



## SPECIFICATION

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SPEC. NO.: PS-51495-xxxxx-xxx REVISION: F

PRODUCT NAME: 0.40mm PITCH LVDS CONNECTOR

PRODUCT NO: 51495、51496

PREPARED:  <b>Jia-Hong Xu</b>  DATE: <b>2023/08/31</b>	CHECKED:  <b>Yung-Huang Liu</b>  DATE: <b>2023/08/31</b>	APPROVED:  <b>Kuo-Hua Huang</b>  DATE: <b>2023/08/31</b>
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**1 Revision History**

Rev.	ECN NO.	Revision Description	Prepared	Date
A	ECN-000416	NEW PRODUCT RELEASE	JH.XU	2020/09/18
B	ECN-000986	SALT SPRAY(ONLY FOR GOLD PLATING) ADD 15u” GOLD PLATING	JH XU	2020/11/11
C	ECN-002576	SALT SPRAY(ONLY FOR GOLD PLATING) ADD 10u” GOLD PLATING MATING FORCE AND UN-MATING FORCE ADD 20 PIN	JH.XU	2021/03/17
D	ECN-012279	ADD AWG#33 cable specification	JH.XU	2023/05/04
E	ECN-013186	ADD 51495-002/51496-MB type	JH.XU	2023/07/20
F	ECN-013325	Change current definition, Operating Temperature	JH.XU	2023/08/31

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## 2 SCOPE

This specification covers performance, tests and quality requirements for 0.40 mm pitch LVDS connector.

## 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

4.2.1 Terminal: High performance copper alloy (Corson Alloy)

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 Shell:

Receptacle: Copper Alloy, Finish: Refer to the drawing.

Cable: Stainless, Finish: Refer to the drawing.

4.2.4 Applicable Cable

Micro Coaxial: AWG#(44 、 42 、 40 、 38 、 36)

Discrete: AWG#(34 、 36)

High Speed Cable: AWG#(33)

### 4.3 Ratings

4.3.1 Voltage: 100 Volts AC (per contact)

4.3.2 Current: 0.15A AC/DC [AWG#44] (per contact pin/Up to 60 contacts)

0.24A AC/DC [AWG#42] (per contact pin/Up to 49 contacts)

0.3A AC/DC [AWG#40] (per contact pin/Up to 38 contacts)

0.5A AC/DC [AWG#38] (per contact/Up to 19 contacts)

0.8A AC/DC [AWG#36] (per contact/Up to 12 contacts)

1.0A AC/DC [AWG#34] (per contact/Up to 10 contacts)

1.1A AC/DC [AWG#33] (per contact/Up to 8 contacts)

4.3.3 Operating Temperature : -40°C to +105°C.

4.3.4 Operating Humidity : 85% max

### 4.4 Storage Conditions

4.4.1 Storage temperature : -25°C~60°C

4.4.2 Storage humidity: 85% max.(Non-condensing)

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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.
<b>ELECTRICAL</b>		
Item	Requirement	Standard
Low Level Contact Resistance	Initial : 160mΩMAX.(AWG#33) 180mΩMAX.(AWG#34) 275mΩMAX.(AWG#36) 360mΩMAX.(AWG#38) 600mΩMAX.(AWG#40) 700mΩMAX.(AWG#42) 1080mΩMAX.(AWG#44) After test : ΔR 40mΩ MAX. Ground Shell Initial : 50mΩ MAX.. After testing : ΔR 40mΩ MAX.	According to EIA-364-23  Solder the receptacle connector to the test board and mate the plug connector together, than measure the contact resistance as shown in <u>Fig.1</u> by the four terminal methods. Apply the low level condition of 20 mV MAX. DC for the open circuit voltage and 100mA MAX. DC for the closed circuit current.
	Initial contains the following conductor resistance of a cable 100mm. 80mΩMAX.(AWG#33) 100mΩMAX.(AWG#34) 195mΩMAX.(AWG#36) 280mΩMAX.(AWG#38) 520mΩMAX.(AWG#40) 620mΩMAX.(AWG#42) 1000mΩMAX.(AWG#44)	
Insulation resistance	Initial: 1000MΩ MIN. After testing: 500 MΩ MIN.	According to EIA-364-21  Mate the plug and receptacle connectors together, and then apply 250 V DC between inner contact and the ground contact.
Dielectric Withstanding Voltage.	No discharge, flashover or breakdown. Current leakage: 1 mA max.	According to EIA-364-20  250 VAC Min. at sea level for 1 minute.

