

SPEC. NO.: PS-51173-XXXXX-XXX

REVISION: B

PRODUCT NAME: 1.5mm Pitch BTB Conn.

PRODUCT NO: 51173 51174 51183 51184 SERIES

PREPARED: STEVEN DATE: 2018/02/23	CHECKED: CARL DATE: 2018/02/23	APPROVED: SEAN DATE: 2018/02/23
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1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
1	1510234	NEW	STEVEN	2015/10/29
O	1707342	Add 51183 51184 series	STEVEN	2017/06/20
A	1708408	Add test requirements	STEVEN	2017/10/17
B	1803070	Composite temperature/humidity cyclic Test content update	STEVEN	2018/02/23

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2 SCOPE

This specification covers performance, tests and quality requirements for [1.5 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: [50 Volts AC/DC](#)
- 4.3.2 Current: [1.5 Amperes \(per pin\)](#)
- 4.3.3 Operating Temperature : [-40°C to +85°C](#)

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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.	1000 VAC Min. at sea level for 1 minute. Test between adjacent contacts of unmated connectors. (EIA-364-20)
Temperature rise	30°C Max. Change allowed	Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25°C (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 \pm 3mm/min. (EIA-364-09)
Mating/Unmating Forces	Mating 20.0N (Max.) Unmating 3.5N (Min).	Operation Speed : 25.4 \pm 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 \pm 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 \pm 3 mm/minute. On the terminal assembled in the housing.

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Destructive	20 N (MIN).	Operation Speed : 25.4 ± 3 mm/minute.. Measure the force that needs to be forced out of the state.
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MECHANICAL

Item	Requirement	Standard
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)

ENVIRONMENTAL

Item	Requirement	Standard
Resistance to Reflow Soldering Heat	See Product Qualification and Test (Lead Free)	Pre Heat : 150°C~180°C, 60~120sec. Heat : 230°C Min., 40sec Min. Peak Temp. : 260°C Max, 10sec Max.
Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40°C, 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°C for 96 hours. (EIA-364-17, Test condition A)

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Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group 6	Mated connectors to 5% salt-solution concentration, 35°C 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°C, for 4-5 sec. (EIA-364-52)
Hand Soldering Temperature Resistance	Appearance: No damage	T ≥ 350°C, 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 °C, 30 minutes +85 +3/-0 °C, 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 °C (b) Duration : 96 hours (JIS C 60068-2-1)
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

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<p>Composite temperature/humidity cyclic</p>	<p>See Product Qualification and Test Sequence Group 13</p>	<p>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.</p> <p>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.</p> <p>The following details shall apply : (a) Test profile : See Figure 3-4 (b) Number of cycle : 10 cycles (IEC 60068-2-38)</p>
<p>Moisture Sensitivity Levels</p>	<p>Level 2 See Product Qualification and Test Sequence Group 14</p>	<p>Bake the sample for 24 hours minimum at 125 +5/-0 °C. Submit each sample to the appropriate soak requirements shown in Figure 5. Reflow Not sooner than 15 minutes and not longer than 4 hours after removal from the temperature/humidity chamber, subject the sample to 1 cycles of the appropriate reflow conditions.</p>
<p>Stress corrosion/moist ammonia (NH4) Test</p>	<p>See Product Qualification and Test Sequence Group 15</p>	<p>Ammonia gas concentration 3 to 4% Temperature 20+2 C Humidity condition 90 to 95% (STM-1126-06)</p>
<p>Flowing mixed gas corrosion</p>	<p>See Product Qualification and Test Sequence Group 16</p>	<p>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)</p>

