

# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

**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).

**CX**



## Specifications

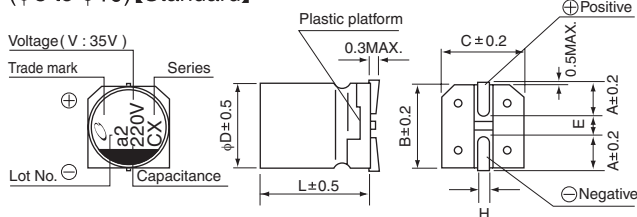
| Item                          | Performance Characteristics                                                                                                                                                                                                             |                 |      |      |      |                    |                                                   |                               |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|------|--------------------|---------------------------------------------------|-------------------------------|
| 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<br>ZT / Z20 (MAX.)                                                                                                                                                                                                      | Z-40°C / Z+20°C | 12   | 8    | 6    | 4                  | 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     |                               |
|                               |                                                                                                                                                                                                                                         |                 |      |      |      | Leakage current    | Less than or equal to 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. |                 |      |      |      |                    |                                                   |                               |
| 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      |                               |
|                               |                                                                                                                                                                                                                                         |                 |      |      |      | tan δ              | Less than or equal to the initial specified value |                               |
|                               |                                                                                                                                                                                                                                         |                 |      |      |      | Leakage current    | Less than or equal to the initial specified value |                               |
| Marking                       | Black print on the case top.                                                                                                                                                                                                            |                 |      |      |      |                    |                                                   |                               |

## Radial Lead Type

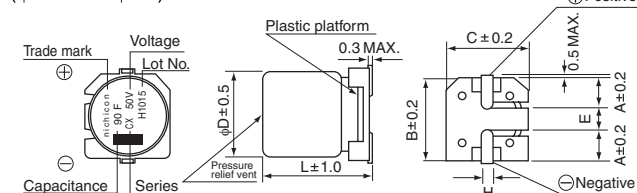
### (φ6.3)【Vibration Resistance】



### (φ8 to φ10)【Standard】



### (φ12.5 to φ18)【Standard】



### Standard

| φD×L | 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

| φD×L | 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

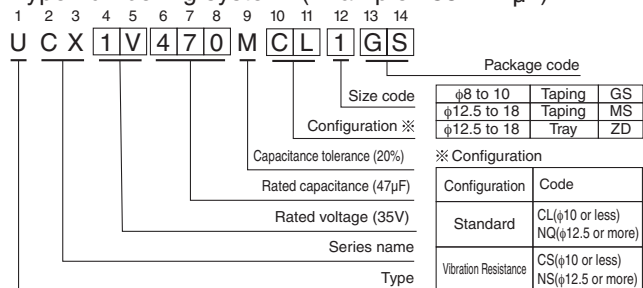
### Rated Voltage

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

●Dimension table in next page.

CAT.8100D

## Type numbering system (Example : 35V 47μF)





## ■ Dimensions

| Cap.(μF) | V   | Code                                                           | 10                            | 16                                                              | 25                                    | 35                                                                            | 50                                   |
|----------|-----|----------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------------------------|--------------------------------------|
|          |     |                                                                | 1A                            | 1C                                                              | 1E                                    | 1V                                                                            | 1H                                   |
| 47       | 470 |                                                                |                               |                                                                 |                                       | ●6.3 X 10   0.25   4   15   197<br>8 X 10   0.20   3   12   270               | 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<br>8 X 10   0.20   3   12   270 | 8 X 10   0.20   3   12   270          | ●6.3 X 10   0.25   4   15   197<br>8 X 10   0.20   3   12   270               | 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 | ●8 X 10   0.20   3   12   270<br>10 X 10   0.15   2   10   500 | 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<br>18 X 16.5   0.05   0.50   2.5   1400 |                                      |
| 1800     | 182 |                                                                |                               |                                                                 | 16 X 16.5   0.05   0.50   2.5   1200  | 18 X 21.5   0.035   0.28   1.4   2200                                         |                                      |
| 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.

## Данный компонент на территории Российской Федерации

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