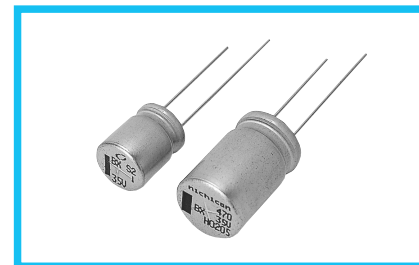


# ALUMINUM ELECTROLYTIC CAPACITORS

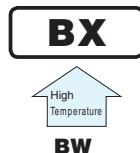
nichicon

**BX** series

High Temperature Range, For +150°C Use

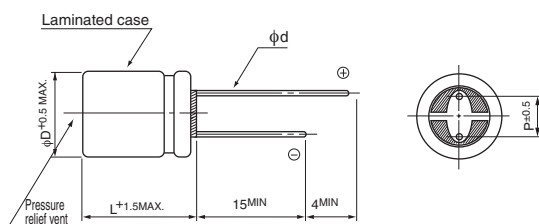
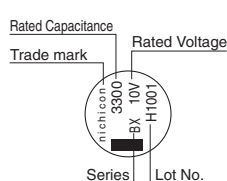


- Laminated case series.
- Suited for automobile electronics where heavy duty services are indispensable.
- Compliant to the RoHS directive (2011/65/EU).



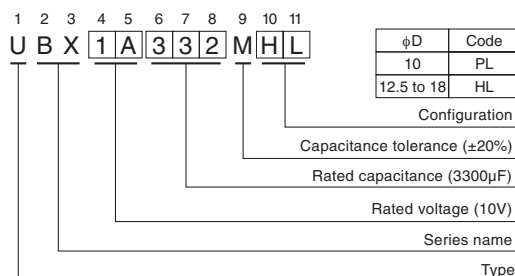
| Item                          | Performance Characteristics                                                                                                                                                                                                                                 |                                                                                                                                 |                                                                                                                          |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|----------------------------------------------------------------------------|---------|------------|---------|---------|-------|
| Category Temperature Range    | -55 to +150°C (10 to 100V), -40 to +150°C (160 · 200V), -25 to +150°C (350 · 400V)                                                                                                                                                                          |                                                                                                                                 |                                                                                                                          |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
| Rated Voltage Range           | 10 to 400V                                                                                                                                                                                                                                                  |                                                                                                                                 |                                                                                                                          |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
| Rated Capacitance Range       | 1 to 4700μF                                                                                                                                                                                                                                                 |                                                                                                                                 |                                                                                                                          |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
| Capacitance Tolerance         | ±20% at 120Hz, 20°C                                                                                                                                                                                                                                         |                                                                                                                                 |                                                                                                                          |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
| Leakage Current               | Rated Voltage (V)                                                                                                                                                                                                                                           | 10 to 100                                                                                                                       |                                                                                                                          |      |      |      |      |      |      | 160 to 400                                                                 |         |            |         |         |       |
|                               | Leakage current                                                                                                                                                                                                                                             | After 1 minute's application of rated voltage at 20°C, leakage current is not more than 0.03CV or 4 (μA), whichever is greater. |                                                                                                                          |      |      |      |      |      |      | CV ≤ 1000 : I = 0.1CV+40 (μA) max.<br>CV > 1000 : I = 0.04CV+100 (μA) max. |         |            |         |         |       |
| Tangent of loss angle (tan δ) | Rated voltage (V)                                                                                                                                                                                                                                           | 10                                                                                                                              | 16                                                                                                                       | 25   | 35   | 50   | 63   | 80   | 100  | 160-200                                                                    | 350-400 | 120Hz 20°C |         |         |       |
|                               | tan δ (MAX.)                                                                                                                                                                                                                                                | 0.20                                                                                                                            | 0.16                                                                                                                     | 0.14 | 0.12 | 0.10 | 0.10 | 0.08 | 0.08 | 0.20                                                                       | 0.24    |            |         |         |       |
|                               | For capacitance of more than 1000μF, add 0.02 for every increase of 1000μF.                                                                                                                                                                                 |                                                                                                                                 |                                                                                                                          |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
| Stability at Low Temperature  | Rated voltage (V)                                                                                                                                                                                                                                           |                                                                                                                                 |                                                                                                                          |      | 10   | 16   | 25   | 35   | 50   | 63                                                                         | 80      | 100        | 160-200 | 350-400 | 120Hz |
|                               | Impedance ratio                                                                                                                                                                                                                                             |                                                                                                                                 | Z-25°C / Z+20°C                                                                                                          |      | 3    | 2    | 2    | 2    | 2    | 2                                                                          | 2       | 2          | 3       | 6       |       |
|                               | ZT / Z20 (MAX.)                                                                                                                                                                                                                                             |                                                                                                                                 | Z-40°C / Z+20°C                                                                                                          |      | 4    | 4    | 4    | 4    | 4    | 4                                                                          | 4       | 4          | 6       | -       |       |
| Endurance                     | The specifications listed at right shall be met when the capacitors are restored to 20°C after D.C. bias plus rated ripple current is applied for 2000 hours (1000 hours for φD=10 and 12.5) at 150°C, the peak voltage shall not exceed the rated voltage. |                                                                                                                                 |                                                                                                                          |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
|                               | Capacitance change                                                                                                                                                                                                                                          |                                                                                                                                 | Within ±30% of the initial capacitance value (10 to 100V)<br>Within ±20% of the initial capacitance value (160 to 400V)  |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
|                               | tan δ                                                                                                                                                                                                                                                       |                                                                                                                                 | 300% or less than the initial specified value (10 to 100V)<br>200% or less than the initial specified value(160 to 400V) |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
| Marking                       | Leakage current                                                                                                                                                                                                                                             |                                                                                                                                 | Less than or equal to the initial specified value                                                                        |      |      |      |      |      |      |                                                                            |         |            |         |         |       |
|                               | Black print on the case top.                                                                                                                                                                                                                                |                                                                                                                                 |                                                                                                                          |      |      |      |      |      |      |                                                                            |         |            |         |         |       |

