



HoAR 贴片陶瓷系列规格书

系列号	HoAR
修订日期	2022-08-17
版本号	Ho-B0

规格书 Specification



制造商:深圳市毫欧电子有限公司

HoAR

适用: 本规格书适用于深圳市毫欧电子有限公司贴片陶瓷电阻 HoAR 系列产品选型。

包括: HoAR0210/ HoAR0402/ HoAR0603/ HoAR0805/ HoAR1206/ HoAR1210/ HoAR2010/ HoAR2512/

产品特点 Features:

- Advanced thin film technology
- Very tight tolerance down to $\pm 0.01\%$
- Extremely low TCR down to $\pm 1\text{PPM}/^\circ\text{C}$
- Wide resistance range 1ohm ~ 3Mega ohm
- Miniature size 0201 available

应用程序 Applications

- Medical Equipment
- Testing / Measurement Equipment
- Printer Equipment
- Automatic Equipment Controller
- Converters
- Communication Device, Cell Phone, GPS, PDA

产品型号 Product number

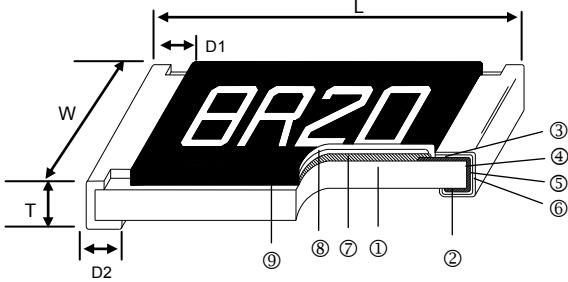
Ho	AR	2512	1/2W	10R	1%	50ppm
↓	↓	↓	↓	↓	↓	↓
制造商	产品系列	封装尺寸	额定功率(W)	阻值 (mR)	精度 (%)	温度系数
毫欧电子	贴片陶瓷	0201	1/16W	0010: 1Ω	$\pm 0.01\%$	± 2
		0402	1/10W	4R70: 4.7Ω	$\pm 0.05\%$	± 3
		0603	1/8W	1001: 1KΩ	$\pm 0.1\%$	± 5
		0805	1/6W	1004: 1MΩ	$\pm 0.25\%$	± 10
		1206	1/5W		$\pm 0.5\%$	± 25
		1210	1/4W		$\pm 1\%$	± 50
		2010	1/3W			
		2512	1/2W			
			3/4W			
			1W			



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

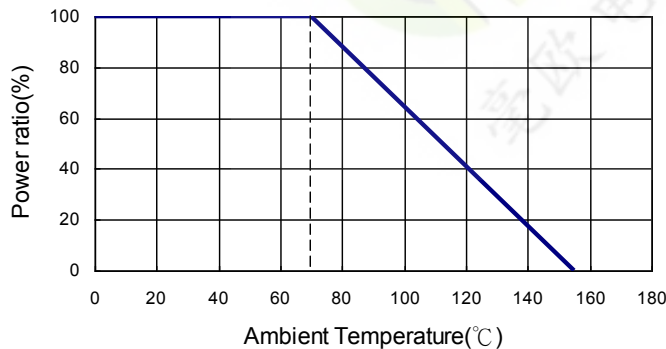
1. Alumina Substrate
2. Bottom Electrode
3. Top Electrode
4. Edge Electrode
5. Barrier Layer
6. External Electrode
7. Resistor Layer
8. Primary Overcoat
9. Secondary Overcoat



产品尺寸:

