MP2 SERIES

VERY HIGH dV/dt PULSE CAPACITOR

DOUBLE METALLIZED POLYPROPYLENE CAPACITOR ▲ THT type
Low dissipation factor at high frequency
Flame retardant epoxy resin, UL 94V-0
Very high pulse strength ▲ Up to 10kV/µs
Normal size ▲ Wide dimension range
Internal series construction ▲ Excellent corona stability

SPECIFICATION

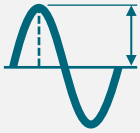
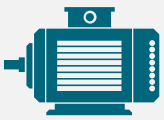
Item		Characteristics
Related Documents		IEC 60384-17
Rated Temperature Range		-40°C to +85°C for V_R (DC) ▲ -40°C to +105°C for V_R (AC)
Usable Temperature Range Note 1		-40°C to +110°C
Capacitance Range	C_R	0.001µF to 0.1µF
Capacitance Tolerance	ΔC	±2% ▲ ±3% ▲ ±5% ▲ ±10%
Rated DC Voltage	$V_{R\,DC}$	800V_{DC} ▲ 1200V_{DC} ▲ 1600V_{DC} ▲ 2000V_{DC} ▲ 2200V_{DC}
Rated AC Voltage	$V_{R\,AC}$	300V_{AC} ▲ 400V_{AC} ▲ 500V_{AC} ▲ 700V_{AC} ▲ 900V_{AC}
Dissipation Factor	tan δ	f (kHz) : C ≤ 0.1µF 1 : ≤ 0.05% 100 : ≤ 0.10%
Insulation Resistance Note 2	R_{INS}	C_R ≤ 0.1µF ≥ 50GΩ
Withstand Voltage Note 3	V_W	1.6 x V_R applied for 2 sec. (cut off current 10mA)

Maximum Pulse Rise Slope dV/dt	Pitch (mm)	300V_{AC}	400V_{AC}	500V_{AC}	700V_{AC}	900V_{AC}
	10	-	4000V/µs	-	-	-
	15	3000V/µs	3400V/µs	5000V/µs	9500V/µs	-
	22.5	1500V/µs	2200V/µs	3000V/µs	5000V/µs	10kV/µs

Notes:

1:	Derating ratio of rated voltage +85°C to +110°C	1.25% per °C for rated DC voltage
	Derating ratio of rated voltage +105°C to +110°C	1.25% per °C for rated AC voltage
2:	Terminal to terminal at 20°C ± 5°C	Voltage charge time: 1minute; Voltage charge: 100V_{DC}
3:	Terminal to terminal at 20°C ± 5°C	Slow-up voltage speed: C ≤ 10µF: 5sec / C > 10µF: 10sec

APPLICATIONS

Electronic Ballast	Pulse Applications	Motor Control Circuits	Switch Mode Power Supplies
			

ELECTRICAL CHARACTERISTICS

V_R	C_R (µF)	Dimensions (mm)			P (mm)	Ød ± 0.05 (mm)	Part Number [Note]
		W + 0.2	H	T			
800V_{DC} ▲ 300V_{AC}	0.01	18	10.5	4.5	15	0.8	MP2–103□0300AB□15□
	0.012	18	10.5	5	15	0.8	MP2–123□0300AB□15□
	0.015	18	11.5	5.5	15	0.8	MP2–153□0300AB□15□
	0.018	18	12	6	15	0.8	MP2–183□0300AB□15□
	0.022	18	12.5	7	15	0.8	MP2–223□0300AB□15□
	0.027	18	13	7.5	15	0.8	MP2–273□0300AB□15□
	0.033	18	14	8.5	15	0.8	MP2–333□0300AB□15□
	0.039	18	15	9	15	0.8	MP2–393□0300AB□15□
	0.047	18	15.5	10	15	0.8	MP2–473□0300AB□15□
	0.056	18	15.5	10	15	0.8	MP2–563□0300AB□15□
	0.068	26	16.5	8	22.5	0.8	MP2–683□0300AB□22□
	0.082	26	17.5	8.5	22.5	0.8	MP2–823□0300AB□22□
	0.1	26	18.5	9.5	22.5	0.8	MP2–104□0300AB□22□
1200V_{DC} ▲ 400V_{AC}	0.001	13	8	4	10	0.6	MP2–102□0400AB□10□
	0.0012	13	8	4	10	0.6	MP2–122□0400AB□10□
	0.0015	13	8.5	4.5	10	0.6	MP2–152□0400AB□10□
	0.0018	13	10	4.5	10	0.6	MP2–182□0400AB□10□
	0.0022	13	10.5	5	10	0.6	MP2–222□0400AB□10□
	0.0027	13	10.5	5	10	0.6	MP2–272□0400AB□10□
	0.0033	13	11	5.5	10	0.6	MP2–332□0400AB□10□
	0.0039	13	12	6	10	0.6	MP2–392□0400AB□10□
	0.0047	13	12.5	7	10	0.6	MP2–472□0400AB□10□
	0.0056	13	13	7.5	10	0.6	MP2–562□0400AB□10□
	0.0068	18	11	5	15	0.8	MP2–682□0400AB□15□
	0.0082	18	11.5	5.5	15	0.8	MP2–822□0400AB□15□
	0.01	18	12	6	15	0.8	MP2–103□0400AB□15□
	0.012	18	12.5	6.5	15	0.8	MP2–123□0400AB□15□
	0.015	18	13	7.5	15	0.8	MP2–153□0400AB□15□
	0.018	18	14	8	15	0.8	MP2–183□0400AB□15□
	0.022	18	15	9	15	0.8	MP2–223□0400AB□15□
	0.027	18	16	10	15	0.8	MP2–273□0400AB□15□
	0.033	26	15.5	7	22.5	0.8	MP2–333□0400AB□22□
	0.039	26	16.5	7.5	22.5	0.8	MP2–393□0400AB□22□
	0.047	26	17	8.5	22.5	0.8	MP2–473□0400AB□22□
	0.056	26	18	9	22.5	0.8	MP2–563□0400AB□22□
	0.068	26	19	10.5	22.5	0.8	MP2–683□0400AB□22□
	0.082	26	19	10.5	22.5	0.8	MP2–823□0400AB□22□
	0.1	26	20.5	11.5	22.5	0.8	MP2–104□0400AB□22□