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		Test between adjacent contacts of unmated connectors.
Temperature rising	Over ambient $\Delta T$ 30°C MAX.	According to EIA-364-70, Method1,Condition1  Mate connector: measure the temperature rise at rated current until temperature stable. The ambient condition is still air at 25°C  The ambient condition is still air at 25°C

**MECHANICAL**

Item	Requirement	Standard
Mating force and Un-mating force.	See <b>Table.1.</b>	According to EIA-364-13 Method A  Operation Speed : 25.4 ± 3 mm/minute.. Measure the force required to mate/un-mate connector.
Durability	Contact resistance : Shall meet Electrical Low Level Contact Resistance	According to EIA-364-09  Solder the receptacle connector to the test board, then place the board and plug on the push-on/pull-off machine, and repeat mating and un-mating 30cycles at a speed 25±3mm/min. Along the mating axis.
Contact retention force	Receptacle contact retention force: 0.2N MIN.	According to EIA-364-29  Place the connector on the push-on/pull off machine, then apply force on the contact head and push the contact along the direction opposite to the contact insertion at a speed of 25±3mm/min. Measure the force when the contact dislodges the

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		connector.
Cable retention force	20P:9.8 N MIN. 30P:14.7 N MIN. 40P:19.6 N MIN.	According to EIA-364-29  Place the plug connector on the push-on/pull-off machine and then apply force on the cable along the direction at a speed $25\pm 3$ mm/min. Measure the force when the cable dislodged.
Vibration	1 $\mu$ s Max.	According to EIA-364-28 Condition I  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.
Shock (Mechanical)	1 $\mu$ s Max.	According to EIA-364-27, test condition A  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.

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NO. OF Ckt.	Initial		After 30 <sup>th</sup> Cycle	
	Mating Force (Max.)	Un-mating Force (Min.)	Mating Force (Max.)	Un-mating Force (Min)
40	40N / 4.0Kgf	4.0N / 0.4kgf	40N / 4.0Kgf	4.0N / 0.4kgf
30	34N / 3.5Kgf	3.0N / 0.3Kgf	34N / 3.5Kgf	3.0N / 0.3Kgf
20	25N / 2.5Kgf	2.0N / 0.2Kgf	25N / 2.5Kgf	2.0N / 0.2Kgf

**Table.1**

<b>ENVIRONMENTAL</b>		
<b>Item</b>	<b>Requirement</b>	<b>Standard</b>
Thermal shock	Contact resistance: Shall meet Low Level Contact Resistance. Insulation resistance: Shall meet Insulation resistance Dielectric withstanding voltage: Shall meet Dielectric Withstanding Voltage. Appearance: No abnormality	According to EIA-364-32 Mate module and subject to follow condition for 5 cycles. 1 cycles: -55 +0/-3 °C, 30 minutes <b>+105</b> +3/-0 °C, 30 minutes
Temperature life	Contact resistance: Shall meet Low Level Contact Resistance. Contact retention force: Shall meet 5.2(MECHANICAL).3. Appearance: No abnormality	According to EIA-364-17 Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment. Temperature: <b>105</b> ±2°C Duration: 250 hours.
Humidity(Steady state)	Contact resistance: Shall meet Low Level Contact Resistance. Insulation resistance: Shall meet Insulation resistance. Dielectric withstanding voltage: Shall meet Dielectric Withstanding Voltage. Appearance: No abnormality	According to EIA-364-31 Method II Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment Temperature: 40±2°C Humidity:90~95%RH Duration: 240 hours

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Humidity(Cycling)	<p>Contact resistance: Shall meet Low Level Contact Resistance.          Insulation resistance: Shall meet Insulation resistance.          Dielectric withstanding voltage: Shall meet Dielectric Withstanding Voltage.          Appearance: No abnormality</p>	<p>According to EIA-364-31 Method III test, without Shock &amp; Vibration section.          Solder the receptacle connector to the test board, then mate plug connector, and expose them to the following environment          Temperature: 25~65°C          Humidity:90~98%RH          Duration: 10cycles (240hours)</p>
Salt spray(Only for Gold Plating)	<p>Contact resistance: Shall meet Low Level Contact Resistance.          Appearance: No abnormality</p>	<p>According to EIA-364-26          Subject mated connectors to 5% salt-solution concentration, 35°C          (I) Gold plating 1u” for 8 hours          (II) Gold plating 3 u” for 48 hours.          (III) Gold plating 10 u” for 96 hours.          (IV) Gold plating 15 u” for 96 hours.</p>
Resistance to Reflow Soldering Heat	<p>Contact resistance: Shall meet Low Level Contact Resistance.          Appearance: No abnormality</p>	<p>According to EIA-364-56          Pre Heat : 150°C~180°C, 60~120sec.          Heat : 230°C Min., 40sec Min.          Peak Temp. : 260°CMax, 10sec Max.          Reflow number cycle: 2 times</p>
Solder ability	<p>More than 75% of the dipped surface shall be evenly wet</p>	<p>According to EIA-364-52          And then into solder bath, Temperature at 245 ±5°C, for 4-5 sec.</p>
Hand Soldering Temperature Resistance	<p>Appearance: No damage</p>	<p>T ≥ 350°C, 3sec at least.</p>

