SPECIFICATION

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SPEC. NO.: PS-51457-XXXXX-XXX **REVISION:** E

PRODUCT NAME: 0.8 mm PITCH WIRE TO BOARD CONNECTOR

PRODUCT NO: 51457/50208 SERIES

PREPARED:	CHECKED:	APPROVED:
HUAI,LIN	**XU,ZHI YONG**	**XU,ZHI YONG**
DATE: **2021.11.08**	DATE: **2021.11.08**	DATE: **2021.11.08**

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1 REVISION HISTORY

Rev.	ECN #	Revision Description	Prepared	Date
A	ECN-1911280	PROPOSAL	XU,BIN	2019.06.27
B	ECN-2003108	UPDATE CRIMPING CONDITION& MATING/UNMATING FORCE	XU,BIN	2020.04.27
C	ECN-000206	UPDATE MATING/UNMATING FORCE	XU,BIN	2020.08.12
D	ECN-002753	UPDATE CRIMPING CONDITION	XU,BIN	2021.03.23
E	ECN-004172	UPDATE ADD 51457 8PIN	HUAI,LIN	2021.11.08

2 SCOPE

This specification covers performance, tests and quality requirements for0.8mm Wire to Board connector. Aces's P/N: 51457/ 50208series.

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
4.2.2 Finish: Refer to the drawing
4.2.3 Housing: Thermoplastic or Thermoplastic High Temp., UL94V-0

4.3 Ratings

4.3.1 Voltage: 30 V AC ,DC
4.3.2 Current Rating: AWG#30: 1.0A (Per Pin)
AWG#32: 1.0A (Per Pin)
AWG#34: 0.2A (Per Pin)
AWG#36: 0.2A (Per Pin)
4.3.3 Operating Temperature : -25℃ 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	Initial:30 m Ω Max. per contact After tests: 50 m Ω Max. per contact	Mate connectors, measure by dry circuit, 20mV Max., 100mA Max. (EIA-364-23)
Insulation Resistance	100 M Ω Min.	Mated connectors, apply 100 V DC between adjacent terminals. (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max	Mated connectors, apply 200 VAC at sea level for 1 minute. between adjacent terminals. After tests, apply 100 VAC at sea level for 1 minute. between adjacent terminals. (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 METHOD 1,CONDITION 1)
MECHANICAL		
Item	**Requirement**	**Standard**
Durability	10 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 / Un-mating Forces	See Product Qualification and Test Sequence Group 2	Operation Speed： 25.4 ± 3 mm/minute.. Measure the force required to mate/Un-mate connector. (EIA-364-13)
Crimping Terminal / Housing Retention Force (Cable Side)	0.30Kgf Min.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the terminal assembled in the housing.

Crimping Pull Out Force (Cable Side)	AWG #30: 0.3Kgf Min. AWG #32: 0.3Kgf Min. AWG #34: 0.3Kgf Min. AWG #36: 0.3Kgf Min	Operation Speed： 25.4 ± 3 mm/minute. Fix the crimped terminal, apply axial pull out force on the wire.
Terminal/Housing Retention Force (Board Side)	0.3Kgf Min.	Operation Speed： 25.4 ± 3 mm/minute. Measure the contact retention force with Tensile strength tester
Fitting Nail/Housing Retention Force (Board Side)	0.3Kgf Min.	Apply axial pull out force at the speed rate of 25.4 ± 3 mm/minute. On the Fitting Nail assembled in the housing
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 Sequence Group 4	Pre Heat：150℃~180℃, 60~90sec. Heat：230℃ Min., 40sec Min. Peak Temp.：260℃Max, 10sec Max.
Thermal Shock	See Product Qualification and Test Sequence Group 4	Mate module and subject to follow condition for 25 cycles. 1 cycles: -55 ±3 ℃, 30 minutes +85 ±2 ℃, 30 minutes (EIA-364-32, test condition I)

