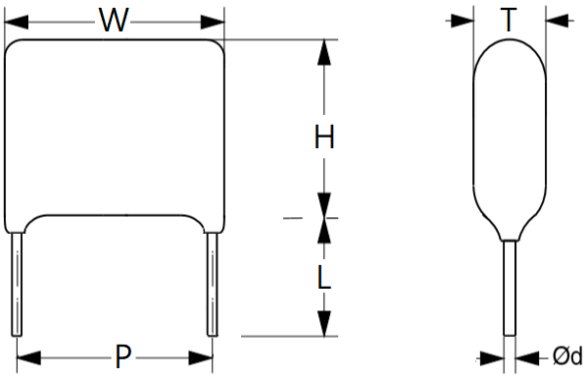
SPPS series (Dipped)

■ Outline Drawing



■ Typical Applications

Horizontal resonance circuits of large screen monitor

Suitable for high pulse and high current loading circuit

Suitable for electronic ballast

■ Features

Metalized polypropylene film/foil, Wound construction

Low loss and small inherent temperature rise

Negative temperature coefficient of capacitance

Flame retardant epoxy resin powder coating (UL94V-0)

■ Construction

■ Specifications

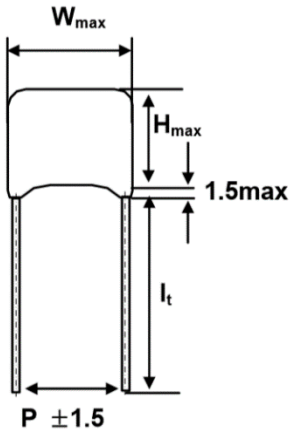
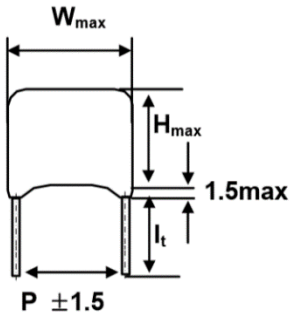
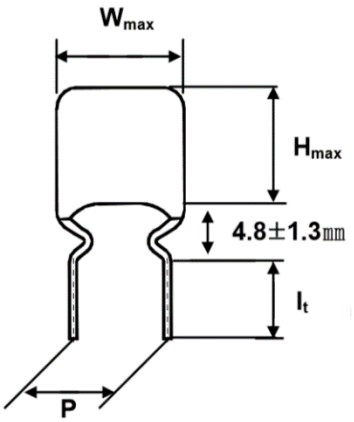
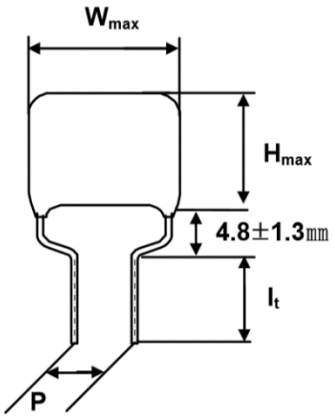
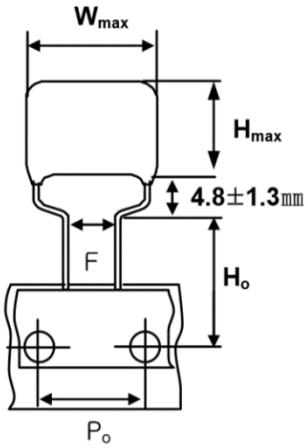
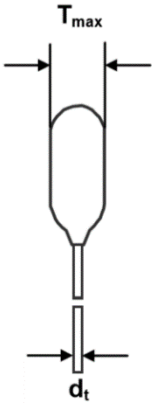
Reference Standard	GB/T 10190 (IEC 60384-16)				
Climatic Category	40/105/21				
Rated Temperature	85℃				
Operating Temperature Range	-40℃~+105℃ (+85℃ to +105℃: decreasing factor 1.25% per ℃ for U_R)				
Capacitance Range	0.001μF ~ 0.036μF				
Rated (DC) Voltage	630V	800V	1000V 1250V	1600V	2000V
Capacitance Tolerance	±5%(J)、±10%(K) 、±20%(M)				
Voltage Proof	1.5UR (60s)				
Dissipation Factor	≤ 0.1% (20℃, 1kHz)				
Insulation Resistance	UR ≤ 100V	C_R ≤ 0.33uF IR ≥ 15,000MΩ C_R >0.33uF IR ≥ 5,000S			

