SUPER DARTER

承認書

SPECIFICATION FOR APPROVAL

客戶名稱: 鈺緯科技開發股份有限公司

日期: 2024-03-01

系列: MA1206-MA4527 Low Ohm Chip Res

MA1206-MA4527 0.75W~2W 0.00025R~0.1R , ±0.5%~±5%

Brand Name: EVEROHMS

Approval By:

承認印:

達而特企業股份有限公司 統一發票專用章 台北市 南港區 統一編號 23742666 負責人:朱榮輝 TEL:27892766 南港路3段80巷26號2F

達而特企業股份有限公司
SUPER DARTER CORPORATION
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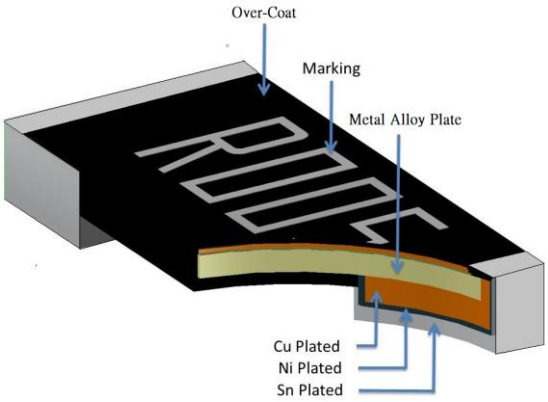
項次	料　　號	原廠料號	規　　格
1	3RC005CFB7E	MA251230FR005MZ	2512 0.005R +-1% 3W Metal 合金



■ Metal Alloy Low Resistance Chip Resistor — MA Series



■ Application

— Entertainment product

— Power supply

— Measuring instrument

— Industrial product

— 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.

— ACE-Q200 qualified available.

■ Parts Number Explanation

■ Example:

MA	2512	20	F	R001	M	Z
Product Type	**Size (Inch)**	**Rated Power**	**Tolerance**	**Resistance**	**Material**	**Optional**
	1206 2512 2725 2728 4527	07=0.75W 10=1.00W 20=2.00W 30=3.00W 40=4.00W 50=5.00W	D：±0.5% F：±1% G：±2% J：±5%	0m20=0.2mR 2m50=2.5mR R000=0mR R005=5.0mR R100=100mR R500=500mR	S：MnCuSn M：MnCu F：FeCrAl C：Cu	A: For Automotive Electronics

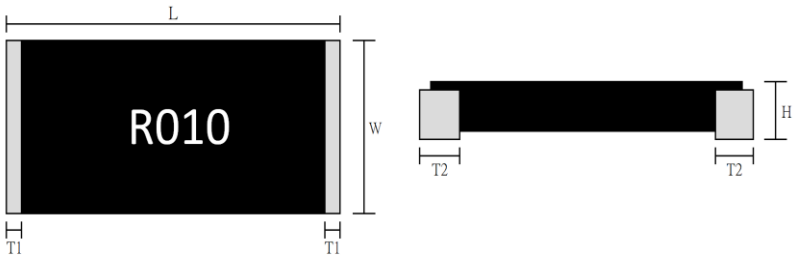
■ Standard Electrical Specifications

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)		
MA1206	0.75W	≦±50	3.83A	7.66A	51~100	51~100	R051~R100：FeCrAl	- 55 ~ + 170
	1W		31.62A	63.25A	7~50	1~50	R001：MnCuSn R002~R007：MnCu R008~R050：FeCrAl	
MA2512	1W		44.72A	100.00A	7~450	0.5~450	R0005：MnCuSn R001~R006：MnCu R007~R450：FeCrAl	
	2W		63.25A	141.42A	7~450	0.5~450		
	3W		77.46A	154.91A	7~100	0.5~100		
MA2725	4W		126.49A	252.98A	---	0.25~3	R00025：MnCuSn R0005~R0025：MnCu R003：FeCrAl	
MA2728	4W		31.62A	54.77A	7~450	4~450	R004~R450：FeCrAl	
MA4527	2W		63.25A	109.54A	7~100	0.5~100	R0005：MnCuSn R001~R005：MnCu R006~R500：FeCrAl	
	3W		77.46A	134.16A	7~60	0.5~60		
	5W		100A	173.20A	7~500	0.5~500		

