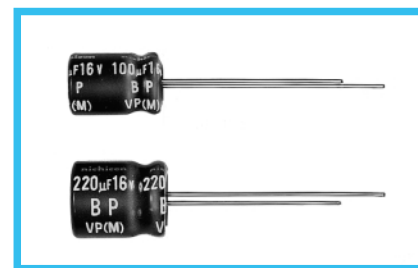
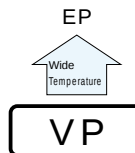


**VP** Bi-Polarized  
series



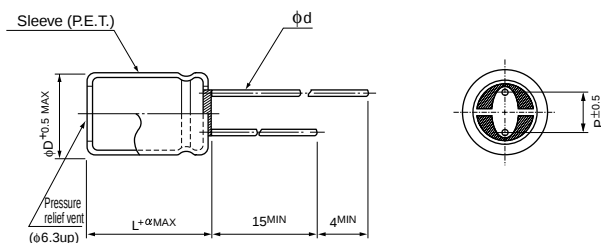
- Standard bi-polarized series for entertainment electronics.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

| Item                          | Performance Characteristics                                                                                                                                                                                                            |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|------|------|------|------|------|-----|--------------------|--|---------------------------------------------------|--|--|--|--|--|--|--|
| Category Temperature Range    | -40 to +85°C                                                                                                                                                                                                                           |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
| Rated Voltage Range           | 6.3 to 100V                                                                                                                                                                                                                            |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
| Rated Capacitance Range       | 0.47 to 6800μF                                                                                                                                                                                                                         |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                                                                                                    |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
| Leakage Current               | After 5 minutes' application of rated voltage, leakage current is not more than 0.03CV or 3 (μA), whichever is greater.                                                                                                                |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
| 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  |     |                    |  |                                                   |  |  |  |  |  |  |  |
|                               | tan δ (MAX.)                                                                                                                                                                                                                           | 0.26            | 0.24 | 0.22 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 |     |                    |  |                                                   |  |  |  |  |  |  |  |
| Stability at Low Temperature  | Measurement frequency : 120Hz                                                                                                                                                                                                          |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
|                               | Rated voltage (V)                                                                                                                                                                                                                      |                 | 6.3  | 10   | 16   | 25   | 35   | 50   | 63   | 100 |                    |  |                                                   |  |  |  |  |  |  |  |
|                               | Impedance ratio                                                                                                                                                                                                                        | Z-25°C / Z+20°C | 4    | 3    | 2    | 2    | 2    | 2    | 2    | 2   |                    |  |                                                   |  |  |  |  |  |  |  |
|                               | ZT / Z20 (MAX.)                                                                                                                                                                                                                        | Z-40°C / Z+20°C | 10   | 8    | 6    | 5    | 4    | 4    | 3    | 3   |                    |  |                                                   |  |  |  |  |  |  |  |
| 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 with the polarity inverted every 250 hours.                                         |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
|                               |                                                                                                                                                                                                                                        |                 |      |      |      |      |      |      |      |     | Capacitance change |  | Within ±20% of the initial capacitance value      |  |  |  |  |  |  |  |
|                               |                                                                                                                                                                                                                                        |                 |      |      |      |      |      |      |      |     | tan δ              |  | 200% or less than the initial specified 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. |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |
|                               |                                                                                                                                                                                                                                        |                 |      |      |      |      |      |      |      |     | Leakage current    |  | Less than or equal to the initial specified value |  |  |  |  |  |  |  |
| Marking                       | Printed with white color letter on black sleeve.                                                                                                                                                                                       |                 |      |      |      |      |      |      |      |     |                    |  |                                                   |  |  |  |  |  |  |  |

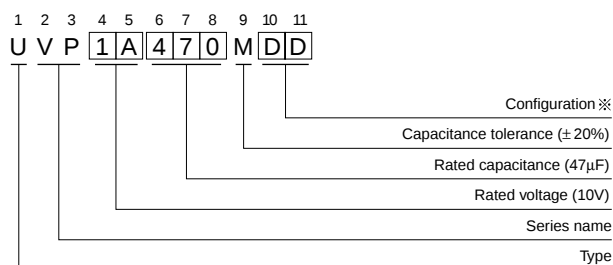
## Radial Lead Type



| α  | (mm)     |     |     |     |      |     |     |  |
|----|----------|-----|-----|-----|------|-----|-----|--|
|    | (L < 20) | 1.5 |     |     |      |     |     |  |
|    | (L ≥ 20) | 2.0 |     |     |      |     |     |  |
| φD | 5        | 6.3 | 8   | 10  | 12.5 | 16  | 18  |  |
| P  | 2.0      | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |  |
| φd | 0.5      | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |  |

