SPEC. NO.: PS-51190-XXXXX-XXX **REVISION:** C

PRODUCT NAME: 3.0mm Pitch BTB Conn.

PRODUCT NO: 51190/51191 SERIES

PREPARED:	CHECKED:	APPROVED:
DATE: **2020/2/03**	DATE: **2020/2/03**	DATE: **2020/2/03**

1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
1	1805117	NEW	TSO I CHIAO	2018/05/08
O	1808319	Dielectric Withstanding Voltage 規格修正	TSO I CHIAO	2018/08/15
A	1808428	Content correction	TSO I CHIAO	2018/08/21
B	1812047	Fitting Nail material correction	TSO I CHIAO	2018/12/07
C	2002002	Friction test after adding terminal lubricant (HANARL SSF-452)	TSO I CHIAO	2020/2/03

2 SCOPE

This specification covers performance, tests and quality requirements for 3.0 mm pitch board to board connector.

3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

4 REQUIREMENTS

4.1 Design and Construction

4.1.1 Product shall be of design, construction and physical dimensions specified on applicable product drawing.
4.1.2 All materials conform to R.o.H.S. and the standard depends on TQ-WI-140101.

4.2 Materials and Finish

4.2.1 Contact: High performance copper alloy (Phosphor Bronze)
Finish: (a) Contact Area: Refer to the drawing.
(b) Under plate: Refer to the drawing.
(c) Solder area: Refer to the drawing.
4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0

4.2.3 Fitting Nail: Copper Alloy, Finish: Refer to the drawing

4.3 Ratings

4.3.1 Voltage: 300 Volts AC/DC
4.3.2 Current: 1.5 Amperes (per pin)
4.3.3 Operating Temperature : -40℃ to +85℃

5 Performance

5.1. Test Requirements and Procedures Summary

Item	Requirement	Standard
Examination of Product	Product shall meet requirements of applicable product drawing and specification.	Visual, dimensional and functional per applicable quality inspection plan.
ELECTRICAL		
Item	**Requirement**	**Standard**
Low Level Contact Resistance	40 m Ω Max.(initial)per contact 80 m Ω Max.(finish)	Mate connectors, measure by dry circuit, 20mV Max., 10mA Max. (EIA-364-23)
Insulation Resistance	1000 M Ω Min.(initial) 100 M Ω Min.(finish)	Unmated connectors, apply 500 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max.	1600 VAC Min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors. (EIA-364-20)
Temperature rise	30℃ Max. Change allowed	Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25℃ (EIA-364-70,METHOD1,CONDITION1)
MECHANICAL		
Item	**Requirement**	**Standard**
Durability	30 cycles.	The sample should be mounted in the tester and fully mated and unmated the number of cycles specified at the rate of 25.4 ± 3mm/min. (EIA-364-09)
Mating/Unmating Forces	Mating 14.7N (Max.) Unmating 3.5N (Min).	Operation Speed： 25.4 ± 3 mm/minute.. Measure the force required to mate/unmate connector. (EIA-364-13)
Terminal / Housing Retention Force	1.5 N (Min).	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.
Fitting nail/ Housing Retention Force	1.5 N (Min).	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.

MECHANICAL

Item	Requirement	Standard
Destructive	20 N (Min).	Operation Speed： 25.4 ± 3 mm/minute.. Measure the force that needs to be forced out of the state.
Vibration	1 μs Max.	The electrical load condition shall be 100 mA maximum for all contacts. Subject to a simple harmonic motion having amplitude of 0.76mm (1.52mm maximum total excursion) in frequency between the limits of 10 and 55 Hz. The entire frequency range, from 10 to 55 Hz and return to 10 Hz, shall be traversed in approximately 1 minute. This motion shall be applied for 2 hours in each of three mutually perpendicular directions. (EIA-364-28 Condition I)
Shock (Mechanical)	1 μs Max.	Subject mated connectors to 50 G's (peak value) half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks). The electrical load condition shall be 100mA maximum for all contacts. (EIA-364-27, test condition A)
Friction test	Gold plating 3u " Min.	The sample should be mounted in the tester and fully mated and unmated the of 5000cycles specified at the rate of 5 ± 0.5mm/min.

