

FEATURE

- Stronger mount structure with wide electrode.
- Higher rated power than normal termination series.
- High reliability and stability.
- Compatible with reflow and wave soldering
- RoHS complaint.
- Applications:
 - Converters, adapters
 - Computer, notebook, workstation, tablet, and peripherals
 - Lighting
 - Consumer electronics.
 - etc.

MANUFACTURER PART NO.

For example: WT0612J100KT5G00-WT0612 ±5% 100KΩ T/R-5000

Series	Size	Tol.	Nominal Resistance Value	PKG	SPQ	Feature	TCR
2 codes	4 codes	1 code	2~5 codes	1 code	1 code	1 code	2 codes
WT	0612	J	100K	T	5	G	00
Wide Termination Thick Film Chip Resistors	0508 0612 1020 1225	F=1% J=5%	1R ^① =1Ω 4R7=4.7Ω 4K7 ^② =4.7KΩ 100K=100KΩ 1M ^③ =1MΩ	T=T/R ^④	4=4K 5=5K	G=Std. S=P.C. ^⑤	00=Refer to table as below.

Note: ① R=Radix, 10⁰, Ω

② K=Kilo, 10³, KΩ

③ M=Mega, 10⁶, MΩ

④ T/R=Taping in Reel packing type

⑤ P.C.=Personal and Customized.

CHARACTERISTICS

Type	Rated Power	MWV ^①	MOV ^②	Tolerance	TCR PPM/°C	Resistance Range	Jumper(0Ω)		
							Rated Current	MOC ^③	Range
WT0508	1/3W	150V	300V	±1%, ±5%	±400 PPM/°C	10Ω	4A	8A	50mΩ Max.
					±200 PPM/°C	10Ω<R≤100Ω			
	±100 PPM/°C				100Ω<R≤1MΩ				
	0~+400 PPM/°C				10mΩ≤R<30mΩ				
	0~+150 PPM/°C				30mΩ≤R<10Ω				
WT0612	1/2W	200V	400V	±1%, ±5%	±200 PPM/°C	10Ω<R≤100Ω	5A	10A	50mΩ Max.
					±100 PPM/°C	100Ω<R≤1MΩ			
	0~+200 PPM/°C				10mΩ≤R<100mΩ				
	0~+150 PPM/°C				100mΩ≤R≤10Ω				
	WT1020				1W	200V			
±5%		±100 PPM/°C	100Ω<R≤1MΩ						
±1%, ±5%		0~+200PPM/°C	10mΩ≤R<30mΩ						
		0~+100PPM/°C	30mΩ≤R≤1Ω						
WT1225	2W	200V	400V	±1%, ±5%	±400 PPM/°C	1Ω<R≤10Ω	6A	15A	50mΩ Max.
					±200 PPM/°C	10Ω<R≤100Ω			
	±100 PPM/°C				100Ω<R≤1MΩ				
	0~+150PPM/°C				10mΩ≤R<30mΩ				
	0~+100PPM/°C				30mΩ≤R≤1Ω				
3W									

Note: ① MWV=Max. Working Voltage

② MOV=Max. Overload Voltage

③ MOC=Max. Overload Current

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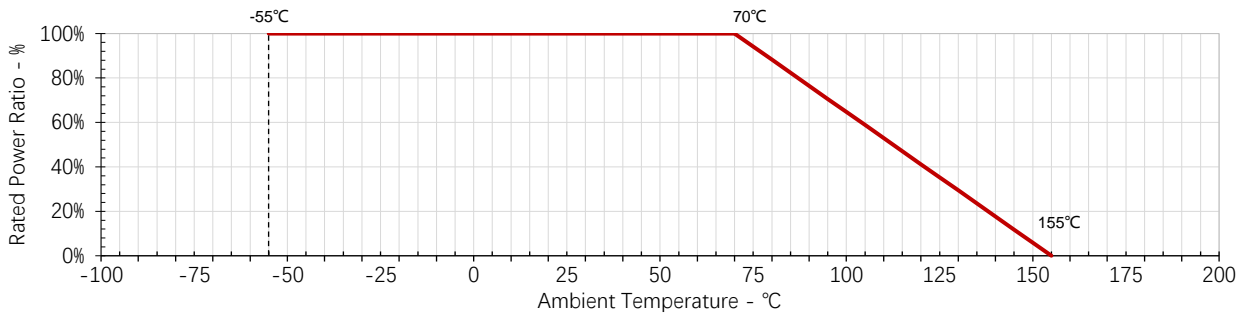
WT Series

