

Product Specification [产品规格书]:	Document No	PS-HRS-2045-01
Subject [主题]:	Date Issued	2023/02/18
2.00mm Pitch HRS 2045 Series Connector Specification	Date Revised	2023/02/18
	Version	A0

This specification is referred to the 2.00mm series wire to board connector

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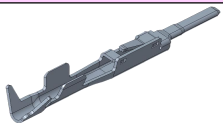
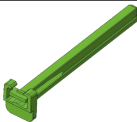
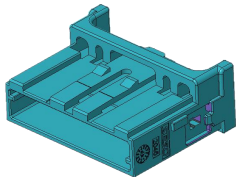
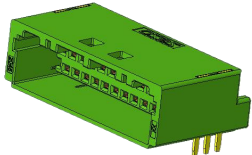
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【1.适用范围 Scope】

此种规格包括 2.00mm Pitch HRS 2045 Series 连接器规格说明.

This Specification Covers the 2.0mm Pitch HRS 2045 Series Connector Specification.

【2.规格与料号 Spec and Part number】

规格内容 Specification	产品料号 Production No.	产品图示 Picture of Product
端子/ Terminal	HRS-2045TXM-BSW1	
二次锁/TPA	HRS-2045C-2*XX-N0BK	
公胶壳/ Male Housing	HRS-2045HM-2*XXX-NOXX	
针座 DIP/ Wafer DIP Type	HRS-2045WRS-2*XXX-10TSW1XR	

【3.材质与表面处理 Disposal of Material and surface】

规格内容 Specification		材 质 Materials	表面处理 Disposal of Surface
端子/Terminal		黄铜/Bronze	Underplated: Ni 40~120u"(1~3μm)overall; Top plating: Sn 80~200u"(2~5μm) overall
公胶壳/ Male Housing		尼龙/Nylon	UL 94V-0
二级锁扣/TPA		尼龙/Nylon	UL 94V-0
针座 SMT/ Wafer SMT Type	Base	尼龙/Nylon	UL 94V-0
	PIN	铜合金/High Conductivity copper	Underplated: Ni 40~120u"(1~3μm)overall; Top plating: Sn 80~200u"(2~5μm) overall
	Solder tab	黄铜/Bronze	Underplated: Ni (1.25μm min)overall; Top plating: Sn (2.5μm min) overall

(上述参数请以工程图为准/Please Refer to the Project drawing for the above Specification)

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【4. 额定等级 Ratings and applicable wires】

项 目 【Item】	规 格 【Standard】	
额定电压 Rated Voltage (Max.)	60V Max.	[AC/DC]
额定电流 Rated Current (Max.)	2A Max.	
使用温度范围 Ambient temperature Range	-40℃~+125℃	

【5.测试方法及要求 Test Methods and Requirements】**5-1. 外观检查 Examination of product.**

测试内容 Item	规格要求 Specification requirements	参考标准 Reference standard
产品外观检查 Visual Inspection	借助 10 倍放大镜对每一个试验样品进行检查，详细记录所有制造或材料的瑕疵，如：裂缝、变色、毛刺等。 Inspect each sample with a 10x magnification, recording all defects in all process or material defects such as cracks,discoloration,flash,etc.	USCAR-2 Rev.7 5.1.8

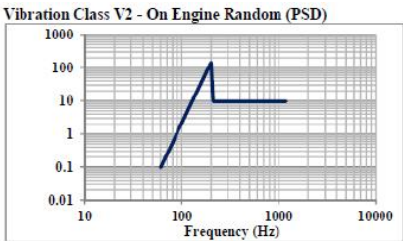
5-2. 电气的性能 Electrical Performance.

项 目 【Item】		条 件 【Test Condition】	规 格 【Requirement】
5-2-1	电路连贯性监控 Circuit Continuity Monitoring	电流的连续性监控不能间断超过 1us；不允许任何端子电阻超过 7 欧的时间大于 1us 的情况发生 There must be no loss of electrical continuity for more than 1 microsecond There must be no instance in which the resistance of any terminal pair exceeds 7.0 Ω for more than 1 microsecond	USCAR-2 Rev.7 5.1.9
5-2-2	干电路电阻 Dry Circuit Resistance	在环境前/后 ≤20mΩ Initial/Final ≤20mΩ	USCAR-2 Rev.7 5.3.1
5-2-3	电压降 Voltage Drop	在环境前/后 ≤50mV Initial/Final ≤50mV	USCAR-2 Rev.7 5.3.2