ENVIRONMENTAL

Item	Requirement	Standard
Resistance to **Reflow** Soldering Heat	See Product Qualification and Test **(Lead Free)**	Pre Heat：150℃~180℃, 60~120sec. Heat：230℃ Min., 40sec Min. Peak Temp.：260℃Max, 10sec Max.
Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40℃, 90~95% RH, 120 hours. (EIA-364-31,Condition A, Method II)
Temperature life	See Product Qualification and Test Sequence Group 5	Mated connectors to temperature life at 85℃ for 96 hours. (EIA-364-17, Test condition A)
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group 6	Mated connectors to 5% salt-solution concentration, 35℃ Gold plating for 48 hours. (EIA-364-26)
Solder ability	Plating: Solder able area shall have minimum of 95% solder	And then into solder bath, Temperature at 245 ±5℃, for 4-5 sec. (EIA-364-52)
Hand Soldering Temperature Resistance	Appearance: No damage	T≧350℃, 3 sec at least.
Thermal Shock	See Product Qualification and Test Sequence Group 4	Mated Connector to follow condition for 5 cycles. 1 cycles: -55 +0/-3 ℃, 30 minutes +85 +3/-0 ℃, 30 minutes (EIA-364-32, test condition I)
Low temperature	See Product Qualification and Test Sequence Group 12	After the mated connector is exposed to a low temperature environment in accordance with The test samples should be measured after take it out in normal condition and leaving you unattended for 1 hours. The following details shall apply : (a) Ambient Temperature : -40 ± 2 ℃ (b) Duration : 96 hours (JIS C 60068-2-1)

ENVIRONMENTAL

Item	Requirement	Standard
Pretreatment	See Product Qualification and Test Sequence Group 13	Ready-for-use state shall be subjected to the conditions for assisted drying" specified in IEC 60068-1 (55 ± 2 °C with a relative humidity not exceeding 20 %)for a period of 24 h prior to the first cycle of the damp heat test. The following details shall apply : (a) Test profile : See Figure 2
Composite temperature/humidity cyclic	See Product Qualification and Test Sequence Group 13	The specimens shall be introduced into the humidity chamber, in the unpacked, switched-off, ready for use state, and mounted in the normal orientation, if this is known, or as otherwise specified and shall be subjected to 10 temperature/humidity cycles, each of 24 h duration. During any five of the first nine of the above cycles after exposure to the humidity subcycle (points a) to in Figure 3), the specimens shall be subjected to cold. The position of the cold subcycles should be defined in the relevant specification. The following details shall apply : (a) Test profile : See Figure 3-4 (b) Number of cycle : 10 cycles (IEC 60068-2-38)
Stress corrosion/moist ammonia (NH3) Test	See Product Qualification and Test Sequence Group 15	Ammonia gas concentration 3 to 4% Temperature 20+2 C Humidity condition 90 to 95% (STM-1126-06)

ENVIRONMENTAL		
Item	**Requirement**	**Standard**
Flowing mixed gas corrosion	See Product Qualification and Test Sequence Group 16	Insert or pull the connector into or out of the printed wiring board 10 times. (Ensure that the printed wiring board is not exposed to sebum.) Test Condition 1 H2S(ppm) 0.5 NO2 (ppm) 1.0 SO2 (ppm) 1.0 Temp.(°C) 35 Humidity (%RH) 70 Testing time (h) 72 (STM-1126-12)

Note. Flowing Mixed Gas shall be conducted by customer request.

