

# X-CON

CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

**2016-2017**



# QC 080000



# ISO 9001 ISO 14001



# ACCREDITED

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**X-CON®**  
**Conductive Polymer**  
**Aluminum Solid Capacitors**

## Features

Low ESR obtained by using conductive polymer electrolyte

- Suitable as a decoupling capacitor, because its impedance has ideal frequency characteristics.
- Suitable as a smoothing capacitor, enabling miniaturizing switching power supplies, because it allows large ripple current.
- Suitable as a backup capacitor for the circuits that consume large current at a high speed.

Pb-free compliant

- All the models are completely Pb-free and RoHS compliant products.

Long life

- Some special series can be expected 50,000 hours life at 85°C suitable for long-operating equipments.

Superior temperature characteristics

- Its ESR has stable characteristics at a temperature from -55°C to 105°C (partly 125°C), suitable for applications used at low temperatures (under 0°C).

Wide capacitance range from 1μF to 2700μF

- An array of various series covers wide capacitance range.

High voltage

- High reliability products have achieved the highest rated voltage 200V.

## Applications

Use as a smoothing, backup and bypass capacitor used in various fields such as digital equipments, household appliances, computer-related hardware and industrial equipment.

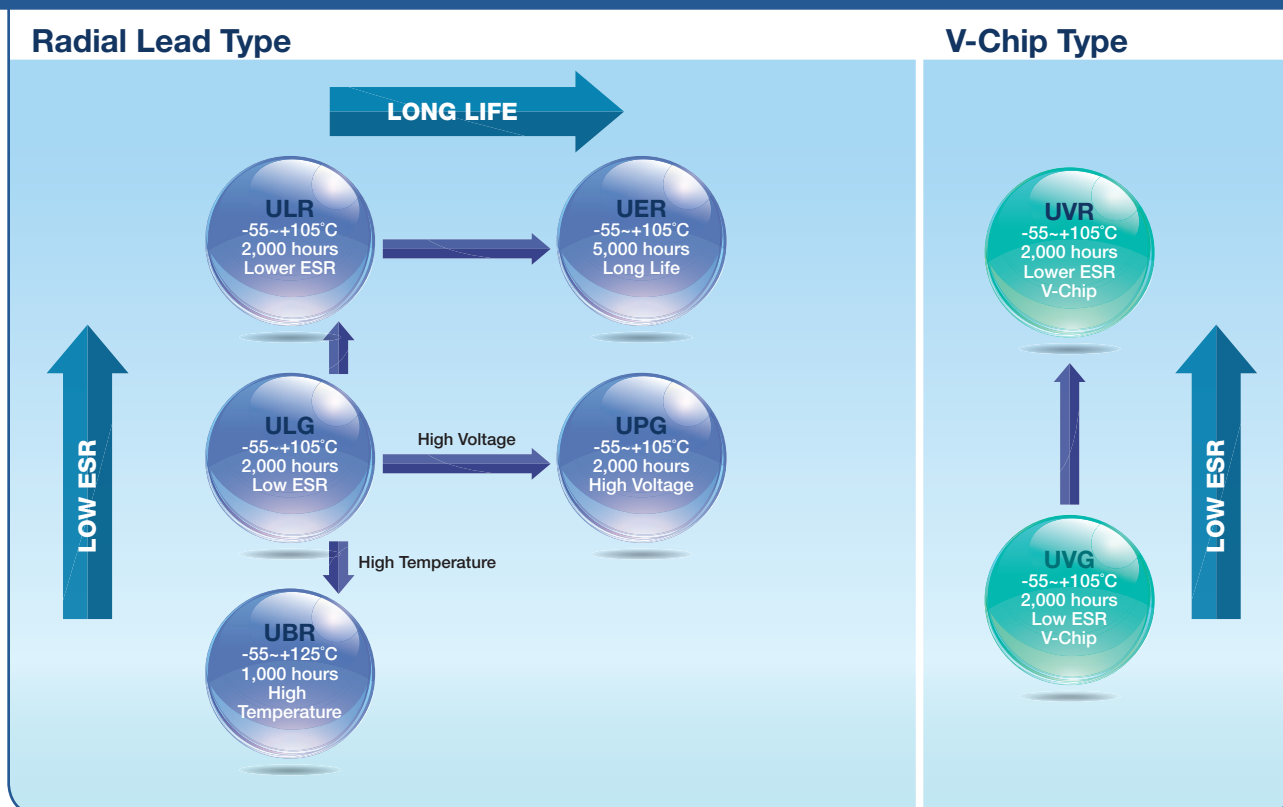
## Series Table

### 產品一覽表

| Series Features (特點)   |  | Temp (°C)   | Voltage (VDC) | Cap. (µF)   | Load Life   | Appearance       | Page |
|--|--|---|---------------|-------------|-------------|------------------|------|
| <b>Radial Lead Type</b> <span style="float: right;">引線式</span> |  |   |               |             |             |                  |      |
| ULG  | +105°C, High Ripple Current, Low ESR<br>(高紋波, 低阻抗)                   | -55 ~ +105°C  | 2.5 to 35     | 10 to 1500  | 2,000 hours | Low ESR          | P.11 |
| ULR  | +105°C, Higher Ripple Current, Lower ESR than ULG<br>(高紋波, 比ULG更低阻抗) | -55 ~ +105°C  | 2.5 to 35     | 22 to 2700  | 2,000 hours | Lower ESR        | P.14 |
| UER  | +105°C, Higher Ripple Current, Long Life 5,000 Hours<br>(高紋波, 長壽命)   | -55 ~ +105°C  | 2.5 to 35     | 100 to 2500 | 5,000 hours | Long Life        | P.19 |
| UPG  | +105°C, High Voltage, Low ESR<br>(高電壓, 低阻抗)                          | -55 ~ +105°C  | 50 to 200     | 1 to 120    | 2,000 hours | High Voltage     | P.22 |
| UBR  | +125°C, High Temperature, Low ESR<br>(高溫度, 低阻抗)                      | -55 ~ +125°C  | 2.5 to 100    | 10 to 1200  | 1,000 hours | High Temperature | P.25 |
| USR  | <b>Discontinued Item</b>   | ** End of life series, replaced by ULR series.<br>停產系列, 以ULR系列取代。 |               |             |             |                  |      |
| <b>V-Chip Type</b> <span style="float: right;">貼片式</span>      |  |   |               |             |             |                  |      |
| UVG  | +105°C, Surface Mount Type, Low ESR (貼片標準品, 低阻抗)                     | -55 ~ +105°C  | 2.5 to 25     | 10 to 820   | 2,000 hours | Low ESR V-Chip   | P.27 |
| UVR  | +105°C, Surface Mount Type, Lower ESR than UVG (貼片標準品, 比UVG更低阻抗)     | -55 ~ +105°C  | 2.5 to 16     | 39 to 2200  | 2,000 hours | Lower ESR V-Chip | P.30 |

## Series Chart

### 產品體系圖



## 應用指引

X-CON should be used in compliance with the following guidelines.

## 1. Circuit Design

### 1.1 Prohibited Circuits

Do not use the capacitors in the following circuits, because leakage current may increase.

- 1) Time constant circuits
- 2) Coupling circuits
- 3) Circuits which are greatly affected by leakage current
- 4) High impedance voltage retention circuits

### 1.2 Polarity

X-CON is a polarized solid aluminum electrolytic capacitor with positive and negative electrodes. Do not apply reverse voltage on the capacitors, otherwise it may cause leakage current increase or life span decreased.

### 1.3 Voltage Applied

The applied voltage is equal to the voltage value including the peak value of the transitional instantaneous voltage and that of ripple voltage, not just steady line voltage.

- 1) Do not apply over-rated voltage or reverse voltage as it may lead to the increase in leakage current and short circuit.
- 2) When DC voltage is low, a negative ripple voltage peak value must not become a reverse voltage that exceeds 10% of the rated voltage.

### 1.4 Restriction on Sudden Charge or Discharge

Sudden charge and discharge may result in short circuits or larger leakage current. Therefore, protection circuits are suggested to build in when one of the following conditions are anticipated.

- 1) The rush current exceeding 10A
- 2) The rush current exceeding 10 times of rated ripple current of X-CON

A protection resistor (1K $\Omega$ ) must be inserted to the circuit during the charge and discharge when measuring the leakage current.

### 1.5 Ripple Current

Use the capacitors within the rated ripple current. When excessive ripple current is applied to the capacitor, it may causes the increase in leakage current and short circuits due to self-heating.

### 1.6 Leakage Current

There is a risk of leakage current increasing even if the following usage environments are within the suggested range. Owing to the self-correction mechanism, the leakage current returns to a small value in most cases after the application of voltage.

- 1) After soldering or re-flow
- 2) High temperature under no loading
- 3) High humidity under no loading
- 4) Sudden temperature changes

### 1.7 Capacitor Insulation

- 1) Insulation of the marked sleeve is not guaranteed. Be aware that the space between the case and the negative electrode terminal is not insulated and has some resistance.
- 2) Completely separate the case, negative lead terminal, positive lead terminal and PCB patterns with each other.

### 1.8 Precautions for Using Capacitors

X-CON capacitors should not be used in the following environments.

- 1) Direct contact with salt water, oil & chemically active gases
- 2) Exposure direct under sunlight
- 3) High temperature owing to heat generating components around the X-CON and on the underside of the PCB
- 4) High humidity where condensation can form on the surface of the capacitor
- 5) Acid or alkaline environments
- 6) High-frequency induction
- 7) Excessive vibration and shock

## 2. Failure and Life-span

The failure rate is 0.5% / 1,000 hours (with a 60% reliability standard) based on JIS-C-5003. The mainly failure modes are as follows.

### 2.1 Contingency Failure

The main causes of failure are thermal stresses cause by the soldering or thermal use environment, along with heat stresses, electrical stresses or mechanical stresses.

The most common failure mode is a short circuit.



# Application Guidelines

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- a) Phenomenon after a short circuit
  - 1) If the pass-through current is 1A or less on  $\Phi 10$ , 0.5A or less on  $\Phi 8$  and 0.2A or less on  $\Phi 6.3$  in case of a short circuit, the X-CON will become heated, but no effects are visible even when the current is continuously carried.
  - 2) If the short circuit currents exceed the mentioned value above, the temperature inside the X-CON will increase. The rubber sealing will be turned over and odorous gas will be released. In this case, keep your face and hands away from the area.
- b) In case a short circuit occurs, ensure safety by fully considering the followings.
  - 1) If odorous gas is released, turn off the main power of the equipment.
  - 2) If the gas comes in contact with eyes, rinse immediately. If the gas is inhaled, gargle immediately.
  - 3) Do not lick the electrolyte. If the electrolyte comes in contact with skin, wash it off with soap immediately.
  - 4) X-CON contains combustible substances. In case a large current continues to flow after a short circuit, in the worst case, the shorted-out section may ignite. For safety, install a redundant circuit or a protective circuit, etc.

### 2.2 Wear-out Failure (Life-span)

When life span exceeded the specified guarantee time of Endurance and Damp heat, electrolyte might insulate and cause electric characteristic changed. This is called an open circuit. The electric characteristics of capacitance and ESR may possibly change within the specified range in specifications when it is used under the condition of the rated voltage, electric and mechanical performance. Please note it when design.

## 3. Mounting Precautions

| Phases                             | Things to be noted   | Disposition  |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
|------------------------------------|--|--|----------|-------------|----------|------------|------------|---|-----------------------|---|----------------------|------------------------------------|------------------------------|----------|
| Before mounting                    | 1) Check the marking on the body   | Don't use products without marked polar, capacitance and rated voltage.  |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
|                                    | 2) Check the pitch between lead terminal and PCB   | Use X-CON only when the said pitch is matched.   |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
|                                    | 3) Find the leakage current increased after long storage   | Apply the capacitor with rated voltage in series with 1K $\Omega$ resistance for 1 hour at the range between 60 and 70°C.  |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
|                                    | 4) Drop to the floor   | Don't use  |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
|                                    | 5) Handling  | Use X-CON with lead terminal and body not subject to any stress.   |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
|                                    | 6) Adopt a used X-CON  | No re-used   |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
| Mounting                           | 1) Soldering with a soldering iron   | <ul style="list-style-type: none"> <li>Meet the temperature and duration requirements of out-going specification;</li> <li>Not allow any stress during mounting;</li> <li>Don't let the tip of the soldering iron touch X-CON.</li> </ul>  |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
|                                    | 2) Flow soldering (for radial type)  | <ul style="list-style-type: none"> <li>Don't submerge X-CON body in melted solder;</li> <li>Meet the temperature and duration requirements of out-going specification;</li> <li>Not allow the flux to adhere to anywhere except the lead terminal.</li> </ul> The details for flow soldering are as follows: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th></th> <th>Temperature</th> <th>Duration</th> <th>Flow times</th> </tr> </thead> <tbody> <tr> <td>Preheating</td> <td><math>\leq 120^{\circ}\text{C}</math><br/>(ambient temp.)</td> <td><math>\leq 120\text{sec.}</math></td> <td>1</td> </tr> <tr> <td>Soldering conditions</td> <td><math>\leq (260 \pm 5)^{\circ}\text{C}</math></td> <td><math>\leq (10 \pm 1)\text{sec.}</math></td> <td><math>\leq 2</math></td> </tr> </tbody> </table> |          | Temperature | Duration | Flow times | Preheating | $\leq 120^{\circ}\text{C}$<br>(ambient temp.) | $\leq 120\text{sec.}$ | 1 | Soldering conditions | $\leq (260 \pm 5)^{\circ}\text{C}$ | $\leq (10 \pm 1)\text{sec.}$ | $\leq 2$ |
|                                    |  | Temperature  | Duration | Flow times  |          |            |            |   |                       |   |                      |                                    |                              |          |
| Preheating                         | $\leq 120^{\circ}\text{C}$<br>(ambient temp.)  | $\leq 120\text{sec.}$  | 1        |             |          |            |            |   |                       |   |                      |                                    |                              |          |
| Soldering conditions               | $\leq (260 \pm 5)^{\circ}\text{C}$   | $\leq (10 \pm 1)\text{sec.}$   | $\leq 2$ |             |          |            |            |   |                       |   |                      |                                    |                              |          |
| 3) Reflow soldering (for SMD type) | Allow for UVG, UVR series. (see page 7 for details)  |  |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
| After mounting                     | 1) Handling  | <ul style="list-style-type: none"> <li>Do not tilt, bend, twist X-CON;</li> <li>Do not allow other things touching X-CON.</li> </ul>   |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |
|                                    | 2) Wash the PCB<br>(Suggested cleaning agents) <ul style="list-style-type: none"> <li>High quality alcohol-based cleaning fluids such as st-100s, 750L, 750M;</li> <li>Detergents including substitute freon such as AK-225AES and IPA)</li> </ul> | <ul style="list-style-type: none"> <li>Use immersion or ultrasonic waves to clean for a total of less than 5 minutes and adjust the temperature of the agents not higher than 60°C;</li> <li>Observe the contamination of the agents (conductivity, pH, specific gravity, water cleaning and etc.);</li> <li>Dry X-CON in hot air with the air temperature less than the maximum operating temperature.</li> </ul>   |          |             |          |            |            |   |                       |   |                      |                                    |                              |          |

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**X-CON®**  
Conductive Polymer  
Aluminum Solid Capacitors

### 4. Reflow Soldering Conditions

| Item                 | Recommended Condition 1               | Recommended Condition 2               |
|----------------------|---------------------------------------|---------------------------------------|
|                      | Peak Temperature                      | 260°C or less                         |
| Preheating           | 150°C to 180°C<br>90 seconds          | 150°C to 180°C<br>90 seconds          |
| A                    | 200°C and higher<br>Within 60 seconds | 200°C and higher<br>Within 60 seconds |
| B                    | 230°C and higher<br>Within 40 seconds | 230°C and higher<br>Within 40 seconds |
| The number of reflow | Only 1 time                           | Twice or less                         |

All temperatures are measured on the topside of the Al-can and terminal surface.

#### Attention:

Reflow soldering may reduce the capacitance of products before or after soldering even if meeting soldering conditions per Recommended Reflow Condition. Soldering considerably deviating from these conditions will cause problems such as a 50% reduction in capacitance, and a considerable increase in leakage current. Thus, the peak temperature at the top of Al-case/Electrode terminals and the duration of the reflow over 200°C should not exceed the specifications.

### 5. Emergency Procedure

If the capacitor is overheated, the resin case may emit smoke. If this occurs, immediately switch off the unit's main power supply to stop operation. Keep your body away from the capacitor as the temperature may be high enough to cause the capacitor to ignite and burn.

### 6. Disposal and Storage Conditions

#### 6.1 Disposal

Since capacitors are composed of various metals and resins, dispose them as industrial waste.

#### 6.2 Storage Conditions

- Do not store the X-CONs in the environment of high temperature and high humidity, or in the location subject to direct sunlight. The X-CONs should be stored under the conditions within 5°C ~ 35°C and relative humidity below 75%;
- Store the X-CONs in the condition as they are shipped to keep good solder ability. SMD types (UVR and UVG series) should be sealed in specifically designed aluminum laminate bags to avoid deterioration in characteristics and solder ability before and after reflows, which results from moisture absorption;
- Store the X-CONs in sealed package bags after delivery per the table below;

| X-CON type                                  | Before unsealing  | After unsealing                               |
|---|---|---|
| Radial lead type<br>packed in bags          | Must be used within 24 months<br>after delivery (unsealed status) | Must be used within a week<br>(opened status) |
| Radial lead type<br>packed in taping method | Must be used within 24 months<br>after delivery (unsealed status) | Must be used within a week<br>(opened status) |
| SMD type                                    | Must be used within 24 months<br>after delivery (unsealed status) | Must be used within a week<br>(opened status) |

- Don't open package bags until mounting, and use up all products once open. In case of leftovers, pack radial lead types in bags, return SMD types and unpackaged ones back into special storage bags (designed aluminum laminate bags for SMD types), and seal up the opening. Put radial lead types with taping in plastic bags as they are put into storage boxes and seal up the opening, too. Regarding leftover storage, please follow the storage instructions as shown in above table;
- Don't store X-CONs in damp conditions or as stated in Item 1.8;
- Don't store X-CONs in places filled with toxic gases or susceptible to ozone, ultraviolet ray and radiation.



