



SPECIFICATION

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SPEC. NO.: SPEC-51309-XXXXX-XXX

REVISION: A

PRODUCT NAME: 1.25mm PITCH WTB CONNECTOR.

PRODUCT NO: 51308 51309 SERIES

PREPARED: Jia-Hong Xu DATE: 2024/02/16	CHECKED: HISATOMI DATE: 2024/02/16	APPROVED: HISATOMI DATE: 2024/02/16
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1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
1	ECN-1512012	PROPOSAL	MARK	2015/12/17
O	ECN-1604017	MODIFY MATING / UNMATING FORCS	MARK	2016/4/1
A	ECN-015427	Change Storage temperature /Thermal shock/Temperature life to -40 degree.	JH.XU	2024/02/16

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This specification covers performance, tests and quality requirements for 1.25mm PITCH WTB CONNECTOR

51308 shows IDC CONN ASSY, and 51309 shows PCB CONN ASSY

This SPEC shows performance when connector mating.

3 APPLICABLE DOCUMENTS

EIA-364: ELECTRONICS INDUSTRIES ASSOCIATION

4 REQUIREMENTS**4.1 Design and Construction**

- 4.1.1 Connector shall be of the design, construction and physical dimensions specified on the applicable sales drawing.

4.2 Materials and Finish**4.2.1 IDC CONN ASSY**

- Contact: High performance copper alloy.
Finish: (a) Contact Area: [Refer to the drawing.](#)
(b) Under plate: [Refer to the drawing.](#)
- Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0
- Housing-cover: Thermoplastic or Thermoplastic High Temp., UL94V-0

4.2.2 PCB CONN ASSY

- Contact: High performance copper alloy.
Finish: (a) Contact Area: [Refer to the drawing.](#)
(b) Under plate: [Refer to the drawing.](#)
- Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0
- Fitting Nail: High performance Brass
Finish: (a) Contact Area: [Refer to the drawing.](#)
(b) Under plate: [Refer to the drawing.](#)

4.3 Ratings

- 4.3.1 Voltage: 50V DC (per pin)
- 4.3.2 Current
[AWG#26: 2.0 Amperes \(per pin\)](#)

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4.3.3 Operating Temperature : -40°C to +85°C

4.3.4 Storage Temperature : -40°C to +85°C

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	30 m Ω Max. (initial) 50 m Ω Max. (After 30 times durability, mechanical and/or environmental test)	Mated connectors, measure by dry circuit, 20mV Max., 100mA Max. (EIA-364-23)
Insulation Resistance	100 M Ω Min.	Mated connectors, apply 500 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max.	500 V AC Min. at sea level for 1 minute. Test between adjacent contacts of Mated connectors. (EIA-364-20)
Temperature Rise	30°C Max. Change allowed	Mated connectors: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25°C (EIA-364-70 METHOD 1, CONDITION 3)
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 200 cycle/hour max.
Mating / Unmating Forces (NON-LOCK)	Mating Force 15N Max Unmating Force 1.5N Min. 12N Max At 50th Unmating Force 1.5N Min. 12N Max	Operation Speed : 25.4 ± 3 mm/minute.. Measure the force required to mate/unmated connector. (EIA-364-13)

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Wire Pull Out Force (IDC CONN ASSY)	See item 9 (AWG26 30N Min over 10 second)	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.
Contact Retention Force (PCB CONN ASSY)	3N Min.	Operation Speed : 25.4 ± 3 mm/minute. Measure the contact retention force with tester.
Fitting Nail /Housing Retention Force (PCB CONN ASSY)	2N Min	Operation Speed : 25.4 ± 3 mm/minute. Measure the Fitting Nail retention force with tester.
Vibration	Discontinuity 1µs Max..	Mated connectors to 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)	Discontinuity 1 µs Max.	Mated connectors to 50G'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 (PCB CONN ASSY)	See Product Qualification and Test Sequence Group 9 (Lead Free)	Pre Heat : 150°C~180°C, 60~120sec. Heat : 230°C Min., 40sec Min. Peak Temp. : 260°C Max, 10sec Max. Reflow number cycle: 2 times (EIA-364-56)

