

Capacitor Series Table

| Series Name | Features | Endurance | Rated Voltage Range(V) | Capacitance Range(μF) | Page |
|-------------|-----------------------------------|-------------------|------------------------|-----------------------|------|
| XT | Standard, 105°C | 105°C ,2000H | 6.3~100 | 1~2200 | 10 |
| KL | Long Life, 105°C | 105°C ,3000~5000H | 6.3~100 | 1~2200 | 13 |
| VD | High Voltage | 105°C ,5000H | 400 | 2.2~10 | 15 |
| LZ | Low Impedance | 105°C ,2000H | 6.3~100 | 1~2200 | 17 |
| FZ | Extra Low Impedance, Long Life | 105°C ,2000~5000H | 6.3~100 | 1~2200 | 20 |
| RX | Miniaturized, Extra Low Impedance | 105°C ,2000H | 6.3~50 | 10~2200 | 23 |
| CN | Bi-polar, 85°C | 85°C ,2000H | 6.3~50 | 1~47 | 25 |
| VN | Bi-polar, 105°C | 105°C ,2000H | 6.3~50 | 1~47 | 27 |
| SC | Low Leakage Current | 85°C ,2000H | 6.3~50 | 1~220 | 29 |
| VH | 125°C | 125°C ,1000~2000H | 10~63 | 10~680 | 31 |

PART NUMBER SYSTEM

For Example: 016 XT 221 M 0607
 (1) (2) (3) (4) (5)

(1) Rated Working Voltage

| | | | | | | | | | | | | | | | | |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| WV | 4 | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |
| Code | 004 | 006 | 010 | 016 | 025 | 035 | 050 | 063 | 080 | 100 | 160 | 200 | 250 | 350 | 400 | 450 |

(2) Series Name (Per DECON's Products Catalogue)

(3) Capacitance
ex)

| | | | | | |
|------|-----|-----|-----|-----|------|
| uF | 0.1 | 1 | 10 | 100 | 1000 |
| Code | R10 | 1R0 | 100 | 101 | 102 |

(4) Capacitance Tolerance

| | | | | |
|---------------|-----------|-----------|-----------|---------|
| Tolerance (%) | -10 ~ +10 | -20 ~ +20 | -10 ~ +20 | 0 ~ +20 |
| Code | K | M | V | R |

(5) Case Size (mm)

| | | | | | | |
|------|----|----|-----|----|----|------|
| ΦD | 4 | 5 | 6.3 | 8 | 10 | 12.5 |
| Code | 04 | 05 | 06 | 08 | 10 | 13 |

| | | | | | | |
|------|-------|---------|-----|------|---------|----|
| L | 5~5.4 | 5.7~6.5 | 7.7 | 10.5 | 13~13.5 | 16 |
| Code | 05 | 06 | 07 | 10 | 13 | 16 |

Precautions and Guidelines for Aluminum Electrolytic Capacitors

1. Guidelines for Circuit Design

(1) Polarity

Aluminum electrolytic capacitors are polarized. Make sure of the polarity, if used in reverse polarity, the circuit life may be shortened or the capacitor may be damaged. When the polarity in a circuit sometimes can be reversed or unknown, a bi-polar capacitor shall be used. Also, note that DC capacitors cannot be used for AC application.

(2) Operating Voltage

Do not apply DC voltage, which exceeds the rated voltage of the capacitor and not be reverse voltage. If a voltage exceeding the capacitor's voltage rating is applied, the capacitor may be damaged as leakage current increase. Using capacitors at recommended working voltage prolongs capacitor life. The surge voltage rating is the maximum DC over-voltage to which the capacitors may be subjected of short periods.

(3) Ripple Current

The combined value of DC voltage and the peak AC voltage shall not exceed the rated voltage. When an excessive ripple current passes, the capacitor may be damaged with the vent operating, etc. Use the electrolytic capacitor within the permissible ripple range current at specified frequency and temperature.

(4) Operating Temperature

Use the capacitors according to the specified operating temperature range. If used the capacitor outside the maximum rated temperature will considerably shorten the life or cause the capacitor to vent. Usage at room ambient will ensure longer life.

(5) Leakage Current

The leakage current shall be within specified levels. When capacitors are applied at a lower voltage, the actual leakage current will be reduced proportionately.

(6) Charge and Discharge

The capacitor is not suitable for a circuit in which charge and discharge are frequently repeated. The capacitance value may drop by forming oxide layer on the cathode foil, or the capacitor may be damaged by generating heat due to continuous rapid charge and discharge.

(7) Surge Voltage

The Surge voltage rating is referred as the maximum DC overvoltage that may be applied to an electrolytic capacitor for a short time. Unless otherwise described on the catalogue or product specifications, please do not apply a voltage exceeding the capacitor's voltage rating. The rated surge voltages corresponding to rated voltages of electrolytic capacitor are presented as follows:

| | | | | | | | | | | |
|------------------|-----|-----|------|------|------|------|------|------|----|-----|
| Rated Voltage(V) | 4 | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 |
| Surge Voltage(V) | 4.6 | 7.3 | 11.5 | 18.4 | 28.8 | 40.3 | 57.5 | 72.5 | 92 | 115 |
| Rated Voltage(V) | 160 | 200 | 250 | 400 | 450 | | | | | |
| Surge Voltage(V) | 184 | 230 | 288 | 440 | 495 | | | | | |

(8) Condition of Use

(a) The capacitors shall not be exposed to water, saltwater spray, oil or fumes, high humidity or humidity condensation and direct sunlight.

(b) Ambient conditions that include hazardous gases / fumes such as hydrogen sulfide, sulfuric acid, nitrous acid, chlorine or bromine gas, ammonia, etc.

(c) Exposed to ozone, ultraviolet rays and radiation.

(d) Severe vibration or physical shock that exceeds the condition in specification sheets.

(9) Consideration to Circuit Design

(a) Please make sure the application and mounting conditions that the capacitor will be used are within the conditions specified in the catalog. If the conditions are beyond the conditions specified in the catalog, please contact us.

(b) Do not design a circuit board so that heat-generating components are places near an aluminum electrolytic capacitor or reverse side of PCB. A cooling system is recommended.

(c) Operating temperature, applied voltage and ripple current shall be within specification. The ambient temperature shall not exceed the operating temperature and applied ripple current shall not exceed the allowable ripple current specified in the specification.

(d) Performances of electrical characteristics of aluminum electrolytic capacitors are affected by variation of operating temperature and frequency. Consider this variation designing the circuit.

(e) When two or more aluminum capacitors are connected in parallel, consider the current balance that flow through the capacitors.

(f) If more than two capacitors are connected in series, make sure the applied voltage will be lower than the rated voltage and that voltage will be applied to each equally using a balancing resistor in parallel with each capacitor.

(g) Do not tilt lay down or twist the capacitor's body after the capacitor is soldered to the PCB.

2. Caution for Assembling Capacitors

(1) Mounting

- (a) Aluminum electrolytic capacitors cannot be re-used once the capacitor has assembled in the set and power applied.
- (b) Aluminum electrolytic capacitors may have electrical potential between positive and negative terminal, please discharge through a $1\text{K}\Omega$ resistor before use.
- (c) Please confirm the rated voltage before mounting.
- (d) Please confirm the polarity before mounting.
- (e) Do not use the capacitor that once dropped on the hard floor.
- (f) Do not damage the capacitor while mounting.
- (g) Capacitors shall be mounted that hold spacing on PCB matches the lead pitch of the capacitors.
- (h) During the auto-insertion process and parts inspection, capacitors shall avoid the excessive force and shock.
- (i) Do not design to locate any wiring or circuit around the capacitor's pressure relief vent. The following clearance should be made above the pressure relief vent. The pressure relief vent will not open without the appropriate free space.

| | | |
|---------------|-----------------------|----------------------|
| Case Diameter | $\Phi 6.3\sim\Phi 16$ | $\Phi 18\sim\Phi 35$ |
| Clearance(mm) | 2mm | 3mm |

(2) Soldering

- (a) Be careful of temperature and time when soldering. Dip or flow soldering of the capacitors should be limited at less than $260\pm 5^\circ\text{C}$ and 10 ± 1 seconds or soldering iron with $350\pm 10^\circ\text{C}$ for $3+1/-0$ seconds. Do not dip capacitor's body into melted solder.
- (b) High humidity will affect the solder ability of lead wire and terminals. High temperature will reduce long-term operating life.
- (c) Except SMD type, reflow soldering can not be used for any types of aluminum electrolytic capacitors. When using SMD type capacitor, please check the reflow profile. The temperature and duration shall not exceed the specified temperature and duration in the specification. If the temperature or duration is higher than the value specified, please consult us before usage.
- (d) Standard aluminum electrolytic capacitors cannot withstand more than 2 reflow process. Please consult our engineering department when needed.

(3) Cleaning Circuit Boards After Soldering

Do not use following chemicals for cleaning: Solvent containing halogen ions, Alkaline solvent, Xylene, Acetone, Terpene, petro-based solvent.

3. Maintenance Inspection

Periodical inspection is necessary for using the aluminum capacitors with industrial equipment. The following items should be checked:

- (1) Appearance: Bloated, vent operation, leaking electrolyte, etc.
- (2) Electrical characteristic: Capacitance, dissipation factor, leakage current, and other specified items listed in specification. We recommend replacing the capacitors if the parts are out of specification.

4. Storage

(1) Aluminum electrolytic capacitor should not be stored in high temperature or high humidity condition. The suitable condition is $5^\circ\text{C} \sim 35^\circ\text{C}$ and less than 75% in relative humidity indoor.

(2) Do not store the capacitors in damp conditions such as water, brine or oil.

(3) Do not store the capacitors that exposed to hazardous gas such as hydrogen sulfide, sulfuric acid, nitrous acid, chlorine, ammonium, etc.

(4) Do not store the capacitors that exposed to ozone, ultraviolet rays or radiation.

(5) Do not expose the capacitors to acidic or alkaline solutions.

(6) It is not applied to a regulation of JEDEC J-STD-020 (Rev. C).

5. Disposal

Please consult with a local industrial waste disposal specialist when disposing of aluminum electrolytic capacitors.

6. Environmental Consideration

We already have received ISO 14001 certificate. Cadmium (Cd), Lead (Pb), Mercury (Hg), Hexavalent Chromium (Cr+6), PBB, PBDE, DEHP, BBP, DBP and DIBP have never been using in capacitor. If you need "Halogen-free" products, please consult with us.

铝电解电容器的注意事项

1、电路设计指南

(1) 极性

绝大部分的铝电解电容器是有极性的，使用时请确认极性标示。如果用反，可能会损坏电容器或发生爆炸。当电路中的极性有时可能反转时，可使用双极性电容器。同时请注意直流电容器不能用于交流电路中。

(2) 工作电压

直流电压不得超过电容器的额定电压，且不得为反向电压。如果施加的电压超过电容器的额定电压，电容器将发热且影响其性能。在额定工作电压下使用电容器可以延长电容器的寿命。额定浪涌电压是电容器在短时间内能够承受的电子直流电压。

(3) 纹波电流

施加过大的纹波电流时，会使得电容器内部发热，减短电容器使用寿命且电容器的容量也会下降。极端情况下将产生高温致使电容器内部损坏或导致防爆阀开启。请在规定的频率和温度及允许的纹波电流范围内使用电解电容器。

(4) 工作温度

根据规定的工作温度范围使用电容器。如果在高于额定温度的情况下使用电容器，将大大缩短寿命。要极端的情况下，高温会使电容防爆阀开启且电容会损坏。在室温下使用可确保电容有更长的使用寿命。

(5) 漏电流

漏电流会因室温的改变，施加的直流电压及时间而有所不同。初始漏电流通常较高，且不能较少，当施加电压一段时间后，漏电流会符合标准。

(6) 充放电

一般电容器不适用于频繁急剧充放电的电路中。如此使用，电容器的容值会下降或因过热而损坏。

(7) 浪涌电压

浪涌电压被称为电解电容器可在短时间内施加的最大直流电压。除非在目录或产品规格书中另有规定，请勿施加大于相应浪涌电压的电压值给电解电容器，额定的浪涌电压值如下表所示。

| | | | | | | | | | | |
|----------|-----|-----|------|------|------|------|------|------|----|-----|
| 额定电压 (V) | 4 | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 |
| 浪涌电压 (V) | 4.6 | 7.3 | 11.5 | 18.4 | 28.8 | 40.3 | 57.5 | 72.5 | 92 | 115 |
| 额定电压 (V) | 160 | 200 | 250 | 400 | 450 | | | | | |
| 浪涌电压 (V) | 184 | 230 | 288 | 440 | 495 | | | | | |

(8) 使用条件

- (a) 电容器不得暴露于水、盐雾、油或油类、高湿度或凝结的气候；
- (b) 请勿在充满有毒气体（如硫化氢、亚硫酸、亚硝酸、氯、溴气、氨）等其他有害气体 / 烟雾的环境下使用；
- (c) 请勿暴露于臭氧、紫外线和放射线环境中；
- (d) 请勿在严重振动或物理冲击超过规范表的环境中使用。