6 INFRARED REFLOW CONDITION

6.1. Lead-Free Process

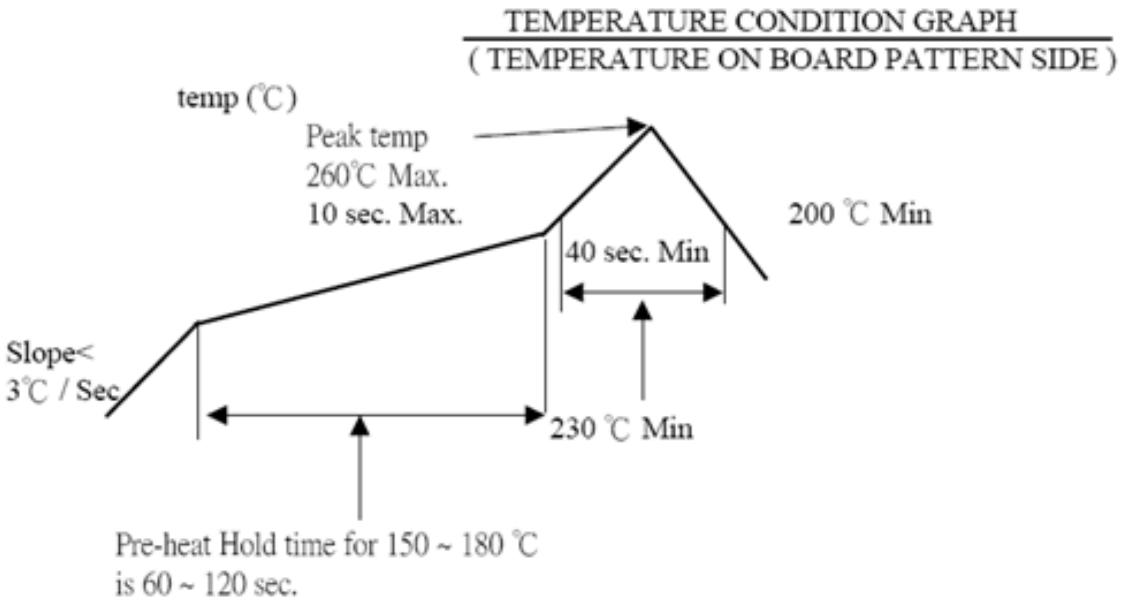


Figure 1

7 Test profile of Moisture

7.1 Preconditioning

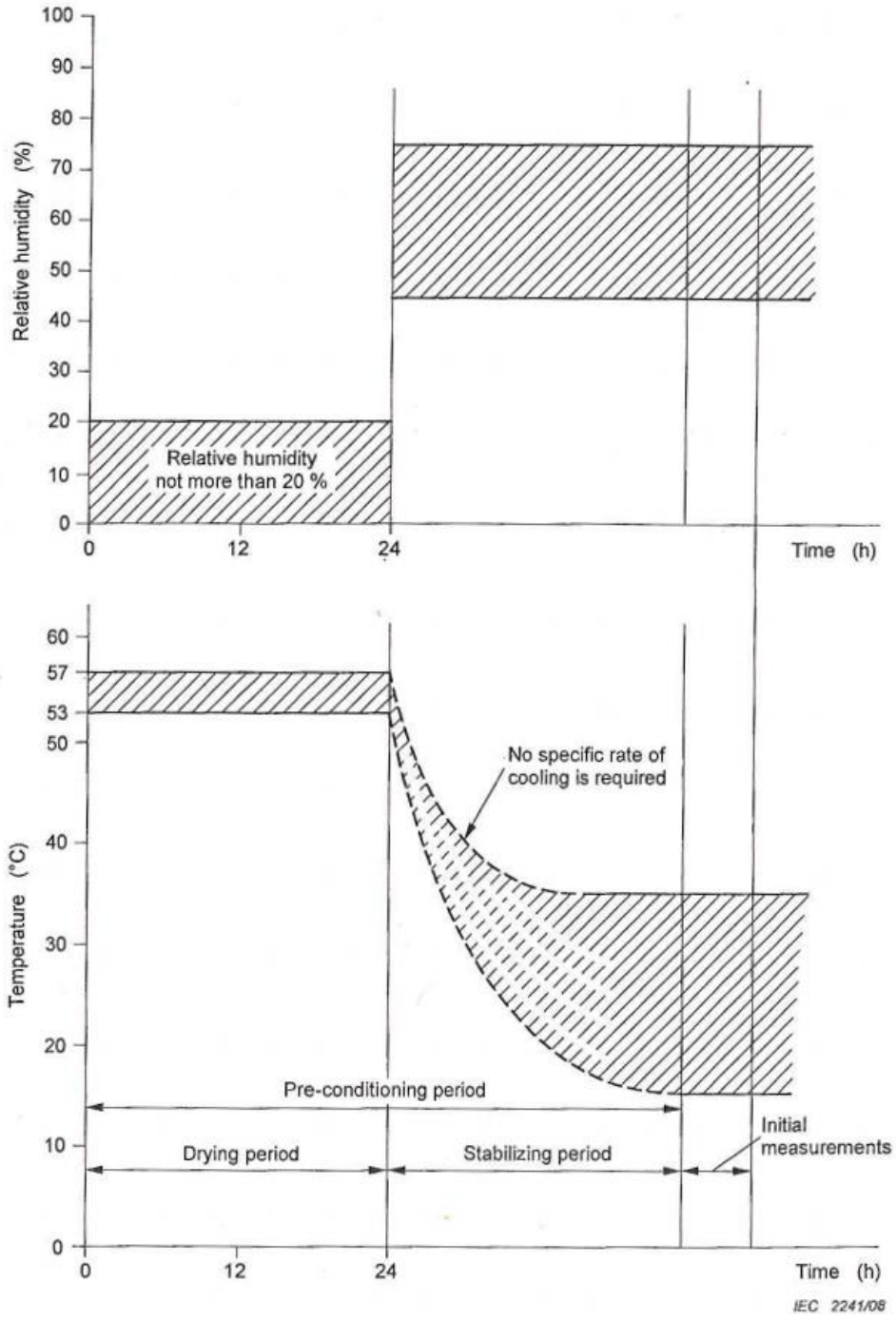


