PRODUCT SPECIFICATION

TITLE :	UNIVERSAL SERIAL BUS
	MICRO – USB CONNECTORS

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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

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	2*pF* Max.	Measured between adjacent circuits of un-mated 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	

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, 0.02G2/Hz 20 minutes per plane EIA-364-28
	Contact Resistance	ΔR =10mΩ 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	ΔR =10mΩ Max.	
	Discontinuity	1 Microsecond Max.	
Temperature Life (Heat Resistance)	Appearance	No damage	Mate plugs and expose to 105±2°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	ΔR =10mΩ Max.	
	Insulation Resistance	100 MΩ 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	ΔR =10mΩ Max.	
	Dielectric Strength	No breakdown	
	Insulation Resistance	100 MΩ Min.	

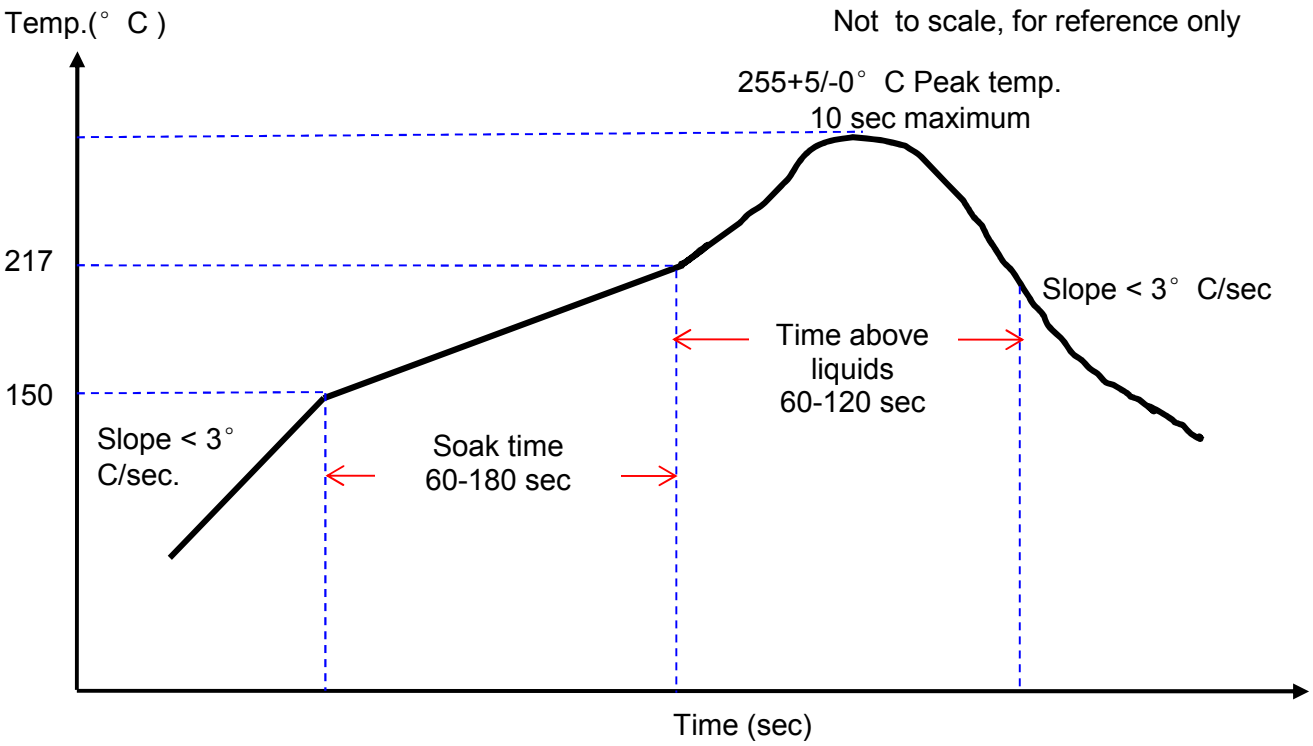
Item	Requirement		Test Condition
Thermal shock (Temperature cycling)	Appearance	No Damage	Mate plugs and subject to the flowing conditions for 10 cycles, Upon completion of the exposure period, the test specimens shall be conditioned at ambient room conditions for 1 to 2 hours, after which the specified measurements shall be performed. 1 cycle a) -55 ± 3°C 30 minutes. b) +85 ± 2°C 30 minutes. EIA-364-32C
	Contact resistance	ΔR =10mΩ Max.	
	Dielectric Strength	No breakdown	
	Insulation Resistance	100 MΩ Min.	
Salt spray	Appearance	By visual inspection without noticeable rust.	Mate plugs and expose to the following salt mist conditions. Upon completion of the exposure period, salt deposits shall be removed by a gentle wash or dip in running water, after which the specified measurements shall be performed. NaCl solution Concentration: 5 ± 1% Spray time: 48 ± 4 hours Ambient Temperature: 35 ± 2°C EIA-364-26
	Contact Resistance	ΔR =10mΩ Max.	
Solder-ability (not for black nickel plating)	Solder Wetting	95% of immersed area must show no voids or pin holes	Dip solder-tails in flux then immerse in solder bath at 245 ± 5°C up to 0.5mm from the bottom of the housing for 4 ~ 5 seconds (EIA-364-52 Category 2)
Resistance to soldering heat	Without any deformation of case or excessive looseness of the terminals (pins). Electrical characteristics shall be satisfied.		For procedures other than specified below, refer to IEC PUB. 68-2-20. Test Tb Method 1A or 2 Solder bath method Solder temperature: 255 +5/-0°C Immersion time: 10 ± 1 second Thickness of PCB: 0.8 mm Solder iron method Solder temperature: 350 ± 10°C Immersion time: 3 ± 1 second However, excessive pressure shall not be applied to the terminal Reference reflow condition at Para. 5.0
	No any damage after reflow		

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

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.