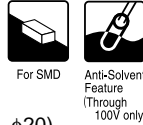
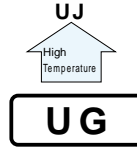


# ALUMINUM ELECTROLYTIC CAPACITORS

**UG** series Chip Type, Higher Capacitance Range



- Chip Type, higher capacitance in larger case sizes (φ12.5, φ16, φ18, φ20)
- Designed for surface mounting on high density PC board.
- Applicable to automatic mounting machine fed with carrier tape and tray.
- Compliant to the RoHS directive (2002/95/EC).

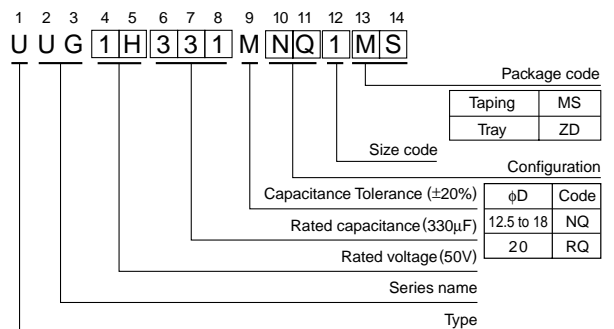
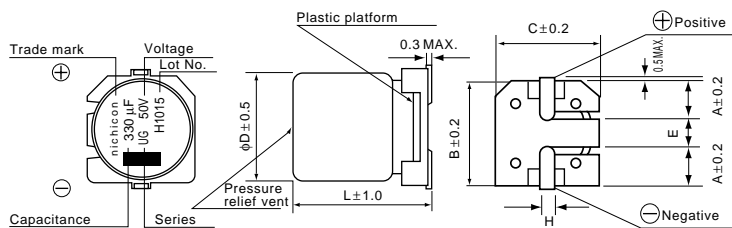


## Specifications

| Item  | Performance Characteristics  |   |      |      |      |      |      |      |                                       |            |           |   |
|---|--|---|------|------|------|------|------|------|---------------------------------------|------------|-----------|---|
| Category Temperature Range  | -40 to +85° C  |   |      |      |      |      |      |      |                                       |            |           |   |
| Rated Voltage Range   | 6.3 to 450V  |   |      |      |      |      |      |      |                                       |            |           |   |
| Rated Capacitance Range   | 4.7 to 10000μF   |   |      |      |      |      |      |      |                                       |            |           |   |
| Capacitance Tolerance   | ±20% at 120Hz, 20°C  |   |      |      |      |      |      |      |                                       |            |           |   |
| Leakage Current   | Rated voltage (V)  | 6.3 to 100  |      |      |      |      |      |      | 160 to 450                            |            |           |   |
|   | —  | After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4 (μA), whichever is greater. |      |      |      |      |      |      | I = 0.04CV+100 (μA) max. (1 minute's) |            |           |   |
| Tangent of loss angle (tan δ)   | Measurement frequency : 120Hz at 20°C  |   |      |      |      |      |      |      |                                       |            |           |   |
|   | Rated voltage (V)  | 6.3   | 10   | 16   | 25   | 35   | 50   | 63   | 100                                   | 160 to 250 | 400 · 450 |   |
|   | tan δ (MAX.)   | 0.28  | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08                                  | 0.20       | 0.25      |   |
| For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. |  |   |      |      |      |      |      |      |                                       |            |           |   |
| Stability at Low Temperature  | Measurement frequency: 120Hz   |   |      |      |      |      |      |      |                                       |            |           |   |
|   | Rated voltage (V)  | 6.3   | 10   | 16   | 25   | 35   | 50   | 63   | 100                                   | 160 to 250 | 400 · 450 |   |
|   | Impedance ratio ZT / Z20 (MAX.)  | Z-25° C / Z+20°C  | 5    | 4    | 3    | 2    | 2    | 2    | 2                                     | 2          | 3         | 6 |
| 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 85°C.  |   |      |      |      |      |      |      |                                       |            |           |   |
|   | Capacitance change   | Within ±20% 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 85° 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. |   |      |      |      |      |      |      |                                       |            |           |   |
| Marking   | Black print on the case top.   |   |      |      |      |      |      |      |                                       |            |           |   |

## Chip Type

Type numbering system (Example : 50V 330μF)



|    | (mm)       |            |            |            |            |            |            |            |            |  |
|----|------------|------------|------------|------------|------------|------------|------------|------------|------------|--|
| φD | 12.5×13.5  | 12.5×16    | 12.5×21    | 16×16.5    | 16×21.5    | 18×16.5    | 18×21.5    | 20×16.5    | 20×21.5    |  |
| A  | 4.8        | 4.8        | 4.8        | 5.4        | 5.4        | 6.4        | 6.4        | 6.2        | 6.2        |  |
| B  | 13.6       | 13.6       | 13.6       | 17.1       | 17.1       | 19.1       | 19.1       | 21.1       | 21.1       |  |
| C  | 13.6       | 13.6       | 13.6       | 17.1       | 17.1       | 19.1       | 19.1       | 21.1       | 21.1       |  |
| E  | 4.0        | 4.0        | 4.0        | 6.3        | 6.3        | 6.3        | 6.3        | 8.8        | 8.8        |  |
| L  | 13.5       | 16.0       | 21.0       | 16.5       | 21.5       | 16.5       | 21.5       | 16.5       | 21.5       |  |
| H  | 1.0 to 1.4 | 1.0 to 1.4 | 1.0 to 1.4 | 1.0 to 1.4 | 1.0 to 1.4 | 1.0 to 1.4 | 1.0 to 1.4 | 1.3 to 1.7 | 1.3 to 1.7 |  |

● Dimension table in next page.

