



SPECIFICATION

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SPEC. NO.: PS-51390-XXXXX-XXX

REVISION: D

PRODUCT NAME: 1.25 PITCH WTB CONN.

PRODUCT NO: 51390、51391 Series

PREPARED: Shi,SongTao DATE: 2022.08.22	CHECKED: Xu,ZhiYong DATE: 2022.08.22	APPROVED: Xu,ZhiYong DATE: 2022.08.22
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1 Revision History

Rev.	ECN #	Revision Description	Prepared	Date
O	ECN-1803480	NEW SPEC Proposal	SHI,YANAN	2018.03.26
A	ECN-1805276	FOR APD1070078 ADD 40PIN Mating/Unmating Forces	Chen,Ya	2018.04.03
B	ECN-1808177	Add Cable Data	SHI,YANAN	2018.09.27
C	ECN-2008323	ADD 30Pin Insertion & Extraction Forces	SHISONGTAO	2020.06.22
D	ECN-005202	Modify The Standard Low Level Contact Resistance And 10PIN Insertion / Extraction Force	Shi,SongTao	2022.08.22

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2 SCOPE

This specification covers performance, tests and quality requirements for **1.25 PITCH WTB CONN.**

Female Board P/N : **51390**

Male Cable P/N : **51391**

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 RoHS. And the standard depends on TQ-W1-140101

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: (a) Under plate: **Refer to the drawing.**

4.3 Ratings

- 4.3.1 Working voltage less than 36 volts(per pin)
- 4.3.2 Voltage: 50 Volts AC (r.m.s)
Current: 1 Amperes /pin
Wire Size: AWG#30~ AWG#26
- 4.3.3 Operating Temperature : **-55°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	30 m Ω Max.(initial) per contact 50 m Ω Max.(finish)	Mate connectors, measure by dry circuit, 20mV Max., 100mA Max. (EIA-364-23)
Insulation Resistance	100 M Ω Min.	Unmated connectors, apply 250 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 2 mA max.	500 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-364-70B,METHOD1,CONDITION1)

Note. High Frequency Test shell be conduct by customer request.

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MECHANICAL

Mating / Unmating Forces	See item 6	Operation Speed : 25.4 ± 3 mm/minute.. Measure the force required to mate/unmate connector. (EIA-364-13D)
Fitting Nail & Terminal /Housing Retention Force	3 N Min.	Operation Speed : 25.4 ± 3 mm/minute. Measure the contact retention force with tester. (EIA-364-29C)
Crimping Terminal / Housing Retention Force (Cable Side)	5 N MIN.	Operation Speed : 25.4 ± 3 mm/minute. Measure the contact retention force with tester.
Crimping Pull Out Force	AWG# 26: 20 N Min. AWG# 28: 10 N Min. AWG# 30: 5 N Min.	Operation Speed : 25.4 ± 3 mm/minute. Fix the crimped terminal, apply axial pull out force on the wire.
Locking Strength	20 N MIN	Operation Speed : 25.4 ± 3 mm/minute. Measure the contact retention force with tester
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 ± 3 mm/min. (EIA-364-09C)



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Vibration	1 μ s 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-364-28E Condition I)
Shock (Mechanical)	1 μ s 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-364-27B, test condition A)