型号	L(mm)	W(mm)	T(mm)	D1(mm)	D2(mm)
HoAR 0201	0.58±0.05	0.29±0.05	0.23±0.05	0.12±0.05	0.15±0.05
HoAR0402	1±0.05	0.5±0.05	0.30±0.05	0.2±0.1	0.2±0.1
HoAR0603	1.55±0.1	0.8±0.1	0.45±0.1	0.3±0.2	0.3±0.2
HoAR0805	2±0.15	1.25±0.15	0.55±0.1	0.30±0.2	0.4±0.20
HoAR 1206	3.05±0.15	1.55±0.15	0.55±0.1	0.42±0.2	0.35±0.25
HoAR1210	3.1±0.15	2.4±0.15	0.55±0.1	0.4±0.2	0.55±0.25
HoAR2010	4.9±0.15	2.4±0.15	0.55±0.1	0.6±0.3	0.5±0.25
HoAR 2010 (1/2W)	6.3±0.15	3.1±0.15	0.55±0.1	0.6±0.3	2.2±0.25
HoAR 2512	6.3±0.15	3.1±0.15	0.55±0.1	0.6±0.3	0.5±0.25
HoAR 2512(1W)	6.3±0.15	3.1±0.15	0.55±0.1	0.6±0.3	2.5±0.25

■ 功率曲线 Power curve



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

I : Rated Current (A)

P: Rated Power (W)

R: Resistance Value (Ω)

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

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■标准的电气规范 Standard Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range					TCR (PPM/°C)
					±0.05%	±0.1%	±0.25%	±0.5%	±1%	
AR0201	1/32W	-55 ~ +155°C	15V	30V	49.9Ω - 4.99KΩ					±25
					49.9Ω - 33KΩ					±50
AR0402	1/16W	-55 ~ +155°C	25V	50V	49.9Ω - 12KΩ	10Ω - 255KΩ	4.7Ω - 511KΩ			±25 ±50
AR0603	1/16W	-55 ~ +155°C	50V	100V	4.7Ω - 332KΩ	4.7Ω - 1MΩ	1Ω - 1MΩ			±25 ±50
AR0805	1/10W	-55 ~ +155°C	100V	200V	4.7Ω - 1MΩ	4.7Ω - 2MΩ	1Ω - 2MΩ			±25 ±50
AR1206	1/8W	-55 ~ +155°C	150V	300V	4.7Ω - 1MΩ	4.7Ω - 2.49MΩ	1Ω - 2.49MΩ			±25 ±50
AR1210	1/4W									
AR2010	1/4W	-55 ~ +155°C	150V	300V	4.7Ω - 1MΩ	4.7Ω - 3MΩ	1Ω - 3MΩ			±25 ±50
AR2512	1/2W									

■ Lower Resistance: 1~10Ω

■ Special Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range					TCR (PPM/°C)
					±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	
AR0402	1/16W	-55 ~ +155°C	50V	100V	49.9Ω - 4.99KΩ		-			±1,±2,±3
					49.9Ω - 20KΩ					±5
					49.9Ω - 20KΩ		49.9Ω - 100KΩ			±10,±15
AR0603	1/16W	-55 ~ +155°C	50V	100V	24.9Ω - 15KΩ		-			±1,±2,±3
					24.9Ω - 60KΩ					±5
					24.9Ω - 100KΩ	4.7Ω - 332KΩ	4.7Ω - 511KΩ			±10 ±15
AR0805	1/10W	-55 ~ +155°C	100V	200V	24.9Ω - 30KΩ		-			±1,±2,±3
					24.9Ω - 150KΩ					±5
					24.9Ω - 200KΩ	4.7Ω - 1MΩ			±10 ±15	
AR1206	1/8W	-55 ~ +155°C	150V	300V	24.9Ω - 49.9KΩ		-			±1,±2,±3
					24.9Ω - 300KΩ					±5
					24.9Ω - 499KΩ	4.7Ω - 1.5MΩ			±10 ±15	
AR1210	1/4W	-55 ~ +155°C	150V	300V	24.9Ω - 49.9KΩ		-			±1,±2,±3
					24.9Ω - 300KΩ					±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ			±10 ±15	
AR2010	1/4W	-55 ~ +155°C	150V	300V	24.9Ω - 100KΩ		-			±1,±2,±3
					24.9Ω - 300KΩ					±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ			±10 ±15	
AR2512	1/2W	-55 ~ +155°C	150V	300V	24.9Ω - 100KΩ		-			±1,±2,±3
					24.9Ω - 300KΩ					±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ			±10 ±15	

