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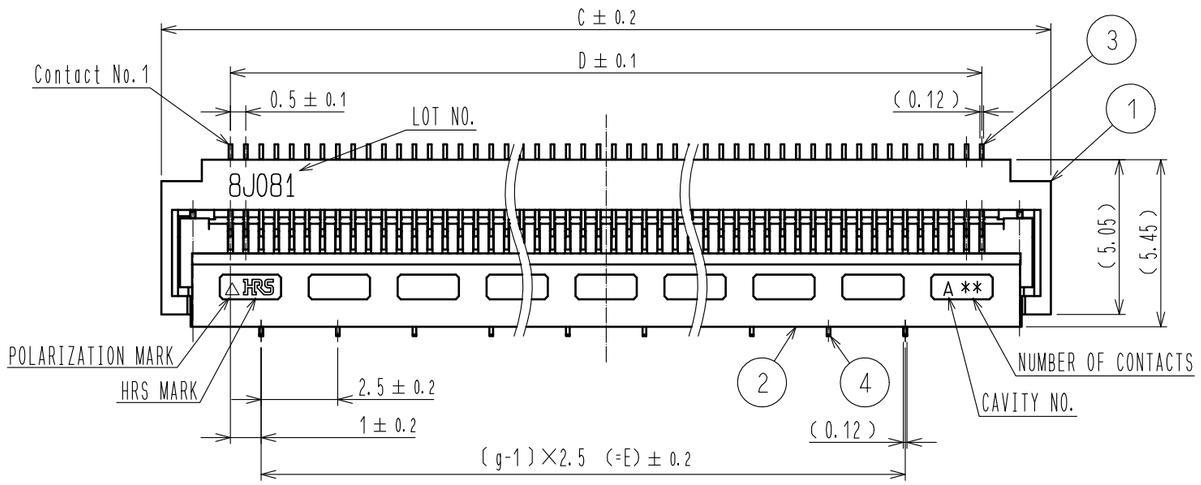

