炬鹿科技有限公司
RIDEE TECH COMPANY LIMITED

Revision Date : **2023 / 5 / 24**

APPROVAL SHEET

Product Name : High Voltage Chip Resistor

Part No. : TCH Series

Description : Size 0402~2512

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

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High Voltage Chip Resistor - TCH Series

■ Applications

— Power Supplies, Industrial control system

— Measurement instrument

— Back light inverter

■ Features

— High voltage up to 4000V

■ Part Number Explanation

TCH	2010	F	1004	T	Z
Product	Size (Inch)	Tolerance	Resistance	Packaging	Funcional
High Voltage Chip Resistor	0402 0603 0805 1206 1210 2010 2512	D：±0.5% F：±1% J：±5%	100Ω=1000 1KΩ=1001 1MΩ=1004	T=Tape & Reel	Z=Type-1 NORMAL TYPE U= Type-2 SUPER TYPE

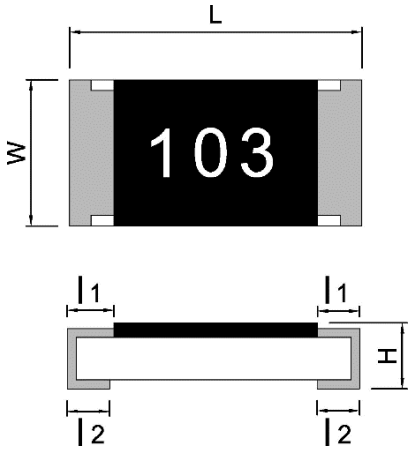
■ Standard Electrical Specifications

Item / Type-1	Rated Power at 70℃	Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/℃)	Resistance Range	
					D±(0.5%)	J(±5%)
						F(±1%)
TCH 0402	0.063 W	100V	200V	±100	-	100Ω≦R≦10MΩ
TCH 0603	0.1 W	350V	500V	±100	-	47Ω≦R<10MΩ
				±200	-	10MΩ≦R≦30MΩ
TCH 0805	0.125 W	450V	800V	±100	100K≦R≦1MΩ	47Ω≦R<10MΩ
				±200	-	10MΩ≦R≦30MΩ
TCH 1206	0.25 W	500V	1000V	±100	100K≦R≦2MΩ	47Ω≦R<10MΩ
				±200	-	10MΩ≦R≦30MΩ
TCH 1210	0.33 W			±100	100K≦R≦1MΩ	47Ω≦R<10MΩ
				±200	-	10MΩ≦R≦30MΩ
TCH 2010	0.5 W			±100	100K≦R≦1MΩ	47Ω≦R<10MΩ
				±200	-	10M≦R≦30MΩ
TCH 2512	1.0 W			±100	43KΩ≦R≦1MΩ	47Ω≦R<10MΩ
				±200	-	10MΩ≦R≦30MΩ

Item / Type-2	Rated Power at 70℃	Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/℃)	Resistance Range	
					D±(0.5%)	J(±5%)
						F(±1%)
TCH 1206	0.25	800V	1000V	±100	100KΩ≦R≦2MΩ	100KΩ≦R<10MΩ
TCH 1210	0.33	800V	1000V	±100	100KΩ≦R≦2MΩ	
TCH 2010	0.5	2000V	3000V	±100	100KΩ≦R≦1MΩ	
TCH 2512	1.0 W	3000V	4000V	±100	43K≦R≦1MΩ	

- Operating Temperature Range:-55℃~+155℃
- For non-standard parts, please contact our sales dept.

■ Type Dimension

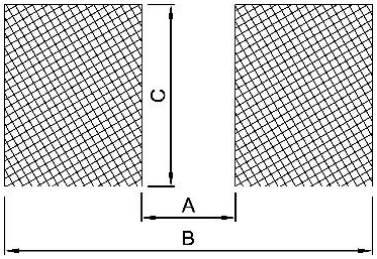


TYPE-1	L	W	H	l_1	l_2
0402	1.00 ±0.10	0.50 ±0.05	0.30 ±0.05	0.15 ±0.10	0.20 ±0.10
0603	1.60 ±0.20	0.80 ±0.15	0.40 ±0.10	0.30 ±0.20	0.30 ±0.10
0805	2.00 ±0.20	1.25 ±0.15	0.50 ±0.15	0.30 ±0.15	0.40 ±0.15
1206	3.05 ±0.10	1.60 ±0.20	0.55 ±0.15	0.40 ±0.20	0.50 ±0.20
1210	3.05 ±0.10	2.50 ±0.20	0.55 ±0.15	0.50 ±0.20	0.50 ±0.20
2010	5.00 ±0.20	2.50 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60 ±0.20
2512	6.30 ±0.20	3.20 ±0.20	0.68 ±0.10	0.60 ±0.20	0.60 ±0.20

