



## SPECIFICATION

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SPEC. NO.: PS-52242-XXXXX-XXX REVISION: D

PRODUCT NAME: 0.8 mm PITCH WIRE TO BOARD CONNECTOR

PRODUCT NO: 52242/52243/52353 SERIES

PREPARED:  Tsai, Wang Kun  DATE: 2023.05.22	CHECKED:  K.HISATOMI  DATE: 2023.05.22	APPROVED:  Huang, Kuo Hua  DATE: 2023.05.22
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## 1 REVISION HISTORY

Rev.	ECN #	Revision Description	Prepared	Date
1	ECN-002311	NEW PROJECT SPEC FOR APD1090531	Tsai, Wang kun	2021.01.29
2	ECN-005652	ADD CURRENT RATING INFORMATION ADD CRIMPING INFORMATION ADD PROTRUSION TYPE UNMATING METHOD OF CONNECTOR	Tsai, Wang kun	2021.10.15
A	ECN-007304	Requirement of Durability modify	Tsai, Wang kun	2022.03.09
B	ECN-010193	ADD AWG28 INFORMATION	Tsai, Wang kun	2022.10.25
C	ECN-011263	ADD CRIMPING CONDITION INFORMATION	Tsai, Wang kun	2023.02.01
D	ECN-012506	ADD CRIMPING CONDITION INFORMATION	Tsai, Wang kun	2023.05.22

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## 2 SCOPE

This specification covers performance, tests and quality requirements for 0.8mm Wire to Board connector. ACES's P/N: 52242/ 52243/**52353** series.

## 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

Refer to the drawing

### 4.3 Ratings

- 4.3.1 Voltage: 30 V AC ,DC
- 4.3.2 Current Rating: Maximum current (Per Pin)

	AWG#28	AWG#30	AWG#32	AWG#34	AWG#36
2~5pin	1.7A	1.4A	1.2A	1.0A	0.7A
6~10pin	1.4A	1.2A	1.0A	0.8A	0.5A

(Please use the wire to adapt to the current)

- 4.3.3 Operating Temperature : -55°C to +85°C

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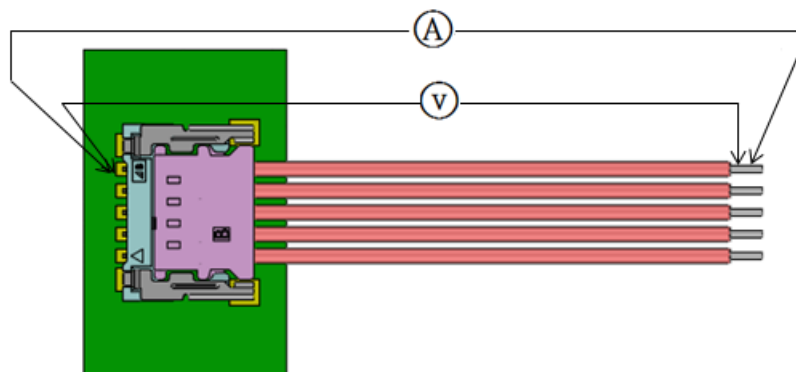
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## 5 PERFORMANCE

### 5.1. Test Requirements and Procedures Summary

Item	Requirement	Standard
Examination of Product	Product shall meet requirements of applicable product drawing and specification.	Appearance, dimensional and functional per applicable quality inspection plan.
<b>ELECTRICAL</b>		
Item	Requirement	Standard
Low Level Contact Resistance	Initial: 30 mΩ max. per contact After tests: 50 mΩ max. per contact	Mated connectors: measure by dry circuit. Current : 100mA max. Voltage : 20mV max. (EIA-364-23)
Insulation Resistance	100 MΩ Min.	Mated connectors: Apply voltage between adjacent terminals. Voltage : DC100V (EIA-364-21)
Dielectric Withstanding Voltage	No discharge, flashover or breakdown. Current leakage: 1 mA max	Mated connectors: Apply voltage for 1 minute between adjacent terminals. Voltage : Initial AC200V After test AC100V (EIA-364-20)
Temperature rise	30°C Max. (Rising temperature)	Mated connectors: Measure the temperature rise when a rated current is applied to the all terminals series. The ambient condition is still air at 25°C (EIA-364-70 METHOD 1, Condition 3)



Contact resistance measurement method  
(Subtract the conductor resistance of the wire from the measured value)

