

PRODUCT SPECIFICATION

Part Number	USB31-TPYE-C-LB01T-2			Rev	E		Date	10/12/18
Product Description	USB Receptacle, Type C, DIP, Vertical Type						Page	1
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1. SCOPE

This product specification specifies the characteristics and test methods of USB 3.1 series "C type" connectors designed and produced by XKB.

2. REFERENCE DOCUMENTS

MIL-STD-1344A Test method for electrical connector
MIL-STD-202F Test method for electrical components
EIA364 Test method for electrical components
JIS C 0051 Test method for electrical components
MIL-G-45204C Specification for gold plating
IEC-512-3 IEC standard for current carrying capacity tests
QQ-N-290A Specification for nickel plating
MIL-P-81728A Specification for tin/lead plating
MIL-T-10727B Specification for tin plating
UL498 UL standard for safety of attachment plug and receptacle
EN/ISO5961 Determinationoftotallead&cadmiumcontent
EN1122 Determinationoftotallead&cadmiumcontent
EN13346 Determinationofheavymetalscontent
EPA3052 Determinationoftotallead&cadmiumcontent

3. FEATURE & DIMENSIONS

3.1. PRODUCT DIMENSION

These connectors shall have the dimensions as shown in customer drawing.

3.2. PCB/PANEL LAYOUT

The recommended PCB layout is shown in customer drawing.

3.3. MATERIAL

The harmful material can follow the requirement of RoHS.

3.4. MECHANICAL & ELECTRICAL CHARACTERISTIC

The connector shall have the mechanical and electrical performance as described in table I:

3.5. PACKAGING

This product adopts tray or REEL package

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3.6.TRANSPORTATION

Any vehicle can be adopted for the transportation, but moisture-proof and no mechanical damage.

3.7.STORAGE

Temperature: -25°C~+85°C, Relative humidity: ≤80%, Not to storage in corrosive environments A re-qualification test shall be conducted immediately while the storage duration exceed 6 months.

4. ENVIRONMENTAL

4.1. SOLDERABILITY

Connector's solderability can meet MIL-STD-202F standard. Finish shall be free of contaminants.

4.2. RESISTANCE TO SOLDER HEAT

4.2.1. Wave Soldering

Consists of three consecutive phases.

4.2.1.1. Preheat

Increase in temperature not to exceed 4°Cper second. Final preheat temperature will be within 125 °Cof solder temperature.

4.2.1.2. Soldering

Device leads will be exposed to solder wave at 250°Cfor a maximum of 5 seconds.

4.2.1.3. Cool Down

Cool down in ambient air at approximately 20°Cto 25°C.

4.2.2. INFRARED REFLOW

Three cycles. Each cycle consisting of three consecutive phased.

4.2.2.1. Preheat

Increase in temperature not to exceed 4°C per second.

4.2.2.2. Soldering

Maximum allowable time above reflow temperature of 183 °C is 90 seconds. Maximum temperature in this interval is 250°C, not to exceed 10 seconds.

4.2.2.3. Cool Down

Cool down shall not exceed 6°C per second.

temperature measurements are referenced from the top-center of the package outer surface.

4.3. CLEANING

Connectors resist to cleaning process. Aqueous Cleaning: Three cycles; each cycle consisting of a

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maximum of one minute exposure to 54°C to 66°C dematerialized tap water at a maximum pressure of 30 psi; followed by air drying for 60°C to 90 seconds at 93°C to 121°C.

5. PERFORMANCE AND TEST DESCRIPTION

5.1. REQUIREMENT

Product is designed to meet electrical, mechanical, and environmental performance requirements specified in **Table I**.

5.2. TEST CONDITION

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

5.3. SAMPLE SELECTION

Test samples shall be selected at random from current production. No test samples shall be reused.

Samples are pre-conditioned with 10cycles of durability. Each group shall be containing 5 test samples.

