TITLE

1.0 SCOPE

This Product Specification covers the requirement of USB type C receptacle.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER

Product name: USB type C receptacle
Series number: 217175/217178

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See sales drawing

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

Industry Standard Reference:

Universal Serial Bus Type-C Cable and Connector Specification, Revision 1.3,Test standard reference: EIA-364 series, IEC 60068 series

Test compliant reference:

Universal Serial Bus Type-C Connectors and Cable Assemblies Compliance Document, Revision 1 Dimensions see sales drawings and other sections of this specification for the relevant reference documents. In cases where the specification differs from the drawings, the sales drawings take precedence.

4.0 RATINGS

4.1 VOLTAGE

30 Volts DC/AC Max..

4.2 CURRENT

3 Amps MAX. for total VBUS pins (Pin A9, B9),
0.6 Amps MAX. for Vconn (B5 of plug) with return path through the corresponding GND pins (Pin A12, B12).
0.25 Amps MIN. for all other contact.

4.3 TEMPERATURE

Operating: - 40°C to + 85°C
Storage: - 40°C to + 85°C

5.0 Test requirements and procedures summary

	Test item	Requirement	TEST CONDITION
1	Appearance of product	Meets requirements of product drawing. No physical damage	Molex PS-45499-002 Cosmetic Specification
	Electrical Requirement		
2	Low Level Contact Resistance (LLCR)	Initial:40mohms Max. After test:50mohms Max..	Mate connector, The solder tail to the solder tail or cable attachment point of the plug, including any internal contacts and paddle card.Measure at 20 mV (max) open circuit at 100 mA. Per EIA-364-23
3	Dielectric withstanding voltage	No breakdown	Mate connector, apply 100 VAC(RMS) for 1 minute between adjacent terminal or ground. Per EIA-364-20 ,Method B.
4	Insulation resistance	100 M ohms Min.	Mate connectors, apply 100 VDC between adjacent terminal or ground. Per EIA-364-21
	Mechanical requirement		
5	Mating force	5~20N	Mate connector, at maximum rate 12.5mm/min. Per EIA-364-13
6	Un mating force	Within the range of 8 N to 20 N. from 1 to 1,000 cycles and within the range of 6 N to 20 N. from 1,000 to 10,000 cycles.	Un-mate connector, at maximum rate 12.5mm/min. Per EIA-364-13
7	Durability (10000 Cycles)	Within the range of 8 N to 20 N. Initial reading	Perform 4 plug/unplug cycles. Cycle rate of 500+/-50cycles per hour in test Group4
		Within: a).33% off the initial reading, and b).8 N to 20 N.	Perform 25 plug/unplug cycles. Cycle rate of 500+/-50cycles per hour in test Group4
		No mechanical damage Contact resistance is not exceed +50 milliohms; Dielectric Withstanding Voltage meet 100 VAC; Extraction force: 6N~20N.	Perform 2468 plug/unplug cycles. Rotate the receptacle or plug 180° and perform 2,500 plug/unplug cycles. Rotate the receptacle or plug 180° and perform 2,500 plug/unplug cycles. Rotate the receptacle or plug 180 and perform 2,500 plug/unplug cycles. Cycle rate of 500+/-50 cycles per hour (total of 10,000 plug/unplug cycles, flipping every 2,500 cycles) in test Group4, Per EIA-364-09
8	Durability (preconditioning)	Perform 50 unplug/plug cycles. EIA-364-09	No physical damage

Environmental requirements			
9	Solderability	Solder coverage: 95% Min. No mechanical damage or change to appearance.	Solder temperature:250±5°C Duration:6±0.5sec .EIA-364-52
10	Resistance to soldering heat	No mechanical damage or change to appearance	Peak temperature in reflow:265°C (– 5/+0°C) .Pb-free reflow profile refer to Section 7.0 ,two cycles. Per EIA 364-56
11	Thermal shock	No mechanical damage. Contact resistance is not Exceed 50 milliohms.	Test Condition I 10 Cycles –55 degree C and +85 degree C. Mate Connector Per EIA 364-32
12	Cyclic Temperature and Humidity	No mechanical damage. Contact resistance is not exceed 50 milliohms. Insulation resistance not less than 100 M ohms	Mate connectors And expose to 40±2°C, relative humidity 90 to 95 % for 96 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. Per EIA-364-31
13	Vibration	No mechanical damage Contact resistance is not exceed 50 milliohms. Signal discontinuity < 1us.	Mate connectors, and subject to the following vibration conditions, Random vibration , 15 minutes in each of 3 mutually perpendicular axes,10~2000Hz, 0.02 g2/Hz 20 minutes per plane Per EIA-364-28 condition VII, Test letter D
14	Thermal Disturbance	Contact resistance is not exceed 50 milliohms.	Cycle the connector between 15°C±3°C and 85°C±3°C, as measured on the part. Ramps should be a minimum of 2°C per minute, and dwell times should insure that contacts reach temperature extreme for a minimum of 5minutes. No humidity control. 10 cycles total.
15	Temperature life	No mechanical damage and visible corrosion. Contact resistance is not exceed 50 milliohms.	Mate connectors, and subject to the conditions of 105°C for 120 hours. Per EIA-364-17 condition A
16	Temperature life (precondition)	Mate connectors, and subject to the conditions of 105°C for 72 hours. Per EIA-364-17 condition A	No mechanical damage and visible corrosion. Contact resistance is not exceed 50 milliohms.
17	Temperature rise VS current rating	Temperature change 30°C Max at the outside surface of the shell receptacle.	Mate connectors, and measure the temperature rise of contact when the maximum rate current is passed per section 4.2.Per EIA-364-70,Method 2
18	4-Axis Continuity Test	Plug and Receptacle: Subject the mating interface to the moments defined in Section 8 for at least 10 seconds.	No discontinuities greater than 1 microsecond duration in any of the four orientations tested.

