

ALUMINUM ELECTROLYTIC CAPACITORS

CX Chip Type, High Reliability
Low temperature ESR specification
series



- Chip type, high temperature range, for +135°C use.
- Added ESR specification after the test at -40°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

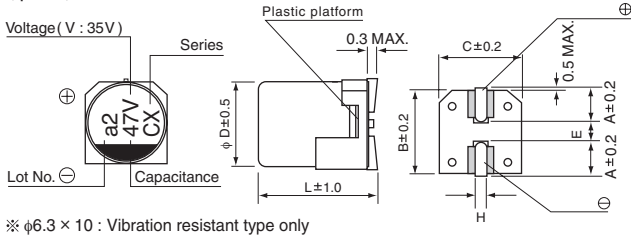


Specifications

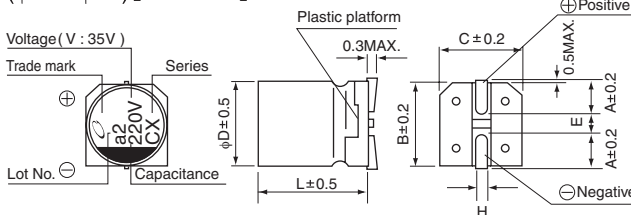
| Item | Performance Characteristics | | | | | | |
|-------------------------------|---|---|------|------|------|------|---------------------------------------|
| Category Temperature Range | -40 to +135°C | | | | | | |
| Rated Voltage Range | 10 to 50V | | | | | | |
| Rated Capacitance Range | 47 to 3300μF | | | | | | |
| Capacitance Tolerance | ±20% at 120Hz, 20°C | | | | | | |
| Leakage Current | After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3(μA), whichever is greater. | | | | | | |
| Tangent of loss angle (tan δ) | Rated voltage (V) | 10 | 16 | 25 | 35 | 50 | Measurement frequency : 120Hz at 20°C |
| | tan δ (MAX.) | 0.30 | 0.23 | 0.18 | 0.16 | 0.16 | |
| Stability at Low Temperature | Rated voltage (V) | 10 | 16 | 25 | 35 | 50 | Measurement frequency : 120Hz |
| | Impedance ratio ZT / Z20 (MAX.) | Z-40°C / Z+20°C | 12 | 8 | 6 | 4 | |
| Endurance | The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 135°C. | | | | | | |
| | Capacitance Change | Within ± 30% of the initial capacitance value | | | | | |
| | tan δ | 300% or less than the initial specified value | | | | | |
| Shelf Life | After storing the capacitors under no load at 135°C for 1000 hours and then performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they shall meet the specified values for the endurance characteristics listed above. | | | | | | |
| | Capacitance Change | Within ±10% of the initial capacitance value | | | | | |
| | tan δ | Less than or equal to the initial specified value | | | | | |
| Resistance to soldering heat | The capacitors shall be kept on the hot plate for 30 seconds, which is maintained at 250°C. The capacitors shall meet the characteristic requirements listed at right when they are removed from the plate and restored to 20°C. | | | | | | |
| | Capacitance Change | Within ±10% of the initial capacitance value | | | | | |
| | Leakage current | Less than or equal to the initial specified value | | | | | |
| Marking | Black print on the case top. | | | | | | |

