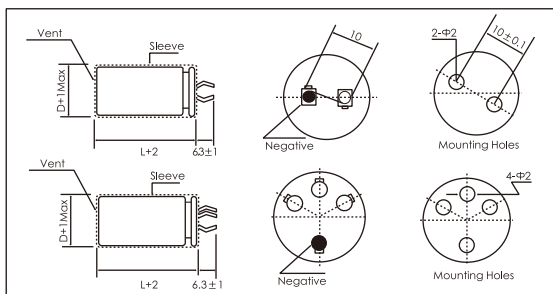
- 2000h at 105°C
- Ultrahigh Voltage
- High Ripple Current 高纹波电流, 耐过压
- Suit for high frequency regenerative voltage for AC servomotor, general inverter 适用于交流伺服电机的高频变频器, 通用变频器。



### ◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能
Operating temperature range 温度范围	-25 to +105°C
Rated Working Voltage Range 电压范围	575 to 600V
Nominal Capacitance Range 容量范围	56 to 390µF
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)
Leakage Current 泄漏电流	$I \leq 0.03CV$ or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试
Dissipation Factor $\tan \delta(120\text{Hz}, +20^\circ\text{C})$ 损耗角正切值	Rated Voltage(V)   575   600
	Tan $\delta(\text{max})$   0.20
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz
	Rated Voltage(V)   575   600 Z-25°C/Z+20°C   8
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压2000小时后, 符合以下要求:
	Capacitance Change 容量   Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角   Not more than 200% of the specified value 不超过标准值的200%
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能耐久性能要求
	Capacitance Change 容量   Within ±15% of initial value 在初始值的±15%
	Dissipation Factor 损耗角   Not more than 150% of the specified value 不超过标准值的150%
	Leakage Current 泄露电流   initial specified value or less 不超过标准值

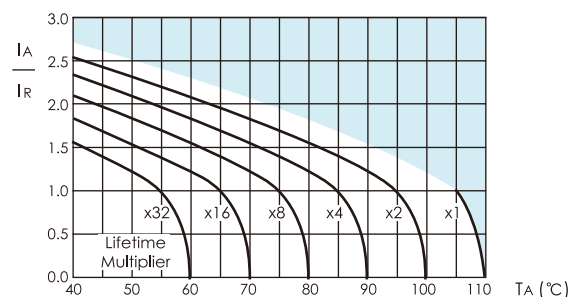
### Dimensions



### mm Frequency Coefficient

Frequency(Hz)	50	120	300	1K	10K	≥50K
Factor	0.75	1.00	1.16	1.30	1.41	1.45

### Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

### Temperature Coefficient

Temperature(°C)	+40	+55	+70	+85	+105
Factor	2.7	2.5	2.1	1.7	1.0

## Ratings for CD294AG Series

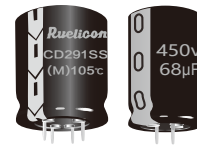
$U_r$ (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
575 (625)	68	3903	1659	0.52	30×25	
	82	3236	1376	0.58	30×30	
	100	2654	1128	0.63	30×35	
	120	2212	940	0.70	30×40	
	150	1769	752	0.81	30×45	
	180	1474	627	0.89	30×50	
	220	1206	513	1.01	30×60	
	270	983	418	1.12	30×70	
		983	418	1.12	35×55	
	330	804	342	1.21	30×85	
		804	342	1.21	35×60	
		804	342	1.21	40×50	
	390	680	289	1.30	40×60	
		680	289	1.30	35×65	
600 (650)	56	4739	2014	0.50	30×25	
	68	3903	1659	0.56	30×30	
	82	3236	1376	0.61	30×35	
		3236	1376	0.61	35×25	
	100	2654	1128	0.67	30×40	
		2654	1128	0.67	35×30	
	120	2212	940	0.74	30×45	
		2212	940	0.74	35×35	
	150	1769	752	0.83	30×50	
		1769	752	0.83	35×40	
	180	1474	627	0.91	30×55	
		1474	627	0.91	35×45	
	220	1206	513	1.05	30×60	
		1206	513	1.05	35×50	
	270	983	418	1.17	35×55	
	330	804	342	1.27	35×65	

Customer products are available on request.



## CD291SS Series (Lug/Snap Terminal Type插入/自立型标准品)

- 2000h at 105°C
- Smaller low profile sizes than ordinary capacitors. 体积小于普通品电容
- 20mm Height
- For laminated electrical devices 用于小型电器设备

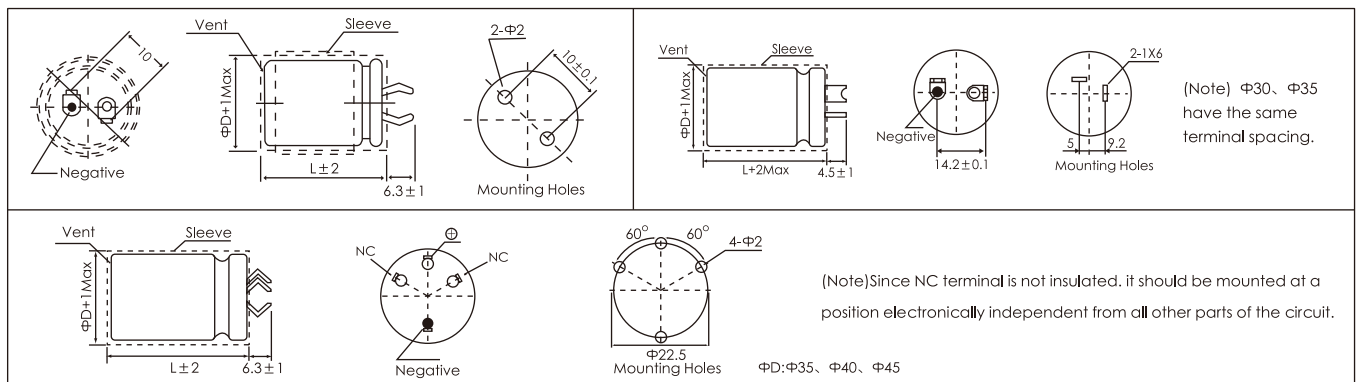


### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能				
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C			
Rated Working Voltage Range 电压范围	10 to 100V	160 to 450V			
Nominal Capacitance Range 容量范围	33 to 10000µF				
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)				
Leakage Current 泄漏电流	I ≤ 0.01CV or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试				
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315-450			
	Tan δ(max)	0.6 0.50 0.45 0.40 0.40 0.30 0.25 0.20 0.15 0.20			
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz				
	Working Voltage(V)	10~100	160~250	315~385	400~450
	Z-25°C/Z+20°C	4	3	5	8
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压 2000小时后, 符合以下要求:				
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%			
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%			
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求				
	Leakage Current 泄露电流	initial specified value or less 不超过标准值			

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~50k
10~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.15	1.47
315~450V		0.8	1	1.15	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-40	60	70	105
Factor	1.37	1.3	1.18	1.00

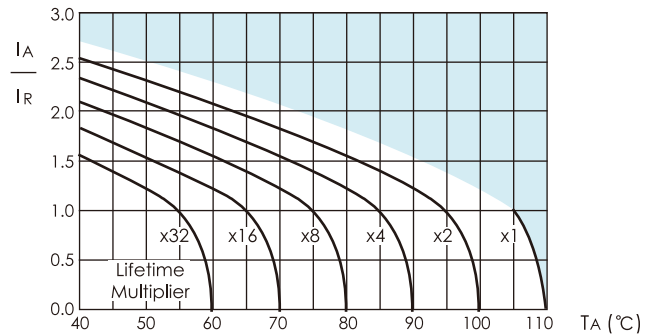
Ratings for CD291SS Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
10 (13)	4700	155	109	0.98	22×20	
	5600	130	91	1.16	25×20	
	6800	107	75	1.31	25×20	
	8200	89	62	1.59	30×20	
	10000	73	51	1.77	30×20	
16 (20)	3300	201	141	1.06	22×20	
	3900	170	119	1.25	25×20	
	4700	141	99	1.38	25×20	
	5600	119	83	1.68	30×20	
	6800	98	68	1.80	30×20	
25 (32)	2200	271	190	0.98	22×20	
	2700	221	155	1.08	25×20	
	3300	181	127	1.29	25×20	
	3900	153	107	1.58	30×20	
	4700	127	89	1.61	30×20	
35 (44)	1500	354	248	0.80	22×20	
	1800	295	206	0.94	25×20	
	2200	241	169	1.04	25×20	
	2700	197	138	1.29	30×20	
50 (63)	3300	161	113	1.45	30×20	
	1000	464	325	0.87	22×20	
	1200	387	271	1.02	25×20	
	1500	310	217	1.15	25×20	
63 (79)	1800	258	181	1.34	30×20	
	2200	211	148	1.60	30×20	
	680	585	410	0.83	22×20	
	820	486	340	0.99	25×20	
	1000	398	279	1.10	25×20	
80 (100)	1200	332	232	1.20	30×20	
	1500	265	186	1.47	30×20	
	1800	221	155	1.52	30×20	
	470	706	494	0.65	22×20	
	560	592	415	0.70	22×20	
	680	488	342	0.84	25×20	
100 (125)	820	405	283	1.04	30×20	
	1000	332	232	1.19	30×20	
	1200	277	194	1.44	30×20	
	330	804	563	0.60	22×20	
	390	681	476	0.71	25×20	
	470	565	395	0.78	25×20	
160 (200)	560	474	332	0.95	30×20	
	680	390	273	1.09	30×20	
	820	324	227	1.32	30×20	
	120	1659	1161	0.53	22×20	
	150	1327	929	0.59	22×20	
	180	1106	774	0.70	25×20	
220	905	633	0.75	25×20		
	270	737	516	0.95	30×20	
	330	603	422	1.05	30×20	

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- cance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
180 (225)	100	1990	1393	0.50	22×20	
	120	1659	1161	0.54	22×20	
	150	1327	929	0.63	25×20	
	180	1106	774	0.70	25×20	
	220	905	633	0.85	30×20	
	270	737	516	0.95	30×20	
200 (250)	100	1990	1393	0.51	22×20	
	120	1659	1161	0.56	22×20	
	150	1327	929	0.65	25×20	
	180	1106	774	0.78	30×20	
	220	905	633	0.85	30×20	
	270	737	516	0.95	30×20	
250 (300)	68	2927	2049	0.39	22×20	
	82	2427	1699	0.45	22×20	
	100	1990	1393	0.59	25×20	
	120	1659	1161	0.62	25×20	
	150	1327	929	0.76	30×20	
	180	1106	774	0.79	30×20	
350 (400)	47	7058	4941	0.28	22×20	
	56	5924	4147	0.34	25×20	
	68	4879	3415	0.39	25×20	
	82	4046	2832	0.45	30×20	
	100	3317	2322	0.49	30×20	
400 (450)	39	8506	5954	0.27	22×20	
	47	7058	4941	0.31	25×20	
	56	5924	4147	0.34	25×20	
	68	4879	3415	0.40	30×20	
	82	4046	2832	0.45	30×20	
450 (500)	33	10053	7037	0.25	22×20	
	39	8506	5954	0.28	25×20	
	47	7058	4941	0.31	25×20	
	56	5924	4147	0.36	30×20	
	68	4879	3415	0.40	30×20	

Customer products are available on request.

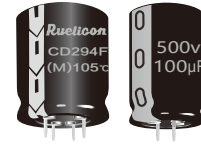
Lifetime Diagram



I<sub>a</sub> = actual ripple current at 120Hz, I<sub>r</sub> = rated ripple current at 120Hz, 105°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD294F Series (Lug/Snap Terminal Type插入/自立型, Wide Temperature宽温度)

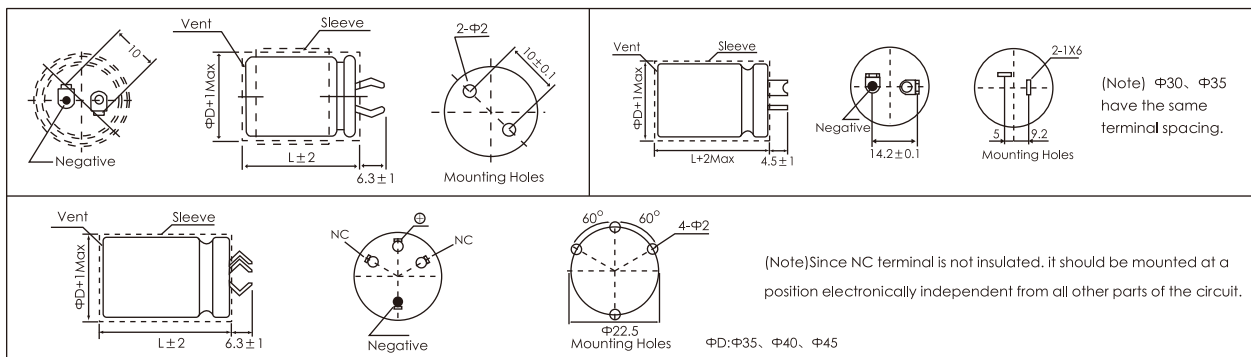
- 3000-5000h at 105°C
- Negative Temperature 层叠电路使用
- Low Impedance, Negative temperature characteristic 低阻抗 负温特性
- High ripple current 高纹波电流
- SMPS, UPS 开关电源和应急电源、逆变电源
- ◆ SPECIFICATIONS (技术性能)



Item项目	Performance Characteristics 性能									
Operating temperature range 温度范围	-55 to +105°C	-40 to +105°C								
Rated Working Voltage Range 电压范围	10 to 100V	160 to 550V								
Nominal Capacitance Range 容量范围	47 to 22000µF									
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)									
Leakage Current 泄漏电流	I ≤ 0.03CV or 3mA whichever is smaller after 5minutes application of rated working voltage at +20°C 两者取较小值, 施加额定电压5分钟测试									
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~550								
	Tan δ(max)	0.55 0.50 0.45 0.35 0.30 0.30 0.25 0.20 0.15 0.20								
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz									
	Working Voltage(V)	10 16 25 35 50 63 80 100 160~250 315~550								
	Z-25°C/Z+20°C	6 6 6 6 4 3 3 3 8 8								
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 3000~5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压 3000~5000小时后, 符合以下要求:									
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%								
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%								
	Leakage Current 泄露电流	initial specified value or less 不超过标准值								
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求									
	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%								
	Dissipation Factor 损耗角	Not more than 150% of the specified value 不超过标准值的150%								
	Leakage Current 泄露电流	initial specified value or less 不超过标准值								

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10~30k
10~100V		0.9	1	1.15	1.25
160~250V		0.8	1	1.25	1.47
315~550V		0.8	1	1.30	1.47

(2) Temperature Coefficient (温度系数)

Temperature (°C)	-55	65	85	105
Factor	2.00	1.89	1.52	1.00

Ratings for CD294F Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capaci- tance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
10 (13)	10000	106	74	2.5	22×25	
	12000	89	62	2.7	22×25	
	15000	71	50	3.2	22×30	
		71	50	3.1	25×25	
	18000	59	41	3.6	22×35	
		59	41	3.6	25×30	
	22000	48	34	4	22×40	
		48	34	4.1	25×35	
		48	34	4.1	30×25	
	16 (20)	8200	97	68	2.2	22×25
10000		80	56	2.6	22×30	
		80	56	2.6	25×25	
12000		66	46	2.9	22×35	
15000		53	37	3.3	22×40	
		53	37	3.3	25×30	
		53	37	3.4	30×25	
18000		44	31	3.8	22×45	
		44	31	3.7	25×35	
		36	25	4.2	22×50	
22000	36	25	4.2	25×40		
	36	25	4.2	30×30		
	36	25	4.4	35×25		
	36	25	4.4	35×25		
25 (32)	5600	119	83	2	22×25	
	6800	98	68	2.3	22×30	
		98	68	2.3	25×25	
	8200	81	57	2.6	22×35	
	10000	66	46	2.9	22×40	
		66	46	2.8	25×30	
		66	46	3	30×25	
	12000	55	39	3.3	22×45	
		55	39	3.2	25×35	
		55	39	3.4	30×30	
	15000	44	31	3.7	25×40	
		44	31	3.9	35×25	
		37	26	4.3	25×50	
	18000	37	26	4.2	30×35	
37		26	4.4	35×30		
30		21	4.8	30×40		
22000	30	21	5	35×35		
35 (44)	3300	161	113	1.8	22×25	
	3900	136	95	2.1	22×30	
	4700	113	79	2.2	25×25	
	5600	95	66	2.3	22×35	
		95	66	2.3	25×30	
		78	55	2.9	22×40	
	6800	78	55	2.6	25×35	
		78	55	2.7	30×25	
		65	45	2.8	22×50	
	8200	65	45	2.8	25×40	
		65	45	2.8	30×30	
		65	45	2.9	35×25	
	10000	53	37	3.1	25×45	
		53	37	3.2	30×35	
		44	31	3.5	25×50	
	12000	44	31	3.5	30×40	
		44	31	3.6	35×30	
		35	25	4.1	30×45	
15000	35	25	4.1	35×35		
	30	21	4.6	30×50		
	30	21	4.7	35×40		
22000	24	17	5.3	35×45		
2200	181	127	1.7	22×25		
50 (63)	2700	147	103	1.9	22×30	
	147	103	1.9	25×25		
	3300	121	85	2.0	22×30	
	3900	102	72	2.1	22×35	
		102	72	2.1	25×30	
	4700	102	72	2.4	30×25	
		85	59	2.4	22×40	
		85	59	2.4	25×35	
	5600	71	50	2.5	22×50	
		71	50	2.5	25×40	
		71	50	2.6	35×25	
	6800	59	41	2.8	25×45	
		59	41	2.8	30×35	
	8200	49	34	3.2	25×50	
		49	34	3	30×40	
		49	34	3	35×30	
	10000	40	28	3.4	30×45	
		40	28	3.4	35×35	
12000	33	23	3.8	30×50		
	33	23	3.8	35×40		
15000	27	19	4.5	35×50		

