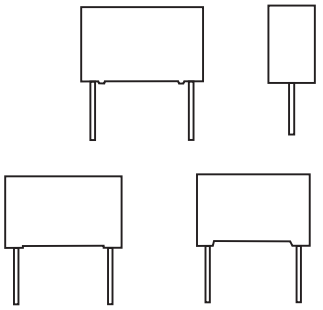
Metalized Polyester Film Capacitors
MEB: General Purpose, Box Type



FEATURES

- High moisture resistance
- Self-healing property
- Non-inductive construction
- Good solderability
- Flame-retardant epoxy resin (Compliant to UL 94V-0)
- Similiar to MDD type but in box encapsulation

PART NUMBER EXAMPLE

MEB 104 K 2A 100 B 200 S

- MEB — Series
- 104 — Capacitance
- K — Tolerance
- 2A — Voltage
- 100 — Lead space*
- B — Packaging
- 200 — Lead Length
- S — Straight

* Leadspace is straight lead non-formed original leadspace.

ELECTRICAL CHARACTERISTICS (T_a=25℃ Unless otherwise specified)

Items	Performance
Operating Voltage Range	100Vdc, 250Vdc, 400Vdc, 450Vdc, 630Vdc, 1000Vdc
Rated Temperature	-40°C ~ + 125°C (Derates over 105°C)
Usable Upper Category Temperature	+ 125°C (Derates over +105°C : 1.25% per °C of Rated Voltage)
Climatic Category	55 / 105 / 56
Capacitance Range	0.01 µF ~ 10 µF
Capacitance Tolerance	5% (J), 10% (K), 20%(M)
Dissipation Factor (at rated capacitance)	1KHz, 20°C: C ≤ 0.1uF ≤ 0.01; C > 0.1uF ≤ 0.01 10KHz, 20°C: C ≤ 0.1uF ≤ 0.015; C > 0.1uF ≤ 0.015 100KHz, 20°C: C ≤ 0.1uF ≤ 0.030
Insulation Resistance Terminal to Terminal	V_R ≤ 100V: IR ≥ 3750MΩ, CN ≤ 0.33uF; IR ≥ 1250S, CN > 0.33uF (20°C, 100V, 1min) V_R > 100V: IR ≥ 15000MΩ, CN ≤ 0.33uF; IR ≥ 10000S, CN > 0.33uF (20°C, 100V, 1min)
Withstand Voltage	Terminal to Terminal: (at 20°C ± 5°C) 1.6 x V_R applied for 2sec. (cut off current 10mA)

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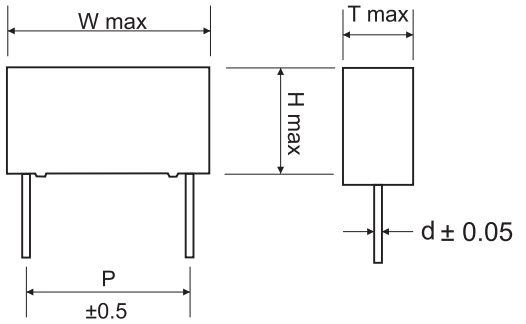
■ MAXIMUM DIMENSIONS (mm)



