



**RIDEE TECH COMPANY LIMITED**

# **APPROVAL SHEET**

**Product Name : Thick Film Chip Resistor**

**Part No. : TC Series**

**Description : Size 0201~2512**

For more contact information, please refer to our website: [www.rideetech.com](http://www.rideetech.com)

## Thick Film Chip Resistor - TC Series

### Applications

- Consumer electrical
- Home Appliance
- Computer & relative products
- Power equipment
- Measuring instrument



### Features

- Small size and light weight
- High quality reliability
- Reduction of assembly costs and matching with placement machines.

### Part Number Explanation

TC	0603	J	10R0	T	S	-
Product	Size (Inch)	Tolerance	Resistance	Packaging	Functional	TCR
Thick Film Chip Resistor	0201 0402 0603 0805 1206 1210 2010 2512	B : ± 0.1% C : ± 0.25% D : ± 0.5% F : ± 1.0% G : ± 2.0% J : ± 5.0%	1R00=1 Ω 10R0=10 Ω 1001=1K Ω 1004=1M Ω	T=Tape & Reel	S=Standard	<b>Null :</b> TCR as rating table <b>P :</b> 50ppm <b>N :</b> 100ppm

## Standard Electrical Specifications

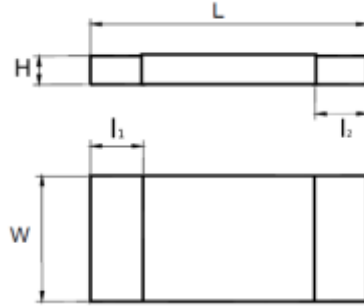
Type	Power Rating at 70°C	Max. RCWV	Max. Overload Voltage	Resistance Tolerance (%)	Temperature Coefficient (TCR; ppm/°C)	Resistance Range(Ω)
TC 0201	0.05W	25V	50V	±1%(F)	±200	10Ω ≤ R ≤ 10MΩ
					-200 ~ +600	1Ω ≤ R ≤ 9.76Ω
				±5%(J)	±200	10Ω ≤ R ≤ 10MΩ
					-200 ~ +600	0Ω, 1Ω ≤ R ≤ 9.76Ω
TC 0402	0.063W	50V	100V	±0.1%(B)	±100	10Ω ≤ R ≤ 1MΩ
				±0.5%(D)	±100	10Ω ≤ R ≤ 1MΩ
				±1%(F)	±100	10.2Ω ≤ R ≤ 10MΩ
					-200 ~ +400	1Ω ≤ R ≤ 10Ω
±5%(J)	±100	10.2Ω ≤ R ≤ 10MΩ				
	-200 ~ +400	0Ω, 1Ω ≤ R ≤ 10Ω				
TC 0603	0.1W	75V	100V	±0.1%(B)	±50	20Ω ≤ R ≤ 510KΩ
				±0.25%(C)		
TC 0805	0.125W	150V	300V	±0.5%(D)		
				±1%(F)		
TC 1206	0.25W	200V	400V	±1%(F)	±100	10.2Ω ≤ R ≤ 10MΩ
					-200 ~ +400	1Ω ≤ R ≤ 10Ω
				±5%(J)	±100	10.2Ω ≤ R ≤ 10MΩ
					-200 ~ +400	0Ω, 1Ω ≤ R ≤ 10Ω
TC 1210	0.33W	200V	400V	±1%(F)	±100	10.2Ω ≤ R ≤ 10MΩ
					±200	1Ω ≤ R ≤ 10Ω
TC 2010	0.75W	200V	400V	±1%(F)	±100	10.2Ω ≤ R ≤ 10MΩ
					-200 ~ +400	0Ω, 1Ω ≤ R ≤ 10Ω
TC 2512	1W	250V	500V	±5%(J)	±100	10.2Ω ≤ R ≤ 10MΩ
					-200 ~ +400	0Ω, 1Ω ≤ R ≤ 10Ω

- Functional code: S
- Beyond the above specification also can meet the special requirements. For detailed questions, please contact us freely.
- Resistance 1~10Ω, TCR 100ppm available upon special request.

