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AN ISO 9001: 2015 CERTIFIED MANUFACTURER
AN ISO 45001 : 2018 MANUFACTURER
AN ISO 14001 : 2015 MANUFACTURER
AN IATF 16949: 2016 MANUFACTURER

SPECIFICATIONS FOR APPROVAL

Customer:

Name of Product: Metal Alloy Chip Resistors - MFR Series

Sales Executive : _____ Date: 2024/11/2

客戶确认 Customer Approval	客戶确认 Customer Approval	客戶确认 Customer Approval	客戶确认 Customer Approval

* A member of the Hong Kong Resistors Manufactory Group of Companies *

Metal Alloy Chip Resistors

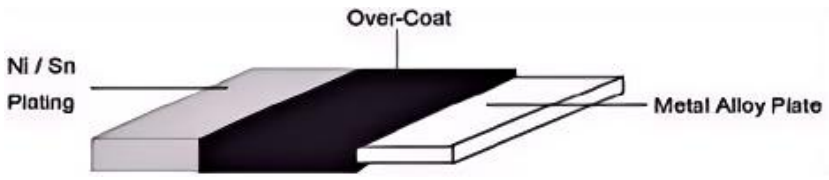
本公司产品遵循 SONY SS-00259 环境要求,不含 10 大环境相关有害禁用物质。
Our products are to comply with environmental requirements in accordance with SONY code no. SS-00259 with restrictions of 10 harmful materials.

特性 (*Features*)

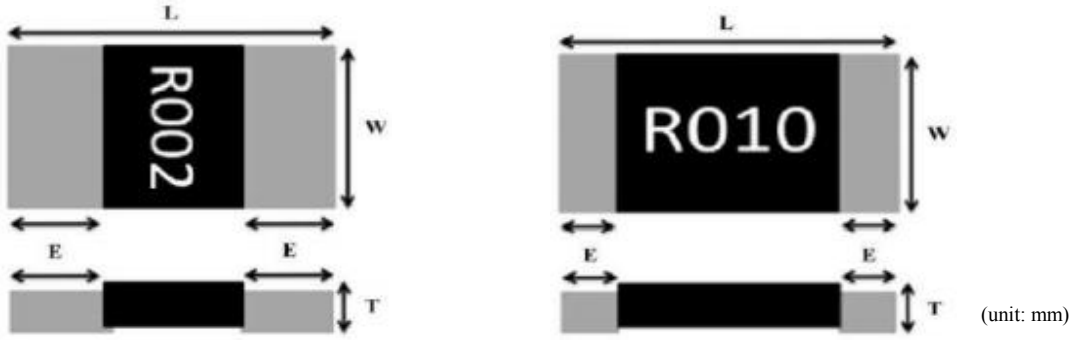
· 最高功率可达4W
High power up to 4W
· 最低TCR为±50ppm/℃
Lowest TCR from ±50ppm/℃
· 可使用于波峰焊及回流焊
Compatible with both wave soldering and reflow soldering

料号编码 (*Part Number*)

MFR	**25**	**0R01**	**J**	**C2**	**3W**	_____
Type 型号	Size 尺寸	Value 阻值	Tolerance 精度	TCR （PPM/℃）	Power	Electrode
	05 : 0805 06 : 1206 25 : 2512	0R01=10mΩ	D : ±0.5% F : ±1% G : ±2% J : ±5%	： ±350 C2 ： ±50	1/2W 1W 2W 3W 4W	: 小电极 D: 大电极



尺寸 (*Dimensions*)



(unit: mm)

Size	长（L）	宽（W）	厚（T）	电极宽（E）
0805	2.00±0.20	1.25±0.20	0.35±0.20	0.5±0.20
1206	3.20 ±0.20	1.60 ±0.20	0.60 ±0.20	0.50 ±0.20
2512	6.40 ±0.20	3.20 ±0.20	0.70 ±0.20	0.90 ±0.20 D: 2.40 ±0.20

字码编码说明 (*Markings*)

