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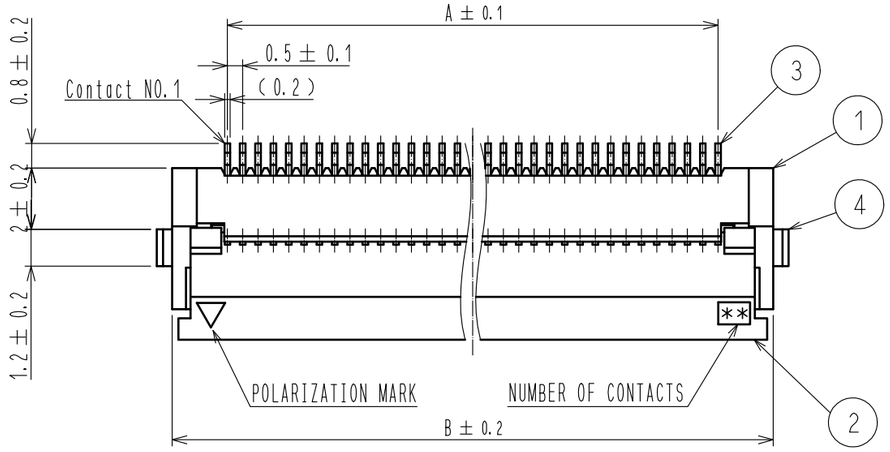
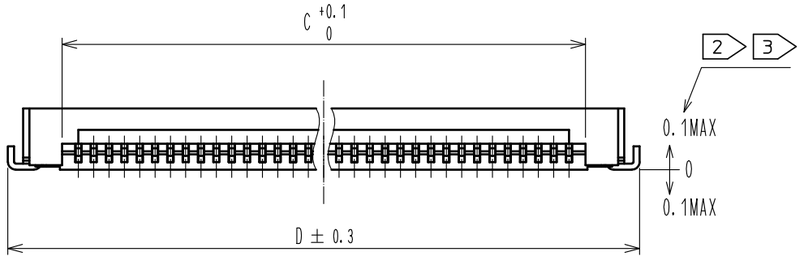
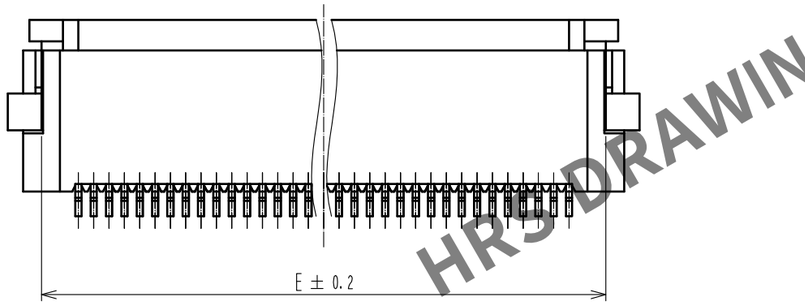
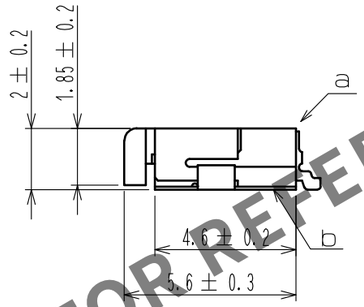
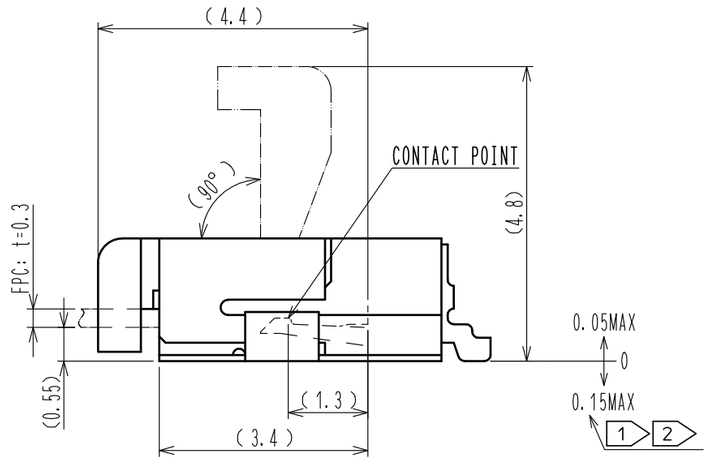




