Box Header Connector, 2.0mm Pitch, Vertical, DIP Type

1. SCOPE

1.1. Contents

This specification covers the performance, tests and quality requirements for the TE Electronics Box Header Connector, 2.0mm Pitch, Vertical, DIP Type.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2. APPLICABLE DOCUMENT

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1. TE Electronics Documents

- 109-1: General Requirements for Test Specifications
- 109-197：Test Specification（AMP test Specifications vs EIA and IEC Test Methods）
- 109-202: Component Heat Resistance to Wave Soldering.
- 501-57856：Test Report （Part numbers are as shown in Appendix. 1)

2.2. Industry Standard

- EIA-364：Electrical Connector/Socket Test Procedures Including Environmental Classifications.
- JESD22-B102D: Solderability Test Method.

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2. Materials

Materials used in the construction of product shall be as specified on the applicable product drawing.

3.3. Ratings

- Voltage：250 VAC rms
- Current：3A Max.
- Temperature：- 40℃ to 85℃

3.4. Performance and Test description

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions per EIA-364.

3.5. Test Requirements and Procedures Summary

TEST ITEM		REQUIREMENT	PROCEDURE
1	Examination of Product	Meets requirements of product drawing. No physical damage.	Visual inspection.
ELECTRICAL REQUIREMENT			
2	Low Level Contact Resistance	20 mΩ Max.	Subject mated contacts assembled in housing. Open circuit at 20mV Max, 100mA Max. EIA-364-23B, Figure 3
3	Dielectric Withstanding Voltage	No creeping discharge or flashover shall occur. Current leakage: 0.5 mA Max.	800 VAC for 1minute Test between adjacent circuits of unmated connector. EIA-364-20B, Method B, Condition II
4	Insulation Resistance	1,000 MΩ Min.	Impressed voltage 500 VDC. Test between adjacent contacts of unmated connector for 1 minutes. EIA-364-21C.
5	Temperature Rising	30℃ Max. Under loaded rating current.	Contact series-wired, apply test current of loaded rating current to the circuit, and measure the temperature rising by probing on soldered areas of contacts, after the temperature becomes stabilized deduct ambient temperature from the measured valu EIA-364-70B, Figure 4.
MECHANICAL REQUIREMENT			
6	Mating Force	6 Pos：2.04 Kgf (20 N) Max. 8 Pos：2.72 Kgf (27 N) Max.	Operation Speed：50 mm/min. Measure the force required to mate connector. EIA-364-13B
7	Un-mating Force	6 Pos：0.25 Kgf (2.45 N) Min. 8 Pos：0.34 Kgf (3.36 N) Min.	Operation Speed：50mm/min. Measure the force required to unmate connector. EIA-364-13B

Figure 1（Continue）

TEST ITEM		REQUIREMENT	PROCEDURE
8	Durability	[See Note 1]	Operation Speed：10 cycle/min. Number of cycles：50 cycles EIA-364-09C
9	Vibration	No electrical discontinuity greater than 1μsec shall occur. [See Note 1]	Subject mated connectors to 10-55-10 Hz traversed in 1minutes at 1.52 mm amplitude 2 hours each of 3 mutually perpendicular EIA-364-28D, Test Condition I
10	Mechanical Shock	No electrical discontinuity greater than 1μsec shall occur. [See Note 1]	Accelerate Velocity：490 m/s2 （50G） Waveform：Half-sine shock plus Duration：11 msec. No. of Drops：3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops. 100mA applied. EIA-364-27B
11	Solderability	The inspected area of each lead must have 95% solder coverage minimum.	Steam Aging Preconditioning： 1. Intended for non-tin and non-tin-alloy leadfinishes for 93+3/-5℃、1hour±5min. JESD22-B102D, Condition A 2. Intended for tin and tin-alloy leadfinishes for 93+3/-5℃、8hours±15min. JESD22-B102D, Condition C Solder pot temperature: 245±5℃, 5sec.
ENVIRONMENTAL REQUIREMENT			
12	Resistance to Wave Soldering Heat [See Note 2]	No physical damage shall occur.	Solder Temp.：265±5℃, 10+2/-0 sec. Test spec. 109-202, Condition B. Figure 5
13	Thermal Shock	[See Note 1]	Mated Connector -55+0/-3℃ (30 min.), +85+3/-0℃ (30 min.) Perform this cycle, repeat 5 cycles EIA-364-32C, Method A, Test condition I
14	Humidity Temperature Cycling	[See Note 1]	Mated Connector 25℃ to 65℃, 90% to 95% RH. Perform this cycle, repeat 10 cycles EIA-364-31B, Method Ⅳ