(9) 电路设计条件

- (a) 请确保电容器的应用和安装条件在目录规定的条件范围内。如果超出目录中规定的条件范围，请与我司联系；
- (b) 在设计电路时，请勿将发热零件安装在过于靠近铝电解电容器的地方。如一定需要，建议加一冷却系统；
- (c) 电路的环境温度不得超过电容的最大工作温度，施加的纹波电流不得超过允许的最大纹波电流；
- (d) 铝电解电容器的电特性会因温度和频率的变化而发生变化。请在确认该变化化再进行电路设计；
- (e) 当两个或多个电容器并联时，需考虑流过电容器之间的电流平衡；
- (f) 如果两个以上的电容器串联，请确保施加的电压低于额定电压，并各使用一电阻与电容器并联使得将该电压均匀地施加到每个电容器上。
- (g) 电容器焊接至 PCB 板后，请勿倾斜或扭转电容器本体。

2. 组装电容器的注意事项

1、安装

- (a) 如电容器曾被组装在 PCB 板上使用过, 请勿再次使用;
- (b) 电容器正负极端子之间可能存在静电, 请通过一个 $1\text{K}\Omega$ 左右的电阻进行放电;
- (c) 安装前请确认额定电压;
- (d) 安装时请确认极性;
- (e) 不要使用掉在硬地板上的电容器;
- (f) 安装时不要损坏电容器;
- (g) 安装时请确保 PCB 上的间距与电容器的引线间距相匹配;
- (h) 在自动插入过程和零件检查过程中, 电容器应避免过大的力冲击;
- (i) 设计时不要在电容器泄压孔周围设置任何接线或电路。泄压孔上方应留有以下规格范围的空间。如果没有适当的空间, 将无法打开泄压孔;

| | | |
|---------|-----------------------|----------------------|
| 外壳直径 | $\Phi 6.3\sim\Phi 16$ | $\Phi 18\sim\Phi 35$ |
| 间距 (mm) | 2mm | 3mm |

2、焊接

- (a) 焊接时应注意温度和时间, 回流焊峰值温度应限制在 $260\pm 5^\circ\text{C}$ 、10 秒 ± 1 秒、或者在 $350\pm 10^\circ\text{C}$ 下的烙铁中 3 秒 $+1/-0$ 秒。且电容本体不可侵入焊锡;
- (b) 高湿度会影响引线和端子的焊接能力。高温会缩短电容使用寿命;
- (c) 除 SMD 类型外, 回流焊不能用于任何类型的铝电解电容器。使用 SMD 类型电容器时, 请检查回流焊条件。焊接温度和持续时间不得超过规范中规定的温度和持续时间。如果温度或持续时间高于规定值, 使用前请咨询我司。
- (d) 标准铝电解电容器不能承受 2 次以上的回流过程。如有需要, 详情请咨询我司。

(3) 清洗电路板

请勿使用以下化学品进行清洗: 含有卤素离子的溶剂、碱性溶剂、二甲苯、丙酮、萜烯、石油基溶剂。

3、维修检查

在工业设备上使用的铝电解电容器, 必须进行定期检查。应检查以下项目:

- (1) 外观: 是否膨胀、损坏、电解液泄漏等;
- (2) 电气特性: 静电容量、损耗角正切值、漏电流和分外看要求的其他规定项目。如果零件不符合规格, 我们建议更换电容器。

4、贮存放置

- (1) 请勿将电容器存放在高温或高湿度环境中。电容器适宜保存的温度为 $5^\circ\text{C} \sim 35^\circ\text{C}$, 室内相对温度小于 75%;
- (2) 请勿将电容器储存在潮湿条件下, 如水、盐水或油等;
- (3) 请勿将电容器存放在充满硫化氢、亚硫酸、亚硝酸、氯、铵等有害气体的环境中;
- (4) 请勿将电容器存放在含臭氧、紫外线及有放射性的环境;
- (5) 请勿将电容器存放在含酸性或碱性溶液中。

5、废弃处理

请咨询当地工业废弃物处理的专业人员进行废弃处理。

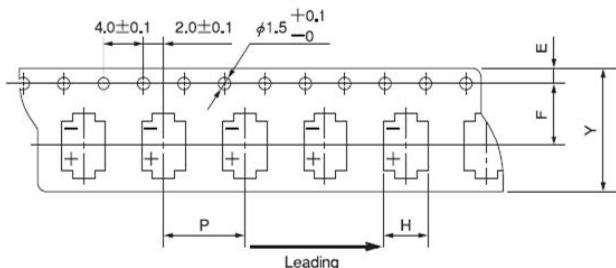
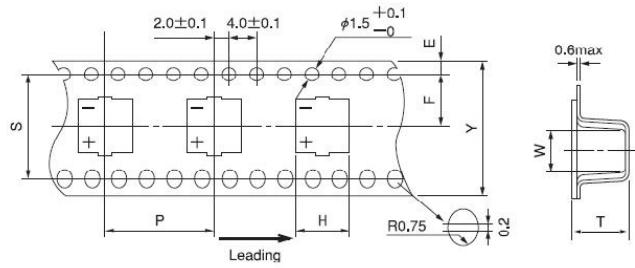
6、环保设计

本公司已获得 ISO14001 认证, 且产品符合 RoHS 2.0 及 REACH & SVHC219 项。如果您需要无卤产品, 请向我司技术人员咨询。

TAPING SPECIFICATIONS

Taping Specifications:

1. Carrier Tape

Fig. 1-1 $\Phi D \leq 10$ Fig. 1-2 $\Phi D \geq 12.5$ 

Unit:mm

| $\Phi D \times L$ | $Y \pm 0.3$ | $H \pm 0.2$ | $W \pm 0.2$ | $P \pm 0.1$ | $E \pm 0.1$ | $F \pm 0.1$ | $T \pm 0.2$ | $S \pm 0.1$ | Fig.No. |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|---------|
| $\Phi 4 \times 5.4$ | | | | | | | 5.8 | | 1-1 |
| $\Phi 4 \times 5.7$ | | 5.0 | 5.0 | 8.0 | | | 6.2 | | 1-1 |
| $\Phi 5 \times 5.4$ | | 6.0 | 6.0 | | | | 5.8 | | 1-1 |
| $\Phi 5 \times 5.7$ | | | | | | | 6.2 | | 1-1 |
| $\Phi 6.3 \times 5.4$ | | | | | | | 5.8 | | 1-1 |
| $\Phi 6.3 \times 5.7$ | | 7.0 | 7.0 | | | | 6.2 | | 1-1 |
| $\Phi 6.3 \times 7.7$ | | | | | | | 8.2 | | 1-1 |
| $\Phi 8 \times 6.5$ | | | | | | | 7.0 | | 1-1 |
| $\Phi 8 \times 10.5$ | | 8.7 | 8.7 | | | | 11.0 | | 1-1 |
| $\Phi 8 \times 13$ | | | | | | | 13.5 | | 1-1 |
| $\Phi 10 \times 7.7$ | | | | | | | 8.5 | | 1-1 |
| $\Phi 10 \times 10.5$ | | 10.7 | 10.7 | | | | 11.0 | | 1-1 |
| $\Phi 10 \times 13$ | | | | | | | 13.5 | | 1-1 |
| $\Phi 12.5 \times 13.5$ | | | | | | | 14.5 | | 1-2 |
| $\Phi 12.5 \times 16.0$ | 32.0 | 13.7 | 13.7 | 24.0 | | | 16.5 | 28.5 | 1-2 |

2. Reel Package

Unit: mm

Fig. 2-1

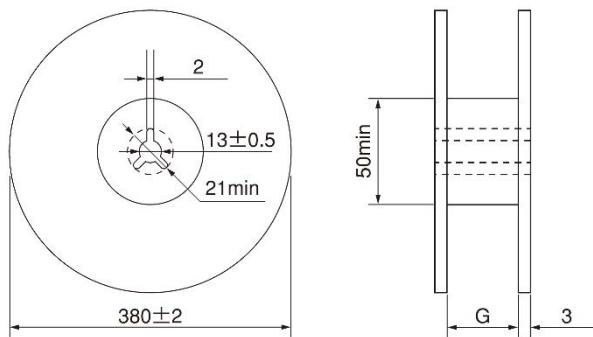
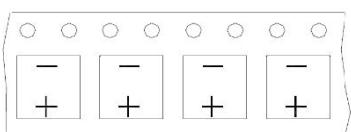


Fig. 2-2

| Case size | G |
|---------------------|----|
| $\Phi 4 \sim 5$ | 14 |
| $\Phi 6.3$ | 18 |
| $\Phi 8 \times 6.5$ | 18 |
| $\Phi 8$ | 26 |
| $\Phi 10$ | 26 |
| $\Phi 12.5$ | 34 |

→ Pull out direction

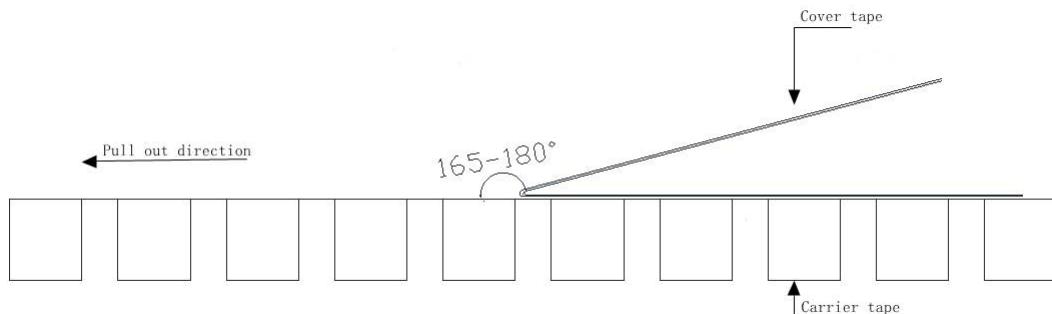


TAPING SPECIFICATIONS

3. Sealing Tape Reel Strength

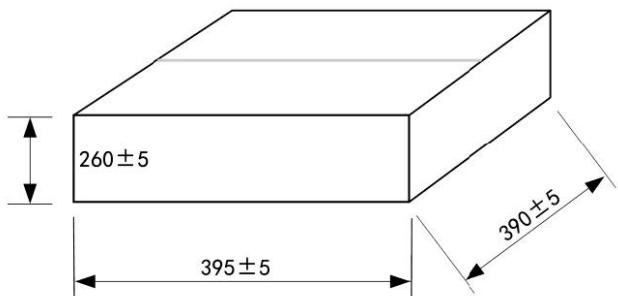
- 3.1 Peel angle: 165 to 180° referred to the surface on which the tape is glued.
- 3.2 Peel speed: 300mm per minutes
- 3.3 The peel strength must be 0.1 ~ 0.7N under these conditions.

Fig. 3-1



4. Package Quantity

Fig. 4-1

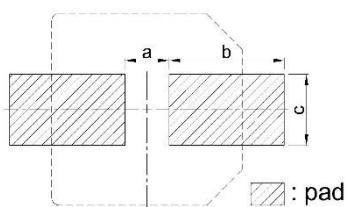


| Case size | pcs/reel | reels/Box | pcs/Box |
|--------------|----------|-----------|---------|
| Φ4 | 2000 | 12 | 24000 |
| Φ5 | 1000 | 12 | 12000 |
| Φ6.3 | 1000 | 10 | 10000 |
| Φ8×6.5 | 1000 | 10 | 10000 |
| Φ8×10.5 | 500 | 8 | 4000 |
| Φ8×13 | 400 | 8 | 3200 |
| Φ10×7.7~10.5 | 500 | 8 | 4000 |
| Φ10×13 | 400 | 8 | 3200 |
| Φ12.5×13.5 | 200 | 6 | 1200 |
| Φ12.5×16 | 200 | 6 | 1200 |

REFLOW SOLDERING CONDITIONS

Reflow Conditions for SMD type

1. Recommended pad pattern and size

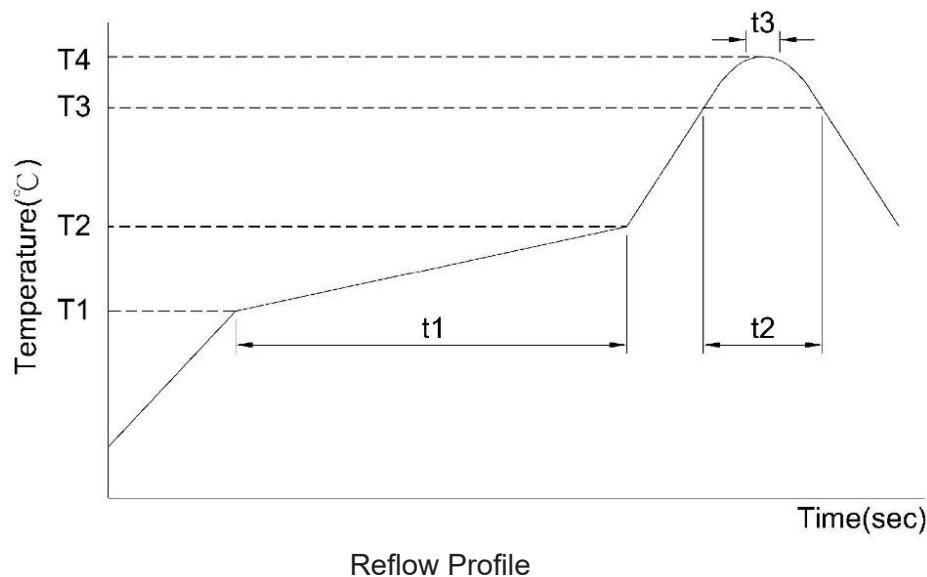


| Case size | Land size | | |
|-----------|-----------|-----|-----|
| | a | b | c |
| Φ4 | 1.0 | 2.6 | 1.8 |
| Φ5 | 1.4 | 3.0 | 1.8 |
| Φ6.3 | 1.9 | 3.5 | 1.8 |
| Φ8 | 3.0 | 4.0 | 2.5 |
| Φ10 | 4.0 | 4.0 | 2.5 |
| Φ12.5 | 4.0 | 6.0 | 3.0 |

2. Recommended Soldering Methods

2.1 Solder iron method: Bit temperature: $350 \pm 5^\circ\text{C}$, Application time of soldering Iron: 3 +1/-0 sec

2.2 Reflow Soldering(Pb-free):



| | | | | | | | | | | | |
|---------------------|---------------------------------|----------|-----|-----------|-------|-----|------------|--|--|--|--|
| Rated voltage(V) | | 4~50 | | ≥ 63 | 4~100 | | ≥ 160 | | | | |
| Case size(Φ) | | 4~6.3 | | $4~6.3$ | 8~18 | | $8~18$ | | | | |
| Preheat | Temp.(T1~T2, $^\circ\text{C}$) | | | | | | 150~180 | | | | |
| | Time(t1)(Max,secs) | | | | | | 100 | | | | |
| Duration | Temp.(T3, $^\circ\text{C}$) | | 217 | 230 | 217 | 217 | 230 | | | | |
| | Time(t2)(Max,secs) | | 90 | 40 | 60 | 60 | 40 | | | | |
| Peak | Temp.(T4, $^\circ\text{C}$) | | 260 | | 250 | 250 | | | | | |
| | Time(t3,secs) | | 5 | | | | | | | | |
| Reflow cycles | | ≤ 2 | | | | | | | | | |

※ Please contact our representative if your condition is higher.

