

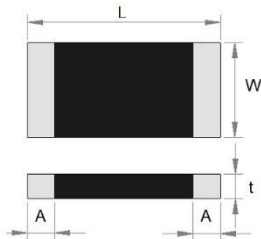
Approval sheet of High Power Chip Current Sensing Resistors

PRODUCE	CHECK AND APPROVE	ACCEPTED BY
EM	CE	HONORABLE CUSTOMER
Edison Chen	Charles Chen	
04 Sept, 2020	05 Sept, 2020	

1. High Power Chip Current Sensing Resistors

This approval sheet applies of high-power chip current sensing resistor rectangular type.

2. Dimensions

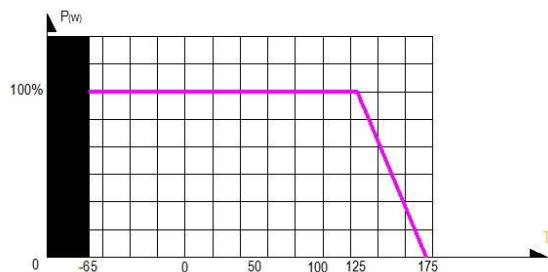


Type	Dimensions(mm)				
	L	W	t	A	R
LFS 2512	6.35±0.20	3.2±0.20	0.80±0.15	1.70±0.20	<4mΩ
LFS 2512	6.35±0.20	3.2±0.20	0.80±0.15	0.90±0.20	>4mΩ

3. Application

- ◆ Switching Power Supply
- ◆ Voltage Regulation Module
- ◆ DC-DC Converter, Adaptor, Battery Pack, Charger
- ◆ PDA & Cell Phone
- ◆ Power management Applications
- ◆ Current sensor for power hybrid sources
- ◆ High current handling for automotive engine

4. Derating Curve



5. Ordering code

LFS 2512 E F H R005
 (1) (2) (3) (4) (5) (6)

(1) Series type: LFS (High Power Chip Current Sensing Resistors)

(2) Chip size: 2512

(3) Packaging Material: Emboss (E)

(4) Resistance Tolerance: $\pm 1\%$ (F), $\pm 2\%$ (G), $\pm 5\%$ (J)

(5) Power rating: H=3W

(6) Resistance Code: R005 means 5m Ω

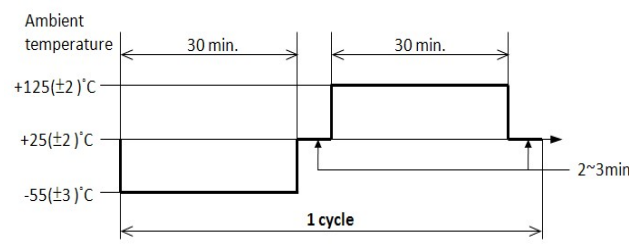
6. Electrical Specification

Type	Power Rating	Resistance Range	Tolerance (%)	TCR
LFS 2512	3W	1~51m Ω	F(± 1.0); J(± 5.0);	± 50 ppm/ $^{\circ}$ C

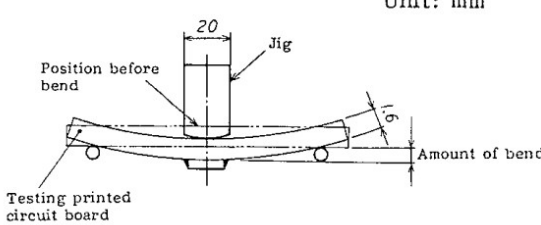
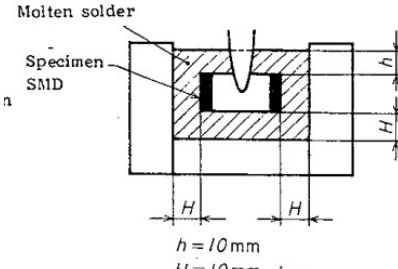
- ◆ Resistance range out of range is available upon request.
- ◆ Lead free, RoHs compliant for global applications and halogen free
- ◆ Excellent long term stability

