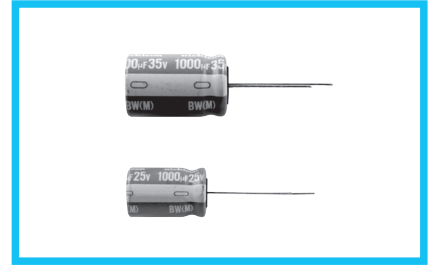
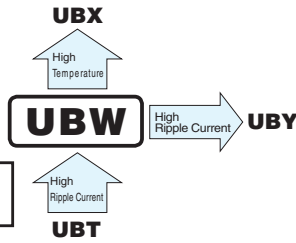


UBW

High Temperature Range, For +135°C Use



- Highly dependable reliability withstanding load life of 1000 to 3000 hours at +135°C.
- Suited for automobile electronics where heavy duty services are indispensable.
- Compliant to the RoHS directive (2011/65/EU).

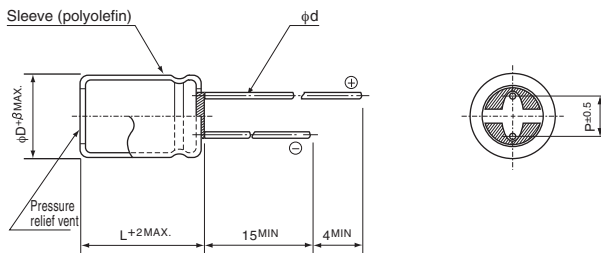


Values marked with an ※ in the dimension table are scheduled to be discontinued and are not recommended for new designs.

Specifications

| Item | Performance Characteristics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|--|--------------------|--|--------------------|---|-----------------|---|------|-------------|-------|-------------|--------------|-----------------|-----------------|------|------|------|------|------|------|---|---|--|-----------------|-----------------|---|---|---|---|---|---|---|---|
| Category Temperature Range | -55 to +135°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated Voltage Range | 10 to 100V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rated Capacitance Range | 1 to 4700µF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 0.03CV or 4 (µA), whichever is greater. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tangent of loss angle (tan δ) | <table border="1"> <tr> <th>Rated voltage (V)</th> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>80</td> <td>100</td> <td>120Hz, 20°C</td> </tr> <tr> <th>tan δ (MAX.)</th> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.08</td> <td>0.08</td> <td></td> </tr> </table> <p>For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF.</p> | Rated voltage (V) | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | 120Hz, 20°C | tan δ (MAX.) | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.10 | 0.08 | 0.08 | | | | | | | | | | | | | |
| Rated voltage (V) | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | 120Hz, 20°C | | | | | | | | | | | | | | | | | | | | | | | | |
| tan δ (MAX.) | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.10 | 0.08 | 0.08 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stability at Low Temperature | <table border="1"> <tr> <th colspan="2">Rated voltage (V)</th> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>80</td> <td>100</td> <td>120Hz</td> </tr> <tr> <th rowspan="2">Impedance ratio</th> <th>Z-25°C / Z+20°C</th> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td></td> </tr> <tr> <th>ZT / Z20 (MAX.)</th> <td>Z-40°C / Z+20°C</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> </tr> </table> | Rated voltage (V) | | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | 120Hz | Impedance ratio | Z-25°C / Z+20°C | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | ZT / Z20 (MAX.) | Z-40°C / Z+20°C | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Rated voltage (V) | | 10 | 16 | 25 | 35 | 50 | 63 | 80 | 100 | 120Hz | | | | | | | | | | | | | | | | | | | | | | | |
| Impedance ratio | Z-25°C / Z+20°C | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | |
| | ZT / Z20 (MAX.) | Z-40°C / Z+20°C | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | | | | | | | | | | | | | | |
| Endurance | <p>The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 3000 hours (1000 hours for φD=8, 2000 hours for φD=10) at 135°C, the peak voltage shall not exceed the rated voltage.</p> <table border="1"> <tr> <td>Capacitance change</td> <td>Within ±30% of the initial capacitance value</td> </tr> <tr> <td>Dissipation Factor</td> <td>300% 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 ±30% of the initial capacitance value | Dissipation Factor | 300% or less than the initial specified value | Leakage current | Less than or equal to the initial specified value | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance change | Within ±30% of the initial capacitance value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dissipation Factor | 300% 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 135°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 blue sleeve. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Radial Lead Type

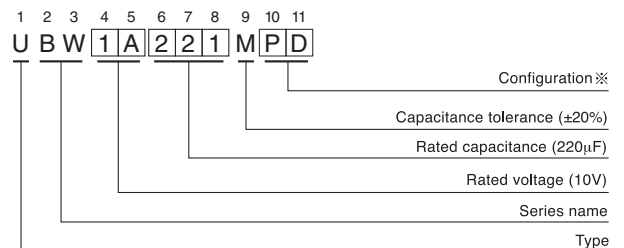


| | (mm) | | | |
|----|------|-----|------------------|-----|
| φD | 8 | 10 | 12.5 | 16 |
| β | 0.8 | 0.8 | 1.0 | 1.0 |
| P | 3.5 | 5.0 | 5.0 | 7.5 |
| φd | 0.8 | 0.6 | 0.6 [※] | 0.8 |

※ In case L > 25 for the φ12.5 dia. unit, lead dia. φ d = 0.8mm.

