

# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon



Chip Type, Higher Capacitance Range



For SMD



Long Life



Anti-Solvent  
Feature  
(Through  
100V only)



- 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 (2011/65/EU).

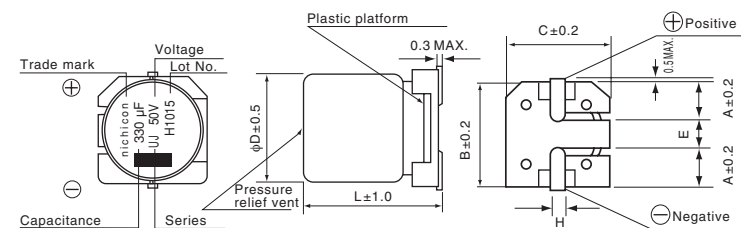


## Specifications

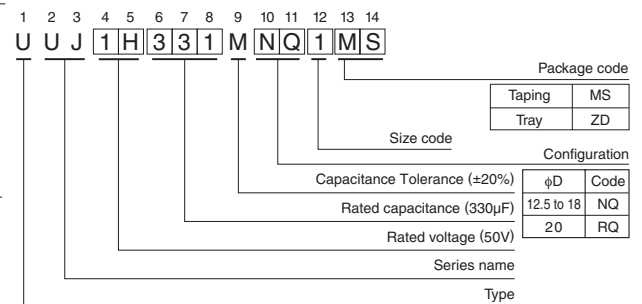
|                                                                             |                                                                                                                                                                                                                                         |                 |                                                                                                                         |      |      |      |                    |      |                                                   |                                       |            |         |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------|------|------|------|--------------------|------|---------------------------------------------------|---------------------------------------|------------|---------|
| Item                                                                        | Performance Characteristics                                                                                                                                                                                                             |                 |                                                                                                                         |      |      |      |                    |      |                                                   |                                       |            |         |
| Category Temperature Range                                                  | -55 to +105°C (6.3 to 100V), -40 to +105°C (160 to 450V)                                                                                                                                                                                |                 |                                                                                                                         |      |      |      |                    |      |                                                   |                                       |            |         |
| Rated Voltage Range                                                         | 6.3 to 450V                                                                                                                                                                                                                             |                 |                                                                                                                         |      |      |      |                    |      |                                                   |                                       |            |         |
| Rated Capacitance Range                                                     | 3.3 to 6800μF                                                                                                                                                                                                                           |                 |                                                                                                                         |      |      |      |                    |      |                                                   |                                       |            |         |
| 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.)                                                                                                                                                                                                                            | 0.26            | 0.22                                                                                                                    | 0.18 | 0.16 | 0.14 | 0.12               | 0.10 | 0.08                                              | 0.15                                  | 0.20       |         |
| 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<br>ZT / Z20 (MAX.)                                                                                                                                                                                                      | Z-25°C / Z+20°C | 5                                                                                                                       | 4    | 3    | 2    | 2                  | 2    | 2                                                 | 2                                     | 3          | 6       |
|                                                                             |                                                                                                                                                                                                                                         | Z-40°C / Z+20°C | 10                                                                                                                      | 8    | 6    | 4    | 3                  | 3    | 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 5000 hours at 105°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 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. |                 |                                                                                                                         |      |      |      |                    |      |                                                   |                                       |            |         |
| Marking                                                                     | Black print on the case top.                                                                                                                                                                                                            |                 |                                                                                                                         |      |      |      |                    |      |                                                   |                                       |            |         |

## Chip Type

Type numbering system (Example : 50V 330 $\mu$ F)



| $\phi D$ | 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 |



※ The vibration structure-resistant product is also available upon request, please ask for details.

● Dimension table in next page.

