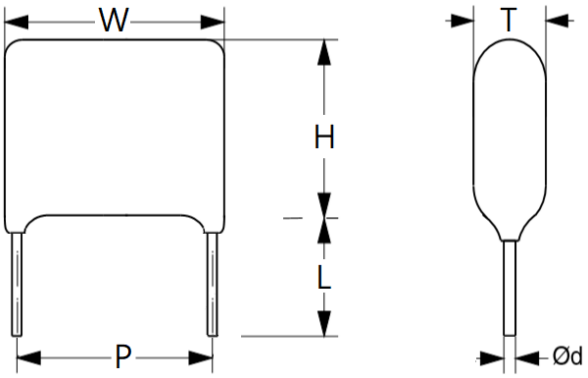
SMEF series

■ Outline Drawing



■ Typical Applications

Suitable for blocking, by-pass and coupling of DC and signals to VHF range

Widely used in filter and low pulse circuits

■ Features

Metalized polyester film,

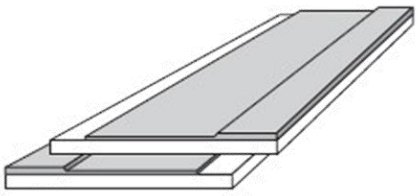
non-inductive wound construction

Wide capacitance range, small size, and light weight

Long life due to self-healing

Flame retardant epoxy resin coating

■ Construction



■ Specifications

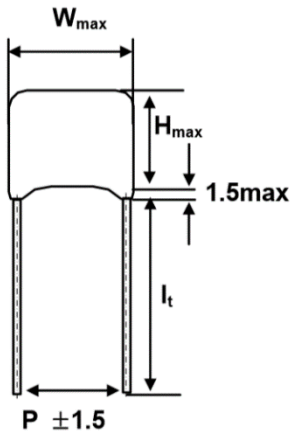
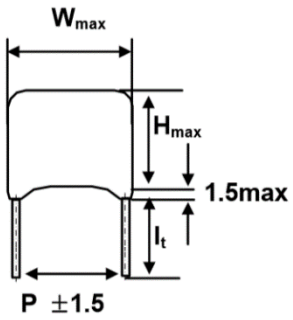
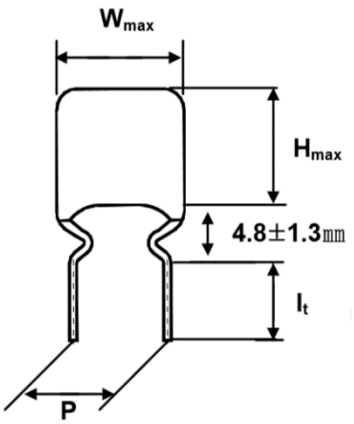
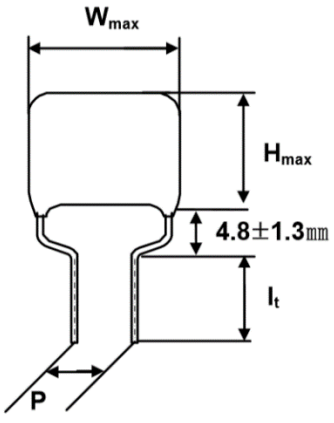
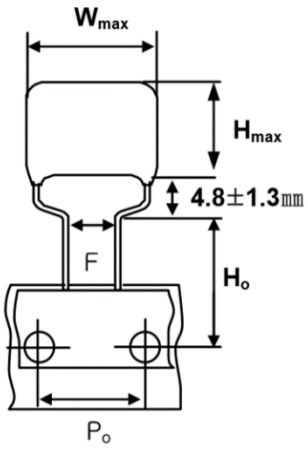
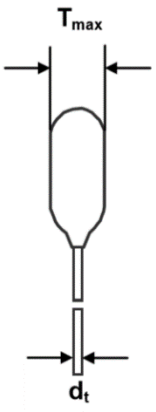
Reference Standard	GB/T 7332 (IEC 60384-2)				
Climatic Category	55/105/21				
Rated Temperature	85℃				
Operating Temperature Range	-40℃~+105℃ (+85℃ to +105℃: decreasing factor 1.25% per ℃ for U_R)				
Capacitance Range	0.01μF ~ 10μF				
Rated (DC) Voltage	63V	100V	250V	400V	630V
Rated (AC) Voltage	40V	63V	160V	200V	220V
Capacitance Tolerance	±5%(J)、±10%(K) 、±20%(M)				
Voltage Proof	1.5UR (60s)				
Dissipation Factor	≤ 1.0% (20℃, 1kHz)				
Insulation Resistance	UR ≤ 100V	C_R ≤ 0.33uF IR ≥ 15,000MΩ C_R >0.33uF IR ≥ 5,000S			

