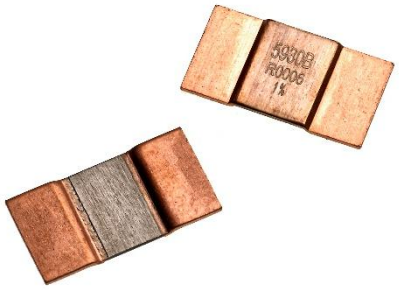
Low Resistance Metal Alloy Power Resistors

LRMAP5930



Features:

- Resistance range 0.1mΩ to 3mΩ
- Excellent long-term stability
- High power rating up to 15W
- Current sensing for power electronics
- AEC-Q200 Qualified

All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863

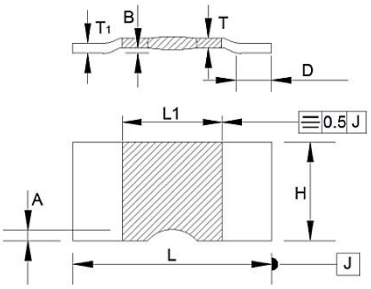
Electrical Data

		LRMAP5930								
Alloy type		A	B				D	C		
Resistance value	mΩ	0.1	0.2	0.3	0.5	0.6	0.5	1	2	3
Power rating, P_{r140} [1]	W	10	10	7	6	5	7	6	4	3
Power rating, P_{rts70} [2]	W	15	15	10	8	8	10	9	7	5
Overload rating (5s) [1]	W	50	50	35	30	25	35	30	20	15
Continuous pulse energy	J	15	19	13	7.5	6	19	13	6.5	4.6
Internal thermal impedance, R_{thi}	°C/W	3	3	4	6	6	4	7	13	20
Resistance tolerance	%	1								
TCR (20 to 60°C)	ppm/°C	±350	±100		±75			±50		
Thermal EMF	µV/°C	<2								
Inductance	nH	<3								
Ambient temperature	°C	-55 to +170								

Note 1: Mounted on FR4 board. See Thermal Data and Mounting section for details.
Note 2: Mounted on thermal substrate. See Thermal Data and Mounting section for details.

Physical Data

Dimensions in mm and weight in g										
Value	**Alloy**	**L** ±0.3	**L1** +0.2 -0.3	**H** +0.3 -0.2	**A** max	**D** +0.1 -1	**B** ±0.1	**T1** nom	**T** nom	**Wt.** nom
R0001	A	15	3.7	7.75	1	4.2	0.5	1.42	1.42	1.46
R0002	B		5							1.44
R0003								0.94	0.94	0.96
R0005								0.56	0.56	0.57
R0006								0.46	0.46	0.47
R0005	D		4.4					1.42	1.57	1.25
R001	C		5					0.91	0.91	0.88
R002								0.7	0.44	0.61
R003								0.5	0.31	0.43



Construction

The component is formed from a continuous band of E-beam welded precision resistive strip. Various alloys are used based on the resistance value.

Marking

The component is laser marked with “5930”, alloy type, ohmic value (using R to indicate decimal position in ohms) and tolerance.

Solvent Resistance

The component is resistant to all normal industrial cleaning solvents suitable for printed circuits.

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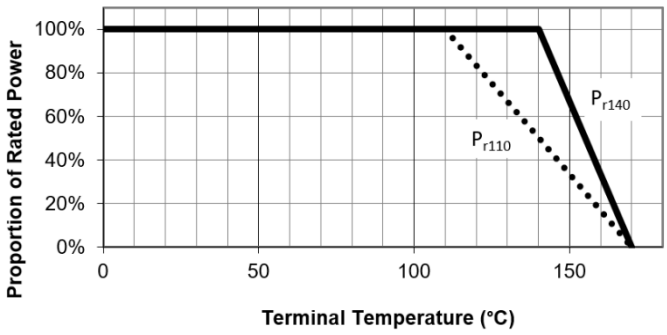
Performance Data

Test	Method	±ΔR%	
		Typical	Maximum
Load life stability	2000 hours, rated power, $T_{terminal}$ =110°C	0.3	0.5
	2000 hours, rated power, $T_{terminal}$ =140°C	0.7	1
Short term overload	5 seconds, 5 x rated power	0.3	1
High temperature exposure	1000 hours, T_A=125°C, unpowered	0.4	1
Mechanical shock	100g, 6ms, half-sine (MIL-STD-202 Method 213)	0.1	0.2
Biased humidity	1000 hours, 85°C, 85%RH, 10% of rated power	0.2	0.5
Moisture resistance	MIL-STD-202 method 106	0.1	0.5
Temperature cycle	1000 cycles, -55°C to 125°C, 15 minutes dwell	0.1	0.5
Resistance to solder heat	260 ± 5°C, 10 ± 1s (MIL-STD-202 Method 210)	0.2	0.5
Vibration	10-2000Hz, 5g, 20 min, 12 cycles/axis, 3 axes (MIL-STD-202 Method 204)	0.1	0.2
Low temperature storage	1000 hours, -55°C	0.1	0.2
Resistance to solvents	MIL-STD-202 Method 215	No damage	
Solderability	J-STD-002	>95% coverage	