※ Please ensure that the capacitor became cold enough to the room temperature ($5~35^\circ\text{C}$) before the second reflow.

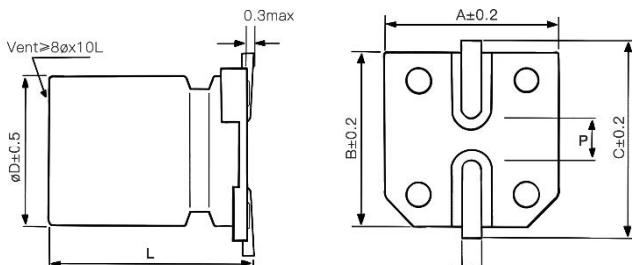
XT Series

- Endurance : 105°C 2000H
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | | | | | |
|--|--|--|-------|------|--------|----|----|----|--|--|--|--|--|--|--|
| Operating temperature range | -55°C to +105°C | | | | | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | | | | | |
| Leakage current max. | $I \leq 0.01 \text{ CV}$ or $3 \mu\text{A}$ whichever is greater (after 2 minutes) | | | | | | | | | | | | | | |
| Dissipation facotr max. | Please see the attached characteristics list. | | | | | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | | | | | | | |
| | Z-25°C /Z+20°C | 4 | 4 | 3 | 2 | 2 | 2 | 3 | | | | | | | |
| | Z-55°C /Z+20°C | 12 | 8 | 6 | 4 | 3 | 3 | 4 | | | | | | | |
| Endurance | After applying rated working voltage for 2000 hours at $+105 \pm 2^\circ\text{C}$, and then being stabilized at $+20^\circ\text{C}$ capacitors shall meet the following limits. | | | | | | | | | | | | | | |
| | Capacitance change | $\phi D \leq 6.3\text{mm}$: Within $\pm 25\%$ of the initial value $\phi D \geq 8\text{mm}$: Within $\pm 20\%$ of the initial value | | | | | | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | $\phi D \leq 6.3\text{mm}$: Less than 300% of the initial value $\phi D \geq 8\text{mm}$: Less than 200% of the initial value | | | | | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | | | | | |
| Shelf life | After storage for 1000 h at $+105 \pm 2^\circ\text{C}$ with no voltage applied and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the limits specified in endurance. | | | | | | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | | | | | | |
| | Capacitance change | Within $\pm 10\%$ of the initial value | | | | | | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Within the initial limit | | | | | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | | | | | |
| Frequency correction factor for ripple current | Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | | | | | | | | | | |
| | C ≤ 1000μF | 0.7 | 1.0 | 1.2 | 1.3 | | | | | | | | | | |
| | C > 1000μF | 0.8 | 1.0 | 1.1 | 1.2 | | | | | | | | | | |

Marking

Unit: mm



| ΦD | L | A | B | C | W | P±0.2 |
|------|----------|------|------|------|---------|-------|
| 4 | 5.7±0.3 | 4.3 | 4.3 | 5.1 | 0.5~0.8 | 1.0 |
| 5 | 5.7±0.3 | 5.3 | 5.3 | 6.1 | 0.5~0.8 | 1.3 |
| 6.3 | 5.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 6.3 | 7.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 8 | 6.5±0.3 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 8 | 10.5±0.5 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 10 | 7.7±0.3 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 10 | 10.5±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 10 | 13±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 12.5 | 13.5±0.5 | 13.0 | 13.0 | 14.0 | 1.0~1.4 | 4.4 |
| 12.5 | 16±0.5 | 13.0 | 13.0 | 14.0 | 1.0~1.4 | 4.4 |

XT Series

● CHARACTERISTICS LIST

| WV μF \ | 6.3 | | | 10 | | | 16 | | |
|------------|----------------------------|-------------------|----------------------|-----------------------------|------------------|----------------------|-------------------------------|-------------------|----------------------|
| 10 | | | | | | | 4x5.7 | 20 | 0.20 |
| 22 | 4x5.7 | 22 | 0.35 | 4x5.7 | 23 | 0.24 | 4x5.7 5x5.7 | 22 30 | 0.20 0.20 |
| 33 | 5x5.7 | 34 | 0.35 | 4x5.7 5x5.7 | 25 35 | 0.24 0.24 | 5x5.7 6.3x5.7 | 35 45 | 0.20 0.20 |
| 47 | 5x5.7 | 38 | 0.35 | 5x5.7 | 38 | 0.24 | 5x5.7 6.3x5.7 | 39 55 | 0.20 0.20 |
| 100 | 5x5.7 6.3x5.7 | 45 69 | 0.35 0.35 | 5x5.7 6.3x5.7 | 45 69 | 0.24 0.24 | 6.3x5.7 8x6.5 | 70 120 | 0.20 0.20 |
| 150 | | | | 6.3x5.7 | 80 | 0.24 | | | |
| 220 | 6.3x5.7 6.3x7.7 | 95 120 | 0.35 0.35 | 6.3x5.7 6.3x7.7 8x6.5 | 80 120 120 | 0.24 0.24 0.24 | 6.3x7.7 8x6.5 8x10.5 | 120 120 220 | 0.20 0.20 0.20 |
| 330 | 6.3x7.7 8x6.5 8x10.5 | 105 120 230 | 0.35 0.35 0.35 | 6.3x7.7 8x10.5 | 125 290 | 0.24 0.24 0.24 | 8x10.5 10x7.7 | 220 200 | 0.20 0.20 0.20 |
| 470 | 6.3x7.7 8x10.5 | 120 230 | 0.35 0.35 | 8x10.5 10x7.7 | 290 290 | 0.24 0.24 | 8x10.5 10x10.5 | 250 340 | 0.20 0.20 |
| 1000 | 10x10.5 | 315 | 0.37 | 10x10.5 | 400 | 0.26 | 10x10.5 10x13 12.5x13.5 | 340 390 500 | 0.22 0.22 0.32 |
| 2200 | 12.5x13.5 | 620 | 0.42 | 12.5x13.5 | 680 | 0.38 | | | |

| WV μF \ | 25 | | | 35 | | | 50 | | |
|------------|----------------------------|-------------------|----------------------|-------------------------------|-------------------|----------------------|-----------------------------|-------------------|----------------------|
| 1 | | | | | | | 4x5.7 | 8 | 0.14 |
| 2.2 | | | | | | | 4x5.7 | 12 | 0.14 |
| 3.3 | | | | | | | 4x5.7 | 14 | 0.14 |
| 4.7 | 4x5.7 | 17 | 0.18 | 4x5.7 | 17 | 0.16 | 4x5.7 5x5.7 | 14 20 | 0.14 0.14 |
| 10 | 4x5.7 5x5.7 | 20 27 | 0.18 0.18 | 4x5.7 5x5.7 | 17 25 | 0.16 0.16 | 5x5.7 6.3x5.7 | 20 32 | 0.14 0.14 |
| 22 | 5x5.7 6.3x5.7 | 30 44 | 0.18 0.18 | 5x5.7 6.3x5.7 | 30 44 | 0.16 0.16 | 6.3x5.7 6.3x7.7 8x6.5 | 38 50 70 | 0.14 0.14 0.14 |
| 33 | 5x5.7 6.3x5.7 | 35 46 | 0.18 0.18 | 6.3x5.7 8x6.5 | 46 76 | 0.16 0.16 | 6.3x7.7 8x6.5 | 60 70 | 0.14 0.14 |
| 47 | 6.3x5.7 8x6.5 | 48 79 | 0.18 0.18 | 6.3x5.7 6.3x7.7 8x6.5 | 50 80 80 | 0.16 0.16 0.16 | 6.3x7.7 8x6.5 8x10.5 | 63 85 100 | 0.14 0.14 0.14 |
| 100 | 6.3x7.7 8x6.5 8x10.5 | 100 100 150 | 0.18 0.18 0.18 | 6.3x7.7 8x10.5 10x7.7 | 85 150 160 | 0.16 0.16 0.16 | 8x10.5 10x7.7 10x10.5 | 160 180 160 | 0.14 0.14 0.14 |
| 150 | | | | 8x10.5 | 185 | 0.16 | | | |
| 220 | 8x10.5 10x7.7 | 200 190 | 0.18 0.18 | 8x10.5 10x10.5 | 220 250 | 0.16 0.16 | 10x10.5 10x13 | 230 300 | 0.14 0.14 |
| 330 | 8x10.5 10x10.5 | 220 240 | 0.18 0.18 | 10x10.5 10x13 | 300 330 | 0.16 0.16 | 12.5x13.5 | 420 | 0.18 |
| 470 | 10x10.5 | 280 | 0.18 | 10x10.5 10x13 12.5x13.5 | 310 375 520 | 0.16 0.16 0.22 | | | |
| 1000 | 12.5x13.5 | 580 | 0.30 | | | | | | |

↑ Tan δ (120Hz / +20°C)
 Ripple current (mA rms) (120Hz / +105°C)
 Case size ΦD×L(mm)

XT Series

● CHARACTERISTICS LIST

| μF | WV | 63 | | 100 | | |
|---------------|-------------------------------|-------------------|----------------------|-------------------------------|-------------------|----------------------|
| 1 | 4x5.7 | 8 | 0.14 | | | |
| 2.2 | 4x5.7 | 11 | 0.14 | | | |
| 3.3 | 5x5.7 6.3x5.7 | 14 30 | 0.14 0.14 | | | |
| 4.7 | 6.3x5.7 | 25 | 0.14 | 5x5.7 6.3x5.7 6.3x7.7 | 15 21 35 | 0.14 0.14 0.14 |
| 10 | 6.3x5.7 8x6.5 | 24 25 | 0.14 0.14 | 6.3x7.7 8x10.5 | 35 80 | 0.14 0.14 |
| 22 | 6.3x7.7 8x6.5 8x10.5 | 49 55 98 | 0.14 0.14 0.14 | 8x10.5 10x10.5 | 90 130 | 0.14 0.14 |
| 33 | 8x10.5 | 112 | 0.14 | 10x10.5 | 130 | 0.14 |
| 47 | 8x10.5 10x10.5 | 119 160 | 0.14 0.14 | 10x10.5 10x13 12.5x13.5 | 140 160 250 | 0.14 0.14 0.16 |
| 100 | 10x10.5 10x13 12.5x13.5 | 196 210 270 | 0.14 0.14 0.16 | 12.5x13.5 | 380 | 0.16 |
| 220 | 12.5x13.5 | 470 | 0.16 | | | |

Tan δ (120Hz / +20°C)
 Ripple current (mA rms) (120Hz / +105°C)
 Case size $\Phi D \times L$ (mm)

