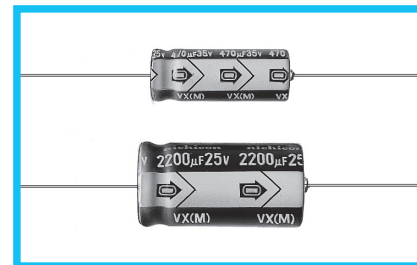


**TVX** (02 type)

Standard, For General Purposes - Axial Lead Type

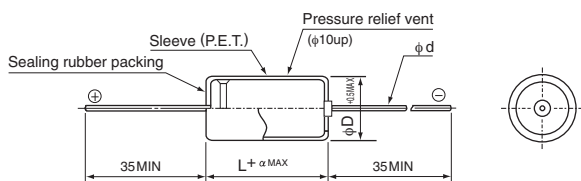


- Axial lead type of standard series for general purposes.
- Compliant to the RoHS directive (2011/65/EU).

## Specifications

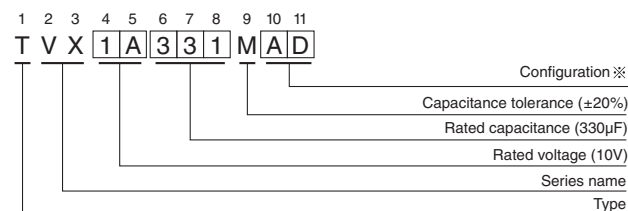
| Item                          | Performance Characteristics                                                                                                                         |                                                                                                                                                                                                                                              |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category Temperature Range    | -40 to +85°C (6.3 to 250V), -25 to +85°C (315 to 450V)                                                                                              |                                                                                                                                                                                                                                              |
| Rated Voltage Range           | 6.3 to 450V                                                                                                                                         |                                                                                                                                                                                                                                              |
| Rated Capacitance Range       | 0.47 to 10000µF                                                                                                                                     |                                                                                                                                                                                                                                              |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                 |                                                                                                                                                                                                                                              |
| Leakage Current               | Rated voltage (V)                                                                                                                                   | 6.3 to 100                                                                                                                                                                                                                                   |
|                               | Leakage current                                                                                                                                     | <p>After 1 minute's application of rated voltage at 20°C, not more than 0.03CV or 4 (µA), whichever is greater.</p> <p>After 2 minutes' application of rated voltage at 20°C, not more than 0.01CV or 3 (µA), whichever is greater.</p>      |
| Tangent of loss angle (tan δ) | Rated voltage (V)                                                                                                                                   | 160 to 450                                                                                                                                                                                                                                   |
|                               | tan δ (MAX.)                                                                                                                                        | <p>In case of CV ≤ 1000<br/>After 1 minute's application of rated voltage at 20°C, not more than 0.1CV+40 (µA).</p> <p>In case of CV &gt; 1000<br/>After 1 minute's application of rated voltage at 20°C, not more than 0.04CV+100 (µA).</p> |
| Stability at Low Temperature  | Measurement frequency : 120Hz at 20°C                                                                                                               |                                                                                                                                                                                                                                              |
|                               | Rated voltage (V)                                                                                                                                   | 6.3 10 16 25 35 50 63 to 100 160 to 315 350 to 450                                                                                                                                                                                           |
| Endurance                     | Impedance ratio ZT / Z20 (MAX.)                                                                                                                     | 0.24 0.20 0.16 0.14 0.12 0.10 0.08 0.20 0.25                                                                                                                                                                                                 |
|                               | For capacitance of more than 1000µF, add 0.02 for every increase of 1000µF.                                                                         |                                                                                                                                                                                                                                              |
| Shelf Life                    | Measurement frequency : 120Hz                                                                                                                       |                                                                                                                                                                                                                                              |
|                               | Rated voltage (V)                                                                                                                                   | 6.3 10 16 25 35 to 100 160 to 250 315 · 350 400 · 450                                                                                                                                                                                        |
| Marking                       | Impedance ratio ZT / Z20 (MAX.)                                                                                                                     | 4 3 2 2 3 4 6 15                                                                                                                                                                                                                             |
|                               | Z-25°C / Z+20°C                                                                                                                                     | 10 8 6 4 3 12 — —                                                                                                                                                                                                                            |
| 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                    | tan δ                                                                                                                                               | 200% or less than the initial specified value                                                                                                                                                                                                |
|                               | Leakage current                                                                                                                                     | Less than or equal to the initial specified value                                                                                                                                                                                            |
| Marking                       | Capacitance change                                                                                                                                  | Within ±20% of the initial capacitance value                                                                                                                                                                                                 |
|                               | tan δ                                                                                                                                               | 200% or less than the initial specified value                                                                                                                                                                                                |
| Marking                       | Leakage current                                                                                                                                     | Less than or equal to the initial specified value                                                                                                                                                                                            |
|                               | Printed with white color letter on purple blue sleeve.                                                                                              |                                                                                                                                                                                                                                              |