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项 目 【Item】		条 件 【Test Condition】	规 格 【Requirement】
5-2-4	最大试验电流能力 Maximum test current capacity	在无风的封闭场所内搭建一个电路 温度：23±5℃(室温) 时间：等待 15 分钟（电流在输出时，电路的温度达到稳定） Create a circuit in a draft free environment Temperature :23±5℃(room temperature) Time: Wait at least 15 minutes for the circuit temperature to reach Steady State	USCAR-2 Rev.7 5.3.3
5-2-5	电流循环 Current Cycling	1.测试电流为最大试验电流 90%，通电 45 分钟，断电 15 分钟，完成 1008 个循环 2.任何端子温升不超过 55℃ 3.干电路电阻 ≤20mΩ 1.Test current is 90% of the maximum test current , 45 minutes of power on , 15 minutes of power off , and 1008 cycles are completed. 2.The temperature rise must not exceed 55℃ at any time during the test for any terminal 3.Dry circuit resistance is less than or equal 20mΩ	USCAR-2 Rev.7 5.3.4
5-2-6	绝缘电阻 Insulation Resistance	将试验样品的所有接端交错连接成两组,再施加 1000 VDC 电压测量绝缘电阻。 绝缘电阻>100 MΩ Apply 1000 VDC voltage (desiccation bound) between all contacts connected together and a metal foil surrounding the housing. In addition, apply the voltage a different test sample to every two adjacent contacts. Insulation resistance >100 MΩ	USCAR-2 Rev.7 5.5.1
5-3. 机械的性能 Mechanical Performance.			
项 目 【Item】		条 件 【Test Condition】	规 格 【Requirement】
5-3-1	连接器/端子循环 Connector and/or Terminal Cycling	完成每一对端子和连接器 50 次插拔 Completely mate and un-mate each connector or terminal pair 50 times	USCAR-2 Rev.7 5.1.7
5-3-2	端子到端子啮合/分离力 Terminal to Terminal Engage/Disengage Force	以不超过 50mm/min 的均匀速度插入对配端子，接触面无破损，未暴露基材 Engage the mating terminals at a uniform rate not to exceed 50 mm/min No base material should be exposed	USCAR-2 Rev.7 5.2.1
5-3-3	连接器至连接器的配合/分离力（无机械辅助） Connector-Connector Mating/Unmating/Retention Forces (non-assist)	连接器的一次自锁机构是完全分离/松开的，拔出力 ≤100 N。 Unmating Force ≤ 75 N with the primary connector lock completely disengaged/disabled	USCAR-2 Rev.7 5.4.2

