高精密薄膜貼片電阻

TFR Series

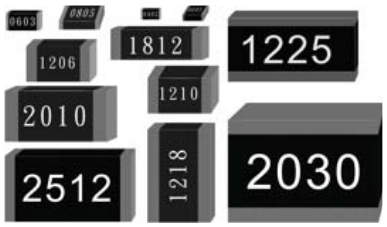
Tolerance range: ±1% ~ ±0.01%

Thin Film Precision Chip Resistor

☐ FEATURE

- ◆ Thin Film Passivated NiCr Resistor
- ◆ Very Tight Tolerance from ±0.01% ~ ±1%
- ◆ Extremely Low TCR from ±5~±50 PPM/℃
- ◆ Wide R-Value Range
- ◆ Rated Power : 0.031W ~ 0.5W

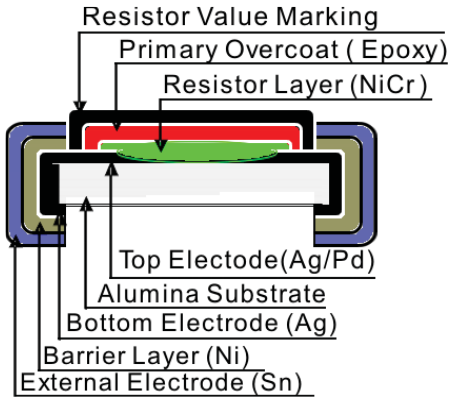
FIGURE



☐ Applications

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

CONSTRUCTION



☐ ORDERING INFORMATION

Example: CRHP05JH1R00

Power	Size	Type	Tolerance	TCR(℃)	Resistance	Packing
0.031W	0402	TFR02	J = ±5%	E=±100ppm	1R = 1R00	5K Reel
0.063W	0603	TFR03	G = ±2%	D=±50ppm	10R=10R0	5K Reel
0.1W	0805	TFR05	F = ±1%	C=±25ppm	100R=100R	5K Reel
0.125W	1206	TFR06	D = ±0.5%	B=±10ppm	1K = 1001	5K Reel
0.165W	1210	TFR10	C = ±0.25%	A=±5ppm	10K = 1002	5K Reel
0.25W	1812	TFR12	B = ±0.05%		100K=1003	5K Reel
0.25W	2010	TFR20	A = ±0.01%		1M=1-004	4K Reel
0.5W	1218	TFR28				4K Reel
0.5W	2512	TFR25				4K Reel

☐ DIMENSION

Power	Size	Type	L	W	H	D1	D2	Fig.
0.031W	0402	TFR02	1.00 ±0.10	0.50 ±0.05	0.30 ±0.05	0.20 ±0.10	0.20 ±0.10	
0.063W	0603	TFR03	1.60 ±0.20	0.80 ±0.15	0.40 ±0.10	0.30 ±0.20	0.30 ±0.15	
0.1W	0805	TFR05	2.00 ±0.20	1.25 ±0.15	0.50 ±0.15	0.35 ±0.15	0.35 ±0.15	
0.125W	1206	TFR06	3.20 ±0.20	1.60 ±0.20	0.55 ±0.15	0.45 ±0.20	0.45 ±0.20	Fig-1
0.165W	1210	TFR10	3.20 ±0.20	2.50 ±0.20	0.55 ±0.15	0.50 ±0.20	0.50 ±0.20	
0.25W	1812	TFR12	4.50 ±0.10	3.00 ±0.10	0.55 ±0.05	0.55 ±0.10	0.80 ±0.10	
0.25W	2010	TFR20	5.00 ±0.20	2.50 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60 ±0.20	
0.5W	1218	TFR28	3.10 ±0.10	4.60 ±0.10	0.55 ±0.05	0.45 ±0.10	0.40 ±0.10	Fig-2
0.5W	2512	TFR25	6.30 ±0.20	3.20 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60 ±0.20	Fig-1