19	Reseating	Manually mate and unmate the connector for 3 cycles. Rate: 5 cycles/min. max. EIA 364-09	No mechanical damage.

The meaning of text **"mechanical damage"** in the table above is:

a. No significant corrosion at contact area

b. No adhesion problem of plating

c. No blistering of plating

d. No flaking of plating

e. No loosen parts

f. No cracks on any parts

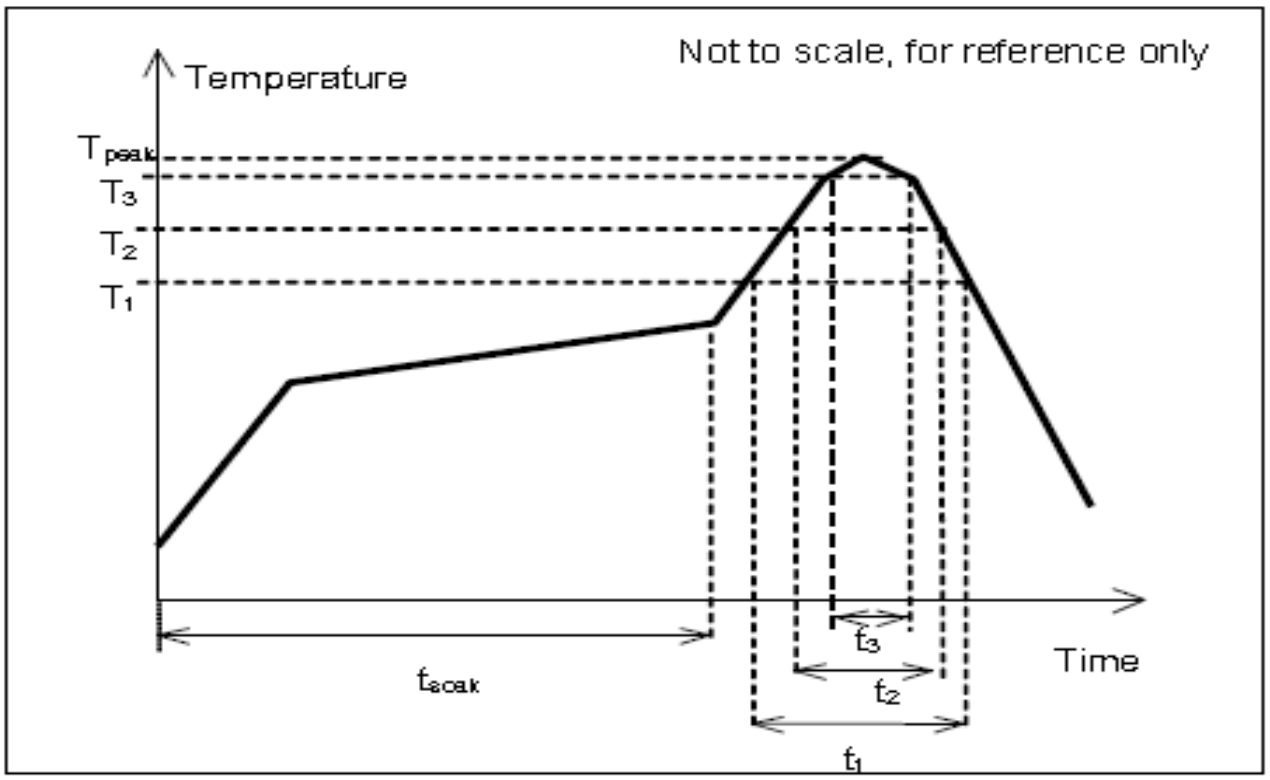
6.0 TEST GROUPINGS

Note: All test specimens (except group E) shall pass the reflow process for 2 times.

Test Item	Test Group and Sequence										
	A	B	C	D	E	F	G	H	I		
1. Low level contact resistance	1,4,6	1,4,6,8	1,4,6	1,4,5,7,9	2,10						
2. Durability (preconditioning)	2	2	2	2							
3. Insulation Resistance					12						
4. Dielectric Withstanding Voltage					1,11						
5. Temperature life(Preconditioning)			3	3							
6. Temperature life	3										
7. Thermal shock		3									
8. Thermal disturbance				6							
9. Cyclic Temperature & Humidity		5									
10. Vibration			5								
11. Reseating	5	7		8							
12. Temperature rise VS current rating							1				
13. Mating force					4						
14. Un-Mating force					5,7,9						
15. Durability(4 cycles)					3						
16. Durability(25 cycles)					6						
17. Durability(9968 cycles)					8						
18. Solderability								1			
19. Resistance to soldering heat									1		
20. 4-Aixs Continuity test						1					
Sample Quantity	5	5	5	5	5	5	5	5	5		

7.0 RECOMMENDED IR REFLOW PROFILE

Pb-free reflow profile requirements for soldering heat resistance		
Parameter	Reference	Specification
Average temperature gradient in preheating		2.5°C/s
Soak time	Tsoak	2-3 minutes
Time above 217°C	T1	Max 60 s
Time above 230°C	T2	Max 50 s
Time above 255°C±5°C	T3	Min 5 s
Peak temperature in reflow	Tpeak	255°C (–0/+5°C)
Temperature gradient in cooling		Max -5°C/s



Reflow profile for soldering heat resistance testing