U <sub>R</sub> (Surge Voltage) Code	Rated Capaci- tance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
63 (79)	1500	177	124	1.6	22×25	
	1800	147	103	1.8	22×25	
	2200	121	84	2	22×30	
		121	84	2	25×25	
	2700	98	69	2.2	22×35	
		98	69	2.3	25×30	
	3300	80	56	2.3	22×40	
		80	56	2.3	25×35	
		80	56	2.3	30×25	
	3900	68	48	2.5	22×45	
		68	48	2.6	25×40	
		68	48	2.6	30×30	
		68	48	2.7	35×25	
	4700	57	40	2.9	30×30	
	5600	47	33	3.1	25×45	
		47	33	3.2	30×35	
	6800	47	33	3.3	35×30	
		39	27	3.6	30×40	
	8200	39	27	3.7	35×35	
		32	23	3.7	30×50	
10000	32	23	3.8	35×40		
	27	19	4.3	35×45		
12000	22	16	4.8	35×50		
1000	265	186	1.3	22×25		
1200	221	155	1.5	22×30		
1500	177	124	1.7	25×25		
1800	147	103	1.9	22×35		
	147	103	1.9	25×30		
2200	121	84	2.1	22×40		
	121	84	2.2	25×35		
	121	84	2.2	30×25		
2700	98	69	2.5	22×50		
	98	69	2.5	25×40		
	98	69	2.5	30×30		
	98	69	2.5	35×25		
3300	80	56	2.8	25×45		
	80	56	2.8	30×35		
3900	68	48	3.1	25×50		
	68	48	3.2	30×40		
4700	68	48	3.2	35×30		
	57	40	3.6	30×45		
	57	40	3.6	35×35		
5600	47	33	3.8	30×50		
	47	33	3.8	35×40		
6800	39	27	4.1	35×50		
680	390	273	1.1	22×25		
820	324	227	1.2	22×30		
1000	265	186	1.4	25×25		
1200	221	155	1.6	22×35		
	221	155	1.6	25×30		
1500	177	124	1.8	22×40		
	177	124	1.7	25×35		
	177	124	1.8	30×25		
1800	147	103	2.1	22×50		
	147	103	2	25×40		
	147	103	2.1	30×30		
	147	103	2.2	35×25		
2200	121	84	2.2	25×45		
	121	84	2.3	30×35		
	121	84	2.5	35×30		
2700	98	69	2.6	25×50		
	98	69	2.7	30×40		
3300	80	56	3	30×45		
	80	56	3.1	35×35		
3900	68	48	3.4	30×50		
	68	48	3.4	35×40		
4700	57	40	4	35×50		
220	905	633	1.0	22×25		
270	737	516	1.1	22×25		
330	603	422	1.3	22×25		
390	510	357	1.5	22×30		
	510	357	1.5	25×25		
470	424	297	1.7	25×25		
	355	249	1.9	22×35		
	355	249	1.9	25×30		
560	355	249	2	30×25		
	293	205	2.1	22×40		
680	293	205	2.2	25×35		
	243	170	2.5	22×50		
	243	170	2.4	25×40		
820	243	170	2.5	30×30		
	243	170	2.4	35×25		
	199	139	2.7	25×45		
1000	199	139	2.8	30×35		
	199	139	2.7	35×30		

Ratings for CD294F Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注		
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)			
160 (200)	1200	166	116	3.1	25 x 50			
		166	116	3.2	30 x 40			
		166	116	3	35 x 35			
	1500	133	93	3.7	30 x 45			
		133	93	3.5	35 x 40			
		1800	111	77	3.9	35 x 45		
2200	91	63	4.5	35 x 50				
180 (225)	270	737	516	1.2	22 x 25			
		330	603	422	1.4	22 x 30		
		390	510	357	1.5	25 x 25		
	470	424	296	1.7	22 x 35			
		424	296	1.7	25 x 30			
		424	296	1.8	30 x 25			
	560	355	249	1.9	22 x 40			
		355	249	2	25 x 35			
		293	205	2.3	22 x 50			
	680	293	205	2.2	25 x 40			
		293	205	2.3	30 x 30			
		293	205	2.2	35 x 25			
	820	243	170	2.5	25 x 45			
		243	170	2.6	30 x 35			
		243	170	2.5	35 x 30			
	1000	199	139	2.9	25 x 50			
		199	139	2.9	30 x 40			
		1200	166	116	3.3	30 x 45		
	166		116	3.1	35 x 35			
	1500		133	93	3.6	35 x 45		
	1800	111	77	4.1	35 x 50			
	200 (250)	220	905	633	1.1	22 x 25		
			270	737	516	1.2	22 x 25	
			330	603	422	1.4	22 x 30	
390		603	422	1.4	25 x 25			
		510	357	1.6	22 x 35			
		510	357	1.6	25 x 30			
470		424	296	1.8	22 x 40			
		424	296	1.9	30 x 25			
		560	355	249	2	22 x 45		
355			249	2	25 x 35			
355			249	2.1	30 x 30			
680		355	249	2	35 x 25			
		293	205	2.3	25 x 40			
		293	205	2.4	30 x 35			
820		243	170	2.6	25 x 50			
		243	170	2.7	30 x 40			
		243	170	2.5	35 x 30			
1000		199	139	3.1	30 x 45			
		199	139	2.8	35 x 35			
		1200	166	116	3.4	30 x 50		
166			116	3.2	35 x 40			
1500			133	93	3.8	35 x 50		
250 (300)		180	1106	774	0.94	22 x 25		
			220	905	633	1.1	22 x 30	
	270		905	633	1.1	25 x 25		
	330	737	516	1.2	22 x 35			
		603	422	1.4	22 x 40			
		603	422	1.4	25 x 30			
	390	603	422	1.5	30 x 25			
		510	357	1.6	22 x 45			
		510	357	1.6	25 x 35			
	470	424	296	1.8	22 x 50			
		424	296	1.8	25 x 40			
		424	296	1.8	30 x 30			
	560	424	296	1.9	35 x 25			
		355	249	2	25 x 45			
		355	249	2	30 x 35			
	680	293	205	2.3	30 x 40			
		293	205	2.4	35 x 30			
		243	170	2.6	30 x 45			
	820	243	170	2.6	35 x 35			
		199	139	3	35 x 40			
		1200	166	116	3.4	35 x 45		
	315 (365)	100	1990	1393	0.67	22 x 25		
			120	1659	1161	0.75	22 x 30	
			150	1327	929	0.85	22 x 30	
1327		929		0.85	25 x 25			
180		1106		774	0.96	22 x 35		
		1106	774	0.96	25 x 30			
		220	905	633	1.1	22 x 40		
905			633	1.1	25 x 35			
905			633	1.1	30 x 25			
270		737	516	1.2	22 x 45			
		737	516	1.3	25 x 40			
		737	516	1.3	30 x 30			
737		516	1.3	35 x 25				

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注	
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)		
315 (365)	330	603	422	1.4	25 x 45		
		603	422	1.4	30 x 35		
		510	357	1.6	25 x 50		
	390	510	357	1.6	30 x 40		
		510	357	1.6	35 x 30		
		470	424	296	1.8	30 x 45	
	560	424	296	1.8	35 x 35		
		355	249	2	30 x 50		
		355	249	2	35 x 40		
	680	293	205	2.3	35 x 45		
	350 (400)	82	2427	1699	0.64	22 x 25	
			100	1990	1393	0.72	22 x 25
120			1659	1161	0.82	22 x 30	
150		1659	1161	0.81	25 x 25		
		1327	929	0.94	22 x 35		
		1327	929	0.94	25 x 30		
180		1106	774	1.1	22 x 40		
		1106	774	1.1	30 x 25		
		905	633	1.2	22 x 45		
220		905	633	1.2	25 x 35		
		905	633	1.2	30 x 30		
		905	633	1.3	35 x 25		
270	737	516	1.4	25 x 45			
	737	516	1.4	30 x 35			
	330	603	422	1.6	25 x 50		
603		422	1.6	35 x 30			
510		357	1.7	30 x 40			
390	510	357	1.8	35 x 35			
	470	424	296	2	30 x 45		
	424	296	2	35 x 40			
400 (450)	560	355	249	2.3	35 x 45		
		680	293	205	2.6	35 x 50	
		68	2927	2049	0.55	22 x 25	
	82	2427	1699	0.6	22 x 25		
		100	1990	1393	0.7	22 x 30	
		100	1990	1393	0.7	25 x 25	
	120	1659	1161	0.79	22 x 35		
		1327	929	0.9	22 x 40		
		1327	929	0.89	25 x 30		
	150	1327	929	0.95	30 x 25		
		1106	774	1	22 x 45		
		1106	774	1	25 x 35		
180	1106	774	1.1	30 x 30			
	1106	774	1.2	35 x 25			
	905	633	1.1	22 x 50			
220	905	633	1.2	25 x 40			
	905	633	1.2	30 x 35			
	737	516	1.3	25 x 45			
270	737	516	1.4	30 x 40			
	737	516	1.6	35 x 30			
	330	603	422	1.6	30 x 45		
603		422	1.7	35 x 35			
510		357	1.8	30 x 50			
390	510	357	1.8	35 x 40			
	470	424	296	2.1	35 x 45		
	560	355	249	2.3	35 x 50		
420 (470)	680	293	235	2.7	35 x 55		
		820	242	194	3.1	35 x 60	
		242	194	3.1	40 x 50		
	1000	199	139	3.8	35 x 70		
		68	2927	1522	0.56	22 x 25	
		82	2427	1262	0.62	22 x 30	
	120	100	1990	1035	0.71	22 x 35	
		1659	863	0.80	22 x 40		
		1659	863	0.81	25 x 30		
	150	1327	690	0.92	22 x 45		
		1327	690	0.93	25 x 35		
		180	1106	575	1.1	25 x 40	
1106	575		1.1	30 x 30			
220	905		471	1.2	25 x 45		
	905	471	1.3	30 x 35			
	270	737	383	1.3	25 x 50		
737		383	1.4	30 x 40			
330		603	314	1.6	30 x 45		
	603	314	1.6	35 x 35			
	390	510	265	1.9	30 x 50		
470		424	220	2.2	35 x 45		
560		355	185	2.4	35 x 50		
680	293	153	2.8	35 x 55			
820	242	126	3.2	35 x 60			

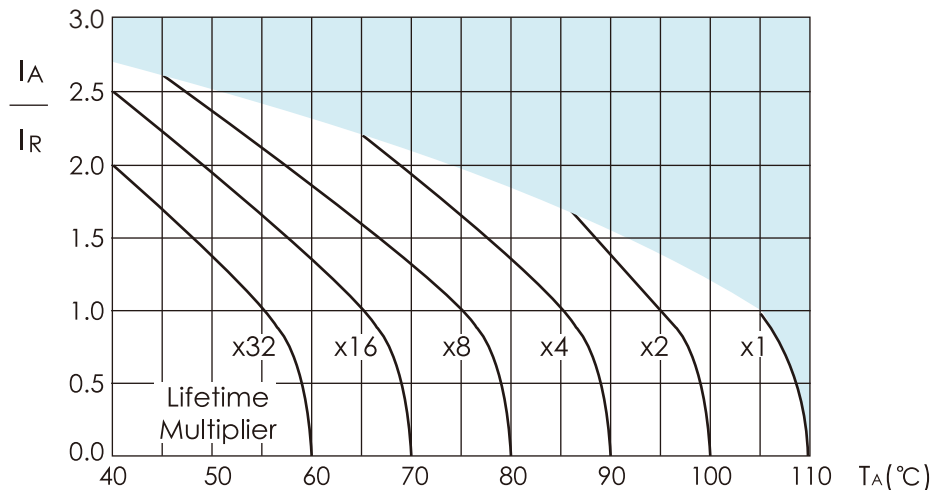
Ratings for CD294F Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
450 (500)	68	2927	2049	0.57	22 x 30	
	82	2427	1699	0.64	22 x 35	
	100	1990	1393	0.72	22 x 35	
		1990	1393	0.73	25 x 30	
	120	1659	1161	0.8	22 x 40	
		1659	1161	0.83	25 x 35	
	150	1327	929	0.95	22 x 50	
		1327	929	0.95	25 x 40	
		1327	929	0.98	30 x 30	
	180	1106	774	1.1	25 x 45	
		1106	774	1.1	30 x 35	
		1106	774	1.2	35 x 25	
	220	905	633	1.2	25 x 50	
		905	633	1.3	30 x 40	
		905	633	1.3	35 x 30	
	270	737	516	1.4	30 x 45	
		737	516	1.5	35 x 35	
	330	603	423	1.7	30 x 50	
	390	510	357	1.9	35 x 45	
	470	424	296	2.2	35 x 50	
560	356	285	2.4	35 x 55		
680	293	235	2.8	35 x 60		
	293	235	2.8	40 x 50		
820	242	194	3.2	35 x 65		
	242	194	3.3	40 x 60		
1000	199	139	3.9	35 x 75		
500 (550)	100	1990	1592	0.90	25 x 30	
		1990	1592	0.88	30 x 25	
	120	1658	1327	1.0	25 x 35	
		1658	1327	1.0	30 x 30	
	150	1327	1062	1.2	25 x 40	
		1327	1062	1.2	30 x 35	
	180	1106	885	1.4	30 x 40	
		1106	885	1.3	35 x 30	
	220	905	724	1.6	30 x 45	
		905	724	1.5	35 x 35	
	270	737	590	1.8	30 x 50	
		737	590	1.7	35 x 40	
	330	603	483	2.0	30 x 50	
		603	483	1.9	35 x 45	
	390	511	409	2.3	35 x 50	
	470	424	339	2.5	35 x 60	
560	356	285	2.8	35 x 65		
680	293	235	3.2	35 x 70		
550 (550)	47	5647	2823	0.41	22 x 30	
	56	4739	2370	0.47	22 x 35	
	68	3903	1951	0.54	22 x 35	
		3903	1951	0.54	25 x 30	
	82	3237	1618	0.62	22 x 45	
		3237	1618	0.62	25 x 35	
	100	2654	1327	0.67	22 x 45	
		2654	1327	0.67	25 x 40	
		2654	1327	0.67	30 x 30	
	120	2212	1106	0.77	22 x 50	
		2212	1106	0.74	25 x 40	
		2212	1106	0.77	30 x 35	
		2212	1106	0.80	35 x 30	
	150	1769	885	0.82	25 x 50	
		1769	885	0.85	30 x 40	
		1769	885	0.85	35 x 35	
	180	1474	737	1.06	25 x 50	
		1474	737	1.06	30 x 45	
	220	1206	603	1.18	30 x 50	
		1206	603	1.18	35 x 40	
270	983	492	1.31	30 x 50		
	983	492	1.31	35 x 45		
330	804	402	1.5	35 x 50		
470	565	282	1.95	35 x 70		

Customer products are available on request.

