

<b>TITLE</b> USB TYPE C CONNECTOR	<b>SPC. NO.</b> KMUSBC012AF24	<b>PAGE :</b> 1 OF 6 <b>DATE :</b> 2018.02.14
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**1. Scope:**

This specification covers the requirements for product performance, test methods and quality assurance provisions of **Universal Serial Bus**.

**2. Reference Documents:**

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. 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.

EIA-364 : The Test Sequence and Test Procedures for Electrical Connectors and Sockets.

UL Std-94 : Test for Flammability of Plastic material for Parts in Devices and Appliances.

**3. Design and Construction:**

Product shall be of the design, construction and physical dimensions specified in the applicable product drawing.

**4. Ratings:**

A.Rating: 100V Max. 3A

B.Temperature: -30 ~ +80°C

**5. Performance and Test Descriptions:**

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in paragraph 7. Unless otherwise specified, All tests are performed at ambient environmental conditions.

**6. Electrical characteristics:**

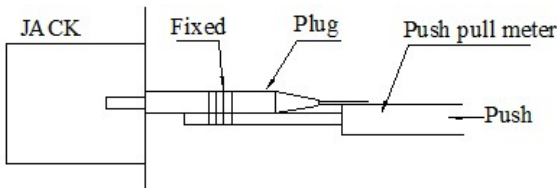
Item	Property	Test condition	Performance
6-1	Temperature Rise vs Current Rating	EIA 364-70 Method B Measure temperature rise vs current at 3A, 250Vac minimum when measured at an ambient temperature of 23±3°C.	The ΔT shall not exceed +30°C at any point in the USB connector under test.
6-2	Low Level Contact Resistance	EIA 364-23 Subject mated contacts assembled in housing to closed circuit current of 100 Ma maximum at open circuit at 20 Mv maximum. After which measurement shall be made.	30 mΩ Max

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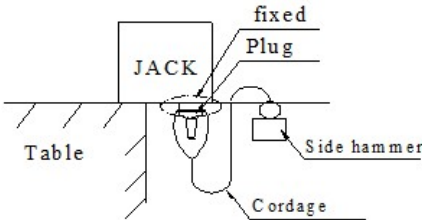
<b>TITLE</b> USB TYPE C CONNECTOR	<b>SPC. NO.</b> KMUSBC012AF24	<b>PAGE :</b> 2 OF 6 <b>DATE :</b> 2018.02.14
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Item	Property	Test condition	Performance
6-3	Insulation Resistance	EIA 364-21 The object of this test procedure is to detail a standard method to assess the insulation resistance of USB connectors. This test procedure is used to determine the resistance offered by the insulation materials and the various seals of a connector to a DC potential tending to produce a leakage of current through or on the surface of these members.	100MΩ Min
6-4	Dielectric Withstanding Voltage	EIA 364-20 Measure by applying test potential between the adjacent contacts, and between the contacts and ground in the mated connector assemblies. Test Potential : 250 Vac at sea level Test Duration : 60 seconds	1.No flashover, No sparkover, No excess leakage, No breakdown. 2.Current leakage: < 0.5 mA

**7. Mechanical characteristics:**

Item	Property	Test condition	Performance
7-1	Insertion force	Jack shall be fixed on PCB ,plug insertion the Jack Insertion direction: parallelism insert Insertion force: product weight×3= N Test Duration : 60 seconds Cycles : 3 continuous cycles  	35.7N Max

