WELLCOMP TECHNOLOGY CO., LTD

APPROVAL SHEET

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

Customer		Maker		
Approved	Checked	Inspector	Checked	Prepared

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WMCSU Series

Ultra Thinner Metal Foil Current Sensing Resistor

Document No: 20231026001
Issued Date: 2023//10/26
Version: Temp. Version

Features

◆Chip size: 0402~1206

◆Resistance value: 1~5mΩ

◆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

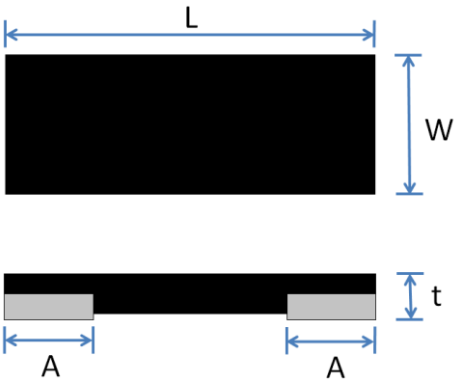
◆Power management applications

Part Numbering System

WMCSU	0805	R001	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: X=1/8W, 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
MCSU0402	1.00±0.15	0.55±0.15	0.5 (Max.)	0.35±0.15
MCSU0603 1mΩ	1.60±0.20	0.95±0.25	0.5 (Max.)	0.50±0.20
MCSU0603 2~5mΩ	1.60±0.20	0.95±0.25	0.4 (Max.)	0.50±0.20
MCSU0805	2.03±0.20	1.40±0.20	0.5(Max.)	0.60±0.20
MCSU1206	3.20±0.25	1.65±0.25	0.65(Max.)	1.19±0.25

Electrical Specification

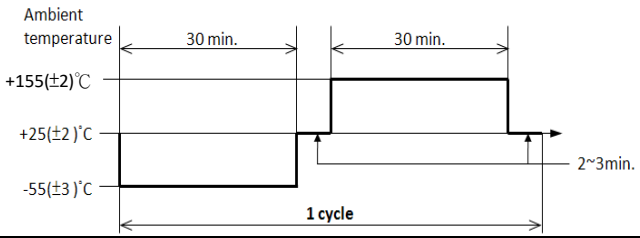
Item	Power Rating	Resistance Range(mΩ)	Operation Temp. Range	TCR (PPM/℃)*
MCSU0402	1/8W, 1/4W**	2.5 ≤ R ≤ 5.0	-55~+170℃	±200
MCSU0603	1/4W, 1/2W**	1.0 < R < 5.0		±100
MCSU0805	1/2W	1 ≤ R ≤ 1.5		±150 (Test Temp. +25~+125°C)
				±150 (Test Temp. -55~+25°C)
		2 ≤ R ≤ 5		±50 (Test Temp. +25~+125°C)
				±100 (Test Temp. -55~+25°C)
MCSU1206	1W	1		±100

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

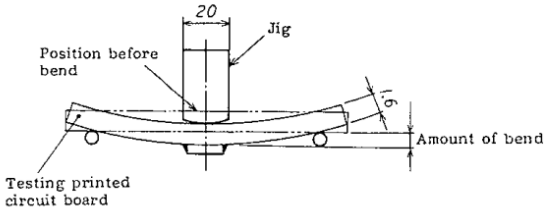
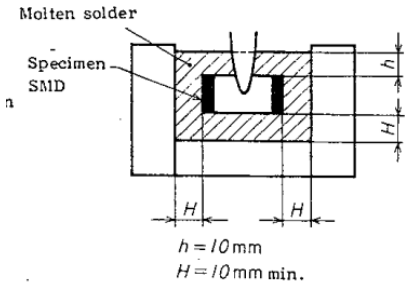
** 2.5 times rated power for 5 sec.

Performances

Environmental Performance

No.	Item	Test Condition	Specification
1	Short Time Overload	5 times rated power for 5 sec. (JIS-C5202-5.5)*	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.

* MCSU0402 (1/4W): 2.5 times rated power for 5 sec. MCSU0603 (1/2W): 2.5 times rated power for 5 sec.