(μF)	W.V.	100VDC (2A)					250VDC (2E)					400VDC (2G)					630VDC (2J)					1000VDC (3A)				
	Code	W	H	T	P	d	W	H	T	P	d	W	H	T	P	d	W	H	T	P	d	W	H	T	P	d
0.01	103																13.0	9.0	4.0	10.0	0.6	13.0	9.0	4.0	10.0	0.6
0.012	123																13.0	9.0	4.0	10.0	0.6					
0.015	153											10.0	9.0	4.0	7.5	0.6	13.0	11.0	5.0	10.0	0.6	13.0	11.0	5.0	10.0	0.6
0.018	183											10.0	9.0	4.0	7.5	0.6	13.0	11.0	5.0	10.0	0.6					
0.022	223											10.0	9.0	4.0	7.5	0.6	13.0	12.0	6.0	10.0	0.6	13.0	11.0	5.0	10.0	0.6
0.027	273											10.0	11.0	5.0	7.5	0.6	13.0	12.0	6.0	10.0	0.6					
0.033	333											10.0	11.0	5.0	7.5	0.6	13.0	13.0	7.0	10.0	0.6	18.0	12.0	6.0	15.0	0.8
0.039	393						10.0	9.0	4.0	7.5	0.6	13.0	9.0	4.0	10.0	0.6	13.0	14.0	8.0	10.0	0.6					
0.047	473						10.0	9.0	4.0	7.5	0.6	13.0	11.0	5.0	10.0	0.6	13.0	15.0	8.0	10.0	0.6	18.0	12.0	6.0	15.0	0.8
0.056	563						10.0	9.0	4.0	7.5	0.6	13.0	11.0	5.0	10.0	0.6	18.0	11.0	5.0	15.0	0.8					
0.068	683						10.0	9.0	4.0	7.5	0.6	13.0	11.0	5.0	10.0	0.6	18.0	12.0	6.0	15.0	0.8	18.0	13.5	7.5	15.0	0.8
0.082	823						10.0	11.0	5.0	7.5	0.6	13.0	12.0	6.0	10.0	0.6	18.0	12.0	6.0	15.0	0.8					
0.1	104	10.0	9.0	4.0	7.5	0.6	10.0	11.0	5.0	7.5	0.6	13.0	12.0	7.0	10.0	0.6	18.0	13.5	7.5	15.0	0.8	18.0	14.5	8.5	15.0	0.8
0.12	124	10.0	9.0	4.0	7.5	0.6	10.0	11.0	5.0	7.5	0.6	18.0	11.0	5.0	15.0	0.8	18.0	14.5	8.5	15.0	0.8					
0.15	154	10.0	9.0	4.0	7.5	0.6	10.0	12.0	6.0	7.5	0.6	18.0	11.0	5.0	15.0	0.8	18.0	14.5	8.5	15.0	0.8	26.5	16.0	7.0	22.5	0.8
0.18	184	10.0	9.0	4.0	7.5	0.6	13.0	10.0	5.0	10.0	0.6	18.0	12.0	6.0	15.0	0.8	18.0	16.5	10.0	15.0	0.8					
0.22	224	10.0	9.0	4.0	7.5	0.6	13.0	11.0	5.0	10.0	0.6	18.0	13.5	7.5	15.0	0.8	18.0	18.0	10.0	15.0	0.8	26.5	17.0	8.5	22.5	0.8
0.27	274	10.0	11.0	5.0	7.5	0.6	13.0	11.0	5.0	10.0	0.6	18.0	13.5	7.5	15.0	0.8	26.0	17.0	8.0	22.5	0.8					
0.33	334	10.0	11.0	5.0	7.5	0.6	13.0	12.0	6.0	10.0	0.6	18.0	14.5	8.5	15.0	0.8	26.0	18.0	9.0	22.5	0.8	26.5	20.0	11.0	22.5	0.8
0.39	394	10.0	11.0	5.0	7.5	0.6	18.0	11.0	5.0	15.0	0.8	18.0	15.0	9.0	15.0	0.8	26.0	19.0	10.0	22.5	0.8					
0.47	474	10.0	12.0	6.0	7.5	0.6	18.0	12.0	6.0	15.0	0.8	18.0	17.5	8.5	15.0	0.8	26.0	19.0	10.0	22.5	0.8	32.0	20.0	11.0	27.5	0.8
0.56	564	13.0	11.0	5.0	10.0	0.6	18.0	12.0	6.0	15.0	0.8	26.5	16.0	7.0	22.5	0.8	26.0	20.0	11.0	22.5	0.8					
0.68	684	13.0	11.0	5.0	10.0	0.6	18.0	13.5	7.5	15.0	0.8	26.5	17.5	8.5	22.5	0.8	26.0	21.5	12.0	22.5	0.8	32.0	28.0	14.0	27.5	0.8
0.82	824	13.0	12.0	6.0	10.0	0.6	18.0	13.5	7.5	15.0	0.8	26.5	17.5	8.5	22.5	0.8	31.0	22.0	13.0	27.5	0.8					
1	105	13.0	12.0	6.0	10.0	0.6	18.0	14.5	8.5	15.0	0.8	26.5	19.0	10.0	22.5	0.8	31.0	22.0	13.0	27.5	0.8	32.0	30.0	16.0	27.5	0.8
1.2	125	18.0	12.0	6.0	15.0	0.8	18.0	15.0	9.0	15.0	0.8	26.5	20.0	11.0	22.5	0.8	31.0	25.0	14.0	27.5	0.8					
1.5	155	18.0	12.5	6.0	15.0	0.8	18.0	17.5	8.5	15.0	0.8	31.0	20.0	11.0	27.5	0.8	31.0	26.0	18.0	27.5	0.8					
1.8	185	18.0	13.5	7.5	15.0	0.8	26.0	16.0	7.0	22.5	0.8	31.0	22.0	13.0	27.5	0.8	31.0	31.0	22.0	27.5	0.8					
2.2	225	18.0	14.0	7.5	15.0	0.8	26.0	17.0	8.5	22.5	0.8	31.0	23.5	14.0	27.5	0.8	31.0	31.0	22.0	27.5	0.8					
2.7	275	18.0	15.0	9.0	15.0	0.8	26.0	19.0	10.0	22.5	0.8															
3.3	335	18.0	16.0	10.0	15.0	0.8	26.0	19.0	10.0	22.5	0.8															
3.9	395	26.0	16.0	6.0	22.5	0.8	26.0	20.0	11.0	22.5	0.8															
4.7	475	26.0	17.0	8.5	22.5	0.8	26.0	22.0	12.0	22.5	0.8															
5.6	565	26.0	18.5	7.0	22.5	0.8	31.0	22.0	13.0	27.5	0.8															
6.8	685	26.0	19.0	10.0	22.5	0.8	31.0	23.5	14.0	27.5	0.8															
8.2	825	26.0	20.0	10.0	22.5	0.8	31.0	25.0	14.0	27.5	0.8															
10	106	26.5	22.0	12.0	22.5	0.8	31.0	28.0	18.0	27.5	0.8															

