

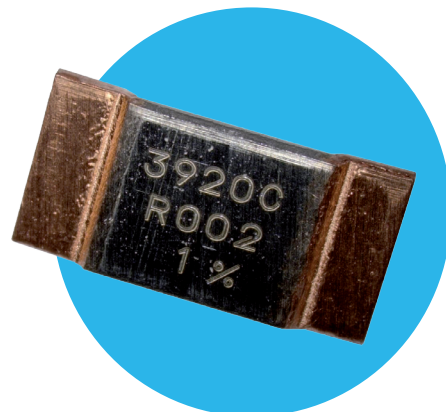
# Low Resistance Metal Alloy Power Resistors

## 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

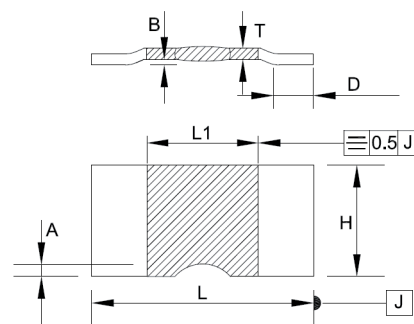
|                                                                   | LRMAP3920 |            |      |     |     |    |    |     |    |    |
|-------------------------------------------------------------------|-----------|------------|------|-----|-----|----|----|-----|----|----|
| Alloy type                                                        | A         | B          |      |     |     | C  |    |     |    |    |
| Resistance value                                                  | mΩ        | 0.2        | 0.3  | 0.5 | 0.7 | 1  | 1  | 1.5 | 2  | 3  |
| Power rating (standard), P <sub>r120</sub> <sup>1</sup>           | W         | 5          |      |     |     | 4  | 5  | 4.5 | 4  | 3  |
| Power rating (thermal substrate), P <sub>rt570</sub> <sup>2</sup> | 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 <sub>thi</sub>                      | °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<br>±0.3 | L1<br>+0.2<br>-0.3 | H<br>+0.3<br>-0.2 | A<br>max | D<br>±0.5 | B<br>±0.1 | T<br>nom | Wt.<br>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

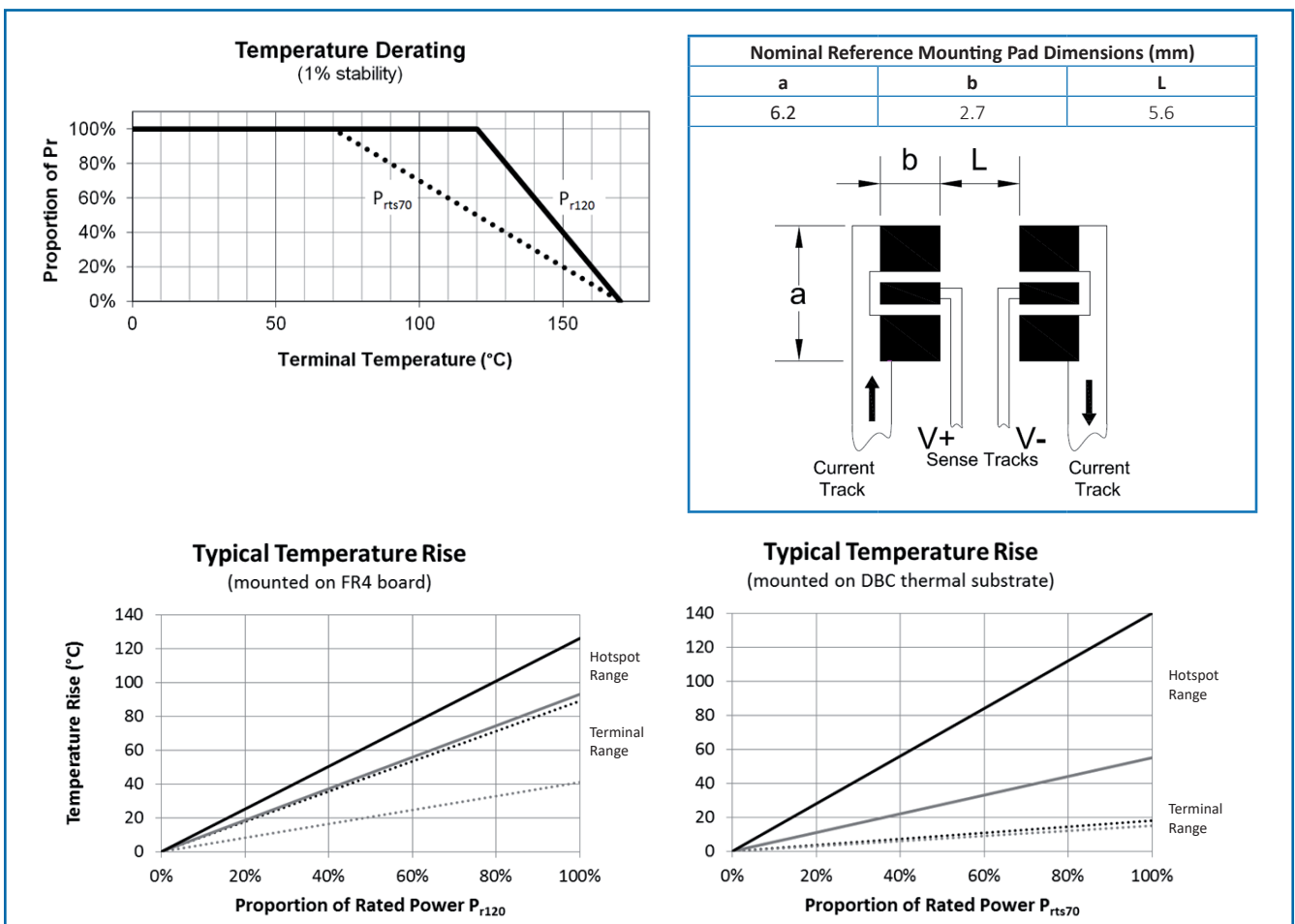
TT Electronics reserves the right to make changes in product specification without notice or liability.

