Designing and Handling Guidline for CX90MWD2G-24P

Table of contents

1. Revision History

Revision History	Date	Handled by	Remarks
1.0	Mar. 03, 2020	SH.LIM	Release
2.0	Apr. 29, 2020	MC.PAEK	Release
3.0	Jul. 29, 2022	YG.KIM	Release
3.1	Nov. 03, 2022	YG.KIM	RE-2-2034
3.2	Nov. 15, 2022	YG.KIM	RE-2-2041
3.3	Nov. 21, 2022	YG.KIM	RE-2-2048

2. Introduction

2.1 Purpose

The guidelines are intended to provide information on product features and how to handle them.

Guidelines are intended to provide general information and do not limit your design or guarantee results in all situations.

2.2 Scope

Guidelines describe basic design information, recommended device dimensions, and regulatory requirements.

These guidelines will be revised from time to time to reflect changes in technology and production capacity.

2.3 Reference Specification

- Universal Serial Bus Type-C Connectors and Cable Assemblies Compliance Document
  Revision 1.2 August 22, 2017
- Universal Serial Bus Type-C Cable and Connector Specification
  Revision 2.0 August 2019

3. Product Information

3.1 Product Feature

* Waterproof type USB Type-C Connector
  - Meet the requirements of the IPX8 standard
* Durable connector
  - Deep drawing uni-body shell design
* Space saving by minimized length design
  - Total Length : 8.35mm
* Enhanced fixation strength on PCB and high durability
  - Dip soldering structures at both shell and mid plate
* Compliant to USB specification
  - USB Type-C compliant interface connector.

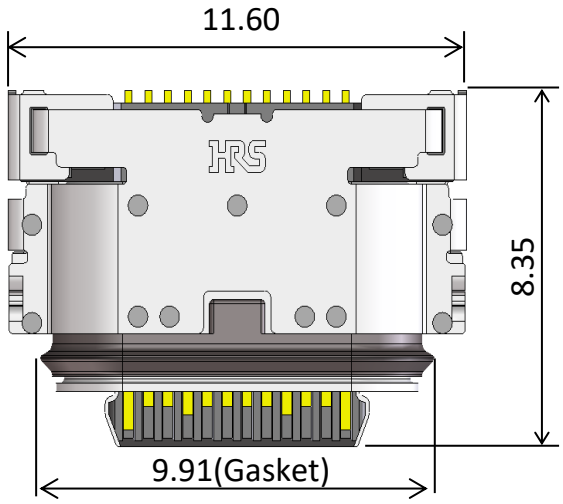
3.2 Specification

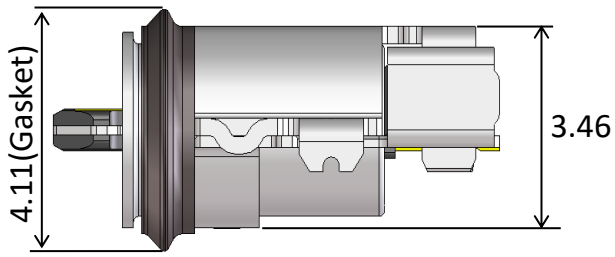
No. of Contacts	24
P.C.B Mounting type	Mid Mount
Soldering type	Double row SMT
Current rating	DC 5A max. for Vbus & GND DC 1.25A for Vconn DC 0.25A for the other pins
Voltage rating	20V AC
Operating Temperature	-40℃ ~ +85℃ (Including Temp.rise), 95% RH MAX
Storage Condition	-10℃ ~ +60℃ (With Packing), 15% ~ 70% RH
Contact Resistance	40mΩ Max. (Initial)
Withstanding Voltage	100V AC for 1 minute
Insulation Resistance	100MΩ Min. (500V DC)
Mating Cycles	10,000 times
Insertion/ Extraction Force	Insertion: 5~20N, Extraction: 8~20N (Initial)

Note

* Storage conditions apply to original packaging only, void if opened. Warranty period is 12month max. in the storage conditions above and calculated by manufacture date

3.3 Product Size

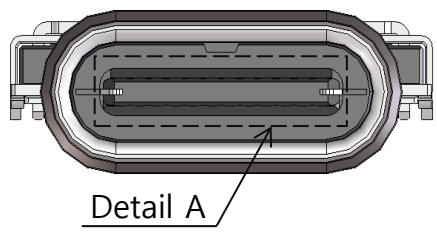




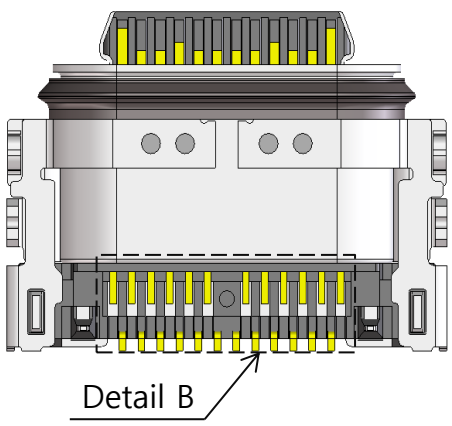
Width	11.60
Length	8.35
Height	3.46

3.4 Pin Assignment

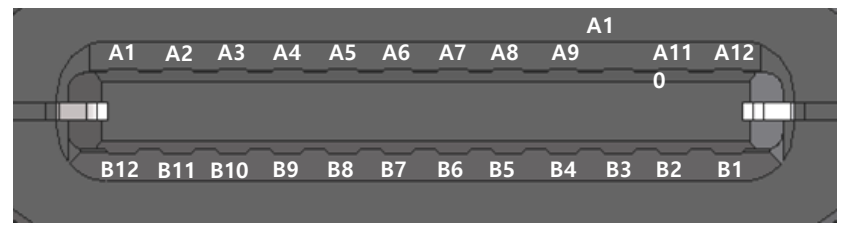
Mating Area



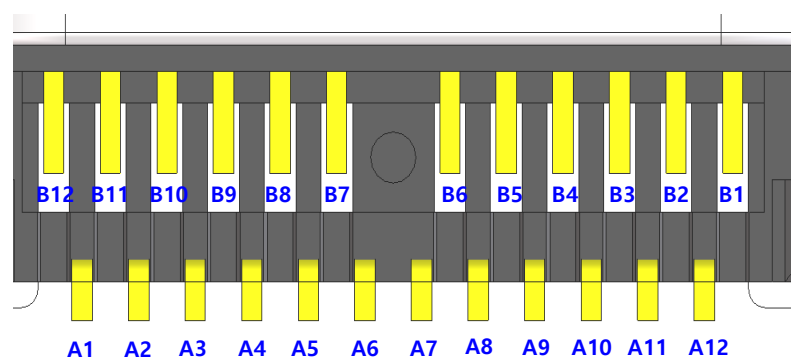
Soldering Area



A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
GND	TX1+	TX1-	Vbus	CC1	D+	D-	SBU1	Vbus	RX2-	RX2+	GND
GND	RX1+	RX1-	Vbus	SBU2	D-	D+	CC2	Vbus	TX2-	TX2+	GND
B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1