■ TAPE CODE (Lead spacing on tape, if taped)

Lead Spacing	7.5mm	10mm	15mm
Packing	A or R	A or R	A or R
Code	RT2	RT3	RT4

■ RADIAL TAPING CODE DIAGRAM

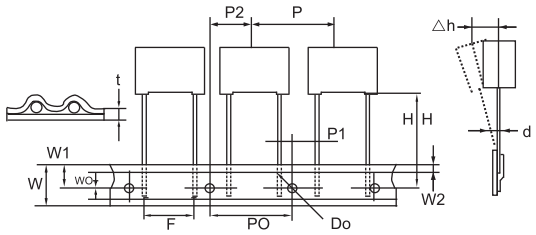


Fig. 2
F=7.5mm
(RT2)

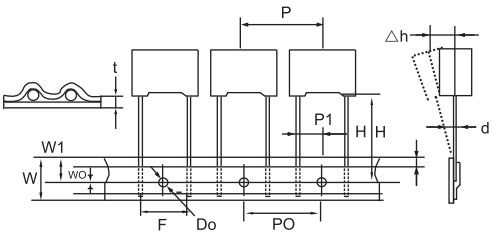


Fig. 3 Box
F=7.5mm
Ammo Only
(RT2)

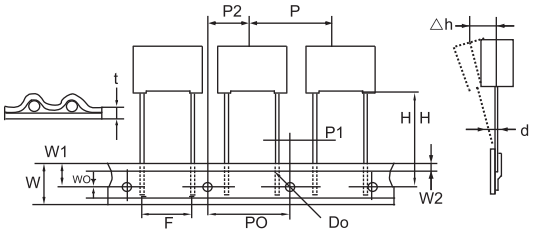


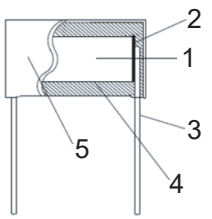
Fig. 4 Box or Expoxy Coated
F=10 = Ammo Only
F=15 Every other space skipped because
of Larger body - Ammo Only
(RT3 or RT4)

