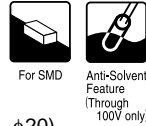
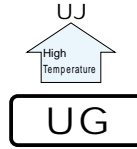


ALUMINUM ELECTROLYTIC CAPACITORS

UG series Chip Type, Higher Capacitance Range



- Chip Type, higher capacitance in larger case sizes ($\phi 12.5$, $\phi 16$, $\phi 18$, $\phi 20$)
- 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).

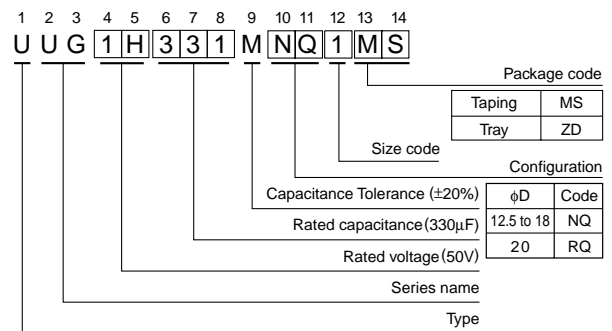
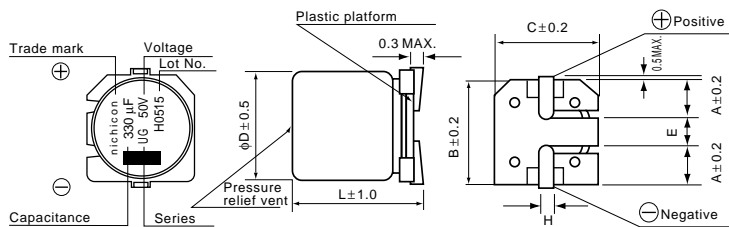


Specifications

| Item | Performance Characteristics | | | | | | | | | | |
|---------------------------------------|--|--|------|------|------|------|------|------|------|------------|-----------|
| Category Temperature Range | -40 to +85°C | | | | | | | | | | |
| Rated Voltage Range | 6.3 to 450V | | | | | | | | | | |
| Rated Capacitance Range | 4.7 to 10000 μ F | | | | | | | | | | |
| Capacitance Tolerance | $\pm 20\%$ 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 (μ A), whichever is greater. I = 0.04CV+100 (μ A) max. (1 minute's) | | | | | | | | | |
| Tangent of loss angle (tan δ) | Measurement frequency : 120Hz, Temperature : 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 1000 μ F, add 0.02 for every increase of 1000 μ F. | | | | | | | | | | |
| 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 | 3 | 6 |
| | | Z-40°C / Z+20°C | 12 | 10 | 8 | 5 | 4 | 3 | 3 | 6 | 10 |
| 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 $\pm 20\%$ 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 330 μ F)



| | (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 (μ F) 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 (μ F) 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 φ D × L (mm) | Rated ripple |

Size φ12.5×21 is available for capacitors marked, "●".

Size φ16×21.5L is available for capacitors marked, "△".

Size φ20×16.5L 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.(μ F) | Frequency | | | | |
|------------|----------------|-----------|-------|-------|------|---------------|
| | | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz or more |
| 6.3 to 100 | Less than 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.