

Product Specification 【产品规格书】	Document No.	PS-3513-01
Product Name 【产品名称】： 3.50mm Pitch 3513 Series Connector	Date Issued	2023/07/11
	Date Revised	2023/07/26
	Version	A0

This specification is only referred to the 3513 series connector

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### 【1.适用范围 Scope】

此规格包括 3.50mm Pitch 3513 Series 连接器规格说明。

This Specification includes the 3.50mm Pitch 3513 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	/	/
胶壳/Housing	/	/
针座/Header	3513WR-2x08-PTSN1NT	

### 【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	/	/
胶壳/Housing	/	/
针座 Header	Housing	PBT (UL 94V-0) 本色 Natural
	Pin	黄铜/Brass Underplated: Ni (1~3μm)overall; Top plating: Sn (2~5μm) 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 Specification	
额定电压 Rated Voltage	150V MAX.	[AC/DC]
额定电流 Rated Current	18A MAX.	
使用温度范围 Ambient Temperature Range	-40°C ~ +125°C	
适用线径 Applicable wire insulation O.D	/	

#### 【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 QJ/GAC 1230.016-2021 5.1.1 对外观进行目视检查。 Refer to QJ/GAC 1230.016-2021 5.1.1 Visual inspection of appearance.	连接器应确保无裂痕、无变形、无明显的颜色变化和吸水。端子表面应整洁，无毛刺和尖角，镀层无叠积、空白与剥落等缺陷。 The connector should ensure that there is no crack, no deformation, no obvious color change and water absorption. The surface of the terminal should be clean, without burrs and sharp corners, and the coating should have no defects such as stacking, blank and peeling.
5.1.2	尺寸特征 Dimensional characteristics	参照 QJ/GAC 1230.016-2021 5.1.2 按照图纸要求，使用满足精度要求的测量仪器对尺寸进行检测。 Refer to QJ/GAC 1230.016-2021 5.1.2 According to the requirements of the drawing, the measurement instrument meeting the accuracy requirements is used to test the dimensions.	应满足产品图纸尺寸及尺寸公差要求。 Dimensions and tolerances of product drawings should be met.

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## 5.2 电气性能 Electrical Performance.

项目 Item	测试描述 Test Description	测试方法 Test Methods	要求 Requirement
5.2.1	低电压低电流电阻 Low voltage low current resistance	参照 QJ/GAC 1230.016-2021 5.3.1 按照 QC/T 1067.1 中微电流连接电阻试验方法进行试验, 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 QJ/GAC 1230.016-2021 5.3.1 According to the test method of microcurrent connection resistance in QC/T 1067.1, 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.	在环境前/后 < 10mΩ Initial/Final < 10mΩ
5.2.2	电压降 Voltage Drop	参照 QJ/GAC 1230.016-2021 5.3.2 提供导体截面所需测试电流为 7.5 A/平方毫米 Refer to QJ/GAC 1230.016-2021 5.3.2 The test current required to provide the conductor cross section is 7.5 A/mm <sup>2</sup>	在环境后 ≤ 50mV Final ≤ 50mV
5.2.3	端子温升 Terminal temperature rise	参照 QJ/GAC 1230.016-2021 5.3.3 将连接器装满端子, 端子按照适配的最大导线线径压接导线。按照表 12 的测试电流 2 要求加载电流, 15min 后测试端子压接位置温度稳定后的温升值。 Refer to QJ/GAC 1230.016-2021 5.3.3 Fill the connectors with terminals. The terminals crimp the wires according to the maximum wire diameter. Load the current according to the requirements of test current 2 in Table 12, and test the temperature rise after 15min after the temperature of the terminal crimp position is stabilized.	端子温升不大于端子最大工作温度与所处环境温度的差值或 55°C, 两种温度中取较小的值。 The terminal temperature rise must not be greater than the difference between the maximum operating temperature of the terminal and the ambient temperature or 55 ° C, the smaller of the two values.
5.2.4	绝缘电阻 Insulation Resistance	参照 QJ/GAC 1230.016-2021 5.3.4 在相对湿度 45% ~ 75% 环境下, 分别在相邻的端子之间和端子与相邻的护套表面之间加载 500V 直流电压。 Refer to QJ/GAC 1230.016-2021 5.3.4	绝缘电阻 > 100 MΩ Insulation resistance > 100 MΩ

