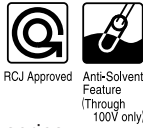
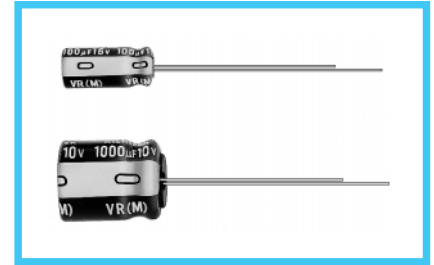
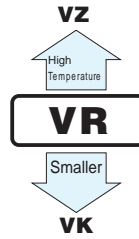


**VR** Miniature Sized series



Approved by Reliability Center for Electronic Component, Japan-Certification No. RCJ-03-22C

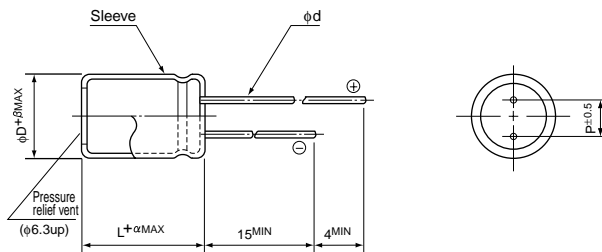
■ One rank smaller case sizes than VX series.



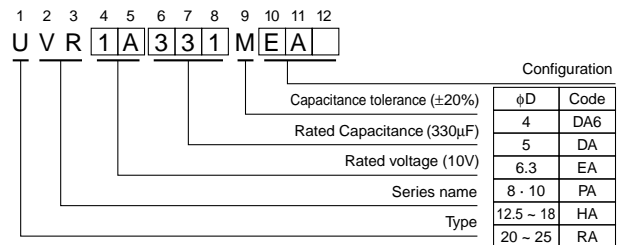
## Specifications

| Item                         | Performance Characteristics   |   |   |    |    |    |    |    |    |     |           |
|------------------------------|---|---|---|----|----|----|----|----|----|-----|-----------|
| Category Temperature Range   | -40 ~ +85°C (6.3V ~ 400V), -25°C ~ +85°C (450V)   |   |   |    |    |    |    |    |    |     |           |
| Rated Voltage Range          | 6.3 ~ 450V  |   |   |    |    |    |    |    |    |     |           |
| Rated Capacitance Range      | 0.1 ~ 33000µF   |   |   |    |    |    |    |    |    |     |           |
| Capacitance Tolerance        | ±20% at 120Hz, 20°C   |   |   |    |    |    |    |    |    |     |           |
| Leakage Current              | Rated voltage (V)   | 6.3 ~ 100V  |   |    |    |    |    |    |    |     |           |
|                              |   | <p>After 1 minute's application of rated voltage, leakage current is not more than 0.03CV or 4 (µA), whichever is greater.</p> <p>After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3 (µA), whichever is greater.</p> |   |    |    |    |    |    |    |     |           |
| tan δ                        | Rated voltage (V)   | 160 ~ 450V  |   |    |    |    |    |    |    |     |           |
|                              |   | <p>After 1 minute's application of rated voltage, CV ≤ 1000 : I = 0.1CV+40µA or less</p> <p>After 1 minute's application of rated voltage, CV &gt; 1000 : I = 0.04CV+100 (µA) or less</p>   |   |    |    |    |    |    |    |     |           |
| Stability at Low Temperature | For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF. Measurement frequency : 120Hz, Temperature : 20°C |   |   |    |    |    |    |    |    |     |           |
|                              | tan δ (MAX.)  |   | 6.3                                     | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 ~ 315 |
| Endurance                    | After 2000 hours' application of rated voltage at 85°C, capacitors meet the characteristic requirements listed at right.      |   |   |    |    |    |    |    |    |     |           |
|                              | Capacitance change  |   | Within ±20% of initial value            |    |    |    |    |    |    |     |           |
| Shelf Life                   | tan δ   |   | 200% or less of initial specified value |    |    |    |    |    |    |     |           |
|                              | Leakage current   |   | Initial specified value or less         |    |    |    |    |    |    |     |           |
| Marking                      | Printed with white color letter on black sleeve.  |   |   |    |    |    |    |    |    |     |           |

## Radial Lead Type



## Type numbering system (Example : 10V 330µF)



| φD | 4    | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 20   | 22   | 25   |
|----|------|-----|-----|-----|-----|------|-----|-----|------|------|------|
| P  | 1.5  | 2.0 | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 | 10.0 | 10.0 | 12.5 |
| φd | 0.45 | 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 | 0.5  | 1.0  | 1.0  |

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

Please refer to page 18, 19, 20 about the formed or taped product spec.  
Please refer to page 3 for the minimum order quantity.



