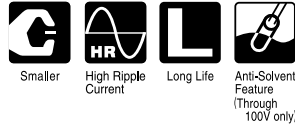


ALUMINUM ELECTROLYTIC CAPACITORS

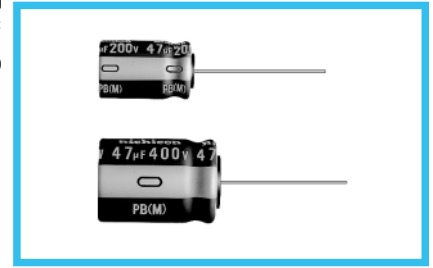
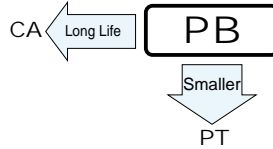


PB series Miniature Sized, High Ripple Current High Reliability



- High ripple current load life of 5000 / 7000 hours at +105°C.
- Suited for ballast application.
- Compliant to the RoHS directive (2002/95/EC).

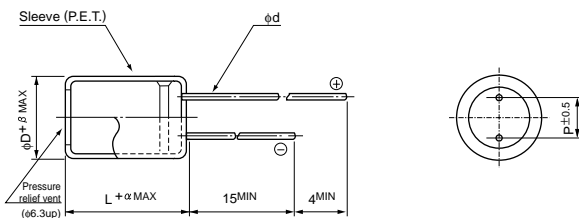
Products which are scheduled to be discontinued. Not recommended for new designs



Specifications

| Item | Performance Characteristics | | | | | | | | | | | |
|-------------------------------|---|--|----|----|----|----|-----|-----|-----|-----|-----|-----|
| Category Temperature Range | -40 to +105°C (10 to 50V), -25 to +105°C (160 to 450V) | | | | | | | | | | | |
| Rated Voltage Range | 10 to 450V | | | | | | | | | | | |
| Rated Capacitance Range | 0.47 to 3300µF | | | | | | | | | | | |
| Capacitance Tolerance | ±20% at 120Hz, 20°C | | | | | | | | | | | |
| Leakage Current | Rated Voltage (V) | 10 to 50V 160 to 450V | | | | | | | | | | |
| | | After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (µA), whichever is greater. | | | | | | | | | | |
| Tangent of loss angle (tan δ) | Measurement frequency : 120Hz at 20°C | | | | | | | | | | | |
| | Rated voltage (V) | 10 | 16 | 25 | 35 | 50 | 160 | 200 | 250 | 350 | 400 | 450 |
| Stability at Low Temperature | Measurement frequency : 120Hz | | | | | | | | | | | |
| | Rated voltage (V) | 10 | 16 | 25 | 35 | 50 | 160 | 200 | 250 | 350 | 400 | 450 |
| Endurance | 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 5000 hours (7000 hours for φD=10 and 12.5 (10 to 50V)) at 105°C, the peak voltage shall not exceed the rated voltage. | | | | | | | | | | | |
| | Capacitance change | Within ±30% of the initial capacitance value (10 to 50V) Within ±20% of the initial capacitance value (160 to 450V) | | | | | | | | | | |
| | tan δ | 300% or less than the initial specified value (10 to 50V) 200% or less than the initial specified value (160 to 450V) | | | | | | | | | | |
| 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. | | | | | | | | | | | |
| | Leakage current | | | | | | | | | | | |
| Marking | Printed with white color letter on dark brown sleeve. | | | | | | | | | | | |

Radial Lead Type

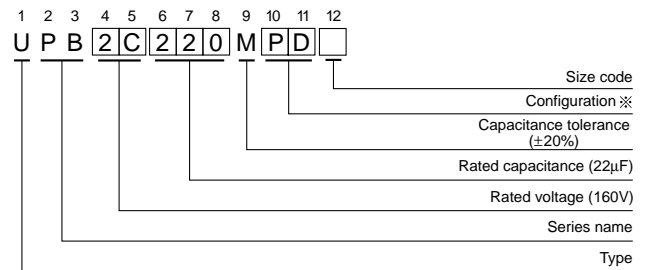


| | (mm) | | | | | | | | |
|----|------|-----|-----|-----|------|-----|-----|------|------|
| φD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 | 22 | 25 |
| P | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 | 10.0 | 12.5 |
| φd | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 | 1.0 | 1.0 |
| β | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 1.0 | 1.0 |

| | |
|---|---------------|
| α | (φD ≤ 18) 1.5 |
| | (φD ≥ 22) 2.0 |

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

Type numbering system (Example : 160V 22µF)



※ Configuration

| φ D | Pb-free leadwire Pb-free PET sleeve |
|------------|--|
| 5 | DD |
| 6.3 | ED |
| 8 · 10 | PD |
| 12.5 to 18 | HD |
| 22 · 25 | RD |