# Application Guidelines

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### 7. Compliance with RoHS Directive

Our company is committed to comply with the European Union Restriction of Hazardous Substance (RoHS) Directive. We hereby guarantee that our products do not contain the following materials exceeding the content regulated in RoHS Directive.

|  |          |
|--|----------|
| Lead (Pb)                              | ≤1000ppm |
| Mercury (Hg)                           | ≤1000ppm |
| Cadmium (Cd)                           | ≤100ppm  |
| Hexavalent Chromium, Cr <sup>6+</sup>  | ≤1000ppm |
| Polybrominated Biphenyls (PBBs)        | ≤1000ppm |
| Polybrominated Diphenyl Ethers (PBDEs) | ≤1000ppm |

### 8. Halogen Free Compliant

The products identified in the catalogue, and their homogeneous subcomponents, do not contain any of the following substances in concentrations greater than the listed maximum limits.

| Substance   | Maximum Limit (ppm) |
|---|---------------------|
| Bromine (Br)  | 900 ppm (0.09%)     |
| Chlorine (Cl)                                       | 900 ppm (0.09%)     |
| Total concentration of Chlorine (Cl) + Bromine (Br) | 1500 ppm (0.15%)    |

### 9. Reliability Presumption of Life

$$L_x = L_0 \times 10^{\frac{T_0 - T_x}{20}}$$

Lx: Life expectancy (Hours) in actual use (Tx)

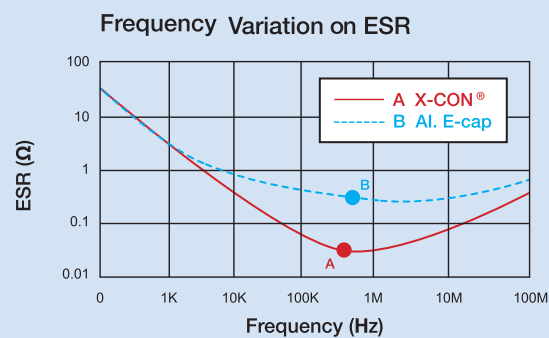
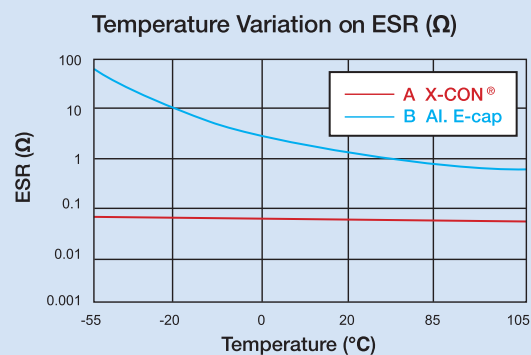
L<sub>0</sub>: Guaranteed (Hours) at maximum temperature (T<sub>0</sub>)

T<sub>0</sub>: Maximum operating temperature (°C)

T<sub>x</sub>: Temperature in actual use (Ambient temperature of X-CON) (°C)

Owing to the excellent heat-proof characteristics of conductive polymer, the estimated life expectancy can be calculated without consideration of self-heating under application of the ripple current.

### 10. General Electrical Characteristics of X-CON



## Part Number System

X-CON®

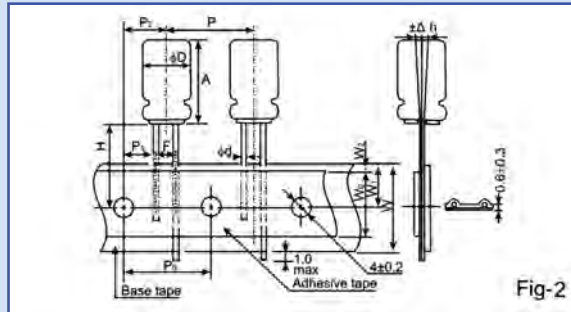
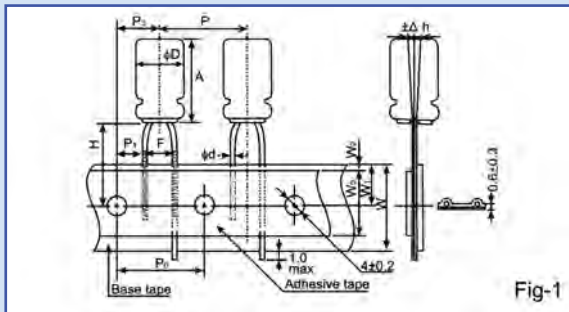
Conductive Polymer  
Aluminum Solid Capacitors

## 產品編碼

| 1 2 3  | 4 5 6       | 7         | 8 9      | 10        | 11 12       | 13 14 |           |      |           |      |                 |      |
|--------|-------------|-----------|----------|-----------|-------------|-------|-----------|------|-----------|------|-----------------|------|
| ULR    | 567         | M         | 0G       | F         | 08          | RR    |           |      |           |      |                 |      |
| Series | Capacitance | Tolerance | Voltage  | Case Dia. | Case Length | Type  |           |      |           |      |                 |      |
|        |             |           |          |           |             |       |           |      |           |      |                 |      |
| Series | Cap. (μF)   | Code      | Tol. (%) | Code      | Vol. (V)    | Code  | Dia. (mm) | Code | Len. (mm) | Code | Feature         | Code |
| ULG    | 3.3         | 335       | ±20      | M         | 2.5         | 0E    | 4         | C    | 4.2       | 42   | Bulk            | RR   |
| ULR    | 10          | 106       |          |           | 4           | 0G    | 5         | D    | 4.5       | 45   | Lead Cut & Form | CB   |
| UER    | 22          | 226       |          |           | 6.3         | 0J    | 5.5       | X    | 5         | 05   |                 |      |
| UPG    | 33          | 336       |          |           | 6.8         | 06    | 6.3       | E    | 5.5       | 55   | Taping F=2.0mm  | TT   |
| UBR    | 47          | 476       |          |           | 7           | 0S    | 8         | F    | 6         | 06   |                 |      |
| UVG    | 68          | 686       |          |           | 7.5         | 07    | 10        | G    | 6.5       | 65   | Taping F=2.5mm  | TU   |
| UVR    | 100         | 107       |          |           | 10          | 1A    |           |      | 7         | 07   |                 |      |
|        | 150         | 157       |          |           | 12          | 10    |           |      | 7.5       | 75   | Taping F=3.5mm  | TV   |
|        | 180         | 187       |          |           | 14          | 14    |           |      | 8         | 08   |                 |      |
|        | 220         | 227       |          |           | 16          | 1C    |           |      | 8.5       | 85   | Taping F=5.0mm  | TC   |
|        | 270         | 277       |          |           | 20          | 1D    |           |      | 9         | 09   |                 |      |
|        | 330         | 337       |          |           | 25          | 1E    |           |      | 10        | 10   | Tape & Reel     | TR   |
|        | 390         | 397       |          |           | 35          | 1V    |           |      | 10.2      | T2   |                 |      |
|        | 470         | 477       |          |           | 50          | 1H    |           |      | 10.5      | 1K   |                 |      |
|        | 560         | 567       |          |           | 63          | 1J    |           |      | 11        | 11   |                 |      |
|        | 680         | 687       |          |           | 80          | 1K    |           |      | 11.5      | 1A   |                 |      |
|        | 820         | 827       |          |           | 100         | 2A    |           |      | 12        | 12   |                 |      |
|        | 1000        | 108       |          |           | 200         | 2D    |           |      | 12.5      | 1B   |                 |      |
|        | 1200        | 128       |          |           |             |       |           |      | 16        | 16   |                 |      |
|        | 1500        | 158       |          |           |             |       |           |      |           |      |                 |      |
|        | 1800        | 188       |          |           |             |       |           |      |           |      |                 |      |
|        | 2200        | 228       |          |           |             |       |           |      |           |      |                 |      |
|        | 2500        | 258       |          |           |             |       |           |      |           |      |                 |      |
|        | 2700        | 278       |          |           |             |       |           |      |           |      |                 |      |

# Taping Specifications

## 編帶產品規格



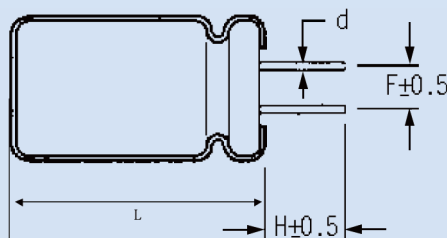
### Specifications

| Item   | Dimensions (mm)                      | Dimensions (mm) |          |          |        |        |
|--|--------------------------------------|-----------------|----------|----------|--------|--------|
|  |                                      | Fig. 1          | Fig. 2   | Fig. 1   | Fig. 2 | Fig. 2 |
| Reference Figure   |                                      | Fig. 1          | Fig. 2   | Fig. 2   | Fig. 2 | Fig. 2 |
| Diameter   | D                                    | 4               | 5        | 6.3      | 8      | 10     |
| Height   | A                                    | 5~11            | 7~11     | 8~11     | 8~11.5 | 12.5   |
| Lead Diameter  | d±0.05                               | 0.45~0.6        | 0.45~0.6 | 0.45~0.6 | 0.6    | 0.6    |
| Component Spacing  | P±1.0                                | 12.7            | 12.7     | 12.7     | 12.7   | 12.7   |
| Pitch of sprocket holes  | P0±0.2                               | 12.7            | 12.7     | 12.7     | 12.7   | 12.7   |
| Distance between centers of terminal and the sprocket holes                                | P1±0.5                               | 5.35            | 5.35     | 5.1      | 4.6    | 3.85   |
| Distance between centers of the component and the sprocket holes                           | P2±1.0                               | 6.35            | 6.35     | 6.35     | 6.35   | 6.35   |
| Distance between centers of component leads  | F <sup>+0.8</sup> / <sub>-0.5</sub>  | 2.0             | 2.0      | 2.5      | 3.5    | 5.0    |
| Carrier tape width   | W±0.5                                | 18.0            | 18.0     | 18.0     | 18.0   | 18.0   |
| Hold down tape width   | W0                                   | 7.0min          | 7.0min   | 7.0min   | 7.0min | 7.0min |
| Distance between the center of upper edge of carrier tape and sprocket hole                | W1±0.5                               | 9.0             | 9.0      | 9.0      | 9.0    | 9.0    |
| Distance between the upper edges of the carrier tape and the hold down tape                | W2                                   | 3max            | 3max     | 3max     | 3max   | 3max   |
| Distance between the abscissa and the bottom of the components body                        | H <sup>+0.75</sup> / <sub>-0.5</sub> | 18.5            | 18.5     | 18.5     | 18.5   | 18.5   |
| Distance between the abscissa and the reference plane of the components with crimped leads | H0±0.5                               | -               | -        | -        | -      | -      |
| Max. lateral deviation of the component body vertical to the tape plane                    | Δh±1.0                               | 0               | 0        | 0        | 0      | 0      |

# Lead Forming Specifications

## 成型產品規格

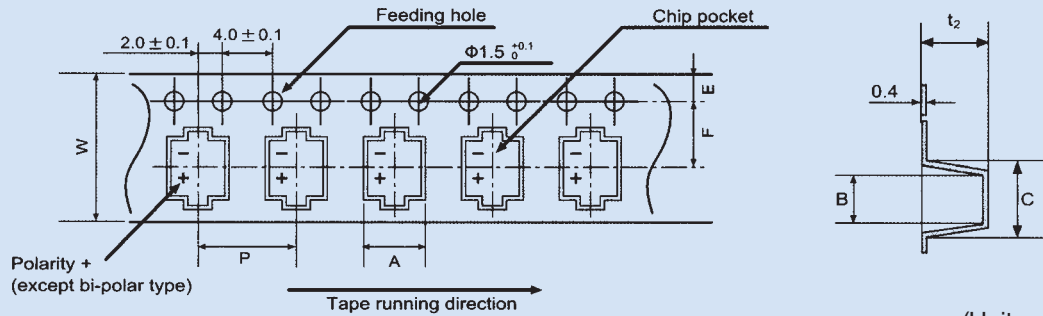
### CB Type



|            |         | (Unit: mm)                   |     |     |     |
|------------|---------|------------------------------|-----|-----|-----|
| Shape Code | ΦD      | 5                            | 6.3 | 8   | 10  |
| CB         | F       | 2.0                          | 2.5 | 3.5 | 5.0 |
|            | H       | 3.2                          | 3.2 | 3.2 | 3.2 |
|            | Φd±0.05 | L<8mm, d≤0.5<br>L≥8mm, d=0.6 |     |     |     |

# Specifications for SMD Type Packing

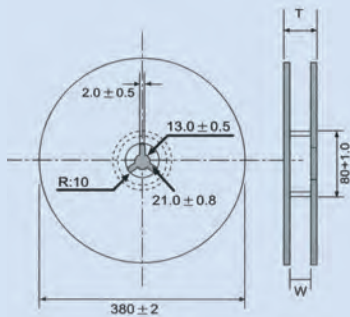
## 貼片產品包裝規格



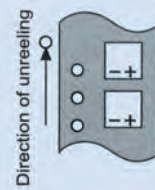
(Unit: mm)

| Size         | Dimensions | A           | B           | C            | W            | F            | E            | P            | t <sub>2</sub> |
|--------------|------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Φ6.3 x 5.9/6 |            | 6.9<br>±0.2 | 6.9<br>±0.5 | 9.0<br>±0.5  | 16.0<br>±0.3 | 7.5<br>±0.2  | 1.75<br>±0.2 | 12.0<br>±0.2 | 6.5<br>±0.5    |
| Φ6.3 x 8     |            | 6.9<br>±0.2 | 6.9<br>±0.5 | 9.5<br>±0.5  | 16.0<br>±0.3 | 7.5<br>±0.2  | 1.75<br>±0.2 | 12.0<br>±0.2 | 8.2<br>±0.5    |
| Φ8 x 8       |            | 8.6<br>±0.2 | 8.6<br>±0.5 | 11.7<br>±0.5 | 24.0<br>±0.3 | 11.5<br>±0.2 | 1.75<br>±0.2 | 16.0<br>±0.2 | 9.0<br>±0.5    |
| Φ8 x 10.2    |            | 8.6<br>±0.2 | 8.6<br>±0.5 | 12.5<br>±0.5 | 24.0<br>±0.3 | 11.5<br>±0.2 | 1.75<br>±0.2 | 16.0<br>±0.2 | 11.0<br>±0.5   |
| Φ8 x 12      |            | 8.6<br>±0.2 | 8.6<br>±0.5 | 12.5<br>±0.5 | 24.0<br>±0.3 | 11.5<br>±0.2 | 1.75<br>±0.2 | 16.0<br>±0.2 | 12.7<br>±0.5   |

### a. Reel



### b. Polarity



(Unit: mm)

| Size                           | W        | T        |
|--------------------------------|----------|----------|
| Φ6.3 x 5.9/6<br>Φ6.3 x 8       | 17.0±1.0 | 21.5±1.0 |
| Φ8 x 8<br>Φ8 x 10.2<br>Φ8 x 12 | 25.0±1.0 | 29.5±1.0 |

# Minimum Order Quantity

## 最少訂單量

| Size of product 產品尺寸 |              |            | Bulk 散裝       |                 |       |               |                 |       | Taping 編帶   |             |
|----------------------|--------------|------------|---------------|-----------------|-------|---------------|-----------------|-------|-------------|-------------|
|                      |              |            | 最少包裝量 (MPQ)   |                 |       | 最少訂單量 (MOQ)   |                 |       | 最少包裝量 (MPQ) | 最少訂單量 (MOQ) |
|                      |              |            | Long lead 長短腳 | Lead forming 成型 |       | Long lead 長短腳 | Lead forming 成型 |       |             |             |
| Cut 直腳               | Formed 彎腳    | Cut 直腳     |               | Formed 彎腳       |       |               |                 |       |             |             |
| Chip type 貼片式        | Φ5           | 6L         | -             |                 |       |               |                 |       | 1,250       | 1,250       |
|                      |              | 4.2L, 4.5L | -             |                 |       |               |                 |       | 1,500       | 1,500       |
|                      | Φ6.3         | 5.9L, 6L   | -             |                 |       |               |                 |       | 1,250       | 1,250       |
|                      |              | 8L, 9L     | -             |                 |       |               |                 |       | 1,000       | 1,000       |
|                      | Φ8           | 7.7L, 8L   | -             |                 |       |               |                 |       | 500         | 500         |
|                      |              | 10.2L      | -             |                 |       |               |                 |       | 500         | 500         |
|                      | 12L          | -          |               |                 |       |               |                 | 400   | 400         |             |
| Φ10                  | 10.2L        | -          |               |                 |       |               |                 | 500   | 500         |             |
|                      | 12.5L        | -          |               |                 |       |               |                 | 300   | 300         |             |
| Radial lead type 導針型 | Φ4           | 6.5L~7L    | 1,000         | 2,000           | -     | 4,000         | 4,000           | -     | -           |             |
|                      | Φ5-Φ5.5      | 6~11L      | 1,000         | 1,000           | 1,000 | 4,000         | 4,000           | 4,000 | 2,000       | 2,000       |
|                      |              | 5~6L       | 1,000         | 1,000           | 1,000 | 4,000         | 4,000           | 4,000 | 1,500       | 1,500       |
|                      | Φ6.3         | 7~11L      | 1,000         | 1,000           | 1,000 | 3,000         | 3,000           | 3,000 | 1,500       | 1,500       |
|                      |              | 6.5~9L     | 500           | 1,000           | -     | 2,000         | 2,000           | -     | 1,000       | 1,000       |
|                      | Φ8           | 11.5L, 16L | 500           | 500             | 500   | 2,000         | 2,000           | 2,000 | 1,000       | 1,000       |
| Φ10                  | 9~12.5L, 16L | 400        | 500           | -               | 1,200 | 1,500         | -               | 500   | 500         |             |

# ULG Series

+105°C, High Ripple Current, Low ESR

## Features

- High Ripple Current, Low ESR
- Wide Temperature Range
- RoHS Compliant

## Applications

- Suitable for DC-DC Converters, Voltage Regulators, Decoupling Applications for Computer Motherboards, etc.