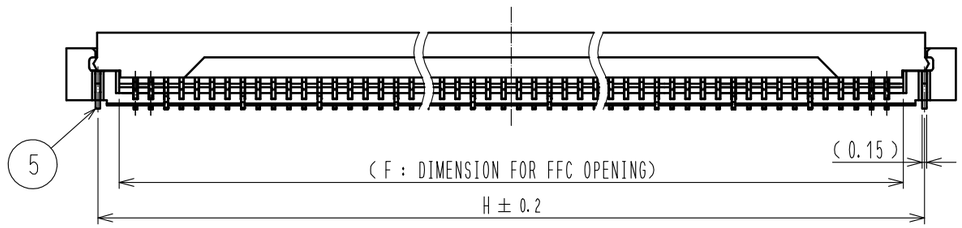

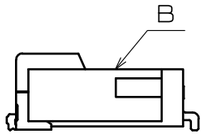

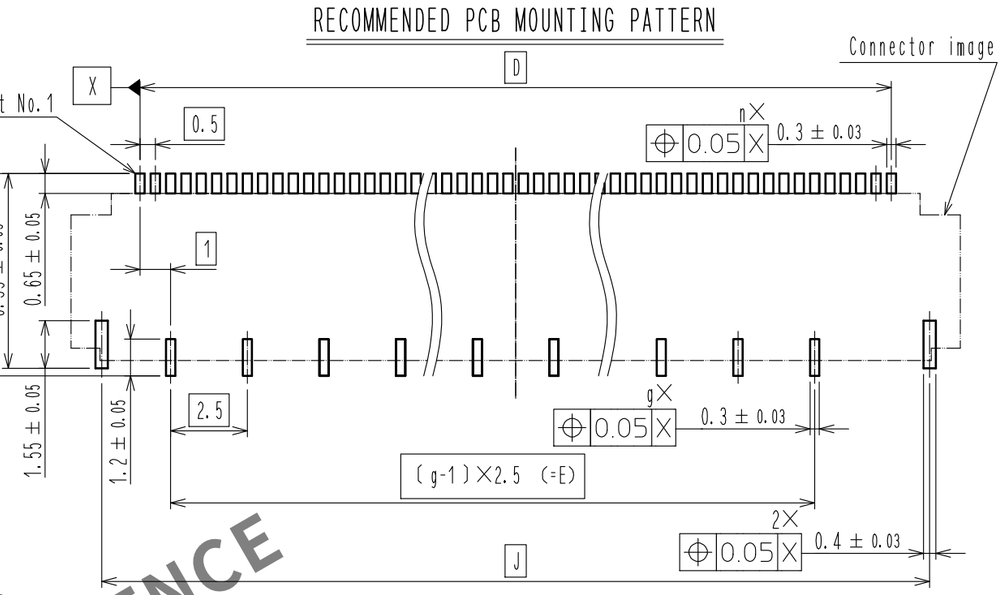

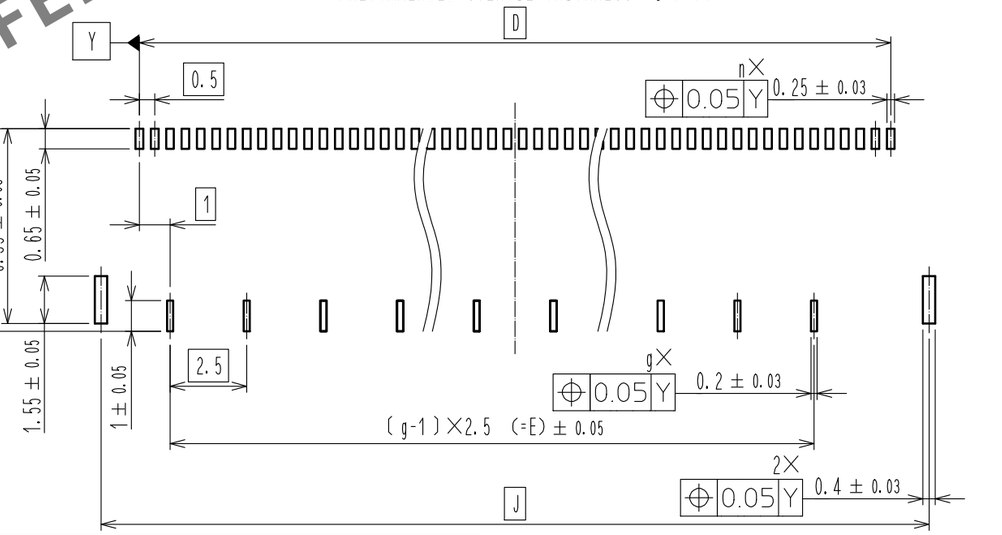

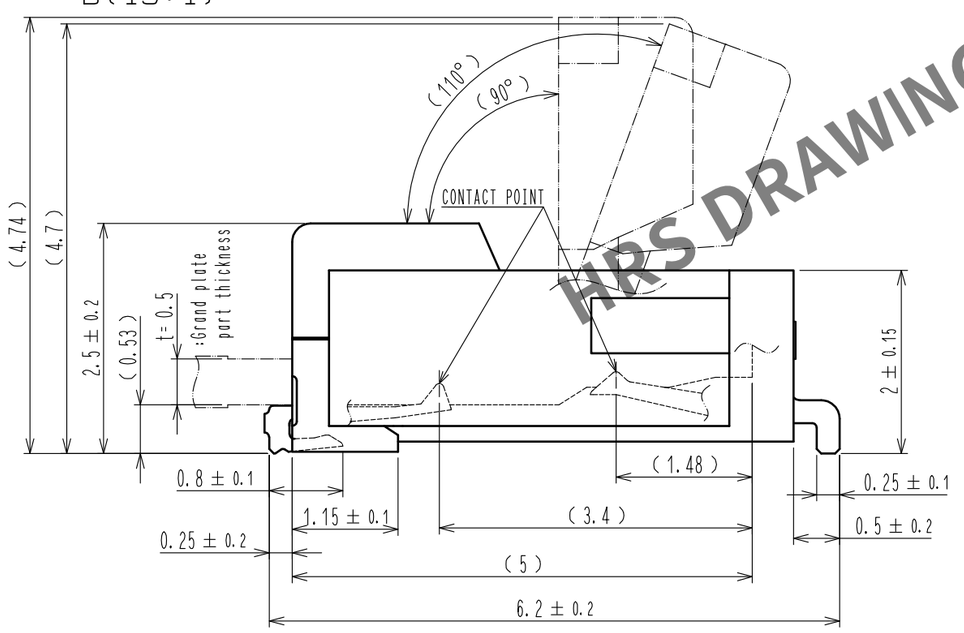

HRS DRAWING FOR REFERENCE

NO.	MATERIAL	FINISH , REMARKS
4	PHOSPHOR BRONZE	TIN PLATING(REFLOW FINISHED) 1μm MIN AND COPPER(INTERLAYYER) 0.15μm MIN OVER NICKEL 1μm MIN
3	PHOSPHOR BRONZE	(CONTACT AREA, LEAD): GOLD PLATING 0.03μm MIN OVER NICKEL 1μm MIN (OTHER): NICKEL 1μm MIN
2	LCP	BLACK, UL94V-0
1	LCP	GRAY, UL94V-0

NO.	MATERIAL	FINISH , REMARKS
9	(CONNECTOR)	
8	POLYSTYRENE	
7	POLYESTER	
6	POLYSTYRENE	
5	PHOSPHOR BRONZE (PLATED MATERIAL)	TIN PLATING(REFLOW FINISHED) 1μmMIN OVER COPPER 0.3μm MIN

NOTES
1. Lead CO-PLANARITY including reinforced metal fittings shall be 0.1 MAX.
2. Note that preventive hole for sink mark could be added for improvemen.
   The quality remains good. Even with the dark spots, which could occasionally occur molded plastics.
3. To be delivered with tape and reel packages.
4. This product satisfies halogen free requirements defined as 900ppm maximum chlorine, 900ppm maximum bromine, and 1500ppm maximum total of chlorine and bromine.
5. 'n' represents the number of contacts. 'g' represents the number of ground contacts.
6. The dimension in parentheses are for reference.

UNITS	SCALE		COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE
mm	5 : 1	8	1	DIS-F-00020506	YT. NINOMIYA	HH. MURAKAMI	20240508

HIROSE ELECTRIC CO., LTD.

APPROVED	MO. ISHIDA	20090707
CHECKED	YN. TAKASHITA	20090707
DESIGNED	YK. OTSUKA	20090707
DRAWN	YK. OTSUKA	20090707

DRAWING NO.	EDC3-325208-00
PART NO.	FH41-**S-0.5SH(05)
CODE NO.	CL580

8 1/9

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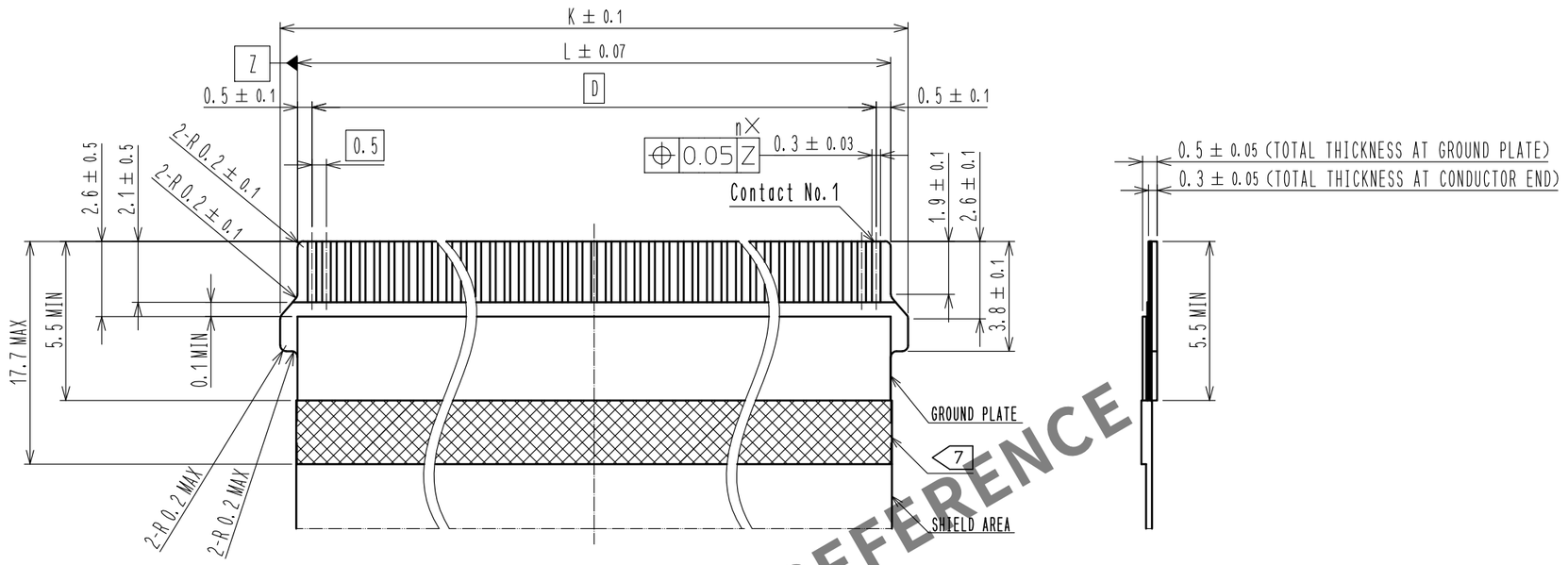
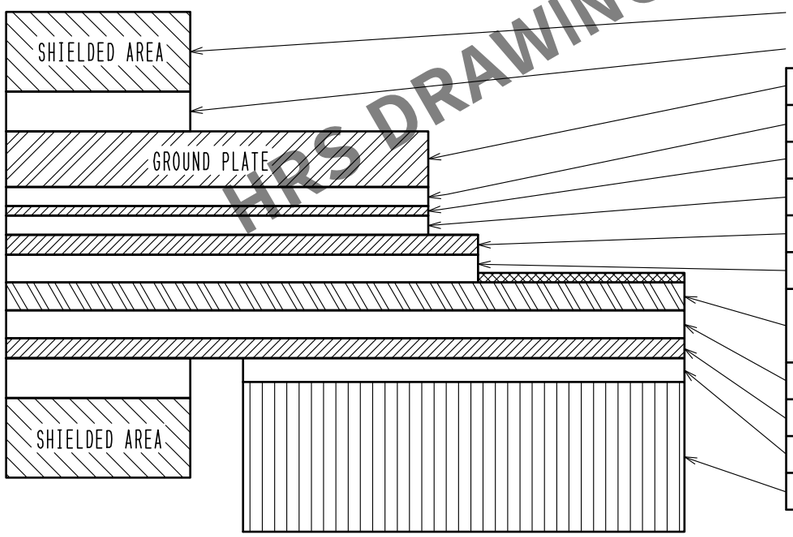
RECOMMENDED FFC (5:1)