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Thermal Shock	See Product Qualification and Test Sequence Group 6	Mated connectors to follow condition for 5 cycles. 1 cycles: -40 +0/-3 °C, 30 minutes +85 +3/-0 °C, 30 minutes (EIA-364-32, test condition I)
Temperature Life (Heat)	See Product Qualification and Test Sequence Group 11	Mated connectors to temperature life at 85°C for 96 hours. (EIA-364-17, Test condition A)
Temperature Life (Cold)	See Product Qualification and Test Sequence Group 12	Mated connectors to temperature life at -40°C for 96 hours. (EIA-364-17, Test condition A)
Humidity	See Product Qualification and Test Sequence Group 6	Mated Connectors 40°C, 90~95% RH, 96 hours. (EIA-364-31, Condition A, Method II)
Salt Spray	See Product Qualification and Test Sequence Group 7	Mated connectors to 5% salt-solution concentration, 35°C 48 hours.(EIA-364-26)
Solder ability (PCB CONN ASSY)	Gold plating: Solder able area shall have minimum of 75% solder coverage	And then into solder bath, Temperature at 245 ±5°C, for 4-5 sec. (EIA-364-52)
Hand Soldering Temperature Resistance (PCB CONN ASSY)	Appearance: No damage	T ≥ 350°C, 3sec at least.

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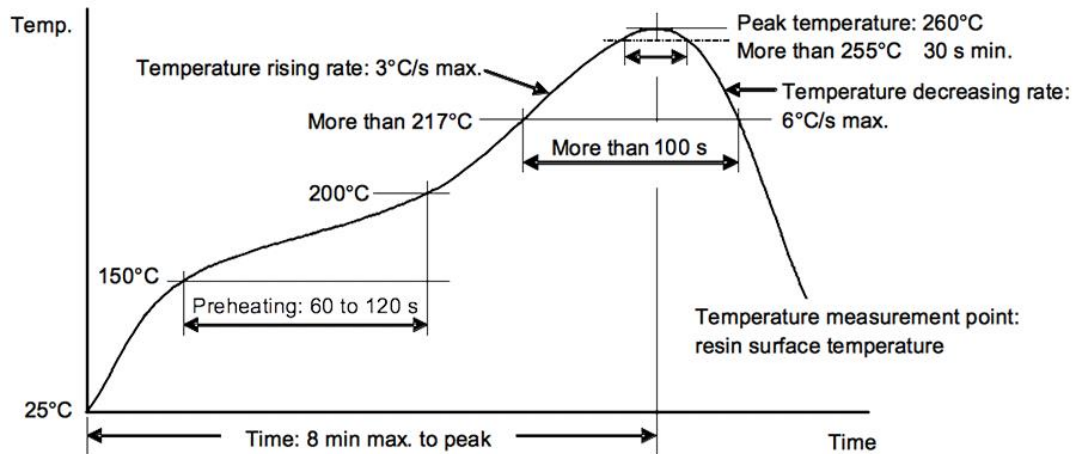
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6 INFRARED REFLOW CONDITION

TEMPERATURE CONDITION GRAPH
(TEMPERATURE ON BOARD PATTERN SIDE)



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7 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group											
	1	2	3	4	5	6	7	8	9	10	11	12
	Test Sequence											
Examination of Product		1,6			1,5	1,7	1,4		1,3	1,3	1,6	1,4
low-level Contact Resistance		2,7			2,6	2,8	2,5		4		2,7	2,5
Insulation Resistance						3,9					3,8	
Dielectric Withstanding Voltage						4,10					4,9	
Temperature Rise	1											
Insertion /Extraction Forces		3,5										
Wire pull out Forces (IDC CONN ASSY)			1									
Terminal/Housing Extraction Forces (PCB CONN ASSY)				1								
Durability		4										
Vibration					3							
Shock(Mechanical)					4							
Resistance to Soldering Heat (PCB CONN ASSY)									2			
Humidity						5						
Temperature Life(Heat)											5	
Temperature Life(Cold)												3
Thermal Shock						6						
Salt Spray							3					
Solder ability (PCB CONN ASSY)								1				
Hand Soldering Temperature Resistance (PCB CONN ASSY)										2		
Sample Size	5	5	5	5	5	5	5	5	5	5	5	5

