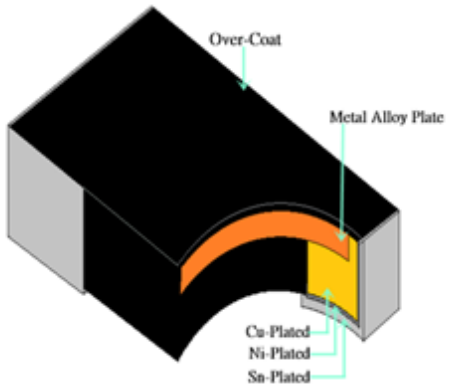
■ Metal Alloy Low Resistance Chip Resistor — MA Series



■ Application

— Entertainment
— Power supply
— Measuring instrument
— Industrial
— Battery management system

■ Features

— Low Resistance / Low TCR
— Excellent long term stability
— RoHs compliant and halogen free
— Lead free
— High precision current sensing and voltage division

■ Parts Number Explanation

■ Example:

MA	0805	10	F	R001	S	Z
Product Type	Size (Inch)	Rated Power	Tolerance	Resistance	Material	Optional
	0805	10=1.00W 05=0.50W	F：±1% G：±2% J：±5%	2m50= 2.5 mR R000= 0 mR R010= 10 mR	S：MnCuSn M：MnCu F：FeCrAl C：Cu	Z : default code

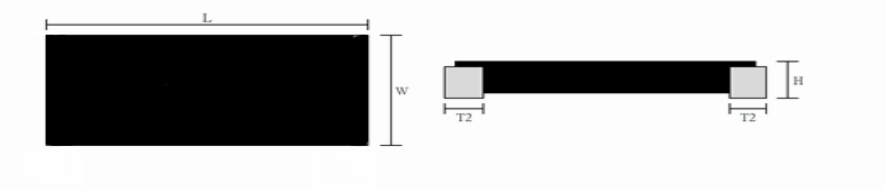
■ Standard Electrical Specifications

Type	Rating Power at 70℃	T.C.R. (ppm/℃)	Max. Rating Current	Max. Overload Current	Resistance Range (mΩ)		Material	Operating Temperature Range (℃)
					0.5% (D)	1.0% (F) 2.0% (G) 5.0% (J)		
MA0805	0.5W	≦±100	31.62A	70.71A	---	0.5	R0005~R002: MnCuSn R0025~R008: MnCu R009~R015: FeCrAl	- 55 ~ + 170
		≦±75	18.26A	40.82A	---	1~2		
		≦±50	14.14A	31.62A	7~15	2.5~15		
	1W	≦±100	44.72A	89.44A	---	0.5		
		≦±75	25.81A	51.63A	---	1~2		
		≦±50	20.0A	40.0A	7~15	2.5~15		

■ Jumper Specifications

Type	Rating Power at 70℃	Max. Rating Current	Resistance (mΩ)	Material	Operating Temperature Range (℃)
MA0805	0.5W	50A	≦0.20	Jumper：Cu	-55~+170°C
	1W	70.7A	≦0.20		

■ Type Dimension



■ Dimension

Unit：mm

Type	Power Rating	Resistance Range	L	W	H	T2
MA0805	0.5W & 1 W	0.5mΩ	2.05±0.25	1.30±0.30	0.60±0.20	0.75±0.20
		1mΩ			0.55±0.20	0.40±0.20
		1.5mΩ			0.45±0.20	
		2mΩ			0.35±0.20	
		2.5mΩ			0.45±0.20	
		3~8mΩ			0.35±0.20	
		9~13mΩ			0.37±0.20	
		14~15mΩ			0.32±0.20	

■ Jumper Dimension

Unit：mm

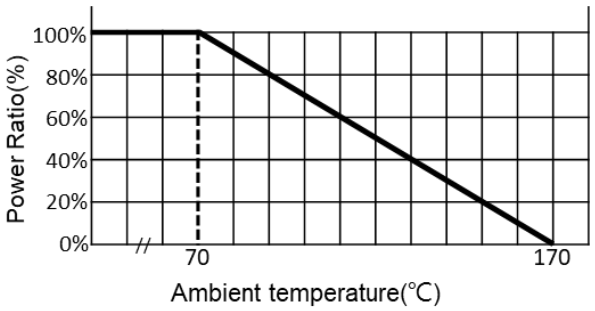
Type	Power Rating	Resistance Range	L	W	H	T2
MA0805	0.5W & 1 W	≦0.20	2.05±0.25	1.300±0.30	0.45±0.20	0.40±0.20

■ Performance Characteristics

Power Derating Curve

The Operating Temperature Range: -55°C ~+170°C.

