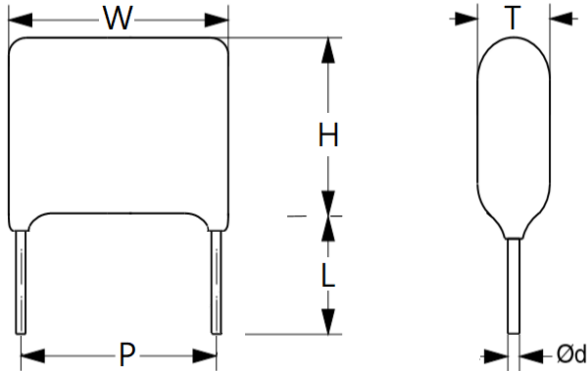


## SMTP series (Segmented design)

### ■ Outline Drawing



### ■ Typical Applications

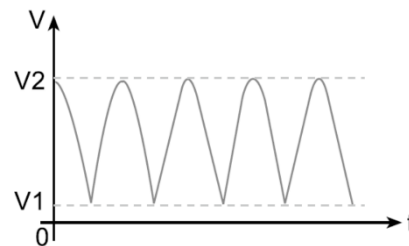
As intermediate circuit capacitors for SMPS,  
Electronic ballast, Inverter  
(i.e. DC-Link, DC-filter and P.F.C)

### ■ Features

Metalized polypropylene film, Segmented design  
Excellent electric property  
Small inherent temperature rise  
Flame retardation epoxy resin coating (UL94V-0)

### ■ Note

The SMTP series is only recommended to use in DC-Filter or DC blocking circuits, It means the voltage applied to the capacitor s must be unidirectional ripple voltage. The typical voltage curve is as following reference.



$$V1 \geq 0, V2 \leq UR, V_{rms} = (V2 - V1) \div \sqrt{2}, I_{rms} = 2\pi f \times C \times (V2 - V1) \div \sqrt{2}$$

### ■ Specifications

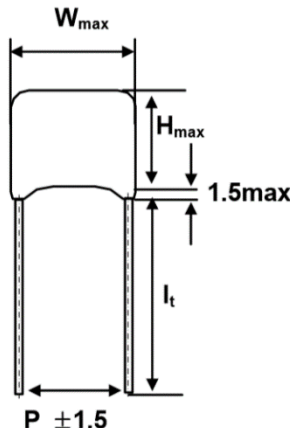
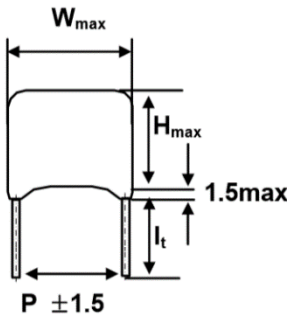
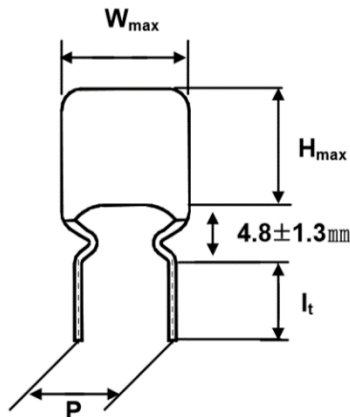
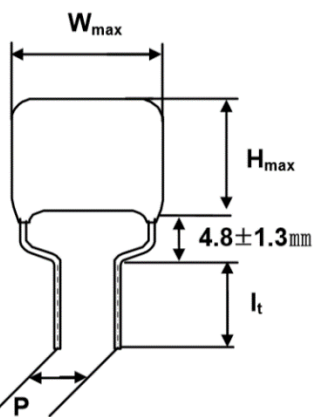
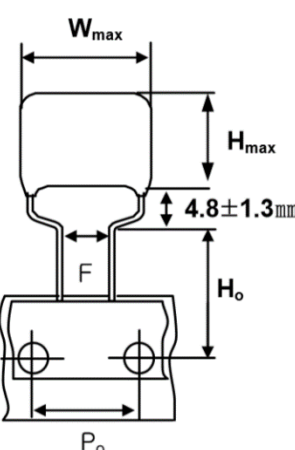
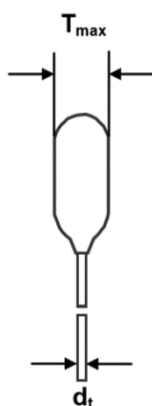
Reference Standard	GB/T 10190 (IEC 60384-16)		
Climatic Category	40/105/21		
Rated Temperature	85°C		
Operating Temperature Range	-40°C~+105°C (+85°C to +105°C: decreasing factor 1.25% per °C for UR)		
Capacitance Range	0.027µF ~ 10µF		
Rated (DC) Voltage	450Vdc	520Vdc	630Vdc
Capacitance Tolerance	±5%(J) 、 ±10%(K) 、 ±20%(M)		
Voltage Proof	1.6UR, 5s (DC)		
Dissipation Factor	≤ 0.1% (25°C, 1kHz)		
Insulation Resistance	UR>100V	CR ≤ 0.33µF IR ≥ 25,000MΩ CR >0.33µF IR ≥ 7,500s (20°C, 100V, 1min)	

