

# ALUMINUM ELECTROLYTIC CAPACITORS

nichicon

**MA** series

5mmL, Standard, For General Purposes

- Standard series with 5mm height.
- Compliant to the RoHS directive (2011/65/EU).



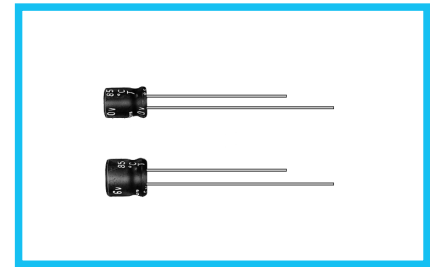
MT

High Temperature

MA

Bi-polarized MP

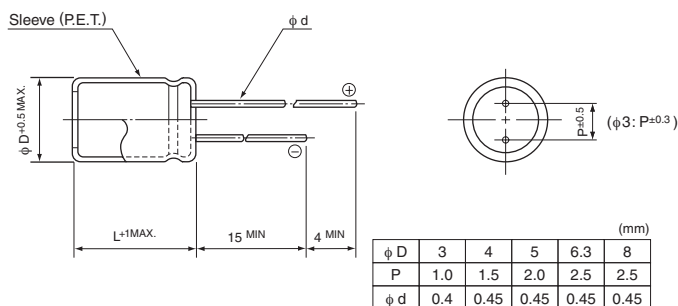
MV Long Life  
MF Low Impedance



## Specifications

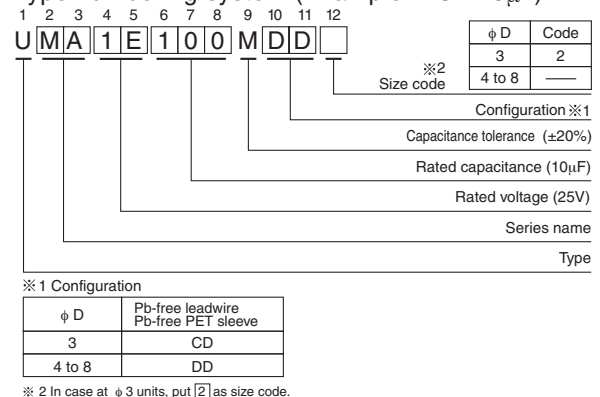
| Item                          | Performance Characteristics                                                                                                                                                                                                            |                 |             |             |                    |                                                                                     |             |             |                                   |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|-------------|--------------------|-------------------------------------------------------------------------------------|-------------|-------------|-----------------------------------|
| Category Temperature Range    | -40 to +85°C                                                                                                                                                                                                                           |                 |             |             |                    |                                                                                     |             |             |                                   |
| Rated Voltage Range           | 4 to 50V                                                                                                                                                                                                                               |                 |             |             |                    |                                                                                     |             |             |                                   |
| Rated Capacitance Range       | 0.1 to 470μF                                                                                                                                                                                                                           |                 |             |             |                    |                                                                                     |             |             |                                   |
| Rated Capacitance Tolerance   | ±20% at 120Hz, 20°C                                                                                                                                                                                                                    |                 |             |             |                    |                                                                                     |             |             |                                   |
| Leakage Current               | After 2 minutes' application of rated voltage at 20°C, leakage current is not more than 0.01CV or 3(μA), whichever is greater.                                                                                                         |                 |             |             |                    |                                                                                     |             |             |                                   |
| Tangent of loss angle (tan δ) | Measurement frequency : 120Hz at 20°C                                                                                                                                                                                                  |                 |             |             |                    |                                                                                     |             |             |                                   |
|                               | Rated voltage (V)                                                                                                                                                                                                                      | 4               | 6.3         | 10          | 16                 | 25                                                                                  | 35          | 50          | Figures in ( ) are for MR series. |
|                               | tan δ (MAX.)                                                                                                                                                                                                                           | 0.35            | 0.24 (0.30) | 0.20 (0.24) | 0.16 (0.20)        | 0.14 (0.18)                                                                         | 0.12 (0.16) | 0.10 (0.13) |                                   |
| Stability at Low Temperature  | Measurement frequency : 120Hz                                                                                                                                                                                                          |                 |             |             |                    |                                                                                     |             |             |                                   |
|                               | Rated voltage (V)                                                                                                                                                                                                                      |                 | 4           | 6.3         | 10                 | 16                                                                                  | 25          | 35          | 50                                |
|                               | Impedance ratio                                                                                                                                                                                                                        | Z-25°C / Z+20°C | 7           | 4           | 3                  | 2                                                                                   | 2           | 2           | 2                                 |
|                               | ZT / Z20 (MAX.)                                                                                                                                                                                                                        | Z-40°C / Z+20°C | 15          | 8           | 6                  | 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.                                                                                    |                 |             |             | Capacitance change | Within ±20% of the initial capacitance value (MR series & ϕ3 product : Within ±25%) |             |             |                                   |
|                               |                                                                                                                                                                                                                                        |                 |             |             | 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 specified values for the endurance characteristics listed above. |                 |             |             |                    |                                                                                     |             |             |                                   |
| Marking                       | Printed with white color letter on black sleeve.                                                                                                                                                                                       |                 |             |             |                    |                                                                                     |             |             |                                   |