Figure 2

7.2 Exposure to humidity followed by exposure to cold

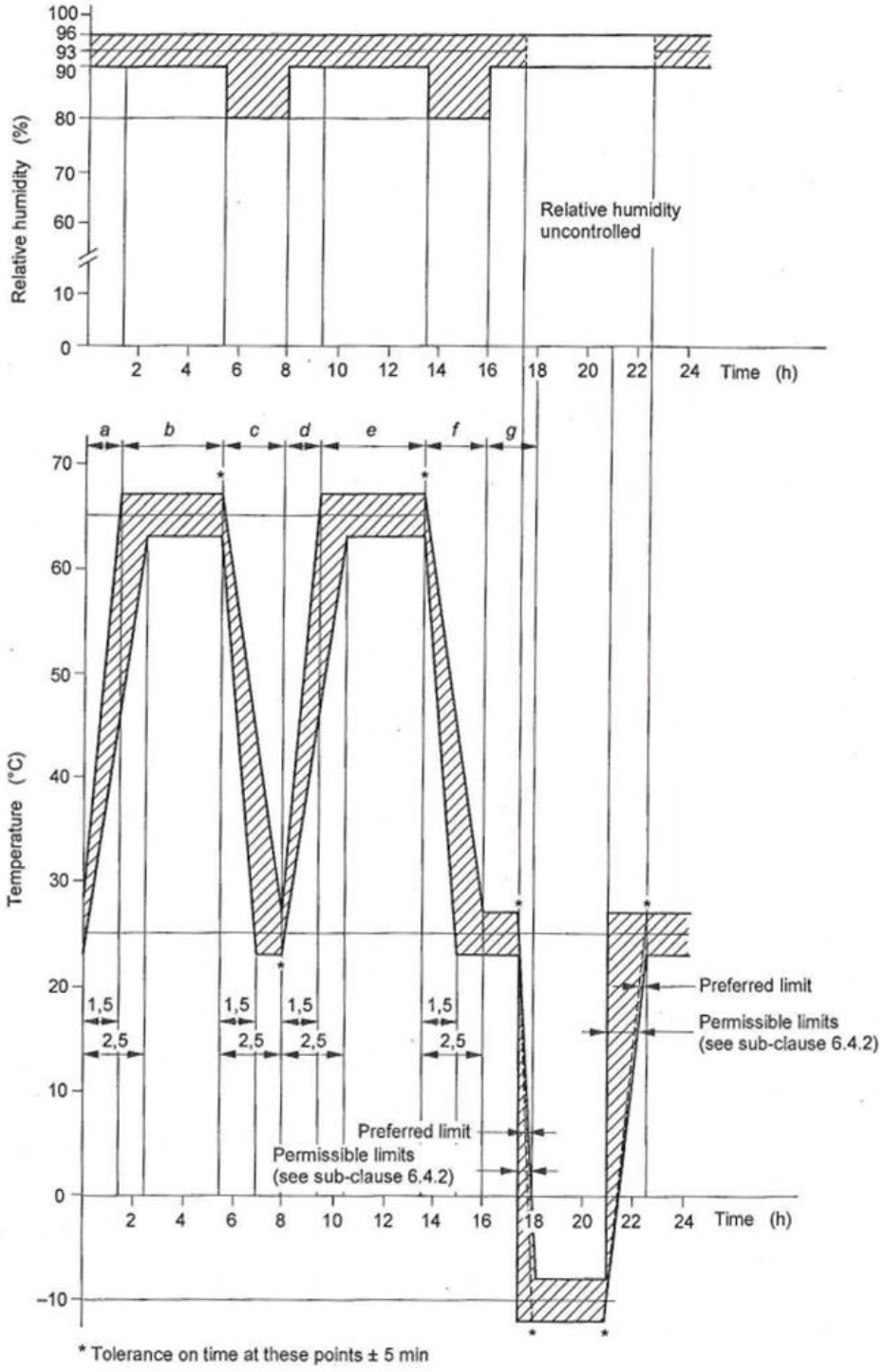


Figure 3

7.3 Exposure to humidity not followed by exposure to cold