SMEF series

■ Product code system

SMEF	J	103	K	0630	D	B	10	23
Type	Internal use	Capacitance	Tolerance	Rated Voltage	Voltage	Lead forming	Lead Pitch	Lead Length
SMEF= Metallized Polyester Capacitor (Dipped)	--	103 =10000pF =10nF =0.01μF	J=±5% K=±10% M=±20%	0063=63V 0100=100V 0250=250V 0400=400V 0630=630V	D=DC	Shown as Table I	08=7.5mm 10=10mm 15=15mm 23=22.5mm 28=27.5mm	04=3.5mm 15=15mm 23=23mm

■ Table I

Code	B (Straight 23mm)	K (Short)	R (Inside Kink)
Lead Forming			
Code	**U** (Vertical Kink)	**T** (Taping)	--
Lead Forming			

SMEF series

■ **Dimensions (mm)**

63(40Vac)/100Vdc (63Vac)

Cap. μF	W	H	T	P	d	Part number
0.010	10	9	5.5	7.5	0.6	SMEF_103+0100D*08**
0.015	10	9.5	6	7.5	0.6	SMEF_153+0100D*08**
0.022	10	9	5.5	7.5	0.6	SMEF_223+0100D*08**
0.027	10	9.5	6	7.5	0.6	SMEF_273+0100D*08**
0.033	10	8.5	5	7.5	0.6	SMEF_333+0100D*08**
0.039	10	9	5	7.5	0.6	SMEF_393+0100D*08**
0.047	10	9	5.5	7.5	0.6	SMEF_473+0100D*08**
0.056	10	9.5	6	7.5	0.6	SMEF_563+0100D*08**
0.068	10	9	5.5	7.5	0.6	SMEF_683+0100D*08**
0.082	10	9.5	6	7.5	0.6	SMEF_823+0100D*08**
0.10	10	8.5	5	7.5	0.6	SMEF_104+0100D*08**
0.15	10	8.5	5	7.5	0.6	SMEF_154+0100D*08**
0.22	10	9.5	5.5	7.5	0.6	SMEF_224+0100D*08**
0.27	10	10	6.5	7.5	0.6	SMEF_274+0100D*08**
0.33	13	10.5	6	10	0.6	SMEF_334+0100D*10**
0.39	13	11	6	10	0.6	SMEF_394+0100D*10**
0.47	13	11.5	6.5	10	0.6	SMEF_474+0100D*10**
0.56	13	12	7	10	0.6	SMEF_564+0100D*10**
0.68	18	11.5	6	15	0.8	SMEF_684+0100D*15**
0.82	18	12.5	6.5	15	0.8	SMEF_824+0100D*15**
1.0	18	12.5	7	15	0.8	SMEF_105+0100D*15**
1.5	18	14	8.5	15	0.8	SMEF_155+0100D*15**
1.8	18	14.5	9	15	0.8	SMEF_185+0100D*15**
2.2	24	14.5	8.5	20	0.8	SMEF_225+0100D*20**
2.7	24	15	8.5	20	0.8	SMEF_275+0100D*20**
3.3	24	16	9.5	20	0.8	SMEF_335+0100D*20**
4.7	29	17	10	25	0.8	SMEF_475+0100D*25**
5.6	29	17.5	10.5	25	0.8	SMEF_565+0100D*25**
6.8	29	18.5	11.5	25	0.8	SMEF_685+0100D*25**
8.2	29	19.5	12.5	25	0.8	SMEF_825+0100D*25**
10	29	21	14	25	0.8	SMEF_106+0100D*25**