SPPS series (Dipped)

■ Product code system

SPPS	M	102	K	2000	D	B	15	23
Type	Internal use	Capacitance	Tolerance	Rated Voltage	Voltage	Lead forming	Lead Pitch	Lead Length
SPPS= Metallized Polypropylene Film/Foil Capacitor (Dipped)	--	102 =1000pF =1nF =0.001μF	J=±5% K=±10% M=±20%	0800=800V 1000=1000V 1250=1250V 1600=1600V 2000=2000V	D=DC	Shown as Table I	15=15mm 20=20mm 23=22.5mm 25=25mm 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			

Film/Foil Capacitor (Dipped) *SPPS series*

■ Dimensions (mm)

800Vdc (400Vac)

Cap. μF	W	H	T	P	d	Part number
0.0010	18.5	12	7	15	0.8	SPPS_102+0800D*15**
0.0015	18.5	13	7.5	15	0.8	SPPS_152+0800D*15**
0.0018	18.5	13.5	8	15	0.8	SPPS_182+0800D*15**
0.0022	18.5	14	9	15	0.8	SPPS_222+0800D*15**
0.0027	18.5	14.5	9.5	15	0.8	SPPS_272+0800D*15**
0.0033	18.5	15.5	10	15	0.8	SPPS_332+0800D*15**
0.0039	18.5	13.5	8.5	15	0.8	SPPS_392+0800D*15**
0.0043	18.5	14	8.5	15	0.8	SPPS_432+0800D*15**
0.0047	18.5	14	9	15	0.8	SPPS_472+0800D*15**
0.0053	18.5	14.5	9.5	15	0.8	SPPS_532+0800D*15**
0.0056	18.5	14.5	9.5	15	0.8	SPPS_562+0800D*15**
0.0068	18.5	15.5	10.5	15	0.8	SPPS_682+0800D*15**
0.0072	18.5	15.5	10.5	15	0.8	SPPS_722+0800D*15**
0.0075	18.5	16	10.5	15	0.8	SPPS_752+0800D*15**
0.0082	18.5	16.5	11	15	0.8	SPPS_822+0800D*15**
0.0084	18.5	16.5	11	15	0.8	SPPS_842+0800D*15**
0.0091	18.5	17	11.5	15	0.8	SPPS_912+0800D*15**
0.010	18.5	17.5	12	15	0.8	SPPS_103+0800D*15**
0.015	18.5	14	8.5	15	0.8	SPPS_153+0800D*15**
0.018	18.5	14.5	9.5	15	0.8	SPPS_183+0800D*15**
0.022	18.5	15.5	10	15	0.8	SPPS_223+0800D*15**
0.024	18.5	15.5	10.5	15	0.8	SPPS_243+0800D*15**
0.027	18.5	16	11	15	0.8	SPPS_273+0800D*15**
0.033	23	16	9.5	20	0.8	SPPS_333+0800D*20**
0.036	23	16.5	9.5	20	0.8	SPPS_363+0800D*20**
0.039	23	16.5	10	20	0.8	SPPS_393+0800D*20**
0.047	23	17.5	11	20	0.8	SPPS_473+0800D*20**
0.056	23	18.5	11.5	20	0.8	SPPS_563+0800D*20**
0.068	26	19	11	22.5	0.8	SPPS_683+0800D*23**
0.10	26	21.5	13	22.5	0.8	SPPS_104+0800D*23**

1000/1250Vdc (450Vac)