■ Jumper Specifications

Type	Rating Power at 70℃	Max. Rating Current	Resistance (mΩ)	Material	Operating Temperature Range (℃)
MA1206	1W	70.7A	≦0.2	Jumper：Cu	-55~+170°C
MA2512	2W	100A			

■ Type Dimension



FOR MA1206~4527

■ Dimension

Unit：mm

Type	Power Rating	Resistance Range	L	W	H	T1	T2
MA1206	0.75W	51~100 mΩ	3.200±0.254	1.650±0.254	0.350±0.254	0.40±0.254	0.508±0.254
	1W	1~2mΩ			0.630±0.254		
		3~50mΩ			0.430±0.254		
MA2512	1W 2W	0.5~1mΩ	6.350±0.254	3.050±0.254	0.650±0.254	1.05±0.254	2.200±0.254
		1.5mΩ			0.510±0.254		2.000±0.254
		2mΩ					1.400±0.254
		2.5~75 mΩ					1.100±0.254
		76~200 mΩ				0.75±0.254	1.100±0.254
		201~450mΩ			0.410±0.254	0.75±0.254	0.850±0.254
	3W	0.5~1mΩ			0.650±0.254	1.05±0.254	2.200±0.254
		1.5mΩ			0.540±0.254	0.75±0.254	2.000±0.254
		2mΩ				0.75±0.254	1.400±0.254
		2.5~100mΩ				0.75±0.254	1.100±0.254
MA2725	4W	0.25mΩ	6.800±0.254	6.350±0.254	0.770±0.254	0.200~1.500	2.300±0.254
		0.5mΩ			0.650±0.254		
		1mΩ			0.650±0.254		1.800±0.254
		1.5~3mΩ			0.550±0.254		
MA2728	4W	4~450mΩ	6.600±0.254	6.700±0.254	0.620±0.254	0.200~1.000	1.100±0.254

Type	Power Rating	Resistance Range	L	W	H	T1	T2
MA4527	2W	0.5mΩ	11.300±0.500	6.600±0.500	0.770±0.254	0.200~1.000	3.000±0.254
		1~1.5mΩ			0.650±0.254		2.000±0.254
		2~5mΩ					
		6~100mΩ			0.550±0.254		
	3W	0.5mΩ			0.770±0.254		3.000±0.254
		1~1.5mΩ			0.650±0.254		2.000±0.254
		2~5mΩ					
		6~60mΩ			0.550±0.254		
	5W	0.5mΩ			0.770±0.254		3.000±0.254
		1~1.5mΩ			0.720±0.254		2.000±0.254
		2~5mΩ					
		6~500mΩ			0.620±0.254		

■Jumper Dimension

Unit：mm

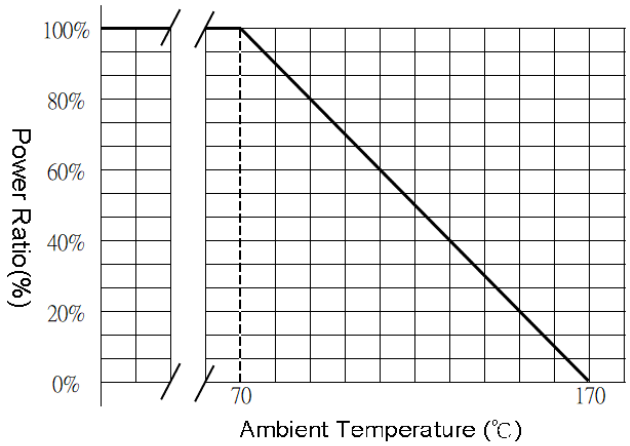
Type	Power Rating	Resistance Range	L	W	H	T1	T2
MA1206	1W	< 0.2mΩ	3.200±0.254	1.650±0.254	0.670±0.254	0.40±0.254	0.508±0.254
MA2512	2W	< 0.2mΩ	6.350±0.254	3.050±0.254	0.670±0.254	1.05±0.254	1.100±0.254

■ 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:

- All the other products marking are 4 digits.
- “R” designates the decimal location in ohms

  e.g. 1mΩ the product marking is R001.