SMD ALUMINUM ELECTROLYTIC CAPACITORS

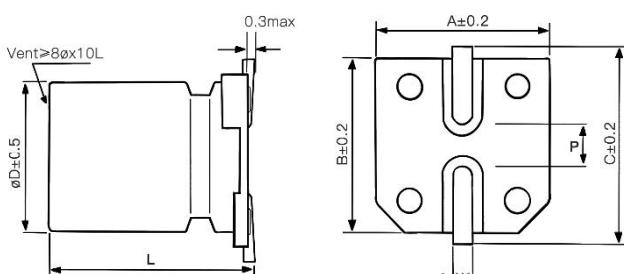
KL Series

- Endurance : 105°C 3000~5000 H
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | |
|--|--|--|----|-------|----|------|----|--------|----|-----|
| Operating temperature range | -55°C to +105°C | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | |
| Leakage current max. | $I \leq 0.01 \text{ CV}$ or $3 \mu\text{A}$ whichever is greater (after 2 minutes) | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list. | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 |
| | Z-25°C /Z+20°C | 4 | 4 | 3 | 2 | 2 | 2 | 2 | 3 | 3 |
| | Z-55°C /Z+20°C | 15 | 8 | 6 | 4 | 4 | 4 | 3 | 3 | 3 |
| Endurance | After applying rated working voltage for 3000/5000 hours at $+105 \pm 2^\circ\text{C}$, and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | |
| | Test Time | $\phi D \leq 6.3\text{mm}: 3000\text{H}, \phi D \geq 8\text{mm}: 5000\text{H}$ | | | | | | | | |
| | Capacitance change | Within $\pm 30\%$ of the initial value | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Less than 300% of the initial value | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | |
| Shelf life | After storage for 1000 h at $+105 \pm 2^\circ\text{C}$ with no voltage applied and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the limits specified in endurance. | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | |
| | Capacitance change | Within $\pm 10\%$ of the initial value | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Within the initial limit | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | |
| Frequency correction factor for ripple current | Frequency | 50Hz | | 120Hz | | 1kHz | | 10kHz≤ | | |
| | C ≤ 1000μF | 0.7 | | 1.0 | | 1.2 | | 1.3 | | |
| | C > 1000μF | 0.85 | | 1.0 | | 1.1 | | 1.15 | | |

Marking

Unit: mm



| ΦD | L | A | B | C | W | P±0.2 |
|------|----------|------|------|------|---------|-------|
| 4 | 5.7±0.3 | 4.3 | 4.3 | 5.1 | 0.5~0.8 | 1.0 |
| 5 | 5.7±0.3 | 5.3 | 5.3 | 6.1 | 0.5~0.8 | 1.3 |
| 6.3 | 5.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 6.3 | 7.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 8 | 10.5±0.5 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 10 | 10.5±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 10 | 13±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 12.5 | 13.5±0.5 | 13.0 | 13.0 | 14.0 | 1.0~1.4 | 4.4 |

KL Series

● CHARACTERISTICS LIST

| WV μF \ | 6.3 | | | 10 | | | 16 | | |
|------------|-----------|-----|------|-----------|-----|------|-----------|-----|------|
| 10 | | | | | | | 4x5.7 | 18 | 0.20 |
| 22 | 4x5.7 | 22 | 0.30 | 5x5.7 | 30 | 0.24 | 5x5.7 | 30 | 0.20 |
| 33 | 5x5.7 | 35 | 0.30 | 5x5.7 | 35 | 0.24 | 6.3x5.7 | 48 | 0.20 |
| 47 | 5x5.7 | 38 | 0.30 | 6.3x5.7 | 50 | 0.24 | 6.3x5.7 | 50 | 0.20 |
| 100 | 6.3x5.7 | 69 | 0.30 | 6.3x7.7 | 80 | 0.24 | 6.3x7.7 | 81 | 0.20 |
| 150 | | | | 8x10.5 | 125 | 0.24 | | | |
| 220 | 6.3x7.7 | 101 | 0.30 | 8x10.5 | 140 | 0.24 | 8x10.5 | 141 | 0.20 |
| 330 | 8x10.5 | 141 | 0.30 | 10x10.5 | 290 | 0.24 | 10x10.5 | 290 | 0.20 |
| 470 | 10x10.5 | 320 | 0.30 | 10x10.5 | 320 | 0.24 | 10x10.5 | 320 | 0.20 |
| 1000 | 10x10.5 | 410 | 0.32 | 10x13 | 390 | 0.26 | 12.5x13.5 | 550 | 0.32 |
| 1500 | 12.5x13.5 | 500 | 0.40 | 12.5x13.5 | 500 | 0.36 | 12.5x13.5 | 600 | 0.32 |
| 2200 | 12.5x13.5 | 600 | 0.42 | 12.5x13.5 | 600 | 0.38 | | | |

| WV μF \ | 25 | | | 35 | | | 50 | | |
|------------|-----------|-----|------|-----------|-----|------|-----------|-----|------|
| 1 | | | | | | | 4x5.7 | 8 | 0.14 |
| 2.2 | | | | | | | 4x5.7 | 12 | 0.14 |
| 3.3 | | | | | | | 4x5.7 | 17 | 0.14 |
| 4.7 | | | | 4x5.7 | 16 | 0.16 | 5x5.7 | 22 | 0.14 |
| 10 | 5x5.7 | 27 | 0.18 | 5x5.7 | 27 | 0.16 | 6.3x5.7 | 32 | 0.14 |
| 22 | 6.3x5.7 | 44 | 0.18 | 6.3x5.7 | 44 | 0.16 | 6.3x7.7 | 58 | 0.14 |
| 33 | 6.3x5.7 | 50 | 0.18 | 6.3x7.7 | 57 | 0.16 | 8x10.5 | 130 | 0.14 |
| 47 | 6.3x7.7 | 63 | 0.18 | 8x10.5 | 92 | 0.16 | 8x10.5 | 141 | 0.14 |
| 100 | 8x10.5 | 116 | 0.18 | 10x10.5 | 151 | 0.16 | 10x10.5 | 160 | 0.14 |
| 220 | 10x10.5 | 290 | 0.18 | 10x10.5 | 320 | 0.16 | 12.5x13.5 | 280 | 0.16 |
| 330 | 10x10.5 | 320 | 0.18 | 12.5x13.5 | 320 | 0.22 | | | |
| 470 | 12.5x13.5 | 400 | 0.28 | 12.5x13.5 | 350 | 0.22 | | | |

| WV μF \ | 63 | | | 80 | | | 100 | | |
|------------|-----------|-----|------|-----------|-----|------|-----------|-----|------|
| 4.7 | | | | | | | 6.3x7.7 | 40 | 0.14 |
| 10 | 6.3x7.7 | 45 | 0.14 | | | | 8x10.5 | 55 | 0.14 |
| 22 | 8x10.5 | 65 | 0.14 | | | | 10x10.5 | 70 | 0.14 |
| 33 | 10x10.5 | 80 | 0.14 | | | | 10x10.5 | 80 | 0.14 |
| 47 | 10x10.5 | 110 | 0.14 | | | | 12.5x13.5 | 150 | 0.14 |
| 100 | 12.5x13.5 | 150 | 0.14 | 12.5x13.5 | 180 | 0.16 | 12.5x13.5 | 220 | 0.16 |
| 150 | | | | 12.5x13.5 | 220 | 0.16 | | | |
| 220 | 12.5x13.5 | 240 | 0.16 | | | | | | |

↑ ↑ ↑ Tan δ (120Hz / +20°C)

Ripple current (mA rms) (120Hz / +105°C)

Case size ΦD×L(mm)

SMD ALUMINUM ELECTROLYTIC CAPACITORS

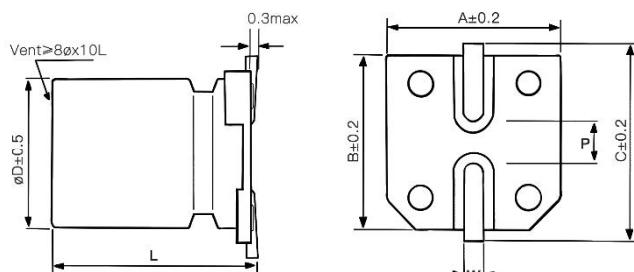
VD Series

- Endurance : 105°C 5000H
- Designed for High Voltage
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | | |
|--|--|-------|--------------------|----------------------------------|-------------------------------------|-------------------------------------|-----------------|--------------------------|-----|-----|-----|-----|
| Operating temperature range | -40°C to +105°C | | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | | |
| Leakage current max. | I ≤ 0.04 CV +100µA, after 5 minutes | | | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list | | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | <table border="1"> <tr> <td>Rated voltage(V)</td> <td>400</td> </tr> <tr> <td>Z-25°C /Z+20°C</td> <td>6</td> </tr> <tr> <td>Z-40°C /Z+20°C</td> <td>10</td> </tr> </table> | | Rated voltage(V) | 400 | Z-25°C /Z+20°C | 6 | Z-40°C /Z+20°C | 10 | | | | |
| Rated voltage(V) | 400 | | | | | | | | | | | |
| Z-25°C /Z+20°C | 6 | | | | | | | | | | | |
| Z-40°C /Z+20°C | 10 | | | | | | | | | | | |
| Endurance | <p>After applying rated working voltage for 5000 hours at $+105 \pm 2^\circ\text{C}$, and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>Within ±30% of the initial value</td> </tr> <tr> <td>Dissipation factor ($\tan\delta$)</td> <td>Less than 300% of the initial value</td> </tr> <tr> <td>Leakage current</td> <td>Within the initial limit</td> </tr> </table> | | Capacitance change | Within ±30% of the initial value | Dissipation factor ($\tan\delta$) | Less than 300% of the initial value | Leakage current | Within the initial limit | | | | |
| Capacitance change | Within ±30% of the initial value | | | | | | | | | | | |
| Dissipation factor ($\tan\delta$) | Less than 300% of the initial value | | | | | | | | | | | |
| Leakage current | Within the initial limit | | | | | | | | | | | |
| Shelf life | <p>After storage for 1000 h at $+105 \pm 2^\circ\text{C}$ with no voltage applied and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the limits specified in endurance.</p> | | | | | | | | | | | |
| Resistance to soldering heat | <p>After reflow soldering and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>Within ±10% of the initial value</td> </tr> <tr> <td>Dissipation factor ($\tan\delta$)</td> <td>Within the initial limit</td> </tr> <tr> <td>Leakage current</td> <td>Within the initial limit</td> </tr> </table> | | Capacitance change | Within ±10% of the initial value | Dissipation factor ($\tan\delta$) | Within the initial limit | Leakage current | Within the initial limit | | | | |
| Capacitance change | Within ±10% of the initial value | | | | | | | | | | | |
| Dissipation factor ($\tan\delta$) | Within the initial limit | | | | | | | | | | | |
| Leakage current | Within the initial limit | | | | | | | | | | | |
| Frequency correction factor for ripple current | <table border="1"> <tr> <th>Frequency</th> <th>50Hz</th> <th>120Hz</th> <th>1kHz</th> <th>10kHz≤</th> </tr> <tr> <td>Correction Factor</td> <td>0.7</td> <td>1.0</td> <td>1.3</td> <td>1.4</td> </tr> </table> | | Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | Correction Factor | 0.7 | 1.0 | 1.3 | 1.4 |
| Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | | | | | | | | |
| Correction Factor | 0.7 | 1.0 | 1.3 | 1.4 | | | | | | | | |

Marking

Unit: mm



| ΦD | L | A | B | C | W | P±0.2 |
|----|----------|------|------|------|---------|-------|
| 8 | 10.5±0.5 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 8 | 13±0.5 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 10 | 10.5±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 10 | 13±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |

VD Series**● CHARACTERISTICS LIST**

| WV μF | 400 | | |
|----------|---------|----|------|
| 2.2 | 8×10.5 | 15 | 0.25 |
| 3.3 | 8×10.5 | 20 | 0.25 |
| 4.7 | 8×10.5 | 25 | 0.25 |
| | 8×13 | 30 | 0.25 |
| | 10×10.5 | 30 | 0.25 |
| 5.6 | 8×13 | 35 | 0.25 |
| | 10×10.5 | 35 | 0.25 |
| 6.8 | 10×10.5 | 45 | 0.25 |
| 8.2 | 10×13 | 55 | 0.25 |
| 10 | 10×13 | 60 | 0.25 |

↑ ↑ ↑

Tan δ (120Hz / +20°C)

Ripple current (mA rms) (120Hz / +105°C)

Case size ΦD×L(mm)

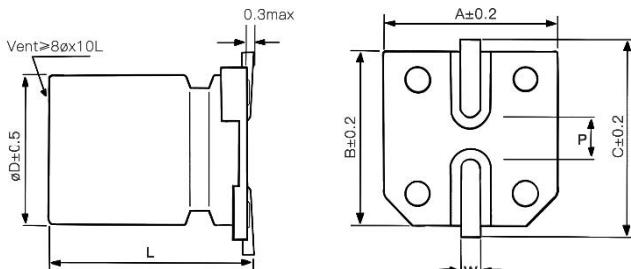
LZ**Series**

- Endurance : 105°C 2000H
- Low Impedance
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|------|-------------------------------------|------|--------|----|----|----|-----|--|------------------|-----|----|----|----|----|----|----|----|-----|----------------|---|---|---|---|---|---|---|---|---|----------------|----|---|---|---|---|---|---|---|---|
| Operating temperature range | -55°C to +105°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage current max. | I ≤ 0.01 CV or 3 μA whichever is greater (after 2 minutes) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | <table border="1"> <thead> <tr> <th>Rated voltage(V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Z-25°C /Z+20°C</td> <td>4</td> <td>4</td> <td>3</td> <td>3</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>7</td> <td>5</td> <td>5</td> <td>4</td> <td>4</td> <td>3</td> <td>4</td> <td>4</td> </tr> </tbody> </table> | | | | | | | | | | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | Z-25°C /Z+20°C | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | Z-55°C /Z+20°C | 10 | 7 | 5 | 5 | 4 | 4 | 3 | 4 | 4 |
| Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Z-25°C /Z+20°C | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Z-55°C /Z+20°C | 10 | 7 | 5 | 5 | 4 | 4 | 3 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Endurance | After applying rated working voltage for 2000 hours at +105 ± 2°C , and then being stabilized at +20°C , capacitors shall meet the following limits. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Capacitance change | | Within ±25% of the initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Dissipation factor (tanδ) | | Less than 250% of the initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Leakage current | | Within the initial limit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf life | After storage for 1000 h at +105 ± 2°C with no voltage applied and then being stabilized at +20°C ,capacitors shall meet the limits specified in endurance. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at +20°C , capacitors shall meet the following limits. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Capacitance change | | Within ±10% of the initial value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Dissipation factor (tanδ) | | Within the initial limit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Frequency correction factor for ripple current | Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Correction Factor | 0.6 | 0.7 | 0.85 | 1.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Marking

