

# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

# UKW

Standard, For Audio Equipment



**UKW**



- Realization of a harmonious balance of sound quality, made possible by the development of new electrolyte.
- Most suited for AV equipment like DVD, MD.
- Compliant to the RoHS directive (2011/65/EU).

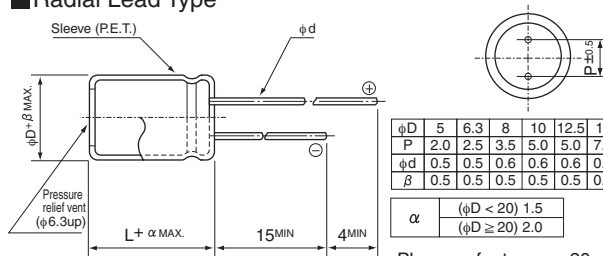
Values marked with an ※ in the dimension table are scheduled to be discontinued and are not recommended for new designs.



## Specifications

| Item                                                                        | Performance Characteristics                                                                                                                                                                                                                                                        |                 |      |      |      |                    |      |                                                   |      |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|------|--------------------|------|---------------------------------------------------|------|-------------------|-----|----|----|----|----|----|----|-----|--------------|------|------|------|------|------|------|------|------|---------------------------------------|
| Category Temperature Range                                                  | -40 to +85°C                                                                                                                                                                                                                                                                       |                 |      |      |      |                    |      |                                                   |      |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
| Rated Voltage Range                                                         | 6.3 to 100V                                                                                                                                                                                                                                                                        |                 |      |      |      |                    |      |                                                   |      |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
| Rated Capacitance Range                                                     | 0.1 to 33000μF                                                                                                                                                                                                                                                                     |                 |      |      |      |                    |      |                                                   |      |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
| Capacitance Tolerance                                                       | ±20% at 120Hz, 20°C                                                                                                                                                                                                                                                                |                 |      |      |      |                    |      |                                                   |      |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
| Leakage Current                                                             | After 1 minute's application of rated voltage at 20°C, leakage current is not more than 0.03 CV or 4 (μA) , whichever is greater.<br>After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01 CV or 3 (μA) , whichever is greater.             |                 |      |      |      |                    |      |                                                   |      |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
| Tangent of loss angle (tan δ)                                               | <table><tr><td>Rated voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td></tr><tr><td>tan δ (MAX.)</td><td>0.28</td><td>0.24</td><td>0.20</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.08</td></tr></table> |                 |      |      |      |                    |      |                                                   |      | Rated voltage (V) | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | tan δ (MAX.) | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | Measurement frequency : 120Hz at 20°C |
|                                                                             | Rated voltage (V)                                                                                                                                                                                                                                                                  | 6.3             | 10   | 16   | 25   | 35                 | 50   | 63                                                | 100  |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
|                                                                             | tan δ (MAX.)                                                                                                                                                                                                                                                                       | 0.28            | 0.24 | 0.20 | 0.16 | 0.14               | 0.12 | 0.10                                              | 0.08 |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
| 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               |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
|                                                                             | Impedance ratio<br>ZT / Z20 (MAX.)                                                                                                                                                                                                                                                 | Z-25°C / Z+20°C | 5    | 4    | 3    | 2                  | 2    | 2                                                 | 2    | 2                 |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |
|                                                                             |                                                                                                                                                                                                                                                                                    | Z-40°C / Z+20°C | 12   | 10   | 8    | 5                  | 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 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                                                                     | Printed with gold color letter on black sleeve.                                                                                                                                                                                                                                    |                 |      |      |      |                    |      |                                                   |      |                   |     |    |    |    |    |    |    |     |              |      |      |      |      |      |      |      |      |                                       |

## Radial Lead Type



## Type numbering system (Example : 10V 1000µF)

|               |   |   |                              |   |   |   |   |   |    |    |
|---------------|---|---|------------------------------|---|---|---|---|---|----|----|
| 1             | 2 | 3 | 4                            | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| U             | K | W | 1                            | A | 1 | 0 | 2 | M | P  | D  |
| Configuration |   |   |                              |   |   |   |   |   |    |    |
|               |   |   | Capacitance tolerance (±20%) |   |   |   |   |   |    |    |
|               |   |   | Rated capacitance (1000µF)   |   |   |   |   |   |    |    |
|               |   |   | Rated voltage (10V)          |   |   |   |   |   |    |    |
|               |   |   | Series name                  |   |   |   |   |   |    |    |
|               |   |   | Type                         |   |   |   |   |   |    |    |
|               |   |   | φ D                          |   |   |   |   |   |    |    |
|               |   |   | 5                            |   |   |   |   |   |    |    |
|               |   |   | 6.3                          |   |   |   |   |   |    |    |
|               |   |   | 8 · 10                       |   |   |   |   |   |    |    |
|               |   |   | 12.5 to 18                   |   |   |   |   |   |    |    |
|               |   |   | 20 to 25                     |   |   |   |   |   |    |    |

## Dimensions

• Please refer to page 20 about the end seal configuration.