250Vdc (160Vac)

Cap. μF	W	H	T	P	d	Part number
0.010	10	9	5.5	7.5	0.6	SMEF_103+0250D*08**
0.015	10	9.5	6	7.5	0.6	SMEF_153+0250D*08**
0.022	10	9.5	5.5	7.5	0.6	SMEF_223+0250D*08**
0.027	10	9.5	6	7.5	0.6	SMEF_273+0250D*08**
0.033	10	8.5	5.5	7.5	0.6	SMEF_333+0250D*08**
0.039	10	9	5	7.5	0.6	SMEF_393+0250D*08**
0.047	10	9	5.5	7.5	0.6	SMEF_473+0250D*08**
0.056	10	9.5	6	7.5	0.6	SMEF_563+0250D*08**
0.068	10	9	5.5	7.5	0.6	SMEF_683+0250D*08**
0.082	10	9.5	6	7.5	0.6	SMEF_823+0250D*08**
0.10	10	10	6	7.5	0.6	SMEF_104+0250D*08**
0.15	10	10.5	6.5	7.5	0.6	SMEF_154+0250D*08**
0.22	13	11	6.5	10	0.6	SMEF_224+0250D*10**
0.27	13	11.5	7	10	0.6	SMEF_274+0250D*10**
0.33	13	12.5	7	10	0.6	SMEF_334+0250D*10**
0.39	18	11.5	6	15	0.8	SMEF_394+0250D*15**
0.47	18	12	6.5	15	0.8	SMEF_474+0250D*15**
0.56	18	12	7	15	0.8	SMEF_564+0250D*15**
0.68	18	13	7.5	15	0.8	SMEF_684+0250D*15**
0.82	18	13.5	8.5	15	0.8	SMEF_824+0250D*15**
1.0	18	14	9	15	0.8	SMEF_105+0250D*15**
1.5	24	14	9	20	0.8	SMEF_155+0250D*20**
1.8	24	16	9.5	20	0.8	SMEF_185+0250D*20**
2.2	24	17	10	20	0.8	SMEF_225+0250D*20**
2.7	24	18	11.5	20	0.8	SMEF_275+0250D*20**
3.3	29	18	11.5	25	0.8	SMEF_335+0250D*25**
4.7	29	20	13	25	0.8	SMEF_475+0250D*25**
5.6	29	19.5	12.5	25	0.8	SMEF_565+0250D*25**
6.8	34	21.5	13.5	30	0.8	SMEF_685+0250D*30**
8.2	34	23	14.5	30	0.8	SMEF_825+0250D*30**
10	34	24.5	16	30	0.8	SMEF_106+0250D*30**

SMEF series

■ **Dimensions (mm)**

400Vdc (200Vac)

