SPECIFICATION

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SPEC. NO.: PS-50213-XXXXX-XXX **REVISION:** A

PRODUCT NAME: 1.0mm PITCH IDT WTB CONN

PRODUCT NO: 50213、50212 SERIES

PREPARED:	CHECKED:	APPROVED:
Xufei	**Jerry**	**Jason**
DATE: **2014.01.10**	DATE: **2014.01.10**	DATE: **2014.01.10**

1. Revision History

Rev.	ECN #	Revision Description	Approved	Date
O	ECN-0812210	RELEASE	JASON	2008/11/25
A	ECN-1401184	ADD WORKING VOLTAGE	XUFEI	2014/01/10

2. SCOPE

This specification covers performance, tests and quality requirements for 1.0MM PITCH IDT WIRE TO BOARD CONNECTOR.

3. APPLICABLE DOCUMENTS

EIA-364 ELECTRONICS INDUSTRIES ASSOCIATION

4. REQUIREMENTS

4.1 Design and Construction

Product shall be of design, construction and physical dimensions specified on applicable product drawing.

4.2 Materials and Finish

4.2.1 Contact: High performance copper alloy (Phosphor Bronze)
Finish: (a) Contact Area: Gold plated based on order information
(b) Under plate: Nickel-plated all over
4.2.2 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0

4.3 Ratings

4.3.1 Working voltage less than 36 volts (per pin)
4.3.2 Voltage: 50 Volts AC (per pin)
4.3.3 Current: 0.7 Amperes (per pin)
4.3.4 Operating Temperature : -25℃ to +85℃(*1)
(*1)：Including terminal temperature rise.

4.4 Applicable wire

4.4.1 AWG #30, conductor/7 stands, tin-coated annealed copper.
Insulation O.D./0.54 to 0.58mm.

5. Performance

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.

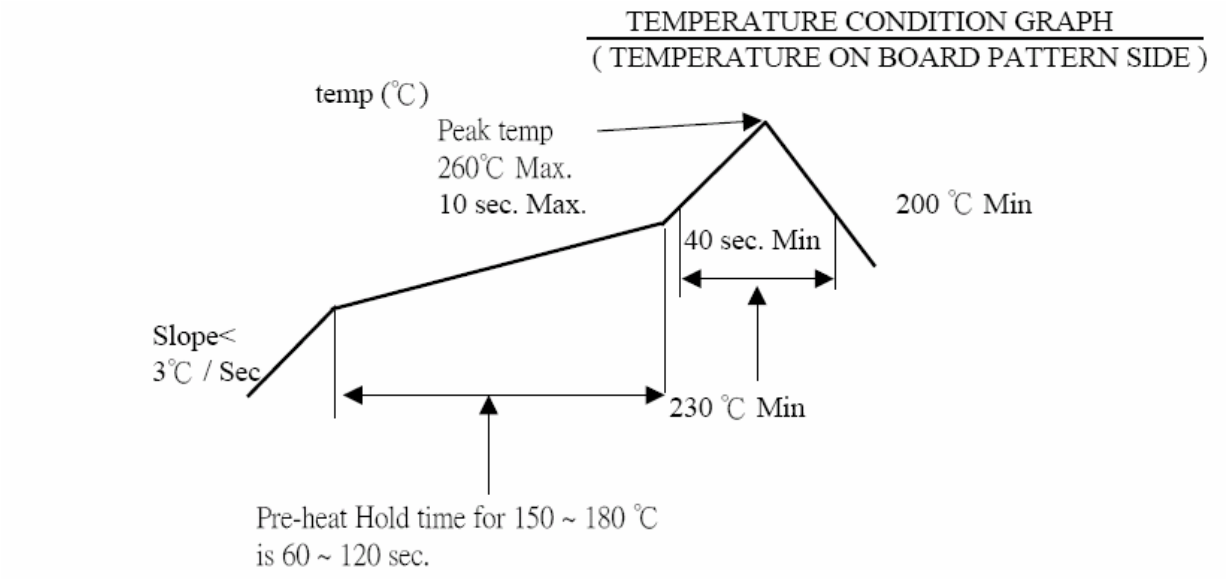
ELECTRICAL		
Item	**Requirement**	**Standard**
Low-signal Level Contact Resistance	40 m Ω Max.(initial)per contact 20 m Ω Max. Change allowed	Mate connectors, measure by dry circuit, 20mV Max., 100mA Max. (EIA-364-23)
Insulation Resistance	100 M Ω Min.	Unmated connectors, apply 250 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	500VAC Min. at sea level for 1 minute. No discharge, flashover or breakdown. Current leakage: 1 mA max.	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 after:0.7 A/Power contact. The temperature rise above ambient shall not exceed 30℃ The ambient condition is still air at 25℃ (EIA-364-70 METHOD 2)
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 10 cycles/min. (EIA-364-09)
Mating / Unmating Forces	Mating Force: 10N(1.02 Kg) Max. /CKTS. Unmating Force: 1N (0.11 Kg) Min./CKTS.	Operation Speed： 25 ± 3 mm/minute.. Measure the force required to mate/Unmate connector. (EIA-364-13)
Contact Retention Force	2.5 N 〔0.26Kgf〕Min.	Operation Speed： 25 ± 3 mm/minute. Measure the contact retention force with Tensile strength tester.
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)

