

CHINSAN STANDARD SPECIFICATION

1. Scope :

- ▶ The specifications deal with Aluminum Electrolytic Capacitors.

2. Standard Test Condition :

- ▶ Unless otherwise specified, all test shall be performed at an ambient temperature of 25 °C and a relative humidity of 65 ± 5%.

3. Mechanical Requirement :

- ▶ Lead Wire Pull Test:
Capacitor lead wire shall withstand a steady pull of 0.5 Kg (lead 0.5 ϕ) or 1 Kg (lead 0.6-0.8 ϕ) or 1.5 Kg (Lead over 0.8 ϕ) applied axially to the leads for 10 ± 1 seconds.
- ▶ Terminal Pull Test :
Capacitor terminal shall withstand a steady pull of 2.0 Kg applied axially to the terminal for 10 ± 1 seconds.

4. Electrical Requirements :

- ▶ 4.1 Operating Temperature : See the respective specifications.
- ▶ 4.2 Rated working voltage and surge voltage :

| | | | | | | | | | | | | | | | | | | |
|-----------------|-----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Working Voltage | 6.3 | 10 | 16 | 25 | 30 | 35 | 50 | 63 | 80 | 100 | 160 | 200 | 220 | 250 | 350 | 400 | 420 | 450 |
| Surge Voltage | 8 | 13 | 20 | 32 | 38 | 44 | 63 | 79 | 100 | 125 | 200 | 250 | 270 | 300 | 400 | 450 | 470 | 500 |

- ▶ 4.3 Dissipation Factor : When measured at 120 Hz +25°C
For capacitance value > 1000 μ F, add 2% per additional 1000 μ F.
See the respective specification
- ▶ 4.4 Equivalent Series Resistance (E.S.R) : Tested at 120Hz and +25°C, use the formula below :

$$\frac{DF}{2 \times \pi \times f \times C} \times 1,000,000$$

- ▶ 4.5 DC Leakage Current :
DC voltage is applied to the capacitors through the series protective resistor (1K Ω), which enables the terminal voltage to reach the rated voltage.
See the respective specification.
- ▶ 4.6 High and Low Temperature Characteristic:
According to JIS-C-5141 (1991)5.3.4 method, capacitors shall be placed in an oven:
 - At +105 or +85°C, the capacitance shall not increase by more than ± 25% of the original capacitance measured at 25°C. Dissipation factor shall be within the specified values.

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b . At -40 or -25°C, the impedance (Z) shall not increase above the specified values in the following tables.

b-1. Radial Type

| | | | | | | | | | | |
|--------------------------|-------|-------|-------|-------|-------|-------|-----------|------------|-------|------------|
| Working Voltage (V) | 6.3 | 10 | 16 | 25 | 30 | 35 | 50 to 100 | 160 to 250 | 350 | 400 to 450 |
| Impedance Z -25°C/ +20°C | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 5 | 6 | 7 |
| Impedance Z -40°C/ +20°C | 10 | 8 | 7 | 5 | 5 | 5 | 3 | ----- | ----- | ----- |

b-2. Terminal type (Snap-in)

| | | | | | | |
|--------------------------|----|----|----------|----|------------|------------|
| Working Voltage (V) | 16 | 25 | 35 to 63 | 80 | 100 to 250 | 350 to 450 |
| Impedance Z -25°C/ +20°C | 5 | 4 | 4 | 4 | 7 | 7 |
| Impedance Z -40°C/ +20°C | 10 | 8 | 6 | 6 | ----- | ----- |

c . The leakage current value shall neither increase by more than five times the original value at 85°C nor more than eight times the original value at 105°C.

▶ 4.7 Surge Voltage Test:

According to JIS-C-5141(1991) 5.3.5 method, after surge voltage is applied to the capacitor with a 30 seconds on and 5 minutes 30 seconds off cycle, for 1000 successive cycles. The following characteristics shall be satisfied.

| | |
|--------------------|--|
| Capacitance Change | : Within $\pm 15\%$ of the original value. |
| Dissipation factor | : Within the specified values. |
| Leakage current | : Within the specified values. |
| Appearance | : Neither damage nor leakage of electrolyte. |

▶ 4.8 Vibration Test :

According to JIS-C-5141(1991) 5.3.7 method, amplitude of 1.5mm with a frequency cycle of 10Hz to 55Hz back to 10Hz taking approximately one minute to complete. This is performed on three different angles (X, Y and Z) each for two hours. After completion of test, there shall be no exterior damage and the performance characteristic shall not have changed.

▶ 4.9 Solder Ability Test:

According to JIS-C-5141(1991) 5.3.9 method, after the lead wire fully immersed in the solder for 2 ± 0.5 seconds at a temperature of $235 \pm 5^\circ\text{C}$, the solder coating must be more than 90%.

▶ 4.10 Solder Heat-Resistance Test:

According to JIS-C-5141(1991) 5.3.10 method, when the lead wire is fully immersed in the solder for 10 ± 1 seconds at a temperature of $260 \pm 5^\circ\text{C}$, the characteristic change shall be within $\pm 10\%$ of the original value and no damage of the physical body.

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▶ 4.11 Vent Test (applies only to those capacitors with vents):

According to JIS-C-5141(1991) 5.3.12 method, during and after the applicable test below there shall be no explosion, flash, flame or expulsion of particles of the element or aluminum case. In addition, the case shall not be expelled from the core. If the capacitor under test is a multisection unit, this test shall apply to the input section only.

| Capacitor Diameter | Current (A) | Minutes |
|--------------------|-------------|-----------|
| under 22.4 | 1 | Within 30 |
| over 22.5 | 10 | |

▶ 4.12 Temperature Cycle Test :

According to JIS-C-5141(1991) 5.3.13 method, capacitors shall be placed in an oven with the following conditions:

| Temperature | Time |
|---|----------------|
| (1) Rated low category temperature (-40 or -25°C) | 30 ± 3 Minutes |
| (2) +25°C | 3 Minutes |
| (3) Rated high category temperature (+85 or +105°C) | 30 ± 3 Minutes |
| (4) +25°C | 3 Minutes |
| (1) to (4)=one cycle total 5 cycle | |

※ The following characteristic shall be satisfied after five cycles has been completed.
Appearance: Neither damage nor leakage of electrolyte.

▶ 4.13 Humidity Test:

According to JIS-C-5141(1991) 5.3.14 method, capacitors shall be exposed for 240 ± 8 hours in an atmosphere with 90% to 95% relative humidity at 40 ± 2°C, the following characteristics shall be satisfied.

| | |
|--------------------|---|
| Capacitance change | : Within ±20% of the original value. |
| Dissipation factor | : Within 120% of specified values. |
| Leakage current | : Within the specified values. |
| Appearance | : Neither leakage nor leakage of electrolyte. |

▶ 5 Marking:

Capacitor shall be marked with Capacitance, rated working voltage , Elite mark, date code, maximum, category temperature and polarity. All marking shall be legible and permanent.

▶ 6 Remark:

Customer's special specifications are subject to meet upon request.