For resistors operated in ambient temperatures above 70°C, power rating must be derating in accordance with the curve below



Rating Current

The following equation may be used to determine the DC (Direct Current) or AC (Alternating Current) (RMS, root mean square value) of normal rated power. However, if the result value exceeds the highest current of regulated standards (paragraph 5), the highest normal rated power is to be used

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

I = Rating current (A)
P= Rating Power (W)
R= Resistance(Ω)

■ Marking Format

MA0805 products no marking.

■ Reliability test and requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	At 25℃ /+150℃, 25℃ is the reference temperature	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	The number of rated power are as follows: ● MA0805-0.5W: 5 times of rated power ● MA0805-1W: 4 times of rated power Rating power duration: 5secs	ΔR/R1≦±1.0%
High Temperature Exposure (Storage)	MIL-STD-202 Method 108	1000 hrs. @ T=170°C. Unpowered. Measurement at 24±4 hours after test conclusion.	ΔR/R1≦±1.0%
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260±5℃ for 10 seconds.	ΔR/R1≦± 0.5%
Temperature Cycling	JESD22 Method JA-104	1000 Cycles (-55°C to +155°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme.	ΔR/R1≦± 0.5%
Biased Humidity	MIL-STD-202 Method 103	1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24±4 hours after test conclusion.	ΔR/R1≦± 0.5%
Load Life (Endurance)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70±2℃, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs〝ON〞and 0.5 hr〝OFF〞.	ΔR/R1≦±1.0%
Solderability	J-STD-002	(1) 4 hrs 155℃ dry heat (2) 245±5℃ 3 sec.	>95% coverage
Dielectric Withstanding Voltage	JIS-C5201-1 clause 4.7	Applied 500VAC for 1 minute, and Limit surge current 50 mA (max.)	No short or burned on the appearance.
Board Flex	AEC Q200-005	Beading once for 60 seconds 0805:2mm	△R/R1≦± 0.5% No broken
Terminal Strength (SMD)	AEC Q200-006	Pressurizing force 17.7N for 60 seconds	△R/R1≦± 0.5% No broken
Moisture Resistance	MIL-STD 202 Method 106	T=24 hours / Cycle ,10Cycles . Steps 7a& 7b not required. Unpowered .(Figure 1)	ΔR/R1≦± 1.0%

■ For Jumper

Test Item	Test Method	Procedure	Requirements
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	4 times of rated power for 5 seconds.	≦0.2mΩ
Temperature Cycling	JESD22 Method JA-104	1000 Cycles (-55°C to +155°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme.	≦0.2mΩ
High Temperature Exposure	JIS-C5201-1 4.25 IEC 60068-2-2	At 170℃ for 1000 hours.	≦0.2mΩ
Biased Humidity	MIL-STD-202 Method 103	1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24±4 hours after test conclusion.	≦0.2mΩ
Load Life (Endurance)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70±2℃, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs〝ON〞and 0.5 hr〝OFF〞.	≦0.2mΩ
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17	245±5℃ for 3 seconds.	>95% coverage