## Radial Lead Type



|    | (mm) |      |     |     |
|----|------|------|-----|-----|
| φD | 10   | 12.5 | 16  | 18  |
| P  | 5.0  | 5.0  | 7.5 | 7.5 |
| φd | 0.6  | 0.6  | 0.8 | 0.8 |

## Type numbering system (Example : 10V 3300μF)



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

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.

CAT.8100D

## ■ Dimensions

| Cap.<br>( $\mu$ F) | V (Code) |           | 10   |  | 16        |      | 25        |      | 35                             |                 |
|--------------------|----------|-----------|------|--|-----------|------|-----------|------|--------------------------------|-----------------|
|                    | Code     |           | 1A   |  | 1C        |      | 1E        |      | 1V                             |                 |
| 1                  | 010      |           |      |  |           |      |           |      | 10 × 12.5                      | 35              |
| 2.2                | 2R2      |           |      |  |           |      |           |      | 10 × 12.5                      | 50              |
| 3.3                | 3R3      |           |      |  |           |      |           |      | 10 × 12.5                      | 60              |
| 4.7                | 4R7      |           |      |  |           |      |           |      | 10 × 12.5                      | 85              |
| 10                 | 100      |           |      |  |           |      |           |      | 10 × 12.5                      | 175             |
| 22                 | 220      |           |      |  |           |      |           |      | 10 × 12.5                      | 200             |
| 33                 | 330      |           |      |  |           |      |           |      | 10 × 12.5                      | 225             |
| 47                 | 470      |           |      |  |           |      |           |      | 10 × 12.5                      | 250             |
| 100                | 101      |           |      |  |           |      | 10 × 12.5 | 250  | 10 × 20                        | 400             |
| 220                | 221      |           |      |  | 10 × 16   | 300  | 12.5 × 20 | 500  | 12.5 × 25                      | 600             |
| 330                | 331      | 10 × 16   | 300  |  | 10 × 20   | 400  | 12.5 × 25 | 600  | 16 × 25                        | 800             |
| 470                | 471      | 10 × 20   | 400  |  | 12.5 × 20 | 600  | 16 × 25   | 800  | 16 × 31.5                      | 1000            |
| 1000               | 102      | 12.5 × 25 | 600  |  | 16 × 25   | 800  | 16 × 31.5 | 1000 | 18 × 40                        | 1300            |
| 2200               | 222      | 16 × 31.5 | 1000 |  | 18 × 35.5 | 1200 |           |      |                                |                 |
| 3300               | 332      | 18 × 35.5 | 1200 |  | 18 × 40   | 1300 |           |      | Case size<br>$\phi$ D × L (mm) | Rated<br>ripple |
| 4700               | 472      | 18 × 40   | 1300 |  |           |      |           |      |                                |                 |