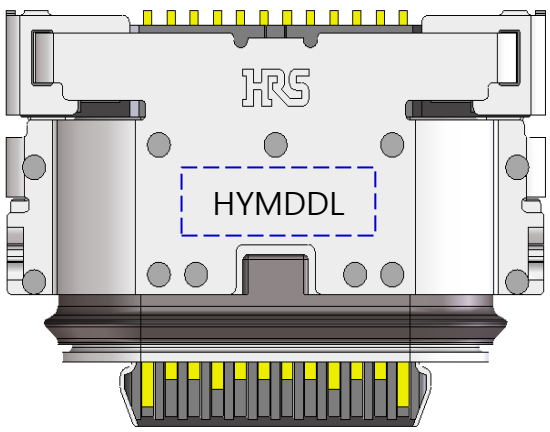


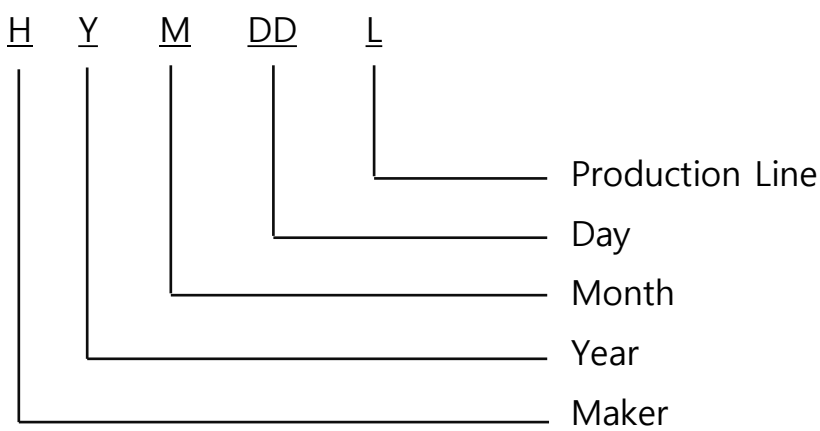
Detail A



Detail B

3.5 Manufacturing Date Code System

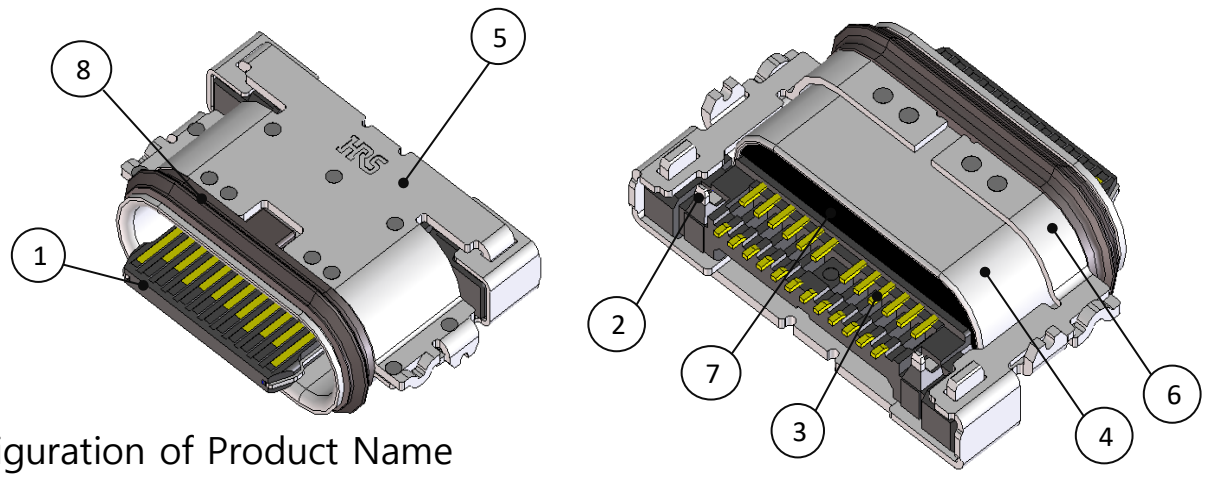




Maker		Year		Month		Day		Production Line	
Ex.	Mark	Ex.	Mark	Ex.	Mark	Ex.	Mark	Ex.	Mark
Hirose Korea	H	2020	0	Jan.	1	1st	01	SAMPLE	S
		2021	1	Feb.	2	2nd	02	Manual #1	1
		2022	2	Mar.	3	3rd	03	Manual #2	2
		2023	3	Apr.	4	4th	04	Manual #3	3
		2024	4	May	5	5th	05	Manual #4	4
		2025	5	Jun.	6	6th	06	…	…
		2026	6	Jul.	7	7th	07	Auto #1	A
		2027	7	Aug.	8	8th	08	Auto #2	B
		2028	8	Sep.	9	9th	09	Auto #3	C
		2029	9	Oct.	A	10th	10	Auto #4	D
		2030	0	Nov.	B	11th	11	Auto #5	E
		…	…	Dec.	C	…	…	…	…

3.6 Part List

No	Part	Materials	Color / Finish
1	Insulator	Thermal Plastic	UL94V-0, Black Color
2	Mid Plate	Stainless Steel (0.15t)	Ni1.0μm Min.
3	Contact	Copper Alloy (0.12t)	Contact Area: Au0.05μm Min over Pd-Ni0.75μm Min over Ni2.0μm Min. Lead Area : Au0.05μm Min over Ni2.0μm Min.
4	Inner Shell	Stainless Steel (0.2t)	Cleansing
5	Top Shell	Stainless Steel (0.3t)	Ni1.0μm Min.
6	Bottom shell	Stainless Steel (0.2t)	Ni1.0μm Min.
7	Potting	Silicone	Black Color
8	Gasket	Silicone	Gray Color

