

 毫欧电阻 毫欧制造	GX2512封体合金系列规格书	系列号	GX
		修订日期	2019-11-25
		版本号	Ho-A0

规格书 Specification

制造商:深圳市毫欧电子有限公司

GX

适用：本规格书适用于深圳市毫欧电子有限公司GX2512封体合金系列产品选型。

■ 产品特点 Features:

高功率、低温漂、低阻值、高精度（1%）

低电感设计，小于1.0nH

卓越的可靠性和合适的成本。

适用于无铅焊接。

高精度修边工具。

符合RoHS标准，无卤素。

■ 产品名称 Product Name

封体合金电阻

■ 产品型号 Product number

GX	2512	2W	10mR	1%	50ppm
产品系列	封装	额定功率(W)	阻值(mR)	精度(%)	温度系数 TCR (ppm)
GX	2512	1W ~3W	1 ~220	1%/2%/5%	50/70/100

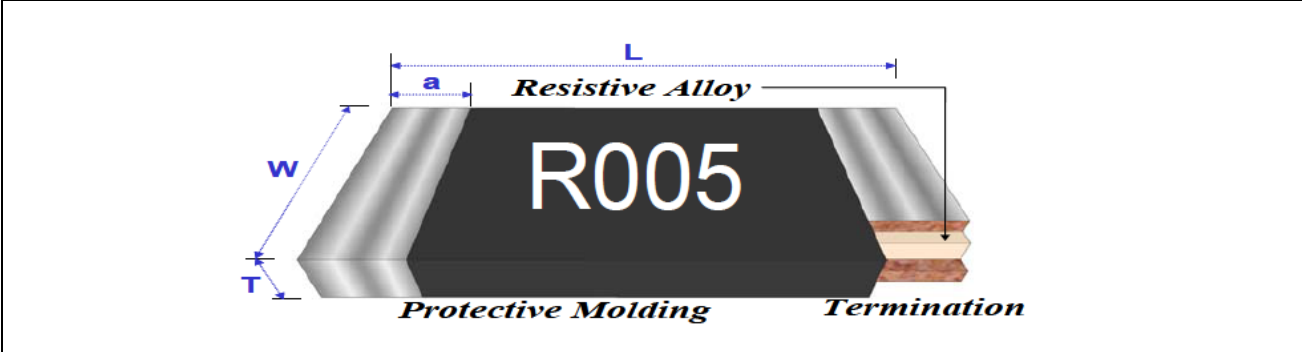
具体参数请查看下页详情



地址：深圳市龙华区观湖街道松轩社区虎地排85号锦绣三期C栋2001

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■ 产品尺寸及结构 Dimension and Construction



产品结构

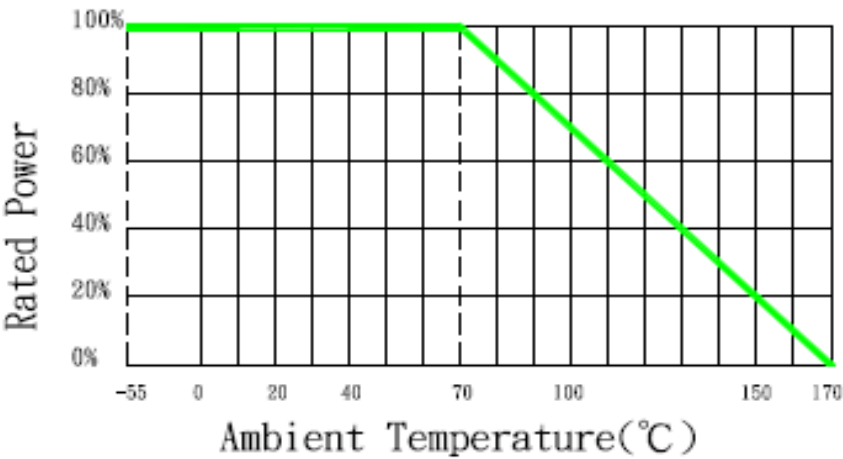
项目	保护性模塑	电阻元件	内部终端	外部 终端
材料	树脂	合金金属	铜	焊料

单位：mm

Type	Resistance	L	W	T	a
GX2512	3~220mR	6.20±0.20	3.25±0.20	0.60±0.20	0.80±0.20
GX2512	3W series	6.20±0.20	3.25±0.20	0.65±0.20	0.80±0.20
GX2512	1~2mR	6.40±0.20	3.25±0.20	0.70±0.20	2.00±0.20