Fig-1

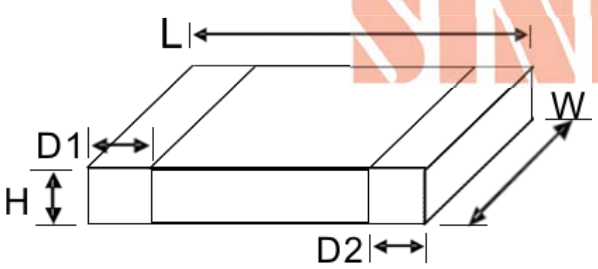
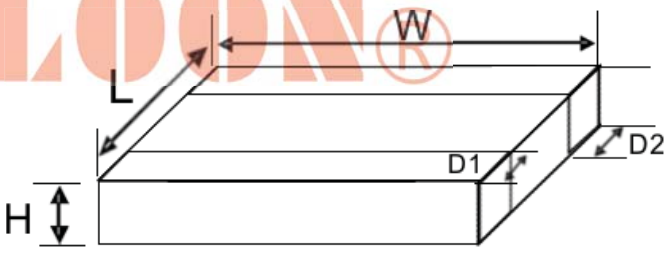


Fig-2



RoHS Compliant
品質承諾標誌
QUALITY COMMITMENT

高精密薄膜貼片電阻 TFR Series

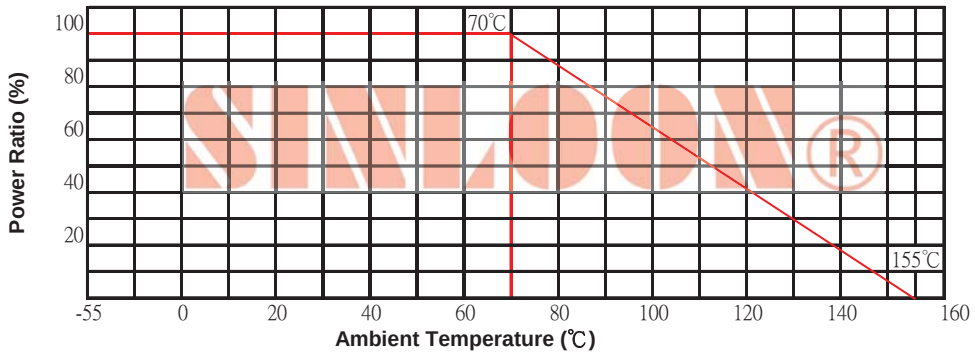
Tolerance range: ±1% ~ ±0.01% **Thin Film Precision Chip Resistor**

□ GENERAL ELECTRICAL SPECIFICATION

Type	Size	Rated Power at 70℃	Maximum Voltage		Resistance	T.C.R.	Tolerance	Operating Temperature
			Working	Overload	(Ω)	(ppm/℃)		
TFR02	0402	0.031W	25V	50V	40R2 ~20K2	±10	±0.1%,±0.25%,±0.5%. ±1%	-55℃ ~ 155℃
					10R ~100K	±25		
					10R ~1M	±50		
TFR03	0603	0.063W	50V	100V	24R9~100K	±10/±25/±50	±0.01%,±0.05%	
					33R~100K	±10	±0.1%,± 0.25%, ±.0.5%,±1%.	
					10R~332K	±25		
					1.5R~4M7	±50		
TFR05	0805	0.1W	100V	200V	24R9~100K	±10/±25/±50	±0.01%,±0.05%	
					33R~220K	±10	±0.1%,± 0.25%, ±.0.5%,±1%.	
					10R~3M32	±25, ±50		
					1R~9R9	±50		
TFR06	1206	0.125W	150V	300V	24R9~100K	±10/±25/±50	±0.01%,±0.05%	
					33R~1M	±10	±0.1%,± 0.25%, ±.0.5%,±1%.	
					10R~2M74	±25/±50		
					1R~9R9	±50		
TFR10	1210	0.165W	150v	300V	24R9~100K	±10/±25/±50	±0.01%,±0.05%	
					33R~220K	±10	±0.1%,± 0.25%, ±.0.5%,±1%.	
					10R~3M32	±25, ±50		
					1R~9R9	±50		
TFR12	1812	0.25W	150V	300V	24R9~100K	±10/±25/±50	±0.01%,±0.05%	
					33R~1M	±10	±0.1%,± 0.25%, ±.0.5%,±1%.	
					10R~2M74	±25/±50		
					1R~9R9	±50		
TFR20	2010	0.25W	150v	300V	24R9~100K	±10/±25/±50	±0.01%,±0.05%	
					30R~499K	±10	±0.1%,± 0.25%, ±.0.5%,±1%.	
					10R~1M	±25, ±50		
					1R~9R9	±50		
TFR28	1218	0.5W	150V	300V	24R9~100K	±10/±25/±50	±0.01%,±0.05%	
					30R~499K	±10	±0.1%,± 0.25%, ±.0.5%,±1%.	
					10R~1M	±25, ±50		
					1R~9R9	±50		
TFR25	2512	0.5W	150V	300V	24R9~100K	±10/±25/±50	±0.01%,±0.05%	
					30R~499K	±10	±0.1%,± 0.25%, ±.0.5%,±1%.	
					10R~1M	±25, ±50		
					1R~9R9	±50		

