



# HoYH 陶瓷合金系列规格书

系列号	HoYH
修订日期	2020-04-22
版本号	Ho-A0



## 规格书 Specification

制造商:深圳市毫欧电子有限公司

HoYH

适用: 本规格书适用于深圳市毫欧电子有限公司陶瓷合金HoYH系列产品选型。

包含: HoYH0603、HoYH0805、HoYH1206、HoYH2010、HoYH3921

### 产品特点 Features:

陶瓷合金芯片, 封体工艺, 焊接性能良好

高可靠性, 高过载能力, 产品精度高。

使用温度范围较宽无感型设计

电阻温度系数  $TCR \times 10^{-6}/^{\circ}C \leq 100ppm$

符合ROHS 要求和无卤要求

### 产品名称 Product Name

陶瓷合金电阻

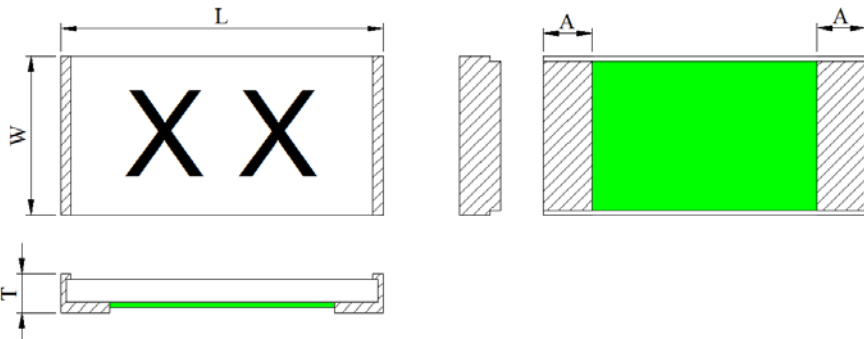
### 产品型号 Product number

Ho	YH	1206	1W	5mR	1%
制造商	产品系列	封装	额定功率(W)	阻值(mR)	精度(%)
Ho 毫欧电子	YH 陶瓷合金	0603	1/2	2~9	1%
				10~75	0.5%/1%
		0805	3/4	2~9	1%
				10~200	0.5%/1%
		1206	1	2~9	1%
				10~500	0.5%/1%
		2010	1.5	2~9	1%
				10~400	0.5%/1%
		3921	3	2~9	1%
				10~100	0.5%/1%



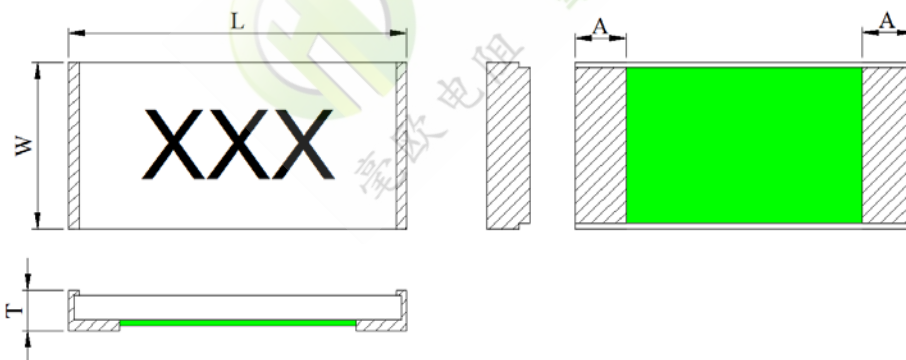
地址: 深圳市龙华新区观澜大布头路南通邦高新产业园 A 栋 8 楼

## ■ 产品尺寸 Product Size



单位(mm)

Part Number	W	L	T	A
HoYH0603-1/2W 2mR~5mR	0.90±0.20	1.70±0.20	0.65±0.20	0.50±0.20
HoYH0603-1/2W 6mR~75mR	0.90±0.20	1.70±0.20	0.65±0.20	0.40±0.20



单位(mm)