Figure 1（Continue）

TEST ITEM		REQUIREMENT	PROCEDURE
15	Temperature Life (Heat Aging)	[See Note 1]	Mated Connector 85℃, 250 hours. EIA-364-17B, Test condition 3 (w/o electrical load), Test time condition B
16	Salt Spray	No detrimental corrosion allowed in contact area and base metal exposed.	Subject mated connectors to 35+/-2 ℃ and 5+/-1% salt condition for 48hours. After test, rinse the sample with water and recondition the room temperature for 1 hour. EIA-364-26B

Figure 1（End）

Note 1：Shall meet visual requirements, show no physical damage, and meet requirement of additional tests as specified in the test sequence in Figure 2

Note 2：Resistance to soldering process is indicated on notes of customer drawing. Select the appropriate test type which drawing notes are matched with.

3.6. Product Qualification and Requalification test

Test or Examination	Test Group									
	A	B	C	D	E	F	G	H	I	J
	Test Sequence（a）									
Examination of Product	1, 7	1, 9	1, 6	1, 5	1, 5	1, 5	1, 5	1, 3	1, 3	1, 3
Contact Resistance		2, 8	2, 5	2, 4	2, 4	2, 4	2, 4			
ielectric withstanding Voltage	3, 6									
Insulation Resistance	2, 5									
Temperature Rising								2		
Insertion Force		3, 7								
Withdraw Force		4, 6								
Durability		5								
Vibration			3(b)							
Mechanical Shock			4(b)							
Solderability										2
Resistance to Soldering Heat									2	
Thermal Shock				3						
Humidity Temperature Cycling	4				3					
Temperature Life						3				
Salt Spray							3			

NOTE：（a）Numbers indicate sequence in which tests are performed.

（b）Discontinuities shall not take place in this test group, during tests.

Figure 2

Figure 3. Low Level Contact Resistance

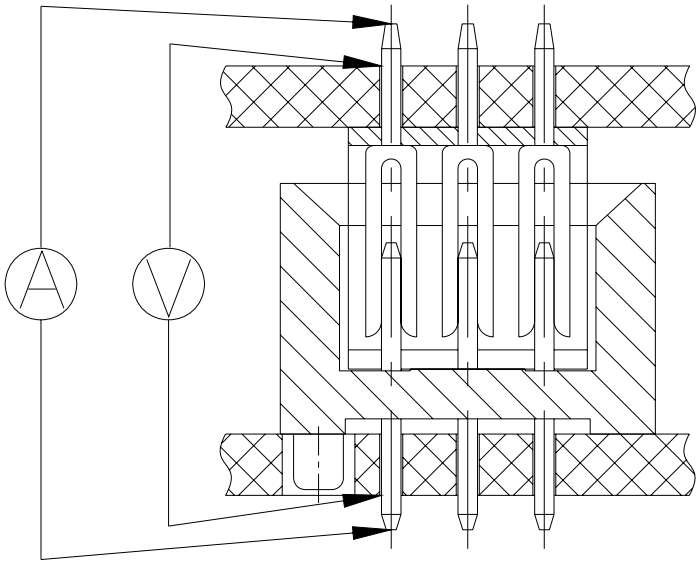


Figure 4. Temperature Rising (Contact Series-Wire)