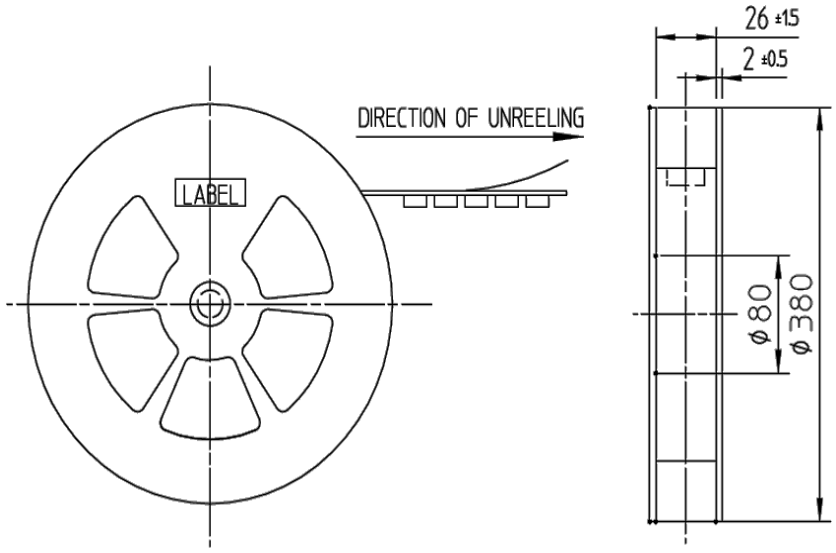


3.7 Configuration of Product Name

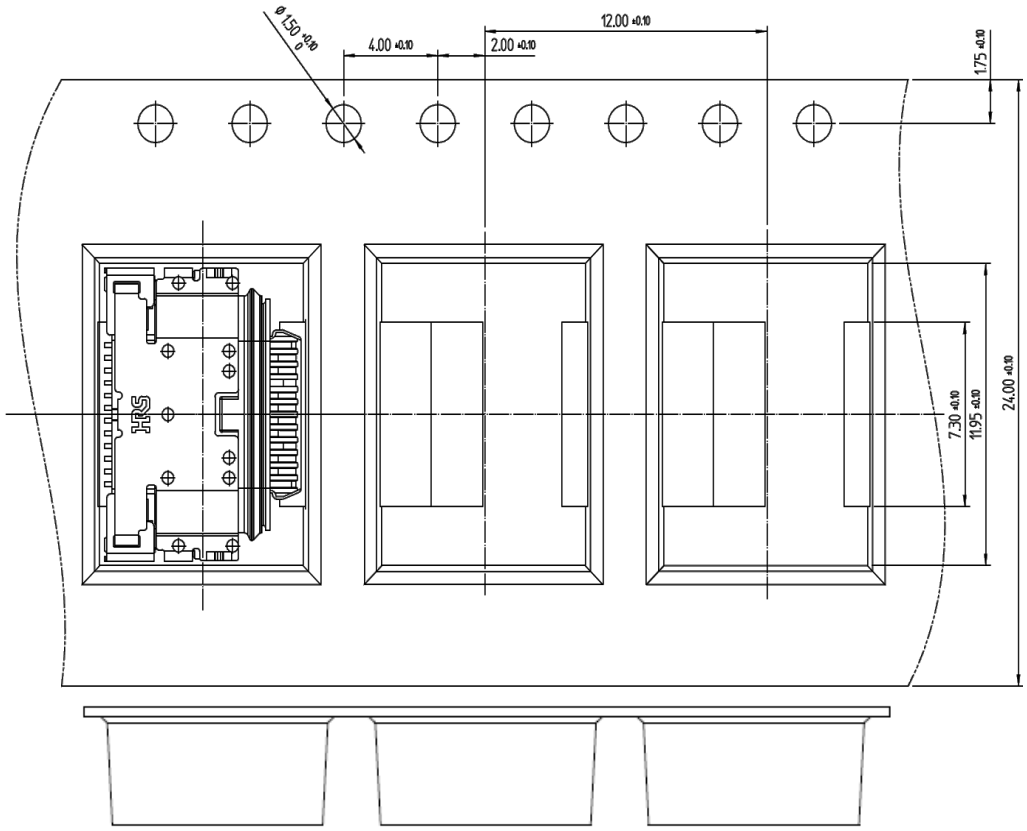
CX (1) 90 (2) M (3) WD (4) 2 (5) G (6) - 24 (7) P (8)

(1) Series Name	CX	CX Series
(2) Soldering Type	70	Right angle Hybird (SMT+Dip)
	80	Straight SMT
	90	Rignt angle SMT
(3) Mounting Type	B	Top-mount
	M	Mid-Mount
(4) Special specifications	W	Waterproof
	D	Deep Drawing
(5) Serial No		None or 1,2,3....
(6) Gasket	None	Without Gasket
	G	With Gasket
(7) Contact No	24	24 position
(8) Contact Type	P	Male contacts
	S	Female contacts

3.8 Reel Dimensions



3.9 Emboss Carrier Tape Dimensions



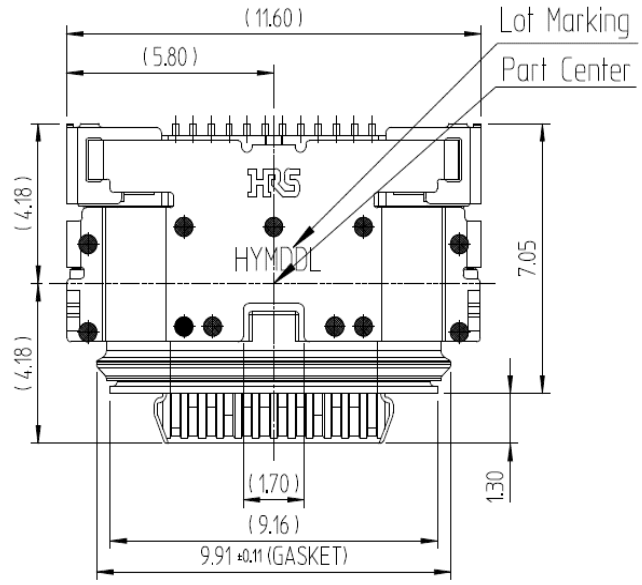
※ Emboss Tape was designed in accordance with EIA-481