TYPE-2	L	W	H	l_1	l_2
1206	3.05 ±0.10	1.60 ±0.20	0.55 ±0.15	0.30 ±0.20	0.60 ±0.20
1210	3.05 ±0.10	2.50 ±0.20	0.55 ±0.15	0.30 ±0.20	0.60 ±0.20
2010	5.00 ±0.20	2.50 ±0.20	0.55 ±0.10	0.50 ±0.20	0.50 ±0.20
2512	6.30 ±0.20	3.20 ±0.20	0.55 ±0.10	0.40 ±0.20	0.60 ±0.20

■ General Information

■ Recommend Land Pattern Design



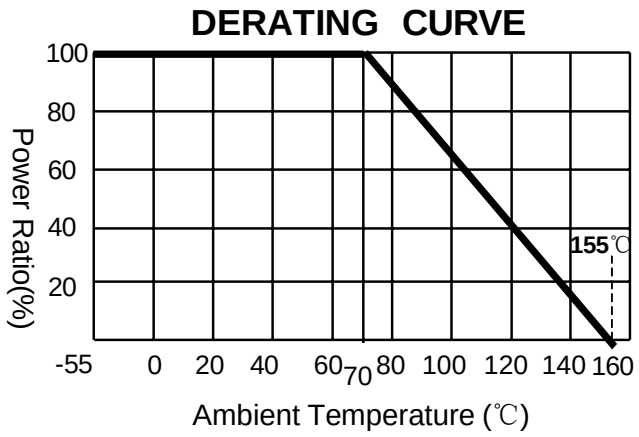
■ Dimension

Unit:mm

Item \ Type	0402	0603	0805	1206	1210	2010	2512
A	0.60	1.00	1.20	2.20	2.20	3.80	4.80
B	1.90	3.05	4.10	5.10	5.10	6.90	8.20
C	0.70	1.20	1.70	2.00	2.90	2.90	3.65

■ Performance Characteristics

■ Power Derating Curve



Power rating or current rating is in the case based on continuous full-load at ambient temperature of 70℃.
For operation at ambient temperature in excess of 70℃, the load should be derated in accordance with figure of derating Curve.

■ 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(RCWV)=$\sqrt{P \times R}$

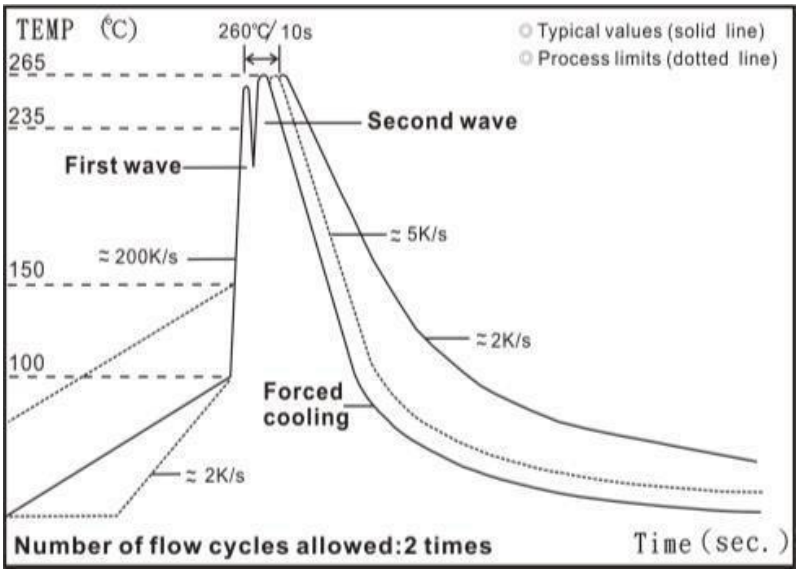
E=Rated voltage(V)
P=Power rating(W)
R=Nominal resistance(Ω)