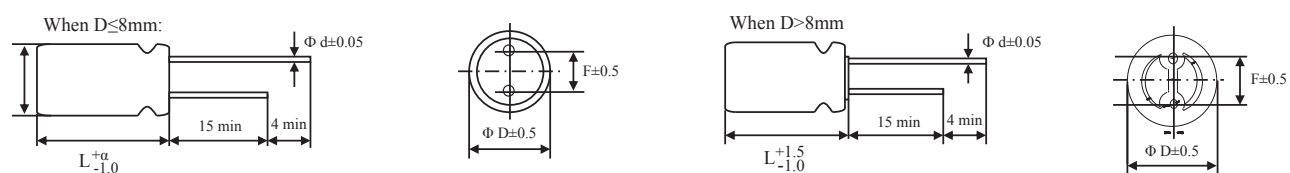
## Specifications



ULG Series

| Item   | Performance Characteristics  |              |   |                |                 |
|--|--|--------------|---|----------------|-----------------|
| Operating Temperature Range                        | -55 to +105°C  |              |   |                |                 |
| Rated Working Voltage Range                        | 2.5VDC to 35VDC  |              |   |                |                 |
| Surge Voltage, SV                                  | SV=VVx1.15VDC (Normal temperature)   |              |   |                |                 |
| Nominal Capacitance Range                          | 10 to 1500μF (120Hz, +20°C)  |              |   |                |                 |
| Capacitance Tolerance                              | ±20% (120Hz, +20°C)  |              |   |                |                 |
| tan δ  | 0.12 (120Hz, +20°C)  |              |   |                |                 |
| Leakage Current, Lc                                | I≤0.2CV or 280 (μA) whichever is greater measured, after 2 minutes application of rated working voltage at +20°C                             |              |   |                |                 |
| Temperature Characteristics, Impedance Ratio       | At -55°C 100kHz (Low temperature)  |              |   | Z/Z20°C≤1.25   |                 |
|  | At +105°C 100kHz (High temperature)  |              |   | Z/Z20°C≤1.25   |                 |
| Frequency Coefficient for Allowable Ripple Current | Frequency  | 120Hz≤f<1kHz | 1kHz≤f<10kHz                              | 10kHz≤f<100kHz | 100kHz≤f<500kHz |
|  | Coefficient  | 0.05         | 0.30                                      | 0.70           | 1.00            |
| Endurance  | Test conditions<br>+105°C, 2,000 hours<br>Rated voltage applied  | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |  | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |  | ESR          | ≤150% of the initial specified value      |                |                 |
|  |  | Lc           | ≤The initial specified value              |                |                 |
| Damp Heat Test (Steady State)                      | Test conditions<br>+60°C, 90% to 95% RH<br>1,000 hours<br>No applied voltage   | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |  | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |  | ESR          | ≤150% of the initial specified value      |                |                 |
|  |  | Lc           | ≤The initial specified value              |                |                 |
| Surge Voltage Test                                 | At normal temperature, charge at surge voltage for 30 sec, and discharge via a 1kΩ protective resistor for 330 sec. Repeat for 1,000 cycles. | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |  | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |  | ESR          | ≤150% of the initial specified value      |                |                 |
|  |  | Lc           | ≤The initial specified value              |                |                 |
| Others   | JIS-C-5101-4   |              |   |                |                 |

## Dimensions



# ULG Series

+105°C, High Ripple Current, Low ESR

ULG Series

## Size List

 New Item | RV: Rated Voltage

| $\mu\text{F}$ \ RV | Code | 2.5 (0E) | 4 (0G) | 6.3 (0J) | 10 (1A) | 16 (1C) | 20 (1D)                                 | 25 (1E)                                       | 35 (1V)                            |
|--------------------|------|----------|--------|----------|---------|---------|---|---|------------------------------------|
| 10                 | 106  |          |        |          |         |         |   |   | E08 <sup>(N)</sup>                 |
| 22                 | 226  |          |        |          |         |         |   | D08 <sup>(N)</sup> , E08                      | F08                                |
| 33                 | 336  |          |        |          |         |         | E08                                     | E08, F08                                      | E08 <sup>(N)</sup> , F08           |
| 47                 | 476  |          |        |          |         |         | F08                                     | D08 <sup>(N)</sup> , E06 <sup>(N)</sup> , F08 | E06 <sup>(N)</sup> , F08, F1A      |
| 56                 | 566  |          |        |          |         |         |   | F08   |                                    |
| 68                 | 686  |          |        |          |         |         | E11 <sup>(N)</sup>                      |   |                                    |
| 100                | 107  |          |        |          |         |         | F1A                                     | E08 <sup>(N)</sup> , F1A, G1B                 | E11 <sup>(N)</sup> , F08, F1A, G1B |
| 150                | 157  |          |        |          |         |         | G1B                                     | E11 <sup>(N)</sup> , F1A                      |                                    |
| 180                | 187  |          |        |          |         | F1A     |   | F1A   |                                    |
| 220                | 227  |          |        |          |         |         |   | F1A <sup>(N)</sup> , G1B                      | F1A <sup>(N)</sup> , G1B           |
| 270                | 277  |          |        |          | F1A     |         |   |   |                                    |
| 330                | 337  |          |        |          |         | G1B     |   | G1B   | G1B                                |
| 390                | 397  |          |        | F1A      |         |         | F1A <sup>(N)</sup>                      | G1B   |                                    |
| 470                | 477  |          |        |          | G1B     |         |   | F1A <sup>(N)</sup> , G1B                      |                                    |
| 560                | 567  |          | F1A    |          |         |         |   |   |                                    |
| 680                | 687  | F1A      |        | G1B      |         |         | F16 <sup>(N)</sup> , G1A <sup>(N)</sup> | F16 <sup>(N)</sup>                            |                                    |
| 820                | 827  |          | G1B    |          |         |         |   |   |                                    |
| 1500               | 158  | G1B      |        |          |         |         |   |   |                                    |

(Unit: mm)

| Size Code                    | D08   | E06     | E08     | E11      | F08   | F1A      | F16    | G1A       | G1B       |
|------------------------------|-------|---------|---------|----------|-------|----------|--------|-----------|-----------|
| $\Phi\text{D}\times\text{L}$ | 5 x 8 | 6.3 x 6 | 6.3 x 8 | 6.3 x 11 | 8 x 8 | 8 x 11.5 | 8 x 16 | 10 x 11.5 | 10 x 12.5 |
| $F\pm 0.5$                   | 2.0   | 2.5     | 2.5     | 2.5      | 3.5   | 3.5      | 3.5    | 5.0       | 5.0       |
| $\Phi\text{d}$               | 0.6   | 0.45    | 0.6     | 0.6      | 0.6   | 0.6      | 0.6    | 0.6       | 0.6       |
| $\alpha$                     | 1.0   | 1.0     | 1.0     | 1.5      | 1.0   | 1.5      | 1.5    | 1.5       | 1.5       |

Specifications are subject to change without notice. Should a safety or technical concern arise regarding the product, please be sure to contact our sales offices or agents immediately.



# ULG Series

**X-CON®**  
Conductive Polymer  
Aluminum Solid Capacitors

+105°C, High Ripple Current, Low ESR

## Characteristics List

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-----------|-----------------------------|
| 2.5            | 680             | 8 x 11.5              | F1A       | ULG687M0EF1A | 10                          | 5230                                | 12        | 340                         |
| 2.5            | 1500            | 10 x 12.5             | G1B       | ULG158M0EG1B | 8                           | 5500                                | 12        | 750                         |
| 4              | 560             | 8 x 11.5              | F1A       | ULG567M0GF1A | 10                          | 5230                                | 12        | 448                         |
| 4              | 820             | 10 x 12.5             | G1B       | ULG827M0GG1B | 8                           | 5500                                | 12        | 656                         |
| 6.3            | 390             | 8 x 11.5              | F1A       | ULG397M0JF1A | 12                          | 4770                                | 12        | 491                         |
| 6.3            | 680             | 10 x 12.5             | G1B       | ULG687M0JG1B | 10                          | 5500                                | 12        | 857                         |
| 10             | 270             | 8 x 11.5              | F1A       | ULG277M1AF1A | 14                          | 4420                                | 12        | 540                         |
| 10             | 470             | 10 x 12.5             | G1B       | ULG477M1AG1B | 12                          | 5300                                | 12        | 940                         |
| 16             | 180             | 8 x 11.5              | F1A       | ULG187M1CF1A | 16                          | 4360                                | 12        | 576                         |
| 16             | 330             | 10 x 12.5             | G1B       | ULG337M1CG1B | 14                          | 5050                                | 12        | 1056                        |
| 20             | 33              | 6.3 x 8               | E08       | ULG336M1DE08 | 45                          | 1880                                | 12        | 280                         |
| 20             | 47              | 8 x 8                 | F08       | ULG476M1DF08 | 42                          | 1952                                | 12        | 280                         |
| 20             | 68              | 6.3 x 11              | E11       | ULG686M1DE11 | 55                          | 1500                                | 12        | 280                         |
| 20             | 100             | 8 x 11.5              | F1A       | ULG107M1DF1A | 35                          | 2670                                | 12        | 400                         |
| 20             | 150             | 10 x 12.5             | G1B       | ULG157M1DG1B | 35                          | 2672                                | 12        | 600                         |
| 20             | 390             | 8 x 11.5              | F1A       | ULG397M1DF1A | 35                          | 2670                                | 12        | 1560                        |
| 20             | 680             | 8 x 16                | F16       | ULG687M1DF16 | 16                          | 4650                                | 12        | 2720                        |
| 20             | 680             | 10 x 11.5             | G1A       | ULG687M1DG1A | 30                          | 2800                                | 12        | 2720                        |
| 25             | 22              | 5 x 8                 | D08       | ULG226M1ED08 | 80                          | 900                                 | 12        | 280                         |
| 25             | 22              | 6.3 x 8               | E08       | ULG226M1EE08 | 55                          | 1700                                | 12        | 280                         |
| 25             | 33              | 6.3 x 8               | E08       | ULG336M1EE08 | 80                          | 1200                                | 12        | 280                         |
| 25             | 33              | 8 x 8                 | F08       | ULG336M1EF08 | 50                          | 1870                                | 12        | 280                         |
| 25             | 47              | 5 x 8                 | D08       | ULG476M1ED08 | 60                          | 1100                                | 12        | 280                         |
| 25             | 47              | 6.3 x 6               | E06       | ULG476M1EE06 | 50                          | 1600                                | 12        | 280                         |
| 25             | 47              | 8 x 8                 | F08       | ULG476M1EF08 | 45                          | 1940                                | 12        | 280                         |
| 25             | 56              | 8 x 8                 | F08       | ULG566M1EF08 | 40                          | 2500                                | 12        | 280                         |
| 25             | 100             | 6.3 x 8               | E08       | ULG107M1EE08 | 50                          | 1200                                | 12        | 500                         |
| 25             | 100             | 8 x 11.5              | F1A       | ULG107M1EF1A | 40                          | 2500                                | 12        | 500                         |
| 25             | 100             | 10 x 12.5             | G1B       | ULG107M1EG1B | 40                          | 4320                                | 12        | 500                         |
| 25             | 150             | 6.3 x 11              | E11       | ULG157M1EE11 | 40                          | 2500                                | 12        | 750                         |
| 25             | 150             | 8 x 11.5              | F1A       | ULG157M1EF1A | 40                          | 2550                                | 12        | 750                         |
| 25             | 180             | 8 x 11.5              | F1A       | ULG187M1EF1A | 40                          | 2550                                | 12        | 900                         |
| 25             | 220             | 8 x 11.5              | F1A       | ULG227M1EF1A | 35                          | 2900                                | 12        | 1100                        |
| 25             | 220             | 10 x 12.5             | G1B       | ULG227M1EG1B | 35                          | 3100                                | 12        | 1100                        |
| 25             | 330             | 10 x 12.5             | G1B       | ULG337M1EG1B | 45                          | 3100                                | 12        | 1650                        |
| 25             | 390             | 10 x 12.5             | G1B       | ULG397M1EG1B | 35                          | 3100                                | 12        | 1950                        |
| 25             | 470             | 8 x 11.5              | F1A       | ULG477M1EF1A | 35                          | 2900                                | 12        | 2350                        |
| 25             | 470             | 10 x 12.5             | G1B       | ULG477M1EG1B | 35                          | 3100                                | 12        | 2350                        |
| 25             | 680             | 8 x 16                | F16       | ULG687M1EF16 | 16                          | 4650                                | 12        | 3400                        |
| 35             | 10              | 6.3 x 8               | E08       | ULG106M1VE08 | 90                          | 1500                                | 12        | 280                         |
| 35             | 22              | 8 x 8                 | F08       | ULG226M1VF08 | 100                         | 1600                                | 12        | 280                         |
| 35             | 33              | 6.3 x 8               | E08       | ULG336M1VE08 | 100                         | 1300                                | 12        | 280                         |
| 35             | 33              | 8 x 8                 | F08       | ULG336M1VF08 | 90                          | 1700                                | 12        | 280                         |
| 35             | 47              | 6.3 x 6               | E06       | ULG476M1VE06 | 90                          | 1250                                | 12        | 329                         |
| 35             | 47              | 8 x 8                 | F08       | ULG476M1VF08 | 90                          | 1500                                | 12        | 329                         |
| 35             | 47              | 8 x 11.5              | F1A       | ULG476M1VF1A | 90                          | 1500                                | 12        | 329                         |
| 35             | 100             | 6.3 x 11              | E11       | ULG107M1VE11 | 75                          | 1800                                | 12        | 700                         |
| 35             | 100             | 8 x 8                 | F08       | ULG107M1VF08 | 80                          | 1900                                | 12        | 700                         |
| 35             | 100             | 8 x 11.5              | F1A       | ULG107M1VF1A | 55                          | 2000                                | 12        | 700                         |
| 35             | 100             | 10 x 12.5             | G1B       | ULG107M1VG1B | 65                          | 1870                                | 12        | 700                         |
| 35             | 220             | 8 x 11.5              | F1A       | ULG227M1VF1A | 55                          | 2000                                | 12        | 1540                        |
| 35             | 220             | 10 x 12.5             | G1B       | ULG227M1VG1B | 55                          | 2450                                | 12        | 1540                        |
| 35             | 330             | 10 x 12.5             | G1B       | ULG337M1VG1B | 45                          | 2700                                | 12        | 2310                        |

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# ULR Series

+105°C, Higher Ripple Current, Lower ESR than ULG

ULR Series

## Features

- Higher Ripple Current, Lower ESR than ULG
- Wide Temperature Range
- RoHS Compliant

## Applications

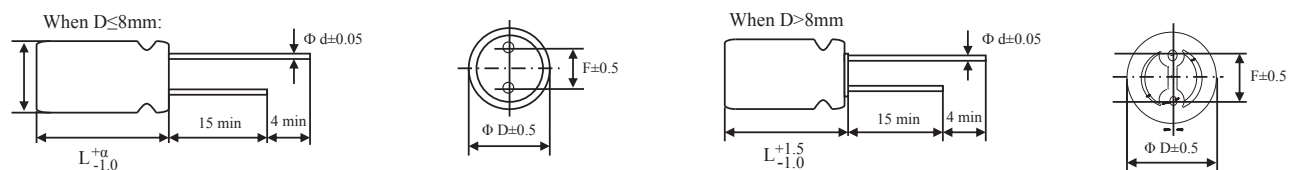
- Suitable for DC-DC Converters, Voltage Regulators, Decoupling Applications for Computer Motherboards, etc.



## Specifications

| Item   | Performance Characteristics  |                  |   |                    |                     |
|--|--|------------------|---|--------------------|---------------------|
| Operating Temperature Range                        | -55 to +105°C  |                  |   |                    |                     |
| Rated Working Voltage Range                        | 2.5VDC to 35VDC  |                  |   |                    |                     |
| Surge Voltage, SV                                  | SV=WVx1.15VDC (Normal temperature)   |                  |   |                    |                     |
| Nominal Capacitance Range                          | 22 to 2700µF (120Hz, +20°C)  |                  |   |                    |                     |
| Capacitance Tolerance                              | ±20% (120Hz, +20°C)  |                  |   |                    |                     |
| tan δ  | 0.10 (120Hz, +20°C)  |                  |   |                    |                     |
| Leakage Current, Lc                                | I ≤ 0.2CV or 280 (µA) whichever is greater measured, after 2 minutes application of rated working voltage at +20°C                           |                  |   |                    |                     |
| Temperature Characteristics, Impedance Ratio       | At -55°C 100kHz (Low temperature)  |                  |   | Z/Z20°C ≤ 1.25     |                     |
|  | At +105°C 100kHz (High temperature)  |                  |   | Z/Z20°C ≤ 1.25     |                     |
| Frequency Coefficient for Allowable Ripple Current | Frequency  | 120Hz ≤ f < 1kHz | 1kHz ≤ f < 10kHz                          | 10kHz ≤ f < 100kHz | 100kHz ≤ f < 500kHz |
|  | Coefficient  | 0.05             | 0.30                                      | 0.70               | 1.00                |
| Endurance  | Test conditions<br>+105°C, 2,000 hours<br>Rated voltage applied  | ΔC/C             | Within ±20% of the initial measured value |                    |                     |
|  |  | tan δ            | ≤ 150% of the initial specified value     |                    |                     |
|  |  | ESR              | ≤ 150% of the initial specified value     |                    |                     |
|  |  | Lc               | ≤ The initial specified value             |                    |                     |
| Damp Heat Test (Steady State)                      | Test conditions<br>+60°C, 90% to 95% RH<br>1,000 hours<br>No applied voltage   | ΔC/C             | Within ±20% of the initial measured value |                    |                     |
|  |  | tan δ            | ≤ 150% of the initial specified value     |                    |                     |
|  |  | ESR              | ≤ 150% of the initial specified value     |                    |                     |
|  |  | Lc               | ≤ The initial specified value             |                    |                     |
| Surge Voltage Test                                 | At normal temperature, charge at surge voltage for 30 sec. and discharge via a 1kΩ protective resistor for 330 sec. Repeat for 1,000 cycles. | ΔC/C             | Within ±20% of the initial measured value |                    |                     |
|  |  | tan δ            | ≤ 150% of the initial specified value     |                    |                     |
|  |  | ESR              | ≤ 150% of the initial specified value     |                    |                     |
|  |  | Lc               | ≤ The initial specified value             |                    |                     |
| Others   | JIS-C-5101-4   |                  |   |                    |                     |

