



PRODUCT SPECIFICATION

TITLE :	UNIVERSAL SERIAL BUS
	MICRO – USB CONNECTORS

TABLE OF CONTENTS

- 1.0 SCOPE
- 2.0 PRODUCT DESCRIPTION
 - 2.1 DESIGN AND CONSTRUCTION
 - 2.2 MATERIAL AND PLATING
- 3.0 APPLICABLE DOCUMENTS
 - 3.1 RATING
 - 3.2 PERFORMANCE AND TEST DESCRIPTION
 - 3.3 TEST REQUIREMENTS AND PROCEDURES
- 4.0 TEST SEQUENCE
- 5.0 REFLOW CONDITION
- 6.0 PACKAGING

<u>REVISION:</u> D	<u>ECR/ECN INFORMATION:</u> EC No: SH2015-0121 DATE: 2014/09/15	<u>TITLE:</u> MICRO-USB CONNECTORS	<u>SHEET No.</u> 1 of 7
<u>DOCUMENT NUMBER:</u> PS-47589-001	<u>CREATED / REVISED BY:</u> XQZHANG	<u>CHECKED BY:</u> XQZHANG	<u>APPROVED BY:</u> AYIN



PRODUCT SPECIFICATION

1.0 SCOPE

This product specification defines the mechanical, electrical and environmental performance requirements and test methods for Micro-USB connector series products.

2.0 PRODUCT DESCRIPTION

2.1 Design and Construction

Construction and physical dimensions shall be specified on the applicable sales drawing. Connector consists of a metal shell, a plastic housing, and 5 terminals.

Solder components shall meet Lead-Free soldering requirements and the connectors shall be RoHS Compliant.

2.2 Materials and Plating

Refer to respective Molex sales drawings for information on materials, plating and marking.

3.0 APPLICABLE DOCUMENTS

In the event of conflict between the requirements of this specification and the sales drawing, the sales drawing shall take precedence. In the event of conflict between the requirements of the specification and the referenced documents, this specification shall take precedence.

EIA-STANDARD-364: ELECTRICAL CONNECTOR/SOCKET TEST PROCEDURES INCLUDING ENVIRONMENTAL CLASSIFICATIONS

3.1 Rating

Item	Standard
Rated Voltage (Max.)	30V AC (rms)
Rated Current (Max.)	Signal (Pins 2,3,4): 1.0A* ¹ Power (Pins 1,5): 1.8 A
Operating Temperature Range	-30°C ~ +85°C (Including Terminal Temperature Rise)
Shipping and Storage Temperature Range	-40°C ~ +85°C
Ambient Temperature (Ta):	25°C ± 2°C

*1: Test with power pins, the rated current of signal pins should be 0.5A.

3.2 Performance and Test Description

The connectors shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Para. 3.3

REVISION: D	ECR/ECN INFORMATION: EC No: SH2015-0121 DATE: 2014/09/15	TITLE: MICRO-USB CONNECTORS	SHEET No. 2 of 7
DOCUMENT NUMBER: PS-47589-001	CREATED / REVISED BY: XQZHANG	CHECKED BY: XQZHANG	APPROVED BY: AYIN



PRODUCT SPECIFICATION

3.3 Test Requirements and Procedures

3.3.1 Electrical Performances

Item	Requirement	Test Condition
Low Level Contact Resistance (initial)	30mΩ Max.	Mated plugs, measure by dry circuit, 20mV DC maximum, open circuit 100mA maximum. Except wire conductor resistance. EIA-364-23
Insulation Resistance (initial)	1000MΩ Min.	Mated plugs, apply 100V DC for 1 minute between adjacent terminal or ground. EIA-364-21
Dielectric Withstanding Voltage	No Breakdown	Mated plugs, apply 100V AC (rms) at 60Hz for 1 minute between adjacent terminal or ground. EIA-364-20
Temperature Rise	30°C Max.	Mated plugs and measure the temperature rise of contact when the maximum DC rated current is passed EIA-364-70
Contact Capacitance	2pF Max.	Measured between adjacent circuits of unmated connectors at 1kHz. EIA-364-30

3.3.2 Mechanical Performances

Item	Requirement		Test Condition
Mating / un-mating force (initial)	Mating force	35N (3.57kgf) Max.	Mating / un-mating at a rate of 12.5mm per minute. EIA-364-13
	Un-mating force	8N (0.82kgf) Min. 25N (2.58kgf) Max.	
Durability	Contact Resistance	ΔR = 10mΩ Max.	Mated / un-mated up to 10,000 cycles repeatedly at maximum rate of 500 cycles per hour. (When manually operated, mating speed should be below 200 cycles per hour.) EIA-364-09
	Mating force	35N (3.57kgf) Max.	
	Un-mating force	8N (0.82kgf) Min. 25N (2.58kgf) Max.	
	Appearance	No breakdown	