FFC CONFIGURATION (REFERENCE EXAMPLE) (SCALE:FREE)



MATERIAL NAME	MATERIAL	TOTAL THICKNESS AT GROUND PLATE (μm)	TOTAL THICKNESS AT CONDUCTOR END (μm)
SHIELDING MATERIAL			
CONDUCTIVE ADHESIVE	POLYESTER TYPE		
COPPER FILM (TIN PLATED)		70 <8>	
ADHESIVE	ACRYLIC TYPE	24 <8>	
BASE MATERIAL	POLYESTER TYPE	12 <8>	
ADHESIVE	ACRYLIC TYPE	24 <8>	
INSULATED LAYER	POLYESTER TYPE	25	
ADHESIVE	POLYESTER TYPE	35	
SOFT COPPER FILM (NICKEL UNDER PLATED / GOLD PLATED)		35	35
ADHESIVE	POLYESTER TYPE	35	35
INSULATED LAYER	POLYESTER TYPE	25	25
ADHESIVE	POLYESTER TYPE	30	30
STIFFENER	POLYESTER TYPE	188	188
	TOTAL	503	313

HRS DRAWING FOR REFERENCE

NOTES
<7> PLEASE OVERLAP SHELD AREA ON GROUND PLATE.
<8> PLEASE INQUIRE OF HIROSE WHEN YOU WANT TO CHANGE THE SPECIFICATION AND THE THICKNESS COMPOSITION IN THIS PART.
9. RECOMMENDED PUNCHER DIRECTION : FROM CONDUCTOR SIDE TO STIFFENER SIDE.

<RECOMMENDED FFC>

HRS	DRAWING NO.	EDC3-325208-00
	PART NO.	FH41-**S-0.5SH(05)
	CODE NO.	CL580 <8> 2/9

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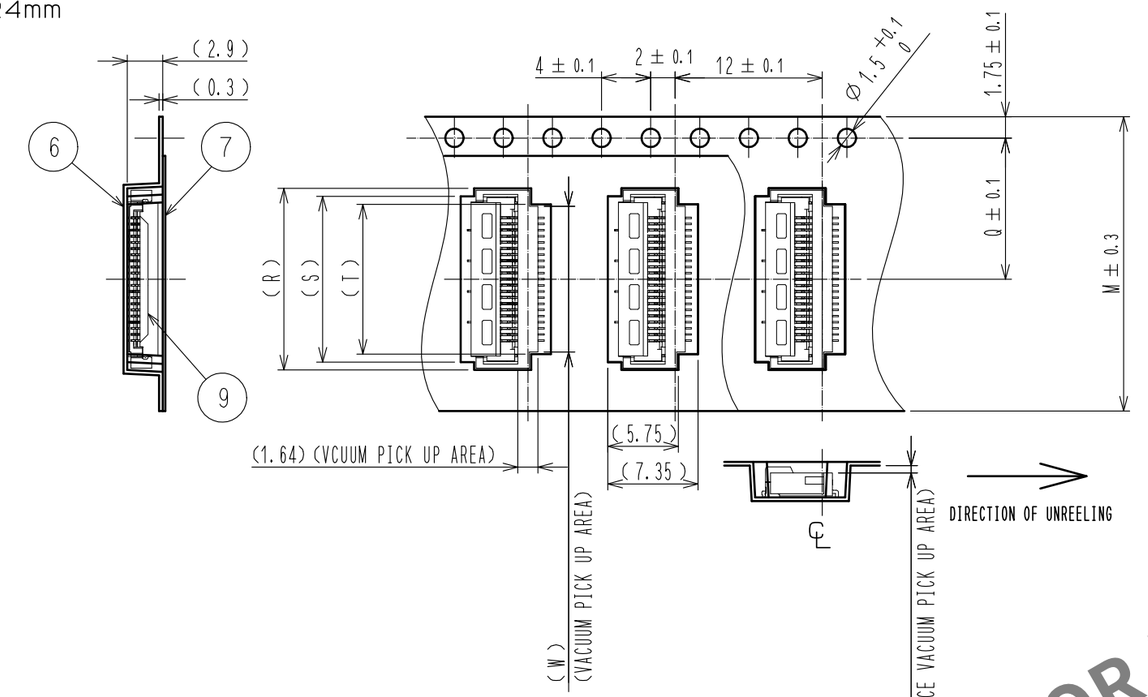
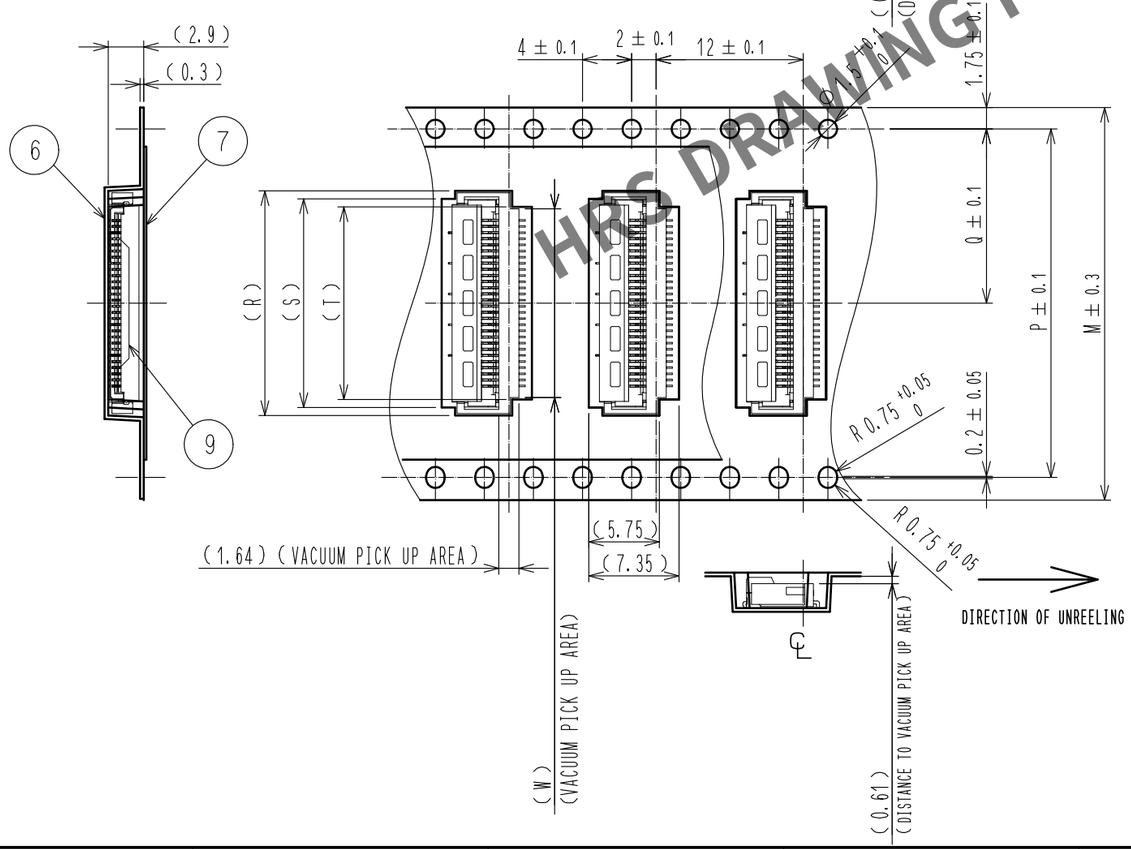
EMBOSSED CARRIER TAPE DIMENSION (2:1)