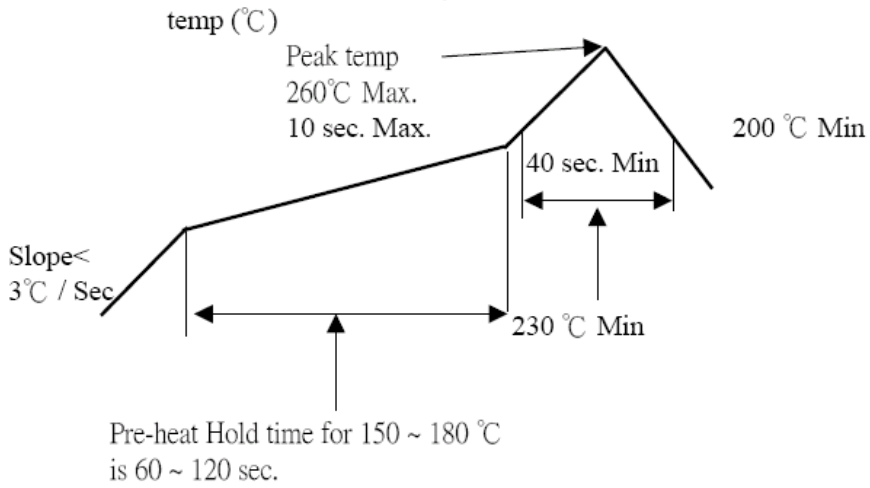
Humidity	See Product Qualification and Test Sequence Group 4	Mated Connector 40±2℃, 90~95% RH, 240 hours. (EIA-364-31,Condition A, Method II)
Temperature life	See Product Qualification and Test Sequence Group 5	Mated connectors to temperature life at 85±2℃ for 250 hours. (EIA-364-17, Test condition A)
Salt Spray	See Product Qualification and Test Sequence Group 6	Subject mated/unmated connectors to 5% salt-solution concentration, 35±2℃, Under the condition that the electroplating layer on the metal surface is not destroyed. (I) Gold flash for 8 hours (II) Gold plating 3 u" for 48 hours. (III) Gold plating 5 u" for 96 hours. (IV)Pure Tin for 48 hours
Solder ability (Board Side)	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℃, for3 ±0.5sec. (EIA-364-52)
Hand Soldering Temperature Resistance (Board Side)	Appearance: No damage	T≧350℃, 3sec at least.
Ammonia Gas	See Product Qualification and Test Sequence Group 13	Ammonia gas concentration 3 to 4% Temperature :20+2°C Humidity condition :90 to 95% Testing time (h) :7 (STM-1126-06)
H2S Gas	See Product Qualification and Test Sequence Group 14	The specimen shall be subjected to hydrogen sulfide gas of the following conditions. Concentration:3±1 ppm Temp.:40±2°C Relative Humidity : 80±5% Period: 96h

Note. Flowing Mixed Gas shell be conduct by customer request.

6 INFRARED REFLOW CONDITION

6.1. Lead-free Process

TEMPERATURE CONDITION GRAPH
(TEMPERATURE ON BOARD PATTERN SIDE)