MECHANICAL		
Item	**Requirement**	**Standard**
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		
Resistance to **Hand** Soldering Heat	Excessive pressure shall not be applied to the terminals. See Product Qualification and Test Sequence Group 8	Soldering iron：350±10℃ Duration：3~4 sec.
Resistance to **Reflow** Soldering Heat	See Product Qualification and Test Sequence Group 8 **(Lead Free)**	Pre Heat：150℃~180℃, 60~90sec. 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, Reefer to Method II. (EIA-364-31, Test condition A)
Temperature life (Heat Aging)	See Product Qualification and Test Sequence Group 5	Subject mated connectors to temperature life at 85±2℃ for 250 hours. Measure Signal. (EIA-364-17)
Salt Spray	See Product Qualification and Test Sequence Group 6	Exposure to salt spray from 5±1% solution at 35 ±2℃ (a) Tin-Lead & Matt Tin: 24 hrs (b) Gold Flash: 8 hrs (c) Gold (3u): 12 hrs (EIA-364-26)
Solder ability	Solder able area shall have minimum of 95% solder coverage.	Subject the test area of contacts into the flux for 5-10 sec. And then into solder bath, Temperature at 245 ±5℃, for 4-5 sec. (EIA-364-52)

6. INFRARED REFLOW CONDITION

6.1.



NOTE：

Please check the Reflow soldering condition by your own devices beforehand.
Because the condition changes by the soldering devices, p.c. boards, and so on.

7. 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、6	1、6	1、4		1		
Low-signal Level Contact Resistance		1、5	1、4	2、9	2、9	2、5		3		
Insulation Resistance				3、8	3、8					
Dielectric Withstanding Voltage				4、7	4、7					
Mating / Unmating Forces		2、4								
Durability		3								
Contact Retention Force	1									
Vibration			2							
Shock (Mechanical)			3							
Humidity				5						
Temperature life					5					
Salt Spray						3				
Solder ability							1			
Resistance to Soldering Heat								2		
SO2 Gas									1	
Sample Size	2	4	2	2	2	2	2	2	2	

8. Handling manual

This manual is describes control points about harness assembling operation for insulation displacement connector (IDC) of 88610 connector by Aces's using automatic insulation displacement (ID) machine.

Refer to handling manual of ID machine for smooth operation as well.

