



# HoMAT封体合金电阻规格书

系列号	HoMAT
修订日期	2021-7-12
版本号	Ho-A0

## Application

- Entertainment product
- Power supply
- Measuring instrument
- Industrial product
- Battery management system

## Features

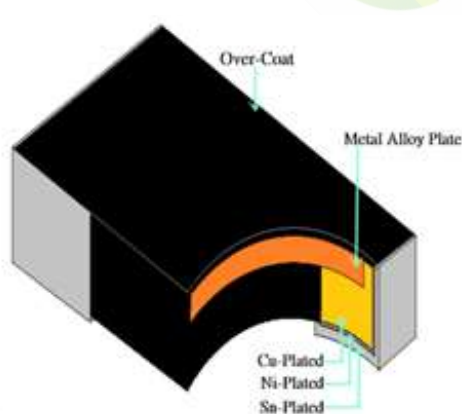
- Low Resistance / Low TCR
- Excellent long term stability
- RoHs compliant and halogen free.
- Lead free.
- High precision current sensing and voltage division.

## Parts Number Explanation

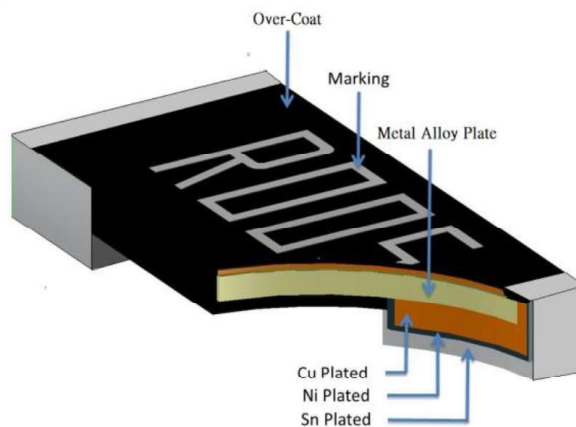
Example:

Ho	MAT	2512	2W	5mR	1%
↓	↓	↓	↓	↓	↓
制造商	产品系列	封装	额定功率	阻值	精度
毫欧电子	封体合金	0805 1206 2512 2725 2728 4527	0.5W 0.75W 1W 2W 3W 4W 5W	0m20=0.2mR 2m50=2.5mR R000=0mR R005=5mR R100=100mR R500=500mR	D=±0.5% F=±1% G=±2% J=±5%

## Construction



0805



1206、2512、2725、2728、4527

地址：深圳市龙华新区观澜大布头路南通邦高新产业园 A 栋 8 楼



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### Standard Electrical Specifications

TYPE	Rating Power at 70°C	T.C.R. (ppm/°C)	Max. Rating Current	Max. Overload Current	Resistance Range (mΩ)		Material	Operating Temperature Range (°C)
					0.5% (D)	1.0% (F) 2.0% (G) 5.0% (J)		
MAT0805	0.5W	≤±100	31.62A	70.71A	---	0.5~1	R0005~R002: MnCuSn R002.5~R008: MnCu R009~R010: FeCrAl	- 55 ~ + 170
		≤±75	18.26A	40.82A	---	1.5~2		
		≤±50	14.14A	31.62A	7~13	2.5~13		
	1W	≤±100	44.72A	89.44A	---	0.5~1		
		≤±75	25.81A	51.63A	---	1.5~2		
		≤±50	20.0A	40.0A	7~13	2.5~13		
MAT1206	0.75W	≤±50	3.83A	7.66A	51~100	51~100	R051~R100 : FeCrAl	
	1W		31.62A	63.24A	7~50	1~50	R001 : MnCuSn R002~R007 : MnCu R008~R050 : FeCrAl	
	1.5W		38.72A	77.49A	7~10	1~10	R001 : MnCuSn R002~R007 : MnCu R008~R010 : FeCrAl	
MAT2512	1W	≤±75	44.72A	100.00A	---	0.5~0.75	R0005~R00075 : MnCuSn	
	1W	≤±50	31.62A	70.71A	7~450	1~450	R001~R006 : MnCu R007~R450 : FeCrAl	
	2W	≤±75	63.24A	141.42A	---	0.5~0.75	R0005~R00075 : MnCuSn	
	2W	≤±50	44.72A	100.00A	7~450	1~450	R001~R006 : MnCu R007~R450 : FeCrAl	
	3W	≤±75	77.45A	154.91A	---	0.5~0.75	R0005~R00075 : MnCuSn	
	3W	≤±50	54.77A	109.54A	7~100	1~100	R001~R006 : MnCu R007~R100 : FeCrAl	
MAT2725	4W	≤±75	126.49A	252.98A	---	0.25~0.3	R00025~R0003 : MnCuSn	
		≤±50	89.44A	178.88A		0.5~3	R0005~R0025 : MnCu R003 : FeCrAl	
MAT2728	4W	≤±50	31.62A	63.24A	7~450	4~450	R004~R450 : FeCrAl	
MAT4527	2W	≤±75	63.24A	141.42A	---	0.5	R0005 : MnCuSn	
	2W	≤±50	44.72A	100.00A	7~100	1~100	R001~R005 : MnCu R006~R100 : FeCrAl	

