

SINLOON®

高精密薄膜貼片電阻  
Tol.±0.01% TCR:±5ppm

TPT Series  
Thin Film Precision Temperature Chip Resistor

□ FEATURE

- ◆ Thin Film Passivity NiCr Resistor
- ◆ Very Tight Tolerance from ±0.01%.
- ◆ Extremely Low TCR from ±5ppm/°C
- ◆ Wide R-Value Range
- ◆ Rated Power : 1/32W ~ 1W (0402 ~2512)

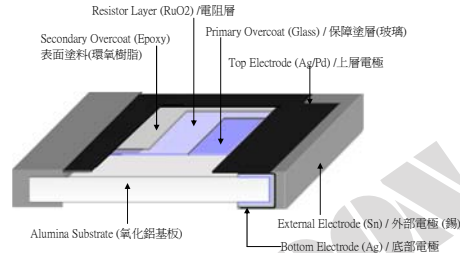
□ Applications

- ◆ Medical Equipment
- ◆ Testing / Measurement Equipment
- ◆ Consumer Product
- ◆ Printer Equipment
- ◆ Automatic Equipment Controller
- ◆ DC-DC Converters, Battery pack, Charge.
- ◆ Communication Device, Cell phone, GPS, PDA
- ◆ Measurement instruments

Figure



CONSTRUCTION



□ ORDERING INFORMATION

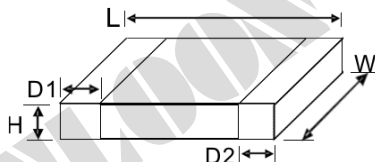
Example: Y-TPT03FC10R0 (1/16W 0603 ±1% 25ppm 10R Ω )

Power		Type Size	Part No		Tolerance	TCR(°C)	Resistance E96 (Ω)	Packing
Standard	High Power		Standard	High Power				
1/16W	---	0402	Y-TPT02	---	A = ±0.01%	S=±5ppm	1R=1R00	10K Reel
1/16W	1/10W	0603	Y-TPT03	X-TPT03	P = ±0.05%	B=±10ppm	10R=10R0	5K Reel
---	1/6W	0603	---	H-TPT03	B = ±0.1%	C=±25ppm	100R=100R	5K Reel
1/10W	1/8W	0805	X-TPT05	W-TPT05	C = ±0.25%	D=±50ppm	1K=1001	5K Reel
---	1/4W	0805	---	V-TPT05	D = ±0.5%	E=±100ppm	10K=1002	5K Reel
1/8W	1/4W	1206	W-TPT06	V-TPT06	F = ±1%		100K=1003	5K Reel
---	1/3W	1206	---	J-TPT06			1M=1004	5K Reel
1/5W	1/3W	1210	I-TPT10	J-TPT10			10M=1005	5K Reel
1/4W	1/3W	2010	V-TPT20	J-TPT20				5K Reel
1/2W	3/4W	2512	U-TPT12	T-TPT12				4K Reel
---	1W	2512	---	S-TPT12				4K Reel

□ DIMENSION

Power		Type Size	L	W	H	D1	D2
Standard	High Power						
1/16W	---	0402	1.00 ±0.05	0.50 ±0.05	0.30 ±0.05	0.20 ±0.15	0.20 ±0.15
1/16W	1/10W	0603	1.50 ±0.15	0.80 ±0.15	0.50 ±0.15	0.35 ±0.15	0.35 ±0.15
---	1/6W	0603	1.50 ±0.15	0.80 ±0.15	0.50 ±0.15	0.35 ±0.15	0.35 ±0.15
1/10W	1/8W	0805	2.00 ±0.20	1.25 ±0.15	0.50 ±0.15	0.35 ±0.15	0.35 ±0.15
---	1/4W	0805	2.00 ±0.20	1.25 ±0.15	0.50 ±0.15	0.35 ±0.15	0.35 ±0.15
1/8W	1/4W	1206	3.20 ±0.20	2.50 ±0.20	0.55 ±0.15	0.50 ±0.20	0.50 ±0.20
---	1/3W	1206	3.20 ±0.20	2.50 ±0.20	0.55 ±0.15	0.50 ±0.20	0.50 ±0.20
1/5W	1/3W	1210	3.10 ±0.10	2.50 ±0.20	0.55 ±0.05	0.45 ±0.10	0.40 ±0.10
1/4W	1/3W	2010	5.0 ±0.10	2.50 ±0.10	0.55 ±0.05	0.60 ±0.20	0.40 ±0.10
1/2W	3/4W	2512	6.30 ±0.20	3.20 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60 ±0.20
---	1W	2512	6.30 ±0.20	3.20 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60 ±0.20

Fig-1



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Tol.±0.01% TCR:±5ppm

TPT Series  
Thin Film Precision Temperature Chip Resistor

Standard Electrical Specification:

