PRODUCT SPECIFICATION

USB A TYPE PLUG
CONNECTOR SMT TYPE

(MOLEX P/N: 48037 Series)

REVISION:	ECR/ECN INFORMATION:	TITLE:	SHEET No.
E	EC No: DATE:	USB A TYPE PLUG CONNECTOR SMT TYPE	**1** of **8**

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USB A TYPE PLUG CONNECTOR

1.0 SCOPE

This specification covers the requirements for product performance and test methods of USB A TYPE (Universal Serial Bus Revision 2.0) Plug Connector.

2.0 PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

2.1.1 PRODUCT NAME : USB A Type Plug Connector
2.1.2 SERIES NUMBER : 48037 Series

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKINGS

See the appropriate Sales Drawings for information on dimensions, materials, platings and markings.

2.3 SAFETY AGENCY APPROVALS

3.0 APPLICABLE DOCUMENTS AND SPECIFICATIONS

EIA-364.
MIL-STD-202.
MIL-STD-1344A.
USB 2.0 SPECIFICATIONS

4.0 RATINGS

4.1 VOLTAGE

150 Volts AC (RMS)

4.2 CURRENT

1.5 Amps

4.3 TEMPERATURE

Operating Temperature: - 45°C to + 85°C
Stock Temperature : - 45°C to + 85°C
Reliability Temperature : -55°C~85°C

5.0 PERFORMANCE

5.1 APPEARANCE REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
1	**Examination of Product**	**EIA-364-18** Visual inspection	Meets requirements of product drawing. No physical damage.

5.2 ELECTRICAL REQUIREMENTS

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
2	**Low Level Contact Resistance**	**EIA 364-23** Mate connectors: apply a maximum voltage of **20** mV and a current of **100** mA.	**30** milliohms MAXIMUM
3	**Insulation Resistance**	**EIA 364-21** Unmate & unmount connectors: apply a voltage of **500** VDC between adjacent terminals and between terminals to ground.	**1000** Megohms MINIMUM
4	**Dielectric Withstanding Voltage**	**EIA 364-20** Unmate connectors: apply a voltage of **500 volts** VAC for **1** minute between adjacent terminals and between terminals to ground.	No breakdown; current leakage < **0.5** mA
5	**Contact Capacitance**	**EIA-364-30** Test between adjacent circuits of unmated connector at 1 KHz. The object of this test is to detail a standard method to determine the capacitance between conductive elements of a USB connector.	2 pF Maximum per Contact

6	**Contact Current Rating**	**EIA 364-70 Method B** When measured at an ambient temperature of 25℃. With Power applied to the contacts, the △T shall not exceed + applied to the contacts, the 30℃ at any point in the USB connector under test The object of this test procedure is to detail a standard method to assess the current caring capacity of mated USB connector contacts.	1.5A at 250Vac minimum & Temperature rise: **+30**°C MAXIMUM

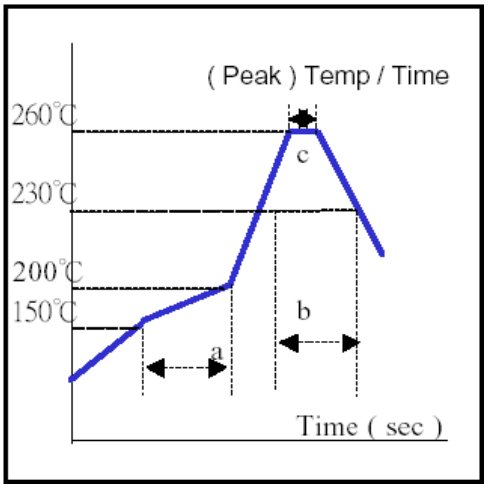
5.3 MECHANICAL REQUIREMENTS (continued)

ITEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
7	**Connector Mate and Unmate Forces**	**EIA 364-13** Mate and unmate connector (male to female) at maximum a rate of **12.5** mm (**0.492** inch) per minute.	**Mating Force : 35** N MAXIMUM
			Unmating Force : 10 N MINIMUM
8	**Durability**	**EIA-364-09** Mate and unmate Connector assemblies for 1500 cycles at maximum rated of 200 cycles per hour.	1) Shall meet visual requirement, show no physical damage 2) 30 milliohms MAXIMUM
9	**Vibration (Random)**	**EIA-364-09 Test Condition V Test Letter A** Mate connectors and subject to 5.35 Gs RMS. For a period of 15 minutes in each of 3 mutually perpendicular axes.	1).No discontinuities of 1 us microsecond or longer duration 2).Shall meet visual requirement, show no physical damage. 3) 30 milliohms MAXIMUM

