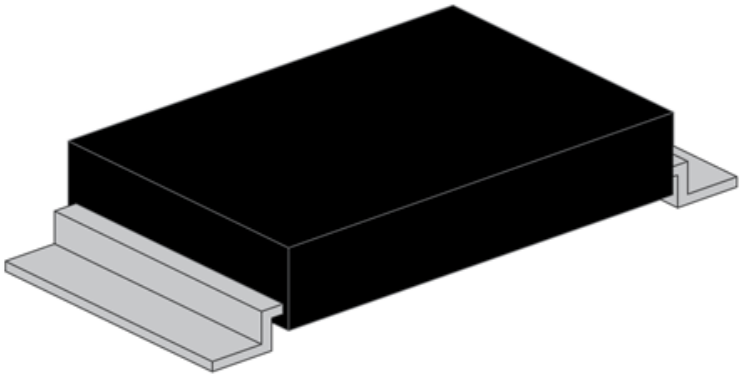
Current Sensing Shunt Resistor with Molding

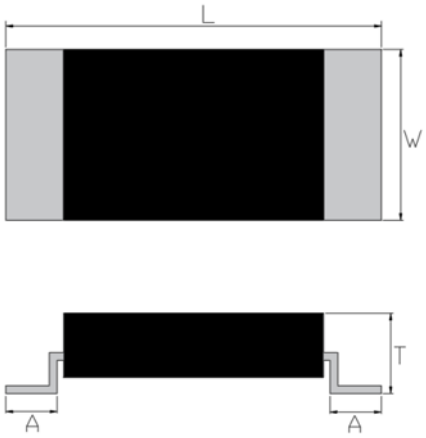


Current Sensing Shunt Resistor with molding

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

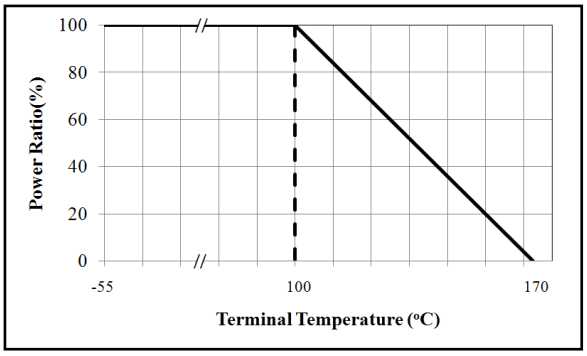
Features

- 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: ± 1% (F), ± 2% (G), ± 5% (J)
(5)Power rating: L=5W
(6)Resistance Code: R010 means 0.010Ω

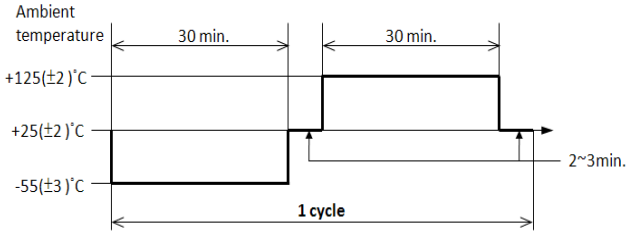
Electrical Specification

Item	Power Rating	Resistance Range(mΩ)	Operation Temp. Range	TCR (PPM/℃)
4320	5.0W	4≤R≤5	-55~+170℃	±200
		6≤R≤20		±75

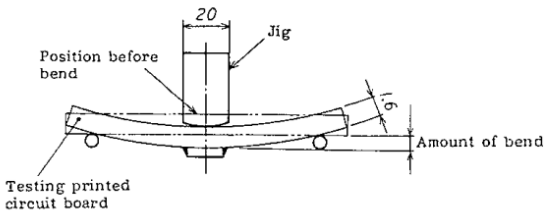
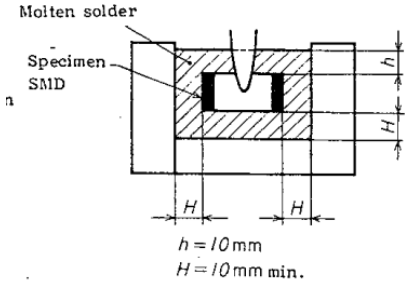
Performances

Environmental Performance

No.	Item	Test Condition	Specification
1	Short Time Overload	4 times rated power for 5 sec. (JIS-C5202-5.5)	ΔR: ±(1%+0.0005Ω)
2	Temperature Coefficient of Resistance (T.C.R.)	+25°C /+125°C. (JIS-C5202-5.2) $TCR\ (\mathrm{ppm/℃}) = \frac{\Delta R}{R \times \Delta t} \times 10^6$	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.)/+125±2°C (30min.) for 5 cycles. The following conditions as the following figure. (JIS-C5202-7.4) 	ΔR: ±(1%+0.0005Ω)