## Dimensions



# ULR Series

+105°C, Higher Ripple Current, Lower ESR than ULG

## Size List

 New item | RV: Rated Voltage

| RV<br>μF | Code | 2.5 (0E)                              | 4 (0G)           | 6.3 (0J)  | 6.8 (06) | 7 (0S)                                  | 7.5 (07)           | 10 (1A)  | 12 (1O)            | 14 (14)            | 16 (1C)  | 20 (1D) | 25 (1E)                  | 35 (1V)                     |
|----------|------|---------------------------------------|------------------|---|----------|---|--------------------|--|--------------------|--------------------|--|---------|--------------------------|-----------------------------|
| 22       | 226  |                                       |                  |   |          |   |                    | E08  |                    |                    | E06 <sup>(N)</sup>   |         | E08                      |                             |
| 33       | 336  |                                       |                  |   |          |   |                    | E08  |                    |                    |  | E08     | F08                      |                             |
| 47       | 476  |                                       |                  |   |          |   |                    | E08  |                    |                    | E08  | F08     | F08                      |                             |
| 100      | 107  |                                       |                  | E55   |          |   | D07 <sup>(N)</sup> |  |                    |                    | D09, E06,<br>E07, E08,<br>E11  | F1A     | F1A                      | F1A <sup>(N)</sup> ,<br>G1B |
| 150      | 157  |                                       |                  | C65   |          | D06 <sup>(N)</sup>                      |                    | E11 <sup>(N)</sup>   |                    |                    |  | G1B     |                          |                             |
| 180      | 187  |                                       |                  |   |          |   |                    | E08  |                    |                    | F1A  |         |                          |                             |
| 220      | 227  | E06                                   |                  | D07, E06,<br>E08  |          |   |                    | E06, E07, E08  |                    |                    | E11, F08,<br>F1A   |         | F1A <sup>(N)</sup>       | G1B                         |
| 270      | 277  |                                       | E08              | D07, E06 <sup>(N)</sup>   |          |   |                    | F08, F1A   |                    |                    | E11, F08,<br>F1A   |         |                          |                             |
| 330      | 337  | E08                                   |                  | D08, D09,<br>X08 <sup>(N)</sup> , E55 <sup>(N)</sup> ,<br>E06, E08,<br>F08                              |          | D09 <sup>(N)</sup>                      | D09 <sup>(N)</sup> | E08,<br>F08 <sup>(N)</sup> , F1A                           | D09 <sup>(N)</sup> |                    | E1K <sup>(N)</sup> , E11 <sup>(N)</sup> ,<br>F07, F08,<br>F1A, G09,<br>G1B |         | F1A <sup>(N)</sup> , G1B |                             |
| 390      | 397  | E06                                   |                  | D09, F08  |          |   |                    | F08, F1A   |                    |                    |  |         |                          |                             |
| 470      | 477  | D09                                   |                  | D95 <sup>(N)</sup> , D11 <sup>(N)</sup> ,<br>X10 <sup>(N)</sup> , E06 <sup>(N)</sup> ,<br>E08, F08, F1A |          |   | E07 <sup>(N)</sup> | E85 <sup>(N)</sup> , E11 <sup>(N)</sup> ,<br>F08, F1A, G1B |                    |                    | F1A, G1B   |         |                          |                             |
| 500      | 507  |                                       |                  |   |          |   | D85 <sup>(N)</sup> |  |                    |                    |  |         |                          |                             |
| 560      | 567  | D08, D09,<br>E06, E08,<br>F08         | E08, F08,<br>F1A | E07 <sup>(N)</sup> , E08,<br>F08  |          |   |                    | F08, F1A   |                    | E10 <sup>(N)</sup> |  |         |                          |                             |
| 680      | 687  | F65 <sup>(N)</sup> , F08              | F08, F1A         | E08, F08,<br>F1A, G1B   |          |   | E85 <sup>(N)</sup> | F1A, G1B   |                    |                    | F1A <sup>(N)</sup> , G1B   |         | F16 <sup>(N)</sup>       |                             |
| 820      | 827  | E08, F07 <sup>(N)</sup> ,<br>F08, F1A | F08, F1A         | E85 <sup>(N)</sup> ,<br>E95 <sup>(N)</sup> , E11 <sup>(N)</sup> ,<br>F08, F1A,<br>G1B                   |          | E10 <sup>(N)</sup> , F08 <sup>(N)</sup> | E11 <sup>(N)</sup> | F1A  |                    |                    | G1B  |         |                          |                             |
| 1000     | 108  | F08, F09,<br>F1A                      | F08, G1B         | E1K, F08,<br>F1A, G1B   |          | E11 <sup>(N)</sup>                      |                    | F1A <sup>(N)</sup> , G1B                                   |                    |                    | F16 <sup>(N)</sup> , G1B   |         | G16 <sup>(N)</sup>       |                             |
| 1200     | 128  | F08                                   | F08, F1A,<br>G1B | F1A   |          |   |                    | G1B  |                    |                    |  |         |                          |                             |
| 1500     | 158  | F1A, G1B                              |                  | F1A, G1B  |          |   |                    |  |                    |                    |  |         |                          |                             |
| 2200     | 228  |                                       |                  | G1B <sup>(N)</sup>  |          |   |                    |  |                    |                    |  |         |                          |                             |
| 2500     | 258  |                                       |                  | F16 <sup>(N)</sup>  |          |   |                    |  |                    |                    |  |         |                          |                             |
| 2700     | 278  | G1B                                   | G1B              |   |          |   |                    |  |                    |                    |  |         |                          |                             |

(Unit: mm)

| Size Code | C65     | D06   | D07   | D08   | D85     | D09   | D95     | D11    | X08     | X10      | E55       | E06     | E07     | E08     |
|-----------|---------|-------|-------|-------|---------|-------|---------|--------|---------|----------|-----------|---------|---------|---------|
| ΦDxL      | 4 x 6.5 | 5 x 6 | 5 x 7 | 5 x 8 | 5 x 8.5 | 5 x 9 | 5 x 9.5 | 5 x 11 | 5.5 x 8 | 5.5 x 10 | 6.3 x 5.5 | 6.3 x 6 | 6.3 x 7 | 6.3 x 8 |
| F±0.5     | 1.5     | 2.0   | 2.0   | 2.0   | 2.0     | 2.0   | 2.0     | 2.0    | 2.5     | 2.5      | 2.5       | 2.5     | 2.5     | 2.5     |
| Φd        | 0.45    | 0.5   | 0.5   | 0.6   | 0.6     | 0.6   | 0.6     | 0.6    | 0.5     | 0.5      | 0.45      | 0.45    | 0.5     | 0.6     |
| α         | 1.0     | 1.0   | 1.0   | 1.0   | 1.0     | 1.0   | 1.0     | 1.5    | 1.0     | 1.0      | 1.0       | 1.0     | 1.0     | 1.0     |

| Size Code | E85       | E95       | E10      | E1K        | E11      | F65     | F07   | F08   | F09   | F1A      | F16    | G09    | G1B       | G16     |
|-----------|-----------|-----------|----------|------------|----------|---------|-------|-------|-------|----------|--------|--------|-----------|---------|
| ΦDxL      | 6.3 x 8.5 | 6.3 x 9.5 | 6.3 x 10 | 6.3 x 10.5 | 6.3 x 11 | 8 x 6.5 | 8 x 7 | 8 x 8 | 8 x 9 | 8 x 11.5 | 8 x 16 | 10 x 9 | 10 x 12.5 | 10 x 16 |
| F±0.5     | 2.5       | 2.5       | 2.5      | 2.5        | 2.5      | 3.5     | 3.5   | 3.5   | 3.5   | 3.5      | 3.5    | 5.0    | 5.0       | 5.0     |
| Φd        | 0.6       | 0.6       | 0.6      | 0.6        | 0.6      | 0.6     | 0.6   | 0.6   | 0.6   | 0.6      | 0.6    | 0.6    | 0.6       | 0.6     |
| α         | 1.0       | 1.0       | 1.0      | 1.0        | 1.5      | 1.0     | 1.0   | 1.0   | 1.0   | 1.5      | 1.5    | 1.5    | 1.5       | 1.5     |

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## ULR Series

+105°C, Higher Ripple Current, Lower ESR than ULG

### Characteristics List

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-----------|-----------------------------|
| 2.5            | 220             | 6.3 x 6               | E06       | ULR227M0EE06 | 15                          | 3400                                | 10        | 280                         |
| 2.5            | 330             | 6.3 x 8               | E08       | ULR337M0EE08 | 7                           | 4200                                | 10        | 280                         |
| 2.5            | 390             | 6.3 x 6               | E06       | ULR397M0EE06 | 15                          | 3400                                | 10        | 280                         |
| 2.5            | 470             | 5 x 9                 | D09       | ULR477M0ED09 | 7                           | 4180                                | 10        | 280                         |
| 2.5            | 560             | 5 x 8                 | D08       | ULR567M0ED08 | 7                           | 4180                                | 10        | 280                         |
| 2.5            | 560             | 5 x 9                 | D09       | ULR567M0ED09 | 7                           | 4180                                | 10        | 280                         |
| 2.5            | 560             | 6.3 x 6               | E06       | ULR567M0EE06 | 15                          | 3400                                | 10        | 280                         |
| 2.5            | 560             | 6.3 x 8               | E08       | ULR567M0EE08 | 7                           | 4000                                | 10        | 280                         |
| 2.5            | 560             | 8 x 8                 | F08       | ULR567M0EF08 | 7                           | 6100                                | 10        | 280                         |
| 2.5            | 680             | 8 x 6.5               | F65       | ULR687M0EF65 | 8                           | 4900                                | 10        | 340                         |
| 2.5            | 680             | 8 x 8                 | F08       | ULR687M0EF08 | 7                           | 6100                                | 10        | 390                         |
| 2.5            | 820             | 6.3 x 8               | E08       | ULR827M0EE08 | 7                           | 5600                                | 10        | 410                         |
| 2.5            | 820             | 8 x 7                 | F07       | ULR827M0EF07 | 8                           | 5600                                | 10        | 410                         |
| 2.5            | 820             | 8 x 8                 | F08       | ULR827M0EF08 | 7                           | 6100                                | 10        | 410                         |
| 2.5            | 820             | 8 x 11.5              | F1A       | ULR827M0EF1A | 7                           | 6100                                | 10        | 410                         |
| 2.5            | 1000            | 8 x 8                 | F08       | ULR108M0EF08 | 7                           | 6100                                | 10        | 500                         |
| 2.5            | 1000            | 8 x 9                 | F09       | ULR108M0EF09 | 7                           | 6100                                | 10        | 500                         |
| 2.5            | 1000            | 8 x 11.5              | F1A       | ULR108M0EF1A | 7                           | 6100                                | 10        | 500                         |
| 2.5            | 1200            | 8 x 8                 | F08       | ULR128M0EF08 | 7                           | 6100                                | 10        | 600                         |
| 2.5            | 1500            | 8 x 11.5              | F1A       | ULR158M0EF1A | 7                           | 6100                                | 10        | 750                         |
| 2.5            | 1500            | 10 x 12.5             | G1B       | ULR158M0EG1B | 7                           | 6100                                | 10        | 750                         |
| 2.5            | 2700            | 10 x 12.5             | G1B       | ULR278M0EG1B | 8                           | 5560                                | 10        | 1350                        |
| 4              | 270             | 6.3 x 8               | E08       | ULR277M0GE08 | 12                          | 3200                                | 10        | 280                         |
| 4              | 560             | 6.3 x 8               | E08       | ULR567M0GE08 | 7                           | 5600                                | 10        | 448                         |
| 4              | 560             | 8 x 8                 | F08       | ULR567M0GF08 | 7                           | 6100                                | 10        | 448                         |
| 4              | 560             | 8 x 11.5              | F1A       | ULR567M0GF1A | 7                           | 6100                                | 10        | 448                         |
| 4              | 680             | 8 x 8                 | F08       | ULR687M0GF08 | 7                           | 6100                                | 10        | 544                         |
| 4              | 680             | 8 x 11.5              | F1A       | ULR687M0GF1A | 7                           | 6100                                | 10        | 544                         |
| 4              | 820             | 8 x 8                 | F08       | ULR827M0GF08 | 7                           | 6100                                | 10        | 656                         |
| 4              | 820             | 8 x 11.5              | F1A       | ULR827M0GF1A | 7                           | 6100                                | 10        | 656                         |
| 4              | 1000            | 8 x 8                 | F08       | ULR108M0GF08 | 7                           | 6100                                | 10        | 800                         |
| 4              | 1000            | 10 x 12.5             | G1B       | ULR108M0GG1B | 7                           | 6640                                | 10        | 800                         |
| 4              | 1200            | 8 x 8                 | F08       | ULR128M0GF08 | 7                           | 6100                                | 10        | 960                         |
| 4              | 1200            | 8 x 11.5              | F1A       | ULR128M0GF1A | 7                           | 6100                                | 10        | 960                         |
| 4              | 1200            | 10 x 12.5             | G1B       | ULR128M0GG1B | 8                           | 5600                                | 10        | 960                         |
| 4              | 2700            | 10 x 12.5             | G1B       | ULR278M0GG1B | 8                           | 6900                                | 10        | 2160                        |
| 6.3            | 100             | 6.3 x 5.5             | E55       | ULR107M0JE55 | 80                          | 1200                                | 10        | 280                         |
| 6.3            | 150             | 4 x 6.5               | C65       | ULR157M0JC65 | 100                         | 2000                                | 10        | 280                         |
| 6.3            | 220             | 5 x 7                 | D07       | ULR227M0JD07 | 11                          | 3700                                | 10        | 280                         |
| 6.3            | 220             | 6.3 x 6               | E06       | ULR227M0JE06 | 20                          | 3160                                | 10        | 280                         |
| 6.3            | 220             | 6.3 x 8               | E08       | ULR227M0JE08 | 20                          | 3400                                | 10        | 280                         |
| 6.3            | 270             | 5 x 7                 | D07       | ULR277M0JD07 | 11                          | 3700                                | 10        | 340                         |
| 6.3            | 270             | 6.3 x 6               | E06       | ULR277M0JE06 | 20                          | 3160                                | 10        | 340                         |
| 6.3            | 330             | 5 x 8                 | D08       | ULR337M0JD08 | 12                          | 2900                                | 10        | 416                         |
| 6.3            | 330             | 5 x 9                 | D09       | ULR337M0JD09 | 11                          | 3100                                | 10        | 416                         |
| 6.3            | 330             | 5.5 x 8               | X08       | ULR337M0JX08 | 12                          | 2900                                | 10        | 416                         |
| 6.3            | 330             | 6.3 x 5.5             | E55       | ULR337M0JE55 | 20                          | 3160                                | 10        | 416                         |
| 6.3            | 330             | 6.3 x 6               | E06       | ULR337M0JE06 | 20                          | 3160                                | 10        | 416                         |
| 6.3            | 330             | 6.3 x 8               | E08       | ULR337M0JE08 | 10                          | 4500                                | 10        | 416                         |
| 6.3            | 330             | 8 x 8                 | F08       | ULR337M0JF08 | 8                           | 5700                                | 10        | 416                         |
| 6.3            | 390             | 5 x 9                 | D09       | ULR397M0JD09 | 11                          | 3100                                | 10        | 492                         |
| 6.3            | 390             | 8 x 8                 | F08       | ULR397M0JF08 | 8                           | 5700                                | 10        | 492                         |
| 6.3            | 470             | 5 x 9.5               | D95       | ULR477M0JD95 | 10                          | 3100                                | 10        | 592                         |
| 6.3            | 470             | 5 x 11                | D11       | ULR477M0JD11 | 11                          | 3700                                | 10        | 592                         |
| 6.3            | 470             | 5.5 x 10              | X10       | ULR477M0JX10 | 11                          | 3100                                | 10        | 592                         |

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## ULR Series

+105°C, Higher Ripple Current, Lower ESR than ULG

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mA rms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|--------------------------------------|-----------|-----------------------------|
| 6.3            | 470             | 6.3 x 6               | E06       | ULR477M0JE06 | 20                          | 3160                                 | 10        | 592                         |
| 6.3            | 470             | 6.3 x 8               | E08       | ULR477M0JE08 | 8                           | 4700                                 | 10        | 592                         |
| 6.3            | 470             | 8 x 8                 | F08       | ULR477M0JF08 | 8                           | 5700                                 | 10        | 593                         |
| 6.3            | 470             | 8 x 11.5              | F1A       | ULR477M0JF1A | 7                           | 6100                                 | 10        | 592                         |
| 6.3            | 560             | 6.3 x 7               | E07       | ULR567M0JE07 | 16                          | 3500                                 | 10        | 706                         |
| 6.3            | 560             | 6.3 x 8               | E08       | ULR567M0JE08 | 8                           | 4700                                 | 10        | 706                         |
| 6.3            | 560             | 8 x 8                 | F08       | ULR567M0JF08 | 8                           | 5700                                 | 10        | 706                         |
| 6.3            | 680             | 6.3 x 8               | E08       | ULR687M0JE08 | 8                           | 4700                                 | 10        | 857                         |
| 6.3            | 680             | 8 x 8                 | F08       | ULR687M0JF08 | 8                           | 5700                                 | 10        | 857                         |
| 6.3            | 680             | 8 x 11.5              | F1A       | ULR687M0JF1A | 7                           | 6100                                 | 10        | 857                         |
| 6.3            | 680             | 10 x 12.5             | G1B       | ULR687M0JG1B | 7                           | 6640                                 | 10        | 857                         |
| 6.3            | 820             | 6.3 x 8.5             | E85       | ULR827M0JE85 | 8                           | 4700                                 | 10        | 1033                        |
| 6.3            | 820             | 6.3 x 9.5             | E95       | ULR827M0JE95 | 8                           | 5030                                 | 10        | 1033                        |
| 6.3            | 820             | 6.3 x 11              | E11       | ULR827M0JE11 | 8                           | 5400                                 | 10        | 1033                        |
| 6.3            | 820             | 8 x 8                 | F08       | ULR827M0JF08 | 7                           | 6100                                 | 10        | 1033                        |
| 6.3            | 820             | 8 x 11.5              | F1A       | ULR827M0JF1A | 7                           | 6100                                 | 10        | 1033                        |
| 6.3            | 820             | 10 x 12.5             | G1B       | ULR827M0JG1B | 7                           | 6640                                 | 10        | 1033                        |
| 6.3            | 1000            | 6.3 x 10.5            | E1K       | ULR108M0JE1K | 8                           | 4700                                 | 10        | 1260                        |
| 6.3            | 1000            | 8 x 8                 | F08       | ULR108M0JF08 | 7                           | 6100                                 | 10        | 1260                        |
| 6.3            | 1000            | 8 x 11.5              | F1A       | ULR108M0JF1A | 7                           | 6100                                 | 10        | 1260                        |
| 6.3            | 1000            | 10 x 12.5             | G1B       | ULR108M0JG1B | 10                          | 5500                                 | 10        | 1260                        |
| 6.3            | 1200            | 8 x 11.5              | F1A       | ULR128M0JF1A | 7                           | 6100                                 | 10        | 1512                        |
| 6.3            | 1500            | 8 x 11.5              | F1A       | ULR158M0JF1A | 10                          | 5500                                 | 10        | 1890                        |
| 6.3            | 1500            | 10 x 12.5             | G1B       | ULR158M0JG1B | 10                          | 5560                                 | 10        | 1890                        |
| 6.3            | 2200            | 10 x 12.5             | G1B       | ULR228M0JG1B | 10                          | 5560                                 | 10        | 2772                        |
| 6.3            | 2500            | 8 x 16                | F16       | ULR258M0JF16 | 8                           | 6100                                 | 10        | 3150                        |
| 6.8            | 1000            | 6.3 x 11              | E11       | ULR108M06E11 | 11                          | 4650                                 | 10        | 1033                        |
| 7              | 150             | 5 x 6                 | D06       | ULR157M0SD06 | 12                          | 2900                                 | 10        | 280                         |
| 7              | 330             | 5 x 9                 | D09       | ULR337M0SD09 | 11                          | 3100                                 | 10        | 462                         |
| 7              | 820             | 6.3 x 10              | E10       | ULR827M0SE10 | 10                          | 4930                                 | 10        | 1148                        |
| 7              | 820             | 8 x 8                 | F08       | ULR827M0SF08 | 10                          | 5030                                 | 10        | 1148                        |
| 7.5            | 100             | 5 x 7                 | D07       | ULR107M07D07 | 12                          | 2900                                 | 10        | 280                         |
| 7.5            | 330             | 5 x 9                 | D09       | ULR337M07D09 | 12                          | 3100                                 | 10        | 495                         |
| 7.5            | 470             | 6.3 x 7               | E07       | ULR477M07E07 | 12                          | 4050                                 | 10        | 705                         |
| 7.5            | 500             | 5 x 8.5               | D85       | ULR507M07D85 | 12                          | 4000                                 | 10        | 750                         |
| 7.5            | 680             | 6.3 x 8.5             | E85       | ULR687M07E85 | 8                           | 4700                                 | 10        | 1020                        |
| 7.5            | 820             | 6.3 x 11              | E11       | ULR827M07E11 | 11                          | 4700                                 | 10        | 1230                        |
| 10             | 22              | 6.3 x 8               | E08       | ULR226M1AE08 | 45                          | 1870                                 | 10        | 280                         |
| 10             | 33              | 6.3 x 8               | E08       | ULR336M1AE08 | 35                          | 2000                                 | 10        | 280                         |
| 10             | 47              | 6.3 x 8               | E08       | ULR476M1AE08 | 32                          | 2100                                 | 10        | 280                         |
| 10             | 150             | 6.3 x 11              | E11       | ULR157M1AE11 | 25                          | 2820                                 | 10        | 300                         |
| 10             | 180             | 6.3 x 8               | E08       | ULR187M1AE08 | 25                          | 2820                                 | 10        | 360                         |
| 10             | 220             | 6.3 x 6               | E06       | ULR227M1AE06 | 15                          | 2700                                 | 10        | 440                         |
| 10             | 220             | 6.3 x 7               | E07       | ULR227M1AE07 | 15                          | 2700                                 | 10        | 440                         |
| 10             | 220             | 6.3 x 8               | E08       | ULR227M1AE08 | 12                          | 3200                                 | 10        | 440                         |
| 10             | 270             | 8 x 8                 | F08       | ULR277M1AF08 | 14                          | 4420                                 | 10        | 540                         |
| 10             | 270             | 8 x 11.5              | F1A       | ULR277M1AF1A | 11                          | 5100                                 | 10        | 540                         |
| 10             | 330             | 6.3 x 8               | E08       | ULR337M1AE08 | 11                          | 3500                                 | 10        | 660                         |
| 10             | 330             | 8 x 8                 | F08       | ULR337M1AF08 | 11                          | 5000                                 | 10        | 660                         |
| 10             | 330             | 8 x 11.5              | F1A       | ULR337M1AF1A | 11                          | 5100                                 | 10        | 660                         |
| 10             | 390             | 8 x 8                 | F08       | ULR397M1AF08 | 11                          | 5000                                 | 10        | 780                         |
| 10             | 390             | 8 x 11.5              | F1A       | ULR397M1AF1A | 9                           | 6100                                 | 10        | 780                         |
| 10             | 470             | 6.3 x 8.5             | E85       | ULR477M1AE85 | 12                          | 3500                                 | 10        | 940                         |
| 10             | 470             | 6.3 x 11              | E11       | ULR477M1AE11 | 12                          | 3750                                 | 10        | 940                         |
| 10             | 470             | 8 x 8                 | F08       | ULR477M1AF08 | 11                          | 5000                                 | 10        | 940                         |
| 10             | 470             | 8 x 11.5              | F1A       | ULR477M1AF1A | 9                           | 5650                                 | 10        | 940                         |
| 10             | 470             | 10 x 12.5             | G1B       | ULR477M1AG1B | 8                           | 6100                                 | 10        | 940                         |