CAT.8100D



## ■ Dimensions

| V            |      | 6.3         |      | 10          |      | 16          |      | 25          |      | 35          |      | 50          |     |
|--------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|------|-------------|-----|
| (μF)<br>Cap. | Code | 0J          |      | 1A          |      | 1C          |      | 1E          |      | 1V          |      | 1H          |     |
| 220          | 221  |             |      |             |      |             |      |             |      | 12.5 × 13.5 | 280  | 12.5 × 16   | 320 |
| 330          | 331  |             |      |             |      |             |      | 12.5 × 13.5 | 320  | 12.5 × 16   | 360  | ● 16 × 16.5 | 440 |
| 470          | 471  |             |      |             |      | 12.5 × 13.5 | 360  | 12.5 × 16   | 400  | ● 16 × 16.5 | 490  | △ 18 × 16.5 | 550 |
| 1000         | 102  | 12.5 × 13.5 | 440  | 12.5 × 16   | 500  | ● 16 × 16.5 | 630  | △ 18 × 16.5 | 700  | △ 18 × 16.5 | 750  | 18 × 21.5   | 820 |
| 2200         | 222  | ● 16 × 16.5 | 750  | ● 16 × 16.5 | 810  | △ 18 × 16.5 | 930  | 18 × 21.5   | 1050 | □ 20 × 21.5 | 1150 |             |     |
| 3300         | 332  | △ 18 × 16.5 | 930  | △ 18 × 16.5 | 1000 | 18 × 21.5   | 1150 |             |      |             |      |             |     |
| 4700         | 472  | ★ 18 × 21.5 | 1100 | 18 × 21.5   | 1200 |             |      |             |      |             |      |             |     |
| 6800         | 682  | □ 20 × 21.5 | 1350 | □ 20 × 21.5 | 1450 |             |      |             |      |             |      |             |     |

| V            |      | 63          |     | 100         |     | 160         |     | 200         |     | 250         |     | 400         |     | 450                      |                 |
|--------------|------|-------------|-----|-------------|-----|-------------|-----|-------------|-----|-------------|-----|-------------|-----|--------------------------|-----------------|
| (μF)<br>Cap. | Code | 1J          |     | 2A          |     | 2C          |     | 2D          |     | 2E          |     | 2G          |     | 2W                       |                 |
| 3.3          | 3R3  |             |     |             |     |             |     |             |     |             |     |             |     | 12.5 × 13.5              | 40              |
| 4.7          | 4R7  |             |     |             |     |             |     |             |     | 12.5 × 13.5 | 65  | 12.5 × 16   | 50  | 12.5 × 16                | 50              |
| 10           | 100  |             |     |             |     |             |     | 12.5 × 13.5 | 80  | 12.5 × 16   | 105 | 16 × 16.5   | 85  | 16 × 16.5                | 85              |
| 22           | 220  |             |     |             |     |             |     | 12.5 × 16   | 105 | ● 16 × 16.5 | 180 | 18 × 21.5   | 130 | 18 × 21.5                | 130             |
| 33           | 330  |             |     |             |     | 12.5 × 13.5 | 95  | ● 16 × 16.5 | 220 | △ 18 × 16.5 | 230 | □ 20 × 21.5 | 160 | □ 20 × 21.5              | 160             |
| 47           | 470  |             |     | 12.5 × 13.5 | 160 | ● 16 × 16.5 | 260 | △ 18 × 16.5 | 270 | ★ 18 × 21.5 | 280 |             |     |                          |                 |
| 68           | 680  | 12.5 × 13.5 | 175 | 12.5 × 16   | 205 | △ 18 × 16.5 | 320 | ★ 18 × 21.5 | 330 | □ 20 × 21.5 | 340 |             |     |                          |                 |
| 100          | 101  | 12.5 × 16   | 225 | ● 16 × 16.5 | 285 | ★ 16 × 21.5 | 380 | □ 20 × 21.5 | 410 |             |     |             |     |                          |                 |
| 220          | 221  | ● 16 × 16.5 | 385 | △ 18 × 16.5 | 440 |             |     |             |     |             |     |             |     |                          |                 |
| 330          | 331  | △ 18 × 16.5 | 490 | □ 20 × 21.5 | 500 |             |     |             |     |             |     |             |     |                          |                 |
| 470          | 471  | 18 × 21.5   | 590 |             |     |             |     |             |     |             |     |             |     | Case size<br>φD × L (mm) | Rated<br>ripple |

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

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

Size φ18 × 21.5L is available for capacitors marked, "□".

Size φ20 × 16.5L is available for capacitors marked, "★".

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

Rated ripple current (mArms) at 105°C 120Hz

## ● Frequency coefficient of rated ripple current

| V          | Cap. (μF)  | Frequency    | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz or more |
|------------|------------|--------------|------|-------|-------|------|---------------|
| 6.3 to 100 | 47 to 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 6800 | 0.85 | 1.00  | 1.10  | 1.13 | 1.15          |
| 160 to 450 | 3.3 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.

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