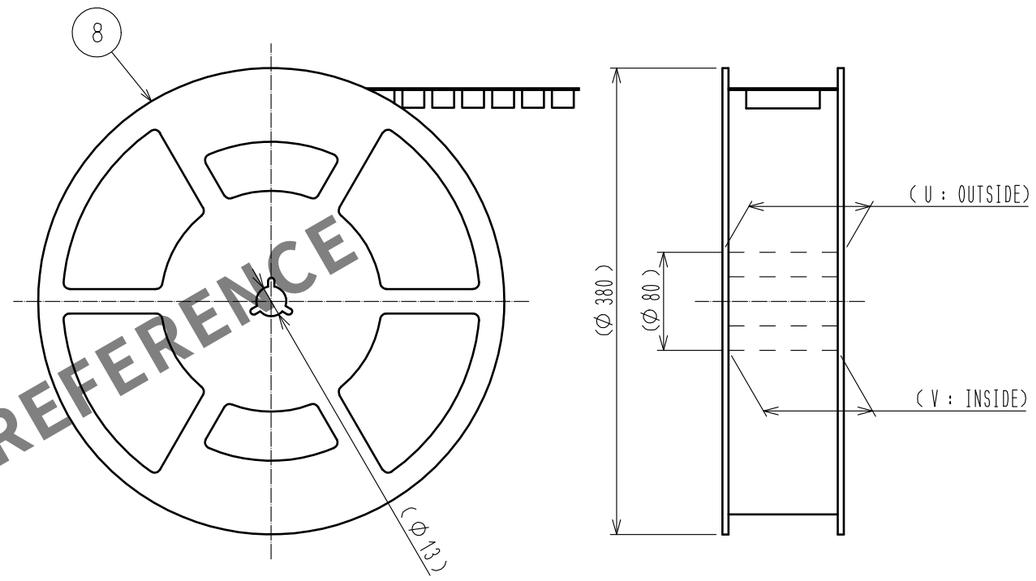
●24mm

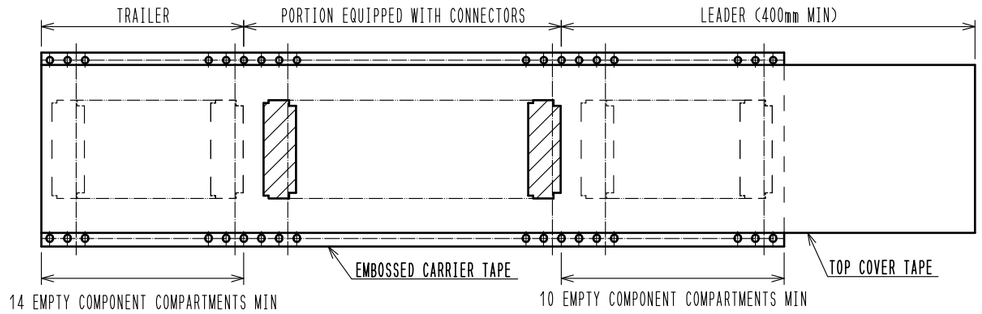


●32mm MIN



REEL DIMENSION (FREE)





NOTES 10. PER REEL: 2,500 CONNECTORS.
11. REFER TO JIS C 0806 AND IEC 60286-3(PACKING OF COMPONENTS FOR AUTOMATIC HANDLING.)

HRS DRAWING FOR REFERENCE

<DRAWING FOR PACKING>

DRAWING NO.	EDC3-325208-00
PART NO.	FH41-**S-0.5SH(05)
CODE NO.	CL580

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PART NUMBER	CODE NUMBER	NUMBER OF CONTACTS	NUMBER OF GROUND CONTACTS : g	DIMENSION OF CONNECTOR, LAND PATTERN, METAL MASK AND FFC								DIMENSION OF DRAWING FOR PACKING								
				C	D	E	F	H	J	K	L	M	P	Q	R	S	T	U	V	W
FH41-15S-0.5SH(05)	CL580-2222-2-05	15	3	11.5	7	5	8.07	9.45	9.5	9.2	8	24	-	11.5	11.8	10.5	9.2	29.4	25.4	8.87
FH41-20S-0.5SH(05)	CL580-2221-0-05	20	4	14	9.5	7.5	10.57	11.95	12	11.7	10.5	24	-	11.5	14.3	13	11.7	29.4	25.4	11.37
FH41-28S-0.5SH(05)	CL580-2208-1-05	28	5	18	13.5	10	14.57	15.95	16	15.7	14.5	32	28.4	14.2	18.3	17	15.7	37.4	33.4	15.37
FH41-30S-0.5SH(05)	CL580-2218-5-05	30	6	19	14.5	12.5	15.57	16.95	17	16.7	15.5	32	28.4	14.2	19.3	18	16.7	37.4	33.4	16.37
FH41-31S-0.5SH(05)	CL580-2216-0-05	31	6	19.5	15	12.5	16.07	17.45	17.5	17.2	16	32	28.4	14.2	19.8	18.4	17.2	37.4	33.4	16.87
FH41-40S-0.5SH(05)	CL580-2205-3-05	40	8	24	19.5	17.5	20.57	21.95	22	21.7	20.5	44	40.4	20.2	24.3	23	21.7	49.4	45.4	21.37
12 FH41-50S-0.5SH(28)	CL580-2204-0-28	50	10	29	24.5	22.5	25.57	26.95	27	26.7	25.5	44	40.4	20.2	29.3	28	26.7	49.4	45.4	26.37
FH41-60S-0.5SH(05)	CL580-2223-0-05	60	12	34	29.5	27.5	30.57	31.95	32	31.7	30.5	56	52.4	26.2	34.3	33	31.7	61.4	57.4	31.37
12 FH41-68S-0.5SH(28)	CL580-2202-5-28	68	13	38	33.5	30	34.57	35.95	36	35.7	34.5	56	52.4	26.2	38.2	36.6	35.7	61.4	57.4	35.37 8