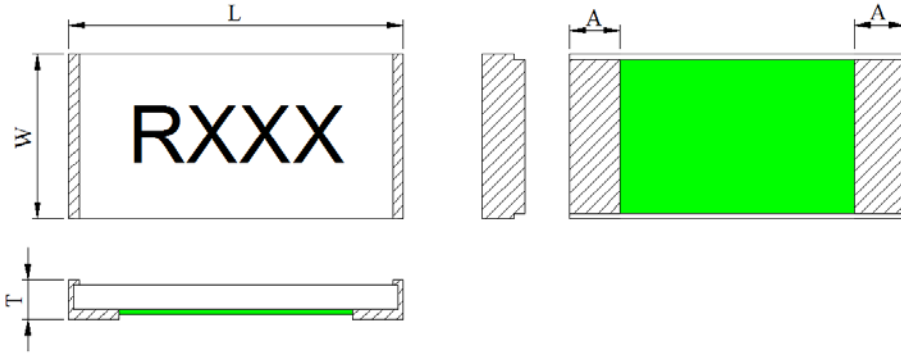
Part Number	W	L	T	A
HoYH0805-3/4W 2mR~3mR	1.35±0.20	2.10±0.20	0.65±0.20	0.65±0.20
HoYH0805-3/4W 4mR~200mR	1.35±0.20	2.10±0.20	0.65±0.20	0.50±0.20



毫欧电阻 毫欧制造

## HoYH 陶瓷合金系列规格书

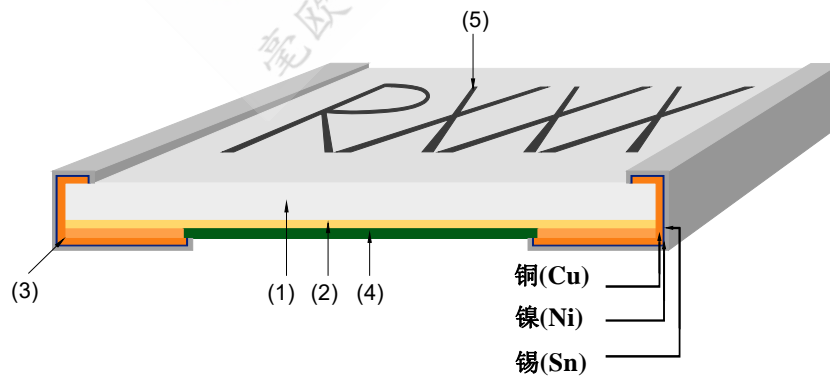
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单位(mm)

Part Number	W	L	T	A
HoYH1206-1W 2mR~4mR	1.70±0.20	3.30±0.20	0.65±0.2	1.20±0.30
HoYH1206-1W 5mR~500mR	1.70±0.20	3.30±0.20	0.65±0.2	0.68±0.30
HoYH2010-1.5W 2mR~3mR	2.60±0.20	5.10±0.20	0.65±0.20	2.10±0.30
HoYH2010-1.5W 4mR~400mR	2.60±0.20	5.10±0.20	0.65±0.20	0.70±0.30
HoYH3921-3W 2mR	5.10±0.30	11.10±0.30	0.65±0.20	4.90±0.30
HoYH3921-3W 3mR	5.10±0.30	11.10±0.30	0.65±0.20	4.55±0.30
HoYH3921-3W 4mR~100mR	5.10±0.30	11.10±0.30	0.65±0.20	2.36±0.30

### ■ 产品结构及使用材料说明 STRUCTURE & MATERIAL



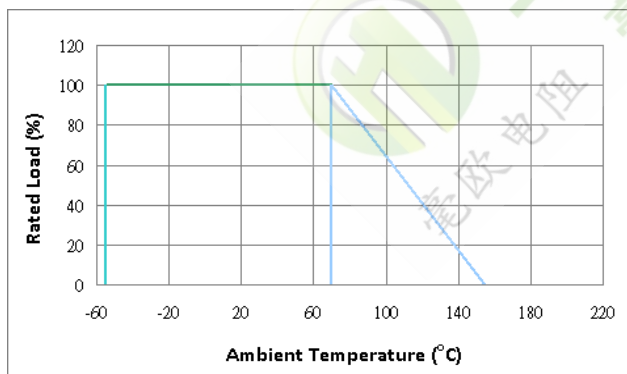
- 4.1 基板 Substrate(1) : 氧化铝陶瓷基板 Alumina Ceramic
- 4.2 粘著层 Adhesion layer(2) : 环氧树脂 Epoxy
- 4.3 电阻本体 Resistive element(3) : M = 锰铜合金 MnCu alloy
- 4.4 两端电极 Terminal electrode(4) : 锡、镍、铜 Sn、Ni、Cu
- 4.5 保护防焊层 Protective coating(5) : 防火级环氧树脂, 符合 UL- 94-V0 要求(绿色) Flame-retardant epoxy, meets UL- 94-V0 requirements(green)
- 4.6 文印防焊层 Marking coating(6) : 防火级环氧树脂, 符合 UL-94-V0 要求(黑色)