Cap. μF	W	H	T	P	d	Part number
0.0010	18.5	12	7	15	0.8	SPPS_102+1250D*15**
0.0015	18.5	13	7.5	15	0.8	SPPS_152+1250D*15**
0.0018	18.5	13.5	8	15	0.8	SPPS_182+1250D*15**
0.0022	18.5	14	9	15	0.8	SPPS_222+1250D*15**
0.0027	18.5	14.5	9.5	15	0.8	SPPS_272+1250D*15**
0.0033	18.5	15.5	10	15	0.8	SPPS_332+1250D*15**
0.0036	18.5	13	8	15	0.8	SPPS_362+1250D*15**
0.0039	18.5	13.5	8.5	15	0.8	SPPS_392+1250D*15**
0.0043	18.5	14	8.5	15	0.8	SPPS_432+1250D*15**
0.0047	18.5	14	9	15	0.8	SPPS_472+1250D*15**
0.0049	18.5	14	9	15	0.8	SPPS_492+1250D*15**
0.0053	18.5	14.5	9.5	15	0.8	SPPS_532+1250D*15**
0.0056	18.5	14.5	9.5	15	0.8	SPPS_562+1250D*15**
0.0062	23	14.5	7.5	20	0.8	SPPS_622+1250D*20**
0.0065	23	14.5	8	20	0.8	SPPS_652+1250D*20**
0.0068	23	14.5	8	20	0.8	SPPS_682+1250D*20**
0.0072	23	15	8	20	0.8	SPPS_722+1250D*20**
0.0075	23	15	8	20	0.8	SPPS_752+1250D*20**
0.0078	23	15	8.5	20	0.8	SPPS_782+1250D*20**
0.0082	23	15.5	8.5	20	0.8	SPPS_822+1250D*20**
0.0084	23	15.5	8.5	20	0.8	SPPS_842+1250D*20**
0.010	23	16	9	20	0.8	SPPS_103+1250D*20**
0.012	23	16.5	10	20	0.8	SPPS_123+1250D*20**
0.015	29	15.5	9	25	0.8	SPPS_153+1250D*25**
0.018	29	16.5	9.5	25	0.8	SPPS_183+1250D*25**
0.022	29	18.5	10	25	0.8	SPPS_223+1250D*25**
0.024	29	18.5	10.5	25	0.8	SPPS_243+1250D*25**
0.027	29	19	11	25	0.8	SPPS_273+1250D*25**
0.033	29	20.5	12	25	0.8	SPPS_333+1250D*25**
0.036	29	20.5	12.5	25	0.8	SPPS_363+1250D*25**

Film/Foil Capacitor (Dipped) *SPPS series*

■ Dimensions (mm)

1600/2000Vdc (500Vac)						
Cap. μF	W	H	T	P	d	Part number
0.0010	18.5	12	7	15	0.8	SPPS_102+2000D*15**
0.0012	18.5	12.5	7	15	0.8	SPPS_122+2000D*15**
0.0015	18.5	13	7.5	15	0.8	SPPS_152+2000D*15**
0.0016	18.5	13	8	15	0.8	SPPS_162+2000D*15**
0.0018	18.5	13.5	8	15	0.8	SPPS_182+2000D*15**
0.0020	18.5	13.5	8.5	15	0.8	SPPS_202+2000D*15**
0.0022	18.5	14	9	15	0.8	SPPS_222+2000D*15**
0.0024	18.5	14.5	9	15	0.8	SPPS_242+2000D*15**
0.0027	18.5	14.5	9.5	15	0.8	SPPS_272+2000D*15**
0.0030	18.5	15	10	15	0.8	SPPS_302+2000D*15**
0.0033	18.5	15.5	10	15	0.8	SPPS_332+2000D*15**
0.0036	23	14.5	9	20	0.8	SPPS_362+2000D*20**
0.0039	23	15.5	9	20	0.8	SPPS_392+2000D*20**
0.0043	23	16	9	20	0.8	SPPS_432+2000D*20**
0.0047	23	16	9.5	20	0.8	SPPS_472+2000D*20**
0.0049	23	16.5	9.5	20	0.8	SPPS_492+2000D*20**
0.0051	23	16.5	10	20	0.8	SPPS_512+2000D*20**
0.0053	23	16.5	10	20	0.8	SPPS_532+2000D*20**
0.0056	23	17	10	20	0.8	SPPS_562+2000D*20**
0.0060	23	15.5	8.5	20	0.8	SPPS_602+2000D*20**
0.0062	23	15.5	9	20	0.8	SPPS_622+2000D*20**
0.0065	23	15.5	9	20	0.8	SPPS_652+2000D*20**
0.0068	23	16	9	20	0.8	SPPS_682+2000D*20**
0.0072	23	16	9.5	20	0.8	SPPS_722+2000D*20**
0.0075	23	16.5	9.5	20	0.8	SPPS_752+2000D*20**
0.0078	23	16.5	9.5	20	0.8	SPPS_782+2000D*20**
0.0082	23	16.5	10	20	0.8	SPPS_822+2000D*20**
0.0084	23	16.5	10	20	0.8	SPPS_842+2000D*20**
0.0091	23	17	10.5	20	0.8	SPPS_912+2000D*20**

