

# MST

## SMD current sensing resistor- metal strip



### Applications

- Switched-mode power supply (SMPS)
- Voltage regulator module
- Power management
- Stepper motor drives

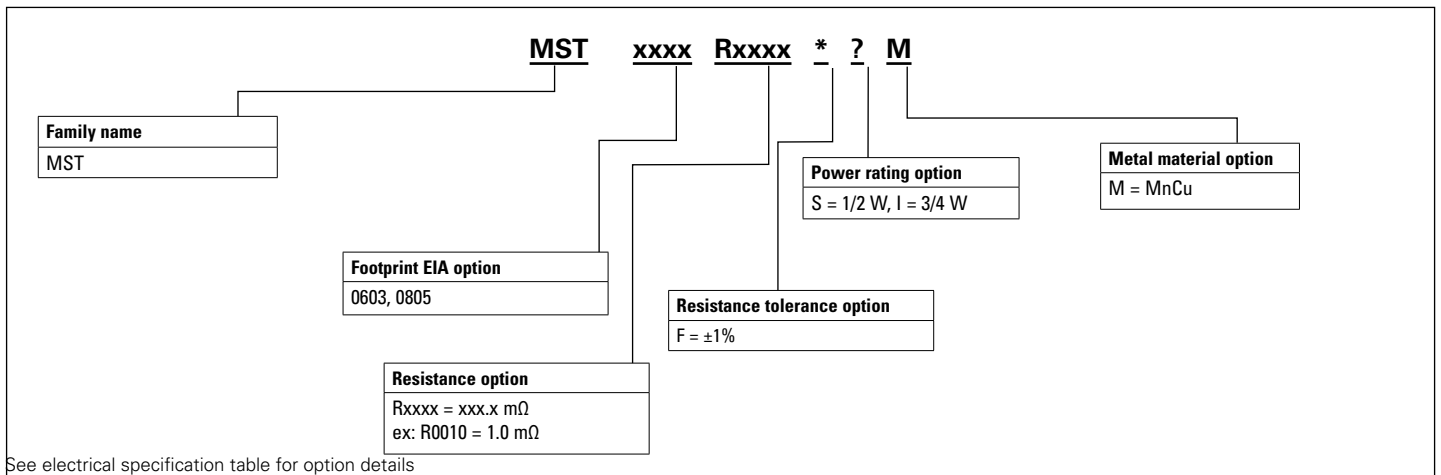
### Environmental compliance



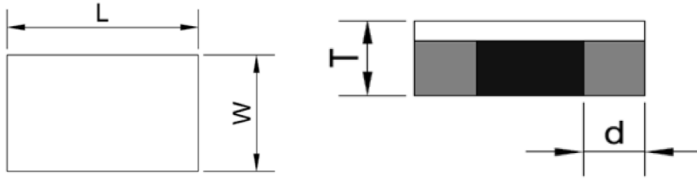
### Product features

- Low sensing resistance
- 0603 (1608 metric) to 0805 (2013 metric)
- High power dissipation
- Moisture sensitivity level (MSL): 1

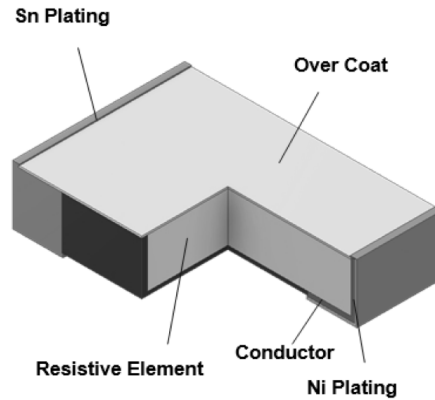
**Table 1. Part numbering configuration scheme**



**Mechanical parameters- Inches [mm]**

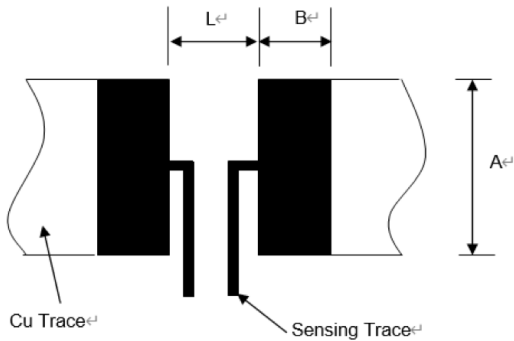


**Construction**



Family	Size code	L	W	d	T
MST0603 R = 1	0603 [1608]	0.063 ± 0.006 [1.60 ± 0.15]	0.031 ± 0.008 [0.08 ± 0.20]	0.024 ± 0.008 [0.60 ± 0.20]	0.016 ± 0.004 [0.40 ± 0.10]
MST0603 R > 1	0603 [1608]	0.063 ± 0.006 [1.60 ± 0.15]	0.031 ± 0.008 [0.08 ± 0.20]	0.014 ± 0.008 [0.35 ± 0.20]	0.016 ± 0.004 [0.40 ± 0.10]
MST0805 R ≤ 2	0805 [2013]	0.081 ± 0.006 [2.05 ± 0.15]	0.051 ± 0.008 [1.30 ± 0.20]	0.014 ± 0.008 [0.35 ± 0.20]	0.016 ± 0.004 [0.40 ± 0.10]
MST0805 R > 2	0805 [2013]	0.081 ± 0.006 [2.05 ± 0.15]	0.051 ± 0.008 [1.30 ± 0.20]	0.014 ± 0.008 [0.35 ± 0.20]	0.010 ± 0.004 [0.25 ± 0.10]

