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	Date revised	2025-02-22	checked by	
Product Specification	Rev. No.	01	Approved by	Willy
Title: D-SUB connector				

1. SCOPE (适用范围)

This specification covers the performance, tests and quality requirements for the **D-SUB Connector**. (本规范涵盖了 **D-SUB** 连接器的性能、测试和质量要求。)

2. PRODUCT DESCRIPTION (产品描述)

DESCRIPTION (描述)	Part Number (料号)
D-SUB 连接器,双排公头黑胶,180 度插板,	X0209WT7BL5

3. APPLICABLE DOCUMENT (适用文件)

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence. (下列文件构成本规范的一部分，在此规定的范围内。本规范要求与产品图纸有冲突时，以产品图纸为准。如果本规范的要求与参考文件发生冲突，应以本规范为准。)

- EIA 364 Test procedures for electrical connector (EIA364电子连接器的测试程序)
- UL 94-V0 Flammability standard (UL 94-V0 阻燃性标准)

4. REQUIREMENTS (要求)

4.1. Design and Structure (设计和结构)

Product shall be of the design, structure and physical dimensions specified on the applicable product drawing. (产品的设计、结构和物理尺寸参考所适用的产品图纸)

4.2. Materials/ Finish (材料/表面处理)

Materials used in the structure of product shall be as specified on the applicable product drawing. (产品结构中使用的材料参考所适用的产品图纸)

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4.3. Ratings （额定功率）

Item（项目）	Standard（标准）	
Rated Voltage (Maximum)额定电压	250V	DC/AC
Rated Current (Maximum)额定电流	3A/5A	
Operating temperature range工作温度范围	-55℃～+105℃ From -55 to +105 degree centigrade	
Storage Temperature Range储存温度范围	-55℃～+105℃ From -55 to +105 degree centigrade	

5. TEST STANDARD （测试标准）

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests are as follows （除另有说明外，用以进行测量和测试的标准环境条件范围如下）

- 5.1 Ambient temperature （环境温度）：5℃ to 35℃
- 5.2 Relative humidity （相对湿度）：45% to 85%
- 5.3 Air pressure （气压）：86Kpa to 106Kpa

6. HOWEVER, IF DOUBTS ARISE CONCERNING JUDGMENTS. PERFORM UNDER THE FOLLOWING STANDARD CONDITIONS. （但是，如果对判决产生疑问，按照下列标准条件执行）

- Temperature （温度）：23±1℃.
- Humidity （湿度）：50%±2% RH.
- Air Pressure （气压）：86~106kPa

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7. PERFORMANCE AND TEST DESCRIPTION（性能和测试类型）

7.1 APPRARANCE（外观）

ITEM	DESCRIPTION（类型）	TEST CONDITION（测试条件）	REQUIREMENT（要求）
1	Appearance （外观）	Visual.（目视）	Should not have any flaw Scratch discoloration and crushed（无任何裂痕、 刮伤、污染和变形）

7.2 ELECTRICAL（电气）

ITEM	DESCRIPTION（类型）	TEST CONDITION（测试条件）	REQUIREMENT（要求）
1	Low Level Contact Resistance（接触电阻）	EIA 364-23 When measured at 20 mV maximum open circuit at 100 mA Mated test contacts must be in a connector housing. Measurements to include Power,Ground,D+ and D- contacts of connector. （在开路最大电流 100mA 电压 20 mV 最大下测 量,测量对插触点上的电阻必须是组装外壳后的连 接器。测量包括电源,接地,信号 PIN)	Iniital:20 mΩ maximum. 30 mΩ maximum change for post test LLCR. （初始: 40 mΩ最大 测试后: 30 mΩ最大变化量）
2	Insulation Resistance （绝缘电阻）	EIA 364-21 Apply 500 volts DC between adjacent terminal or ground。（分别在相邻端子或壳体 之间施加 500V DC 1mA 的电流持续 1 分钟）	1000 MΩ minimum.
3	Dielectric Withstanding Voltage（耐电压）	EIA 364-20 Apply 1000 Volts AC(RMS) between adjacent terminal or ground. Leakage current: 0.5mA Max. （分别在相邻端子或壳体之间施加 1000V AC 1mA 的电流持续 1 分钟,最大漏电电流 0.5mA）	No Breakdown（没有损 坏）

