Product Specification【产品规格书】	Document No.	PS-HRS-2551-01
Product Name 【产品名称】: 2.54mm Pitch HRS-2551 Series Connector	Date Issued	2023/1/5
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This specification is only referred to the HRS-2551 series connector

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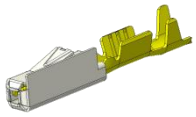
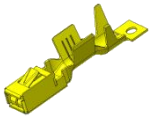
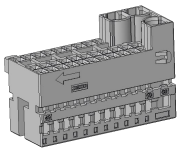
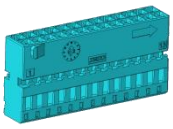
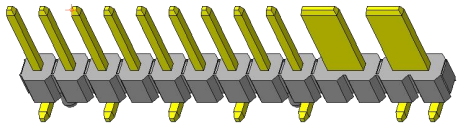
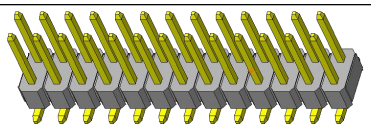
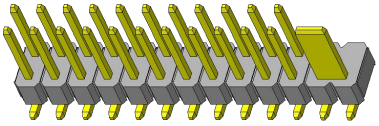
【1.适用范围 Scope】

此规格包括 2.54mm Pitch HRS-2551 Series 连接器规格说明.

This Specification includes the 2.54mm Pitch HRS-2551 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
HRS-0631 端子/Terminal	HRS-0631TXF-HY2B	
HRS-2803 端子/Terminal	HRS-2803TXF-HY2B	
胶壳/Housing	HRS-2551H-34-PTBK	
胶壳/Housing	HRS-2551H-2*13-PTGY	
空壳/BASE	HRS-2551C-PTBK-A	
	HRS-2551C-PTBK-B	
针座/Wafer	HRS-2551WVS-13P-9TSWBC24Q	
	HRS-2551WVS-2x13P-9TSWBC-16Q	
	HRS-2551WVS-2x13P-9TSWBC-15Q	

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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	高导铜/High conductivity copper	/
胶壳/Housing	PBT-GF15(UL 94V-0)	黑色 Black
胶壳/Housing	PBT-GF15(UL 94V-0)	灰色 Gray
空壳/Base	PBT-GF15(UL 94V-0)	黑色 Black
CPA	PBT-GF20(UL 94V-0)	灰色 Gray
针座/Wafer	Brass/PA9T UL94V-0	Matte Tin plating 80~200u"(2~5um) ;30u" Ni Min

（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	250V	[AC/DC]
额定电流 Rated Current	PIN0.64*0.64mm： 5A PIN2.80*0.64mm： 20A	
使用温度范围 Ambient Temperature Range	高导铜/High conductivity copper： -40℃~+125℃	
适用线径 Applicable wire insulation O.D	HRS-0631TXF-HY2B： (0.75~0.50mm²) (0.35~0.22mm²) nsulation O.D. 1.90mm(Max.) HRS-2803TXF-HY2B： (0.50~1.00mm²) (1.50~2.50mm²) (3.00~4.00mm²) nsulation O.D. 3.70mm(Max.)	

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【5.测试方法及要求 Test Methods and Requirements】

5-1. 外观尺寸检查 Inspection of appearance dimensions.

项目 Item	测试描述 Test Description	测试方法 Test Methods	要求 Requirement
5.1.1	外观检查 Visual Inspection	参照 SAE USCAR-2 Rev8-2022 5.1.8 借助 10 倍放大镜对每一个试验样品进行检查。 Refer to SAE USCAR-2 Rev8-2022 5.1.8 Inspect each sample with a 10x magnification.	所有制造或材料的无瑕疵，如：裂缝、变色、毛刺等。 All manufacturing or materials are free from defects such as: cracks, discoloration, burrs, etc.
5.1.2	尺寸特征 Dimensional characteristics	参照 SAE USCAR-2 Rev8-2022 5.1.2 Refer to SAE USCAR-2 Rev8-2022 5.1.2	零件结构应符合最新版本中规定的尺寸、形状和详细属性可适用部份图纸。 Part construction shall conform to the size, shape and detailed attributes specified in the latest version.