Rated Power at 70°C	Type Size	Maximum Voltage		Tolerance Range / Resistance Range (Ω)						TCR ppm/°C
		Operating	Overload	±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	±1%	
1/16W	0402	25V	50V	50~5K	50~5K	50~5K				±5
				50~12K	50~12K	50~12K				±10
				50~12K	50~12K	50~68K				±15
						10~200K	10~200K	10~200K	10~200K	±25
						10~200K	10~200K	1R~200K	1R~200K	±50
1/16W	0603	50V	100V	25~15K	25~15K	25~15K				±5
				25~100K	4.7~332K	4.7~332K				±10
				25~100K	4.7~332K	4.7~332K				±15
					4.7~332K	4.7~1M	2.2~1M	2.2~1M	2.2~1M	±25
					4.7~332K	4.7~1M	1R0~1M	1R0~1M	1R0~1M	±50
1/10W	0805	100V	200V	25~30K	25~30K	25~30K				±5
				25~100K	4.7~510K	4.7~510K				±10
				25~100K	4.7~510K	4.7~510K				±15
					4.7~510K	4.7~2M	1R0~2M	1R0~2M	1R0~2M	±25
					4.7~510K	4.7~2M	1R0~2M	1R0~2M	1R0~2M	±50
1/8W	1206	150V	300V	25~50K	25~50K	25~50K				±5
				25~510K	4.7~1M	4.7~1M				±10
				25~510K	4.7~1M	4.7~1M				±15
					4.7~1M	4.7~2.2M	1R~2.2M	1R~2.2M	1R~2.2M	±25
					4.7~1M	4.7~2.2M	1R~2.2M	1R~2.2M	1R~2.2M	±50
1/5W	1210	150V	300V	25~50K	25~50K	25~50K				±5
				25~510K	4.7~1M	4.7~1M				±10
				25~510K	4.7~1M	4.7~1M				±15
					4.7~1M	4.7~2.2M	1R~2.2M	1R~2.2M	1R~2.2M	±25
					4.7~1M	4.7~2.2M	1R~2.2M	1R~2.2M	1R~2.2M	±50
1/4W	2010	150V	300V	25~100K	25~100K	25~100K				±5
				25~510K	4.7~1M	4.7~1M				±10
				25~510K	4.7~1M	4.7~1M				±15
					4.7~1M	4.7~3.0M	1R~3.0M	1R~3.0M	1R~3.0M	±25
					4.7~1M	4.7~3.0M	1R~3.0M	1R~3.0M	1R~3.0M	±50
1/2W	2512	150V	300V	25~100K	25~100K	25~100K				±5
				25~510K	4.7~1M	4.7~1M				±10
				25~510K	4.7~1M	4.7~1M				±15
					4.7~1M	4.7~3.0M	1R~3.0M	1R~3.0M	1R~3.0M	±25
					4.7~1M	4.7~3.0M	1R~3.0M	1R~3.0M	1R~3.0M	±50

Operating Temperature Range:

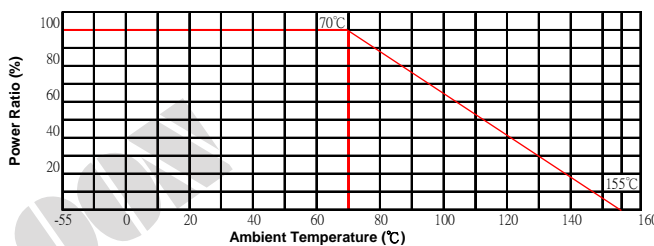
-55°C ~ +155°C

\* In case resistors operating ambient temperature in excess of the temperature range -55°C ~+155°C power ratio will be derated in accordance with the figure as shown on the right.

\* Others data not in the specification of data, please contact us.

如果你要求的規格不在本規格書裡請與我們聯絡。

POWER DERATING CURVE



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High Power Electrical Specification:

