4.2 间距防水连接器

目录

Index

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1、 范围 Scope

本产品规格书适用于浙江珠城科技股份有限公司生产的 HW7623 半包系列连接器

2、 产品描述 Product Description

产品名称 Product name	规格型号 Part No.	材质 Material	阻燃等级	压接范围 Applicable Wire Size	备注 Remark
公端子 Male Terminal	TR10008-4A	黄铜	/	16-18AWG	镀镍 Nickel-plating
母端子 Female Terminal	TP10008-4A	磷铜	/	16-18AWG	镀镍 Nickel-plating
公端连接器 Male connector	AR10003-nY n：2,3,4,6,8,12	PA66	UL94V-0	/	
母端连接器 Female connector	AP10003-nY n：2,3,4,6,8,12	PA66	UL94V-0	/	

3、 相关标准 Related Standards

注：本规格书为系列产品通用，当规格书参数要求与产品图纸发生冲突时，以产品图纸中的要求为准，当规格书参数与参考标准内容冲突时，以本规格书中的要求为准。

Note: If this specification has any conflicting items with products drawings, should take product drawings as right one. If any parameter is this specification conflict with reference standard, should take the parameter in this specification as right one.

参考文件：Reference standard.

QC/T 1067.1-2017 汽车电线束和电气设备用连接器 第1 部分：定义、试验方法和一般性能要求

Connector used in automobile wire harness and electrical device Part 1 : Definition.. test method and requirement

4、 参数范围　Parameter Ratings

适用条件 Suitable conditions

a) 适用温度(Temperature)：-40℃~125℃

b) 额定电压(Rated voltage)：250V DC.；

c) 防水等级(IP rate)：IPX9K*

5、 产品性能　Performance Specification

产品应满足电气，机械和环境性能要求，测试方法及判断标准如下。所有测试在室温进行，除非另有说明。

The product shall meet the electrical, mechanical and environmental performance requirements, and the test methods and judgment criteria are as follows.

All tests shall be performed in the room temperature, unless otherwise specified.

序号 COD	项　目 Test project	引用标准 Reference	测试方法及条件 Test methods and conditions	标 准 规 格 Standard
5.1	外观 Visual Inspection	QC/T 1067.1-2017:4.2 外观 Visual Inspection	详细检查试验前的每一种试验连接器或端子，连接器外观满足要求。	样品不应出现膨胀、腐蚀、色变、触点镀层磨损、物理变形、开裂等影响产品功能的缺陷。
			Carefully check each type of test connector or terminal before the test, and the connector appearance meets the requirements.	The sample should not have defects that affect the function of the product, such as expansion, corrosion, discoloration, contact plating wear, physical deformation, cracking, etc.
5.2	插拔循环 Connector and/or Terminal Cycling	QC/T 1067.1-2017:4.3 插拔循环 Connector and/or Terminal Cycling	连接器插拔 20 次	无影响后续试验的损坏。
			Connector-Connector Mating and Unmating 20 times	No damage affecting subs- equent tests.

5.3	端子对端子的插入拔出力 Insertion&Retention force between terminals	QC/T 1067.1-2017:4.3 插拔循环 Insertion&Retention force between terminals	沿端子中心线方向施力，将两端子以不超过 50mm/min 的均匀速度对插，记录端子对配过程测力计显示的最大值。在同样的方向施力，将两端子以不超过 50 mm/min 的均匀速度分离，记录分离过程中测力计的最大值。记录第一次插拔力、最后一次拔出力。	第一次插拔力： 3~5N 最后一次拔出力： ≥3N
			Apply force along the center line of the terminal， Connect the two terminals at a uniform speed of not more than 50mm/min, and record the maximum value which the forcemeter shows during terminal pairing Apply force along the same direction， Separate the the two terminals at a uniform speed of not more than 50mm/min, and record the maximum value during the separation process.Record the first insertion and retention force and the last retention force .	The first insertion force and retention force: 3~5N The last Retention force: ≥3N
5.4	端子抗弯力 Terminal bend resistance	QC/T 1067.1-2017:4.5 端子抗弯力 Terminal bend resistance	对端子施加不同方向的力，测试后端子的外观应满足要求。	端子不应被撕裂，如果端子在试验过程中弯曲，校直后不应被撕裂。
			Apply force in different directions to the terminal, and the appearance of the terminal should meet the requirements after testing.	The terminal should not be torn, and if the terminal is bent during the test, it should not be torn after straightening.
5.5	微电流接触电阻 Dry Circuit Resistance	QC/T 1067.1-2017:4.7 微电流接触电阻 Dry Circuit Resi- stance	在连接器导体两端施加不高于 20mV 的电压和不高于 100mA 的电流，测试并记录接触电阻	接触电阻：≤15mΩ

