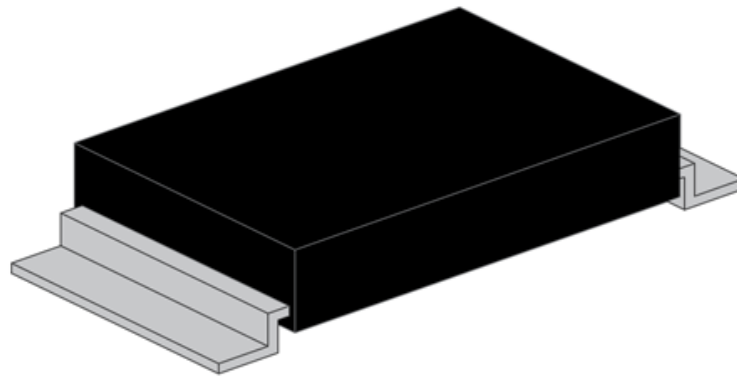


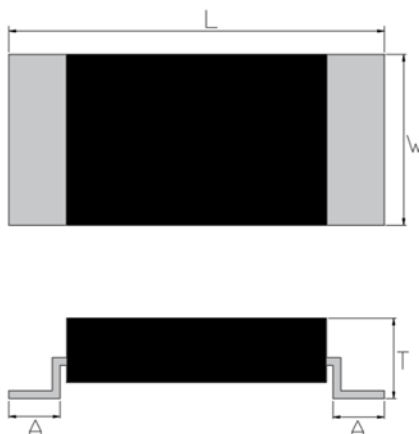
Current Sensing Shunt Resistor with Molding



Scope

This specification of high power molding type current sensing resistor rectangular type.

Dimensions



Type	Dimensions(mm)			
	L	W	T	A
4320	11.2±0.20	5.0±0.20	1.65±0.20	2.2±0.30

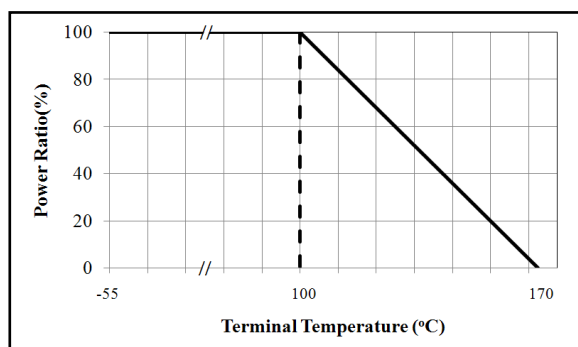
Features

- ◆ Chip size 4320
- ◆ Resistance value from 4mΩ to 20mΩ
- ◆ Lead free, RoHs compliant for global applications and halogen free

Application

- ◆ Switching Power Supply
- ◆ Voltage Regulation Module
- ◆ DC-DC Converter, Adaptor, Battery Pack, Charger
- ◆ PDA & Cell Phone
- ◆ Power management Applications

Derating Curve



Part Numbers

SRM 4320 E F L R010

(1) (2) (3) (4) (5) (6)

(1)Series Name: SRM (Shunt Resistor with Molding)

(2)Chip size: 4320

(3)Packaging Material: Emboss (E)

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

(5)Power rating: L=5W

(6)Resistance Code: R010 means 0.010Ω

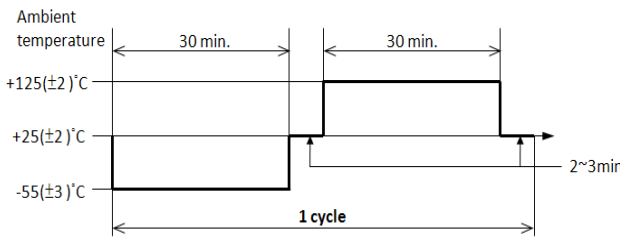
Electrical Specification

Item	Power Rating	Resistance Range(mΩ)	Operation Temp. Range	TCR (PPM/°C)
SRM4320	5.0W	$4 \leq R \leq 7$	-55~+170°C	± 200
		$8 \leq R \leq 20$		± 75