## ■ Dimensions

| V<br>Cap.(μF)<br>Code | 6.3 |         | 10   |         | 16   |         | 25   |         | 35   |         | 50   |         | 63   |         | 100  |           | D×L (mm)     |
|-----------------------|-----|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|-----------|--------------|
|                       | 0J  |         | 1A   |         | 1C   |         | 1E   |         | 1V   |         | 1H   |         | 1J   |         | 2A   |           |              |
| 0.1                   | OR1 |         |      |         |      |         |      |         |      |         |      | • 5×11  | 13   |         |      | 5×11      | 21           |
| 0.22                  | R22 |         |      |         |      |         |      |         |      |         |      | • 5×11  | 29   |         |      | 5×11      | 47           |
| 0.33                  | R33 |         |      |         |      |         |      |         |      |         |      | • 5×11  | 43   |         |      | 5×11      | 7            |
| 0.47                  | R47 |         |      |         |      |         |      |         |      |         |      | • 5×11  | 62   |         |      | 5×11      | 10           |
| 1                     | 010 |         |      |         |      |         |      |         |      |         |      | • 5×11  | 17   |         |      | 5×11      | 21           |
| 2.2                   | 2R2 |         |      |         |      |         |      |         |      |         |      | • 5×11  | 28   |         |      | 5×11      | 30           |
| 3.3                   | 3R3 |         |      |         |      |         |      |         |      |         |      | • 5×11  | 35   |         |      | 5×11      | 40           |
| 4.7                   | 4R7 |         |      |         |      |         |      | • 5×11  | 35   | • 5×11  | 40   | • 5×11  | 40   |         |      | 5×11      | 45           |
| 10                    | 100 |         |      |         |      | • 5×11  | 50   | • 5×11  | 55   | • 5×11  | 60   | • 5×11  | 60   | 5×11    | 65   | 6.3×11    | 75           |
| 22                    | 220 | • 5×11  | 65   | • 5×11  | 65   | • 5×11  | 75   | • 5×11  | 80   | • 5×11  | 90   | • 5×11  | 95   | 5×11    | 100  | 6.3×11    | 130          |
| 33                    | 330 | • 5×11  | 80   | • 5×11  | 85   | • 5×11  | 90   | • 5×11  | 95   | 5×11    | 105  | 5×11    | 125  | 6.3×11  | 140  | 8×11.5    | 180          |
| 47                    | 470 | • 5×11  | 95   | • 5×11  | 100  | • 5×11  | 110  | • 5×11  | 115  | 5×11    | 130  | 6.3×11  | 155  | 6.3×11  | 170  | 10×12.5   | 230          |
| 100                   | 101 | • 5×11  | 135  | • 5×11  | 145  | 5×11    | 160  | 6.3×11  | 190  | 6.3×11  | 210  | 8×11.5  | 260  | 10×12.5 | 300  | 10×20     | 370          |
| 220                   | 221 | 5×11    | 200  | 6.3×11  | 240  | 6.3×11  | 260  | 8×11.5  | 330  | 10×12.5 | 385  | 10×12.5 | 430  | 10×16   | 490  | 12.5×25   | 620          |
| 330                   | 331 | 6.3×11  | 270  | 6.3×11  | 290  | 8×11.5  | 370  | 10×12.5 | 440  | 10×12.5 | 490  | 10×16   | 590  | 10×20   | 710  | 12.5×25   | 760          |
| 470                   | 471 | 6.3×11  | 320  | 6.3×11  | 350  | 8×11.5  | 440  | 10×12.5 | 550  | 10×16   | 650  | 12.5×20 | 760  | 12.5×20 | 900  | 16×25     | 1000         |
| 1000                  | 102 | 8×11.5  | 540  | 10×12.5 | 650  | 10×16   | 790  | 10×20   | 960  | 12.5×20 | 1150 | 12.5×25 | 1350 | 16×25   | 1300 | 18×40     | 1380         |
| 2200                  | 222 | 10×20   | 1000 | 10×20   | 1100 | 12.5×20 | 1300 | 12.5×25 | 1550 | 16×25   | 1800 | 16×35.5 | 2100 | 18×35.5 | 2300 | 22×50     | 2400         |
| 3300                  | 332 | 10×20   | 1190 | 12.5×20 | 1450 | 12.5×25 | 1700 | 16×25   | 1980 | 16×35.5 | 2280 | 18×35.5 | 2500 | 20×40   | 2700 | 25×50     | 2900         |
| 4700                  | 472 | 12.5×20 | 1550 | 12.5×25 | 1800 | 16×25   | 2100 | 16×31.5 | 2450 | 18×35.5 | 2700 | 20×40   | 2900 | 22×50   | 3400 |           |              |
| 6800                  | 682 | 12.5×25 | 1920 | 16×25   | 2250 | 16×35.5 | 2650 | 18×35.5 | 2900 | 20×40   | 3000 | 22×50   | 3500 | 25×50   | 3900 |           |              |
| 10000                 | 103 | 16×25   | 2350 | 16×35.5 | 2700 | 18×35.5 | 2950 | 20×40   | 3000 | 22×50   | 3700 | 25×50   | 4000 |         |      |           |              |
| 15000                 | 153 | 16×35.5 | 2850 | 18×35.5 | 3100 | 20×40   | 3400 | 22×50   | 3800 | 25×50   | 4300 |         |      |         |      |           |              |
| 22000                 | 223 | 18×40   | 3350 | 20×40   | 3700 | 22×50   | 4200 | 25×50   | 4500 |         |      |         |      |         |      |           |              |
| 33000                 | 333 | 22×50   | 3900 | 22×50   | 4500 | 25×50   | 4800 |         |      |         |      |         |      |         |      | Case size | Rated ripple |