1600/2000Vdc (500Vac)						
Cap. μF	W	H	T	P	d	Part number
0.010	29	15.5	8.5	25	0.8	SPPS_103+2000D*25**
0.012	29	16	9.5	25	0.8	SPPS_123+2000D*25**
0.015	29	18	9.5	25	0.8	SPPS_153+2000D*25**
0.018	29	19	10.5	25	0.8	SPPS_183+2000D*25**
0.022	29	20	11.5	25	0.8	SPPS_223+2000D*25**
0.024	29	20.5	12	25	0.8	SPPS_243+2000D*25**
0.027	31	20.5	12	27.5	0.8	SPPS_273+2000D*28**
0.033	31	21.5	13	27.5	0.8	SPPS_333+2000D*28**
0.036	31	22	13.5	27.5	0.8	SPPS_363+2000D*28**

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

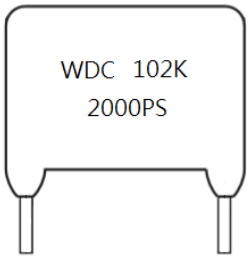
■ Specifications

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	0.001 (0.1%) 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

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

Marking



1. WDC is a registered trademark of WINDAY	2. Capacitance: 102 indicates 1000pF or 0.001μF
3. Capacitors Tolerance: K=±10%	4. Rated Voltage: 2000Vdc, Indicates 2000
5. PS for High Voltage Metallized polypropylene film/foil capacitor	

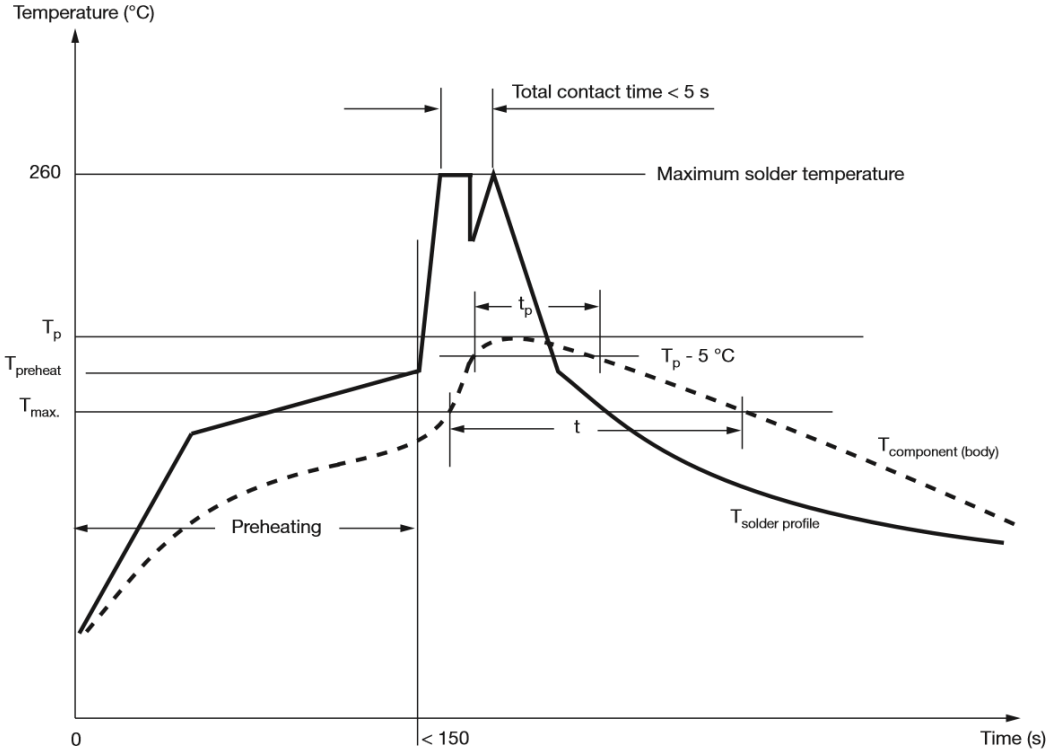
■ Soldering Guidelines for Film Capacitors