12 THE SPECIFICATION OF (28) IS APPLIED TO NUMBER OF CONTACTS 50 AND 68.

HRS DRAWING FOR REFERENCE

HRS	DRAWING NO.	EDC3-325208-00
	PART NO.	FH41-**S-0.5SH(05)
	CODE NO.	CL580

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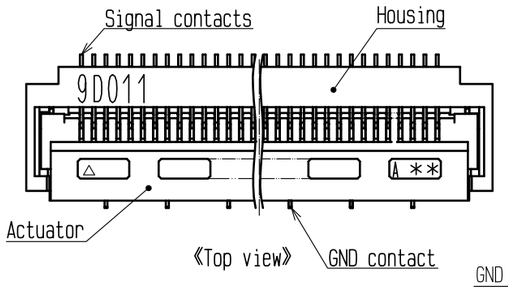
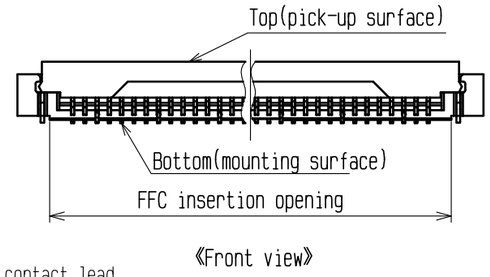
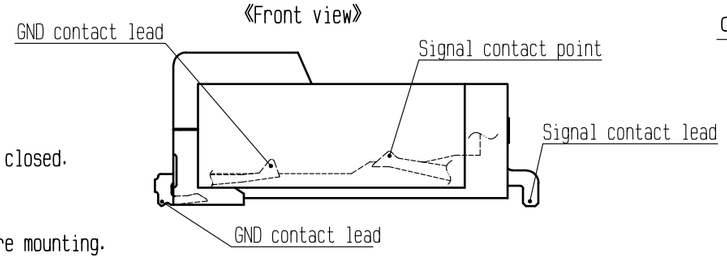
HRS DRAWING FOR REFERENCE

This connector requires delicate and careful handling.
Read through the instructions shown below and handle the connector properly.
Each values indicating here are for reference and may differ from standard value.

[Connector Part Nomenclature]







[Operation and Precautions]

1. Initial condition
The connector is delivered with the actuator closed.

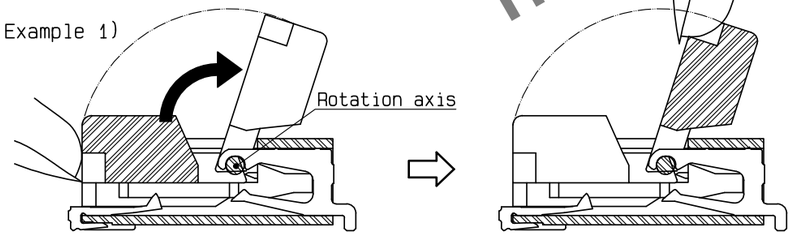
[Caution]
-Do not insert FFC or operate actuator before mounting.

2. How to unlock (Before inserting FFC)

The actuator rotates on its axis as shown below.
Slowly flip up the actuator to release the lock.(example 1)

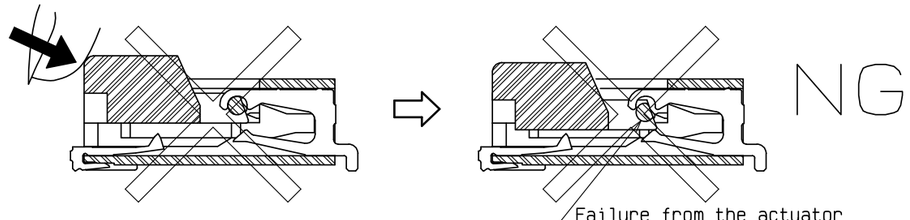
[Caution]
-Do not apply extra force to the connector while rotating the actuator as the illustration shows.(example 2)
-Open the actuator by carefully lifting it at the center.(example 3)
-Do not lift the actuator at one end only.(example 4)
-The actuator must be operated by hand only.
Do not insert any tools or fingernails into the connector.(example 5, 6)
-The actuator rotates 116 degrees max.
Do not try to rotate the actuator further towards the opening direction or apply any extra force to the actuator while it is fully open.(example 7)
-Do not attempt to dislodge the actuator.(example 8,9)

Example 1)



-Correct operation-

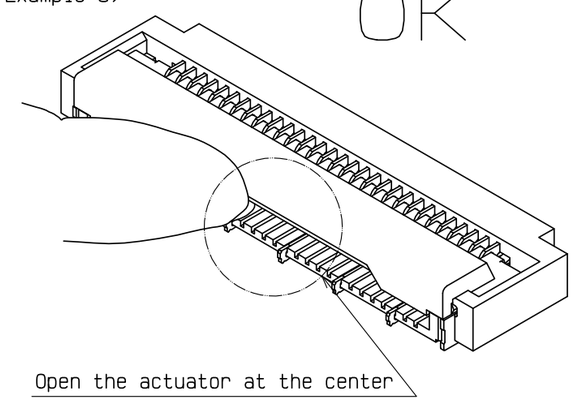
Example 2)



-Incorrect operation-

Failure from the actuator pushed in

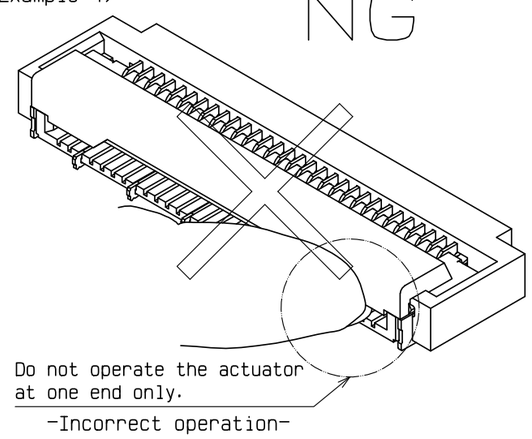
Example 3)



Open the actuator at the center

-Correct operation-

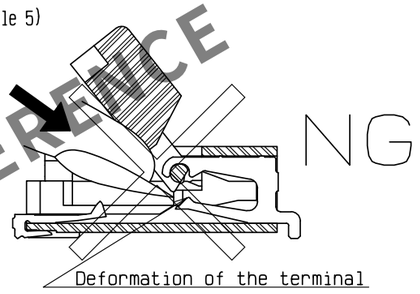
Example 4)



Do not operate the actuator at one end only.

-Incorrect operation-

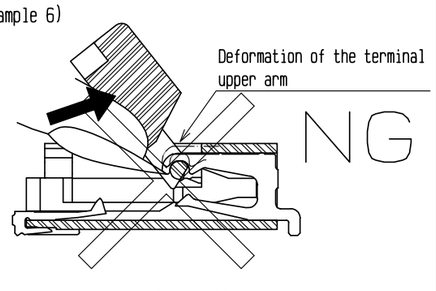
Example 5)



Deformation of the terminal

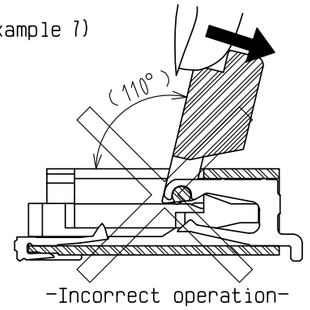
-Incorrect operation-

Example 6)



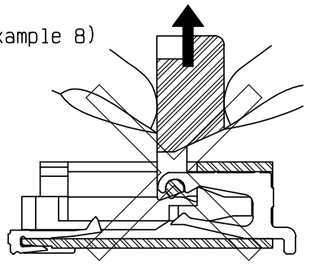
-Incorrect operation-

Example 7)



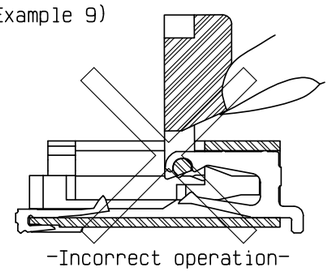
-Incorrect operation-

Example 8)



-Incorrect operation-

Example 9)



