



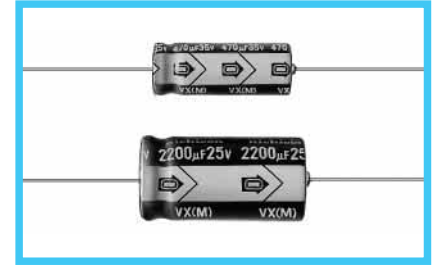
Standard, For General Purposes - Axial Lead Type

(02 type) series



Anti-Solvent  
Feature  
(Through 100V only)

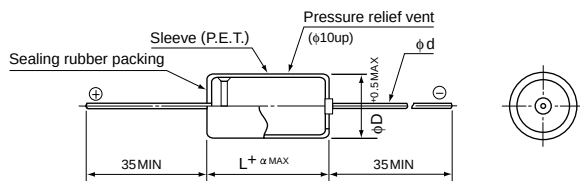
- Axial lead type of standard series for general purposes.
- Adapted to the RoHS directive (2002/95/EC).



## Specifications

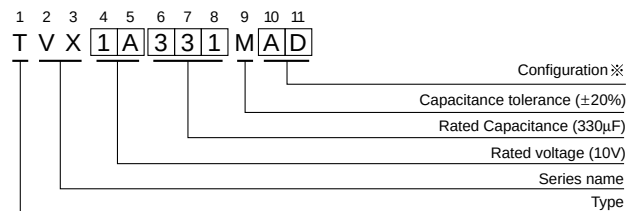
| Item                         | Performance Characteristics                                                                                                   |                                                                                                                                                                                                                    |      |      |      |                    |                                                                                                                                                                                                                    |                                         |           |           |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------|-----------|
| Category Temperature Range   | -40 ~ +85°C (6.3 ~ 250V), -25 ~ +85°C (315 ~ 450V)                                                                            |                                                                                                                                                                                                                    |      |      |      |                    |                                                                                                                                                                                                                    |                                         |           |           |
| Rated Voltage Range          | 6.3 ~ 450V                                                                                                                    |                                                                                                                                                                                                                    |      |      |      |                    |                                                                                                                                                                                                                    |                                         |           |           |
| Rated Capacitance Range      | 0.47 ~ 10000μF                                                                                                                |                                                                                                                                                                                                                    |      |      |      |                    |                                                                                                                                                                                                                    |                                         |           |           |
| Capacitance Tolerance        | ±20% at 120Hz, 20°C                                                                                                           |                                                                                                                                                                                                                    |      |      |      |                    |                                                                                                                                                                                                                    |                                         |           |           |
| Leakage Current              | Rated voltage (V)                                                                                                             | 6.3 ~ 100                                                                                                                                                                                                          |      |      |      |                    | 160 ~ 450                                                                                                                                                                                                          |                                         |           |           |
|                              | Leakage current                                                                                                               | After 1 minute's application of rated voltage, not more than 0.03CV or 4 (μA) , whichever is greater.<br><br>After 2 minutes' application of rated voltage, not more than 0.01CV or 3 (μA) , whichever is greater. |      |      |      |                    | In case of CV ≤ 1000<br>After 1 minute's application of rated voltage, not more than 0.1CV+40 (μA) .<br><br>In case of CV > 1000<br>After 1 minute's application of rated voltage, not more than 0.04CV+100 (μA) . |                                         |           |           |
| tan δ                        | For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF. Measurement frequency : 120Hz, Temperature : 20°C |                                                                                                                                                                                                                    |      |      |      |                    |                                                                                                                                                                                                                    |                                         |           |           |
|                              | Rated voltage (V)                                                                                                             | 6.3                                                                                                                                                                                                                | 10   | 16   | 25   | 35                 | 50                                                                                                                                                                                                                 | 63 ~ 100                                | 160 ~ 315 | 350 ~ 450 |
|                              | tan δ (MAX.)                                                                                                                  | 0.24                                                                                                                                                                                                               | 0.20 | 0.16 | 0.14 | 0.12               | 0.10                                                                                                                                                                                                               | 0.08                                    | 0.20      | 0.25      |
| Stability at Low Temperature | Measurement frequency : 120Hz                                                                                                 |                                                                                                                                                                                                                    |      |      |      |                    |                                                                                                                                                                                                                    |                                         |           |           |
|                              | Rated voltage (V)                                                                                                             |                                                                                                                                                                                                                    | 6.3  | 10   | 16   | 25                 | 35 ~ 100                                                                                                                                                                                                           | 160 ~ 250                               | 315 ~ 350 | 400 ~ 450 |
|                              | Impedance ratio<br>ZT / Z20 (MAX.)                                                                                            | Z-25°C / Z+20°C                                                                                                                                                                                                    | 4    | 3    | 2    | 2                  | 2                                                                                                                                                                                                                  | 4                                       | 6         | 15        |
|                              |                                                                                                                               | Z-40°C / Z+20°C                                                                                                                                                                                                    | 10   | 8    | 6    | 4                  | 3                                                                                                                                                                                                                  | 12                                      | —         | —         |
| 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            |           |           |
|                              |                                                                                                                               |                                                                                                                                                                                                                    |      |      |      | tan δ              |                                                                                                                                                                                                                    | 200% or less of initial specified value |           |           |
|                              |                                                                                                                               |                                                                                                                                                                                                                    |      |      |      | Leakage current    |                                                                                                                                                                                                                    | Initial specified value or less         |           |           |
| Shelf Life                   | After leaving capacitors under no load at 85°C for 1000 hours, they meet the characteristic requirements at right.            |                                                                                                                                                                                                                    |      |      |      | Capacitance change |                                                                                                                                                                                                                    | Within ±20% of initial value            |           |           |
|                              |                                                                                                                               |                                                                                                                                                                                                                    |      |      |      | 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.                                                                              |                                                                                                                                                                                                                    |      |      |      |                    |                                                                                                                                                                                                                    |                                         |           |           |