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	20mm	22.5 mm	25 mm	27.5 mm
SPPS	--	--	--	(1),(6)	(1),(6)	(1),(6)	(1),(6)	(1),(6)

(1) No risk

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

(3) Risk for product damage if PSL is not strictly followed

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

During preheating: Tmax. ≤ 100 °C

During soldering: Tp ≤ 110 °C, tp ≤ 20 s, t ≤ 30 s

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

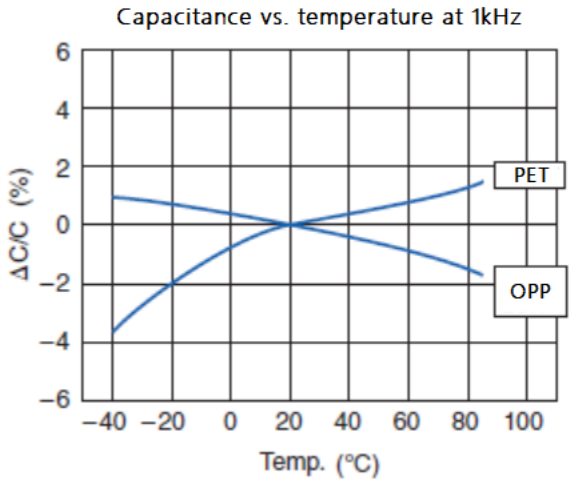
During preheating: Tmax. ≤ 110 °C

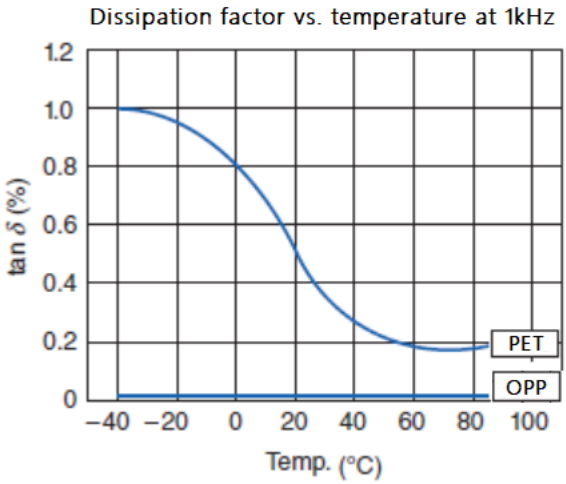
During soldering: Tp ≤ 120 °C, tp ≤ 20 s, t ≤ 30 s

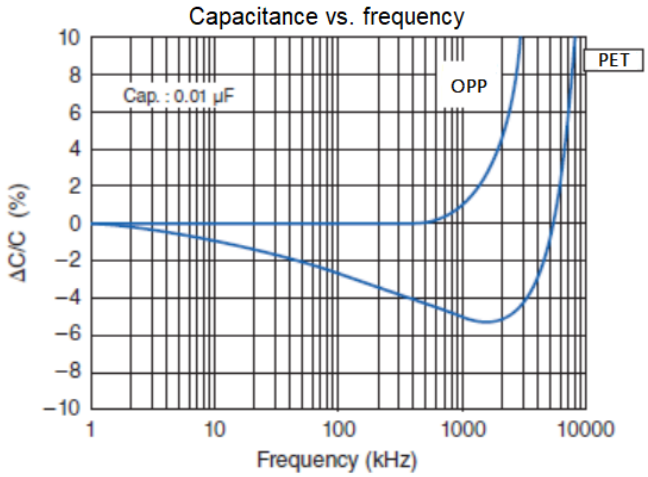
(6) The component has a preheat limitation of 150 °C

