

Product Specification 【产品规格书】	Document No.	PS-2024-03
Product Name 【产品名称】： 2.00mm Pitch 2024A Series Connector	Date Issued	2022/10/28
	Date Revised	/
	Version	X1

This specification is only referred to the 2024A series connector

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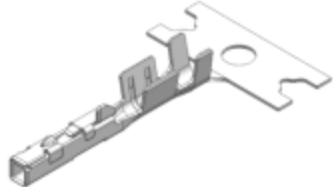

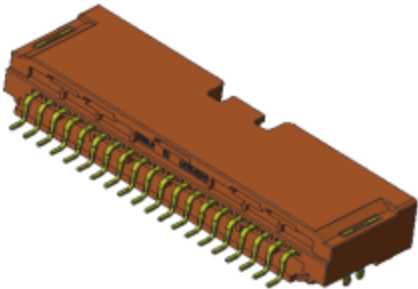
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【1.适用范围 Scope】

此规格包括 2.00mm Pitch 2024A Series 连接器规格说明.

This Specification includes the 2.00mm Pitch 2024A Series Connector Specification.

【2.产品型号描述 Product Description】

产品名称 Part Name	产品料号 Part No.	产品图示 Picture
端子/Terminal	2024T-HY2BL	
胶壳/Housing	2024A-XXA-PTBK 2024A-XXB-PTGY	
针座/Wafer	2024WRS-XXA-PPSW1BR 2024WRS-XXB-PPSW1GR	

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

规格内容 Specification	材质 Materials	颜色/表面处理 Color/Surface treatment
端子/Terminal	铜合金/Copper alloy	Top plating: Sn (1~3 μ m) overall
胶壳/Housing	PBT-GF15 (UL 94V-0)	黑色 Black 灰色 Gray
二次锁/TPA	PBT-GF15 (UL 94V-0)	白色 White
针座 Header	Housing	PPS-GF40 (UL 94V-0) 黑色 Black 灰色 Gray
	Pin	铜合金/Copper alloy Underplated: Ni (1~3 μ m)overall; Top plating: Sn (2~5 μ m) overall
	Solder tab	铜合金/Copper alloy Underplated: Ni (1~3 μ m)overall; Top plating: Sn (2~5 μ m) overall

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

【4. 额定等级 Ratings and applicable wires】

项目 Item	规格 Specification
额定电压 Rated Voltage	50V
额定电流 Rated Current	3A 0.35mm ²
使用温度范围 Ambient Temperature Range	-40 $^{\circ}$ C~+ 125 $^{\circ}$ C

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【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
5-1-1 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.8 5.1.8

5-2. 电气性能 Electrical Performance.

测试内容 Item	规格要求 Specification requirements	参考标准 Reference standard
5-2-1 电路连贯性监控 Circuit Continuity Monitoring	电流的连续性监控中断不能超过 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.8 5.1.9
5-2-2 干电路电阻 Dry Circuit Resistance	在环境后 $\leq 25m\Omega$ Final $\leq 25m\Omega$	USCAR-2 Rev.8 5.3.1
5-2-3 电压降 Voltage Drop	在环境后 $\leq 50mV$ Final $\leq 50mV$	USCAR-2 Rev.8 5.3.2

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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°C(室温) 时间: 等待 15 分钟 (电流在输出时, 电路的温度达到稳定) 温升: 55°C Create a circuit in a draft free environment Temperature :23±5°C(room temperature) Time: Wait at least 15 minutes for the circuit temperature to reach Steady State Temperature Rise: 55°C	USCAR-2 Rev.8 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% (测试项 5-2-4) 2.通电 45 分钟, 断电 15 分钟, 完成 1008 个循环 3.任何端子温升不超过 55°C 4.干电路电阻 ≤25mΩ 1.The test current is 90% of the maximum test current (Item:5-2-4) 2.45 minutes of power on ,15 minutes of power off ,and 1008 cycles are completed. 3.The temperature rise must not exceed 55°C at any time during the test for any terminal 4.Dry circuit resistance is less than or equal 25mΩ	USCAR-2 Rev.8 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 500 VDC 电压测量绝缘电阻。绝缘电阻>100 MΩ Apply 500 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.8 5.5.1

5-3. 机械的性能 Mechanical Performance.

