



**STACKED TYPE METALLIZED POLYESTER FILM CAPACITOR**

**Typical applications:** is a micro-miniature capacitor in stacked construction composed of ultra-thin metallized polyester film made available by our unique engineering method to meet the needs of miniaturization.

PRODUCT CODE: **MMT**

All dimensions are in mm.

**PRODUCT CODE SYSTEM**

The part number, comprising 15 digits, is formed as follows:



- Digit 1 to 3 Series code.
- Digit 4 to 6 The rated capacitance of the capacitor is defined by an exponential code where positions 4-5 express the two first capacitance figures and position 6 expresses the number of zeros that must be added to obtain the Rated Capacitance in pF.
- Digit 7 It defines the capacitance tolerance percentage, according to IEC 62 Standard, when possible. At present, the following tolerances have been defined:  
 J=±5%
- Digit 8 It defines the product voltage according to page 21.
- Digit 9 to 13 Indicate leads / packaging according to page 20.
- Digit 14 to 15 Internal use

**GENERAL TECHNICAL DATA**

- Dielectric:** polyester film (polyethylene terephthalate).
- Plates:** aluminium layer deposited by evaporation under vacuum.
- Winding:** non-inductive type.
- Leads:** tinned wires.
- Protection:** thermosetting resin.

Rated Cap.	50 Vdc					Max dv/dt (V/µs)	Part Number	Number of pieces for packing unit	
	W	H	T	P	F			Taped (ammopack)	Loose (box)
0.010 µF	7.3	5.0	3.2	5.0	5.0	36	MMT103 - C - - - - -	2000	4000
0.015 µF	7.3	5.0	3.2	5.0	5.0	36	MMT153 - C - - - - -	2000	4000
0.022 µF	7.3	5.0	3.2	5.0	5.0	36	MMT223 - C - - - - -	2000	4000
0.033 µF	7.3	5.0	3.2	5.0	5.0	36	MMT333 - C - - - - -	2000	4000
0.047 µF	7.3	5.0	3.2	5.0	5.0	36	MMT473 - C - - - - -	2000	4000
0.068 µF	7.3	5.0	3.2	5.0	5.0	36	MMT683 - C - - - - -	2000	4000
0.10 µF	7.3	5.0	3.2	5.0	5.0	36	MMT104 - C - - - - -	2000	4000
0.15 µF	7.3	5.5	3.5	5.0	5.0	36	MMT154 - C - - - - -	2000	4000
0.22 µF	7.3	5.5	4.3	5.0	5.0	36	MMT224 - C - - - - -	2000	3000
0.33 µF	7.3	6.5	4.8	5.0	5.0	36	MMT334 - C - - - - -	1000	3000
0.47 µF	7.3	8.0	5.5	5.0	5.0	36	MMT474 - C - - - - -	1000	2000
0.68 µF	7.3	8.0	6.5	5.0	5.0	36	MMT684 - C - - - - -	1000	2000
1.0 µF	7.3	9.5	7.5	5.0	5.0	36	MMT105 - C - - - - -	1000	2000
1.5 µF	10.0	9.5	6.5	7.5	5.0	20	MMT155 - C - - - - -	1000	1000
2.2 µF	10.0	11.0	7.0	7.5	5.0	20	MMT225 - C - - - - -		1000
3.3 µF	10.0	13.5	8.0	7.5	5.0	20	MMT335 - C - - - - -		1000

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Rated Cap.	63 Vdc					Max dv/dt (V/μs)	Part Number	Number of pieces for packing unit	
	W	H	T	P	F			Taped (ammopack)	Loose (box)
0.010 μF	8.0	5.0	3.2	5.0	5.0	42	MMT103 - D - - - - -	2000	4000
0.015 μF	8.0	5.0	3.2	5.0	5.0	42	MMT153 - D - - - - -	2000	4000
0.022 μF	8.0	5.0	3.2	5.0	5.0	42	MMT223 - D - - - - -	2000	4000
0.033 μF	8.0	5.0	3.2	5.0	5.0	42	MMT333 - D - - - - -	2000	4000
0.047 μF	8.0	5.0	3.2	5.0	5.0	42	MMT473 - D - - - - -	2000	4000
0.068 μF	8.0	5.0	3.2	5.0	5.0	42	MMT683 - D - - - - -	2000	4000
0.10 μF	8.0	5.0	3.2	5.0	5.0	42	MMT104 - D - - - - -	2000	4000
0.15 μF	8.0	5.5	3.5	5.0	5.0	42	MMT154 - D - - - - -	2000	3000
0.22 μF	8.0	5.5	3.8	5.0	5.0	42	MMT224 - D - - - - -	2000	3000
0.33 μF	8.0	6.5	4.5	5.0	5.0	42	MMT334 - D - - - - -	1000	3000
0.47 μF	8.0	8.0	5.0	5.0	5.0	42	MMT474 - D - - - - -	1000	2000
0.68 μF	8.0	10.0	4.5	5.0	5.0	42	MMT684 - D - - - - -	1000	2000
1.0 μF	8.0	11.0	5.3	5.0	5.0	42	MMT105 - D - - - - -	1000	2000
1.5 μF	11.0	11.0	5.0	7.5	5.0	22	MMT155 - D - - - - -	1000	1000
2.2 μF	11.0	12.0	6.0	7.5	5.0	22	MMT225 - D - - - - -		1000
3.3 μF	11.0	13.5	7.0	7.5	5.0	22	MMT335 - D - - - - -		1000