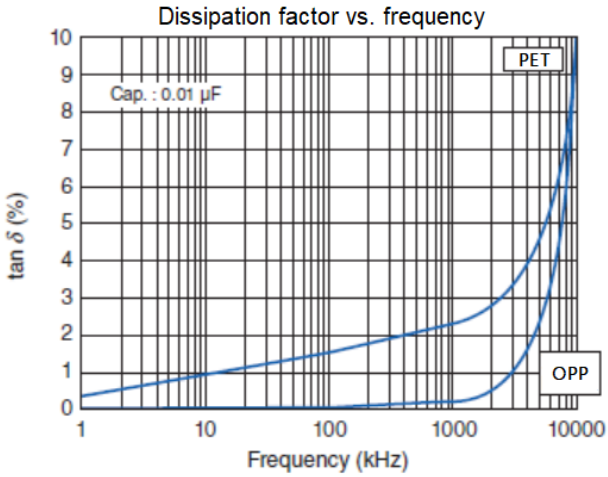
SPPS series (Dipped)

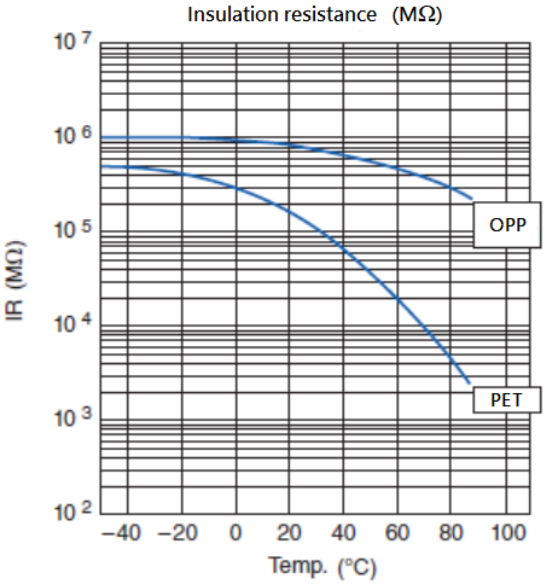
■ Typical graphs







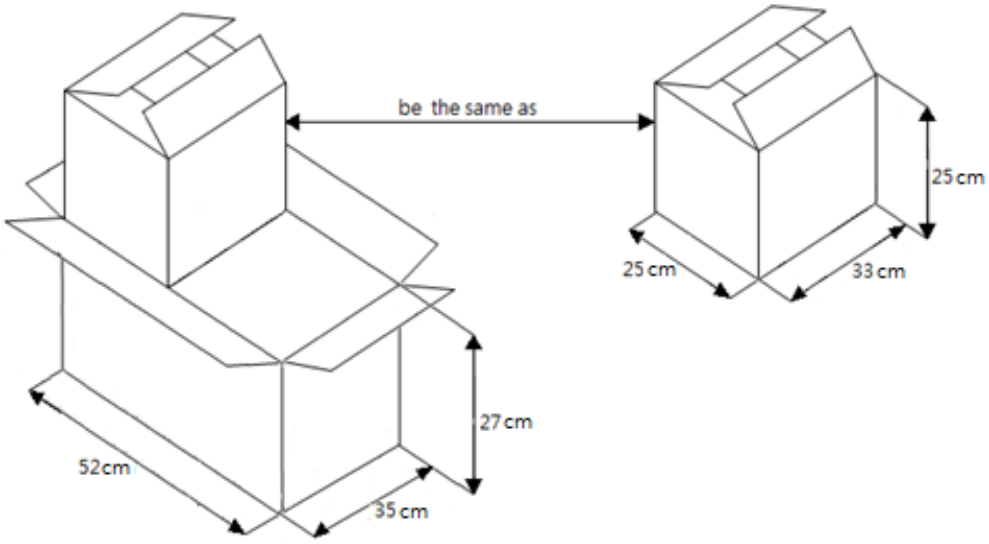




PET : Metallized Polyester film capacitor

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	300 or 500	3000 or 5000	6000 or 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.