## ■ 电气参数 Electrical parameter

Part Number	Resistance Value (mΩ)	Power Rating (Watt)	Resistance Tolerance (%)	TCR (ppm)
HoYH0603	2~9	1/2	±1%	±100
	10~75	1/2	±0.5% / ±1%	±50
HoYH0805	2~9	3/4	±1%	±100
	10~200	3/4	±0.5% / ±1%	±50
HoYH1206	3~9	1.0	±1%	±100
	10~500	1.0	±0.5% / ±1%	±50
HoYH2010	2~9	1.5	±1%	±100
	10~400	1.5	±0.5% / ±1%	±50
HoYH3921	2~9	3.0	±1%	±100
	10~100	3.0	±0.5% / ±1%	±50

## ■ 功率曲线 Power curve

操作温度范围 -55 ~ +155 °C 电阻温度达到 70°C 时降功率示意图



## ■ 存储条件 STORAGE CONDITIONS

在温度+10°C~40°C、相对湿度≤75%的密闭条件下可存放 2 年。

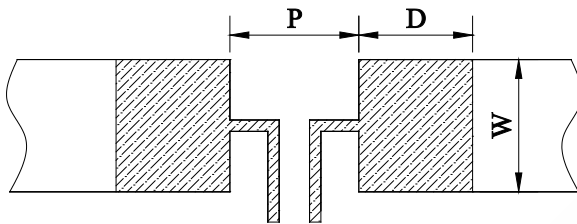
在温度+10°C~60°C、相对湿度为95%的非露天下最多可存放 30 天。

■ 额定电流计算公式 The rated current is calculated by the following Formu

$$I = \sqrt{P/R}$$

I :Rated Current (A)  
 P:Rated Power (W)  
 R:Resistance Value ( $\Omega$ )

■ 建议焊盘尺寸 Recommended Solder Pad Dimension

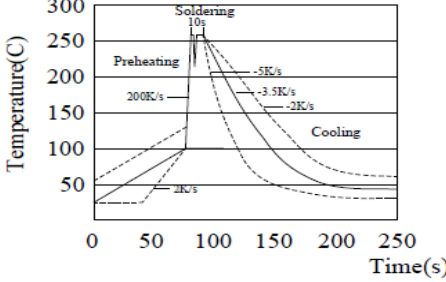
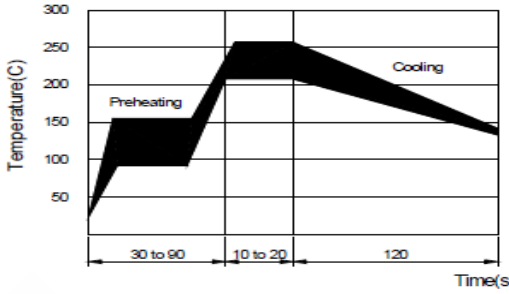


单位: mm

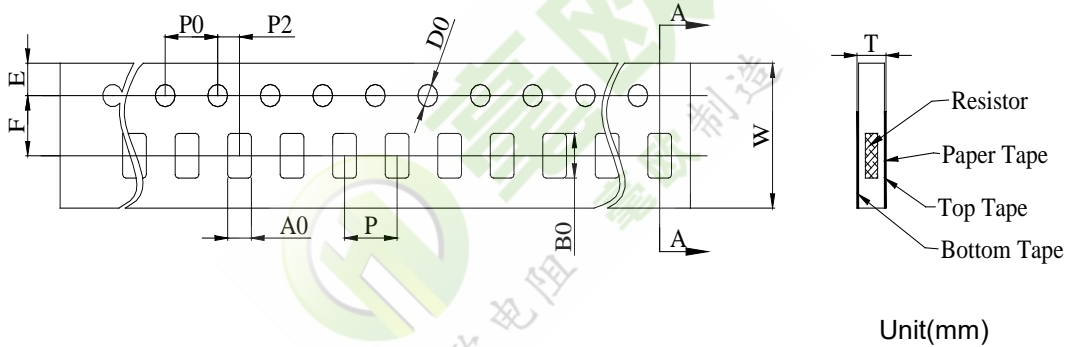
Part Number	P	W	D
HoYH0603-1/2W R002~R005	0.50	0.92	1.35
HoYH06031/2W R006~R075	0.60	0.92	1.30
HoYH0805-3/4 W R002~R006	0.80	1.44	1.40
HoYH0805-3/4W R007~R200	0.80	1.44	1.40
HoYH1206-1W R002~R004	0.60	1.84	2.10
HoYH1206-1W R005~R008	1.20	1.84	1.80
HoYH1206-1W R009~R500	1.20	1.84	1.80
HoYH2010-1.5W R002~R003	0.70	2.88	3.65
HoYH2010-1.5W R004~R009	2.70	2.88	2.65
HoYH2010-1.5W R010~R400	2.70	2.88	2.65
HoYH3921-3W R002	1.10	5.75	6.45
HoYH3921-3W R003	1.70	5.75	6.15
HoYH3921-3W R004~R100	5.00	5.75	4.50