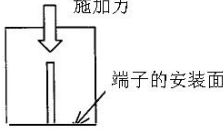
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		At 45% to 75% relative humidity, 500V DC is applied between adjacent terminals and between terminals and adjacent sheath surfaces Voltage.	
5.2.5	绝缘介电强度 Dielectric strength of insulation	参照 QJ/GAC 1230.016-2021 5.3.5 在相对湿度 45%~75%环境下, 分别在相邻的端子之间和端子与相邻的护套表面之间加载 1000V 交流电压并保持 1min。 Refer to QJ/GAC 1230.016-2021 5.3.5 There should be no electrical breakdown or spark. At 45% ~ 75% relative humidity, load 1000V AC voltage between adjacent terminals and between terminals and adjacent sheath surfaces and hold it for 1min.	不应有电击穿或产生电火花 There should be no electrical breakdown or spark generation

### 5-3. 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
5.3.1	公母端子装配力 Assembly force of male and female terminals	参照 QJ/GAC 1230.016-2021 5.2.1 将端子固定在试验夹具上, 将对配端子以 50mm/min 的速度沿端子中心线方向匀速插入直至完全装配状态 Refer to SAE USCAR-2 Rev7-2020 5.1.7 Fix the terminal on the test fixture and insert the matching terminal at a constant speed along the center line of the terminal at a speed of 50mm/min until it is fully assembled	装配力: 1.5 ~ 5.5N assembly force: 1.5 ~ 5.5N
5.3.2	公母端子保持力 Holding force of male and female terminals	参照 QJ/GAC 1230.016-2021 5.2.2 将装配好的一对端子固定在试验夹具上, 将对配端子以 50mm/min 的速度沿端子中心线方向匀速拔出至完全脱离状态 参照 QJ/GAC 1230.016-2021 5.2.2 Terminal holding force Fix the assembled pair of terminals on the test fixture, and pull out the matching terminals at a constant speed along the center line of the terminals at a speed of 50mm/min until they are completely detached	保持力: 1.5 ~ 5.5N Holding force: 1.5 ~ 5.5N
5.3.3	端子抗弯强度 Terminal bending strength	参照 QJ/GAC 1230.016-2021 5.2.4 按照图示沿垂直方向以 50mm/min 的速度施加测试力, 测试力的大小为 75N。	端子应无弯曲, 端子脱离端子安装面的移动距离应小于 1mm。 The terminal should not be bent, and the

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		Refer to QJ/GAC 1230.016-2021 5.2.4 The test force is applied in the vertical direction at a speed of 50mm/min, and the size of the test force is 75N. 	distance between the terminal and the terminal mounting surface should be less than 1mm.
5.3.4	连接器插入力和拔出力 Connector insertion force and withdrawal force	参照 QJ/GAC 1230.016-2021 5.2.7 a) 插入力 将公母端护套的所有孔位装配适配的带有导线的端子，将连接器固定在试验工装上，沿轴向用 50mm/min 的恒定速度插入连接器至完全装配位置。 b) 拔出力 将公母端护套的所有孔位装配适配的带有导线的端子，将连接器固定在试验工装上，将连接器锁止装置保持在打开状态，沿轴向用 50mm/min 的恒定速度拔出连接器至完全脱离位置。 Refer to QJ/GAC 1230.016-2021 5.2.7 a) insertion force Assemble all holes of the male and female end sheathing with suitable terminals with wires, fix the connector on the test kit, and insert the connector to the fully assembled position along the axis at a constant speed of 50mm/min. b) withdrawal force Assemble all holes of the male and female end sheathing with suitable terminals with wires, fix the connector on the test kit, keep the connector locking device open, and pull out the connector along the axis at a constant speed of 50mm/min to the completely disengaged position.	插入力 ≤ 70 N 拔出力 ≤ 70 N insertion force ≤ 70 N withdrawal force ≤ 70 N
5.3.5	护套自锁装置强度 Strength of sheath self-locking device	参照 QJ/GAC 1230.016-2021 5.2.8 将连接器固定在试验工装上，用 0.35mm <sup>2</sup> 导线缠绕住连接器自锁装置，分别沿水平及垂直方向对导线施加 150N 的力。 Refer to QJ/GAC 1230.016-2021 5.2.8 Fix the connector on the test kit, wrap the connector self-locking device with a 0.35mm <sup>2</sup> wire, and apply 150N force to the wire in the horizontal and vertical directions respectively.	自锁装置应至少能承受沿水平及垂直方向 150N 的力 The self-locking device shall be able to withstand a force of at least 150N in the horizontal and vertical directions