Note: **Enter the appropriate tolerance lead length code and lead configuration □ from the product code table**

ELECTRICAL CHARACTERISTICS

V_R	C_R (µF)	Dimensions (mm)			P (mm)	Ød ± 0.05 (mm)	Part Number [Note]
		W + 0.2	H	T			
1600V_{DC} ▲ 500V_{AC}	0.001	18	10	4.5	15	0.8	MP2–102□0500AB□15□
	0.0012	18	10.5	5	15	0.8	MP2–122□0500AB□15□
	0.0015	18	10.5	5	15	0.8	MP2–152□0500AB□15□
	0.0018	18	10.5	5	15	0.8	MP2–182□0500AB□15□
	0.0022	18	10.5	5.5	15	0.8	MP2–222□0500AB□15□
	0.0027	18	10.5	5.5	15	0.8	MP2–272□0500AB□15□
	0.0033	18	11	5.5	15	0.8	MP2–332□0500AB□15□
	0.0039	18	11	5.5	15	0.8	MP2–392□0500AB□15□
	0.0047	18	11	5.5	15	0.8	MP2–472□0500AB□15□
	0.0056	18	11.5	6	15	0.8	MP2–562□0500AB□15□
	0.0068	18	12	6.5	15	0.8	MP2–682□0500AB□15□
	0.0082	18	12.5	7	15	0.8	MP2–822□0500AB□15□
	0.01	18	13.5	7.5	15	0.8	MP2–103□0500AB□15□
	0.012	18	14	8.5	15	0.8	MP2–123□0500AB□15□
	0.015	18	15	9.5	15	0.8	MP2–153□0500AB□15□
	0.018	26	15	6.5	22.5	0.8	MP2–183□0500AB□22□
	0.022	26	16	7	22.5	0.8	MP2–223□0500AB□22□
	0.027	26	16.5	8	22.5	0.8	MP2–273□0500AB□22□
2000V_{DC} ▲ 700V_{AC}	0.001	18	10	4.5	15	0.8	MP2–102□0700AB□15□
	0.0012	18	10.5	5	15	0.8	MP2–122□0700AB□15□
	0.0015	18	10.5	5	15	0.8	MP2–152□0700AB□15□
	0.0018	18	11	5	15	0.8	MP2–182□0700AB□15□
	0.0022	18	11.5	5.5	15	0.8	MP2–222□0700AB□15□
	0.0027	18	12	6	15	0.8	MP2–272□0700AB□15□
	0.0033	18	12	6.5	15	0.8	MP2–332□0700AB□15□
	0.0039	18	13	7.5	15	0.8	MP2–392□0700AB□15□
	0.0047	18	14	8	15	0.8	MP2–472□0700AB□15□
	0.0056	18	14.5	9	15	0.8	MP2–562□0700AB□15□
	0.0068	18	15	9	15	0.8	MP2–682□0700AB□15□
	0.0082	26	15	6	22.5	0.8	MP2–822□0700AB□22□
	0.01	26	15.5	7	22.5	0.8	MP2–103□0700AB□22□
	0.012	26	16.5	7.5	22.5	0.8	MP2–123□0700AB□22□
	0.015	26	17.5	8.5	22.5	0.8	MP2–153□0700AB□22□
	0.018	26	18.5	9.5	22.5	0.8	MP2–183□0700AB□22□
	0.022	26	18.5	9.5	22.5	0.8	MP2–223□0700AB□22□
	0.027	26	19.5	11	22.5	0.8	MP2–273□0700AB□22□

Note: **Enter the appropriate tolerance lead length code and lead configuration □ from the product code table**

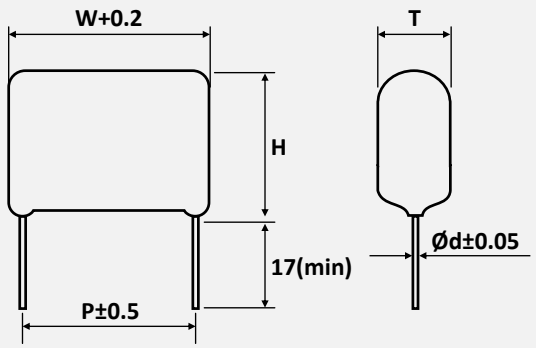
ELECTRICAL CHARACTERISTICS

V_R	C_R (µF)	Dimensions (mm)			P (mm)	Ød ± 0.05 (mm)	Part Number Note
		W + 0.2	H	T			
2200V_{DC} ▲ 900V_{AC}	0.001	26	12	5	22.5	0.8	MP2–102□0900AB□22□
	0.0012	26	12.5	5	22.5	0.8	MP2–122□0900AB□22□
	0.0015	26	13.5	5.5	22.5	0.8	MP2–152□0900AB□22□
	0.0018	26	13.5	6	22.5	0.8	MP2–182□0900AB□22□
	0.0022	26	13.5	6	22.5	0.8	MP2–222□0900AB□22□
	0.0027	26	13.5	6	22.5	0.8	MP2–272□0900AB□22□
	0.0033	26	13.5	6.5	22.5	0.8	MP2–332□0900AB□22□
	0.0039	26	13.5	6.5	22.5	0.8	MP2–392□0900AB□22□
	0.0047	26	13.5	6.5	22.5	0.8	MP2–472□0900AB□22□
	0.0056	26	14	6.5	22.5	0.8	MP2–562□0900AB□22□
	0.0068	26	14	7.5	22.5	0.8	MP2–682□0900AB□22□
	0.0082	26	16	7.5	22.5	0.8	MP2–822□0900AB□22□
	0.01	26	17	8	22.5	0.8	MP2–103□0900AB□22□
	0.012	26	18	9	22.5	0.8	MP2–123□0900AB□22□
	0.015	26	19	10	22.5	0.8	MP2–153□0900AB□22□
	0.018	26	20	11.5	22.5	0.8	MP2–183□0900AB□22□