±1%,，±2%,，±5%的产品，以四字码标示，第一位字码R标示10^{-3}，后三位表示阻值的有效数字。

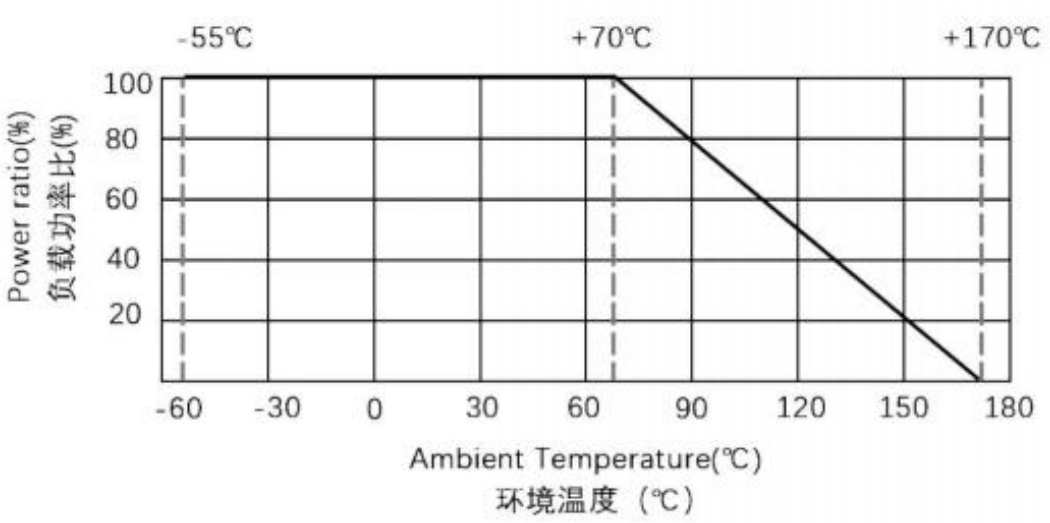
±1% ，±2%,，±5% tolerance product: the marking is 4 digits, The first letter'R'denotes 10^{-3},The other three digitals declare resistance .



R010=10mΩ

阻值	代码	阻值	代码	阻值	代码	阻值	代码
0.5mΩ	R50m	25mΩ	R025	80mΩ	R080	200mΩ	R200
1mΩ	R001	30mΩ	R030	90mΩ	R090	220mΩ	R220
1.5mΩ	1R5m	35mΩ	R035	100mΩ	R100	250mΩ	R250
2mΩ	R002	40mΩ	R040	120mΩ	R120	270mΩ	R270
3mΩ	R003	50mΩ	R050	130mΩ	R130	300mΩ	R300
5mΩ	R005	57mΩ	R057	140mΩ	R140	330mΩ	R330
10mΩ	R010	60mΩ	R060	150mΩ	R150	360mΩ	R360
15mΩ	R015	68mΩ	R068	160mΩ	R160	400mΩ	R400
20mΩ	R020	75mΩ	R075	180mΩ	R180	500mΩ	R500

功率衰减曲线 (*Power Derating Curve)*



工作温度范围 (operating Temperature Range) ： -55℃ ~＋170℃ .
当电阻在高于 70℃的周围环境中工作时,最大负载功率应该按照以上曲线减少.
when the resistor is operating in an ambient environment above 70℃, the maximum load power should be reduced according to the above curve.

阻值范围及电气特性 *(Resistance Range and Electrical characteristics)*

型别 Type	额定功率 Rated power	阻值范围 Resistance Range		温度特性TCR (ppm/℃)	绝缘阻抗 Insulation Resistance
		D(±0.5%)	F(±1%) G(±2%) J(±5%)		
MFR05	1W	5mΩ ≤R≤ 10mΩ		±50	>100MΩ
MFR06	1W	0Ω : R ≤ 0.8mΩ ； 1mΩ ≤R≤ 100m		0Ω&1mΩ ≤R≤ 4mΩ: ±350	
	1/2W	101mΩ ≤R≤ 200mΩ		5mΩ ≤R≤ 500mΩ: ±50	
MFR25	1W 2W 3W 4W	/	0Ω: R<0.45mΩ; 0.5mΩ ≤R≤ 500mΩ	0.5mΩ ≤R≤ 4mΩ 大电极: ±50	
				0Ω&1mΩ ≤R≤ 2mΩ: ±350	
				3mΩ ≤R≤ 500mΩ: ±50	

备 注 (remark):

※ 额定电流计算公式 (The rated current is calculated by the following formula)

$I = \sqrt{P/R}$

I: 额定电流 (Rated current) (A)
P： 额定功率 (Rated power) (w)
R： 电阻阻值 (Resistance) (ohm)

※如果计算出的电流超过此型别的最大工作电流，则此型别的最大工作电流为此电阻的额定电流。
In case the value calculated by the formula exceed the maximum working current as above table,

the maximum working current shal1be regarded as rated current.