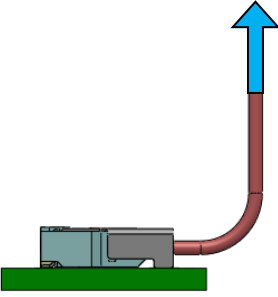
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<b>MECHANICAL</b>		
<b>Item</b>	<b>Requirement</b>	<b>Standard</b>
Durability	Appearance : No damage Contact Resistance : 50 mΩ max. Unmating force : see page 10	Mating and Untaing the sample a predetermined number of times. Number of cycles : 10 cycles (EIA-364-09)
Mating / Un-mating Forces	Please see page 10	Measure the force required to mate/Un-mate connector. Operation Speed : 25.4 ± 3 mm/minute. (EIA-364-13)
Crimping Terminal / Housing Retention Force (Cable Side)	3.5N MIN.	Pull out the terminal assembled in the housing in the axial direction. Operation Speed : 25.4 ± 3 mm/minute.
Crimping Pull Out Force (Cable)	AWG #28 : 10N min. AWG #30 : 5N min. AWG #32 : 3N min. AWG #34 : 3N min. AWG #36 : 3N min.	Pull the terminal crimped only on the core wire in the axial direction. Operation Speed : 25.4 ± 3 mm/minute.
Terminal/Housing Retention Force (Board Side)	3.0N MIN.	Pull out the terminal assembled in the housing in the axial direction. Operation Speed : 25.4 ± 3 mm/minute.
Connector tensile strength	8.0N MIN.  	Mated connectors: Pull the wire vertically until the connector breaks Operation Speed : 25.4 ± 3 mm/minute.
Vibration	Discontinuity : 1 μs max. Appearance : No damage Contact Resistance : 50 mΩ max.	Mated connectors: Check the discontinuity by applying 100mA to all terminals during the test. Frequency : 10~55~10Hz (Round trip 1 minute) Amplitude : 1.52mmp-p Time : 2 hours × 3 axes (EIA-364-28 Condition I)

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Shock (Mechanical)	Discontinuity : 1 $\mu$ s max. Appearance : No damage Contact Resistance : 50 m $\Omega$ max.	Mated connectors: Check the discontinuity by applying 100mA to all terminals during the test . Acceleration : 50G (Half-sine) Duration : 11ms Number of times : 3 times $\times$ $\pm$ 3 axes (18 times in total) (EIA-364-27, Condition A)
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**ENVIRONMENTAL**

Item	Requirement	Standard						
Resistance to Reflow Soldering Heat	Appearance : No damage	Pre Heat : 150°C~180°C, 60~90sec. Heat : 230°C Min., 40sec Min. Peak Temp. : 260°CMax, 10sec Max.						
Thermal Shock	Appearance : No damage Contact Resistance : 50 m $\Omega$ max. Insulation Resistance : 100 M $\Omega$ Min. Dielectric Withstanding Voltage : No discharge, flashover or breakdown	Mated connectors: Cycles : 25 cycles 1 cycle <table border="1" style="margin-left: 20px;"> <tr> <th><math>^{\circ}</math>C</th> <th>minutes</th> </tr> <tr> <td>-55 +0/-3</td> <td>30</td> </tr> <tr> <td>85 +3/-0</td> <td>30</td> </tr> </table> (EIA-364-32, Condition I)	$^{\circ}$ C	minutes	-55 +0/-3	30	85 +3/-0	30
$^{\circ}$ C	minutes							
-55 +0/-3	30							
85 +3/-0	30							
Humidity	Appearance : No damage Contact Resistance : 50 m $\Omega$ max. Insulation Resistance : 100 M $\Omega$ Min. Dielectric Withstanding Voltage : No discharge, flashover or breakdown	Mated Connectors: Temperature : 40 $\pm$ 2°C Humidity : 90~95% RH Time : 240 hours (EIA-364-31,Condition A)						
Temperature life	Appearance : No damage Contact Resistance : 50 m $\Omega$ max.	Mated Connectors: Temperature : 85 $\pm$ 2°C Time : 250 hours (EIA-364-17, Test condition A)						
Salt Spray	Appearance : No damage Contact Resistance : 50 m $\Omega$ max.	Mated Connectors: After taking out from the test chamber, soak in running water and dry for 12 hours. Temperature : 35+2°C Salt water concentration :5% Time : 8 hours (EIA-364-26)						
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	Soak in solder bath. Temperature : 245 $\pm$ 5°C Time : 4-5 sec. (EIA-364-52)						
Hand Soldering Temperature Resistance (Board Side)	Appearance: No damage	T $\geq$ 350°C, 3sec at least.						