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

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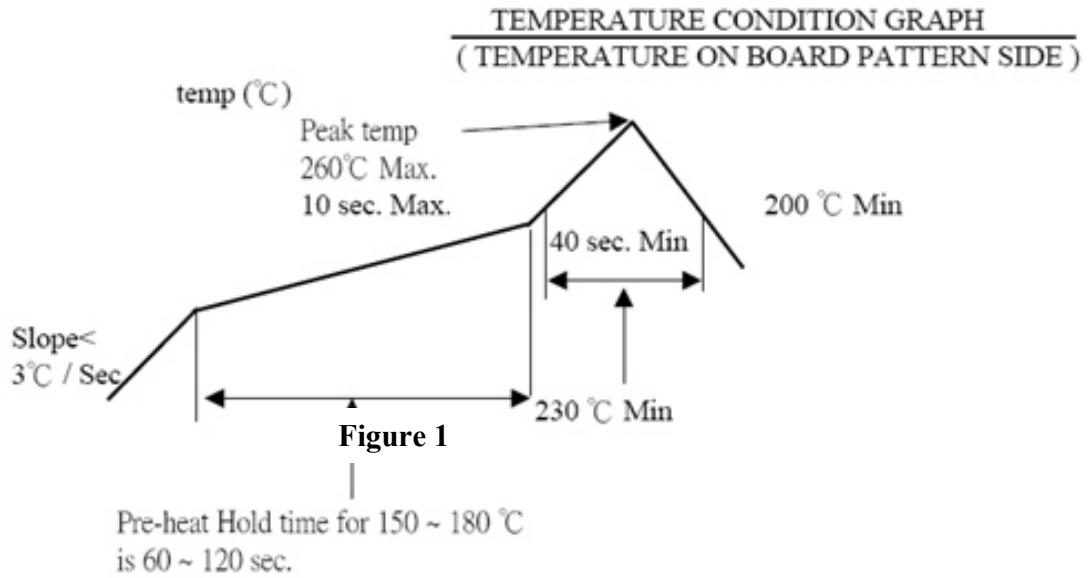
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6 INFRARED REFLOW CONDITION