■ 功率降额曲线 Power Derating Curve

工作温度范围：-55至+170摄氏度



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■ 电气参数规格Electrical parameterSpecification(0.5~2W)

Rating Type	Tolerance (%)	Rating 70°C (W)	Max. Working Current (Voltage)*	Max. Overload Current (Voltage)*	Alloy Type	Temperature coefficient of Resistance (ppm/°C)**	Resistance (mΩ) ***
GX2512	±1%(F) ±2%(G) ±5%(J)	1	31.6A (158mV)	70.7A (354mV)	Low EMF	±70	1,2,2.5,3,4,5 10,15,20,25
			18.3A (469mV)	40.8A (1049mV)	Standard	±50	3,4,5,6,7,8,9,10 12,15,20,22,25,30 33,35,40,50,60,70 75,80,100,200,220
		2	44.7A (224mV)	100A (500mV)	Low EMF	±70	1,2,2.5,3,4,5 10,15,20,25
			25.8A (663mV)	57.7A (1483mV)	Standard	±50	3,4,5,6,7,8,9,10 12,15,20,22,25,30 33,35,40,50,60,70 75,80,100,200,220

Note:

- (i) $= \sqrt{P \cdot R}$ or Max. Working Voltage whichever is lower.
- (ii) : Working Voltage(V) , P : Rated Power (W) , R : Resistance Value(Ω)
- (iii) Solder-pad and trace size should be >300 mm² and board surface temperature should not exceed 105°C when applying rated power
- (iv) * : Related number are depend on specific items only. ** : TCR Hot (+25~+155°C).
*** : Special requests and details please contact factory.

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■ 电气参数规格Electrical parameterSpecification(3~5W)

Rating Type	Rating 70℃ (W)	Max. Working Current (Voltage)*	Max. Overload Current (Voltage)*	Resistance Tolerance (%)	Temperature coefficient of Resistance (ppm/℃)**	Resistance (mΩ) ***
2512 低电磁波	3	31.6A (245mV)	70.7A (548mV)	±1%(F) ±2%(G) ±5%(J)	±70	3,4,5,6,7,8,9,10
					±50	20
2512 标 准	3	24.5A (812mV)	54.8A (1817mV)	±1%(F) ±2%(G) ±5%(J)	±70	5,6,8,10
					±50	12,14,15,16,18,20 25,30,33,35,40,50 60,75,80,100 200,220

Note: $E = \sqrt{P \cdot R}$ or Max. Working Voltage whichever is lower.

(vi) E : Working Voltage(V) , P : Rated Power (W) , R : Resistance Value(Ω)

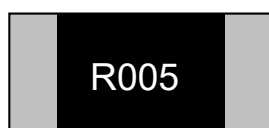
(vii) Solder-pad and trace size should be >300 mm² and board surface temperature should not exceed 105℃ when applying rated power

(viii) * : Related number are depend on specific items only. ** : TCR Hot (+25~+155℃). *** : Special requests and details please contact factory.

■ 标记Marking

GX2512

TOP: Marking. (4 Digits marking to identify the resistance value.)



R005=5mΩ



R001=1 mΩ

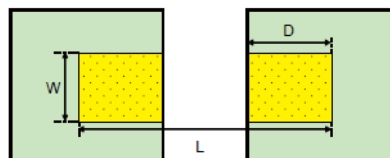
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■ 建议焊盘尺寸 Recommended Solder Pad Dimension