Wide Termination Thick Film Chip Resistors

Version. B



POWER DERATING CURVE



Note: Operating Temperature Range: -55°C ~ +155°C

RATED VOLTAGE

Resistors should have a Rated Voltage DC or AC corresponding to Rated Power which can be calculated by formula as below.

The Rated Voltage of certain resistance value should be the calculated result or Max. Working Voltage of product series whichever less.

Formula:

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

E=Rated voltage(V)

P=Rated power(W)

R=Nominal resistance(Ω)

DIMENSIONS

Figure	Type	L	W	H	Unit: mm	
					A	B
	WT0508	1.20±0.10	2.0±0.10	0.55±0.10	0.20±0.10	0.30±0.20
	WT0612	1.60±0.15	3.20±0.15	0.55±0.10	0.30±0.20	0.45±0.20
	WT1020	2.50±0.15	5.00±0.15	0.55±0.10	0.40±0.20	0.60±0.20
	WT1225	3.10±0.15	6.25±0.15	0.55±0.10	0.45±0.20	0.65±0.20

RELIABILITY

Item	Test Method	Acceptable criterion
Temperature Coefficient of Resistance (T.C.R.)	$TCR(PPM/°C) = \frac{(R_2 - R_1)}{R_1 \times (T_2 - T_1)} \times 10^6$ R ₁ =Value in room temperature R ₂ =Value in test temperature -55°C or +125°C T ₁ =Room temperature T ₂ =Test temperature -55°C or +125°C Reference: IEC 60115-1 6.2	Refer to CHARACTERISTICS
Insulation Resistance	Load 100±15V _{DC} between the electrode and substrate for 60 seconds by parallel clamp method. Then measure the insulation impedance between the termination and the back of the specimen. Reference: IEC 60115-1 12.1.3.5	≥ 1,000MΩ
Dielectric Withstanding Voltage	Load the AC voltage with the effective value of Max Overload Voltage between the electrode and the substrate with 100V/s speed, and stabilize for 60±5 seconds. Then measure the current and observe. Reference: IEC 60115-1 12.2.4	No current more than 10μA Without arcing.

