

MA series

5mmL, Standard, For General Purposes

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



Anti-Solvent Feature

ML

Low Leakage Current

MV

Long Life

MF

Low Impedance

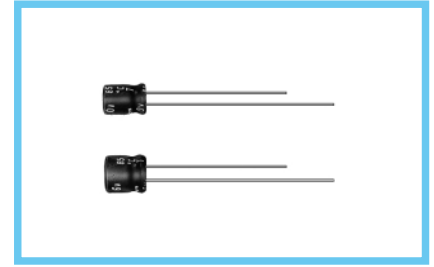
MT

High Temperature

MA

Smaller

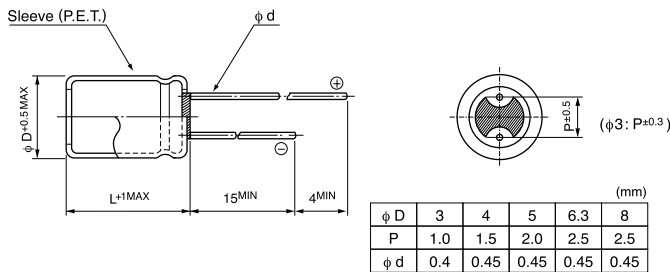
MJ



Specifications

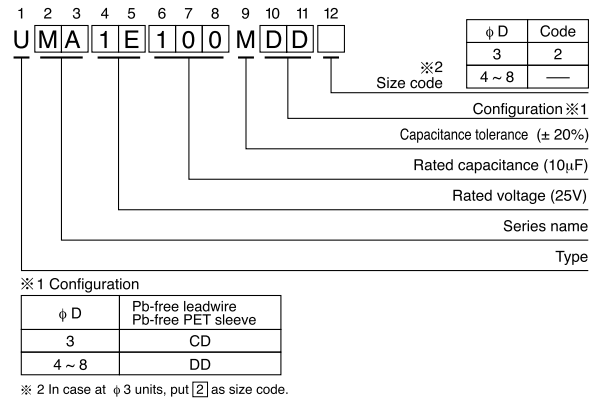
Item	Performance Characteristics																									
Category Temperature Range	-40 ~ +85°C																									
Rated Voltage Range	4 ~ 50V																									
Rated Capacitance Range	0.1 ~ 470μF																									
Rated Capacitance Tolerance	±20% at 120Hz, 20°C																									
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> <p>Figures in () are for MR series.</p>	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 colspan="2">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 rowspan="2">Impedance ratio ZT / Z20 (MAX.)</td> <td>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>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> <td>3</td> </tr> </table>	Rated voltage (V)		4	6.3	10	16	25	35	50	Impedance ratio ZT / Z20 (MAX.)	Z-25°C / Z+20°C	7	4	3	2	2	2	2	Z-40°C / Z+20°C	15	8	6	4	4	3
Rated voltage (V)		4	6.3	10	16	25	35	50																		
Impedance ratio ZT / Z20 (MAX.)	Z-25°C / Z+20°C	7	4	3	2	2	2	2																		
	Z-40°C / Z+20°C	15	8	6	4	4	3	3																		
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 (MR series & φ 3 product : Within ±25%)																								
	tan δ	200% or less of initial specified value																								
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.																									
	Leakage current	Initial specified value or less																								
Marking	Printed with white color letter on black sleeve.																									

Radial Lead Type



• Please refer to page 21 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	17
4.7	4R7													4×5	20
10	100													3×5	20
22	220	3×5	19	• 4×5	28(21)	5×5	33	5×5	23(18)	5×5	27	5×5	29	6.3×5	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
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												
														Case size $\phi D \times L$ (mm)	Rated ripple

Size $\phi 3 \times 5$ is available for capacitors marked. "•"/ Size $\phi 5 \times 5$ is available for capacitors marked. "○"

Size $\phi 6.3 \times 5$ 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

() = $\phi 3$ units and MR series.

Frequency coefficient of rated ripple current

Frequency	50 Hz	120 Hz	300 Hz	1 kHz	10 kHz ~
Coefficient	0.70	1.00	1.17	1.36	1.50

Please refer to page 21, 22, 23 about the formed or taped product spec.
Please refer to page 3 for the minimum order quantity.