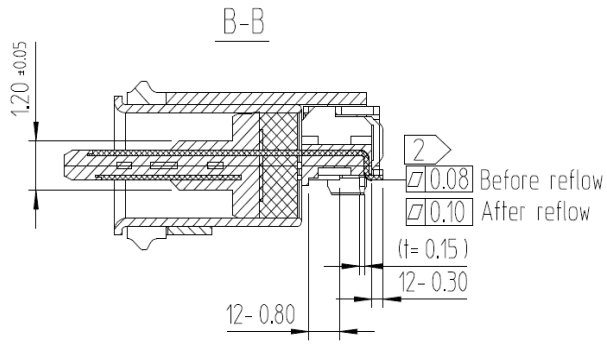
3.10 Packing Quantity Peer Reel: 1,500 PCS

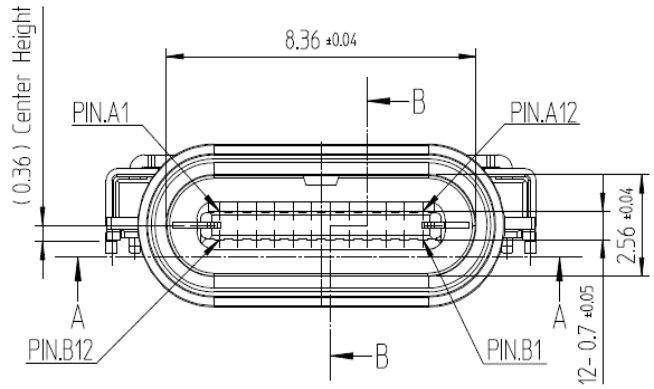
3.11 Peeling Strength:

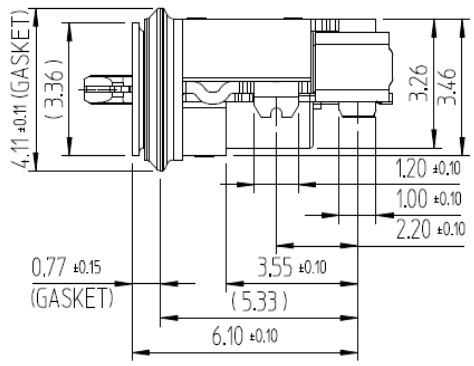
Cover tape shall have a total peel strength of from 0.1N to 1.3N

