

Leader New Energy Technology Co., Ltd.

SR Series

High Power Current Shunt Sensing Resistor

Features: Available in up to 2512/3W, 3920/5W, 5930/10W power rating
Resistance value from 0.1m Ω to 5m Ω
Current handling up to 129A in 3920 size
Excellent long term stability
RoHS compliant



Applications: Power modules
Frequency converters
Current sensor for power hybrid sources
High current handling for automotive engine controls and power management

SR Series						
Type / Code	Ohm Range Ω /m Ω and Tolerance		P 100°C (W)	P 70°C (W)	TCR (ppm/°C)	Resistance Material
	1%, 2% and 5%					
2512	0.00025	0.25	3W	7W	±300 ppm/°C	MnCuSn
	0.0003	0.3		6W	±200 ppm/°C	MnCuSn
	0.0004	0.4		6W	±150 ppm/°c	MnCu
	0.0005	0.5		6W	±115 ppm/°C	MnCu
	0.00075	0.75		5W	±115 ppm/°C	MnCu
	0.001	1		5W	±100 ppm/°C	MnCu
	0.002	2		5W	±50 ppm/°C	FeCrAl
	0.003	3	2W	4W	±50 ppm/°C	FeCrAl
	0.004	4		3W	±50 ppm/°C	FeCrAl
				3W	±50 ppm/°C	NiCrAl
0.005	5	1.5W	2.5W	±50 ppm/°C	FeCrAl	

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SR Series

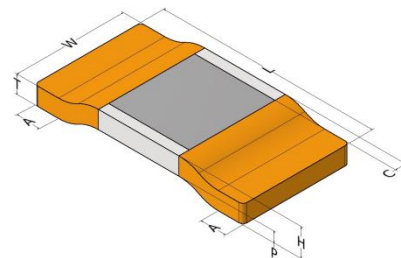
High Power Current Shunt Sensing Resistor

SR Series						
Type / Code	Ohm Range Ω /m Ω and Tolerance		P 100°C (W)	P 70°C (W)	TCR (ppm/°C)	Resistance Material
	1%, 2% and 5%					
3920	0	0	I max=160A		~	Cu
	0.0002	0.2	5W	12W	±150 ppm/°C	MnCuSn
	0.0003	0.3		10W	±150 ppm/°C	MnCu
	0.0005	0.5		9W	±70 ppm/°C	MnCu
	0.0007	0.7		8W	±60 ppm/°C	MnCu
	0.001	1		7W	±50 ppm/°C	MnCu
	0.001	1	5W	8W	±50 ppm/°C	FeCrAl
	0.0015	1.5	4.5W	7W	±50 ppm/°C	FeCrAl
	0.0018	1.8	4W	6W	±50 ppm/°C	FeCrAl
	0.002	2	4W	6W	±50 ppm/°C	FeCrAl
	0.0025	2.5	3W	5W		FeCrAl
	0.003	3	3W	5W		FeCrAl
	0.004	4	2.5W	4W		FeCrAl
	0.005	5	2W	3W		FeCrAl
5930	0.0001	0.1	10W	15W	±250 ppm/°C	MnCuSn
	0.0002	0.2	10W	15W	±100 ppm/°C	MnCu
	0.0003	0.3	7W	10W		MnCu
	0.0005	0.5	6W	8W	±75 ppm/°C	MnCu
	0.001	1		9W	±50 ppm/°C	FeCrAl
	0.002	2	4W	7W		FeCrAl