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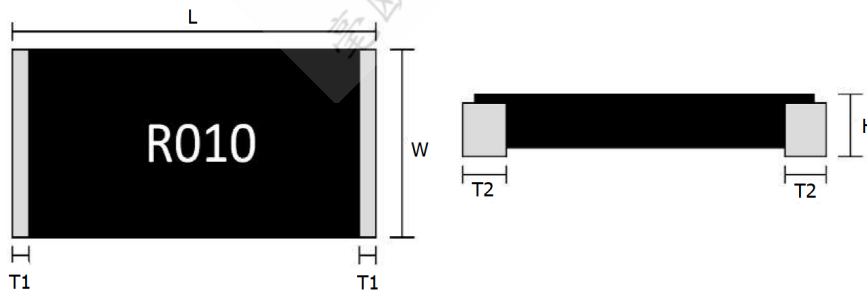
### Standard Electrical Specifications

TYPE	Rating Power at 70°C	T.C.R. (ppm/°C)	Max. Rating Current	Max. Overload Current	Resistance Range (mΩ)		Material	Operating Temperature Range (°C)
					0.5% (D)	1.0% (F) 2.0% (G) 5.0% (J)		
MAT4527	3W	≤±75	77.45	173.20	---	0.5	R0005 : MnCuSn	- 55 ~ + 170
	3W	≤±50	54.77	122.47	7~60	1~60	R001~R005 : MnCu R006~R060 : FeCrAl	
	5W	≤±75	100.00	173.20	---	0.5	R0005 : MnCuSn	
	5W	≤±50	70.71	122.47	7~500	1~500	R001~R005 : MnCu R006~R500 : FeCrAl	

### Jumper Specifications

Type	Rating Power at 70°C	Max. Rating Current	Resistance (mΩ)	Material	Operating Temperature Range (°C)
MAT0805	0.5W	50A	≤0.20	Jumper : Cu	-55~+170°C
	1W	70.7A	≤0.20		
MAT1206	1W	70.7A	≤0.2		
MAT2512	2W	100A	≤0.2		

### Type Dimension



Type	Power Rating	Resistance Range	L	W	H	T2
MAT0805	0.5W&1 W	0.5mR	2.05±0.25	1.30±0.30	0.60±0.20	0.75±0.20
		1mR			0.55±0.20	0.40±0.20
		1.5mR、2.5mR			0.45±0.20	
		2mR~8mR			0.35±0.20	
		9mR~13mR			0.37±0.20	

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## ■ Type Dimension

Type	Power Rating	Resistance Range	L	W	H	T1	T2			
MAT1206	0.75W	51~75mR	3.2±0.254	1.65±0.254	0.40±0.25	0.508±0.25	0.508±0.20			
		76~100mR			0.35±0.25					
	1W	1mR			0.77±0.25					
		2mR			0.65±0.25					
		3mR~20mR			0.55±0.25					
		21mR~50mR			0.47±0.25					
	1.5W	1mR			0.77±0.25					
		2mR			0.65±0.25					
		3mR~10mR			0.55±0.25					
	MAT2512	1W 2W			0.5mR			6.35±0.25	3.05±0.25	0.77±0.25
0.75mR			0.65±0.25	1.98±0.25						
1mR			0.67±0.25	2.20±0.25						
1.5mR				1.40±0.25						
2mR				1.15±0.25						
2.5mR~6mR				1.05±0.25	1.10±0.25					
7mR~10mR			0.55±0.25							
11mR~75mR			0.60±0.25							
76mR~100mR			0.60±0.25							
101mR~135mR			0.75±0.25	0.85±0.25						
136mR~200mR		0.47±0.25								
201mR~450mR		0.40±0.25								
3W		0.5mR			0.77±0.25	1.15±0.25	2.20±0.25			
		0.75mR	0.65±0.25	1.98±0.25						
		1mR								0.67±0.25
		1.5mR	1.40±0.25							
		2mR		1.15±0.25						
		2.5mR~6mR	0.55±0.25							
		7mR~75mR		0.60±0.25						
		76mR~100mR								0.75±0.25
	0.55±0.25									
MAT2725	4W	0.25mR	6.80±0.25	6.35±0.25	0.77±0.25	1.15±0.254	2.30±0.25			
		0.3mR					1.80±0.25			
		0.5mR					0.65±0.25	2.30±0.25		
		1mR			1.80±0.25					
		1.5mR			0.55±0.25			1.50±0.25		
		2mR~3mR								

