规格书 Specification

制造商:深圳市毫欧电子有限公司 HoGX

适用：本规格书适用于深圳市毫欧电子有限公司HoGX封体合金系列产品选型。

包含：**HoGX1206/ HoGX2512**等封装。

■ 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

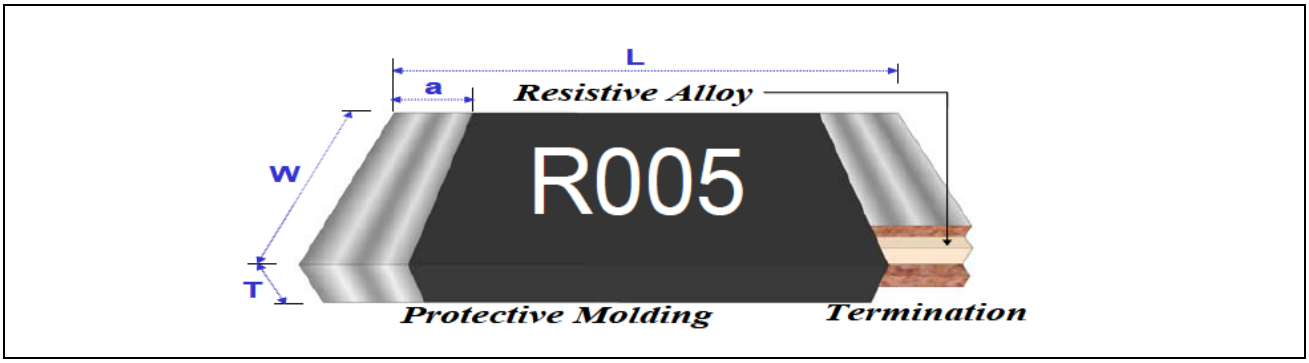
Ho	GX	2512	2W	10mR	1%	50ppm
制造商	产品系列	封装	额定功率(W)	阻值(mR)	精度(%)	温度系数 TCR（ppm）
Ho	GX	1206	0.5W~1W	3 ~30	1%/2%/5%	50/70
		2512	1W ~3W	1 ~220	1%/2%/5%	50/70/100

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

深圳市毫欧电子有限公司 | 电话：0755-28153546 | 传真：0755-22630181 | 网址：www.milliohm.net

■ 产品尺寸及结构 Dimension and Construction



产品结构

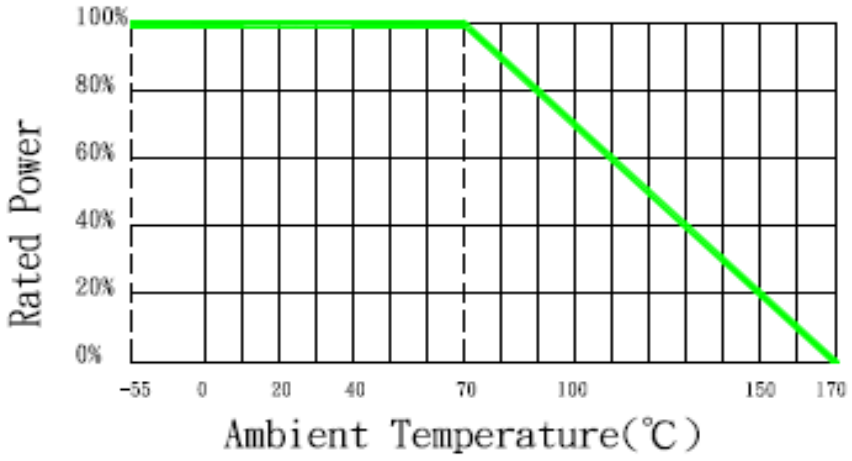
项目	保护性模塑	电阻元件	内部终端	外部 终端
材料	树脂	合金金属	铜	焊料

单位：mm

Type	Resistance	L	W	T	a
HoGX1206	3~30mR	3.10±0.20	1.65±0.20	0.60±0.20	0.60±0.20
HoGX2512	3~220mR	6.20±0.20	3.25±0.20	0.60±0.20	0.80±0.20
HoGX2512	3W series	6.20±0.20	3.25±0.20	0.65±0.20	0.80±0.20
HoGX2512	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



