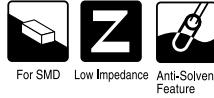


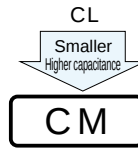
## CM series

Chip Type, Low Impedance



NEW

- Chip type, low impedance temperature range up to +105°C.
- Applicable to automatic mounting machine fed with carrier tape.
- Compliant to the RoHS directive (2011/65/EU).

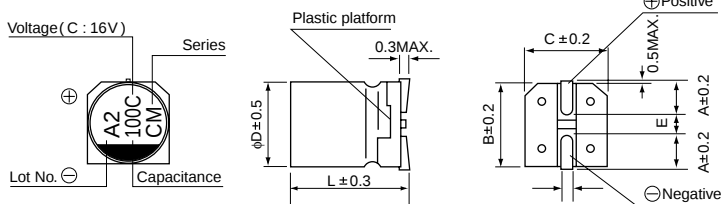


### Specifications

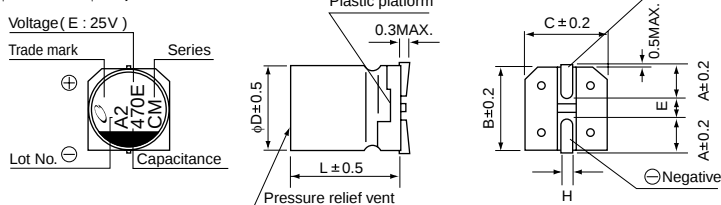
|                               |                                                                                                                                                                                                                                         |                 |      |      |                    |                                                   |      |                                       |                               |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|--------------------|---------------------------------------------------|------|---------------------------------------|-------------------------------|
| Item                          | Performance Characteristics                                                                                                                                                                                                             |                 |      |      |                    |                                                   |      |                                       |                               |
| Category Temperature Range    | -55 to +105°C                                                                                                                                                                                                                           |                 |      |      |                    |                                                   |      |                                       |                               |
| Rated Voltage Range           | 6.3 to 50V                                                                                                                                                                                                                              |                 |      |      |                    |                                                   |      |                                       |                               |
| Rated Capacitance Range       | 10 to 2200μF                                                                                                                                                                                                                            |                 |      |      |                    |                                                   |      |                                       |                               |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                                                                                                     |                 |      |      |                    |                                                   |      |                                       |                               |
| Leakage Current               | After 2 minutes' application of rated voltage, leakage current is not more than 0.01 CV                                                                                                                                                 |                 |      |      |                    |                                                   |      |                                       |                               |
| Tangent of loss angle (tan δ) | Rated voltage (V)                                                                                                                                                                                                                       | 6.3             | 10   | 16   | 25                 | 35                                                | 50   | Measurement frequency : 120Hz at 20°C |                               |
|                               | tan δ (MAX.)                                                                                                                                                                                                                            | 0.26            | 0.19 | 0.16 | 0.14               | 0.12                                              | 0.10 |                                       |                               |
| Stability at Low Temperature  | Rated voltage (V)                                                                                                                                                                                                                       |                 | 6.3  | 10   | 16                 | 25                                                | 35   | 50                                    | Measurement frequency : 120Hz |
|                               | Impedance ratio<br>ZT / Z20 (MAX.)                                                                                                                                                                                                      | Z-25°C / Z+20°C | 2    | 2    | 2                  | 2                                                 | 2    | 2                                     |                               |
|                               |                                                                                                                                                                                                                                         | Z-40°C / Z+20°C | 3    | 3    | 3                  | 3                                                 | 3    | 3                                     |                               |
|                               |                                                                                                                                                                                                                                         | Z-55°C / Z+20°C | 4    | 4    | 4                  | 3                                                 | 3    | 3                                     |                               |
| 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 105°C.                                                                                    |                 |      |      | Capacitance change | Within ±30% of the initial capacitance value      |      |                                       |                               |
|                               |                                                                                                                                                                                                                                         |                 |      |      | tan δ              | 200% 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 105°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 are kept on a 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.                                                                                                                                                                                                            |                 |      |      |                    |                                                   |      |                                       |                               |

### Chip Type

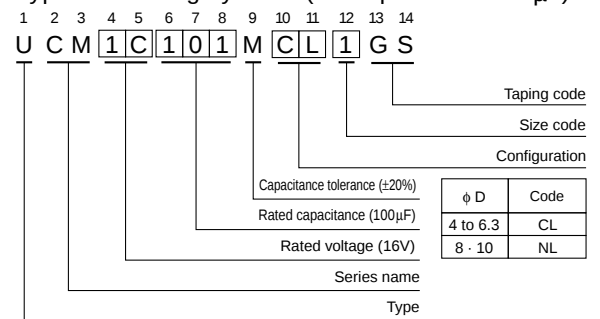
(φ4 to φ6.3)



(φ8 × 10L, φ10)