5.2 材料特性 Material characteristics

项目 Item	测试描述 Test Description	测试方法 Test Methods	要求 Requirement
5.2.1	材料特性 Material characteristics	参照 SAE USCAR-2 Rev8-2022 5.1.3 在测试开始时,除非测试要求/顺序中包含关于任何测试前"条件"的具体指示,否则部件应处于"作为车辆装配用设备"的状态。 Refer to SAE USCAR-2 Rev8-2022 5.1.3 Parts are intended to be in their "as furnished for vehicle assembly" condition when testing begins, unless specific instructions as to any pre-test "conditioning" are contained in the test request/order.	在每个测试样品中使用的所有材料都应符合最新版本的适用零件图的材料规格。All material used in each test sample shall conform to the material specifications shown on the latest revision of the applicable part drawing(s).

5.3 电气性能 Electrical Performance.

项目 Item	测试描述 Test Description	测试方法 Test Methods	要求 Requirement
5.3.1	干电路电阻 Dry Circuit Resistance	参照 SAE USCAR-2 Rev8-2022 5.3.1 测量并记录用于测试的 150 mm 导体的电阻。 对于使用板端端子作为一半测试连接的测试，导体只有 75 毫米(大多数应用的推荐长度)。对于每边超过 75 mm 的连接点，应测量额外的导线电阻并减去记录导体电阻。 Refer to SAE USCAR-2 Rev8-2022 5.3.1	在环境前/后<20mΩ Initial/Final < 20mΩ

		Measure and record the resistance across 150 mm of the conductor to be used for the test. For tests using a Header terminal as one half of the test connection, only 75 mm (recommended length for most applications) of the conductor. For attachment points exceeding 75 mm per side, the extra wire resistance shall be measured and subtracted Record the conductor resistance.	
5.3.2	电压降 Voltage Drop	参照 SAE USCAR-2 Rev8-2022 5.3.2 提供导体截面所需测试电流为 5 A/平方毫米 Refer to SAE USCAR-2 Rev8-2022 5.3.2 The test current required to provide the conductor cross section is 5 A/mm²	在环境后≤50mV Final≤50mV
5.3.3	绝缘电阻 Insulation Resistance	参照 SAE USCAR-2 Rev8-2022 5.5.1 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。 Refer to SAE USCAR-2 Rev8-2022 5.5.1 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.	绝缘电阻>100 MΩ Insulation resistance >100 MΩ
5.3.4	电路连贯性监控 Circuit Continuity Monitoring	参照 SAE USCAR-2 Rev8-2022 5.1.9 必须监控至少十个单独的端子和五个连接器对。 Refer to SAE USCAR-2 Rev8-2022 5.1.9 At least ten individual terminal and five connector pairs must be monitored.	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 instance in which the resistance of any terminal pair exceeds 7.0 Ω for more than 1 microsecond
5.3.5	最大试验电流能力 Maximum test current capacity	参照 SAE USCAR-2 Rev8-2022 5.3.3 温度：23±5℃(室温)；以被测端子预期最大电流能力的 50%开始测试，再以最大电流能力的 10%递增测试。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℃，接触电阻≤20mΩ 。 Refer to SAE USCAR-2 Rev8-2022 5.3.3 Temperature: 23±5℃ (room temperature); start the test with 50% of the expected maximum current capacity of the tested terminal, and then test in increments of 10% of the maximum current capacity. Time: wait for 15 minutes (when the current is output, the temperature of the circuit is stable); temperature rise: 55℃, contact resistance ≤20mΩ.	不作判定，主要用电流循环的电流(最大电流的 90%)。 No judgment is made, and the current circulating by the current (90% of the maximum current) is mainly used.

5.3.6	电流循环 Current Cycling	参照 SAE USCAR-2 Rev8-2022 5.3.4 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。 Refer to SAE USCAR-2 Rev8-2022 5.3.4 The test current is 90% of the maximum test current, 45 minutes of power on, 15 minutes of power off, and 1008 cycles are completed.	任何端子温升不超过 55℃ ， 接触电阻≤ 25mΩ。 The temperature rise of any terminal does not exceed 55℃, and the contact resistance is less than or equal to 25mΩ.

5-4. 机械的性能 Mechanical Performance.