6.1. Lead-Free Process



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7 Test profile of Moisture

7.1 Preconditioning

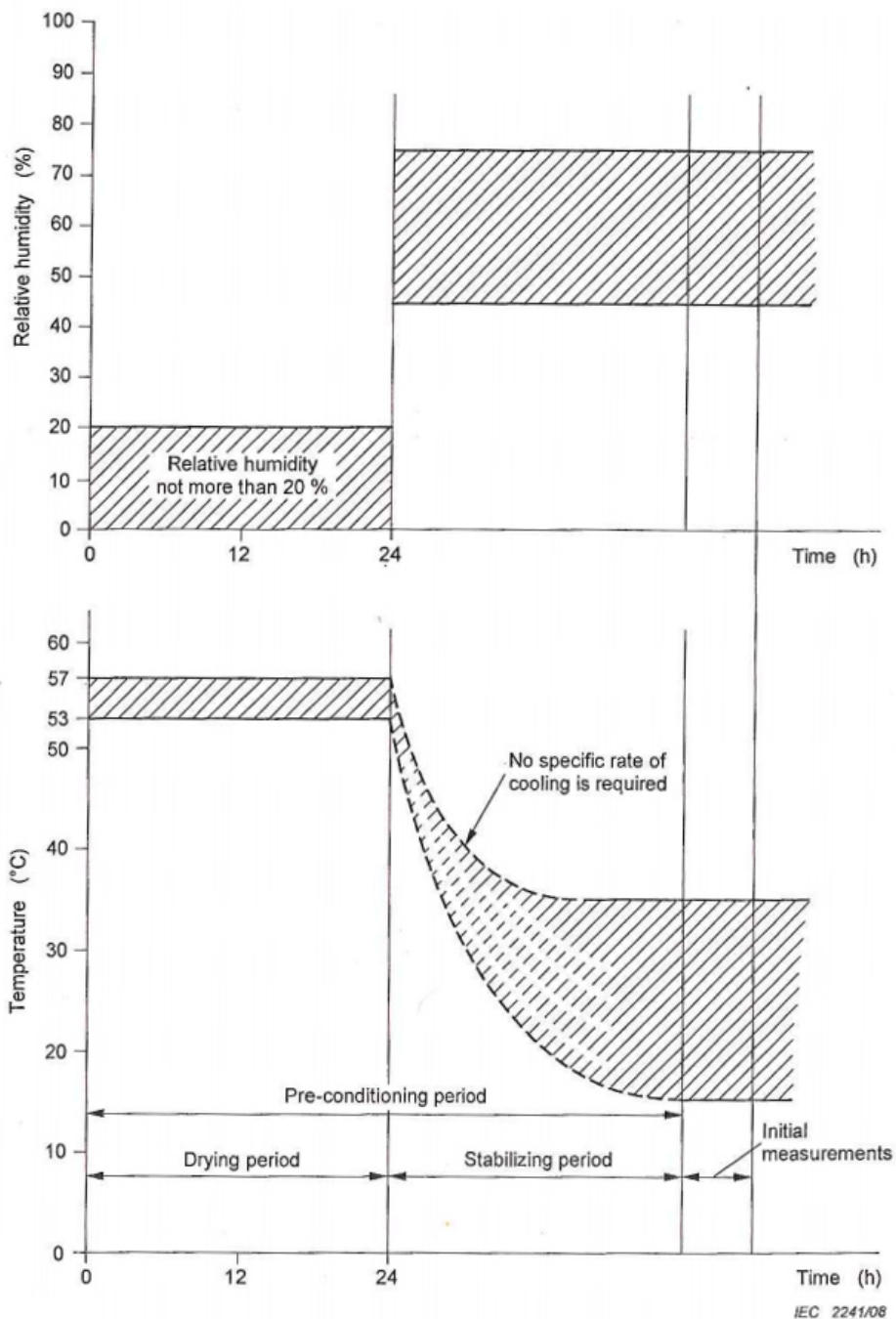


Figure 2

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7.2 Exposure to humidity followed by exposure to cold