8.1. Composition and Parts Identification

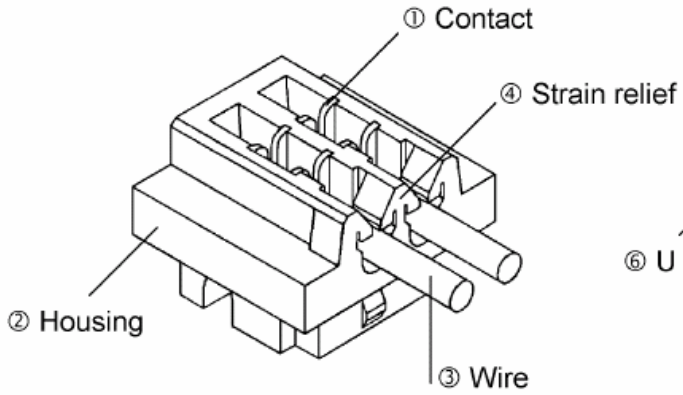


Fig.1 Harness

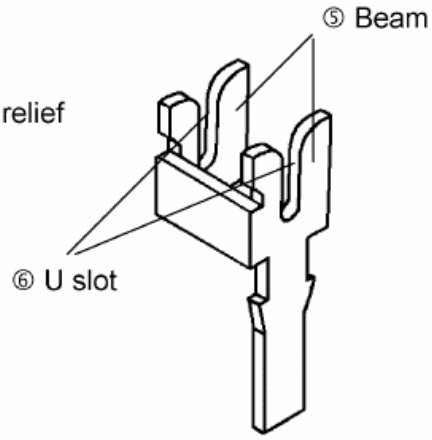


Fig.-2 Contact

④ Strain relief:.. Strain relief retains wire insulation to prevent from that external force loaded on wire affects U slot.

⑤ Beam..... Two beams have an individual U slot construction.

⑥ U slot..... It cuts wire insulation to contact with wire conductors electrically and mechanically.

8.2. Model number and Applicable wire size

8.2.1. Model number

50213	-	XX	X	X	-	XX
88609	-	XX	X	X	-	XX
		Pin no.	Package	Plating		Color

8.2.2. Applicable wire size

Wire size	UL style	Material of insulation	Insulation outer dia.
AWG#30	UL 1571	PVC	ϕ 0.56±0.02 mm

8.2.3. Wire conductors：7 standard wire (annealed copper wire with Tin-plated)

8.3. Termination depth

Application termination depth is stated below.

8.3.1. Termination appearance

Wire position must be under the protrusion of strain relief of connector as shown in Fig.-3. Rigid condition of wire insulation and connector may cause wrinkle on wire insulation at strain relief part of connector as shown in Fig.-4. If wrinkle is found, check wire retention force referring to item 6 “Wire Retention Force.” When measured wire retention force satisfies specified value mentioned in item 6, termination is good.

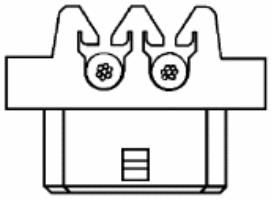


Fig.-3

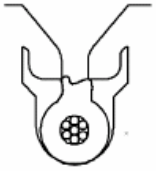


Fig.-4 (Example of wrinkling)

8.3.2. Wire conditions at termination part (U slot part)

After termination, cut off diagonally shaded area (strain relief and housing wall) of housing as shown in Fig.-5 and pick up connector contact having terminated wire with pliers. Then, carefully take wire off contact U slot, holding wire as shown in Fig.-6.

Check terminated part of wire at U slot. When termination is conducted properly, wire insulation at terminated part remains as shown in Fig.-7.

Note: Conduct observation right after taking wire off U slots of contact without delay due to elasticity of wire insulation.