| Cap.<br>( $\mu$ F) | V (Code) |             | 50   |  | 63          |      | 80        |      | 100                            |                 |
|--------------------|----------|-------------|------|--|-------------|------|-----------|------|--------------------------------|-----------------|
|                    | Code     |             | 1H   |  | 1J          |      | 1K        |      | 2A                             |                 |
| 22                 | 220      |             |      |  |             |      |           |      | 10 × 12.5                      | 390             |
| 33                 | 330      |             |      |  |             |      | 10 × 12.5 | 420  | 10 × 16                        | 510             |
| 47                 | 470      |             |      |  |             |      | 10 × 16   | 550  | 10 × 20                        | 640             |
| 56                 | 560      |             |      |  | 10 × 12.5   | 430  | 10 × 20   | 690  | 10 × 20                        | 640             |
| 68                 | 680      |             |      |  | 10 × 16     | 560  | 10 × 20   | 690  | 12.5 × 20                      | 760             |
| 100                | 101      | 10 × 12.5   | 380  |  | 10 × 20     | 710  | 12.5 × 20 | 820  | 12.5 × 25                      | 950             |
| 220                | 221      | 10 × 20     | 640  |  | 12.5 × 25   | 1040 | 16 × 25   | 1250 | 16 × 31.5                      | 1380            |
| 330                | 331      | 12.5 × 20   | 770  |  | 12.5 × 31.5 | 1170 | 16 × 31.5 | 1480 | 18 × 31.5                      | 1430            |
| 470                | 471      | 12.5 × 25   | 960  |  | 16 × 25     | 1280 | 18 × 31.5 | 1530 |                                |                 |
| 560                | 561      | 12.5 × 31.5 | 1080 |  | 16 × 31.5   | 1520 |           |      |                                |                 |
| 680                | 681      | 16 × 25     | 1190 |  | 16 × 35.5   | 1520 |           |      | Case size<br>$\phi$ D × L (mm) | Rated<br>ripple |
| 1000               | 102      | 16 × 31.5   | 1420 |  |             |      |           |      |                                |                 |

## ● Frequency coefficient of rated ripple current

Rated ripple current (mA<sub>rms</sub>) at 150°C 100kHz

| V         | CV        | Frequency | 120Hz | 300Hz | 1kHz | 10kHz or more |
|-----------|-----------|-----------|-------|-------|------|---------------|
| 10 to 100 | 1000 > CV |           | 0.50  | 0.64  | 0.83 | 1.00          |
|           |           | 1000 ≤ CV | 0.67  | 0.79  | 0.91 | 1.00          |
|           | 1000 ≤ CV |           | 0.67  | 0.79  | 0.91 | 1.00          |

| Cap.<br>( $\mu$ F) | V (Code) |           | 160 |  | 200       |     | 350       |     | 400                            |                 |
|--------------------|----------|-----------|-----|--|-----------|-----|-----------|-----|--------------------------------|-----------------|
|                    | Code     |           | 2C  |  | 2D        |     | 2V        |     | 2G                             |                 |
| 4.7                | 4R7      |           |     |  |           |     | 10 × 16   | 77  | 10 × 20                        | 83              |
| 6.8                | 6R8      |           |     |  | 10 × 12.5 | 83  | 10 × 20   | 110 | 12.5 × 20                      | 88              |
| 10                 | 100      | 10 × 12.5 | 110 |  | 10 × 12.5 | 83  | 12.5 × 20 | 120 | 12.5 × 25                      | 105             |
| 15                 | 150      | 10 × 12.5 | 110 |  | 10 × 16   | 130 | 12.5 × 25 | 130 | 12.5 × 25                      | 105             |
| 22                 | 220      | 10 × 16   | 160 |  | 10 × 20   | 170 |           |     |                                |                 |
| 33                 | 330      | 12.5 × 20 | 230 |  | 12.5 × 20 | 210 |           |     |                                |                 |
| 47                 | 470      | 12.5 × 20 | 250 |  | 12.5 × 25 | 250 |           |     |                                |                 |
| 56                 | 560      | 12.5 × 25 | 270 |  | 16 × 20   | 270 |           |     |                                |                 |
| 68                 | 680      | 16 × 20   | 290 |  | 16 × 25   | 290 |           |     | Case size<br>$\phi$ D × L (mm) | Rated<br>ripple |
| 100                | 101      | 16 × 25   | 300 |  |           |     |           |     |                                |                 |

Rated ripple current (mA<sub>rms</sub>) at 150°C 120Hz

## ● Frequency coefficient of rated ripple current

| V          | Cap. ( $\mu$ F) | Frequency | 50Hz | 120Hz | 300Hz | 1kHz | 10kHz | 100kHz or more |
|------------|-----------------|-----------|------|-------|-------|------|-------|----------------|
| 160 to 400 | 4.7 to 33       |           | 0.75 | 1.00  | 1.25  | 1.50 | 1.75  | 1.80           |
|            |                 | 47 to 100 | 0.80 | 1.00  | 1.15  | 1.30 | 1.40  | 1.50           |
|            | 47 to 100       |           | 0.80 | 1.00  | 1.15  | 1.30 | 1.40  | 1.50           |