■ Reliability Test and Requirement

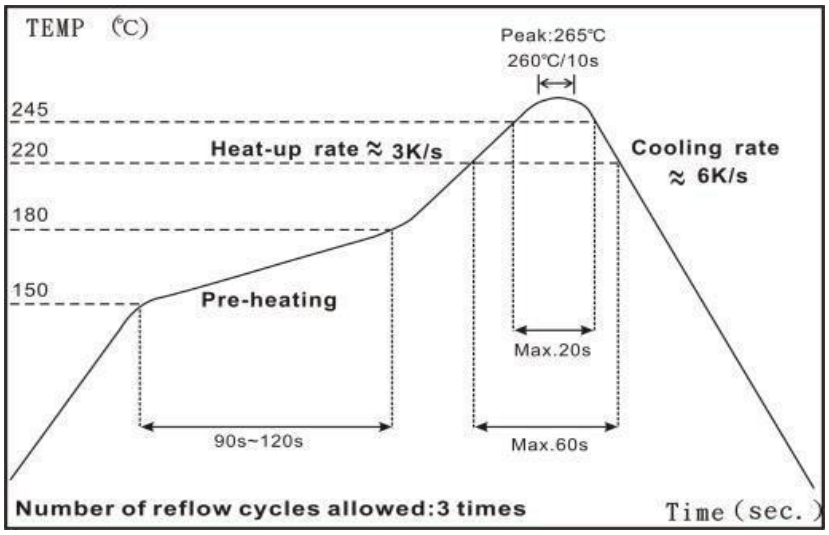
Test Item	Test Method	Procedure	Requirements	
			TYPE-1	TYPE-2
Temperature Coefficient of Resistance (T.C.R)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	At 25 / -55℃ and 25℃ /+155℃, 25℃ is the reference temperature	As Spec	
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	2.5 times RCWV or Max. Overload voltage whichever is less for 5 seconds.	1% and below ±(1.0%+0.05Ω) 5% ±(2.0%+0.1Ω)	±2.0%
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1	260±5℃ for 30 seconds.	Individual leaching area 5% Total leaching area ≤ 10%	
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260±5℃ for 10 seconds.	1% and below ±(0.5%+0.05Ω) 5% ±(1.0%+0.05Ω)	±1.0%
Rapid Change of Temperature	JIS-C-5201-1 4.19 IEC-60115-1 4.19	-55℃ to +155℃ ,5 cycles	1% and below ±(0.5%+0.05Ω) 5% ±(1.0%+0.10Ω)	±1.0%
Resistance to Solvent	JIS-C-5201-1 4.29	The tested resistor be immersed into isopropyl alcohol of 20~25℃for 60 secs. Then the resistor os left in the room for 48hrs.	1% and below ±(0.5%+0.05Ω) 5% ±(0.5%+0.05Ω)	±1.0%
Damp Heat With Load	JIS-C-5201-1 4.24 IEC-60115-1 4.24	40±2℃,90~95% R.H RCWV or Max. working voltage whichever is less for 1000hrs with 1.5hrs "ON" and 0.5hrs "OFF"	1% and below ±(1.0%+0.05Ω) 5% ±(2.0%+0.05Ω)	±3.0%
Load Life (Endurance)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70±2℃,RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"	1% and below ±(1.0%+0.05Ω) 5% ±(3.0%+0.10Ω)	±3.0%
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Apply 100VDC for 1 minute	≥10GΩ	
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	Bending once for 5 seconds D:0402.0603.0805=5mm 1206,1210,1812=3mm 2010,2512=2mm	1% and below ±(1.0%+0.05Ω) 5%: ±(1.0%+0.05Ω)	±1.0%

■ Soldering Conditions

■ Wave Soldering



■ Solder reflow Temperature condition



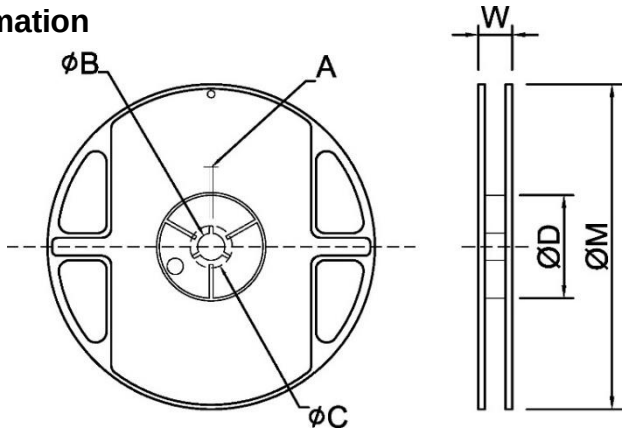
■ Rework temperature（hot air equipment）：350℃, 3~5seconds