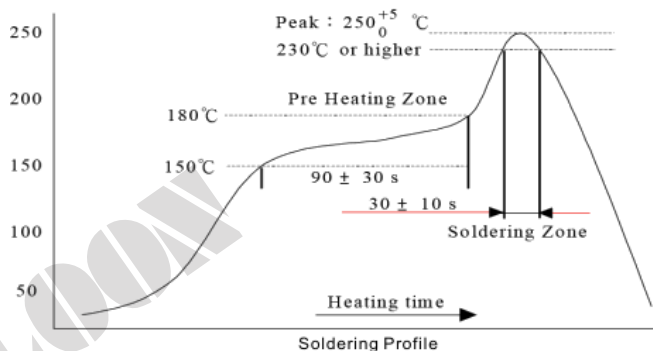
Rated Power at 70°C	Type Size	Maximum Voltage		Tolerance Range / Resistance Range (Ω)					TCR ppm/°C	Operating Temp.
		Operating	Overload	±0.01%	±0.05%	±0.1%	±0.25%	±0.5%		
1/10W	0603	75V	150V	50~15K	50~15K	50~15K	50~15K	50~15K	±5	-55°C ~ +155°C
				25~100K	4.7~332K	4.7~332K	4.7~332K	4.7~332K	±10	
				25~100K	4.7~332K	4.7~332K	4.7~332K	4.7~332K	±15	
				25~100K	4.7~332K	4.7~1M	4.7~1M	4.7~1M	±25	
				25~100K	4.7~332K	4.7~1M	4.7~1M	4.7~1M	±50	
1/6W	0603	100V	150V		10~332K	10~332K	10~332K	10~332K	±25,±50	
1/8W	0805	150V	300V	25~30K	25~30K	25~30K	25~30K	25~30K	±5	
				25~200K	4.7~510K	4.7~510K	4.7~510K	4.7~510K	±10	
				25~200K	4.7~510K	4.7~1M	4.7~1M	4.7~1M	±15	
				25~200K	4.7~510K	4.7~1M	1R~1M	1R~1M	±25	
				25~200K	4.7~510K	4.7~1M	1R~1M	1R~1M	±50	
1/4W	0805	150V	300V		10R~500K	10R~500K	10R~500K	10R~500K	±25,±50	
1/4W	1206	200V	400V	25R~50K	25R~50K	25R~50K	25R~50K	25R~50K	±5	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±10	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±15	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±25	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±50	
1/3W	1206	200V	400V		10R~1M	10R~1M	10R~1M	10R~1M	±25,±50	
1/3W	1210	200V	400V	25R~50K	25R~50K	25R~50K	25R~50K	25R~50K	±5	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±10	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±15	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±25	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±50	
1/3W	2010	200V	400V	25R~50K	25R~50K	25R~50K	25R~50K	25R~50K	±5	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±10	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±15	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±25	
				25R~500K	4.7R~1M	4.7R~1M	4.7R~1M	4.7R~1M	±50	
3/4W	2512	200V	400V	25R~50K	25R~50K	25R~50K	25R~50K	25R~50K	±5	
				25R~2K	4.7R~2K	4.7R~2K	1R0~2K	1R0~2K	±10	
				25R~2K	4.7R~2K	4.7R~2K	1R0~2K	1R0~2K	±15	
				25R~2K	4.7R~2K	4.7R~2K	1R0~2K	1R0~2K	±25	
				25R~2K	4.7R~2K	4.7R~2K	1R0~2K	1R0~2K	±50	
1W	2512	200V	400V			4.7R~100R	1R0~100R	1R0~100R	±25	
						4.7R~100R	1R0~100R	1R0~100R	±50	

\* In case resistors operating ambient temperature in excess of the temperature range -55°C ~+155°C power ratio will be derated in accordance with the figure as shown on the right.

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IR Reflow



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TPT Series  
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□ Test Procedures and Requirements

Test Item	Test Method	Requirement
Temperature coefficient of resistance (T.C.R.)	MIL-STD202F Method 304 +25/-55/+25/+125/+25	As specification
Short time overload	JIS-C-5201-1 5.5 RCWV*2.5 or Max. overload voltage for 5 seconds	Tol.<0.05% $\Delta\pm 0.05\%$ ; Tol.>0.05% $\Delta\pm 0.2\%$ $\Delta R\pm 0.2\%$ for high power rating
Insulation resistance	MIL-STD202F Method 302 Apply 100VDC for min	>100M $\Omega$
Endurance	MIL-STD-202F Method 108A 70+2°C, Max.working voltage for 1000hrs with 1.5hrs [ON] and 0.5hrs [OFF]	Tol.<0.05% $\Delta\pm 0.05\%$ ; Tol.>0.0% $\Delta\pm 0.2\%$ >7K $\Omega$ $\Delta R\pm 0.5\%$ $\Delta R\pm 0.5\%$ for high power rating
Damp heat with load	MIL-STD-202F Method 103B 40+2°C, 90~95%, R.H. Max working voltage for 1000hrs with 1.5hrs [ON] and 0.5hrs [OFF]	Tol.<0.05% $\Delta\pm 0.05\%$ ; Tol.>0.05% $\Delta\pm 0.3\%$ $\Delta R\pm 0.5\%$ for high power rating
bending strength	JIS-C-5201-1 6.1.4 Bending amplitude 3mm for 10 seconds	Tol.<0.05% $\Delta\pm 0.05\%$ ; Tol.>0.05% $\Delta\pm 0.2\%$
Solderability	MIL-STD-202F Method 208H 245+5°C for 3seconds	95% min. coverage
Resistance to soldering heat	MIL-STD-202F Method 210E 245+5°C for 10 seconds	Tol.<0.05% $\Delta\pm 0.05\%$ ; Tol.>0.05% $\Delta\pm 0.2\%$
Dielectric withstand voltage	MIL-STD-202F Method 301 Max. overload voltage for 1 minute	By Type
Thermal shock	MIL-STD-202F Method 107G -55°C~155°C, 100 cycles.	Tol.<0.05% $\Delta\pm 0.05\%$ ; Tol.>0.05% $\Delta\pm 0.25\%$
Low temperature operation	JIS-C-5201-1 7.1 1 hour, -65°C, followed by 45 min. of RCWV.	Tol.<0.05% $\Delta\pm 0.05\%$ ; Tol.>0.05% $\Delta\pm 0.2\%$ $\Delta R\pm 0.5\%$ for high power rating