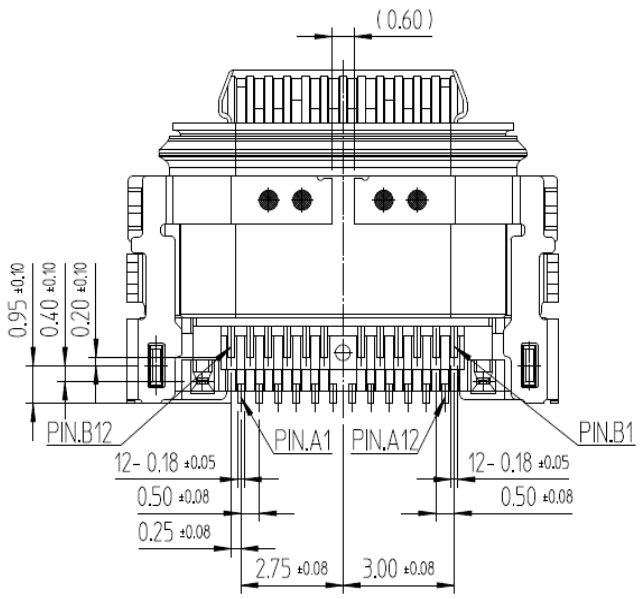
3.12 Product Dimensions

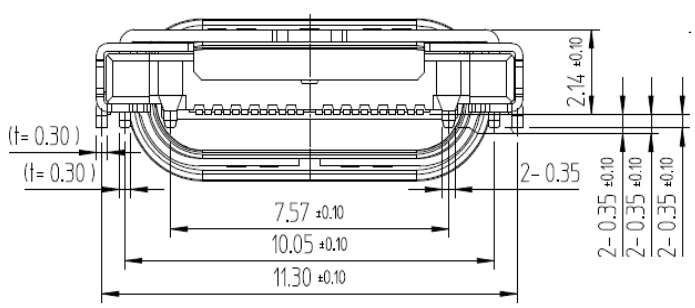






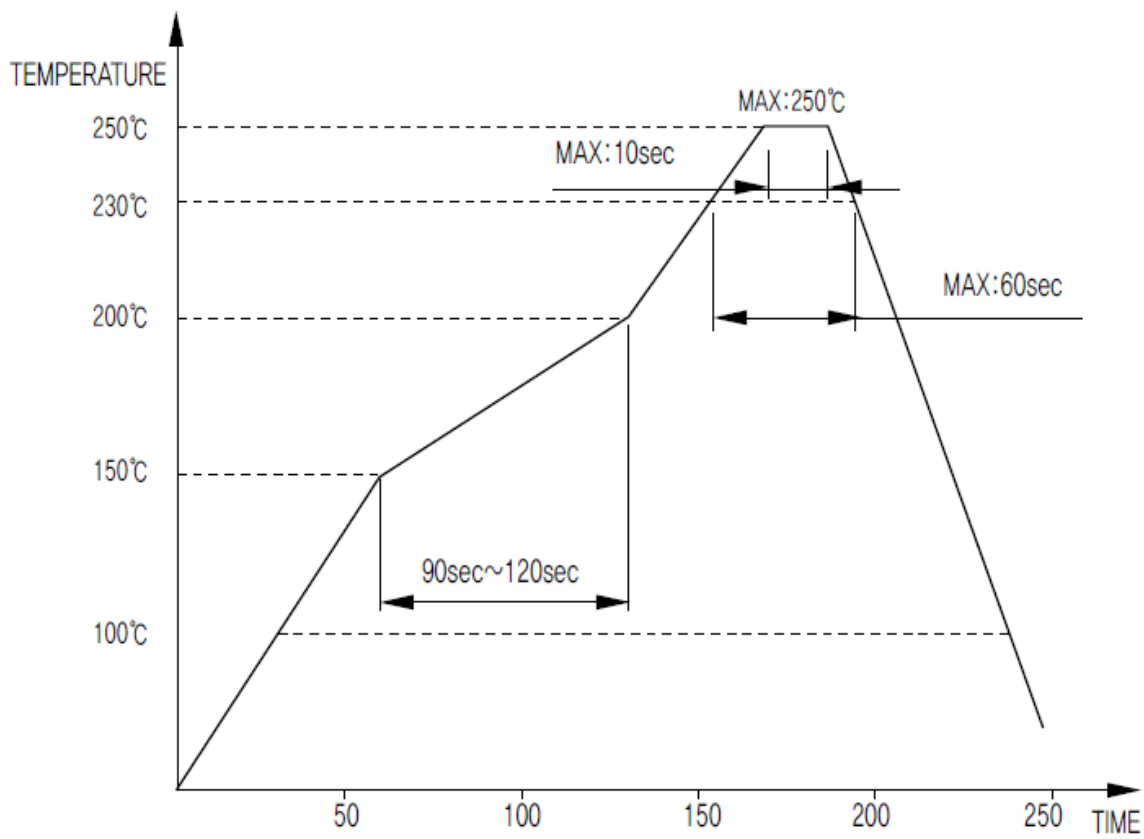






4. Notice for Soldering

4.1 Recommended Reflow Temperature Profile



- Profile measuring point
  The temperature profile indicates the board surface temperature at the point of contacts with the connector terminals.

- Reflow cycles
  Up to 2 cycles of reflow soldering are possible under the same
  * Temperature between 1st and 2nd reflow must be cooled down to room temperature

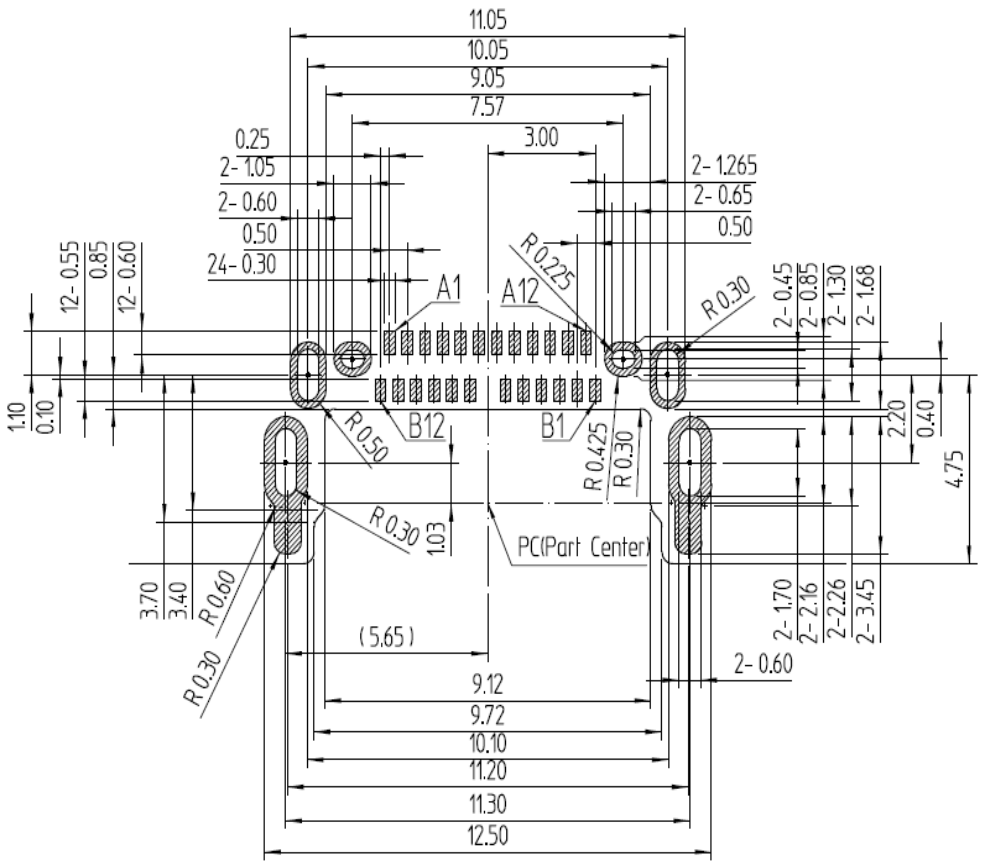
- Reflow heating method and condition
  Far-infrared heater and hot convective blowers used in combination,
  normal atmosphere, or nitrogen atmosphere..

- Top surface of the contact leads may not covered by solder depending on reflow condition

4.2 PCB Designing

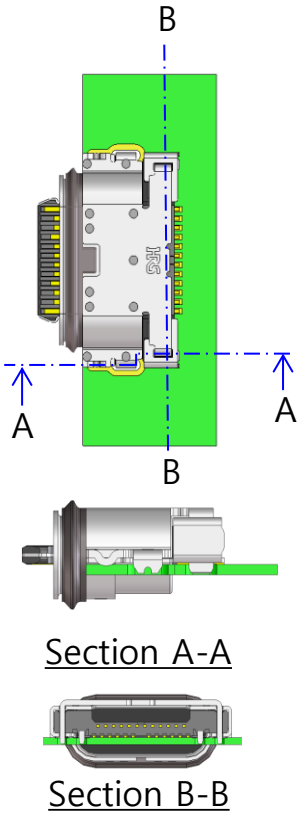
RECOMMENDED PCB LAYOUT (TOP-VIEW)

(REFERENCE ONLY)



