

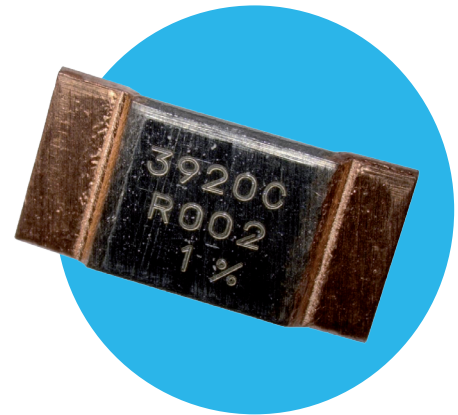
# Low Resistance Metal Alloy Power Resistors

## LRMAP3920

- Resistance range 0.2mΩ to 3mΩ
- Excellent long-term stability
- Standard power rating up to 5W
- Thermal substrate power rating up to 10W
- 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)



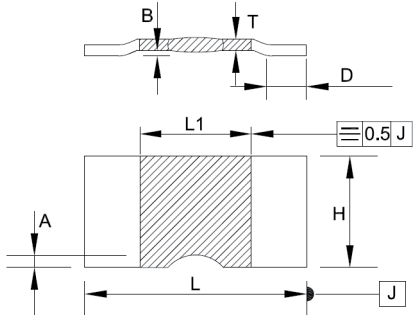
## Electrical Data

		LRMAP3920									
Alloy type		A		B				C			
Resistance value	mΩ	0.2	0.3	0.5	0.7	1	1	1.5	2	3	
Power rating (standard), $P_{r120}^1$	W	5				4	5	4.5	4	3	
Power rating (thermal substrate), $P_{rts70}^2$	W	10				7				5	
Overload rating (5s) <sup>1</sup>	W	25				20	25	23	20	15	
Continuous pulse energy	J	11	13	8	6	4	12	9	6	4	
Internal thermal impedance, $R_{thi}$	°C/W	2.5	4	6	9	12	7	11	14	17	
Resistance tolerance	%	1									
TCR (20 to 60°C)	ppm/°C	±200	±150	±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 mg									
Type	L ±0.3	L1 +0.2 -0.3	H +0.3 -0.2	A max	D ±0.5	B ±0.1	T nom	Wt. nom	
LRMAP3920A-R0002	10.0	5.0	5.2	0.6	2.0	0.5	1.50	694	
LRMAP3920B-R0003							1.43	608	
LRMAP3920B-R0005							0.85	380	
LRMAP3920B-R0007							0.62	271	
LRMAP3920B-R001							0.43	188	
LRMAP3920C-R001							1.36	542	
LRMAP3920C-R0015							0.90	361	
LRMAP3920C-R002							0.67	277	
LRMAP3920C-R003							0.45	180	

### Marking

The component is laser marked with "3920", 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 precision resistive strip. Various alloys are used based on the resistance value.

### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability.

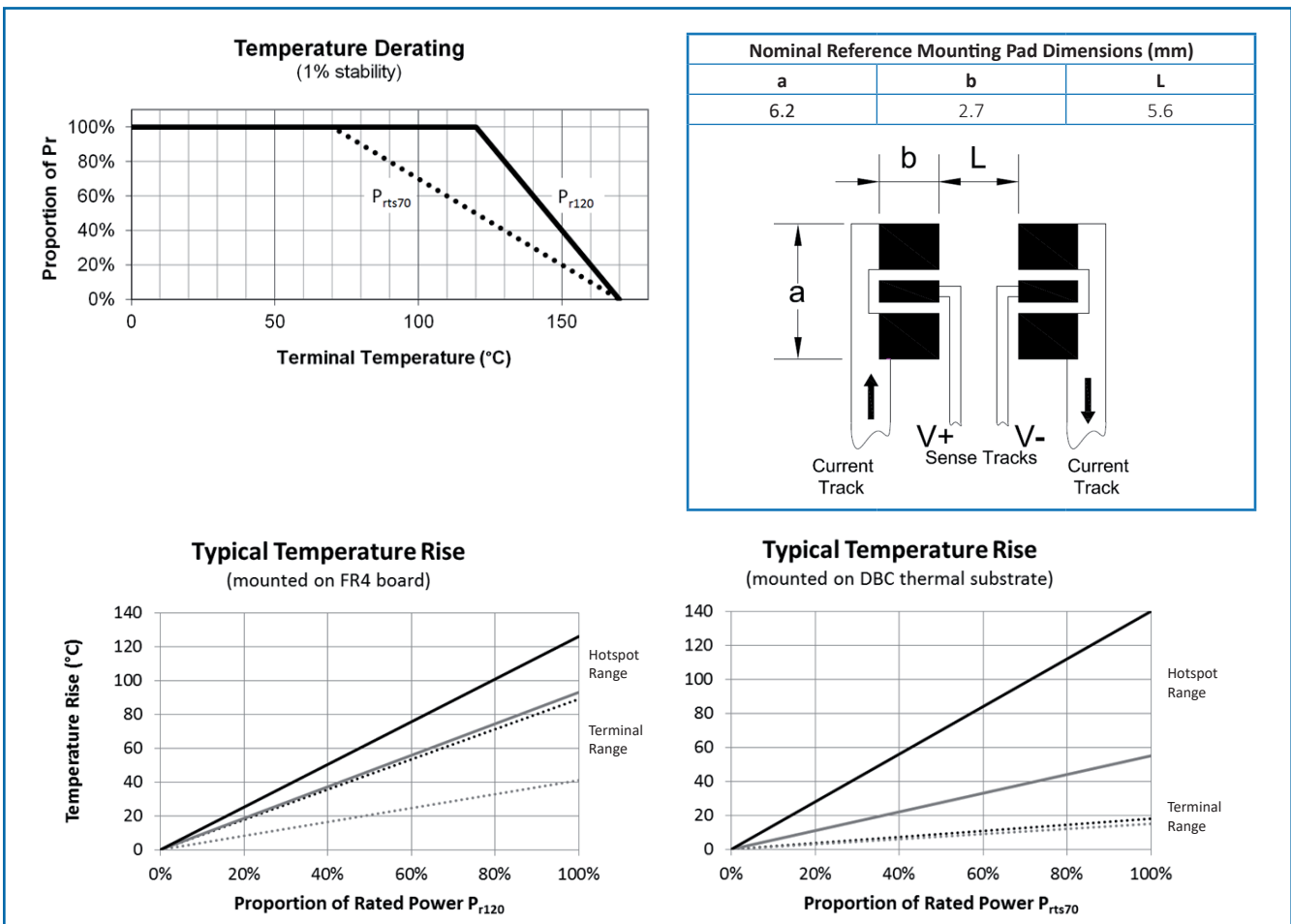
All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