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SR Series

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Type / Code	L	W	H	T	A	C (max.)	P	Unit
SR2512...L300	6.50 ± 0.20	3.25 ± 0.20	1.24 ± 0.15	0.89 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...L500	6.50 ± 0.20	3.25 ± 0.20	1.07 ± 0.15	0.72 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...L750	6.50 ± 0.20	3.25 ± 0.20	0.95 ± 0.15	0.60 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...1L00	6.50 ± 0.20	3.25 ± 0.20	0.73 ± 0.15	0.38 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...2L00	6.50 ± 0.20	3.25 ± 0.20	1.03 ± 0.15	0.67 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...2L00-L	6.50 ± 0.20	3.25 ± 0.20	0.96 ± 0.15	0.61 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...3L00	6.50 ± 0.20	3.25 ± 0.20	0.85 ± 0.15	0.50 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...3L00-L	6.50 ± 0.20	3.25 ± 0.20	0.77 ± 0.15	0.42 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...4L00	6.50 ± 0.20	3.25 ± 0.20	0.70 ± 0.15	0.35 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...4L00-L	6.50 ± 0.20	3.25 ± 0.20	0.70 ± 0.15	0.35 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...5L00	6.50 ± 0.20	3.25 ± 0.20	0.70 ± 0.15	0.35 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR2512...5L00-L	6.50 ± 0.20	3.25 ± 0.20	0.70 ± 0.15	0.35 ± 0.15	0.90 ± 0.20	0.4	0.35 ± 0.10	mm
SR3920...0L00	10.20 ± 0.20	5.20 ± 0.20	0.92 ± 0.15	0.42 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...L200	10.20 ± 0.20	5.20 ± 0.20	1.98 ± 0.15	1.48 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...L300	10.20 ± 0.20	5.20 ± 0.20	1.92 ± 0.15	1.42 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...L500	10.20 ± 0.20	5.20 ± 0.20	1.36 ± 0.15	0.86 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...1L00	10.20 ± 0.20	5.20 ± 0.20	0.92 ± 0.15	0.42 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...1L00-F	10.20 ± 0.20	5.20 ± 0.20	1.92 ± 0.15	1.42 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...1L50	10.20 ± 0.20	5.20 ± 0.20	1.37 ± 0.15	0.87 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...1L80	10.20 ± 0.20	5.20 ± 0.20	1.33 ± 0.15	0.83 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...2L00	10.20 ± 0.20	5.20 ± 0.20	1.19 ± 0.15	0.69 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...2L50	10.20 ± 0.20	5.20 ± 0.20	1.19 ± 0.15	0.69 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...3L00	10.20 ± 0.20	5.20 ± 0.20	1.0 ± 0.15	0.50 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...3L00-L	10.20 ± 0.20	5.20 ± 0.20	0.95 ± 0.15	0.45 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...4L00	10.20 ± 0.20	5.20 ± 0.20	0.87 ± 0.15	0.37 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...4L00-L	10.20 ± 0.20	5.20 ± 0.20	0.85 ± 0.15	0.35 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...5L00	10.20 ± 0.20	5.20 ± 0.20	0.87 ± 0.15	0.37 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm
SR3920...5L00-L	10.20 ± 0.20	5.20 ± 0.20	0.85 ± 0.15	0.35 ± 0.15	1.80 ± 0.30	0.6	0.50 ± 0.10	mm

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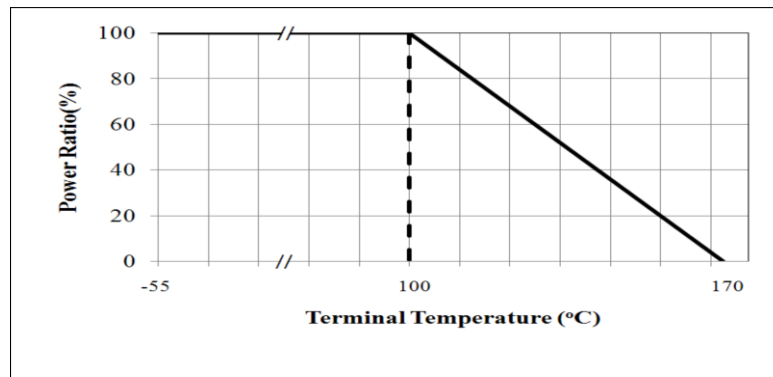
SR Series

High Power Current Shunt Sensing Resistor

Type / Code	L	W	H	T	A	C (max.)	P	Unit
SR5930...L100	15.00 ± 0.20	7.75 ± 0.20	1.92 ± 0.15	1.42 ± 0.15	4.20 ± 0.20	1	0.50 ± 0.10	mm
SR5930...L200	15.00 ± 0.20	7.75 ± 0.20	1.92 ± 0.15	1.42 ± 0.15	4.20 ± 0.20	1	0.50 ± 0.10	mm
SR5930...L300	15.00 ± 0.20	7.75 ± 0.20	1.44 ± 0.15	0.94 ± 0.15	4.20 ± 0.20	1	0.50 ± 0.10	mm
SR5930...L500	15.00 ± 0.20	7.75 ± 0.20	1.08 ± 0.15	0.58 ± 0.15	4.20 ± 0.20	1	0.50 ± 0.10	mm
SR5930...1L00	15.00 ± 0.20	7.75 ± 0.20	1.37 ± 0.15	0.87 ± 0.15	4.20 ± 0.20	1	0.50 ± 0.10	mm
SR5930...2L00	15.00 ± 0.20	7.75 ± 0.20	0.95 ± 0.15	0.46 ± 0.15	4.20 ± 0.20	1	0.50 ± 0.10	mm
SR5930...3L00	15.00 ± 0.20	7.75 ± 0.20	0.90 ± 0.15	0.40 ± 0.15	4.20 ± 0.20	1	0.50 ± 0.10	mm

Derating Curve

Operating temperature range of -55 to 170°C.