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

## Performance Data

| Test                      | Method                                      | $\pm\Delta R\%$ |         |
|---------------------------|---------------------------------------------|-----------------|---------|
|                           |                                             | Typical         | Maximum |
| Load Life                 | 1000 hours, cyclic load at $P_{r120}$       | 0.5             | 1.0     |
| Short Term Overload       | 5 seconds, $5 \times P_{r120}$              | 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



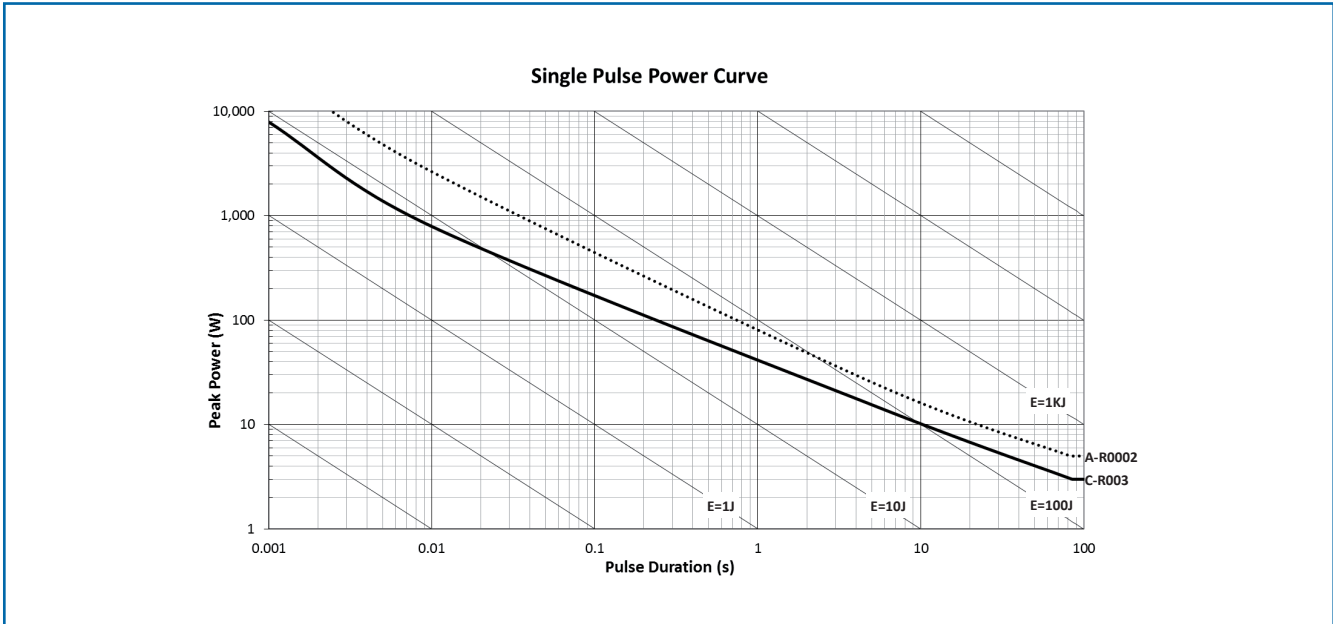
FR4 board details: 102x51mm, high  $T_g$  FR4 board with 70 $\mu$ m (2 ounce) inner and outer Cu planes or similar substrate, such that terminal temperature is maintained at  $\leq 120^\circ\text{C}$ .