Radial Lead Type

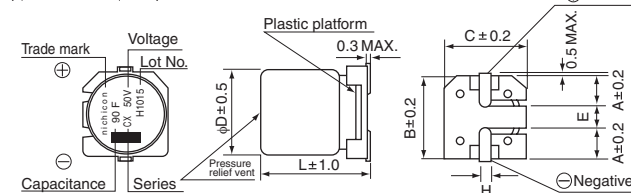
(φ 6.3)【Vibration Resistance】



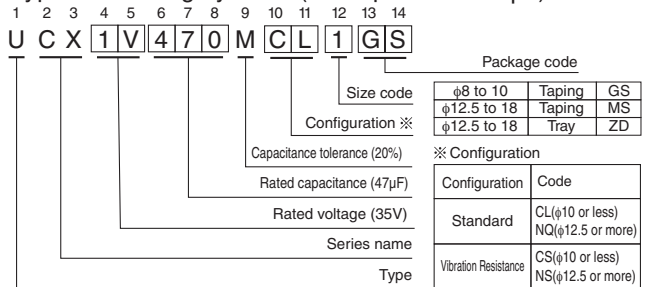
(φ 8 to φ 10)【Standard】



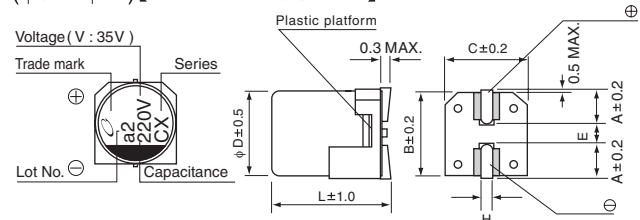
(φ 12.5 to φ 18)【Standard】



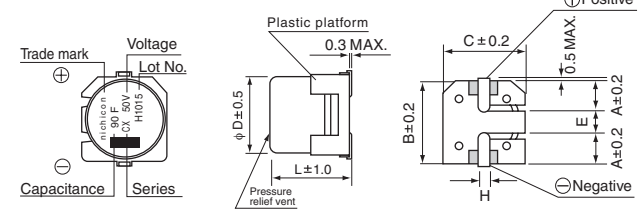
Type numbering system (Example : 35V 47μF)



(φ 8 to φ 10)【Vibration Resistance】



(φ 12.5 to φ 18)【Vibration Resistance】



Standard

| | (mm) | | | | |
|------|------------|------------|------------|---------------|---------------|
| φDXL | 8×10 | 10×10 | 12.5×13.5 | 16×16.5, 21.5 | 18×16.5, 21.5 |
| A | 2.9 | 3.2 | 4.8 | 5.4 | 6.4 |
| B | 8.3 | 10.3 | 13.6 | 17.1 | 19.1 |
| C | 8.3 | 10.3 | 13.6 | 17.1 | 19.1 |
| E | 3.1 | 4.5 | 4 | 6.3 | 6.3 |
| L | 10 | 10 | 13.5 | 16.5, 21.5 | 16.5, 21.5 |
| H | 0.8 to 1.1 | 0.8 to 1.1 | 1.0 to 1.4 | 1.0 to 1.4 | 1.0 to 1.4 |

Vibration Resistance

| | (mm) | | | | | |
|------|------------|------------|------------|------------|---------------|---------------|
| φDXL | 6.3×10 | 8×10 | 10×10 | 12.5×13.5 | 16×16.5, 21.5 | 18×16.5, 21.5 |
| A | 2.4 | 2.9 | 3.2 | 4.8 | 5.4 | 6.4 |
| B | 6.6 | 8.3 | 10.3 | 13.6 | 17.1 | 19.1 |
| C | 6.6 | 8.3 | 10.3 | 13.6 | 17.1 | 19.1 |
| E | 2.2 | 3.1 | 4.5 | 4 | 6.3 | 6.3 |
| L | 10 | 10 | 10 | 13.5 | 16.5, 21.5 | 16.5, 21.5 |
| H | 0.5 to 0.8 | 1.1 to 1.5 | 1.1 to 1.5 | 1.0 to 1.4 | 1.0 to 1.4 | 1.0 to 1.4 |

⊕ Aid electrode

Rated Voltage

| V | 10 | 16 | 25 | 35 | 50 |
|------|----|----|----|----|----|
| Code | A | C | E | V | H |

●Dimension table in next page.



