

APPROVAL SHEET

Product Name : Non-Magnetic Chip Resistor

Part No. : TFR Series

Description : Size 0603~1206

For more contact information, please refer to our website: www.rideetech.com



Non-Magnetic Chip Resistor – TFR Series

■ Applications

- Automotive industry
- Medical equipment



■ Features

- Non-Magnetic Chip Resistor using Thick Film non-magnetic termination
- Suitable for Flow , Reflow and lead free Soldering
- Meet RoHS and Halogen Free

■ Part Number Explanation

TFR	0603	F	1002	T	S
Product	Size (Inch)	Tolerance	Resistance	Packaging	Functional
Non-Magnetic Chip Resistor	0603 0805 1206	F : $\pm 1.0\%$ J : $\pm 5.0\%$	1R00=1 Ω 10R0=10 Ω 100R=100 Ω 1001=1K Ω 1004=1M Ω	T= Tape & Reel	S= Standard



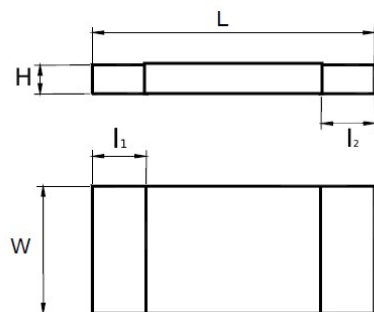
Standard Electrical Specifications

Type	Power Rating at 70°C	Max RCWV	Max Overload Voltage	Temperature Coefficient (TCR; ppm/°C)	Resistance Range	
					F(±1%)	J(±5%)
TFR0603	0.1 W	50V	100V	±100	$1\Omega \leq R < 10M\Omega$	-
				±200	-	0Ω, $1\Omega \leq R < 10M\Omega$
TFR0805	0.125 W	150V	300V	±100	$1\Omega \leq R < 10M\Omega$	-
				±200	-	0Ω, $1\Omega \leq R < 10M\Omega$
TFR1206	0.25 W	200V	400V	±100	$1\Omega \leq R < 10M\Omega$	-
				±200	-	0Ω, $1\Omega \leq R < 10M\Omega$

- Functional code: S
- Beyond the above specification also can meet the special requirements. For detail questions, please contact us freely.

Standard Type	0603	0805	1206
Jumper Resistance Value	50mΩ Max		
Jumper Rated Current	1A	2A	

■ Dimension

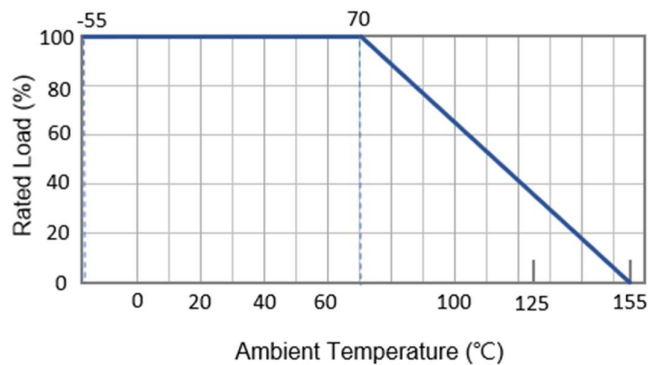


Unit : mm

Type	L	W	l ₁	l ₂	H
TFR0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
TFR0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
TFR1206	3.10±0.10	1.60±0.10	0.50±0.25	0.50±0.25	0.55±0.10

■ Derating Curve

Operating Temperature Range: -55°C to +155°C



■ Voltage Rating or Current Rating

The direct or alternating voltage for the rated power can be calculated from the following formula but must not exceed the maximum voltage.

$$V = \sqrt{P \times R}$$

V = Rated Voltage(V)
 P = Rated Power(W)
 R = Rated Resistance(Ω)

