MST

SMD current sensing resistor- metal strip

Applications

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

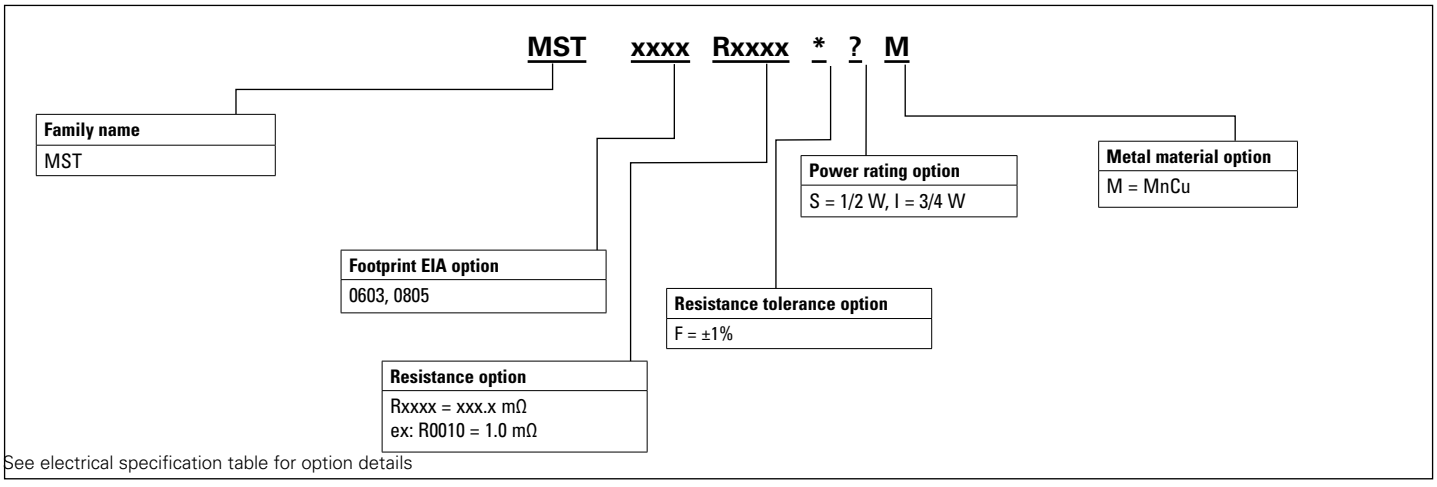
Product features

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

Environmental compliance

Pb HALOGEN HF FREE RoHS

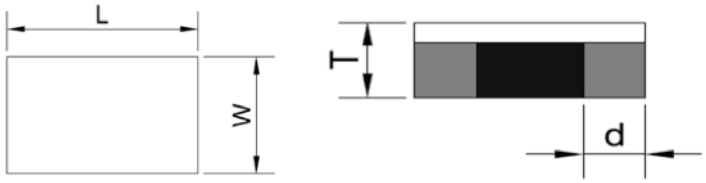
Table 1. Part numbering configuration scheme



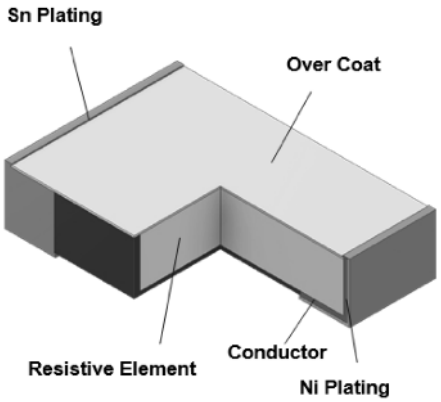
See electrical specification table for option details

Powering Business Worldwide

Mechanical parameters- Inches [mm]

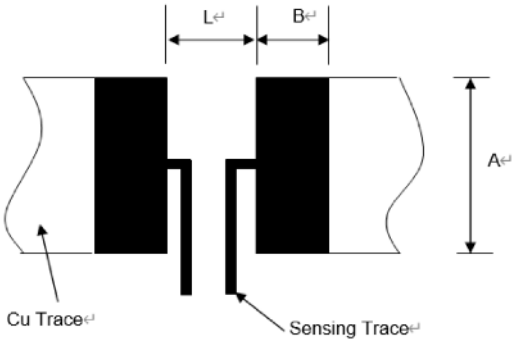


Construction



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 deign 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

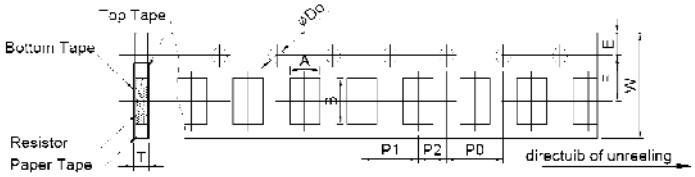
Rxxxx = Enter resistance code option from table above xxxx= resistance code (xxx.x mΩ ex: R0010 = 1.0 mΩ)
*= Enter resistance tolerance code option from table above (F= ±1%)
?= Enter power rating code option from table above (S = 1/2W, I = 3/4W)
M= MnCu (Metal material)