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Item	Test Method	Acceptable criterion						
Short Time Over Load	Load 2.5 times of rated voltage or maximum overload voltage whichever is less for 5 seconds. Then measure the resistance value change rate. Reference: IEC 60115-1 8.1.4.2	1% series: $\Delta R/R = \pm 1.0\%$ 5% series: $\Delta R/R = \pm 2.0\%$						
Intermittent Overload	Put the specimens in the thermostat, load 2.5 times of rated voltage with $10,000 \pm 400$ cycles which set up with 1 second power on and 25 seconds power off, then take them out to stabilize for 60 minutes, and measure the resistance value change rate. Reference: IEC 60115-1 8.4.4	$\Delta R/R = \pm 5.0\%$						
Resistance to Solvent	Put the specimens in isopropanol solvent at room temperature $23 \pm 5^\circ\text{C}$ for 5 minutes, brush 10 times as a group with a hard toothbrush, 3 times for each group. Then take them out to blow dry, and check their appearance. Reference: IEC 60115-1 11.3.2 method1	Without visible damage, peeling, swelling.						
Solderability	Pretreatment: Dry heat $+155^\circ\text{C}$ for 4 hours, or with equivalent test method, PCT aging for 4 hours. Then take the specimens out to stabilize at room temperature for 2 hours. Test method: 1. Put the specimens in a tin furnace at $245 \pm 3^\circ\text{C}$ for 3 seconds, then take them out and check the soldering appearance by microscope. 2. Reflow soldering test with peak temperature 235°C for 40 ± 5 seconds. Reference: 1. IEC 60115-1 11.1.4.3 2. IPC-A-610 8.3.2	1. Solder coverage must be 95% minimum. 2. Without welding rejection. And soldering is higher than 1/2 of side termination height.						
Leaching	Pretreatment: Dry heat $+155^\circ\text{C}$ for 4 hours, or with equivalent test method, PCT aging for 4 hours. Then take the specimens out to stabilize at room temperature for 2 hours. Test method: 1. Put the specimens in a tin furnace at $260 \pm 5^\circ\text{C}$ for 30 ± 1 seconds, then take them out and clean. 2. Check the soldering appearance by microscope. Reference: IEC-60068-2-58	Without substrate exposed because of electrode eroded.						
Resistance to Soldering Heat	Put the specimens in tin furnace at $260 \pm 5^\circ\text{C}$ for 10 ± 1 seconds. Then take them out to stabilize for 1 hour, and measure the resistance value change rate. Reference: IEC 60115-1 11.2.4.3	$\Delta R/R = \pm 1.0\%$						
Thermal Shock	Put the specimens in test environment at high or low temperature 500 cycles which stabilize for 30 minutes each temperature, and change to the upper and lower application temperature limits of various series products. Reference: IEC 60115-1 10.1.4	$\Delta R/R = \pm 1.0\%$						
Solder Joint Endurance Test	Put PCBA mounted with the specimens in test machine, press down the PCBA to standard depth with testing block and stabilize for 60 seconds, then measure the resistance value change rate. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Size</td> <td style="width: 40%;">0508, 0612</td> <td style="width: 40%;">1225, 1020</td> </tr> <tr> <td>Depth</td> <td>3mm</td> <td>2mm</td> </tr> </table> Reference: IEC 60115-1 9.8.4	Size	0508, 0612	1225, 1020	Depth	3mm	2mm	$\Delta R/R = \pm 1.0\%$
Size	0508, 0612	1225, 1020						
Depth	3mm	2mm						
Resistance to Dry Heat	Put the specimens in an oven at $+155 \pm 5^\circ\text{C}$ for 1000 ± 48 hours, then take them out to stabilize for 1 hour minimum, and measure the resistance value change rate. Reference: IEC 60115-1 7.3	1% series: $\Delta R/R = \pm 1.0\%$ 5% series: $\Delta R/R = \pm 3.0\%$						
Loading Life in Moisture	Put the specimens applied rated voltage in a constant temperature and humidity champ with $+40 \pm 2^\circ\text{C}$ and $93 \pm 3\% \text{RH}$ for 1,000 hours. Then take them out to stabilize for 60 minutes minimum, and measure the resistance value change rate. Reference: IEC 60115-1 10.4	1% series: $\Delta R/R = \pm 1.0\%$ 5% series: $\Delta R/R = \pm 3.0\%$						

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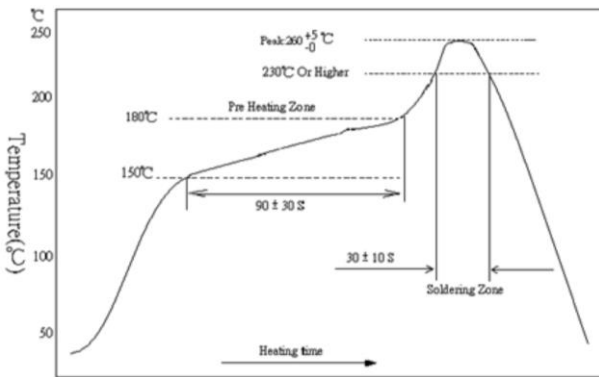
Version. B