SMTP series (Segmented design)

■ Product code system

SMTP	E	105	K	0450	D	B	15	23
Type	Internal use	Capacitance	Tolerance	Rated Voltage	Voltage	Lead forming	Lead Pitch	Lead Length
SMTP= Metallized Polypropylene Capacitor (Dipped)	--	105 =1000nF =1.0μF	J=±5% K=±10% M=±20%	0450=450V 0520=520V 0630=630V	D=DC	Shown as Table I	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			

SMT series (Segmented design)

■ Specifications ( GB/T 10190 )

試驗項目 Test items	性能要求 Performance requirements	試驗條件 Conditions of test
電容量 Capacitance	在規定公差內 Within the tolerance specified	1KHz, 1Vrms Max. at 25°C
損耗因素 Dissipation Factor	0.001 (0.1%) Max.	1KHz, 1Vrms Max. at 25°C
耐電壓 Voltage proof	應無異常 Shall be no abnormality	引線間 Between terminals 1.6U <sub>R</sub> (Vdc) Test of 5sec.
絕緣電阻 Insulation resistance	C <sub>R</sub> ≤ 0.33μF IR ≥ 25,000MΩ, C <sub>R</sub> > 0.33μF IR ≥ 7,500s	100Vdc, 60sec / 20°C
引出端強度試驗 Robustness of terminations	無斷線, 電容器無損壞 No wire breakage and no damage of capacitor	端子強度 Tense Strength of Terminal 負載重量 Load Force : 1.0 Kg 保持時間 Holding Time : 10 ± 1sec
		抗彎強度 Bending Strength of Terminal 負載重量 Load Force : 0.5 Kg 彎曲時間 Bending Time : 4 x 90 °
耐焊接熱 Resistance to soldering heat	(1) Appearance : No visible damage (2) ΔC/C : ≤ ±3% of the initial value (3) DF ( tanδ ) : ≤ 0.004 of increased value	焊接溫度 Solder temperature: 260±5°C 焊接時間 Solder time: 5±0.5sec
可焊性 Solderability	表面鍍錫 95% 95% of the surface tinning	焊接溫度 Solder temperature: 260±5°C 焊接時間 Solder time: 2±0.5sec
溫度快速變化 Rapid change of temperature	應目視檢查電容器, 並無可見損壞 The capacitors shall be visually examined and there shall be no visible damage.	下限溫度 Lower category temperature: -40°C 上限溫度 Upper category temperature: 85°C 循環次數 Number of cycles: 5 持續時間 Duration t1 = 30 min
振動 Vibration	應目視檢查電容器, 並無可見損壞 The capacitors shall be visually examined and there shall be no visible damage	頻率範圍 Frequency range: 10~55Hz 振幅軸向 Course: X、Y、Z (axis) 持續時間 2h / axis ( 6h in total) 位移振幅 Displacement amplitude: 0.75mm

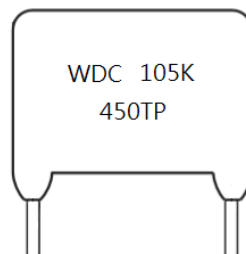
## SMTP series (Segmented design)