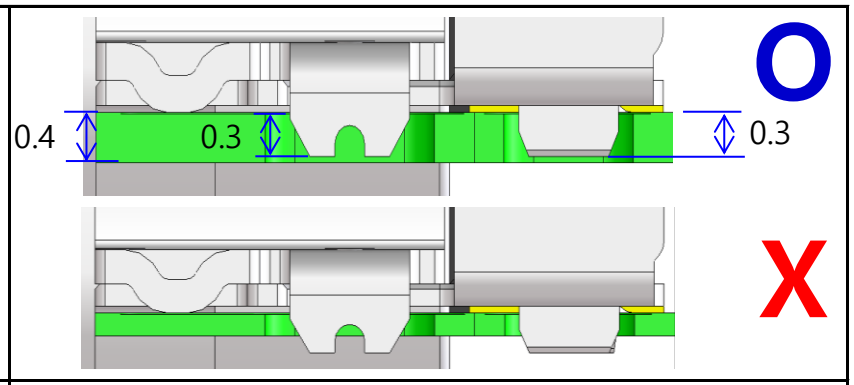
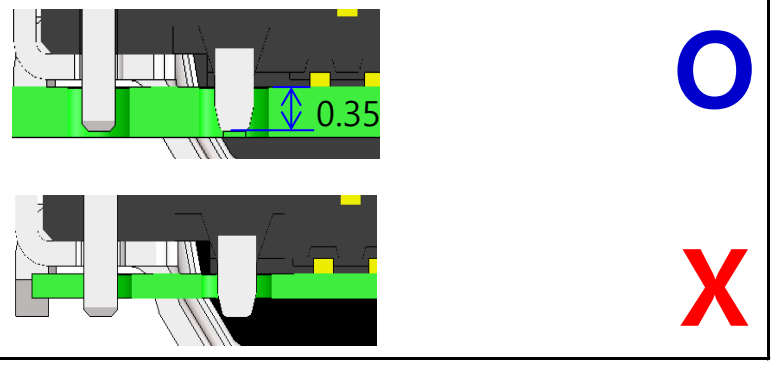
4.3 PCB Thickness

Recommended PCB thickness is 0.4mm or over considering 0.35mm PIP leg length



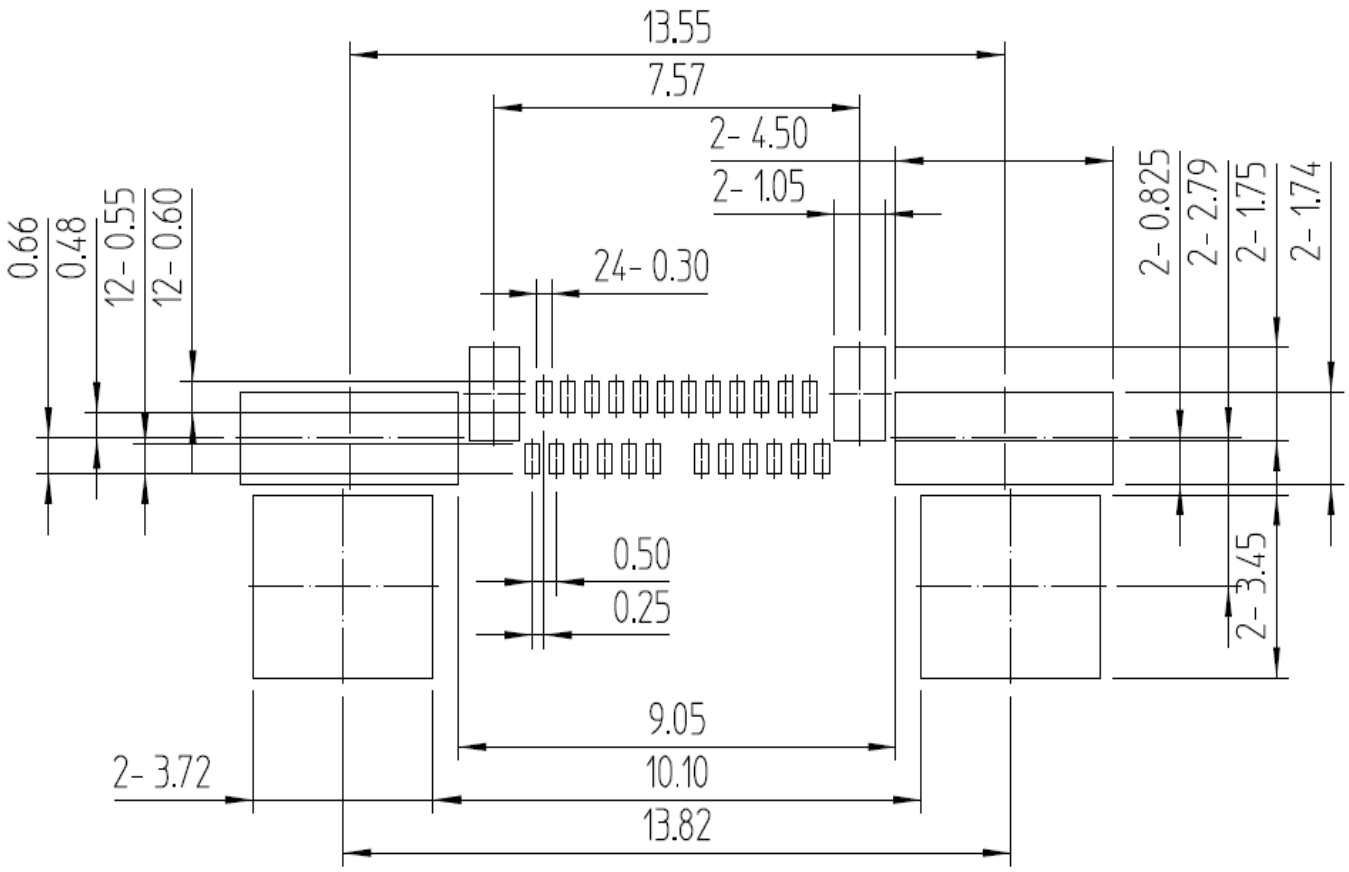
Section A-A

Section B-B

SECTION A-A	
SECTION B-B	

4.4 Metal Mask Designing

RECOMMENDED METAL MASK LAYOUT (TOP-VIEW)