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5-3-4	端子至连接器插入/保持力 Terminal-Connector Insertion/Retention Force	端子以不超过 50mm/min 的均匀速度插入连接器 端子插入力 $\leq 15\text{N}$ 端子以不超过 50mm/min 的均匀速度拉出连接器, 端子保持力(一次锁) $\geq 30\text{N}$ 端子保持力(一次锁+二次锁) $\geq 60\text{N}$ The terminal straight into the connector at a uniform rate not to exceed 50 mm/min The Insertion Force $\leq 15\text{N}$; Pull the terminal straight back from the connector at a uniform rate not to exceed 50mm/min, until pullout occurs. The Retention Force (Primary) $\geq 30\text{N}$ The Retention Force (Primary+Secondary Lock) $\geq 60\text{N}$	USCAR-2 Rev.7 5.4.1
5-3-5	极性特征有效性 Polarization Feature Effectiveness	以错误的方向将公连接器插入母连接器,公母端子间不通电 Insert the male connector into the female connector in the wrong direction, and the male and female terminals are not electrical contact	USCAR-2 Rev.7 5.4.4
5-3-6	混合组件的啮合分离力 Miscellaneous Component Engage/Disengage Force	$15\text{N} \leq \text{啮合力} \leq 60\text{N}$ 分离力: $18\text{N} \leq \text{锁定到预锁} \leq 60\text{N}$ 预锁到完全分离 $\geq 25\text{N}$ $15\text{N} \leq \text{Engagement Force} \leq 60\text{N}$ Removal Force: $18\text{N} \leq \text{Lock to pre-set} \leq 60\text{N}$ Removal from Pre-state $\geq 25\text{N}$	USCAR-2 Rev.7 5.4.5
5-3-7	震动/机械冲击 Vibration/Mechanical Shock	冲击: 1.加速度 35g、脉宽 5~10ms、半正弦 2.每轴 10/次、6 个轴向 振动: 三个相互垂直的轴中各进行 8 小时振动测试, 使用 60-1200HZ 12.1grms 没有任何端子对的电阻在 1 微秒内超过 7.0 Ω 的情况发生 Shock :1. Acceleration 35 g, Duration 5~10 ms,Half Sine Wave 2.Each axis 10/times ,6 axes. Vibration :8 hours of vibration test in each of the three vertical axes, using 60-1200 HZ 12.1grms Does not occur when the resistance of any terminal pair exceeds 7.0 Ω within 1 microsecond. 	USCAR-2 Rev.7 5.4.6
WRITTEN BY: ZEE.WANG		APPROVED BY: Jack Zhang	
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项 目 【Item】	条 件 【Test Condition】	规 格 【Requirement】
5-3-8 端板 Pin 针保持力 Header Pin Retention	保持力≥15N Retention force≥15 N	USCAR-2 Rev.7 5.7.1
5-3-9 连接器安装特征机械强度 Connector Mounting Feature Mechanical Strength	断开安装特征或将连接器与安装部件分离所需的最小力 The minimum force required to break the mounting feature or separate the connector from the mounting feature	USCAR-2 Rev.7 5.4.11

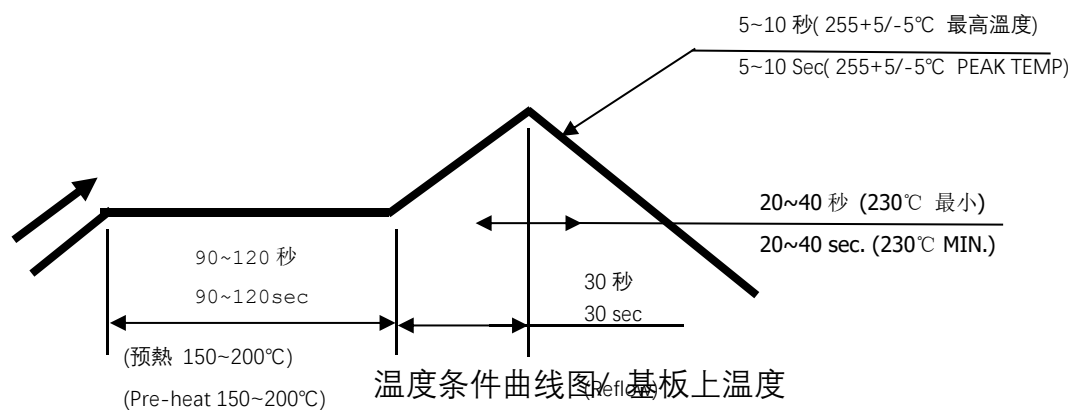
5-4. 环境性能及其它 Environmental Performance and Others.

项 目 【Item】	条 件 【Test Condition】	规 格 【Requirement】
5-4-1 热冲击 Thermal Shock	低温-40℃，高温+125℃ 低温保持 30 分钟，高温保持 30 分钟，高低温转换小于 30 秒，1000 次循环，不能有任何端子电阻超过 7 欧的时间大于 1us 的情况发生 干电路电阻≤20mΩ; 电压降≤50mV Min.temperature:-40℃,Max.temperature:+125℃ Cold soak for 30 min,Heat soak for 30 min,Transfer time<30s,Cycles 100 times,There must be no instance in which the resistance of any terminal pair exceeds 7.0 Ω for more than 1 microsecond Dry Circuit Resistance≤20mΩ; Voltage Drop≤50mV	USCAR-2 Rev.7 5.6.1
5-4-2 温度/湿度循环 Temperature/H umidity Cycling	温度变化幅度：-40℃ to 125℃ 时间：温室内 5 小时内不能进行泄漏 湿度：(80-100)% 干电路电阻≤20mΩ;电压降≤50mV 绝缘电阻> 100 MΩ 端子插入力≤15N 端子保持力(一次锁)≥30N 端子保持力(一次锁+二次锁)≥50N Time: No leakage within 5 hours of greenhouse Temperature range :-40℃ to 125℃ Humidity :(80-100)% Dry Circuit Resistance≤20mΩ; Voltage Drop≤50mV Insulation resistance > 100 MΩ The Insertion Force≤15N The Retention Force (Primary)≥30N The Retention Force (Primary + Secondary Lock)≥50N	USCAR-2 Rev.7 5.6.2