Cap. µF	W	H	T	P	d	Part number
0.010	10	9	5.5	7.5	0.6	SMEF_103+0400D*08**
0.015	10	9.5	6	7.5	0.6	SMEF_153+0400D*08**
0.018	10	10	6	7.5	0.6	SMEF_183+0400D*08**
0.022	10	9.5	5.5	7.5	0.6	SMEF_223+0400D*08**
0.027	10	9.5	6	7.5	0.6	SMEF_273+0400D*08**
0.033	10	10	6	7.5	0.6	SMEF_333+0400D*08**
0.039	10	10.5	6.5	7.5	0.6	SMEF_393+0400D*08**
0.047	10	10.5	7	7.5	0.6	SMEF_473+0400D*08**
0.056	13	10.5	6	10	0.6	SMEF_563+0400D*10**
0.068	13	11	6.5	10	0.6	SMEF_683+0400D*10**
0.082	13	11.5	7	10	0.6	SMEF_823+0400D*10**
0.10	13	12	7	10	0.6	SMEF_104+0400D*10**
0.12	13	12.5	8	10	0.6	SMEF_124+0400D*10**
0.15	18	11.5	7	15	0.8	SMEF_154+0400D*15**
0.18	18	12	7.5	15	0.8	SMEF_184+0400D*15**
0.22	18	13	8	15	0.8	SMEF_224*0400D*15**
0.27	18	13.5	9	15	0.8	SMEF_274*0400D*15**
0.33	18	14.5	9.5	15	0.8	SMEF_334+0400D*15**
0.39	18	15.5	9.5	15	0.8	SMEF_394+0400D*15**
0.47	18	16	10.5	15	0.8	SMEF_474+0400D*15**
0.56	24	15	9.5	20	0.8	SMEF_564+0400D*20**
0.68	24	16	10.5	20	0.8	SMEF_684+0400D*20**
0.82	24	17	11.5	20	0.8	SMEF_824+0400D*20**
1.0	29	17	10.5	25	0.8	SMEF_105+0400D*25**
1.2	29	18	11.5	25	0.8	SMEF_125+0400D*25**
1.5	29	19.5	12.5	25	0.8	SMEF_155+0400D*25**
1.8	34	21	12	30	0.8	SMEF_185+0400D*30**
2.2	34	21.5	13.5	30	0.8	SMEF_225+0400D*30**
2.7	34	23	14.5	30	0.8	SMEF_275+0400D*30**
3.3	34	24.5	16.5	30	0.8	SMEF_335+0400D*30**
4.7	34	28	19.5	30	0.8	SMEF_475+0400D*30**

630Vdc (220Vac)

Cap. µF	W	H	T	P	d	Part number
0.010	13	9	5	10	0.6	SMEF_103+0630D*10**
0.015	13	9.5	5.5	10	0.6	SMEF_153+0630D*10**
0.018	13	10	6	10	0.6	SMEF_183+0630D*10**
0.022	13	10	6	10	0.6	SMEF_223+0630D*10**
0.027	13	10.5	6.5	10	0.6	SMEF_273+0630D*10**
0.033	13	11	7	10	0.6	SMEF_333+0630D*10**
0.039	13	11.5	7	10	0.6	SMEF_393+0630D*10**
0.047	13	12.5	8	10	0.6	SMEF_473+0630D*10**
0.056	13	13	8.5	10	0.6	SMEF_563+0630D*10**
0.068	18	12	7.5	15	0.8	SMEF_683+0630D*15**
0.10	18	13	8	15	0.8	SMEF_104+0630D*15**
0.12	18	13.5	9	15	0.8	SMEF_124+0630D*15**
0.15	18	14	9.5	15	0.8	SMEF_154+0630D*15**
0.18	18	15	10	15	0.8	SMEF_184+0630D*15**
0.22	18	16	11	15	0.8	SMEF_224+0630D*15**
0.27	24	16	9.5	20	0.8	SMEF_274+0630D*20**
0.33	24	17	10	20	0.8	SMEF_334+0630D*20**
0.39	24	18	11	20	0.8	SMEF_394+0630D*20**
0.47	29	18	10	25	0.8	SMEF_474+0630D*25**
0.56	29	19	10.5	25	0.8	SMEF_564+0630D*25**
0.68	29	20	12	25	0.8	SMEF_684+0630D*25**
0.82	29	21.5	13	25	0.8	SMEF_824+0630D*25**
1.0	34	21.5	13	30	0.8	SMEF_105+0630D*30**
1.2	34	22.5	14.5	30	0.8	SMEF_125+0630D*30**
1.5	34	24	15.5	30	0.8	SMEF_155+0630D*30**
1.8	34	26	17.5	30	0.8	SMEF_185+0630D*30**
2.2	34	27.5	19.5	30	0.8	SMEF_225+0630D*30**