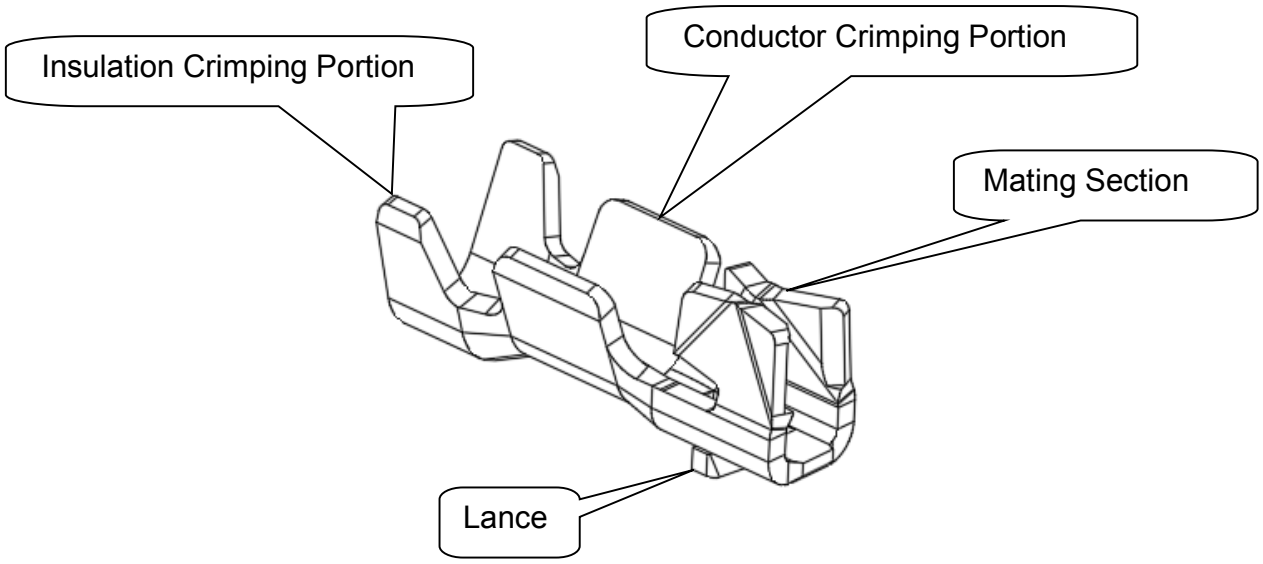
7 PRODUCT QUALIFICATION AND TEST SEQUENCE

Test or Examination	Test Group													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Test Sequence													
Examination of Product		1、6	1、5	1、7	1、6		1、3	1、3				1	1、3	1、4
Low Level Contact Resistance		2、7	2、6	2、10	2、9	1、3		4						2、5
Insulation Resistance				3、9	3、8									
Dielectric Withstanding Voltage				4、8	4、7									
Temperature rise	1													
Mating / Un-mating Forces		3、5												
Durability		4												
Crimping Terminal / Housing Retention Force(Cable Side)									1					
Crimping Pull Out Force (Cable Side)										1				
Terminal/Housing Retention Force(Board Side)											1			
Fitting Nail /Housing Retention Force(Board Side)											2			
Vibration			3											
Shock (Mechanical)			4											
Thermal Shock				5										
Humidity				6										
Temperature life					5									
Salt Spray						2								
Solder ability(Board Side)							2							
Resistance to reflow Soldering Heat(Board Side)								2						
Hand Soldering Temperature Resistance(Board Side)												2		
Stress corrosion/moist ammonia (NH3) Test													2	
H2S Gas														3
Sample Size	2	4	4	4	4	4	2	4	4	4	4	4	4	4

8 MATING / UNMATING FORCE

NO. OF Ckt.	At Initial		At 10th
	Mating(kgf max)	Un-mating(kgf min)	Un-mating(kgf min)
2~8	1.00	0.20	0.15
10~12	3.00	0.30	0.20
16	3.00	0.40	0.30

9 ANATOMY OF CRIMPING TERMINAL



10 APPLICABLE WIRES: UL10064 ETFE WIRE

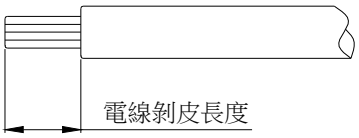
AWG Size:AWG#30 ~AWG#36 ,
Insulation OD: Φ0.5mm~Φ0.28mm

