WELLCOMP TECHNOLOGY CO., LTD

APPROVAL SHEET

Model Name	**Thinner Metal Foil Current Sensing Resistor**
Part Number	**WMCST Series**
Customer Name	
Customer P/N	
Issued Date	

Customer		Maker		
Approved	Checked	Inspector	Checked	Prepared

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WMCST Series

Thinner Metal Foil Current Sensing Resistor

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Version: A06

Features

◆Chip size: 0603 / 0805 / 0612/1225

◆Resistance value from 1~20mΩ(refer to Electrical Specification)

◆Lead free, RoHS compliant for global applications and halogen free

Application

◆Switching power supply

◆Voltage Regulation module

◆DC-DC converter, Adapter, Battery pack and charger

◆Pad and Cell Phone

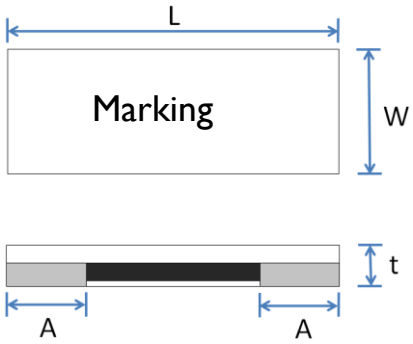
◆Power management applications

Part Numbering System

WMCST	0805	R003	F	S	T	A
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) Series Code
(2) Size (EIA): Length x Width
(3) Resistance: R002=2mΩ, R010=10mΩ
(4) Tolerance: F=+/-1%, G=+/-2%, J=+/-5%
(5) Power Rating: A=1/4W, F=1/3W, S=1/2W, Q=3/4W, C=1W, D=1.5W, E=2W, H=3W
(6) Packaging: T- Embossed paper tape, 7" reel
E-Embossed plastic tape, 7” reel
(7) Factory Code, A=TWN Factory

Dimension



Type (inch size)	Dimensions(mm)			
	L	W	t	A
MCST0603	1.60±0.20	0.95±0.25	0.60±0.25	0.55±0.20
MCST0805	2.1±0.20	1.40±0.20	0.60 (Max.)	0.60±0.20
MCST1206	3.10±0.20	1.55±0.20	0.75±0.25	1.3±0.20
MCSTL0612	1.6±0.20	3.20±0.20	0.75±0.25	0.3±0.20
MCST2512	6.4±0.20	3.2±0.20	0.8±0.25	2.0±0.30
MCSTL1225	3.2±0.20	6.4±0.20	0.8±0.25	0.3±0.20

Electrical Specification

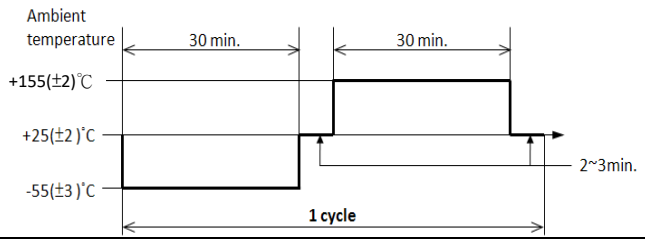
Item	Power Rating	Resistance Range(mΩ)	Operation Temp. Range	TCR (PPM/℃)
MCST0603	1/4W, 1/3W	1.0 ≤ R ≤ 5.0	-55~+170℃	±100*
MCST0805	1/2W	1.0 ≤ R ≤ 5.0	-55~+170℃	±100*
MCST1206	1W	1.0≤ R ≤ 3.0	-55~+170℃	±100*
MCSTL0612	1W, 2W**	1.0≤ R ≤ 5.0	-55~+170℃	±100*
MCST2512	2W,3W**	1.0≤ R ≤ 10.0	-55~+170℃	±100*
MCSTL1225	3W	5.0≤ R ≤ 20.0	-55~+170℃	±100*

*TCR was measured by resistor element, but the value will difference by different measurement method.

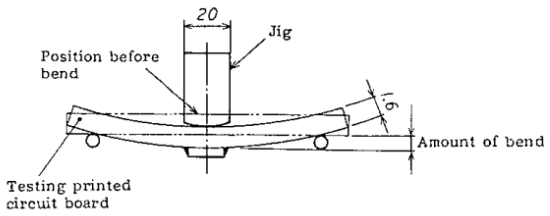
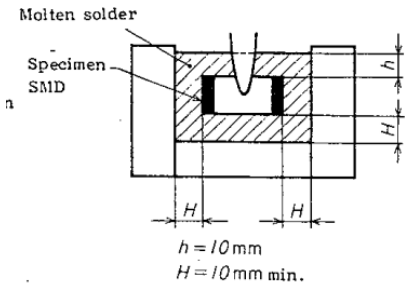
** 3times rated power for 5 sec.