### Type numbering system (Example : 16V 100μF)



| φD×L | 4×5.8      | 5×5.8      | 6.3×5.8    | 6.3×7.7    | 8×10       | 10×10      |
|------|------------|------------|------------|------------|------------|------------|
| A    | 1.8        | 2.1        | 2.4        | 2.4        | 2.9        | 3.2        |
| B    | 4.3        | 5.3        | 6.6        | 6.6        | 8.3        | 10.3       |
| C    | 4.3        | 5.3        | 6.6        | 6.6        | 8.3        | 10.3       |
| E    | 1.0        | 1.3        | 2.2        | 2.2        | 3.1        | 4.5        |
| L    | 5.8        | 5.8        | 5.8        | 7.7        | 10         | 10         |
| H    | 0.5 to 0.8 | 0.5 to 0.8 | 0.5 to 0.8 | 0.5 to 0.8 | 0.8 to 1.1 | 0.8 to 1.1 |

### Voltage

|      |     |    |    |    |    |    |
|------|-----|----|----|----|----|----|
| V    | 6.3 | 10 | 16 | 25 | 35 | 50 |
| Code | j   | A  | C  | E  | V  | H  |

● Dimension table in next page.

## ■Dimensions

| Cap.<br>(μF) | V<br>Code | 6.3     |      |      | 10      |      |      | 16      |      |      | 25      |      |      | 35      |      |      | 50                     |           |              |
|--------------|-----------|---------|------|------|---------|------|------|---------|------|------|---------|------|------|---------|------|------|------------------------|-----------|--------------|
|              |           | 0J      |      |      | 1A      |      |      | 1C      |      |      | 1E      |      |      | 1V      |      |      | 1H                     |           |              |
| 10           | 100       |         |      |      |         |      |      |         |      |      |         |      |      |         |      |      | • 4×5.8                | 2.30      | 85           |
|              |           |         |      |      |         |      |      |         |      |      |         |      |      |         |      |      | 5×5.8                  | 0.88      | 165          |
| 22           | 220       |         |      |      |         |      |      |         |      |      | 4×5.8   | 1.00 | 160  | 4×5.8   | 1.00 | 160  | 5×5.8                  | 0.88      | 165          |
| 33           | 330       |         |      |      |         |      |      |         |      |      | 4×5.8   | 1.00 | 160  | 5×5.8   | 0.36 | 240  |                        |           |              |
| 47           | 470       |         |      |      |         |      |      | 4×5.8   | 1.00 | 160  | 5×5.8   | 0.36 | 240  | 5×5.8   | 0.36 | 240  | 6.3×5.8                | 0.68      | 195          |
| 68           | 680       |         |      |      | 4×5.8   | 1.00 | 160  | 5×5.8   | 0.36 | 240  | 5×5.8   | 0.36 | 240  | 6.3×5.8 | 0.26 | 300  |                        |           |              |
| 100          | 101       | 4×5.8   | 1.00 | 160  |         |      |      | 5×5.8   | 0.36 | 240  | 6.3×5.8 | 0.26 | 300  | 6.3×5.8 | 0.26 | 300  | 6.3×7.7                | 0.34      | 350          |
| 150          | 151       |         |      |      | 5×5.8   | 0.36 | 240  | 6.3×5.8 | 0.26 | 300  | 6.3×7.7 | 0.16 | 600  | 6.3×7.7 | 0.16 | 600  |                        |           |              |
| 220          | 221       | 5×5.8   | 0.36 | 240  | 6.3×5.8 | 0.26 | 300  | 6.3×5.8 | 0.26 | 300  | 6.3×7.7 | 0.16 | 600  |         |      |      | 8×10                   | 0.18      | 670          |
| 330          | 331       | 6.3×5.8 | 0.26 | 300  | 6.3×7.7 | 0.16 | 600  | 6.3×7.7 | 0.16 | 600  |         |      |      | 8×10    | 0.08 | 850  | 10×10                  | 0.12      | 900          |
| 470          | 471       | 6.3×7.7 | 0.16 | 600  | 6.3×7.7 | 0.16 | 600  |         |      |      | 8×10    | 0.08 | 850  |         |      |      |                        |           |              |
| 560          | 561       |         |      |      |         |      |      |         |      |      |         |      |      | 10×10   | 0.06 | 1190 |                        |           |              |
| 680          | 681       | 6.3×7.7 | 0.16 | 600  |         |      |      | 8×10    | 0.08 | 850  |         |      |      |         |      |      |                        |           |              |
| 820          | 821       |         |      |      |         |      |      |         |      |      | 10×10   | 0.06 | 1190 |         |      |      |                        |           |              |
| 1000         | 102       |         |      |      | 8×10    | 0.08 | 850  | 10×10   | 0.06 | 1190 |         |      |      |         |      |      |                        |           |              |
| 1500         | 152       | 8×10    | 0.08 | 850  | 10×10   | 0.06 | 1190 |         |      |      |         |      |      |         |      |      | Case size<br>ΦD×L (mm) | Impedance | Rated ripple |
| 2200         | 222       | 10×10   | 0.06 | 1190 |         |      |      |         |      |      |         |      |      |         |      |      |                        |           |              |

MAX. Impedance (Ω) at 20 100kHz, Rated ripple current(mArms) at 105 100kHz

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

## ●Frequency coefficient of rated ripple current

| Frequency   | 50 Hz | 120 Hz | 300 Hz | 1 kHz | 10 kHz 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.