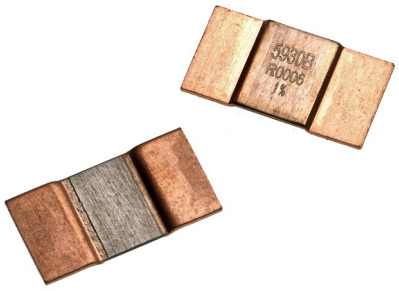
Low Resistance Metal Alloy Power Resistors

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 (RoHS3)

Electrical Data

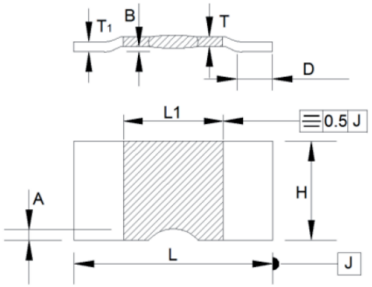
		LRMAP5930								
Alloy type		A	B				D	C		
Resistance value	mΩ	0.1	0.2	0.3	0.5	0.6	0.5	1	2	3
Power rating, P_{r140} [1]	W	10	10	7	6	5	7	6	4	3
Power rating, P_{rts70} [2]	W	15	15	10	8	8	10	9	7	5
Overload rating (5s) [1]	W	50	50	35	30	25	35	30	20	15
Continuous pulse energy	J	15	19	13	7.5	6	19	13	6.5	4.6
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



Marking

The component is laser marked with “5930”, alloy type, ohmic value and tolerance.

Solvent Resistance

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

Construction

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

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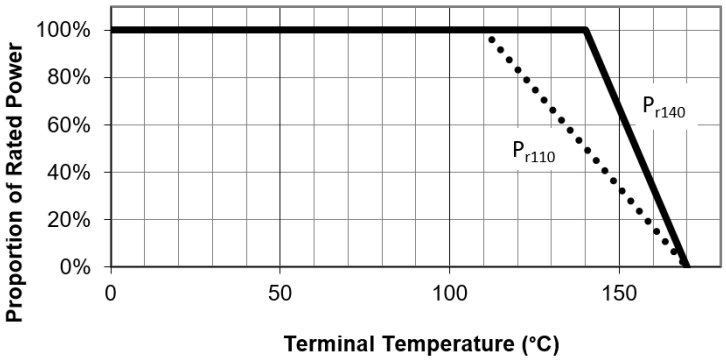
Performance Data

Test	Method	±ΔR%	
		Typical	Maximum
Load life stability	2000 hours, rated power, $T_{terminal}$ =110°	0.3	0.5
	2000 hours, rated power, $T_{terminal}$ =140°	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	