-Incorrect operation-

<INSTRUCTION MANUAL(1)>

DRAWING NO.	EDC3-325208-00
PART NO.	FH41-**S-0.5SH(05)
CODE NO.	CL580

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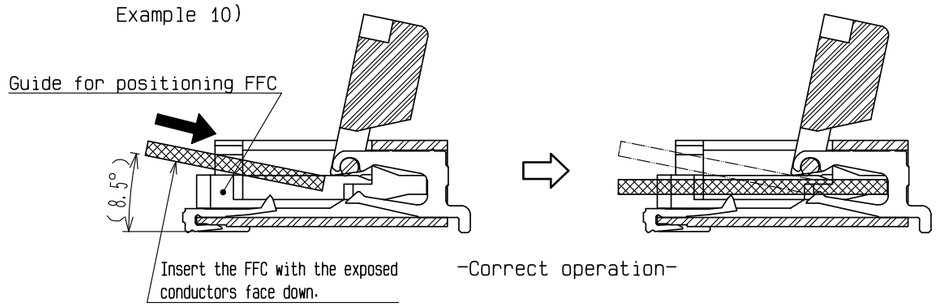
HRS DRAWING FOR REFERENCE

3. How to insert FFC

This connector has contact point on the bottom, insert the FFC with the exposed conductors face down.
This connector has Guide for positioning FFC, insert the FFC at about 8.5 degree angle
to the PCB mounting surface. (example 10)

[Caution]
-Do not insert the FFC with the conductor surface face up.
-Insert the FFC properly to the very end.
-Do not insert the FFC at an angle. (example 11)
-Insert the FFC with the actuator opened. (example 12)
-Do not twist the FFC to up and down, right and left or an angle. (example 13)

Example 10)



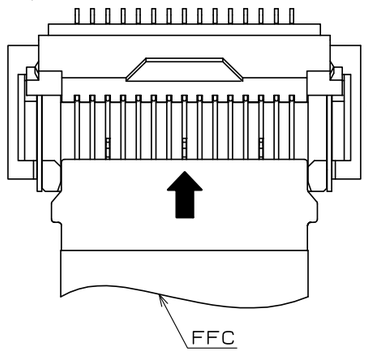
-Correct operation-

Example 11)

NG

-Incorrect operation-

Example 12)

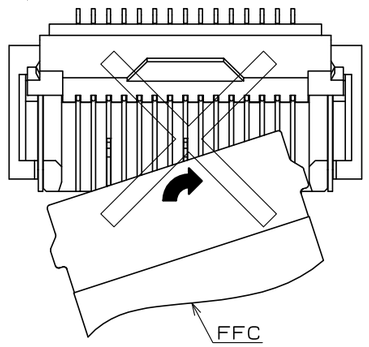


OK

FFC

-Correct operation-

Example 13)



NG

FFC

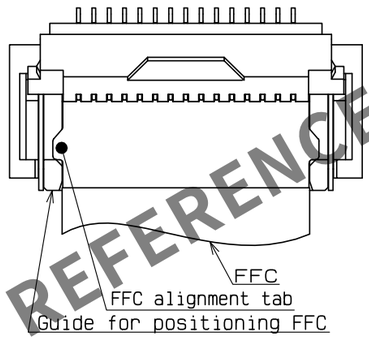
-Incorrect operation-

4. FFC insertion check

Guide for positioning FFC guide the FFC tabs to the correct position.
Make sure that the FFC tabs are located in correct position
as shown in the figure below after FFC insertion. (example 14)

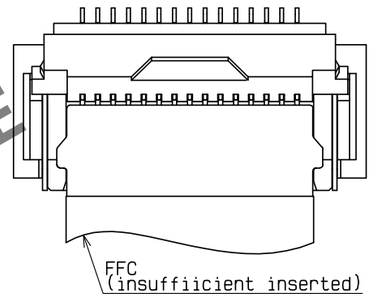
[Caution]
-Do not insert the FFC at an angle and/or stop it before insertion is completed. (example 15, 16)

Example 14)



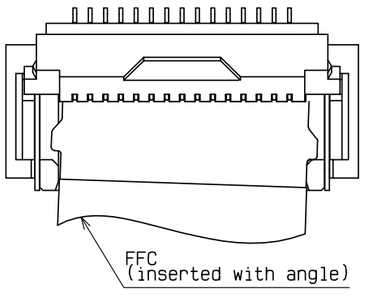
-Correct operation-

Example 15)



-Incorrect operation-

Example 16)



-Incorrect operation-

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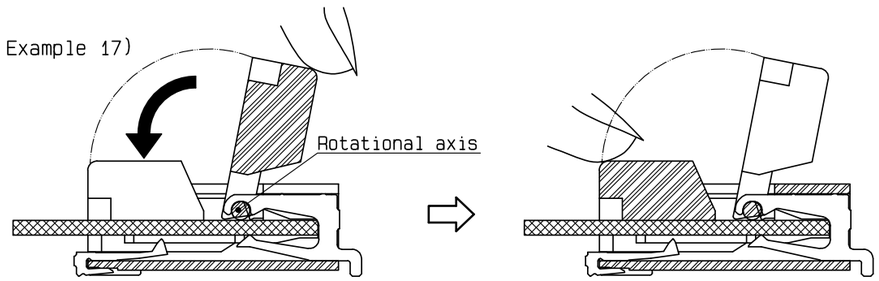
HRS DRAWING FOR REFERENCE

5. How to lock

The actuator rotates on its axis as shown below.
Apply load to rotate the actuator after inserting the FFC. (example 17)

[Caution]
- -Close the actuator by carefully operating it at the center. (example 18)
- -Do not operate the actuator at one end only. (example 19)
- -The actuator must be operated by hand only.
  Do not insert any tools or fingernails into the connector.
- -Do not try to rotate the actuator further towards the opening direction while it is fully open.
- -Do not apply excessive force to the actuator other than force necessary for rotating the actuator.
- -Do not attempt to dislodge the actuator.
- -After the actuator is closed, the actuator should be parallel to the PCB mounting surface.

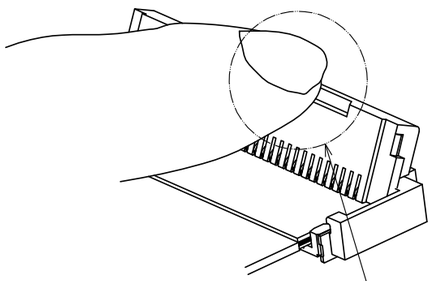
Example 17)



-Correct operation-

Example 18)

OK

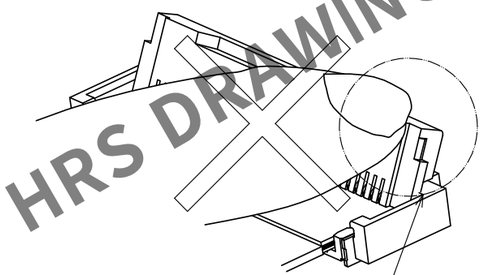


Close the actuator at the center

-Correct operation-

Example 19)

NG



Do not operate the actuator at one end only

-Incorrect operation-

6. Mating confirmation of the FFC

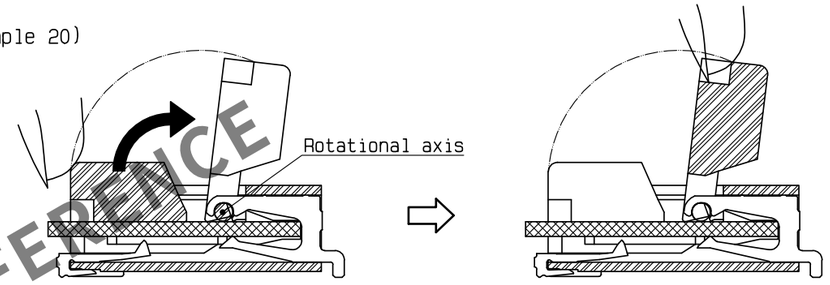
After the actuator is closed, please check if the actuator is parallel to the PCB mounting surface.
Please keep the actuator stress free while it is near its 0° position.
Any extra stress on actuator may lead to contact deformation.