## Axial Lead Type



| α | (φD < 10) 1 | φD 5 to 13 | 16 to 18 |
|---|-------------|------------|----------|
|   | (φD ≥ 10) 2 | φd 0.6     | 0.8      |

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



※ Configuration

| φD       | Pb-free leadwire<br>Pb-free PET sleeve |
|----------|----------------------------------------|
| 5 to 8   | AD                                     |
| 10 to 18 | CD                                     |

Please refer to page 22 about the taped product spec.  
Please refer to page 4 for the minimum order quantity.

● Dimension table in next page.

**TVX** (02 type)

**■ Dimensions**

| V        |      | 6.3       |      | 10        |      | 16        |      | 25        |      | 35        |      | 50        |      | 63        |      | 100       |     |
|----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|-----|
| Cap.(μF) | Code | 0J        |      | 1A        |      | 1C        |      | 1E        |      | 1V        |      | 1H        |      | 1J        |      | 2A        |     |
| 0.47     | R47  |           |      |           |      |           |      |           |      |           |      | 5 × 12    | 5    |           |      | 5 × 12    | 10  |
| 1        | 010  |           |      |           |      |           |      |           |      |           |      | 5 × 12    | 10   |           |      | 5 × 12    | 18  |
| 2.2      | 2R2  |           |      |           |      |           |      |           |      |           |      | 5 × 12    | 23   |           |      | 5 × 12    | 28  |
| 3.3      | 3R3  |           |      |           |      |           |      |           |      |           |      | 5 × 12    | 28   |           |      | 5 × 12    | 34  |
| 4.7      | 4R7  |           |      |           |      |           |      |           |      |           |      | 5 × 12    | 34   |           |      | 5 × 12    | 40  |
| 10       | 100  |           |      |           |      |           |      |           |      |           |      | 5 × 12    | 50   | 5 × 12    | 55   | 6.3 × 12  | 60  |
| 22       | 220  |           |      |           |      |           |      |           |      | 5 × 12    | 70   | 6.3 × 12  | 85   | 6.3 × 12  | 90   | 8 × 16    | 120 |
| 33       | 330  |           |      |           |      |           |      | 5 × 12    | 80   | 6.3 × 12  | 90   | 6.3 × 16  | 110  | 6.3 × 16  | 120  | 8 × 16    | 150 |
| 47       | 470  |           |      |           |      | 5 × 12    | 85   | 6.3 × 12  | 100  | 6.3 × 16  | 120  | 6.3 × 16  | 130  | 8 × 16    | 160  | 8 × 20    | 190 |
| 100      | 101  | 5 × 12    | 110  | 6.3 × 12  | 130  | 6.3 × 16  | 160  | 6.3 × 16  | 170  | 8 × 16    | 210  | 8 × 16    | 220  | 8 × 20    | 260  | 10 × 26   | 340 |
| 220      | 221  | 6.3 × 16  | 200  | 6.3 × 16  | 210  | 8 × 16    | 260  | 8 × 16    | 280  | 8 × 20    | 340  | 10 × 21   | 410  | 10 × 26   | 480  | 13 × 26   | 560 |
| 330      | 331  | 6.3 × 16  | 250  | 8 × 16    | 300  | 8 × 16    | 320  | 8 × 20    | 380  | 10 × 21   | 460  | 10 × 26   | 560  | 13 × 26   | 650  | 13 × 31.5 | 750 |
| 470      | 471  | 8 × 16    | 330  | 8 × 16    | 350  | 8 × 20    | 430  | 10 × 26   | 510  | 10 × 26   | 610  | 13 × 26   | 730  | 13 × 31.5 | 840  | 16 × 31.5 | 970 |
| 1000     | 102  | 10 × 21   | 600  | 10 × 21   | 640  | 10 × 26   | 770  | 13 × 26   | 900  | 13 × 31.5 | 1060 | 16 × 31.5 | 1260 | 16 × 31.5 | 1330 |           |     |
| 2200     | 222  | 13 × 26   | 1020 | 13 × 26   | 1090 | 13 × 31.5 | 1180 | 16 × 31.5 | 1480 | 16 × 31.5 | 1580 | 18 × 41   | 1920 |           |      |           |     |
| 3300     | 332  | 13 × 26   | 1200 | 13 × 31.5 | 1390 | 16 × 31.5 | 1620 | 16 × 41.5 | 1710 | 16 × 41.5 | 2050 |           |      |           |      |           |     |
| 4700     | 472  | 16 × 31.5 | 1500 | 16 × 31.5 | 1730 | 16 × 41.5 | 1840 | 18 × 41   | 2170 |           |      |           |      |           |      |           |     |
| 6800     | 682  | 16 × 31.5 | 1840 | 16 × 41.5 | 1930 | 18 × 41   | 2310 |           |      |           |      |           |      |           |      |           |     |
| 10000    | 103  | 16 × 41.5 | 2260 | 18 × 41   | 2350 |           |      |           |      |           |      |           |      |           |      |           |     |