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## ■ Type Dimension

Type	Power Rating	Resistance Range	L	W	H	T1	T2	
MAT2728	4W	4mR~450mR	6.60±0.25	6.70±0.25	0.58±0.25	0.40±0.25	1.05±0.25	
MAT4527	2W	0.5mR	11.30±0.50	6.60±0.50	0.77±0.25	0.9±0.25	3.00±0.25	
		1mR			0.65±0.25			
		1.5mR~5mR			0.55±0.25			2.00±0.25
		6mR~100mR			0.77±0.25			
	3W	0.5mR			0.65±0.25		3.00±0.25	
		1mR			0.55±0.25			
		1.5mR~5mR			0.80±0.25			2.00±0.25
		6mR~60mR			0.68±0.25			
	5W	0.5mR			0.58±0.25		3.00±0.25	
		1mR			0.65±0.25			
		1.5mR~5mR						2.00±0.25
		6mR~450mR						

## ■ Jumper Dimension

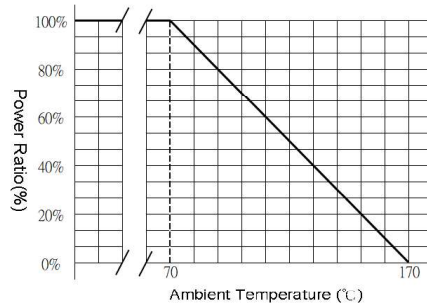
Type	Power Rating	Resistance Range	L	W	H	T1	T2
MAT0805	0.5W&1W	≤0.2mR	2.05±0.25	1.30±0.30	0.45±0.20		0.40±0.20
MAT1206	1W	< 0.2mR	3.20±0.25	1.65±0.25	0.65±0.25	0.508±0.25	0.508±0.25
MAT2512	2W	< 0.2mR	6.35±0.25	3.05±0.25	0.65±0.25	1.15±0.25	1.100±0.25

## ■ 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.



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## 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( $\Omega$ )

## Marking Format:

- All the other products marking are 4 digits.
- “R” designates the decimal location in ohms
  - e.g. 1m $\Omega$  the product marking is R001.
  - 25m $\Omega$  the product marking is R025.
  - 100m $\Omega$  the product marking is R100.
- “m” designates the decimal location in milli-ohms
  - e.g. 0.25m $\Omega$  the product marking is 0m25.
  - 0.5m $\Omega$  the product marking is 0m50.
  - 5.5m $\Omega$  the product marking is 5m50.
  - 25.5m $\Omega$  the product marking is 25m5.
- 0 $\Omega$  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 4.8 IEC-60115-1 4.8	At 25 $^{\circ}$ C /+150 $^{\circ}$ C, 25 $^{\circ}$ C is the reference temperature	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	<p>The number of rated power are as follows:</p> <ul style="list-style-type: none"> <li>MA0805-0.5W: 5 times of rated power</li> <li>MA0805-1W: 4 times of rated power</li> <li>MA1206-0.75W: 4 times of rated power</li> <li>MA1206-1W: 4 times of rated power</li> <li>MA1206-1.5W: 4 times of rated power</li> <li>MA2512-1W: 5 times of rated power</li> <li>MA2512-2W: 5 times of rated power</li> <li>MA2512-3W: 5 times of rated power<sup>(Note)</sup></li> <li>MA2725-4W: 4 times of rated power</li> <li>MA2728-4W: 4 times of rated power</li> <li>MA4527-2W: 5 times of rated power</li> <li>MA4527-3W: 5 times of rated power</li> <li>MA4527-5W: 3 times of rated power</li> </ul> <p>for 5 seconds.</p>	<ul style="list-style-type: none"> <li>MA4527: <math>\Delta R/R1 \leq \pm 2.0\%</math></li> <li>The others: <math>\Delta R/R1 \leq \pm 0.5\%</math></li> </ul>