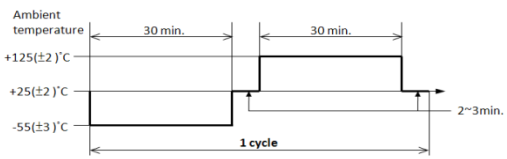


No.	Item	Test Condition	Specification
1	Short Time Overload	Loading 5 times rate power 5sec	ΔR: ±1% Jump is <0.2mΩ
2	Temperature Coefficient of Resistance (T.C.R.)	+25°C / +125°C. (JIS-C5202-5.2) $TCR \text{ (ppm/°C)} = \frac{\Delta R}{R \times \Delta t} \times 10^6$	Refer to electrical specification.
3	Moisture Resistance	The specimens shall be placed in a chamber and subjected to a relative humidity of 90~98% percent and a temperature of 25°C / 65°C 10 cycles (MIL-STD-202, Method 106)	ΔR: ±1% Jump is <0.2mΩ
4	High Temperature Exposure	The ship (mounted on board) is exposed in the heat chamber 170°C for 1000 hrs. (JIS-C5202-7.2)	ΔR: ±1% Jump is <0.2mΩ
5	Load Life	Apply rated power for 1000 hours with 1.5 hours ON and 0.5 hour OFF. (JIS-C5202-7.10)	ΔR: ±1% Jump is <0.2mΩ

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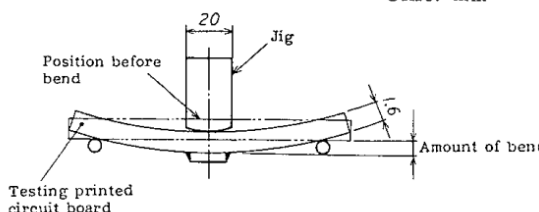
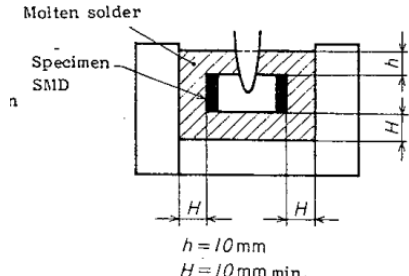
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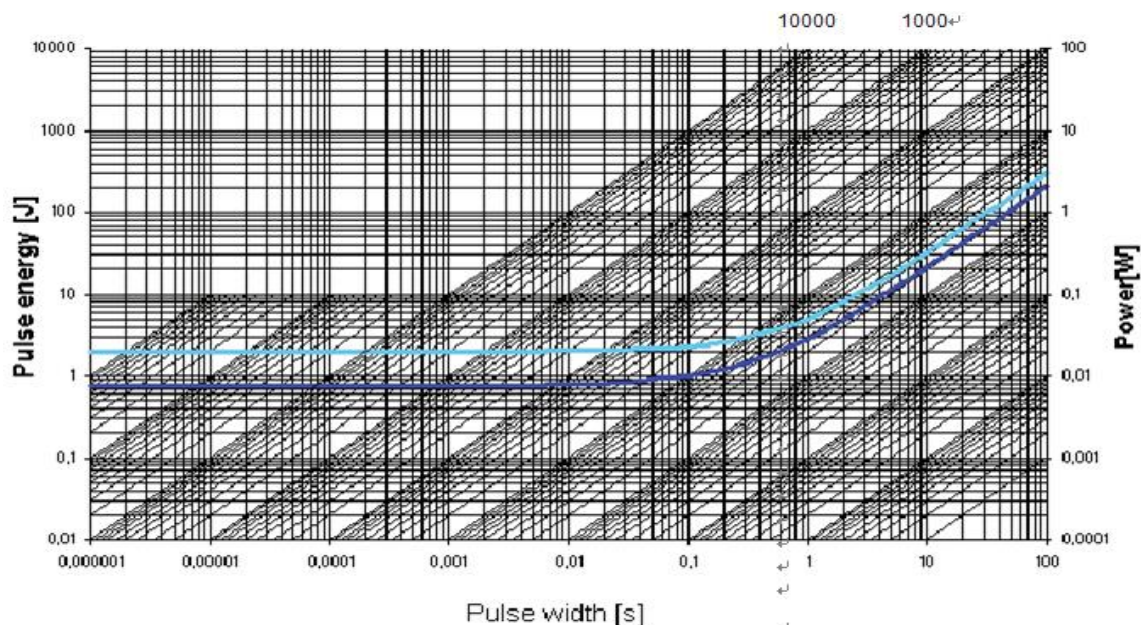
6	Rapid change of temperature	The chip (mounted on board) is exposed, $-55\pm 3^{\circ}\text{C}$ (30min.)/$+125\pm 2^{\circ}\text{C}$ (30min.) for 1000 cycles. The following conditions as the following figure. (JIS-C5202-7.4)  $\Delta R: \pm 1\%$ Jump is $< 0.2\text{m}\Omega$
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Note.