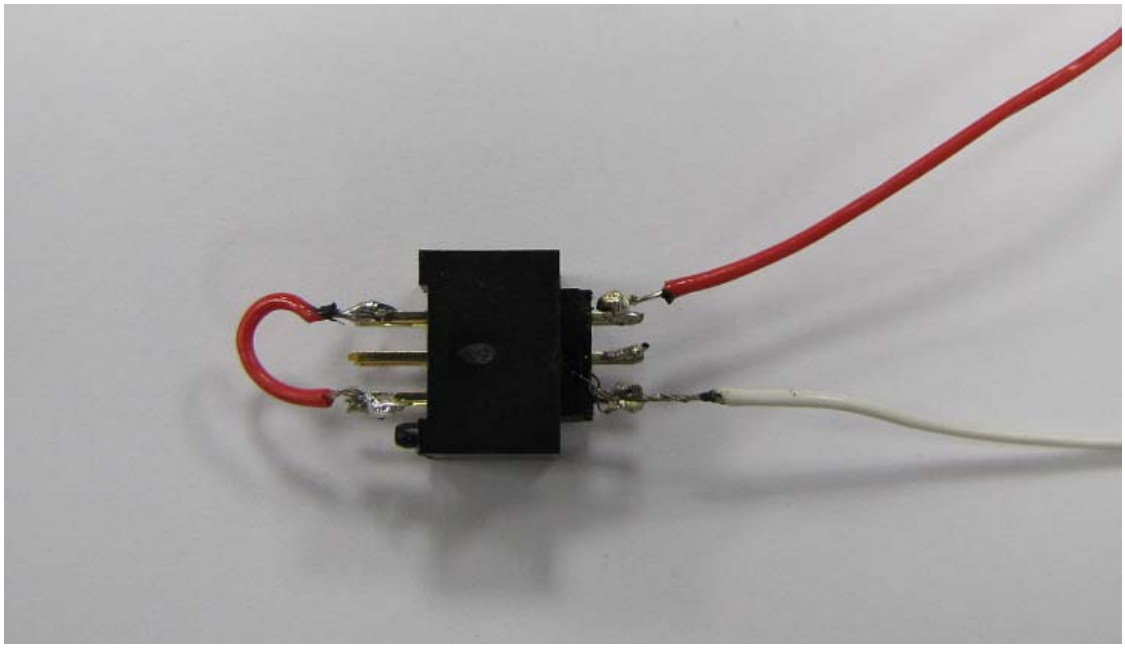
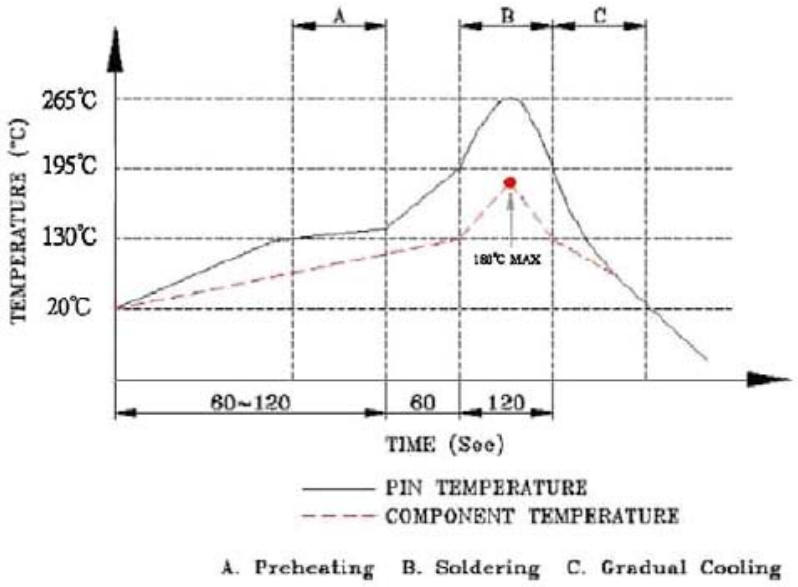


Figure 5. Temperature Profile of wave Soldering



RECOMMENDED WAVE SOLDER

(1) Tip Temperature : 265±5℃
(2) Tip Temperature Time : 10 sec Max

The applicable product descriptions and part numbers are as shown in Appendix. 1.

Appendix 1

Product Part No.	Product name	Note
X-1775397-X	Box Header Connector, 2.0mm Pitch, Vertical, DIP Type	
X-2041540-X	Box Header Connector, 2.0mm Pitch, Vertical, DIP Type	