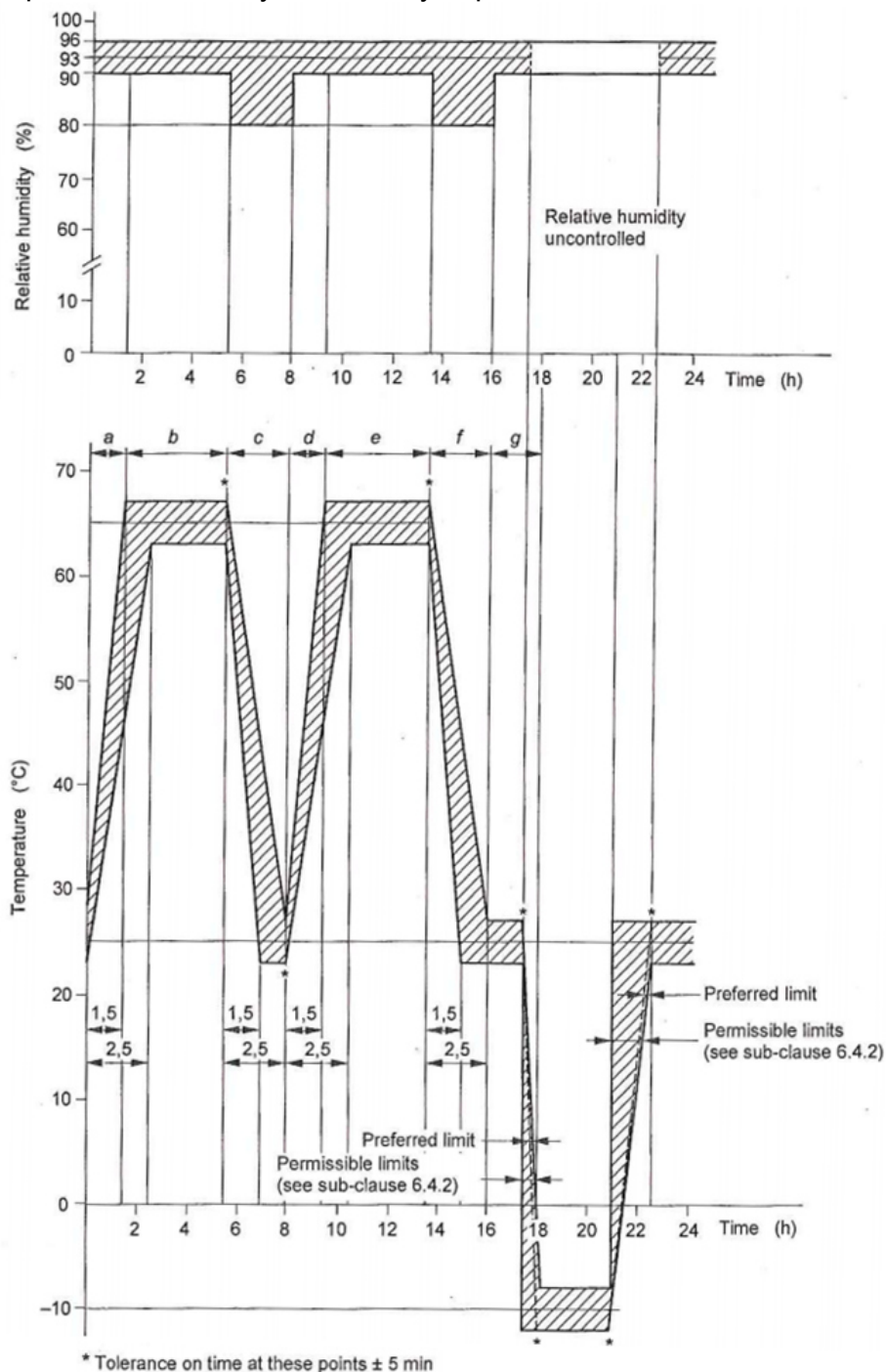


Figure 3

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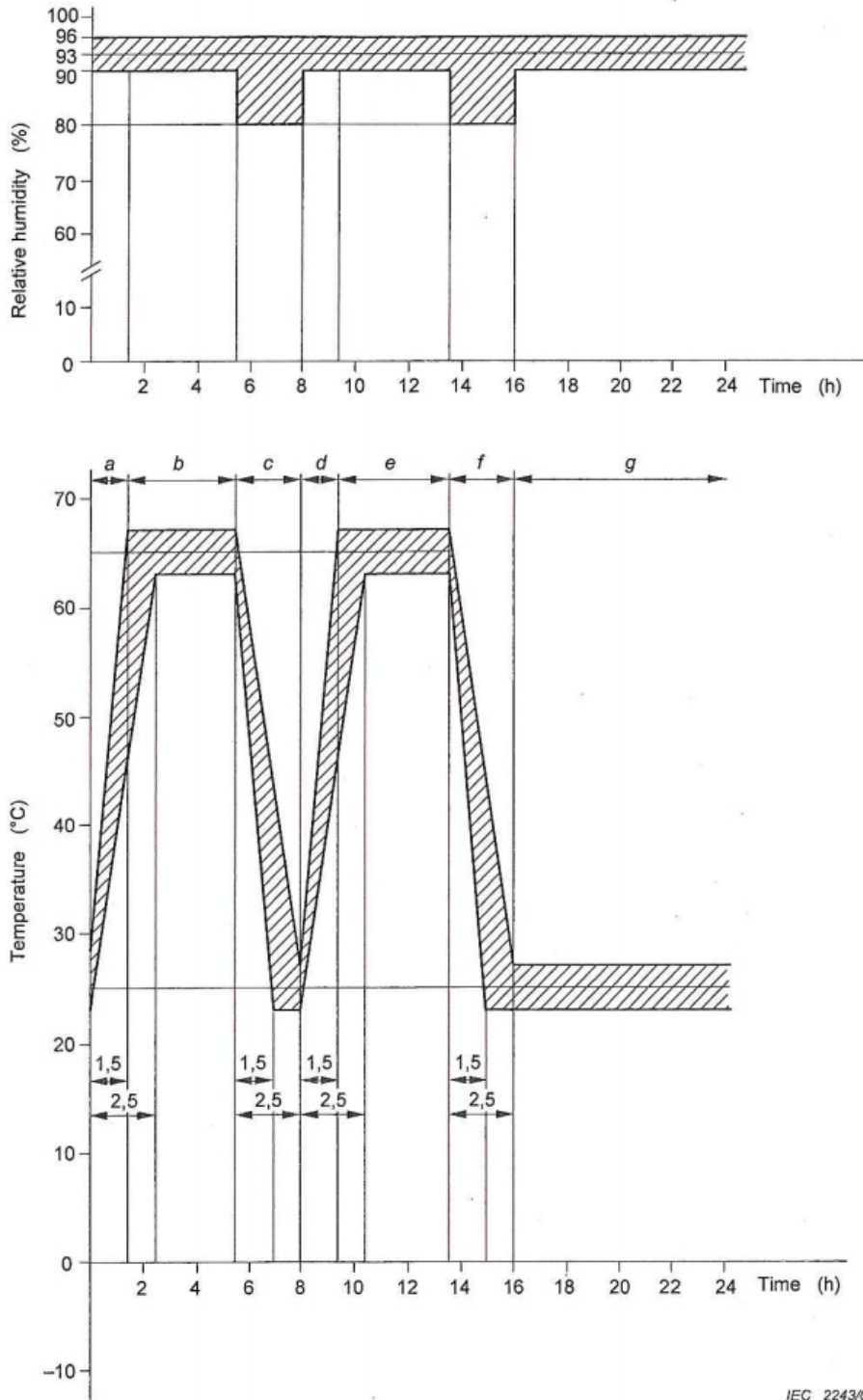
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7.3 Exposure to humidity not followed by exposure to cold



