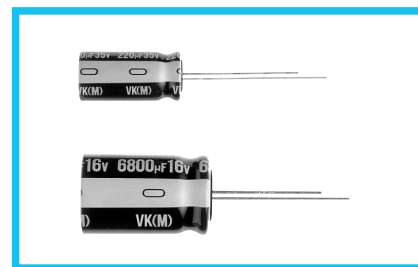
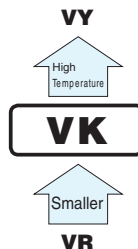


VK Miniature Sized series



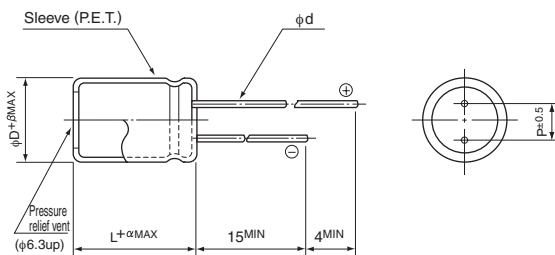
- One rank smaller case sizes than VR series.
- Compliant to the RoHS directive (2011/65/EU).



Specifications

| Item | Performance Characteristics | |
|-------------------------------|--|---|
| Category Temperature Range | -40 to +85°C (6.3V to 400V), -25°C to +85°C (450V) | |
| Rated Voltage Range | 6.3 to 450V | |
| Rated Capacitance Range | 0.1 to 68000μF | |
| Capacitance Tolerance | ±20% at 120Hz, 20°C | |
| Leakage Current | Rated voltage (V) | 6.3 to 100V |
| | | 160 to 450V |
| Tangent of loss angle (tan δ) | For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. | |
| | Rated voltage (V) | 6.3 10 16 25 35 50 63 100 160 to 250 350 to 450 |
| Stability at Low Temperature | Measurement frequency : 120Hz | |
| | Rated voltage (V) | 6.3 10 16 25 35 50 to 100 160 to 200 250 to 350 400 450 |
| 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 |
| 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. | |
| | tan δ | 200% or less than the initial specified value |
| Marking | Printed with white color letter on black sleeve. | |
| | Leakage current | Less than or equal to the initial specified value |

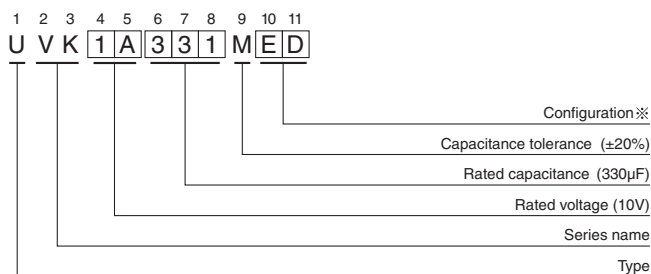
Radial Lead Type



| | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 | 20 | 22 | 25 |
|----|-----|-----|-----|-----|------|-----|-----|------|------|------|
| 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 | 10.0 | 10.0 | 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 | (L < 20) | 1.5 |
| | (L ≥ 20) | 2.0 |

Type numbering system (Example : 10V 330μF)



| ※ Configuration | |
|-----------------|--|
| φ D | Pb-free leadwire 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.