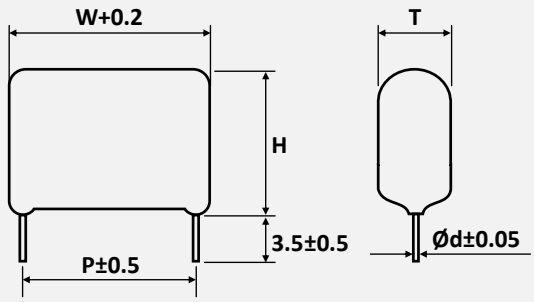
Note: **Enter the appropriate tolerance lead length code and lead configuration □ from the product code table**

PACKAGE OUTLINE ▲ All dimensions in mm

Long Leads

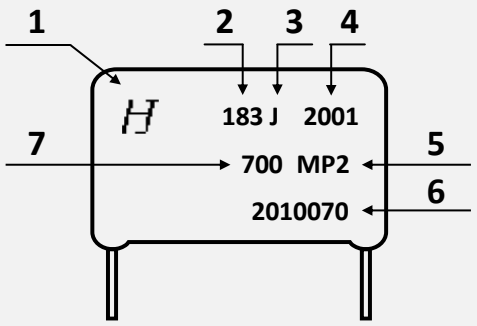


Short Leads



PRODUCT MARKING

Marking	Details



P ≤ 10mm H P 15 to 27.5mm H P > 27.5mm HJC

No.	Description
1	Manufacturer Logo *
2	Nominal capacitance in µF
3	Capacitance tolerance
4	Date code
5	Series name
6	Production no.
7	AC rated voltage

DATE CODE & APPLICATION CATEGORY

Example:

Date code

2001: 2001 = 1st week of 2020

Lot number

2010070: 20 = Year, here 2020
1 = Month, here January
0001 to XXXX = Serial number

20		01	
Year		Week	
19	2019	01	1st
20	2020	02	2nd
21	2021	03	3rd
22	2022	04	4th
23	2023	05	5th
...	...	...	...
30	2030	53	53rd

PRODUCT CODE

Example: MP2 series ▲ 0.018µF ▲ 700V_{AC} ▲ ±5% ▲ P=22.5mm ▲ Bulk ▲ Straight leads ▲ 17mm lead length

MP2-		183		J		0700		A		B		1		22		1	
Series		Capacitance Code Note1 (pF)		Capacitance Tolerance (%)		Rated Voltage (V_{AC})		Voltage Type		Packaging Type		Lead Configuration Note2		Pitch (mm)		Lead Length (mm)	
Code	Series	Code	µF	Code	Tol.	Code	VAC	Code	Type	Code	Type	Code	Style	Code	mm	Code	mm
MP2-	MP2	102	0.001	G	±2	0300	300	A	AC	B	Bulk	1	SL	10	10.0	1	17.0
		182	0.0018	H	±3	0400	400							15	15.0	2	3.5
		473	0.047	J	±5	0500	500							22	22.5		
		683	0.068	K	±10	0700	700										
		104	0.1			0900	900										

Note:

1 **Capacitance code expressed in pF. The first two digits represent significant figures. The last digit specifies the total number of zeros to be added.**