Size	0201	0402	0603	0805	1206	1210	2010	2512
Jumper Resistance Value	50mΩ(max)							
Jumper Rated Current	1A			2A		2.5A	3.8A	4.5A

- ±1% Jumper or 0Ω is available, all size Rmax < 30mΩ.
- Beyond the above specification also can meet the special requirements. For detailed questions, please contact us freely.
- TCR parameter is not applicable to jumper

## Dimension



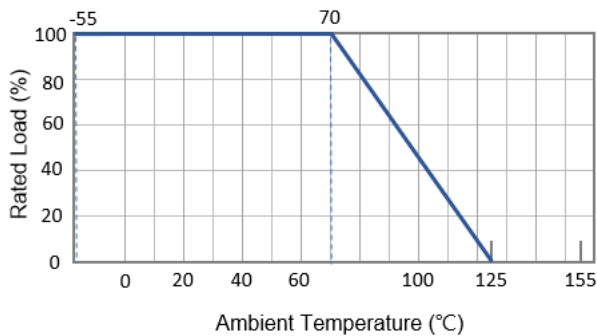
Unit:mm

Size	L	W	H	l <sub>1</sub>	l <sub>2</sub>
0201	0.60 ±0.03	0.30 ±0.03	0.23 ±0.03	0.10 ±0.05	0.15 ±0.05
0402	1.00 ±0.05	0.50 ±0.05	0.35 ±0.05	0.20 ±0.10	0.25 ±0.10
0603	1.60 ±0.10	0.80 ±0.10	0.45 ±0.10	0.30 ±0.20	0.30 ±0.20
0805	2.00 ±0.10	1.25 ±0.10	0.50 ±0.10	0.40 ±0.20	0.40 ±0.20
1206	3.10 ±0.10	1.60 ±0.10	0.55 ±0.10	0.50 ±0.20	0.50 ±0.25
1210	3.10 ±0.10	2.60 ±0.15	0.55 ±0.10	0.50 ±0.25	0.50 ±0.25
2010	5.00 ±0.20	2.50 ±0.20	0.60 ±0.10	0.60 ±0.25	0.60 ±0.25
2512	6.40 ±0.20	3.20 ±0.20	0.60 ±0.15	0.60 ±0.25	0.90 ±0.25

## Power Derating Curve

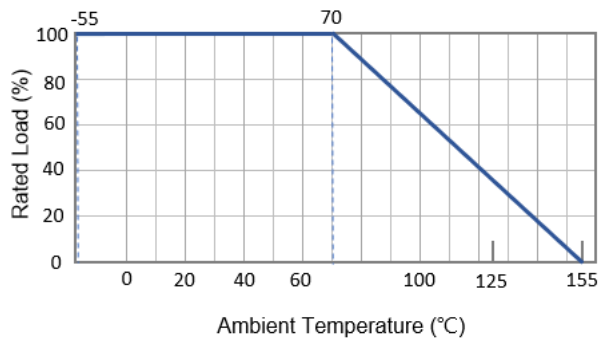
### For 0201

Operating Temperature Range: -55 to +125°C



### For 0402,0603,0805,1206,1210,2010,2512

Operating Temperature Range: -55 to +155°C



## 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:

$$E(RCWV) = \sqrt{P \times R}$$

E=Rated voltage(V)

P=Power rating(W)

R=Nominal resistance( $\Omega$ )

## Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	IEC-60115-1 4.8	At 25 / -55°C and 25°C /+155°C, 25°C is the reference temperature	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	2.5 times RCWV or Max. Overload voltage whichever is less for 5 seconds. measure resistance after 30 minutes	J、G: $\Delta R \leq \pm (2\% + 0.1\Omega)$ F、D: $\Delta R \leq \pm (1\% + 0.05\Omega)$ C、B: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1	260±5°C for 30 seconds.	Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260±5°C for 10 seconds.	J、G: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F、D、C、B: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Temperature Cycling	JIS-C-5201-1 4.19 IEC-60115-1 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、G: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F、D、C、B: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Damp Heat	JIS-C-5201-1 4.24 IEC-60115-1 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、G: $\Delta R \leq \pm (3\% + 0.1\Omega)$ F、D: $\Delta R \leq \pm (1\% + 0.05\Omega)$ C、B: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Load Life	JIS-C-5201-1 4.25 IEC-60115-1 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、G: $\Delta R \leq \pm (3\% + 0.1\Omega)$ F、D: $\Delta R \leq \pm (1\% + 0.05\Omega)$ C、B: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Test voltage: 100±15V	≥10GΩ
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	Resistance change after bended on the 90mm PCB. Bend: 3mm for 01005、0201、0402、0603、0805、1206、1210; 2mm for 2010、2512	J、G: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F、D、C、B: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 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 Solder