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



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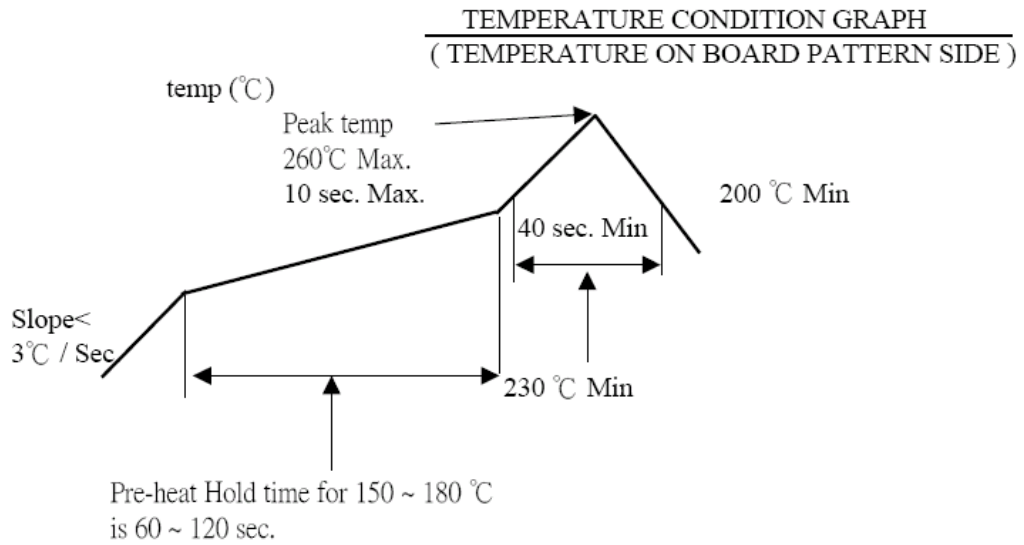
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## 6 INFRARED REFLOW CONDITION

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
Examination of Product	1,10	1,5	1,4,7	1,9	1,5	1,9	1,11	1,5	1,3	1,3	1,3	1,3
Low level Contact Resistance	3,7		2,5,8	2,6	2,4	2,6	2,6,8	2,4				
Insulation Resistance				3,7		3,7	3,9					
D. W. Voltage				4,8		4,8	4,10					
Temperature rising											2	
Mating Force	2,6											
Un-mating Force	4,8											
Durability	5						5 (10cycles)					
Contact Retention Force		2,4										
Cable Retention Force	9											
Vibration			3									
Shock			6									
Thermal Shock				5								
Temperature Life		3			3							
Humidity (Steady State)						5						
Humidity(Cycling)							7					
Salt spray(Only for Gold Plating)								3				
Solder ability									2			
Soldering Heat Resistance										2		
Hand Soldering Temperature Resistance												2
Sample Size	4 Pcs.	20 Pos.	4 Pcs.	4 Pcs.	4 Pcs.	4 Pcs.	4 Pcs.	4 Pcs.	2 Pcs.	2 Pcs.	2 Pcs.	2 Pcs.

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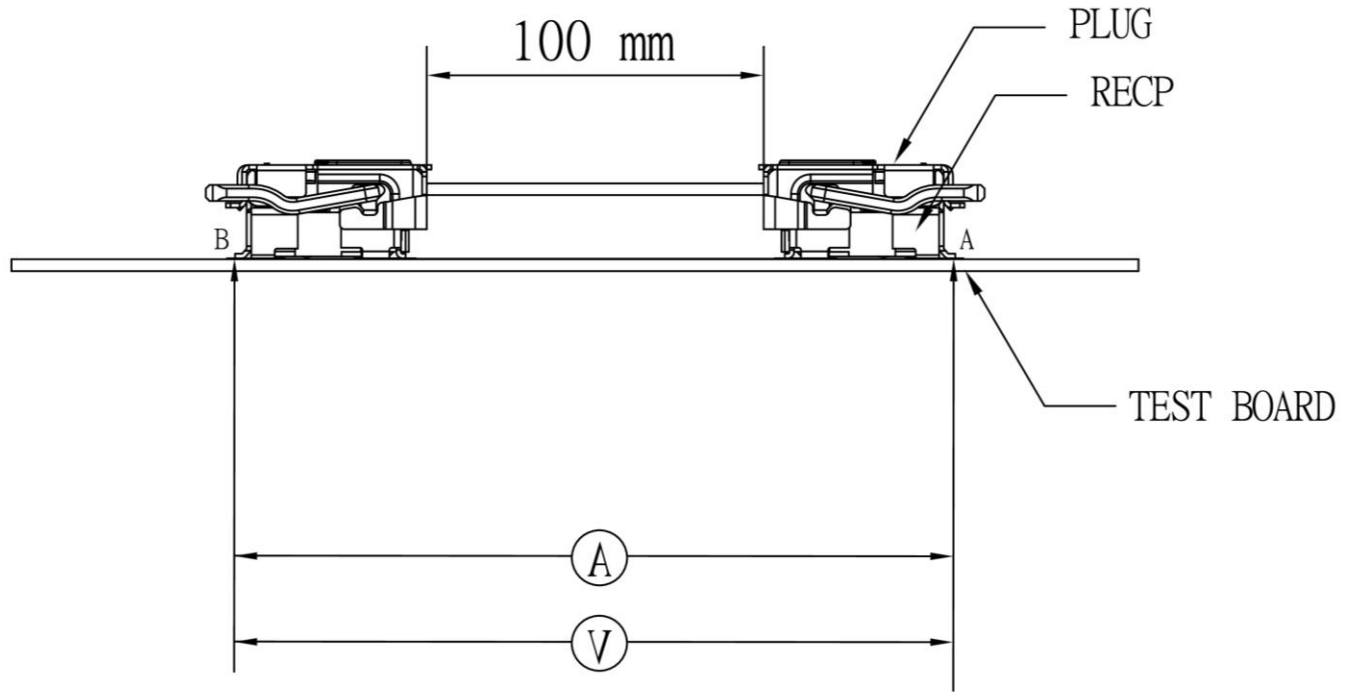
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**8 Recommended Metal Mask**