**Recommended PCB layout- mm**



Family	Resistance (mΩ)	A	L	B
MST0603	R = 1	1.0	0.45	0.75
MST0603	R > 1	1.0	0.80	0.75
MST0805	1.5 ≤ R ≤ 3	1.4	0.80	1.2

1. The copper foil minimum thickness of PCB needs 3 oz.
2. PCB layout dimension tolerance is +/-0.1 mm.
3. The resistance will change slightly after soldered; it is dependent on PCB pad size design and it's necessary to consider the effect of the resistance increase or decrease.

**Part marking**

Family	Marking
MST0603	No marking
MST0805	

**Electrical specifications**

Part number	Size	Resistance value mΩ (Part number code)	Resistance tolerance (Part number code)	Power rating (Part number code)	TCR (ppm/°C)	Operating temperature
MST0603Rxxxx*?M	0603 (1608 metric)	1 (0010)	±1% (F)	1/2 W (S)	± 50	-55 °C to +155 °C
MST0603Rxxxx*?M	0603 (1608 metric)	2 (0020)	±1% (F)	1/2 W (S)	± 50	-55 °C to +155 °C
MST0805Rxxxx*?M	0805 (2013 metric)	1.5 (0015)	±1% (F)	3/4 W (I)	± 50	-55 °C to +155 °C
MST0805Rxxxx*?M	0805 (2013 metric)	2 (0020)	±1% (F)	3/4 W (I)	± 50	-55 °C to +155 °C
MST0805Rxxxx*?M	0805 (2013 metric)	3 (0030)	±1% (F)	3/4 W (I)	± 50	-55 °C to +155 °C

Rxxxx = Enter resistance code option from table above xxx= resistance code (xxx.x mΩ ex: R0010 = 1.0 mΩ)

\*= Enter resistance tolerance code option from table above (F= ±1%)

?= Enter power rating code option from table above (S = 1/2W, I = 3/4W)

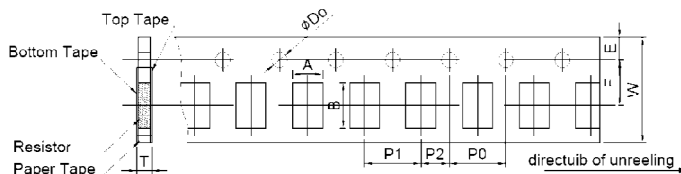
M= MnCu (Metal material)

**Packaging information- mm**

Supplied in tape and reel on a 7.0" diameter reel (EIA-481 compliant)

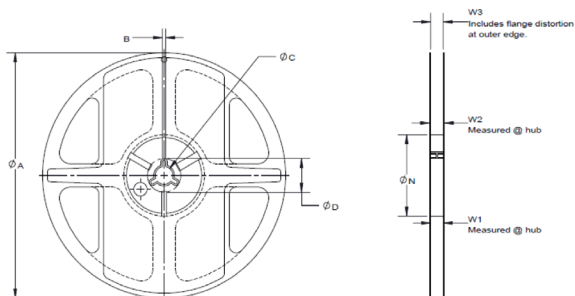
Size	Tape	Quantity
0603	7 inch paper	5K
0805	7 inch paper	5K

**Tape carrier and dimensions**



Dimension	0603	0805
E	1.75 ± 0.1	1.75 ± 0.1
F	3.5 ± 0.05	3.5 ± 0.05
P2	2.0 ± 0.1	2.0 ± 0.1
D0	1.50 ± 0.1	1.50 ± 0.1
P0	4.0 ± 0.1	4.0 ± 0.1
W	8.0 ± 0.1	8.0 ± 0.2
P1	4.0 ± 0.1	4.0 ± 0.1
A0	1.1 ± 0.1	1.6 ± 0.15
B0	1.9 ± 0.1	2.4 ± 0.2
T	0.64 ± 0.1	0.64 ± 0.1

**Reel dimensions-mm**



Size	A	B	C	D	N	W1	W2	W3
0603	178 ± 2.0	3.5 ± 0.5	13.0 ± 1.0	na	60 ± 1.0	9.0 ± 1.0	11.4 ± 1.0	na
0805	178 ± 2.0	3.5 ± 0.5	13.0 ± 1.0	na	60 ± 1.0	9.0 ± 1.0	11.4 ± 1.0	na

### General specifications

Temperature coefficient of resistance: IEC 60115-1-4.8 JIS-C5201-4.8 +25 ° to +125 °C

Short time overload: IEC60115-1-4.13 JIS-C5201-4.13 5 X rated power for 5 s

Load life: IEC60115-1-4.25.1 JIS-C5201-4.25.1 1000 hours at rated power , +70 °C, 1.5 hours "ON ", 0.5 hours "OFF"

Load life with humidity: IEC60115-1-4.24 JIS-C5201-4.24 1000 hours at rated power , +40 °C ± 2 °C, 90-95% RH 1.5 hours "ON ", 0.5 hours "OFF"

Temperature cycling: IEC60115-1-4.19 JIS-C5201-4.19 -55 °C (30 minutes ) / +125 °C (30 minutes ) 1000 cycles

Resistance to soldering heat: IEC60115-1-4.18 JIS-C5201-4.18 +260 °C ± 5 °C solder , 10 seconds ± 1 second dwell .