Ratings for CD294F Series

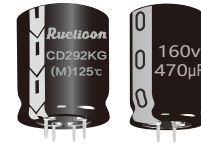
Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
 Multiplier of Useful Life as a function of ambient temperature and ripple current load

**CD292KG Series (High temperature 耐高温 Long Life Assurance 长寿命 High Righ Current高纹波)**

- 2000h at 125°C
- High ripple current at high frequency, Load Life (Load Life of 10000h at 105°C)  
高频高纹波电流, 寿命125°C 2000小时 (105°C 10000小时)
- For automotive electrical equipment, LED lighting, Hith temperature service  
适用于汽车电器、LED照明、高温设备

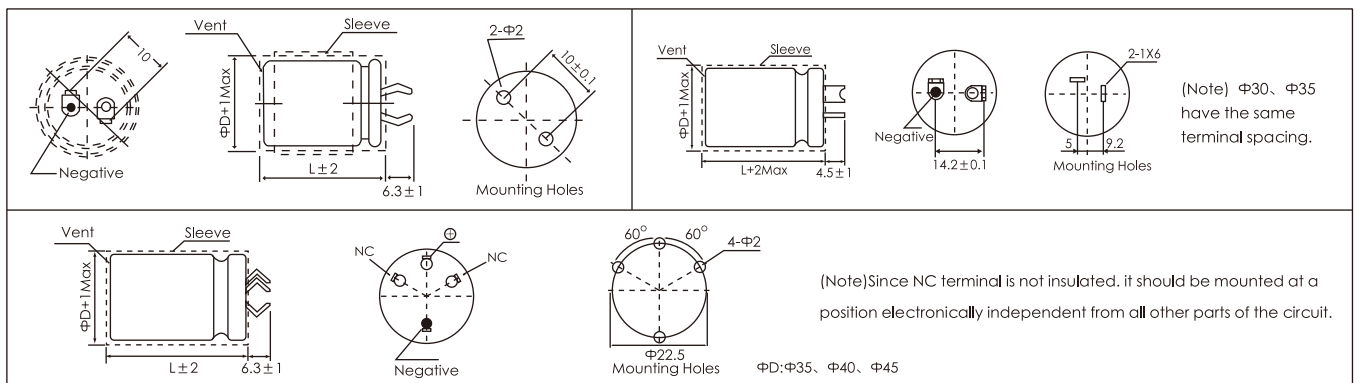


◆SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能		
Operating temperature range 温度范围	-25 to +125°C		
Rated Working Voltage Range 电压范围	160 to 450V		
Nominal Capacitance Range 容量范围	47 to 2200µF		
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)		
Leakage Current 泄漏电流	≤0.01CV or 3(µA) after 2minutes whichever is greater measured with rated working voltage applied at +20 °C 两者取较大值, 2分钟测试	≤0.03CV (µA) after 2minutes application of rated working vlotage at +20 °C 2分钟测试	
Dissipation Factor tan δ(120Hz,+20°C) 损耗角正切值	Rated Voltage(V)	160~250    400~450	
	Tan δ(max)	0.15    0.20	
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz		
	Rated Voltage(V)	160~250	400    450
	Z-25°C/Z+20°C	3	6    6
	Z-40°C/Z+20°C	-	-    -
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 125°C The capacitors shall meet the following requirements. 在125°C环境下施加额定电压2000小时后, 符合以下要求:		
	Capacitance Change容量	Within ±30% of initial value 在初始值的±30%	
	Dissipation Factor 损耗角	Not more than 300% of the specified value 不超过标准值的300%	
	Leakage Current 泄露电流	initial specified value or less 不超过标准值	
	Life Time: 试验时间		
	Ambient temp	125°C	105°C
	Life(H)	2000	4000
High Temperature Shelf Life 高温贮存	After leving capacitors under no load at 125°C for 500 hours(at 105°C for 1000 hours). the capacitors shall meet the same requirement as Endurance. 在125°C环境下不加负载放置500小时后(105°C 1000小时后) 电性能同耐久性要求		

Dimensions

mm



◆RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1)Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	120	300	1k	10k~	100k~
<100		0.30	0.55	0.7	0.90	1.00
≥100		0.40	0.60	0.75	0.90	1.00

(2) Tmperature Coefficient (温度系数)

Temperature (°C)	-55	65	85	105	125
Factor	2.4	2.10	1.75	1.65	1.00



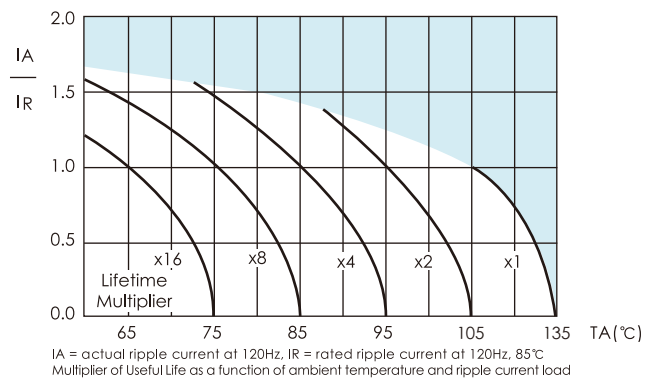
Ratings for CD292KCT Series

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
160 (200)	330	603	355	1.5	22x25	
	390	510	300	1.6	25x25	
	470	424	245	1.8	22x35	
	560	355	215	2.1	22x35	
		355	215	2.2	25x30	
		355	215	2.1	30x25	
	680	293	178	2.6	22x40	
		293	178	2.5	25x35	
	820	243	145	2.8	22x50	
		243	145	2.7	25x40	
		243	145	2.9	30x30	
		243	145	2.8	35x25	
	1000	199	115	3.3	25x45	
		199	115	3.4	30x35	
		199	115	3.3	35x30	
	1200	166	95	3.7	25x50	
		166	95	3.8	30x40	
		166	95	3.6	35x35	
	1500	133	75	4.4	30x45	
		133	75	4.3	35x40	
1800	111	75	4.4	35x45		
2200	91	58	4.9	35x50		
200 (250)	220	905	375	1.2	22x25	
	330	603	258	1.5	22x30	
		603	258	1.6	25x25	
	390	510	221	1.8	22x35	
		510	221	1.8	25x30	
	470	424	175	2	22x40	
		424	175	2.1	30x25	
	560	355	150	2.2	22x45	
		355	150	2.2	25x35	
		355	150	2.3	30x30	
		355	150	2.2	35x25	
	680	293	128	2.6	25x40	
		293	128	2.4	30x30	
	820	243	105	2.7	25x50	
		243	105	2.8	30x40	
		243	105	2.6	35x30	
	1000	199	80	3.4	30x40	
		199	80	3.6	35x35	
	1200	166	70	3.8	30x50	
		166	70	3.7	35x40	
1500	133	55	4.2	35x50		
250 (300)	150	1327	550	0.92	22x25	
	180	1106	470	0.98	22x25	
	220	905	370	1.25	22x30	
		905	370	1.25	25x25	
	270	737	370	1.25	22x35	
	330	603	250	1.64	22x40	
		603	255	1.64	25x30	
		603	255	1.64	30x25	
	390	510	250	1.9	22x45	
		510	250	1.9	25x35	
	470	424	175	2.2	22x50	
		424	175	2.2	25x40	
		424	175	2.2	30x30	
		424	175	2.2	35x25	
	560	355	150	2.4	25x45	
		355	150	2.4	30x35	
	680	293	123	2.8	30x40	
		293	123	2.8	35x30	
	820	243	105	3.2	30x45	
		243	105	3.2	35x35	
1000	199	80	3.7	35x40		
1200	166	70	4.1	35x45		
1500	133	60	4.6	35x50		

U <sub>R</sub> (Surge Voltage) Code	Rated Capa- citance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
400 (450)	68	2342	960	0.62	22x25	
	100	1592	600	0.81	22x30	
		1592	600	0.83	25x25	
	120	1327	550	0.93	22x35	
	150	1062	440	1.2	22x40	
		1062	440	1.2	25x30	
		1062	440	1.2	30x25	
	180	885	360	1.3	22x45	
		885	360	1.3	25x35	
		885	360	1.3	30x30	
		885	180	1.3	35x25	
	220	724	300	1.5	22x50	
		724	300	1.5	25x40	
		724	300	1.5	30x35	
	270	590	240	1.7	25x45	
		590	240	1.7	30x40	
		590	240	1.7	35x30	
	330	483	200	2.1	30x45	
		483	200	2.1	35x35	
	390	408	170	2.3	30x50	
408		170	2.3	35x40		
470	339	140	2.7	35x45		
560	284	110	3	35x50		
450 (500)	47	3388	2800	0.52	22x25	
	68	2342	1940	0.66	22x30	
		2342	1940	0.66	25x25	
	100	1592	1310	0.9	22x35	
		1592	1310	0.9	25x30	
	120	1327	910	1.1	22x40	
		1327	910	1.1	25x35	
	150	1062	880	1.3	22x50	
		1062	880	1.3	25x40	
		1062	880	1.3	30x30	
	180	885	740	1.4	25x45	
		885	740	1.4	30x35	
		885	740	1.4	35x25	
	220	724	590	1.6	25x50	
		724	590	1.6	30x40	
		724	590	1.6	35x30	
	270	590	490	1.9	30x45	
		590	490	1.9	35x35	
	330	483	395	2.2	35x40	
	390	408	300	2.4	35x45	
470	339	280	2.8	35x50		

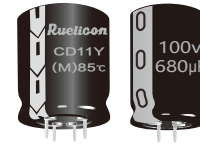
Customer products are available on request.

Lifetime Diagram



## CD11Y Series (Lug/Snap-In Terminal Type 插入/自立型, For Audio 音响电容)

- 2000h at 85°C
- Designed for high grade audio equipment, giving priority to high sound quality.  
专为高档音响设备, 高音质产品
- Suit for use in mini-compos, CD, DAT players, cassette decks and etc.  
用于 mini-compos, CD, DAT

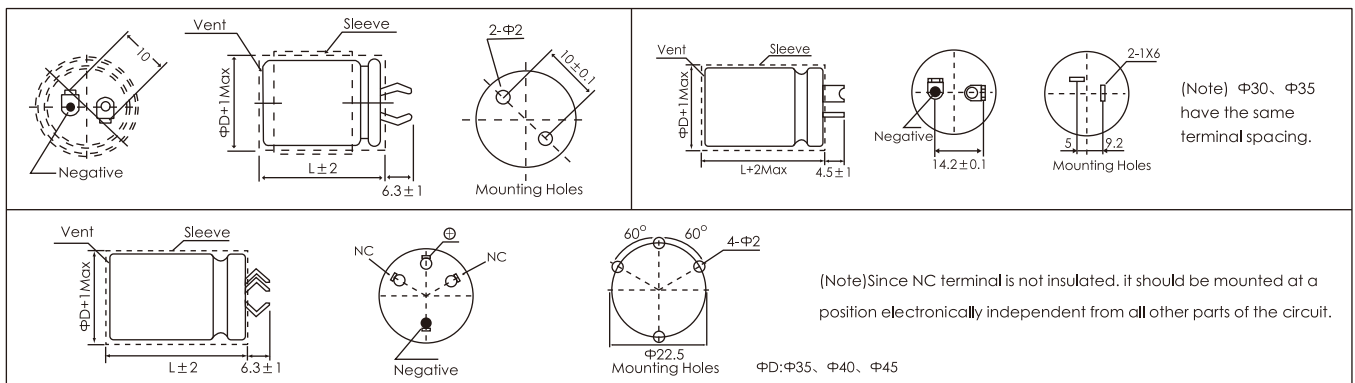


### ◆ SPECIFICATIONS (技术性能)

Item 项目	Performance Characteristics 性能			
Operating temperature range 温度范围	-40 to +85°C			
Rated Working Voltage Range 电压范围	10 to 100V			
Nominal Capacitance Range 容量范围	680 to 22000µF			
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)			
Leakage Current 泄漏电流	$I \leq 0.01CV$ or 3mA whichever is smaller after 5 minutes application of rated working voltage at +20°C 两者取较大值, 施加额定电压5分钟测试			
Dissipation Factor $\tan \delta$ (120Hz, +20°C) 损耗角正切值	Rated Voltage(V)	10~16	25~63	80~100
	Tan $\delta$ (max)	0.30	0.25	0.22
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz			
	Rated Voltage(V)	10~100		
	Z-25°C/Z+20°C	4		
Z-40°C/Z+20°C	12			
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压2000小时后, 符合以下要求:			
	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%		
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%		
	Leakage Current 泄露电流	initial specified value or less 不超过标准值		
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求			

### Dimensions

mm



### ◆ RIPPLE CURRENT MULTIPLIER (纹波电流修正系数)

(1) Frequency Coefficient (频率系数)

cap(µf)	freq. (Hz)	60	120	1k	10k
10~100		0.9	1.0	1.15	1.25

(2) Temperature Coefficient (温度系数)

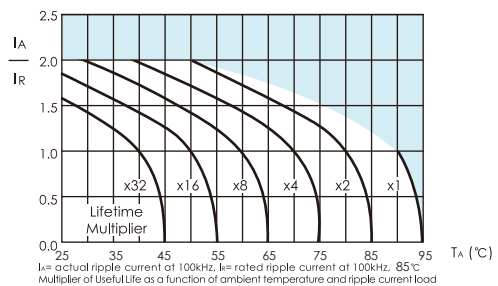
Temperature (°C)	-55	65	70	85
Factor	1.65	1.5	1.3	1.0

Ratings for CD11Y Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
10 (13)	10000	106	74	2.5	22×25	
	12000	89	62	2.7	22×25	
	15000	71	50	3.2	22×30	
		71	50	3.1	25×25	
	18000	59	41	3.6	22×35	
		59	41	3.6	25×30	
	22000	48	34	4	22×40	
		48	34	4.1	25×35	
		48	34	4.1	30×25	
	16 (20)	8200	97	68	2.2	22×25
10000		80	56	2.6	22×30	
		80	56	2.6	25×25	
12000		66	46	2.9	22×35	
		53	37	3.3	22×40	
15000		53	37	3.3	25×30	
		53	37	3.4	30×25	
18000		44	31	3.8	22×45	
		44	31	3.7	25×35	
22000		36	25	4.2	22×50	
	36	25	4.2	25×40		
	36	25	4.2	30×30		
	36	25	4.4	35×25		
	36	25	4.4	35×25		
	36	25	4.4	35×25		
25 (32)	5600	119	83	2	22×25	
	6800	98	68	2.3	22×30	
		98	68	2.3	25×25	
	8200	81	57	2.6	22×35	
		66	46	2.9	22×40	
	10000	66	46	2.8	25×30	
		66	46	3	30×25	
		55	39	3.3	22×45	
	12000	55	39	3.2	25×35	
		55	39	3.4	30×30	
15000	44	31	3.7	25×40		
	44	31	3.9	35×25		
	37	26	4.3	25×50		
	37	26	4.2	30×35		
18000	37	26	4.4	35×30		
	30	21	4.8	30×40		
22000	30	21	5	35×35		
	30	21	5	35×35		
35 (44)	3300	161	113	1.8	22×25	
	3900	136	95	2.1	22×30	
	4700	113	79	2.2	25×25	
		95	66	2.3	22×35	
	5600	95	66	2.3	25×30	
		78	55	2.9	22×40	
	6800	78	55	2.6	25×35	
		78	55	2.7	30×25	
		65	45	2.8	22×50	
	8200	65	45	2.8	25×40	
65		45	2.8	30×30		
65		45	2.9	35×25		
10000	53	37	3.1	25×45		
	53	37	3.2	30×35		
12000	44	31	3.5	25×50		
	44	31	3.5	30×40		
	44	31	3.6	35×30		
	35	25	4.1	30×45		
15000	35	25	4.1	35×35		
	30	21	4.6	30×50		
18000	30	21	4.7	35×40		
	24	17	5.3	35×45		
50 (63)	2200	181	127	1.7	22×25	
	2700	147	103	1.9	22×30	
		147	103	1.9	25×25	
	3300	121	85	2.0	22×30	
		102	72	2.1	22×35	
	3900	102	72	2.1	25×30	
		102	72	2.4	30×25	
	4700	85	59	2.4	22×40	
		85	59	2.4	25×35	
	5600	71	50	2.5	22×50	
71		50	2.5	25×40		
71		50	2.5	30×30		
6800	71	50	2.6	35×25		
	59	41	2.8	25×45		
8200	59	41	2.8	30×35		
	49	34	3.2	25×50		
10000	49	34	3	30×40		
	49	34	3	35×30		
12000	40	28	3.4	30×45		
	40	28	3.4	35×35		
15000	33	23	3.8	30×50		
	33	23	3.8	35×40		
15000	27	19	4.5	35×50		