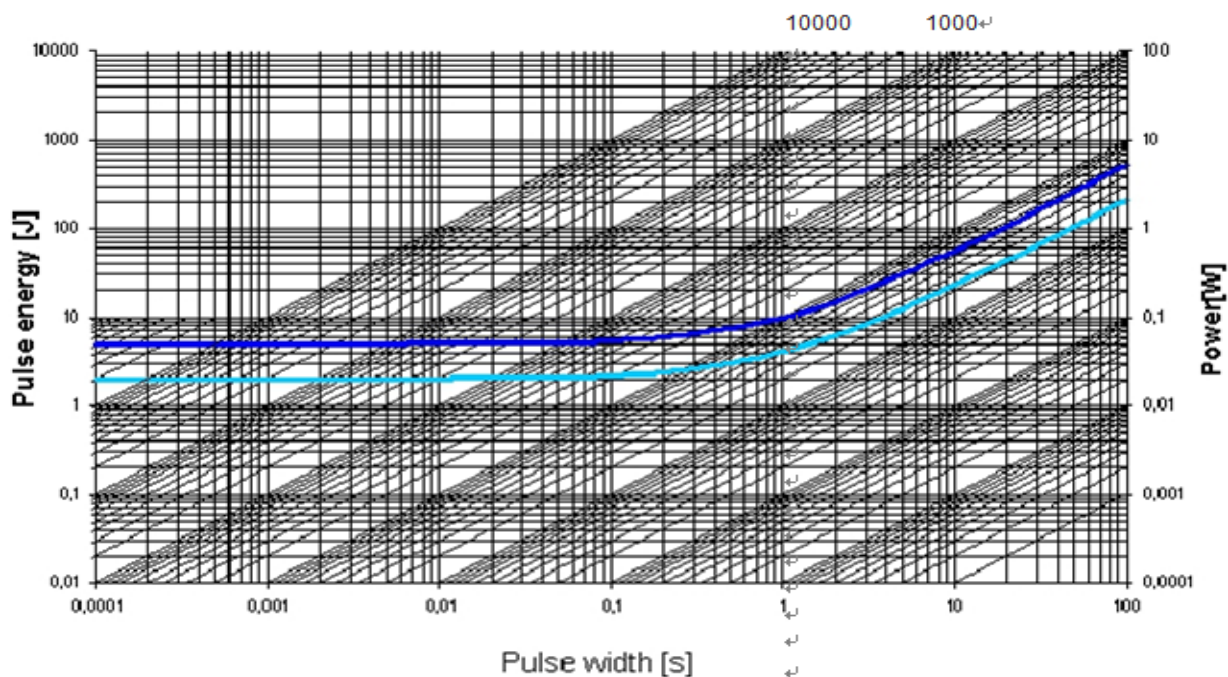
All Reliability test should follow De-rating curve , terminal temperature of component should be below 100°C .

No.	Item	Test Condition	Specification
1	Bending Strength	Mount the chip to test 90mm(L)*40mm(W) FR4 printed circuit board 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 	$\Delta R: \Delta R: \pm 1\%$ Jump is <0.2mΩ
2	Solderability	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)  $h = 10 \text{ mm}$ $H = 10 \text{ mm min.}$	Solder shall be covered 95% or more of the electrode area.