项目 Item	测试描述 Test Description	测试方法 Test Methods	要求 Requirement
5.4.1	连接器/端子循环 Connector and/or Terminal Cycling	参照 SAE USCAR-2 Rev8-2022 5.1.7 完成每一对端子和连接器 10 次插拔 Refer to SAE USCAR-2 Rev8-2022 5.1.7 Completely mate and un-mate each connector or terminal pair 10 times	无 none
5.4.2	端子至连接器的插入/保持力 Terminal-Connecto Insertion/Retention Force	参照 SAE USCAR-2 Rev8-2022 5.4.1 端子以不超过 50mm/min 的均匀速度插入与拔出连接器。 Refer to SAE USCAR-2 Rev8-2022 5.4.1 The terminal inserts and unplugs the connector at a uniform speed not exceeding 50mm/min.	0.64mm 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)≥60N。 2.80mm 端子插入力≤20N,端子保持力(一次锁)≥60N 端子保持力(一次锁+二次锁)≥100N。 0.64mm terminal Insertion Force≤ 15N,Retention Force (Primary Lock)≥ 30N.Retention Force (Primary+Secondary Lock)≥60N. 2.80mm terminal Insertion Force≤ 20N,Retention Force (Primary Lock)≥ 60N.Retention Force (Primary+Secondary Lock)≥100N.
5.4.3	连接器到连接器配对/非配对力(机械辅助) Connector to Connector Mate/Unmate Forces (mechanical assist)	参照 SAE USCAR-2 Rev8-2022 5.4.3 用合适的力测试仪以不超过 50mm/分钟的速率 Refer to SAE USCAR-2 Rev8-2022 5.4.3 Use a suitable force tester at a rate not exceeding 50mm/ min	此部分验收标准随被测试连接器的可用接触(握持)面积而变化。有关验收标准的详细信息，请参阅 SAE/USCAR-25 电气连接器装配人体工程学设计标准。 Acceptance criteria of this section vary with the available contact (grip) area of the connector being tested. Refer to SAE/USCAR-25 Electrical Connector Assembly Ergonomic Design Criteria for details of the acceptance criteria.

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5.4.4	极性特征 Polarization Feature Effectiveness	参照 SAE USCAR-2 Rev8-2022 5.4.4 以错误的方向将公连接器插入母连接器,尝试以不超过 50mm /min 的速度接合连接器的一半，直到正确匹配的连接器最大值力的 3X(力≥60 N 和≤150 N)正确匹配连接器最大值力的 3X 为 150N Refer to SAE USCAR-2 Rev8-2022 5.4.4 Attempt to engage the connector halves at a rate not to exceed 50 mm/min until a force of 3X the maximum value of a properly mated connector (with force being ≥60 N and ≤150 N) is applied Insert the male connector into the female connector in the wrong direction,3X that correctly matches the maximum force of the connector is 150N	连接系统必须能够承受错配力，以免损坏连接器，并且公/母端子之间不得进行电接触。 The connection system must withstand a mis-mating force as without damage to the connector and no electrical contact shall be made between the male/female terminals.
5.4.5	混合部件的啮合/分离力 Miscellaneous Component Engage/Disengage Force	参照 SAE USCAR-2 Rev8-2022 5.4.5 组装所有适配组件, 以 50mm/min 的均匀速度啮合/分离连接器。 Refer to SAE USCAR-2 Rev8-2022 5.4.5 Completely assemble all connector halves using all applicable components， mating /unmating the connectors at a uniform rate 50mm/min.	啮合力:≤60N, 分离力： ≥25N Engagement Force:≤60N Removal Force： ≥25N
5.4.6	连接器到连接器可听见的咔嚓声 Connector and/or Terminal Cycling	参照 SAE USCAR-2 Rev8-2022 5.4.7 需要 16 对样本(两组，每组 8 个)。样品是有生产意图的。连接器腔不应是填充终端。如适用，包括所有 tpa、密封件、填充物和辅助件。 1.测量并记录测试环境中环境声音的分贝(A)级。环境噪音水平必须在 30 至 50 分贝(A)之间。 2. 连接器放置于声音测量装置或麦克风 600+/-50mm。 3.用手匹配组 1 中的连接器,并测量当锁接合时产生的声音的 dB(A)水平。当连接器接合时,不要将连接器偏向或偏离门锁。 4.使用组 2 连接器重复步骤 1 至 3,水分调节后。通过将"干燥的模制件"在 40 摄氏度下暴露于 95-98%的相对湿度下 6 小时(最低) ,然后 30 分钟内完成试验,使部件达到它们的实际含水量极限。 Refer to SAE USCAR-2 Rev8-2022 5.4.7 1. Measure and record the dB (A) level of the ambient sound within the test environment. The ambient noise level must be between 30 and 50 dB (A). 2. Locate the sound measuring device or microphone 600 mm ± 50 mm from the connector.	测试中测量的值应记录在测试报告中。这些值应仅作为参考，并用于比较连接器设计或协助连接器选择/线束设计过程。 The values measured in this test shall be documented in the test report. These values should be considered for information only and are used to compare connector designs or to assist in the connector selection/wire harness design process.