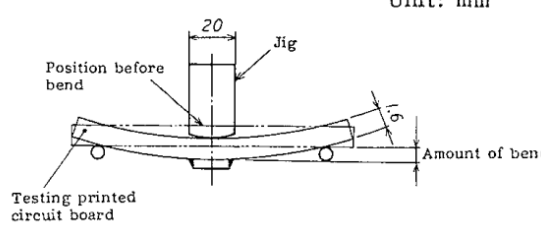
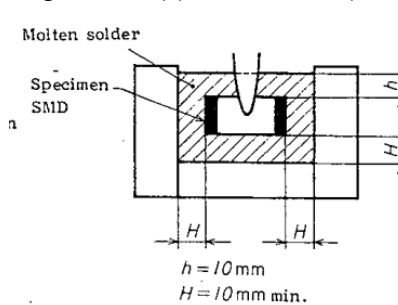
Performances

Environmental Performance

No.	Item	Test Condition	Specification
1	Short Time Overload	4 times rated power for 5 sec. (JIS-C5202-5.5)	$\Delta R: \pm(1\%+0.0005\Omega)$
2	Temperature Coefficient of Resistance (T.C.R.)	+25°C /+125°C. (JIS-C5202-5.2) $TCR (ppm/^{\circ}C) = \frac{\Delta R}{R \times \Delta t} \times 10^6$	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° $\pm 2^{\circ}C$ for the period of 1000 hr with applying rated power 1.5 hours ON and 0.5 hour OFF. (MIL-STD-202, Method 103)	$\Delta R: \pm(1\%+0.0005\Omega)$
4	High Temperature Exposure	The chip (mounted on board) is exposed in the heat chamber 125 $\pm 3^{\circ}C$ for 1000 hrs. (JIS-C5202-7.2)	$\Delta R: \pm(1\%+0.0005\Omega)$
5	Load Life	Apply rated power at 70 $\pm 2^{\circ}C$ for 1000 hours with 1.5 hours ON and 0.5 hour OFF. (JIS-C5202-7.10)	$\Delta R: \pm(1\%+0.0005\Omega)$

6	Rapid change of temperature	<p>The chip (mounted on board) is exposed, $-55\pm 3^{\circ}\text{C}$ (30min.)/$+125\pm 2^{\circ}\text{C}$ (30min.) for 5 cycles. The following conditions as the following figure. (JIS-C5202-7.4)</p> 	$\Delta R: \pm(1\%+0.0005\Omega)$
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Function Performance

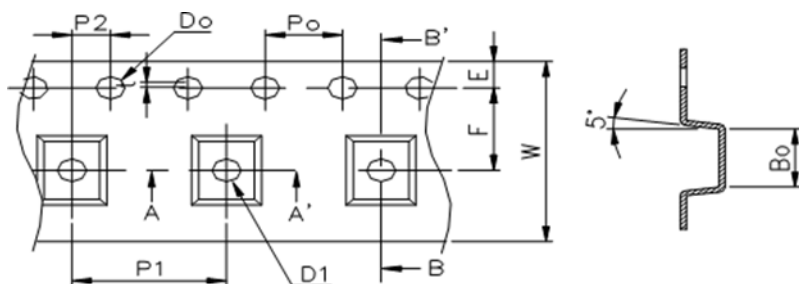
No.	Item	Test Condition	Specification
1	Bending Strength	<p>Mount the chip to test substrate. Apply pressure in direction of arrow unit band width reaches 2mm(+0.2/-0mm) illustrated in the figure below and hold for 10 ± 1 sec. (JIS-C5202-6.1)</p> <p>Unit: mm</p> 	$\Delta R: \pm(1\%+0.0005\Omega)$
2	Solvent Resistance	<p>The chip is completed immersion of the specimens in the isopropyl alcohol for 3 (+5, -0) min. at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$. (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 $260\pm 5^{\circ}\text{C}$ for 10 ± 1 sec. (MIL-STD-202, Method 210)</p>	$\Delta R: \pm(1\%+0.0005\Omega)$
4	Solderability	<p>The specimen chip shall be immersed into the flux specified in the solder bath $235\pm 5^{\circ}\text{C}$ 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>  <p>$h = 10\text{ mm}$ $H = 10\text{ mm min.}$</p>	Solder shall be covered 95% or more of the electrode area.