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5.3.6	产品固定结构强度 Sheath fixed structural strength	<p>参照 QJ/GAC 1230.016-2021 5.2.9 按照图示 F1 ~ F6 方向以 50mm/min 的恒定速度施加推力，直至护套固定结构破坏，测试所需的力。 Refer to QJ/GAC 1230.016-2021 5.2.9 Test the required force by applying thrust at a constant speed of 50mm/min in the direction F1 ~ F6 as shown in the figure until the fixed structure of the sheath is broken.</p>	<p>按照 F1 ~ F5 方向，能承受的破力应 &gt;50N； 按照 F6 方向，能承受的破坏力应 &gt; 120N。</p>
5.3.7	连接器的编码和定位 Coding and positioning of connectors	<p>参照 QJ/GAC 1230.016-2021 5.2.11 取同类型相似连接器数对，人为进行接插操作，使用力度不可过大，不可损坏连接器。 Refer to QJ/GAC 1230.016-2021 5.2.11 Take the number of pairs of similar connectors of the same type, manually insert the operation, the use of force should not be too large, and the connector should not be damaged.</p>	<p>在零件没有损坏的情况下,在任何错误位置,都应避免电气连接,并不能对连接器进行顺利插接。</p>
5.3.8	连接器或端子重复插拔 Insert and remove the connector or terminal repeatedly	<p>参照 QJ/GAC 1230.016-2021 5.2.14 完成每一对连接器或端子的配合和拆分 10 次。 Refer to QJ/GAC 1230.016-2021 5.2.14 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.</p>	<p>连接器应确保无裂痕、无变形、无明显的颜色变化和吸水。端子表面应整洁，无毛刺和尖角，镀层无叠积、空白与剥落等缺陷。 The connector should ensure that there is no crack, no deformation, no obvious color change and water absorption. The surface of the terminal should be clean, without burrs and sharp corners, and the coating should have no defects such as stacking, blank and peeling.</p>