2 **SL = Straight leads**

REFERENCE DATA

Fig. 1 ▪ Capacitance Drift vs. Ambient Temperature

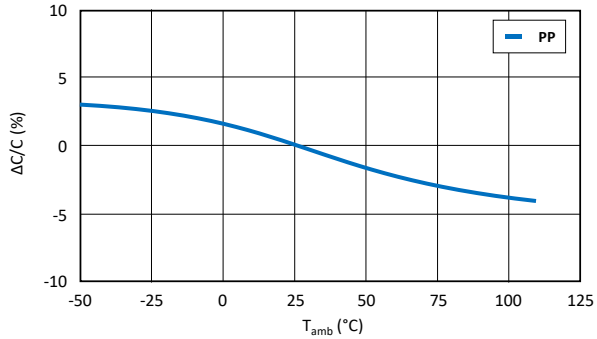


Fig. 2 ▪ Insulation Resistance vs. Ambient Temperature

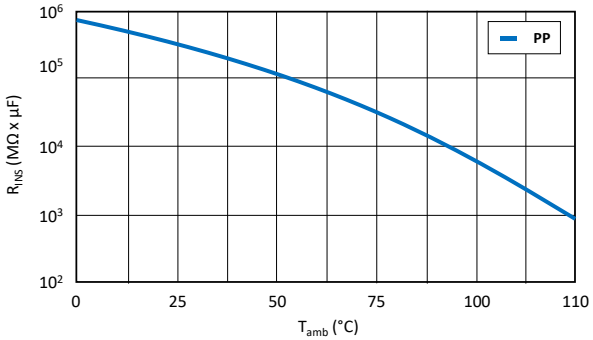


Fig. 3 ▪ Dissipation Factor vs. Ambient Temperature

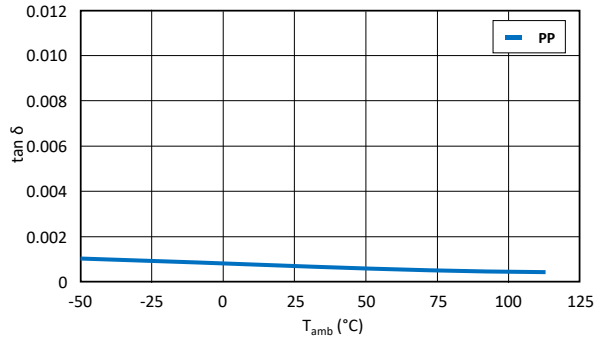


Fig. 4 ▪ Dissipation Factor vs. Frequency

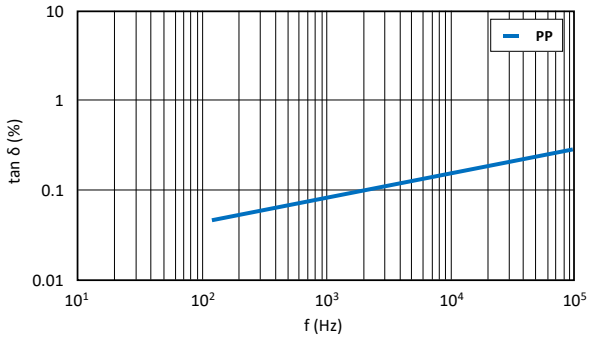


Fig. 5 ▪ Capacitance Drift vs. Frequency

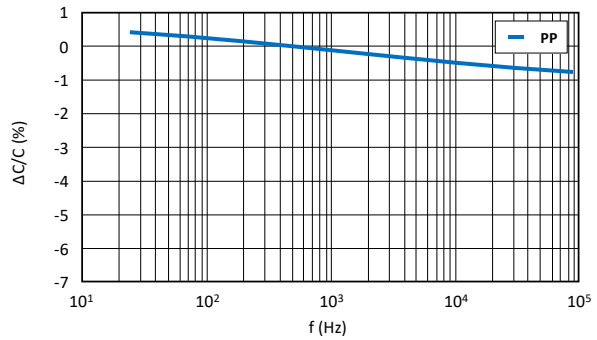


Fig. 6 ▪ Impedance vs. Frequency ▪ Typical Curve

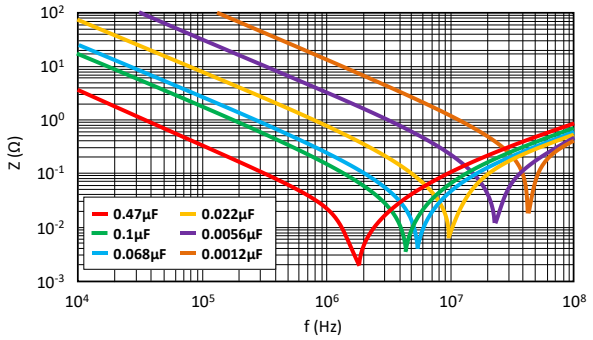


Fig. 7 ▪ Max. RMS Voltage vs. Frequency ▪ 800V_{DC}/300V_{AC}

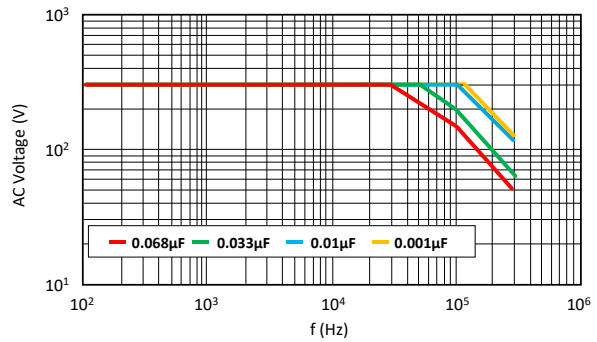
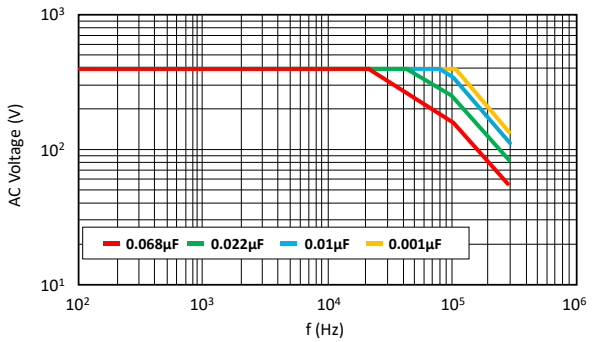