LRMAP3920

## Performance Data

Test	Method	±DR%	
		Typical	Maximum
Load Life	1000 hours, cyclic load at $P_{r120}$	0.5	1.0
Short Term Overload	5 seconds, 5 x $P_{r120}$	0.1	0.5
High Temperature Exposure	1000 hours, 170°C	0.3	1.0
Temperature Cycle	1000 cycles, -55 to +125°C, 15 minute dwell	0.1	0.5
Low Temperature Storage	1000 hours, -55°C	0.1	0.2
Biased Humidity	1000 hours, 85°C, 85%RH	0.2	1.0
Moisture Resistance	MIL-STD-202 method 106	0.1	0.2
Vibration	MIL-STD-202 Method 204	0.1	0.2
Mechanical Shock	MIL-STD-202 Method 213	0.1	0.5
Board Flex	AEC Q200-005	No damage	
Terminal Strength	AEC Q200-006	No damage	
Resistance to Solder Heat	MIL-STD-202 Method 210	0.3	0.5
Solderability	J-STD-002	95% coverage	
Resistance to Solvents	MIL-STD-202 Method 215	No damage	

## Thermal Data & Mounting



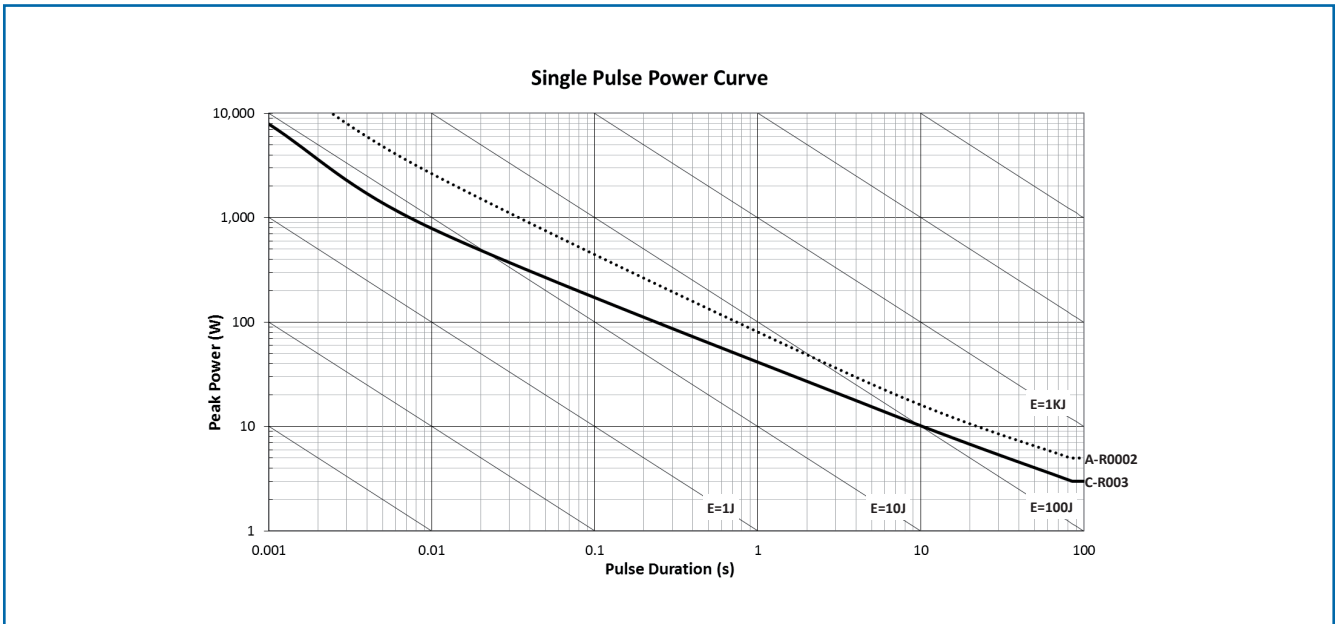
FR4 board details: 102x51mm, high  $T_g$  FR4 board with 70 $\mu$ m (2 ounce) inner and outer Cu planes or similar substrate, such that terminal temperature is maintained at  $\leq 120^\circ\text{C}$ .