  25mΩ the product marking is R025.

  100mΩ the product marking is R100.
- “m” designates the decimal location in milli-ohms

  e.g. 0.25mΩ the product marking is 0m25.

  0.5mΩ the product marking is 0m50.

  5.5mΩ the product marking is 5m50.

  25.5mΩ the product marking is 25m5.
- 0Ω product marking is 0R
- The criteria to distinguishing the mark on the surface of products are that characters can be identified.

■ Reliability test and requirement

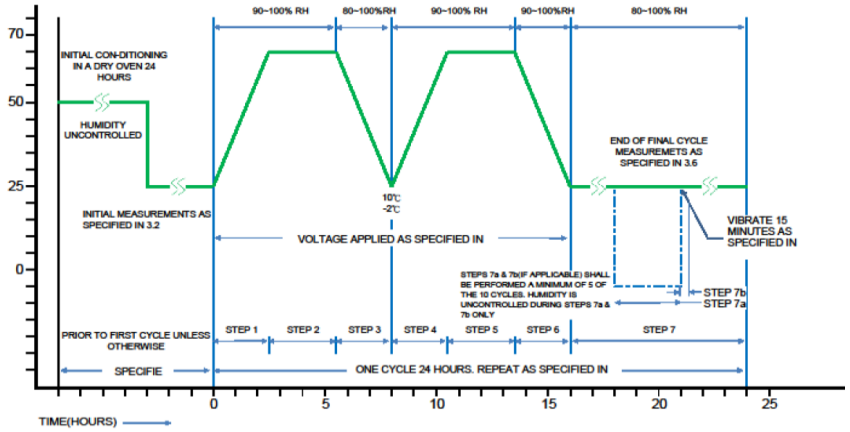
Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS C 5201-1 clause 4.8	• T.C.R. (ppm/℃) = $\frac{(R2-R1)}{R1\ (T2-T1)} \times 10^6$ R1: resistance at room temperature (T1) R2: resistance at 150°C (T2)	Refer to Standard Electrical Specifications
Short Time Overload	JIS C 5201-1 clause 4.13	The number of rated power are as follows: • MA1206-0.75W: 4 times of rated power • MA1206-1W: 4 times of rated power • MA2512-1W: 5 times of rated power • MA2512-2W: 5 times of rated power • MA2512-3W: 4 times of rated power • MA2725-4W: 4 times of rated power • MA2728-4W: 3 times of rated power • MA4527-2W: 5 times of rated power • MA4527-3W: 5 times of rated power • MA4527-5W: 3 times of rated power Rating power duration: 5secs	• MA4527: ΔR/R1≦±2.0% • The others: ΔR/R1≦±0.5%
High Temperature Exposure	JIS C 5201-1 clause 4.23.2	1,000hrs at + 170 °C	• MA4527: ΔR/R1≦±2.0% • The others: ΔR/R1≦±1.0%
Soldering Heat	JIS C 5201-1 clause 4.18	260±5℃ for 10 seconds.	ΔR/R1≦± 0.5%
Temperature Cycling	JIS C 5201-1 clause 4.19	-55°C to +150°C, 1,000cycles, 15min at each extreme	ΔR/R1≦± 0.5%
Bias Humidity	JIS C 5201-1 clause 4.24	1,000hrs@+85°C/85%RH, 10%Bias 1.5hrs “ON”, 0.5hrs “OFF”	ΔR/R1≦± 0.5%
Load at Rated Power	JIS C 5201-1 clause 4.25	1,000hrs@70 °C, 1.5hrs “ON”, 0.5hrs “OFF”	• MA4527: ΔR/R1≦±2.0% • The others: ΔR/R1≦±1.0%
Solderability	JIS C 5201-1 clause 4.17	245±5°C for 2±0.5secs	>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.
Core Body Strength	JIS-C5201-1 clause 4.15	Central part pressurizing force：5N , 10 seconds	No broken