### ■ Specifications ( GB/T 10190 )

試驗項目 Test items	性能要求 Performance requirements	試驗條件 Conditions of test
氣候序列 Climatic sequence	(1) Appearance : No visible damage (2) $\Delta C/C : \leq \pm 5\%$ of the initial value (3) DF ( $\tan\delta$ ) : $\leq 0.005$ of increased value (4) IR : $\geq 50\%$ of the applicable limits (5) Voltage proof : Normal	乾熱 Dry Heat 上限溫度 Upper Temperature: 85°C 持續時間 Lower Duration: 16Hrs
		寒冷 Cold 下限溫度 Temperature: -40°C 持續時間 Duration: 2Hrs
濕熱穩態 Damp Heat Steady State	(1) Appearance : No visible damage (2) $\Delta C/C : \leq \pm 5\%$ of the Initial value (3) DF ( $\tan\delta$ ) : $\leq 0.002$ of increased value (4) IR : $\geq 50\%$ of the applicable limits (5) Voltage proof : Normal	溫度 +40°C, 濕度 93%, 21 天 +40°C and 93% RH, 21 days
耐久性 Endurance	(1) Appearance : No Visible Damage (2) $\Delta C/C : \leq \pm 5\%$ of the initial value (3) DF ( $\tan\delta$ ) : $\leq 0.004$ of increased value (4) IR : $\geq 50\%$ of the applicable limits	實驗電壓 $U_R \times 125\%$ , 實驗溫度 Temperature: +85°C 實驗時間 Time: 1000Hrs
充放電 Charge and discharge	(1) Appearance : No visible damage (2) $\Delta C/C : \leq \pm 5\%$ of the initial value (3) DF ( $\tan\delta$ ) : $\leq 0.005$ of increased value (4) IR : $\geq 50\%$ of the applicable limits	實驗電壓 Test voltage : Rated (DC) voltage 充放電 Charge and discharge: 0.5sec/time 重複次數 Repeated for 10000 cycles

### ■ Mark

#### Marking



1. WDC is a registered trademark of WINDAY	2. Capacitance: 105 indicates 1.0 $\mu$ F or 100nF
3. Capacitors Tolerance: K= $\pm 10\%$	4. Rated Voltage: 450Vdc, Indicates 450
5. TP for Segmented design Metallized polypropylene film	

## SMT<sub>P</sub> series (Segmented design)

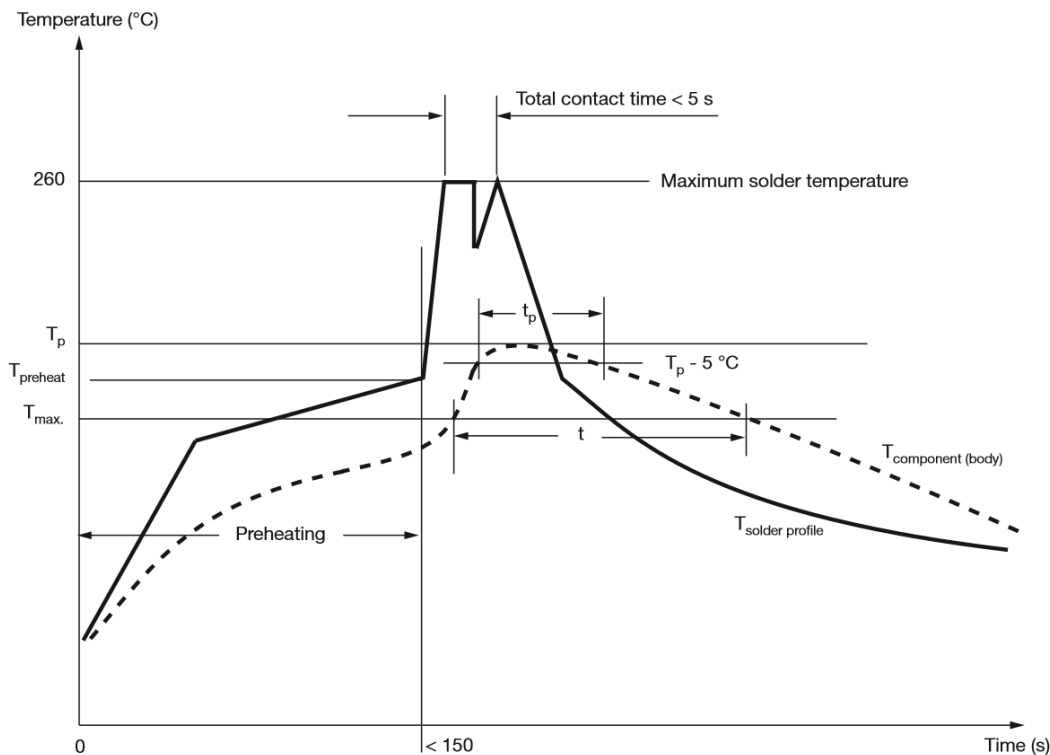
### ■ Soldering Guidelines for Film Capacitors

