PRODUCT SPECIFICATION

TITLE

USB SERIES CONNECTOR

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1.0 SCOPE

This specification covers the USB SERIES 105057 CONNECTOR product.

2.0 APPLICABLE DOCUMENTS

The following documents from a part of this specification to the extent specified herewith. In the event of conflict between the requirements of the specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of the specification and he referenced documents, this specification shall take precedence.

MIL-STD-202 Test Methods for Electronic and Electrical Component Parts

MIL-STD-1344 Test Methods for Electrical Connectors

3.0 MATERIAL SPECIFICATIONS

3.1 Design and Construction

Connector shall be of the design, construction and physical dimensions specified on the applicable sales drawing.

3.2 Materials

a) Contacts : Refer to respective Molex sales & engineering drawings
b) Housing : Refer to respective Molex sales & engineering drawings
c) Shield : Refer to respective Molex sales & engineering drawings
d) Plating : Refer to respective Molex sales & engineering drawings

3.3 Ratings

Item	Standard	
Rated Voltage (Max.)	30 V	AC (rms) / DC
Rated Current (Max.)	1.5 A	
Ambient Temperature Range	-40℃~ +85 ℃(Including Terminal Temperature rise)	
Shipping and Storage Temperature Range	-40 ℃~ +85℃ (Including Terminal Temperature rise)	

3.4 Performance and Test Description

Connector shall be designed to meet the electrical, mechanical and environmental performance requirements specified in 3.5.

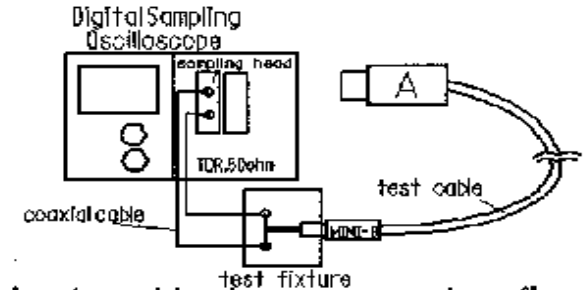
3.5 Test Requirements and Procedures.

Method of measuring resistance should be used connector and cable harness.

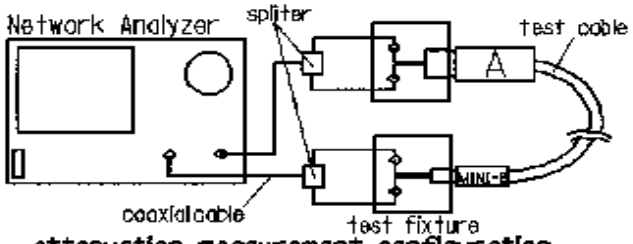
But, Requirement of contact resistance is expect resistance of cable.

3.6 ELECTRICAL PERFORMANCES

	Item	Requirement	Test Condition
3.6.1	Contact Resistance (initial and after mate/un-mate)	30 mΩ Max. (100 mΩ Max. after test)	Mate connectors, measure by dry circuit, 20 mV Max. 100mA Max. Except wire conductor resistance. EIA - 364 -23
3.6.2	Insulation Resistance	1000 MegaΩ Min	Mate/Un-mate connectors, apply 500V DC for 1 minute between adjacent terminal or ground. EIA - 364 - 21
3.6.3	Dielectric Strength	No Breakdown	Mate/Un-mate connectors, apply 750V AC (RMS) for 1 minute between adjacent terminal or ground. EIA - 364 -20
3.6.4	Temperature Rise	30 ℃ Max.	Mate connector and measure the temperature rise of contact when the DC rated current(1.5A) is passed EIA - 364 - 70
3.6.5	Capacitance	2 pF Max.	Measured between adjacent circuits of un-mated connectors at 1MHz. EIA - 364 - 30
3.6.6	Attenuation	Reference page 4	Connect the cable to attenuation test fixture, measure by Network Analyzer. Measurement configuration are page 4
3.6.7	Propagation Delay	5.2ns / m Max.	Connect the cable to test fixture, measure by TDR. Measurement configuration are page 4
3.6.8	Propagation Delay Skew	100ps / cable Max.	Connect the cable to test fixture, measure by TDR. Measurement configuration are page 4



impedance,delay,skew measurement configuration



attenuation measurement configuration

Frequency (MHz)	Attenuation Max. (dB/cable)	Remark
200	3.2	USB 2.0
400	5.8	USB 2.0