Function Performance

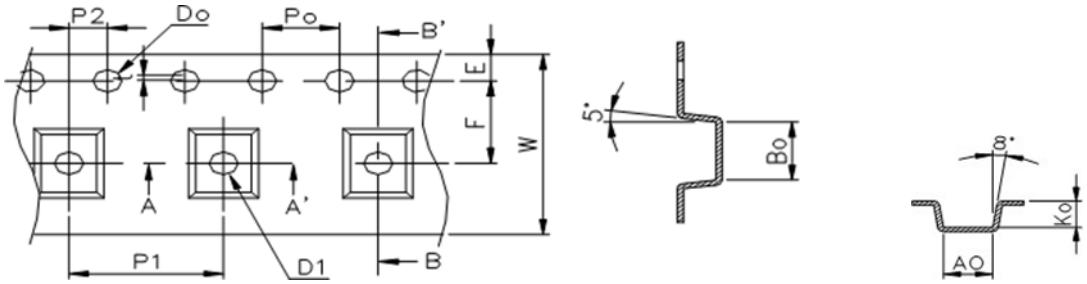
No.	Item	Test Condition	Specification
1	Bending Strength	Mount the chip to test substrate. Apply pressure in direction of arrow unit band width reaches 2mm(+0.2/-0mm) illustrated in the figure below and hold for 10±1 sec. (JIS-C5202-6.1) Unit: mm 	ΔR: ±(1%+0.0005Ω)
2	Solvent Resistance	The chip is completed 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. 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

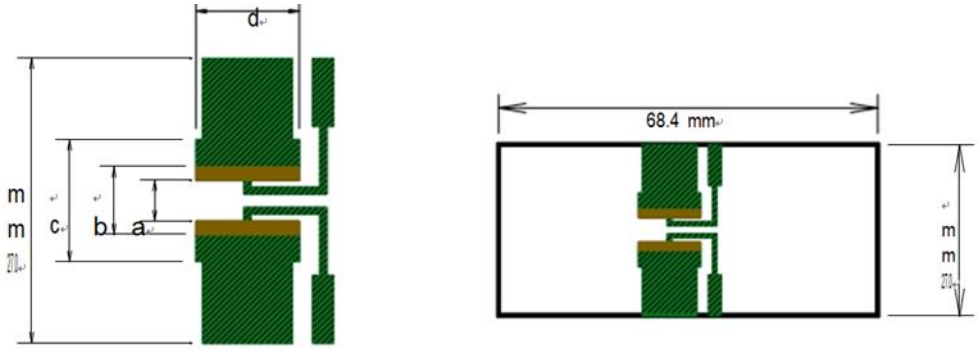
Packaging

Size EIA (EIAJ)	4320
Standard Packing Quantity (pcs /reel)	1,000

Storage Conditions

Temperature：5~35℃, Humidity：40~75%

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

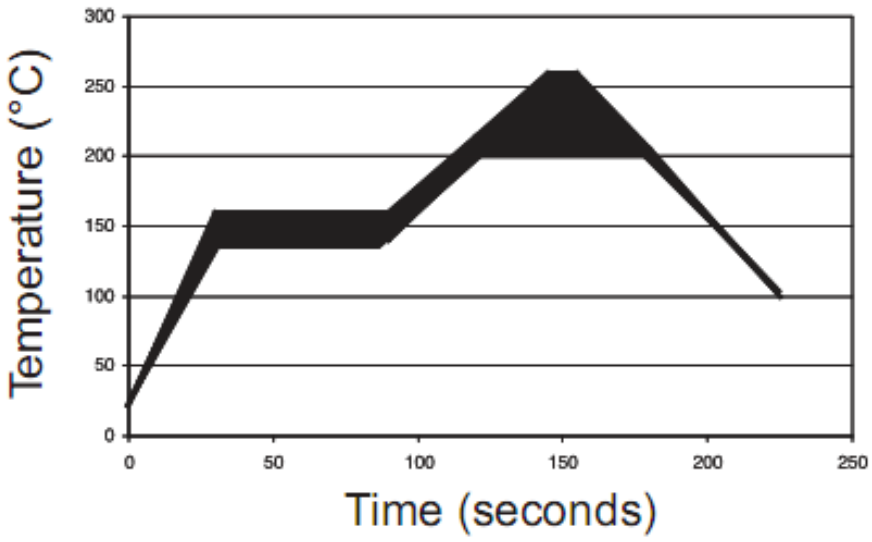
Soldering Recommendations

◆ Peak reflow temperatures and durations：

- IR Reflow Peak = 260℃ 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.