REVISION: D	ECR/ECN INFORMATION: EC No: SH2015-0121 DATE: 2014/09/15	TITLE: MICRO-USB CONNECTORS	SHEET No. 3 of 7
DOCUMENT NUMBER: PS-47589-001	CREATED / REVISED BY: XQZHANG	CHECKED BY: XQZHANG	APPROVED BY: AYIN



PRODUCT SPECIFICATION

3.3.3 Environmental Performances

Item	Requirement		Test Condition
Vibration	Appearance	No Damage	Mate plugs and subject to the following vibration conditions: Random Vibration 3 mutually perpendicularly. 10~2000Hz, 0.02G ² /Hz 20 minutes per plane EIA-364-28
	Contact Resistance	$\Delta R = 10\text{m}\Omega$ Max.	
	Discontinuity	1 microsecond Max.	
Mechanical Shock	Appearance	No damage	Mate plugs and subject to the following shock conditions, 3 shocks shall be applied along 3 mutually perpendicular axes, passing DC 100mA current during the test. (Total of 18 shocks) Test Pulse : Half Sine Peak Value: 30G Duration: 11 ms EIA-364-27
	Contact Resistance	$\Delta R = 10\text{m}\Omega$ Max.	
	Discontinuity	1 Microsecond Max.	
Temperature Life (Heat Resistance)	Appearance	No damage	Mate plugs and expose to $105\pm 2^{\circ}\text{C}$ for 250 hours, Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed EIA-364-17B
	Contact Resistance	$\Delta R = 10\text{m}\Omega$ Max.	
	Insulation Resistance	100 M Ω Min.	
	Dielectric Strength	No Breakdown	
Cyclic Humidity	Appearance	There shall be no remarkable corrosion	Mate connectors and expose to humidity in 7 cycles 7 clause. Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. EIA-364-31 method III
	Contact Resistance	$\Delta R = 10\text{m}\Omega$ Max.	
	Dielectric Strength	No breakdown	
	Insulation Resistance	100 M Ω Min.	

REVISION: D	ECR/ECN INFORMATION: EC No: SH2015-0121 DATE: 2014/09/15	TITLE: MICRO-USB CONNECTORS	SHEET No. 4 of 7
DOCUMENT NUMBER: PS-47589-001	CREATED / REVISED BY: XQZHANG	CHECKED BY: XQZHANG	APPROVED BY: AYIN



PRODUCT SPECIFICATION

Item	Requirement	Test Condition
Thermal shock (Temperature cycling)	Appearance	No Damage
	Contact resistance	$\Delta R = 10\text{m}\Omega$ Max.
	Dielectric Strength	No breakdown
	Insulation Resistance	100 M Ω Min.
Salt spray	Appearance	By visual inspection without noticeable rust.
	Contact Resistance	$\Delta R = 10\text{m}\Omega$ Max.
Solder-ability (not for black nickel plating)	Solder Wetting	95% of immersed area must show no voids or pin holes
Resistance to soldering heat	Without any deformation of case or excessive looseness of the terminals (pins). Electrical characteristics shall be satisfied.	
	No any damage after reflow	

<u>REVISION:</u>	<u>ECR/ECN INFORMATION:</u>	<u>TITLE:</u>	<u>SHEET No.</u>
D	EC No: SH2015-0121 DATE: 2014/09/15	MICRO-USB CONNECTORS	5 of 7
<u>DOCUMENT NUMBER:</u>	<u>CREATED / REVISED BY:</u>	<u>CHECKED BY:</u>	<u>APPROVED BY:</u>
PS-47589-001	XQZHANG	XQZHANG	AYIN



PRODUCT SPECIFICATION

4.0 TEST SEQUENCE

All samples have to be soldered on PCB and reflow twice before measuring and testing.