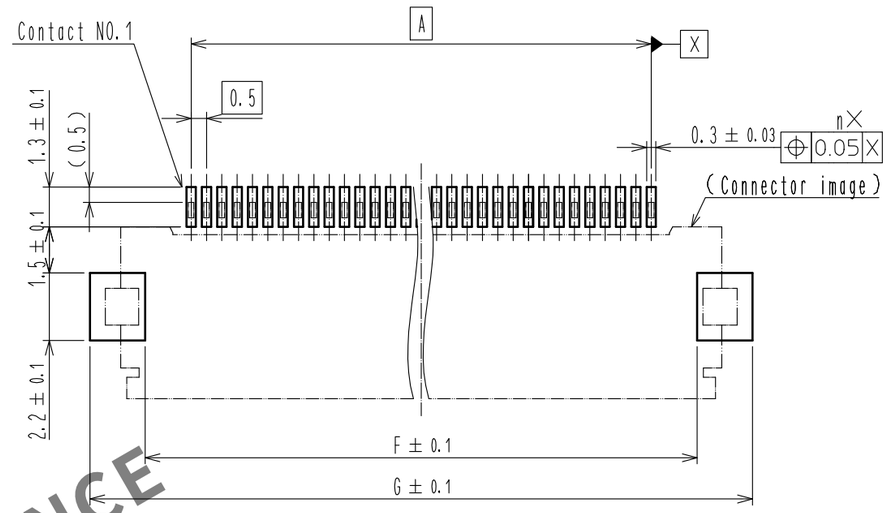




a (10 : 1)

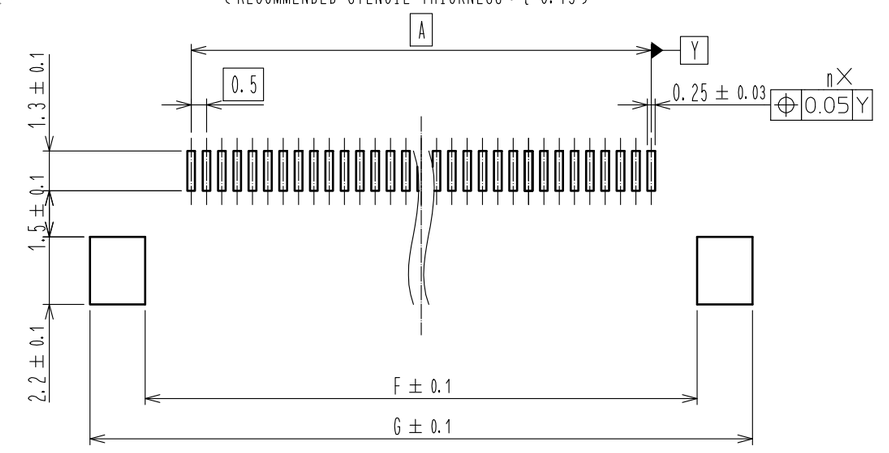


RECOMMENDED PCB MOUNTING PATTERN



RECOMMENDED STENCIL PATTERN

(RECOMMENDED STENCIL THICKNESS : t=0.15)



NOTE
1. The dimension in parentheses are for reference. ⚠1
2. Reference is b.
3. Lead CO-PLANARITY shall be 0.1 max.
4. 'n' represents the number of contacts.
5. The quality remains good. Even with the dark spots, ⚠1 which could occasionally occur molded plastics.