+	=	Capacitance tolerance: K=±10% , J=±5%
*	=	Lead forming
**	=	Lead length

SMEF series

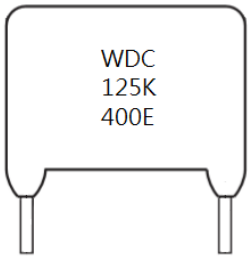
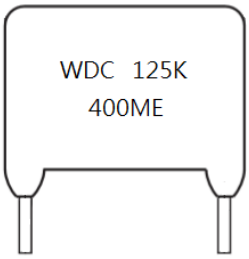
■ Specifications

Test items	Performance	Test Method
Withstand voltage (Between Terminals)	Shall be no abnormality	150% of rated voltage, 60sec
Between terminal and Enclosure	Shall be no abnormality	UR×200%+1000Vac, 60sec.
Insulation resistance (Between Terminals)	$C_R \leq 0.33\mu F$, IR ≥ 15000MΩ $C_R > 0.33\mu F$, IR ≥ 5000S	Measured at 100±15Vdc, For 60sec / 25℃
Capacitance	Within the tolerance specified	1KHz, 1Vrms Max. at 25℃
Dissipation Factor	0.01 (1.0%) Max.	1Vrms Max. at 25℃
Tense Strength of Terminal	No wire breakage and no damage of capacitor	1. Load Force : 1.0 Kg 2. Holding Time : 10 ± 1sec
Bending Strength of Terminal	No wire breakage and no damage of capacitor	1. Load Force : 0.5 Kg 2. Bending Time : 4 x 90˚ in 5sec
Solderability	(1) Appearance : No visible damage (2) Covering an area of > solder 95%	1. Solder Temperature : 240±5℃ 2. Solder Time : 3±0.5 sec
Heat Shock test	(1) Appearance : No visible damage (2) △C/C : ≤ 3% of the initial value (3) DF (tgδ) : Growth less than ≤ 0.004	The terminal of capacitor shall be immersed in the melting solder. a. Solder Temperature: 260±5℃ b. Solder Time: 10±1sec
Cold Resistance	(1) Appearance : No visible damage (2) △C/C : ≤ 5% of the initial value (3) DF (tgδ) : Growth less than ≤ 0.005 (4) IR : ≥ 50% of clause shall be satisfied	a. Test Temperature: -40℃ b. Test Times: 2Hrs
Dry Heat Resistance		a. Test Temperature: 85℃ b. Test Times: 16Hrs

SMEF series

Test items	Performance	Test Method
Humidity Resistance	(1) Appearance : No visible damage (2) ▵C/C : ≤ 5% of the initial value (3) DF (tgδ) : Growth less than ≤ 0.002 (4) IR : ≥ 50% of clause shall be satisfied	a. Test Temperature: 40℃ ± 2℃ b. Relative Humility: 90 ~ 95% c. Test Times: 500±8Hrs d. Applied voltage: R.V Then recovery at ordinary condition at least 6Hrs
Charge & Discharge	(1) Appearance : No visible damage (2) ▵C/C : ≤ 5% of the initial value (3) DF (tgδ) : Growth less than ≤ 0.005 (4) IR : ≥ 50% of clause shall be satisfied	a. Test Voltage : Rated voltage charge for 0.5 sec. Discharge for 0.5 sec. b. Repeated for 10000 cycles
High Temp Loading test (Continuous)	(1) Appearance : No visible damage (2) DF (tgδ) : Growth less than ≤ 0.004 (3) ▵C/C : ≤ 5% of the initial value (4) IR : ≥ 50% of clause shall be satisfied	a. Test Temperature: 85℃±2℃ b. Test Times: 1000±24Hrs c. Apply 125% of the rated voltage Then recovery at ordinary condition at least 6Hrs

■ **Mark**

Pitch 7.5mm	Pitch ≥10mm
	
1. WDC is a registered trademark of WINDAY	2. Capacitance: 125 indicates 1.2μF or 1200nF
3. Capacitors Tolerance: K=±10%	4. Rated Voltage: 400Vdc, Indicates 400
5. E or ME for Metallized polyester film capacitor	