■ Dimensions

| Cap.(μ F) | Code | V | | 6.3 | | 10 | | 16 | | 25 | | 35 | | 50 | | 63 | | |
|----------------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|----------|--------------------------------|-----------------|
| | | OJ | | 1A | | 1C | | 1E | | 1V | | 1H | | 1J | | | | |
| 0.1 | 0R1 | | | | | | | | | | | | | 5 × 11 | 1.3 | | | |
| 0.22 | R22 | | | | | | | | | | | | | 5 × 11 | 2.9 | | | |
| 0.33 | R33 | | | | | | | | | | | | | 5 × 11 | 4.3 | | | |
| 0.47 | R47 | | | | | | | | | | | | | 5 × 11 | 6.2 | | | |
| 1 | 010 | | | | | | | | | | | | | 5 × 11 | 17 | | | |
| 2.2 | 2R2 | | | | | | | | | | | | | 5 × 11 | 28 | | | |
| 3.3 | 3R3 | | | | | | | | | | | | | 5 × 11 | 35 | | | |
| 4.7 | 4R7 | | | | | | | | | | | | | 5 × 11 | 40 | | | |
| 10 | 100 | | | | | | | | | | | | | 5 × 11 | 60 | | | |
| 22 | 220 | | | | | | | | | | | | | 5 × 11 | 95 | 5 × 11 | 100 | |
| 33 | 330 | | | | | | | | | | | | | 5 × 11 | 125 | 6.3 × 11 | 140 | |
| 47 | 470 | | | | | | | | | | | 5 × 11 | 130 | 6.3 × 11 | 155 | 6.3 × 11 | 170 | |
| 68 | 680 | | | | | | | | | | | 6.3 × 11 | 160 | 6.3 × 11 | 210 | 8 × 11.5 | 220 | |
| 100 | 101 | | | | | | | | | 5 × 11 | 180 | 6.3 × 11 | 210 | 8 × 11.5 | 260 | 8 × 11.5 | 280 | |
| 220 | 221 | | | 5 × 11 | 220 | 6.3 × 11 | 260 | 6.3 × 11 | 280 | 8 × 11.5 | 350 | 10 × 12.5 | 430 | 10 × 16 | 490 | | | |
| 330 | 331 | | | 6.3 × 11 | 290 | 6.3 × 11 | 320 | 8 × 11.5 | 390 | 10 × 12.5 | 490 | 10 × 16 | 590 | 10 × 20 | 710 | | | |
| 470 | 471 | | | 6.3 × 11 | 350 | 8 × 11.5 | 440 | 10 × 12.5 | 550 | 10 × 16 | 650 | 10 × 20 | 760 | 12.5 × 20 | 900 | | | |
| 1000 | 102 | 8 × 11.5 | 540 | 10 × 12.5 | 650 | 10 × 12.5 | 700 | 10 × 16 | 860 | 12.5 × 20 | 1150 | 12.5 × 25 | 1350 | 16 × 25 | 1300 | | | |
| 2200 | 222 | 10 × 16 | 890 | 10 × 16 | 990 | 10 × 20 | 1000 | 12.5 × 25 | 1550 | 16 × 25 | 1800 | 16 × 31.5 | 1980 | 18 × 35.5 | 2300 | | | |
| 3300 | 332 | 10 × 20 | 1190 | 12.5 × 20 | 1450 | 12.5 × 25 | 1700 | 16 × 25 | 1980 | 16 × 31.5 | 2100 | 18 × 35.5 | 2500 | 20 × 40 | 2700 | | | |
| 4700 | 472 | 12.5 × 20 | 1550 | 12.5 × 25 | 1800 | 16 × 25 | 2100 | 16 × 25 | 2200 | 16 × 35.5 | 2500 | 20 × 40 | 2900 | 22 × 50 | 3400 | | | |
| 6800 | 682 | 12.5 × 25 | 1920 | 16 × 25 | 2250 | 16 × 25 | 2250 | 16 × 35.5 | 2600 | 18 × 40 | 2800 | 22 × 50 | 3500 | 25 × 50 | 3900 | | | |
| 10000 | 103 | 16 × 25 | 2350 | 16 × 31.5 | 2550 | 16 × 35.5 | 2710 | 18 × 40 | 2800 | 22 × 50 | 3700 | 25 × 50 | 4000 | | | | | |
| 15000 | 153 | 16 × 31.5 | 2550 | 16 × 35.5 | 2880 | 18 × 40 | 3100 | 22 × 50 | 3800 | 25 × 50 | 4300 | | | | | | | |
| 22000 | 223 | 18 × 35.5 | 3200 | 18 × 40 | 3400 | 22 × 40 | 3800 | 25 × 50 | 4500 | | | | | | | | | |
| 33000 | 333 | 20 × 40 | 3500 | 22 × 50 | 4500 | 25 × 50 | 4800 | | | | | | | | | | | |
| 47000 | 473 | 22 × 50 | 3900 | 25 × 50 | 5000 | | | | | | | | | | | | | |
| 68000 | 683 | 25 × 50 | 4300 | | | | | | | | | | | | | | Case size ϕ D × L (mm) | Rated ripple |