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- citan- ce	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
63 (79)	1500	177	124	1.6	22×25	
	1800	147	103	1.8	22×25	
		121	84	2	22×30	
	2200	121	84	2	25×25	
		98	69	2.2	22×35	
	2700	98	69	2.3	25×30	
		80	56	2.3	22×40	
	3300	80	56	2.3	25×35	
		80	56	2.3	30×25	
		68	48	2.5	22×45	
3900	68	48	2.6	25×40		
	68	48	2.6	30×30		
	68	48	2.7	35×25		
	57	40	2.9	30×30		
4700	47	33	3.1	25×45		
	47	33	3.2	30×35		
	47	33	3.3	35×30		
	39	27	3.6	30×40		
5600	39	27	3.7	35×35		
	32	23	3.7	30×50		
6800	32	23	3.8	35×40		
	27	19	4.3	35×45		
8200	22	16	4.8	35×50		
	22	16	4.8	35×50		
80 (100)	1000	265	186	1.3	22×25	
	1200	221	155	1.5	22×30	
	1500	177	124	1.7	25×25	
	1800	147	103	1.9	22×35	
		147	103	1.9	25×30	
	2200	121	84	2.1	22×40	
		121	84	2.2	25×35	
		121	84	2.2	30×25	
	2700	98	69	2.5	22×50	
		98	69	2.5	25×40	
98		69	2.5	35×25		
3300	80	56	2.8	25×45		
	80	56	2.8	30×35		
3900	68	48	3.1	25×50		
	68	48	3.2	30×40		
	68	48	3.2	35×30		
4700	57	40	3.6	30×45		
	57	40	3.6	35×35		
5600	47	33	3.8	30×50		
	47	33	3.8	35×40		
6800	39	27	4.1	35×50		
	390	273	1.1	22×25		
100 (125)	820	324	227	1.2	22×30	
	1000	265	186	1.4	25×25	
	1200	221	155	1.6	22×35	
		221	155	1.6	25×30	
	1500	177	124	1.8	22×40	
		177	124	1.7	25×35	
		177	124	1.8	30×25	
	1800	147	103	2.1	22×50	
		147	103	2	25×40	
		147	103	2.1	30×30	
2200	147	103	2.2	35×25		
	121	84	2.2	25×45		
	121	84	2.3	30×35		
2700	121	84	2.5	35×30		
	98	69	2.6	25×50		
3300	98	69	2.7	30×40		
	80	56	3	30×45		
3900	80	56	3.1	35×35		
	68	48	3.4	30×50		
4700	68	48	3.4	35×40		
4700	57	40	4	35×50		

Lifetime Diagram



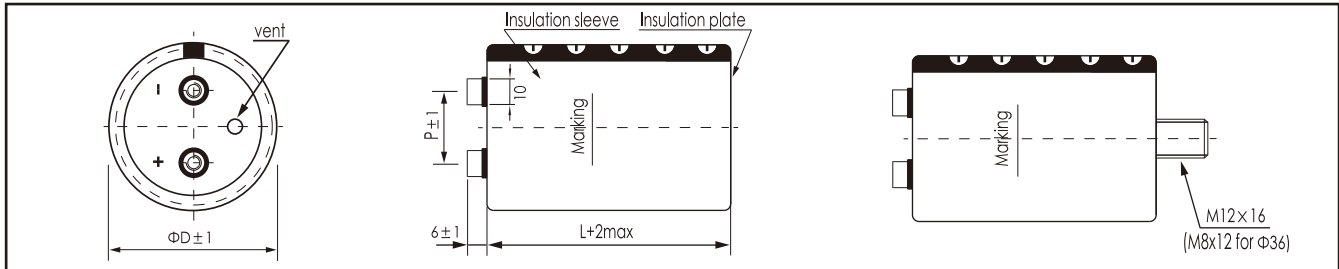
## CD135 Series (2000h screw terminal type 螺栓型, long life assurance 长寿命保证)



- 2000h at 85°C
- Features: Standard at 85°C, RoHS Compliant 特点: 在85°C正常工作, 符合RoHS标准
- Applications UPS, Drive, Inverter 应用范围: UPS, 防水, 变频器
- ♦ **SPECIFICATIONS (技术性能)**

Item 项目	Performance Characteristics 性能	
Operating temperature range 温度范围	-40 to +85°C	-25 to +85°C
Rated Working Voltage Range 电压范围	10 to 100V	160 to 500V
Nominal Capacitance Range 容量范围	470 to 820000µF	
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)	
Leakage Current 泄漏电流	≤0.01CV or 3(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试	
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz	
	Working Voltage(V)	10~100    160~500
	Z-25°C/Z+20°C	-    8
	Z-40°C/Z+20°C	12    -
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压2000小时后, 符合以下要求:	
	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%
	Leakage Current 泄露电流	initial specified value or less 不超过标准值
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求	
Other 其它	JIS C-5141 JIS C-5102	

### Dimensions



ΦD/mm	36	51	64	77	90
P/mm	12.7	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Rated Voltage(V)	Frequency(Hz)				
	50/60	120	300	1k	>10k
10~50	0.95	1.00	1.04	1.10	1.15
63~100	0.95	1.00	1.06	1.16	1.30
160~500	0.80	1.00	1.10	1.25	1.50

Ambient Temp (°C)	40	60	70	85
Coefficient	2.70	2.00	1.70	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Ratings for CD135 Series

U <sub>s</sub> (Surge Voltage) Code	Rated Capa- cance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	
10 (13)	33000	0.80	21	4.3	36×53	
	39000	0.80	18	4.7	36×53	
	47000	0.80	15	5.2	36×65	
	56000	0.80	13	6.1	36×83	
	68000	0.80	10	6.7	36×83	
	82000	0.80	9	7.7	36×100	
	100000	0.80	8	8.8	36×100	
	120000	0.80	7	10.0	36×121	
	150000	1.00	7	10.8	36×121	
	180000	1.00	6	12.0	51×96	
	220000	1.50	5	11.2	51×121	
	270000	1.50	4	12.8	51×121	
	330000	1.50	4	15.3	64×96	
	390000	1.50	3	17.3	64×115	
	470000	2.00	3	16.7	64×130	
	560000	2.00	3	19.0	77×115	
680000	2.00	3	21.7	77×130		
820000	2.00	2	24.7	77×155		
16 (20)	22000	0.60	22	4.1	36×53	
	27000	0.60	19	4.5	36×53	
	33000	0.60	16	5.0	36×53	
	39000	0.60	13	5.9	36×65	
	47000	0.60	11	6.4	36×83	
	56000	0.60	10	7.3	36×83	
	68000	0.60	8	8.4	36×100	
	82000	0.80	7	8.3	36×100	
	100000	0.80	6	9.5	36×121	
	120000	0.80	5	10.9	36×121	
	150000	1.00	4	11.3	51×96	
	180000	1.00	3	12.8	51×115	
	220000	1.00	3	15.3	51×130	
	270000	1.00	3	17.6	64×96	
	330000	1.50	3	16.8	64×115	
	390000	1.50	3	18.3	64×130	
470000	1.50	2	21.3	77×115		
560000	1.50	2	23.6	77×130		
680000	1.50	2	27.6	77×155		
820000	2.00	2	27.1	90×157		
25 (32)	15000	0.50	22	3.7	36×53	
	18000	0.50	18	4.1	36×53	
	22000	0.50	16	4.5	36×53	
	27000	0.50	13	5.0	36×65	
	33000	0.50	11	5.9	36×83	
	39000	0.50	9	6.7	36×83	
	47000	0.50	8	7.7	36×100	
	56000	0.60	7	7.9	36×100	
	68000	0.60	6	9.1	36×121	
	82000	0.60	5	10.4	36×121	
	100000	0.80	4	10.3	51×96	
	120000	0.80	4	11.7	51×115	
	150000	0.80	3	14.1	51×130	
	180000	0.80	3	15.7	64×96	
	220000	1.00	3	16.1	64×115	
	270000	1.00	3	18.6	64×130	
330000	1.00	2	21.9	64×155		
390000	1.20	2	22.0	77×115		
470000	1.20	2	25.6	77×155		
560000	1.20	2	27.9	90×131		
680000	1.20	2	32.5	90×157		
35 (44)	10000	0.40	24	3.4	36×53	
	12000	0.40	20	3.7	36×53	
	15000	0.40	17	4.2	36×65	
	18000	0.40	14	4.9	36×83	
	22000	0.40	12	5.7	36×83	
	27000	0.40	9	6.3	36×100	
	33000	0.40	9	7.2	36×100	
	39000	0.50	8	7.3	36×121	
	47000	0.50	8	8.7	51×96	
	56000	0.60	8	8.6	51×96	
	68000	0.60	6	9.8	51×115	
	82000	0.60	5	11.6	64×96	
	100000	0.60	4	13.3	64×115	
	120000	0.60	4	14.8	64×121	
	150000	0.80	4	14.9	64×130	
	180000	0.80	3	17.0	77×115	
220000	0.80	3	20.0	77×130		

U <sub>s</sub> (Surge Voltage) Code	Rated Capa- cance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	
35 (44)	270000	1.00	3	20.3	77×155	
	330000	1.00	2	23.5	90×131	
	390000	1.00	2	26.4	90×157	
	470000	1.00	2	29.6	90×157	
	5600	0.30	46	3.0	36×53	
	6800	0.30	38	3.3	36×53	
50 (63)	8200	0.30	31	3.6	36×53	
	10000	0.30	26	4.0	36×65	
	12000	0.30	22	4.7	36×83	
	15000	0.30	15	5.5	36×83	
	18000	0.30	12	6.2	36×100	
	22000	0.40	11	6.3	36×121	
	27000	0.40	10	7.1	36×121	
	33000	0.40	9	8.2	51×96	
	39000	0.50	8	8.1	51×96	
	47000	0.50	8	9.3	51×115	
	56000	0.50	6	10.5	64×96	
	68000	0.50	5	12.0	64×96	
	82000	0.50	4	13.7	64×115	
	100000	0.60	4	14.7	77×115	
	120000	0.60	3	16.7	77×115	
	150000	0.60	3	19.3	77×130	
180000	0.60	3	21.9	77×155		
220000	0.60	2	21.4	90×131		
270000	0.60	2	24.6	90×157		
63 (79)	3900	0.25	47	2.7	36×53	
	4700	0.25	39	3.0	36×53	
	5600	0.25	38	3.3	36×53	
	6800	0.25	32	3.6	36×65	
	8200	0.25	26	4.3	36×83	
	10000	0.25	23	4.9	36×83	
	12000	0.25	18	5.6	36×100	
	15000	0.30	16	5.9	36×100	
	18000	0.30	15	6.7	36×121	
	22000	0.30	13	7.8	36×121	
	27000	0.40	12	7.4	51×96	
	33000	0.40	8	8.4	51×96	
	39000	0.40	7	9.5	51×115	
	47000	0.40	6	11.3	51×130	
	56000	0.40	6	12.8	64×115	
	68000	0.50	5	12.7	64×121	
82000	0.50	4	14.5	64×130		
100000	0.50	4	16.7	77×115		
120000	0.50	3	18.9	77×130		
150000	0.50	2	22.4	77×155		
180000	0.60	2	22.4	90×131		
220000	0.60	2	26.2	90×157		
80 (100)	3300	0.25	54	2.5	36×53	
	3900	0.25	46	2.8	36×53	
	4700	0.25	38	3.0	36×65	
	5600	0.25	32	3.6	36×83	
	6800	0.25	26	3.9	36×83	
	8200	0.25	22	4.5	36×83	
	10000	0.25	17	5.2	36×100	
	12000	0.25	15	5.9	36×100	
	15000	0.25	12	6.8	36×121	
	18000	0.25	10	7.8	36×121	
	22000	0.30	10	8.0	51×96	
	27000	0.30	8	9.2	51×96	
	33000	0.30	7	10.5	51×115	
	39000	0.30	6	12.0	51×130	
	47000	0.30	5	13.6	64×115	
	56000	0.40	4	13.4	64×130	
68000	0.40	4	15.4	77×115		
82000	0.40	4	17.5	77×130		
100000	0.40	3	20.5	77×155		
120000	0.40	2	22.4	90×131		
150000	0.40	2	26.5	90×157		
100 (125)	1800	0.25	48	1.9	36×53	
	2200	0.25	44	2.1	36×53	
	2700	0.25	39	2.3	36×53	
	3300	0.25	35	2.6	36×65	
	3900	0.25	28	3.0	36×83	
	4700	0.25	26	3.5	36×83	
	5600	0.25	23	3.9	36×100	
	6800	0.25	22	4.5	36×100	
	8200	0.25	20	5.1	36×121	
	10000	0.25	19	5.9	36×121	
	12000	0.25	16	6.4	51×75	
	15000	0.25	12	7.0	51×96	
	18000	0.25	10	8.3	51×115	
	22000	0.25	8	10.0	51×130	
	27000	0.25	7	11.5	64×115	
	33000	0.25	6	11.9	64×130	
39000	0.25	5	13.4	77×115		
47000	0.35	5	14.2	77×130		
56000	0.35	4	16.0	77×155		
68000	0.35	3	18.8	90×131		
82000	0.35	3	20.5	90×157		
100000	0.35	3	24.0	90×171		

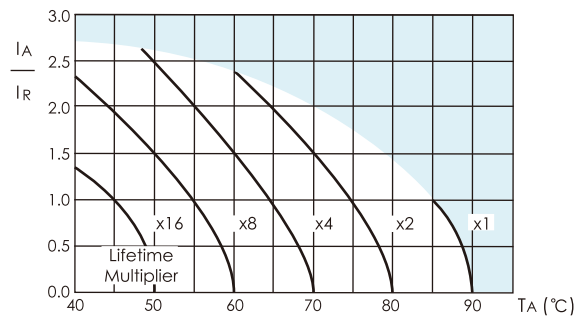
Ratings for CD135 Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	
160 (200)	3300	0.25	31	5.2	36×121	
	4700	0.25	21	5.9	51×75	
	5600	0.25	19	7.0	51×96	
	6800	0.25	16	7.8	51×96	
	10000	0.25	13	10.4	64×96	
	12000	0.25	10	11.6	51×120	
	15000	0.25	9	14.3	64×130	
	18000	0.25	8	15.6	64×130	
	22000	0.25	6	18.3	77×130	
	33000	0.25	4	23.8	90×131	
39000	0.25	2	27.9	90×157		
200 (250)	2200	0.25	38	3.9	36×100	
	3300	0.25	24	4.9	51×75	
	4700	0.25	20	6.4	51×96	
	5600	0.25	18	7.6	51×115	
	6800	0.25	14	8.8	51×130	
	8200	0.25	11	9.4	64×96	
	10000	0.25	9	10.4	64×96	
	15000	0.25	7	14.4	77×96	
	18000	0.25	6	16.5	77×130	
	22000	0.25	4	19.6	77×155	
33000	0.25	3	25.3	90×157		
250 (300)	1500	0.25	49	3.2	36×100	
	2200	0.25	33	4.0	51×75	
	3300	0.25	23	5.4	51×96	
	4700	0.25	17	7.1	64×96	
	6800	0.25	12	9.1	64×115	
	8200	0.25	11	10.0	64×115	
	10000	0.25	11	11.7	64×130	
	15000	0.25	7	15.1	77×130	
18000	0.25	6	17.7	77×155		
22000	0.25	3	20.9	90×157		
350 (400)	470	0.2	228	2.2	36×83	
	680	0.2	152	2.6	36×83	
	1000	0.2	104	3.4	36×100	
	1500	0.2	72	4.3	51×75	
	1800	0.2	58	5.1	51×96	
	2200	0.2	48	5.7	51×96	
	2700	0.2	39	7.1	51×130	
	3300	0.2	32	7.9	51×130	
	3900	0.2	28	9.0	64×115	
	4700	0.2	25	10.3	64×130	
	5600	0.2	22	11.4	77×115	
	6800	0.2	17	13.1	77×130	
	8200	0.2	14	15.4	77×155	
	10000	0.2	12	18.1	90×157	
	12000	0.2	10	20.0	90×157	
	15000	0.2	8	24.5	90×196	
18000	0.2	6	28.8	90×236		
400 (450)	470	0.2	178	2.2	36×83	
	680	0.2	119	2.8	36×100	
	1000	0.2	82	3.5	51×75	
	1200	0.2	68	3.8	51×75	
	1500	0.2	58	4.7	51×96	
	1800	0.2	47	5.2	51×96	
	2200	0.2	35	6.4	51×120	
	2700	0.2	33	7.0	64×96	
	3300	0.2	31	8.2	64×115	

$U_r$ (Surge Voltage) Code	Rated Capacitance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	
400 (450)	3900	0.2	25	9.4	64×130	
	4700	0.2	24	10.4	77×115	
	5600	0.2	19	11.9	77×130	
	6800	0.2	16	14.1	77×155	
	8200	0.2	14	16.4	90×157	
	10000	0.2	11	18.3	90×157	
	12000	0.2	10	21.8	90×196	
	15000	0.2	8	26.3	90×236	
450 (500)	470	0.2	200	2.2	36×83	
	680	0.2	140	2.8	36×100	
	820	0.2	96	3.2	51×75	
	1000	0.2	82	3.5	51×75	
	1200	0.2	72	4.2	51×96	
	1500	0.2	58	5.1	51×115	
	1800	0.2	46	5.9	51×130	
	2200	0.2	33	6.3	64×96	
	2700	0.2	32	7.5	64×115	
	3300	0.2	30	8.7	64×130	
	3900	0.2	29	9.5	77×115	
	4700	0.2	24	10.9	77×130	
500 (550)	5600	0.2	16	12.8	77×155	
	6800	0.2	14	15.0	90×157	
	8200	0.2	12	16.5	90×157	
	10000	0.2	10	20.0	90×196	
	12000	0.2	8	23.6	90×236	
	1000	0.25	85	4.6	51×115	
	1500	0.25	60	5.7	64×96	
	2200	0.25	41	6.9	64×130	
	2700	0.25	36	8.1	77×115	
	3300	0.25	32	9.6	77×130	
	3900	0.25	30	10.8	77×130	
	4700	0.25	27	12.1	77×155	
5600	0.25	21	13.8	90×157		
6800	0.25	18	15.8	90×171		
8200	0.25	14	17.2	77×220		
10000	0.25	10	22.1	90×236		

Customer products are available on request.