		3. Mate the connectors in group 1 by hand and measure the dB (A) level of the sound generated as the lock engages. Do not bias the connectors toward or away from the latch as they are engaged. 4. Repeat steps 1 through 3 using the group 2 connectors, post moisture conditioning. Parts are brought to their practical limit of moisture content by exposing “dry as molded parts” to 95 to 98% Relative Humidity at 40 °C for 6 hours (minimum), then completing the test within 30 minutes.	
5.4.7	连接器跌落测试 Connector Drop Test	参照 SAE USCAR-2 Rev8-2022 5.4.8 对于每组，一次将一个样品从至少 1 m 的高度掉落到水平混凝土表面上，将样品分为六组，对应于矩形连接器的六个连接器“面”。 对显示的每个方向使用一组。 Refer to SAE USCAR-2 Rev8-2022 5.4.8 For each group, drop one sample at a time from a height of at least 1 m onto a horizontal concrete surface, dividing the samples into six groups corresponding to the six connector "faces" of the rectangular connector. Use one set for each direction of the display.	记录任何部件的损坏或移动/分离。 Document any component damage or movement/separation.
5.4.8	模腔损坏系数 Cavity Damage	参照SAE USCAR-2 Rev8-2022 5.4.9，将其中一颗或多颗端子未插入到位，然后以50mm/min 的速度将TPA 插入到锁止位置 Refer to SAE USCAR-2 Rev8-2022 5.4.9, insert one or more terminals out of position, and then insert the TPA into the locking position at a speed of 50mm/min	具体见 SAE USCAR-2 Rev8 5.4.9.4 验收标准 See SAE USCAR-2 Rev8 5.4.9.4 Acceptance Criteria for details
5.4.9	端子/腔体极化测试 Terminal/Cavity Polarization	参照SAE USCAR-2 Rev8-2022 5.4.10，选择不正确的端子方向进行测试，至少必须以90 度为增量对每个不正确的方向进行测试以不超过50 毫米/分钟的速度，施加15N 的力将端子插入空腔 Refer to SAE USCAR-2 Rev8-2022 5.4.10,Incorrect terminal orientation is selected for testing and must be tested in increments of at least 90 degrees for each incorrect direction with a force of 15 N not exceeding 50 mm/min to insert the terminal into the cavity	具体见 SAE USCAR-2 Rev8 5.4.10.4 验收标准 See SAE USCAR-2 Rev8 5.4.10.4 Acceptance Criteria for details

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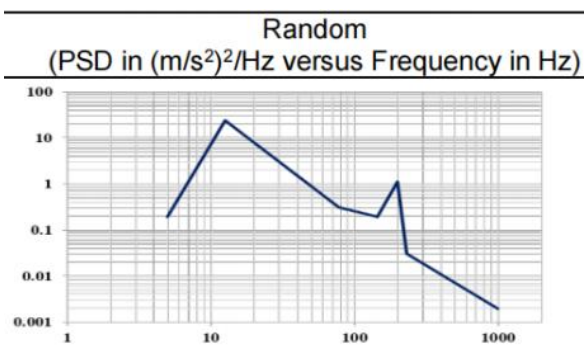
5.4.10	机械辅助完整性-仅带机械辅助的连接器 Mechanical Assist Integrity – Connectors with Mechanical Assist Only	参照 SAE USCAR-2 Rev8-2022 5.4.12, 以 50+10mm/min 的速率,1.在“F”方向上施加 100N 的力,杠杆或滑块处于打开和关闭位置。2.将滑块或杠杆定位在开启和关闭位置之间大约一半的位置，在“F”方向上施加 60N 的力。3.在 1 与 2 方法的相反方向施力。 Refer to SAE USCAR-2 Rev8-2022 5.4.12, At a rate of 50+10mm/min,1. Apply 100N of force in the "F" direction with the lever or slider in the open and closed positions. 2 Position the slider or lever about halfway between the open and closed positions and apply 60N of force in the "F" direction. 3. Apply force in the opposite direction of methods 1 and 2.	1. 杠杆/滑块在打开和关闭位置必须承受 100 N 的力，不会分离或损坏。 2. 杠杆/滑块必须在中间位置（杠杆半关闭）承受 60 N 的力而不会分离或损害。 1. The lever/slide must withstand a 100 N force in the open and closed positions without separation or damage. 2. The lever/slide must withstand a 60 N force in the midpoint position (lever half -way closed) without separation or damage.
5.4.11	板端 Pin 针保持力 Header Pin Retention	参照 SAE USCAR-2 Rev8-2022 5.7.1，在 40 °C 下将“干燥的模制部件”暴露在 95 至 98% 的相对湿度下 6 小时，然后立即完成保持测试。 Refer to SAE USCAR-2 Rev8-2022 5.7.1, Moisture condition samples by exposing “dry as molded parts” to 95 to 98% relative humidity at 40 °C for 6 hours, then immediately complete the retention test	使销在任一方向纵向位移0.2 mm 所需的最小力应满足15N The minimum force required to displace the pin 0.2 mm longitudinally in either direction shall meet the 15N
5.4.12	振动冲击 Vibration/Mechanical Shock	参照 SAE USCAR-2 Rev8-2022 5.4.6 冲击: 1.加速度 35g、脉宽 5~10ms、半正弦 ，每轴 10/次、3 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 Refer to SAE USCAR-2 Rev8-2022 5.4.6 Shock: 1. Acceleration of 35g, pulse width of 5-10ms, half sine, 10/ times per axis, 3 axial vibration: 8 hours vibration test was carried out in each of the three mutually perpendicular axes, using 60-1200HZ 12.1grms 	满足测试组顺序要求 Satisfy test group sequence requirements