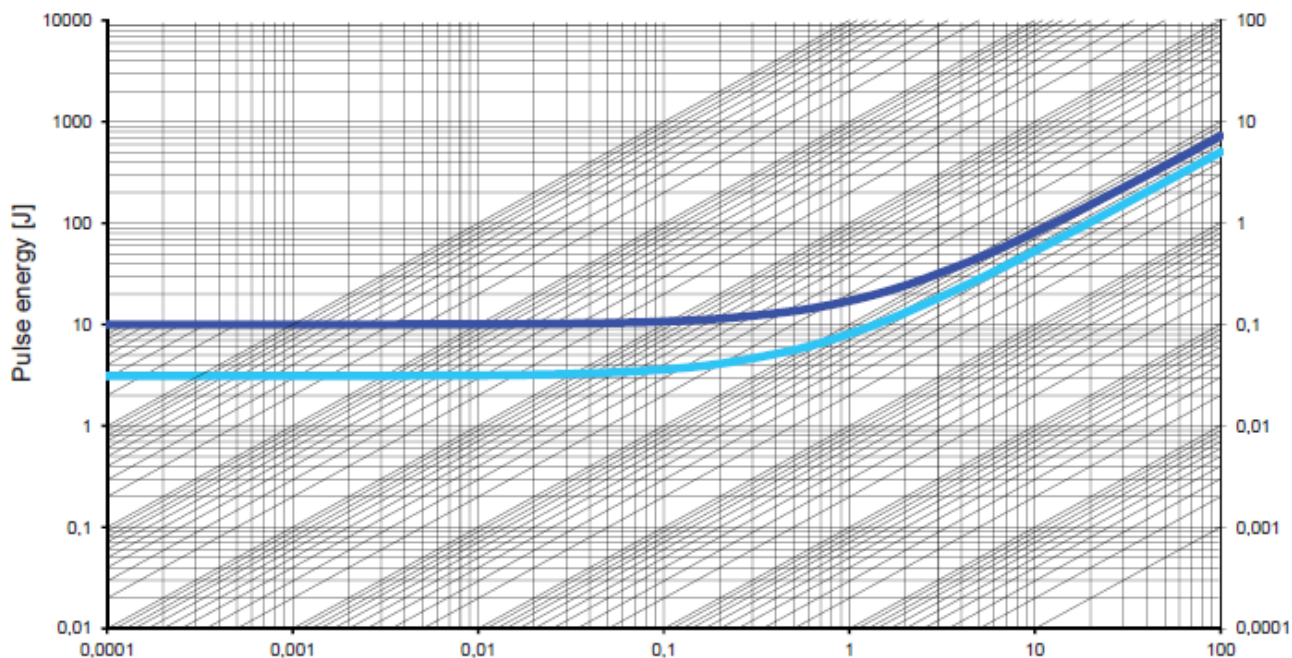
Pulse Power Characteristics – SR2512



Pulse Power Characteristics – SR3920



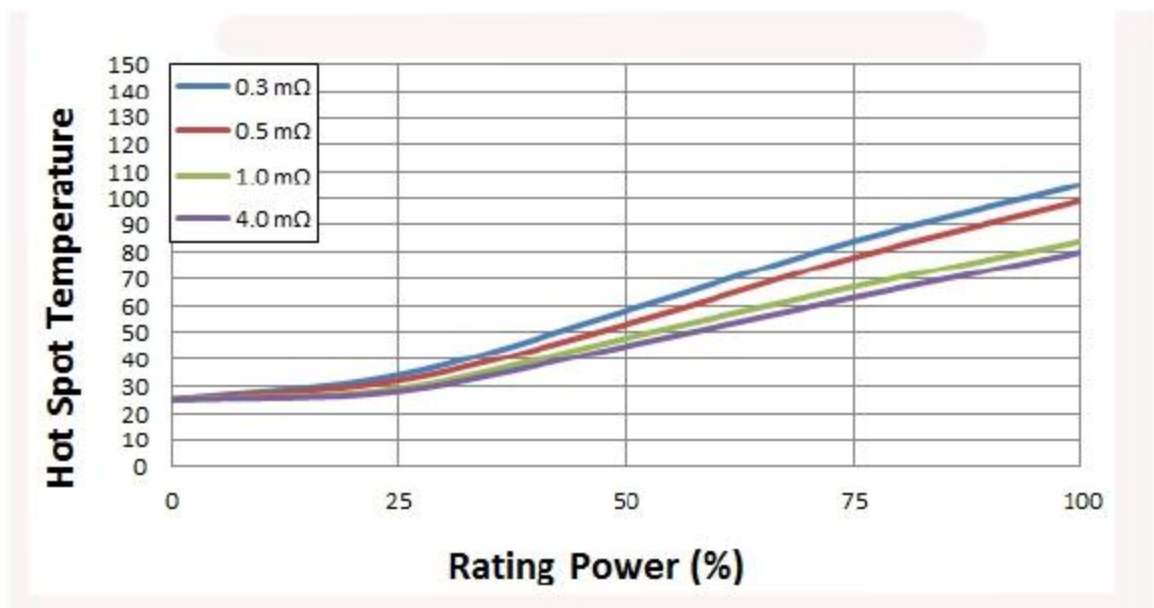
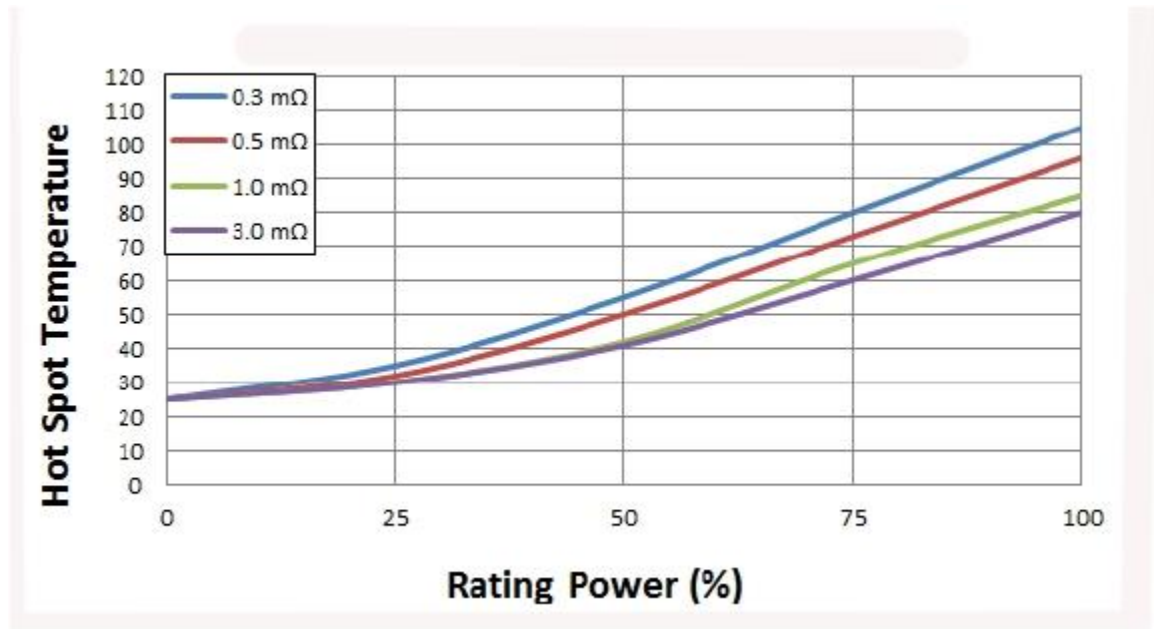
Pulse Power Characteristics – SR5930



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Temperature rise test boards use aluminum substrate (MCPCB).

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Part Numbers Description

SR 2512 E F F 4L00 - L

(1) (2) (3) (4) (5) (6) (7)

(1)Series Name: SR

(2) Chip size: 2512、3920、5930

(3)Packaging Material: Emboss (E)

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

(5)Power rating: D=1.0W,E=1.5W,F=2.0W,G=2.5W,H=3W,I=3.5W,J=4.0W,K=4.5W,L=5W,M=6W,N=7W,O=8W,P=9W,Q=10W

(6)Resistance Code: Ex: 0L30 means 0.3mOhm, 5L00 means 5.0mOhm ...etc.