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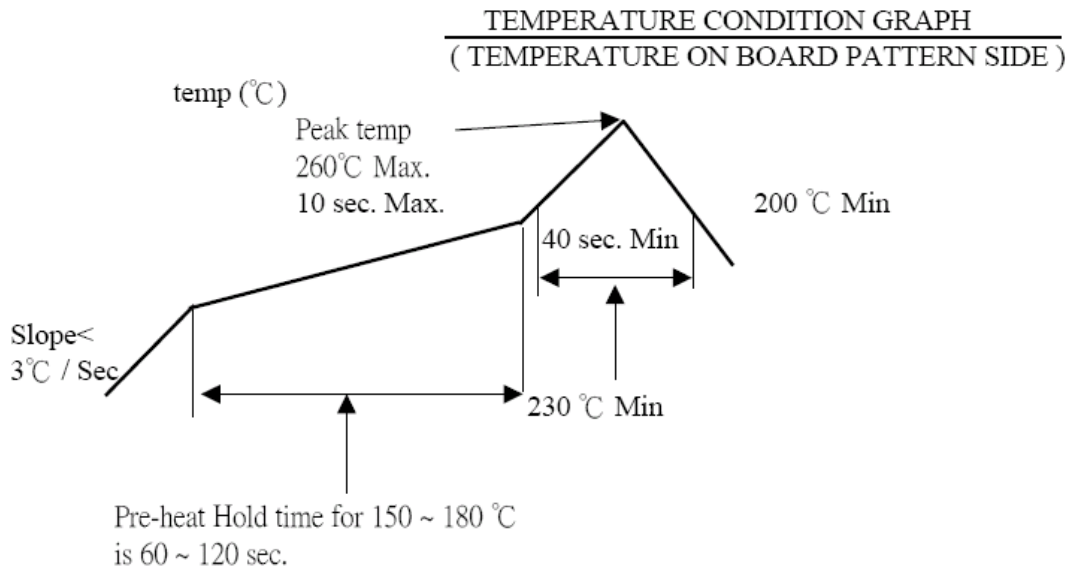
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Ammonia Gas	Appearance: No damage	Mated Connectors: Ammonia water concentration :3% Temperature : 20+2°C Humidity condition : 90 to 95% Time : 7 hours
H2S Gas	Appearance : No damage Contact Resistance : 50 mΩ max.	Mated Connectors: Concentration:3±1 ppm Temp.: 40±2°C Humidity : 80±5% RH Time : 96h

**Note.** Flowing Mixed Gas shall be conduct by customer request.

**6 INFRARED REFLOW CONDITION**

6.1. Lead-free Process





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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	13	14	15
	Test Sequence														
Examination of Product		1,6	1,5	1,6,11	1,4	1,4	1,3	1,4		1,3	1,3	1,3	1	1	1
Low Level Contact Resistance		3,7	2,6	2,7,12	2,5	2,5		2,5					3		
Insulation Resistance				3,8,13											
Dielectric Withstanding Voltage				4,9,14											
Temperature rise	1														
Mating / Un-mating Forces		2,4,8													
Durability		5													
Crimping Terminal / Housing Retention Force(Cable Side)									1						
Crimping Pull Out Force (Cable)										2					
Terminal/Housing Retention Force(Board Side)											2				
Connector tensile strength															2
Vibration			3												
Shock (Mechanical)			4												
Thermal Shock				5											
Humidity				10											
Temperature life					3										
Salt Spray						3									
Ammonia Gas							2								
H2S Gas								3							
Solder ability(Board Side)												2			
Resistance to reflow Soldering Heat(Board Side)													2		
Hand Soldering Temperature Resistance(Board Side)														2	
Sample Size	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

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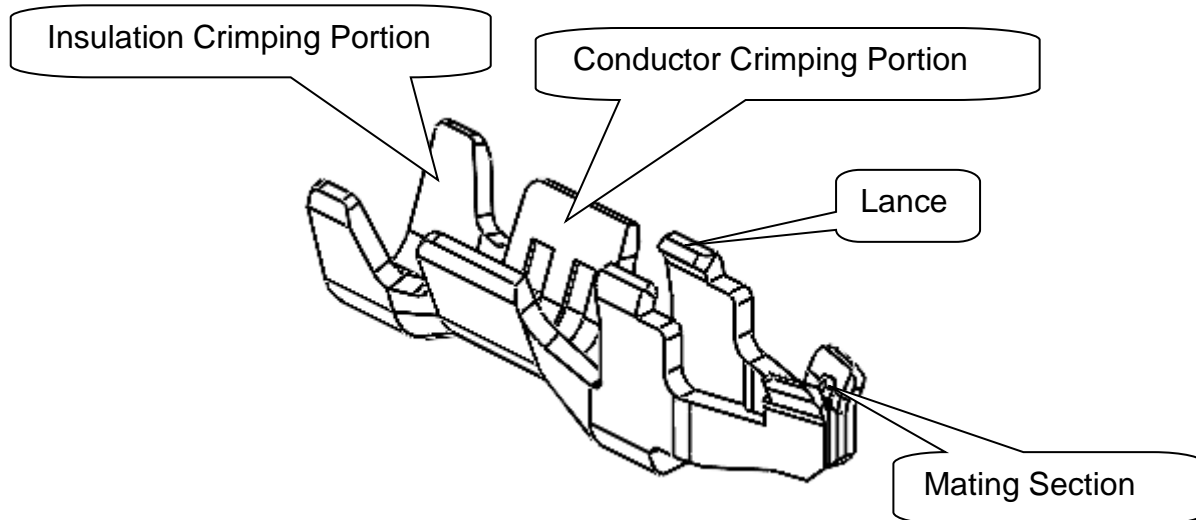
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## 8 MATING / UNMATING FORCE