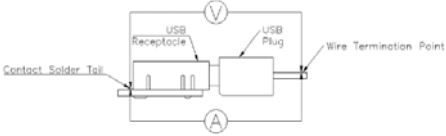
6. QUALITY ASSURANCE PROVISIONS

The company is responsible for the quality of all products sent to customers, and the defective batches are returned or corrected by the supplier

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TABLE I: PERFORMANCE REQUIREMENTS

Items		Requirements	Test Methods
1	Confirmation of Product	Product shall be conforming to the requirements of applicable product drawing	Visually dimensions and functionally inspected per applicable product drawing.
Electrical Requirement			
Items		Requirements	Test Methods
2	Low level Contact resistance	1. 40 mΩ (Max) initial for VBUS, GND and all other contacts. 2. Maximum change (delta) of +10 mΩ after environmental stresses. 	The low level contact resistance measurement is made from the solder tail of the receptacle to the soldering point of the plug. when measured at 20mV Max. open circuit at 100mA. Mated test contacts must be in a connector housing. Test reference standard EIA-364-23B
3	Insulation Resistance	100 MΩ Min.	Test between adjacent circuits Insulation Resistance of unmated and mated connectors. Test reference standard EIA 364-21. Test reference standard: EIA-364-20.
4	Dielectric Strength	No breakdown shall occur.	when 100 Volts AC (RMS) is applied between adjacent contacts of unmated and mated connectors.

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5	Contact current rating	1.A current of 3.0 A shall be applied collectively to VBUS pins (pins A4, A9, B4, and B9) 2.1.25 A applied to the VCONN pin (B5 of the plug connector) with the return path through the corresponding GND pins (pins A1, A12, B1, and B12). 3. A minimum current of 0.25 A shall also be applied individually to all the other contacts.	When the currents are applied to the contacts, the temperature rise shall not exceed 30 °C at any point on the USB Type-C mated plug and receptacle under test, when measured at an ambient temperature of 25 °C. Test reference standard: EIA -364-70 method B
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Mechanical Requirement

	Items	Requirements	Test Methods
6	Insertion Force	The initial connector insertion force shall be within the range from 5 N to 20 N。	Measure the force required to mate connector, At a maximum rate of 12.5mm(0.492") per minute. Test reference standard: EIA-364-13
7	Extraction Force	The initial connector Extraction force shall be within the range from 6 N to 20 N。	Measure the force required to mate connector, At a maximum rate of 12.5mm(0.492") per minute. Test reference standard: EIA-364-13
8	Durability or Insertion/extraction Cycles	The durability ratings shall be 1,0000 cycles.	The durability test shall be done at a maximum rate of 200 cycles per Hour and no physical damage to any part of the connector and cable assembly shall occur.

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9	Physical Shock	No breakdown shall occur.	No discontinuities of 1μs or Longer duration. when mated USB C type connectors are subjected to 11ms duration 30Gs half-sine shock pluses. Three shocks in each direction applied along three mutually perpendicular planes for a total of 18 shocks. Test reference standard: EIA 364-27 Test Condition H.
Environmental Requirements			
	Items	Requirements	Test Methods
10	Humidity	Shall meet visual requirements, show no physical damage. Contact Resistance (Low Level) 40 mΩ max. Dielectric Strength should be OK, Insulation Resistance should be 100 MΩ min.	Temperature: 25~65°C, Relative humidity: 90-95%, Duration: 96Hours, Circulate test: 10 Cycles. Test reference standard: EIA 364-31
11	Thermal shock	Shall meet visual requirements, show no physical damage. Contact Resistance (Low Level) 40 mΩ max. Dielectric Strength should be OK, Insulation Resistance should be 100 MΩ min.	Temperature range from -55°C to +85°C .Start from -55°C. After 30 min. change to +85°C, change time is no more than 30 seconds. Total 5 cycles. Test reference standard: EIA 364-32
12	Hot air reflow or IR reflow for SMT curing process SMT	More than 95% of the dipped surface shall be wet with solder	Place subjected connector on the PCB Board and expose them to the reflow oven and apply the following condition: Room 1: preheat temperature 150°C - 170°C for 100 seconds. Room 2: preheat temperature 170°C - 200°C for 100 seconds. Room 3: reflow temperature 200°C -

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			260°C for 120-60 seconds. (For 260°C ONLY 5-10 seconds)
13	Solderability	The inspected area of each lead must have 95% solder coverage Minimum.	Solder pot temperature: 250±5°C Soldering time: 3 to 5 Seconds Test reference standard: EIA 364-52
14	Salt Spray	Shall meet visual requirements, No detrimental corrosion allowed in contact area and base metal exposed.	Subject mated connectors to 35+/-2 °C and 5+/-1% salt condition for 24 hours. After test, rinse the sample with water and recondition the room temperature for 1 hour. Test reference standard:EIA-364-26B.