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) | Code | V | | 10 | | 16 | | 25 | | 35 | | 50 | |
|----------|------|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
| | | 1A | | 1C | | 1E | | 1V | | 1H | | | |
| 0.47 | R47 | | | | | | | | | | | 5×11 | 5 |
| 1 | 010 | | | | | | | | | | | 5×11 | 10 |
| 2.2 | 2R2 | | | | | | | | | | | 5×11 | 15 |
| 3.3 | 3R3 | | | | | | | | | | | 5×11 | 20 |
| 4.7 | 4R7 | | | | | | | | | | | 5×11 | 25 |
| 10 | 100 | | | | | | | | | | | 5×11 | 30 |
| 22 | 220 | | | | | | | | | | | 5×11 | 40 |
| 33 | 330 | | | | | | | | | 5×11 | 50 | 6.3×11 | 55 |
| 47 | 470 | | | | | | | 5×11 | 55 | 6.3×11 | 60 | 6.3×11 | 65 |
| 100 | 101 | 5×11 | 70 | 6.3×11 | 85 | 6.3×11 | 95 | 8×11.5 | 100 | 8×11.5 | 100 | 8×11.5 | 100 |
| 220 | 221 | 6.3×11 | 100 | 8×11.5 | 130 | 8×11.5 | 195 | 10×12.5 | 200 | 10×12.5 | 200 | 10×16 | 235 |
| 330 | 331 | 8×11.5 | 150 | 8×11.5 | 195 | 10×12.5 | 255 | 10×16 | 280 | 10×16 | 280 | 10×20 | 295 |
| 470 | 471 | 8×11.5 | 180 | 10×12.5 | 270 | 10×16 | 325 | 10×20 | 350 | 10×20 | 350 | 12.5×20 | 370 |
| 1000 | 102 | 10×16 | 350 | 10×20 | 430 | 12.5×20 | 500 | 12.5×25 | 570 | | | | |
| 2200 | 222 | 12.5×20 | 550 | 12.5×25 | 710 | | | | | | | | |
| 3300 | 332 | 12.5×25 | 810 | | | | | | | | | | |

Case size φD×L(mm) | Rated ripple

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

| Cap.(μF) | Code | V | | 160 | | 200 | | 250 | | 350 | | 400 | | 450 | |
|----------|------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|-------------|---------|-------------|---------|-------------|
| | | 2C | | 2D | | 2E | | 2V | | 2G | | 2W | | | |
| 10 | 100 | | | | | | | | | 10×20 | 125 250 | 10×20 | 125 250 | 12.5×20 | 150 300 |
| 22 | 220 | 10×20 | 250 500 | 10×20 | 250 500 | 12.5×20 | 300 600 | 12.5×20 | 175 350 | 12.5×20 | 200 400 | 12.5×25 | 300 600 | 16×25 | 275 550 |
| 33 | 330 | 10×20 | 250 500 | 12.5×20 | 300 600 | 12.5×20 | 300 600 | 16×20 | 250 500 | 16×20 | 300 600 | 16×25 | 300 600 | 18×25 | 350 700 |
| 47 | 470 | 12.5×20 | 300 600 | 12.5×20 | 300 600 | 12.5×25 | 350 700 | 16×25 | 325 650 | 16×25 | 375 750 | 18×25 | 375 750 | 18×31.5 | 425 850 |
| 56 | 560 | | | | | | | | | | | | | 18×35.5 | 475 950 |
| 68 | 680 | 12.5×25 | 375 750 | 12.5×25 | 375 750 | 16×25 | 500 1000 | 18×25 | 400 800 | 18×25 | 450 900 | 18×31.5 | 500 1000 | 18×40 | 500 1000 |
| 82 | 820 | | | | | | | | | | | 18×35.5 | 500 1000 | 22×40 | 550 1100 |
| 100 | 101 | 16×25 | 550 1100 | 16×25 | 550 1100 | 18×25 | 600 1200 | 18×31.5 | 500 1000 | 18×31.5 | 550 1100 | 18×40 | 550 1100 | | |
| 120 | 121 | | | | | | | | | 18×35.5 | 575 1150 | 22×40 | 600 1200 | 22×50 | 700 |
| 150 | 151 | 18×25 | 650 1300 | 18×25 | 650 1300 | 18×31.5 | 750 1500 | 18×40 | 650 1300 | | | | | ▲25×40 | 800 1600 |
| 180 | 181 | | | | | 18×35.5 | 850 1700 | 22×40 | 750 1500 | 22×40 | 800 1600 | ▲25×40 | 800 1600 | | |
| 220 | 221 | | | 18×31.5 | 850 1700 | 18×40 | 950 1900 | | | | | 25×50 | 900 1800 | | |
| 270 | 271 | | | 18×31.5 | 950 1900 | 22×40 | 1050 2100 | ▲25×40 | 950 1900 | | | | | | |
| 330 | 331 | 18×31.5 | 850 1700 | 18×40 | 1050 2100 | | | 25×50 | 1050 2100 | | | | | | |
| 390 | 391 | 18×35.5 | 950 1900 | 22×40 | 1150 2300 | ▲25×40 | 1150 2300 | | | | | | | | |
| 470 | 471 | 18×40 | 1050 2100 | | | 25×50 | 1400 2800 | | | | | | | | |
| 560 | 561 | 22×40 | 1150 2300 | ▲25×40 | 1350 2700 | | | | | | | | | | |
| 680 | 681 | ▲25×40 | 1350 2700 | 25×50 | 1500 3000 | | | | | | | | | | |
| 820 | 821 | 25×50 | 1500 3000 | | | | | | | | | | | | |

Case size φD×L(mm) | Rated ripple ●

●Frequency coefficient of rated ripple current

| V | Cap.(μF) | Frequency | | | | | | |
|------------|--------------|-----------|-------|-------|------|--------------|----------------|--|
| | | 50Hz | 120Hz | 300Hz | 1kHz | 10k to 50kHz | 100kHz or more | |
| 10 to 50 | 0.47 to 10 | 0.75 | 1.00 | 1.20 | 1.40 | 1.55 | 1.65 | |
| | 22 to 470 | 0.85 | 1.00 | 1.10 | 1.20 | 1.25 | 1.30 | |
| | 1000 to 3300 | 0.95 | 1.00 | 1.03 | 1.05 | 1.10 | 1.15 | |
| 160 to 450 | 10 to 820 | 0.60 | 1.00 | 1.20 | 1.60 | 1.80 | 2.00 | |

●: Rated ripple current (mArms) at 105°C 120Hz
 ▲: Rated ripple current (mArms) at 105°C 100kHz
 ▲: In this case, ⑥ will be put at 12th digit of type numbering system.