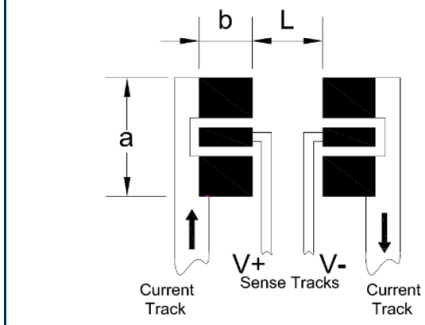
Thermal Data & Mounting

Temperature Derating



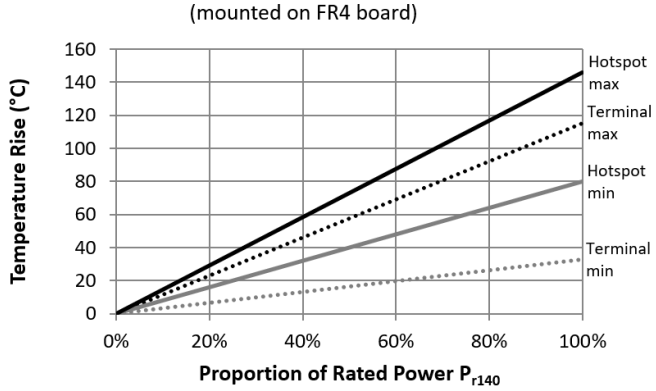
Nominal Mounting Pad Dimensions

a	b	L
8.75mm	5.2mm	5.6mm

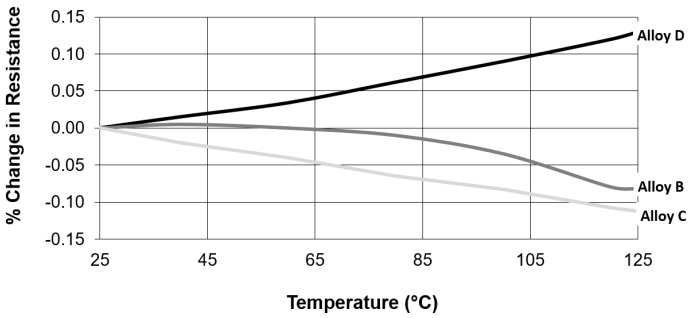


Typical Temperature Rise

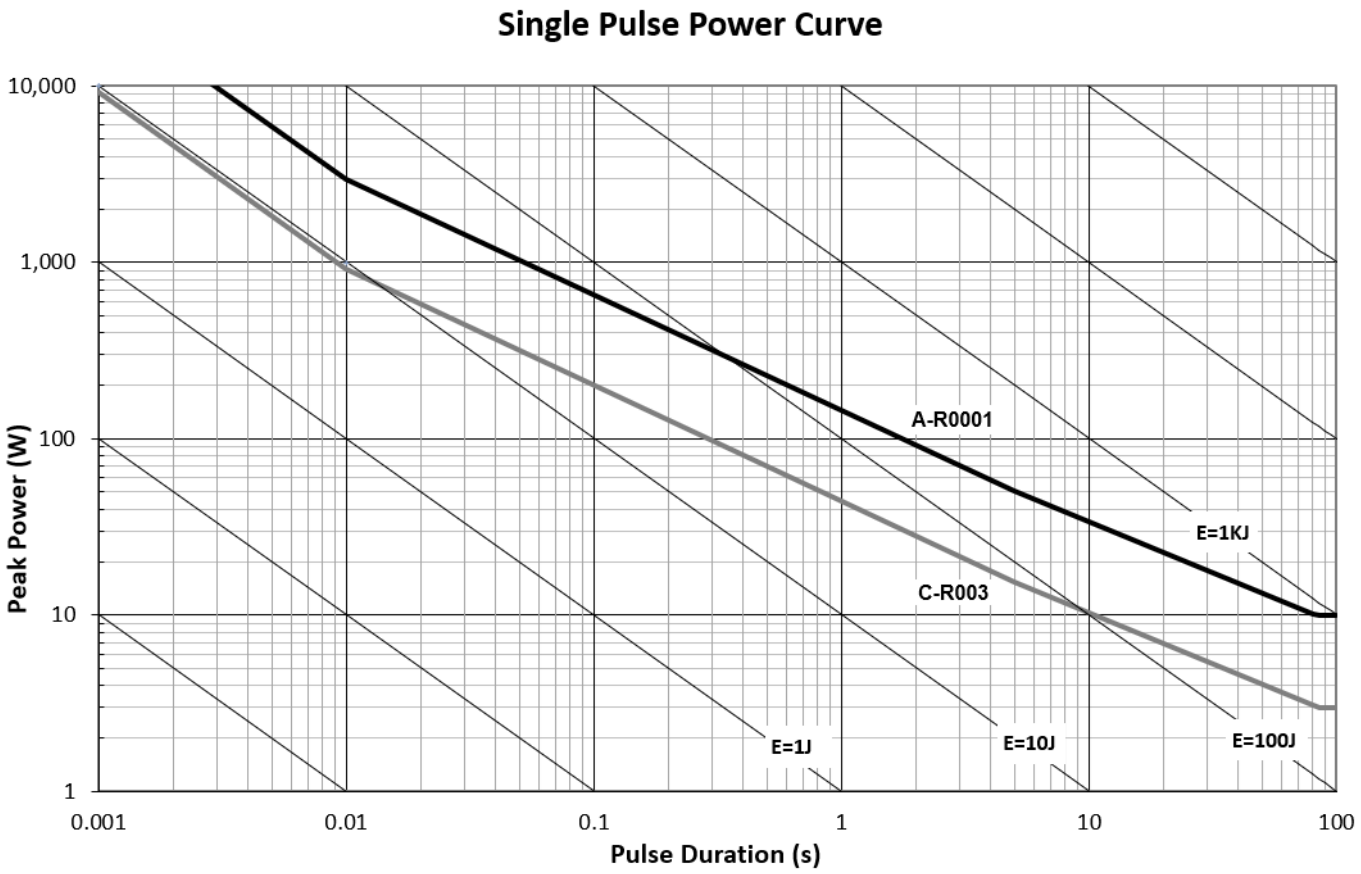
(mounted on FR4 board)



Typical Resistance - Temperature Characteristics



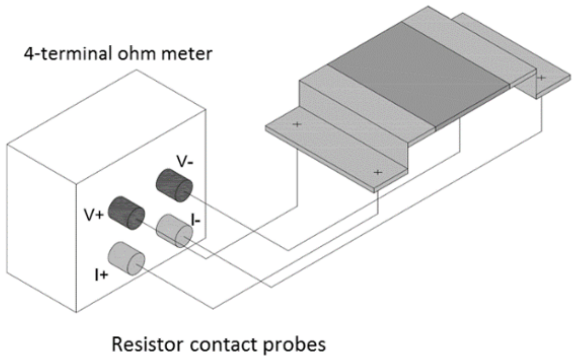
Pulse and Overload Performance



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



Resistor contact probes

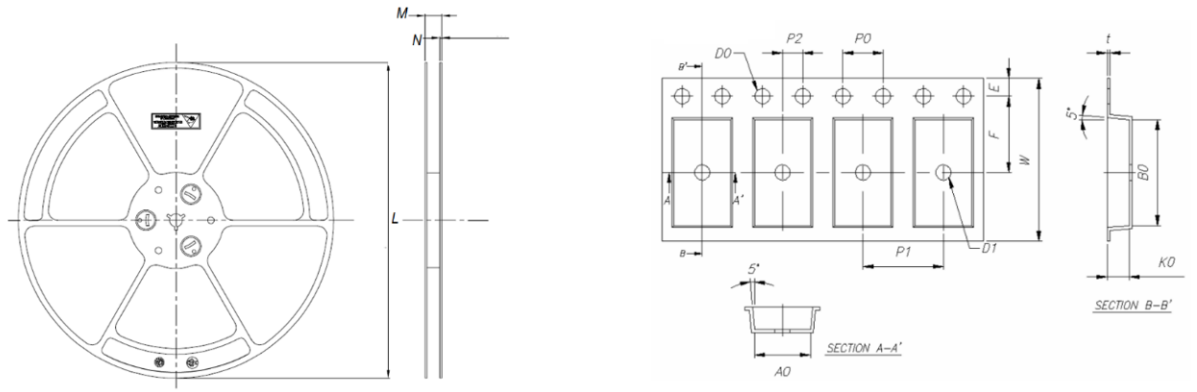
Soldering

LRMAP5930 series resistors are suitable for IR reflow soldering. The recommended reflow profile for Pb-free soldering, for example using SAC387 alloy (Sn 95.5%, 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

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			