HRS DRAWING FOR REFERENCE

<34 CONTACT OR LESS>

NO.	MATERIAL	FINISH , REMARKS	NO.	MATERIAL	FINISH , REMARKS
4	BRASS	TIN PLATING 1μmMIN OVER NICKEL 1μmMIN.	8	(CONNECTOR)	
3	PHOSPHOR BRONZE	GOLD PLATING 0.05μmMIN OVER NICKEL 1μmMIN	7	POLYSTYRENE	
2	PPS	(DEEP BROWN) UL94V-0	6	POLYESTER	
1	POLYAMIDE	(BEIGE) UL94V-0	5	POLYSTYRENE	

UNITS	SCALE		COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE
mm	5 : 1	⚠1	17	DIS-F-00013152	HN. UCHIUMI	HS. HIRAHARA	20220401

HIROSE ELECTRIC CO., LTD.

APPROVED	MO. ISHIDA	20131209
CHECKED	HS. SAKAMOTO	20131209
DESIGNED	RT. IKEDA	20131207
DRAWN	NM. SANPEI	20131205

DRAWING NO.	EDC3-150229-11
PART NO.	FH12-**S-0.5SH(55)
CODE NO.	CL586

⚠1 1/10

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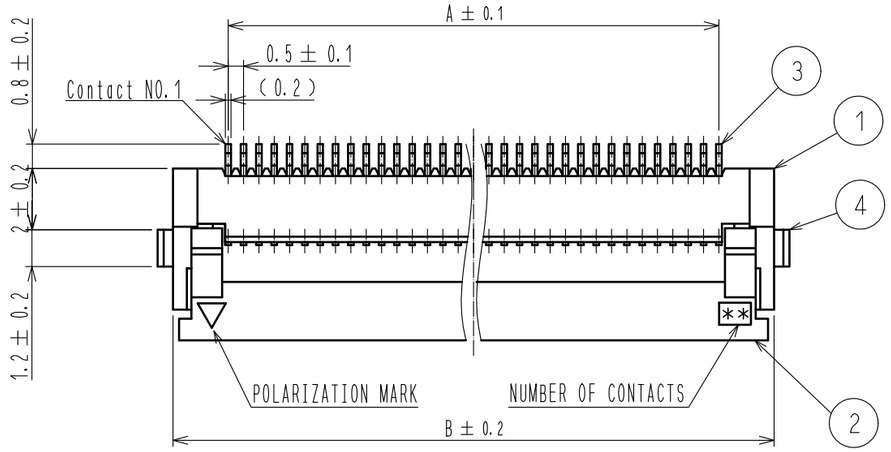