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毫欧电阻 毫欧制造

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■高功率额定电气规格High Power Rating Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range					TCR (PPM/°C)
					±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	
AR 0201	1/20W	-55 ~ +155°C	25V	50V	—		5KΩ - 75KΩ			±25,±50
AR0402	1/10W	-55 ~ +155°C	50V	100V	49.9Ω - 4.99KΩ		—			±1,±2,±3
					49.9Ω - 4.99KΩ					±5
					49.9Ω - 12KΩ		49.9Ω - 60KΩ			±10
					—		49.9Ω - 12KΩ	4.7Ω - 69.8KΩ		±15
AR0603	1/10W	-55 ~ +155°C	75V	150V	24.9Ω - 15KΩ		—			±1,±2,±3
					24.9Ω - 60KΩ					±5
					24.9Ω - 100KΩ	4.7Ω - 332KΩ	4.7Ω - 511KΩ			±10
					—		10Ω - 332KΩ		±15	
AR0805	1/8W	-55 ~ +155°C	150V	300V	24.9Ω - 30KΩ		—			±1,±2,±3
					24.9Ω - 150KΩ					±5
					24.9Ω - 200KΩ	4.7Ω - 511KΩ	4.7Ω - 511KΩ			±10
					—		10Ω - 499KΩ		±15	
AR1206	1/4W	-55 ~ +155°C	200V	400V	24.9Ω - 49.9KΩ		—			±1,±2,±3
					24.9Ω - 300KΩ					±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ			±10	
					—		10Ω - 1MΩ		±15	
AR1210	1/3W	-55 ~ +155°C	200V	400V	24.9Ω - 49.9KΩ		—			±1,±2,±3
					24.9Ω - 300KΩ					±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ			±10	
					—		10Ω - 1MΩ		±15	
AR2010	1/3W	-55 ~ +155°C	200V	400V	24.9Ω - 49.9KΩ		—			±1,±2,±3
					24.9Ω - 300KΩ					±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ			±10	
					—		10Ω - 1MΩ		±15	
AR2512	3/4W	-55 ~ +155°C	200V	400V	24.9Ω - 2KΩ	4.7Ω - 2KΩ	1Ω - 2KΩ			±10
	1W	-55 ~ +155°C	200V	400V	24.9Ω - 2KΩ	4.7Ω - 1MΩ	1Ω - 1MΩ			±15, ±25, ±50


Operating Voltage= $\sqrt{P \cdot R}$ or Max. operating voltage listed above, whichever is lower.

Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max. overload voltage listed above, whichever is lower.

■Viking is capable of manufacturing the optional spec based on customer's requirement.

(Lower Resistance:1~10Ω ; High Power Rating)

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■ 环境特征 Environmental Characteristics

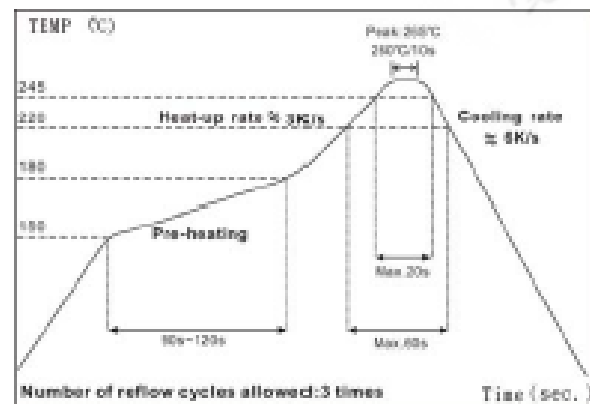
Item	Requirement		Test Method
	Tol. ≤ 0.05%	Tol. > 0.05%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		MIL-STD-202 Method 304 +25/-55/+25/+125/+25°C
Short Time Overload	ΔR±0.05%	ΔR±0.2%	JIS-C-5201-1 4.13 RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
	ΔR±0.2% for high power rating		
Insulation Resistance	>9999 MΩ		MIL-STD-202 Method 302 Apply 100V _{DC} for 1 minute
Endurance	ΔR±0.05%	ΔR±0.2%	MIL-STD-202 Method 108A 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	>7kΩ ΔR±0.5%		
	ΔR±0.5% for high power rating		
Damp Heat with Load	ΔR±0.05%	ΔR±0.3%	MIL-STD-202 Method 103B 40±2°C, 90~95% R.H. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	ΔR±0.5% for high power rating		
Bending Strength	ΔR±0.05%	ΔR±0.1%	JIS-C-5201-1 4.33 Bending amplitude 3 mm for 10 seconds
Solderability	95% min. coverage		MIL-STD-202 Method 208H 245±5°C for 3 seconds
Resistance to Soldering Heat	ΔR±0.05%	ΔR±0.1%	MIL-STD-202 Method 210E 260±5°C for 10 seconds
Dielectric Withstand Voltage	By Type		MIL-STD-202 Method 301 Max. overload voltage for 1 minute
Thermal Shock	ΔR±0.05%	ΔR±0.2%	MIL-STD-202 Method 107G -55°C ~150°C, 100 cycles
Low Temperature Operation	ΔR±0.05%	ΔR±0.2%	JIS-C-5201-1 4.36 1 hour, -65°C, followed by 45 minutes of RCWV
	ΔR±0.5% for high power rating		
High Temperature Exposure	ΔR±0.5%		MIL-STD-202 Method 108 at +155°C for 1000 hrs