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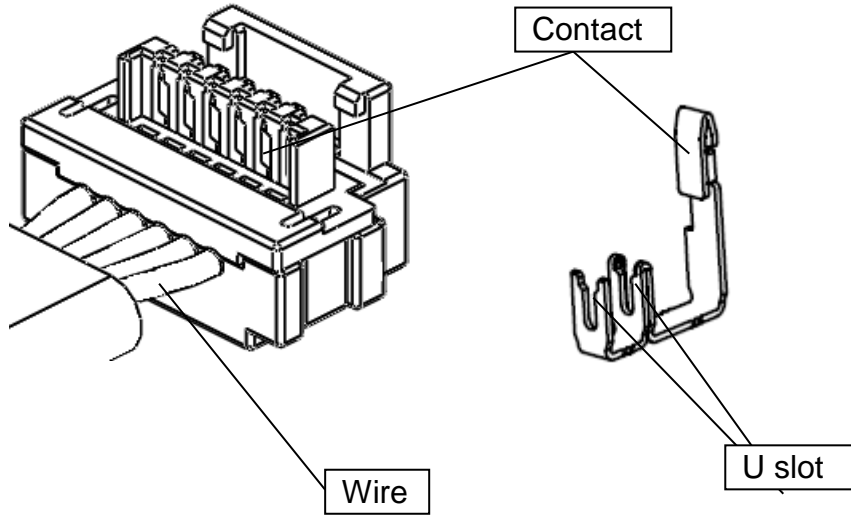
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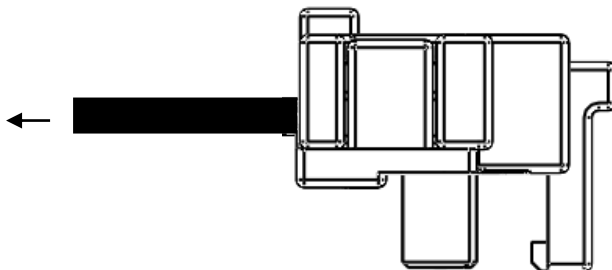
8 APPLICABLE SPECIFICATIONS



9 CONTACT V.S WIRE RETENTION FORCE

Wire Size	CONSTRUCTION	Material of insulation	Insulation OD	Parallel
AWG#26	20/ $\Phi 0.1$	TPEE	$\Phi 0.95$ +0.05-0.03mm	60N min over 10 second (6 pin)

Note : It is necessary to use the UV glue for the application of the wire retention force increasing.



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10 TERMINATION DEPTH

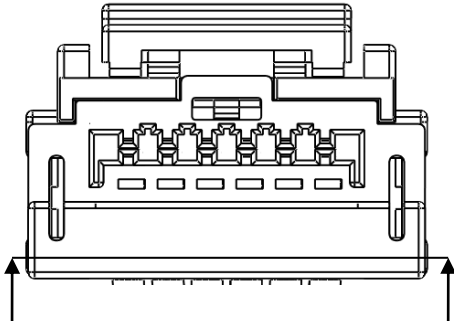


Fig.-1

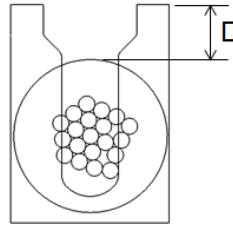


Fig.-2

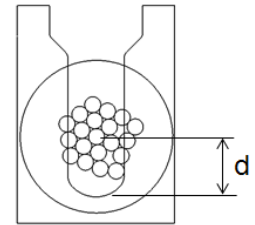


Fig.-3

Measure termination depth dimension “D” in Fig.-2 at X-X part in Fig.-1 where is in the middle part of two U slots and a flattened part pressed by termination punch, and check it satisfies specified value in table

Exact termination depth is measure “d” between bottom of slot and position of center core wire of wire conductors as shown in Fig.-3 ; Aces specifies termination depth dimension “D” force to facilitate a time-consuming work of measuring “d” as a daily control.