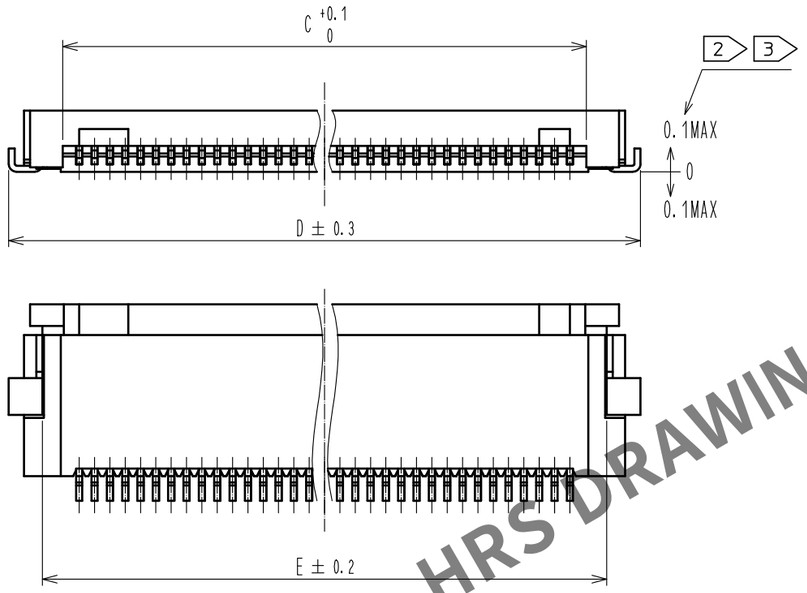

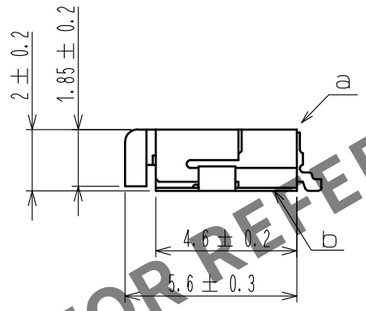

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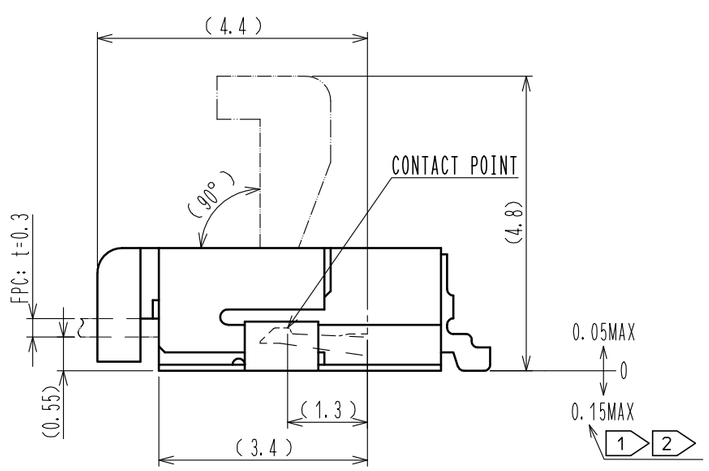
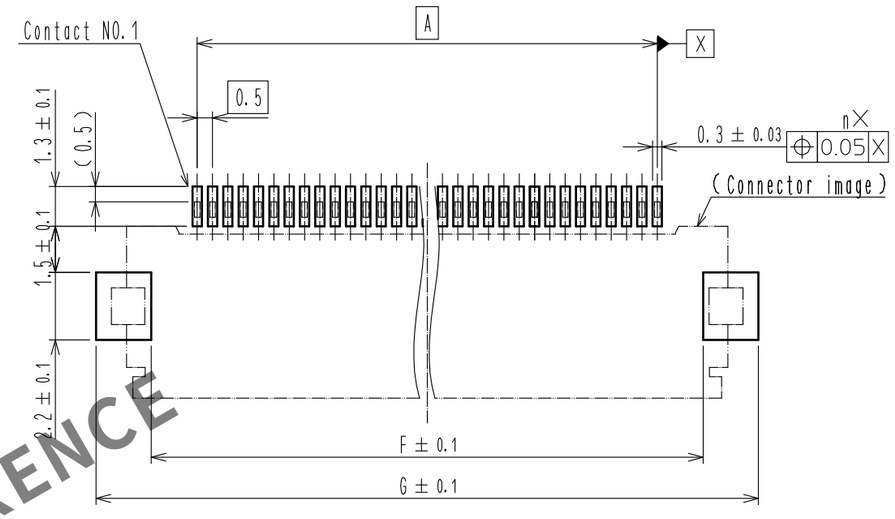
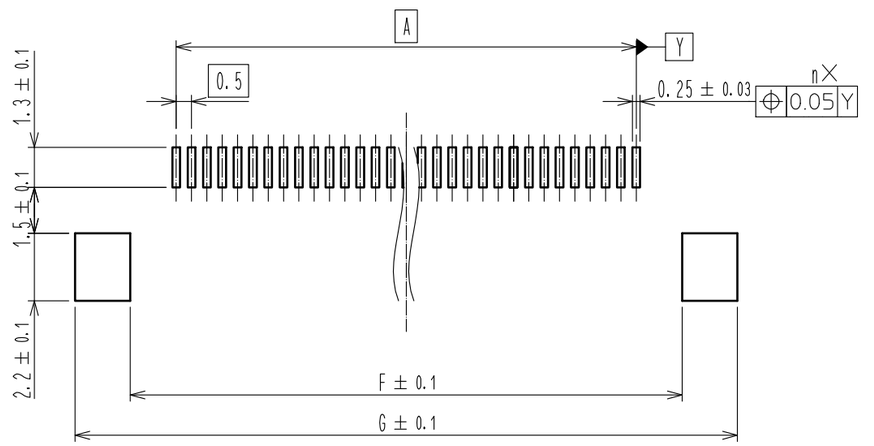


RECOMMENDED PCB MOUNTING PATTERN



RECOMMENDED STENCIL PATTERN

(RECOMMENDED STENCIL THICKNESS : t=0.15)



NOTE
1. The dimension in parentheses are for reference. △1
2. ▷2◁ Reference is b.
3. ▷3◁ Lead CO-PLANARITY shall be 0.1 max.
4. 'n' represents the number of contacts.
5. The quality remains good. Even with the dark spots. △1 which could occasionally occur molded plastics.