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## ■ 建议焊接参数 / Recommended Customer Soldering Parameters

预热 / Preheating : 100°C~130°C, max.100 sec. 焊锡 / Soldering: 250°C~265°C max. 10 sec. 最高温度 / Maximum temperature : 260±5°C, max. 10sec.	预热/ Preheating : 145 ± 15°C, max.120 sec. 焊锡/ Soldering : min. 220°C, max. 60 sec. 最高温度 / Maximum temperature : 260±5°C, max. 10sec.
<b>波峰焊曲线图</b>  <p>The graph shows a temperature profile for wave soldering. The y-axis is Temperature (C) from 50 to 300. The x-axis is Time (s) from 0 to 250. The profile includes a preheating phase (0-100s) with a 200K/s ramp, a soldering phase (100-110s) at 260°C, and a cooling phase (110-250s) with a -5K/s ramp. Other cooling rates of -3.5K/s and -2K/s are also indicated.</p>	<b>回流焊曲线图</b>  <p>The graph shows a temperature profile for reflow soldering. The y-axis is Temperature (C) from 50 to 300. The x-axis is Time (s) from 0 to 120. The profile includes a preheating phase (0-30s) with a 30 to 90s duration, a soldering phase (30-40s) at 260°C with a 10 to 20s duration, and a cooling phase (40-120s) with a 120s duration.</p>

## ■ 彩带尺寸 Ribbon size(Unit:mm)

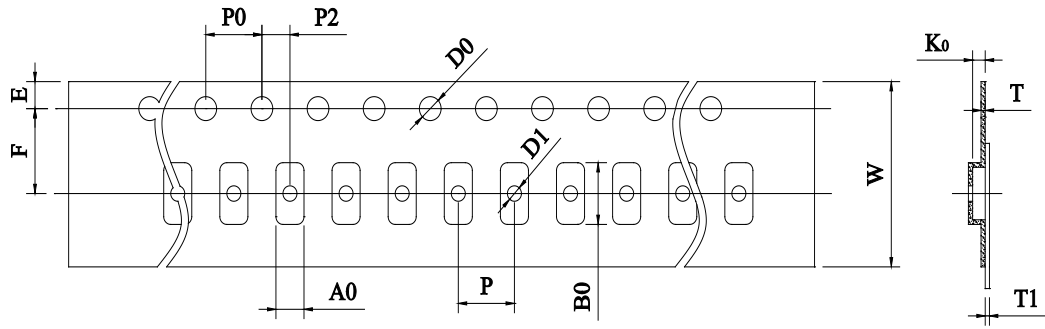


Unit(mm)

HoYH0603-1/2W							
W	8.00 ± 0.30	P0	4.00 ± 0.10	P	4.00 0.10	P2	2.00 0.10
A0	1.18 ± 0.20	B0	1.98 ± 0.20	D0	1.50 ± 0.10	F	3.50 ± 0.10
E	1.75 ± 0.10	T	0.75 ± 0.20	/	/	/	/

HoYH0805-3/4W							
W	8.00 ± 0.30	P0	4.00 ± 0.10	P	4.00 0.10	P2	2.00 0.10
A0	1.68 ± 0.20	B0	2.38 ± 0.20	D0	1.50 ± 0.10	F	3.50 ± 0.10
E	1.75 ± 0.10	T	0.87 ± 0.20	/	/	/	/

HoYH1206-1W							
W	8.00 ± 0.30	P0	4.00 ± 0.10	P	4.00 0.10	P2	2.00 0.10
A0	2.05 ± 0.20	B0	3.65 ± 0.20	D0	1.50 ± 0.10	F	3.50 ± 0.10
E	1.75 ± 0.10	T	0.87 ± 0.10	/	/	/	/

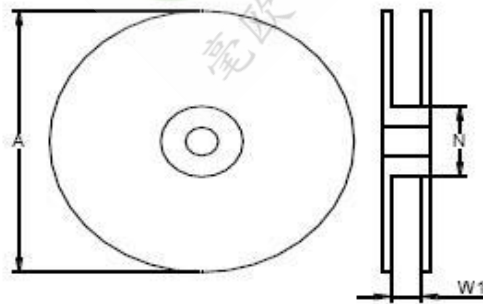


Unit(mm)