Recommended thickness of METAL MASK:  $t=0.10\text{mm}$ .

Refer to drawing for the recommended metal mask opening dimension.

**9 Precautions for Handling Cable Connectors**



(Contact Resistance) =  $R_{AB}$

**Fig.1 Contact Resistance**

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**10 Instruction Manual**

10.1 Connector Name, Part number.

	Product Name	Part NO.
The cable side connector	0,4mm Pitch WTB LVDS connector Plug	51496-xxxxx-xxx 51496-Mxxx-xxx
The PCB side connector	0.4mm Pitch LVDS. Rcpt.	51495-xxxxx-xxx

10.2 Names of each part of the connector.

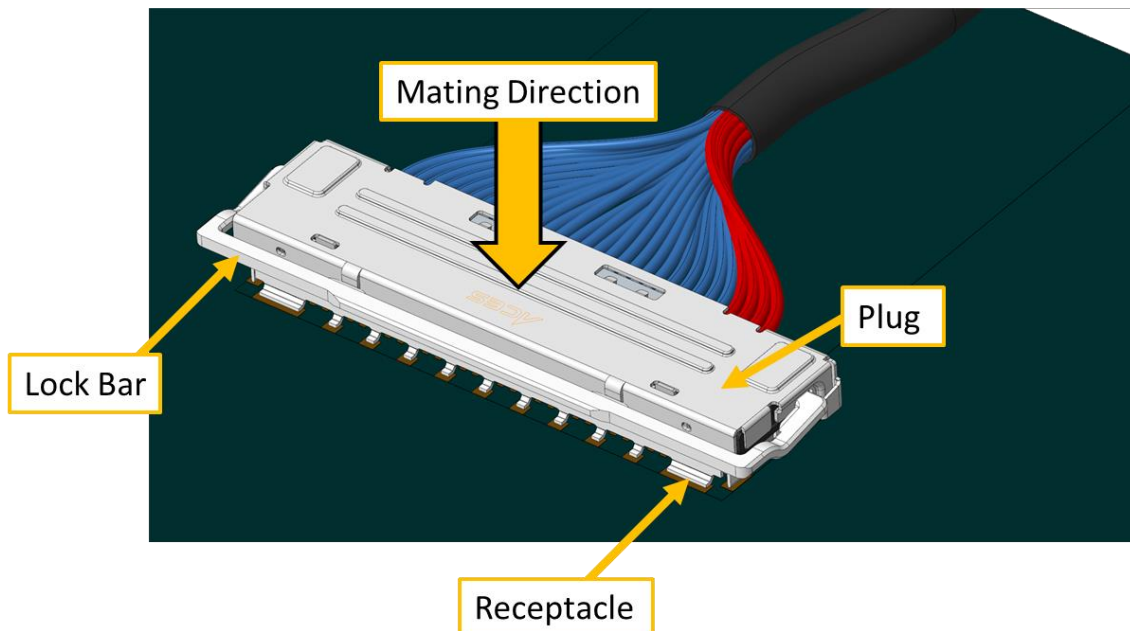


Fig.2

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10.3 Connector Insertion Manual  
10.3.1 Which direction to mate.

As shown in Fig.3, make sure place cable is soldered tail side.

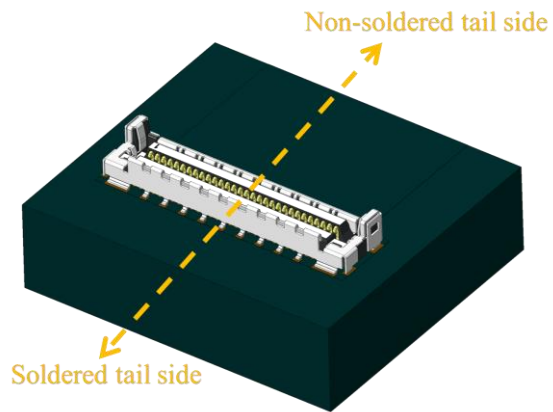


Fig.3

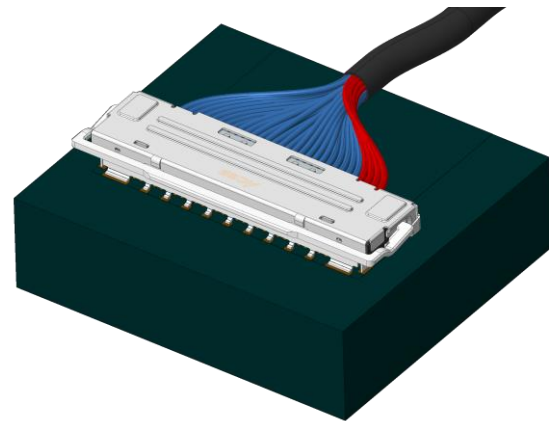


Fig.4 Correct Connector Mating View

CAUTION

Do not mate the connector while cable is at soldered tail side.