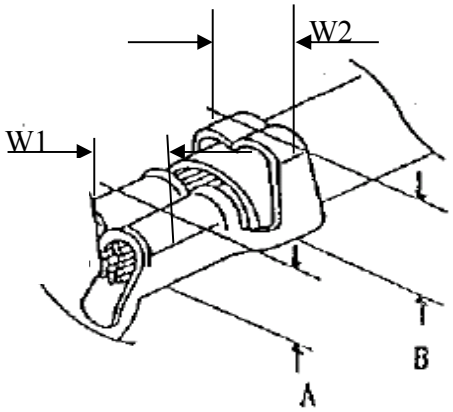
11 CRIMPING CONDITION

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
51457-TXXX-001	UL10064	30	0.5	0.45~0.51	0.95MAX	0.50~0.70	0.65MAX
51457-TXXX-001	UL10064	32	0.5	0.45~0.55	0.95MAX	0.55~0.65	0.65MAX
51457-TXXX-002	UL10064	32	0.39	0.36~0.44	0.95MAX	0.65~0.75	0.65MAX
51457-TXXX-002	UL10064	34	0.31	0.31~0.39	0.95MAX	0.55~0.65	0.65MAX
51457-TXXX-002	UL10064	36	0.28	0.38~0.48	0.95MAX	0.55~0.65	0.65MAX

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）

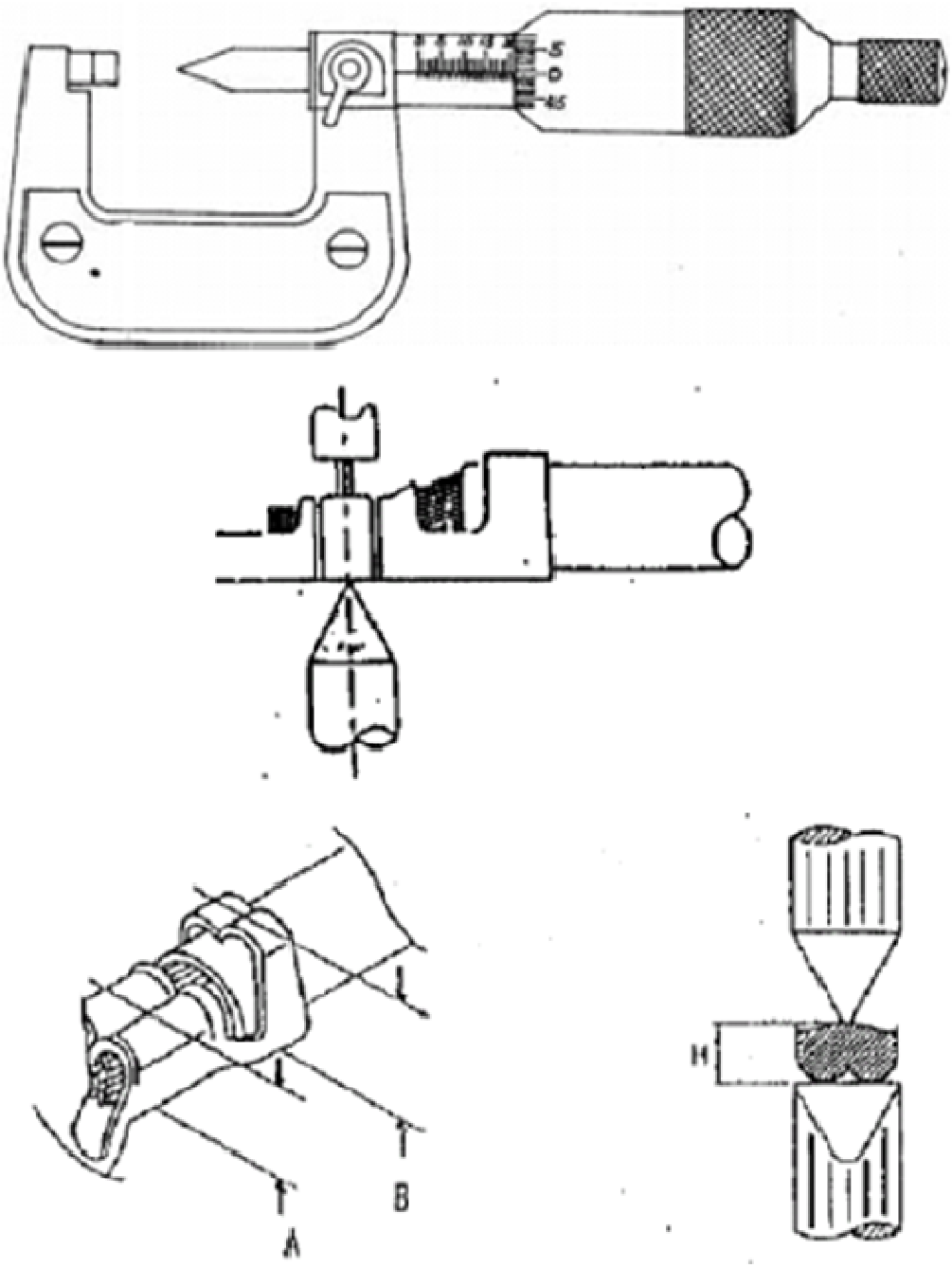
2、W2為電線外被部分鉚壓後之寬度(Insulation Crimping Width)：W2值如上表(參考值）