- Metal mask thickness: 0.10mm
- Open rate: 100%

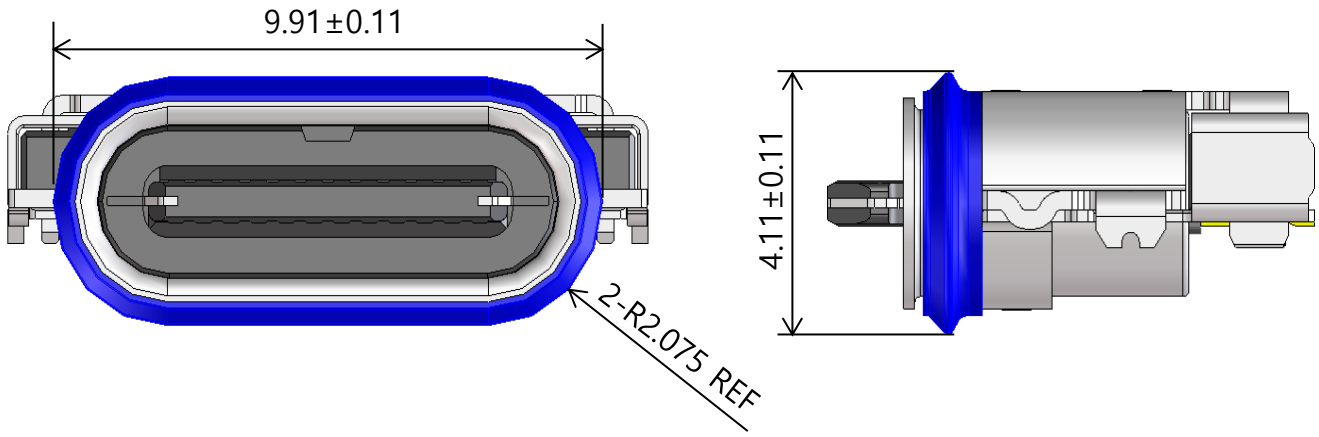
$$\text{Open rate}(\%) = \frac{\text{Opening size of mask}}{\text{Land size of PCB}}$$