			Apply a voltage of not more than 20mV and a current of not more than 100mA to both ends of the connector conductor, test and record the contact resistance	Contact resistance：≤15mΩ
5.6	电压降 Voltage Drop	QC/T 1067.1-2017:4.8 电压降 Voltage Drop	在连接器导体两端提供每平方毫米 5A 的电流，测量并记录其电压降；	电压降：≤50mV
			Provide current 5A per square millimeter at both ends of the connector wire and measure and record their voltage drop；	Voltage Drop：≤50mV
5.7	电流循环 Current Cycling	QC/T 1067.1-2017:4.9 电流循环 Current Cycling	用端子最大载流的 90%设定电源，使电源接通 45min，断开 15min。进行 1008 个小时循环测试，在循环的 30 分钟时进行端子压接区和接触区的毫伏电压降读数以及热电偶读数，计算连接电阻并记录。	接触温升：≤55℃， 接触电阻：≤15mΩ。
			Set the power supply with 90% of the terminal's maximum current carrying capacity, and turn the power on for 45 min and off for 15 min. Perform 1008-hour cycle test, take millivolt drop readings in the terminal crimp area and contact area and thermocouple readings at 30 minutes of the cycle, calculate the connection resistance and record.	Temperature rise:≤55℃; Contact resistance: ≤15mΩ
5.8	端子对护套的插入力、保持力 Terminal-Connector Insertion/Reten-tion Force	QC/T 1067.1-2017:4.11 端子对护套的插入力、保持力 Terminal Connector Insertion/Retention Force	以 50 mm/min 的均匀速度测试，并记录力值。 插入力：把端子直线插人护套中，记录端子在未到达预期的停止位置所需的峰值力。 保持力：端子从护套中直线拔出，记录端子从护套中拔出所需要的力，另一组安装了 TPA 的样品也测试端子从护套中拔出所需要的力	插入力：≤15N 保持力：≥40N ≥70N（TPA）

			Test at a rate of 50 mm/min and record the force. Insertion force: Insert the terminal into the connector in a straight line and record the peak force required before the terminal reaches the desired stopping position. Retention force:Pull the terminal out of the connector in a straight line and record the force required for the terminal to be pulled out of the connector,and another set of samples fitted with TPA were also tested for the force required for the terminals to be pulled out of the connector.	Insertion force：≤15N Retention force ： ≥40N； ≥70N（TPA）
5.9	连接器的接合力、分离力 Connector-Connector Mating/Unmating/Lock Deflection Forces	QC/T 1067.1-2017:4.12 连接器的接合力、分离力 Connector-Connector Mating/Unmating/Lock Deflection Forces	以 50 mm/min 的均匀速度测试，并记录峰值力。装配所有附件，例如端子、二次锁止机构、密封件等。 接合力：连接器完全配合至锁定位置需要的峰值力。 分离力：解除连接器一次锁止机构，直至连接器完全分离。 解锁力：向锁止结构持续施加解锁力直至解锁。	接合力：≤75N； 分离力：≤75N； 解锁力： 6N～51 N
			Test at a rate of 50 mm/min and record the peak force. Assembly of all accessories such as terminals, secondary locking mechanisms, seals, etc. Mating force: the peak force required to fully mate the connector to the locked position. Unmating force: To release the primary locking mechanism of the connector until the connector is completely separated. Lock Deflection Force: Continuous application of unlocking force to the locking mech- anism until it is unlocked	Mating force： ≥75N； Unmating force： ≤75N； Lock Deflection Force： 6N～51 N