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

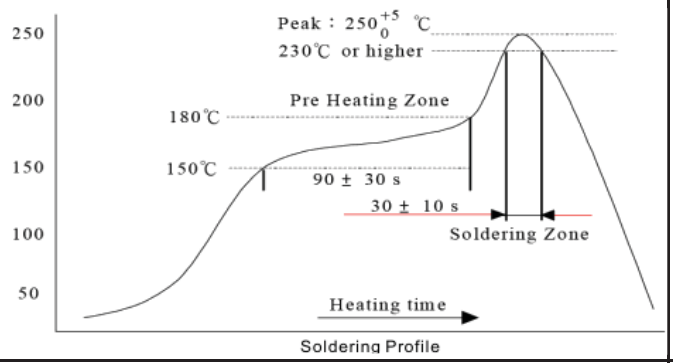
□ POWER DERATING CURVE



高精密薄膜貼片電阻 **TFR Series**

Tolerance range: ±1% ~ ±0.01% **Thin Film Precision Chip Resistor**

☐ Test Procedures and Requirements

Test Item	Procedue	Requirement	Test Method
Temperature Coeffient of Resistance (T.C.R)	-55℃ ~ +155℃, 20℃ is the reference temperature	Refer to Rating	JIS C 5201-1 clause 4.8
Short Time Overload	General: 2.5 time RCWV or Max. Overload voltage for 5 seconds. Hifh Power: 2.5 times RCWV of Mac. Overload voltage for 2 seconds.	±1=±(1.0% +0.05Ω) ±5=±(2.0% +0.1Ω)	JIS C 5201-1 clause 4.13
IR Reflow	 Soldering Profile	±1=±(1.0% +0.05Ω) ±5=±(1.0% +0.05Ω)	SONY SS-00254
Leaching	260±5℃ for 30 seconds	>95% Coverge	SONY SS-00254-9
Soldering Heat	260±5℃ for 10 seconds	±1=±(1.0% +0.05Ω) ±5=±(1.0% +0.05Ω)	JIS C 5201-2 clause 4.18
Temperature Cycling	-555℃ to +155℃ 5 cycles	0.10%,0.50%,1% : ±(0.1%+0.05Ω) 2%,5%: ±(0.1%+0.01Ω)	JIS C 5201-2 clause 4.19
Electric Iron	Preheating temperature : 350±5℃ Electric iron preheating time: 3+1/-0 second	±1=±(1.0% +0.05Ω) ±5=±(1.0% +0.05Ω)	SONY SS-00254-5
Resistance Solcent	The tested resistor be immersed into isproply alcohol of 20 ~ 25℃ for 60 secs. Then the resistor is left in the room for 48 hours.	±1=±(1.0% +0.05Ω) ±5=±(1.0% +0.05Ω)	JIS C 5201-1 clause 4.29
Load life in Humidity	40±2℃, 90-95% R.H. or Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"	0.10%,0.50%,1% : ±(0.1%+0.05Ω) 2%,5%: ±(2%+0.05Ω)	JIS C 5201-1 clause 4.24
Load life (Endurance)	70±2℃, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"	0.10%,0.50%,1% : ±(0.1%+0.05Ω) 2%,5%: ±(2%+0.05Ω)	JIS C 5201-1 clause 4.24
Insulation Resistance	Max. Overload voltage for 1 mimute	≧ 10G Ω	JIS C 5201-1 clause 4.6