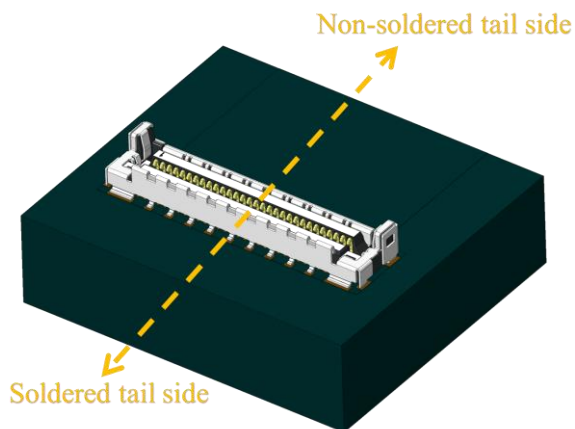
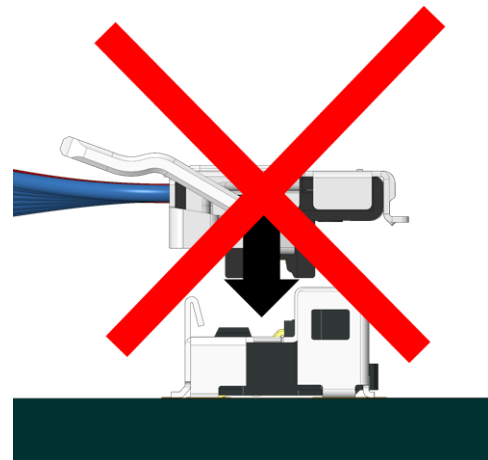


Fig.5



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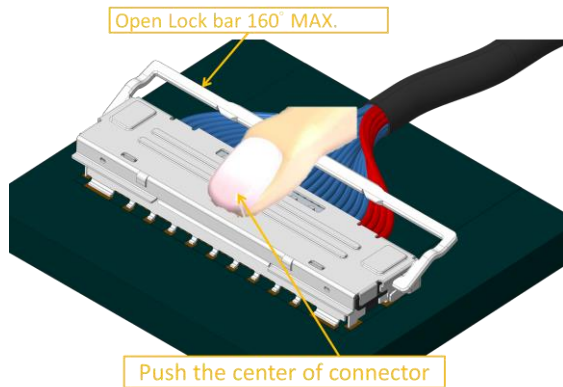
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10.4 How to mate

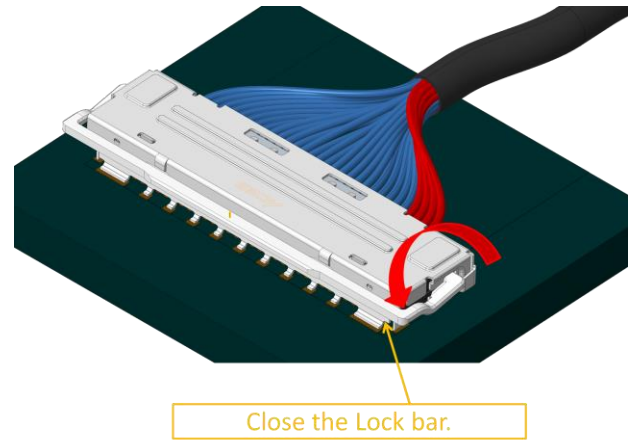
Open the Lock Bar first. Push the center of cable connector vertically until it clicks.

The clicking shows the mating completion. [Fig.6]

Close Lock Bar make sure Plug and Receptacle complete locked. [Fig.7]



**Fig.6**



**Fig.7**

**CAUTION**

·A support shall be designed and placed under PCB in order to prevent PCB from being deformed when cable connector is inserted with a pressing.

· The initial connector insertion angle allowance is given in Fig.8. Please set so that it becomes parallel without applying excessive force afterwards. Do not force to press cable connector when the insertion angle is out of this allowance angle.

Note 1. One side mating: Receptacle and plug mating slot side wall are touched on one end.