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）

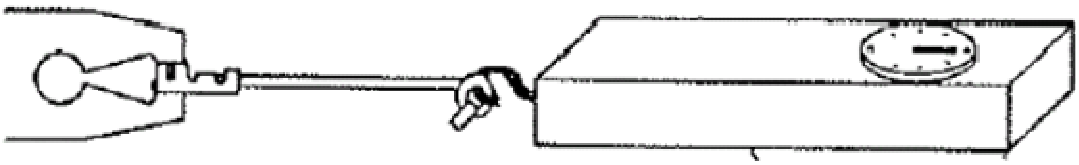
5、電線剝皮長度(Strip length)：1.5~1.9mm(參考值)

12 CRIMPING HEIGHT MEASUREMENT



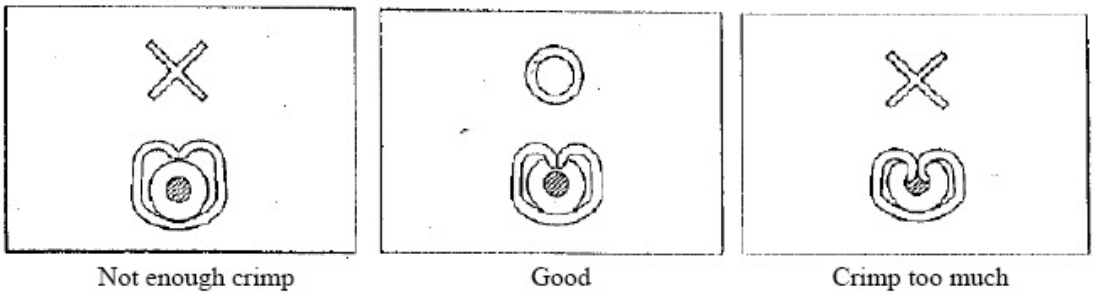
13 PULL FORCE OF CRIMPING SECTION MEASUREMENT