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## ULR Series

+105°C, Higher Ripple Current, Lower ESR than ULG

ULR Series

| Rated Vol. (V) | Rated Cap. (µF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (µA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-----------|-----------------------------|
| 10             | 560             | 8 x 8                 | F08       | ULR567M1AF08 | 9                           | 5600                                | 10        | 1120                        |
| 10             | 560             | 8 x 11.5              | F1A       | ULR567M1AF1A | 9                           | 5650                                | 10        | 1120                        |
| 10             | 680             | 8 x 11.5              | F1A       | ULR687M1AF1A | 10                          | 5800                                | 10        | 1360                        |
| 10             | 680             | 10 x 12.5             | G1B       | ULR687M1AG1B | 8                           | 6100                                | 10        | 1360                        |
| 10             | 820             | 8 x 11.5              | F1A       | ULR827M1AF1A | 8                           | 6100                                | 10        | 1640                        |
| 10             | 1000            | 8 x 11.5              | F1A       | ULR108M1AF1A | 10                          | 5200                                | 10        | 2000                        |
| 10             | 1000            | 10 x 12.5             | G1B       | ULR108M1AG1B | 9                           | 6100                                | 10        | 2000                        |
| 10             | 1200            | 10 x 12.5             | G1B       | ULR128M1AG1B | 8                           | 6200                                | 10        | 2400                        |
| 12             | 330             | 5 x 9                 | D09       | ULR337M1OD09 | 12                          | 2690                                | 10        | 792                         |
| 14             | 560             | 6.3 x 10              | E10       | ULR567M14E10 | 12                          | 3800                                | 10        | 1568                        |
| 16             | 22              | 6.3 x 6               | E06       | ULR226M1CE06 | 80                          | 1200                                | 10        | 280                         |
| 16             | 47              | 6.3 x 8               | E08       | ULR476M1CE08 | 60                          | 1500                                | 10        | 280                         |
| 16             | 100             | 5 x 9                 | D09       | ULR107M1CD09 | 24                          | 2820                                | 10        | 320                         |
| 16             | 100             | 6.3 x 6               | E06       | ULR107M1CE06 | 25                          | 2700                                | 10        | 320                         |
| 16             | 100             | 6.3 x 7               | E07       | ULR107M1CE07 | 24                          | 2820                                | 10        | 320                         |
| 16             | 100             | 6.3 x 8               | E08       | ULR107M1CE08 | 24                          | 2820                                | 10        | 320                         |
| 16             | 100             | 6.3 x 11              | E11       | ULR107M1CE11 | 24                          | 2820                                | 10        | 320                         |
| 16             | 180             | 8 x 11.5              | F1A       | ULR187M1CF1A | 13                          | 5000                                | 10        | 576                         |
| 16             | 220             | 6.3 x 11              | E11       | ULR227M1CE11 | 20                          | 3100                                | 10        | 704                         |
| 16             | 220             | 8 x 8                 | F08       | ULR227M1CF08 | 13                          | 4300                                | 10        | 704                         |
| 16             | 220             | 8 x 11.5              | F1A       | ULR227M1CF1A | 13                          | 5000                                | 10        | 704                         |
| 16             | 270             | 6.3 x 11              | E11       | ULR277M1CE11 | 20                          | 3100                                | 10        | 864                         |
| 16             | 270             | 8 x 8                 | F08       | ULR277M1CF08 | 13                          | 4300                                | 10        | 864                         |
| 16             | 270             | 8 x 11.5              | F1A       | ULR277M1CF1A | 13                          | 5000                                | 10        | 864                         |
| 16             | 330             | 6.3 x 10.5            | E1K       | ULR337M1CE1K | 18                          | 3200                                | 10        | 1056                        |
| 16             | 330             | 6.3 x 11              | E11       | ULR337M1CE11 | 18                          | 3200                                | 10        | 1056                        |
| 16             | 330             | 8 x 7                 | F07       | ULR337M1CF07 | 13                          | 4300                                | 10        | 1056                        |
| 16             | 330             | 8 x 8                 | F08       | ULR337M1CF08 | 13                          | 4300                                | 10        | 1056                        |
| 16             | 330             | 8 x 11.5              | F1A       | ULR337M1CF1A | 10                          | 5800                                | 10        | 1056                        |
| 16             | 330             | 10 x 9                | G09       | ULR337M1CG09 | 13                          | 4300                                | 10        | 1056                        |
| 16             | 330             | 10 x 12.5             | G1B       | ULR337M1CG1B | 10                          | 6100                                | 10        | 1056                        |
| 16             | 470             | 8 x 11.5              | F1A       | ULR477M1CF1A | 11                          | 5100                                | 10        | 1504                        |
| 16             | 470             | 10 x 12.5             | G1B       | ULR477M1CG1B | 10                          | 6100                                | 10        | 1504                        |
| 16             | 680             | 8 x 11.5              | F1A       | ULR687M1CF1A | 11                          | 5100                                | 10        | 2176                        |
| 16             | 680             | 10 x 12.5             | G1B       | ULR687M1CG1B | 10                          | 6100                                | 10        | 2176                        |
| 16             | 820             | 10 x 12.5             | G1B       | ULR827M1CG1B | 10                          | 6100                                | 10        | 2624                        |
| 16             | 1000            | 8 x 16                | F16       | ULR108M1CF16 | 10                          | 5950                                | 10        | 3200                        |
| 16             | 1000            | 10 x 12.5             | G1B       | ULR108M1CG1B | 10                          | 6100                                | 10        | 3200                        |
| 20             | 33              | 6.3 x 8               | E08       | ULR336M1DE08 | 35                          | 2000                                | 10        | 280                         |
| 20             | 47              | 8 x 8                 | F08       | ULR476M1DF08 | 33                          | 2100                                | 10        | 280                         |
| 20             | 100             | 8 x 11.5              | F1A       | ULR107M1DF1A | 32                          | 2750                                | 10        | 400                         |
| 20             | 150             | 10 x 12.5             | G1B       | ULR157M1DG1B | 28                          | 2900                                | 10        | 600                         |
| 25             | 22              | 6.3 x 8               | E08       | ULR226M1EE08 | 45                          | 1870                                | 10        | 280                         |
| 25             | 33              | 8 x 8                 | F08       | ULR336M1EF08 | 40                          | 2050                                | 10        | 280                         |
| 25             | 47              | 8 x 8                 | F08       | ULR476M1EF08 | 36                          | 2100                                | 10        | 280                         |
| 25             | 100             | 8 x 11.5              | F1A       | ULR107M1EF1A | 32                          | 2750                                | 10        | 500                         |
| 25             | 220             | 8 x 11.5              | F1A       | ULR227M1EF1A | 32                          | 2750                                | 10        | 1100                        |
| 25             | 330             | 8 x 11.5              | F1A       | ULR337M1EF1A | 32                          | 2750                                | 10        | 1650                        |
| 25             | 330             | 10 x 12.5             | G1B       | ULR337M1EG1B | 45                          | 2700                                | 10        | 1650                        |
| 25             | 680             | 8 x 16                | F16       | ULR687M1EF16 | 16                          | 4700                                | 10        | 3400                        |
| 25             | 1000            | 10 x 16               | G16       | ULR108M1EG16 | 10                          | 6100                                | 10        | 5000                        |
| 35             | 100             | 8 x 11.5              | F1A       | ULR107M1VF1A | 55                          | 2000                                | 10        | 700                         |
| 35             | 100             | 10 x 12.5             | G1B       | ULR107M1VG1B | 60                          | 2000                                | 10        | 700                         |
| 35             | 220             | 10 x 12.5             | G1B       | ULR227M1VG1B | 50                          | 2500                                | 10        | 1540                        |

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## UER Series

+105°C, Higher Ripple Current, Long Life 5,000 Hours

### Features

- Higher Ripple Current, Long Life 5,000 Hours
- Wide Temperature Range
- RoHS Compliant



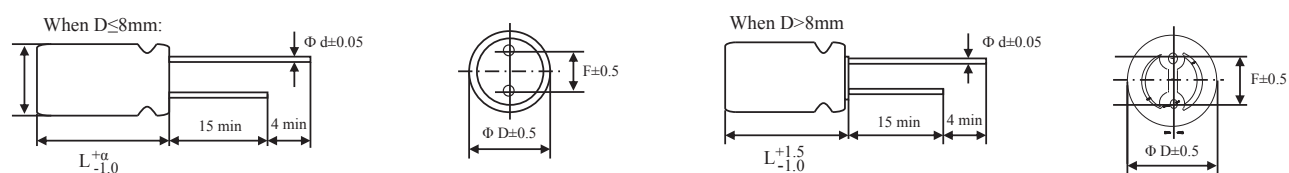
### Applications

- Suitable for DC-DC Converters, Voltage Regulators, Decoupling Applications for Computer Motherboards, etc.

### Specifications

| Item   | Performance Characteristics   |              |   |                |                 |
|--|---|--------------|---|----------------|-----------------|
| Operating Temperature Range                        | -55 to +105°C   |              |   |                |                 |
| Rated Working Voltage Range                        | 2.5VDC to 35VDC   |              |   |                |                 |
| Surge Voltage, SV                                  | SV=WVx1.15VDC (Normal temperature)  |              |   |                |                 |
| Nominal Capacitance Range                          | 100 to 2500μF (120Hz, +20°C)  |              |   |                |                 |
| Capacitance Tolerance                              | ±20% (120Hz, +20°C)   |              |   |                |                 |
| tan δ  | 0.10 (120Hz, +20°C)   |              |   |                |                 |
| Leakage Current, Lc                                | I≤0.2CV or 280 (μA) whichever is greater measured, after 2 minutes application of rated working voltage at +20°C  |              |   |                |                 |
| Temperature Characteristics, Impedance Ratio       | At -55°C 100kHz (Low temperature)   |              |   | Z/Z20°C≤1.25   |                 |
|  | At +105°C 100kHz (High temperature)   |              |   | Z/Z20°C≤1.25   |                 |
| Frequency Coefficient for Allowable Ripple Current | Frequency   | 120Hz≤f<1kHz | 1kHz≤f<10kHz                              | 10kHz≤f<100kHz | 100kHz≤f<500kHz |
|  | Coefficient   | 0.05         | 0.30                                      | 0.70           | 1.00            |
| Endurance  | Test conditions<br>+105°C, 5,000 hours<br>Rated voltage applied   | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |   | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |   | ESR          | ≤150% of the initial specified value      |                |                 |
|  |   | Lc           | ≤The initial specified value              |                |                 |
| Damp Heat Test (Steady State)                      | Test conditions<br>+60°C, 90% to 95% RH<br>1,000 hours<br>No applied voltage  | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |   | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |   | ESR          | ≤150% of the initial specified value      |                |                 |
|  |   | Lc           | ≤The initial specified value              |                |                 |
| Surge Voltage Test                                 | At normal temperature,<br>charge at surge voltage<br>for 30 sec. and discharge<br>via a 1kΩ protective<br>resistor for 330 sec.<br>Repeat for 1,000 cycles. | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |   | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |   | ESR          | ≤150% of the initial specified value      |                |                 |
|  |   | Lc           | ≤The initial specified value              |                |                 |
| Others   | JIS-C-5101-4  |              |   |                |                 |

### Dimensions



# UER Series

+105°C, Higher Ripple Current, Long Life 5,000 Hours

## Size List

 New Item | RV: Rated Voltage

| RV<br>μF | Code | 2.5 (0E)               | 4 (0G) | 6.3 (0J)                            | 7.5 (07)         | 10 (1A) | 16 (1C)                        | 20 (1D)          | 25 (1E)                             | 35V (1V)         |
|----------|------|------------------------|--------|-------------------------------------|------------------|---------|--------------------------------|------------------|-------------------------------------|------------------|
| 100      | 107  |                        |        | E06                                 |                  |         | E05, E07, E08                  |                  | F1A <sup>①</sup>                    |                  |
| 120      | 127  |                        |        |                                     |                  |         |                                |                  |                                     | G1B <sup>①</sup> |
| 220      | 227  |                        |        |                                     |                  |         | F1A                            |                  | F1A <sup>①</sup>                    |                  |
| 270      | 277  |                        |        |                                     |                  |         | E05 <sup>①</sup> , F08,<br>F1A |                  |                                     |                  |
| 330      | 337  |                        |        |                                     | D09 <sup>①</sup> |         | F1A                            |                  | F1A <sup>①</sup> , G1B <sup>①</sup> |                  |
| 390      | 397  |                        |        |                                     |                  |         |                                | F1A <sup>①</sup> |                                     |                  |
| 470      | 477  | E08                    |        | E08, F08                            |                  |         | F1A, G1B                       |                  | F1A <sup>①</sup>                    |                  |
| 500      | 507  |                        |        |                                     | D09 <sup>①</sup> |         |                                |                  |                                     |                  |
| 560      | 567  | D08 <sup>①</sup> , D09 | E08    | E08, F08                            |                  |         |                                | G1B <sup>①</sup> |                                     |                  |
| 680      | 687  |                        |        | E75, E11 <sup>①</sup>               |                  |         |                                |                  |                                     |                  |
| 820      | 827  | E08, F08               |        | E85 <sup>①</sup> , F08 <sup>①</sup> | E10 <sup>①</sup> |         |                                |                  |                                     |                  |
| 1000     | 108  |                        |        | F1A <sup>①</sup>                    |                  |         | G1B                            |                  | G16 <sup>①</sup>                    |                  |
| 1200     | 128  |                        |        |                                     |                  | G1B     |                                |                  |                                     |                  |
| 1500     | 158  |                        |        | F1A <sup>①</sup>                    |                  |         | G16 <sup>①</sup>               |                  |                                     |                  |
| 2500     | 258  |                        |        | G1B <sup>①</sup>                    |                  |         |                                |                  |                                     |                  |

(Unit: mm)

| Size Code | D08   | D09   | E05     | E06     | E07     | E75       | E08     |
|-----------|-------|-------|---------|---------|---------|-----------|---------|
| ΦDxL      | 5 x 8 | 5 x 9 | 6.3 x 5 | 6.3 x 6 | 6.3 x 7 | 6.3 x 7.5 | 6.3 x 8 |
| F±0.5     | 2.0   | 2.0   | 2.5     | 2.5     | 2.5     | 2.5       | 2.5     |
| Φd        | 0.6   | 0.6   | 0.45    | 0.45    | 0.5     | 0.5       | 0.6     |
| α         | 1.0   | 1.0   | 1.0     | 1.0     | 1.0     | 1.0       | 1.0     |

| Size Code | E85       | E10      | E11      | F08   | F1A      | G1B       | G16     |
|-----------|-----------|----------|----------|-------|----------|-----------|---------|
| ΦDxL      | 6.3 x 8.5 | 6.3 x 10 | 6.3 x 11 | 8 x 8 | 8 x 11.5 | 10 x 12.5 | 10 x 16 |
| F±0.5     | 2.5       | 2.5      | 2.5      | 3.5   | 3.5      | 5.0       | 5.0     |
| Φd        | 0.6       | 0.6      | 0.6      | 0.6   | 0.6      | 0.6       | 0.6     |
| α         | 1.0       | 1.0      | 1.5      | 1.0   | 1.5      | 1.5       | 1.5     |