Fig. 8 ▪ Max. RMS Voltage vs. Frequency ▪ 1200V_{DC}/400V_{AC}



REFERENCE DATA

Fig. 9 ▪ Max. RMS Voltage vs. Frequency ▪ 1600V$_{DC}$/500V$_{AC}$

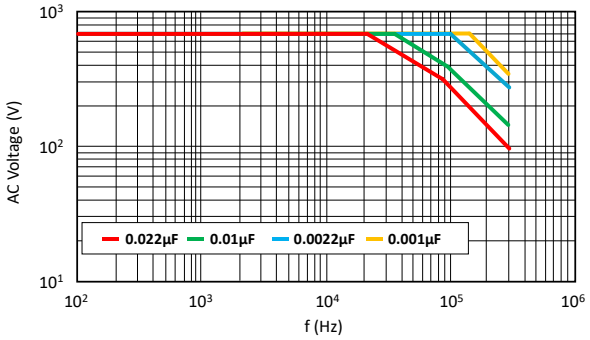


Fig. 10 ▪ Max. RMS Voltage vs. Frequency ▪ 2000V$_{DC}$/700V$_{AC}$

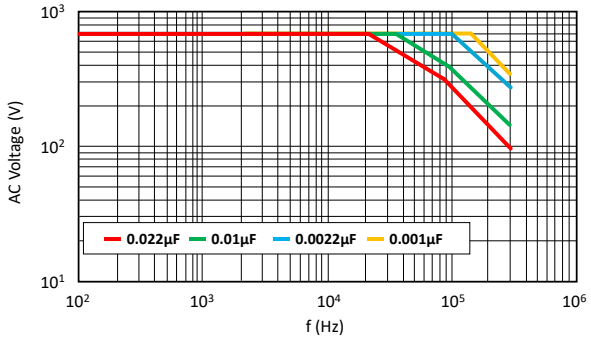


Fig. 11 ▪ Max. RMS Voltage vs. Frequency ▪ 2200V$_{DC}$/900V$_{AC}$

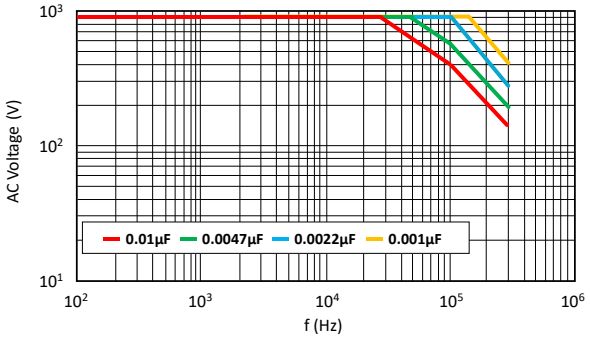


Fig. 12 ▪ Max. DC Voltage vs. Temperature

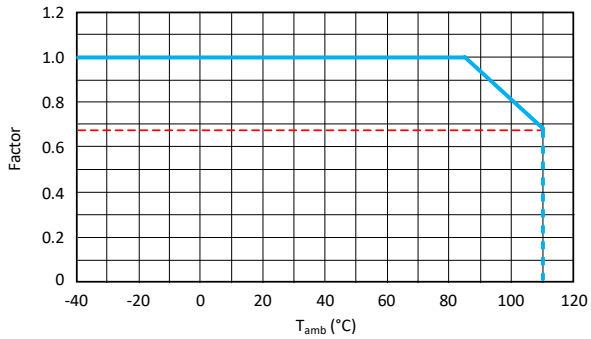


Fig. 13 ▪ Max. AC Voltage vs. Temperature

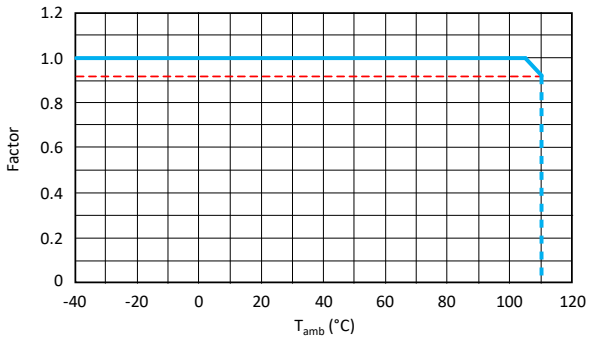
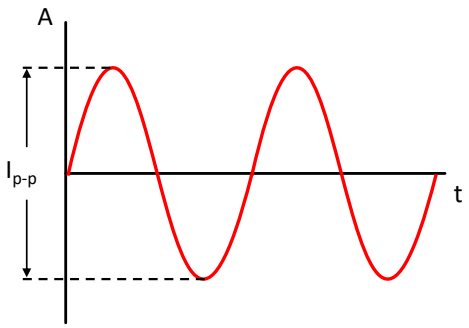


Fig. 14 ▪ Max. RMS Current - Wave Form



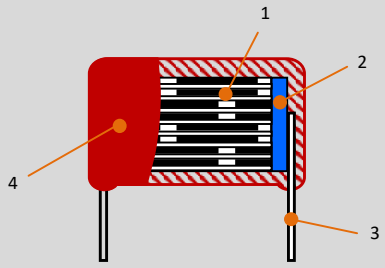
MAXIMUM RMS CURRENT

V_R	C_R (µF)	P (mm)	I_{RMS} (A) at f							
			15.75kHz	35kHz	45kHz	65kHz	80kHz	100kHz	130kHz	200kHz
800V_{DC} ▲ 300V_{AC}	0.01	15	0.82	1.10	1.20	1.40	1.55	1.65	1.80	2.07
	0.015	15	1.01	1.35	1.50	1.70	1.85	2.00	2.20	2.60
	0.027	15	1.35	1.80	2.00	2.25	2.45	2.60	2.90	3.35
	0.033	15	1.68	2.30	2.45	2.80	3.00	3.30	3.60	4.20
	0.047	15	2.20	3.00	3.20	3.70	4.10	4.40	4.80	5.70
1000V_{DC} ▲ 400V_{AC}	0.0022	10	0.28	0.37	0.41	0.47	0.50	0.54	0.60	0.70
	0.0033	10	0.30	0.40	0.44	0.50	0.54	0.59	0.65	0.76
	0.0012	15	0.22	0.29	0.32	0.36	0.39	0.42	0.46	0.54
	0.0015	15	0.24	0.31	0.35	0.40	0.43	0.46	0.50	0.60
	0.0082	15	0.85	1.15	1.25	1.45	1.55	1.70	1.90	2.15
	0.01	15	0.90	1.25	1.35	1.55	1.65	1.85	2.00	2.35
	0.033	15	1.90	2.55	2.80	3.20	3.50	3.80	4.15	4.80
	0.047	15	2.05	2.70	3.00	3.50	3.70	4.10	4.50	5.20
	0.033	22.5	1.80	2.40	2.60	3.05	3.30	3.60	3.90	4.60
1600V_{DC} ▲ 500V_{AC}	0.0033	10	0.35	0.47	0.52	0.60	0.65	0.71	0.77	0.91
	0.001	15	0.16	0.22	0.24	0.28	0.30	0.33	0.36	0.42
	0.0015	15	0.27	0.37	0.40	0.46	0.49	0.54	0.60	0.68
	0.0022	15	0.42	0.55	0.60	0.69	0.75	0.82	0.90	1.05
	0.0033	15	0.52	0.71	0.78	0.90	0.97	1.05	1.15	1.35
	0.0039	15	0.58	0.79	0.85	0.98	1.05	1.15	1.30	1.50
	0.0047	15	0.63	0.85	0.95	1.05	1.15	1.25	1.40	1.65
	0.0056	15	0.70	0.94	1.05	1.20	1.30	1.40	1.55	1.80
	0.0082	15	0.95	1.30	1.40	1.60	1.75	1.90	2.10	2.45
	0.01	15	1.10	1.50	1.65	1.85	2.00	2.20	2.40	2.80
	0.033	22.5	2.05	2.70	3.00	3.40	3.70	4.00	4.40	5.00
2000V_{DC} ▲ 700V_{AC}	0.001	15	0.24	0.32	0.35	0.41	0.44	0.48	0.53	0.62
	0.0015	15	0.29	0.38	0.43	0.49	0.53	0.58	0.64	0.74
	0.0022	15	0.37	0.50	0.55	0.63	0.68	0.74	0.82	0.96
	0.0033	15	0.46	0.62	0.68	0.78	0.84	0.92	1.02	1.20
	0.0047	15	0.54	0.72	0.80	0.92	1.00	1.08	1.18	1.40
	0.0056	15	0.63	0.84	0.93	1.05	1.15	1.25	1.35	1.63
	0.0068	15	0.76	1.05	1.15	1.30	1.40	1.50	1.65	1.95
	0.01	15	0.92	1.25	1.35	1.55	1.70	1.85	2.03	2.35
	0.0047	22.5	0.65	0.88	0.95	1.10	1.20	1.30	1.40	1.65
	0.0082	22.5	0.80	1.05	1.20	1.35	1.45	1.60	1.75	2.05
	0.022	22.5	1.55	2.10	2.30	2.60	2.85	3.05	3.40	4.00
2200V_{DC} ▲ 900V_{AC}	0.0012	15	0.25	0.33	0.36	0.42	0.46	0.48	0.54	0.65
	0.0047	15	0.70	0.92	1.02	1.15	1.25	1.35	1.50	1.75
	0.0033	22.5	0.50	0.65	0.72	0.83	0.90	0.96	1.05	1.25
	0.01	22.5	0.83	1.10	1.25	1.40	1.55	1.65	1.80	2.13
	0.015	22.5	1.35	1.80	2.00	2.25	2.45	2.60	2.90	3.40