NO. OF Ckt.	At Initial		At 10th
	Mating(N max)	Un-mating(N min)	Un-mating(N min)
2	12.0	2.0	1.5
3	12.0	2.0	1.5
4	12.0	2.0	1.5
5	15.0	2.0	1.5
6	15.0	2.3	2.0
7	15.0	2.3	2.0
8	20.0	2.6	2.2
9	20.0	2.6	2.2
10	25.0	3.0	2.5

## 9 ANATOMY OF CRIMPING TERMINAL



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### 10 APPLICABLE WIRES: UL10064 ETFE WIRE

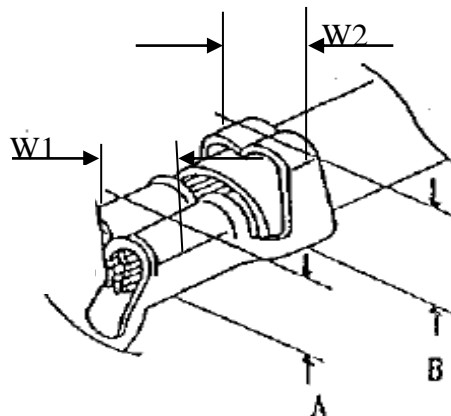
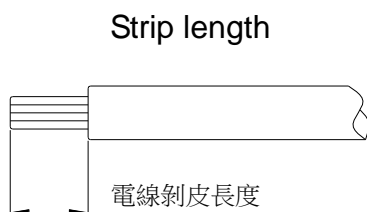
AWG Size: AWG#28 ~AWG#36 ,  
Insulation OD:  $\Phi$ 0.88mm~ $\Phi$ 0.28mm

### 11 CRIMPING CONDITION

#### 鉚線條件表 CRIMPING CONDITION

Part Number	Wire Specification			Term terminal Height (mm) (including burrs)		Term terminal width (mm) (including burrs)	
	UL Style (REF.)	AWG Size	Insulation OD(mm)	Conductor area A	Insulation area B	Conductor area W1	Insulation area W2
52243-TXXX-001	UL10064	28	0.6	0.45~0.52	0.85 MAX.	0.55~0.6	0.6~0.65
52243-TXXX-001	UL10064	30	0.5	0.42~0.47	0.75 MAX.	0.55~0.6	0.6~0.65
52243-TXXX-001	UL10064	32	0.5	0.4~0.45	0.75 MAX.	0.55~0.6	0.6~0.65
52243-TXXX-002	UL10064	32	0.38	0.4~0.45	0.6 MAX.	0.55~0.6	0.6~0.65
52243-TXXX-002	UL10064	34	0.31	0.32~0.37	0.55 MAX.	0.55~0.6	0.6~0.65
52243-TXXX-002	UL10064	36	0.28	0.3~0.35	0.5 MAX.	0.55~0.6	0.6~0.65

If the width of W1 or W2 exceeds 0.65mm, it may interfere with the housing and may not fit.



Note:

- 1、W1為芯線導體鉚壓後之寬度(Conductor area Crimping Width)：W1值如上表(Reference)
- 2、W2為電線外被部分鉚壓後之寬度(Insulation area Crimping Width)：W2值如上表(Reference)
- 3、A為芯線導體鉚壓後之高度(Conductor area Crimping height)：A值如上表(Reference)

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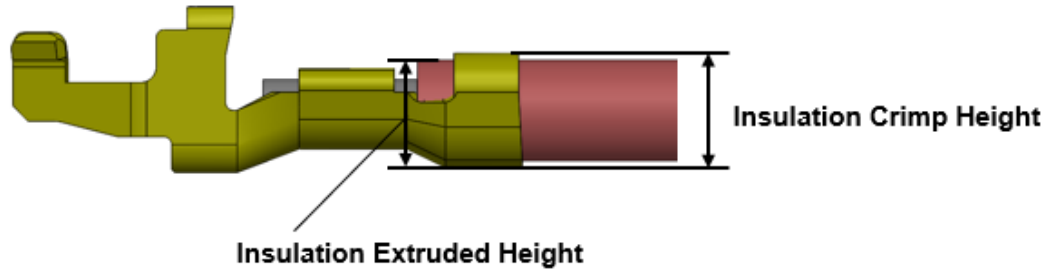
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4、B為電線外被鉚壓後之高度(Insulation area Crimping height) : B值如上表(Reference)