## Radial Lead Type



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

## Type numbering system (Example : 25V 10μF)



## Dimensions

| V        | 4   | 6.3      | 10             | 16             | 25             | 35           | 50                |
|----------|-----|----------|----------------|----------------|----------------|--------------|-------------------|
| Cap.(μF) | 0G  | 0J       | 1A             | 1C             | 1E             | 1V           | 1H                |
| 0.1      | 0R1 |          |                |                |                |              | 4×5(3×5) 1.0(1.0) |
| 0.22     | R22 |          |                |                |                |              | 4×5(3×5) 2.0(2.0) |
| 0.33     | R33 |          |                |                |                |              | 4×5(3×5) 2.8(2.8) |
| 0.47     | R47 |          |                |                |                |              | 4×5(3×5) 4.0(4.0) |
| 1        | 010 |          |                |                |                |              | 4×5(3×5) 8.4(8.0) |
| 2.2      | 2R2 |          |                |                |                | 3×5 8.4      | • 4×5 13(10)      |
| 3.3      | 3R3 |          |                |                |                | • 4×5 15(10) | 4×5 17            |
| 4.7      | 4R7 |          |                |                |                | 4×5 18       | 5×5 20            |
| 10       | 100 |          | 3×5 15         |                | • 4×5 23(18)   | 5×5 27       | 6.3×5 33          |
| 22       | 220 | 3×5 19   | • 4×5 28(21)   | 5×5 33         | 5×5 37         | 6.3×5 42     | 6.3×5 46          |
| 33       | 330 | 4×5 28   | 5×5 37         | 5×5 41         | ○ 6.3×5 49(43) | 6.3×5 52     | □ 8×5 62(52)      |
| 47       | 470 | 4×5 33   | 5×5 45         | ○ 6.3×5 52(43) | 6.3×5 58       | □ 8×5 70(62) | 8×5 80            |
| 100      | 101 | 5×5 56   | ○ 6.3×5 70(68) | □ 8×5 80(76)   | □ 8×5 92(86)   | 8×5 110      |                   |
| 220      | 221 | 6.3×5 96 | □ 8×5 110(90)  | 8×5 135        |                |              |                   |
| 330      | 331 | 8×5 145  | 8×5 170        |                |                |              |                   |
| 470      | 471 | 8×5 185  |                |                |                |              |                   |

Size φ3 × 5 is available for capacitors marked. "●"/ Size φ5 × 5 is available for capacitors marked. "○"  
Size φ6.3 × 5 is available for capacitors marked. "□" In such a case, [M/R] will be put at 2nd and 3rd digit of type numbering system.

## Frequency coefficient of rated ripple current

| Frequency   | 50 Hz | 120 Hz | 300 Hz | 1 kHz | 10kHz or more |
|-------------|-------|--------|--------|-------|---------------|
| Coefficient | 0.70  | 1.00   | 1.17   | 1.36  | 1.50          |

Please refer to page 20, 21, 22 about the formed or taped product spec.  
Please refer to page 4 for the minimum order quantity.

CAT.8100D