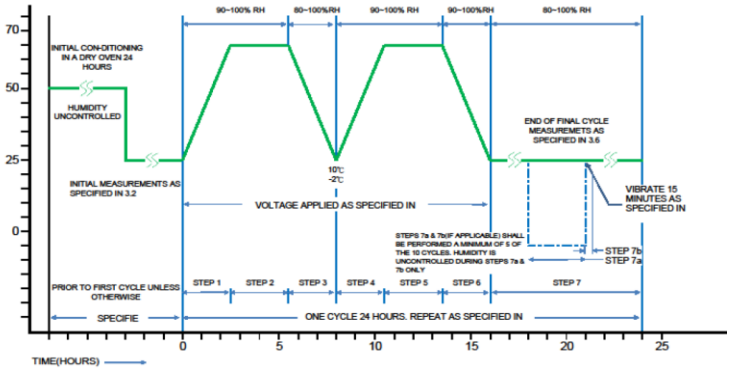
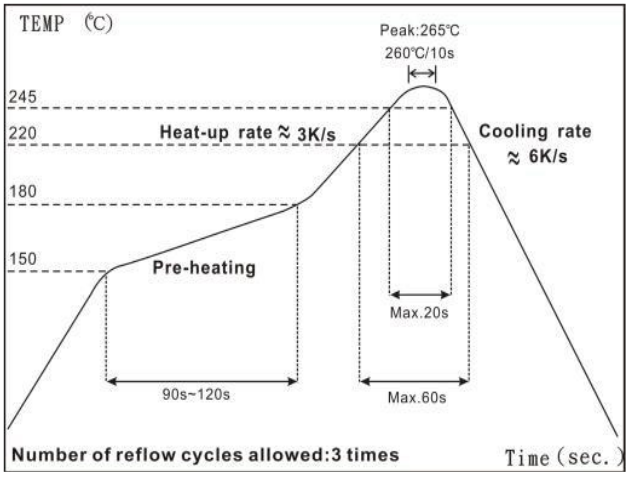
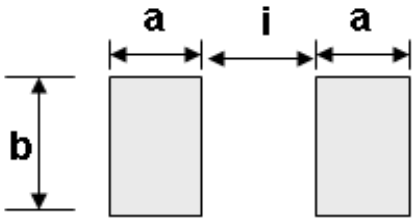


Figure 1

■ Soldering Profile



■ Recommend Land Pattern Design



■ Dimension

Unit: mm

Type	Resistance Range	a	b	i
MA0805- 0.5W&1W	0.5mΩ	1.35	1.80	0.3
	0 / 1~15mΩ	1.00	1.80	1.00

■ Packing Quantity

Type	PCS /Reel
MA0805	5000

■ Plating Thickness:

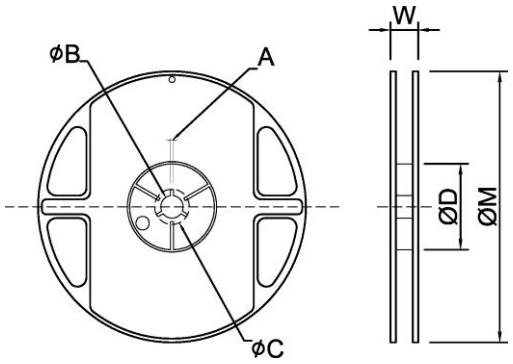
Ni:≧2μm

Sn(Tin):≧3μm

■ Appendix For SMD Chip Resistor

● Packaging Information

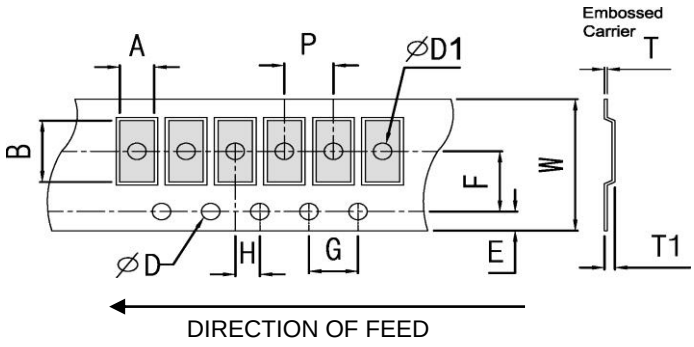
■ Reel Dimensions



Unit: mm

Reel Type / Tape	A	ΦB	ΦC	ΦD	W	ΦM
7" reel for 8 mm embossed (for MA0805)	2.0±0.5	13.2±0.5	17.7±0.5	60.0±0.5	12.0±0.5	178±1.0

■ Embossed Dimensions



Unit: mm

Item	Resistance Range (mΩ)	W	P	E	F	ΦD	ΦD1	G	H	A	B	T1	T
MA0805	0.5mΩ~1mΩ	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	$1.50^{+0.1}_{-0}$	1.0±0.10	4.0±0.10	2.0±0.10	1.70±0.10	2.45±0.10	0.90±0.25	0.20±0.05
	0mΩ/ 1.5mΩ~15mΩ	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	$1.50^{+0.1}_{-0}$	1.0±0.10	4.0±0.10	2.0±0.10	1.70±0.10	2.45±0.10	0.55±0.25	0.20±0.05

■ Storage Temperature

Storage time at the environment temp: 25±5℃& humidity: 60±20% is valid for two years.