(1) IR, vapor phase oven, hot air oven

(2) If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

■ Appendix For SMD Chip Resistor

■ Packaging Information

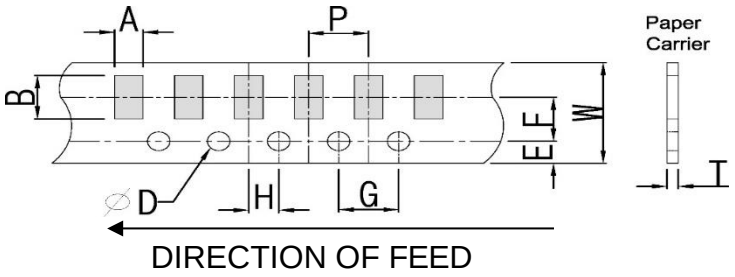


■ Dimension

Unit:mm

TYPE	SIZE		A	ψB	ψC	ψD	W	ψM
0402	7”	10K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
0603 / 0805 1206 / 1210	7”	5K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
2010/2512	7”	4K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	16.0±2.0	178±2.0

■ Tapping Specification



■ Dimension

Unit:mm

Packaging	Type	A	B	W	E	F	G	H	T	ψD	P
Paper Type	0402	0.70±0.1	1.20±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.45±0.1	+0.1	2.0±0.1
	0603	1.05±0.2	1.80±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.60±0.1	1.5	4.0±0.1
	0805	1.55±0.2	2.30±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1	-0	
	1206	1.90±0.2	3.50±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		
	1210	2.85±0.2	3.50±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		

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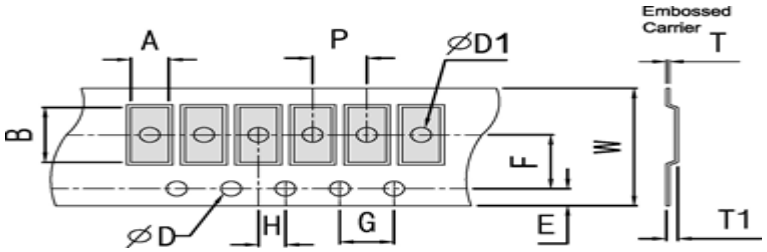


■ Dimension

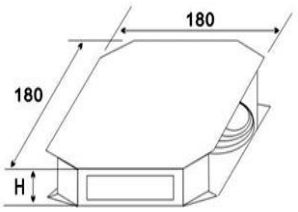
Unit:mm

Packaging	Type	A	B	W	E	F	G	H	T	ψD	ΨD1	T1	P
Embossed Type	2010	2.80± 0.20	5.60± 0.20	12± 0.10	1.75± 0.10	5.5± 0.05	4.0± 0.10	2.0± 0.05	0.23± 0.10	+0.1	1.50± 0.10	0.85± 0.15	4.0 ± 0.1
	2512	3.40± 0.20	6.70± 0.20	12± 0.10	1.75± 0.10	5.5± 0.05	4.0± 0.10	2.0± 0.05	0.23± 0.10	1.5 -0	1.50± 0.10	0.85± 0.15	

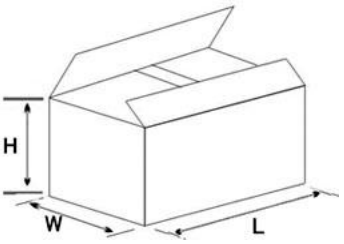
■ Packing Material Storage Data

■ Package

Inner Box Size	
Reel	Size H(mm)
1	13
2	24
3	36
5	60
10	113



External Box Size			
Contain (Kpcs)	Length (mm)	Width (mm)	Height (mm)
25K	180	180	60
50K	180	180	110
150K	430	200	200
300K	400	400	200



■ Storage Data：

Storage time at the environment temp: 25±5℃& humidity: 60±20% is valid for one year from the date of delivery.