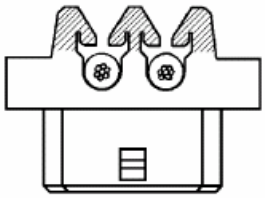


Fig.-5

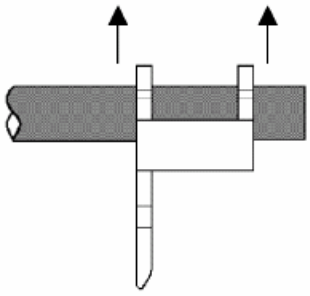


Fig.-6

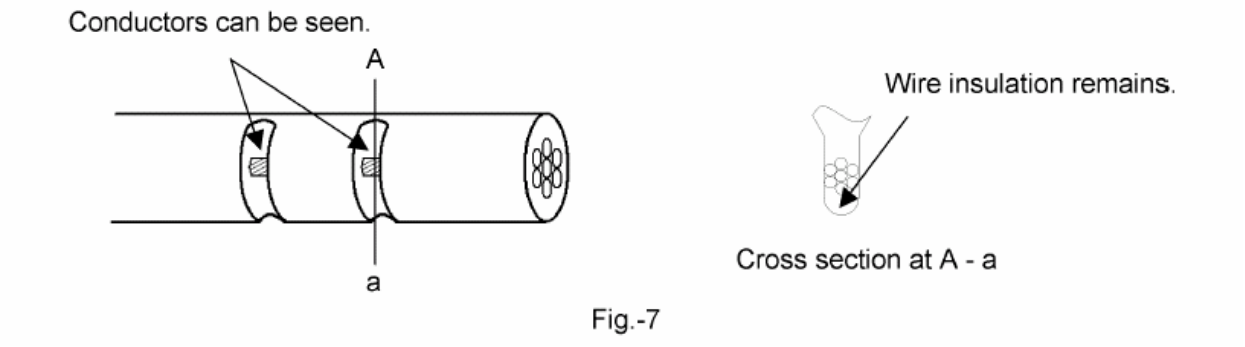


Fig.-7

8.3.3. Termination depth dimension (Reference value)

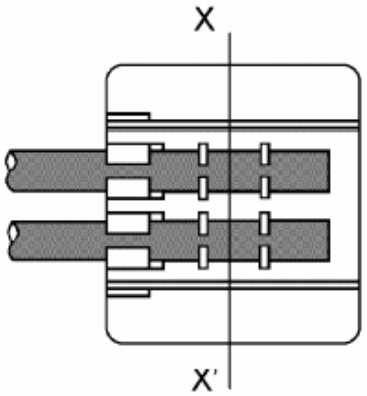


Fig.-8

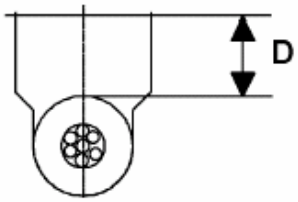


Fig.-9

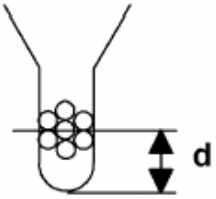


Fig.-10

Measure termination depth dimension "D" in Fig.-9 at X-X[1] part in Fig.-8 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.

Wire size	UL style	Insulation outer dia.	Termination Depth
AWG#30	UL 1571	ϕ 0.56±0.02 mm	0.55±0.05 mm

Termination depth dimension for ID connectors is a similar control point to crimp height for crimp type connectors, but it is totally different in principle. As crimp height of crimp type connector varies, a coefficient of deformation of wire conductors changes enormously, and electrical and mechanical connection to connector is much affected so that crimp height is one of important crimp operation control points.

On the other hand, U slot dimension of ID connector varies as per wire size, and connection between wire conductors and connector is decided according to U slot dimension. Therefore, control of termination depth dimension is to manage the position where wire conductors are located in U slots. This is the concept of termination depth dimension.

The reason as a reference value for values of termination depth is that termination depth measuring the distance between surface levels of terminated wire insulation vinyl and connector housing is affected by hardness of wire to be used and its wire insulation outer diameter. Accordingly, a value of termination depth is a reference value not an absolute value.

Exact termination depth is measure “d” between bottom of slot and position of center core wire of wire conductors as shown in Fig.10；however, 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 be ACES expect specified wires.

8.3.4. Shallow termination depth (Insufficient termination)

When termination is insufficient,

① Wire insulation is not located under protrusions of strain relief as shown in Fig.-11.