7. How to unlock

Slowly flip up the actuator to release the lock. (example 20)

[Caution]
- -Open the actuator by carefully lifting it at the center. (example 21)
- -Do not lift the actuator at one end only. (example 22)
- -Do not apply excessive force to the actuator in the direction parallel to the actuator while unlocking the actuator.
- -The actuator must be operated by hand only.
  Do not insert any tools or fingernails into the connector.
- -The actuator rotates 116 degrees max.
  Do not try to rotate the actuator further towards the opening direction or apply any extra force to the actuator while it is fully open. (example 23)
- -Do not attempt to dislodge the actuator. (example 24)

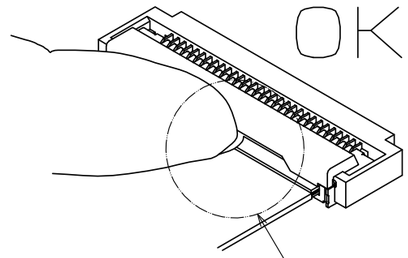
Example 20)



-Correct operation-

Example 21)

OK

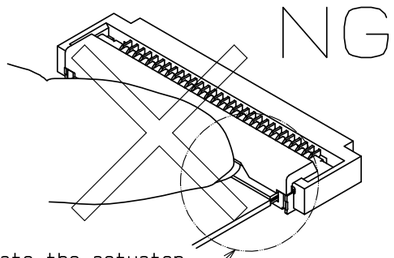


Close the actuator at the center

-Correct operation-

Example 22)

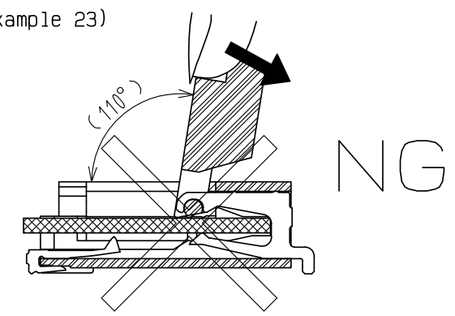
NG



Do not operate the actuator at one end only

-Incorrect operation-

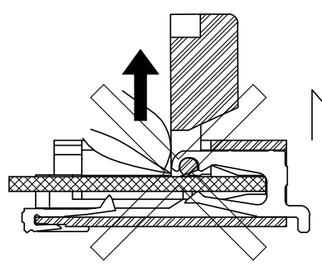
Example 23)



NG

-Incorrect operation-

Example 24)



NG

-Incorrect operation-

<INSTRUCTION MANUAL(3)>

HRS	DRAWING NO.	EDC3-325208-00
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	CODE NO.	CL580

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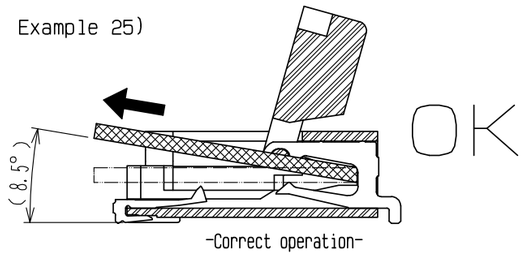
8. How to remove FFC

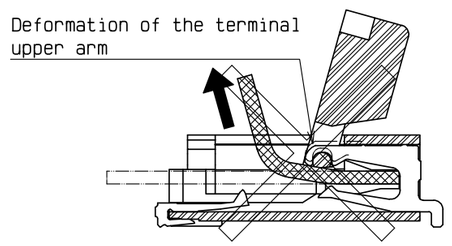
This connector has a FFC positioning structure for guiding the FFC into the right position while insertion.
After rotating the actuator to the fully open position, carefully withdraw the FFC
at about 8.5 degree angle to the PCB mounting surface. (example 25)

[Caution]
-For FFC removal, do not pull out the FFC horizontally.
-Do not withdraw the FFC at extreme(inclined towards vertical) angle. (example 26)
-Do not attempt to pull the FFC without unlocking the actuator. (example 27)

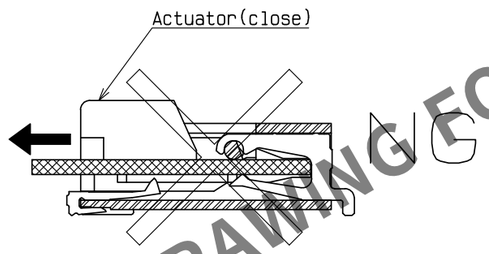
Example 25)



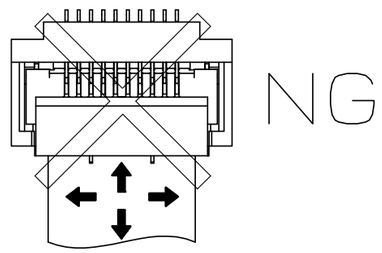
Example 26)



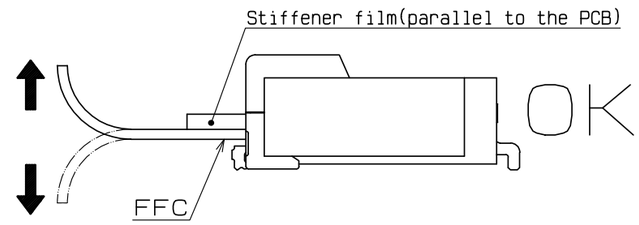
Example 27)



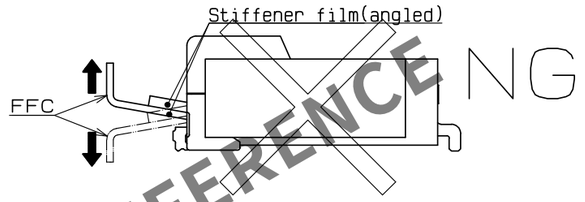
Example 28)



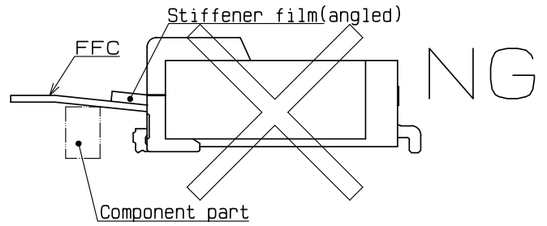
Example 29)



Example 30)



Example 31)



HRS DRAWING FOR REFERENCE

[Precautions for component layout]
While the FFC is under tension due to the connecting configuration, extra stress may be applied to the connector.
As a result, conduction failure may occur due to the extra stress.
In order to prevent such kind of conduction failure, please read through the following parts before making circuits/mechanism design.