4.5 Solder Paste

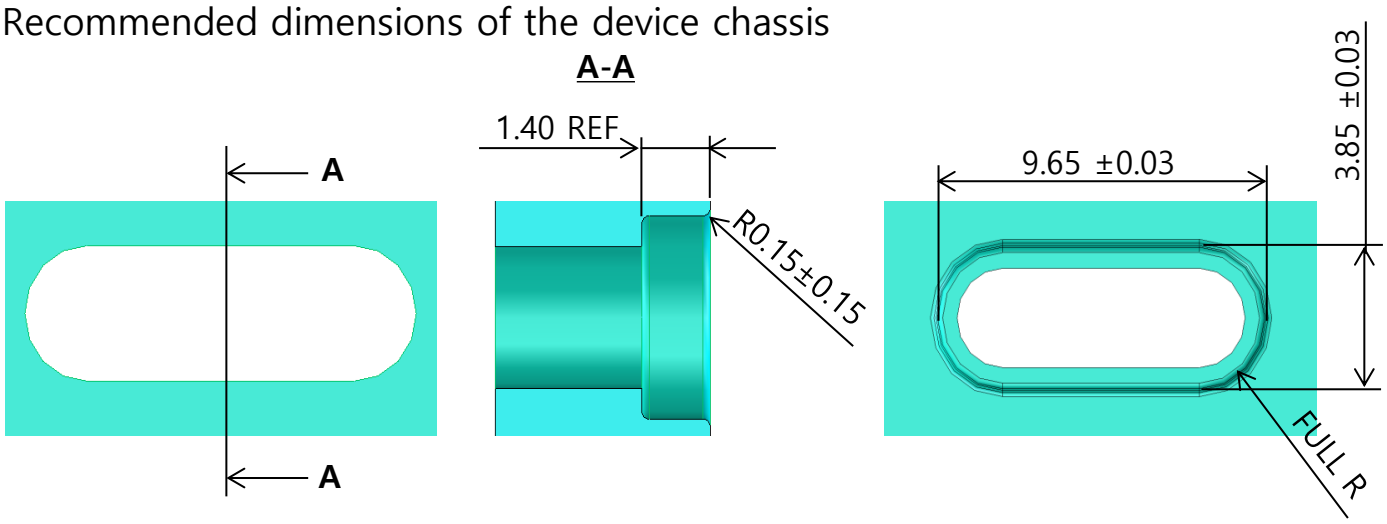
Lead-free solder paste

5. Gasket Reference dimension

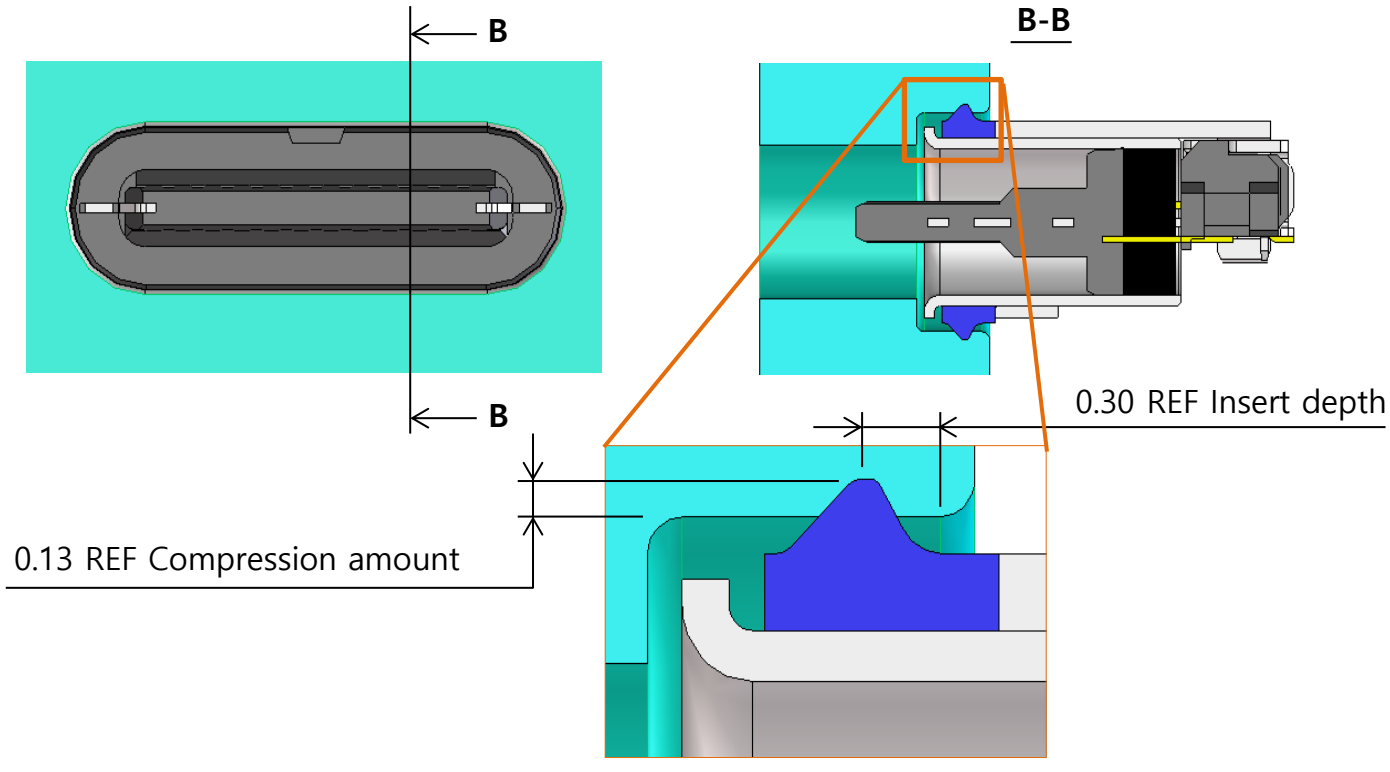
5.1 Connector with a Gasket



5.2 Recommended dimensions of the device chassis



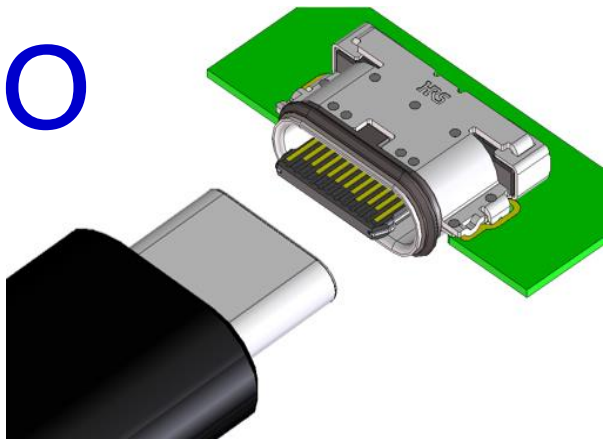
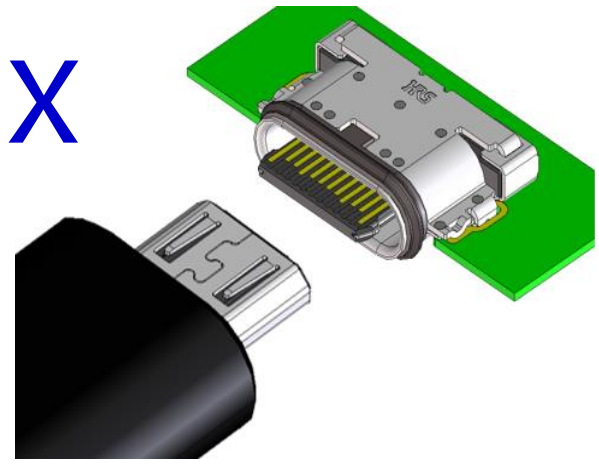
5.3 Recommended compression condition of a Gasket



6. Notice for Connector Handling

6.1 Mating Plug

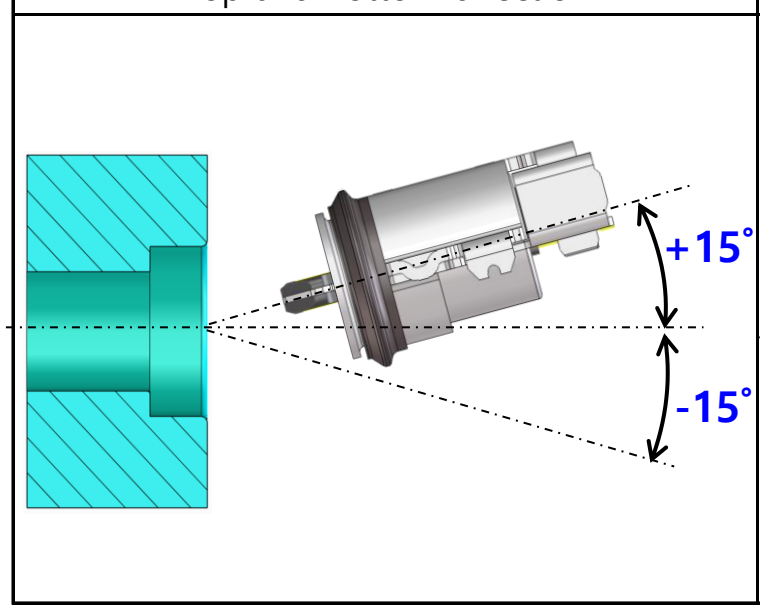
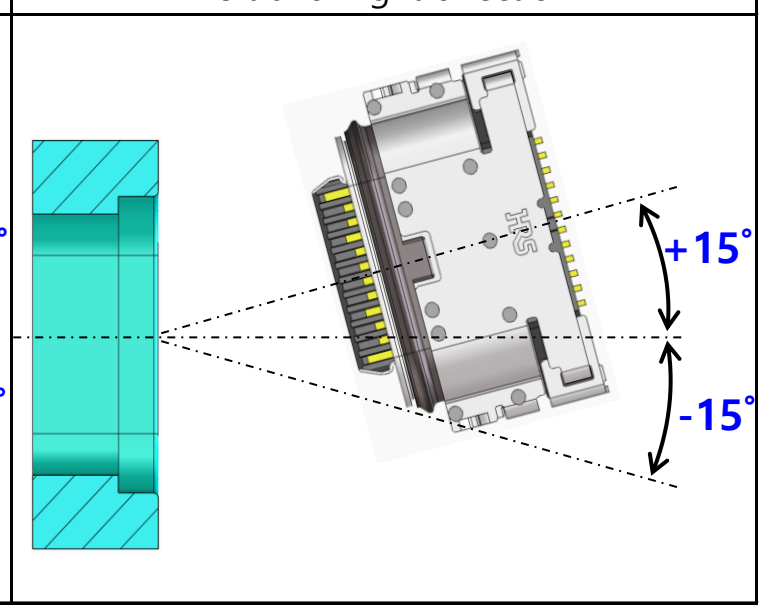
Please use USB Type-C Plug only

With USB Type-C Plug	With the other Plugs
O 	X 

7. Connector Installation Guideline

15º max. of angular position or 0.13mm max. of shifted conditions are available during assembly process which the connector is inserted into the set chassis. Then, the connector should be back to the center position without angular condition after finishing the assembly process in order to make the waterproof performance stable.

※ Maximum angle when assembled in to the set chassis

Top and Bottom direction	Left and Right direction
	

※ Maximum shifted amount when assembled in to the set chassis

Top and Bottom direction	Left and Right direction