(7) L: means NiCrAl low inductance material

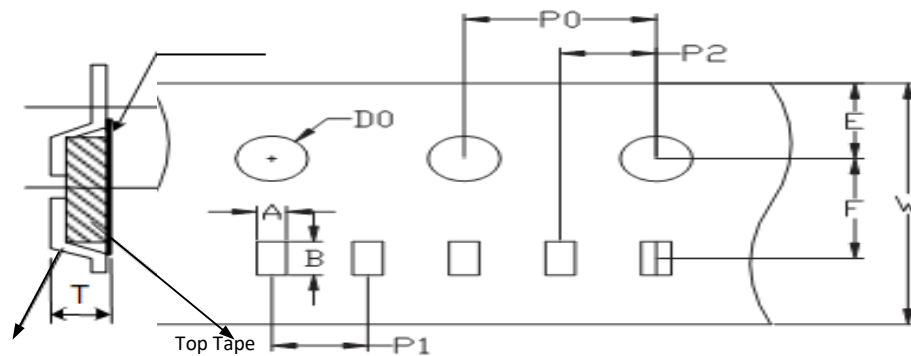
Packing information

Carrier Tape Specification						
Type / Code	A	B	E	F	W	Unit
2512	3.55 $\pm$ 0.10	6.75 $\pm$ 0.10	1.75 $\pm$ 0.10	5.50 $\pm$ 0.05	12.00 $\pm$ 0.20	mm
3920	5.50 $\pm$ 0.10	10.80 $\pm$ 0.10	1.75 $\pm$ 0.10	7.50 $\pm$ 0.05	16.00 $\pm$ 0.20	mm
5930	8.30 $\pm$ 0.10	15.40 $\pm$ 0.10	1.75 $\pm$ 0.10	11.50 $\pm$ 0.10	24.00 $\pm$ 0.30	mm
Type / Code	P0	P1	P2	D0	T	Unit
2512 0.3, 0.5, 0.75, 2.0m Ω	4.00 $\pm$ 0.05	4.00 $\pm$ 0.10	2.00 $\pm$ 0.05	1.50 $\pm$ 0.10	1.40 $\pm$ 0.10	mm
2512 1.0m Ω , 3.0m Ω	4.00 $\pm$ 0.05	4.00 $\pm$ 0.10	2.00 $\pm$ 0.05	1.50 $\pm$ 0.10	1.10 $\pm$ 0.10	mm
2512 4.0m Ω , 5.0m Ω	4.00 $\pm$ 0.05	4.00 $\pm$ 0.10	2.00 $\pm$ 0.05	1.50 $\pm$ 0.10	0.8 $\pm$ 0.10	mm
3920 0.2, 0.3, 0.5, 2.0m Ω ,	4.00 $\pm$ 0.05	8.00 $\pm$ 0.10	2.00 $\pm$ 0.05	1.50 $\pm$ 0.10	1.97 $\pm$ 0.10	mm
3920 1.0, 3.0, 4.0, 5.0m Ω					1.25 $\pm$ 0.10	mm
5930 0.2m Ω ,0.3m Ω , 1.0m Ω	4.00 $\pm$ 0.10	12.00 $\pm$ 0.10	2.00 $\pm$ 0.10	1.50 $\pm$ 0.10	2.30 $\pm$ 0.10	mm
5930 0.5m Ω , 2.0m Ω , 3m Ω	4.00 $\pm$ 0.10	12.00 $\pm$ 0.10	2.00 $\pm$ 0.10	1.50 $\pm$ 0.10	1.40 $\pm$ 0.10	mm

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SR Series

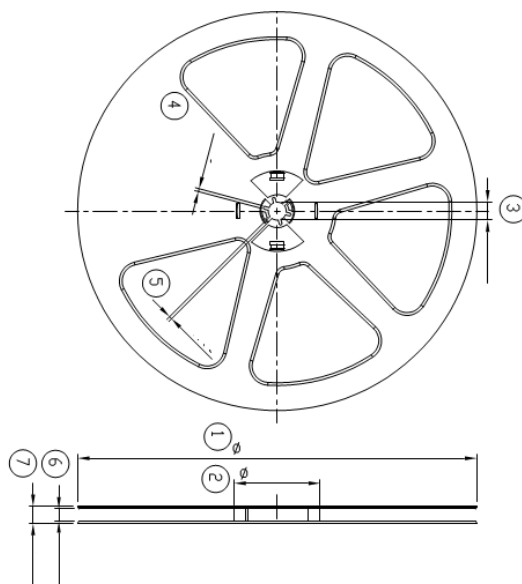
High Power Current Shunt Sensing Resistor



Reel Specification

unit: mm

Chip Size	Reel Width	①	②	③	④	⑤	⑥	⑦
2512	10"	$\phi 250 \pm 1$	$\phi 62 \pm 0.5$	13 ± 0.5	2 ± 0.5	2 ± 0.5	12.5 ± 0.1	16.5 ± 0.1
3920	13"	$\phi 330 \pm 1$	$\phi 99 \pm 0.5$	13.5 ± 0.5	2.3 ± 0.5	2.5 ± 0.5	20.7 ± 0.1	16.7 ± 0.1
5930	13"	$\phi 330 \pm 1$	$\phi 99 \pm 0.5$	13.5 ± 0.5	2.5 ± 0.5	2.5 ± 0.5	25.4 ± 0.1	29.4 ± 0.1