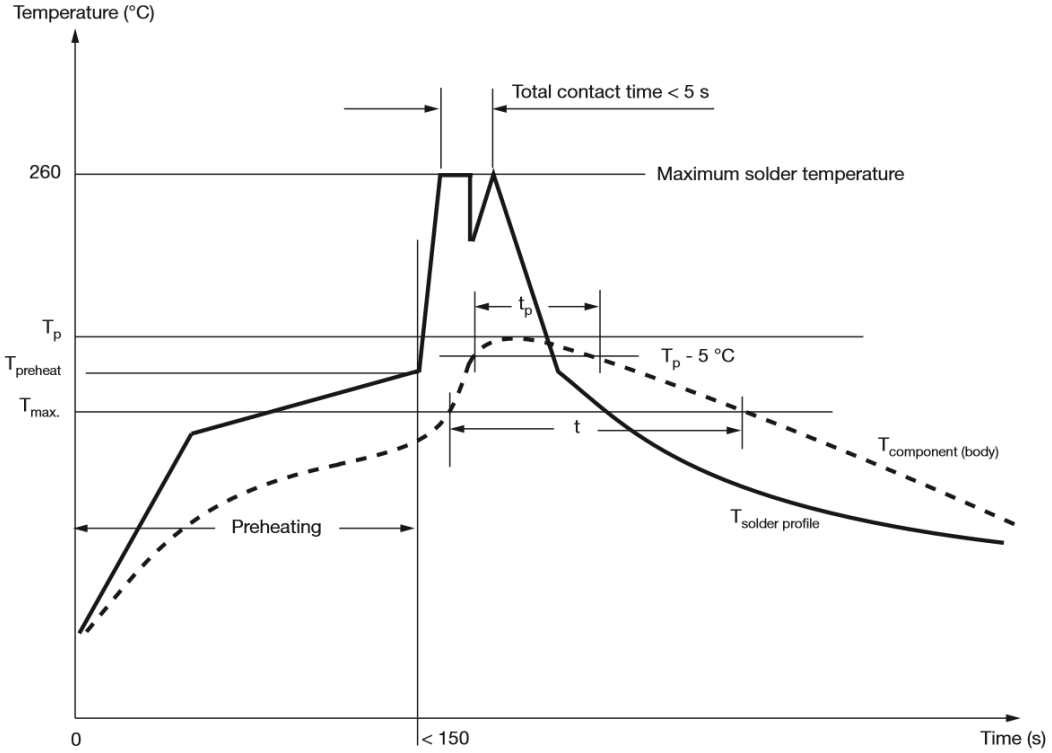
■ Soldering Guidelines for Film Capacitors

WDC recommends that users observe the following guidelines for soldering our film capacitors. Adherence to these recommendations will help to safeguard product specifications and reliability while preventing damage to the capacitors during soldering.

SOLDERING GUIDELINES AND RECOMMENDED WAVE SOLDERING PROFILE

With regard to the resistance to soldering heat and the solderability, our products comply with "IEC 60384-1" and the additional type specifications. The recommended wave soldering profile for our leaded components is defined as follows:

■ Wave Soldering Recommendations



Tp : Peak temperature of the component body (top)

Tmax : Maximum application temperature of the component

The PSL (Process Sensitivity Level) is classified according JEDEC standard J-STD-075 "Classification of Non-IC Electronic Components for Assembly Processes" and summarized in following tables per product family and pitch size of the component:

SERIES	PRODUCT PITCH SIZE							
	5 mm	7.5 mm	10 mm	15 mm	20/22.5 mm	27.5 mm	31.5 mm	37.5 mm
SMEF		(2),(4)	(1),(3)	(1),(3)	(1),(3)	(1),(3)	(1),(3)	(1),(3)