Storage temperature: 25±3°C; Humidity <80%RH.

□ VOLTAGE RATING OR CURRENT RATING

Resistance Range:  $\geq 1\Omega$

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$E = \sqrt{R \times P}$  P=Power rating(W) R=Nominal resistance( $\Omega$ )

Overload voltage(V)  $2.5 \times \sqrt{R \times P}$

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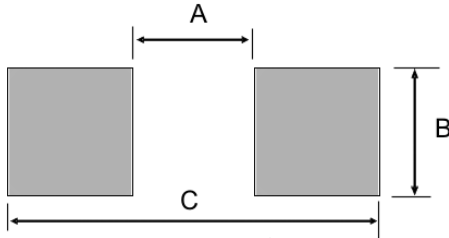
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RECOMMEND LAND PATTERN DESIGN (For Reflow Soldering)

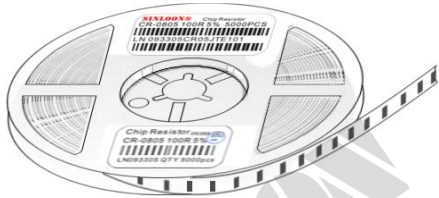
Unit: mm

Type	TPT02	TPT03	TPT05	TPT06	TPT10	TPT12	TPT20	TPT28	TPT12
Dim.	0402	0603	0805	1206	1210	1812	2010	1218	2512
A	0.5	0.8	1.30	2.20	2.00	3.11	3.80	2.04	4.90
B	0.6	0.9	1.40	1.70	2.70	3.00	2.70	4.50	3.40
C	1.5	2.8	2.90	4.20	4.40	5.91	6.60	4.24	8.10

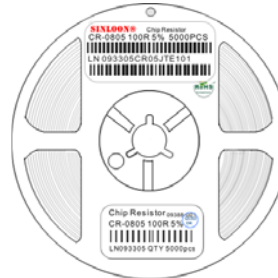


PACKAGE SPECIFICATION

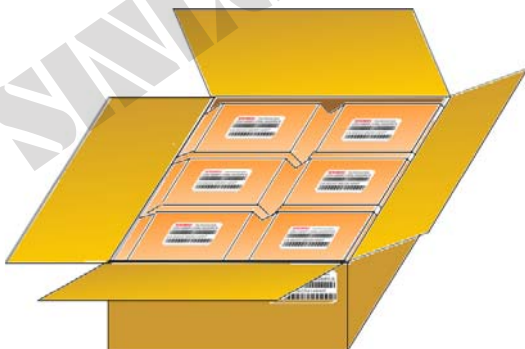
Power		Type Size	Quantity(ea)			SINLOON® ROHS Compliant 品質承諾標誌 QUALITY COMMITMENT
Standard	High Power		Paper Reel Tape		In Box	
1/16W	---	0402	10,000 Pcs	7" Reel	100K pcs	600K pcs
1/16W	1/10W	0603	5,000 Pcs	7" Reel	50K pcs	300K pcs
1/10W	1/8W	0805	5,000 Pcs	7" Reel	50K pcs	300K pcs
1/8W	1/4W	1206	5,000 Pcs	7" Reel	40K pcs	300K pcs
1/5W	1/3W	1210	5,000 Pcs	7" Reel	40K pcs	300K pcs
1/4W	1/3W	2010	5,000 Pcs	7" Reel	40K pcs	300K pcs
1/2W	3/4W	2512	4,000 Pcs	7" Reel	40K pcs	240K pcs
---	1W	2512	4,000 Pcs	7" Reel	40K pcs	240K pcs



Paper Reel Tape



Reel Tape Leble



Carton Pack



In Box

※ 美隆電子產品規格特性參數的改變和更新,不會另行通知。

※ Mayloon characteristic parameters of electronic product specification changes or updates without prior notice。