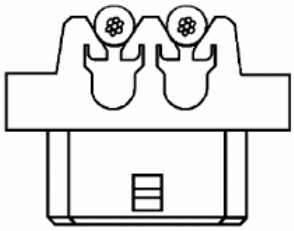


Fig.-11

② Wire conductors in U slot are hardly seen or not seen at all as shown in Fig.-12.

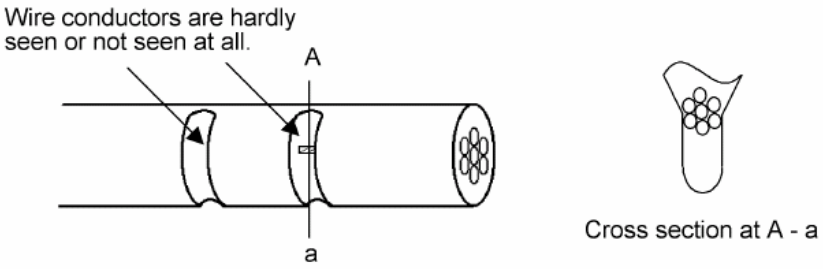


Fig.-12

8.3.5. Deep termination depth (Excessive termination)

When termination is excessive,

① Wire insulation is cut at the bottom of U slot and wire conductors are seen as shown in Fig.-13.

② Punching flaws caused by termination punch appear on flange of housing as shown in Fig.-14.

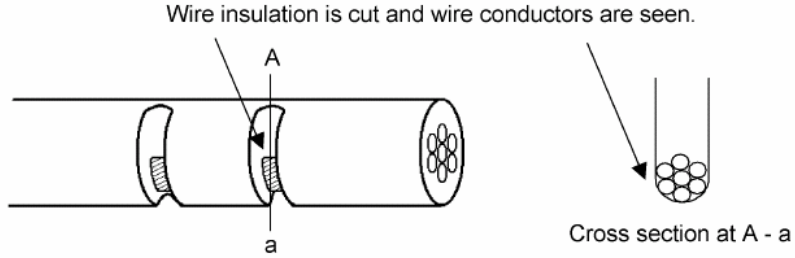


Fig.-13

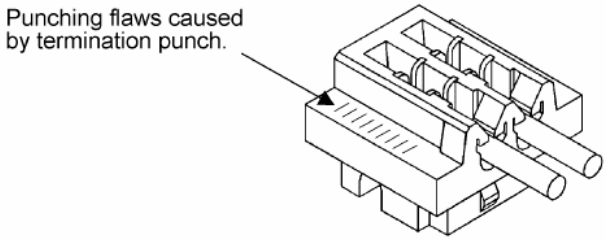


Fig.-14

8.4. Wire retention force

Pull termination wire in the direction of arrow in Fig.-15 and measure force by a push-pull gauge, etc. when wire comes off contact. (Wire retention force) Then, check that measured wire retention force satisfies specified value in Table.

Wire size	Material of insulation	Parallel	Perpendicular
AWG#30	PVC	8N min.	4N min.

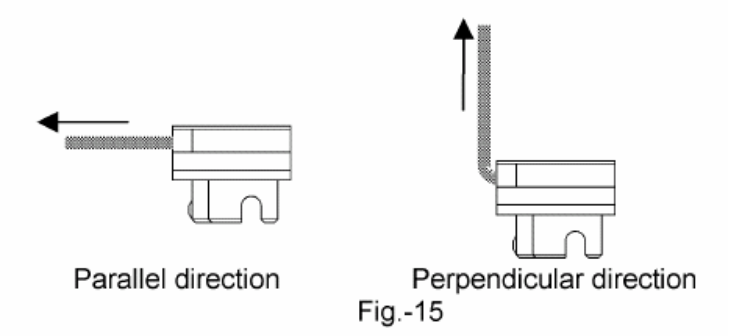


Fig.-15

8.5. Termination Appearance

Inspect the following points after termination.

8.5.1. 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.-16.