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

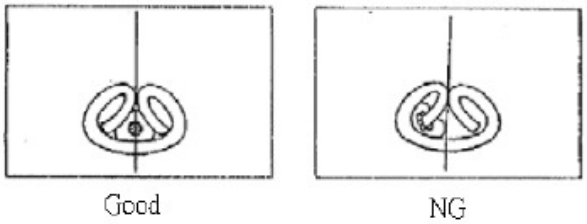


Pull Force of Crimp Section Measurement

14 STANDARD INSULATION CRIMPING

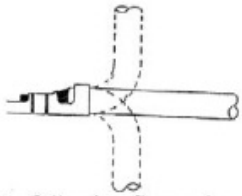


Not enough crimp | Good | Crimp too much



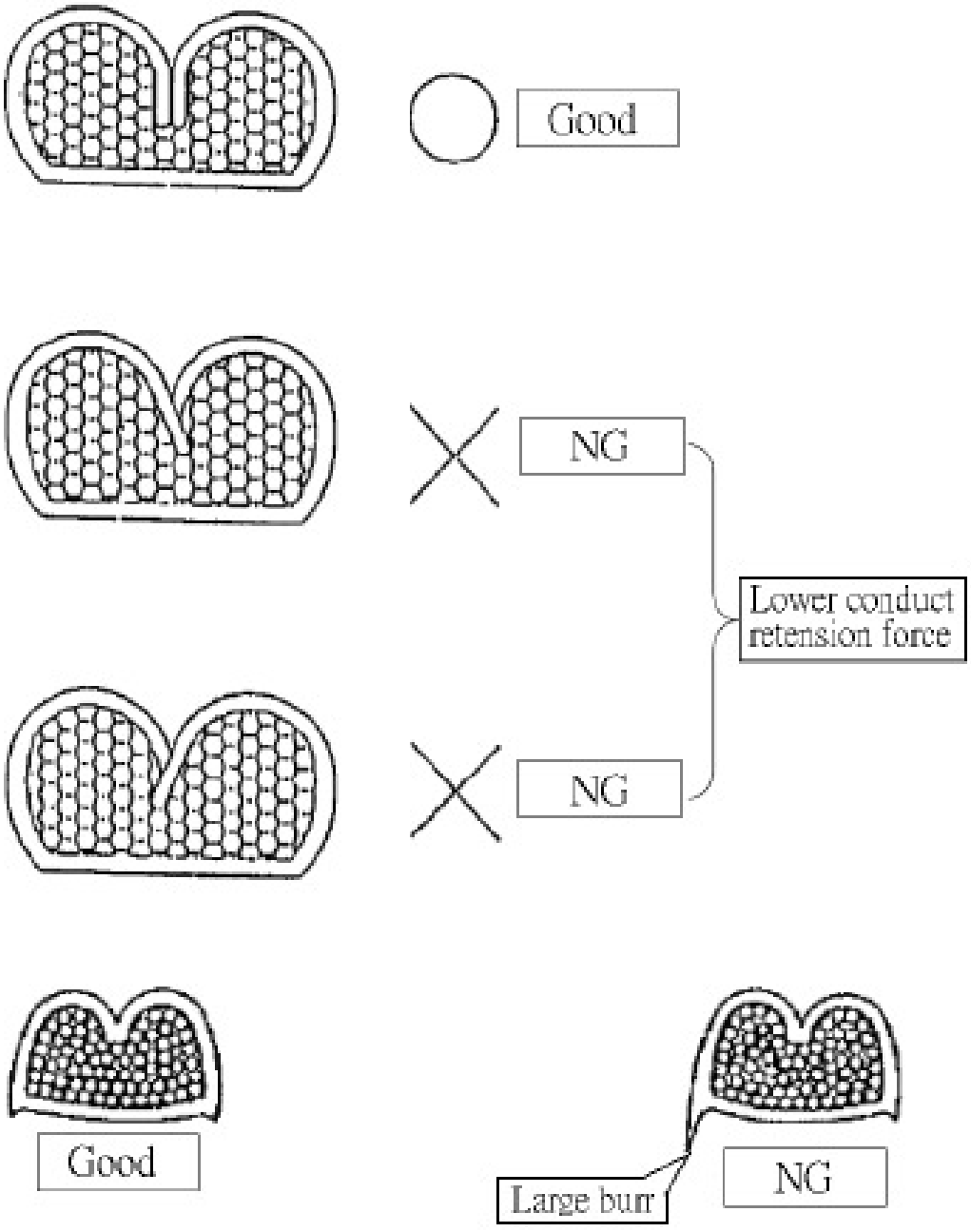
Good | NG

Insulation Crimp Condition

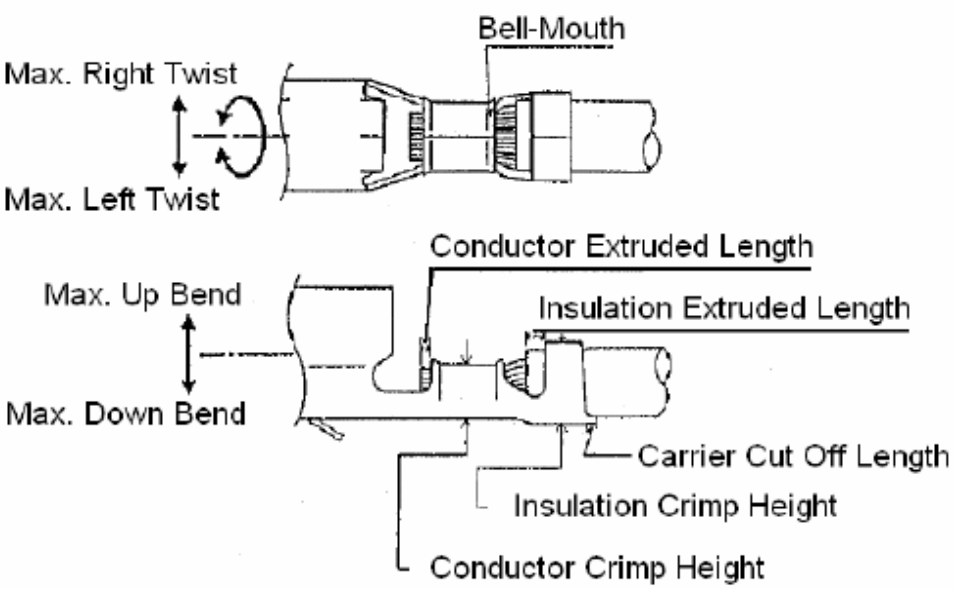


As following figure shown. It is no problem if wire bent up down 90 degrees 1 cycle and insulation position still in ideal position.

15 CONDUCTORS CRIMPING CONDITION



16 CRIMPING REQUIREMENT



Item	Range(Ref.)
Max. Up Bend	0°
Max. Down Bend	0°
Max. Left Twist	0°
Max. Right Twist	0°
Bell-Mouth Length	0.1~0.3mm
Carrier Cut Off Length	0~0.2mm
Conductor Extruded Length	0.05~0.15mm

17 HANDLING PRECAUTION

17.1 Mating Method of Connector

Mate the socket with the header straightly on the same axis. When the position of the mating part of the header is aligned with that of the socket, align one side of the mating part of the header with the end of the socket within 20 degrees as shown in Fig-1. At that time, do not mate the connector deeply at the angle over 20 degrees because such defect as connector breakage is likely to occur.

As far as the wire only is hold in the alignment, undue load not apply to the connector.

After the header is aligned with the socket, holding the wire, press the socket straightly into the innermost.

Besides, after the mating operation, check that there is no clearance between the header and the socket as shown in Fig-2, because such defect as electrical discontinuity is likely to occur.