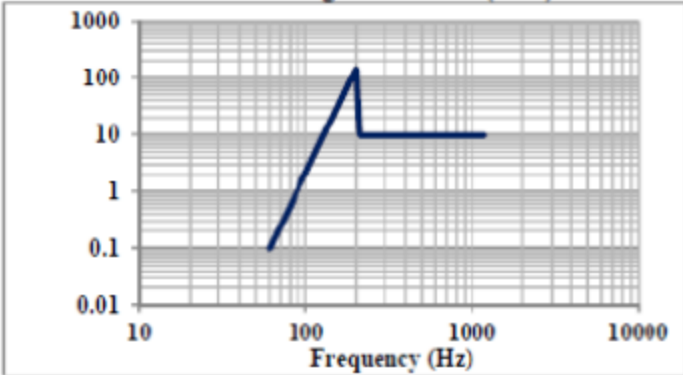
测试内容 Item	规格要求 Specification requirements	参考标准 Reference standard
5-3-1 连接器/端子循环 Connector and/or Terminal Cycling	完成每一对连接器或端子 10 次插拔 Completely mate and un-mate each connector or terminal pair 10 times	USCAR-2 Rev.8 5.1.7
5-3-2 端子到端子啮合/分离力 Terminal to Terminal Engage/Disengage Force	以不超过 50mm/min 的均匀速度插入-分离对配端子 注意接触面的任何磨损, 不应暴露基材 Engage and disengage the mating terminals at a uniform rate not to exceed 50 mm/min No base material should be exposed	USCAR-2 Rev.8 5.2.1

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5-3-3	<p>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)</p>	<p>组装所有适配组件，以 50mm/min 的均匀速度配合连接器，插入力 $\leq 75\text{ N}$ 以不超过 50mm/min 的均匀速度拔出配合的主锁被完全分离/禁用的连接器，拔出力 $\leq 75\text{ N}$ Completely assemble all connector halves using all applicable components, mating the connectors at a uniform rate 50mm/min, Mating Force $\leq 75\text{ N}$ Disengage the mating connectors that primary lock completely disengaged/disabled at a uniform rate not to exceed 50mm/min. Unmating Force $\leq 75\text{ N}$</p> <p>注：组装所有适配组件，以 50mm/min 的均匀速度卡扣保持力 (不含端子) 不依 5.4.2.4 要求的 $>110\text{ N}$ 标准。该项标准依 LV214-1 TG7 执行 (下表)。 Note: All adaptive components shall be assembled, and the retaining force of the buckle (excluding terminals) shall not comply with 5.4.2.4 at a uniform speed of 50mm/min. 110 n. This standard is implemented according to LV214-1 TG7 (Table below).</p> <p style="text-align: center;">Table 5 – Positive-locking contact housing holding forces</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">Positive-locking contact housing holding forces</th> </tr> <tr> <th rowspan="2" style="text-align: center;">Contact size in mm</th> <th colspan="3" style="text-align: center;">Number of pins</th> </tr> <tr> <th style="text-align: center;">1 to 2 pins</th> <th style="text-align: center;">3 to 6 pins</th> <th style="text-align: center;">> 6 pins</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0.5</td> <td style="text-align: center;">$> 40\text{ N}$</td> <td style="text-align: center;">$> 50\text{ N}$</td> <td style="text-align: center;">$> 60\text{ N}$</td> </tr> <tr> <td style="text-align: center;">0.63 to 1.2</td> <td style="text-align: center;">$> 60\text{ N}$</td> <td style="text-align: center;">$> 80\text{ N}$</td> <td style="text-align: center;">$> 100\text{ N}$</td> </tr> <tr> <td style="text-align: center;">> 1.2 to 2.8</td> <td style="text-align: center;">$> 80\text{ N}$</td> <td style="text-align: center;">$> 100\text{ N}$</td> <td style="text-align: center;">$> 100\text{ N}$</td> </tr> <tr> <td style="text-align: center;">> 2.8 to 6.3</td> <td style="text-align: center;">$> 100\text{ N}$</td> <td style="text-align: center;">$> 100\text{ N}$</td> <td style="text-align: center;">$> 100\text{ N}$</td> </tr> <tr> <td style="text-align: center;">> 6.3</td> <td style="text-align: center;">$> 150\text{ N}$</td> <td style="text-align: center;">$> 150\text{ N}$</td> <td style="text-align: center;">$> 150\text{ N}$</td> </tr> </tbody> </table>	Positive-locking contact housing holding forces				Contact size in mm	Number of pins			1 to 2 pins	3 to 6 pins	> 6 pins	0.5	$> 40\text{ N}$	$> 50\text{ N}$	$> 60\text{ N}$	0.63 to 1.2	$> 60\text{ N}$	$> 80\text{ N}$	$> 100\text{ N}$	> 1.2 to 2.8	$> 80\text{ N}$	$> 100\text{ N}$	$> 100\text{ N}$	> 2.8 to 6.3	$> 100\text{ N}$	$> 100\text{ N}$	$> 100\text{ N}$	> 6.3	$> 150\text{ N}$	$> 150\text{ N}$	$> 150\text{ N}$	<p>USCAR-2 Rev.8 5.4.2 LV214-1 TG7 (Table 5)</p>
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> 6.3	$> 150\text{ N}$	$> 150\text{ N}$	$> 150\text{ N}$																															