| Cap.(μ F) | Code | V | | 100 | | 160 | | 200 | | 250 | | 350 | | 400 | | 450 | | |
|----------------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|-----|-----------|-----|-----|--------------------------------|-----------------|
| | | 2A | | 2C | | 2D | | 2E | | 2V | | 2G | | 2W | | | | |
| 0.1 | 0R1 | 5 × 11 | 2.1 | | | 6.3 × 11 | 2.1 | | | | | | | | | | | |
| 0.22 | R22 | 5 × 11 | 4.7 | | | 6.3 × 11 | 4.7 | | | | | | | | | | | |
| 0.33 | R33 | 5 × 11 | 7 | | | 6.3 × 11 | 7 | | | | | | | | | | | |
| 0.47 | R47 | 5 × 11 | 10 | | | 6.3 × 11 | 15 | | | | | | | 6.3 × 11 | 12 | | | |
| 1 | 010 | 5 × 11 | 21 | | | 6.3 × 11 | 22 | | | | | | | 6.3 × 11 | 20 | | | |
| 2.2 | 2R2 | 5 × 11 | 30 | | | 6.3 × 11 | 33 | | | 6.3 × 11 | 30 | 8 × 11.5 | 38 | 8 × 11.5 | 28 | | | |
| 3.3 | 3R3 | 5 × 11 | 40 | | | 6.3 × 11 | 40 | 6.3 × 11 | 40 | 8 × 11.5 | 43 | 8 × 11.5 | 48 | 10 × 12.5 | 40 | | | |
| 4.7 | 4R7 | 5 × 11 | 45 | | | 6.3 × 11 | 50 | 6.3 × 11 | 50 | 8 × 11.5 | 55 | 10 × 12.5 | 60 | 10 × 12.5 | 46 | | | |
| 10 | 100 | 5 × 11 | 70 | 8 × 11.5 | 80 | 8 × 11.5 | 80 | 10 × 12.5 | 100 | 10 × 12.5 | 90 | 10 × 16 | 90 | 10 × 20 | 80 | | | |
| 22 | 220 | 6.3 × 11 | 130 | 10 × 12.5 | 130 | 10 × 16 | 150 | 10 × 20 | 150 | 12.5 × 20 | 150 | 12.5 × 25 | 200 | 12.5 × 25 | 140 | | | |
| 33 | 330 | 8 × 11.5 | 180 | 10 × 16 | 180 | 10 × 20 | 200 | 10 × 20 | 200 | 12.5 × 25 | 240 | 16 × 25 | 240 | 16 × 25 | 180 | | | |
| 47 | 470 | 8 × 11.5 | 200 | 10 × 20 | 210 | 12.5 × 20 | 270 | 12.5 × 20 | 270 | 16 × 25 | 300 | 16 × 25 | 280 | 16 × 31.5 | 220 | | | |
| 68 | 680 | 10 × 12.5 | 270 | 12.5 × 20 | 350 | 12.5 × 25 | 350 | 16 × 25 | 380 | 16 × 25 | 400 | 16 × 31.5 | 340 | 18 × 35.5 | 260 | | | |
| 100 | 101 | 10 × 16 | 340 | 12.5 × 25 | 430 | 16 × 25 | 450 | 16 × 25 | 440 | 18 × 35.5 | 520 | 18 × 35.5 | 440 | 18 × 40 | 280 | | | |
| 220 | 221 | 12.5 × 20 | 550 | 16 × 31.5 | 580 | 16 × 35.5 | 700 | 18 × 35.5 | 680 | 22 × 50 | 760 | 22 × 50 | 650 | 25 × 50 | 350 | | | |
| 330 | 331 | 12.5 × 25 | 760 | 18 × 35.5 | 800 | 18 × 40 | 950 | 20 × 40 | 1000 | 25 × 50 | 1000 | | | | | | | |
| 470 | 471 | 16 × 25 | 1000 | 18 × 40 | 1200 | 22 × 40 | 1300 | 22 × 50 | 1400 | | | | | | | | | |
| 1000 | 102 | 18 × 35.5 | 1350 | 25 × 50 | 1900 | | | | | | | | | | | | | |
| 2200 | 222 | 22 × 50 | 2400 | | | | | | | | | | | | | | | |
| 3300 | 332 | 25 × 50 | 2900 | | | | | | | | | | | | | | Case size ϕ D × L (mm) | Rated ripple |

Rated ripple current (mArms) at 85°C 120Hz

● Frequency coefficient of rated ripple current

| V | Cap.(μ F) | Frequency | | | | |
|------------|----------------|-----------|-------|-------|-------|---------------|
| | | 50Hz | 120Hz | 300Hz | 1 kHz | 10kHz or more |
| 6.3 to 100 | 0.1 to 68 | 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 68000 | 0.85 | 1.00 | 1.10 | 1.13 | 1.15 |
| 160 to 450 | 0.1 to 220 | 0.80 | 1.00 | 1.25 | 1.40 | 1.60 |
| | 330 to 1000 | 0.90 | 1.00 | 1.10 | 1.13 | 1.15 |