■ SPECIFICATIONS

Description	Letter	Dimension (mm)			
		RT2	RT3	RT4	Tol.
Lead Wire Diameter	d	0.5 / 0.6	0.6	0.6 / 0.8	± 0.05
Tape Pitch	P	12.7	12.7	25.4	± 1
Feed Hole Pitch	PO	12.7	12.7	12.7	± 0.2
Centering of the Lead Wire	P1	2.6 / 3.75	7.7	5.2	± 0.7
Centering of the Body	P2	6.35	12.7	12.7	± 1.3
Lead Spacing (Pitch)	F	7.5	10	15	± 0.6; -0.1
Component Alignment	Δh	0	0	0	± 2
Height of Componenet from Tape Center	H	18.5	18.5	18.5	± 0.5
Carrier Tape Width	W	18	18	18	± 1; -0.5
Hold Down Tape Width	WO	6	9	10	Min
Hole Position	W1	9	9	9	± 0.5
Hold Down Tape Position	W2	3	3	3	Max
Feed Hole Diameter	Do	4	4	4	± 0.2
Tape Thickness	t	0.5	0.5	0.5	± 0.2
Figure	fig	1.2 or 3	4	4	

Remark: *Allowance of accumulated pitch less than 1mm at the sum of 20 pitches.
*Continuous empty component less than 3 consecutive pieces.
*Total empty on one reel less than 1%.

TYPE: MEB		
Product Specifications		
1. Scope	This specification applies to directly filim capacitors of the following type: Metallized polyester dielectric fixed capacitor	
2. Product Name	Miniature Metallized Polyester Film Capacitor	
3. Construction (Dimensions and Materials)	Dimensions: Refer to Dimensions Drawing	
	Materials:	
4. Characteristics	1. Element:	Metallized Polyester Film
	2. Metal Spray:	Special Solder (Lead Free)
	3. Lead wire:	Tinned wire (Cu wire) or Tinned copper clad steel (CP wire) Lead Free
	4. Inner coating:	Epoxy Resin
	5. Outer coating:	Plastic case (UL-94V-0)



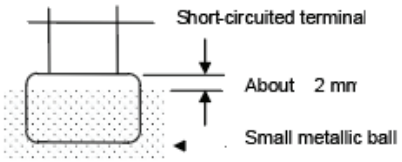
CHARACTERISTICS		
Standard Atmospheric Conditions		
Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:		
Ambient Temperature:	15 to 35˚C	
Relative Humidity:	45 to 85%	
Air Pressure:	86 to 106 kpa	
If there may be any doubt on the results, measurements shall be made wtihin the following limits:		
Ambient Temperature:	20˚C to 5˚C	
Relative Humidity:	60 to 70%	
Operating Temperature Range	-40 to +125˚C	
Rated Temperature Range	-40 to +125˚C	
Rated Temperature Range is the range of ambient temperature for which the capacitor can be operated continuously at rated voltage.		

ELECTRICAL CHARACTERISTICS		
Rated Voltage (Vg):	50/63 Vdc, 100 Vdc, 250 Vdc, 400 Vdc, 630 Vdc	
Category Voltage (Vc):	105˚C	Vc = Vg
For temperatures over 105˚C, a decreasing factor of 1.25% per degree celcius ˚C on the nominal voltage Vg has to be applied.		
Rated upper limit temperature:	105˚C	
Usable upper limit temperature:	125˚C	
Capacitance Range:	0.01µF to 10µF	
Capacitance Tolerances:	(Measured at 1KHz, 1V) ±5% (J), ±10% (K), ±20% (M),	
Dissipation Factor: (DF%)	LCR METER : HP -4284A, at 20˚C ±5˚C	
	1.0% (max.) at 1 KHz.	
	1.5% (max.) at 10 KHz.	