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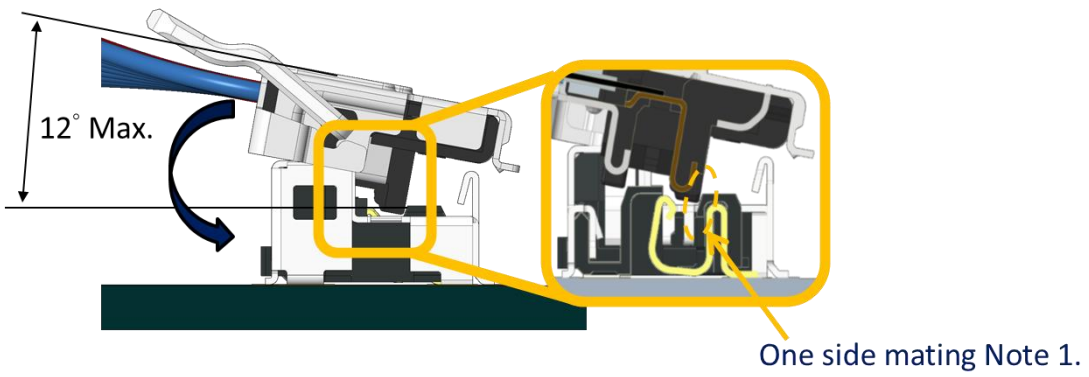
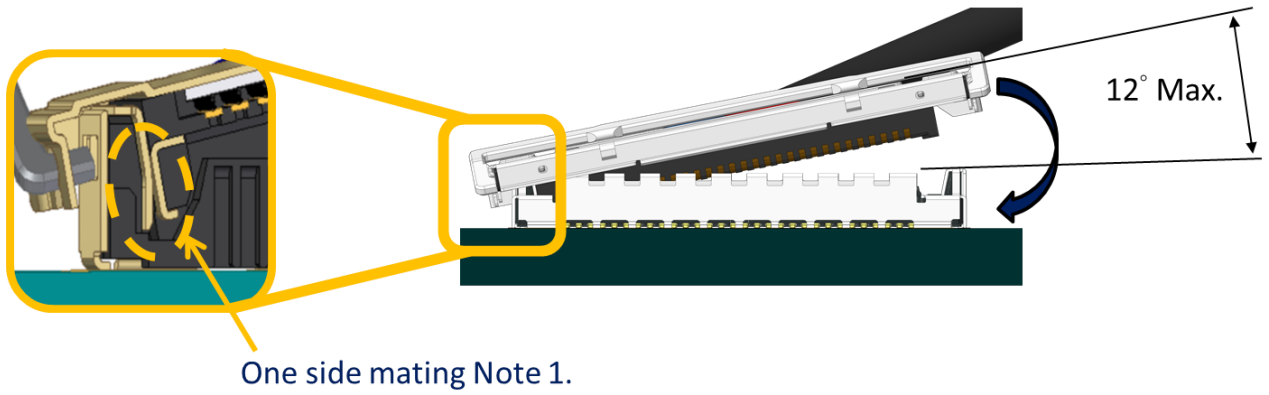


Fig.8 Insertion angle allowance

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10.4.1 How to Withdraw Cable Connector by finger.

① Lift a lock cover finger hook outward on one end and repeat it again on opposite side to release lock cover. Make sure that the inner lock part is completely released. (See Fig.9)

② Hook **center** of the Lock Bar with finger and withdraw the connector. (See Fig.10)