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项 目 【Item】	条 件 【Test Condition】	规 格 【Requirement】
5-4-3 高温暴露 High Temperature Exposure	时间: 1008H, 温度: 125℃ 干电路电阻 $\leq 25\text{m}\Omega$;电压降 $\leq 50\text{mV}$ 端子插入力 $\leq 15\text{N}$ 端子保持力(一次锁) $\geq 30\text{N}$ 端子保持力(一次锁+二次锁) $\geq 50\text{N}$ Time: 1008H, Temperature :125℃ Dry Circuit Resistance $\leq 25\text{m}\Omega$; Voltage Drop $\leq 50\text{mV}$ The Insertion Force $\leq 15\text{N}$ The Retention Force (Primary) $\geq 30\text{N}$ The Retention Force (Primary + Secondary Lock) $\geq 50\text{N}$	USCAR-2 Rev.7 5.6.3
5-4-4 焊锡耐热性 Resistance to Soldering Heat	焊接时间: 5~10 秒. 焊接温度: 255+5/-5℃. Soldering time:5~10 sec solder. Temperature:255+5/-5℃.	EIA-364-56

【6. SMT 回流条件 SMT REFLOW CONDITION】



TEMPERATURE CONDITION GRAPH/ (TEMPERATURE ON BOARD PATTERN SIDE)

注记: 由于 P.C 板等焊接装置改变条件,所以请预先用自己的装置检查回流焊的条件.

Notes: Please check the reflow soldering condition by your own devices beforehand. Because the condition changes by the soldering devices, P.C. boards, and so on.

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【7.测试组 Test Group】

流程图		端子机械测试	电气性能	连接器机械测试				
参考标准	测试序列	端子至端子的啮合/分离力	最大电流/电流循环	端子至连接器的插入/保持力	混合部件的啮合/分离力	连接器至连接器的配合/分离力	极性特征	板端 Pin 针保持力
USCAR-2	序列 ID	A	B	C	D	E	F	G
	测试样品	10	10	10	10	15	10	10
5.1.7	连接器/端子循环		2					
5.1.8	外观检查	1、3	1、5	1、3	1、3	1、3	1、3	1、3
5.2.1	端子至端子的啮合/分离力	2						
5.3.3	最大试验电流能力		3					
5.3.4	电流循环		4					
5.4.1	端子至连接器的插入/保持力			2				
5.4.2	连接器至连接器的配合/分离力 (无机械辅助)					2		
5.4.4	极化特征效果						2	
5.4.5	混合部件的啮合/分离力				2			
5.7.1	板端 Pin 针保持力							2

说明:
准备的样品应与适用于生产的说明一致，应随机从当前生产中选取

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流程图		连接器系统电性能测试顺序				
参考标准	测试序列	振动	冲击	温度/湿度循环	绝缘电阻	焊锡耐热性
USCAR-2 或 EIA-364	序列 ID	H	I	J	K	L
	测试样品	10	10	10	10	5
5.1.8	外观检查	1、7	1、7	1、8	1、7	1、3
5.1.7	连接器/端子循环	2	2	2	2	
5.1.9	电路连贯性监控	4	4			
5.3.1	干式电路电阻	3、5	3、5	3、5	3、5	
5.3.2	电压降	6	6	6	6	
5.4.1	端子至连接器的插入/保持力			9	8	
5.4.6	振动/机械冲击	4				
5.5.1	绝缘电阻			7		
5.6.1	热冲击		4			
5.6.2	温度/湿度循环			4		
5.6.3	高温暴露				4	
EIA-364-56	焊锡耐热性					2

注释：

(1) 环境温度等级 T3: -40℃ to 125℃。

(2) 振动等级 V2

(3) 本产品适用于线缆选用 28~18 AWG (0.09~0.85mm²) ， AVSS(0.85mm²)(Max)， Insulation O.D. 1.90mm(Max.)