HoYH2010-1.5W							
W	12.00 0.30	P0	4.00 ± 0.10	P	4.00 0.10	P2	2.00 0.10
A0	2.85 ± 0.20	B0	5.45 ± 0.20	D0	1.50 ± 0.10	F	5.50 ± 0.10
E	1.75 ± 0.10	T	0.25 ± 0.10	T1	Max. 0.1	K0	0.80 0.20

HoYH3921-3W							
W	24.00 ± 0.30	P0	4.00 ± 0.10	P	8.00 ± 0.10	P2	2.00 ± 0.10
A0	5.50 ± 0.20	B0	11.50 ± 0.20	D0	1.50 ± 0.10	F	11.50 ± 0.10
E	1.75 ± 0.10	T	0.30 ± 0.10	T1	Max. 0.1	K0	0.90 ± 0.20

## ■ 卷轴规格 Reel Specification



型号 / Type Number	A±5 (mm)	N±2 (mm)	W1±1 (mm)
HoYH0603	178	60	9.0
HoYH0805	178	60	9.0
HoYH1206	178	60	9.0
HoYH2010	178	60	13
HoYH3921	178	60	24.5

 毫欧电阻 毫欧制造	<b>HoYH 陶瓷合金系列规格书</b>	系列号	HoYH
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## ■ 性能测试 Performance Testing

测试方法 Parameter	条件 Conditions	允收标准 Requirements
瞬间过载测试 / Short Time Over Load	$P = 2.5P_r$ ; $T = 25 \pm 2^\circ\text{C}$ , $t = 5\text{sec.}$	$\pm (1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.13
高温测试 / High Temp. Exposure	$T = +170 \pm 2^\circ\text{C}$ ; $t = 1000\text{h}$	$\pm (1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.25
低温测试 / Low Temp. Storage	$T = -55 \pm 2^\circ\text{C}$ ; $t = 1000\text{h}$	$\pm (1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.25
湿度负载寿命测试 / Moisture Load Life (60°C、95%RH)	$V_{\text{test}} = V_{\text{max}}$ ; $T = 60 \pm 2^\circ\text{C}$ ; $\text{RH} = 95\%$ ; $t = 90\text{min ON}$ , $30\text{min OFF}$ , $1000\text{h}$	$\pm (2.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.25
冷热动击测试 / Thermal Shock	$[-55^\circ\text{C } 30\text{min.} \rightarrow \text{R.T. } 3\text{min.} \rightarrow +155^\circ\text{C } 30\text{min.} \rightarrow \text{R.T. } 3\text{min.}]$ , 100 个连续循环 / 100Cycles	$\pm (1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.19
在 70°C 下负载寿命测试 / Load Life at 70°C	$V_{\text{test}} = V_{\text{max}}$ ; $T = 70 \pm 2^\circ\text{C}$ ; $t = 90\text{min ON}$ , $30\text{min OFF}$ , $1000\text{h}$	$\pm (2\% + 0.5\text{m}\Omega)$ IEC60115-1 4.25
可焊性测试 / Solderability	浸入锡炉 / Dip into solder at $T = 245 \pm 5^\circ\text{C}$ , $t = 3 \pm 0.5\text{sec.}$	锡涵盖面积 / The covered area $> 95\%$ IEC60115-1 4.17
抗焊热性测试 / Resistance to Solder Heat	经热风式回焊炉 / Through Reflow $T = 275 \pm 5^\circ\text{C}$ , $t = 20 \pm 1\text{sec.}$	$\pm (1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.18
机械热击测试 / Mechanical Shock	加速度 $a = 100\text{G}$ , 振幅时间 $t = 11\text{ms}$ , 5 个热击 $a = 100\text{G}$ , $t = 11\text{ms}$ , 5 times shock	$\pm (1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.21
基板弯曲测试 / Substrate Bending	两支撑点间距 / Span between fulcrums : 90mm ; 振幅 / Bend Width: 2mm ; 测试板 / Test board: 玻璃纤维板 / Glass-Epoxy Board ; 厚度 / Thickness = 1.6mm	$\pm (1.0\% + 0.5\text{m}\Omega)$ IEC60115-1 4.33

## ■ 包装方式 Packing

型号 / Type Number	数量 / Quantity (pcs)	重量 / Weight (g)
HoYH0603	5,000	130±30
HoYH0805	5,000	150±30
HoYH1206	5,000	160±40
HoYH2010	4,000	210±40
HoYH3921	2,000	510±60



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