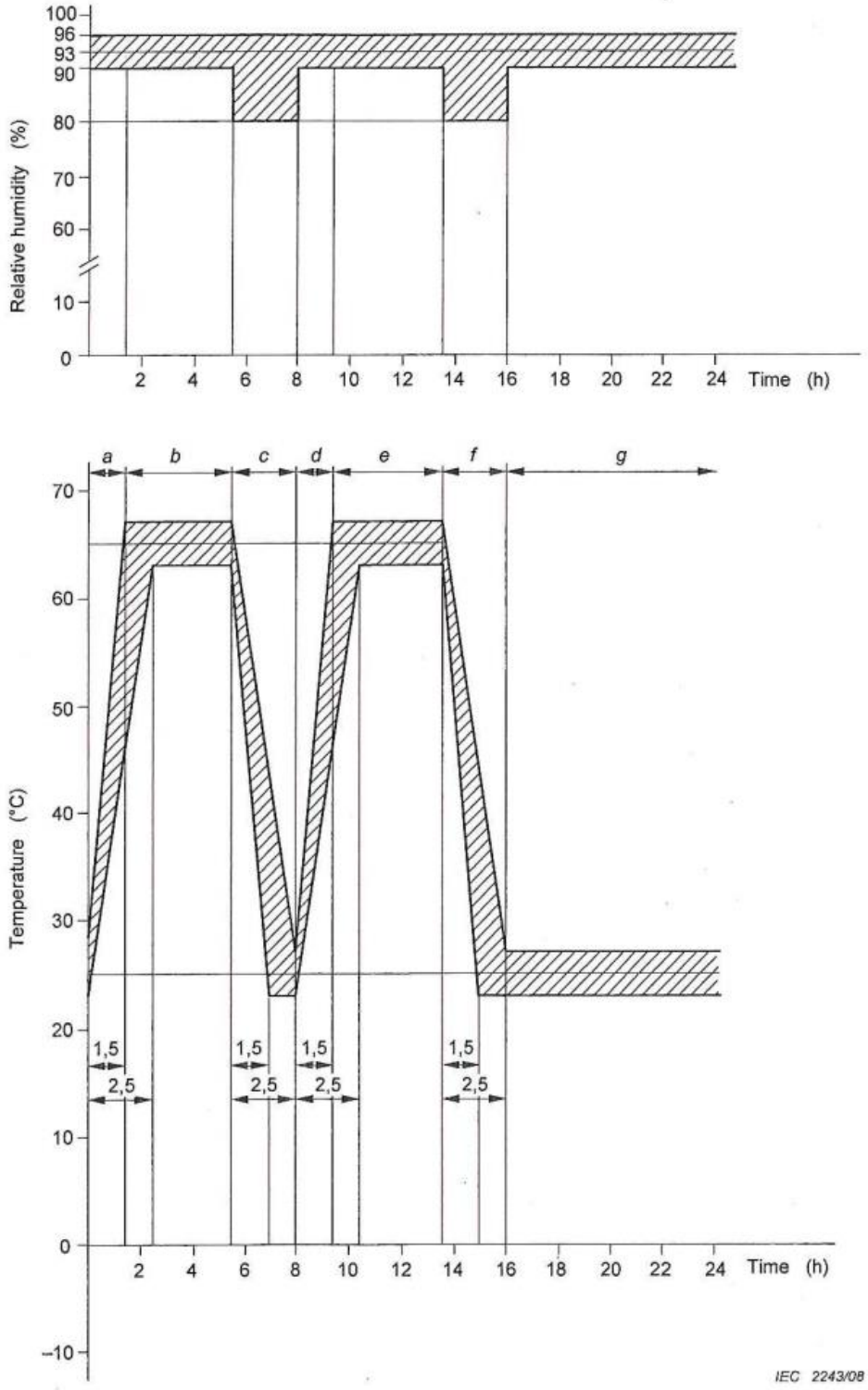
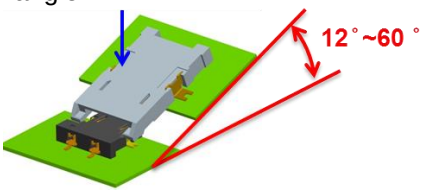
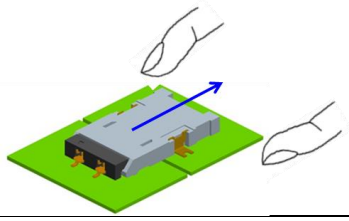
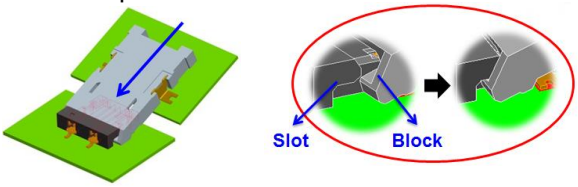
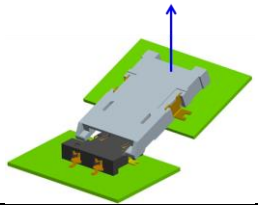
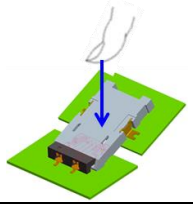
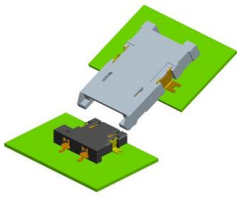
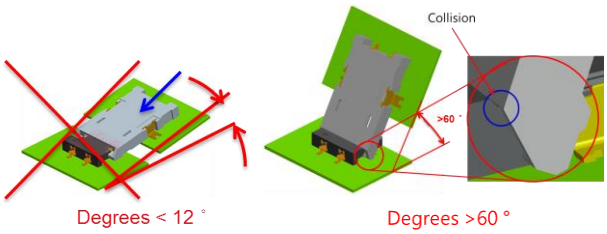
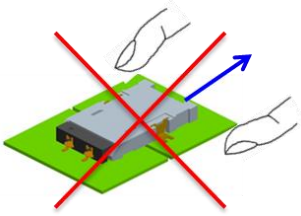