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

**Insulation Extruded Height must not be higher than Insulation Crimp Height**



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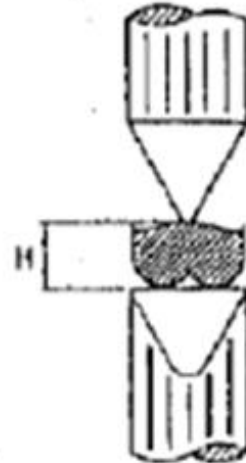
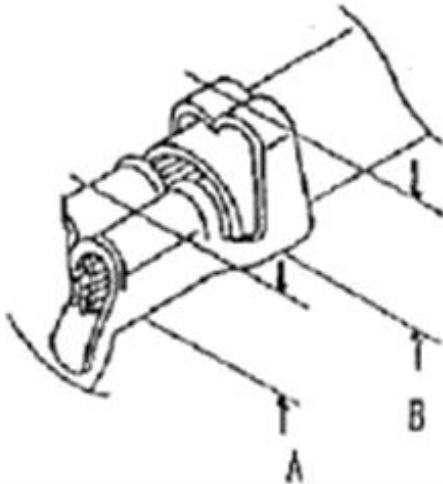
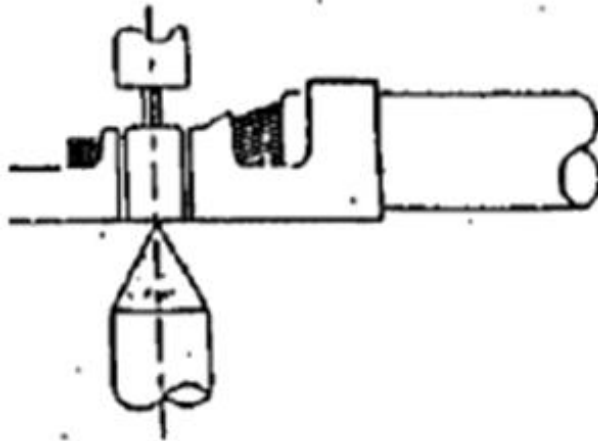
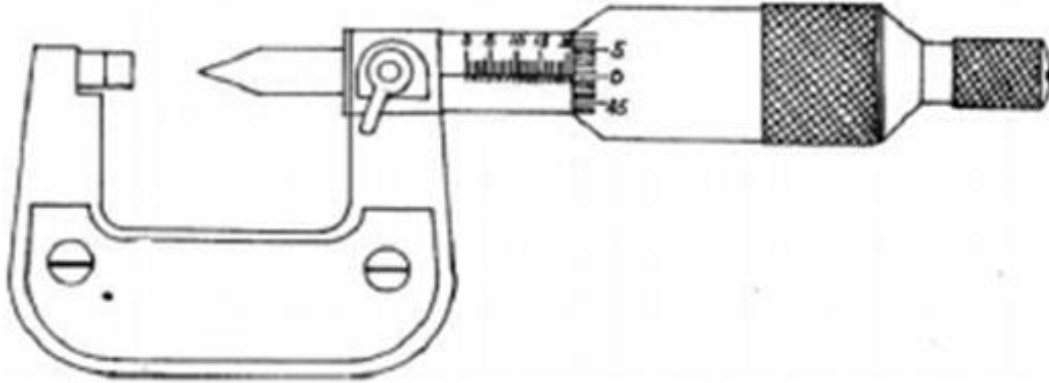
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## 12 CRIMPING HEIGHT MEASUREMENT



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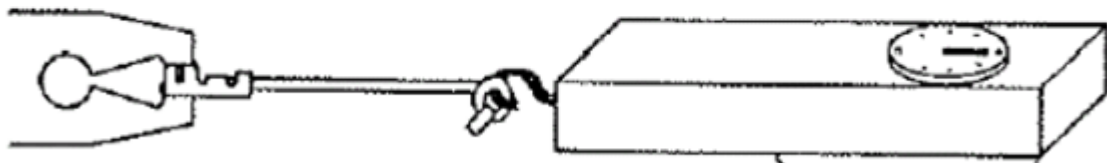
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### 13 PULL FORCE OF CRIMPING SECTION MEASUREMENT

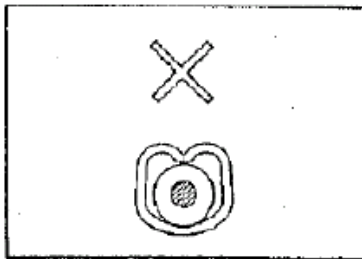


Before test samples, please measure crimp height and do not crimp insulation.