10	**Mechanical Shock**	**EIA 364-27 Test Condition H** Subject mated connectors to 30G's half-sine shock pulses of 11ms duration. Three shocks in each direction applied along three mutually perpendicular planes, 18 total shock.	1).No discontinuities of 1 us microsecond or longer duration 2).Shall meet visual requirement, show no physical damage. 3) 30 milliohms MAXIMUM
11	**Cable Pull-out Force**	**EIA 364-38 Test condition A** Shall be measured with TENSION GAUGE or TENSION TESTER in same direction.	40 Newtons to the connector for 1 minute.

5.4 ENVIRONMENTAL REQUIREMENTS

TEM	DESCRIPTION	TEST CONDITION	REQUIREMENT
12	**Humidity**	**EIA 364-31 Test condition A method III** Subject mated connectors to Duration : 168 hours temperature between –25℃ to +65℃ with 90 to 95% RH	1).Dielectric Withstanding Voltage: No Breakdown at 500 VAC 2).Insulation Resistance: 1000 Megohms MINIMUM 3).Visual: No Damage 4) 30 milliohms MAXIMUM
13	**Shock (Thermal)**	**EIA 364-32, Test Condition I** Subject mated connectors to ten cycles between –55℃ to +85℃.	1).Dielectric Withstanding Voltage: No Breakdown at 500 VAC 2).Insulation Resistance: 1000 Megohms MINIMUM 3).Visual: No Damage 4) 30 milliohms MAXIMUM
14	**Temperature Life**	**EIA 364-17 Test Condition 2 Method A** Subject mated connectors to temperature life at 85℃ for 500hours	1).30 milliohms MAXIMUM 2).Shall meet visual requirement, show no physical damage.
15	**Mixed Flowing Gas**	**EIA 364-65 Class IIA Exposures** Cl2;10±3 NO2; 200±50 H2S;10±5 (ppb),SO2; 100±20 1). Mating Conditions : 5 days. 2). Unmated: 5 days Mated Temperature : 30±1℃, Humidity : 70±2%R.H.	1).Shall meet visual requirement, show no physical damage. 2).Shall meet requirements of additional tests 3). 30 milliohms MAXIMUM

16	**Solderability**	**EIA 364-52** connector terminal tails in solder: (held at 245± 5℃) up to 0.5mm from the bottom of the housing for 5± 0.5 sec.	The surface of the portion to be soldered shall at least 95% covered with new solder coating
17	**Resistance To Soldering Heat**	REFLOW SOLDERING : Pre-heat : 150~200℃ for 120 sec : 230℃ 20~40sec REFLOW : 260 ± 5 ℃ 10sec 	No mechanical defect on housing or other parts

6.0 PRODUCT Qualification and Requalification Test Sequence

TEST SEQUENCES IDENTIFICATION

Test Group		Sample Groups						
Item	Test Description	A	B	C	D	E	F	G
1	Examination of product	1 10	1 5	1 7	1 9	1 3	1 3	1 3
2	Low Level Contact Resistance	3 7	2 4	2 4 6				
3	Insulation Resistance				3 7			
4	Dielectric Withstanding Voltage				4 8			
5	Contact Capacitance				2			
6	Contact Current Rating						2	
7	Mating & Unmating Force	2 8						
8	Durability	4						
9	Random Vibration	6						
10	Mechanical Shock	5						
11	Cable Pull-out Force	9						
12	Humidity				5			
13	Thermal Shock				6			
14	Temperature Life		3					
15	Mixed Flowing Gas			3 5				
16	Solderability					2		
17	Resistance to solder heat							2
Number of Test Samples (Minimum)		8	8	8	8	8	8	8

Note:

a. Samples shall be prepare in accordance with applicable manufacture's instructions and shall be selected at random from current production.

b. Precondition samples with 3 cycles durability.

c. All the tests shall be performed in the sequence.