

|                                                                                   |              |             |             |          |
|-----------------------------------------------------------------------------------|--------------|-------------|-------------|----------|
|  | Doc. No.     | SP-A0162-09 | Page No.    | 1/8      |
|                                                                                   | Date Issued  | 2024-07-30  | Prepared by | Shanzha  |
|                                                                                   | Date revised | 2024-07-30  | Checked by  | Sangshen |
| Product Specification                                                             | Rev. No.     | A0          | Approved by | Willy    |
| Title : Board to Board Pitch 0.5mm X0502 Series Connector                         |              |             |             |          |

1. SCOPE ( 适用范围 )

This specification covers the performance, tests and quality requirements for the Board to Board 0.5mm Connector.(本规范涵盖了 Board to Board 0.5mm 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 )  |
|-----------------------|---------------------|
| BTB 立贴 0.5mm 公座 合高3.0 | X0502WVS-XXAS-LPSN  |
| BTB 立贴 0.5mm 母座 合高3.0 | X0502FVS-XXAS-LPSN  |
| BTB 立贴 0.5mm 公座 合高3.4 | X0502WVS-XXBXS-LPSN |
| BTB 立贴 0.5mm 母座 合高3.4 | X0502FVS-XXBXS-LPSN |
| BTB 立贴 0.5mm 公座 合高4.0 | X0502WVS-80CS-LPSN  |
| BTB 立贴 0.5mm 母座 合高4.0 | X0502FVS-XXCS-LPSN  |
| BTB 立贴 0.5mm 公座 合高5.0 | X0502WVS-XXDS-LPSN  |
| BTB 立贴 0.5mm 母座 合高5.0 | X0502FVS-XXDS-LPSN  |

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.(XKB Connection 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。)

- MIL-STD-1344A Test method for electrical connector ( 电子连接器测试方法 )
- MIL-STD-202F Test method for electrical components ( 电子零件测试方法 )
- EIA364 Test method for electrical components ( 电子零件测试方法 )
- JIS C0051 Test method for electrical components ( 电子零件测试方法 )
- MIL-G-45204C Specification for gold plating ( 镀金规格 )
- IEC-512-3 IEC standard for current carrying capacity tests ( IEC 电流测试标准 )
- QQ-N-290A Specification for nickel plating ( 镀镍规格 )
- MIL-P-81728A Specification for tin/lead plating ( 镀锡铅规格 )
- MIL-T-10727B Specification for tin plating ( 镀锡规格 )
- UL498 UL standard for safety of attachment plug and receptacle ( UL 安规要求标准 )
- EN/ISO5961 Determination of total lead & cadmium content ( 总铅和总镉含量测定 )
- EN1122 Determination of total lead & cadmium content ( 总铅和总镉含量测定 )

|                                                                                   |              |             |             |          |
|-----------------------------------------------------------------------------------|--------------|-------------|-------------|----------|
|  | Doc. No.     | SP-A0162-09 | Page No.    | 2/8      |
|                                                                                   | Date Issued  | 2024-07-30  | Prepared by | Shanzha  |
|                                                                                   | Date revised | 2024-07-30  | Checked by  | Sangshen |
| Product Specification                                                             | Rev. No.     | A0          | Approved by | Willy    |
| Title : Board to Board Pitch 0.5mm X0502 Series Connector                         |              |             |             |          |

- EN13346 Determination of heavy metals content (重金属含量测定)
- EPA3052 Determination of total lead & cadmium content (总铅和总镉含量测定)

4. REQUIREMENTS ( XKB CONNECTION 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. ( XKB Connection 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. (产品中使用的材料参考所适用的产品图纸)

4.3. Ratings ( 额定功率 )

| XKB Connection Item ( 项目 )        | Standard ( 标准 )                                  |    |
|-----------------------------------|--------------------------------------------------|----|
| Rated Voltage (Maximum)额定电压       | 100V                                             | AC |
| Rated Current (Maximum)额定电流       | 0.3A                                             |    |
| Operating temperature range工作温度范围 | -40℃~+125℃<br>From -40 to +125 degree centigrade |    |

4.4. PACKAGING ( 包装 )

Please refer to the packing drawing. 请参考产品包装图纸

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. (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

|                                                                                  |              |             |             |          |
|----------------------------------------------------------------------------------|--------------|-------------|-------------|----------|
|  | Doc. No.     | SP-A0162-09 | Page No.    | 3/8      |
|                                                                                  | Date Issued  | 2024-07-30  | Prepared by | Shanzha  |
|                                                                                  | Date revised | 2024-07-30  | Checked by  | Sangshen |
| Product Specification                                                            | Rev. No.     | A0          | Approved by | Willy    |
| Title : Board to Board Pitch 0.5mm X0502 Series Connector                        |              |             |             |          |

