SPECIFICATION

ACES Electronics Co.,Ltd.

No.13, Dongyuan Rd., Jhongli City,

Taoyuan County 320, Taiwan (R.O.C.)

TEL: +886-3-463-2808
FAX: +886-3-463-1800

SPEC. NO.: PS-51093-XXXXX-XXX **REVISION:** D

PRODUCT NAME: 0.5mm BTB CONN. SMT TYPE

PRODUCT NO: 51087; 51090; 51091;51092;51093;51094 Series

PREPARED:	CHECKED:	APPROVED:
TSO I CHIAO	**Chen,ChunYuan**	**Huang Kuo Hua**
DATE: **2023/04/28**	DATE: **2023/04/28**	DATE: **2023/04/28**

1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
A	ECN-2005116	FOR APD1090146 NEW REV	TSO I CHIAO	2020/05/05
B	ECN-000721	增加插拔手法說明	TSO I CHIAO	2020/10/20
C	ECN-005620	修正插拔手法圖示	TSO I CHIAO	2023/02/03
D	ECN-012262	增加長 PIN 數插拔力規格	TSO I CHIAO	2023/04/28

2 SCOPE

This specification covers performance, tests and quality requirements for 0.5 mm pitch board to board connectors SMT TYPE

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

4.3 Ratings

4.3.1 Working Voltage Less than 36 Volts
4.3.2 Voltage: 60 Volts AC/DC
4.3.3 Current: 0.5 Amperes Max. (per pin)
10 Amperes Max. (All pins can carry)
4.3.4 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	60 m Ω Max. per contact	Mate connectors, measure by dry circuit, 20mV Max., 100mA Max. (EIA-364-23)
Insulation Resistance	1000 M Ω Min.	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.	150 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	50 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 <=100PIN 0.08Kgf(Max.) /Per Pin <=200PIN 0.04Kgf(Max)/Per Pin Unmating <=100PIN 0.006Kgf(Min.)/Per Pin <=200PIN 0.003Kgf(Min)/Per Pin	Operation Speed： 25.4 ± 3 mm/minute.. Measure the force required to mate/unmate connector. (EIA-364-13)
Terminal / Housing Retention Force	0.1Kgf 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**
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℃~200℃,60~120sec Heat：217℃ Min., 100sec Min. & 230℃ Min., 50sec Min. Peak Temp.：260℃Max, 10sec Max. Reflow number cycle: 2 times (EIA-364-56)
Thermal Shock	See Product Qualification and Test Sequence Group 4	Mated Connector to follow condition for 5 cycles. 1 cycles: -40 +0/-3 ℃, 30 minutes +85 +3/-0 ℃, 30 minutes (EIA-364-32, test condition I)
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	Mated connectors to temperature

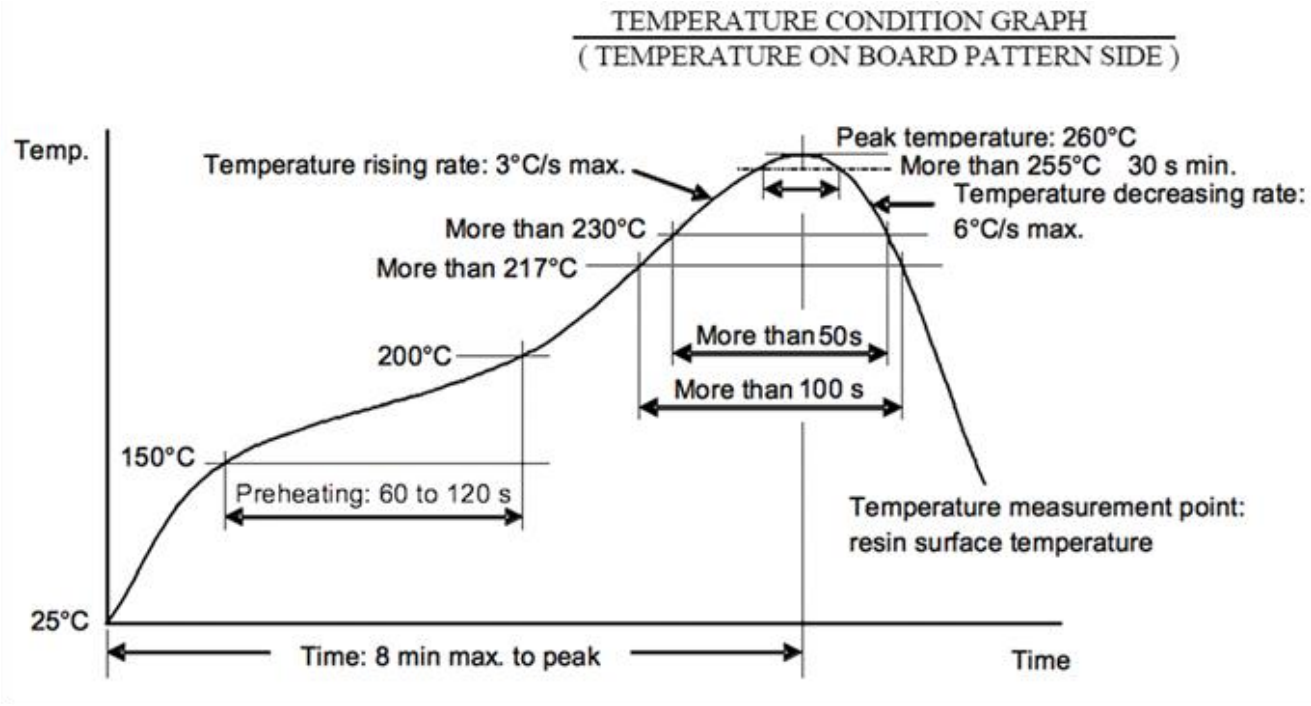
	Sequence Group 5	life at 85℃ for 96 hours. (EIA-364-17, Test condition A)
Item	**Requirement**	**Standard**
Salt Spray (Only For Gold Plating)	See Product Qualification and Test Sequence Group 6	Mated connectors to 5% salt-solution concentration, 35℃ (I) Gold flash for 8 hours (II) Gold plating 3 u" for 48 hours (III) Gold plating 5 u" for 96 hours. (EIA-364-26)
H_2S resistance	After 48 Hours Contact resistance 60 m Ω Max.	Conformed to JEIDA-38-1984 Bath temperature 40±2℃ Gas concentration 3±1ppm Humidity 75 to 80％RH
Solder ability	Tin plating: Solder able area shall have minimum of 95% solder coverage. Gold plating: Solder able area shall have minimum of 75% solder coverage	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℃, 3sec at least.