Unless otherwise specified, all values are tested at the following condition:
 Temperature: 21 $^{\circ}$ C to 25 $^{\circ}$ C and Relative humidity: 45% to 75%

7. Environmental Characteristics

No.	Item	Test Condition	Specification
1	Temperature Coefficient of Resistance (T.C.R.)	+25°C /+125°C. (JIS-C5202-5.2) $TCR \text{ (ppm/}^\circ\text{C)} = \frac{\Delta R}{R \times \Delta t} \times 10^6$	Refer to electrical specification.
2	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)	$\Delta R \leq \pm(1\% + 0.0005\Omega)$
3	High Temperature Exposure	The chip (mounted on board) is exposed in the heat chamber 125±3°C for 1000 hrs. (JIS-C5202-7.2)	$\Delta R \leq \pm(1\% + 0.0005\Omega)$
4	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)	$\Delta R \leq \pm(1\% + 0.0005\Omega)$
5	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) 	$\Delta R \leq \pm(1\% + 0.0005\Omega)$

8. Function Performance

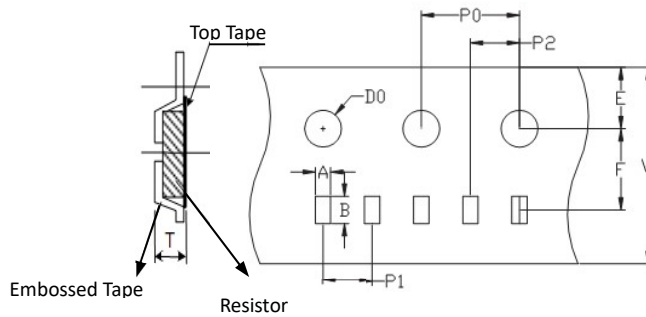
No.	Item	Test Condition	Specification
1	Bending Strength	<p>Mount the chip to test substrate. Apply pressure in direction of arrow unit band width reaches 2mm(+0.2/-0mm) illustrated in the figure below and hold for 10±1 sec. (JIS-C5202-6.1)</p> <p style="text-align: right;">Unit: mm</p> 	$\Delta R \leq \pm(1\% + 0.0005\Omega)$
2	Solvent Resistance	<p>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)</p>	Verify marking permanency. (Nor required for laser etched parts or parts with no marking)
3	Resistance to solder Heat	<p>The specimen chip shall be immersed into the flux specified in the solder bath 260±5°C for 10±1 sec. (MIL-STD-202, Method 210)</p>	$\Delta R \leq \pm(1\% + 0.0005\Omega)$
4	Solderability	<p>The specimen chip shall be immersed into the flux specified in the solder bath 235±5°C 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)</p> 	Solder shall be covered 95% or more of the electrode area.

Remark:

a. 3.0 W with total solder pad trace size of 300 mm². The surface temperature of component should below 100°C.

9. Tape Packaging Specifications

◆ Embossed Plastic Tape Specifications



Type	Carrier Dimensions (mm)									
	A	B	E	F	W	P0	P1	P2	D0	T
2512	3.6±0.1	6.9±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

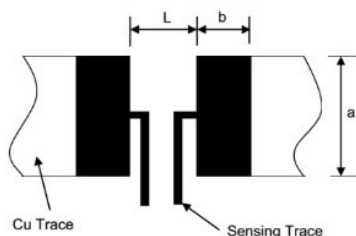
10. Minimum packaging quantity

Size EIA (EIAJ)	2512
Standard Packing Quantity (pcs /reel)	4,000

11. Storage Conditions

Temperature : 5~35°C, Humidity : 40~75%

12. Recommended Soldering Pad Layout



Type	Pad Layout Dimension (mm)		
	a	b	L
2512	3.80	2.10	4.10