8.5.2. 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.-17.
In this case, not only contact but also termination die may be damaged.

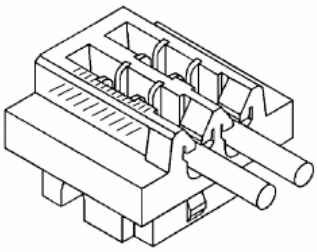


Fig.-16

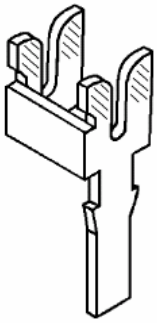


Fig.-17

8.5.3. Exposure of wire conductors around beams of contact；Wire conductors must not be exposed. When connector set position deviates to wire axis direction, wire conductors may expose in front or back of beams of contact as shown in Fig.-18.

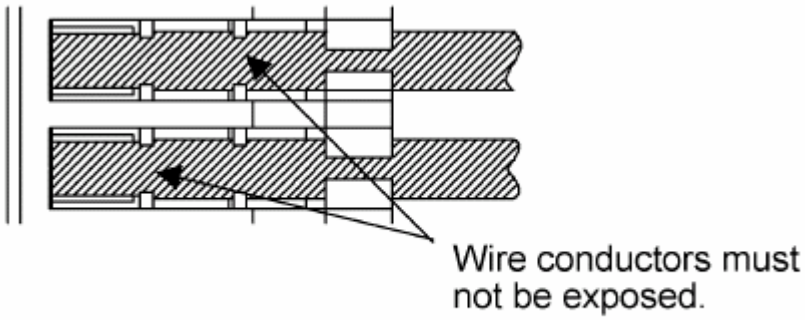


Fig.-18

8.5.4. Gap between housing wall and wire tip (Wire protruding length) Gap “G” between housing walls and wires tip in Fig.-19 should be 0.2 mm max.

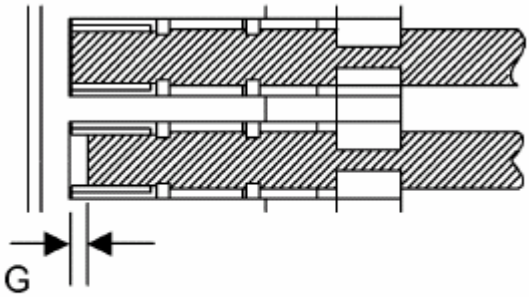


Fig.-19

8.5.5. Overrun of wire (Wire must not overrun) when wire tension is not adequate, overrun of wire may appear as shown in Fig.-20.

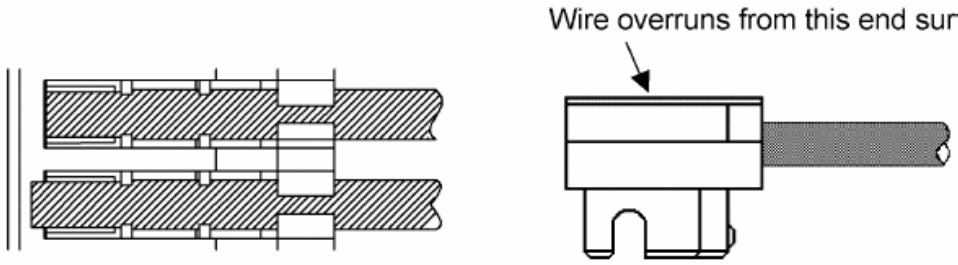


Fig.-20

8.5.6. 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.-21 and Fig.-22

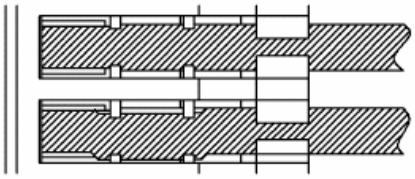


Fig.-21

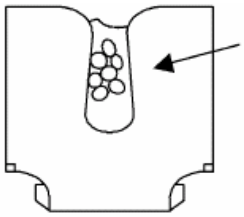


Fig.-22