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## UER Series

+105°C, Higher Ripple Current, Long Life 5,000 Hours

### Characteristics List

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-----------|-----------------------------|
| 2.5            | 470             | 6.3 x 8               | E08       | UER477M0EE08 | 10                          | 4500                                | 10        | 280                         |
| 2.5            | 560             | 5 x 8                 | D08       | UER567M0ED08 | 7                           | 4300                                | 10        | 280                         |
| 2.5            | 560             | 5 x 9                 | D09       | UER567M0ED09 | 7                           | 4350                                | 10        | 280                         |
| 2.5            | 820             | 6.3 x 8               | E08       | UER827M0EE08 | 7                           | 5600                                | 10        | 410                         |
| 2.5            | 820             | 8 x 8                 | F08       | UER827M0EF08 | 7                           | 5600                                | 10        | 410                         |
| 4              | 560             | 6.3 x 8               | E08       | UER567M0GE08 | 7                           | 4500                                | 10        | 448                         |
| 6.3            | 100             | 6.3 x 6               | E06       | UER107M0JE06 | 30                          | 2580                                | 10        | 280                         |
| 6.3            | 470             | 6.3 x 8               | E08       | UER477M0JE08 | 10                          | 4500                                | 10        | 592                         |
| 6.3            | 470             | 8 x 8                 | F08       | UER477M0JF08 | 8                           | 4000                                | 10        | 592                         |
| 6.3            | 560             | 6.3 x 8               | E08       | UER567M0JE08 | 8                           | 4700                                | 10        | 706                         |
| 6.3            | 560             | 8 x 8                 | F08       | UER567M0JF08 | 8                           | 4800                                | 10        | 706                         |
| 6.3            | 680             | 6.3 x 7.5             | E75       | UER687M0JE75 | 8                           | 4800                                | 10        | 857                         |
| 6.3            | 680             | 6.3 x 11              | E11       | UER687M0JE11 | 8                           | 4950                                | 10        | 857                         |
| 6.3            | 820             | 6.3 x 8.5             | E85       | UER827M0JE85 | 8                           | 4800                                | 10        | 1033                        |
| 6.3            | 820             | 8 x 8                 | F08       | UER827M0JF08 | 8                           | 4850                                | 10        | 1033                        |
| 6.3            | 1000            | 8 x 11.5              | F1A       | UER108M0JF1A | 8                           | 4900                                | 10        | 1260                        |
| 6.3            | 1500            | 8 x 11.5              | F1A       | UER158M0JF1A | 8                           | 4900                                | 10        | 1890                        |
| 6.3            | 2500            | 10 x 12.5             | G1B       | UER258M0JG1B | 7                           | 6100                                | 10        | 3150                        |
| 7.5            | 330             | 5 x 9                 | D09       | UER337M07D09 | 12                          | 3100                                | 10        | 495                         |
| 7.5            | 500             | 5 x 9                 | D09       | UER507M07D09 | 12                          | 3100                                | 10        | 750                         |
| 7.5            | 820             | 6.3 x 10              | E10       | UER827M07E10 | 10                          | 4200                                | 10        | 1230                        |
| 10             | 1200            | 10 x 12.5             | G1B       | UER128M1AG1B | 8                           | 5000                                | 10        | 2400                        |
| 16             | 100             | 6.3 x 5               | E05       | UER107M1CE05 | 24                          | 2490                                | 10        | 320                         |
| 16             | 100             | 6.3 x 7               | E07       | UER107M1CE07 | 24                          | 2490                                | 10        | 320                         |
| 16             | 100             | 6.3 x 8               | E08       | UER107M1CE08 | 24                          | 2820                                | 10        | 320                         |
| 16             | 220             | 8 x 11.5              | F1A       | UER227M1CF1A | 15                          | 4300                                | 10        | 704                         |
| 16             | 270             | 6.3 x 8               | E08       | UER277M1CE08 | 15                          | 3800                                | 10        | 864                         |
| 16             | 270             | 8 x 8                 | F08       | UER277M1CF08 | 12                          | 5000                                | 10        | 864                         |
| 16             | 270             | 8 x 11.5              | F1A       | UER277M1CF1A | 10                          | 5000                                | 10        | 864                         |
| 16             | 330             | 8 x 11.5              | F1A       | UER337M1CF1A | 10                          | 5000                                | 10        | 1056                        |
| 16             | 470             | 8 x 11.5              | F1A       | UER477M1CF1A | 11                          | 5400                                | 10        | 1504                        |
| 16             | 470             | 10 x 12.5             | G1B       | UER477M1CG1B | 11                          | 5600                                | 10        | 1504                        |
| 16             | 1000            | 10 x 12.5             | G1B       | UER108M1CG1B | 11                          | 5600                                | 10        | 3200                        |
| 16             | 1500            | 10 x 16               | G16       | UER158M1CG16 | 10                          | 6100                                | 10        | 4800                        |
| 20             | 390             | 8 x 11.5              | F1A       | UER397M1DF1A | 18                          | 4520                                | 10        | 1560                        |
| 20             | 560             | 10 x 12.5             | G1B       | UER567M1DG1B | 30                          | 3350                                | 10        | 2240                        |
| 25             | 100             | 8 x 11.5              | F1A       | UER107M1EF1A | 38                          | 2600                                | 10        | 500                         |
| 25             | 220             | 8 x 11.5              | F1A       | UER227M1EF1A | 38                          | 2600                                | 10        | 1100                        |
| 25             | 330             | 8 x 11.5              | F1A       | UER337M1EF1A | 35                          | 3100                                | 10        | 1650                        |
| 25             | 330             | 10 x 12.5             | G1B       | UER337M1EG1B | 35                          | 2750                                | 10        | 1650                        |
| 25             | 470             | 8 x 11.5              | F1A       | UER477M1EF1A | 35                          | 2750                                | 10        | 2350                        |
| 25             | 1000            | 10 x 16               | G16       | UER108M1EG16 | 20                          | 5050                                | 10        | 5000                        |
| 35             | 120             | 10 x 12.5             | G1B       | UER127M1VG1B | 40                          | 3030                                | 10        | 840                         |

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# UPG Series

+105°C, High Voltage, Low ESR

## Features

- High Voltage, Low ESR
- Wide Temperature Range
- RoHS Compliant

## Applications

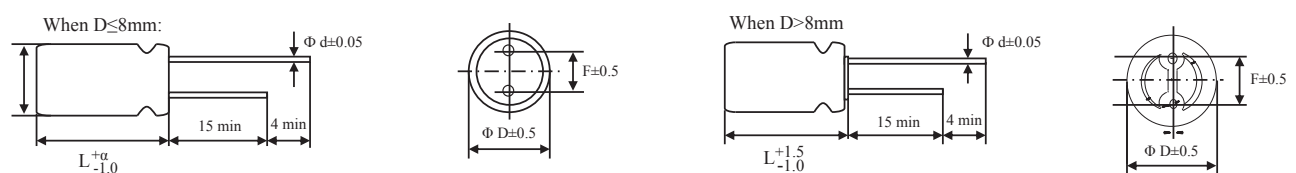
- Suitable for DC-DC Converters, Voltage Regulators, Decoupling Applications for Computer Motherboards, etc.



## Specifications

| Item   | Performance Characteristics   |                  |   |                            |                     |
|--|---|------------------|---|----------------------------|---------------------|
| Operating Temperature Range                        | -55 to +105°C   |                  |   |                            |                     |
| Rated Working Voltage Range                        | 50VDC to 200VDC   |                  |   |                            |                     |
| Surge Voltage, SV                                  | SV=WVx1.15VDC (Normal temperature)  |                  |   |                            |                     |
| Nominal Capacitance Range                          | 1 to 120μF (120Hz, +20°C)   |                  |   |                            |                     |
| Capacitance Tolerance                              | ±20% (120Hz, +20°C)   |                  |   |                            |                     |
| tan δ  | 0.12 (120Hz, +20°C)   |                  |   |                            |                     |
| Leakage Current, Lc                                | I ≤ 0.2CV or 280 (μA) whichever is greater measured, after 2 minutes application of rated working voltage at +20°C  |                  |   |                            |                     |
| Temperature Characteristics, Impedance Ratio       | At -55°C 100kHz (Low temperature)   |                  |   | Z/Z <sub>20°C</sub> ≤ 1.25 |                     |
|  | At +105°C 100kHz (High temperature)   |                  |   | Z/Z <sub>20°C</sub> ≤ 1.25 |                     |
| Frequency Coefficient for Allowable Ripple Current | Frequency   | 120Hz ≤ f < 1kHz | 1kHz ≤ f < 10kHz                          | 10kHz ≤ f < 100kHz         | 100kHz ≤ f < 500kHz |
|  | Coefficient   | 0.05             | 0.30                                      | 0.70                       | 1.00                |
| Endurance  | Test conditions<br>+105°C, 2,000 hours<br>Rated voltage applied   | ΔC/C             | Within ±20% of the initial measured value |                            |                     |
|  |   | tan δ            | ≤ 150% of the initial specified value     |                            |                     |
|  |   | ESR              | ≤ 150% of the initial specified value     |                            |                     |
|  |   | Lc               | ≤ The initial specified value             |                            |                     |
| Damp Heat Test (Steady State)                      | Test conditions<br>+60°C, 90% to 95% RH<br>1,000 hours<br>No applied voltage  | ΔC/C             | Within ±20% of the initial measured value |                            |                     |
|  |   | tan δ            | ≤ 150% of the initial specified value     |                            |                     |
|  |   | ESR              | ≤ 150% of the initial specified value     |                            |                     |
|  |   | Lc               | ≤ The initial specified value             |                            |                     |
| Surge Voltage Test                                 | At normal temperature,<br>charge at surge voltage<br>for 30 sec. and discharge<br>via a 1kΩ protective<br>resistor for 330 sec.<br>Repeat for 1,000 cycles. | ΔC/C             | Within ±20% of the initial measured value |                            |                     |
|  |   | tan δ            | ≤ 150% of the initial specified value     |                            |                     |
|  |   | ESR              | ≤ 150% of the initial specified value     |                            |                     |
|  |   | Lc               | ≤ The initial specified value             |                            |                     |
| Others   | JIS-C-5101-4  |                  |   |                            |                     |

## Dimensions



# UPG Series

+105°C, High Voltage, Low ESR

## Size List

 New Item | RV: Rated Voltage

| RV<br>μF | Code | 50 (1H)                             | 63 (1J)          | 80 (1K)          | 100 (2A)               | 200 (2D) |
|----------|------|-------------------------------------|------------------|------------------|------------------------|----------|
| 1        | 105  |                                     |                  |                  |                        | E08      |
| 3.3      | 335  |                                     |                  | E06 <sup>Ⓢ</sup> |                        | F08      |
| 4.7      | 475  |                                     |                  |                  |                        | F1A      |
| 6.8      | 685  |                                     |                  |                  | F1A                    | G1B      |
| 8.2      | 825  |                                     |                  |                  |                        | G1B      |
| 10       | 106  | D08 <sup>Ⓢ</sup> , E06 <sup>Ⓢ</sup> | E11 <sup>Ⓢ</sup> |                  | E11 <sup>Ⓢ</sup> , F1A |          |
| 18       | 186  |                                     |                  |                  | G1B                    |          |
| 22       | 226  | F08                                 | F08              |                  | G1B <sup>Ⓢ</sup>       |          |
| 33       | 336  | F08                                 | F08              |                  | G1B <sup>Ⓢ</sup>       |          |
| 47       | 476  | F1A                                 | G1B              |                  |                        |          |
| 56       | 566  | G1B                                 | G1B              |                  |                        |          |
| 68       | 686  | G1B                                 |                  |                  |                        |          |
| 100      | 107  | G1B                                 |                  |                  |                        |          |
| 120      | 127  | G1B                                 |                  |                  |                        |          |

(Unit: mm)

| Size Code | D08   | E06     | E08     | E11      | F08   | F1A      | G1B       |
|-----------|-------|---------|---------|----------|-------|----------|-----------|
| ΦDxL      | 5 x 8 | 6.3 x 6 | 6.3 x 8 | 6.3 x 11 | 8 x 8 | 8 x 11.5 | 10 x 12.5 |
| F±0.5     | 2.0   | 2.5     | 2.5     | 2.5      | 3.5   | 3.5      | 5.0       |
| Φd        | 0.6   | 0.45    | 0.6     | 0.6      | 0.6   | 0.6      | 0.6       |
| α         | 1.0   | 1.0     | 1.0     | 1.5      | 1.0   | 1.5      | 1.5       |

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## UPG Series

+105°C, High Voltage, Low ESR

### Characteristics List

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-----------|-----------------------------|
| 50             | 10              | 5 x 8                 | D08       | UPG106M1HD08 | 80                          | 790                                 | 12        | 280                         |
| 50             | 10              | 6.3 x 6               | E06       | UPG106M1HE06 | 200                         | 547                                 | 12        | 280                         |
| 50             | 22              | 8 x 8                 | F08       | UPG226M1HF08 | 45                          | 1300                                | 12        | 280                         |
| 50             | 33              | 8 x 8                 | F08       | UPG336M1HF08 | 45                          | 1300                                | 12        | 330                         |
| 50             | 47              | 8 x 11.5              | F1A       | UPG476M1HF1A | 42                          | 1500                                | 12        | 470                         |
| 50             | 56              | 10 x 12.5             | G1B       | UPG566M1HG1B | 38                          | 2000                                | 12        | 560                         |
| 50             | 68              | 10 x 12.5             | G1B       | UPG686M1HG1B | 35                          | 2100                                | 12        | 680                         |
| 50             | 100             | 10 x 12.5             | G1B       | UPG107M1HG1B | 35                          | 2100                                | 12        | 1000                        |
| 50             | 120             | 10 x 12.5             | G1B       | UPG127M1HG1B | 35                          | 2100                                | 12        | 1200                        |
| 63             | 10              | 6.3 x 11              | E11       | UPG106M1JE11 | 90                          | 850                                 | 12        | 280                         |
| 63             | 22              | 8 x 8                 | F08       | UPG226M1JF08 | 65                          | 1100                                | 12        | 280                         |
| 63             | 33              | 8 x 8                 | F08       | UPG336M1JF08 | 65                          | 1100                                | 12        | 416                         |
| 63             | 47              | 10 x 12.5             | G1B       | UPG476M1JG1B | 60                          | 1300                                | 12        | 592                         |
| 63             | 56              | 10 x 12.5             | G1B       | UPG566M1JG1B | 55                          | 1500                                | 12        | 706                         |
| 80             | 3.3             | 6.3 x 6               | E06       | UPG335M1KE06 | 300                         | 350                                 | 12        | 280                         |
| 100            | 6.8             | 8 x 11.5              | F1A       | UPG685M2AF1A | 45                          | 1600                                | 12        | 280                         |
| 100            | 10              | 6.3 x 11              | E11       | UPG106M2AE11 | 90                          | 1650                                | 12        | 280                         |
| 100            | 10              | 8 x 11.5              | F1A       | UPG106M2AF1A | 42                          | 1800                                | 12        | 280                         |
| 100            | 18              | 10 x 12.5             | G1B       | UPG186M2AG1B | 38                          | 2200                                | 12        | 300                         |
| 100            | 22              | 10 x 12.5             | G1B       | UPG226M2AG1B | 38                          | 2200                                | 12        | 440                         |
| 100            | 33              | 10 x 12.5             | G1B       | UPG336M2AG1B | 65                          | 1550                                | 12        | 660                         |
| 200            | 1               | 6.3 x 8               | E08       | UPG105M2DE08 | 2000                        | 150                                 | 12        | 280                         |
| 200            | 3.3             | 8 x 8                 | F08       | UPG335M2DF08 | 500                         | 300                                 | 12        | 280                         |
| 200            | 4.7             | 8 x 11.5              | F1A       | UPG475M2DF1A | 400                         | 350                                 | 12        | 280                         |
| 200            | 6.8             | 10 x 12.5             | G1B       | UPG685M2DG1B | 300                         | 500                                 | 12        | 280                         |
| 200            | 8.2             | 10 x 12.5             | G1B       | UPG825M2DG1B | 300                         | 595                                 | 12        | 328                         |

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# UBR Series

+125°C, High Temperature, Low ESR

## Features

- High Temperature
- Low ESR
- RoHS Compliant

## Applications

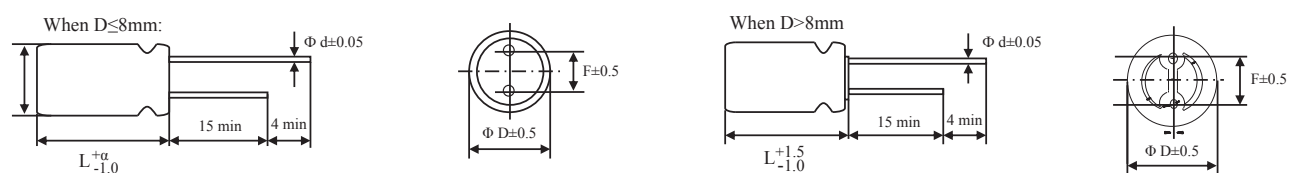
- Suitable for DC-DC Converters, Voltage Regulators, Decoupling Applications for Computer Motherboards, etc.