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5.3.9	连接器对配保持力 Coupling retention	<p>参照 QJ/GAC 1230.016-2021 5.2.15</p> <p>将公母端连接器的所有孔位装配适配的带有导线的端子，将连接器固定在试验工装上，连接器锁止装置保持在关闭状态，沿轴向用 50mm/min 的恒定速度分离连接器至完全脱离位置。</p> <p>Refer to QJ/GAC 1230.016-2021 5.2.15</p> <p>Assemble all holes of the male and female connectors with suitable terminals with wires, fix the connectors on the test kit, keep the connector locking device in the closed state, and separate the connectors along the axis with a constant speed of 50mm/min to the completely detached position.</p> <table border="1"> <thead> <tr> <th rowspan="2">端子尺寸/mm</th> <th colspan="3">连接器孔位数</th> </tr> <tr> <th>1-2 孔</th> <th>3-6 孔</th> <th>&gt;6 孔</th> </tr> </thead> <tbody> <tr> <td>0.5</td> <td>&gt;40N</td> <td>&gt;50N</td> <td>&gt;60N</td> </tr> <tr> <td>0.64-1.2</td> <td>&gt;60N</td> <td>&gt;80N</td> <td>&gt;100N</td> </tr> <tr> <td>&gt;1.2-2.8</td> <td>&gt;80N</td> <td>&gt;100N</td> <td>&gt;100N</td> </tr> <tr> <td>&gt;2.8-6.3</td> <td>&gt;100N</td> <td>&gt;100N</td> <td>&gt;100N</td> </tr> <tr> <td>&gt;6.3</td> <td>&gt;150N</td> <td>&gt;150N</td> <td>&gt;150N</td> </tr> </tbody> </table> <p>注：含多种端子尺寸的连接器的，以最大端子尺寸为准。</p>	端子尺寸/mm	连接器孔位数			1-2 孔	3-6 孔	>6 孔	0.5	>40N	>50N	>60N	0.64-1.2	>60N	>80N	>100N	>1.2-2.8	>80N	>100N	>100N	>2.8-6.3	>100N	>100N	>100N	>6.3	>150N	>150N	>150N	<p>具体见 QJ/GAC 1230.016-2021 4.3.14 验收标准</p> <p>See QJ/GAC 1230.016-2021 4.3.14 Acceptance Criteria for details</p>
端子尺寸/mm	连接器孔位数																													
	1-2 孔	3-6 孔	>6 孔																											
0.5	>40N	>50N	>60N																											
0.64-1.2	>60N	>80N	>100N																											
>1.2-2.8	>80N	>100N	>100N																											
>2.8-6.3	>100N	>100N	>100N																											
>6.3	>150N	>150N	>150N																											
5.3.10	连接器对配声音 Connector pairs sound	<p>参照 QJ/GAC 1230.016-2021 5.2.18</p> <p>a) 准备 10 对连接器样品，平均分为两组，装配 TPA、密封件等附件（如适用）。</p> <p>b) 测量并记录环境声音等级。环境声音等级应为 30dB ~ 50dB。</p> <p>c) 将分贝测量仪放置于离连接器（600±50）mm 处。</p> <p>d) 手工对插第一组连接器，测量并记录连接器锁合产生的声音等级。</p> <p>e) 将第二组连接器潮湿处理（温度 40℃，相对湿度 95% ~ 98%环境中保存 6h）后，30min 内重复上述 b) 至 d) 步骤。</p> <p>Refer to QJ/GAC 1230.016-2021 5.2.18</p> <p>a) Prepare 10 pairs of connector samples, evenly divided into two groups, and assemble TPA, seals and other accessories (if applicable).</p> <p>b) Measure and record ambient sound levels. The ambient sound level should be 30dB ~ 50dB.</p> <p>c) Place the decibel measuring instrument (600±50) mm away from the connector.</p> <p>d) Manually insert the first set of connectors, measure and record the sound level generated by connector locking.</p>	<p>连接器对配到位时产生的声音等级应高于环境声音：未潮湿 7dB,潮湿后 5 dB。</p> <p>The sound level generated when the connector pair is in place should be higher than the ambient sound: 7dB without humidity and 5dB after humidity.</p>																											



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		e) After humid treatment of the second group of connectors (temperature 40°C, relative humidity 95% ~ 98% environment for 6 hours), repeat within 30 minutes Steps b) to d) are described.	
5.3.11	耐振动/机械冲击 Resistance to vibration/mechanical shock	<p>参照 QJ/GAC 1230.016-2021 5.4.7 按照 QC/T 1067.1 中振动/机械冲击 V1 等级试验方法进行试验。 Refer to QJ/GAC 1230.016-2021 5.4.7 Test according to QC/T 1067.1 vibration/mechanical impact grade V1 test method.</p>	<p>试验中接触电阻值的变化在连续大于 7Ω 的时间不得超过 1μs; 满足测试组顺序要求。 The change of the contact resistance value in the test shall not exceed 1μs for a continuous time greater than 7Ω; Satisfy test group sequence requirements.</p>

### 5-4. 环境性能 Environmental Performance

项目 Item	测试描述 Test Description	测试方法 Test Methods	要求 Requirement
5.4.1	温湿度循环 Temperature and humidity cycle	<p>参照 QJ/GAC 1230.016-2021 5.4.3</p> <p>a) 按照 5.2.14 要求对试验样品进行处理; b) 在室温(23±5)°C和相对湿度 (45%~75%) 下放置 4h; c) 按照下图所示试验条件和要求, 进行 10 次温湿度循环。</p> <p>Refer to QJ/GAC 1230.016-2021 5.4.3</p> <p>a) The test sample shall be processed according to 5.2.14; b) Place at room temperature (23±5)°C and relative humidity (45% ~ 75%) for 4h; c) Conduct 10 temperature and humidity cycles</p> <p>the test and shown in figure.</p>	<p>满足测试组顺序要求 Satisfy test group sequence requirements</p>