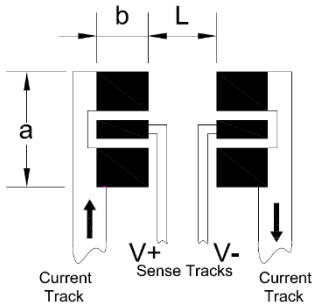
Thermal Data & Mounting

Temperature Derating



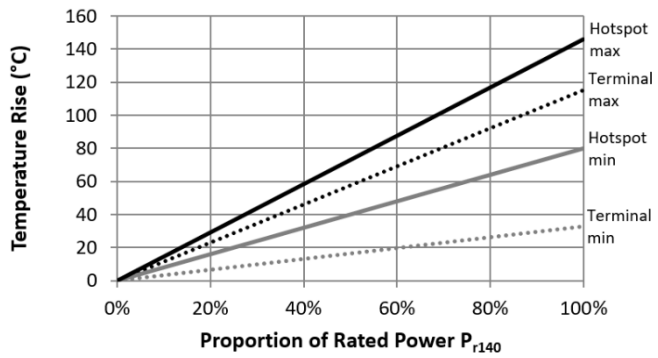
Nominal Mounting Pad Dimensions

a	b	L
8.75mm	5.2mm	5.6mm

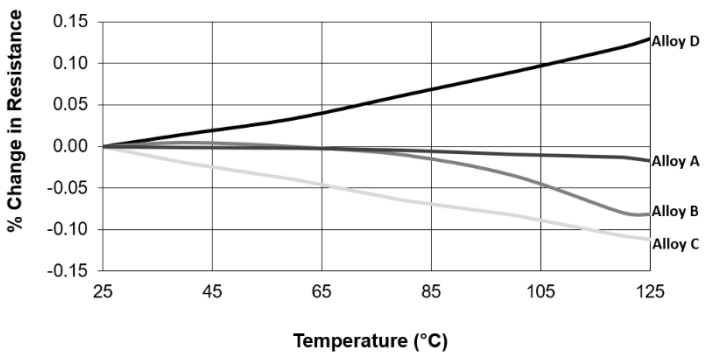


Typical Temperature Rise

(mounted on FR4 board)



Typical Resistance-Temperature Characteristics



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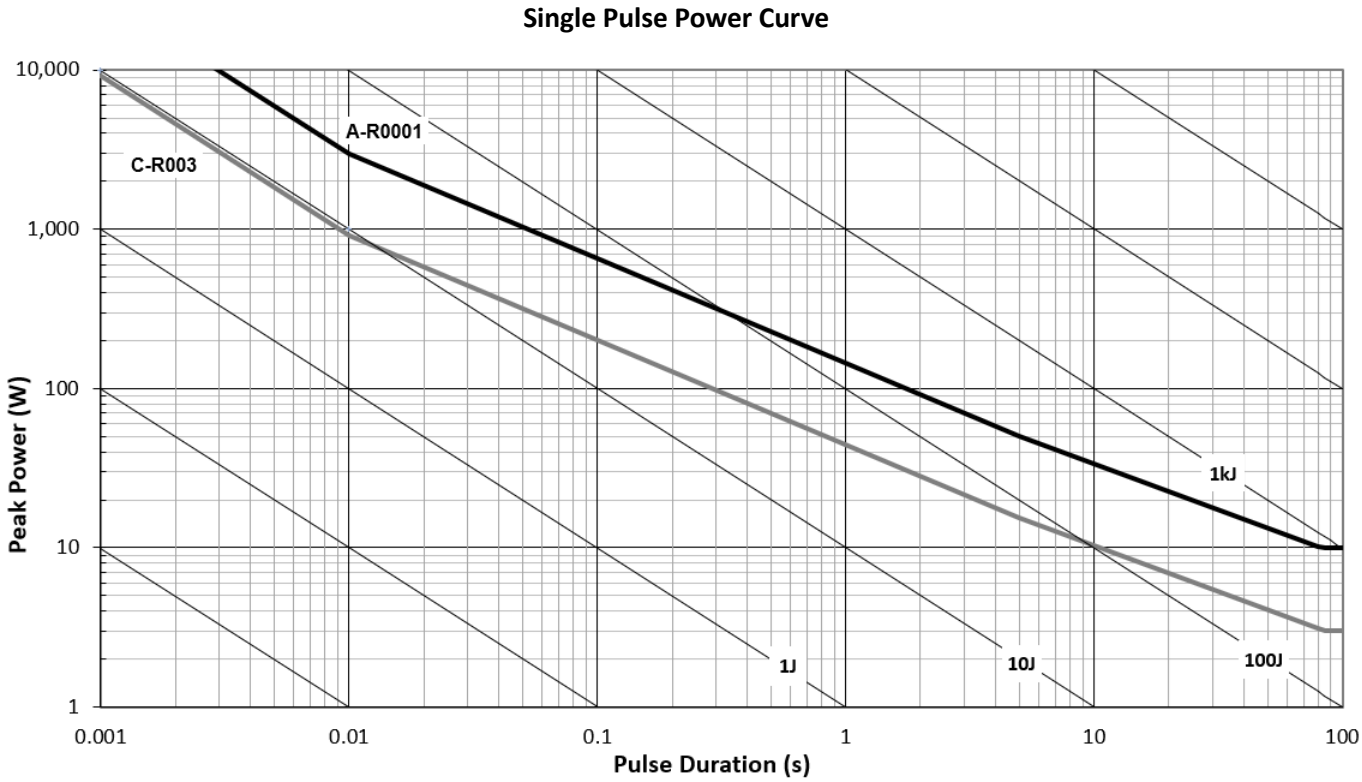
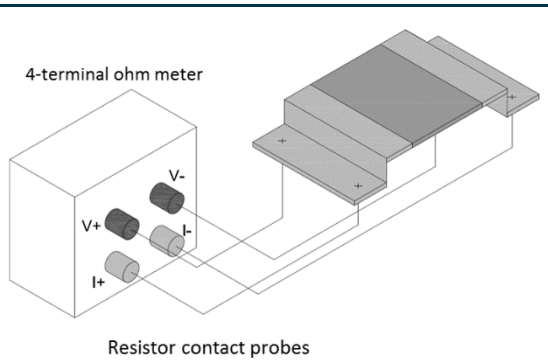
Pulse and Overload Performance