Performances

Environmental Performance

No.	Item	Test Condition	Specification
1	Short Time Overload	5 times rated power for 5 sec. (JIS-C5202-5.5)* * 3 times rated power for 5 sec for MCSTL0612(2W) & MCST2512(3W)	ΔR: ±(1%+0.0005Ω)
2	Temperature Coefficient of Resistance (T.C.R.)	+25°C /+125°C. (JIS-C5202-5.2) $TCR\ (\text{ppm/℃}) = \frac{\Delta R}{R \times \Delta t} \times 10^6$	Refer to electrical specification.
3	Damp Heat with Load	The specimens shall be placed in a chamber and subjected to a relative humidity of 90~95% percent and a temperature of 40° ±2°C for the period of 1000 hr with applying rated power 1.5 hours ON and 0.5 hour OFF. (MIL-STD-202, Method 103)	ΔR: ±(1%+0.0005Ω)
4	High Temperature Exposure	The chip (mounted on board) is exposed in the heat chamber 125±3℃ for 1000 hrs. (JIS-C5202-7.2)	ΔR: ±(1%+0.0005Ω)
5	Load Life	Apply rated power at 70±2°C for 1000 hours with 1.5 hours ON and 0.5 hour OFF. (JIS-C5202-7.10)	ΔR: ±(1%+0.0005Ω)
6	Rapid change of temperature	The chip (mounted on board) is exposed, -55±3°C (30min.)/+155±2°C (30min.) for 5 cycles. The following conditions as the following figure. (JIS-C5202-7.4) 	ΔR: ±(1%+0.0005Ω)

Function Performance

No.	Item	Test Condition	Specification
1	Bending Strength	Mount the chip to test substrate. Apply pressure in direction of arrow unit band width reaches 2mm(+0.2/-0mm) illustrated in the figure below and hold for 10±1 sec. (JIS-C5202-6.1) Unit: mm 	ΔR: ±(1%+0.0005Ω)
2	Solvent Resistance	The chip is completed immersion of the specimens in the isopropyl alcohol for 3 (+5, -0) min. at 25°C ±5°C. ((MIL-STD-202, Method 215)	Verify marking permanency. (Nor required for laser etched parts or parts with no marking)
3	Resistance to solder Heat	The specimen chip shall be immersed into the flux specified in the solder bath 260±5℃ for 10±1 sec. (MIL-STD-202, Method 210)	ΔR: ±(1%+0.0005Ω)
4	Solderability	The specimen chip shall be immersed into the flux specified in the solder bath 235±5℃ for 2±0.5 sec. It shall be immersed to a point 10mm from its root. (Sn96.5/Ag3.0/Cu0.5) (JIS-C5 202-6.11) 	Solder shall be covered 95% or more of the electrode area.

Remark:

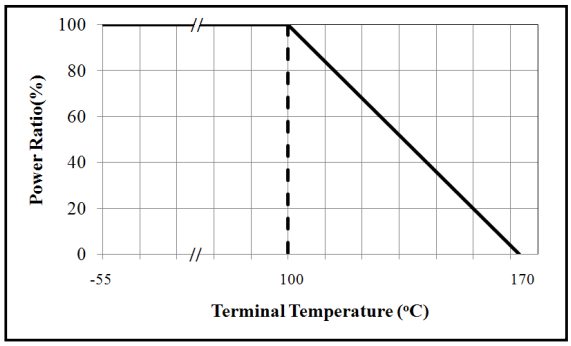
a. 0.5W with total solder pad trace size of 100 mm². The surface temperature of component should below 100°C.

b. 1W with total solder pad trace size of 150 mm². The surface temperature of component should below 100°C.

c. 2W with total solder pad trace size of 300 mm². The surface temperature of component should below 100°C.

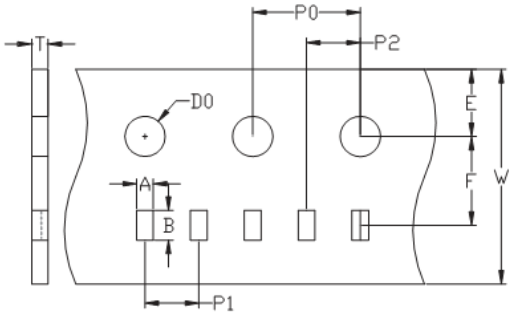
d. 3W with total solder pad trace size of 450 mm². The surface temperature of component should below 100°C.