Type	W	D	L
GX2512	3.70	1.60	7.60
GX2512 R001/R002	4.00	3.00	7.30

Unit:mm



■ 可靠性能 Reliability Performance

标准品常规检验项目

Test Item	Specification	Test Method (AEC-Q200. IEC 60115)
*DC Resistance	F : $\pm 1\%$ 、G : $\pm 2\%$ 、J : $\pm 5\%$	AEC-Q200 TABLE 7.1 IEC 60115-1 / JIS C 5201-1 , Clause 4.5 Measure the resistance Value.
High Temperature Exposure (Storage)	J、G : $\Delta R \leq \pm(3\%+0.5m\Omega)$ F : $\Delta R \leq \pm(1\%+0.5m\Omega)$	AEC-Q200 TABLE 7.3 1000 hrs. @ T=125°C. Unpowered. Measurement at 24 ± 2 hours after test conclusion.
*Temperature Cycling	J、G : $\Delta R \leq \pm(1\%+1m\Omega)$ F : $\Delta R \leq \pm(0.5\%+1m\Omega)$ No mechanical damage.	AEC-Q200 TABLE 7.4 1000 Cycles (-55°C to +125°C). Measurement at 24 ± 2 hours after test conclusion.
Moisture Resistance	J、G : $\Delta R \leq \pm(1\%+0.5m\Omega)$ F : $\Delta R \leq \pm(0.5\%+0.5m\Omega)$	AEC-Q200 TABLE 7.6 Test 65°C/80~100%RH/10Cycles. Measurement at 24 ± 2 hours after test conclusion. (t=24hrs/cycle).
Biased Humidity	J、G : $\Delta R \leq \pm(3\%+0.5m\Omega)$ F : $\Delta R \leq \pm(1\%+0.5m\Omega)$	AEC-Q200 TABLE 7.7 1000 hours 85°C/85%RH. 10% of operating power. Measurement at 24 ± 2 hours after test conclusion.
Operational Life	J、G : $\Delta R \leq \pm(3\%+0.5m\Omega)$ F : $\Delta R \leq \pm(1\%+0.5m\Omega)$	AEC-Q200 TABLE 7.8 Test 1000hr @ TA=125°C at specified rated power. Measurement at 24 ± 2 hours after test conclusion.

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■ 可靠性能 Reliability Performance

External Visual	No visual damage and refer PDC marking code.	AEC-Q200 TABLE 7.9 Inspect device construction, marking and workmanship.
Physical Dimension	Within the spec.	AEC-Q200 TABLE 7.10 Verify physical dimensions to the applicable device detail specification.
Mechanical Shock	Within product specification tolerance and no visible damage.	AEC-Q200 TABLE 7.13 Test Peak value:100g's,Wave:Hail-sine, Duration:6ms,Velocity:12.3ft/sec.
Vibration	No mechanical damage.	AEC-Q200 TABLE 7.14 5 g's for 20 min., 12 cycles each of 3 orientations. Test from 10-2000 Hz.
*Resistance to Solder Heat	J、G : $\Delta R \leq \pm(1\% + 0.5m\Omega)$ F : $\Delta R \leq \pm(0.5\% + 0.5m\Omega)$ No mechanical damage.	AEC-Q200 TABLE 7.15 Solder dipping @ 270°C $\pm 5^\circ\text{C}$ for 10sec. ± 1 sec.
Thermal Shock	J、G : $\Delta R \leq \pm(1\% + 0.5m\Omega)$ F : $\Delta R \leq \pm(0.5\% + 0.5m\Omega)$ No mechanical damage.	AEC-Q200 TABLE 7.16 -55 to 155°C/ dwell time 15min/ Max transfer time 20sec/ 300cycles.
ESD	$\Delta R \leq \pm(1\% + 0.5m\Omega)$ No mechanical damage.	AEC-Q200-002 Test contact min. 1KV.
*Solder Ability	Over 95% of termination must be covered with solder.	AEC-Q200 TABLE 7.18 a)Baking 155°C 4H, dipping 235°C 5s b)Steam 1H, dipping 215°C 5s c)Steam 1H, dipping 260°C 7s
Flammability	Refer UL-94.	AEC-Q200 TABLE 7.20 UL-94 V-0 or V-1 are acceptable
*Board Flex	J、G : $\Delta R \leq \pm(1\% + 1m\Omega)$ F : $\Delta R \leq \pm(0.5\% + 1m\Omega)$ No mechanical damage.	AEC-Q200 TABLE 7.21 Bending 2mm 5931.2512.1206
Terminal Strength	No mechanical damage	AEC-Q200 TABLE 7.22 Force 1 Kg for 60 seconds.
*Short Time Overload	J、G : $\Delta R \leq \pm(2\% + 0.5m\Omega)$ F : $\Delta R \leq \pm(1\% + 0.5m\Omega)$	IEC 60115-1, Clause 4.13 5 × Rated power for 5 seconds