Rated Cap.	100 Vdc					Max dv/dt (V/μs)	Part Number	Number of pieces for packing unit	
	W	H	T	P	F			Taped (ammopack)	Loose (box)
0.010 μF	7.3	5.0	3.2	5.0	5.0	69	MMT103 - E - - - - -	2000	4000
0.015 μF	7.3	5.0	3.2	5.0	5.0	69	MMT153 - E - - - - -	2000	4000
0.022 μF	7.3	5.0	3.2	5.0	5.0	69	MMT223 - E - - - - -	2000	4000
0.033 μF	7.3	5.0	3.2	5.0	5.0	69	MMT333 - E - - - - -	2000	4000
0.047 μF	7.3	5.0	3.2	5.0	5.0	69	MMT473 - E - - - - -	2000	4000
0.068 μF	7.3	5.0	3.2	5.0	5.0	69	MMT683 - E - - - - -	2000	4000
0.10 μF	7.3	5.0	3.2	5.0	5.0	69	MMT104 - E - - - - -	2000	4000
0.15 μF	7.3	5.5	3.7	5.0	5.0	69	MMT154 - E - - - - -	2000	4000
0.22 μF	7.3	6.5	4.2	5.0	5.0	69	MMT224 - E - - - - -	2000	3000
0.33 μF	7.3	6.5	5.4	5.0	5.0	69	MMT334 - E - - - - -	1000	3000
0.47 μF	7.3	7.5	5.6	5.0	5.0	69	MMT474 - E - - - - -	1000	2000
0.68 μF	7.3	8.2	6.4	5.0	5.0	69	MMT684 - E - - - - -	1000	2000
1.0 μF	7.3	9.3	7.4	5.0	5.0	69	MMT105 - E - - - - -	1000	2000

Rated Cap.	250 Vdc					Max dv/dt (V/μs)	Part Number	Number of pieces for packing unit	
	W	H	T	P	F			Taped (ammopack)	Loose (box)
0.010 μF	7.3	5.0	3.2	5.0	5.0	120	MMT103 - I - - - - -	2000	4000
0.015 μF	7.3	6.0	3.2	5.0	5.0	120	MMT153 - I - - - - -	2000	4000
0.022 μF	7.3	6.0	3.5	5.0	5.0	120	MMT223 - I - - - - -	2000	4000
0.033 μF	7.3	5.5	3.5	5.0	5.0	120	MMT333 - I - - - - -	2000	4000
0.047 μF	7.3	6.8	3.3	5.0	5.0	120	MMT473 - I - - - - -	2000	3000
0.068 μF	7.3	7.5	4.2	5.0	5.0	120	MMT683 - I - - - - -	2000	3000
0.10 μF	7.3	8.3	4.3	5.0	5.0	120	MMT104 - I - - - - -	2000	2000
0.15 μF	7.3	10.0	5.0	5.0	5.0	120	MMT154 - I - - - - -	1000	2000
0.22 μF	7.3	13.0	5.2	5.0	5.0	120	MMT224 - I - - - - -	1000	2000

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**ELECTRICAL CHARACTERISTICS**

**Rated voltage ( $V_R$ ):** 50 Vdc - 63 Vdc - 100 Vdc  
250 Vdc

**Rated temperature ( $T_R$ ):** -40 to +85°C (+105°C)

**Temperature derated voltage:**

for temperatures between +85°C and +105°C a decreasing factor of 1.50% per degree °C on the rated voltage  $V_R$  (d.c. and a.c.) has to be applied.

**Capacitance range:**

50Vdc, 63Vdc: from 0.010 to 3.3  $\mu$ F

100Vdc: from 0.010 to 1.0  $\mu$ F

250Vdc: from 0.010 to 0.22  $\mu$ F

**Capacitance values:**

E6 series (IEC 60063 Norm).

**Capacitance tolerances** (measured at 1 kHz):

$\pm$ 5% (J)

**Total self-inductance (L):**

max 1 nH per 1 mm lead and capacitor length.

**Dissipation factor (DF):**

$\leq$ 100 $\times$ 10<sup>-4</sup> at 1kHz

**Insulation resistance:**

C $\leq$ 0.33  $\mu$ F: 3000 M $\Omega$  or more

C $>$ 0.33  $\mu$ F: 1000  $\Omega$ F or more

**TEST METHOD AND PERFORMANCE****Damp heat, steady state:****Test conditions**

Temperature: +40°C  $\pm$ 2°C

Relative humidity (RH): 93%  $\pm$ 2%

Test duration: 500 h

**Performance**

Capacitance change  $|\Delta C/C|$ :  $\leq$ 7%

DF:  $\leq$ 110 $\times$ 10<sup>-4</sup> at 1kHz

Insulation resistance: C $\leq$ 0.33  $\mu$ F 100 M $\Omega$  or more

C $>$ 0.33  $\mu$ F 300  $\Omega$ F or more

**Endurance:****Test conditions**

Temperature: +85°C  $\pm$ 2°C

Test duration: 1000 h

Voltage applied: 1.25 $\times$  $V_R$

**Performance**

Capacitance change  $|\Delta C/C|$ :  $\leq$ 7%

DF:  $\leq$ 110 $\times$ 10<sup>-4</sup> at 1kHz

Insulation resistance: C $\leq$ 0.33  $\mu$ F 1000 M $\Omega$  or more

C $>$ 0.33  $\mu$ F 300  $\Omega$ F or more

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**MAX. CURRENT (I<sub>r.m.s.</sub>) VERSUS FREQUENCY**