Lifetime Diagram



$I_A$  = Actual ripple current at 120Hz;  
 $I_R$  = Rated ripple current at 120Hz, 85°C;  
 $T_A$  = Ambient temperature

## CD136 Series (2000h screw terminal type 螺栓型, long life assurance 长寿命保证)

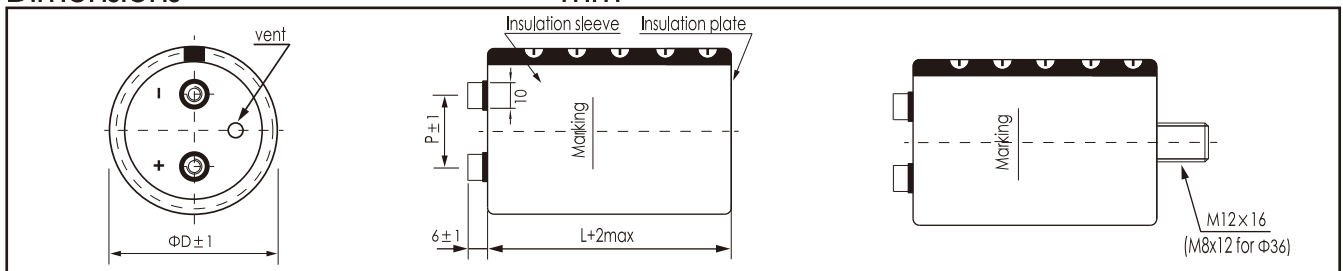
- 2000h at 105°C
- Features: Standard at 105°C, RoHS Compliant 特点: 在105°C正常工作, 符合RoHS标准
- Applications: professional Inverters and power supplies 应用范围: 专业变频器和电源
- ◆ SPECIFICATIONS (技术性能)



Item 项目	Performance Characteristics 性能	
Operating temperature range 温度范围	-40 to +105°C	-25 to +105°C
Rated Working Voltage Range 电压范围	25 to 100V	160 to 450V
Nominal Capacitance Range 容量范围	220 to 330000µF	
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)	
Leakage Current 泄漏电流	≤0.01CV or 3(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试	
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz	
	Working Voltage(V)	25~100    160~450
	Z-25°C/Z+20°C	-    8
Z-40°C/Z+20°C	12    -	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压2000小时后, 符合以下要求:	
	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%
Leakage Current 泄露电流	initial specified value or less 不超过标准值	
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours, the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求	
Other 其它	JIS C-5141 JIS C-5102	

### Dimensions

mm



ΦD/mm	36	51	64	77	90
P/mm	12.7	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm.  
 Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately.  
 See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Rated Voltage(V)	Frequency(Hz)					
	50/60	120	300	1K	>10k	
25~100	0.95	1.00	1.04	1.10	1.15	
160~250	0.90	1.00	1.08	1.15	1.20	
350~450	0.80	1.00	1.18	1.35	1.40	

Coefficient	Ambient Temp(°C)					
	40	55	70	85	105	
	25~100V	4.9	3.9	3.0	1.8	1.0
160~250V	3.8	3.3	2.5	2.0	1.0	
350~450V	2.44	2.28	2.12	2.0	1.0	

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Ratings for CD136 Series

U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	
25 (32)	10000	0.35	25	2.9	36×53	
	15000	0.35	20	4.2	36×83	
	22000	0.40	13	5.1	36×83	
	33000	0.40	10	6.3	36×100	
	47000	0.40	7	8	51×75	
	68000	0.50	6	10	51×115	
	100000	0.60	5	11.3	64×96	
	150000	0.80	4	12.9	64×115	
	220000	1.00	3	14.8	77×115	
330000	1.00	2	19.9	90×131		
35 (44)	6800	0.30	25	2.6	36×53	
	10000	0.30	20	3.7	36×83	
	15000	0.30	13	4.5	36×83	
	22000	0.35	10	5.5	36×100	
	33000	0.40	7	6.7	51×75	
	47000	0.45	6	8.1	51×96	
	68000	0.50	5	10	51×115	
	100000	0.60	4	12.1	64×115	
	150000	0.70	3	13.8	77×115	
220000	0.70	2	17.6	90×131		
50 (63)	3300	0.20	50	2.2	36×53	
	4700	0.25	36	3.3	36×53	
	6800	0.25	32	3.4	36×83	
	10000	0.25	22	4.1	36×83	
	15000	0.30	14	4.9	36×100	
	22000	0.35	10	5.9	51×75	
	33000	0.40	7	7.8	51×115	
	47000	0.40	6	9.5	64×96	
	68000	0.45	5	11.6	64×115	
100000	0.50	4	14.1	77×115		
150000	0.50	3	18.9	90×131		
63 (79)	2200	0.15	70	2.1	36×53	
	3300	0.20	50	2.2	36×53	
	4700	0.20	36	3.1	36×83	
	6800	0.20	25	3.7	36×83	
	10000	0.25	20	4.4	36×100	
	15000	0.25	14	5.7	51×75	
	22000	0.30	10	6.8	51×96	
	33000	0.30	7	9.2	64×96	
	47000	0.35	6	10.9	64×115	
68000	0.40	5	13	77×115		
100000	0.40	4	17.2	90×131		
80 (100)	2200	0.15	57	2.1	36×53	
	3300	0.15	38	3	36×83	
	4700	0.15	27	3.6	36×83	
	6800	0.20	19	4	36×100	
	10000	0.20	17	5.2	51×75	
	15000	0.25	11	6.2	51×96	
	22000	0.25	8	8.2	64×96	
	33000	0.30	7	9.7	77×96	
	47000	0.30	6	12.5	77×115	
68000	0.30	5	16.4	90×131		
100 (125)	1000	0.15	70	1.4	36×53	
	1500	0.15	55	1.7	36×53	
	2200	0.15	38	2.5	36×83	
	3300	0.15	25	3	36×83	
	4700	0.15	21	3.9	36×100	
	6800	0.15	19	5	51×75	
	10000	0.15	13	6.5	51×96	
	15000	0.20	9	7.6	64×96	
	22000	0.20	7	9.7	77×96	
33000	0.25	6	11.8	77×130		
47000	0.25	5	15	90×131		

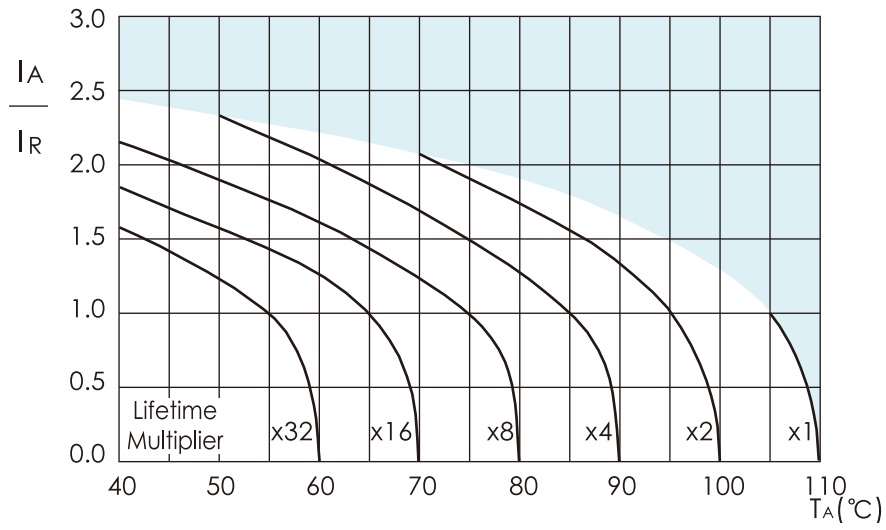
U <sub>r</sub> (Surge Voltage) Code	Rated Capa- cance	Dissipation Factor 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	-	(mΩ)	(Arms)	(mm)	
160 (200)	470	0.15	265	1	36×53	
	680	0.15	186	1.1	36×53	
	1000	0.15	125	1.7	36×83	
	1500	0.15	85	2	36×83	
	2200	0.15	55	2.7	36×100	
	3300	0.15	38	3.5	51×83	
	4700	0.15	35	4.4	51×96	
	6800	0.15	25	5.9	64×96	
	10000	0.15	15	7.6	77×96	
	15000	0.15	11	10.3	77×130	
	22000	0.15	6	13.2	90×131	
200 (250)	330	0.15	375	0.8	36×53	
	470	0.15	262	1	36×53	
	680	0.15	180	1.1	36×53	
	1000	0.15	125	1.7	36×83	
	1500	0.15	75	2.2	36×100	
	2200	0.15	50	2.8	51×75	
	3300	0.15	36	3.7	51×96	
	4700	0.15	24	4.9	64×96	
	6800	0.15	16	6.3	64×115	
250 (300)	10000	0.15	12	8.1	77×115	
	15000	0.15	6	10.9	90×131	
	330	0.15	160	0.8	36×53	
	470	0.15	120	1	36×53	
	680	0.15	85	1.4	36×83	
	1000	0.15	55	1.9	36×100	
	1500	0.15	40	2.3	51×75	
	2200	0.15	28	3.1	51×96	
	3300	0.15	20	4.2	64×96	
400 (450)	4700	0.15	15	5.4	64×115	
	6800	0.15	10	6.9	64×115	
	10000	0.15	8	9.3	77×155	
	15000	0.15	6	12.2	90×157	
	1000	0.15	82	2.5	51×75	
	1200	0.15	70	3	51×96	
	1500	0.15	49	3.6	51×115	
	1800	0.15	39	4.1	51×130	
	2200	0.15	30	4.5	64×96	
450 (500)	2700	0.15	22	5.3	64×115	
	3300	0.15	20	6.2	64×130	
	3900	0.15	18	7.2	64×155	
	3900	0.15	18	6.8	77×115	
	4700	0.15	13	8.7	64×195	
	4700	0.15	13	7.8	77×130	
	5600	0.15	12	9.6	64×195	
	5600	0.15	12	9.2	77×155	
	6800	0.15	11	10.7	90×157	
	8200	0.15	10	11.8	90×157	
	10000	0.15	9	14.1	90×196	
450 (500)	220	0.15	415	1.1	36×53	
	330	0.15	277	1.5	36×100	
	470	0.15	195	2.1	51×83	
	680	0.15	135	2.7	51×96	
	1000	0.15	90	4.2	51×100	
	1500	0.15	54	5.7	51×130	
	2200	0.15	33	7.3	64×115	
	3300	0.15	22	10.1	77×130	
	4700	0.15	15	12.6	77×155	
5600	0.15	11	15.8	90×157		

Customer products are available on request.



Ratings for CD136 Series

### Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 105°C  
 Multiplier of Useful Life as a function of ambient temperature and ripple current load

## CD136H Series (2000h screw terminal type 螺栓型, long life assurance 长寿命保证)

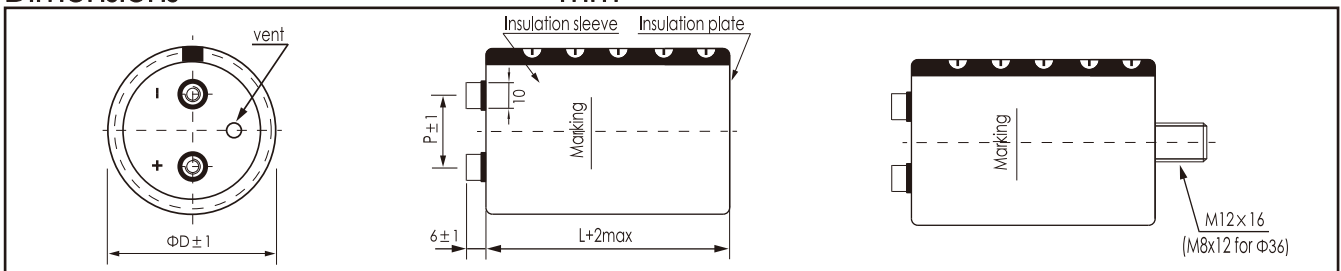


- 2000h at 105°C
- Features: Standard 2000h at 105°C, RoHS Compliant 特点: 在105°C正常工作2000小时, 符合RoHS标准
- Applications: professional Inverters and power supplies 应用范围: 专业变频器和电源
- ♦ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能						
Operating temperature range 温度范围	-40 to +105°C						
Rated Working Voltage Range 电压范围	350 to 500V						
Nominal Capacitance Range 容量范围	5600 to 39000µF						
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)						
Leakage Current 泄漏电流	$I \leq 0.01CV$ or 3(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试						
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>350~500</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>-</td> </tr> </table>	Working Voltage(V)	350~500	Z-25°C/Z+20°C	8	Z-40°C/Z+20°C	-
Working Voltage(V)	350~500						
Z-25°C/Z+20°C	8						
Z-40°C/Z+20°C	-						
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压2000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值
Capacitance Change容量	Within ±20% of initial value 在初始值的±20%						
Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%						
Leakage Current 泄露电流	initial specified value or less 不超过标准值						
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求						
Other 其它	JIS C-5141 JIS C-5102						

### Dimensions

mm



ΦD/mm	36	51	64	77	90
P/mm	12.7	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm.  
 Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately.  
 See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Rated Voltage(V)	Frequency(Hz)				
	50/60	120	300	1K	>10k
25~100	0.95	1.00	1.04	1.10	1.15
160~250	0.90	1.00	1.08	1.15	1.20
350~500	0.80	1.00	1.18	1.35	1.40

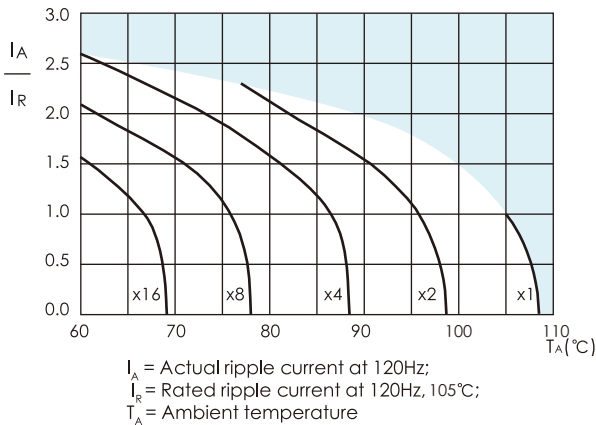
Coefficient	Ambient Temp(°C)				
	40	55	70	85	105
	25~100V	4.9	3.9	3.0	1.8
160~250V	3.8	3.3	2.5	2.0	1.0
350~500V	2.44	2.28	2.12	2.0	1.0