5-3-4	<p>端子至连接器插入/保持力 Terminal-Connector Insertion/Retention Force</p>	<p>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+二次锁) $\geq 40\text{ N}$ The terminal straight into the connector at a uniform rate not to exceed 50 mm/min 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. Retention Force (Primary+Secondary Lock) $\geq 40\text{ N}$</p>	<p>USCAR-2 Rev.8 5.4.1</p>
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5-3-5	混合组件的啮合分离力 Miscellaneous Component Engage/Disengage Force	15N ≤ 啮合力 ≤ 60N 分离力：18N ≤ 锁定到预锁 ≤ 60N 15N ≤ Engagement Force ≤ 60N Removal Force: 18N ≤ Lock to pre-set ≤ 60N	USCAR-2 Rev.8 5.4.5
5-3-6	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 7.0Ω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 7.0Ω within 1 microsecond. Vibration Class V2 - On Engine Random (PSD) 	USCAR-2 Rev.8 5.4.6
5-3-7	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.8 5.4.4
5-3-8	端板 Pin 针保持力 Header Pin Retention	保持力 ≥ 15N Retention force ≥ 15 N	USCAR-2 Rev.8 5.7.1

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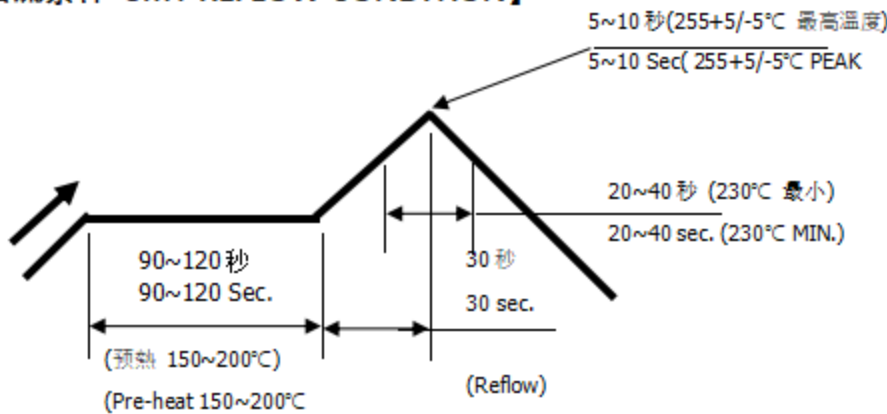
5-4. 环境性能及特殊要求 Environmental Performance and Special Requirments.

测试内容 Item	规格要求 Specification requirements	参考标准 Reference standard
5-4-1 热冲击 Thermal Shock	低温-40°C, 高温+125°C 低温保持 30 分钟, 高温保持 30 分钟, 高低温转换小于 30 秒, 100 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 $\leq 25\text{m}\Omega$; 电压降 $\leq 50\text{mV}$ Min.temperature:-40°C,Max.temperature:+125°C 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 $\leq 25\text{m}\Omega$; Voltage Drop $\leq 50\text{mV}$	USCAR-2 Rev.8 5.6.1
5-4-2 温度/湿度循环 Temperature/Humidity Cycling	温度变化幅度: -40°C to 125°C 时间: 温室内 5 小时内不能进行泄漏 湿度: (80-100)% 干电路电阻 $\leq 25\text{m}\Omega$;电压降 $\leq 50\text{mV}$ 绝缘电阻 $>100 \text{M}\Omega$ 端子插入力 $\leq 15\text{N}$ 端子保持力(一次锁+二次锁) $\geq 40\text{N}$ Time: No leakage within 5 hours of greenhouse Temperature range :-40°C to 125°C Humidity :(80-100)% Dry Circuit Resistance $\leq 25\text{m}\Omega$; Voltage Drop $\leq 50\text{mV}$ Insulation resistance $>100 \text{M}\Omega$ Insertion Force $\leq 15\text{N}$ Retention Force (Primary+Secondary Lock) $\geq 40\text{N}$	USCAR-2 Rev.8 5.6.2
5-4-3 高温暴露 High Temperature Exposure	时间: 1008H, 温度: 125°C 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+二次锁) $\geq 40\text{N}$ Time: 1008H, Temperature :125°C Dry Circuit Resistance $\leq 25\text{m}\Omega$; Voltage Drop $\leq 50\text{mV}$ Insertion Force $\leq 15\text{N}$ Retention Force (Primary+Secondary Lock) $\geq 40\text{N}$	USCAR-2 Rev.8 5.6.3

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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°C. Soldering time:5~10 sec solder. Temperature:255+5/-5°C.	EIA-364-56
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【6. SMT 回流条件 SMT REFLOW CONDITION】



温度条件曲线图/ 基板上温度

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
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	热冲击	温度/湿度循环	高温暴露	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：

- 环境温度等级 T3: -40°C to 125°C。
- 振动等级 V2
- 本产品适用于线缆选用 AWG 24~22 (0.22~0.35mm²)。