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

## Type numbering system (Example : 10V 47µF)



### ※ Configuration

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

## ■ Dimensions

| Cap. (μF) | V<br>Code | 6.3     |      | 10      |      | 16      |      | 25      |      | 35      |      | 50      |     | 63      |     | 100                    |                 |
|-----------|-----------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|-----|---------|-----|------------------------|-----------------|
|           |           | 0J      |      | 1A      |      | 1C      |      | 1E      |      | 1V      |      | 1H      |     | 1J      |     | 2A                     |                 |
| 0.47      | R47       |         |      |         |      |         |      |         |      |         |      | 5×11    | 11  |         |     | 5×11                   | 14              |
| 1         | 010       |         |      |         |      |         |      |         |      |         |      | 5×11    | 17  |         |     | 5×11                   | 21              |
| 2.2       | 2R2       |         |      |         |      |         |      |         |      |         |      | 5×11    | 25  |         |     | 6.3×11                 | 34              |
| 3.3       | 3R3       |         |      |         |      |         |      |         |      |         |      | 5×11    | 27  | 5×11    | 28  | 6.3×11                 | 39              |
| 4.7       | 4R7       |         |      |         |      |         |      |         |      | 5×11    | 34   | 5×11    | 34  | 6.3×11  | 34  | 6.3×11                 | 47              |
| 10        | 100       |         |      |         |      | 5×11    | 42   | 5×11    | 42   | 5×11    | 43   | 6.3×11  | 52  | 6.3×11  | 57  | 8×11.5                 | 71              |
| 22        | 220       |         |      | 5×11    | 57   | 5×11    | 57   | 6.3×11  | 65   | 6.3×11  | 73   | 8×11.5  | 89  | 8×11.5  | 95  | 10×16                  | 135             |
| 33        | 330       | 5×11    | 64   | 5×11    | 64   | 5×11    | 70   | 6.3×11  | 80   | 8×11.5  | 100  | 8×11.5  | 105 | 10×12.5 | 135 | 12.5×20                | 220             |
| 47        | 470       | 5×11    | 76   | 5×11    | 76   | 6.3×11  | 95   | 6.3×11  | 95   | 8×11.5  | 120  | 10×12.5 | 150 | 10×16   | 180 | 12.5×20                | 240             |
| 100       | 101       | 6.3×11  | 125  | 6.3×11  | 125  | 8×11.5  | 160  | 8×11.5  | 160  | 10×16   | 230  | 10×20   | 265 | 12.5×20 | 320 | 16×25                  | 425             |
| 220       | 221       | 8×11.5  | 215  | 8×11.5  | 215  | 10×12.5 | 275  | 10×16   | 305  | 12.5×20 | 410  | 12.5×25 | 480 | 16×25   | 575 | 18×35.5                | 720             |
| 330       | 331       | 8×11.5  | 265  | 10×16   | 345  | 10×16   | 375  | 12.5×20 | 450  | 12.5×20 | 505  | 16×25   | 650 | 16×31.5 | 655 |                        |                 |
| 470       | 471       | 10×12.5 | 370  | 10×16   | 410  | 10×20   | 485  | 12.5×20 | 540  | 12.5×25 | 655  | 16×31.5 | 835 | 18×35.5 | 965 |                        |                 |
| 1000      | 102       | 10×20   | 650  | 12.5×20 | 720  | 12.5×25 | 855  | 16×25   | 950  | 16×31.5 | 1140 |         |     |         |     |                        |                 |
| 2200      | 222       | 12.5×25 | 1160 | 16×25   | 1280 | 16×31.5 | 1510 | 18×35.5 | 1620 |         |      |         |     |         |     |                        |                 |
| 3300      | 332       | 16×25   | 1570 | 16×31.5 | 1690 | 18×35.5 | 1980 |         |      |         |      |         |     |         |     |                        |                 |
| 4700      | 472       | 16×31.5 | 2020 | 18×35.5 | 2160 |         |      |         |      |         |      |         |     |         |     |                        |                 |
| 6800      | 682       | 18×35.5 | 2600 |         |      |         |      |         |      |         |      |         |     |         |     | Case size<br>φD×L (mm) | Rated<br>ripple |

Rated ripple current (mA<sub>rms</sub>) at 85°C 120Hz

## ● Frequency coefficient of rated ripple current

| Cap. (μF)    | Frequency | 50 Hz | 120 Hz | 300 Hz | 1 kHz | 10 kHz or more |
|--------------|-----------|-------|--------|--------|-------|----------------|
| 0.47 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 6800 |           | 0.85  | 1.00   | 1.10   | 1.13  | 1.15           |