Note: **Maximum capacitor surface temperature $T_S \leq 110°C$; Maximum body temperature rise $\Delta T \leq 10°C$**

$$I_{RMS} = \frac{I_{p-p}}{2 \cdot \sqrt{2}}$$

TECHNICAL SPECIFICATION

No.	Category	Specification					
1	Scope	This specification applies to capacitors for electronics applications. Reference standards: IEC 60384-17					
2	Product Name	Metallized polypropylene film capacitor, with very high dV/dt, Type MP2					
3	Construction	Dimensions:	Refer to dimensions drawing				
							
		1 = Element	Polypropylene film and double-sided metallized polyester film				
		2 = Metal spray	Special solder. (Lead Free) compliant to RoHS directive				
		3 = Lead wire	Tinned wire (Cu wire) or tinned copper clad-steel wire (CP wire). (Lead Free) compliant to RoHS directive				
		4 = Coating	Epoxy resin. (UL-94V-0 Standard)				
4	Atmospheric and Temperature Characteristics	**Standard atmospheric conditions.** Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:					
		Ambient temperature:	15 to 35°C				
		Relative humidity	45% to 85%				
		Air pressure	86 to 106 kPa				
		If there may be any doubt on the results, measurements shall be made within the following limits.					
		Ambient temperature:	20°C ± 5°C				
		Relative humidity:	60 to 70%				
		Operating temperature range					
		Lowest operating temperature:	-40°C				
		Maximum operating temperature:	+110°C (case-temperature) with specified voltage-derating				
		The capacitor can be operated up to 110°C case-temperature (according to the power to be dissipated). Derating ratio of rated voltage +85°C to +110°C: 1.25% per °C for V_{RDC} Derating ratio of rated voltage +105°C to +110°C: 1.25% per °C for V_{RAC} The temperature is measured at the hottest point of the case when the capacitor has reached its thermal equilibrium.					
		Rated temperature range	-40°C to +85°C				
		Rated temperature range is the range of ambient temperature for which the capacitor can be operated continuously at rated voltage.					
5	Electrical Characteristics	Rated voltage V_R at 85°C:	$800V_{DC}$	$1200V_{DC}$	$1600V_{DC}$	$2000V_{DC}$	$2200V_{DC}$
			$300V_{AC}$	$400V_{AC}$	$500V_{AC}$	$700V_{AC}$	$900V_{AC}$
		Category voltage:	Up to 85°C $V_C = V_{RDC}$				
		Category voltage:	Up to 110°C $V_C = V_{RAC}$				
		Rated upper limit temperature:	+85°C				
		Usable upper limit temperature:	+110°C				
		Capacitance range:	0.001µF to 0.1µF				
		Capacitance tolerance:	±2% (G), ±3% (H), ±5% (J), ±10% (K)			Measured at 1kHz, 1V	