## Specifications

| Item   | Performance Characteristics   |              |   |                |                 |
|--|---|--------------|---|----------------|-----------------|
| Operating Temperature Range                        | -55 to +125°C   |              |   |                |                 |
| Rated Working Voltage Range                        | 2.5VDC to 100VDC  |              |   |                |                 |
| Surge Voltage, SV                                  | SV=VVx1.15VDC (Normal temperature)  |              |   |                |                 |
| Nominal Capacitance Range                          | 10 to 1200μF (120Hz, +20°C)   |              |   |                |                 |
| Capacitance Tolerance                              | ±20% (120Hz, +20°C)   |              |   |                |                 |
| tan δ  | 0.12 (120Hz, +20°C)   |              |   |                |                 |
| Leakage Current, Lc                                | I≤0.2CV or 280 (μA) whichever is greater measured, after 2 minutes application of rated working voltage at +20°C  |              |   |                |                 |
| Temperature Characteristics, Impedance Ratio       | At -55°C 100kHz (Low temperature)   |              |   | Z/Z20°C≤1.25   |                 |
|  | At +125°C 100kHz (High temperature)   |              |   | Z/Z20°C≤1.25   |                 |
| Frequency Coefficient for Allowable Ripple Current | Frequency   | 120Hz≤f<1kHz | 1kHz≤f<10kHz                              | 10kHz≤f<100kHz | 100kHz≤f<500kHz |
|  | Coefficient   | 0.05         | 0.30                                      | 0.70           | 1.00            |
| Endurance  | Test conditions<br>+125°C, 1,000 hours<br>Rated voltage applied   | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |   | tan δ        | ≤200% of the initial specified value      |                |                 |
|  |   | ESR          | ≤200% of the initial specified value      |                |                 |
|  |   | Lc           | ≤The Initial specified value              |                |                 |
| Damp Heat Test (Steady State)                      | Test conditions<br>+60°C, 90% to 95% RH<br>1,000 hours<br>No applied voltage  | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |   | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |   | ESR          | ≤150% of the initial specified value      |                |                 |
|  |   | Lc           | ≤The initial specified value              |                |                 |
| Surge Voltage Test                                 | At normal temperature,<br>charge at surge voltage<br>for 30 sec. and discharge<br>via a 1kΩ protective<br>resistor for 330 sec.<br>Repeat for 1,000 cycles. | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |   | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |   | ESR          | ≤150% of the initial specified value      |                |                 |
|  |   | Lc           | ≤The initial specified value              |                |                 |
| Others   | JIS-C-5101-4  |              |   |                |                 |

## Dimensions



## UBR Series

+125°C, High Temperature, Low ESR

### Size List

 New Item | RV: Rated Voltage

| RV<br>μF | Code | 2.5 (0E) | 4 (0G) | 6.3 (0J)  | 10 (1V)          | 16 (1C)          | 20 (1D)          | 25 (1E) | 35 (1V)          | 63 (1J)          | 100 (2A)         |
|----------|------|----------|--------|---|------------------|------------------|------------------|---------|------------------|------------------|------------------|
| 10       | 827  |          |        |   |                  |                  |                  |         | E08 <sup>Ⓢ</sup> | E11 <sup>Ⓢ</sup> | E11 <sup>Ⓢ</sup> |
| 47       | 476  |          |        |   |                  |                  |                  |         | F08              |                  |                  |
| 100      | 107  |          |        |   |                  | E11              |                  |         | F1A <sup>Ⓢ</sup> |                  |                  |
| 180      | 187  |          |        |   |                  |                  |                  | F1A     |                  |                  |                  |
| 220      | 227  |          |        |   |                  | F08              |                  | F1A     | G1B              |                  |                  |
| 270      | 277  |          |        |   |                  | F1A <sup>Ⓢ</sup> |                  | F1A     |                  |                  |                  |
| 470      | 477  |          |        |   |                  | G1B <sup>Ⓢ</sup> |                  |         |                  |                  |                  |
| 560      | 567  |          |        | F08   |                  |                  | G1B <sup>Ⓢ</sup> |         |                  |                  |                  |
| 820      | 827  | E08      |        | E85 <sup>Ⓢ</sup> , E11 <sup>Ⓢ</sup> ,<br>F08 <sup>Ⓢ</sup> | F1A <sup>Ⓢ</sup> |                  |                  |         |                  |                  |                  |
| 1200     | 128  | F1A      | G1B    |   |                  |                  |                  |         |                  |                  |                  |

(Unit: mm)

| Size Code | E08     | E85       | E11      | F08   | F1A      | G1B       |
|-----------|---------|-----------|----------|-------|----------|-----------|
| ΦDxL      | 6.3 x 8 | 6.3 x 8.5 | 6.3 x 11 | 8 x 8 | 8 x 11.5 | 10 x 12.5 |
| F±0.5     | 2.5     | 2.5       | 2.5      | 3.5   | 3.5      | 5.0       |
| Φd        | 0.6     | 0.6       | 0.6      | 0.6   | 0.6      | 0.6       |
| α         | 1.0     | 1.0       | 1.5      | 1.0   | 1.5      | 1.5       |

### Characteristics List

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 125°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-------------------------------------|-----------|-----------------------------|
| 2.5            | 820             | 6.3 x 8               | E08       | UBR827M0EE08 | 12                          | 1680                                | 5600                                | 12        | 410                         |
| 2.5            | 1200            | 8 x 11.5              | F1A       | UBR128M0EF1A | 10                          | 1830                                | 6100                                | 12        | 600                         |
| 4              | 1200            | 10 x 12.5             | G1B       | UBR128M0GG1B | 10                          | 1830                                | 6100                                | 12        | 960                         |
| 6.3            | 560             | 8 x 8                 | F08       | UBR567M0JF08 | 12                          | 1710                                | 5700                                | 12        | 706                         |
| 6.3            | 820             | 6.3 x 8.5             | E85       | UBR827M0JE85 | 12                          | 1180                                | 3950                                | 12        | 1033                        |
| 6.3            | 820             | 6.3 x 11              | E11       | UBR827M0JE11 | 10                          | 1560                                | 5200                                | 12        | 1033                        |
| 6.3            | 820             | 8 x 8                 | F08       | UBR827M0JF08 | 12                          | 1500                                | 5000                                | 12        | 1033                        |
| 10             | 820             | 8 x 11.5              | F1A       | UBR827M1AF1A | 12                          | 1530                                | 5100                                | 12        | 1640                        |
| 16             | 100             | 6.3 x 11              | E11       | UBR107M1CE11 | 24                          | 846                                 | 2820                                | 12        | 320                         |
| 16             | 220             | 8 x 8                 | F08       | UBR227M1CF08 | 13                          | 1290                                | 4300                                | 12        | 704                         |
| 16             | 270             | 8 x 11.5              | F1A       | UBR277M1CF1A | 13                          | 1500                                | 5000                                | 12        | 864                         |
| 16             | 470             | 10 x 12.5             | G1B       | UBR477M1CG1B | 10                          | 1800                                | 6000                                | 12        | 1504                        |
| 20             | 560             | 10 x 12.5             | G1B       | UBR567M1DG1B | 30                          | 1000                                | 3350                                | 12        | 2240                        |
| 25             | 180             | 8 x 11.5              | F1A       | UBR187M1EF1A | 35                          | 825                                 | 2750                                | 12        | 900                         |
| 25             | 220             | 8 x 11.5              | F1A       | UBR227M1EF1A | 40                          | 600                                 | 2000                                | 12        | 1100                        |
| 25             | 270             | 8 x 11.5              | F1A       | UBR277M1EF1A | 40                          | 600                                 | 2000                                | 12        | 1350                        |
| 35             | 10              | 6.3 x 8               | E08       | UBR106M1VE08 | 90                          | 450                                 | 1500                                | 12        | 280                         |
| 35             | 47              | 8 x 8                 | F08       | UBR476M1VF08 | 90                          | 360                                 | 1200                                | 12        | 329                         |
| 35             | 100             | 8 x 11.5              | F1A       | UBR107M1VF1A | 70                          | 540                                 | 1800                                | 12        | 700                         |
| 35             | 220             | 10 x 12.5             | G1B       | UBR227M1VG1B | 55                          | 735                                 | 2450                                | 12        | 1540                        |
| 63             | 10              | 6.3 x 11              | E11       | UBR106M1JE11 | 90                          | 490                                 | 1650                                | 12        | 280                         |
| 100            | 10              | 6.3 x 11              | E11       | UBR106M2AE11 | 90                          | 490                                 | 1650                                | 12        | 280                         |

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# UVG Series

+105°C, Surface Mount Type, Low ESR

## Features

- Standard SMD Type Product
- Support Lead Free Reflow
- RoHS Compliant

## Applications

- Suitable for DC-DC Converters, Voltage Regulators, Decoupling Applications for Computer Motherboards, etc.

## Specifications

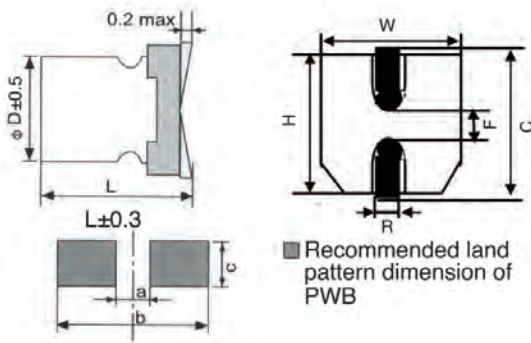


| Item   | Performance Characteristics  |                  |   |                            |                     |
|--|--|------------------|---|----------------------------|---------------------|
| Operating Temperature Range                        | -55 to +105°C  |                  |   |                            |                     |
| Rated Working Voltage Range                        | 2.5VDC to 25VDC  |                  |   |                            |                     |
| Surge Voltage, SV                                  | SV=WV x 1.15VDC (Normal temperature)   |                  |   |                            |                     |
| Nominal Capacitance Range                          | 10 to 820μF (120Hz, +20°C)   |                  |   |                            |                     |
| Capacitance Tolerance                              | ±20% (120Hz, +20°C)  |                  |   |                            |                     |
| tan δ  | 0.15 (120Hz, +20°C)  |                  |   |                            |                     |
| Leakage Current, Lc                                | After 2 minutes of rated voltage applied at +20°C, please see the characteristics list |                  |   |                            |                     |
| Temperature Characteristics, Impedance Ratio       | At -55°C 100kHz (Low temperature)  |                  |   | Z/Z <sub>20°C</sub> ≤ 1.25 |                     |
|  | At +105°C 100kHz (High temperature)  |                  |   | Z/Z <sub>20°C</sub> ≤ 1.25 |                     |
| Frequency Coefficient for Allowable Ripple Current | Frequency  | 120Hz ≤ f < 1kHz | 1kHz ≤ f < 10kHz                          | 10kHz ≤ f < 100kHz         | 100kHz ≤ f < 500kHz |
|  | Coefficient  | 0.05             | 0.30                                      | 0.70                       | 1.00                |
| Endurance  | Test conditions<br>+105°C, 2,000 hours<br>Rated voltage applied                        | ΔC/C             | Within ±20% of the initial measured value |                            |                     |
|  |  | tan δ            | ≤ 150% of the initial specified value     |                            |                     |
|  |  | ESR              | ≤ 150% of the initial specified value     |                            |                     |
|  |  | Lc               | ≤ The initial specified value             |                            |                     |
| Damp Heat Test (Steady State)                      | Test conditions<br>+60°C, 90% to 95% RH<br>1,000 hours<br>No applied voltage           | ΔC/C             | Within ±20% of the initial measured value |                            |                     |
|  |  | tan δ            | ≤ 150% of the initial specified value     |                            |                     |
|  |  | ESR              | ≤ 150% of the initial specified value     |                            |                     |
|  |  | Lc               | ≤ The initial specified value             |                            |                     |
| Resistance to Soldering Heat                       | +230°C, 75 sec.  | ΔC/C             | Within ±20% of the initial measured value |                            |                     |
|  |  | tan δ            | ≤ 150% of the initial specified value     |                            |                     |
|  |  | ESR              | ≤ 150% of the initial specified value     |                            |                     |
|  |  | Lc               | ≤ The initial specified value             |                            |                     |
| Others   | JIS-C-5101-18  |                  |   |                            |                     |

# UVG Series

+105°C, Surface Mount Type, Low ESR

## Case Size Table



(Unit: mm)

| Size Code         | D06     | E06     | F08     | FT2      | F12     | G1B       |
|-------------------|---------|---------|---------|----------|---------|-----------|
| $\Phi D \times L$ | 5 x 6   | 6.3 x 6 | 8 x 8   | 8 x 10.2 | 8 x 12  | 10 x 12.5 |
| $W \pm 0.2$       | 5.3     | 6.6     | 8.3     | 8.3      | 8.3     | 10.3      |
| $H \pm 0.2$       | 5.3     | 6.6     | 8.3     | 8.3      | 8.3     | 10.3      |
| $C \pm 0.2$       | 6       | 7.3     | 9.0     | 9.0      | 9.0     | 11        |
| R                 | 0.5~0.8 | 0.5~0.8 | 0.6~1.0 | 0.8~1.1  | 0.8~1.1 | 0.8~1.1   |
| $F \pm 0.2$       | 1.7     | 1.9     | 3.2     | 3.2      | 3.2     | 4.6       |
| a                 | 2.1     | 2.1     | 2.8     | 2.8      | 2.8     | 4.3       |
| b                 | 7.7     | 9.1     | 11.1    | 11.1     | 11.1    | 13.1      |
| c                 | 1.6     | 1.6     | 1.9     | 1.9      | 1.9     | 1.9       |

## Size List

New Item | RV: Rated Voltage

| $\mu F$ \ RV | Code | 2.5 (0E) | 4 (0G) | 6.3 (0J) | 10 (1A) | 16 (1C)           | 20 (1D)           | 25 (E)            |
|--------------|------|----------|--------|----------|---------|-------------------|-------------------|-------------------|
| 10           | 106  |          |        |          |         |                   | D06 <sup>tr</sup> | E06 <sup>tr</sup> |
| 22           | 226  |          |        |          |         |                   | E06               |                   |
| 47           | 476  |          |        |          |         |                   | F08               | E06, FT2          |
| 100          | 107  |          |        |          |         |                   | F12               | F12               |
| 150          | 157  |          |        |          |         |                   |                   | G1B <sup>tr</sup> |
| 180          | 187  |          |        |          |         | F12               |                   |                   |
| 220          | 227  |          |        |          |         |                   |                   | G1B <sup>tr</sup> |
| 270          | 277  |          |        |          |         | F12 <sup>tr</sup> |                   |                   |
| 330          | 337  | E06      | E06    |          | F12     |                   |                   |                   |
| 470          | 477  |          |        | F12      |         |                   |                   |                   |
| 560          | 567  | FT2      | F12    |          | F12     |                   |                   |                   |
| 680          | 687  | F12      |        |          |         |                   |                   |                   |
| 820          | 827  |          |        | F12      |         |                   |                   |                   |

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## UVG Series

+105°C, Surface Mount Type, Low ESR

### Characteristics List

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-----------|-----------------------------|
| 2.5            | 330             | 6.3 x 6               | E06       | UVG337M0EE06 | 26                          | 2247                                | 15        | 500                         |
| 2.5            | 560             | 8 x 10.2              | FT2       | UVG567M0EFT2 | 15                          | 4210                                | 15        | 500                         |
| 2.5            | 680             | 8 x 12                | F12       | UVG687M0EF12 | 13                          | 4520                                | 15        | 500                         |
| 4              | 330             | 6.3 x 6               | E06       | UVG337M0GE06 | 21                          | 2630                                | 15        | 500                         |
| 4              | 560             | 8 x 12                | F12       | UVG567M0GF12 | 15                          | 4000                                | 15        | 500                         |
| 6.3            | 470             | 8 x 12                | F12       | UVG477M0JF12 | 15                          | 4210                                | 15        | 592                         |
| 6.3            | 820             | 8 x 12                | F12       | UVG827M0JF12 | 15                          | 4210                                | 15        | 1033                        |
| 10             | 330             | 8 x 12                | F12       | UVG337M1AF12 | 17                          | 3950                                | 15        | 660                         |
| 10             | 560             | 8 x 12                | F12       | UVG567M1AF12 | 17                          | 3950                                | 15        | 1120                        |
| 16             | 180             | 8 x 12                | F12       | UVG187M1CF12 | 20                          | 3640                                | 15        | 576                         |
| 16             | 270             | 8 x 12                | F12       | UVG277M1CF12 | 19                          | 4070                                | 15        | 864                         |
| 20             | 10              | 5 x 6                 | D06       | UVG106M1DD06 | 120                         | 1000                                | 15        | 500                         |
| 20             | 22              | 6.3 x 6               | E06       | UVG226M1DE06 | 60                          | 1650                                | 15        | 500                         |
| 20             | 47              | 8 x 8                 | F08       | UVG476M1DF08 | 45                          | 1890                                | 15        | 500                         |
| 20             | 100             | 8 x 12                | F12       | UVG107M1DF12 | 30                          | 2960                                | 15        | 500                         |
| 25             | 10              | 6.3 x 6               | E06       | UVG106M1EE06 | 70                          | 1600                                | 15        | 500                         |
| 25             | 47              | 6.3 x 6               | E06       | UVG476M1EE06 | 70                          | 1600                                | 15        | 500                         |
| 25             | 47              | 8 x 10.2              | FT2       | UVG476M1EFT2 | 45                          | 2000                                | 15        | 500                         |
| 25             | 100             | 8 x 12                | F12       | UVG107M1EF12 | 40                          | 2500                                | 15        | 500                         |
| 25             | 150             | 10 x 12.5             | G1B       | UVG157M1EG1B | 35                          | 3050                                | 15        | 750                         |
| 25             | 220             | 10 x 12.5             | G1B       | UVG227M1EG1B | 35                          | 3050                                | 15        | 1100                        |

Specifications are subject to change without notice. Should a safety or technical concern arise regarding the product, please be sure to contact our sales offices or agents immediately.

# UVR Series

+105°C, Surface Mount Type, Lower ESR than UVG

## Features

- Surface Mount Type Product with Large Capacitance and Low ESR
- Support Lead Free Reflow
- RoHS Compliant

## Applications

- Suitable for DC-DC Converters, Voltage Regulators, Decoupling Applications for Computer Motherboards and High End Graphic Card, etc..



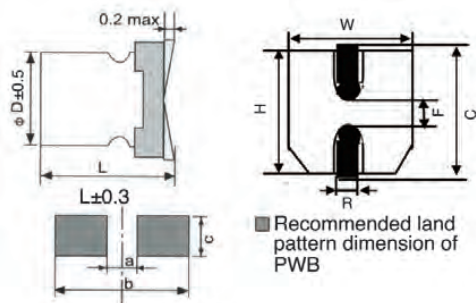
## Specifications

| Item   | Performance Characteristics  |              |   |                |                 |
|--|--|--------------|---|----------------|-----------------|
| Operating Temperature Range                        | -55 to +105°C  |              |   |                |                 |
| Rated Working Voltage Range                        | 2.5VDC to 16VDC  |              |   |                |                 |
| Surge Voltage, SV                                  | SV=WVx1.15VDC (Normal temperature)   |              |   |                |                 |
| Nominal Capacitance Range                          | 39 to 2200μF (120Hz, +20°C)  |              |   |                |                 |
| Capacitance Tolerance                              | ±20% (120Hz, +20°C)  |              |   |                |                 |
| tan δ  | 0.12 (120Hz, +20°C)  |              |   |                |                 |
| Leakage Current, Lc                                | After 2 minutes of rated voltage applied at +20°C, please see the characteristics list |              |   |                |                 |
| Temperature Characteristics, Impedance Ratio       | At -55°C 100kHz (Low temperature)  |              |   | Z/Z20°C≤1.25   |                 |
|  | At +105°C 100kHz (High temperature)  |              |   | Z/Z20°C≤1.25   |                 |
| Frequency Coefficient for Allowable Ripple Current | Frequency  | 120Hz≤f<1kHz | 1kHz≤f<10kHz                              | 10kHz≤f<100kHz | 100kHz≤f<500kHz |
|  | Coefficient  | 0.05         | 0.30                                      | 0.70           | 1.00            |
| Endurance  | Test conditions<br>+105°C, 2,000 hours<br>Rated voltage applied                        | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |  | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |  | ESR          | ≤150% of the initial specified value      |                |                 |
|  |  | Lc           | ≤The initial specified value              |                |                 |
| Damp Heat Test (Steady State)                      | Test conditions<br>+60°C, 90% to 95% RH<br>1,000 hours<br>No applied voltage           | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |  | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |  | ESR          | ≤150% of the initial specified value      |                |                 |
|  |  | Lc           | ≤The initial specified value              |                |                 |
| Resistance to Soldering Heat                       | +230°C, 75 sec.  | ΔC/C         | Within ±20% of the initial measured value |                |                 |
|  |  | tan δ        | ≤150% of the initial specified value      |                |                 |
|  |  | ESR          | ≤150% of the initial specified value      |                |                 |
|  |  | Lc           | ≤The initial specified value              |                |                 |
| Others   | JIS-C-5101-18  |              |   |                |                 |