| Cap.<br>(μF) | V   | 6.3       |      | 10        |      | 16        |      | 25        |      | 35        |      | 50        |      | 63        |      | 100                   |              |
|--------------|-----|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------------------|--------------|
|              |     | 0J        |      | 1A        |      | 1C        |      | 1E        |      | 1V        |      | 1H        |      | 1J        |      | 2A                    |              |
| 0.1          | 0R1 |           |      |           |      |           |      |           |      |           |      | ※5 × 11   | 1.1  |           |      | ※ 5 × 11              | 2.1          |
| 0.22         | R22 |           |      |           |      |           |      |           |      |           |      | ※5 × 11   | 2.4  |           |      | ※ 5 × 11              | 4.7          |
| 0.33         | R33 |           |      |           |      |           |      |           |      |           |      | ※5 × 11   | 3.5  |           |      | ※ 5 × 11              | 7.0          |
| 0.47         | R47 |           |      |           |      |           |      |           |      |           |      | ※5 × 11   | 5.0  |           |      | ※ 5 × 11              | 10           |
| 1            | 010 |           |      |           |      |           |      |           |      |           |      | ※5 × 11   | 10   |           |      | ※ 5 × 11              | 21           |
| 2.2          | 2R2 |           |      |           |      |           |      |           |      |           |      | 5 × 11    | 23   |           |      | 5 × 11                | 30           |
| 3.3          | 3R3 |           |      |           |      |           |      |           |      |           |      | 5 × 11    | 35   |           |      | 5 × 11                | 40           |
| 4.7          | 4R7 |           |      |           |      |           |      |           |      |           |      | 5 × 11    | 40   |           |      | 5 × 11                | 45           |
| 10           | 100 |           |      |           |      |           |      |           |      |           |      | 5 × 11    | 65   | 5 × 11    | 70   | 6.3 × 11              | 75           |
| 22           | 220 |           |      |           |      |           |      |           |      |           |      | 5 × 11    | 95   | 5 × 11    | 100  | 6.3 × 11              | 120          |
| 33           | 330 |           |      |           |      |           |      |           |      | 5 × 11    | 105  | 5 × 11    | 120  | 6.3 × 11  | 140  | 8 × 11.5              | 160          |
| 47           | 470 |           |      |           |      |           |      | 5 × 11    | 115  | 5 × 11    | 120  | 6.3 × 11  | 150  | 6.3 × 11  | 165  | 10 × 12.5             | 210          |
| 100          | 101 |           |      | 5 × 11    | 145  | 5 × 11    | 155  | 6.3 × 11  | 185  | 6.3 × 11  | 200  | 8 × 11.5  | 250  | 10 × 12.5 | 300  | 10 × 20               | 350          |
| 220          | 221 |           |      | 6.3 × 11  | 230  | 6.3 × 11  | 250  | 8 × 11.5  | 320  | 10 × 12.5 | 370  | 10 × 12.5 | 410  | 10 × 16   | 470  | 12.5 × 25             | 600          |
| 330          | 331 | 6.3 × 11  | 265  | 6.3 × 11  | 270  | 8 × 11.5  | 360  | 10 × 12.5 | 420  | 10 × 12.5 | 470  | 10 × 16   | 570  | 10 × 20   | 650  | 12.5 × 25             | 750          |
| 470          | 471 | 6.3 × 11  | 310  | 6.3 × 11  | 330  | 8 × 11.5  | 420  | 10 × 12.5 | 530  | 10 × 16   | 630  | 12.5 × 20 | 760  | 12.5 × 20 | 880  | 16 × 25               | 1000         |
| 1000         | 102 | 8 × 11.5  | 530  | 10 × 12.5 | 630  | 10 × 16   | 770  | 10 × 20   | 950  | 12.5 × 20 | 1100 | 12.5 × 25 | 1300 | 16 × 25   | 1300 | 18 × 40               | 1370         |
| 2200         | 222 | 10 × 20   | 980  | 10 × 20   | 1050 | 12.5 × 20 | 1250 | 12.5 × 25 | 1550 | 16 × 25   | 1800 | 16 × 35.5 | 2090 | 18 × 35.5 | 2200 | 22 × 50               | 2400         |
| 3300         | 332 | 10 × 20   | 1170 | 12.5 × 20 | 1420 | 12.5 × 25 | 1700 | 16 × 25   | 1950 | 16 × 35.5 | 2220 | 18 × 35.5 | 2360 | 20 × 40   | 2700 | 25 × 50               | 2900         |
| 4700         | 472 | 12.5 × 20 | 1350 | 12.5 × 25 | 1800 | 16 × 25   | 2100 | 16 × 31.5 | 2360 | 18 × 35.5 | 2490 | 20 × 40   | 2900 | 22 × 50   | 3400 |                       |              |
| 6800         | 682 | 12.5 × 25 | 1600 | 16 × 25   | 2150 | 16 × 35.5 | 2500 | 18 × 35.5 | 2590 | 20 × 40   | 3000 | 22 × 50   | 3500 | 25 × 50   | 3500 |                       |              |
| 10000        | 103 | 16 × 25   | 2000 | 16 × 35.5 | 2500 | 18 × 35.5 | 2640 | 20 × 40   | 3000 | 22 × 50   | 3700 | 25 × 50   | 4000 |           |      |                       |              |
| 15000        | 153 | 16 × 35.5 | 2550 | 18 × 35.5 | 2720 | 20 × 40   | 3400 | 22 × 50   | 3800 | 25 × 50   | 4300 |           |      |           |      |                       |              |
| 22000        | 223 | 18 × 40   | 3200 | 20 × 40   | 3700 | 22 × 50   | 4200 | 25 × 50   | 4500 |           |      |           |      |           |      |                       |              |
| 33000        | 333 | 22 × 50   | 3900 | 22 × 50   | 4500 | 25 × 50   | 4800 |           |      |           |      |           |      |           |      | Case size φD x L (mm) | Rated ripple |

## Frequency coefficient of rated ripple current

| Cap. (µF)     | Frequency | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz or more |
|---------------|-----------|------|-------|-------|------|---------------|
| 0.1 to 47     |           | 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 33000 |           | 0.85 | 1.00  | 1.10  | 1.13 | 1.15          |

Rated ripple current (mA rms) at 85°C 120Hz

Please refer to page 20, 21, 22 about the formed or taped product spec.  
Please refer to page 4 for the minimum order quantity.