Measurement

Resistance testing for the LRMAP5930 is performed on the underside of the copper contacts using the following method.

Measurement current	≥2mΩ: 1A 0.2 to 1mΩ: 3A 0.1mΩ: 5A
Probe spacing along component length	13.2mm
Probe spacing across component width	3.65mm
Probe tip diameter	≤0.5mm



Processing

LRMAP5930 series resistors are suitable for IR reflow soldering. The recommended reflow profile for Pb-free soldering, for example using SAC387 alloy (Sn95.5%, Ag 3.8%, Cu 0.7%), is as follows:

Pre-heat: 30s to 45s at 180°C
Soldering: 20s to 40s at 210°C
Peak: 260°C

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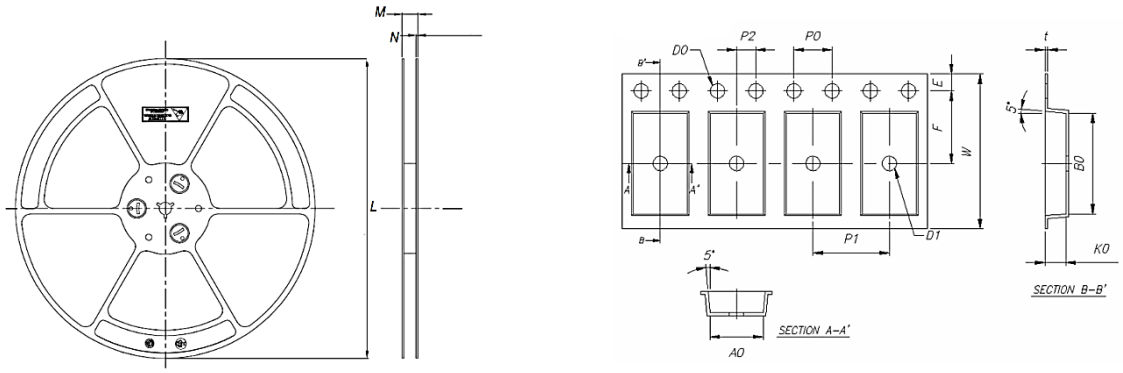
Packaging

LRMAP5930 resistors are packed in 24mm tape, 2000 pieces per reel.



All dimensions in mm

LRMAP5930 Type	L ±1	M ±1	N +0.3/ -0.1	W ±0.3	E ±0.1	F +0.1	D0 +0.1/ -0	D1 +0.1/ -0	P0 ±0.1	P1 ±0.1	P2 ±0.1	P0x10 ±0.2	t ±0.05	A0 +0.15/ -0.1	B0 ±0.12	K0 ±0.1
A-R0001 B-R0002 D-R0005	330	29	2.2	24	1.75	11.5	1.5	1.5	4	12	2	40	0.3	8.2	15.5	2.25
All remaining values																1.4

Ordering Procedure

Example: LRMAP5930B-R0002FT (0.2 milliohms ±1%, Pb-free)

L	R	M	A	P	5	9	3	0	B	-	R	0	0	0	2	F	T
1									2		3					4	5

1 Type	2 Alloy	3 Value	4 Tolerance	5 Packing
LRMAP5930	A	4 / 5 characters R = ohms	F = ±1%	T = plastic tape, 2000/reel
	B			
	C			
	D			

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