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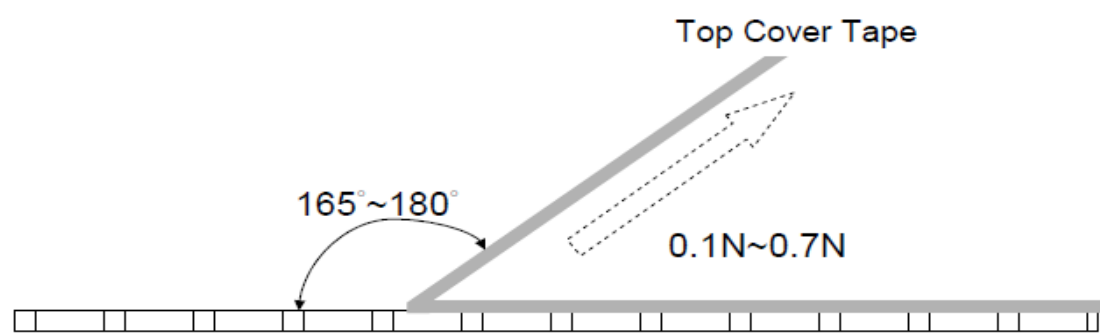
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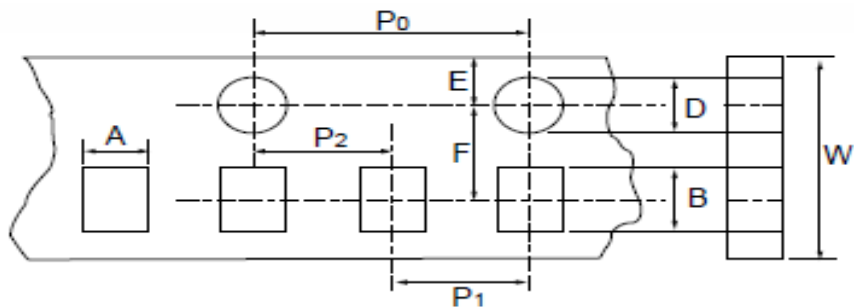
*Load Life Humidity	J、G： $\Delta R \leq \pm(3\%+0.5m\Omega)$ F： $\Delta R \leq \pm(1\%+0.5m\Omega)$	IEC 60115-1, Clause 4.24 40±2℃ with relative humidity 90% ~ 95% D.C. rated voltage for 1.5 hours ON 30 minutes OFF. Cycle repeated 1000 hours.
*Temperature Coefficient of Resistance (TCR)	Within the spec.	IEC 60115-1, Clause 4.8 Test temperature：25℃ ~ +155℃ TCR(ppm/℃) = (R2-R1)/R1×1 / (T2-T1)×10 ⁶ (+25~ -55℃ please contact factory.)
*Load Life	J、G： $\Delta R \leq \pm(3\%+0.5m\Omega)$ F： $\Delta R \leq \pm(1\%+0.5m\Omega)$	IEC 60115-1, Clause 4.25 Rated voltage for 1.5 hours for followed by a pause 0.5 hour at 70±2℃. Cycle repeated 1000 hours.
*Insulation Resistance	Between termination and coating must over 1000MΩ	IEC 60115-1, Clause 4.6 Test voltage：100±15V

■ 顶盖胶带剥离强度 Peel Strength of Top Cover Tape

剥离速度约为300 mm/min
 顶盖胶带的剥离力应在0.1~0.7N之间



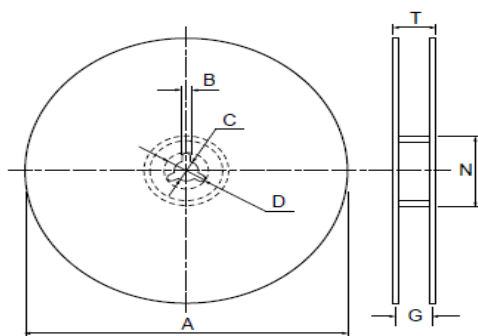
■ 载带尺寸 Ribbon size(Unit:mm)



- Accumulated dimensional tolerance $40\pm0.2\text{mm}$

Size	A	B	W	F	E	P1	P2	P0	D
2512	3.50 ± 0.20	6.75 ± 0.20	12.0 ± 0.30	5.50 ± 0.05	1.75 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	4.00 ± 0.10	1.50 ± 0.10

■ 卷轴规格 Reel Specification



Size	Packaging Q'ty	A	N	C	D	B	G	T
	4kpcs/Reel	178.0 ± 2.0	0.0 ± 0.5	13.0 ± 0.5	20(Min.)	2.0 ± 0.5	13.8 ± 1.5	16.7max.
2512	8kpcs/Reel	254.0 ± 2.0	100.0 ± 0.5	13.5 ± 0.5	20(Min.)	2.0 ± 0.5	13.8 ± 1.5	20.0max.
	16kpcs/Reel	330.0 ± 2.0	100.0 ± 1.0	13.5 ± 0.5	20(Min.)	2.0 ± 0.5	13.8 ± 1.5	20.0max.

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