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4	Contact Current Rating (温升)	EIA 364-70 — Method B 1A at 300V AC minimum when measured at an ambient temperature of 25°C.with power applied to the contacts ,the ΔT must not exceed +30°C at any point in the USB connector under test. (相对温度为 25℃, 300VAC, 最小为 1A。接通电压, 测试中端子任一点的温度不超过+30℃。)	$\Delta T=30^{\circ}\text{C}(\text{Max.})$ 温度上升不超过30℃
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7.3 MECHANICAL (机械)

ITEM	DESCRIPTION (类型)	TEST CONDITION (测试条件)	REQUIREMENT (要求)
1	Insertion Force (插入力)	EIA364-13 Solder each of the plug and receptacle connector to the P.C.Board then do insertion/extraction along the axis 3 times at speed 25mm. After place each of the P.C.Board onto the push-on/pull-off machine to be measurement the insertion force. (将公、母座焊接在 PCB 板上, 再将 PCB 板置于插拔力实验机上, 然后以每分钟 25mm 的速度沿轴向插拔 3 之次后再测试其插入力。)	3.1Kgf Max.
2	Extraction Force (拔出力)	EIA364-13 Solder each of the plug and receptacle connector to the P.C.Board then do insertion/extraction along the axis 3 times at speed 25mm. After place each of the P.C.Board onto the push-on/pull-off machine to be measurement the insertion force. (将公、母座焊接在 PCB 板上, 再将 PCB 板置于插拔力实验机上, 然后以每分钟 25mm 的速度沿轴向插拔 3 之次后再测试其拔出力。)	1.0Kgf Min.

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3	Durability (寿命测试)	EIA 364-09 Solder each of the plug and receptacle connector to the P.C. Board, then place each of the P.C. Board onto the push-on/pull-off machine, then do insertion / Withdrawal 3000 cycles along the axis at speed of 100 ±50 cycles per hours . (将公、母座焊接在 PCB 上, 再将 PCB 板置于耐插拔实验机上, 然后以每小时 100±50 次的速度沿轴向插拔 3000 次)	Insertion force (插入力): 2.0~5.0Kgf . Extraction Force (拔出力): 1.0Kgf Min.
4	Terminal strength (端子强度)	Apply 5N gravity in the direction of the terminal of axis X,Y,Z for 10 seconds. After soldering and fixing the PC board properly, insert and withdraw 100 cycles. But the insertion force is 15N max. (在端子各方向加 5N 的重力 (X, Y, Z 方向), 时间 10 秒。焊接并固定好印刷线路板后, 插拔 100 次。但插力在 15N 以下)	There are no crack, no damage, electrical performance normal. (端子无裂痕, 损伤等; 电气电能正常。)
5	Random Vibration (机械振动)	EIA 364-28 No discontinuities of 1 μs or longer duration when mated plug connectors are subjected to 5.35 GRMS. 2 Hours in each of three mutually perpendicular planes. (匹配公头, 中断不得大于或等于 1 μs, 承受 1.52 GRMS, 朝各个相正交的方向振动 2 小时)	Appearance (外观): No Damage (没有损坏) Discontinuity (断讯): 1 μsec maximum. (不能超过 1 微秒) Contact resistance (接触阻抗): 50 mΩ Max.
6	Mechanical Shock (机械冲击)	EIA 364-27 No discontinuities of 1 μs or longer duration when mated SUB connectors are subjected to 11 ms duration 30 Gs half-sine shock pulses. Three shocks in each direction applied along three mutually perpendicular planes for 18 shocks. (将对插后的连接器固定于冲击实验机上, 中断不得大于或等于 1 μs, 施加 11 ms 持续 30 Gs 半正弦脉冲波, 沿 3 个互相垂直达的方向每个方向三次冲击共 18 次冲击)	Appearance (外观): No Damage (没有损坏) Discontinuity (断讯): 1 μsec maximum. (不能超过 1 微秒) Contact resistance (接触阻抗): 50 mΩ Max.