ELECTRICAL CHARACTERISTICS (continued)

Insulation resitance between terminals		
Test conditions:		
Temperature:	20˚C ±5˚C	
Voltage charge time:	1 minute	
Voltage charge:	100 Vdc	
Performance:		
	≥9000MΩ	for C ≤ 0.33 µF
	≥3000MΩ x µF	for C > 0.33 µF
Test voltage between terminals:		
1.6 x Vg applied for 2 sec, at 20˚C ±5˚C (cut off current 10mA)		
Performance:	There shall be no dielectric breakdown or other damage.	
Dielectric strength:		
Between terminal and enclosure		
Apply 200% of rated voltage between terminals and enclosure for 2 to 5 seconds.		
Method of the test as described below:		
Put the 1mm diameter of small metallic balls in a vessel.		
The test capacitor shall be submerged with the small metallic balls. Distance of the metallic balls and the terminals shall be kept about		
The test voltage shall be applied between the short-circuited terminals and the metallic balls		
Performance:	There should be no dielectric breakdown or other damage	

Fig(V)



Rapid change of temperature. (Testing method IEC 68-2-21)

The test capacitor shall be kept in the testing oven and be kept at conditions of the following table, and it shall be repeated for 5 cycles successfully. After the test, the capacitor shall be left alone at the ordinary conditions for 2 hours.

Step	temperature	minute
1	-40±3	30± 3
2	ordinary	3 or under
3	110±2	30 ± 3
4	ordinary	3 or under

Performance:	
Capacitance change ΔC/C:	≤ ± 10%
DF change Δtan δ:	≤ 0.5% at 1KHz
Insulation resistance:	≥ 50% at limit value

MECHANICAL CHARACTERISTICS

Terminal strength (Testing method IEC 68-2-21)	
Tensile: (Test Ual)	
	A load of 10N (1.0kg) shall be gradually applied to the terminal in the axial direction and held thus for 10 seconds.
Bending: (Test Ub)	
	While a load of 500g applied to the lead wire, the body of the capacitor shall bent 90˚ and returned to the original position. This operation shall be conducted in a few seconds. Then the body shall be bent 90˚ in the opposite direction and returned to the original position.
Performance:	
	There shall be no such mechanical damage as terminal damage, etc.

ENDURANCE CHARACTERISTICS		
Solderability: (Testing method IEC 68-2-20 Ta)		
	Solder temperature:	245˚C ±5˚C
	Immersion time:	2.5 ± 0.5 seconds
Performance:		
	At least 95% of the circumferential face of lead wire up to immersed lecvel shall be covered with new solder.	
Resistance to soldering heat: (Testing method IEC 68-2-20 Tb)		
	Solder bath method	
	Solder temperature:	260˚C ±5˚C
	Immersion time:	10 ± 1 second
	Thickness of heat shunt	
	(printed wiring board)	1.6mm
	Performance: (Capacitance change ΔC/C)	≤ ± 3%
	DF change Δtan δ:	≤ ± 0.5% at 1 KHz
Vibration Proof: (Testing method IEC 68-2-6 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 20 min of vibration in each direction, checks shall be made for open or short-circuiting and interruption.	
	Performance:	
	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): (Testing method IEC 69-2-3 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.	
	Performance: (Capacitance change ΔC/C)	≤ ± 5%
	DF change Δtan δ:	≤ ± 0.5% at 1 KHz
	Insulation resistance:	≥ 50% of limit value
Electrical endurance: (Testing method IEC 60384-2)		
	hours. And then the capacitor shall be subjected to standard atmospheric conditions for 1 to 2 hours, after which measurement shall be made. The lead resistor in series with the capacitor shall be 20Ω to 1KΩ.	
	Performance: (Capacitance change ΔC/C)	≤ ± 10%
	DF change Δtan δ:	≤ ± 0.5% at 1 KHz
	Insulation resistance:	≥ 50% of limit value

STORAGE CONDITIONS		
It should be noted that the solderability of the terminals may be deteriorated when stored barely in an atmosphere for long periods.		
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 ~ 35˚C
	Relative Humidity:	≤ 70%
	Storage Period:	≤ 12 months
	(following the manufacturing date marked on the label in package bag)	
Capacitors shall avoid the conditions of being wetted by water, oil, salt water and/or poisonous gases.		
If using a capacitor past its storage time, its characteristics should be tested or contact our technical engineer.		

■ SOLDERING