Terminal Strength	JIS-C5201-1 clause 4.32	Pressurizing force：17.7N , 10 seconds	No broken
Terminal Bending Strength	JIS-C5201-1 clause 4.33	Bending once for 2mm , 10 seconds	ΔR/R1≦± 0.5% No broken
Moisture Resistance (Climatic Sequence)	MIL-STD 202 Method 106	T=24 hours / Cycle ,10Cycles . Steps 7a& 7b not required. Unpowered . (Figure 1)	ΔR/R1≦± 0.5%

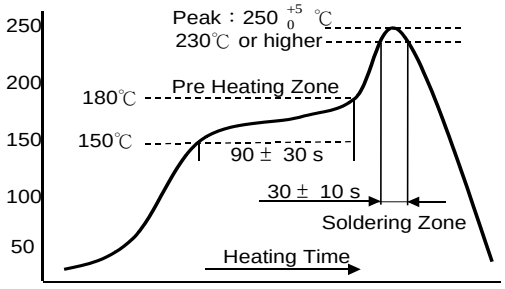
■ For Jumper

Test Item	Test Method	Procedure	Requirements
Short Time Overload	JIS C 5201-1 clause 4.13	4 times of rated power , 5secs	≦0.2mΩ
Temperature Cycling	JIS C 5201-1 clause 4.19	-55°C to +150°C, 1,000cycles, 15min at each extreme	≦0.2mΩ
High Temperature Exposure	JIS C 5201-1 clause 4.23.2	1,000hrs at + 170 °C	≦0.2mΩ
Bias Humidity	JIS C 5201-1 clause 4.24	1,000hrs@+85°C/85%RH, 10%Bias 1.5hrs “ON”, 0.5hrs “OFF”	≦0.2mΩ
Load at Rated Power	JIS C 5201-1 clause 4.25	1,000hrs@70 °C, 1.5hrs “ON”, 0.5hrs “OFF”	≦0.2mΩ
Solderability	JIS C 5201-1 clause 4.17	245±5°C for 2±0.5secs	>95% coverage

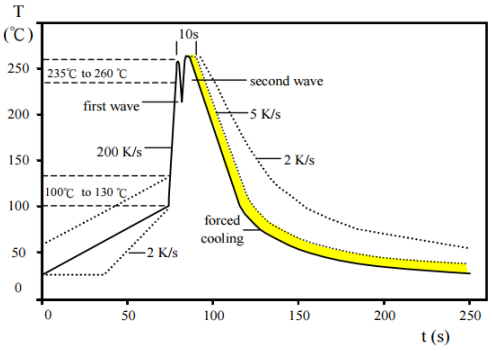
Figure 1



Soldering Profile

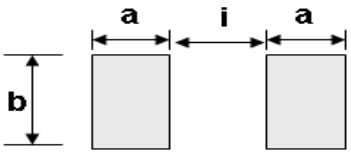


Reflow Soldering



WAVE soldering.

Recommend Land Pattern Design



Dimension

Unit: mm

TYPE	Resistance Range	a	b	i
MA1206 – 0.75W,1W	Jumper：≦0.2mΩ	1.00	1.90	1.40
	1mΩ~100mΩ	1.60	2.18	0.66
MA2512 -1W, 2W, 3W	Jumper：≦0.2mΩ	2.11	3.68	3.18
	0.5mΩ~1.5mΩ	3.05	3.68	1.27
	2mΩ~3.5mΩ	2.11	3.68	3.18
	3.6mΩ~450mΩ	1.90	3.68	3.50
MA2725 - 4W	0.25mΩ~0.5mΩ	3.18	6.86	1.32
	1mΩ~3mΩ	2.34	6.86	3.00
MA2728 - 4W	4mΩ~450mΩ	2.75	7.82	3.51
MA4527 – 2W,3W,5W	0.5mΩ~3mΩ	4.50	8.74	4.50
	3.5mΩ~100mΩ	3.40	8.74	6.43
	101mΩ~500mΩ	2.93	8.74	7.63