3.7 MECHANICAL AND ENVIRONMENTAL PERFORMANCES

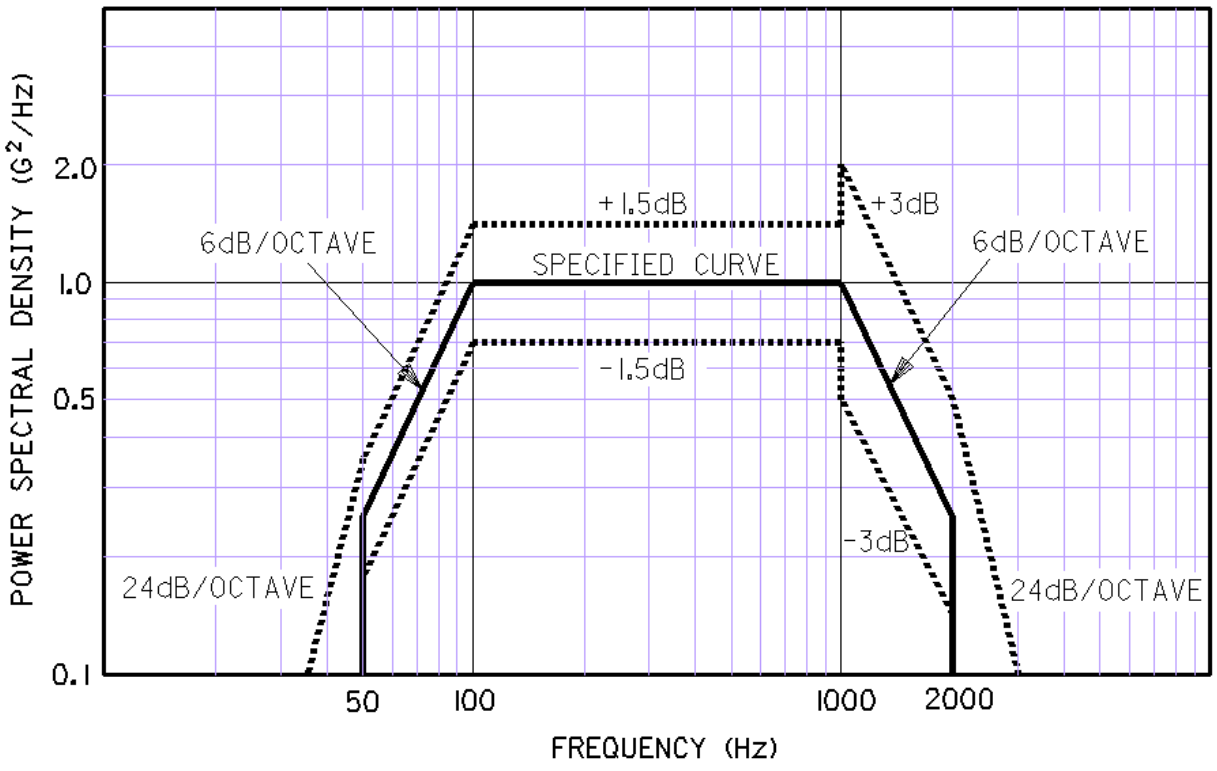
	Item	Requirement		Test Condition
3.7.1	Mating/un-mating force (initial)	Mating force	35N Max.	Mate/un-mated at a rate of 12.5 mm/min. EIA - 364 - 13
		Un-mating force	10N Min.	
3.7.2	Terminal/housing retention force	5N MIN.		Apply axial pull out force on the terminal assembled in the housing at a rate of 25 +/- 3 mm / min.
3.7.3	Repeated mate / un-mate	Contact Resistance	100 mΩ Max.	When mate / un-mated up to 20000 cycles repeatedly at Max. rate of 200 cycles / hour. EIA - 364 - 09
		Mating force	3N~29 N	
		Un-mating force	3N~29N	
		Appearance	No breakdown	
3.7.4	Vibration	Appearance	No Damage	Mate connectors and subject to the following vibration conditions(refer to 6 clause), for a period of 15 minutes in each 3 mutually perpendicular axes, passing DC 100mA during the test. EIA - 364 – 28
		Contact Resistance	100mΩ Max.	
		Dis-continuity	1.0 microsecond Max	