(1) No risk

(2) Risk for parameter change if PSL is not strictly followed

(3) The component has a preheat limitation of 150 °C

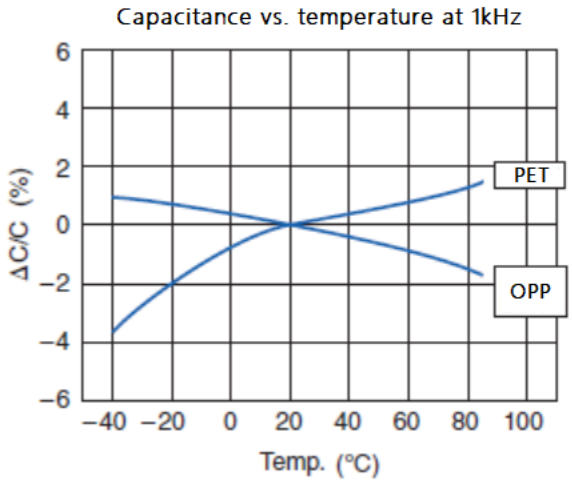
(4) Temperature is measured at the body top and must be kept as follows:

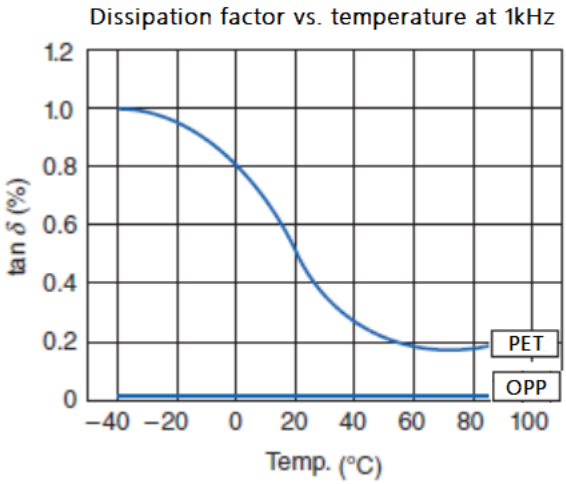
During preheating: $T_{max.} \leq 125$ °C

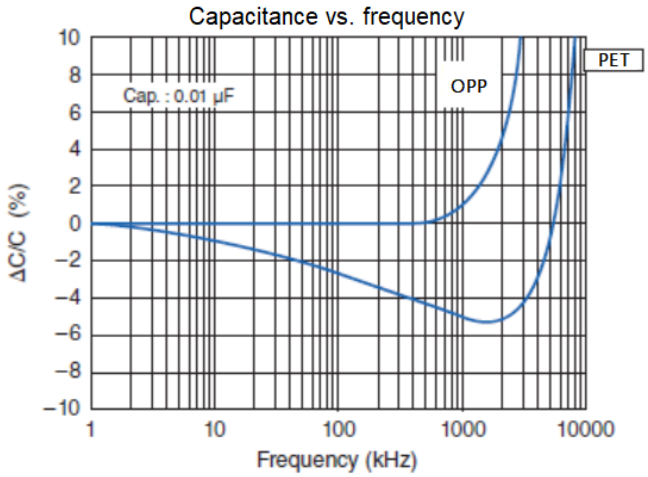
During soldering: $T_p \leq 135$ °C, $t_p \leq 30$ s, $t \leq 50$ s