HRS DRAWING FOR REFERENCE

<35 CONTACT OR MORE>

DRAWING NO.	EDC3-150229-11
PART NO.	FH12-**S-0.5SH(55)
CODE NO.	CL586 △1 2/10

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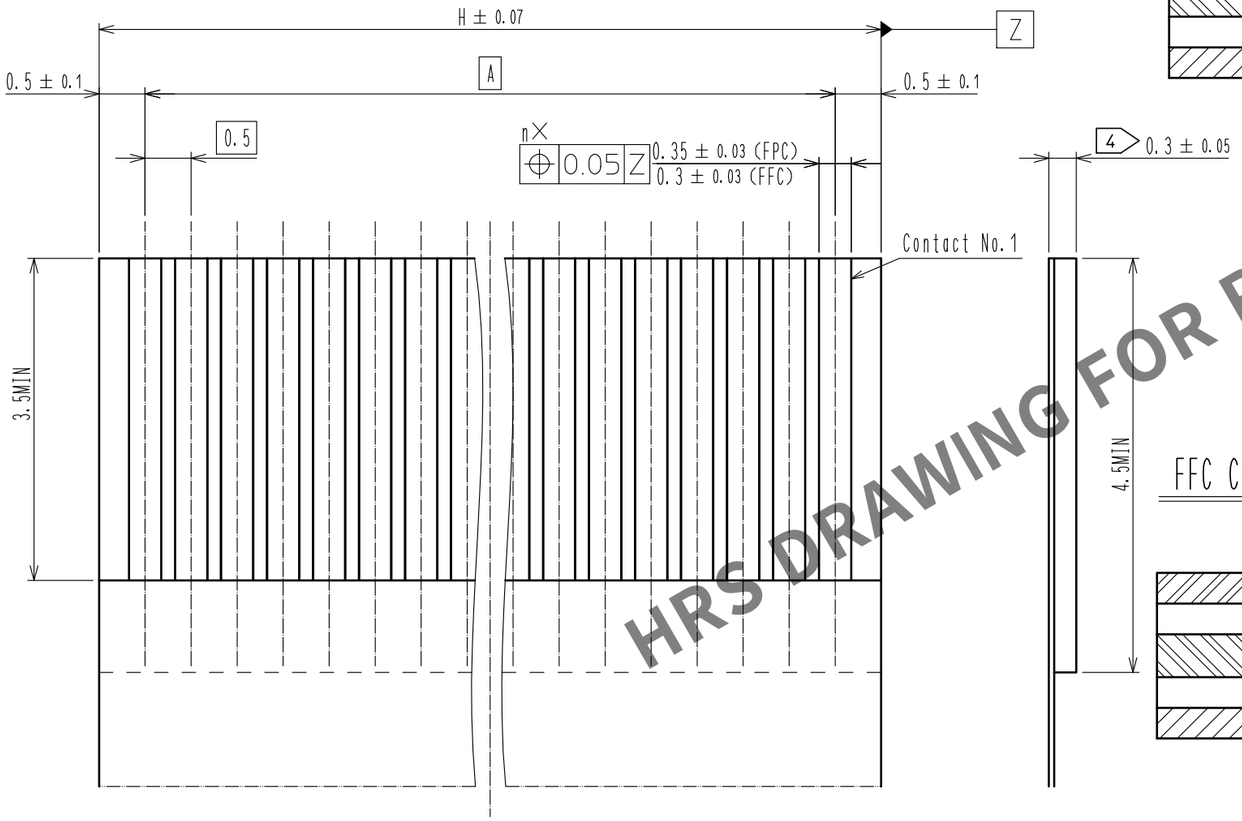
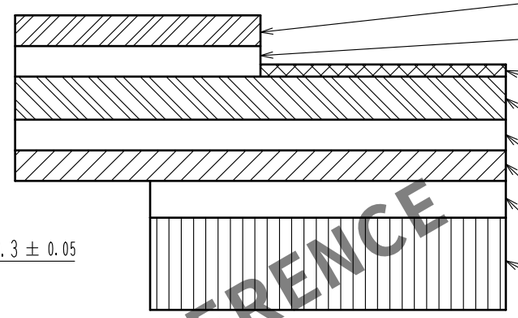
RECOMMENDED FPC/FFC (15:1)