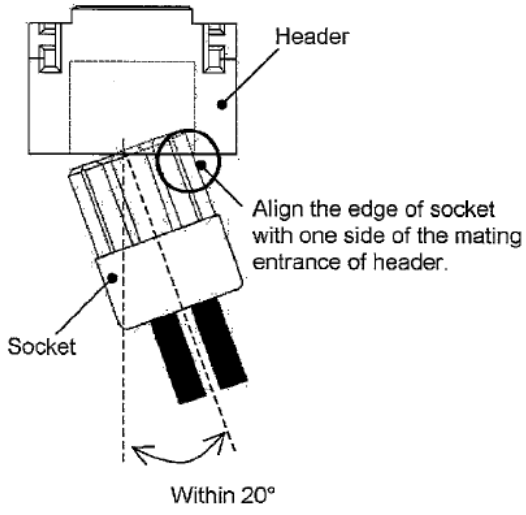


Fig.-1: Alignment of connector at the mating entrance

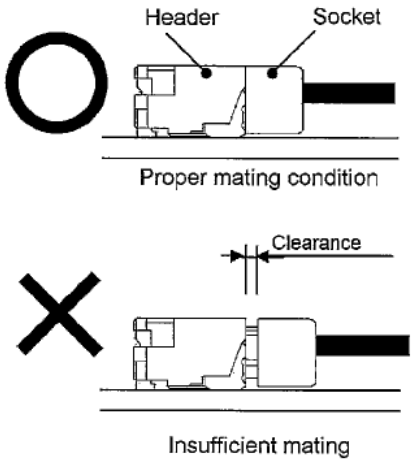


Fig.-2: Connector mating condition

17.2 Unmating Method of Connector

Hold the wires in a bundle and unmate the socket from the header on the same axis.
At this time, conduct the operation within 15 degrees to the mating axis.
Do not pry out the socket forcibly more than 15 degrees, because such handling may cause such defect as breakage of connector.
If the socket is unmated with holding the wire around the end circuit of one side, such handling is the same as prying-out connector.

Be sure to hold all wires in unmating the connector, because the wire is likely to come off of the socket.

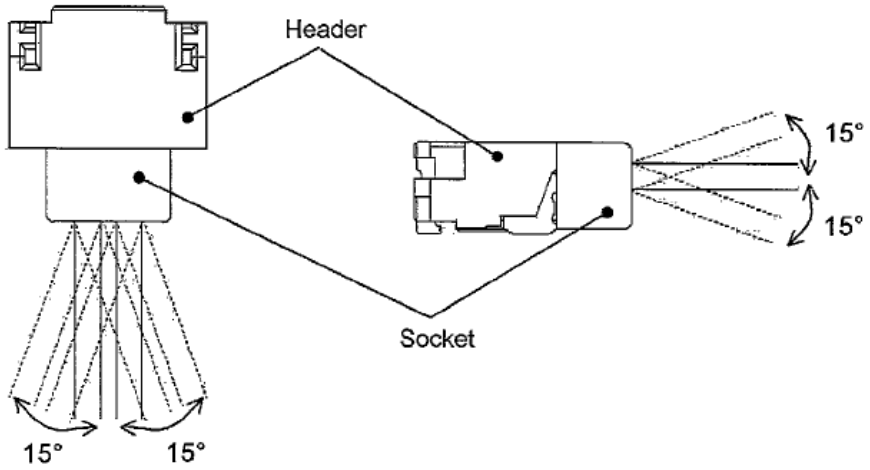
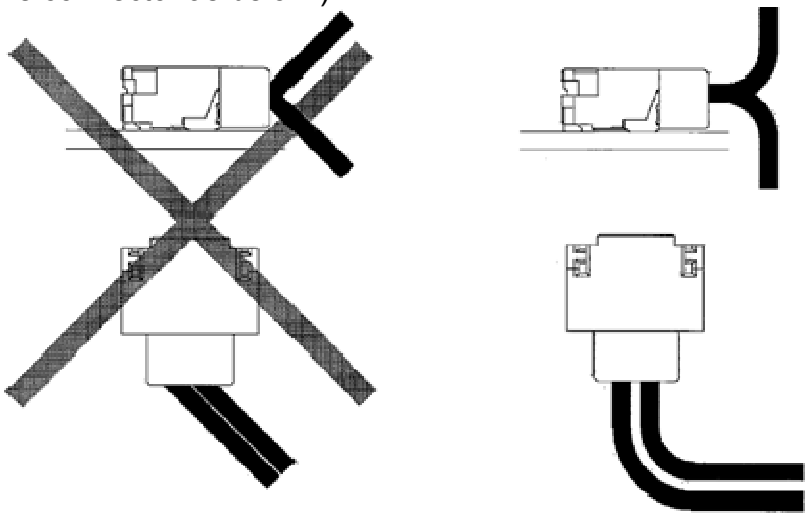


Fig.-3: Unmating method of connector

17.3 Routing of wire

Make allowance so that power more than the tension applied by bending the wire is not applied to the connector when you handle the wire.

(Provide a space above the connector in order to from the wire by bending and do not apply tension to the connector as below.)



18 ACES APPLICATION SOP

When the IDC cable after crimping , we suggest that the IDC Cable can be glued .This can ensure better wire pull out force.