Derating Curve



Tape Packaging Specifications

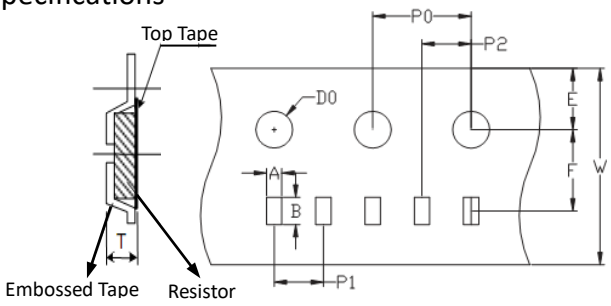
◆Paper Tape Specifications



Unit:mm

Type	Carrier Dimensions (mm)									
	A	B	E	F	W	P0	P1	P2	D0	T
0603	1.4±0.1	1.9±0.1	1.75±0.1	3.5±0.05	8.0±0.2	4.0±0.1	4.0±0.1	2.0±0.05	1.55±0.05	0.75±0.1
0805	1.6±0.1	2.4±0.1	1.75±0.1	3.5±0.05	8.0±0.2	4.0±0.1	4.0±0.1	2.0±0.05	1.55±0.05	0.75±0.1
0612	2.0±0.1	3.6±0.1	1.75±0.1	3.5±0.05	8.0±0.2	4.0±0.1	4.0±0.1	2.0±0.05	1.55±0.05	0.87±0.1
1206	2.0±0.1	3.6±0.1	1.75±0.1	3.5±0.05	8.0±0.2	4.0±0.1	4.0±0.1	2.0±0.05	1.55±0.05	0.87±0.1

◆Embossed Plastic Tape Specifications



Type	Carrier Dimensions (mm)									
	A	B	E	F	W	P0	P1	P2	D0	T
2512	3.5±0.1	6.8±0.1	1.75±0.1	5.5±0.05	12.0±0.2	4.0±0.05	4.0±0.1	2.0±0.05	1.5±0.1	1.0±0.2
1225	3.5±0.1	6.8±0.1	1.75±0.1	5.5±0.05	12.0±0.2	4.0±0.05	4.0±0.1	2.0±0.05	1.5±0.1	1.0±0.2

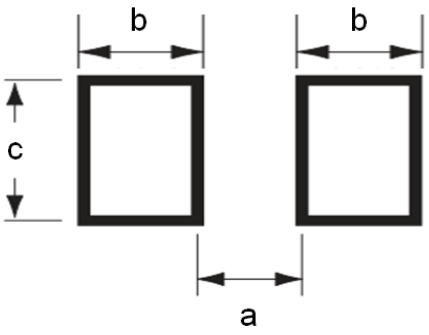
Packaging

Size EIA (EIAJ)	0603/0805/0612/1206	2512/1225
Standard Packing Quantity (pcs /reel)	5,000	4000

Storage Conditions

Temperature：5~35℃, Humidity：40~75%

Recommended Solder Pad Layout



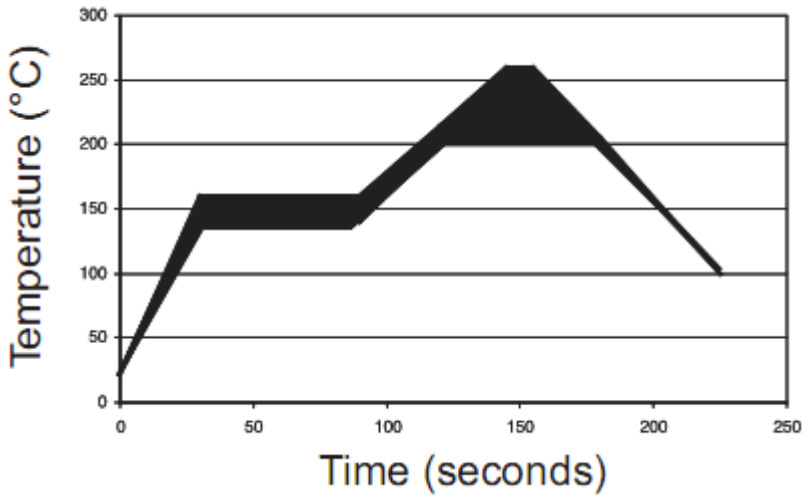
Type	Pad Layout Dimension (mm)		
	a	b	c
0603	0.30	1.10	1.50
0805	0.80	1.60	1.45
1206	0.40	1.80	2.20
0612	0.60	1.30	3.8
2512	1.30	3.00	4.00
1225	2.00	2.00	7.00

Soldering Recommendations

◆ Peak reflow temperatures and durations：
- IR Reflow Peak = 260℃ max for 10 sec
- Wave Solder = 260℃ max for 10 sec

◆ Compatible with lead and lead-free solder reflow processes

◆ Recommended IR Reflow Profile：



ECN

Engineering Change Notice：The customer will be informed with ECN if there is significant modification on the characteristics and materials described in Approval Sheet.

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