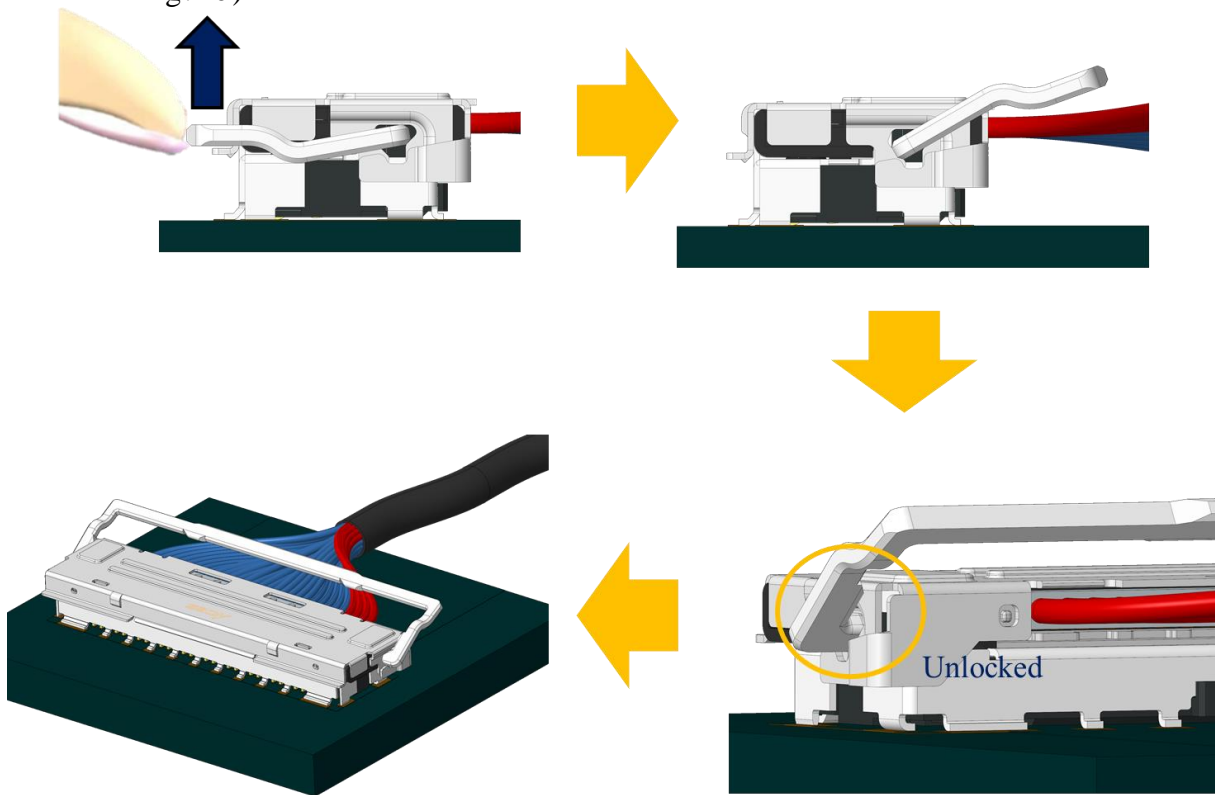


Fig.9



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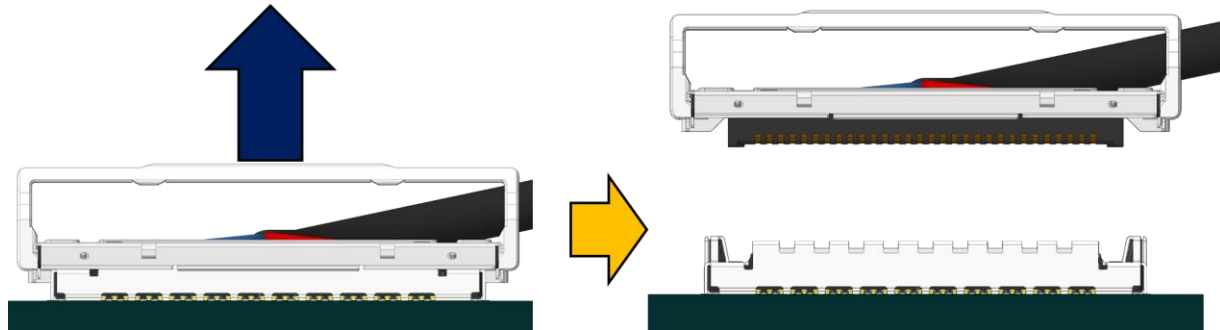
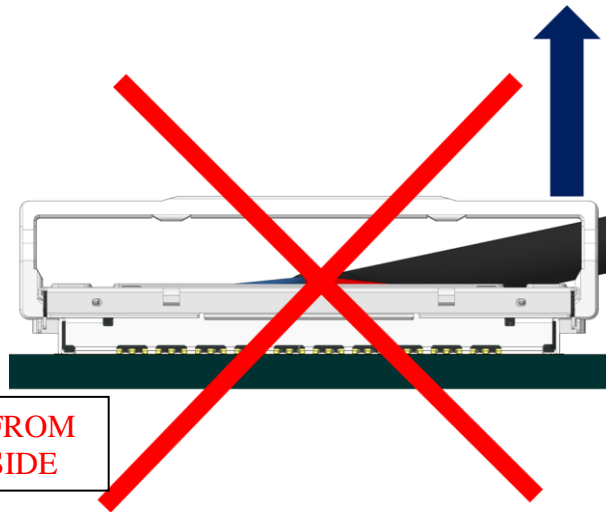


Fig.10

**CAUTION**

- Do not un-mate a cable connector by pulling cable.
- When withdrawing the connector. We recommend that you pull the finger perpendicular to PCB.
- DO NOT WITHDRAWING FROM THE BOTTOM OF ONE SIDE(Fig.11)



**DO NOT WITHDRAWING FROM THE BOTTOM OF ONE SIDE**

Fig.11

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10.4.2 Caution in Cable Connector Handling

- Handle the cable connector carefully in cable harnessing work so that pulling force is NOT applied to the cable attachment part of a cable connector.
- Be careful so that pulling force and/or repeated bending force is NOT applies to the cable attachment part of a cable connector.