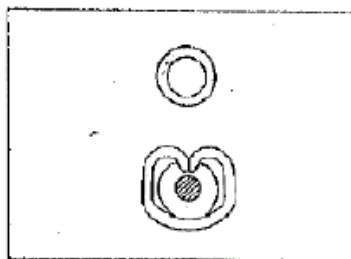


Pull Force of Crimp Section Measurement

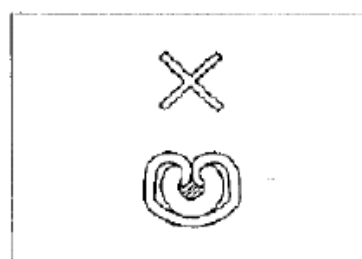
### 14 STANDARD INSULATION CRIMPING



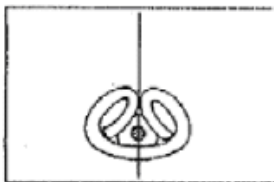
Not enough crimp



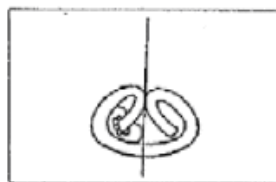
Good



Crimp too much

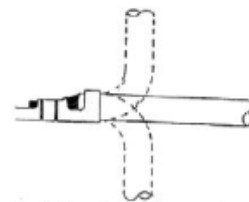


Good



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.

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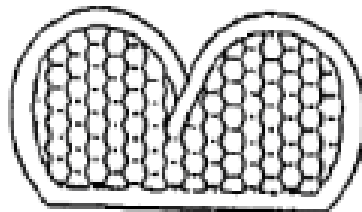
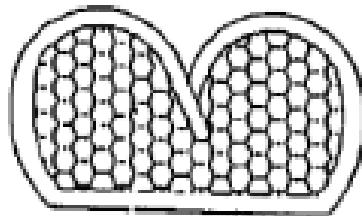
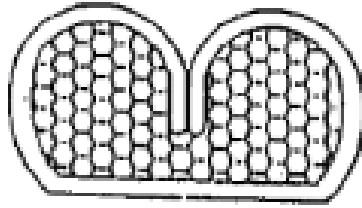
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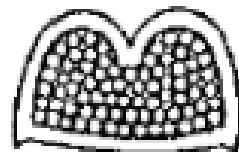
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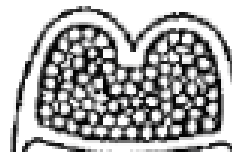
### 15 CONDUCTORS CRIMPING CONDITION



Lower conduct  
retension force



Good



Large burr

NG

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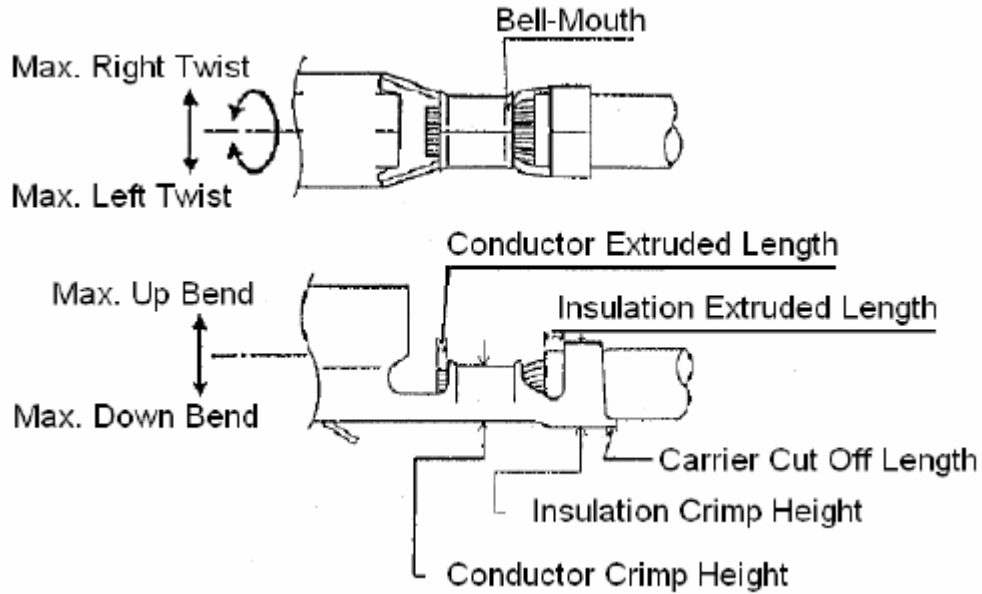
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## 16 CRIMPING REQUIREMENT



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

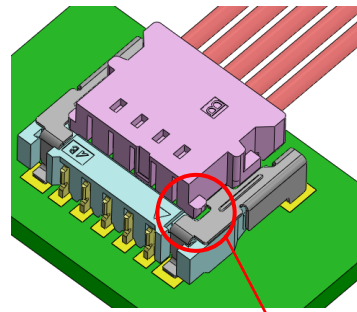
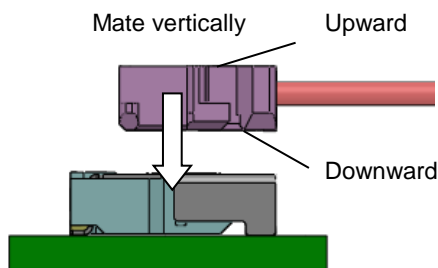


## 17 HANDLING PRECAUTION

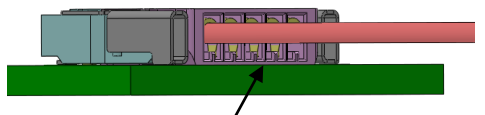
### 17.1 Mating Method of Connector

When mating the connector, mate the cable side connector to the board side connector from directly above. Refer to the figure for alignment of connectors. Push the cable side connector until it hits the board surface.