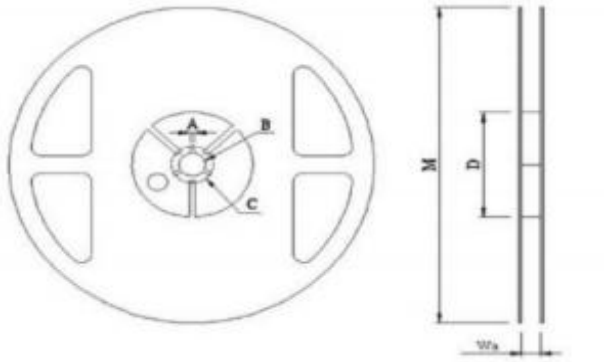
性能信赖性测试 *(performance Reliability Test Methods)*

测试项目 Test Item	测试方法 Test ethods	测试条件 Test conditions	规格specification
温度系数 Temperature coefficient	IEC601 15-14.8	TCR= (R-R0) / (t-to) Ro × 10^6 (ppm) Ro： 电阻在室温下的阻值(resistance at room temperature) R：电阻在 ＋125 ℃ 或 ＋155 ℃下的阻值 (resistance at ＋125℃ or +155℃) to： 室温 (room temperature) T： 测试温度 (test temperature +125℃ or +155℃)	请参考特性规格表 please refer to the spec.
高温储存 High Temperature Exposure	MIL-STD-202 Method 108	125℃下放置1000H，试验结束24±4小时后量测试验前后阻值变化率。 1000 hrs. @T= 125 ℃. Measure the variation of resistance at 24±4 hours after test conclusion.	△<±1%
低温储存 Low Temperature operation	IEC601 15-14.23.4	-55℃下放置45 分钟后，量测试验前后阻值变化率 45 min. @T=-55 ℃ . Measure the variation of resistance after test conclusion.	△<±1%
温度循环 Temperature cycling	JESD22 Method JA - 104	-55℃/＋125℃ , 循环 1000 次，试验结束24±4小时后量测试验前后阻值变化率 · 1000cycles (-55℃ to ＋125℃) Measurement at 24±4 hours after test conclusion. Measure the variation of resistance at 24±4 hours after test conclusion.	△<±1%
短时间过负荷 short-time overload	IEC601 15-14.13	加载5 倍的额定功率，时间5 秒后测量试验前后的阻值变化率。 Applied 5 . 0 times ofrated power for 5 second Measure the variation ofresistance.	△<±1%

性能信赖性测试 *(performance Reliability Test Methods)*

测试项目 Test Item	测试方法 Test ethods	测试条件 Test conditions	规格specification
耐湿特性 **Biased Humidity**	MIL-STD-202 METHOD 103	加载 10%额定功率，85℃/85%RH 持续通电 1000H,试验结束 24±4 小时后进行测试 1000 hours 85℃/85%RH Note: specified conditions：10% of operating power. Measurement at 24±4 hours after test conclusion.	△<±1%
负荷寿命 **operational life**	MIL-STD-202 METHOD 108	电阻放入恒温箱中，温度70±2℃，通电额定电流1.5小时，断电0.5小时；重复通断电至试验时间1000+48/-0 小时，量测试验前后阻值变化率 put the specimen in a chamber at 70±2℃ temperature and applied rated currrnt for1 . 5H and rested for 0. 5H repeatedly till total test time is 1000+48/-0Measure the variation ofresistance ·	△<±1%
焊锡性 **solderability**	J-STD- 002B test B	沾助焊剂后浸入锡炉，锡炉温度245±5℃，时间2~3秒 Dip the terminal in a flux and then dipinto a soldering bath at 245±5℃ for 2~3sec.	最少95%面积上锡 (Min 95%coverage)
抗焊锡热 **Resistance to soldering heat**	IEC601 15-1 4.18	沾助焊剂后浸入锡炉,锡炉温度 260±5℃,时间10±1秒,测量试验前后的阻值变化率 。 Dip the terminal in a flux and then dip into a soldering bath at 260±5℃ for 10±1sec. Measure the variation of resistance.	△<±1%
端子弯曲 **Terminal Bending**	AEC-Q200-005	弯曲2mm,60秒,量测试验前后阻值变化率。 Min 2mm deflection ,60sec. Measure the variation of resistance. Measure the variation of resistance.	△<±1%

包装及卷包规格 (*Tape and Reel Package*)



卷盘尺寸 (reel dimension)