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<br>（外观） | Visual. （目视）          | Should not have any flaw<br>Scratch discoloration and<br>crushed （无任何裂痕、刮伤、<br>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<br>Resistance （接触电阻）   | EIA 364-23<br>Subject mated contacts assembled in<br>housing to closed circuit of 100 mA<br>max. at open circuit voltage of 20 mV<br>max. （在开路最大电流 100mA 电压 20 mV 最<br>大下测量）      | Iniital:50 mΩ max<br>（初始：50 mΩ 最大） |
| 2    | Insulation Resistance<br>（绝缘电阻）          | MIL-STD-202, Method 302,Condition B<br>Apply 250±10% volts DC between<br>adjacent terminal or ground 。 （分别在相<br>邻端子或壳体之间施加 250V±10% DC 的电压持<br>续 1 分钟）                            | 100 MΩ min                         |
| 3    | Dielectric Withstanding<br>Voltage （耐电压） | MIL-STD-202, Method 301.<br>Apply 150 Volts AC(RMS) between<br>adjacent terminal or ground.<br>Leakage current: 1mA Max.<br>（分别在相邻端子或壳体之间施加 150V AC<br>1mA 的电流持续 1 分钟，最大漏电电流 1mA） | No Breakdown （没有损坏）                |

7.3 MECHANICAL （机械）

| ITEM | DESCRIPTION （类型） | TEST CONDITION （测试条件） | REQUIREMENT （要求） |
|------|------------------|-----------------------|------------------|
|------|------------------|-----------------------|------------------|

|                                                                                   |              |             |             |          |
|-----------------------------------------------------------------------------------|--------------|-------------|-------------|----------|
|  | Doc. No.     | SP-A0162-09 | Page No.    | 4/8      |
|                                                                                   | Date Issued  | 2024-07-30  | Prepared by | Shanzha  |
|                                                                                   | Date revised | 2024-07-30  | Checked by  | Sangshen |
| <b>Product Specification</b>                                                      | Rev. No.     | A0          | Approved by | Willy    |
| <b>Title :</b> Board to Board Pitch 0.5mm X0502 Series Connector                  |              |             |             |          |

|   |                                                       |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                  |
|---|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <b>Insertion Force</b> (插入力)                          | <b>EIA364-13</b><br><b>Insertion and withdrawal speed :</b><br><b>25mm/minute.</b> (以每分钟 25mm 的速度沿轴向插入母座测量其插入力)                                                                                                                                                                                              | <b>1.2N *Pin Max.</b>                                                                                                                            |
| 2 | <b>Extraction Force</b> (拔出<br>力)                     | <b>EIA364-13</b><br><b>Insertion and withdrawal speed :</b><br><b>25mm/minute.</b> 以每分钟 25mm 的速度沿轴向从母座拔出测量其拔出力)                                                                                                                                                                                              | <b>0.098N *Pin Min.</b>                                                                                                                          |
| 3 | <b>Durability</b> (寿命测试)                              | <b>EIA 364-09</b><br><b>Mate and Unmated connector for 30 cycles</b><br>(沿轴向插拔 30 次)                                                                                                                                                                                                                         | <b>Meets requirements of product appearance.</b><br><b>Contact Resistance: 80 mΩ Max. after testing</b><br>(符合产品外观要求, 测试后接触阻抗不大于 80mΩ )          |
| 4 | <b>Vibration Sinusoidal Low Frequency</b><br>(低频正弦振动) | <b>MIL-STD-202, Method 201.</b><br><b>Subject mated connector to 10-55-10 Hz traversed in 1 minute at 1.5 mm amplitude 2 hours each of 3 mutually perpendicular plane, 10 mA.</b><br>(对测试样品,在频率变化每分钟从10-55-10 Hz , 振幅 1.5 mm 条件下,在互相垂直的三个面上, 每个面 2 小时下测量, 电流 10 mA)                                          | <b>No electrical discontinuity greater than 1 μ sec (s) shall occur.</b><br><b>Contact resistance:80 mΩ max.</b> (不能超过 1 微秒瞬间断开, 接触阻抗: 80 mΩ 最大) |
| 5 | <b>Mechanical Shock</b> (机械冲击)                        | <b>MIL-STD-202, Method 213</b><br><b>No discontinuities of 1 μS or longer duration when mated connectors are subjected to 490m/s2 half-sine shock pulses. Three shocks in each direction applied along three mutually shocks.</b><br>(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 μ s, 施加 490m/s2 半正弦脉冲波, 沿 3 个互相垂直达的方向冲击) | <b>Appearance (外观) :</b><br><b>No Damage</b> (没有损坏)<br><b>Discontinuity (断讯) :</b><br><b>1 μ sec maximum.</b> (不能超过 1微秒)                         |

