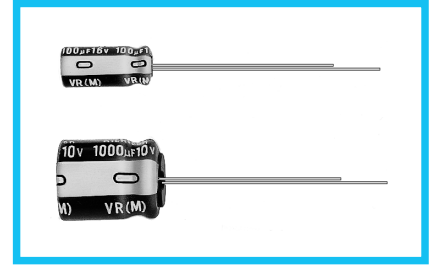


**VR** Miniature Sized series



Anti-Solvent Feature (Through 100V only)

- One rank smaller case sizes than VX 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 to +85°C (450V)   |   |    |    |    |    |    |    |     |            |            |   |
| Rated Voltage Range           | 6.3 to 450V  |   |    |    |    |    |    |    |     |            |            |   |
| Rated Capacitance Range       | 0.1 to 33000µF   |   |    |    |    |    |    |    |     |            |            |   |
| 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. Measurement frequency : 120Hz at 20°C  |   |    |    |    |    |    |    |     |            |            |   |
|                               | Rated voltage (V)  | 6.3   | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 to 315 | 350 to 450 |   |
| Stability at Low Temperature  | Measurement frequency : 120Hz  |   |    |    |    |    |    |    |     |            |            |   |
|                               | Impedance ratio Z-25°C / Z+20°C  | 5   | 4  | 3  | 2  | 2  | 2  | 2  | 2   | 3          | 4          | 6 |
| 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

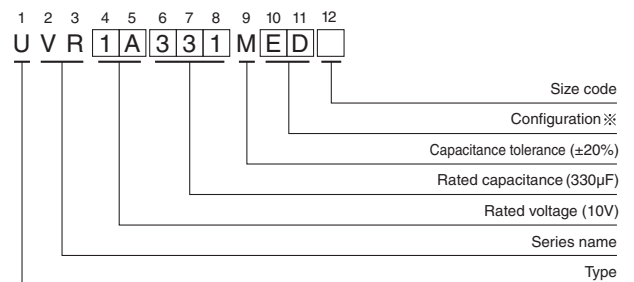


|         | 4    | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 20   | 22   | 25   |
|---------|------|-----|-----|-----|-----|------|-----|-----|------|------|------|
| φD (mm) | 4    | 5   | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 20   | 22   | 25   |
| P (mm)  | 1.5  | 2.0 | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 | 10.0 | 10.0 | 12.5 |
| φd (mm) | 0.45 | 0.5 | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 | 1.0  | 1.0  | 1.0  |
| β (mm)  | 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 20 about the end seal configuration.

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



※ Configuration

| φ D        | Pb-free leadwire<br>Pb-free PET sleeve |
|------------|--|
| 4          | DD6                                    |
| 5          | DD                                     |
| 6.3        | ED                                     |
| 8 · 10     | PD                                     |
| 12.5 to 18 | HD                                     |
| 20 to 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