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ENVIRONMENTAL		
Item	Requirement	Standard
Temperature life	See Product Qualification and Test Sequence Group 5	Subject mated connectors to temperature life at 85°C for 96 hours . (EIA-364-17, Test condition A)
Thermal Shock	See Product Qualification and Test Sequence Group 6	Mate module and subject to follow condition for 5 cycles. 1 cycles: -55 +0/-3 °C , 30 minutes +85 +3/-0 °C , 30 minutes Transform 5 minutes (EIA-364-32E, test condition A)
Humidity	See Product Qualification and Test Sequence Group 6	Mated Connector 40+2/-2 °C , 90~95% RH, 96 hours (EIA-364-31C, Condition A, Method II)
Salt Spray	See Product Qualification and Test Sequence Group 7	Subject mated/unmated connectors to 5% salt-solution concentration, 35°C (I) Gold plating < 3u" for 8 hours . (II) 3u" ≤ Gold plating < 5u" for 48 hours (III) Gold plating ≥ 5u" for 96 hours (EIA-364-26, Test condition B)
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	Subject the test area of contacts into the flux for 5-10 sec. And then into solder bath, Temperature at 245 ±5 °C , for 4-5 sec . (EIA-364-52)
Resistance to Reflow Soldering Heat	See Product Qualification and Test Sequence Group 9 (Lead Free) 2 cycles	Pre Heat : 150~180 °C , 60~90sec. Heat : 230 °C Min., 40sec Min. Peak Temp. : 260 °C Max, 10sec Max.
Hand Soldering Temperature Resistance	Appearance: No damage	T ≥ 350 °C , 3sec at least.

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

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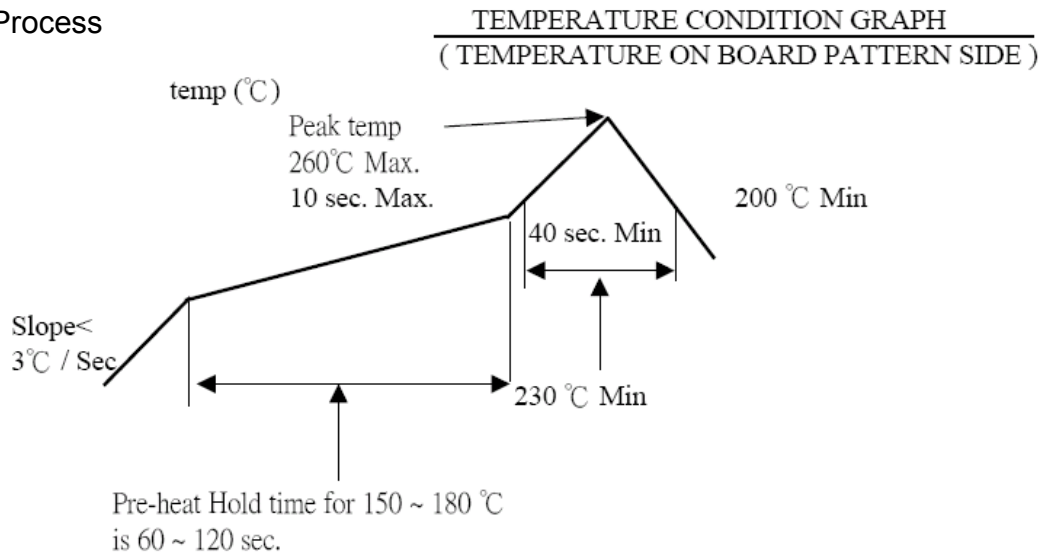
6 Insertion / Extraction Force

NO. OF Ckt.	Initial		After 30 th Cycle	
	Insertion Force (Max.)	Extraction Force (Min.)	Insertion Force (Max.)	Extraction Force (Min)
10	40N / 4.08 Kgf	4N / 0.41 Kgf	40N / 4.08 Kgf	4N / 0.41 Kgf
20	50N / 5.10 Kgf	5N / 0.51 Kgf	50N / 5.10 Kgf	5N / 0.51 Kgf
30	60N / 6.12 Kgf	6N / 0.61 Kgf	60N / 6.12 Kgf	6N / 0.61 Kgf
40	70N / 7.14 Kgf	7N / 0.71 Kgf	70N / 7.14 Kgf	7N / 0.71 Kgf
50	80N / 8.16 Kgf	8N / 0.81 Kgf	80N / 8.16 Kgf	8N / 0.81 Kgf

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INFRARED REFLOW CONDITION

Lead-free Process



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8.PRODUCT QUALIFICATION AND TEST SEQUENCE