IEC 2243/08

Figure 4

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8 Moisture Sensitivity Levels

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS				
			STANDARD		ACCELERATED EQUIVALENT ¹		
					eV 0.40-0.48	eV 0.30-0.39	CONDITION
TIME	CONDITION	TIME (hours)	CONDITION	TIME (hours)	TIME (hours)	CONDITION	
1	Unlimited	≤30 °C/85% RH	168 +5/-0	85 °C/85% RH	NA	NA	NA
2	1 year	≤30 °C/60% RH	168 +5/-0	85 °C/60% RH	NA	NA	NA
2a	4 weeks	≤30 °C/60% RH	696 ² +5/-0	30 °C/60% RH	120 +1/-0	168 +1/-0	60 °C/60% RH
3	168 hours	≤30 °C/60% RH	192 ² +5/-0	30 °C/60% RH	40 +1/-0	52 +1/-0	60 °C/60% RH
4	72 hours	≤30 °C/60% RH	96 ² +2/-0	30 °C/60% RH	20 +0.5/-0	24 +0.5/-0	60 °C/60% RH
5	48 hours	≤30 °C/60% RH	72 ² +2/-0	30 °C/60% RH	15 +0.5/-0	20 +0.5/-0	60 °C/60% RH
5a	24 hours	≤30 °C/60% RH	48 ² +2/-0	30 °C/60% RH	10 +0.5/-0	13 +0.5/-0	60 °C/60% RH
6	Time on Label (TOL)	≤30 °C/60% RH	TOL	30 °C/60% RH	NA	NA	NA

Figure 5

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9 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	16	
	Test Sequence																
Examination of Product	1,3	1	1	1,7	1,6	1,4	1,3					1,3	1,5	2,8	1,4	1,3	1,5
Low Level Contact Resistance		2,6	2,5	2,8	2,7	2,5							2,4	3,12	3		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				
Moisture Sensitivity Levels														2			
Stress corrosion/moist ammonia (NH4) Test															2		
Flowing mixed gas corrosion																	3
Sample Size	2	5	5	5	5	5	2	5	5	5	5	5	4	5	5	5	5