| V<br>Cap.(μF)<br>Code | 6.3 |                     | 10           |                     | 16           |                       | 25           |                       | 35           |                       | 50           |                       | 63           |                     | 100          |                           |                 |
|-----------------------|-----|---------------------|--------------|---------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|---------------------|--------------|---------------------------|-----------------|
|                       | 0J  |                     | 1A           |                     | 1C           |                       | 1E           |                       | 1V           |                       | 1H           |                       | 1J           |                     | 2A           |                           |                 |
| 0.1                   | 0R1 |                     |              |                     |              |                       |              |                       |              |                       |              | • 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<br>▲25 × 40       | 2400            |
| 3300                  | 332 | 10 × 20             | 1190         | 12.5 × 20           | 1450         | 12.5 × 25             | 1700         | 16 × 25               | 1980         | 16 × 35.5             | 2280         | 18 × 35.5<br>▲22 × 30 | 2500<br>2450 | 20 × 40<br>▲25 × 30 | 2700<br>2600 | 25 × 50                   | 2900            |
| 4700                  | 472 | 12.5 × 20           | 1550         | 12.5 × 25           | 1800         | 16 × 25               | 2100         | 16 × 31.5             | 2450         | 18 × 35.5<br>▲20 × 31 | 2700         | 20 × 40<br>▲25 × 30   | 2900<br>2900 | 22 × 50<br>▲25 × 40 | 3400<br>3200 |                           |                 |
| 6800                  | 682 | 12.5 × 25           | 1920         | 16 × 25             | 2250         | 16 × 35.5             | 2650         | 18 × 35.5<br>▲20 × 31 | 2900<br>2700 | 20 × 40<br>▲25 × 30   | 3000<br>2900 | 22 × 50<br>▲25 × 40   | 3500<br>3300 | 25 × 50             | 3900         |                           |                 |
| 10000                 | 103 | 16 × 25             | 2350         | 16 × 35.5           | 2700         | 18 × 35.5<br>▲20 × 31 | 2950<br>3000 | 20 × 40<br>▲25 × 30   | 3000<br>2900 | 22 × 50<br>▲25 × 40   | 3700<br>3600 | 25 × 50               | 4000         |                     |              |                           |                 |
| 15000                 | 153 | 16 × 35.5           | 2850         | 18 × 35.5           | 3100         | 20 × 40<br>▲25 × 30   | 3400<br>3300 | 22 × 50<br>▲25 × 40   | 3800<br>3600 | 25 × 50               | 4300         |                       |              |                     |              |                           |                 |
| 22000                 | 223 | 18 × 40<br>▲22 × 30 | 3350<br>3200 | 20 × 40<br>▲25 × 30 | 3700<br>3300 | 22 × 50<br>▲25 × 40   | 4200<br>4000 | 25 × 50               | 4500         |                       |              |                       |              |                     |              |                           |                 |
| 33000                 | 333 | 22 × 50<br>▲25 × 40 | 3900<br>3800 | 22 × 50<br>▲25 × 40 | 4500<br>4800 | 25 × 50               | 4800         |                       |              |                       |              |                       |              |                     |              | Case size<br>φ D × L (mm) | Rated<br>ripple |

| V<br>Cap.(μF)<br>Code | 160 |                     | 200          |                     | 250          |                     | 315         |                     | 350        |                     | 400        |                     | 450        |                     |                           |                 |  |
|-----------------------|-----|---------------------|--------------|---------------------|--------------|---------------------|-------------|---------------------|------------|---------------------|------------|---------------------|------------|---------------------|---------------------------|-----------------|--|
|                       | 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<br>▲22 × 30 | 300<br>290                |                 |  |
| 100                   | 101 | 12.5 × 25           | 430          | 16 × 31.5           | 530          | 16 × 31.5           | 520         | 18 × 35.5           | 560        | 18 × 40<br>▲22 × 30 | 590<br>570 | 20 × 40<br>▲25 × 30 | 550<br>530 | 22 × 40             | 350                       |                 |  |
| 220                   | 221 | 16 × 35.5           | 800          | 18 × 35.5           | 810          | 20 × 40<br>▲22 × 30 | 740<br>820  | 22 × 50<br>▲25 × 30 | 850<br>770 | 22 × 50<br>▲25 × 40 | 850<br>890 | 25 × 50             | 750        |                     |                           |                 |  |
| 330                   | 331 | 18 × 40<br>▲22 × 30 | 940<br>900   | 20 × 40<br>▲25 × 30 | 1130<br>1090 | 22 × 50<br>▲25 × 30 | 1170<br>970 | 25 × 50             | 1250       |                     |            |                     |            |                     |                           |                 |  |
| 470                   | 471 | 22 × 40<br>▲25 × 30 | 1410<br>1290 | 22 × 50<br>▲25 × 40 | 1490<br>1550 | 25 × 50             | 1600        |                     |            |                     |            |                     |            |                     | Case size<br>φ D × L (mm) | Rated<br>ripple |  |
| 1000                  | 102 | 25 × 50             | 1900         |                     |              |                     |             |                     |            |                     |            |                     |            |                     |                           |                 |  |

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

Rated ripple current (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 |       |       |       |               |
|------------|---------------|-----------|-------|-------|-------|---------------|
|            |               | 50Hz      | 120Hz | 300Hz | 1 kHz | 10kHz or more |
| 6.3 to 100 | 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          |
| 160 to 450 | 0.47 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          |

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