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5-5. 环境性能 Environmental Performance

项目 Item	测试描述 Test Description	测试方法 Test Methods	要求 Requirement
5.5.1	热冲击 Thermal Shock	参照 SAE USCAR-2 Rev8-2022 5.6.1 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， 100 次循环。 Refer to SAE USCAR-2 Rev8-2022 5.6.1 Min.temperature:-40℃,Max.temperature:+125℃ Cold soak for 30 min,Heat soak for 30 min,Transfer time<30s, Cycles 100 times.	满足测试组顺序要求 Satisfy test group sequence requirements
5.5.2	温度/湿度循环 Temperature/Humidity Cycling	参照 SAE USCAR-2 Rev8-2022 5.6.2 按照图中所示的蓝色阴影循环计划对样品进行 40 次测试。延长过渡时间只要保持在温度下的停留时间，就可以使用。循环从 -40 °C 的样品开始，然后不受控制的相对湿度。 Refer to SAE USCAR-2 Rev8-2022 5.6.2 Samples were tested 40 times according to the blue shaded cycle schedule shown in the figure. Extended transition times can be used as long as the residence time at temperature is maintained. Cycles start with samples at -40 °C, followed by uncontrolled relative humidity.	满足测试组顺序要求 Satisfy test group sequence requirements
5.5.3	高温暴露 High Temperature Exposure	参照 SAE USCAR-2 Rev8-2022 5.6.3 时间：1008H，温度：125℃ Refer to SAE USCAR-2 Rev8-2022 5.6.3 Time: 1008H，Temperature :125℃	满足测试组顺序要求 Satisfy test group sequence requirements

【6.测试组 Test Group】

项目	测试组	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q		
	测试样品	5	5	10	10	10	3	30	16	18	5	3	5	3	10	10	10	10		
5.1.1	外观检查	1	1	1,5	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,7	1,7	1,8	1,7		
5.1.2	尺寸特征	2																		
5.2.1	材料特性		2																	
5.3.1	干式电路电阻														3,6	3,6	3,6	3,6		
5.3.2	电压降														5	5	5	5		
5.3.3	绝缘电阻																7			

Product Specification【产品规格书】	Document No.	PS-HRS-2551-01
Product Name 【产品名称】: 2.54mm Pitch HRS-2551 Series Connector	Date Issued	2023/1/5
	Date Revised	2023/11/28
	Version	B

5.3.4	电路连贯性监控													4	4				
5.3.5	最大试验电流能力			3															
5.3.6	电流循环			4															
5.4.1	连接器/端子循环			2										2	2	2	2		
5.4.2	端子至连接器的插入/保持力				2											9	8		
5.4.3	连接器到连接器配对/非配对力(机械辅助)					2													
5.4.4	极化特征效果						2								2				
5.4.5	混合组件的啮合分离力							2											
5.4.6	连接器到连接器可听见的咔嚓声								2										
5.4.7	连接器落下试验									2									
5.4.8	腔体损坏性										2								
5.4.9	端子与腔体极化性											2							
5.4.10	机械辅助完整性												2						
5.4.11	板端 Pin 针保持力													2					
5.4.12	振动/机械冲击														4				
5.5.1	热冲击															4			
5.5.2	温度/湿度循环																4		
5.5.3	高温暴露																	4	

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

注释:

（1）环境温度等级 T3: -40℃ to 125℃。

（2）振动等级 V1