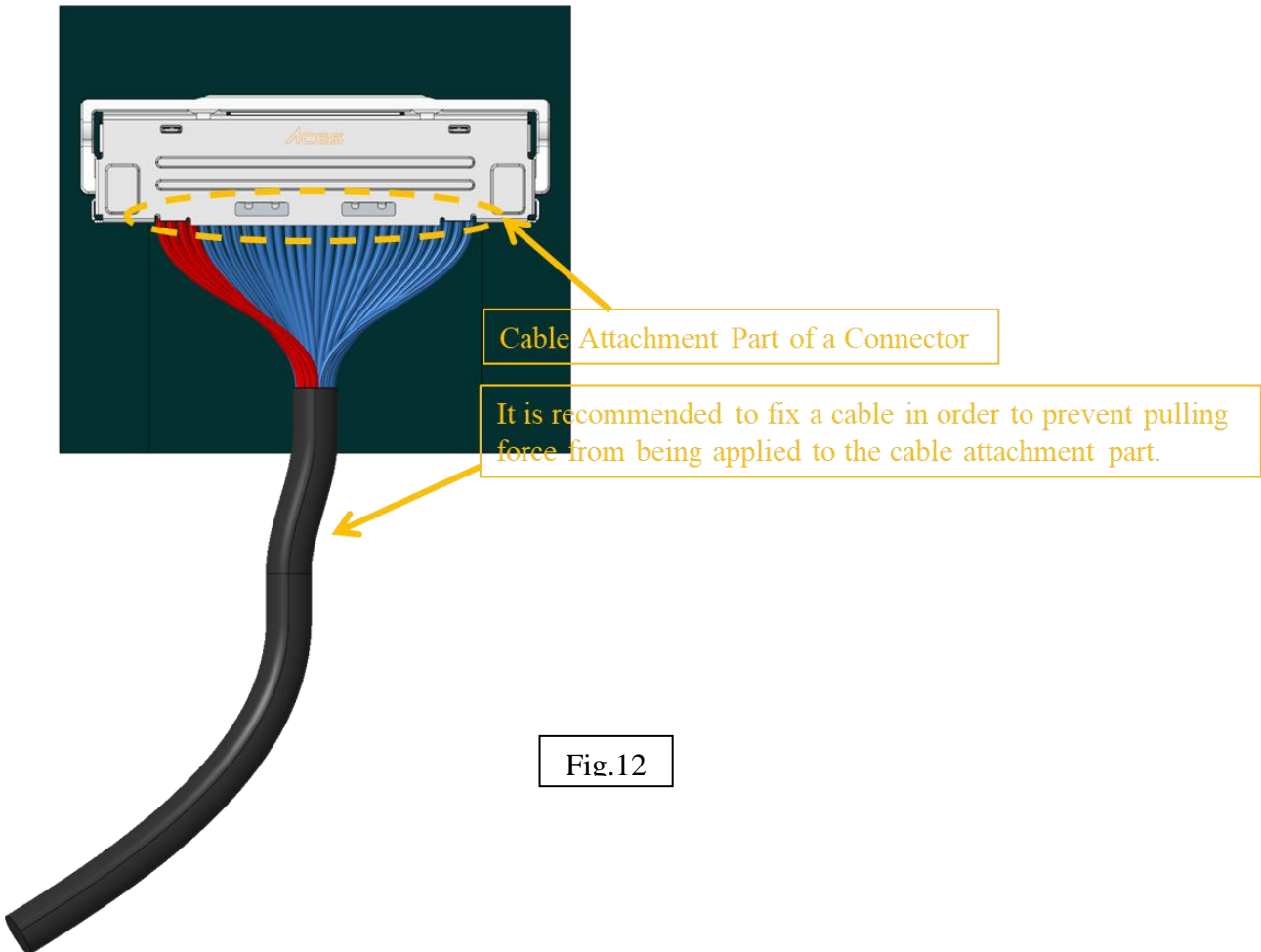


Fig.12

- Do not pull cable that will apply excess force to it or it may damage or un-mate the connector.[Fig.13]
- Do not pull cable to un-mating connectors or it may damage receptacle.[Fig.14]

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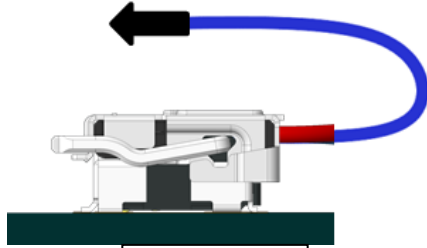


Fig.13-1

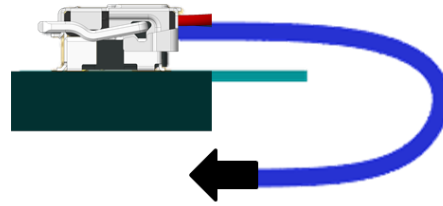


Fig.13-2

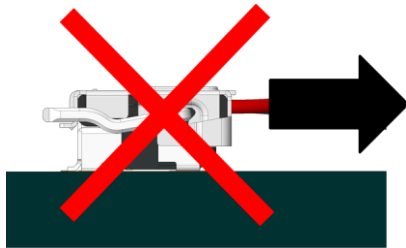


Fig.14-1

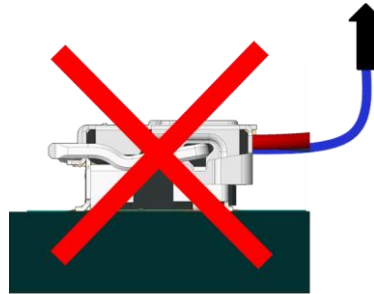


Fig.14-2