Packaging information- mm

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

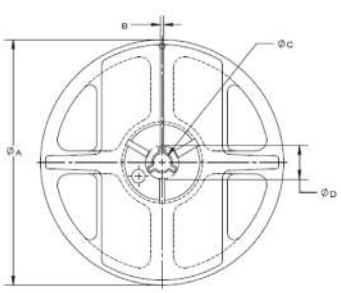
Size	Tape	Quantity
0603	7 inch paper	5K
0805	7 inch paper	5K

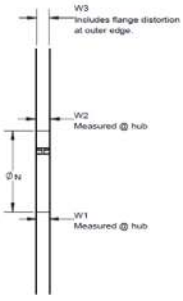
Tape carrier and dimensions



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



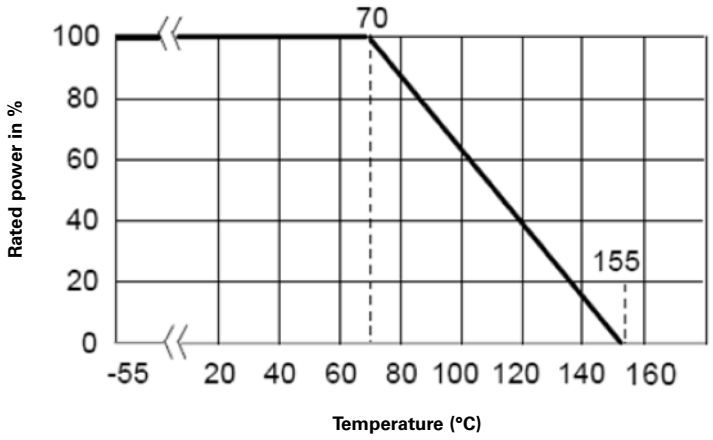


Size	A	B	C	D	N	W1	W2	W3
0603	178 ± 2.0	3.5 ± 0.5	13.0 ± 1.0	na	60 ± 1.0	9.0 ± 1.0	11.4 ± 1.0	na
0805	178 ± 2.0	3.5 ± 0.5	13.0 ± 1.0	na	60 ± 1.0	9.0 ± 1.0	11.4 ± 1.0	na

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

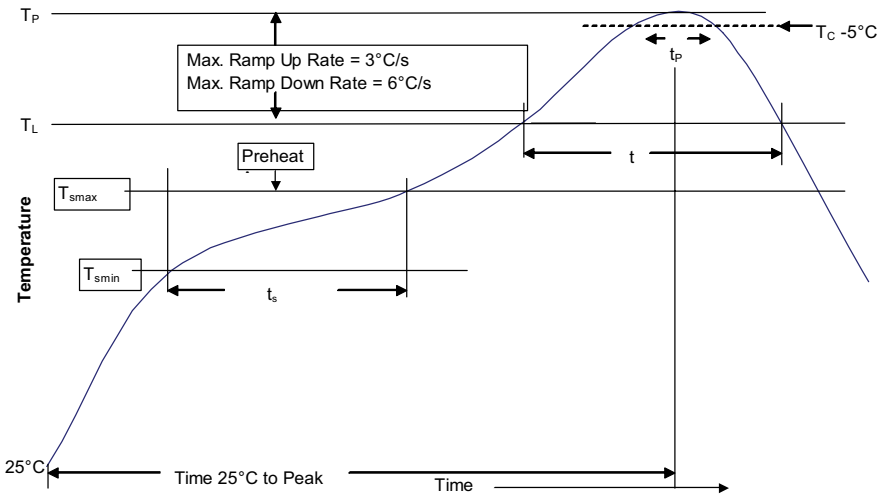


Table 1 - Standard SnPb solder (T_C)

Package thickness	Volume mm3 <350	Volume mm3 ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder (T_C)

Package thickness	Volume mm^3 <350	Volume mm^3 350 - 2000	Volume mm^3 >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_{smin})	100 °C	150 °C
	• Temperature max. (T_{smax})	150 °C	200 °C
	• Time (T_{smin} to T_{smax}) (t_S)	60-120 seconds	60-150 seconds
Ramp up rate T_L to T_p		3 °C/ second max.	3 °C/ second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L		183 °C 60-150 seconds	217 °C 60-120 seconds
Peak package body temperature (T_P)*		Table 1	Table 2
Time (t_p)* within 5 °C of the specified classification temperature (T_C)		20 seconds*	10 seconds*
Ramp-down rate (T_p to T_L)		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_p) is defined as a supplier minimum and a user maximum.

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