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



$T_p$  : Peak temperature of the component body (top)

$T_{max}$  : 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
SMT <sub>P</sub>	--	--	(2),(5)	(1),(6)	(1),(6)	(1),(6)	--	--

(1) No risk

During soldering:  $T_p \leq 110^\circ\text{C}$ ,  $t_p \leq 20$  s,  $t \leq 30$  s

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

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

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

During preheating:  $T_{max} \leq 110^\circ\text{C}$

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

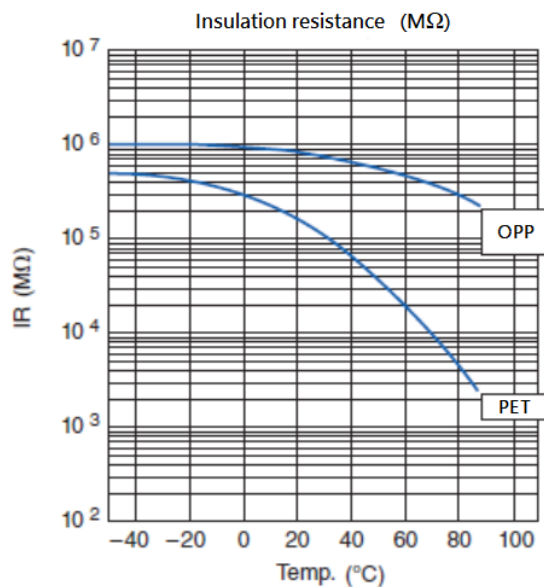
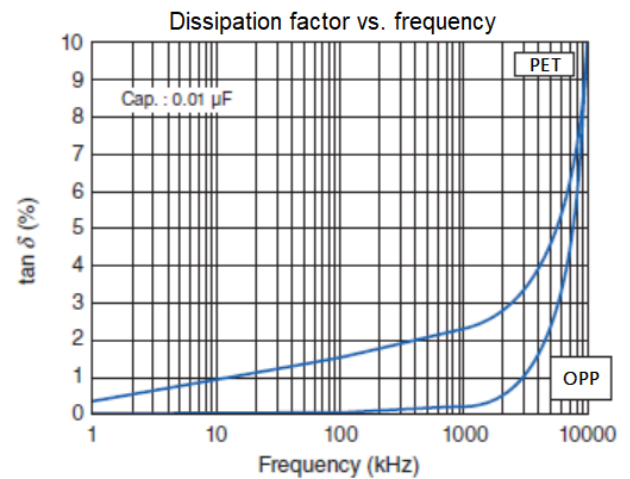
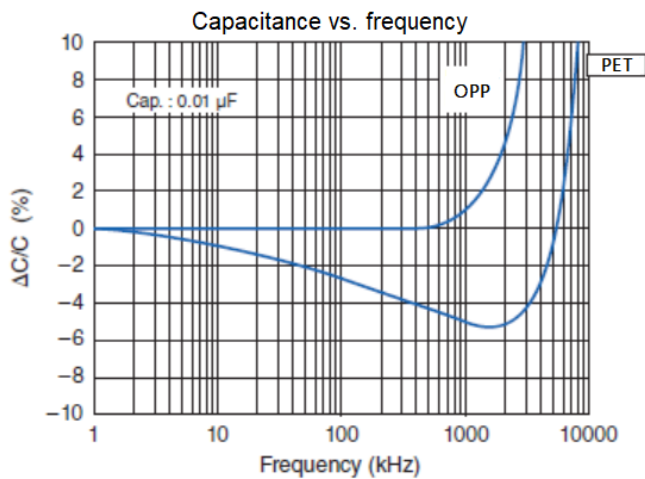
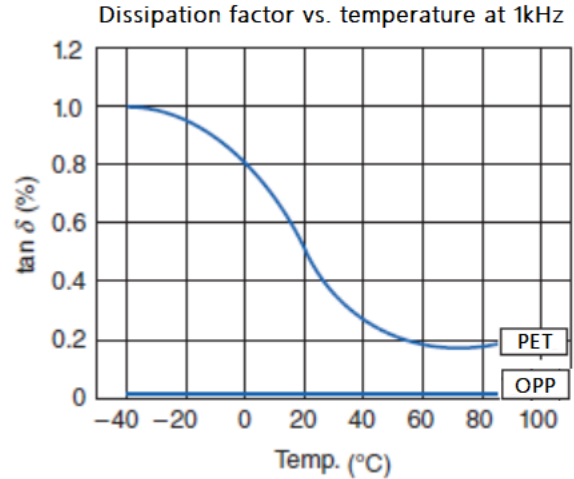
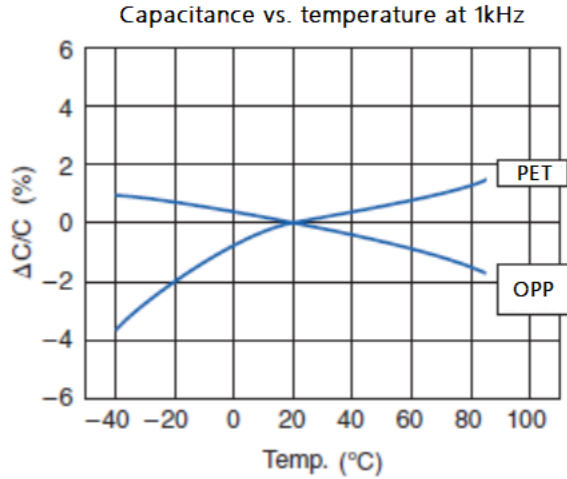
During soldering:  $T_p \leq 120^\circ\text{C}$ ,  $t_p \leq 20$  s,  $t \leq 30$  s

