



- Standard bi-polarized series for entertainment electronics.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

| Item                            | Performance Characteristics  |                    |  |       |   |                 |   |      |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
|---------------------------------|--|--------------------|--|-------|---|-----------------|---|------|----|-----|---------------------------------|------|------|------|------|------|------|------|------|-----------------|----|---|---|---|---|---|---|---|
| Category Temperature Range      | -40 to +85°C   |                    |  |       |   |                 |   |      |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| Rated Voltage Range             | 6.3 to 100V  |                    |  |       |   |                 |   |      |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| Rated Capacitance Range         | 0.47 to 6800µF   |                    |  |       |   |                 |   |      |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| Capacitance Tolerance           | ±20% at 120Hz, 20°C  |                    |  |       |   |                 |   |      |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| Leakage Current                 | After 5 minutes' application of rated voltage at 20°C, leakage current is not more than 0.03CV or 3 (µA), whichever is greater.  |                    |  |       |   |                 |   |      |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| Tangent of loss angle (tan δ)   | For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF. Measurement frequency : 120Hz at 20°C<br><table border="1"> <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>0.26</td> <td>0.24</td> <td>0.22</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> </tr> </table>  | Rated voltage (V)  | 6.3  | 10    | 16  | 25              | 35  | 50   | 63 | 100 | tan δ (MAX.)                    | 0.26 | 0.24 | 0.22 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 |                 |    |   |   |   |   |   |   |   |
| Rated voltage (V)               | 6.3  | 10                 | 16   | 25    | 35  | 50              | 63  | 100  |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| tan δ (MAX.)                    | 0.26   | 0.24               | 0.22   | 0.20  | 0.16  | 0.14            | 0.12  | 0.10 |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| Stability at Low Temperature    | Measurement frequency : 120Hz<br><table border="1"> <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>Impedance ratio Z-25°C / Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT / Z20 (MAX.)</td> <td>10</td> <td>8</td> <td>6</td> <td>5</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> </table>                              | Rated voltage (V)  | 6.3  | 10    | 16  | 25              | 35  | 50   | 63 | 100 | Impedance ratio Z-25°C / Z+20°C | 4    | 3    | 2    | 2    | 2    | 2    | 2    | 2    | ZT / Z20 (MAX.) | 10 | 8 | 6 | 5 | 4 | 4 | 3 | 3 |
| Rated voltage (V)               | 6.3  | 10                 | 16   | 25    | 35  | 50              | 63  | 100  |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| Impedance ratio Z-25°C / Z+20°C | 4  | 3                  | 2  | 2     | 2   | 2               | 2   | 2    |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| ZT / Z20 (MAX.)                 | 10   | 8                  | 6  | 5     | 4   | 4               | 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 with the polarity inverted every 250 hours.<br><table border="1"> <tr> <td>Capacitance change</td> <td>Within ±20% of the initial capacitance value</td> </tr> <tr> <td>tan δ</td> <td>200% or less than the initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Less than or equal to the initial specified value</td> </tr> </table> | 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 |      |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |
| 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 white color letter on black sleeve.   |                    |  |       |   |                 |   |      |    |     |                                 |      |      |      |      |      |      |      |      |                 |    |   |   |   |   |   |   |   |

## Radial Lead Type



| α  |          | (mm) |     |     |     |      |     |     |  |
|----|----------|------|-----|-----|-----|------|-----|-----|--|
| α  | (L < 20) | 1.5  |     |     |     |      |     |     |  |
|    | (L ≥ 20) | 2.0  |     |     |     |      |     |     |  |
| φD |          | 5    | 6.3 | 8   | 10  | 12.5 | 16  | 18  |  |
| P  |          | 2.0  | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |  |
| φd |          | 0.5  | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |  |

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

## Type numbering system (Example : 10V 47µF)



※ Configuration

| φ D        | Pb-free leadwire<br>Pb-free PET sleeve |
|------------|--|
| 5          | DD                                     |
| 6.3        | ED                                     |
| 8 · 10     | PD                                     |
| 12.5 to 18 | HD                                     |

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

● Dimension table in next page.