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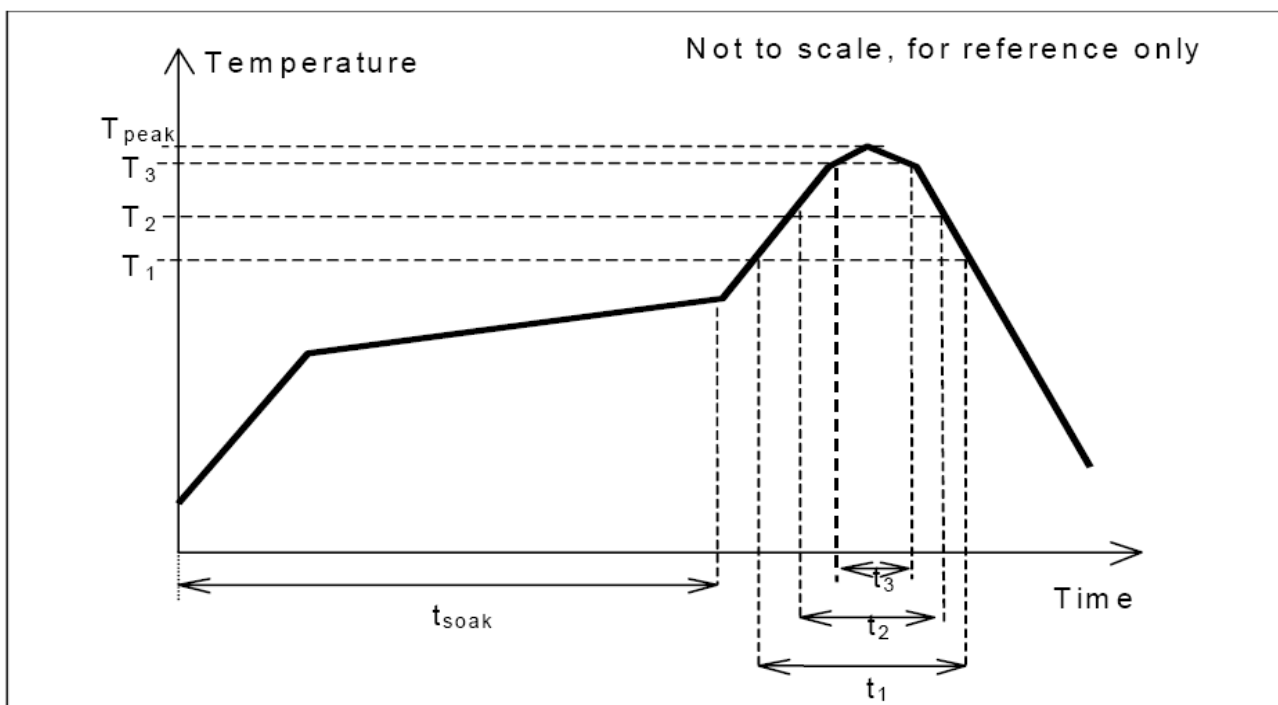
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TABLE II:

REFLOW SOLDERING PROFILE

Pb-free reflow profile requirements:

Parameter	Reference	Specification
Average temperature gradient in preheating		2.5°C/s
Soak time	T soak	2-3 minutes
Time above 217°C	t1	60 s
Time above 230°C	t2	50 s
Time above 250°C	t3	5 s
Peak temperature in reflow	T peak	260°C (+/-5°C)
Temperature gradient in cooling		Max -5°C/s



This profile is the minimum requirement for evaluating soldering heat resistance of components. Heat transfer method used for reflow soldering is hot air convection. The actual air temperatures used to achieve the specified profile is higher and largely dependent on the reflow equipment.