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

5.2 Signal Integrity Performance

The connector designs provide support for 5.0GT/s (Gen 2), 8.0GT/s (Gen 3) ,16GT/s (Gen 4), and 10Gbps(ICC1.1) differential signal pair.
For detailed signal integrity test information, please contact our sales

6 INFRARED REFLOW CONDITION



7 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group										
	1	2	3	4	5	6	7	8	9	10	11
	Test Sequence										
Examination of Product	1,3	1	1	1、7	1、6	1、4	1、4	1,3		1,3	1,3
Low Level Contact Resistance		2、6	2、5	2、8	2、7	2、5	2、5				4
Insulation Resistance				3、9	3、8						
Dielectric Withstanding Voltage				4、10	4、9						
Temperature rise	2										
Mating / Unmating Forces		3、5									
Durability		4									
Vibration			3								
Shock (Mechanical)			4								
Thermal Shock				5							
Humidity				6							
Temperature life					5						
Salt Spray(Only For Gold Plating)						3					
H2S resistance							3				
Solder ability								2			
Terminal / Housing Retention Force									1		
Hand Soldering Temperature Resistance										2	
Resistance to Soldering Heat											2
Sample Size	4	4	4	4	4	4	4	4	4	4	4

8. MATED HEIGHT

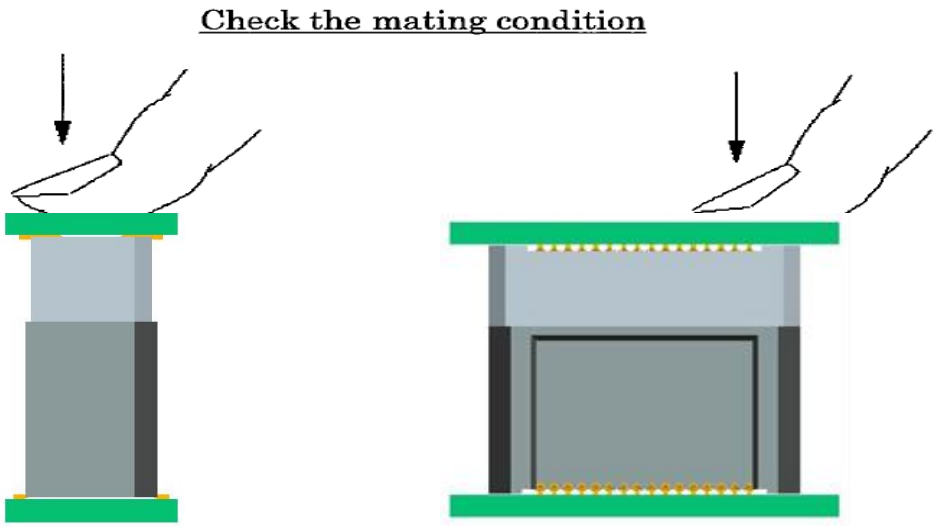
0.5PITCH BTB 對配高度表	High(mm)	51091-xxxxx	51087-xxxxx	51093-xxxxx
		3.3	4.3	5.3
51090-xxxxx	3.05	4.0	5.0	6.0
51092-xxxxx	3.55	4.5	5.5	6.5
51094-xxxxx	6.05	7.0	8.0	9.0

9. CONNECTOR USAGE

MATING PROCEDURE

1.Set the PCB block's position roughly.
2.Check the position of PCB block, moving it slightly.
3.Mate the connector until it becomes flat.(Don't push by too much force)
4.Check the mating state by pushing every corner of connector to prevent

Miss mating



UNMATING PROCEDU