| V<br>Cap.(μF)<br>Code | 160 |         | 200  |         | 250  |         | 315  |         | 350  |         | 400 |         | 450 |         | D×L (mm)  |              |
|-----------------------|-----|---------|------|---------|------|---------|------|---------|------|---------|-----|---------|-----|---------|-----------|--------------|
|                       | 2C  |         | 2D   |         | 2E   |         | 2F   |         | 2V   |         | 2G  |         | 2W  |         |           |              |
| 0.47                  | R47 | 6.3×11  | 15   | 6.3×11  | 15   | 6.3×11  | 15   |         |      |         |     |         |     |         |           |              |
| 1                     | 010 | 6.3×11  | 22   | 6.3×11  | 22   | 6.3×11  | 22   | 6.3×11  | 22   | 6.3×11  | 22  | 8×11.5  | 25  | 8×11.5  | 23        |              |
| 2.2                   | 2R2 | 6.3×11  | 33   | 6.3×11  | 33   | 6.3×11  | 33   | 8×11.5  | 33   | 8×11.5  | 38  | 10×12.5 | 45  | 10×12.5 | 35        |              |
| 3.3                   | 3R3 | 6.3×11  | 40   | 6.3×11  | 40   | 8×11.5  | 46   | 10×12.5 | 55   | 10×12.5 | 55  | 10×12.5 | 55  | 10×16   | 45        |              |
| 4.7                   | 4R7 | 6.3×11  | 50   | 8×11.5  | 55   | 8×11.5  | 55   | 10×12.5 | 65   | 10×12.5 | 65  | 10×16   | 70  | 10×20   | 55        |              |
| 10                    | 100 | 8×11.5  | 80   | 10×12.5 | 95   | 10×16   | 105  | 10×20   | 115  | 10×20   | 115 | 12.5×20 | 130 | 12.5×20 | 90        |              |
| 22                    | 220 | 10×16   | 155  | 10×20   | 170  | 12.5×20 | 190  | 12.5×20 | 190  | 12.5×25 | 200 | 16×25   | 240 | 16×25   | 165       |              |
| 33                    | 330 | 10×20   | 205  | 12.5×20 | 230  | 12.5×20 | 230  | 16×25   | 275  | 16×25   | 275 | 16×31.5 | 300 | 16×35.5 | 230       |              |
| 47                    | 470 | 12.5×20 | 270  | 12.5×20 | 270  | 12.5×25 | 300  | 16×25   | 340  | 16×35.5 | 380 | 16×35.5 | 370 | 18×40   | 300       |              |
| 100                   | 101 | 12.5×25 | 430  | 16×31.5 | 530  | 16×31.5 | 520  | 18×35.5 | 560  | 18×40   | 590 | 20×40   | 550 | 22×40   | 350       |              |
| 220                   | 221 | 16×35.5 | 800  | 18×35.5 | 810  | 20×40   | 740  | 22×50   | 850  | 22×50   | 850 | 25×50   | 750 |         |           |              |
| 330                   | 331 | 18×40   | 940  | 20×40   | 1130 | 22×50   | 1170 | 25×50   | 1250 | 22×50   | 890 |         |     |         |           |              |
| 470                   | 471 | 22×40   | 1410 | 22×50   | 1490 | 25×50   | 1600 |         |      |         |     |         |     |         |           |              |
| 1000                  | 102 | 25×50   | 1900 |         |      |         |      |         |      |         |     |         |     |         | Case size | Rated ripple |

Size 4×11 is available for capacitors marked "•"

Rated Ripple (mA rms) at 85°C 120Hz

In this case, [6] will be put at 12th digit of type numbering system "▲"

## ■ Frequency coefficient of rated ripple current

| V         | Cap.(μF)     | Frequency |      |       |       |       |
|-----------|--------------|-----------|------|-------|-------|-------|
|           |              | ~ 47      | 50Hz | 120Hz | 300Hz | 1 kHz |
| 6.3 ~ 100 | ~ 47         | 0.75      | 1.00 | 1.35  | 1.57  | 2.00  |
|           | 100 ~ 470    | 0.80      | 1.00 | 1.23  | 1.34  | 1.50  |
|           | 1000 ~ 33000 | 0.85      | 1.00 | 1.10  | 1.13  | 1.15  |
| 160 ~ 450 | 0.47 ~ 220   | 0.80      | 1.00 | 1.25  | 1.40  | 1.60  |
|           | 330 ~ 1000   | 0.90      | 1.00 | 1.10  | 1.13  | 1.15  |