Remark:

a. 5 W with total solder pad trace size of 500 mm². The surface temperature of component should below 100°C.

Tape Packaging Specifications

◆Embossed Plastic Tape Specifications



Type	Carrier Dimensions (mm)										
	A0	B0	E	F	W	P0	P1	P2	D0	D1	T1
4320	5.40±0.1	11.5±0.1	1.75±0.1	11.5±0.1	24±0.3	4.0±0.1	8.0±0.1	2.0±0.1	1.5+0.1,-0	1.50+0.1,-0	0.30±0.05

Packaging

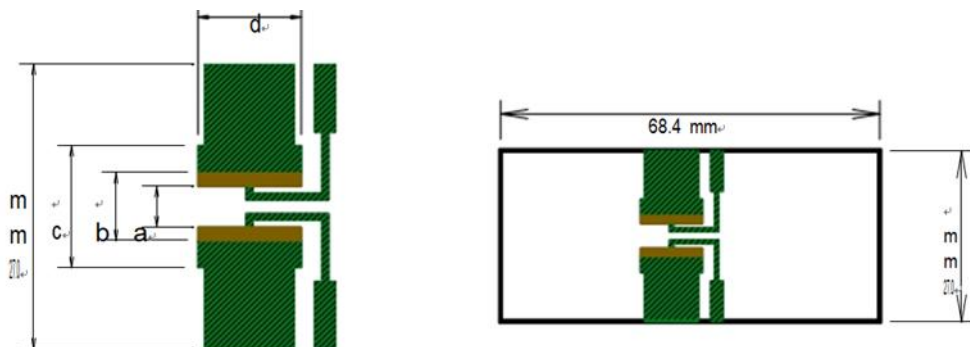
Size EIA (EIAJ)	4320
Standard Packing Quantity (pcs /reel)	1000

Storage Conditions

Temperature : 5~35℃, Humidity : 40~75%

Current Sensing Shunt Resistor with molding

Recommended Pad Layout



Substrate material: Glass epoxy (FR-4)

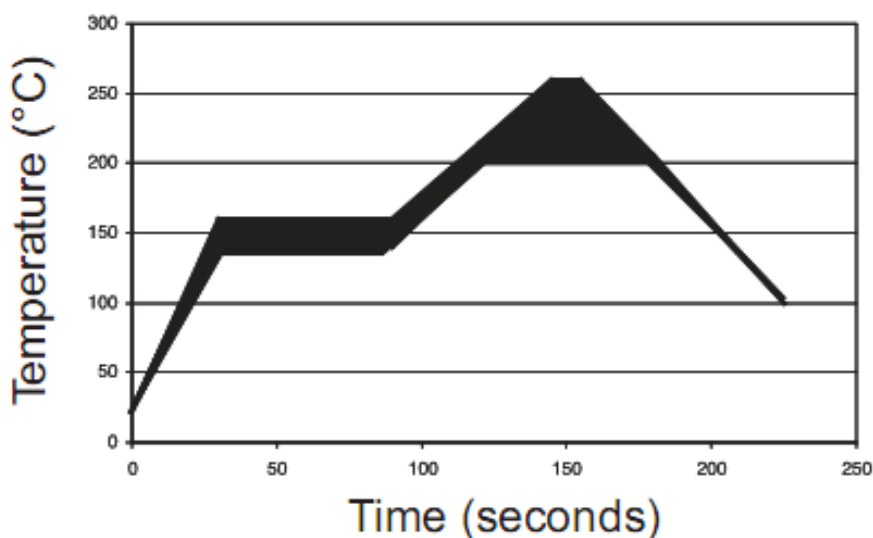
thickness 0.6mm Copper thickness

(both sides): 100μm

Type	Pad Layout Dimension (mm)			
	a	b	c	d
SRM 4320	5.00	14.0	14.0	5.75

Soldering Recommendations

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