Unit: mm



| ΦD | L | A | B | C | W | P±0.2 |
|------|----------|------|------|------|---------|-------|
| 4 | 5.7±0.3 | 4.3 | 4.3 | 5.1 | 0.5~0.8 | 1.0 |
| 5 | 5.7±0.3 | 5.3 | 5.3 | 6.1 | 0.5~0.8 | 1.3 |
| 6.3 | 5.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 6.3 | 7.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 8 | 6.5±0.3 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 8 | 10.5±0.5 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 10 | 7.7±0.3 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 10 | 10.5±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 10 | 13±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 12.5 | 13.5±0.5 | 13.0 | 13.0 | 14.0 | 1.0~1.4 | 4.4 |
| 12.5 | 16±0.5 | 13.0 | 13.0 | 14.0 | 1.0~1.4 | 4.4 |

LZ**Series****● CHARACTERISTICS LIST**

| WV μF \ | 6.3 | | | | 10 | | | |
|------------|--------------------|------------|--------------|--------------|------------------------------|-------------------|----------------------|----------------------|
| 22 | 4×5.7 | 60 | 3.00 | 0.26 | 4×5.7 | 60 | 3.00 | 0.20 |
| 33 | 4×5.7 | 60 | 3.00 | 0.26 | 4×5.7 | 60 | 3.00 | 0.20 |
| 47 | 5×5.7 | 95 | 1.80 | 0.26 | 5×5.7 6.3×5.7 | 95 140 | 1.80 1.00 | 0.20 0.20 |
| 100 | 5×5.7 6.3×5.7 | 100 140 | 1.80 1.00 | 0.26 | 5×5.7 6.3×5.7 | 100 140 | 1.80 1.00 | 0.20 0.20 |
| 150 | | | | | 6.3×5.7 | 140 | 1.00 | 0.20 |
| 220 | 6.3×5.7 6.3×7.7 | 140 230 | 1.00 0.60 | 0.26 0.26 | 6.3×5.7 6.3×7.7 8×10.5 | 140 230 450 | 1.00 0.60 0.45 | 0.20 0.20 0.20 |
| 330 | 6.3×7.7 8×10.5 | 230 450 | 0.60 0.45 | 0.26 0.26 | 8×10.5 | 450 | 0.45 | 0.20 |
| 470 | 6.3×7.7 8×10.5 | 230 450 | 0.60 0.45 | 0.26 0.26 | 8×10.5 | 450 | 0.45 | 0.20 |
| 820 | 8×10.5 10×10.5 | 450 670 | 0.40 0.25 | 0.26 0.26 | | | | |
| 1000 | 10×10.5 | 670 | 0.25 | 0.28 | 10×10.5 | 670 | 0.25 | 0.22 |
| 1500 | 10×10.5 | 670 | 0.25 | 0.28 | | | | |
| 2200 | 12.5×13.5 | 820 | 0.12 | 0.34 | 12.5×13.5 | 820 | 0.12 | 0.28 |

↑ ↑ ↑
 Ripple current (mA rms) (100kHz / +105°C) Tan δ (120Hz / +20°C)
 Case size ΦD×L(mm) Impedance (100kHz / +20°C)

| WV μF \ | 16 | | | | 25 | | | |
|------------|-----------------------------|-------------------|----------------------|----------------------|-----------------------------|-------------------|----------------------|----------------------|
| 4.7 | | | | | 4×5.7 | 60 | 3.00 | 0.16 |
| 10 | 4×5.7 | 60 | 3.00 | 0.18 | 4×5.7 5×5.7 | 60 95 | 3.00 1.80 | 0.16 0.16 |
| 22 | 4×5.7 5×5.7 | 60 95 | 3.00 1.80 | 0.18 | 5×5.7 6.3×5.7 | 95 140 | 1.80 1.00 | 0.16 0.16 |
| 33 | 5×5.7 6.3×5.7 | 95 140 | 1.80 1.00 | 0.18 | 5×5.7 6.3×5.7 | 95 140 | 1.80 1.00 | 0.16 0.16 |
| 47 | 5×5.7 6.3×5.7 | 95 140 | 1.80 1.00 | 0.18 | 6.3×5.7 | 140 | 1.00 | 0.16 |
| 68 | 8×6.5 | 230 | 0.60 | 0.18 | | | | |
| 100 | 6.3×5.7 6.3×7.7 8×6.5 | 140 230 230 | 1.00 0.60 0.60 | 0.18 0.18 0.18 | 6.3×7.7 8×10.5 | 230 450 | 0.60 0.45 | 0.16 0.16 |
| 150 | 6.3×7.7 8×10.5 | 230 450 | 0.60 0.45 | 0.18 | 8×10.5 | 450 | 0.45 | 0.16 |
| 220 | 6.3×7.7 8×6.5 8×10.5 | 230 230 450 | 0.60 0.60 0.45 | 0.18 0.18 0.18 | 8×10.5 10×7.7 10×10.5 | 450 450 670 | 0.45 0.45 0.25 | 0.16 0.16 0.16 |
| 330 | 8×10.5 10×7.7 | 450 450 | 0.45 0.45 | 0.18 | 8×10.5 10×10.5 | 450 670 | 0.40 0.25 | 0.16 0.16 |
| 470 | 8×10.5 10×10.5 | 450 670 | 0.45 0.25 | 0.18 | 10×10.5 | 670 | 0.25 | 0.16 |
| 680 | 10×10.5 | 670 | 0.25 | 0.18 | 10×13 | 750 | 0.15 | 0.16 |
| 1000 | 10×10.5 10×13 | 670 750 | 0.25 0.15 | 0.20 | 12.5×13.5 | 820 | 0.11 | 0.20 |
| 1500 | 12.5×13.5 | 820 | 0.12 | 0.22 | | | | |

LZ**Series****● CHARACTERISTICS LIST**

| WV μF | 35 | | | | 50 | | | |
|----------|---------------------------------------|--------------------------|------------------------------|------------------------------|-----------------------------|-------------------|----------------------|----------------------|
| 1 | | | | | 4x5.7 | 30 | 5.00 | 0.12 |
| 2.2 | | | | | 4x5.7 | 30 | 5.00 | 0.12 |
| 3.3 | | | | | 4x5.7 | 30 | 5.00 | 0.12 |
| 4.7 | 4x5.7 | 60 | 3.00 | 0.14 | 4x5.7 5x5.7 | 30 50 | 5.00 3.00 | 0.12 0.12 |
| 10 | 4x5.7 5x5.7 | 60 95 | 3.00 1.80 | 0.14 0.14 | 5x5.7 6.3x5.7 | 50 70 | 3.00 2.00 | 0.12 0.12 |
| 22 | 5x5.7 6.3x5.7 | 95 140 | 1.80 1.00 | 0.14 0.14 | 6.3x5.7 6.3x7.7 8x6.5 | 70 120 120 | 2.00 1.00 1.00 | 0.12 0.12 0.12 |
| 33 | 6.3x5.7 8x6.5 | 140 230 | 1.00 0.60 | 0.14 0.14 | 6.3x7.7 8x10.5 | 120 280 | 1.00 0.80 | 0.12 |
| 47 | 6.3x5.7 6.3x7.7 8x6.5 8x10.5 | 140 230 230 450 | 1.00 0.60 0.60 0.45 | 0.14 0.14 0.14 0.14 | 6.3x7.7 8x6.5 8x10.5 | 120 120 300 | 1.00 1.00 0.80 | 0.12 0.12 0.12 |
| 100 | 6.3x7.7 8x6.5 8x10.5 | 230 230 450 | 0.60 0.60 0.45 | 0.14 0.14 0.14 | 8x10.5 10x7.7 10x10.5 | 300 300 450 | 0.80 0.80 0.45 | 0.12 0.12 0.12 |
| 150 | 8x10.5 10x7.7 | 450 450 | 0.45 0.45 | 0.14 0.14 | 10x10.5 | 450 | 0.45 | 0.12 |
| 220 | 8x10.5 10x10.5 | 450 670 | 0.40 0.25 | 0.14 0.14 | 10x10.5 10x13 | 500 550 | 0.45 0.35 | 0.12 0.12 |
| 330 | 10x10.5 | 670 | 0.25 | 0.14 | 12.5x13.5 | 650 | 0.25 | 0.14 |
| 470 | 10x13 | 750 | 0.15 | 0.14 | | | | |
| 680 | 12.5x13.5 | 820 | 0.12 | 0.6 | | | | |

↑ ↑ ↑ ↓
 Ripple current (mA rms) (100kHz / +105°C) Tan δ (120Hz / +20°C)
 Case size ΦD×L(mm) Impedance (100kHz / +20°C)

| WV μF | 63 | | | | 80 | | | |
|----------|-------------------------------|-------------------|----------------------|----------------------|-------------------------------|-------------------|----------------------|----------------------|
| 4.7 | 5x5.7 | 50 | 5.00 | 0.12 | | | | |
| 10 | 6.3x5.7 | 80 | 3.00 | 0.12 | 6.3x7.7 | 60 | 3.00 | 0.12 |
| 22 | 6.3x7.7 | 100 | 2.50 | 0.12 | 8x10.5 | 130 | 2.00 | 0.12 |
| 33 | 8x10.5 | 250 | 2.00 | 0.12 | 10x10.5 | 180 | 1.50 | 0.12 |
| 47 | 8x10.5 10x7.7 10x10.5 | 250 250 300 | 2.00 2.00 1.50 | 0.12 0.12 0.12 | 8x10.5 10x10.5 10x13 | 130 180 240 | 2.00 1.50 1.20 | 0.12 0.12 0.12 |
| 100 | 10x10.5 10x13 12.5x13.5 | 300 400 500 | 1.50 1.00 0.85 | 0.12 0.12 0.14 | 10x10.5 10x13 12.5x13.5 | 180 240 500 | 1.50 1.20 0.85 | 0.12 0.12 0.14 |
| 150 | | | | | 12.5x13.5 | 500 | 0.85 | 0.14 |
| 220 | 12.5x13.5 | 550 | 0.65 | 0.14 | | | | |

| WV μF | 100 | | | |
|----------|-------------------------------|-------------------|----------------------|----------------------|
| 4.7 | 5x5.7 6.3x5.7 | 25 40 | 5.00 5.00 | 0.12 0.12 |
| 10 | 6.3x7.7 8x6.5 | 60 60 | 3.00 3.00 | 0.12 0.12 |
| 22 | 8x10.5 10x10.5 | 130 180 | 2.00 1.50 | 0.12 0.12 |
| 33 | 10x10.5 10x13 | 180 210 | 1.50 1.20 | 0.12 0.12 |
| 47 | 10x10.5 10x13 12.5x13.5 | 180 240 500 | 1.50 1.20 0.85 | 0.12 0.12 0.14 |
| 100 | 12.5x13.5 | 500 | 0.85 | 0.14 |

SMD ALUMINUM ELECTROLYTIC CAPACITORS

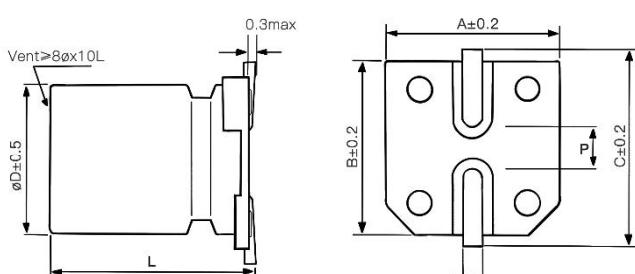
FZ Series

- Endurance : 105°C 2000H~5000H
- Extra Low Impedance (40% ~ 60% lower than LZ Series)
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | | | | | | | |
|--|--|--|----|-------|----|------|----|--------|----|-----|--|--|--|--|--|--|--|
| Operating temperature range | -55°C to +105°C | | | | | | | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | | | | | | | |
| Leakage current max. | $I \leq 0.01 \text{ CV}$ or $3 \mu\text{A}$ whichever is greater (after 2 minutes) | | | | | | | | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list | | | | | | | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | | | | | | | |
| | Z-25°C /Z+20°C | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | |
| | Z-55°C /Z+20°C | 8 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | | |
| Endurance | After applying rated working voltage for 2000/3000/5000 hours at $+105 \pm 2^\circ\text{C}$, and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | | | | | | | | |
| | Test Time | $\Phi D \times L \leq 6.3 \times 5.7 L \text{mm: } 2000\text{H}, \Phi 6.3 \times 7.7 \text{L, } \Phi 8 \times 6.5 \text{L, } \Phi 10 \times 7.7 \text{L: } 3000\text{H, } \Phi D \geq 8\text{mm: } 5000\text{H}$ | | | | | | | | | | | | | | | |
| | Capacitance change | Within $\pm 30\%$ of the initial value | | | | | | | | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Less than 300% of the initial value | | | | | | | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | | | | | | | |
| Shelf life | After storage for 1000 h at $+105 \pm 2^\circ\text{C}$ with no voltage applied and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the limits specified in endurance. | | | | | | | | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | | | | | | | | |
| | Capacitance change | Within $\pm 10\%$ of the initial value | | | | | | | | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Within the initial limit | | | | | | | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | | | | | | | |
| Frequency correction factor for ripple current | Frequency | 50Hz | | 120Hz | | 1kHz | | 10kHz≤ | | | | | | | | | |
| | Correction Factor | 0.6 | | 0.7 | | 0.85 | | 1.0 | | | | | | | | | |