## Axial Lead Type



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

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



### ※Configuration

| φ D     | Pb-free leadwire<br>Pb-free PET sleeve |
|---------|----------------------------------------|
| 5 ~ 8   | AD                                     |
| 10 ~ 18 | CD                                     |

Please refer to page 23 about the taped product spec.  
Please refer to page 3 for the minimum order quantity.

- Dimension table in next page.

## ■Dimensions

 $\phi D \times L$  (mm)

| V              |      | 6.3       | 10   | 16        | 25     | 35        | 50       | 63        | 100      |
|----------------|------|-----------|------|-----------|--------|-----------|----------|-----------|----------|
| Cap.( $\mu$ F) | Code | 0J        | 1A   | 1C        | 1E     | 1V        | 1H       | 1J        | 2A       |
| 0.47           | R47  |           |      |           |        |           | 5 × 12   | 5         | 5 × 12   |
| 1              | 010  |           |      |           |        |           | 5 × 12   | 10        | 5 × 12   |
| 2.2            | 2R2  |           |      |           |        |           | 5 × 12   | 23        | 5 × 12   |
| 3.3            | 3R3  |           |      |           |        |           | 5 × 12   | 28        | 5 × 12   |
| 4.7            | 4R7  |           |      |           |        |           | 5 × 12   | 34        | 5 × 12   |
| 10             | 100  |           |      |           |        |           | 5 × 12   | 50        | 5 × 12   |
| 22             | 220  |           |      |           |        | 5 × 12    | 70       | 6.3 × 12  | 85       |
| 33             | 330  |           |      |           | 5 × 12 | 80        | 6.3 × 12 | 90        | 6.3 × 16 |
| 47             | 470  |           |      | 5 × 12    | 85     | 6.3 × 12  | 100      | 6.3 × 16  | 120      |
| 100            | 101  | 5 × 12    | 110  | 6.3 × 12  | 130    | 6.3 × 16  | 160      | 6.3 × 16  | 170      |
| 220            | 221  | 6.3 × 16  | 200  | 6.3 × 16  | 210    | 8 × 16    | 260      | 8 × 16    | 280      |
| 330            | 331  | 6.3 × 16  | 250  | 8 × 16    | 300    | 8 × 16    | 320      | 8 × 20    | 380      |
| 470            | 471  | 8 × 16    | 330  | 8 × 16    | 350    | 8 × 20    | 430      | 10 × 26   | 510      |
| 1000           | 102  | 10 × 21   | 600  | 10 × 21   | 640    | 10 × 26   | 770      | 13 × 26   | 900      |
| 2200           | 222  | 13 × 26   | 1020 | 13 × 26   | 1090   | 13 × 31.5 | 1180     | 16 × 31.5 | 1480     |
| 3300           | 332  | 13 × 26   | 1200 | 13 × 31.5 | 1390   | 16 × 31.5 | 1620     | 16 × 41.5 | 1710     |
| 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.( $\mu$ F) | 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  |
| 2.2            | 2R2  | 6.3 × 16  | 23  | 6.3 × 16  | 23  | 8 × 16    | 27  | 8 × 16    |
| 3.3            | 3R3  | 8 × 16    | 33  | 8 × 16    | 33  | 8 × 20    | 36  | 8 × 20    |
| 4.7            | 4R7  | 8 × 16    | 39  | 8 × 16    | 39  | 8 × 20    | 45  | 8 × 20    |
| 10             | 100  | 8 × 20    | 60  | 10 × 21   | 70  | 10 × 26   | 80  | 13 × 26   |
| 22             | 220  | 10 × 26   | 120 | 13 × 26   | 140 | 13 × 26   | 85  | 13 × 26   |
| 33             | 330  | 13 × 26   | 170 | 13 × 26   | 170 | 13 × 31.5 | 150 | 16 × 31.5 |
| 47             | 470  | 13 × 31.5 | 230 | 13 × 31.5 | 230 | 16 × 31.5 | 210 | 16 × 31.5 |
| 100            | 101  | 16 × 41.5 | 430 | 16 × 41.5 | 430 | 16 × 41.5 | 260 | 18 × 41   |

Rated Ripple (mA rms) at 85°C 120Hz

## ●Frequency coefficient of rated ripple current

| V         | Cap.( $\mu$ F) | Frequency(Hz) | 120  | 300  | 1k   | 10k ~ |
|-----------|----------------|---------------|------|------|------|-------|
| 6.3 ~ 100 | ~ 47           | ~ 47          | 1.00 | 1.35 | 1.57 | 2.00  |
|           |                | 100 ~ 470     | 1.00 | 1.23 | 1.34 | 1.50  |
|           |                | 1000 ~ 10000  | 1.00 | 1.10 | 1.13 | 1.15  |
| 160 ~ 450 | 1 ~ 100        |               | 1.00 | 1.25 | 1.40 | 1.60  |