During preheating:  $T_{max} \leq 100^\circ\text{C}$

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

SMTP series (Segmented design)

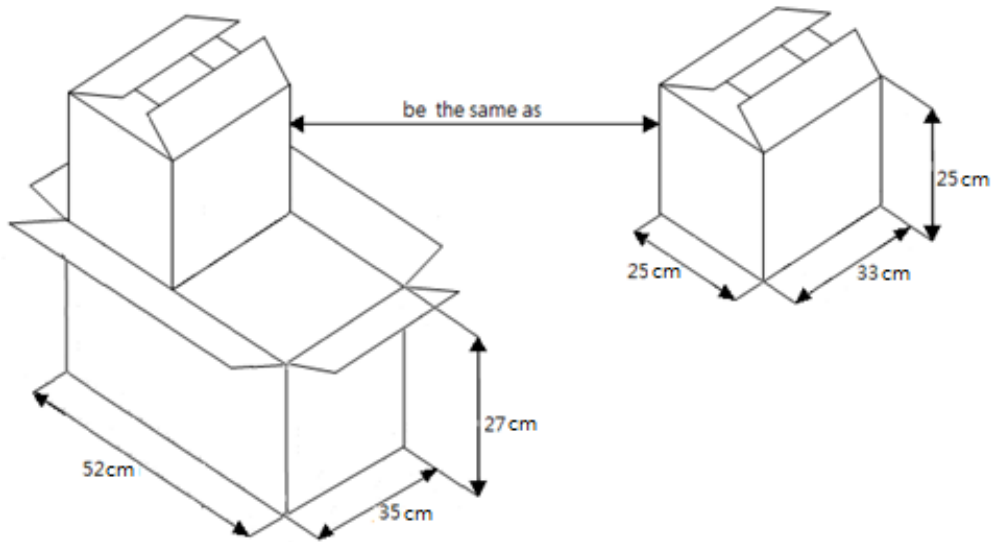
■ Typical graphs



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

SMTP series (Segmented design)

■ 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 °C, humidity less than 50% of the state of storage for one year.