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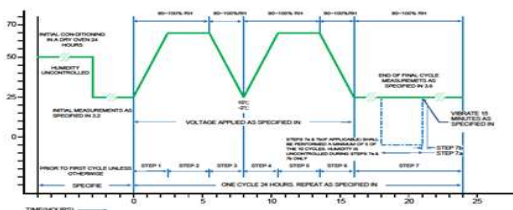
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## Reliability test and requirement

Test Item	Test Method	Procedure	Requirements
High Temperature Exposure (Storage)	MIL-STD-202 Method 108	1000 hrs. @ T=170°C. Unpowered. Measurement at 24±4 hours after test conclusion.	$\Delta R/R1 = \leq \pm 1.0\%$
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260±5 °C for 10 seconds.	$\Delta R/R1 = \leq \pm 0.5\%$
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.	$\Delta R/R1 = \leq \pm 0.5\%$
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.	$\Delta R/R1 = \leq \pm 0.5\%$
Load Life (Endurance)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70±2 °C , RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"	$\Delta R/R1 = \leq \pm 0.5\%$
Solderability	J-STD-002	(1) 4 hrs 155°C dry heat (2) 245±5°C 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	$\Delta R/R1 \leq \pm 0.5\%$ No broken
Terminal Strength (SMD)	AEC Q200-006	Pressurizing force 17.7N for 60 seconds	$\Delta R/R1 \leq \pm 0.5\%$ No broken
Moisture Resistance	MIL-STD 202 Method 106	T=24 hours / Cycle ,10Cycles . Steps 7a& 7b not required. Unpowered .(Figure 1)	$\Delta R/R1 = \leq \pm 1.0\%$

## 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.	$\leq 0.2m \Omega$
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.	$\leq 0.2m \Omega$
High Temperature Exposure	JIS-C5201-1 4.25 IEC 60068-2-2	At 170 °C for 1000 hours.	$\leq 0.2m \Omega$
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.	$\leq 0.2m \Omega$
Load Life (Endurance)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70±2 °C , RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF."	$\leq 0.2m \Omega$
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17	245±5 °C for 3 seconds.	>95% coverage

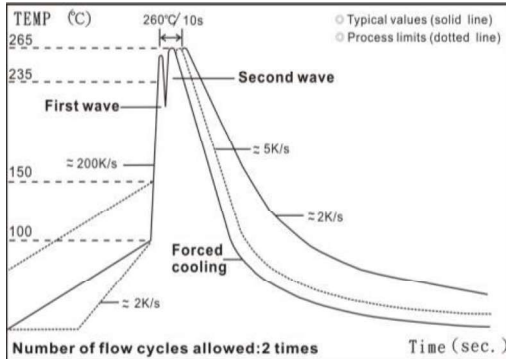


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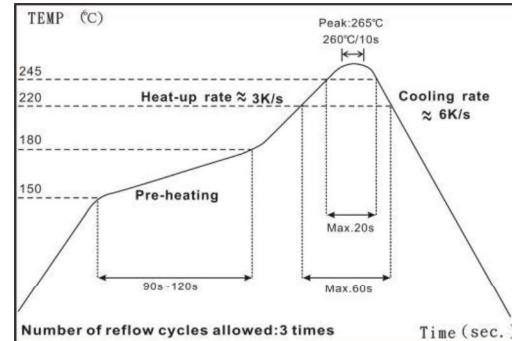
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## Recommended Customer Soldering Parameters