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Ratings for CD136H Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Case Size $\Phi D \times L$	Rated Ripple Current 40°C, 120Hz	Rated Ripple Current 85°C, 120Hz $I_R$	Typ. ESR 20°C, 120Hz	Max. Z 20°C, 10KHz	Typ. ESL	Remarks 备注
(V)	( $\mu F$ )	(mm)	(Arms)	(Arms)	(m $\Omega$ )	(mm)	(nH)	
350 (400)	13000	77×155	20.7	7.67	25	26	26	
	17000	90×157	25.4	9.41	19	20	26	
	18000	77×195	26.8	9.93	18	20	26	
	22000	77×235	32.1	11.9	17	18	26	
	24000	101×175	33.8	12.5	16	18	36	
	25000	90×196	33.6	12.4	15	16	26	
	31000	90×236	40.4	15.0	12	13	26	
	31000	101×195	38.1	14.1	12	13	36	
400 (450)	39000	101×237	46.2	17.1	10	12	36	
	11000	77×155	19.2	7.11	31	32	26	
	14000	77×195	23.9	8.85	24	25	26	
	16000	77×235	28.0	10.4	21	22	26	
	16000	90×157	24.8	9.19	21	22	26	
	20000	90×196	30.3	11.2	20	21	26	
	22000	101×175	30.8	11.4	18	19	36	
	25000	90×236	36.6	13.6	16	18	26	
450 (500)	25000	101×195	34.5	12.8	16	18	36	
	32000	101×237	41.8	15.5	12	13	36	
	9500	77×155	17.9	6.63	36	37	26	
	12000	77×195	22.1	8.19	28	29	26	
	13000	90×157	21.0	7.78	26	27	26	
	15000	77×235	27.3	10.1	24	27	26	
	17000	90×196	27.9	10.3	21	22	26	
	18000	101×175	27.9	10.3	20	21	36	
500 (550)	22000	90×236	34.3	12.7	18	19	26	
	22000	101×195	32.2	11.9	18	19	36	
	27000	101×237	38.4	14.2	15	17	36	
	5600	77×155	13.7	5.07	60	62	26	
	8200	77×195	18.2	6.74	41	43	26	
	8200	90×157	17.7	6.56	41	43	26	
	9500	77×235	21.7	8.04	36	37	26	
	11000	90×196	22.4	8.30	32	33	26	
	12000	101×175	22.7	8.41	30	33	36	
	14000	90×236	27.4	10.1	29	30	26	
	14000	101×195	25.6	9.26	29	30	36	
	16000	101×237	29.6	11.0	26	26	36	

Lifetime Diagram



## CD137 Series (5000h at 85°C screw terminal type 螺栓型, long life assurance 长寿命保证)

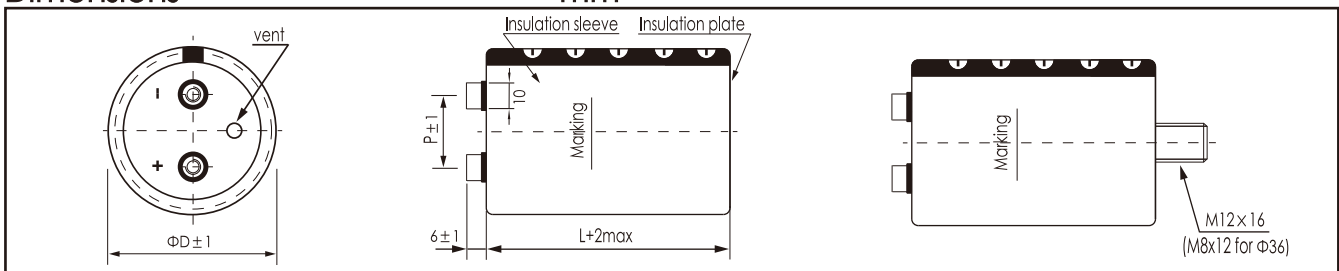


- 5000h at 85°C
- Features: High Reliability at High Voltage, Long Life at compact Size, RoHs  
特点: 耐高压, 长寿命, 符合RoHs标准
- Applications: professional Inverters and power supplies  
应用范围: 专业变频器和电源

### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能						
Operating temperature range 温度范围	-40 to +85°C						
Rated Working Voltage Range 电压范围	400 to 550V						
Nominal Capacitance Range 容量范围	1000 to 22000µF						
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)						
Leakage Current 泄漏电流	$I \leq 0.02CV$ or 5(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试						
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>400~550</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>-</td> </tr> </table>	Working Voltage(V)	400~550	Z-25°C/Z+20°C	8	Z-40°C/Z+20°C	-
Working Voltage(V)	400~550						
Z-25°C/Z+20°C	8						
Z-40°C/Z+20°C	-						
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压5000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值
Capacitance Change容量	Within ±20% of initial value 在初始值的±20%						
Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%						
Leakage Current 泄露电流	initial specified value or less 不超过标准值						
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求						
Other 其它	JIS C-5141 JIS C-5102						

### Dimensions



ΦD/mm	36	51	64	77	90
P/mm	12.7	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

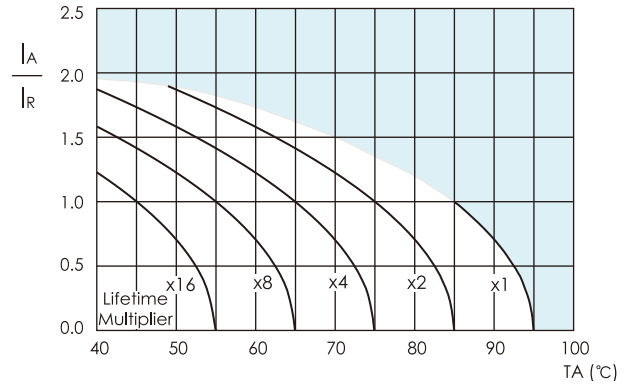
Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Ratings for CD137 Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
400 (450)	2200	98	28	8.8	51×115	
	2700	80	24	10.2	51×130	
	3300	65	21	11.0	64×96	
	3900	55	19	12.8	64×115	
	4700	46	15	14.8	64×130	
	5600	38	14	16.2	77×115	
	6800	32	13	18.7	77×130	
	8200	26	12	22.0	77×155	
	10000	22	10	26.7	77×195	
	10000	22	10	24.2	90×131	
	12000	18	8	28.5	90×157	
	15000	14	6	34.8	90×196	
	18000	12	5	41.2	90×236	
	22000	10	5	47.0	101×237	
450 (500)	1800	119	45	7.6	51×115	
	2200	98	35	8.8	51×130	
	2700	80	30	9.5	64×96	
	3300	65	24	11.2	64×115	
	3900	55	20	12.8	64×130	
	4700	46	16	14.1	77×115	
	5600	38	13	16.2	77×130	
	6800	32	11	19.1	77×155	
	8200	26	10	23.0	77×195	
	8200	26	10	21.0	90×131	
	10000	22	9	25.7	90×171	
	12000	18	8	29.7	90×196	
	12000	18	8	29.3	101×175	
	15000	14	7	35.9	90×236	
15000	14	7	34.2	101×195		
18000	12	6	40.5	101×237		
500 (550)	1200	215	94	6.2	51×115	
	1200	215	94	6.3	64×96	
	1500	172	72	7.3	51×130	
	1500	172	72	7.1	64×96	
	1800	143	51	8.3	64×115	
	2200	117	40	9.6	64×130	
	2700	96	35	10.7	77×115	
	3300	78	30	12.4	77×130	
	3900	66	25	14.4	77×155	
	4700	55	24	16.5	77×171	
	4700	55	24	15.8	90×131	
	5600	46	22	19.0	77×195	
	5600	46	22	18.6	90×157	
	6800	38	19	21.2	90×171	
	8200	31	14	24.5	90×196	
	8200	31	14	24.2	101×175	
10000	26	12	29.3	90×236		
10000	26	12	27.9	101×195		
12000	22	11	33.1	101×237		
550 (600)	1000	258	110	5.9	51×130	
	1200	215	95	6.8	64×115	
	1500	172	74	8.0	64×130	
	1800	143	72	8.7	77×115	
	2200	117	50	10.1	77×130	
	2700	96	40	12.0	77×155	
	3300	78	36	13.3	77×155	
	3900	66	30	15.5	90×157	
	4700	55	24	17.6	90×171	
	5600	46	20	20.3	90×196	
6800	38	16	24.1	90×236		
8200	31	14	27.3	101×237		

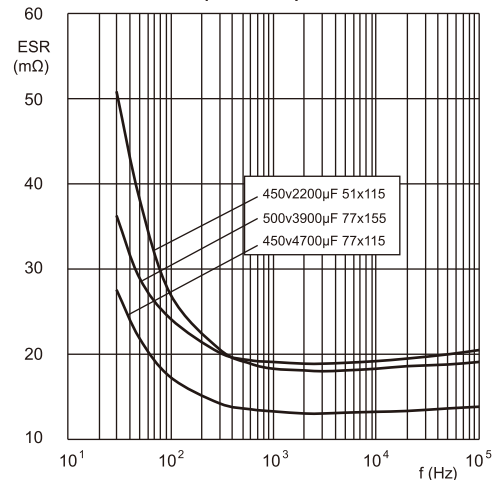
Lifetime Diagram



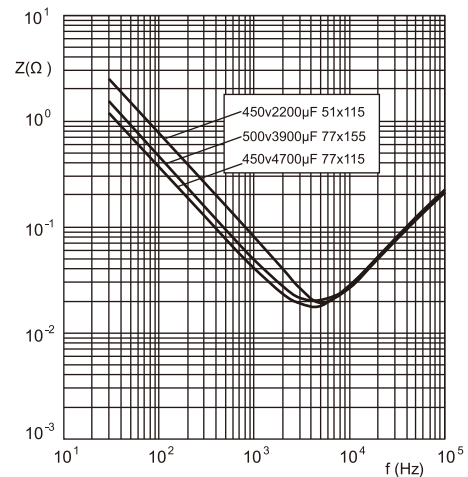
$I_a$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Typical Curves

ESR ~ Frequency f at 20°C



Impedance Z ~ Frequency f at 20°C



Customer products are available on request.

# Large Can Aluminum Electrolytic Capacitors

## CD137H Series (12000h at 85°C screw terminal type 螺栓型, long life assurance 长寿命保证)



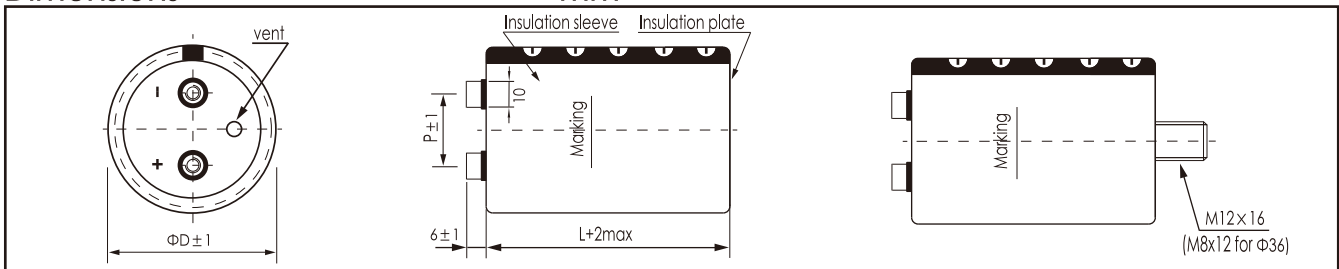
- 12000h at 85°C
- Features: Extremely compact, High ripple current & High Reliability, RoHs Compliant  
特点: 极其紧凑, 高纹波电流和高可靠性, 符合RoHs标准
- Applications: Higher Currents for High Professional power Application and Inverters.  
应用范围: 大电流用于高专业功率应用和变频器

### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能
Operating temperature range 温度范围	-40 to +85°C
Rated Working Voltage Range 电压范围	350 to 500V
Nominal Capacitance Range 容量范围	1000 to 22000µF
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)
Leakage Current 泄漏电流	$I \leq 0.02CV$ or 5(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz
	Working Voltage(V) 350~500
	Z-25°C/Z+20°C 8
Z-40°C/Z+20°C -	
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 12000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压12000小时后, 符合以下要求:
	Capacitance Change容量 Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角 Not more than 200% of the specified value 不超过标准值的200%
Leakage Current 泄露电流 initial specified value or less 不超过标准值	
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求
Other 其它	JIS C-5141 JIS C-5102

### Dimensions

mm



ΦD/mm	51	64	77	90
P/mm	22.0	28.2	31.4	31.4

\*Hex head screw M5 x 10 and M6 x 12 are standard screws.  
Longer screws are available on request.  
\*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm.  
Max torque for bolt mounting M12: 12.5Nm.  
\*Screws, Bracket and cap nut will be delivered separately.  
See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

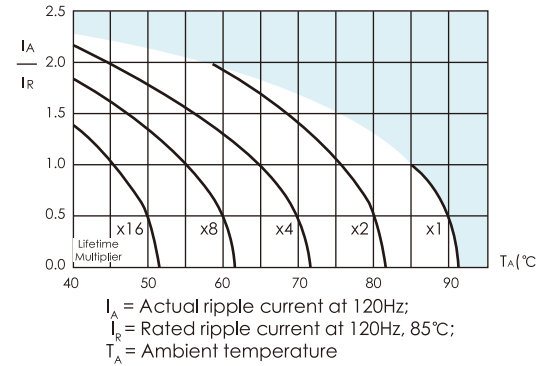
The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.

It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Ratings for CD137H Series

$U_p$ (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
350 (400)	2200	56	28	8.38	51 × 80	
	2700	46	23	9.90	51 × 96	
	3300	40	20	11.0	51 × 105	
		40	20	11.4	64 × 80	
	3900	34	17	12.7	51 × 117	
		34	17	13.2	64 × 96	
	4700	28	14	14.4	64 × 96	
		24	12	16.8	64 × 115	
	5600	24	12	17.2	77 × 96	
		20	10	18.8	64 × 130	
	6800	20	10	19.5	77 × 105	
		18	9	22.3	77 × 117	
	10000	14	7	28.3	90 × 115	
	12000	12	6	29.8	77 × 155	
		12	6	32.0	90 × 130	
	15000	10	5	36.0	90 × 145	
	18000	9	4.5	40.4	90 × 171	
	22000	7	3.5	46.9	90 × 196	
400 (450)	1800	68	34	7.58	51 × 80	
	2200	56	28	9.05	51 × 96	
	2700	46	23	10.4	51 × 105	
		46	23	10.5	64 × 80	
	3300	38	19	12.5	51 × 130	
		38	19	12.4	64 × 96	
	3900	32	16	13.3	64 × 96	
		28	14	15.2	64 × 115	
	4700	28	14	16.3	77 × 96	
		24	12	17.1	64 × 130	
	5600	24	12	18.2	77 × 105	
		20	10	20.6	77 × 117	
	8200	18	9	23.3	77 × 130	
		14	7	27.0	77 × 155	
	10000	14	7	29.1	90 × 130	
		12	6	31.5	77 × 190	
	12000	12	6	32.4	90 × 145	
		10	5	37.2	77 × 220	
15000	10	5	38.3	90 × 170		
	9	4.5	42.4	90 × 196		
450 (500)	1500	112	56	7.10	51 × 80	
	1800	94	47	8.03	51 × 96	
		78	39	9.22	51 × 105	
	2200	78	39	9.70	64 × 80	
		66	33	10.5	51 × 117	
	2700	66	33	10.9	64 × 96	
		56	28	12.1	64 × 100	
	3300	48	24	13.9	64 × 115	
		48	24	15.2	77 × 96	
	3900	40	20	15.5	64 × 130	
		40	20	16.9	77 × 105	
	5600	34	17	18.2	64 × 155	
		34	17	19.4	77 × 117	
	6800	28	14	21.5	77 × 130	
		28	14	24.3	90 × 115	
	8200	24	12	24.5	77 × 155	
		24	12	27.5	90 × 130	
	10000	20	10	29.2	77 × 190	
20		10	30.3	90 × 145		
12000	17	8.5	33.4	77 × 220		
	17	8.5	34.6	90 × 170		
15000	14	6.8	39.8	90 × 196		
500 (550)	1000	176	88	6.14	51 × 80	
	1200	146	73	7.00	51 × 92	
		120	60	8.06	51 × 105	
	1500	120	60	8.15	64 × 80	
		102	51	9.25	51 × 117	
	2200	86	43	10.6	64 × 100	
		86	43	11.0	77 × 85	
	2700	72	36	12.2	64 × 115	
	3300	60	30	14.1	77 × 105	
	3900	52	26	16.5	77 × 130	
		42	21	18.8	77 × 143	
	4700	42	21	19.2	90 × 115	
		38	19	21.4	90 × 130	
	6800	32	16	24.6	90 × 145	
		26	13	28.5	90 × 170	
	8200	26	13	28.5	90 × 170	
	10000	22	11	32.9	90 × 196	
	12000	20	10	34.7	90 × 220	

Lifetime Diagram



Customer products are available on request.