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7.4 ENVIRONMENTAL (环境)

ITEM	DESCRIPTION (类型)	TEST CONDITION (测试条件)	REQUIREMENT (要求)
1	Thermal Shock (冷热冲击)	EIA 364-32 5 cycles of: a) -50°C for 30 minutes b) +105°C for 30 minutes (将连接器焊在 PCB 上后将其暴露在下列环境长件中循环 5 次: 置于-50°C± 3°C 温度中 30 分钟, 再转换至+105°C± 2°C 下 30 分钟, 再换至标准温度条件 2 小时)	Appearance: No Damage (外观无损坏) Electrical characteristics shall be satisfied. (电气特性必须符合规格)
2	Withstand heat (耐热)	EIA 364-17 The connector shall be exposed in a hot chamber at temperature of 105±2°C for a period of 96 hours ,shall then be returned at room conditions for 2 hours. the socket shall be capable of satisfactory performance. (将连接器暴露在温度为 105±2°C 的恒温恒湿槽中放置 96 小时后, 再在室温下自然干燥 2 小时后, 绝缘部分应无变形、裂痕、金属部分无变色。)	Appearance: No Damage (外观无损坏) Electrical characteristics shall be satisfied. (电气特性必须符合规格)
3	Withstand cold (耐寒)	EIA 364-17 The connector shall be exposed in a cold chamber at temperature of -50°C±2°C for a period of 96hours, shall then be returned at room conditions for 2 hours, the socket shall be capable of satisfactory performance. (将连接器暴露在温度为-50±2°C 的恒温恒湿槽中放置 96 小时后, 再在室温下自然干燥 2 小时后, 绝缘部分应 无变形、裂痕、金属部分无变色。)	Appearance: No Damage (外观无损坏) Electrical characteristics shall be satisfied. (电气特性必须符合规格)
4	Resistance to Soldering heat (焊锡耐热性)	EIA-364-52 Place the connector on the P.C.Board,then immerse the solder pin up to the surface of the board in the solder bath at 260°C±5°C for 10 seconds. (将连接器置于 PCB 上,然后将露出 PCB 板表面的 Pin 脚部分浸入 260±5°C 的锡炉中 10 秒)	Appearance: No Damage (外观无损坏) Electrical characteristics shall be satisfied. (电气特性必须符合规格)

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5	Withstand humidity (恒温恒湿)	EIA-364-31) Solder each of the plug and receptacle connector to the P.C.Board ,then mate them together and exposed at temperature of 40℃±2℃ and humidity of 90-95% for a period of 96 hours. after removal from chamber, socket shall be returned at room condition for a period of 2 hours. the socket shall be capable of. (将公母座连接器各自焊接于 PCB 板上后将其对插再暴露在温度为 40℃±2℃，湿度为 90-95%的恒温恒湿槽中放置 96 小时进行测试，完成测试后将插座取回在常温常湿下放置 2 小时后测定。)	Appearance: No Damage (外观无损坏) Electrical characteristics shall be satisfied.(电气特性必须符合规格)
6	Solder ability (可焊性)	Immerse the solder pin of the connector in solder bath at 235±5℃ for 3±0.5sec. After dipped the pin in the flux 5sec. (将端子脚浸入助焊剂中 5 秒，然后将端子脚浸入 235±5℃ 的锡炉中 3±0.5 秒)	Solder wetting: 95% of immersed area must show voids, Pin holes. (锡附着的面积应超过浸入表面积的 95%以上)
7	Salt Spray (盐雾)	EIA 364-26 Connectors to 35+/-2℃.Humidity. PH value:6.5~7.2 and 5+/-1% salt condition for 24hours. After test, rinse the sample with water and recondition the room temperature for 1 hour test CR and IR. (将连接器放置在 35±2℃，PH 值 6.5~7.2 和 5%浓度的实验箱内测试 48 小时，测试后用水清洗样品，放置室温 1 小时测试接触阻抗与绝缘阻抗)	Appearance 外观: No Damage 无异状 Contact Resistance 接触阻抗: 50 mΩ Max.

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8. REEL PACKAGING 盘装

8.1. Scope 范围: This specification covers the requirements of the reel packaging for SMT standard type of tact switches. 该规范包含 SMT 标准型拨动开关的绕带封装的要求

8.2. Packaging Material 包装材料

ITEM 项目	DESCRIPTION 说明
Package 包装	Cartons 卡通箱
Reel 转轴	Delete Cartons 可降解箱
Carrier Tape 载带	Polypropylene 聚丙烯

8.3. Packaging Quantity 封装数量
Please refer to the packing drawing. 请参考产品包装图纸

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