	Item	Requirement		Test Condition
3.7.5	Shock	Appearance	No damage	Mate connectors and subject to the following shock conditions, 3 shocks shall be applied along 3 mutually perpendicular axes, passing DC 100 mA current during the test. (Total of 18 shocks) Test Pulse : Half Sine Peak Value : 294 m/s2 (30G) Duration : 11 ms EIA - 364 - 27
		Contact Resistance	100 mΩ Max.	
		Dis-continuity	1.0 microsecond Max.	
3.7.6	Heat Resistance	Appearance	No damage	Mate connectors and expose to 105 +/- 2 ℃ 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 - 17
		Contact Resistance	100 mΩ□ Max.	
		Insulation Resistance	1000 MegaΩ □ Min	
		Dielectric Strength	No Breakdown	
3.7.7	Cold Resistance	Appearance	No damage	Mate connectors and expose to -55 +/- 2 ℃ 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
		Contact resistance	100mΩ□ Max.	
		Insulation Resistance	1000 MegaΩ □ Min	
		Dielectric Strength	No Breakdown	
3.7.8	Humidity	Appearance	There shall be no remarkable corrosion	Mate connectors and expose to humidity in 4 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. EIA-364-31 method III
		Contact Resistance	100mΩ□ Max.	
		Dielectric Strength	No breakdown	
		Insulation Resistance	1000MΩ□ Min.	

	Item	Requirement		Test Condition
3.7.9	Temperature cycling	Appearance	No Damage	Mate connectors 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 ℃ 30 minutes. b). +85 +/- 2 ℃ 30 Minutes. (Transit time shall be within 10 to 15 minutes)
		Contact resistance	100 mΩ□ Max.	
		Dielectric Strength	No breakdown	
		Insulation Resistance	1000 MΩ□ Min.	
3.7.10	Salt spray	Appearance	by visual inspection without noticeable rust.	Mate connectors 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. NaC1 solution Concentration : 5 +/- 1 % Spray time : 48 +/- 4 h Ambient Temperature : 35 +/- 2 ℃ (EIA - 364 -26)
		Contact Resistance	100 mΩ□ Max.	
3.7.11	Solder -ability	Solder Wetting	95% of immersed area must show no voids , pin holes	Dip solder-tails in flux then immerse in solder bath at 245+/- 5 ℃ up to 0.5 mm from the bottom of the housing for 4 ~ 5 seconds (EIA - 364 -52 Category 2)

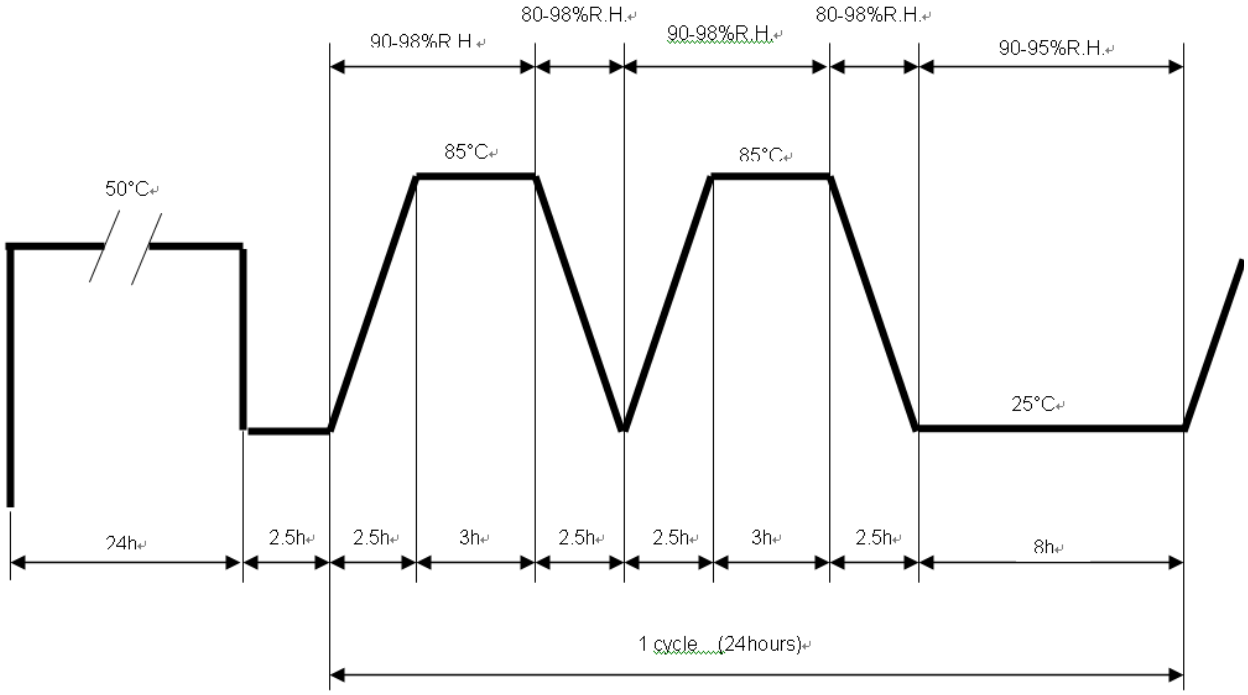
	Item	Requirement	Test Condition
3.7.12	Resistance to soldering heat	Without deformation of case or excessive looseness of the terminals(pin.). Electrical characteristics shall be satisfied.	Refer soldering method: The conditions specified on paragraph 6 shall be repeated twice.
			Soldering iron method: Soldering Time: 5 sec. Solder Temperature: 370-400 ℃ 0.5mm from terminal tip