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

Rating / Type	Tolerance (%)	Rating 70℃ (W)	Max. Working Current (Voltage)*	Max. Overload Current (Voltage)*	Alloy Type	Temperature coefficient of Resistance (ppm/℃)**	Resistance (mΩ) ***
HoGX1206	**±1%(F) ±2%(G) ±5%(J)**	**0.5**	12.9A **(111mV)**	28.9A **(250mV)**	Low EMF	**±70**	**3,4,5,6,9,10, 15,20,25**
			10.0A **(111mV)**	22.4A **(250mV)**	Standard	**±50**	**5,10,15,15.5 18,20,25,30**
		1	18.3A **(158mV)**	40.8A **(354mV)**	Low EMF	**±70**	**3,4,5,6,9,10 15,20,25**
			14.1A **(173mV)**	31.6A **(387mV)**	Standard	**±50**	**5,10,15,15.5 18,20,25,30**
HoGX2512	**±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) = $\sqrt{P*R}$ 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 mm^2 and board surface temperature should not exceed 105℃ when applying rated power

(iv) * : Related number are depend on specific items only. ** : TCR Hot (+25~+155℃).

*** : Special requests and details please contact factory.

■ 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: (v) $E = \sqrt{P*R}$ 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 mm^2 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

HoGX1206/HoGX2512

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



R005=5mΩ

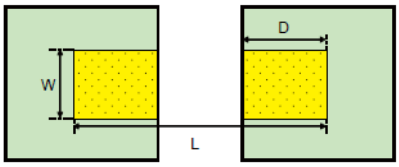


R001=1 mΩ

■ 建议焊盘尺寸 Recommended Solder Pad Dimension

Type	W	D	L
HoGX1206	1.80	1.30	4.70
HoGX2512	3.70	1.60	7.60
HoGX2512 R001/R002	4.00	3.00	7.30

Unit:mm



■ 可靠性性能 Reliability Performance

标准品常规检验项目

Test Item	Specification	**Test Method (AEC-Q200. IEC 60115)**
***DC Resistance**	F：±1%、G：±2%、J：±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：△R≦ ±(3%+0.5mΩ) F：△R≦ ±(1%+0.5mΩ)	**AEC-Q200 TABLE 7.3** 1000 hrs. @ T=125℃. Unpowered. Measurement at 24 ±2 hours after test conclusion.
***Temperature Cycling**	J、G：ΔR≦ ±(1%＋1mΩ) F：ΔR≦ ±(0.5%＋1mΩ) 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：△R≦ ±(1%+0.5mΩ) F：△R≦ ±(0.5%+0.5mΩ)	**AEC-Q200 TABLE 7.6** Test 65℃/80~100%RH/10Cycles. Measurement at 24±2 hours after test conclusion. (t=24hrs/cycle).
Biased Humidity	J、G：△R≦ ±(3%+0.5mΩ) F：△R≦ ±(1%+0.5mΩ)	**AEC-Q200 TABLE 7.7** 1000 hours 85℃/85%RH. 10% of operating power. Measurement at 24 ±2 hours after test conclusion.
Operational Life	J、G：△R≦ ±(3%+0.5mΩ) F：△R≦ ±(1%+0.5mΩ)	**AEC-Q200 TABLE 7.8** Test 1000hr @ TA=125℃ at specified rated power. Measurement at 24±2 hours after test conclusion.