Marking

Unit: mm



| ΦD | L | A | B | C | W | $P \pm 0.2$ |
|----------|----------------|------|------|------|---------|-------------|
| 4 | 5.7 ± 0.3 | 4.3 | 4.3 | 5.1 | 0.5~0.8 | 1.0 |
| 5 | 5.7 ± 0.3 | 5.3 | 5.3 | 6.1 | 0.5~0.8 | 1.3 |
| 6.3 | 5.7 ± 0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 6.3 | 7.7 ± 0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 8 | 6.5 ± 0.3 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 8 | 10.5 ± 0.5 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 10 | 7.7 ± 0.3 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 10 | 10.5 ± 0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 10 | 13 ± 0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 12.5 | 13.5 ± 0.5 | 13.0 | 13.0 | 14.0 | 1.0~1.4 | 4.4 |
| 12.5 | 16 ± 0.5 | 13.0 | 13.0 | 14.0 | 1.0~1.4 | 4.4 |

FZ Series

● CHARACTERISTICS LIST

| WV μF | 6.3 | | | | 10 | | | |
|----------|-----------------------------|-------------------|----------------------|----------------------|--------------------|------------|--------------|--------------|
| 22 | 4x5.7 | 80 | 1.45 | 0.26 | 4x5.7 | 80 | 1.45 | 0.22 |
| 33 | 4x5.7 5x5.7 | 80 150 | 1.45 0.80 | 0.26 0.26 | 5x5.7 | 150 | 0.80 | 0.22 |
| 47 | 5x5.7 | 150 | 0.80 | 0.26 | 6.3x5.7 | 230 | 0.44 | 0.22 |
| 100 | 5x5.7 6.3x5.7 | 150 230 | 0.80 0.44 | 0.26 0.26 | 6.3x5.7 | 230 | 0.44 | 0.22 |
| 150 | 6.3x5.7 | 230 | 0.44 | 0.26 | 6.3x5.7 | 230 | 0.44 | 0.22 |
| 220 | 6.3x5.7 6.3x7.7 | 230 280 | 0.44 0.36 | 0.26 0.26 | 6.3x7.7 8x6.5 | 280 280 | 0.36 0.36 | 0.22 0.22 |
| 330 | 6.3x7.7 8x6.5 8x10.5 | 280 280 450 | 0.36 0.36 0.17 | 0.26 0.26 0.26 | 8x10.5 10x7.7 | 450 450 | 0.17 0.17 | 0.22 0.22 |
| 470 | 6.3x7.7 8x10.5 10x7.7 | 280 450 450 | 0.36 0.17 0.17 | 0.26 0.26 0.26 | 8x10.5 10x7.7 | 450 450 | 0.17 0.17 | 0.22 0.22 |
| 680 | 8x10.5 10x7.7 | 450 450 | 0.17 0.17 | 0.26 0.26 | 10x10.5 | 670 | 0.09 | 0.22 |
| 1000 | 8x10.5 | 450 | 0.17 | 0.28 | 10x10.5 | 670 | 0.09 | 0.24 |
| 1500 | 10x10.5 10x13 | 670 720 | 0.09 0.08 | 0.28 0.28 | 10x13 12.5x13.5 | 720 820 | 0.08 0.07 | 0.24 0.27 |
| 2200 | 12.5x13.5 | 820 | 0.07 | 0.34 | 12.5x13.5 | 820 | 0.07 | 0.29 |

↑ ↑ ↑ ↑
 Ripple current (mA rms) (100kHz / +105°C) Impedance (100kHz / +20°C)
 Case size ΦD×L(mm)

| WV μF | 16 | | | | 25 | | | |
|----------|--------------------|------------|--------------|--------------|--------------------|------------|--------------|--------------|
| 10 | 4x5.7 | 80 | 1.45 | 0.18 | 4x5.7 | 80 | 1.45 | 0.16 |
| 22 | 5x5.7 | 150 | 0.80 | 0.18 | 5x5.7 | 150 | 0.80 | 0.16 |
| 33 | 5x5.7 6.3x5.7 | 150 230 | 0.80 0.44 | 0.18 0.18 | 5x5.7 6.3x5.7 | 150 230 | 0.80 0.44 | 0.16 0.16 |
| 47 | 6.3x5.7 | 230 | 0.44 | 0.18 | 6.3x5.7 | 230 | 0.44 | 0.16 |
| 68 | 6.3x5.7 | 230 | 0.44 | 0.18 | 6.3x5.7 | 230 | 0.44 | 0.16 |
| 100 | 6.3x5.7 8x6.5 | 230 280 | 0.44 0.36 | 0.18 0.18 | 6.3x7.7 8x6.5 | 280 280 | 0.36 0.36 | 0.16 0.16 |
| 150 | 6.3x7.7 8x6.5 | 280 280 | 0.36 0.36 | 0.18 0.18 | 8x10.5 | 450 | 0.17 | 0.16 |
| 220 | 6.3x7.7 | 280 | 0.36 | 0.18 | 8x10.5 10x7.7 | 450 450 | 0.17 0.17 | 0.16 0.16 |
| 330 | 8x10.5 10x7.7 | 450 450 | 0.17 0.17 | 0.18 0.18 | 8x10.5 | 450 | 0.17 | 0.16 |
| 470 | 8x10.5 10x10.5 | 450 670 | 0.17 0.09 | 0.18 0.18 | 10x10.5 | 670 | 0.09 | 0.16 |
| 680 | 10x10.5 | 670 | 0.09 | 0.18 | 10x13 12.5x13.5 | 720 820 | 0.08 0.07 | 0.16 0.18 |
| 1000 | 10x13 12.5x13.5 | 720 820 | 0.08 0.07 | 0.20 0.22 | 12.5x13.5 | 820 | 0.07 | 0.20 |

SMD ALUMINUM ELECTROLYTIC CAPACITORS

FZ Series

● CHARACTERISTICS LIST

| WV μF | 35 | | | | 50 | | | |
|----------|----------------------|------------|--------------|--------------|----------------------------|-------------------|----------------------|----------------------|
| 1 | | | | | 4x5.7 | 60 | 2.9 | 0.12 |
| 2.2 | | | | | 4x5.7 | 60 | 2.9 | 0.12 |
| 3.3 | | | | | 4x5.7 | 60 | 2.9 | 0.12 |
| 4.7 | 4x5.7 | 80 | 1.45 | 0.14 | 4x5.7 5x5.7 | 60 85 | 2.9 1.52 | 0.12 0.12 |
| 10 | 4x5.7 5x5.7 | 80 150 | 1.45 0.80 | 0.14 | 6.3x5.7 | 165 | 0.88 | 0.12 |
| 22 | 5x5.7 6.3x5.7 | 150 230 | 0.80 0.44 | 0.14 | 6.3x5.7 | 165 | 0.88 | 0.12 |
| 33 | 6.3x5.7 | 230 | 0.44 | 0.14 | 6.3x7.7 | 185 | 0.68 | 0.12 |
| 47 | 6.3x5.7 | 230 | 0.44 | 0.14 | 6.3x7.7 8x6.5 8x10.5 | 185 185 360 | 0.68 0.68 0.34 | 0.12 0.12 0.12 |
| 68 | 6.3x7.7 8x6.5 | 280 280 | 0.36 0.36 | 0.14 | 8x10.5 | 360 | 0.34 | 0.12 |
| 100 | 6.3x7.7 8x10.5 | 280 450 | 0.36 0.17 | 0.14 | 8x10.5 10x10.5 | 360 560 | 0.34 0.18 | 0.12 |
| 150 | 8x10.5 10x7.7 | 450 450 | 0.17 0.17 | 0.14 | 10x10.5 | 560 | 0.18 | 0.12 |
| 220 | 8x10.5 10x10.5 | 600 670 | 0.17 0.09 | 0.14 | 10x10.5 12.5x13.5 | 560 650 | 0.18 0.12 | 0.12 |
| 330 | 10x10.5 12.5x13.5 | 850 820 | 0.09 0.07 | 0.14 0.16 | 12.5x13.5 | 650 | 0.12 | 0.12 |
| 470 | 10x13 12.5x13.5 | 720 820 | 0.08 0.07 | 0.14 0.16 | | | | |

↑ Tan δ (120Hz / +20°C)
 ↑ Impedance (100kHz / +20°C)
 Ripple current (mA rms) (100kHz / +105°C)
 Case size ΦD×L(mm)

| WV μF | 63 | | | | 80 | | | |
|----------|----------------------|------------|--------------|--------------|--------------------|------------|--------------|--------------|
| 3.3 | | | | | 5x5.7 | 25 | 5.0 | 0.12 |
| 4.7 | 5x5.7 | 60 | 2.9 | 0.12 | 6.3x5.7 | 40 | 3.0 | 0.12 |
| 10 | 6.3x5.7 | 80 | 1.5 | 0.12 | 6.3x7.7 8x6.5 | 60 60 | 2.4 2.4 | 0.12 |
| 22 | 6.3x7.7 8x6.5 | 120 120 | 1.2 1.2 | 0.12 | 8x10.5 | 130 | 1.3 | 0.12 |
| 33 | 8x10.5 | 250 | 0.65 | 0.12 | 8x10.5 | 130 | 1.3 | 0.12 |
| 47 | 8x10.5 | 250 | 0.65 | 0.12 | 10x10.5 | 200 | 0.70 | 0.12 |
| 68 | 8x10.5 | 250 | 0.65 | 0.12 | 10x13 12.5x13.5 | 400 500 | 0.40 0.32 | 0.12 0.14 |
| 100 | 10x10.5 12.5x13.5 | 400 800 | 0.35 0.16 | 0.12 0.14 | 10x13 12.5x13.5 | 400 500 | 0.40 0.32 | 0.12 0.14 |
| 150 | 12.5x13.5 | 800 | 0.16 | 0.14 | 12.5x13.5 | 500 | 0.32 | 0.14 |
| 220 | 12.5x13.5 | 800 | 0.16 | 0.14 | | | | |

| WV μF | 100 | | | |
|----------|-------------------------------|-------------------|----------------------|----------------------|
| 22 | 8x10.5 | 130 | 1.3 | 0.12 |
| 33 | 10x10.5 | 200 | 0.70 | 0.12 |
| 47 | 10x10.5 10x13 12.5x13.5 | 200 400 500 | 0.70 0.40 0.32 | 0.12 0.12 0.14 |
| 68 | 12.5x13.5 | 500 | 0.32 | 0.14 |
| 100 | 12.5x13.5 | 500 | 0.32 | 0.14 |

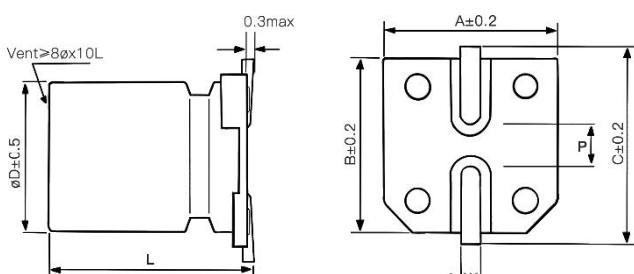
RX Series

- Endurance : 105°C 2000H
- Miniaturized, Extra Low Impedance (1 size smaller than FZ Series)
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | |
|--|--|-------------------------------------|-------|------|--------|----|--|--|--|--|--|
| Operating temperature range | -55°C to +105°C | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | |
| Leakage current max. | $I \leq 0.01 \text{ CV}$ or $3 \mu\text{A}$ whichever is greater (after 2 minutes) | | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | | | | | |
| | Z-25°C /Z+20°C | 4 | 3 | 2 | 2 | 2 | | | | | |
| | Z-55°C /Z+20°C | 8 | 5 | 4 | 3 | 3 | | | | | |
| Endurance | After applying rated working voltage for 2000 hours at $+105 \pm 2^\circ\text{C}$, and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | Within ±30% of the initial value | | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Less than 200% of the initial value | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | |
| Shelf life | After storage for 1000 h at $+105 \pm 2^\circ\text{C}$ with no voltage applied and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the limits specified in endurance. | | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | Within ±10% of the initial value | | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Within the initial limit | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | |
| Frequency correction factor for ripple current | Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | | | | | | |
| | C ≤ 470μF | 0.50 | 0.65 | 0.85 | 1.00 | | | | | | |
| | C > 470μF | 0.55 | 0.70 | 0.90 | 1.00 | | | | | | |