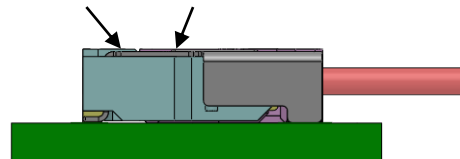
Also, after mating, make sure there is no gap [A] between the Cable connector and PCB connector.



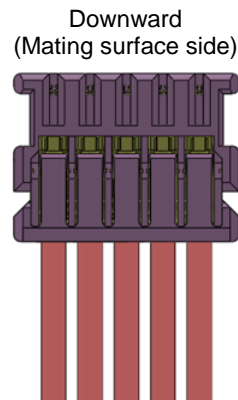
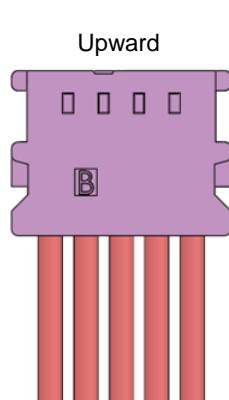
Align the metal protrusion on the PCB connector with the recess on the Cable connector.



Push in until it hits the board surface



Push in until the PCB connector and Cable connector are at the same height.



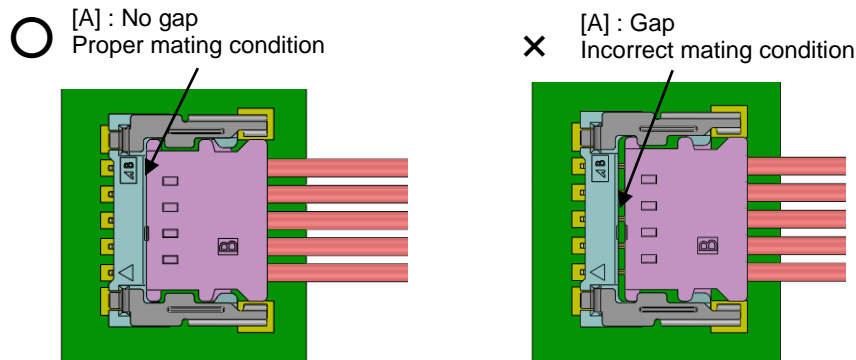
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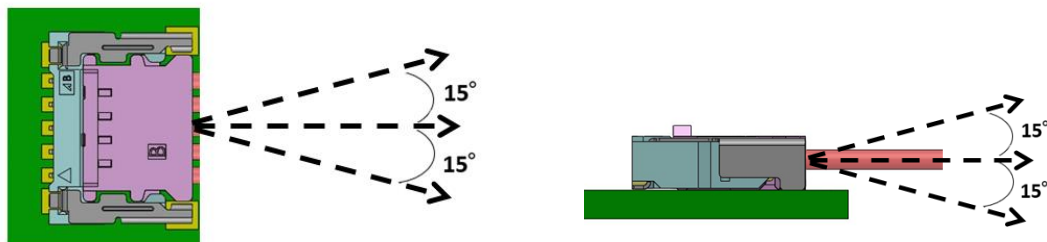


17.2 Unmating Method of Connector

When unmating the connector, bundle the wires together, hold them together, and pull them straight out in the axial direction of the wires. Be sure to hold the wires together for all the terminals and pull. At this time, pull out at an angle of 15 ° or less with respect to the wire axis direction. If the angle is more than 15 °, it may cause damage. If pull the wires without bundling them together, the wires may be damaged or come off.