# UVR Series

+105°C, Surface Mount Type, Lower ESR than UVG

## Case Size Table



(Unit: mm)

| Size Code | E42       | E45       | E59       | E06     | E08     | E09     | F08     | FT2      | F12     | G1B       |
|-----------|-----------|-----------|-----------|---------|---------|---------|---------|----------|---------|-----------|
| ΦDxL      | 6.3 x 4.2 | 6.3 x 4.5 | 6.3 x 5.9 | 6.3 x 6 | 6.3 x 8 | 6.3 x 9 | 8 x 8   | 8 x 10.2 | 8 x 12  | 10 x 12.5 |
| W±0.2     | 6.6       | 6.6       | 6.6       | 6.6     | 6.6     | 6.6     | 8.3     | 8.3      | 8.3     | 10.3      |
| H±0.2     | 6.6       | 6.6       | 6.6       | 6.6     | 6.6     | 6.6     | 8.3     | 8.3      | 8.3     | 10.3      |
| C±0.2     | 7.3       | 7.3       | 7.3       | 7.3     | 7.3     | 7.3     | 9.0     | 9.0      | 9.0     | 11        |
| R         | 0.5-0.8   | 0.5-0.8   | 0.5-0.8   | 0.5-0.8 | 0.5-0.8 | 0.5-0.8 | 0.6-1.0 | 0.8-1.1  | 0.8-1.1 | 0.8-1.1   |
| F±0.2     | 1.9       | 1.9       | 1.9       | 1.9     | 1.9     | 1.9     | 3.2     | 3.2      | 3.2     | 4.6       |
| a         | 2.1       | 2.1       | 2.1       | 2.1     | 2.1     | 2.1     | 2.8     | 2.8      | 2.8     | 4.3       |
| b         | 9.1       | 9.1       | 9.1       | 9.1     | 9.1     | 9.1     | 11.1    | 11.1     | 11.1    | 13.1      |
| c         | 1.6       | 1.6       | 1.6       | 1.6     | 1.6     | 1.6     | 1.9     | 1.9      | 1.9     | 1.9       |

## Size List

New Item | RV: Rated Voltage

| RV<br>μF | Code | 2.5 (0E)                                  | 4 (0G)   | 6.3 (0J)                                  | 10 (1A) | 16 (1C)          |
|----------|------|---|----------|---|---------|------------------|
| 39       | 396  |   |          |   |         | E06              |
| 47       | 476  |   |          | E06 <sup>Ⓢ</sup>                          | E06     |                  |
| 68       | 686  |   |          |   |         | E06              |
| 100      | 107  |   |          | E06                                       |         | E06              |
| 120      | 127  |   |          |   | E06     |                  |
| 150      | 157  |   |          | E06                                       | E06     | F08              |
| 180      | 187  |   |          |   |         | F12              |
| 220      | 270  |   |          | E42 <sup>Ⓢ</sup> , E45 <sup>Ⓢ</sup> , E59 |         | F08, FT2, F12    |
| 270      | 277  |   |          |   |         | FT2, F12         |
| 330      | 337  | E42 <sup>Ⓢ</sup> , E45 <sup>Ⓢ</sup> , E06 | E06      | E59, E08                                  | F12     | F12, G1B         |
| 390      | 397  | E06                                       |          |   |         |                  |
| 470      | 477  |   |          | E09, F12                                  | F12     | F12, G1B         |
| 560      | 567  | E06, FT2                                  | FT2, F12 | F08, F12                                  |         |                  |
| 680      | 687  | F12                                       | F08      | G1B                                       |         | G1B <sup>Ⓢ</sup> |
| 820      | 827  | FT2                                       |          | F12, G1B                                  |         |                  |
| 1000     | 108  | F08                                       | G1B      | F12                                       |         |                  |
| 1500     | 158  |   |          | G1B                                       |         |                  |
| 2200     | 228  |   |          | G1B <sup>Ⓢ</sup>                          |         |                  |

## Characteristics List

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-----------|-----------------------------|
| 2.5            | 330             | 6.3 x 4.2             | E42       | UVR337M0EE42 | 17                          | 2300                                | 12        | 700                         |
| 2.5            | 330             | 6.3 x 4.5             | E45       | UVR337M0EE45 | 17                          | 2300                                | 12        | 700                         |
| 2.5            | 330             | 6.3 x 6               | E06       | UVR337M0EE06 | 17                          | 2900                                | 12        | 500                         |
| 2.5            | 390             | 6.3 x 6               | E06       | UVR397M0EE06 | 17                          | 3390                                | 12        | 500                         |
| 2.5            | 560             | 6.3 x 6               | E06       | UVR567M0EE06 | 16                          | 3500                                | 12        | 500                         |
| 2.5            | 560             | 8 x 10.2              | FT2       | UVR567M0EFT2 | 12                          | 4210                                | 12        | 500                         |

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## UVR Series

+105°C, Surface Mount Type, Lower ESR than UVG

| Rated Vol. (V) | Rated Cap. (μF) | Case Size ΦD x L (mm) | Size Code | Part Number  | ESR (mΩ, max/ 20°C, 100kHz) | Rated Ripple (mArms/ 105°C, 100kHz) | DF (%max) | Leakage Current (μA/2 mins) |
|----------------|-----------------|-----------------------|-----------|--------------|-----------------------------|-------------------------------------|-----------|-----------------------------|
| 2.5            | 680             | 8 x 12                | F12       | UVR687M0EF12 | 10                          | 5020                                | 12        | 500                         |
| 2.5            | 820             | 8 x 10.2              | FT2       | UVR827M0EFT2 | 12                          | 4210                                | 12        | 500                         |
| 2.5            | 1000            | 8 x 8                 | F08       | UVR108M0EF08 | 12                          | 4260                                | 12        | 500                         |
| 4              | 330             | 6.3 x 6               | E06       | UVR337M0GE06 | 17                          | 2900                                | 12        | 500                         |
| 4              | 560             | 8 x 10.2              | FT2       | UVR567M0GFT2 | 14                          | 3950                                | 12        | 544                         |
| 4              | 560             | 8 x 12                | F12       | UVR567M0GF12 | 13                          | 4520                                | 12        | 500                         |
| 4              | 680             | 8 x 8                 | F08       | UVR687M0GF08 | 13                          | 3950                                | 12        | 544                         |
| 4              | 1000            | 10 x 12.5             | G1B       | UVR108M0GG1B | 10                          | 4850                                | 12        | 800                         |
| 6.3            | 47              | 6.3 x 6               | E06       | UVR476M0JE06 | 70                          | 1600                                | 12        | 500                         |
| 6.3            | 100             | 6.3 x 6               | E06       | UVR107M0JE06 | 50                          | 1620                                | 12        | 500                         |
| 6.3            | 150             | 6.3 x 6               | E06       | UVR157M0JE06 | 50                          | 1620                                | 12        | 500                         |
| 6.3            | 220             | 6.3 x 4.2             | E42       | UVR227M0JE42 | 24                          | 2100                                | 12        | 700                         |
| 6.3            | 220             | 6.3 x 4.5             | E45       | UVR227M0JE45 | 24                          | 2100                                | 12        | 700                         |
| 6.3            | 220             | 6.3 x 5.9             | E59       | UVR227M0JE59 | 26                          | 2450                                | 12        | 500                         |
| 6.3            | 330             | 6.3 x 5.9             | E59       | UVR337M0JE59 | 25                          | 2200                                | 12        | 500                         |
| 6.3            | 330             | 6.3 x 8               | E08       | UVR337M0JE08 | 15                          | 2700                                | 12        | 500                         |
| 6.3            | 470             | 6.3 x 9               | E09       | UVR477M0JE09 | 15                          | 2700                                | 12        | 592                         |
| 6.3            | 470             | 8 x 12                | F12       | UVR477M0JF12 | 12                          | 4780                                | 12        | 592                         |
| 6.3            | 560             | 8 x 8                 | F08       | UVR567M0JF08 | 20                          | 2500                                | 12        | 706                         |
| 6.3            | 560             | 8 x 12                | F12       | UVR567M0JF12 | 12                          | 4780                                | 12        | 706                         |
| 6.3            | 680             | 10 x 12.5             | G1B       | UVR687M0JG1B | 15                          | 3500                                | 12        | 857                         |
| 6.3            | 820             | 8 x 12                | F12       | UVR827M0JF12 | 12                          | 4260                                | 12        | 1033                        |
| 6.3            | 820             | 10 x 12.5             | G1B       | UVR827M0JG1B | 12                          | 4500                                | 12        | 1033                        |
| 6.3            | 1000            | 8 x 12                | F12       | UVR108M0JF12 | 15                          | 3500                                | 12        | 1260                        |
| 6.3            | 1500            | 10 x 12.5             | G1B       | UVR158M0JG1B | 10                          | 4850                                | 12        | 1890                        |
| 6.3            | 2200            | 10 x 12.5             | G1B       | UVR228M0JG1B | 12                          | 5250                                | 12        | 2772                        |
| 10             | 47              | 6.3 x 6               | E06       | UVR476M1AE06 | 50                          | 1620                                | 12        | 500                         |
| 10             | 120             | 6.3 x 6               | E06       | UVR127M1AE06 | 25                          | 2320                                | 12        | 500                         |
| 10             | 150             | 6.3 x 6               | E06       | UVR157M1AE06 | 27                          | 2320                                | 12        | 500                         |
| 10             | 330             | 8 x 12                | F12       | UVR337M1AF12 | 14                          | 4390                                | 12        | 660                         |
| 10             | 470             | 8 x 12                | F12       | UVR477M1AF12 | 25                          | 3500                                | 12        | 940                         |
| 16             | 39              | 6.3 x 6               | E06       | UVR396M1CE06 | 50                          | 1620                                | 12        | 500                         |
| 16             | 68              | 6.3 x 6               | E06       | UVR686M1CE06 | 30                          | 2200                                | 12        | 500                         |
| 16             | 100             | 6.3 x 6               | E06       | UVR107M1CE06 | 25                          | 2700                                | 12        | 500                         |
| 16             | 150             | 8 x 8                 | F08       | UVR157M1CF08 | 22                          | 3150                                | 12        | 500                         |
| 16             | 180             | 8 x 12                | F12       | UVR187M1CF12 | 16                          | 4040                                | 12        | 576                         |
| 16             | 220             | 8 x 8                 | F08       | UVR227M1CF08 | 22                          | 3150                                | 12        | 704                         |
| 16             | 220             | 8 x 10.2              | FT2       | UVR227M1CFT2 | 22                          | 3450                                | 12        | 704                         |
| 16             | 220             | 8 x 12                | F12       | UVR227M1CF12 | 22                          | 3450                                | 12        | 704                         |
| 16             | 270             | 8 x 10.2              | FT2       | UVR277M1CFT2 | 20                          | 3600                                | 12        | 864                         |
| 16             | 270             | 8 x 12                | F12       | UVR277M1CF12 | 13                          | 5200                                | 12        | 864                         |
| 16             | 330             | 8 x 12                | F12       | UVR337M1CF12 | 16                          | 4720                                | 12        | 1056                        |
| 16             | 330             | 10 x 12.5             | G1B       | UVR337M1CG1B | 13                          | 5200                                | 12        | 1056                        |
| 16             | 470             | 8 x 12                | F12       | UVR477M1CF12 | 14                          | 4700                                | 12        | 1504                        |
| 16             | 470             | 10 x 12.5             | G1B       | UVR477M1CG1B | 13                          | 5200                                | 12        | 1504                        |
| 16             | 680             | 10 x 12.5             | G1B       | UVR687M1CG1B | 18                          | 4750                                | 12        | 2176                        |

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**總公司**  
**HEAD OFFICE**

**香港**  
**HONG KONG**  
萬裕電子有限公司  
香港柴灣嘉業街10號  
益高工業大廈16字樓  
Man Yue Electronics Co., Ltd.  
16/F, Yiko Industrial Building,  
10 Ka Yip Street, Chai Wan, Hong Kong  
電話 TEL: (852) 2897 5277  
傳真 FAX: (852) 2558 6299

**分公司**  
**BRANCH OFFICE**

**香港**  
**HONG KONG**  
X-CON電子有限公司  
香港柴灣嘉業街10號  
益高工業大廈19字樓C室  
X-CON Electronics Ltd.  
Unit C, 19/F, Yiko Industrial Building,  
10 Ka Yip Street, Chai Wan, Hong Kong  
電話 TEL: (852) 2897 5277  
傳真 FAX: (852) 2558 6299

**台灣**  
**TAIWAN**  
香港商萬裕國際電子有限公司台灣分公司  
台灣新北市23553中和區  
連城路258號13樓之1  
郵政編碼: 23553  
Man Yue Electronics Co., Ltd.  
Taiwan Branch (H.K.)  
13F-1, No. 258 Liancheng Road,  
Zhonghe District, New Taipei City,  
Taiwan 23553, R.O.C.  
Postal Code: 23553  
電話 TEL: 886 (02) 8227 2227  
傳真 FAX: 886 (02) 8227 2226

**中國深圳**  
**SHENZHEN, CHINA**  
萬晉電子(深圳)有限公司  
中國深圳市羅湖區  
寶安南路2014號振業大廈B座913、915  
郵政編碼: 518000  
Man Jin Electronics (Shenzhen) Co., Ltd.  
Rm 913 & 915, Block B, 9/F., Zhenye Tower,  
2014 Baoan South Road,  
Luohu, Shenzhen City,  
Guangdong Province, PR China  
Postal Code: 518000  
電話 TEL: 86 (755) 2586 2216  
傳真 FAX: 86 (755) 2586 2239

**中國上海**  
**SHANGHAI, CHINA**  
萬發國際貿易(上海)有限公司  
中國江蘇省無錫市錫山經濟開發區  
東亭鎮春暉東路148號  
郵政編碼: 214101  
Man Fat International Trading  
(Shanghai) Co., Ltd.  
148 Chunhui East Road, Dongting Town,  
Xishan Economic Development Zone,  
Wuxi, Jiangsu Province, PR China  
Postal Code: 214101  
電話 TEL: 86 (510) 8866 2688  
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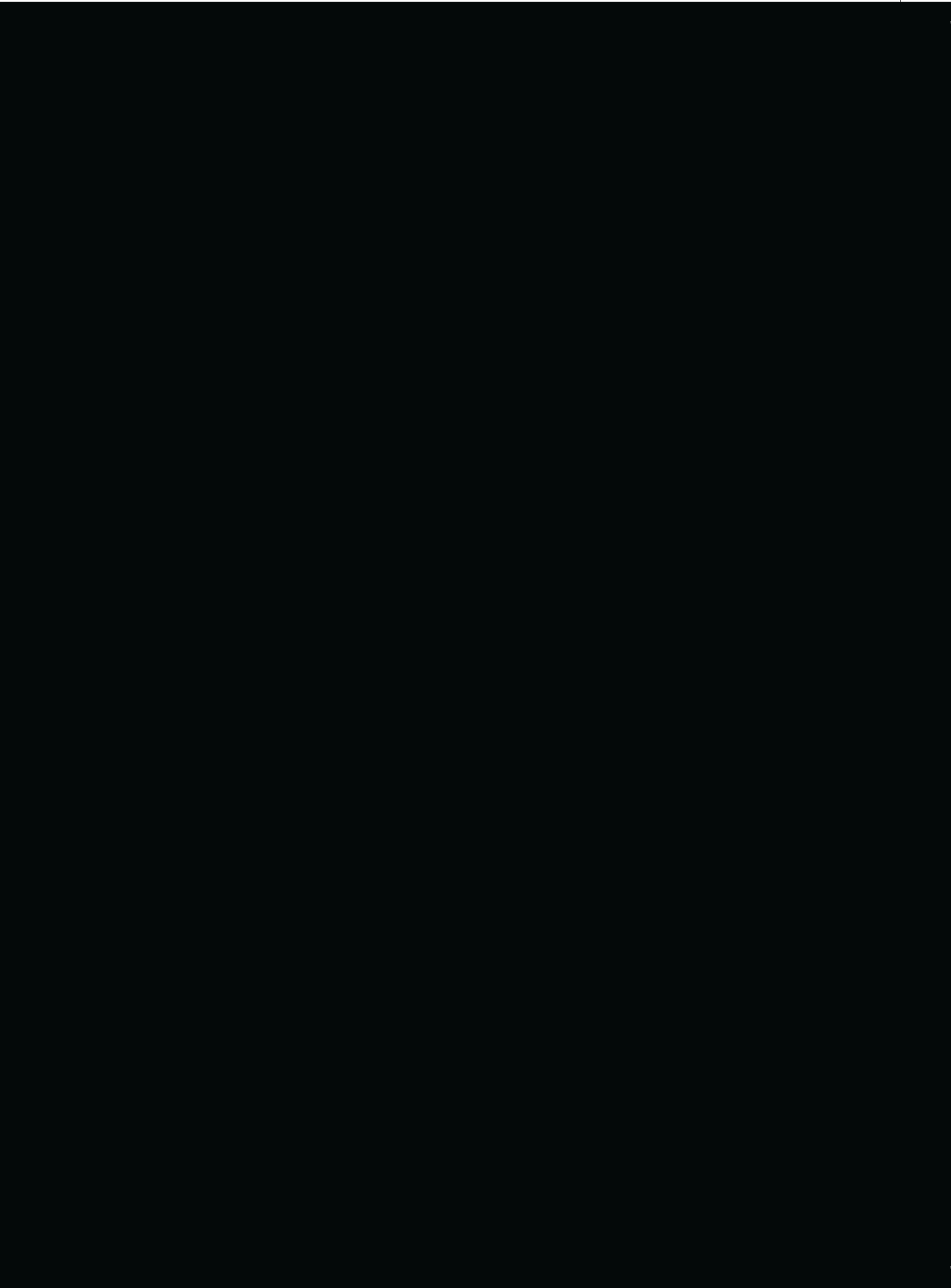
中國上海市寶山區  
共和新路4995號611室  
郵政編碼: 200435  
Room 611,  
No.4995 Gong He Xin Road,  
Baoshan District,  
Shanghai, PR China  
Postal Code: 200435  
電話 TEL: 86 (021) 6639 2180  
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**中國廠址**  
**PRC MANUFACTURING PLANTS**

**中國東莞**  
**DONGGUAN, CHINA**  
萬星光電子(東莞)有限公司  
中國廣東省東莞市長安鎮烏沙村  
興發南路新星工業園  
郵政編碼: 523857  
Starzeon Electronics (Dongguan) Co., Ltd.  
Xin Xing Industrial Area,  
Xing Fa South Road, Wu Sha Village,  
Changan Town, Dongguan,  
Guangdong Province, PR China  
Postal Code: 523857  
電話 TEL: 86 (769) 8115 2888  
傳真 FAX: 86 (769) 8542 1790

萬裕三信電子(東莞)有限公司  
中國廣東省東莞市長安鎮烏沙村  
興發南路新星工業園  
郵政編碼: 523857  
Samxon Electronics (Dongguan) Co., Ltd.  
Xin Xing Industrial Area,  
Xing Fa South Road, Wu Sha Village,  
Changan Town, Dongguan,  
Guangdong Province, PR China  
Postal Code: 523857  
電話 TEL: 86 (769) 8228 6000 / 8532 3339  
傳真 FAX: 86 (769) 8541 6401

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