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5.4.2	热老化性能 Thermal aging property	参照 QJ/GAC 1230.016-2021 5.4.4 a) 按照 5.2.14 要求对试验样品进行处理; b) 把样品放入试验箱, 时间: 1008H, 温度: 125°C。 Refer to QJ/GAC 1230.016-2021 5.4.4 a) Treat the test sample in accordance with 5.2.14; b) Put the sample into the test box, time: 1008H, temperature: 125°C.	满足测试组顺序要求 Satisfy test group sequence requirements
5.4.3	热冲击 thermal shock	参照 QJ/GAC 1230.016-2021 5.4.5 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 10 秒, 100 次循环。 Refer to QJ/GAC 1230.016-2021 5.4.5 Low temperature -40°C, high temperature +125°C, low temperature for 30 minutes, high temperature for 30 minutes, high and low temperature conversion less than 10 seconds, 100 cycles.	满足测试组顺序要求 Satisfy test group sequence requirements
5.4.4	盐雾腐蚀 salt-spray corrosion	参照 QJ/GAC 1230.016-2021 5.5.1 按照 IEC 60068-2-52 Kb 规定的试验方法进行试验 Refer to QJ/GAC 1230.016-2021 5.5.1 Tests are carried out in accordance with the test method specified in IEC 60068-2-52 Kb	满足测试组顺序要求 Satisfy test group sequence requirements
5.4.5	禁限用有害物质检测 The detection of hazardous substances is prohibited	参照 QJ/GAC 1110.025 Refer to QJ/GAC 1110.025	连接器材料中禁用有害物质要求按 QJ/GAC 1110.025 的规定执行 The requirements for the prohibition of hazardous substances in connector materials shall be implemented in accordance with the provisions of QJ/GAC 1110.025
5.4.6	阻燃性 inflamming retarding	参照 QJ/GAC 1230.016-2021 GB 8410 Refer to QJ/GAC 1230.016-2021 GB 8410	要求试样能自熄灭或燃烧率小于 100mm/min。 对于出口车型, 需符合 FMVSS 302 要求 (适用北美市场)。 It is required that the sample can self-extinguish or the combustion rate is less than 100mm/min. For export models, FMVSS 302 requirements must be met (for the North American market).

Product Specification 【产品规格书】	Document No.	PS-3513-01
Product Name 【产品名称】： 3.50mm Pitch 3513 Series Connector	Date Issued	2023/07/11
	Date Revised	2023/07/26
	Version	A0

**【6.测试组 Test Group】**

项目	测试组	A	B	I	C	D	E	H	T	K	L	M	P	Q	S	U
	测试样品	10	10	10	10	10	10	10	10	10	10	10	10	10	3	5
5.1.1	外观检查	1	1,4	1,6	1	1	1	1,3	1,3	1,6	1,6	1,6	1,7	1		
5.1.2	尺寸特征	2	2		2	2	2					2				
5.2.1	低电压低电流电阻			3,5						3,7	3,7	3,7	4,8	3,6		
5.2.2	电压降									4,8	4,8	4,8	5,9	4,7		
5.2.3	端子温升			4									10			
5.3.4	绝缘电阻									9	9	9		8		
5.2.5	绝缘介电强度									10	10	10		9		
5.3.1	公母端子装配力	3														
5.3.2	公母端子保持力	4														
5.3.3	端子抗弯强度		3													
5.3.4	连接器插入力和拔出力				3											
5.3.5	护套自锁装置强度					3										
5.3.6	产品固定结构强度						3									
5.3.7	连接器的编码和定位							2								
5.3.8	连接器或端子重复插拔			2						2	2	2	3	2		
5.3.9	连接器对配保持力				4											
5.3.10	连接器对配声音							2								
5.3.11	耐振动/机械冲击												6			
5.4.1	温湿度循环									5						
5.4.2	热老化性能										5					
5.4.3	热冲击											5				
5.4.4	盐雾腐蚀													5		
5.4.5	禁限用有害物质检测														1	
5.4.6	阻燃性															1

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择

注释:

- 环境温度等级 T3: -40°C to 125°C。
- 振动等级 V1