☐ VOLTAGE RATING OR CURRENT RATING

Resistance Range: ≧1Ω

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=Rated voltage(V) $E=\sqrt{R\times P}$ P=Power rating(W) R=Nominal resistance(Ω)

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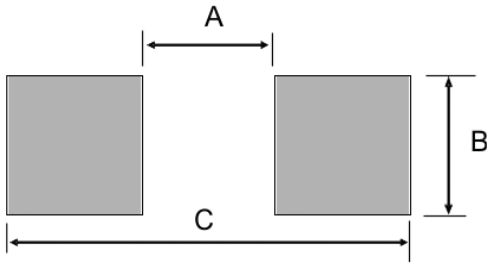
Thin Film Precision Chip Resistor

☐ RECOMMEND LAND PATTERN DESIGN (For Reflow Soldering)

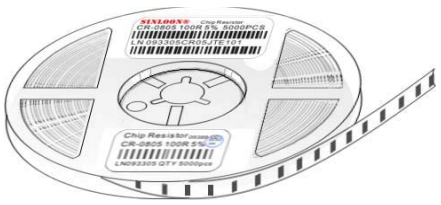
Unit: mm

Type / Dim.	TFR02	TFR03	TFR05	TFR06	TFR10	TFR12	TFR20	TFR28	TFR25
	0402	0603	0805	1206	1210	1812	2010	1218	2512
A	0.60	0.80	1.30	2.20	2.00	3.11	3.80	2.04	4.90
B	0.70	1.00	1.40	1.70	2.70	3.00	2.70	4.50	3.40
C	1.60	2.40	2.90	4.20	4.40	5.91	6.60	4.24	8.10

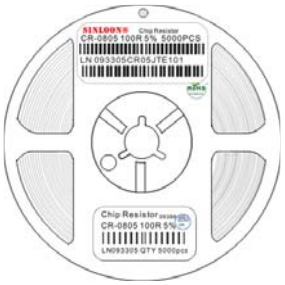


☐ PACKAGE SPECIFICATION

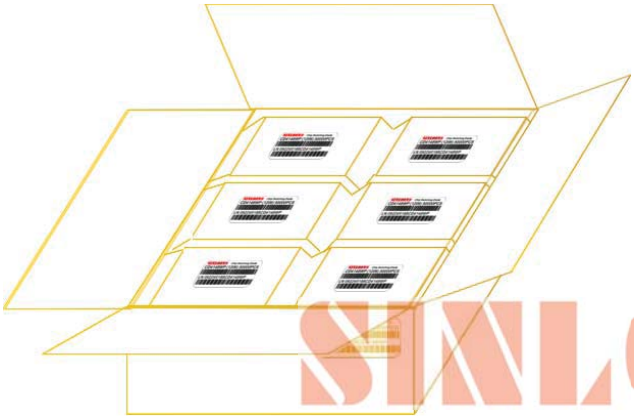
Power	Size	Type	Quantity(ea)			SINLOON®
			Paper Reel Tape	In Box	Carton	
0.031W	0402	TFR02	5,000 Pcs 7" Reel	50K pcs	300K pcs	RoHS Compliant 品質承諾標誌 QUALITY COMMITMENT
0.063W	0603	TFR03	5,000 Pcs 7" Reel	50K pcs	300K pcs	
0.1W	0805	TFR05	5,000 Pcs 7" Reel	50K pcs	300K pcs	
0.125W	1206	TFR06	5,000 Pcs 7" Reel	50K pcs	300K pcs	
0.165W	1210	TFR10	5,000 Pcs 7" Reel	40K pcs	300K pcs	
0.25W	1812	TFR12	5,000 Pcs 7" Reel	40K pcs	300K pcs	
0.25W	2010	TFR20	5,000 Pcs 7" Reel	40K pcs	300K pcs	
0.5W	1218	TFR28	4,000 Pcs 7" Reel	40K pcs	240K pcs	
0.5W	2512	TFR25	4,000 Pcs 7" Reel	40K pcs	240K pcs	



Paper Reel Tape



Reel Tape Leble



Carton Pack

In Box

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

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