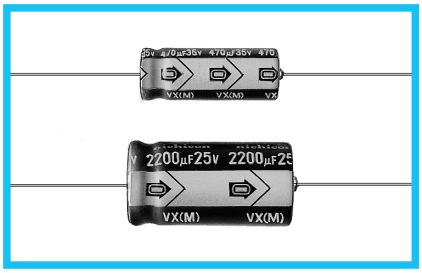
# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

## VX 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.
- 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: After 1 minute's application of rated voltage at 20°C, not more than 0.03CV or 4 (μA), whichever is greater. After 2 minutes' application of rated voltage at 20°C, not more than 0.01CV or 3 (μA), whichever is greater. / 160 to 450 — In case of CV ≦ 1000: After 1 minute's application of rated voltage at 20°C, not more than 0.1CV+40 (μA). In case of CV > 1000: After 1 minute's application of rated voltage at 20°C, not more than 0.04CV+100 (μA). |
| Tangent of loss angle (tan δ) | 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 |
|---|---|---|---|---|---|---|---|---|---|
| tan δ (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.

Stability at Low Temperature — Measurement frequency : 120Hz

| Rated voltage (V) | | 6.3 | 10 | 16 | 25 | 35 to 100 | 160 to 250 | 315 · 350 | 400 · 450 |
|---|---|---|---|---|---|---|---|---|---|
| Impedance ratio 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**

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 |
| tan δ | 200% or less than the initial specified value |
| Leakage current | Less than or equal to the initial specified value |

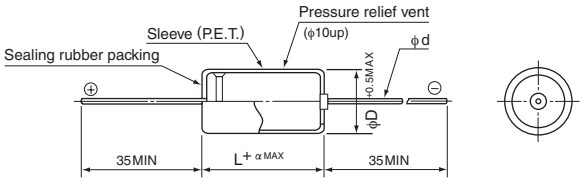
**Shelf Life**

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 characteristic requirements at right.

| | |
|---|---|
| Capacitance change | Within ±20% of the initial capacitance value |
| tan δ | 200% or less than the initial specified value |
| Leakage current | Less than or equal to the initial specified value |

| Item | Performance Characteristics |
|---|---|
| Marking | Printed with white color letter on purple blue sleeve. |

## ■Axial Lead Type




| | | |
|---|---|---|
| α | (φD < 10) | 1 |
| | (φD ≧ 10) | 2 |

(mm)

| φD | 5 to 13 | 16 to 18 |
|---|---|---|
| φd | 0.6 | 0.8 |

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

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| T | V | X | 1 | A | 3 | 3 | 1 | M | A | D |

- 11: Configuration※
- 9–10: Capacitance tolerance (±20%)
- 6–8: Rated capacitance (330μF)
- 4–5: Rated voltage (10V)
- 3: Series name
- 1–2: Type

※Configuration

| φD | Pb-free leadwire 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.

# VX (02 type) series

## ■Dimensions

| Cap.(μF) \ V | Code | 6.3 | | 10 | | 16 | | 25 | | 35 | | 50 | | 63 | | 100 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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 | | | | | | | | | | | | |

| Cap.(μF) \ V | Code | 160 | | 200 | | 250 | | 315 | | 350 | | 400 | | 450 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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 φD × L (mm) | Rated ripple |
| **100** | 101 | 16 × 41.5 | 430 | 16 × 41.5 | 430 | 16 × 41.5 | 430 | | | | | | | | |

Rated ripple current (mArms) 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 |