## ■ Dimensions

| Cap. (μF) | V<br>Code | 6.3       |      | 10        |      | 16        |      | 25        |      | 35        |        | 50        |        | 63        |          | 100       |                          |                 |
|-----------|-----------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|--------|-----------|--------|-----------|----------|-----------|--------------------------|-----------------|
|           |           | 0J        |      | 1A        |      | 1C        |      | 1E        |      | 1V        |        | 1H        |        | 1J        |          | 2A        |                          |                 |
| 0.47      | R47       |           |      |           |      |           |      |           |      |           |        | 5 × 11    | 11     |           |          | 5 × 11    | 14                       |                 |
| 1         | 010       |           |      |           |      |           |      |           |      |           |        | 5 × 11    | 17     |           |          | 5 × 11    | 21                       |                 |
| 2.2       | 2R2       |           |      |           |      |           |      |           |      |           |        | 5 × 11    | 25     |           |          | 6.3 × 11  | 34                       |                 |
| 3.3       | 3R3       |           |      |           |      |           |      |           |      |           |        | 5 × 11    | 27     | 5 × 11    | 28       | 6.3 × 11  | 39                       |                 |
| 4.7       | 4R7       |           |      |           |      |           |      |           |      |           | 5 × 11 | 34        | 5 × 11 | 34        | 6.3 × 11 | 34        | 6.3 × 11                 | 47              |
| 10        | 100       |           |      |           |      | 5 × 11    | 42   | 5 × 11    | 42   | 5 × 11    | 43     | 6.3 × 11  | 52     | 6.3 × 11  | 57       | 8 × 11.5  | 71                       |                 |
| 22        | 220       |           |      | 5 × 11    | 57   | 5 × 11    | 57   | 6.3 × 11  | 65   | 6.3 × 11  | 73     | 8 × 11.5  | 89     | 8 × 11.5  | 95       | 10 × 16   | 135                      |                 |
| 33        | 330       | 5 × 11    | 64   | 5 × 11    | 64   | 5 × 11    | 70   | 6.3 × 11  | 80   | 8 × 11.5  | 100    | 8 × 11.5  | 105    | 10 × 12.5 | 135      | 12.5 × 20 | 220                      |                 |
| 47        | 470       | 5 × 11    | 76   | 5 × 11    | 76   | 6.3 × 11  | 95   | 6.3 × 11  | 95   | 8 × 11.5  | 120    | 10 × 12.5 | 150    | 10 × 16   | 180      | 12.5 × 20 | 240                      |                 |
| 100       | 101       | 6.3 × 11  | 125  | 6.3 × 11  | 125  | 8 × 11.5  | 160  | 8 × 11.5  | 160  | 10 × 16   | 230    | 10 × 20   | 265    | 12.5 × 20 | 320      | 16 × 25   | 425                      |                 |
| 220       | 221       | 8 × 11.5  | 215  | 8 × 11.5  | 215  | 10 × 12.5 | 275  | 10 × 16   | 305  | 12.5 × 20 | 410    | 12.5 × 25 | 480    | 16 × 25   | 575      | 18 × 35.5 | 720                      |                 |
| 330       | 331       | 8 × 11.5  | 265  | 10 × 16   | 345  | 10 × 16   | 375  | 12.5 × 20 | 450  | 12.5 × 20 | 505    | 16 × 25   | 650    | 16 × 31.5 | 655      |           |                          |                 |
| 470       | 471       | 10 × 12.5 | 370  | 10 × 16   | 410  | 10 × 20   | 485  | 12.5 × 20 | 540  | 12.5 × 25 | 655    | 16 × 31.5 | 835    | 18 × 35.5 | 965      |           |                          |                 |
| 1000      | 102       | 10 × 20   | 650  | 12.5 × 20 | 720  | 12.5 × 25 | 855  | 16 × 25   | 950  | 16 × 31.5 | 1140   |           |        |           |          |           |                          |                 |
| 2200      | 222       | 12.5 × 25 | 1160 | 16 × 25   | 1280 | 16 × 31.5 | 1510 | 18 × 35.5 | 1620 |           |        |           |        |           |          |           |                          |                 |
| 3300      | 332       | 16 × 25   | 1570 | 16 × 31.5 | 1690 | 18 × 35.5 | 1980 |           |      |           |        |           |        |           |          |           |                          |                 |
| 4700      | 472       | 16 × 31.5 | 2020 | 18 × 35.5 | 2160 |           |      |           |      |           |        |           |        |           |          |           |                          |                 |
| 6800      | 682       | 18 × 35.5 | 2600 |           |      |           |      |           |      |           |        |           |        |           |          |           | Case size<br>φD × L (mm) | Rated<br>ripple |

Rated ripple current (mA<sub>rms</sub>) at 85°C 120Hz

## ● Frequency coefficient of rated ripple current

| Cap. (μF)    | Frequency | 50 Hz | 120 Hz | 300 Hz | 1 kHz | 10 kHz or more |
|--------------|-----------|-------|--------|--------|-------|----------------|
| 0.47 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 6800 |           | 0.85  | 1.00   | 1.10   | 1.13  | 1.15           |

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