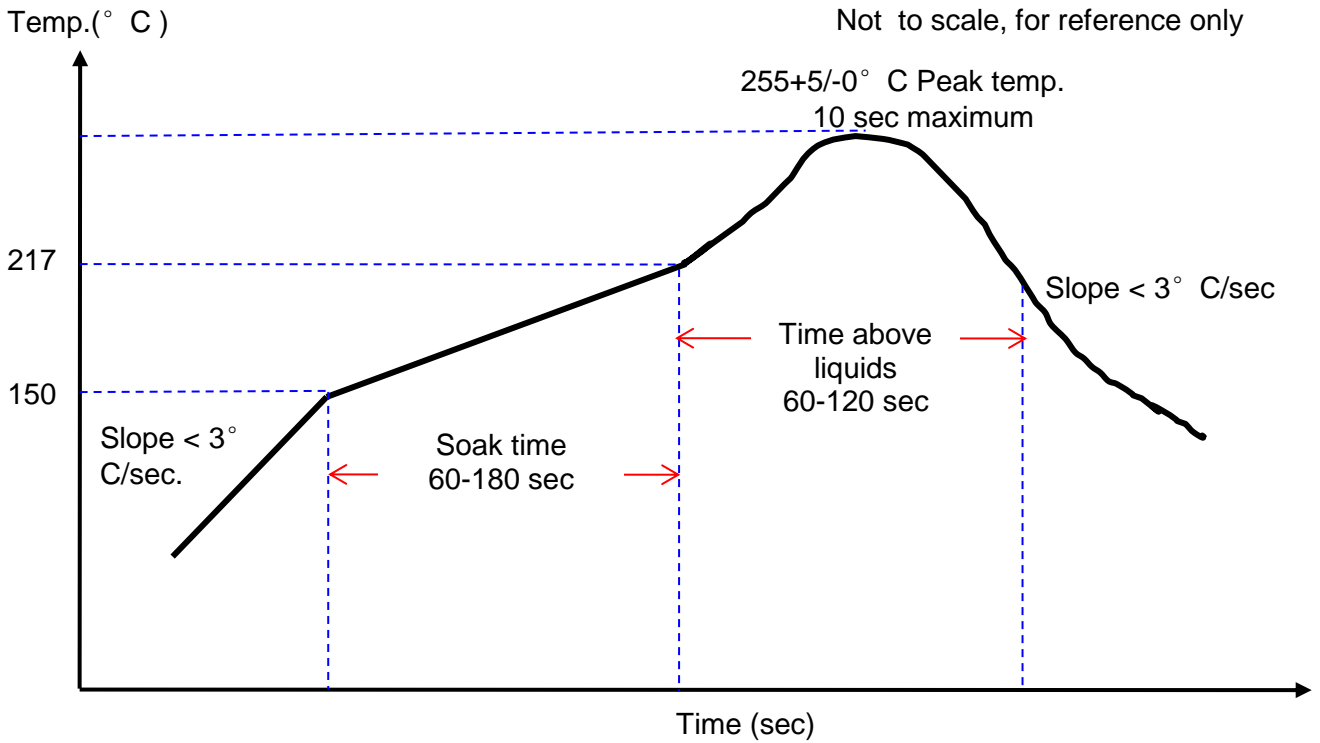
Item		A	B	C	D	E	F	G	H
1	Contact Resistance	1, 4	2, 5	1, 7	1, 3	1, 3			
2	Insulation Resistance			3, 8					
3	Dielectric Strength			4, 9					
4	Contact capacitance			2					
5	Durability		3						
6	Vibration	3							
7	Mechanical Shock	2							
8	Temperature Life					2			
9	Humidity			6					
10	Thermal shock			5					
11	Salt spray				2				
12	Temperature Rise						1		
13	Mating / un-mating force		1, 4						
14	Solder-ability							1	
15	Resistance to soldering heat								1
Number of sample		5	5	5	5	5	5	5	5

REVISION: D	ECR/ECN INFORMATION: EC No: SH2015-0121 DATE: 2014/09/15	TITLE: MICRO-USB CONNECTORS	SHEET No. 6 of 7
DOCUMENT NUMBER: PS-47589-001	CREATED / REVISED BY: XQZHANG	CHECKED BY: XQZHANG	APPROVED BY: AYIN



PRODUCT SPECIFICATION

5.0 REFLOW CONDITION



TEMPERATURE CONDITION GRAPH

6.0 PACKAGING

Parts shall be packaged to protect against damage during handling, transit and storage. Receptacles will be supplied in tape and reel.

REVISION: D	ECR/ECN INFORMATION: EC No: SH2015-0121 DATE: 2014/09/15	TITLE: MICRO-USB CONNECTORS	SHEET No. 7 of 7
DOCUMENT NUMBER: PS-47589-001	CREATED / REVISED BY: XQZHANG	CHECKED BY: XQZHANG	APPROVED BY: AYIN