Packing Quantity

TYPE	PCS /Reel
MA1206	5000
MA2512	4000
MA2725	2000
MA2728	2000
MA4527	1000

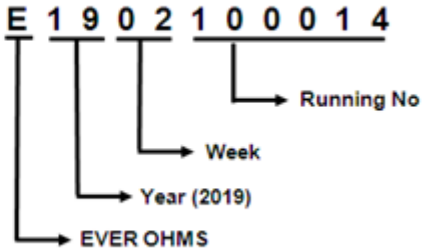
■ Plating Thickness:

Ni:≧2μm

Sn(Tin):≧3μm

■ Lable :

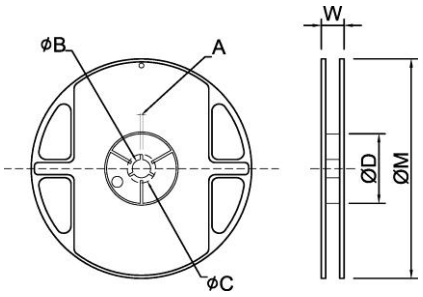




■ Appendix For SMD Chip Resistor

● Packaging Information

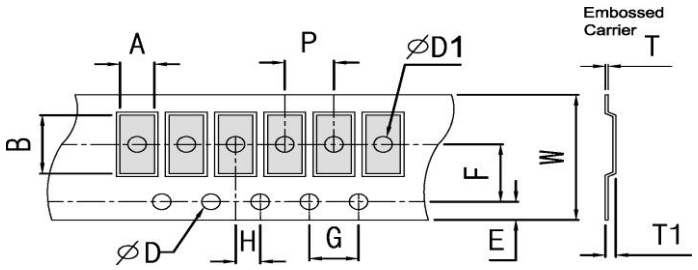
■ Reel Dimensions



■ **Dimension** **Unit: mm**

Reel Type / Tape	A	φB	φC	φD	W	φM
7” reel for 8 mm embossed (for MA1206)	2.0±0.5	13.2±0.5	17.7±0.5	60.0±0.5	12.0±0.5	178±1.0
7” reel for 12 mm embossed	2.5±0.5	13.5±0.5	17.7±0.5	60.0±0.5	16.2±0.5	178±1.0
7” reel for 24 mm embossed	2.0±0.5	13.2±0.5	17.7±0.5	60.0±0.5	24.4±2.0	178±1.0

■ Embossed Dimensions



■ Dimension

Unit: mm

Item	W	P	E	F	ØD	ØD1	G	H	A	Bo	T1	T
MA1206	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	2.03±0.10	3.55±0.10	0.70±0.10	0.20±0.05
MA2512	12.0±0.30	4.0±0.10	1.75±0.10	5.5±0.10		1.55±0.10	4.0±0.10	2.0±0.10	3.50±0.10	6.75±0.10	0.90±0.10	0.20±0.05
MA2725	12.0±0.30	8.0±0.10	1.75±0.10	5.5±0.10		1.55±0.10	4.0±0.10	2.0±0.10	6.81±0.10	7.16±0.10	1.05±0.10	0.25±0.05
MA2728	12.0±0.30	8.0±0.10	1.75±0.10	5.5±0.10		1.55±0.10	4.0±0.10	2.0±0.10	7.10±0.10	7.05±0.10	0.95±0.10	0.20±0.05
MA4527	24.0±0.30	12.0±0.10	1.75±0.10	11.5±0.10		1.50±0.10	4.0±0.10	2.0±0.10	7.38±0.10	12.0±0.10	1.05±0.10	0.30±0.10

■ Storage Temperature

Temperature：25±5℃, Humidity：60±20%