■ Recommended Customer Soldering Parameters

■ Recommended IR Reflow Soldering Conditions

Preliminary heating: 150°C ~ 180°C, 120s max

Soldering: 220°C, 60s max

Peak temperature: 245°C, 15s max

■ Recommended WAVE Soldering Conditions

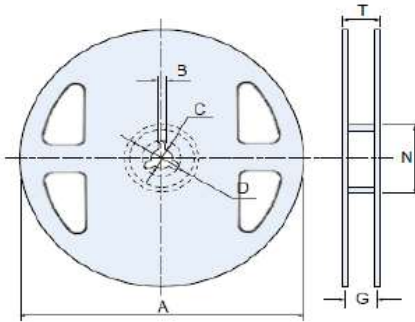
Reservoir Temperature: 260°C, 10s max

Number of times: two times max

Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	IEC-60115-1 4.8 JIS C 5201-1 4.8	At 25 / -55°C and 25°C /+155°C, 25°C is the reference temperature	As Spec
Short Time Overload	IEC 60115-1 4.13 JIS C 5201-1 4.13	2.5×Rated voltage or Max. Overload Voltage for 5 sec. measure resistance after 30 minutes	J: $\Delta R \leq \pm (2\% + 0.1\Omega)$ F: $\Delta R \leq \pm (1\% + 0.05\Omega)$
Resistance to Soldering Heat	IEC 60115-1 4.18 JIS C 5201-1 4.18	Solder dipping 260±5°C for 10 sec. ±1sec.	J: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$ No mechanical damage
Rapid Change of Temperature	IEC 60115-1 4.19 JIS C 5201-1 4.19	Repeat 5 cycles as follows -55°C(30 min.) + 25°C(2 ~ 3 min.) +155°C(30 min.) + 25°C(2 ~ 3 min.)	J: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$ No mechanical damage
Damp Heat	IEC 60115-1 4.24 JIS C 5201-1 4.24	Maintain the temperature of the resistor at 40±2°C and 90 ~ 95% R.H. with the rated voltage applied. Cycle ON for 1.5 hours and OFF for 0.5 hour for 1000+48/-0 hours. After 1 ~ 4 hour, measure the resistance value.	J: $\Delta R \leq \pm (3\% + 0.1\Omega)$ F: $\Delta R \leq \pm (1\% + 0.05\Omega)$
Load Life	IEC 60115-1 4.25 JIS C 5201-1 4.25	Permanent resistance change after 1000+48/-0 hours (1.5 hours ON , 0.5 hour OFF) at RCWV or Max. Keep the resistor at 70±2°C ambient	J: $\Delta R \leq \pm (3\% + 0.1\Omega)$ F: $\Delta R \leq \pm (1\% + 0.05\Omega)$
Insulation Resistance	IEC 60115-1 4.6 JIS C 5201-1 4.6	Test voltage : 100±15V	Between termination and coating must over 1000MΩ
Bending Strength	IEC 60115-1 4.33 JIS C 5201-1 4.33	Resistance change after bended on the 90mm PCB. Bend: 3mm for 0603,0805, 2mm for 1206	J: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$ No mechanical damage
Solderability	IEC 60115-1 4.17 JIS C 5201-1 4.17	After immersing flux, dip in the 245±2°C molten solder bath for 3±0.5 sec	Over 95% of termination must be covered with (Sn+Ag+Cu)

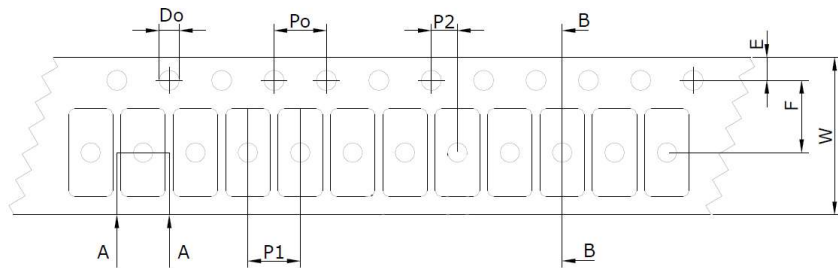
■ Packaging Information



Unit : mm

Size	Packaging Q'ty	A	N	C	D	B	G	T
0603 0805 1206	5kpcs/Reel	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	10.0±1.5	14.9max.

■ Tapping Specification



Unit:mm

Size	A	B	W	F	E	P1	P2	Po	Do
0603	1.10±0.20	1.90±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
0805	1.65±0.20	2.40±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0
1206	2.00±0.20	3.60±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50+0.10/-0

■ Marking

0805/1206 $\pm 1\%$: 4 digits marking

0603 $\pm 1\%$: 3 digits marking

E24 $\pm 5\%$: 3 digits marking

Resistance	47K Ω	1.5 Ω
3 digits code	473	1R5

E96 4 digits marking – 0805, 1206

Resistance	15K4 Ω	22.1 Ω
4 digits code	1542	22R1

E96 3 digits marking – 0603

Resistance	10K2 Ω
3 digits code	02C