## ■ Dimensions

| V<br>( $\mu$ F)<br>Cap. | Code | 6.3         |      | 10          |      | 16          |      | 25          |      | 35          |      | 50          |      |
|-------------------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|
|                         |      | 0J          |      | 1A          |      | 1C          |      | 1E          |      | 1V          |      | 1H          |      |
| 220                     | 221  |             |      |             |      |             |      |             |      |             |      | 12.5 × 13.5 | 450  |
| 330                     | 331  |             |      |             |      |             |      |             |      |             |      | 12.5 × 13.5 | 520  |
| 470                     | 471  |             |      |             |      |             |      | 12.5 × 13.5 | 550  | 12.5 × 13.5 | 580  | ● 16 × 16.5 | 740  |
| 1000                    | 102  |             |      | 12.5 × 13.5 | 620  | 12.5 × 13.5 | 710  | 12.5 × 16   | 820  | ● 16 × 16.5 | 1000 | 18 × 21.5   | 1150 |
| 2200                    | 222  | 12.5 × 16   | 890  | 12.5 × 16   | 960  | ● 16 × 16.5 | 1150 | △ 18 × 16.5 | 1350 | 18 × 21.5   | 1550 |             |      |
| 3300                    | 332  | ● 16 × 16.5 | 1200 | 16 × 16.5   | 1300 | △ 18 × 16.5 | 1450 | 18 × 21.5   | 1700 |             |      |             |      |
| 4700                    | 472  | 16 × 16.5   | 1400 | △ 18 × 16.5 | 1500 | 18 × 21.5   | 1750 |             |      |             |      |             |      |
| 6800                    | 682  | △ 18 × 16.5 | 1650 | 18 × 21.5   | 1850 |             |      |             |      |             |      |             |      |
| 10000                   | 103  | 18 × 21.5   | 2000 | 20 × 21.5   | 2200 |             |      |             |      |             |      |             |      |

| V<br>( $\mu$ F)<br>Cap. | Code | 63          |     | 100         |     | 160         |     | 200         |     | 250         |     | 400         |     | 450                            |                 |
|-------------------------|------|-------------|-----|-------------|-----|-------------|-----|-------------|-----|-------------|-----|-------------|-----|--------------------------------|-----------------|
|                         |      | 1J          |     | 2A          |     | 2C          |     | 2D          |     | 2E          |     | 2G          |     | 2W                             |                 |
| 4.7                     | 4R7  |             |     |             |     |             |     |             |     |             |     | 12.5 × 13.5 | 115 | 12.5 × 13.5                    | 115             |
| 10                      | 100  |             |     |             |     |             |     |             |     | 12.5 × 13.5 | 150 | ● 16 × 16.5 | 140 | ● 16 × 16.5                    | 140             |
| 22                      | 220  |             |     |             |     |             |     | 12.5 × 13.5 | 235 | 12.5 × 16   | 240 | △ 18 × 16.5 | 280 | 16 × 21.5                      | 275             |
| 33                      | 330  |             |     |             |     |             |     | 12.5 × 16   | 310 | ● 16 × 16.5 | 340 | 18 × 21.5   | 350 | 18 × 21.5                      | 345             |
| 47                      | 470  |             |     |             |     | 12.5 × 16   | 370 | ● 16 × 16.5 | 415 | △ 18 × 16.5 | 415 | 20 × 21.5   | 430 |                                |                 |
| 68                      | 680  |             |     | 12.5 × 13.5 | 350 | ● 16 × 16.5 | 500 | △ 18 × 16.5 | 505 | ★ 18 × 21.5 | 490 |             |     |                                |                 |
| 100                     | 101  | 12.5 × 13.5 | 370 | 12.5 × 16   | 440 | △ 18 × 16.5 | 590 | 18 × 21.5   | 590 |             |     |             |     |                                |                 |
| 220                     | 221  | 12.5 × 16   | 580 | △ 18 × 16.5 | 665 |             |     |             |     |             |     |             |     |                                |                 |
| 330                     | 331  | ● 16 × 16.5 | 680 | 18 × 21.5   | 825 |             |     |             |     |             |     |             |     |                                |                 |
| 470                     | 471  | △ 18 × 16.5 | 850 |             |     |             |     |             |     |             |     |             |     | Case size<br>$\phi$ D × L (mm) | Rated<br>ripple |

Size  $\phi$ 12.5×21 is available for capacitors marked,"●".

Size  $\phi$ 16×21.5L is available for capacitors marked,"△".

Size  $\phi$ 20×16.5L is available for capacitors marks,"★".

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

Rated ripple current (mArms) at 85° C 120Hz

## ● Frequency coefficient of rated ripple current

| V          | Cap.( $\mu$ F) | Frequency |       |       |      |               |
|------------|----------------|-----------|-------|-------|------|---------------|
|            |                | 50Hz      | 120Hz | 300Hz | 1kHz | 10kHz or more |
| 6.3 to 100 | 68             | 0.75      | 1.00  | 1.35  | 1.57 | 2.00          |
|            | 100 to 470     | 0.80      | 1.00  | 1.23  | 1.34 | 1.50          |
|            | 1000 to 10000  | 0.85      | 1.00  | 1.10  | 1.13 | 1.15          |
| 160 to 450 | 4.7 to 100     | 0.80      | 1.00  | 1.25  | 1.40 | 1.60          |

- 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.