Remark:

a. 1/4W with total solder pad trace size of 200 mm². The surface temperature of component should below 100°C.

b. 1/2W with total solder pad trace size of 200 mm². The surface temperature of component should below 100oC.

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

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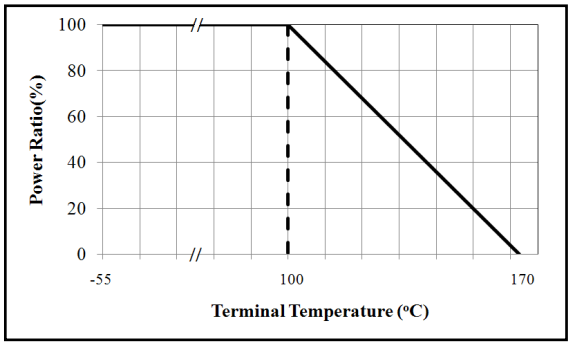
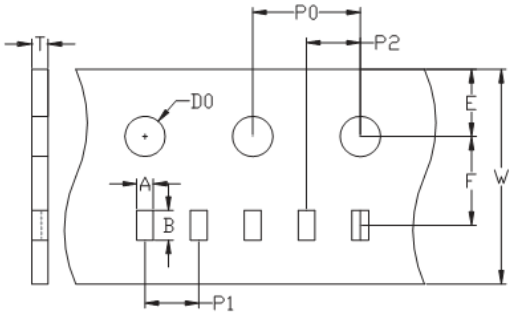
Derating Curve



Tape Packaging Specifications

◆Paper Tape Specifications



Unit:mm

Type	Carrier Dimensions (mm)									
	A	B	E	F	W	P0	P1	P2	D0	T
0402	0.7±0.05	1.2±0.05	1.75±0.1	3.5±0.05	8.0±0.2	4.0±0.1	2.0±0.1	2.0±0.05	1.55±0.05	0.45±0.1
0603	1.3±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	0.6±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	0.60±0.1
1206	2.05±0.1	3.55±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

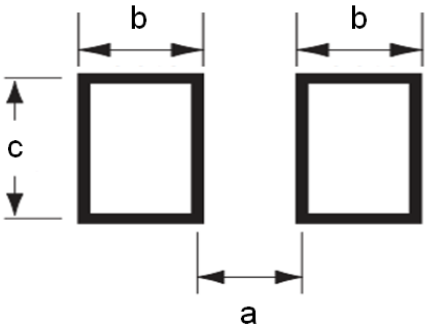
Packaging

Size EIA (EIAJ)	0402	0603/0805/1206
Standard Packing Quantity (pcs /reel)	10,000	5,000

Storage Conditions

Temperature：5~35℃, Humidity：40~75%

Recommended Solder Pad Layout



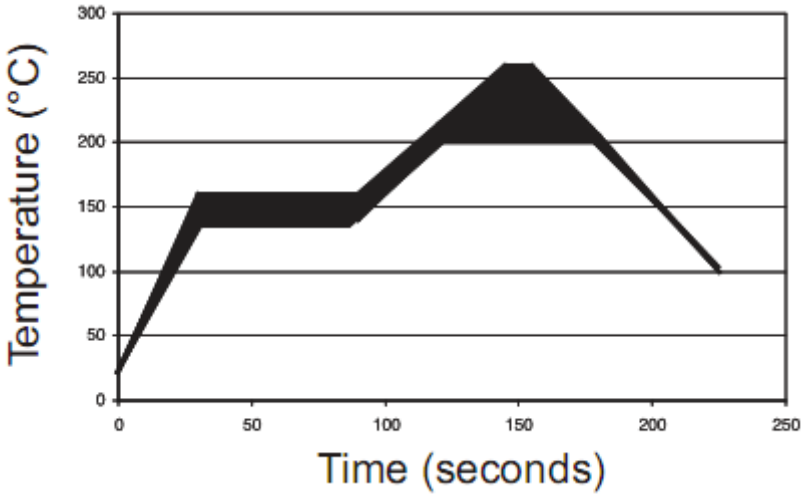
Type	Pad Layout Dimension (mm)		
	a	b	c
0402	0.30	0.80	0.60
0603	0.30	1.10	1.50
0805	0.46	1.60	1.45
1206	0.46	1.65	2.20

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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