Solderability: IEC60115-1-4.17 JIS-C5201-4.17 +245 °C ±5 °C solder, 2 seconds ±0.5 seconds dwell.

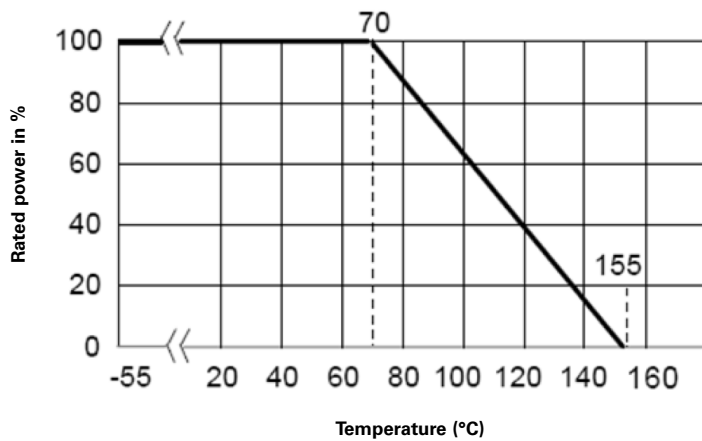
Board flex: IEC60115-1-4.33 JIS-C5201-4.33 Bending width 2 mm

High temperature exposure: IEC60115-1-4.23.2 JIS-C5201-4.23.2 +155 °C , 1000 hours

Low temperature storage: EC60115-1- 4.23.4 JIS-C5201-4.23.4 -55 °C, 1000 hours

Insulation Resistance: IEC60115-1-4.6 JIS-C5201-4.6 100 V DC for 1 minute

### Temperature derating curve



### Rated current & voltage

The rated Current and Voltage are calculated by the following formula:

$$I = \sqrt{P \div R}$$

$$V = \sqrt{P \times R}$$

I: Rated current (A)

V: Rated voltage (V)

P: Rated power (W)

R: Resistance value (Ω)

Solder reflow profile

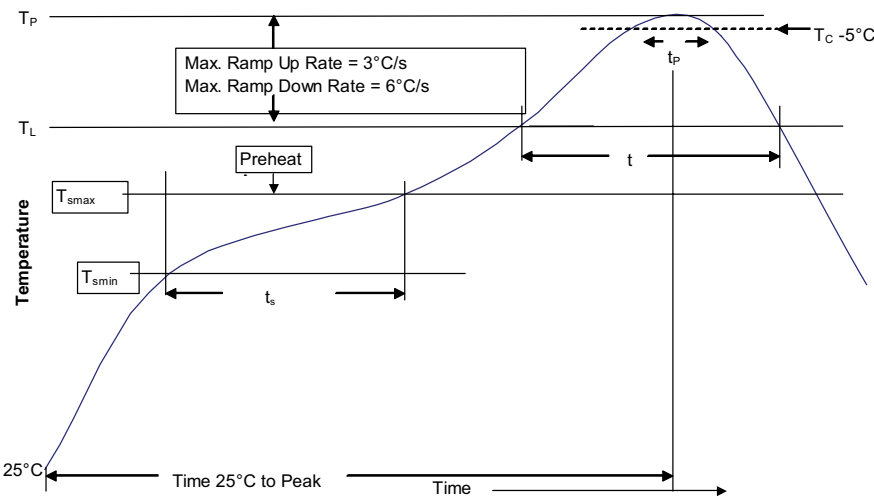


Table 1 - Standard SnPb solder (T<sub>C</sub>)

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T<sub>C</sub>)

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak		
• Temperature min. (T <sub>smin</sub> )	100 °C	150 °C
• Temperature max. (T <sub>smax</sub> )	150 °C	200 °C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 seconds	60-150 seconds
Ramp up rate T <sub>L</sub> to T <sub>p</sub>	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T <sub>L</sub> )	183 °C	217 °C
Time (t <sub>L</sub> ) maintained above T <sub>L</sub>	60-150 seconds	60-120 seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )* within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 seconds*	10 seconds*
Ramp-down rate (T <sub>p</sub> to T <sub>L</sub> )	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

\* Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

**Eaton**  
Electronics Division  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
Eaton.com/electronics

© 2022 Eaton  
All Rights Reserved  
Printed in USA  
Publication No. ELX1184 BU-ELX22044  
June 2022

Eaton is a registered trademark.

All other trademarks are property of their respective owners.

Follow us on social media to get the latest product and support information.