## CD138 Series (5000h at 85°C screw terminal type 螺栓型, long life assurance 长寿命保证)

- 5000h at 85°C
- Features: Long Life, High Reliability, RoHS Compliant  
特点: 长寿命, 高可靠性, 符合RoHS标准
- Applications: Higher Currents for High Professional power Application and Inverters.  
应用范围: 大电流用于高专业功率应用和变频器

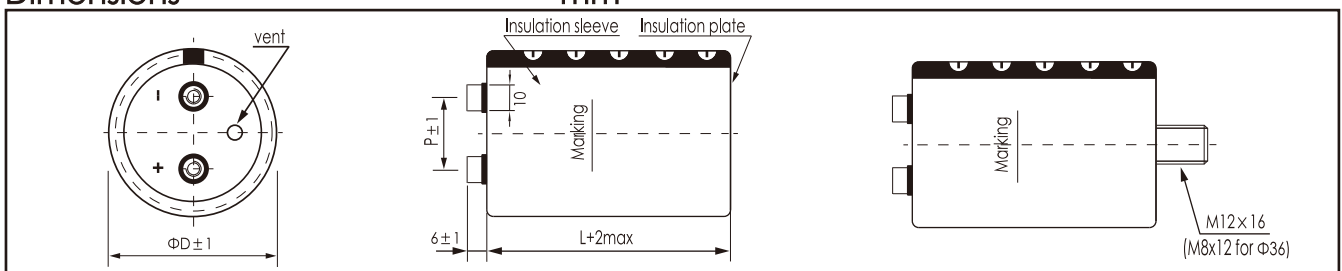


### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能
Operating temperature range 温度范围	-40 to +85°C
Rated Working Voltage Range 电压范围	350 to 400V
Nominal Capacitance Range 容量范围	1000 to 18000µF
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)
Leakage Current 泄漏电流	$I \leq 0.02CV$ or 5(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz
	Working Voltage(V) 350~450
	Z-25°C/Z+20°C 8 Z-40°C/Z+20°C -
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压5000小时后, 符合以下要求:
	Capacitance Change 容量 Within ±20% of initial value 在初始值的±20%
	Dissipation Factor 损耗角 Not more than 200% of the specified value 不超过标准值的200%
High Temperature Shelf Life 高温贮存	Leakage Current 泄露电流 initial specified value or less 不超过标准值
	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求
Other 其它	JIS C-5141 JIS C-5102

### Dimensions

mm



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm.  
 Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately.  
 See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.18	1.30	1.40

Ambient Temp (°C)	40	60	70	85
Coefficient	2.24	1.81	1.56	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

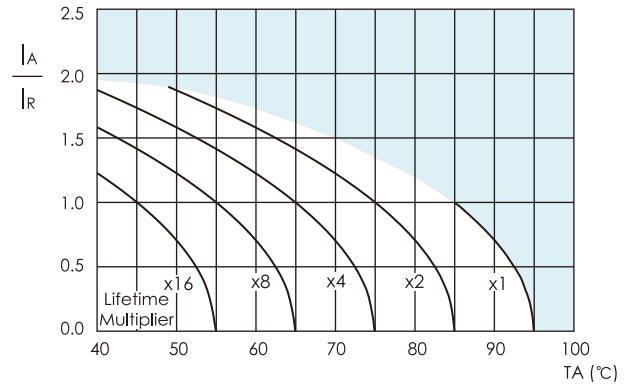


Ratings for CD138 Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
350 (400)	1200	215	67	5.50	51×83	
	1500	172	55	6.10	51×83	
	1800	143	43	7.40	51×96	
	2200	117	30	8.20	51×96	
	2700	96	27	10.20	51×130	
	3300	78	23	11.30	51×130	
	3900	66	19	12.80	64×115	
	4700	55	16	14.80	64×130	
	5600	46	14	16.30	77×115	
	6800	38	13	18.80	77×130	
	8200	31	11	22.10	77×155	
	10000	26	10	25.90	90×157	
	12000	22	8	28.40	90×157	
15000	17	6	34.60	90×196		
18000	14	4	41.40	90×236		
400 (450)	1000	215	82	5.00	51×83	
	1200	179	70	5.50	51×83	
	1500	143	50	6.70	51×96	
	1800	119	40	7.40	51×96	
	2200	98	28	9.20	51×130	
	2700	80	23	9.90	64×96	
	3300	65	21	11.80	64×115	
	3900	55	19	13.50	64×130	
	4700	46	15	14.90	77×115	
	5600	39	14	17.00	77×130	
	6800	32	13	20.20	77×155	
	8200	26	12	23.50	90×157	
	10000	22	10	25.90	90×157	
12000	18	8	31.00	90×196		
15000	14	6	37.50	90×236		
450 (500)	1000	215	93	5.00	51×83	
	1200	179	69	6.00	51×96	
	1500	143	56	7.20	51×115	
	1800	119	45	8.30	51×130	
	2200	98	35	9.00	64×96	
	2700	80	30	10.70	64×115	
	3300	65	24	12.40	64×130	
	3900	55	20	13.60	77×115	
	4700	46	16	15.60	77×130	
	5600	38	13	18.30	77×155	
	6800	32	11	21.40	90×157	
	8200	26	10	23.50	90×157	
	10000	22	9	28.30	90×196	
12000	18	8	33.60	90×236		

Customer products are available on request.

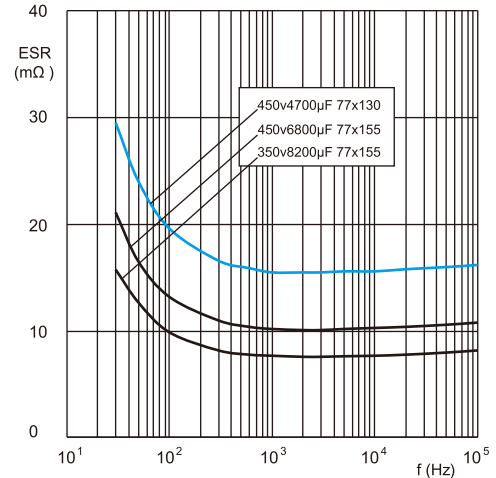
Lifetime Diagram



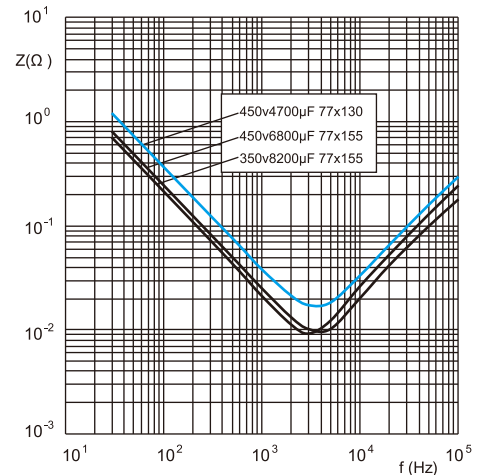
$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Typical Curves

ESR ~ Frequency f at 20°C



Impedance Z ~ Frequency f at 20°C



# Large Can Aluminum Electrolytic Capacitors

## CD138H Series (10000h at 85°C screw terminal type 螺栓型, long life assurance 长寿命保证)

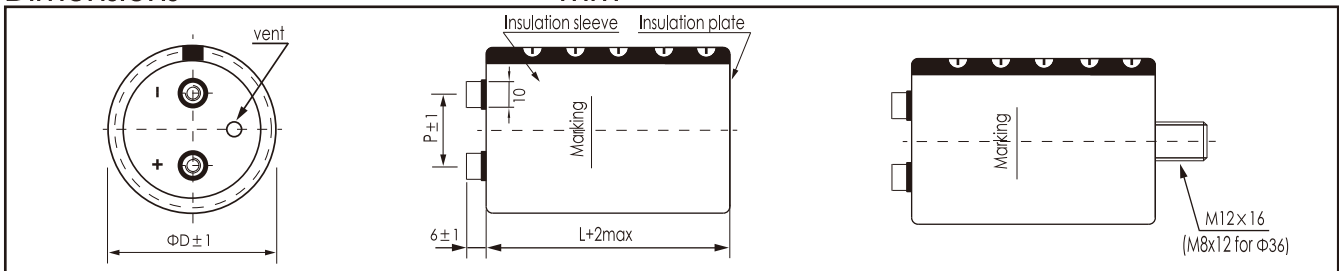


- 10000h at 85°C
- Features: Higher ripple current, Long useful life & High Reliability, RoHs Compliant  
特点: 高纹波电流, 长寿命, 高可靠性, 符合RoHs标准
- Applications: For professional power application and Inverters  
应用范围: 专业电源应用和变频器

### ◆ SPECIFICATIONS (技术性能)

Item 项目	Performance Characteristics 性能						
Operating temperature range 温度范围	-40 to +85°C						
Rated Working Voltage Range 电压范围	350 to 500V						
Nominal Capacitance Range 容量范围	1500 to 12000µF						
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)						
Leakage Current 泄漏电流	$I \leq 0.02CV$ or 5(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试						
Low Temperature Characteristics 低温阻抗比	Impedance ration max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>350~500</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>-</td> </tr> </table>	Working Voltage(V)	350~500	Z-25°C/Z+20°C	8	Z-40°C/Z+20°C	-
Working Voltage(V)	350~500						
Z-25°C/Z+20°C	8						
Z-40°C/Z+20°C	-						
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 10000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压10000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change 容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值
Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%						
Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%						
Leakage Current 泄露电流	initial specified value or less 不超过标准值						
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求						
Other 其它	JIS C-5141 JIS C-5102						

### Dimensions



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws.  
Longer screws are available on request.  
\*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm.  
Max torque for bolt mounting M12: 12.5Nm.  
\*Screws, Bracket and cap nut will be delivered separately.  
See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.

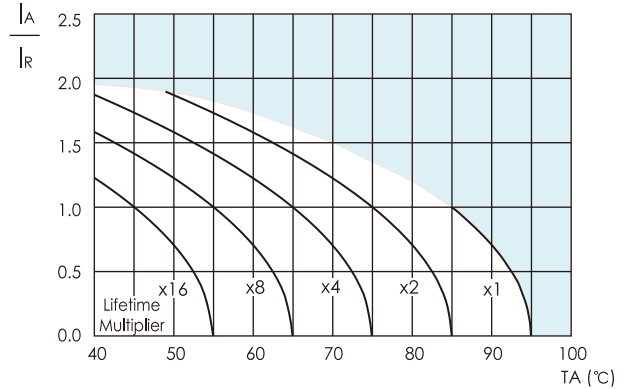
It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Ratings for CD138S Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C, 120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
350 (400)	3900	50	25	14.6	64×96	
	4700	40	20	16.9	64×115	
	5600	34	17	19.8	64×130	
	5600	34	17	21.6	77×115	
	6800	28	14	25.0	77×143	
	6800	28	14	26.2	90×105	
	8200	24	12	29.3	77×143	
	8200	24	12	30.1	77×155	
	10000	18	9	35.7	90×157	
12000	16	8	39.1	90×157		
400 (450)	2700	76	38	11.5	64×96	
	3300	60	30	14.2	64×115	
	3900	52	26	16.5	64×115	
	3900	52	26	17.2	77×105	
	4700	42	21	18.1	64×130	
	4700	42	21	20.8	77×115	
	5600	36	18	22.7	77×130	
	5600	36	18	23.8	90×105	
	6800	30	15	26.6	77×155	
	6800	30	15	27.4	90×130	
	8200	24	12	32.2	90×157	
10000	20	10	35.7	90×157		
450 (500)	2200	92	46	10.4	64×96	
	2200	92	46	11.5	77×80	
	2700	76	38	12.8	64×115	
	3300	60	30	15.2	64×130	
	3300	60	30	15.8	77×105	
	3900	54	27	16.5	64×130	
	3900	54	27	18.0	77×115	
	4700	42	21	20.8	77×143	
	4700	42	21	21.8	90×105	
	5600	36	18	24.2	77×143	
	5600	36	18	24.9	90×130	
	6800	30	15	29.4	90×157	
	8200	24	12	32.2	90×157	
10000	20	10	36.9	90×171		
500 (550)	1500	148	74	8.6	64×96	
	1800	132	62	10.0	64×115	
	2200	102	51	11.7	64×130	E
	2700	82	41	15.0	77×115	
	3300	68	34	17.5	77×130	
	3900	58	29	20.2	77×143	
	4700	48	24	21.8	90×130	
	5600	40	20	25.3	90×157	
6800	32	16	29.0	90×171		

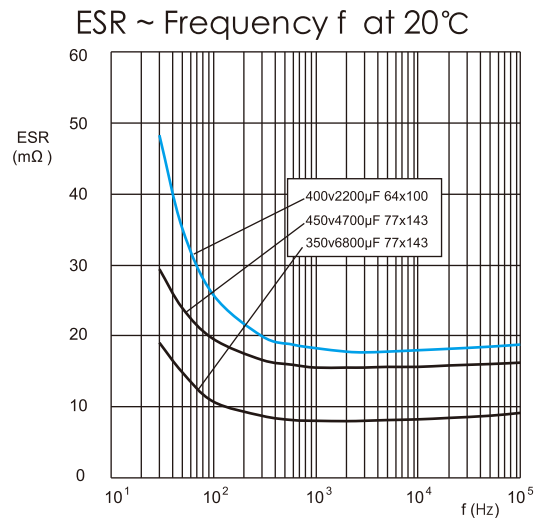
Customer products are available on request.

Lifetime Diagram

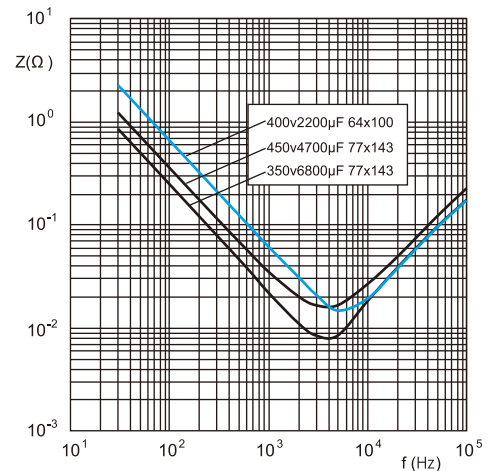


$I_a$  = actual ripple current at 120Hz,  $I_r$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Typical Curves



Impedance Z ~ Frequency f at 20°C



## CD139 Series (5000h screw terminal type 螺栓型, long life assurance 长寿命保证)

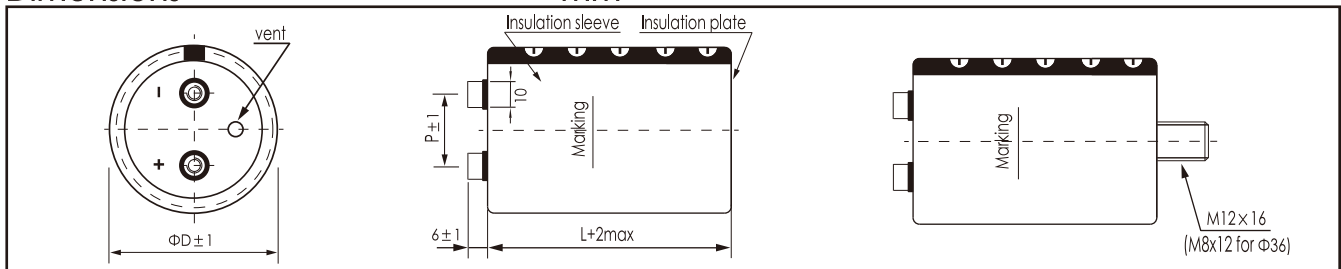


- 5000h at 105°C
- Features: Long Useful life at 105°C, RoHS Compliant  
特点: 105°C下长寿命工作, 符合RoHS标准
- Applications: Highest professional power  
应用范围: 专业电源应用

### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能						
Operating temperature range 温度范围	-40 to +105°C						
Rated Working Voltage Range 电压范围	350 to 450V						
Nominal Capacitance Range 容量范围	1000 to 15000µF						
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)						
Leakage Current 泄漏电流	$I \leq 0.02CV$ or 5(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试						
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>350~450</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>-</td> </tr> </table>	Working Voltage(V)	350~450	Z-25°C/Z+20°C	8	Z-40°C/Z+20°C	-
Working Voltage(V)	350~450						
Z-25°C/Z+20°C	8						
Z-40°C/Z+20°C	-						
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压5000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change 容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值
Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%						
Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%						
Leakage Current 泄露电流	initial specified value or less 不超过标准值						
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours, the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求						
Other 其它	JIS C-5141 JIS C-5102						

### Dimensions



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85	105
Coefficient	2.44	2.16	2.00	1.00