Item	Test Method	Acceptable criterion						
Load Life	Put the specimens applied rated voltage in an oven at $70\pm 2^{\circ}\text{C}$ for 1,000 hours with cycles which set up with 90 minutes power on and 30 minutes power off, then take them out to stabilize for 60 minutes minimum, and measure the resistance value change rate. Reference: IEC 60115-1 7.1	1% series: $\Delta R/R = \pm 1.0\%$ 5% series: $\Delta R/R = \pm 3.0\%$						
Low temperature load test	Put the specimens without powered in -55°C for 60 minutes, then powered with rated voltage or rated current for 45 minutes, unpowered for 15 minutes. Finally, take them out to stabilize at room temperature for 24 hours, measure the resistance value change rate. Reference: IEC 60115-1 10.2.4	1% series: $\Delta R/R = \pm 1.0\%$ 5% series: $\Delta R/R = \pm 2.0\%$						
Shear force test	Put the specimens mounted on PCB in test machine, push their side termination constantly with force defined as following table for 10 seconds, then stabilize to check the soldering appearance. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Size</td> <td style="width: 40%;">0508, 0612</td> <td style="width: 40%;">1225, 1020</td> </tr> <tr> <td>Force</td> <td>25N</td> <td>45N</td> </tr> </table> Reference: IEC 60115-1 9.7	Size	0508, 0612	1225, 1020	Force	25N	45N	There was no obvious injury
Size	0508, 0612	1225, 1020						
Force	25N	45N						

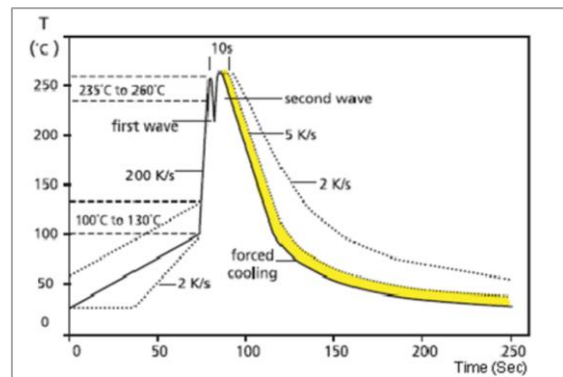
SOLDERING

Lead Free IR Reflow Soldering Profile



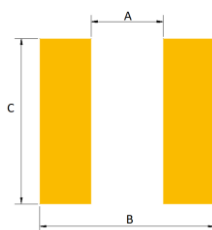
- Top temperature should be under $260\pm 5^{\circ}\text{C}$, 10Sec.
- Reference: J-STD-020D

Lead Free Double-Wave Soldering Profile



- $350\pm 10^{\circ}\text{C}$ within 3 Sec. if soldering iron.

SOLDERING PAD



Type	A	B	C
WT0508	0.6	2.2	2.3
WT0612	0.7	2.6	3.5
WT1020	0.5	3.5	5.3
WT1225	1.3	4.2	6.4

Unit: mm

WORKING ENVIRONMENT

If user intends to use products in special environments or states (including but not limited to the following), it is necessary to approve special characteristics and reliability for the following or other application environments.

- Hot temperature.
- Near the sea, or corrosive gas, such as Cl_2 , H_2S , NH_3 , SO_2 and NO_2 , etc.
- Unverified liquids, such as water, oil, chemical or organic solvent.
- Unverified resin or paint to cover products.
- Products should be washed with water soluble cleaner even if non cleaning flux.

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STORAGE / CARRY CONDITIONS

- A. Temperature: 25±5°C
- B. Humidity: 60±15%RH
- C. Storage life: 2 years, FIFO
- D. Please hold box correct orientation when storing and carrying. It is strictly prohibited to fall or squeeze the box, otherwise the product electrode or body may be damaged.

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