7.4 ENVIRONMENTAL (环境)

| ITEM | DESCRIPTION (类型) | TEST CONDITION (测试条件) | REQUIREMENT (要求) |
|------|------------------|-----------------------|------------------|
|------|------------------|-----------------------|------------------|

|                                                                                   |              |             |             |          |
|-----------------------------------------------------------------------------------|--------------|-------------|-------------|----------|
|  | Doc. No.     | SP-A0162-09 | Page No.    | 5/8      |
|                                                                                   | Date Issued  | 2024-07-30  | Prepared by | Shanzha  |
|                                                                                   | Date revised | 2024-07-30  | Checked by  | Sangshen |
| <b>Product Specification</b>                                                      | Rev. No.     | A0          | Approved by | Willy    |
| <b>Title</b> : Board to Board Pitch 0.5mm X0502 Series Connector                  |              |             |             |          |

|   |                                 |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                             |
|---|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <b>Thermal Shock</b><br>(冷热冲击)  | <b>MIL-STD-202, Method 107D, condition A.</b><br><b>Temperature range from -35°C to +85°C .Start from -35°C, after 30 min. change to +85°C; change time is no more than 30 seconds. Total 5 cycles.</b><br>(温度变化范围: -35 ° C~ +85° C; 从 -35° C 开始, 30 分钟后换到+85° C; 转换时间不超过 30 秒; 共 5 个循环。) | <b>No damage, Contact Resistance 80 mΩ max.</b><br>(外观无损坏, 接触阻抗: 80 mΩ 最大)                                                                                                                  |
| 2 | <b>Humidity</b><br>(恒温恒湿)       | <b>MIL-STD-202, Method 103</b><br><b>Temperature (温度) :40±2°C</b><br><b>Relative Humidity (相对湿度) : 90-95%;</b><br><b>Duration (时间) :96 Hours</b>                                                                                                                                          | <b>No damage, Contact Resistance 80 mΩ max..</b><br><b>Dielectric Strength should be OK.</b><br><b>Insulation Resistance 100MΩ min.</b><br>(产品无损坏, 接触阻抗: 80 mΩ 最大; 耐电压测试 OK, 绝缘阻抗 100MΩ 最小) |
| 3 | <b>Solder ability</b><br>(可焊性)  | <b>Immerse the solder pin of the connector in solder bath at 255±5°C for 3±0.5sec.</b><br><b>After dipped the pin in the flux 5sec.</b><br>(将端子脚浸入助焊剂中 5 秒, 然后将端子脚浸入 255±5°C 的锡炉中 3±0.5 秒)                                                                                                | <b>Solder wetting: 95% of immersed area must show voids, Pin holes.</b><br>(锡附着的面积应超过浸入表面积的 95%以上)                                                                                          |
| 4 | <b>High temperature</b><br>(高温) | <b>MIL-STD-202, Method 108.</b><br><b>Subject product to 85±2°C for 96 hours Continuously.</b><br>(产品置于 85 ± 2° C 连续 96 小时)                                                                                                                                                               | <b>Contact resistance: 80m Ω max.</b><br>(接触阻抗 80 mΩ max. )                                                                                                                                 |

|                                                                                   |              |             |             |          |
|-----------------------------------------------------------------------------------|--------------|-------------|-------------|----------|
|  | Doc. No.     | SP-A0162-09 | Page No.    | 6/8      |
|                                                                                   | Date Issued  | 2024-07-30  | Prepared by | Shanzha  |
|                                                                                   | Date revised | 2024-07-30  | Checked by  | Sangshen |
| <b>Product Specification</b>                                                      | Rev. No.     | A0          | Approved by | Willy    |
| <b>Title :</b> Board to Board Pitch 0.5mm X0502 Series Connector                  |              |             |             |          |