(Rated continuous working voltage)= $\sqrt{P \cdot R}$ or Max. Operating voltage whichever is lower ■

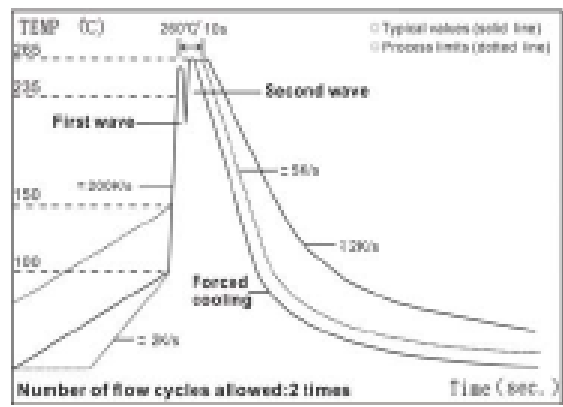
Storage Temperature: 15~28°C; Humidity < 80%RH

- (1) 最高温度260° C下进行回流焊接的时间: 10s
- (2) 最高温度点260° C下波峰焊接的时间: 10s
- (3) 最高温度410°C下烙铁的时间: 5s

回流焊曲线图



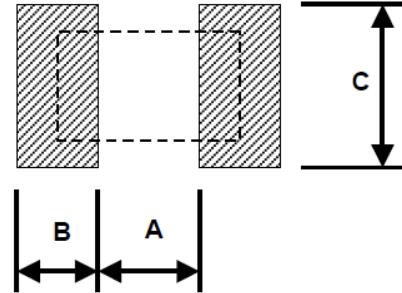
波峰焊曲线图



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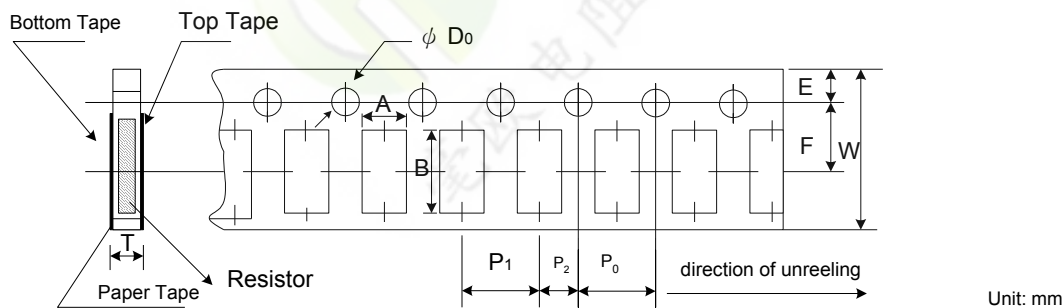
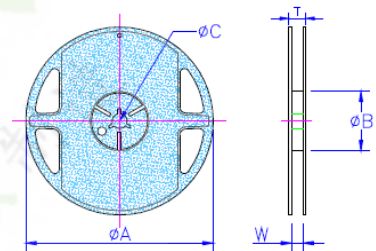
■ 建议焊盘尺寸 Recommended Solder Pad Dimension