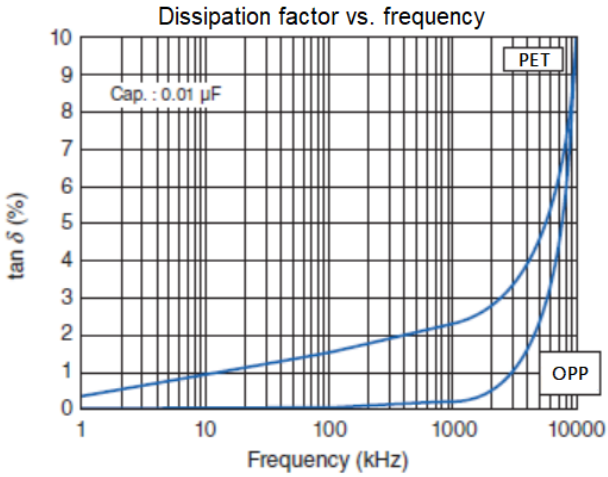
SMEF series

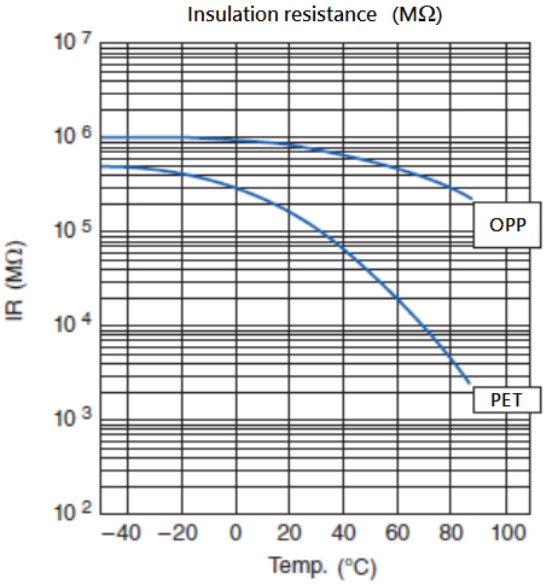
■ Typical graphs





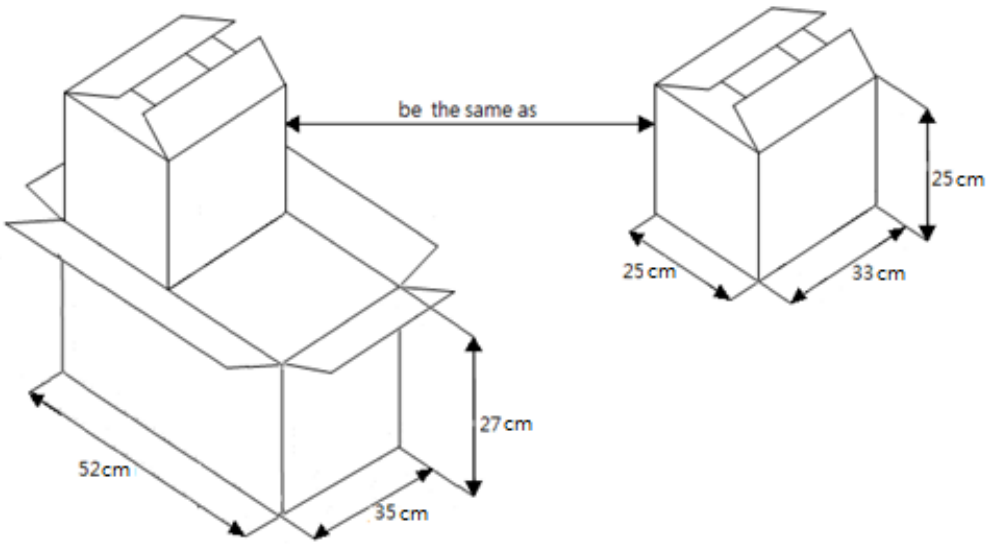






PET :	Metallized Polyester film capacitor
OPP :	Metallized Polypropylene film capacitor

■ Packaging



Pitch (mm)	Pcs / Bag	Pcs / Inner carton (L33:cm XH:25cm X T:25cm)	Pcs / Out box (L52:cm XH:27cm X T:35cm)
5~10	1000	10000	20000
15	500	5000	10000
20	500	5000	10000
22.5	300	3000	6000
27.5	200	2000	4000
≥27.5	100	1000	2000

■ Storage conditions and duration

Packaged capacitors should be kept in clean, ventilated, dry coffers, not near the heat source, not subject to direct sunlight, is strictly prohibited and chemical reagents, acid and harmful gas storage together.

Capacitor at a temperature within the range 20 ~ 25 ℃, humidity less than 50% of the state of storage for one year.