5.10	连接器防错结构 Polarization Feature Effectiveness	QC/T 1067.1-2017:4.14 连接器防错结构 Polarization Feature Effectiveness	按对插方向正确，但对配端（防错插结构不同）错误；对配端正确，但对插方向错误的两种方向，以 50mm/min 的均匀速度对插连接器，逐渐施加力直至正确配合时所需力的 3 倍，保持此力 3s。	连接器承受错误接合力时不应损毁，插头端子和插座端子不应接触。
			According to the two directions of correct mating direction but wrong mating end (different anti-misalignment structure) and correct mating end but wrong mating direction, apply force to the connector at a rate of 50mm/min until the force required for correct mating is 3 times, and keep this force for 3s.	Connectors should not be damaged when subjected to incorrect mating forces, and plug terminals and socket terminals should not make contact.
5.11	振动/机械冲击 Vibration/Mechani cal Shock	QC/T 1067.1-2017:4.17 振动/机械冲击 Vibration/Mechanical Shock	将样品固定在测试台上，在 3 个互相垂直 方向上依次对试验样品进行机械冲击。 脉冲 10 方向 正向 持续时间 5~10ms 加速度 35g 将样品固定在测试台上，测试参数按 V2 等级进行设置，对试验样品进行振动测试。	试验过程中，端子接触电阻连续大于 7Ω 的时间不应超过 1μs；符合后续测试要求；
			Fix the sample on the test bench and mechanically shock the test specimen in 3 mutually perpendicular directions in sequence. Pulse 10 Direction Forward Duration 5~10ms Acceleration 35g The test specimen is fixed on the test stand and the test parameters are set according to the V2 level, and the test specimen is subjected to vibration testing.	Contact resistance is greater than 7Ω for no more than 1μs;Meet subsequent test requirements

5.12	跌落 Drop Test	QC/T 1067.1-2017:4.19 跌落 Drop Test	准备 18 个护套，将 TPA、CPA、控制杆或滑杆置于预装位置（如适用）。在 X，Y，Z，3 个方向上，对于矩形连接器的 6 个面，每个面试验一组护套。从 1m 高的位置把护套跌落到水平握凝土地面上。	附件不应从它的预装位置脱离
			Prepare 18 sheaths and place TPA,CPA,levers, or sliders in the pre- assembled position (if applicable).In the X, Y ,Z directions,a set of sheaths was tested on each of the 6 faces of the rectangular connector. Drop the sheath from a height of 1m onto a horizontal grip on the ground.	The accessory should not be detached from its pre-assembled position.
5.13	绝缘电阻 Insulation Resistance	QC/T 1067.1-2017:4.27 绝缘电阻 Insulation Resistance	在相邻两端子间、端子与锡箔间施加 500V DC 电压，测量并记录其绝缘电阻	绝缘电阻 ≥1000MΩ；
			Measure and record the insulation resistance by applying 1000V DC voltage between two adjacent terminals for 1 minute；	Insulation Resistance ≥1000MΩ；
5.14	绝缘介电强度 Withstand voltage	QC/T 1067.1-2017:4.28 绝缘介电强度 Withstand voltage	在相邻两端子间施加 1000V 交流电(50Hz 或 60Hz)或 1600V 直流电，持续 1 分钟	试验过程中无击穿现象；
			Measure and record the leakage current by applying 1000V AC (50Hz or 60Hz) or 1600V DC between two adjacent terminals for 1 minute.	No breakdown；
5.15	热冲击 Thermal Shock	QC/T 1067.1-2017:4.29 热冲击 Thermal Shock	将连接器放入温度箱内，测试 100 个周期。 每周期： -40℃，30 分钟； +125℃，30 分钟； 10s 最大过渡时间	试验过程中，端子接触电阻连续大于 7Ω 的时间不应超过 1μs；符合后续测试要求；

			Mated connectors subjected to:100 cycles composed of: -40℃_30min +125℃_30min (max.time to change condition:10s.)	Contact resistance is greater than 7Ω for no more than 1μs;Meet subse- quent test require- ments
5.16	温度/湿度循环 Temperature/Humidity Cycling	QC/T 1067.1-2017:4.30 温度/湿度循环 Temperature/Humidity Cycling	互配连接器，测试 10 个周期。每周期： 4H_(23±5)℃，45%～75%RH； 10H_(55±2)℃，95～99%RH，调整时间：≤0.5 H； 2H_(-40±2)℃，调整时间：≤2.5H； 2H_125℃，调整时间：≤1.5H； (23±5)℃，45～75%RH，调整时间：≤1.5H；	试验过程中，端子接触电阻连续大于 7Ω 的时间不应超过 1μs；符合后续测试要求
			Mated connectors subjected to: -10cycles composed of: • 4 hours at (+23±5 ℃), 45%～75% r.h. max.time to change condi-tion: 0.5h. • 10 hours at (55±2), 95%～99% r.h. max.time to change condition: 2.5h. • 2hours at (-40±2). max.time to change condition: 2.5h. • 2 hours at +100 ℃ max.time to change condition: 1.5h. • (+23±5 ℃), 45%～75% r.h. max.time to change condition: 1.5h.	Contact resistance is greater than 7Ω for no more than 1μs; Meet subsequent test requirements.
5.17	热老化 High Temperature Exposure	QC/T 1067.1-2017:4.31 热老化 High Temperature Exposure	将试验连接器置于 125℃的温度箱内 1008H	通过后续测试
			Place the test connector in a temperature chamber at 125℃ for 1008H.	Meet subsequent test requirements