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

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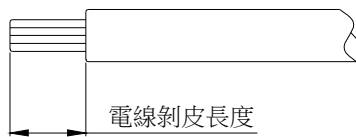
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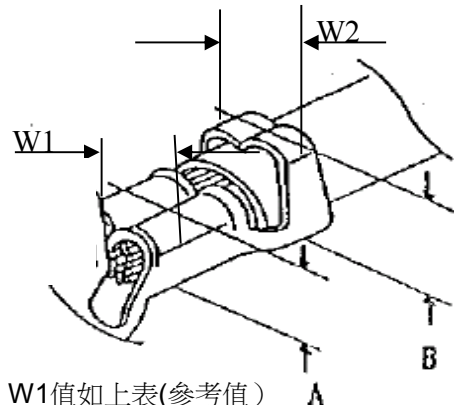
9 CRIMPING CONDITION

鉚線條件表 CRIMPING CONDITION

Part Number	Wire Specification			Crimp Height (mm)		Crimp Width (mm)	
	UL Style (REF.)	AWG Size	Insulation OD(mm)	Conductor A	Insulation B	Conductor W1	Insulation W2
51391-Txxx	UL1061	26	1.00	0.55~0.60	1.05~1.10	0.90~0.95	0.95~1.00
51391-Txxx	UL1061	28	0.90	0.50~0.55	1.00~1.05	0.88~0.95	0.90~0.98
51391-Txxx	UL1571	30	0.70	0.45~0.55	0.95~1.05	0.88~0.95	0.88~0.95



Strip length



Note:

- 1、W1為芯線導體鉚壓後之寬度(Conductor Crimping Width)：W1值如上表(參考值)
- 2、W2為電線外被部分鉚壓後之寬度(Insulation Crimping Width)：W2值如上表(參考值)
- 3、A為芯線導體鉚壓後之高度(Conductor Crimping height)：A值如上表(參考值)
- 4、B為電線外被鉚壓後之高度(Insulation Crimping height)：B值如上表(參考值)
- 5、電線剝皮長度(Strip length)：0.7~1.0mm(參考值)

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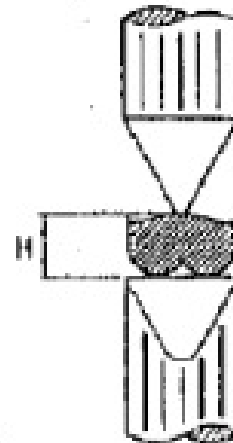
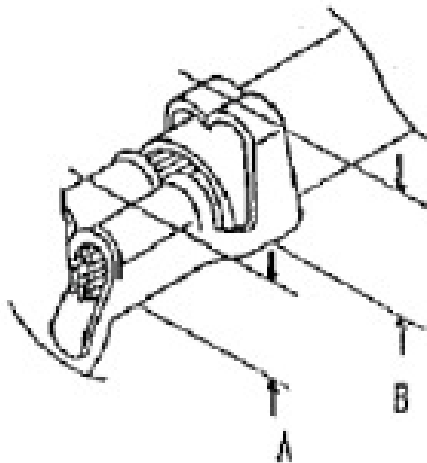
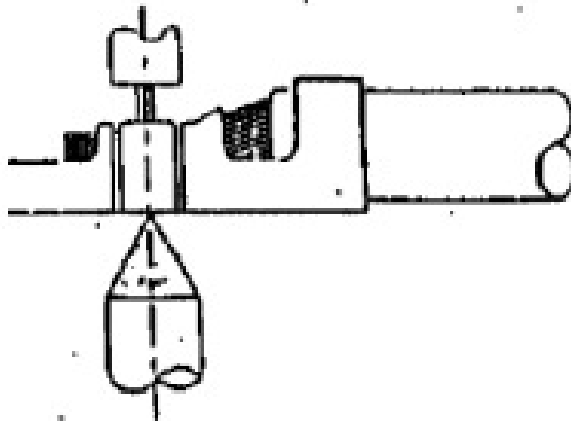
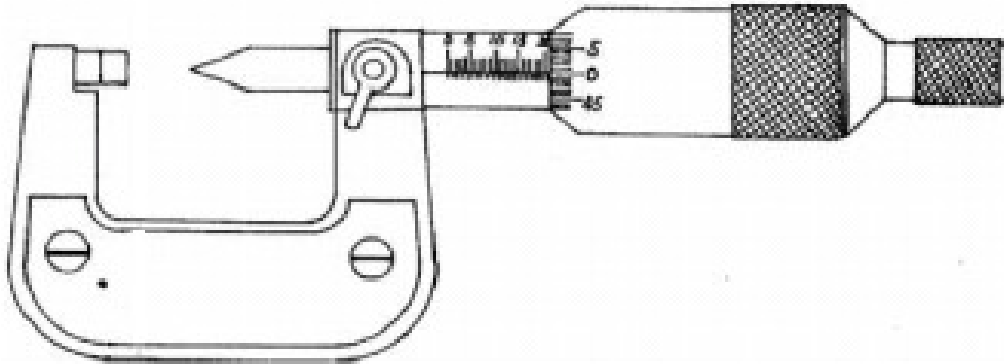
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10 CRIMPING HEIGHT MEASUREMENT