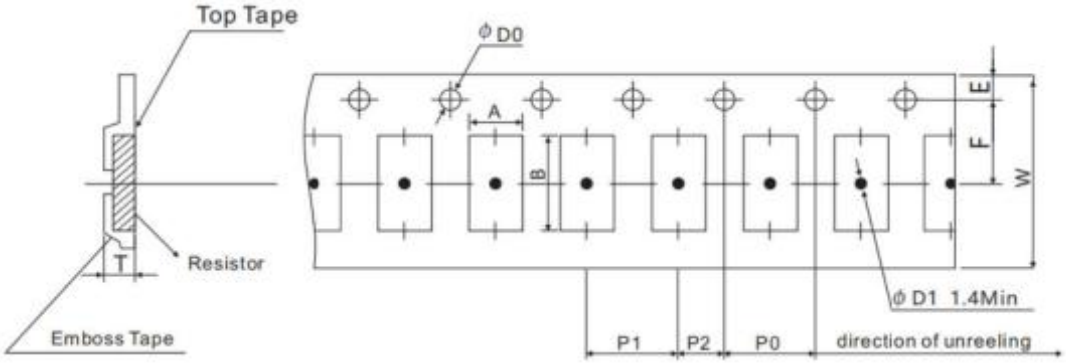
尺寸 Dimensions	M	D	W	A	B	C
MFR05	178.0±2.0	60.0±1.0	9.0±0.30	2.0±0.50	13.0±1.00	21.0±0.50
MFR06	178.0±2.0	60.0±1.0	13.5±0.50	2.00±0.50	13.5±0.5	21.0±0.50
MFR25	178.0±2.0	80.0±1.0	13.8±0.50	2.00±0.50	13.5±0.5	21.0±0.50

※备注 (Remark):

(1) 2512每卷4000pcs 2512 Quantity per Reel 4000pcs/Reel

(2) 0805 、1206每卷5000pcs 0805 、1206 Quantity per Reel 5000pcs/Reel

包装尺寸 (packing dimension)

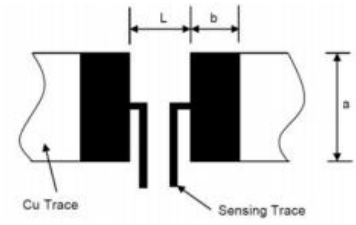


unit: mm

Size	A	B	W	F	E	P0	P1	P2	øD0	T
MFR05	1.65±0.05	2.40±0.10	8.00±0.20	3.50±0.05	1.75±0.10	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	0.80±0.10
MFR06	2.00±0.15	3.60±0.20	8.00±0.20	3.50±0.05	1.00±0.10	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	0.84±0.10
MFR25	3.60±0.15	6.90±0.15	12.00±0.20	5.50±0.05	1.75±0.10	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	1.20±0.10

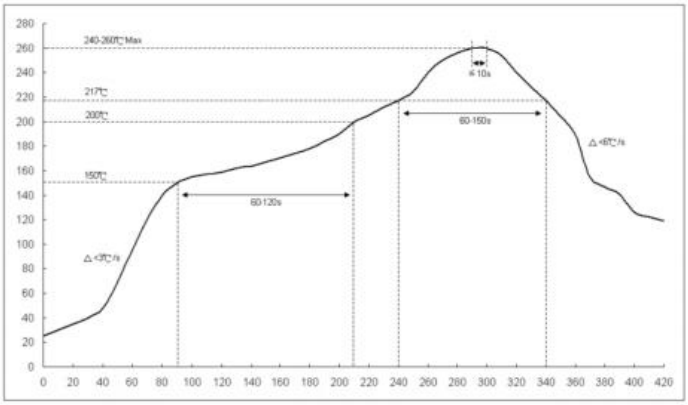
焊接 *(soldering)*

1.建议焊盘尺寸 (Recommended solderpad Dimension)

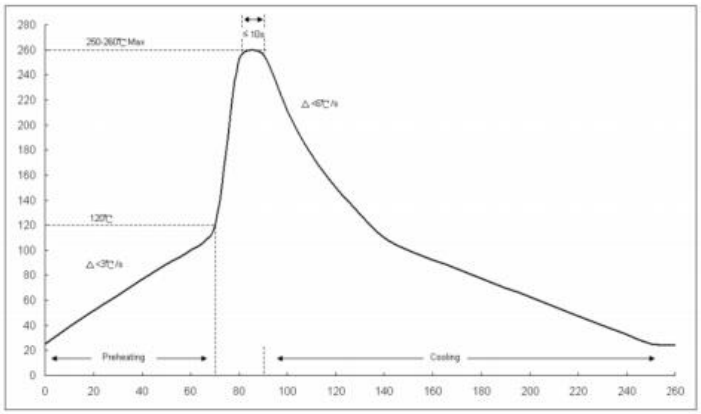


尺寸 Dimension	阻值范围 Resistance Range	a	b	L
MFR05	5mΩ~10mΩ	1.50	1.00	1.00
MFR06	0Ω : R ≤ 0.8mΩ; 1mΩ~200mΩ	1.80	1.70	1.60
MFR25	0Ω: R<0.45mΩ & 0.5mΩ~4mΩ大电极	4.00	3.10	1.30
	1mΩ~500mΩ	4.00	2.10	4.10

2.建议回流焊曲线(Recommend reflow soldering profile)



3.建议波峰焊曲线 (Recommend wave soldering profile)



贮存环境 Storage Condition	温度 Temp	湿度 Humidity	Storage Time 储存期	1年 1 year
	5~35℃	45%-75%		