TECHNICAL SPECIFICATION

<table>
<tr><th>No.</th><th>Category</th><th colspan="5">Specification</th></tr>
<tr><td rowspan="20">5</td><td rowspan="20">Electrical Characteristics</td><td colspan="5">Dissipation factor tanδ (%): LCR meter: HP-4284A, at 20°C ± 5°C</td></tr>
<tr><td colspan="2">f (kHz)</td><td colspan="2">C ≤ 0.1μF</td></tr>
<tr><td colspan="2">1</td><td colspan="2">≤ 0.05%</td></tr>
<tr><td colspan="2">100</td><td colspan="2">≤ 0.10%</td></tr>
<tr><td colspan="5">Insulation resistance between terminals</td></tr>
<tr><td colspan="5">Test conditions:</td></tr>
<tr><td>Temperature:</td><td colspan="4">25°C ± 5°C</td></tr>
<tr><td>Voltage charge:</td><td colspan="4">100V_{DC}</td></tr>
<tr><td rowspan="2">Performance:</td><td colspan="4">C ≤ 0.1μF</td></tr>
<tr><td colspan="4">After voltage charge
1 minute > 50GΩ</td></tr>
<tr><td colspan="5">Test voltage between terminals</td></tr>
<tr><td colspan="5">1.6 × V_{RDC} applied for 2 sec, at 25°C ±5°C</td></tr>
<tr><td>Cut off current:</td><td colspan="4">10mA</td></tr>
<tr><td>Ramp/rise time:</td><td colspan="2">C ≤ 10μF: 5 sec</td><td colspan="2">C > 10μF: 10 sec</td></tr>
<tr><td>Performance:</td><td colspan="4">There shall be no dielectric breakdown or other damage</td></tr>
<tr><td rowspan="2">Test Item</td><td colspan="4">The test capacitor shall be kept in the testing oven and kept at condition of following table, and it shall be repeated for 5 cycles successively. After the test, the capacitor shall be let alone at the ordinary condition for 2 hours</td></tr>
<tr><td colspan="3">Conditions</td><td>Performance</td></tr>
<tr><td rowspan="5">Rapid change of temperature (IEC68-2-14 Na)</td><td>Step</td><td>Temperature</td><td>Time</td><td></td></tr>
<tr><td>1</td><td>-40 ± 3°C</td><td>30 ± 3 min</td><td rowspan="4">Capacitance change
|ΔC/C| ≤ ± 5%
tan δ change
≤ 0.1% at 1kHz
R insulation ≥ 50 % of limit value</td></tr>
<tr><td>2</td><td>Ordinary</td><td>3 min or less</td></tr>
<tr><td>3</td><td>+110 ± 2°C</td><td>30 ± 3 min</td></tr>
<tr><td>4</td><td>Ordinary</td><td>3 min or less</td></tr>
</table>

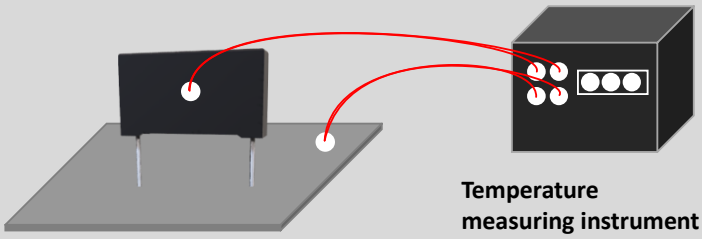
TECHNICAL SPECIFICATION

No.	Category	Specification		
6	**Mechanical Characteristics**	**Test Item**	**Conditions**	**Performance**
		Robustness of terminations (IEC68-2-21)	Tensile Ua1 A load of 10 N (1.0kg) shall be gradually applied to the terminal in the axial direction and held thus for 10 sec Bending Ub methode 1 While a load of 500g applied to the lead wire, the body of the capacitor shall be bent 90° and returned to the original position. This operation shall be conducted in a few seconds. Then the body shall be bent 90° at the same speed in the opposite direction and returned to the original position	There shall be no such mechanical damage as terminal damage etc.
7	**Endurance Characteristics**	Solderability (IEC68-2-20 Ta)	Solder bath: 245°C ± 5°C Immersion time:2.5±0.5sec Visual examination	At least 95% of the circumferential face of lead wire up to immersed level shall be covered with new solder
		Resistance to soldering heat (IEC 68-2-20 Tb)	Solder bath: 260 °C ± 5 °C Immersion time:10±1sec Thickness of heat shunt (Printed wiring board): 1.6mm Capacitance at 1kHz tan δ at 1kHz	Capacitance change |ΔC/C| ≤ ± 1% tan δ change ≤ 0.1% at 1kHz
		Vibration proof (IEC68-2-6 Fc)	The frequency shall be varied form from 10Hz to 55Hz at 1.5mm amplitude and back to 10Hz in approximately 1-minute intervals. This motion shall be applied for a period of 2 hours in each of 3 mutually perpendicular directions. During the last 30 min of vibration in each direction, checks shall be made for open or short-circuit and interruption	Bending strength: There shall be no open or short-circuiting and the connections must be stabilized. Appearance: There shall be no such mechanical damage as terminal damage etc.
		Damp heat steady state (IEC68-2-3 Ca)	The capacitor shall be stored at a temperature of 40 ± 2°C and relative humidity of 90% to 95% for 1000 hours. And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2 hours, after which measurement shall be made	Capacitance change |ΔC/C| ≤ ± 3% tan δ change ≤ 0.1% at 1kHz R insulation ≥ 50 % of limit value