■ 可靠性性能 Reliability Performance

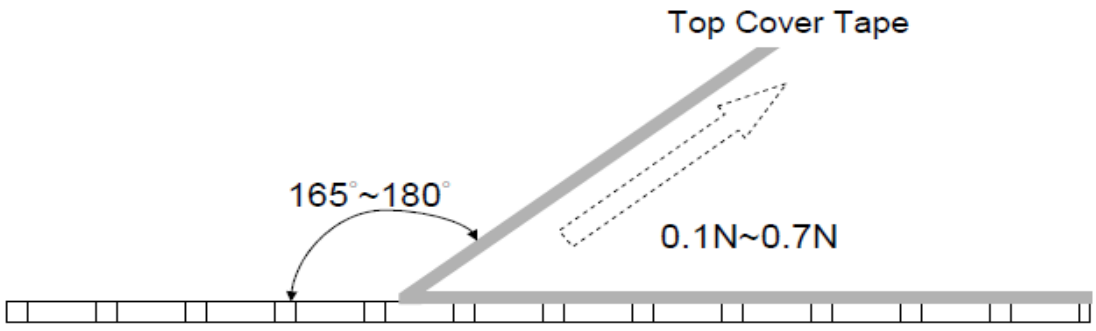
External Visual	No visual damage and refer PDC marking code.	**AEC-Q200 TABLE 7.9** Inspect device construction, marking and workmanship.
Physical Dimension	Within the spec.	**AEC-Q200 TABLE 7.10** Verify physical dimensions to the applicable device detail specification.
Mechanical Shock	Within product 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：ΔR≦ ±(1%＋0.5mΩ) F：ΔR≦ ±(0.5%＋0.5mΩ) No mechanical damage.	**AEC-Q200 TABLE 7.15** Solder dipping @ 270℃±5℃ for 10sec.±1sec.
Thermal Shock	J、G：ΔR≦ ±(1%＋0.5mΩ) F：ΔR≦ ±(0.5%＋0.5mΩ) No mechanical damage.	**AEC-Q200 TABLE 7.16** -55 to 155℃/ dwell time 15min/ Max transfer time 20sec/ 300cycles.
ESD	ΔR≦ ±(1%＋0.5mΩ) 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℃ 4H, dipping 235℃ 5s b)Steam 1H, dipping 215℃ 5s c)Steam 1H, dipping 260℃ 7s
Flammability	Refer UL-94.	**AEC-Q200 TABLE 7.20** UL-94 V-0 or V-1 are acceptable
***Board Flex**	J、G：ΔR≦ ±(1%＋1mΩ) F：ΔR≦ ±(0.5%＋1mΩ) 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：ΔR≦ ±(2%＋0.5mΩ) F：ΔR≦ ±(1%＋0.5mΩ)	**IEC 60115-1, Clause 4.13** 5 × Rated power for 5 seconds

■ 可靠性性能 Reliability Performance

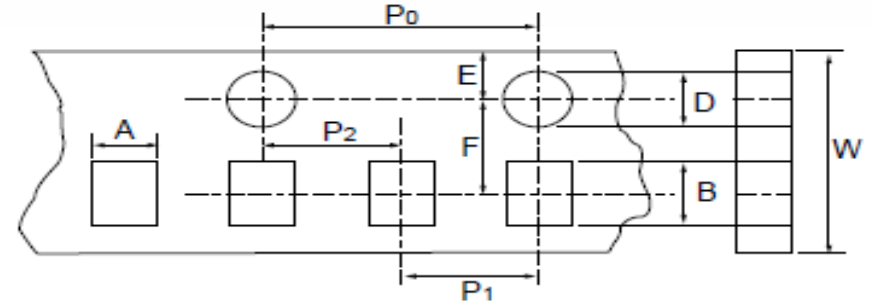
***Load Life Humidity**	J、G：△R≦ ±(3%+0.5mΩ) F：△R≦ ±(1%+0.5mΩ)	**IEC 60115-1, Clause 4.24** 40±2℃ with relative humidity 90% ~ 95% D.C. rated voltage for 1.5 hours ON 30 minutes OFF. Cycle repeated 1000 hours.
***Temperature Coefficient of Resistance (TCR)**	Within the spec.	**IEC 60115-1, Clause 4.8** Test temperature： 25℃~ +155℃ TCR(ppm/℃) $= (R_2-R_1)/R_1 \times 1 / (T_2-T_1) \times 10^6$ (+25~ -55℃ please contact factory.)
***Load Life**	J、G：△R≦ ±(3%+0.5mΩ) F：△R≦ ±(1%+0.5mΩ)	**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



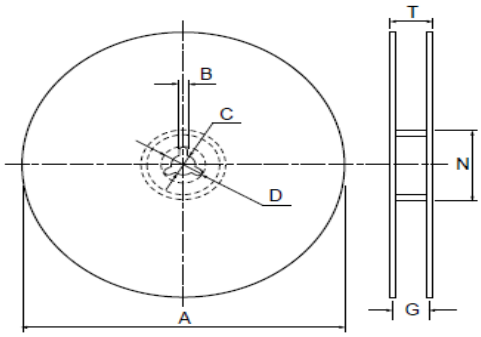
■ 载带尺寸 **Ribbon size**(Unit:mm)



- Accumulated dimensional tolerance 40±0.2mm

Size	A	B	W	F	E	P1	P2	P0	D
1206	2.00±0.20	3.60±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	2.00±0.05	4.00±0.10	1.50±0.10
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
1206	4kpcs/Reel	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	10.0±1.5	14.9max.
2512	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.
	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	00.0±1.0	13.5±0.5	20(Min.)	2.0±0.5	13.8±1.5	20.0max.