

# XC<sub>Series</sub>

- High reliability and high voltage are realized by hybrid electrolyte
- Endurance with ripple current : 4,000 hours at 125°C
  Rated voltage range : 16 to 35Vdc, Capacitance range : 150 to 470μF
- For high temperature and high reliability applications. (Automotive equipment, Base station equipment, etc.)
- Halogen Free.

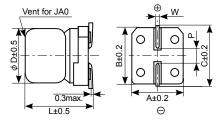


# SPECIFICATIONS

| Items                         | Characteristics   |   |  |  |  |  |  |  |
|-------------------------------|---|---|--|--|--|--|--|--|
| Category<br>Temperature Range | -55 to +125°C   |   |  |  |  |  |  |  |
| Rated Voltage Range           | 16 to 35V <sub>dc</sub>   |   |  |  |  |  |  |  |
| Capacitance Tolerance         | ±20% (M)  | (at 20°C , 120Hz)   |  |  |  |  |  |  |
| Leakage Current               | I=0.01CV  |   |  |  |  |  |  |  |
|                               | Where, I: Max. leakage  | e current ( $\mu$ A), C : Nominal capacitance ( $\mu$ F), V : Rated voltage (V) (at 20°C after 2 minutes)                             |  |  |  |  |  |  |
| Dissipation Factor            | Rated voltage (V <sub>dc</sub> )  | 16V 25V 35V   |  |  |  |  |  |  |
| (tan δ)                       | tan δ (Max.)  | 0.16 0.14 0.12 (at 20°C , 120Hz)  |  |  |  |  |  |  |
| Low Temperature               | Z(-25°C) / Z(+20°C) ≦   | 15  |  |  |  |  |  |  |
| Characteristics               | $Z(-55^{\circ}C) / Z(+20^{\circ}C) \le$   |   |  |  |  |  |  |  |
| (Max. Impedance Ratio)        | . , , ,   | (at 100KHZ)   |  |  |  |  |  |  |
| Endurance                     | 0 1   | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated |  |  |  |  |  |  |
|                               |   | (the peak voltage shall not exceed the rated voltage) for 4,000 hours at 125°C.   |  |  |  |  |  |  |
|                               | Capacitance change  | $\leq \pm 30\%$ of the initial value  |  |  |  |  |  |  |
|                               | D.F. (tan $\delta$ )  | ≦ 200% of the initial specified value   |  |  |  |  |  |  |
|                               | ESR   | ≦ 200% of the initial specified value   |  |  |  |  |  |  |
|                               | Leakage current   | ≦ The initial specified value   |  |  |  |  |  |  |
| Shelf Life                    | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 125°C without |   |  |  |  |  |  |  |
|                               |   | the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.                     |  |  |  |  |  |  |
|                               | Capacitance change  | $\leq \pm 30\%$ of the initial value  |  |  |  |  |  |  |
|                               | D.F. (tan $\delta$ )  | ≦ 200% of the initial specified value   |  |  |  |  |  |  |
|                               | ESR   | ≦ 200% of the initial specified value   |  |  |  |  |  |  |
|                               | Leakage current   | ≦ The initial specified value   |  |  |  |  |  |  |
| Bias Humidity Test            | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at     |   |  |  |  |  |  |  |
|                               | 85°C , 85% RH for 2,000   |   |  |  |  |  |  |  |
|                               | Appearance  | No significant damage   |  |  |  |  |  |  |
|                               | Capacitance change  | $\leq \pm 30\%$ of the initial value  |  |  |  |  |  |  |
|                               | D.F. (tan $\delta$ )  | ≦ 200% of the initial specified value   |  |  |  |  |  |  |
|                               | ESR   | ≤ 200% of the initial specified value   |  |  |  |  |  |  |
|                               | Leakage current   | ≦ The initial specified value   |  |  |  |  |  |  |

## **◆ DIMENSIONS** [mm]

# •Terminal Code : A



| Size Code | φD | L    | Α    | В    | С    | W          | Р   |
|-----------|----|------|------|------|------|------------|-----|
| HA0       | 8  | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10 | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

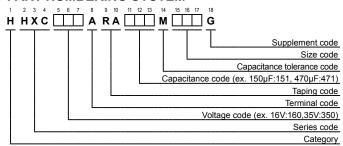
#### **◆ MARKING**



#### •Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | Symbol |  |  |
|----------------------------------|--------|--|--|
| 16                               | С      |  |  |
| 25                               | E      |  |  |
| 35                               | V      |  |  |

## **♦ PART NUMBERING SYSTEM**



Please contact us for mass production schedule. Specifications in this bulletin are subject to change without notice.



#### STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Size code | ESR<br>(mΩ max/20°C , 100kHz) | Rated ripple current<br>(mArms/125°C , 100kHz) | Part No.           |
|--------------------------|-------------|-----------|-------------------------------|--|--------------------|
| 16                       | 270         | HA0       | 22                            | 1,700  | HHXC160ARA271MHA0G |
|                          | 470         | JA0       | 18                            | 2,100  | HHXC160ARA471MJA0G |
| 25                       | 220         | HA0       | 27                            | 1,600  | HHXC250ARA221MHA0G |
|                          | 330         | JA0       | 20                            | 2,000  | HHXC250ARA331MJA0G |
| 35                       | 150         | HA0       | 27                            | 1,600  | HHXC350ARA151MHA0G |
|                          | 270         | JA0       | 20                            | 2,000  | HHXC350ARA271MJA0G |

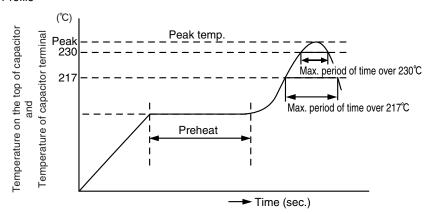
#### **♦** RECOMMENDED REFLOW SOLDERING CONDITIONS

The following conditions are recommended for air convection and infrared reflow soldering on the SMD products on to a glass epoxy circuit boards by cream solder. The dimensions of the glass epoxy boards with resist are 90×50×0.8mm.

The temperatures shown are the surface temperature values on the top of the can and on the capacitor terminals. Reflow should be performed twice or less.

Please ensure that the capacitor became cold enough to the room temperature (5 to 35°C) before the second reflow.

#### Reflow Profile



| Size Code | Preheat                       | Time maintained above 217°C | Time maintained<br>above 230°C | Peak temp. | Reflow number   |
|-----------|-------------------------------|-----------------------------|--------------------------------|------------|-----------------|
| HA0, JA0  | 150 to 180°C<br>120 sec. max. | 50 sec. max.                | 40 sec. max.                   | 260°C max. | 1-cycle only    |
|           |                               |                             |                                | 245°C max. | 2-cycle allowed |