Thermal substrate details: DBC or similar thermal substrate, such that terminal temperature is maintained at  $\leq 70^\circ\text{C}$ .

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## Pulse and Overload Performance



## Measurement

Resistance testing for the LRMAP3920 is performed on the underside of the copper contacts using the following method.

Measurement current	≥1.5mΩ: 1A <1.5mΩ: 3A	<p>4-terminal ohm meter</p> <p>Resistor contact probes</p>
Probe spacing along component length	8.80mm	
Probe spacing across component width	2.44mm	
Probe tip diameter	≤0.5mm	

## Processing

LRMAP3920 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 250°C
- Peak:** 260°C

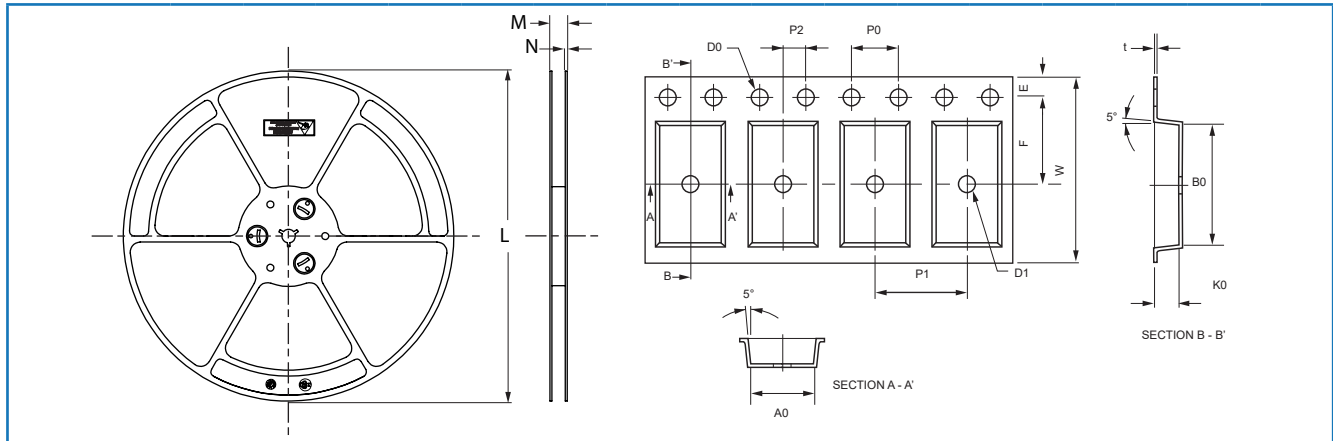
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LRMAP3920

## Packaging

LRMAP3920 resistors are packed in 16mm plastic tape, 3000 pieces per reel.

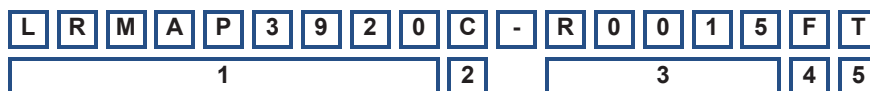


All dimensions in mm

LRMAP3920 Type	L	M	N	W	E	F	D0	D1	P0	P1	P2	P0x10	t	A0	B0	K0
	±1.00	±1.00	+0.30/ -0.10	+0.30/ -0.05	±0.10	+0.10	+0.10/ -0.0	+0.10/ -0.0	±0.10	±0.10	±0.10	±0.20	+0.15/ -0.10	+0.15/ -0.10	±0.13	±0.10
(B)-R001 (B)-R0007 (C)-R002 (C)-R003	330	21.4	2.0	16.00	1.75	7.50	1.50	1.50	4.00	8.00	2.00	40.00	0.30	5.55	10.47	1.25
All remaining values																2.20

## Ordering Procedure

Example: LRMAP3920C-R0015FT (1.5 milliohms ±1%, Pb-free)



1 Type	2 Alloy	3 Value	4 Tolerance	5 Packing
LRMAP3920	A	4 / 5 characters	F = ±1%	T = Plastic tape 3000/reel
	B	R = ohms		
	C			

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<http://moschip.ru/get-element>

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