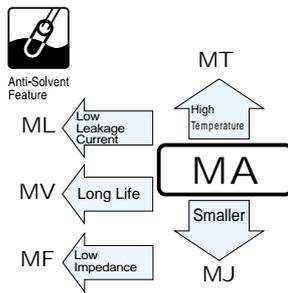


ALUMINUM ELECTROLYTIC CAPACITORS

MA series 5mmL, Standard, For General Purposes

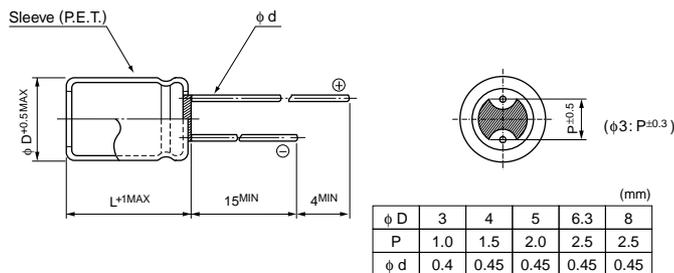
- Standard series with 5mm height.
- Adapted to the RoHS directive (2002/95/EC).



Specifications

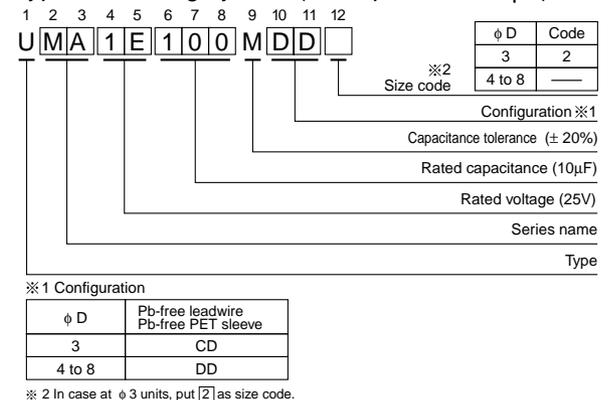
Item	Performance Characteristics																							
Category Temperature Range	-40 to +85°C																							
Rated Voltage Range	4 to 50V																							
Rated Capacitance Range	0.1 to 470μF																							
Rated Capacitance Tolerance	±20% at 120Hz, 20°C																							
Leakage Current	After 2 minutes' application of rated voltage, leakage current is not more than 0.01CV or 3(μA), whichever is greater.																							
tan δ	Measurement frequency : 120Hz, Temperature : 20°C																							
	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>tan δ (MAX.)</td> <td>0.35</td> <td>0.24 (0.30)</td> <td>0.20 (0.24)</td> <td>0.16 (0.20)</td> <td>0.14 (0.18)</td> <td>0.12 (0.16)</td> <td>0.10 (0.13)</td> </tr> </table> Figures in () are for MR series.	Rated voltage (V)	4	6.3	10	16	25	35	50	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)							
Rated voltage (V)	4	6.3	10	16	25	35	50																	
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																							
	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Impedance ratio Z-25°C / Z+20°C</td> <td>7</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>ZT / Z20 (MAX.)</td> <td>Z-40°C / Z+20°C</td> <td>15</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> </tr> </table>	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
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																	
Endurance	After 2000 hours' application of rated voltage at 85°C, capacitors meet the characteristic requirements listed at right.																							
	<table border="1"> <tr> <td>Capacitance change</td> <td>Within ±20% of initial value (MR series & φ 3 product : Within ±25%)</td> </tr> <tr> <td>tan δ</td> <td>200% or less of initial specified value</td> </tr> <tr> <td>Leakage current</td> <td>Initial specified value or less</td> </tr> </table>	Capacitance change	Within ±20% of initial value (MR series & φ 3 product : Within ±25%)	tan δ	200% or less of initial specified value	Leakage current	Initial specified value or less																	
	Capacitance change	Within ±20% of initial value (MR series & φ 3 product : Within ±25%)																						
tan δ	200% or less of initial specified value																							
Leakage current	Initial specified value or less																							
Shelf Life	After storing the capacitors under no load at 85°C for 1000 hours, and after performing voltage treatment based on JIS C 5101-4 clause 4.1 at 20°C, they will meet the specified value for 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

Cap.(μF)	V		4		6.3		10		16		25		35		50		
	Code	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
3.3	3R3															4×5	15(10)
4.7	4R7															4×5	18
10	100															4×5	20
22	220	3×5	19	• 4×5	28(21)	5×5	33	• 4×5	23(18)	5×5	27	5×5	29	6.3×5	33	33	33
33	330	4×5	28	5×5	37	5×5	41	○ 6.3×5	49(43)	6.3×5	52	□ 8×5	62(52)	8×5	71	71	71
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.

Rated Ripple (mArms) at 85°C 120Hz
() = φ 3 units and MR series.

Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz 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.