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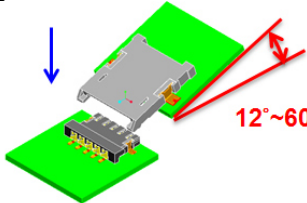
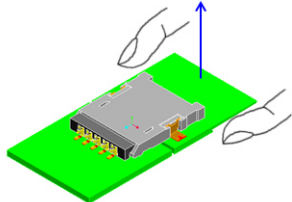
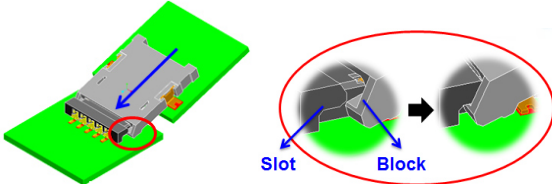
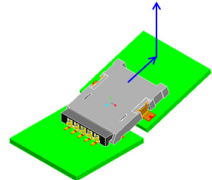
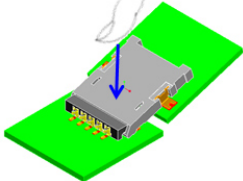
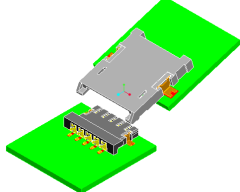
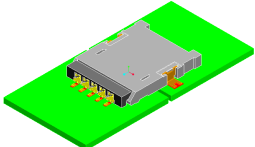
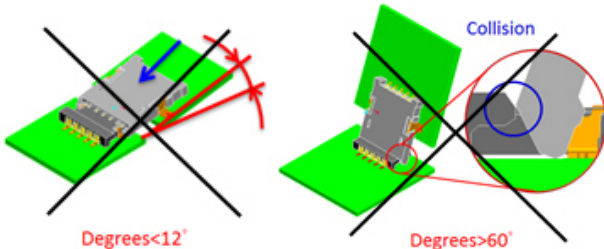
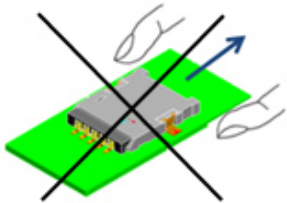
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10 MATING APPLICATION

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

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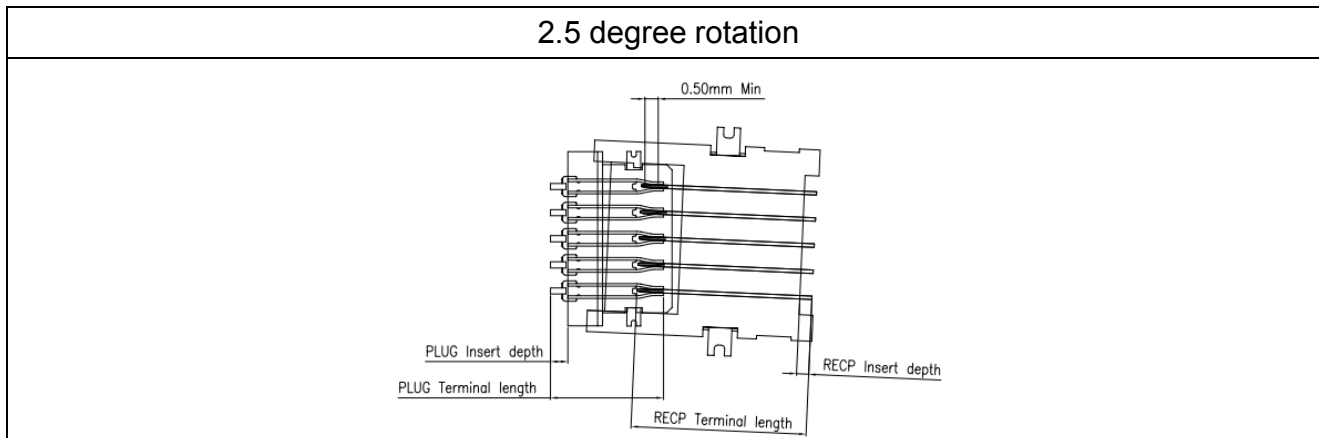
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11 Minimum mating length with 2.5 degree rotation.

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



11.2 Control following dimensions to ensure connector mating length.