型号	A(mm)	B(mm)	C(mm)
HoAR 0201	0.25	0.3	0.4±0.2
HoAR0402	0.5	0.5	0.6±0.2
HoAR0603	0.8	1	0.9±0.2
HoAR0805	1.0	1	1.35±0.2
HoAR 1206	2.0	1.15	1.7±0.2
HoAR1210	2.0	1.15	2.5±0.2
HoAR2010	3.6	1.4	2.5±0.2
HoAR 2512	4.9	1.6	3.1±0.2



■ 卷轴规格 / 包装方式 Reel Specification / Packing Unit : mm

Type	ØA	ØB	ØC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
HoAR0201	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	10,000	-
HoAR0402	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	10,000	-
HoAR0603	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
HoAR0805	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
HoAR1206	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
HoAR1210	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
HoAR2010	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000
HoAR2512	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000



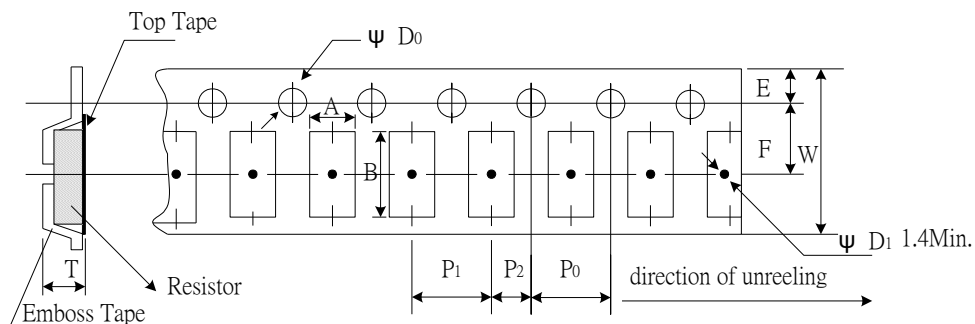
Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ØD ₀	T
HoAR0201	0.40±0.05	0.70±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.03	0.42±0.02
HoAR0402	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.05	0.40±0.03
HoAR0603	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.60±0.03
HoAR0805	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
HoAR1206	2.00±0.05	3.55±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
HoAR1210	2.75±0.05	3.40±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.60±0.10	0.75±0.05

- Peel force of top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 8gf to 60gf

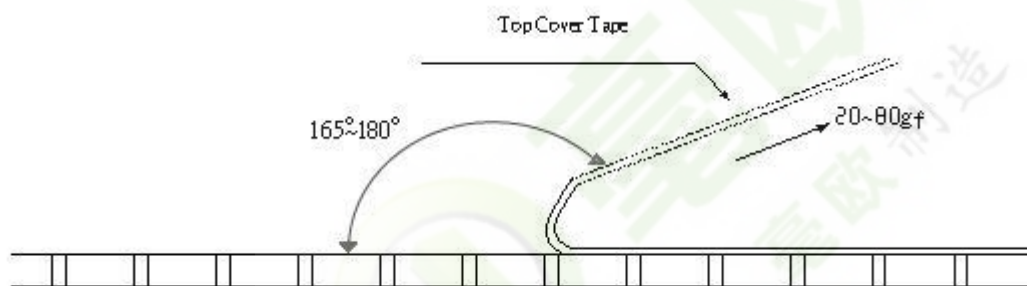
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Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ØD ₀	T
HoAR2010	2.85±0.10	5.45±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20
HoAR2512	3.40±0.10	6.65±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20



顶盖胶带的剥离力

剥离速度约为300mm / min ± 5%

顶盖胶带的剥离力应在20gf至80gf之间

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