Marking

Unit: mm



| ØD | L | A | B | C | W | P±0.2 |
|-----|----------|------|------|------|---------|-------|
| 4 | 5.7±0.3 | 4.3 | 4.3 | 5.1 | 0.5~0.8 | 1.0 |
| 5 | 5.7±0.3 | 5.3 | 5.3 | 6.1 | 0.5~0.8 | 1.3 |
| 6.3 | 5.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 6.3 | 7.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 8 | 6.5±0.3 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 8 | 10.5±0.5 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 10 | 10.5±0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |

SMD ALUMINUM ELECTROLYTIC CAPACITORS

RX**Series****● CHARACTERISTICS LIST**

| WV μF | 6.3 | | | | 10 | | | |
|----------|---------|------|------|------|---------|------|------|------|
| 68 | | | | | 4×5.7 | 160 | 1.25 | 0.19 |
| 100 | 4×5.7 | 160 | 1.25 | 0.26 | | | | |
| 150 | | | | | 5×5.7 | 240 | 0.76 | 0.19 |
| 220 | 5×5.7 | 240 | 0.76 | 0.26 | 6.3×5.7 | 300 | 0.36 | 0.19 |
| 330 | 6.3×5.7 | 300 | 0.36 | 0.26 | 6.3×7.7 | 600 | 0.26 | 0.19 |
| 470 | 6.3×7.7 | 600 | 0.26 | 0.26 | 6.3×7.7 | 600 | 0.26 | 0.19 |
| 680 | 6.3×7.7 | 600 | 0.26 | 0.26 | | | | |
| 1000 | | | | | 8×10.5 | 850 | 0.16 | 0.21 |
| 1500 | 8×10.5 | 850 | 0.16 | 0.28 | 10×10.5 | 1190 | 0.08 | 0.21 |
| 2200 | 10×10.5 | 1190 | 0.08 | 0.32 | | | | |

↑ ↑ ↑ ↑
 Ripple current (mA rms)(100kHz / +105°C) Impedance (100kHz / +20°C)
 Case size ΦD×L(mm) Tan δ (120Hz / +20°C)

| WV μF | 16 | | | | 25 | | | |
|----------|---------|------|------|------|---------|------|------|------|
| 22 | | | | | 4×5.7 | 160 | 1.25 | 0.14 |
| 33 | | | | | 4×5.7 | 160 | 1.25 | 0.14 |
| 47 | 4×5.7 | 160 | 1.25 | 0.16 | 5×5.7 | 240 | 0.76 | 0.14 |
| 68 | 5×5.7 | 240 | 0.76 | 0.16 | 5×5.7 | 240 | 0.76 | 0.14 |
| 100 | 5×5.7 | 240 | 0.76 | 0.16 | 6.3×5.7 | 300 | 0.36 | 0.14 |
| 150 | 6.3×5.7 | 300 | 0.36 | 0.16 | 6.3×7.7 | 600 | 0.26 | 0.14 |
| 220 | 6.3×5.7 | 300 | 0.36 | 0.16 | 6.3×7.7 | 600 | 0.26 | 0.14 |
| 330 | 6.3×7.7 | 600 | 0.26 | 0.16 | | | | |
| 390 | | | | | 8×10.5 | 850 | 0.16 | 0.14 |
| 470 | 8×6.5 | 600 | 0.16 | 0.16 | 8×10.5 | 850 | 0.16 | 0.14 |
| 560 | | | | | 8×10.5 | 850 | 0.16 | 0.14 |
| 680 | 8×10.5 | 850 | 0.16 | 0.16 | | | | |
| 820 | 8×10.5 | 850 | 0.16 | 0.16 | 10×10.5 | 1190 | 0.08 | 0.14 |
| 1000 | 10×10.5 | 1190 | 0.08 | 0.18 | 10×10.5 | 1190 | 0.08 | 0.16 |
| 1200 | 10×10.5 | 1190 | 0.08 | 0.18 | | | | |

| WV μF | 35 | | | | 50 | | | |
|----------|---------|------|------|------|----------------|-----------|--------------|--------------|
| 10 | | | | | 4×5.7 5×5.7 | 85 165 | 2.60 1.18 | 0.10 0.10 |
| 22 | 4×5.7 | 160 | 1.25 | 0.12 | 5×5.7 | 165 | 1.18 | 0.10 |
| 33 | 5×5.7 | 240 | 0.76 | 0.12 | | | | |
| 47 | 5×5.7 | 240 | 0.76 | 0.12 | 6.3×5.7 | 195 | 0.74 | 0.10 |
| 68 | 6.3×5.7 | 300 | 0.36 | 0.12 | | | | |
| 100 | 6.3×5.7 | 300 | 0.36 | 0.12 | 6.3×7.7 | 350 | 0.40 | 0.10 |
| 150 | 6.3×7.7 | 600 | 0.26 | 0.12 | | | | |
| 220 | | | | | 8×10.5 | 670 | 0.24 | 0.10 |
| 330 | 8×10.5 | 850 | 0.16 | 0.12 | 10×10.5 | 900 | 0.18 | 0.10 |
| 390 | 8×10.5 | 850 | 0.16 | 0.12 | | | | |
| 470 | 10×10.5 | 1190 | 0.08 | 0.12 | | | | |
| 560 | 10×10.5 | 1190 | 0.08 | 0.12 | | | | |
| 680 | 10×10.5 | 1190 | 0.08 | 0.12 | | | | |

SMD ALUMINUM ELECTROLYTIC CAPACITORS

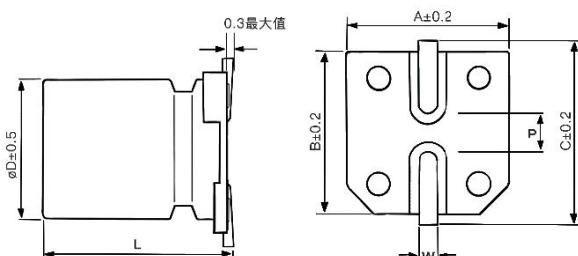
CN Series

- Endurance : 85°C 2000H
- Bi-polar
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | |
|--|---|-------------------------------------|-------|------|--------|----|--|--|--|--|--|
| Operating temperature range | -40°C to +85°C | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | |
| Leakage current max. | $I \leq 0.03 CV + 6\mu A$, after 2 minutes. | | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list. | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | | | | | |
| | Z-25°C /Z+20°C | 4 | 3 | 2 | 2 | 2 | | | | | |
| | Z-40°C /Z+20°C | 10 | 8 | 6 | 4 | 3 | | | | | |
| Endurance | After applying rated working voltage for 2000 hours at $+85 \pm 2^\circ C$, and then being stabilized at $+20^\circ C$, capacitors shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | Within ±20% of the initial value | | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Less than 200% of the initial value | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | |
| Shelf life | After storage for 1000 h at $+85 \pm 2^\circ C$ with no voltage applied and then being stabilized at $+20^\circ C$, capacitors shall meet the limits specified in endurance. | | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at $+20^\circ C$, capacitors shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | Within ±10% of the initial value | | | | | | | | | |
| | Dissipation factor ($\tan\delta$) | Within the initial limit | | | | | | | | | |
| Frequency correction factor for ripple current | Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | | | | | | |
| | Correction Factor | 0.7 | 1.0 | 1.3 | 1.4 | | | | | | |

Marking

Unit: mm



| ΦD | L | A | B | C | W | P±0.2 |
|-----|---------|-----|-----|-----|---------|-------|
| 4 | 5.4±0.4 | 4.3 | 4.3 | 5.1 | 0.5~0.8 | 1.0 |
| 5 | 5.4±0.4 | 5.3 | 5.3 | 6.1 | 0.5~0.8 | 1.3 |
| 6.3 | 5.4±0.4 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |

CN Series

● CHARACTERISTICS LIST

| WV μF | 6.3 | | | 10 | | | 16 | | |
|----------|---------|----|------|---------|----|------|---------|----|------|
| 4.7 | | | | | | | 4×5.4 | 14 | 0.24 |
| 10 | | | | 4×5.4 | 18 | 0.26 | 5×5.4 | 26 | 0.24 |
| 22 | 5×5.4 | 27 | 0.32 | 5×5.4 | 28 | 0.26 | 6.3×5.4 | 45 | 0.24 |
| 33 | 6.3×5.4 | 45 | 0.32 | 6.3×5.4 | 33 | 0.26 | 6.3×5.4 | 55 | 0.24 |
| 47 | 6.3×5.4 | 54 | 0.32 | | | | | | |

| WV μF | 25 | | | 35 | | | 50 | | |
|----------|---------|----|------|---------|----|------|---------|----|------|
| 1 | | | | | | | 4×5.4 | 7 | 0.20 |
| 2.2 | | | | 4×5.4 | 10 | 0.20 | 5×5.4 | 14 | 0.20 |
| 3.3 | 4×5.4 | 13 | 0.22 | 5×5.4 | 17 | 0.20 | 5×5.4 | 17 | 0.20 |
| 4.7 | 5×5.4 | 20 | 0.22 | 5×5.4 | 21 | 0.20 | 6.3×5.4 | 24 | 0.20 |
| 10 | 6.3×5.4 | 35 | 0.22 | 6.3×5.4 | 35 | 0.20 | 6.3×5.4 | 35 | 0.20 |

↑ Tan δ (120Hz / +20°C)
 ↑ Ripple current (mA rms) (120Hz / +85°C)
 Case size ΦD×L(mm)

SMD ALUMINUM ELECTROLYTIC CAPACITORS

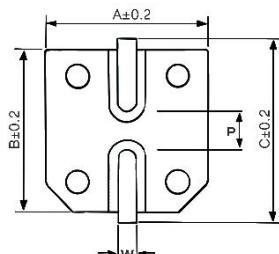
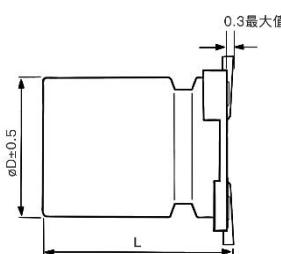
VN Series

- Endurance : 105°C 2000H
- Bi-polar
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | |
|--|--|-------------------------------------|-------|------|--------|----|--|--|--|--|--|
| Operating temperature range | -55°C to +105°C | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | |
| Leakage current max. | $I \leq 0.03 CV + 6\mu A$, after 2 minutes. | | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list. | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | | | | | |
| | Z-25°C /Z+20°C | 4 | 3 | 2 | 2 | 2 | | | | | |
| | Z-55°C /Z+20°C | 10 | 8 | 6 | 4 | 3 | | | | | |
| Endurance | After applying rated working voltage for 2000 hours at $+105 \pm 2^\circ C$, and then being stabilized at $+20^\circ C$, capacitors shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | Within ±30% of the initial value | | | | | | | | | |
| | Dissipation factor ($\tan \delta$) | Less than 300% of the initial value | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | |
| Shelf life | After storage for 1000 h at $+105 \pm 2^\circ C$ with no voltage applied and then being stabilized at $+20^\circ C$, capacitors shall meet the limits specified in endurance. | | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at $+20^\circ C$, capacitors shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | Within ±10% of the initial value | | | | | | | | | |
| | Dissipation factor ($\tan \delta$) | Within the initial limit | | | | | | | | | |
| Frequency correction factor for ripple current | Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | | | | | | |
| | Correction Factor | 0.7 | 1.0 | 1.2 | 1.3 | | | | | | |

Marking

Unit: mm



| ΦD | L | A | B | C | W | P±0.2 |
|-----|---------|-----|-----|-----|---------|-------|
| 4 | 5.7±0.3 | 4.3 | 4.3 | 5.1 | 0.5~0.8 | 1.0 |
| 5 | 5.7±0.3 | 5.3 | 5.3 | 6.1 | 0.5~0.8 | 1.3 |
| 6.3 | 5.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |

VN**Series**

● **CHARACTERISTICS LIST**

| WV μF | 6.3 | | | 10 | | | 16 | | |
|----------|---------|----|------|---------|----|------|---------|----|------|
| 4.7 | | | | | | | 4x5.7 | 12 | 0.24 |
| 10 | | | | 4x5.7 | 17 | 0.26 | 5x5.7 | 23 | 0.24 |
| 22 | 5x5.7 | 28 | 0.32 | 5x5.7 | 28 | 0.26 | 6.3x5.7 | 37 | 0.24 |
| 33 | 6.3x5.7 | 37 | 0.32 | 6.3x5.7 | 33 | 0.26 | 6.3x5.7 | 49 | 0.24 |
| 47 | 6.3x5.7 | 45 | 0.32 | | | | | | |

| WV μF | 25 | | | 35 | | | 50 | | |
|----------|---------|----|------|---------|----|------|---------|----|------|
| 1 | | | | | | | 4x5.7 | 8 | 0.20 |
| 2.2 | | | | 4x5.7 | 8 | 0.20 | 5x5.7 | 13 | 0.20 |
| 3.3 | 4x5.7 | 12 | 0.22 | 5x5.7 | 16 | 0.20 | 5x5.7 | 17 | 0.20 |
| 4.7 | 5x5.7 | 16 | 0.22 | 5x5.7 | 18 | 0.20 | 6.3x5.7 | 20 | 0.20 |
| 10 | 6.3x5.7 | 27 | 0.22 | 6.3x5.7 | 29 | 0.20 | | | |