[Caution]
-Avoid applying forces to/pulling the FFC along/perpendicular to the direction of FFC insertion. (example 28)
Avoid pushing/pulling the FFC upwards/downwards.
-If the FFC has to be curled/bended in your cabling design,
please keep enough degree of freedom in your design to keep the FFC tension free.
In this regard, the stiffener should be parallel to the PCB. (example 29)
-If the FFC has to be curled/bended in your cabling design, do not curl/bend the FFC area near the connector.
This may lead to conduction failure or FFC breakage. (example 30)
It is recommended to keep the FFC fixed to avoid applying stress through the FFC to the connector.
-Do not mount other components underneath the FFC stiffener which may interfere with the connection. (example 31)
-Follow the recommended FFC design.
Please consult with the FFC manufacturer about FFC bending performance and wire breakage strength while making design.
-Keep sufficient operating space for FFC insertion during layout design in order to avoid incorrect FFC insertion.
Please keep enough FFC length and component layout space for assembly during design process.
FFC with too short length may make the assembly difficult.
-Keep enough space for the rotation of the actuator during PCB and component layout design.
-Please consult with our sales representative if you are using FFC with different configuration from our recommendation.

[Instructions for mounting on the PCB]

Follow the instructions shown below when mounting on the PCB.

[Caution]
-Refer to recommended layouts on page 1 for PCB and stencil pattern.
-Using either narrower land pattern or wider stencil pattern than recommendation
may end up with excessive amount of solder/flux climbing on contact.
Please inspect the size of solder fillet and flux climbing height of the mounted connector
while using different land/stencil pattern from our recommendation.
-Clearance between the mounting surface of the connector contact lead and the bottom of the housing is
very small. Solder resist/silk screening applied underneath the connector may interfere with the connector.
This may lead to soldering defect/insufficient fillet formation.
Please verify your solder resist/silk screening design carefully before implementing the design.
-Please try to minimize the warpage of the PCB. Soldering failure could still occur
due to the PCB warpage even if the coplanarity of the connecter is under 0.1mm.
-If the connector is mounting on FFC, please make sure to put a stiffener
on the backside of the FFC.
Recommended stiffner: Glass epoxy material with thickness of 0.3 mm MIN.
-Do not apply 1 N or greater external force on the connector when unreeling
or handling the connector before mounting.
Excessive mechanical stress may damage the connector before mounting.

<INSTRUCTION MANUAL(4)>

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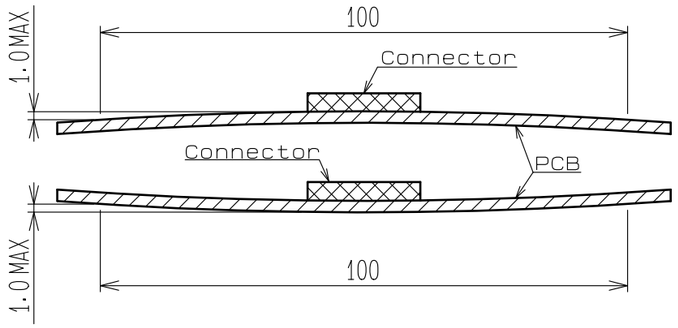
HRS DRAWING FOR REFERENCE

Instructions for PCB handling after mounting the connector

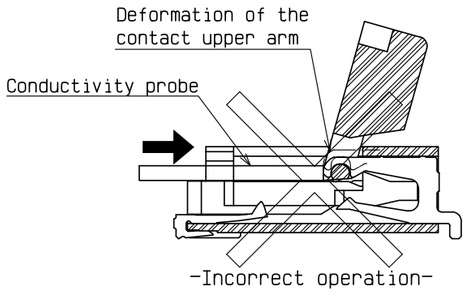
Follow the instructions shown below when mounting on the PCB.

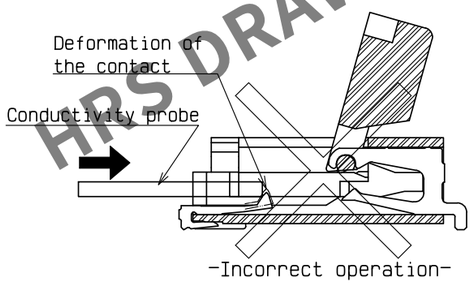
[Caution]
- ·Splitting a large PCB into several pieces
  ·Installing mounting screw on PCB
  During the assembly processes described above, care shall be taken so as not to give any stresses of deflection or twisting to the PCB.
  Stresses applied on PCB may damage the connector as well
- The warpage of a 100 mm wide PCB should remain within 0.5 mm .(example 32)
  The warpage of PCB may apply excessive stress on the connnector and damage the connector.
- Please perform conduction check with caution.Conductivity probe may damage the connector contacts.(example 33)
- Attachment of foreign particles with the connector contact may lead to conduction failure.
  In this particular case, the conduction failure may be fixed by re-inserting the FFC.

Example 32)



Example 33)





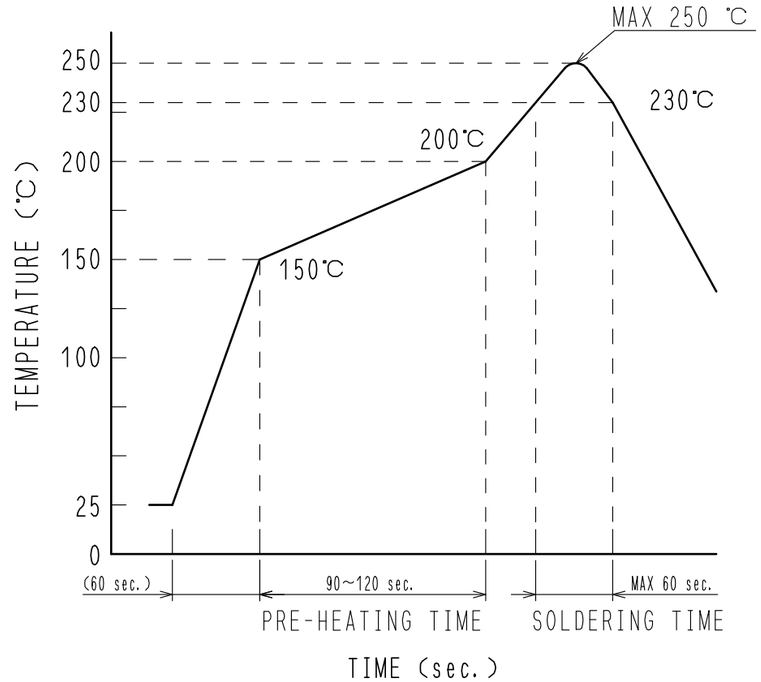
Instructions on manual soldering

Follow the instructions shown below when soldering the connector manually during repair work, etc.

[Caution]
- Do not perform manual soldering with the FFC inserted into the connector.
- Do not heat the connector excessively. Be very careful not to let the soldering iron touch any parts other than connector leads. Otherwise, the connector may be deformed or melted.
- Do not supply excessive solder (or flux).
  If excessive solder (or flux) is supplied on the contact lead, solder or flux may adhere to the contact point or rotating parts of the actuator, resulting in conduction failure or a rotation failure of the actuator.
  Supplying excessive solder to the metal fittings may hinder actuator rotation, resulting in breakage of the connector.

Recommended reflow temperature profile

The temperatures mentioned below refer to the PCB surface temperature near the connector contact leads.
For specific applications the recommended temperature may vary depending on solder paste type, volume/thickness and board size/thickness.
Please consult with your solder paste and equipment manufacturer for specific recommendations.
- Reflow method:IR reflow
- Number of reflow cycles:2 cycles MAX.



<Recommended reflow temperature profile>

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