(52243 HOUSING-NO PROTRUSION)



(52243 HOUSING-WITH PROTRUSION)

TITLE: **0.8 mm PITCH WIRE TO BOARD**

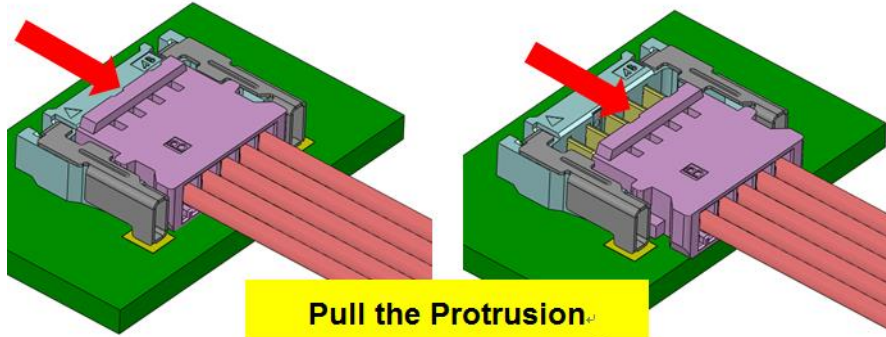
RELEASE DATE: 2023.05.22

REVISION: D

ECN No: ECN-012506

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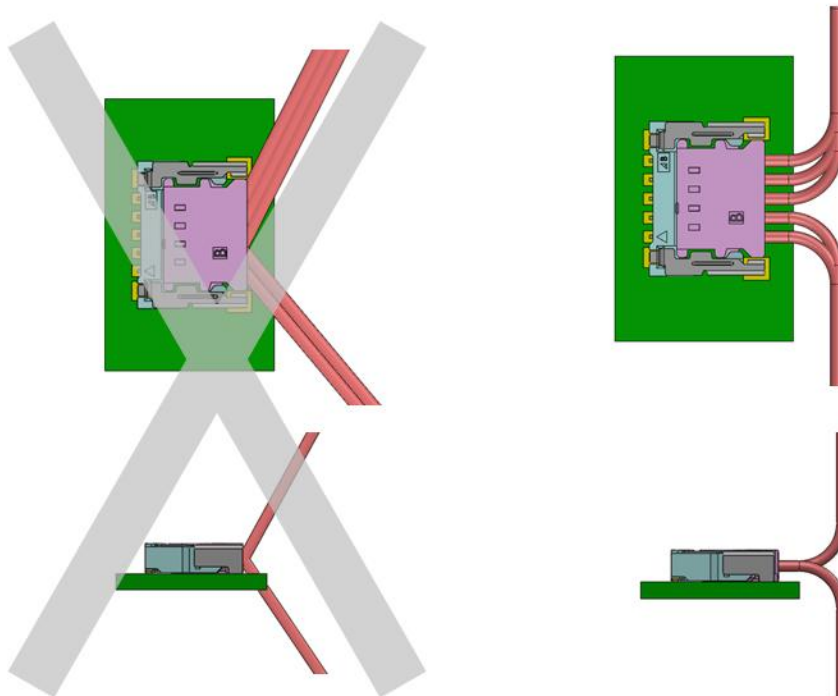
Protrusion type (Mating high: 1.80mm)



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 form the wire by bending and do not apply tension to the connector as below.)



TITLE: **0.8 mm PITCH WIRE TO BOARD**

RELEASE DATE: 2023.05.22

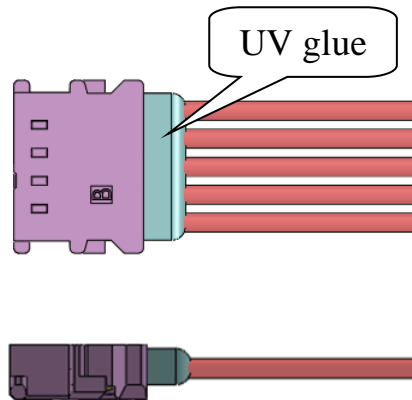
REVISION: D

ECN No: ECN-012506

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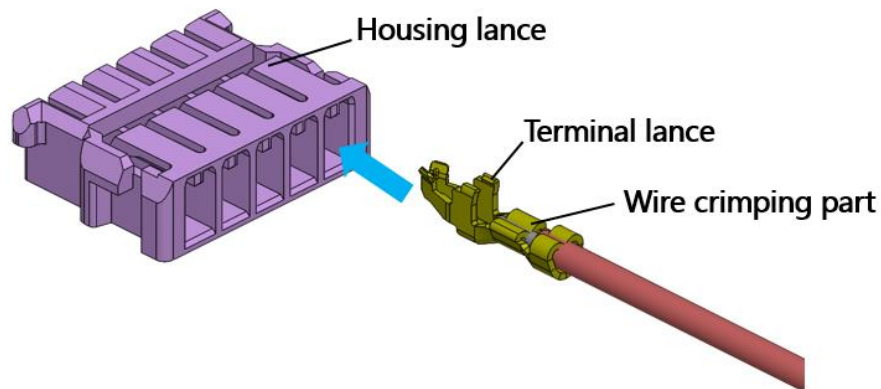
### 18 ACES APPLICATION SOP

It is recommended that the wires of the crimp terminals be glued or bundled with tape. Do not allow the adhesive to stick out of the Housing. It becomes in the way of mating.



Do not protrude below this.

When assembling the crimp terminal into the housing, the orientation of the crimp terminal lance and the housing lance should be the same.



That the terminal lance is caught on the housing lance