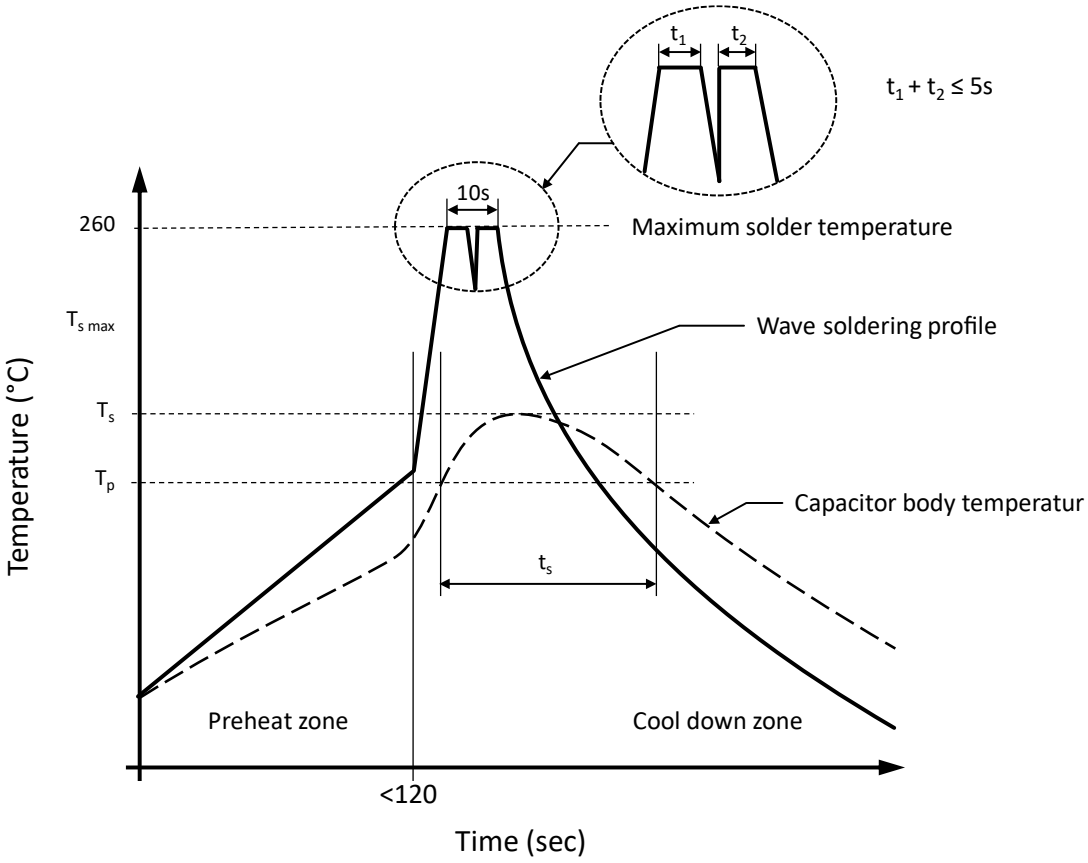
TECHNICAL SPECIFICATION

<table>
<tr><th>No.</th><th>Category</th><th colspan="3">Specification</th></tr>
<tr><td rowspan="4">7</td><td rowspan="4">Endurance Characteristics</td><td>Test Item</td><td>Conditions</td><td>Performance</td></tr>
<tr><td>Electrical endurance (IEC 60384-17)</td><td>125% of category voltage shall be applied to the capacitor at a temperature of 85 ± 2°C for 2000 hours. Then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2 hours, after which measurement shall be made.
The load resistor in series with the capacitor shall be 20Ω to 1kΩ.</td><td>Capacitance change
|ΔC/C| ≤ ± 10%
tan δ change
≤ 0.4% at 1kHz
R insulation ≥ 50 % of limit value</td></tr>
<tr><td>Method of measuring inherent temperature rise ΔT</td><td>Inherent temperature of capacitor shall be measured by keeping away from heat influence of surrounding components after attaching thermocouple to the capacitor as show below.

(They shall be measured in normal temperature).

Measurement shall be down by soldering capacitor on the opposite side of the printed circuit board etc. in case of being influenced by heat of surrounding components.
Besides, they shall be measured in calm condition by putting capacitor into box etc. in case of being influence by convection or wind.</td><td>Less than +10°C</td></tr>
<tr><td colspan="3"> 
</td></tr>
<tr><td rowspan="4">8</td><td rowspan="4">Storage conditions</td><td colspan="3">It should be noted that the solderability of the terminals may be deteriorated when stored barely in an atmosphere for a long period.</td></tr>
<tr><td colspan="3">It should not be located in particularly high temperature and high humidity, it must submit to the following conditions (Keeping in the original package)
Temperature: 5°C to 35°C
Relative humidity: ≤ 70%
Storage period: ≤ 12 months
(Following the manufacturing date marked on the label in package bag)</td></tr>
<tr><td colspan="3">Avoid wetting the capacitor by water, oil, salt and/or poisonous gas.</td></tr>
<tr><td colspan="3">If used the capacitor that overdue the storage time, it should be test, the characteristics of the capacitor or contact with our technical engineer.</td></tr>
</table>

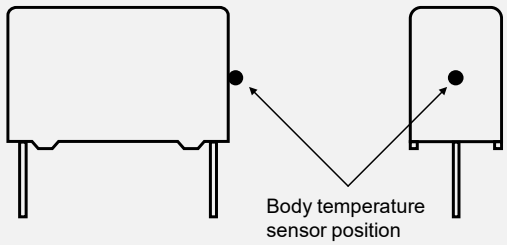
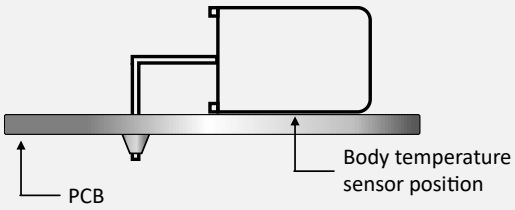
RECOMMENDED WAVE SOLDERING PROFILE ▲ THT PACKAGE



Capacitor body temperature should follow the description below:

Profile Features		Polypropylene Film Capacitor	Polyester Film Capacitor
Capacitor body maximum temperature at preheating	T_P	≤ 110°C / 120 seconds	≤ 125°C / 120 seconds
Capacitor body maximum temperature at wave soldering	T_S	≤ 120°C / t_s ≤ 45 seconds	≤ 150°C / t_s ≤ 45 seconds

DETERMINING THE CAPACITOR BODY TEMPERATURE

Vertical Mounting	Horizontal Mounting
	
The body temperature sensor position is defined as the highest temperature point around the capacitor body.	If there is 90 degree bending product, the sensor position shall between product and PCB

REVISION TABLE

Revision	Date	Status	Notes
001	01/10/2021	Initial release	Initial publication

DISCLAIMER

Except for the written expressed warranties, MGT does not implicitly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any MGT product.

All information and technical specifications made available by MGT are for guidance only and we reserve the right to change or modify them without prior notice. Unless expressly stated in writing by MGT, we reject any guarantees, obligations, or warranties.

All MGT products with the technical specifications described are suitable for use in certain applications. Operating, production, storage and environmental conditions can have a massive influence on the parameters mentioned in the data sheets, which cause the performance to vary over time.

It is subject to the user's duty of care to design and validate his products in such a way that appropriate measures are taken, such as protective circuits or redundant systems to ensure the safety standards required in the application.

MGT components are not designed or rated for use in life support, rescue, safety critical, military, or aerospace applications where failure or malfunction could result in property or environmental damage, serious injury or death. In the aforementioned cases, please contact us before using MGT products.

In principle, we reserve all rights and MGT's general terms and conditions apply. You can find them on our website www.mgt.co.com.