Size EIA (EIAJ) Type/2512	Cover Tape Width 12mm	Packing Quantity (pcs/reel)	
		Emboss Type	4mm pitch
		4,000 pcs/reel	
Size EIA (EIAJ) Type/3920	Cover Tape Width 16mm	Packing Quantity (pcs/reel)	
		Emboss Type	8mm pitch
		3,000 pcs/reel	
Size EIA (EIAJ) Type/5930	Cover Tape Width 24mm	Packing Quantity (pcs/reel)	
		Emboss Type	12mm pitch
		2,000 pcs/reel	

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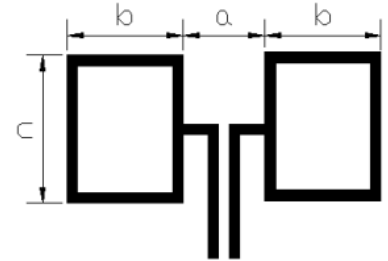
SR Series

High Power Current Shunt Sensing Resistor

Recommended Pad Layout

Recommended PAD Layout				
Type / Code	a	b	c	Unit
2512	3.8	1.8	3.4	mm
3920	5.6	2.7	6.2	mm
5930	5.6	5.2	8.75	mm

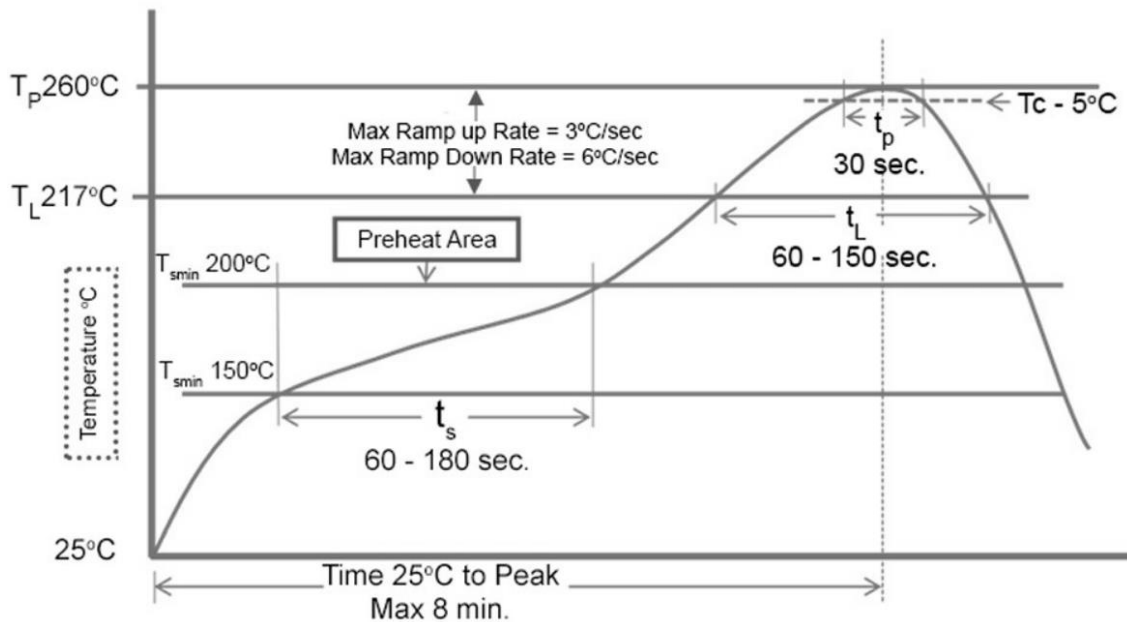
Recommended Pad Layout



Note. pad size, solder insufficient, excessive solder, solder void and component shifted will affect the resistance accuracy after IR reflow. Circuit calibration is a must to be done by functional test.

Soldering Recommendations:

- Peak reflow temperatures and durations
 - ✓ IR Reflow Peak = 260°C max for 10 seconds
 - ✓ Not suitable for wave soldering
- Compatible with lead and lead-free solder reflow processes
- Recommended IR reflow profile:



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Storage Temperature

Storage condition: 22~28°C, humidity of 40~75%.

ECN

Engineering Change Notice :

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