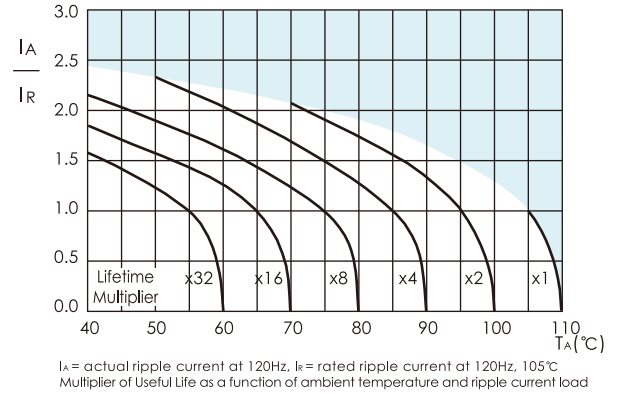
The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Ratings for CD139 Series

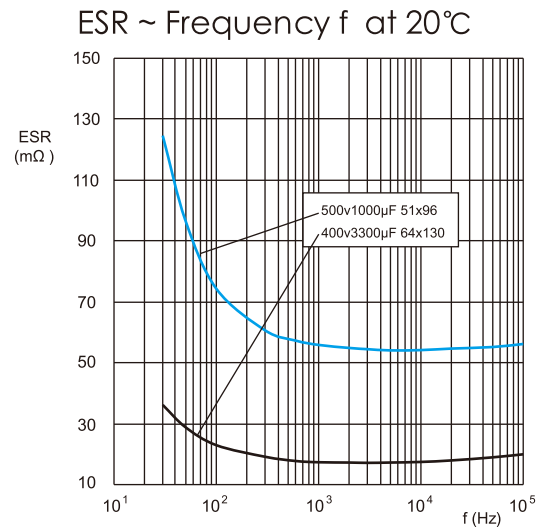
$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C, 120Hz	Size $\Phi D \times L$	Remarks 备注
(V)	( $\mu F$ )	(m $\Omega$ )	(m $\Omega$ )	(Arms)	(mm)	
350 (400)	1000	259	69	3.9	51×75	
	1200	215	65	4.2	51×75	
	1500	172	55	5.2	51×96	
	1800	143	43	5.7	51×96	
	2200	117	30	7.1	51×130	
	2700	96	27	7.7	64×96	
	3300	78	23	9.1	64×115	
	3900	66	19	10.4	64×130	
	4700	55	15	12.2	64×155	
		55	16	11.5	77×115	
	5600	46	13	14.6	64×195	
		46	14	13.1	77×130	
	6800	38	13	15.5	77×155	
	8200	31	11	18.1	90×157	
	10000	26	10	19.9	90×157	
12000	22	8	23.8	90×196		
15000	17	6	28.8	90×236		
400 (450)	1000	215	70	3.9	51×75	
	1200	179	64	4.6	51×96	
	1500	143	54	5.6	51×115	
	1800	119	43	6.4	51×130	
	2200	98	41	6.9	64×96	
	2700	80	38	8.2	64×115	
	3300	65	29	9.5	64×130	
	3900	55	26	11.1	64×155	
		55	28	10.4	77×115	
	4700	46	20	13.4	64×195	
		46	22	12.0	77×130	
	5600	39	19	14.6	64×195	
		39	19	14.0	77×155	
	6800	32	17	16.5	90×157	
	8200	26	15	18.1	90×157	
10000	22	12	21.7	90×196		
12000	18	8	25.8	90×236		
450 (500)	1000	215	70	4.2	51×96	
	1200	179	66	5.0	51×115	
	1500	143	54	5.9	51×130	
	1800	119	44	6.3	64×96	
	2200	98	42	7.4	64×115	
	2700	80	40	8.6	64×130	
	2700	80	42	8.7	77×115	
		65	31	10.2	64×155	
	3300	65	35	10.1	77×130	
		55	28	12.3	64×195	
	4700	46	25	12.9	77×155	
		5600	38	22	15.4	77×195
	38		24	14.9	90×157	
	6800	32	21	18.0	90×196	
	8200	27	18	19.8	90×196	
10000	22	16	23.6	90×236		

Customer products are available on request.

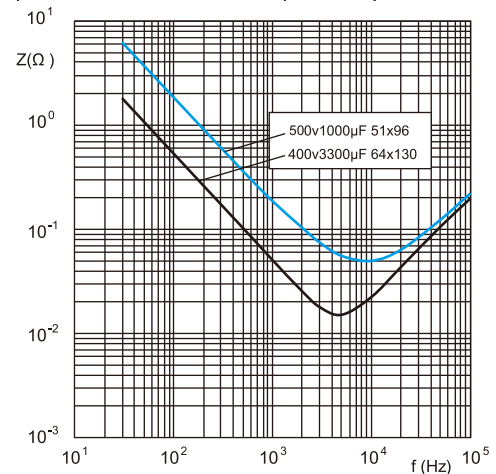
Lifetime Diagram



Typical Curves



Impedance Z ~ Frequency f at 20°C



# Large Can Aluminum Electrolytic Capacitors

## CD139H Series (5000h screw terminal type 螺栓型, long life assurance 长寿命保证)



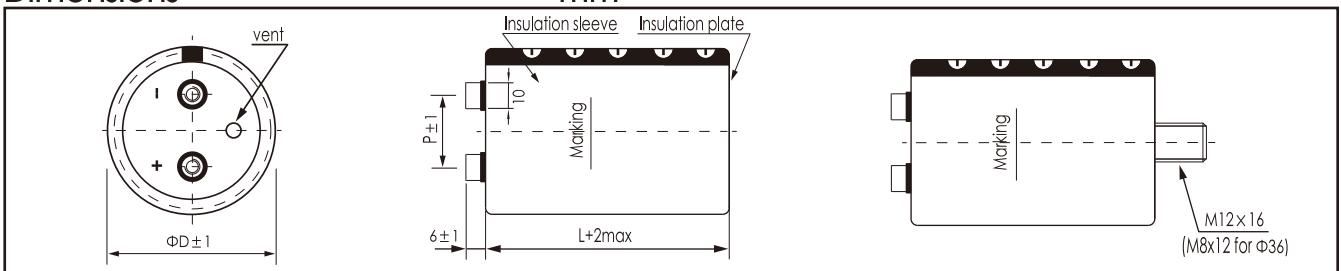
- 5000h at 105°C
- Features: Long Useful life at 105°C, Higher current and high reliability, RoHs Compliant  
特点: 105°C下长寿命工作, 高电流和高可靠性, 符合RoHs标准
- Applications: Highest professional power  
应用范围: 专业电源应用

### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能						
Operating temperature range 温度范围	-40 to +105°C						
Rated Working Voltage Range 电压范围	350 to 450V						
Nominal Capacitance Range 容量范围	1000 to 15000µF						
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)						
Leakage Current 泄漏电流	$I \leq 0.02CV$ or 5(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试						
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>350~450</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>-</td> </tr> </table>	Working Voltage(V)	350~450	Z-25°C/Z+20°C	8	Z-40°C/Z+20°C	-
Working Voltage(V)	350~450						
Z-25°C/Z+20°C	8						
Z-40°C/Z+20°C	-						
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 5000 hours at 105°C The capacitors shall meet the following requirements. 在105°C环境下施加额定电压5000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值
Capacitance Change容量	Within ±20% of initial value 在初始值的±20%						
Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%						
Leakage Current 泄露电流	initial specified value or less 不超过标准值						
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 105°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在105°C环境下不加负载放置1000小时后电性能同耐久性要求						
Other 其它	JIS C-5141 JIS C-5102						

### Dimensions

mm



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85	105
Coefficient	2.44	2.16	2.00	1.00

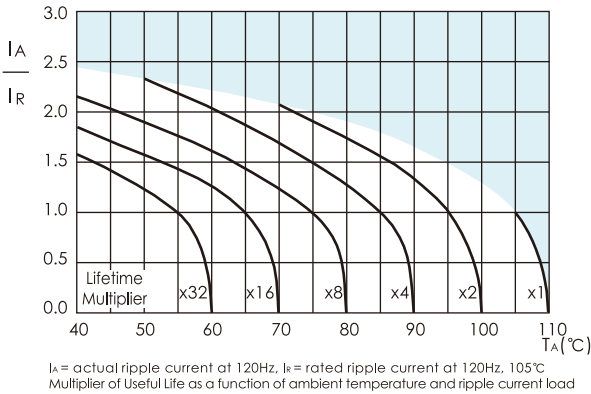
The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.

Ratings for CD139H Series

$U_r$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 105°C,120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
350 (400)	3300	55	23	14.4	64×115	
	3900	46	19	16.6	64×130	
	4700	39	17	19.8	64×155	
	4700	39	17	19.1	77×115	
	5600	32	14	21.9	77×130	
	6800	27	12	26.2	77×155	
	8200	22	11	29.3	90×157	
	10000	18	10	32.3	90×157	
400 (450)	12000	15	8	39.0	90×196	
	2700	56	28	13.1	64×115	
	3300	46	23	15.2	64×130	
	3900	39	21	17.9	64×155	
	3900	39	21	18.2	77×115	
	4700	32	17	20.1	77×130	
	5600	27	15	23.8	77×155	
	6800	22	13	26.7	90×157	
450 (500)	8200	18	11	29.3	90×157	
	10000	15	9	35.6	90×196	
	2200	69	38	11.8	64×115	
	2700	56	31	13.7	64×130	
	2700	56	31	14.5	77×115	
	3300	46	23	16.5	64×155	
	3300	46	25	16.9	77×130	
	4700	32	18	21.7	77×155	
	5600	27	16	26.4	77×195	
	5600	27	16	24.2	90×157	
6800	22	14	29.5	90×196		
8200	19	12	32.4	90×196		

Customer products are available on request.

Lifetime Diagram



# Large Can Aluminum Electrolytic Capacitors

## CD135G Series (2000h screw terminal type 螺栓型, long life assurance 长寿命保证)



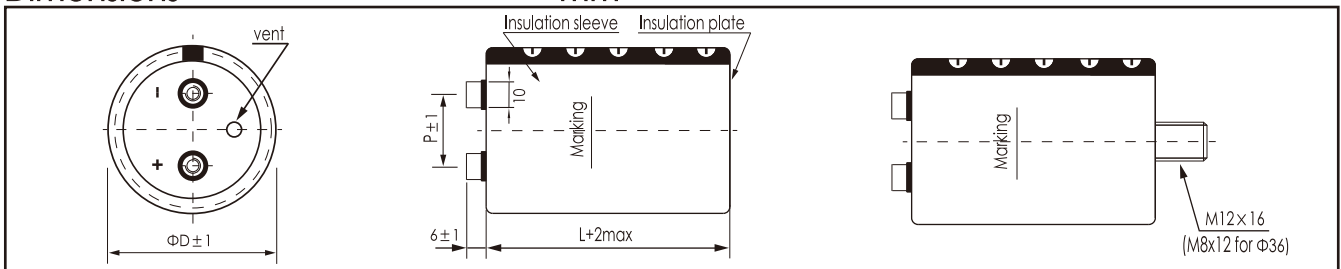
- 2000h at 85°C
- Features: 600V standard at 85°C, RoHS Compliant  
特点: 600V在85°C下工作, 符合RoHS标准
- Applications: Highest professional Inverters and power supplies  
应用范围: 专业电源应用和变频器

### ◆ SPECIFICATIONS (技术性能)

Item项目	Performance Characteristics 性能						
Operating temperature range 温度范围	-25 to +85°C						
Rated Working Voltage Range 电压范围	600V						
Nominal Capacitance Range 容量范围	1200 to 5600µF						
Capacitance Tolerance 容量偏差	±20(120Hz, +20°C)						
Leakage Current 泄漏电流	$I \leq 0.02CV$ or 5(mA) after 5 minutes application of rated working voltage at +20°C which is smaller 两者取较小值, 施加额定电压5分钟测试						
Low Temperature Characteristics 低温阻抗比	Impedance ratio max at 120Hz <table border="1"> <tr> <td>Working Voltage(V)</td> <td>600</td> </tr> <tr> <td>Z-25°C/Z+20°C</td> <td>8</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>-</td> </tr> </table>	Working Voltage(V)	600	Z-25°C/Z+20°C	8	Z-40°C/Z+20°C	-
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Z-25°C/Z+20°C	8						
Z-40°C/Z+20°C	-						
High Temperature Load Life 高温负载耐久性	After applying rated voltage for 2000 hours at 85°C The capacitors shall meet the following requirements. 在85°C环境下施加额定电压2000小时后, 符合以下要求: <table border="1"> <tr> <td>Capacitance Change 容量</td> <td>Within ±20% of initial value 在初始值的±20%</td> </tr> <tr> <td>Dissipation Factor 损耗角</td> <td>Not more than 200% of the specified value 不超过标准值的200%</td> </tr> <tr> <td>Leakage Current 泄露电流</td> <td>initial specified value or less 不超过标准值</td> </tr> </table>	Capacitance Change 容量	Within ±20% of initial value 在初始值的±20%	Dissipation Factor 损耗角	Not more than 200% of the specified value 不超过标准值的200%	Leakage Current 泄露电流	initial specified value or less 不超过标准值
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Leakage Current 泄露电流	initial specified value or less 不超过标准值						
High Temperature Shelf Life 高温贮存	After leaving capacitors under no load at 85°C for 1000 hours. the capacitors shall meet the same requirement as Endurance. 在85°C环境下不加负载放置1000小时后电性能同耐久性要求						
Other 其它	JIS C-5141 JIS C-5102						

### Dimensions

mm



ΦD/mm	51	64	77	90	101
P/mm	22.0	28.2	31.4	31.4	41.5

\*Hex head screw M5 x 10 and M6 x 12 are standard screws. Longer screws are available on request.  
 \*Max tightening torque for screw terminal M5: 3Nm, M6: 4Nm. Max torque for bolt mounting M12: 12.5Nm.  
 \*Screws, Bracket and cap nut will be delivered separately. See "Accessories" for shape and dimensions.

### Ripple Current Coefficient

Frequency (Hz)	50/60	120	300	1k	>10k
Coefficient	0.80	1.00	1.10	1.30	1.40

Ambient Temp (°C)	40	60	85
Coefficient	1.89	1.67	1.00

The useful life can be prolonged by operating capacitor at loads below the rated values (e.g. lower operating voltage, Rms ripple current or ambient temperature) and by appropriate cooling measures.  
 It is advisable not to apply a ripple current exceeding the rated ripple current without any cooling measures as this will shorten capacitor's life.



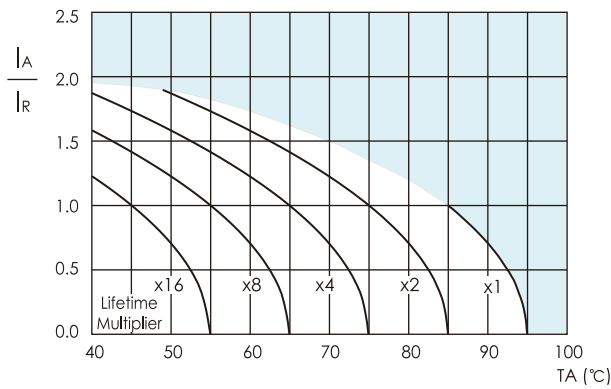
# Large Can Aluminum Electrolytic Capacitors

## Ratings for CD135G Series

$U_R$ (Surge Voltage) Code	Rated Capacitance	Max.ESR 20°C, 120Hz	Typ ESR 20°C, 120Hz	Rated Ripple Current 85°C,120Hz	Size ΦD x L	Remarks 备注
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)	
600 (650)	1200	242	121	7.7	64×96	
	1500	224	112	9.3	64×115	
	1800	194	97	10.1	77×96	
	2200	162	81	12.0	77×115	
	2700	132	66	14.0	77×130	
	3300	88	44	16.4	77×155	
	3300	88	44	16.4	90×131	
	3900	74	37	17.8	90×131	
	4700	62	31	21.0	90×157	
5600	56	28	24.5	90×196		

Customer products are available on request.

## Lifetime Diagram



$I_A$  = actual ripple current at 120Hz,  $I_R$  = rated ripple current at 120Hz, 85°C  
Multiplier of Useful Life as a function of ambient temperature and ripple current load

# 我们的理念




**诚信**——以诚信理念为本，  
为客户提供优异的产品和服务。

**共赢**——以客户的价值为导向，  
实现客户、供应商和公司员工的价值体现。

**创新**——努力提升自身价值，锐意进取、开拓创新，  
不断为客户提供先进的技术和产品解决方案。

**卓越**——跟进和领悟客户超前的技术发展，  
将零缺陷的理念诠释成对每一个细节的把握。



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