↑ ↑ ↑
 Tan δ (120Hz / +20°C)
 Ripple current (mA rms) (120Hz / +105°C)
 Case size ΦD×L(mm)

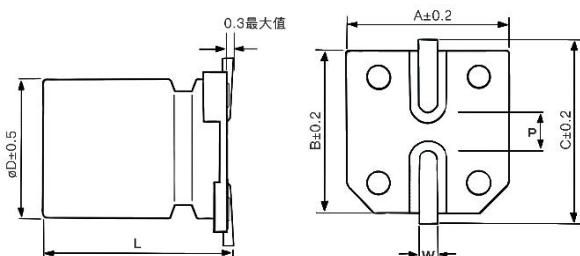
SC Series

- Endurance : 85°C 2000H
- Low Leakage Current
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|-------|------|--------|----|----|--------------------|----------------------------------|--------------------------------------|-------------------------------------|-----------------|--------------------------|-----|----------------|-----|-----|---|---|---|---|----------------|----|---|---|---|---|---|
| Operating temperature range | -40°C to +85°C | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage current max. | $I \leq 0.002 CV$ or $3 \mu A$ whichever is greater (after 2 minutes). | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | <table border="1"> <thead> <tr> <th>Rated voltage(V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <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> </tr> <tr> <td>Z-40°C /Z+20°C</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> </tr> </tbody> </table> | | | | | | Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | Z-25°C /Z+20°C | 4 | 3 | 2 | 2 | 2 | 2 | Z-40°C /Z+20°C | 10 | 8 | 6 | 4 | 3 | 3 |
| Rated voltage(V) | 6.3 | 10 | 16 | 25 | 35 | 50 | | | | | | | | | | | | | | | | | | | | | |
| Z-25°C /Z+20°C | 4 | 3 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | |
| Z-40°C /Z+20°C | 10 | 8 | 6 | 4 | 3 | 3 | | | | | | | | | | | | | | | | | | | | | |
| Endurance | After applying rated working voltage for 2000 hours at $+85 \pm 2^\circ C$, and then being stabilized at $+20^\circ C$, capacitors shall meet the following limits. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>Capacitance change</td> <td>Within ±20% of the initial value</td> </tr> <tr> <td>Dissipation factor ($\tan \delta$)</td> <td>Less than 200% of the initial value</td> </tr> <tr> <td>Leakage current</td> <td>Within the initial limit</td> </tr> </table> | | | | | | Capacitance change | Within ±20% of the initial value | Dissipation factor ($\tan \delta$) | Less than 200% of the initial value | Leakage current | Within the initial limit | | | | | | | | | | | | | | | |
| Capacitance change | Within ±20% of the initial value | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation factor ($\tan \delta$) | Less than 200% of the initial value | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage current | Within the initial limit | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shelf life | After storage for 1000 h at $+85 \pm 2^\circ C$ with no voltage applied and then being stabilized at $+20^\circ C$, capacitors shall meet the limits specified in endurance. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at $+20^\circ C$, capacitors shall meet the following limits. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <tr> <td>Capacitance change</td> <td>Within ±10% of the initial value</td> </tr> <tr> <td>Dissipation factor ($\tan \delta$)</td> <td>Within the initial limit</td> </tr> <tr> <td>Leakage current</td> <td>Within the initial limit</td> </tr> </table> | | | | | | Capacitance change | Within ±10% of the initial value | Dissipation factor ($\tan \delta$) | Within the initial limit | Leakage current | Within the initial limit | | | | | | | | | | | | | | | |
| Capacitance change | Within ±10% of the initial value | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation factor ($\tan \delta$) | Within the initial limit | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Leakage current | Within the initial limit | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Frequency correction factor for ripple current | <table border="1"> <thead> <tr> <th>Frequency</th> <th>50Hz</th> <th>120Hz</th> <th>1kHz</th> <th>10kHz≤</th> </tr> </thead> <tbody> <tr> <td>Correction Factor</td> <td>0.7</td> <td>1.0</td> <td>1.3</td> <td>1.4</td> </tr> </tbody> </table> | | | | | | Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | Correction Factor | 0.7 | 1.0 | 1.3 | 1.4 | | | | | | | | | | | |
| Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | | | | | | | | | | | | | | | | | | | | | | | |
| Correction Factor | 0.7 | 1.0 | 1.3 | 1.4 | | | | | | | | | | | | | | | | | | | | | | | |

Marking

Unit: mm



| ΦD | L | A | B | C | W | P±0.2 |
|-----|---------|-----|-----|-----|---------|-------|
| 4 | 5.4±0.4 | 4.3 | 4.3 | 5.1 | 0.5~0.8 | 1.0 |
| 5 | 5.4±0.4 | 5.3 | 5.3 | 6.1 | 0.5~0.8 | 1.3 |
| 6.3 | 5.4±0.4 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 6.3 | 7.7±0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |

SC**Series**

● **CHARACTERISTICS LIST**

| WV μF \ | 6.3 | | | 10 | | | 16 | | |
|------------|---------|----|------|---------|----|------|---------|----|------|
| 10 | | | | | | | 4×5.4 | 25 | 0.20 |
| 22 | 4×5.4 | 31 | 0.28 | 5×5.4 | 35 | 0.24 | 5×5.4 | 39 | 0.20 |
| 33 | 5×5.4 | 39 | 0.28 | 5×5.4 | 43 | 0.24 | 6.3×5.4 | 57 | 0.20 |
| 47 | 5×5.4 | 47 | 0.28 | 6.3×5.4 | 59 | 0.24 | 6.3×5.4 | 68 | 0.20 |
| 100 | 6.3×5.7 | 75 | 0.28 | 6.3×5.4 | 76 | 0.24 | 6.3×7.7 | 96 | 0.20 |
| 220 | 6.3×7.7 | 85 | 0.28 | | | | | | |

| WV μF \ | 25 | | | 35 | | | 50 | | |
|------------|---------|-----|------|---------|-----|------|---------|----|------|
| 1 | | | | | | | 4×5.4 | 10 | 0.12 |
| 2.2 | | | | | | | 4×5.4 | 15 | 0.12 |
| 3.3 | | | | | | | 4×5.4 | 18 | 0.12 |
| 4.7 | 4×5.4 | 19 | 0.16 | 4×5.4 | 20 | 0.14 | 5×5.4 | 23 | 0.12 |
| 10 | 5×5.4 | 28 | 0.16 | 5×5.4 | 30 | 0.14 | 6.3×5.4 | 34 | 0.12 |
| 22 | 6.3×5.4 | 52 | 0.16 | 6.3×5.4 | 54 | 0.14 | 6.3×7.7 | 85 | 0.12 |
| 33 | 6.3×5.4 | 63 | 0.16 | 6.3×7.7 | 105 | 0.14 | | | |
| 47 | 6.3×7.7 | 100 | 0.16 | 6.3×7.7 | 110 | 0.14 | | | |

↑ ↑ ↑
 Case size ΦD×L(mm)
 Ripple current (mA rms) (120Hz / +105°C)
 Tan δ (120Hz / +20°C)

SMD ALUMINUM ELECTROLYTIC CAPACITORS

VH

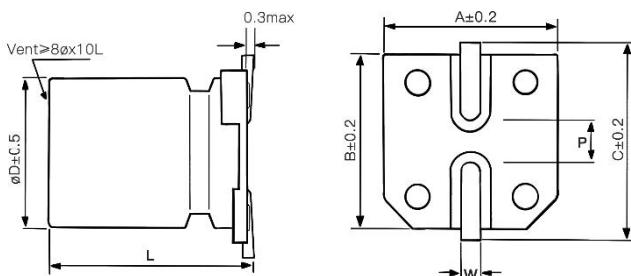
Series

- Endurance : 125°C 1000~2000H
- Designed for reflow soldering
- Designed for surface mounting on high-density PCB
- Complied to the RoHS directive

| Items | Performance characteristics | | | | | | | | | | |
|--|--|---|-------|------|--------|----|--|--|--|--|--|
| Operating temperature range | -40°C to +125°C | | | | | | | | | | |
| Capacitance tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | |
| Leakage current max. | $I \leq 0.01 \text{ CV}$ or $3 \mu\text{A}$ whichever is greater (after 2 minutes). | | | | | | | | | | |
| Dissipation factor max. | Please see the attached characteristics list. | | | | | | | | | | |
| Low temperature characteristics (Impedance ratio at 120 Hz) | Rated voltage(V) | 10 | 16 | 25 | 35 | 50 | | | | | |
| | Z-25°C /Z+20°C | 6 | 5 | 4 | 3 | 3 | | | | | |
| | Z-40°C /Z+20°C | 12 | 8 | 6 | 4 | 4 | | | | | |
| Endurance | After applying rated working voltage for 1000/2000 hours at $+125 \pm 2^\circ\text{C}$, and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | | |
| | Test Time | $\phi D \leq 8 \times 6.5 \text{ mm}$: 1000H, $\phi D \geq 8 \text{ mm}$: 2000H | | | | | | | | | |
| | Capacitance change | Within $\pm 30\%$ of the initial value | | | | | | | | | |
| | Dissipation factor ($\tan \delta$) | Less than 300% of the initial value | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | |
| Shelf life | After storage for 1000 h at $+125 \pm 2^\circ\text{C}$ with no voltage applied and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the limits specified in endurance. | | | | | | | | | | |
| Resistance to soldering heat | After reflow soldering and then being stabilized at $+20^\circ\text{C}$, capacitors shall meet the following limits. | | | | | | | | | | |
| | Capacitance change | Within $\pm 10\%$ of the initial value | | | | | | | | | |
| | Dissipation factor ($\tan \delta$) | Within the initial limit | | | | | | | | | |
| | Leakage current | Within the initial limit | | | | | | | | | |
| Frequency correction factor for ripple current | Frequency | 50Hz | 120Hz | 1kHz | 10kHz≤ | | | | | | |
| | $C \leq 330\mu\text{F}$ | 0.7 | 1.0 | 1.2 | 1.3 | | | | | | |
| | $C > 330\mu\text{F}$ | 0.8 | 1.0 | 1.1 | 1.2 | | | | | | |

Marking

Unit: mm



| ϕD | L | A | B | C | W | $P \pm 0.2$ |
|----------|----------------|------|------|------|---------|-------------|
| 6.3 | 5.7 ± 0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 6.3 | 7.7 ± 0.3 | 6.6 | 6.6 | 7.3 | 0.5~0.8 | 2.2 |
| 8 | 6.5 ± 0.3 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 8 | 10.5 ± 0.5 | 8.3 | 8.3 | 9.2 | 0.7~1.2 | 3.1 |
| 10 | 10.5 ± 0.5 | 10.3 | 10.3 | 11.2 | 0.7~1.2 | 4.4 |
| 12.5 | 13.5 ± 0.5 | 13.0 | 13.0 | 14.0 | 1.0~1.4 | 4.4 |

VH**Series**

● **CHARACTERISTICS LIST**

| WV μF \ | 10 | | | 16 | | | 25 | | |
|------------|-----------|-----|------|-----------|-----|------|-----------|-----|------|
| 33 | | | | 6.3×5.7 | 50 | 0.24 | 6.3×5.7 | 50 | 0.21 |
| 47 | 6.3×5.7 | 50 | 0.32 | 6.3×7.7 | 70 | 0.24 | 6.3×7.7 | 70 | 0.21 |
| 100 | 8×6.5 | 75 | 0.32 | 8×6.5 | 75 | 0.24 | 8×10.5 | 130 | 0.21 |
| 220 | 8×10.5 | 130 | 0.32 | 10×10.5 | 180 | 0.24 | 10×10.5 | 180 | 0.21 |
| 330 | 8×10.5 | 130 | 0.32 | 12.5×13.5 | 480 | 0.24 | 12.5×13.5 | 480 | 0.21 |
| 470 | 12.5×13.5 | 480 | 0.32 | 12.5×13.5 | 480 | 0.24 | 12.5×13.5 | 480 | 0.21 |
| 680 | 12.5×13.5 | 480 | 0.32 | 12.5×13.5 | 480 | 0.24 | | | |

| WV μF \ | 35 | | | 50 | | | 63 | | |
|------------|-----------|-----|------|-----------|-----|------|-----------|-----|------|
| 10 | | | | | | | 8×6.5 | 60 | 0.15 |
| 22 | 6.3×5.7 | 50 | 0.18 | 8×6.5 | 75 | 0.15 | 8×10.5 | 100 | 0.15 |
| 33 | 6.3×7.7 | 70 | 0.18 | 8×10.5 | 130 | 0.15 | 10×10.5 | 150 | 0.15 |
| 47 | 8×6.5 | 75 | 0.18 | 8×10.5 | 130 | 0.15 | 10×10.5 | 150 | 0.15 |
| 100 | 10×10.5 | 180 | 0.18 | 12.5×13.5 | 357 | 0.15 | 12.5×13.5 | 300 | 0.15 |
| 220 | 12.5×13.5 | 357 | 0.18 | | | | | | |

↑ ↑ ↑
 WV (Voltage rating)
 Ripple current (mA rms) (120Hz / +125°C)
 Case size ΦD×L(mm)