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

### General Note

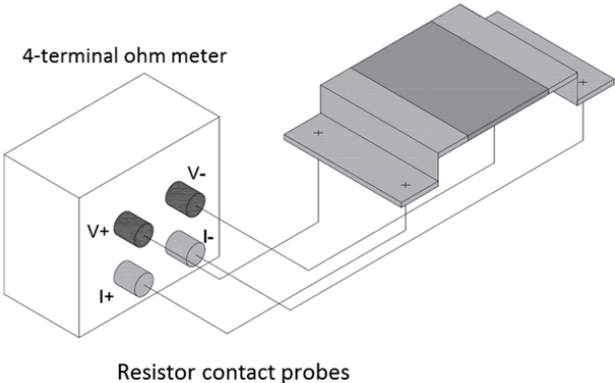
TT Electronics reserves the right to make changes in product specification without notice or liability.  
All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

## 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                  | $\geq 1.5\text{m}\Omega$ : 1A<br>$< 1.5\text{m}\Omega$ : 3A |  <p style="text-align: center;">4-terminal ohm meter</p> <p style="text-align: center;">Resistor contact probes</p> |
| Probe spacing along component length | 8.80mm                                                      |                                                                                                                                                                                                         |
| Probe spacing across component width | 2.44mm                                                      |                                                                                                                                                                                                         |
| Probe tip diameter                   | $\leq 0.5\text{mm}$                                         |                                                                                                                                                                                                         |

## 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

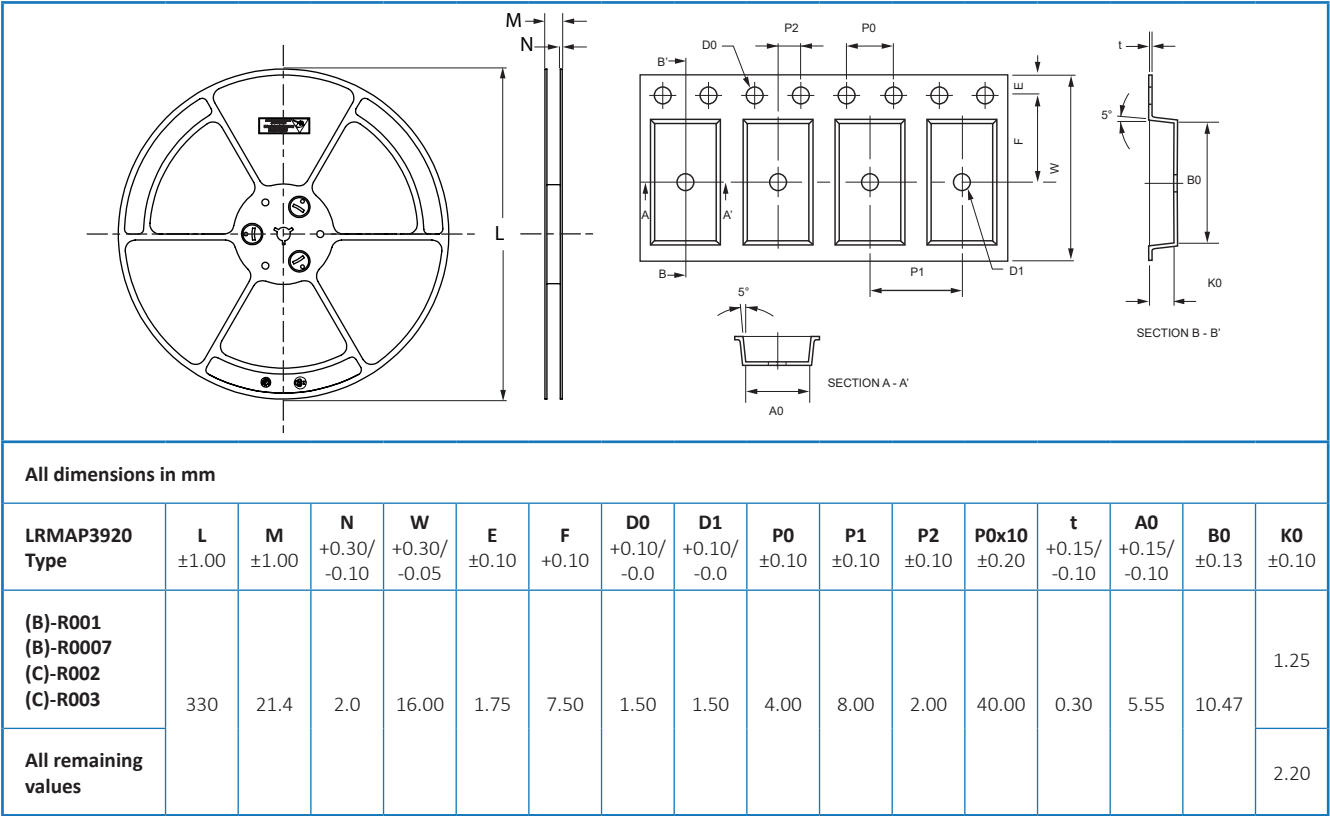
### General Note

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

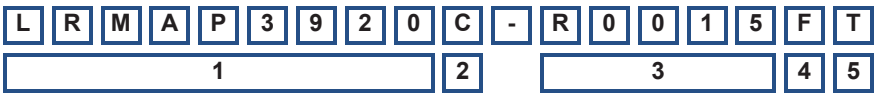
Packaging

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



Ordering Procedure

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



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

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.

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

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

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9