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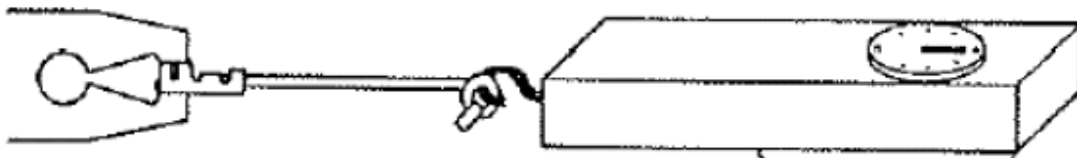
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11 PULL FORCE OF CRIMPING SECTION MEASUREMENT

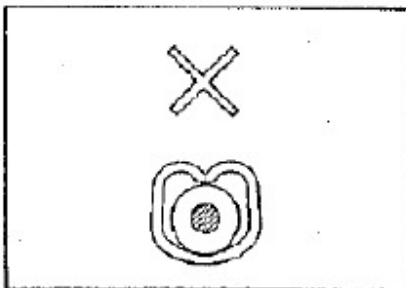


Before test samples, please measure crimp height and do not crimp insulation.

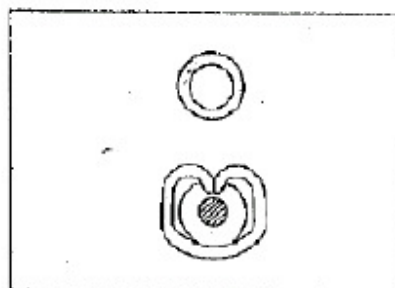


Pull Force of Crimp Section Measurement

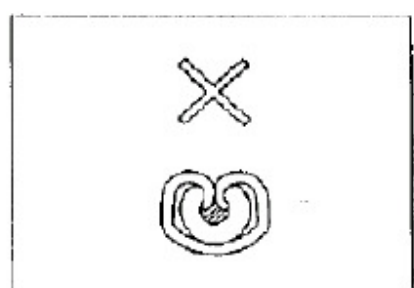
12 STANDARD INSULATION CRIMPING



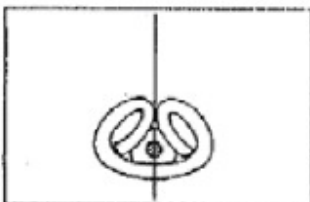
Not enough crimp



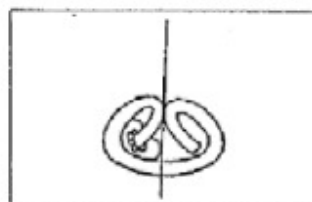
Good



Crimp too much

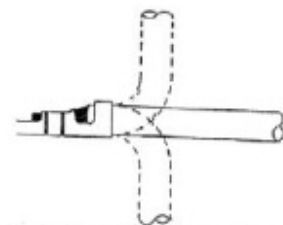


Good



NG

Insulation Crimp Condition



As following figure shown. It is no problem if wire bent up down 90 degrees 1 cycle and insulation position still in ideal position.