<b>TITLE</b> USB TYPE C CONNECTOR	<b>SPC. NO.</b> KMUSBC012AF24	<b>PAGE :</b> 3 OF 6 <b>DATE :</b> 2018.02.14
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Item	Property	Test condition	Performance
7-2	Extraction force	<p>Jack shall be fixed on PCB, plug shall be fixed on Jack. Side hammer weight: 200gf Side hammer cordage length:50 cm Test direction: side hammer fall plumb down Cycles : 3 continuous cycles</p> 	10.2N Min
7-3	Terminal strength (crack test)	<p>Jack shall be fixed on PCB ,plug insertion the JACK Side hammer weight: 400gf Side hammer cordage length:50 cm Test direction: side hammer fall plumb down Cycles : 3 continuous cycles</p>	The jack shall be comply with paragraphs6-2, 3, 4and7-4,8 JACK and PCB without distinct damage on appearance
7-4	Mating and Unmating force	<p>EIA 364-13 Subject USB connector to mate and unmate to measure the mechanical forces required to engage and disengage at a rate of 12.5mm per minute. Record by using autograph.</p>	<p>Mating force: Maximum 35Newtons Unmating force: Minimum 10Newtons</p>
7-5	Life test	<p>EIA 364-09 Durability cycling with a gauge is intended only to produce mechanical stress. Durability performed with mating components is intended to produce both mechanical and wear stress.</p>	<p>1.10,000 insertion / extraction cycles at a maximum rate of 200 cycles per hour. 2. No evidence of damage. 3.The electrical performances should meet the spec specified.</p>
7-6	Vibration ( Random )	<p>EIA 364-28 Condition V Test letter A Subject mated connectors should be tested according to the condition listed below : Test condition : Random Frequency : 50 ~ 2000 Hz PSD value : 5.35 Grms minimum Duration : 15 minutes/axis Times : Each of three mutually perpendicular planes.</p>	<p>1.No discontinuities of 1μs or longer duration. 2. No evidence of damage. 3.The electrical performances should meet the spec specified.</p>

<b>TITLE</b> USB TYPE C CONNECTOR	<b>SPC. NO.</b> KMUSBC012AF24	<b>PAGE :</b> 4 OF 6 <b>DATE :</b> 2018.02.14
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Item	Property	Test condition	Performance
7-7	Physical Shock	EIA 364-27 Condition H Subject mated connectors should be tested according to the condition listed below :  Wave form : Half-sine Peak acceleration : 30 G's Duration : 11 ms Times : 3 shocks in each direction applied along three mutually perpendicular planes, total 18 shocks.	1.No discontinuities of 1μs or longer duration. 2. No evidence of damage. 3.The electrical performances should meet the spec specified.
7-8	Retention force of terminal	Apply the following static load to terminal for 10 seconds. 4.9N(0.5kgf)	It west has no damage or looseness of terminal and earth metal.
7-9	4-Axes continuity Test	Plugs shall be supplied in a cable assembly with a representative overmold.a USB receptale shall be mounted on a 2-layer printed circuit board(PCB).The PCB shall be clamped on either side of the receptacle no further than 5mm away from the solder tail.The PCB shall initially be placed in a horizontal plane and an 3kgf tensile force shall be applied to the cable in a downward direction.Prependicularay to the axis of insertion for a period of at least 10 seconds.	No physical damage shall occur.

**8. Environment characteristics:**

Item	Property	Test condition	Performance
8-1	Humidity ( Temperature Cycling )	EIA 364-31 Method III Test Condition A Subject mated connectors should be tested according to the condition listed below : Temperature: 25 ~ 65°C Humidity: 90 ~ 95% ( R.H ) Duration: 168 hours ( 7 complete cycles )	No evidence of damage. 2. The electrical performances should meet the spec. specified.
8-2	Thermal Shock	Subject mated connectors should be tested according to the condition listed below: Temperature: -30 ~ 80°C Cycles: 10 cycles Exposure time at temp. extreme: 30 minutes	No evidence of damage. 2. The electrical performances should meet the spec. specified.