## Recommended Customer Soldering Parameters

### Recommended IR Reflow Soldering Conditions

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

Soldering: 220°C, 60s max

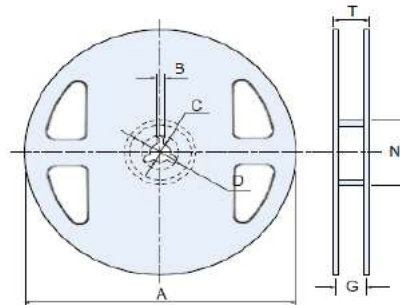
Peak temperature: 245°C, 15s max

### Recommended WAVE Soldering Conditions

Reservoir Temperature: 260°C, 10s max

Number of times: two times max

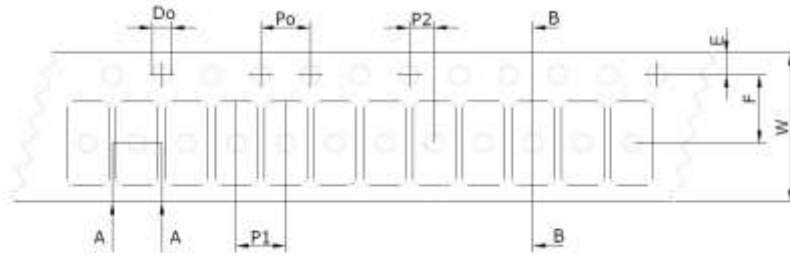
## Packaging Information



Unit:mm

Size	Type		A	N	C	D	B	G	T
0201	7"	15K/Reel	178±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	9.0±0.5	14.9 max
0402	7"	10K/Reel	178±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9 max
0603 / 0805 / 1206 / 1210	7"	5K/Reel	178±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9 max
2010/2512	7"	4K/Reel	178±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	13.8±1.5	16.7 max.

## ■ Tapping Specification



Unit:mm

Packaging	Size	A	B	W	E	F	P1	P2	D0	P0
Paper Type	0201	$0.37 \pm 0.05$	$0.67 \pm 0.05$	$8.00 \pm 0.20$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$2.00 \pm 0.05$	$2.00 \pm 0.05$	$1.50 + 0.10 / - 0$	$4.00 \pm 0.10$
	0402	$0.70 \pm 0.10$	$1.20 \pm 0.10$	$8.00 \pm 0.30$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$2.00 \pm 0.10$	$2.00 \pm 0.05$	$1.50 + 0.10 / - 0$	$4.00 \pm 0.10$
	0603	$1.10 \pm 0.20$	$1.90 \pm 0.20$	$8.00 \pm 0.30$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$4.00 \pm 0.10$	$2.00 \pm 0.05$	$1.50 + 0.10 / - 0$	$4.00 \pm 0.10$
	0805	$1.65 \pm 0.20$	$2.40 \pm 0.20$	$8.00 \pm 0.30$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$4.00 \pm 0.10$	$2.00 \pm 0.05$	$1.50 + 0.10 / - 0$	$4.00 \pm 0.10$
	1206	$2.00 \pm 0.20$	$3.60 \pm 0.20$	$8.00 \pm 0.30$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$4.00 \pm 0.10$	$2.00 \pm 0.05$	$1.50 + 0.10 / - 0$	$4.00 \pm 0.10$
	1210	$3.00 \pm 0.20$	$3.60 \pm 0.20$	$8.00 \pm 0.30$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$4.00 \pm 0.10$	$2.00 \pm 0.05$	$1.50 + 0.10 / - 0$	$4.00 \pm 0.10$

Packaging	Size	A	B	W	E	F	P1	P2	D0	P0
Embossed Type	2010	$2.80 \pm 0.20$	$5.50 \pm 0.20$	$12.00 \pm 0.30$	$1.75 \pm 0.10$	$5.50 \pm 0.05$	$4.00 \pm 0.10$	$2.00 \pm 0.05$	$1.50 + 0.10 / - 0$	$4.00 \pm 0.10$
	2512	$3.50 \pm 0.20$	$6.70 \pm 0.20$	$12.00 \pm 0.30$	$1.75 \pm 0.10$	$5.50 \pm 0.05$	$4.00 \pm 0.10$	$2.00 \pm 0.05$	$1.50 + 0.10 / - 0$	$4.00 \pm 0.10$

## ■ Marking

### ■ E24 ±5%:

3 digits marking for 0603/0805/1206/1210

Resistance	47K $\Omega$
3 digits code	473

4 digits marking for 2010/2512

Resistance	47K $\Omega$
4 digits code	4702

### ■ E96, E24 ±1%: 4 digits marking

Resistance	15K4 $\Omega$
4 digits code	1542

### ■ E96 ±1%: 3 digits marking for 0603

Resistance	10K2 $\Omega$
4 digits code	02C

### ■ No marking code for 0402 / 0201 size