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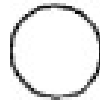
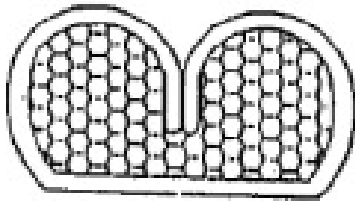
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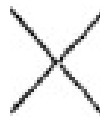
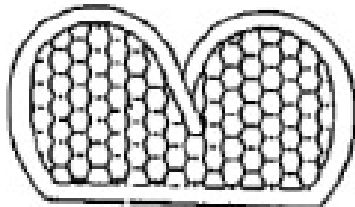
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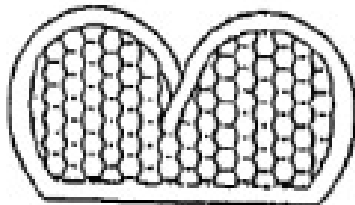
13 CONDUCTORS CRIMPING CONDITION



Good

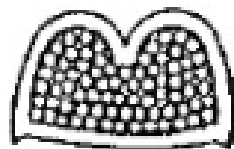


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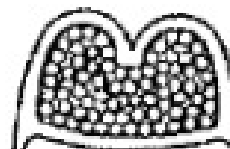


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Lower conduct
retension force



Good



Large burr

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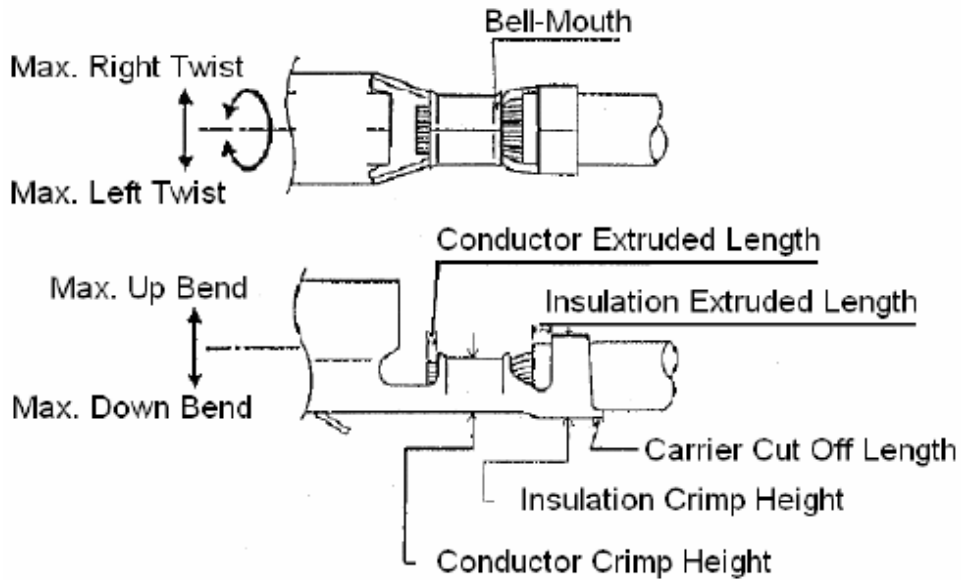
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14 CRIMPING REQUIREMENT



Item	Range(Ref.)
Max. Up Bend	6°
Max. Down Bend	6°
Max. Left Twist	5°
Max. Right Twist	5°
Bell-Mouth Length	0.1~0.3mm
Carrier Cut Off Length	0~0.2mm
Conductor Extruded Length	0.05~0.2mm