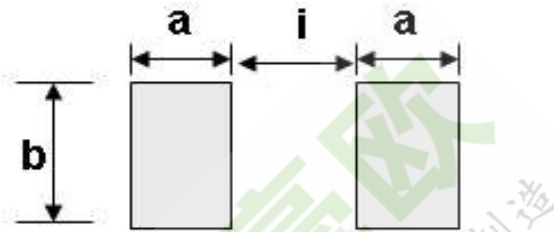
### Wave solder Temperature condition



### Solder reflow Temperature condition



## Recommend Land Pattern Design



Unit: mm

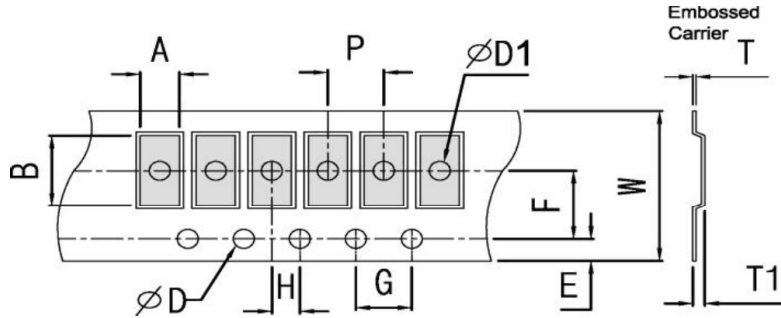
TYPE	Resistance Range	a	b	i
MAT0805- 0.5W&1W	0.5mΩ	1.35	1.80	0.3
	0 / 1~13mΩ	1.00	1.80	1.00
MAT1206 -0.75W,1W,1.5W	Jumper : ≤0.2mΩ	1.46	2.15	1.68
	1mΩ~100mΩ	1.46	2.15	1.68
MAT2512 -1W, 2W, 3W	Jumper : ≤0.2mΩ	2.30	3.68	3.15
	0.5mΩ~1mΩ	3.40	3.68	0.95
	1.5 mΩ	2.35	3.68	1.35
	2 mΩ	2.10	3.68	2.55
	2.5mΩ~200mΩ	2.30	3.68	3.15
	201mΩ~450mΩ	2.05	3.68	3.65
MAT2725 - 4W	0.25mΩ ; 0.5mΩ	3.25	6.85	1.70
	0.3mΩ ; 1mΩ~3mΩ	2.75	6.85	2.70
MAT2728 - 4W	4mΩ~450mΩ	2.05	7.20	3.90
MAT4527 - 2W,3W,5W	0.5mΩ~1.5mΩ	4.50	8.74	4.50
	2.0mΩ~100mΩ	3.50	8.74	6.50
	101mΩ~500mΩ	3.50	8.74	6.50

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### ■ Embossed Dimensions



Unit: mm

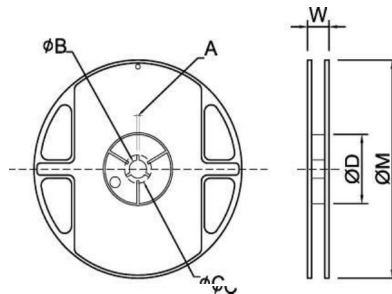
Item	Resistance Range (mΩ)	W	P	E	F	φD	φD1	G	H	A	B	T1	T
0805	0mR~2.5mR	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	1.50 <sup>+0.1</sup> <sub>0</sub>	1.0±0.10	4.0±0.10	2.0±0.10	1.70±0.10	2.45±0.10	0.90±0.25	0.20±0.05
0805	3mR~13mR	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	1.50 <sup>+0.1</sup> <sub>0</sub>	1.0±0.10	4.0±0.10	2.0±0.10	1.70±0.10	2.45±0.10	0.55±0.25	0.20±0.05

Item	Resistance Range (mΩ)	W	P	E	F	φD	φD1	G	H	A	B	T1	T
1206	1mR	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	1.50 <sup>+0.1</sup> <sub>0</sub>	1.0±0.10	4.0±0.10	2.0±0.10	2.03±0.10	3.55±0.10	1.10±0.10	0.20±0.05
1206	2~100mR	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10		1.0±0.10	4.0±0.10	2.0±0.10	2.03±0.10	3.55±0.10	0.85±0.10	0.20±0.05
2512	0.5~2mR	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	1.10±0.10	0.20±0.05
2512	3~450mR	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
2725	0.25~3mR	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
2728	4~450mR	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
4527	0.5~500mR	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

### ■ Appendix For SMD Chip Resistor

#### ● Packaging Information

##### ■ Reel Dimensions



Unit: mm

##### ■ Dimension

Reel Type / Tape	A	φB	φC	φD	W	φM
7" reel for 8 mm embossed (for MAT0805/1206)	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

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