Figure 4

8 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Test Sequence														
Examination of Product	1,3	1	1	1,7	1,6	1,4	1,3				1,3	1,5	2,8	1,3	1,5
Low Level Contact Resistance		2,6	2,5	2,8	2,7	2,5						2,4	3,12		2,4
Insulation Resistance				3,9	3,8								4,11		
Dielectric Withstanding Voltage				4,10	4,9								5,10		
Temperature rise	2														
Mating / Unmating Forces		3,5											6,9		
Durability		4													
Vibration			3												
Shock (Mechanical)			4												
Thermal Shock				5											
Humidity				6											
Temperature life					5										
Salt Spray(Only For Gold Plating)						3									
Solder ability							2								
Terminal / Housing Retention Force								1							
Fitting nail / Housing Retention Force									1						
Destructive										1					
Hand Soldering Temperature Resistance											2				
Low temperature												3			
Pretreatment													1		
Composite temperature/humidity cyclic													7		
Stress corrosion/moist ammonia (NH3) Test														2	
Flowing mixed gas corrosion															3
Sample Size	2	5	5	5	5	5	2	5	5	5	5	5	4	5	5

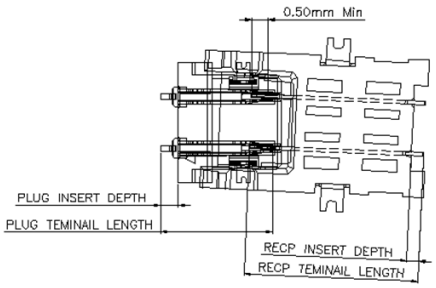
9 MATING APPLICATION

	Mating	Un-mating
1	Start by placing the connector against the header lock at an angle. 	Start by placing the connector against the header lock at an angle. 
2	Verify that the block of the Plug is inserted in the slot of Receptacle. 	Once the reinforced lock is released, The plug moves back and then moves upwards. 
3	In the lock part of the downward pressure. 	Complete the order of mismatches. 
4	Keep pressing down until a “click ” feeling is sensed. The connector is now fully and properly mated. 	
NG		

10 Minimum mating length with 2.5 degree rotation.

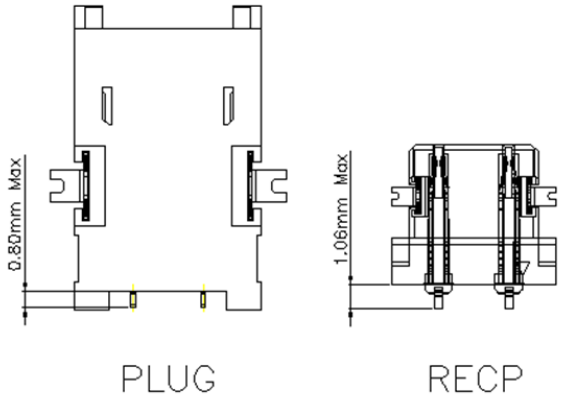
10.1 Connector has mating length minimum 0.50mm when connector with 2.5 degrees rotation .

2.5 degree rotation



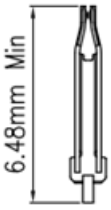
10.2 Control following dimensions to ensure connector mating length.

Insert depth



Terminal length

PLUG-Terminal



RECP-Terminal