4.0 VIBRATION CONDITION

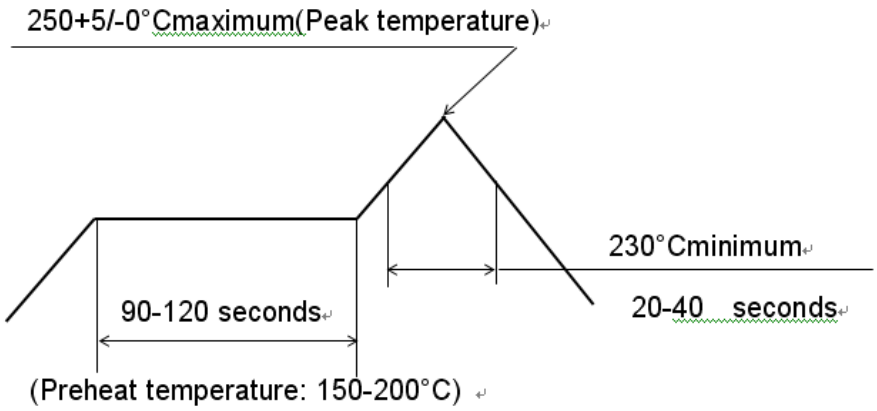


Power spectral density, G^2/Hz	Overall rms miniimum
0.02	5.35

5.0 HUMIDITY CONDITION



6.0 RECOMMENDED REFLOW CONDITION



TEMPERATURE CONDITION GRAPH

(TEMPERATURE ON TRANSITION AREA)

7.0 TEST GROUP

Item		Test group								
		1	2	3	4	5	6	7	8	9
1	Appearance	1,7	1,9	1,6	1,6	1,6		1,3	1,3	
2	Contact resistance (3.6.1)	2,8	2,10	2,7	2,7	2,7				
3	Insulation Resistance (3.6.2)	3,9	3,11	3,8	3,8	3,8				
4	Dielectric Strength (3.6.3)	4,10	4,12	4,9	4,9	4,9				
5	Temperature Rise (3.6.4)									1
6	Capacitance (3.6.5)									
7	Mating/un-mating force (3.7.1)	5,11								
8	Terminal/housing retention force (3.7.2)						1			
9	Repeated mate/un-mate (3.7.3)	6								
10	Vibration (3.7.4)		5							
11	Shock (3.7.5)		6							
12	Heat Resistance (3.7.6)		7							
13	Cold Resistance (3.7.7)		8							
14	Humidity (3.7.8)			5						
15	Temperature cycling (3.7.9)					5				
16	Salt Spray (3.7.10)				5					
17	Solder –ability (3.7.11)							2		
18	Resistance to soldering heat (3.7.12)								2	
Number of sample		2 Pcs	2 Pcs	2 Pcs	2 Pcs	2 Pcs	2 Pcs	2 Pcs	2 Pcs	2 Pcs