|   |                                             |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                             |
|---|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 5 | <b>Salt Spray (盐雾)</b>                      | <b>MIL-STD-202, Method 101 Condition B. Connectors to 35+/-2°C.</b><br><b>Humidity:85%(R.H). PH value:6.5~7.2 and 5+/-1% salt condition for 24hours.</b><br><b>After test, rinse the sample with water and recondition the room temperature for 1 hour test CR and IR.</b> (将连接器放置在 35±2℃, 温度为 85% PH 值 6.5~7.2 和 5%浓度的实验箱内测试 24 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) | <b>Appearance: No Damage</b><br>(外观无损坏)<br><b>Contact Resistance 80 mΩ Max.</b><br>(接触阻抗(末态) 80 mΩ Max. )                   |
| 6 | <b>Resistance to Soldering heat (焊锡耐热性)</b> | <b>The contact of terminal shall be tested resistance to soldering heat in the following conditions. After Resistance to soldering heat test Contact Resistance.</b> (端子应在下列条件下做耐吃锡性试验, 焊锡耐热性后试接触阻抗)<br><b>In case of solder iron (2 time) 电烙铁(两次)</b><br><b>Temperature 温度:≤350°C</b><br><b>Time 时间: 5s+/-1s</b>                                                     | <b>Should not have any flaw scratch and crack.</b><br>(无任何裂痕、刮伤和破裂)                                                         |
| 7 | <b>IR-reflow (回流焊)</b>                      | <b>MIL-STD-202G method 210F Peak temperature time 260°C Max,10 sec or more.</b> (峰值温度时间最高 260℃, 10 秒或以上)<br><b>Duration : 2 cycles (过炉 2 次)</b><br><b>Lead-Free Solder (无铅锡膏): Sn96.5Ag3Cu0.5</b><br><b>Refer to section 9 (请参阅第 9 条)</b>                                                                                                                             | <b>Should not have any flaw scratch and crack</b><br>(无任何裂痕、刮伤和破裂)<br><b>No visual damage to insulator.</b><br>(绝缘体不得有严重变形) |



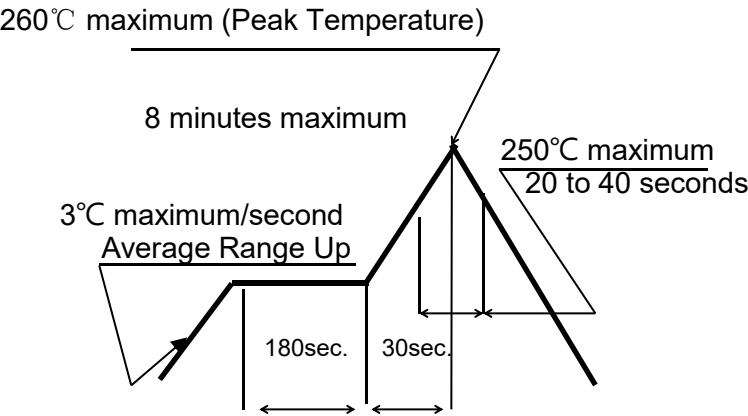
|                                                                                   |              |             |             |          |
|-----------------------------------------------------------------------------------|--------------|-------------|-------------|----------|
|  | Doc. No.     | SP-A0162-09 | Page No.    | 8/8      |
|                                                                                   | Date Issued  | 2024-07-30  | Prepared by | Shanzha  |
|                                                                                   | Date revised | 2024-07-30  | Checked by  | Sangshen |
| Product Specification                                                             | Rev. No.     | A0          | Approved by | Willy    |
| Title : Board to Board Pitch 0.5mm X0502 Series Connector                         |              |             |             |          |

**9. SOLDERING 焊接 :**

9.1. Wave soldering ( 波峰焊 ) : DIP Suggestions solder temperature at 260°C(500°F) max.5 seconds . DIP 型推荐焊接焊锡温度为 260°C ( 500°F) 最多 5 秒

9.2. Hand soldering ( 手焊 ) : Use a soldering iron of 30 watts controlled at 350°C approximately 5 seconds. while applying solder.  
使用 30W 烙铁控制温度在 350°C,焊接时长约 5 秒

9.3. Reflow soldering profile( 回炉焊 ):When the maximum temperature of the reflow furnace is 260 °C and the temperature is 260 °c. 10 seconds MAX. (reference) SMT 型回焊炉最高温度为 260°C , 温度为 260°C时 , 最长时间不超过 10 秒 ( 如图 )



(Preheat Temperature预热温度: 150~200°C Maximum.)  
Temperature Condition Graph.温度状态图  
(Temperature on Board Pattern Side )

Requirement要求: No physical damaged or plastic melting.: 无物理损伤或塑料熔化

| Rev. | Description | Date revised | Created/<br>Revised by |
|------|-------------|--------------|------------------------|
| A0   | New Release | 2024/07/30   | Shanzha                |
|      |             |              |                        |
|      |             |              |                        |
|      |             |              |                        |
|      |             |              |                        |
|      |             |              |                        |