Accordingly, dimension “D” becomes not reference value but control value for the use of the wire to be checked is Aces expect specified wires.

Wire Size	Insulation OD	Termination Depth D	d
AWG # 26	Φ0.95 +0.05-0.03mm	D=0.27±0.05mm	d=0.45±0.05mm

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11 ERMINATION APPEARANCE

Inspect the following points after termination.

11.1 Punching flaws on housing caused by termination punch; Housing must be free from flaws. When connector set position deviation, scratches and deformation caused by termination punch may appear at the diagonally shaded areas in Fig.-4.

11.2 Flaws and deformation at beams of contact. Beams must be free from flaws and dimension. When connector set position deviation to wire axis direction, scratches and deformation caused by termination punch may appear at beams of contact as shown in Fig.-5. In this case, not only contact but also termination die may be damaged. Fig.-4

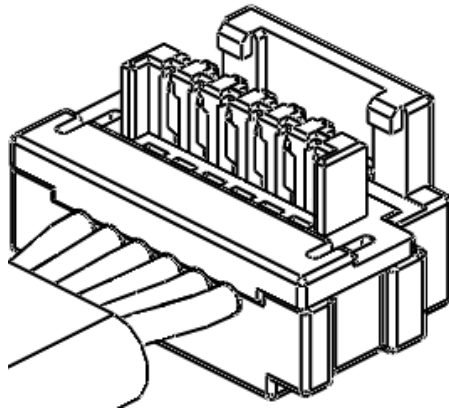


Fig.-4

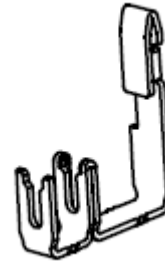


Fig.-5

11.3 Gap between housing wall and wire tip (Wire protruding length) Gap “G” between housing walls and wires tip in Fig.-6 should be 0.20mm max.

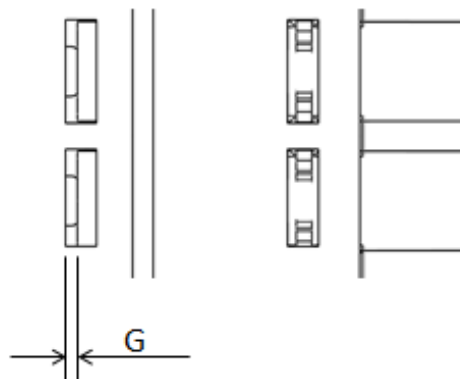


Fig.-6

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11.4 Deviation of insulation displacement center (Deviation of insulation displacement center must not happen. When connector set position or wire deviates to pitch direction, termination punch, wire and U slots do not align so that insulation displacement center deviate as shown in Fig.-7 and Fig.-8

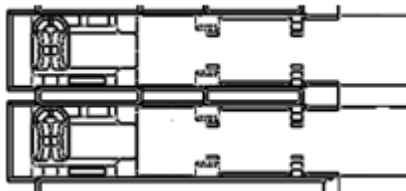


Fig.-7

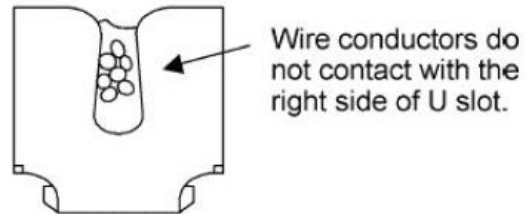


Fig.-8

11.5 Describes a recommended removal method