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

Type numbering system (Example : 10V 220µF)



※ Configuration

| φ D | Pb-free leadwire Pb-free Polyolefin sleeve |
|-----------|---|
| 8, 10 | PD |
| 12.5 · 16 | 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

| V(Code) | | 10 (1A) | | | 16 (1C) | | | 25 (1E) | | | 35 (1V) | | |
|-----------|-----------|-----------------------|--------------------|----------------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|----------------------|
| Cap. (μF) | Item Code | Case size φD × L (mm) | Impedance (Ω) MAX. | Rated ripple (mArms) | Case size φD × L (mm) | Impedance (Ω) MAX. | Rated ripple (mArms) | Case size φD × L (mm) | Impedance (Ω) MAX. | Rated ripple (mArms) | Case size φD × L (mm) | Impedance (Ω) MAX. | Rated ripple (mArms) |
| 100 | 101 | | | | 8 × 11.5 | 0.32 | 340 | 8 × 11.5 | 0.13 | 500 | 10 × 12.5 | 0.15 | 620 |
| 220 | 221 | 8 × 11.5 | 0.26 | 340 | 10 × 12.5 | 0.15 | 620 | 10 × 12.5 | 0.10 | 680 | 10 × 16 | 0.094 | 790 |
| 330 | 331 | 10 × 12.5 | 0.15 | 620 | 10 × 12.5 | 0.10 | 680 | 10 × 16 | 0.075 | 945 | 10 × 20 | 0.075 | 950 |
| 470 | 471 | 10 × 12.5 | 0.10 | 680 | 10 × 16 | 0.075 | 945 | 10 × 20 | 0.057 | 1100 | 12.5 × 20 | 0.058 | 1330 |
| 1000 | 102 | 10 × 20 | 0.057 | 1100 | 12.5 × 20 | 0.042 | 1490 | 12.5 × 25 | 0.033 | 1750 | 16 × 25 | 0.031 | 2010 |
| 2200 | 222 | 12.5 × 25 | 0.033 | 1750 | 16 × 25 | 0.024 | 2300 | 16 × 31.5 | 0.020 | 2710 | | | |
| 3300 | 332 | 16 × 25 | 0.024 | 2300 | 16 × 31.5 | 0.020 | 2710 | | | | | | |
| 4700 | 472 | 16 × 31.5 | 0.020 | 2710 | | | | | | | | | |

| V(Code) | | 50 (1H) | | | 63 (1J) | | | 80 (1K) | | | 100 (2A) | | |
|-----------|-----------|-----------------------|--------------------|----------------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|----------------------|-----------------------|--------------------|----------------------|
| Cap. (μF) | Item Code | Case size φD × L (mm) | Impedance (Ω) MAX. | Rated ripple (mArms) | Case size φD × L (mm) | Impedance (Ω) MAX. | Rated ripple (mArms) | Case size φD × L (mm) | Impedance (Ω) MAX. | Rated ripple (mArms) | Case size φD × L (mm) | Impedance (Ω) MAX. | Rated ripple (mArms) |
| 1 | 010 | *8 × 11.5 | 2.00 | 35 | | | | | | | | | |
| 2.2 | 2R2 | *8 × 11.5 | 1.80 | 50 | | | | | | | | | |
| 3.3 | 3R3 | *8 × 11.5 | 1.50 | 60 | | | | | | | | | |
| 4.7 | 4R7 | 8 × 11.5 | 1.15 | 85 | | | | | | | *8 × 11.5 | 2.00 | 130 |
| 10 | 100 | 8 × 11.5 | 0.75 | 180 | | | | | | | 8 × 11.5 | 1.50 | 150 |
| 22 | 220 | 8 × 11.5 | 0.50 | 250 | 8 × 11.5 | 2.00 | 130 | 8 × 11.5 | 1.50 | 150 | 10 × 12.5 | 0.80 | 480 |
| 33 | 330 | 8 × 11.5 | 0.45 | 300 | 8 × 11.5 | 1.50 | 150 | 10 × 12.5 | 0.80 | 480 | 10 × 12.5 | 0.80 | 480 |
| 47 | 470 | 8 × 11.5 | 0.35 | 440 | 10 × 12.5 | 0.59 | 530 | 10 × 12.5 | 0.80 | 480 | 10 × 16 | 0.55 | 630 |
| 100 | 101 | 10 × 12.5 | 0.18 | 555 | 10 × 16 | 0.41 | 690 | 10 × 20 | 0.39 | 790 | 12.5 × 20 | 0.25 | 990 |
| 220 | 221 | 10 × 20 | 0.098 | 930 | 12.5 × 20 | 0.16 | 1050 | 12.5 × 25 | 0.18 | 1240 | 16 × 25 | 0.11 | 1500 |
| 330 | 331 | 12.5 × 20 | 0.070 | 1330 | 12.5 × 25 | 0.12 | 1290 | 12.5 × 31.5 | 0.16 | 1390 | 16 × 31.5 | 0.079 | 1790 |
| 470 | 471 | 12.5 × 25 | 0.055 | 1650 | 12.5 × 31.5 | 0.097 | 1460 | 16 × 25 | 0.11 | 1500 | | | |
| 1000 | 102 | 16 × 31.5 | 0.031 | 2430 | 16 × 31.5 | 0.055 | 1900 | | | | | | |

Rated ripple current (mArms) at 135°C 100kHz
Impedance (Ω) MAX. at 20°C 100kHz

● Frequency coefficient of rated ripple current

| CV | Frequency | 120Hz | 300Hz | 1kHz | 10kHz or more |
|-----------|-----------|-------|-------|------|---------------|
| 1000 > CV | | 0.50 | 0.64 | 0.83 | 1.00 |
| 1000 ≤ CV | | 0.67 | 0.79 | 0.91 | 1.00 |