■ Dimensions

| Cap.(μ F) | V Code | 10 | | | 16 | | | 25 | | | 35 | | | 50 | | |
|----------------|-----------|--------------------------------|--|--|--------------------------------|-------------------------------|--|----|--|---------------------------------------|----|---------------------------------------|--------------------------------------|----|--|--------------------------------------|
| | | 1A | | | 1C | | | 1E | | | 1V | | | 1H | | |
| 47 | 470 | | | | | | | | | | | 6.3 X 10 0.25 4 15 197 | 8 X 10 0.25 3.5 15 270 | | | |
| 68 | 680 | | | | | | | | | | | 8 X 10 0.20 3 12 270 | | | | |
| 100 | 101 | | | | 6.3 X 10 0.25 4 15 197 | | | | | 8 X 10 0.20 3 12 270 | | 6.3 X 10 0.25 4 15 197 | 10 X 10 0.2 2.5 12 500 | | | |
| 220 | 221 | 8 X 10 0.20 3 12 270 | | | | 8 X 10 0.20 3 12 270 | | | | 10 X 10 0.15 2 10 500 | | 10 X 10 0.15 2 10 500 | | | | |
| 330 | 331 | 6.3 X 10 0.20 3 12 270 | | | | 10 X 10 0.15 2 10 500 | | | | 10 X 10 0.15 2 10 500 | | | | | | |
| 390 | 391 | | | | | | | | | | | | | | | 12.5 X 13.5 0.09 1.3 6.5 750 |
| 470 | 471 | 10 X 10 0.15 2 10 500 | | | | 10 X 10 0.15 2 10 500 | | | | | | 12.5 X 13.5 0.07 1.0 5.0 750 | 16 X 16.5 0.07 0.70 3.5 1000 | | | |
| 560 | 561 | | | | | | | | | | | 12.5 X 13.5 0.07 1.0 5.0 750 | 16 X 16.5 0.07 0.70 3.5 1000 | | | |
| 680 | 681 | | | | | | | | | | | 12.5 X 13.5 0.07 1.0 5.0 750 | 18 X 16.5 0.07 0.70 3.5 1200 | | | |
| 820 | 821 | | | | | | | | | 12.5 X 13.5 0.07 1.0 5.0 750 | | 16 X 16.5 0.05 0.50 2.5 1200 | 18 X 16.5 0.07 0.70 3.5 1200 | | | |
| 1000 | 102 | | | | | | | | | 12.5 X 13.5 0.07 1.0 5.0 750 | | 16 X 16.5 0.05 0.50 2.5 1200 | 16 X 21.5 0.05 0.40 2.0 1600 | | | |
| 1200 | 122 | | | | | | | | | 16 X 16.5 0.05 0.50 2.5 1200 | | 18 X 16.5 0.05 0.50 2.5 1400 | 18 X 21.5 0.04 0.32 1.6 1900 | | | |
| 1500 | 152 | | | | | | | | | 16 X 16.5 0.05 0.50 2.5 1200 | | 16 X 21.5 0.04 0.32 1.6 1900 | | | | |
| 1800 | 182 | | | | | | | | | 16 X 16.5 0.05 0.50 2.5 1200 | | 18 X 16.5 0.05 0.50 2.5 1400 | | | | |
| 2200 | 222 | | | | | | | | | 18 X 16.5 0.05 0.50 2.5 1400 | | 18 X 21.5 0.035 0.28 1.4 2200 | | | | |
| 2700 | 272 | | | | | | | | | 16 X 21.5 0.04 0.32 1.6 1900 | | | | | | |
| 3300 | 332 | | | | | | | | | 18 X 21.5 0.035 0.28 1.4 2200 | | | | | | |

MAX. ESR (Ω) at 20°C / -40°C 100kHz, Rated ripple current(mArms) at 135°C 100kHz

● In this case, **6** will be put at 12th digit of type numbering system.

● Frequency coefficient of rated ripple current

| Frequency | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz or more |
|-------------|------|-------|-------|------|---------------|
| Coefficient | 0.35 | 0.50 | 0.64 | 0.83 | 1.00 |

- Taping specifications are given in page 23.
- Recommended land size, soldering by reflow are given in page 18, 19.
- Please refer to page 3 for the minimum order quantity.



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