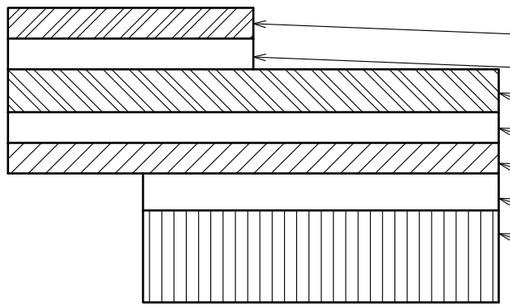
NOTE deleted ⚠1

FPC CONFIGURATION (REFERENCE EXAMPLE) (SCALE:FREE)



MATERIAL NAME	MATERIAL	THICKNESS(μm)
COVERING FILM LAYER	POLYIMIDE 1mil thick.	(25)
COVER ADHESIVE		(25)
SURFACE TREATMENT	NICKEL UNDERCOAT 1 to 5μm + GOLD PLATING 0.2μm	3
COPPER FOIL	Cu 1 oz	35
BASE ADHESIVE	HEAT-HARDENED ADHESIVE	25
BASE FILM	POLYIMIDE 1mil thick	25
REINFORCEMENT MATERIAL ADHESIVE	HEAT-HARDENED ADHESIVE	30
STIFFENER FILM	POLYIMIDE 7mil thick	175

FFC CONFIGURATION (REFERENCE EXAMPLE) (SCALE:FREE)



MATERIAL NAME	MATERIAL	THICKNESS(μm)
POLYESTER FILM		(12)
ADHESIVE	THERMOPLASTIC POLYESTER	(30)
GOLD PLATED, SOFT COPPER FILM		35
ADHESIVE	POLYESTER	30
POLYESTER		12
ADHESIVE	POLYESTER	30
STIFFENER FILM	POLYESTER	188

