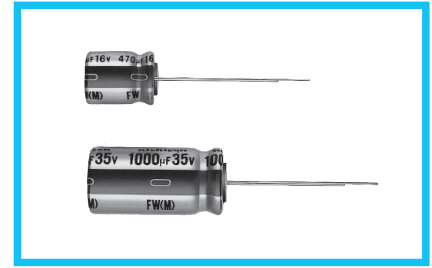
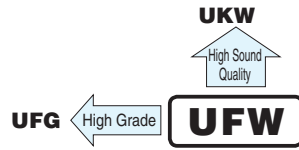


# UFW

Standard, For Audio Equipment



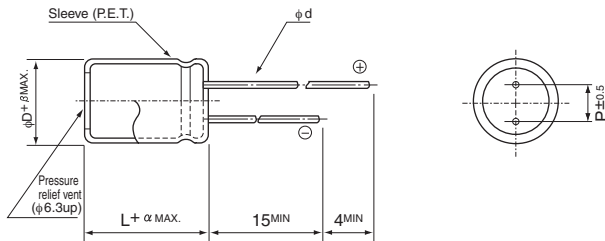
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

| Item                          | Performance Characteristics  |                    |  |       |   |                 |   |      |     |     |              |                 |                 |      |      |      |      |      |      |   |   |                 |                 |    |    |   |   |   |   |   |   |
|-------------------------------|--|--------------------|--|-------|---|-----------------|---|------|-----|-----|--------------|-----------------|-----------------|------|------|------|------|------|------|---|---|-----------------|-----------------|----|----|---|---|---|---|---|---|
| Category Temperature Range    | -40 to +85°C   |                    |  |       |   |                 |   |      |     |     |              |                 |                 |      |      |      |      |      |      |   |   |                 |                 |    |    |   |   |   |   |   |   |
| Rated Voltage Range           | 6.3 to 100V  |                    |  |       |   |                 |   |      |     |     |              |                 |                 |      |      |      |      |      |      |   |   |                 |                 |    |    |   |   |   |   |   |   |
| Rated Capacitance Range       | 0.1 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 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>0.28</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> <p>Measurement frequency : 120Hz at 20°C<br/>For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF.</p>  | 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 |   |   |                 |                 |    |    |   |   |   |   |   |   |
| 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 |     |     |              |                 |                 |      |      |      |      |      |      |   |   |                 |                 |    |    |   |   |   |   |   |   |
| Stability at Low Temperature  | <table border="1"> <tr> <td colspan="2">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</td> <td>Z-25°C / Z+20°C</td> <td>5</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT / Z20 (MAX.)</td> <td>Z-40°C / Z+20°C</td> <td>12</td> <td>10</td> <td>8</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table> <p>Measurement frequency : 120Hz</p> | Rated voltage (V)  |  | 6.3   | 10  | 16              | 25  | 35   | 50  | 63  | 100          | Impedance ratio | Z-25°C / Z+20°C | 5    | 4    | 3    | 2    | 2    | 2    | 2 | 2 | ZT / Z20 (MAX.) | Z-40°C / Z+20°C | 12 | 10 | 8 | 5 | 4 | 3 | 3 | 3 |
| Rated voltage (V)             |  | 6.3                | 10   | 16    | 25  | 35              | 50  | 63   | 100 |     |              |                 |                 |      |      |      |      |      |      |   |   |                 |                 |    |    |   |   |   |   |   |   |
| Impedance ratio               | Z-25°C / Z+20°C  | 5                  | 4  | 3     | 2   | 2               | 2   | 2    | 2   |     |              |                 |                 |      |      |      |      |      |      |   |   |                 |                 |    |    |   |   |   |   |   |   |
| ZT / Z20 (MAX.)               | Z-40°C / Z+20°C  | 12                 | 10   | 8     | 5   | 4               | 3   | 3    | 3   |     |              |                 |                 |      |      |      |      |      |      |   |   |                 |                 |    |    |   |   |   |   |   |   |
| Endurance                     | <p>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.</p> <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 black color letter on Gold sleeve.  |                    |  |       |   |                 |   |      |     |     |              |                 |                 |      |      |      |      |      |      |   |   |                 |                 |    |    |   |   |   |   |   |   |

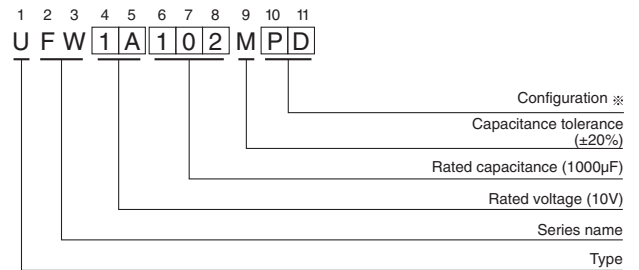
## Radial Lead Type



|    | (mm) |     |     |     |      |     |     |     |     |      |
|----|------|-----|-----|-----|------|-----|-----|-----|-----|------|
| φD | 5    | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 20  | 22  | 25   |
| P  | 2.0  | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 | 10  | 10  | 12.5 |
| φd | 0.5  | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 | 1.0 | 1.0 | 1.0  |
| β  | 0.5  | 0.5 | 0.5 | 0.5 | 0.5  | 0.5 | 0.5 | 0.5 | 1.0 | 1.0  |

|   |               |
|---|---------------|
| α | (φD < 20) 1.5 |
|   | (φD ≥ 20) 2.0 |

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



※ Configuration

| φ D        | Pb-free leadwire<br>Pb-free PET sleeve |
|------------|--|
| 5          | DD                                     |
| 6.3        | ED                                     |
| 8 · 10     | PD                                     |
| 12.5 to 18 | HD                                     |
| 20 to 25   | RD                                     |

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

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.

## UFW

### ■ Dimensions

| V         |      | 6.3       |      | 10        |      | 16        |      | 25        |      | 35        |      | 50        |      | 63        |      | 100       |                                      |
|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|--------------------------------------|
| Cap. (μF) | Code | 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 × L (mm)   Rated ripple |

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

### ● 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          |