| V        |      | 160       |     | 200       |     | 250       |     | 315       |     | 350       |     | 400       |     | 450                       |                 |
|----------|------|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|-----------|-----|---------------------------|-----------------|
| Cap.(μF) | Code | 2C        |     | 2D        |     | 2E        |     | 2F        |     | 2V        |     | 2G        |     | 2W                        |                 |
| 1        | 010  | 6.3 × 12  | 13  | 6.3 × 12  | 13  | 6.3 × 16  | 14  | 6.3 × 16  | 14  | 6.3 × 16  | 12  | 8 × 16    | 14  | 8 × 16                    | 14              |
| 2.2      | 2R2  | 6.3 × 16  | 23  | 6.3 × 16  | 23  | 8 × 16    | 27  | 8 × 16    | 27  | 8 × 16    | 24  | 8 × 20    | 28  | 10 × 21                   | 31              |
| 3.3      | 3R3  | 8 × 16    | 33  | 8 × 16    | 33  | 8 × 16    | 33  | 8 × 20    | 36  | 8 × 20    | 32  | 10 × 21   | 38  | 10 × 21                   | 38              |
| 4.7      | 4R7  | 8 × 16    | 39  | 8 × 16    | 39  | 8 × 20    | 45  | 8 × 20    | 45  | 10 × 21   | 46  | 10 × 21   | 46  | 10 × 26                   | 50              |
| 10       | 100  | 8 × 20    | 60  | 10 × 21   | 70  | 10 × 21   | 70  | 10 × 26   | 80  | 13 × 26   | 85  | 13 × 26   | 85  | 13 × 26                   | 85              |
| 22       | 220  | 10 × 26   | 120 | 13 × 26   | 140 | 13 × 26   | 140 | 13 × 31.5 | 150 | 13 × 31.5 | 140 | 16 × 31.5 | 150 | 16 × 31.5                 | 150             |
| 33       | 330  | 13 × 26   | 170 | 13 × 26   | 170 | 13 × 31.5 | 190 | 16 × 31.5 | 210 | 16 × 31.5 | 190 | 16 × 41.5 | 210 | 18 × 41                   | 230             |
| 47       | 470  | 13 × 31.5 | 230 | 13 × 31.5 | 230 | 16 × 31.5 | 260 | 16 × 31.5 | 260 | 16 × 41.5 | 260 | 18 × 41   | 290 | Case size<br>φ D × L (mm) | Rated<br>ripple |
| 100      | 101  | 16 × 41.5 | 430 | 16 × 41.5 | 430 | 16 × 41.5 | 430 |           |     |           |     |           |     |                           |                 |

Rated ripple current (mA rms) at 85°C 120Hz

**● Frequency coefficient of rated ripple current**

| V          | Cap.(μF) | Frequency     | 120 Hz | 300 Hz | 1kHz | 10kHz or more |
|------------|----------|---------------|--------|--------|------|---------------|
| 6.3 to 100 |          | 0.47 to 47    | 1.00   | 1.35   | 1.57 | 2.00          |
|            |          | 100 to 470    | 1.00   | 1.23   | 1.34 | 1.50          |
|            |          | 1000 to 10000 | 1.00   | 1.10   | 1.13 | 1.15          |
| 160 to 450 |          | 1 to 100      | 1.00   | 1.25   | 1.40 | 1.60          |