5.18	气密性 Pressure/Vacuum Leak	QC/T 1067.1-2017:4.34 气密性 Pressure/Vacuum Leak	把样品浸泡在每升水 15g~16g 食盐和 10mL 液体洗涤剂的比例配制盐水溶液中，提供 48kPa 的压力，至少 15s，之后提供-48kPa 的压力，至少 15s。如在温/湿度循环或热老化试验后，压力值相应调整为 28kPa 和-28kPa	测试中样品不应有气泡出现，且通过后续测试。
			The samples are immersed in a brine solution of 15 g to 16 g of common salt and 10 mL of liquid detergent per liter of water at a pressure of 48 kPa for at least 15 s, followed by a pressure of -48 kPa for at least 15 s. The pressure is adjusted to 28 kPa and -28 kPa accordingly, e.g., after temperature/humidity cycling or thermal aging tests.	Free of air bubbles during test and pass subsequent tests
5.19	高压水喷射 High Pressure Spray	QC/T 1067.1-2017:4.35 高压水喷射 High Pressure Spray	把样品固定到试验台上，使连接器面对喷 嘴放置。喷嘴从 0° 开始对连接器进行喷 射，每个位置喷射 30s。	擦干样品外表，符合绝缘电阻要求。
			Fix the sample to the test bench so that the connector is facing the nozzle. The nozzle sprays the connector from 0° for 30s at each position.	Wipe dry the exterior of the sample, meet insulation resistance requirements.
5.20	盐雾 Salt spray	QC/T 1067.1-2017:4.36 盐雾 Salt spray	连接器应包括所有附件，如 TPA、CPA、密封件等按 GB/T2423.17 执行中性盐雾试验，试验时间 48h	盐雾试验后的微电流连接电阻不应大于试验前的 2 倍，且通过后续测试。
			Connectors should include all accessories, such as TPA, CPA, seals, etc. According to GB/T 2423. 17 implementation of neutral salt spray test, test time 48h	The dry circuit resistance after the salt spray test shall not be more than twice the resistance before the test and meet subsequent test requirements

6、 测试分组 Test Sequences

	测试项目 Test item	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	外观 Visual Inspection	1, 3	1, 3	1, 4	1, 3	1, 3	1, 3	1, 3	1, 7	1, 7	1, 9	1, 7	1, 7	1, 10	1, 10
2	插拔循环 Connector and/or Terminal Cycling			2					2	2	2	2	2	2	2
3	端子对端子的插入拔出力 Insertion&Retention force between terminals	2													
4	端子抗弯力 Terminal bend resistance		2												
5	微电流接触电阻 Dry Circuit Resistance								3, 5	3, 5	3, 5	3, 5			
6	电压降 Voltage Drop								6	6	6	6			
7	电流循环 Current Cycling			3											
8	端子对护套的插入力、保持力 Terminal-Connector Insertion/ Retention Force				2						10	8			
9	连接器的接合力、分离力 Connector-Connector Mating/ Unmating/ Lock Deflection Forces					2									
10	连接器防错结构 Polarization Feature Effectiveness						2								
11	振动/机械冲击 Vibration/Mechani cal Shock								4						
12	跌落 Drop Test							2							
13	绝缘电阻 Insulation Resistance										7		3, 5	3, 8	3, 8
14	绝缘介电强度 Withstand voltage										8		6	9	9
15	热冲击 Thermal Shock									4					
16	温度/湿度循环 Temperature/Humidity Cycling										4			5	
17	热老化 High Temperature Exposure											4			5

18	气密性 Pressure/Vacuum Leak													4,7	4,7
19	高压水喷射 High Pressure Spray													6	6
20	盐雾 Salt spray												4		

注意事项： 1.实验所用样品均需符合对应图纸规定之要求。电线与端子压接时需符合对应压接规范并且所用端子直接从现有生产品中随机取样