<b>TITLE</b> USB TYPE C CONNECTOR	<b>SPC. NO.</b> KMUSBC012AF24	<b>PAGE :</b> 5 OF 6 <b>DATE :</b> 2018.02.14
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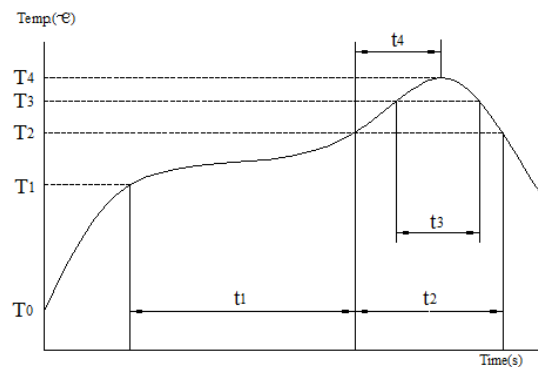
<b>Item</b>	<b>Property</b>	<b>Test condition</b>	<b>Performance</b>
8-3	Salt Spray	EIA 364-26 Test Condition A Subject mated and unmated connectors should be tested according to the condition listed below: Temperature: 35±1.1°C Humidity: 95 ~ 98% ( R.H. ) PH Value: 6.5 ~ 7.2 Duration: 48 hours	No evidence of damage. 2. The electrical performances should meet the spec. specified.
8-4	Temperature Life	EIA 364-17 Subject mated connectors should be tested according to the condition listed below: Temperature: 80±2°C Duration: 250 hours	No evidence of damage. 2. The electrical performances should meet the spec. specified.
8-5	Solder ability	Disposal in advance: pre-heat to 150°C for 1 hour, then 2 hours in a room ambient, Flux :Rosin 25% IPA 75% or similar flux. Temperature: 240±2°C , Duration of immersion: 3±0.5 seconds. Solder: 96.5% Sn /3%Ag /0.5%Cu Part of sample :Terminal tip. Depth of immersion: 2±0.5mm	Continuous solder coating with a minimum 95% coverage.
8-6	Resistance to Soldering Heat	The JACK terminal shall be dipped in solder under the condition as specified below: Temperature of solder: 260±5°C Dip time: 10±1 seconds. Soldering iron method: Tip of the terminal shall be applied to a soldering iron (60W) at a temperature of 380±10°C for 3±1 seconds. However, test shall be made with the jack installed on a P.W.B.(t=1.6), and excessive pressure shall not be applied to the terminal.	The jack shall be comply with paragraphs 6-2,3,4 and 7-4,8 Fixed terminal-leads shall not be heat-deformation which can reduce efficiency. Insulation resistance: 100 MΩ MIN. Contact resistance: 30 mΩ MAX.

<b>TITLE</b>	<b>SPC. NO.</b>	<b>PAGE :</b> 6 OF 6
USB TYPE C CONNECTOR	KMUSBC012AF24	<b>DATE :</b> 2018.02.14

Item	Property	Test condition	Performance
8-7	Hydrogen sulfide test (H <sub>2</sub> S) (Apply to silver plating)	a. Reagent: Na <sub>2</sub> S <sub>03</sub> , K <sub>2</sub> HP <sub>04</sub> b. Temperature:40±2°C c. Humidity:90~95% d. Concentration: 3±1ppm e. Jack placed in the chamber above condition for 96H f. After testing the jack shall be left alone for 1 to 2 hours in room ambient.	Insulation resistance: 100MΩ MIN Contact resistance: 200mΩ MAX The jack shall be comply with paragraphs 6-4

**9. Reflow soldering temperature profile:**

Start temperature	T0	35°C(Reference)
Pre-heat	Time	T1~T2 150~195°C
	Temperature	t1 160s
Heating time	T2/t2	195°C/115s
	T3/t3	225°C/60s
Peak temperature	T4	245°C
Time to peak temperature	t4	40~90s
Rate of rising temperature	T0~T1	1~5°C/s
	T2~T4	1~3°C/s
Peak temperature (soldering points)	230°CMin	
Number of tests	3 times	



**10. Reflow soldering temperature profile:**

No scratches 、 soil 、 rust or discoloration shall be observed.

**11. Compliance with specifications:**

The above specification shall be read in conjunction with the applicable drawing and the individual specification, whenever this specification conflicts with the applicable drawing or the individual specification, the latter shall be govern.

**12. Country of origin:**

This jack is made and assembly in china.

**13. Amendment:**

When the amendment of this specification comes into necessity, it shall be made by the mutual consultation and the agreement between manufacturer and customer.