HRS DRAWING FOR REFERENCE

DRAWING NO.	EDC3-150229-11
PART NO.	FH12-**S-0.5SH(55)
CODE NO.	CL586

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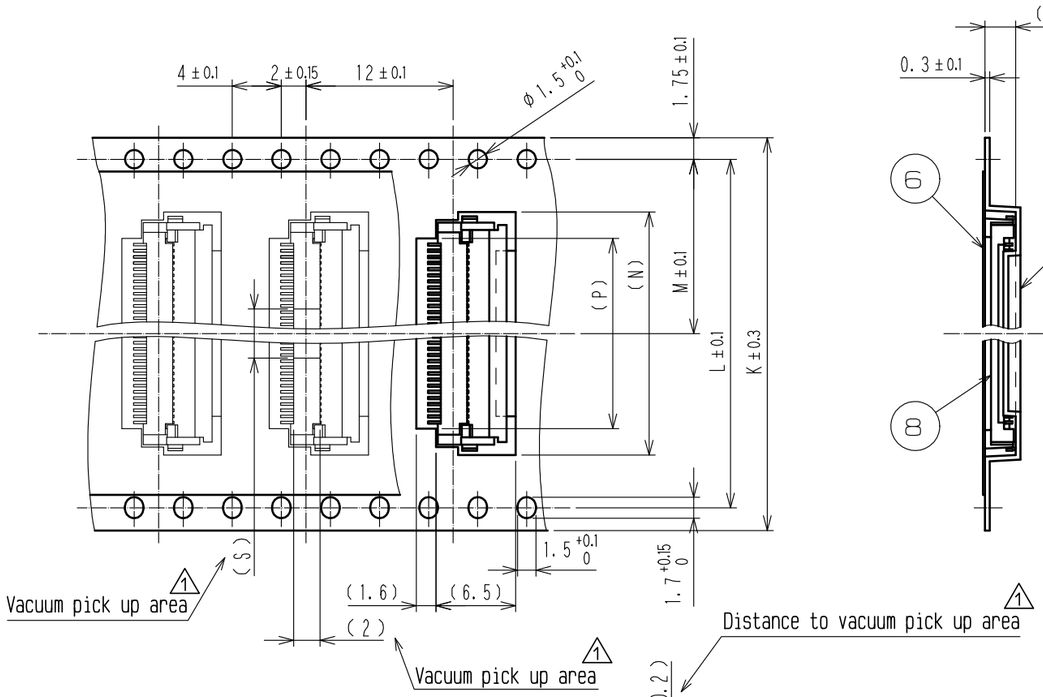
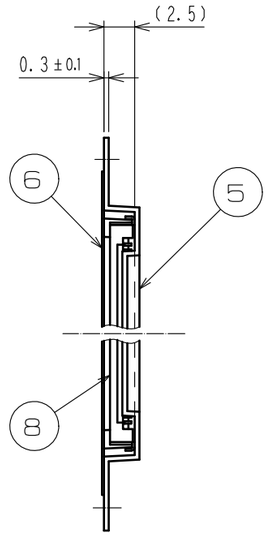
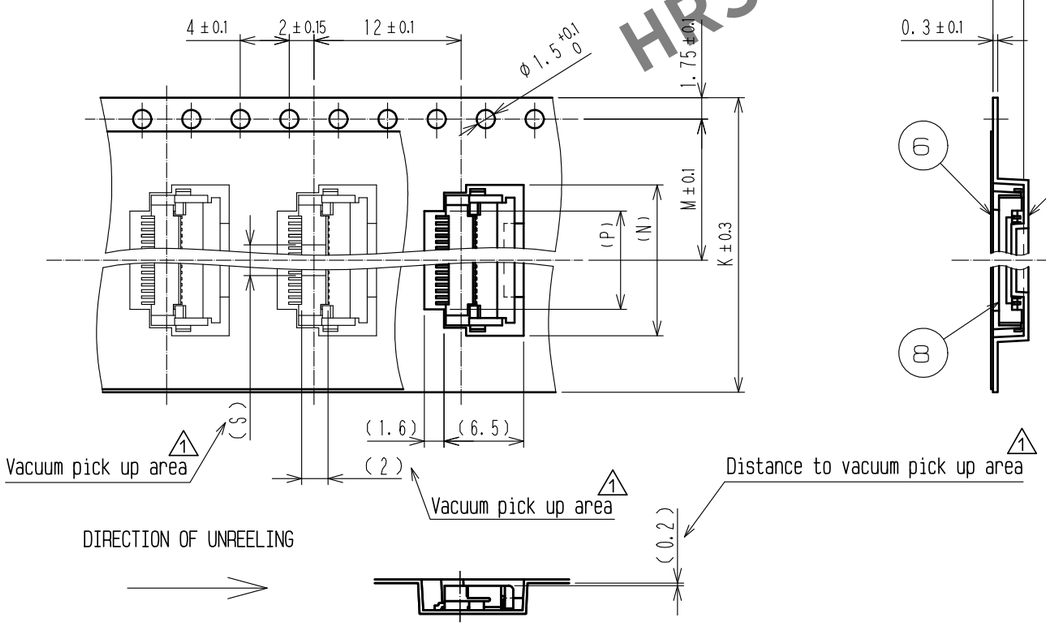
EMBOSSED CARRIER TAPE DIMENSION(2:1)

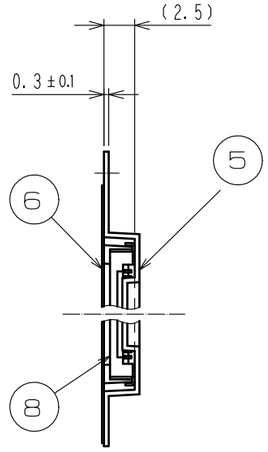
TAPE WIDTH:32mm MIN



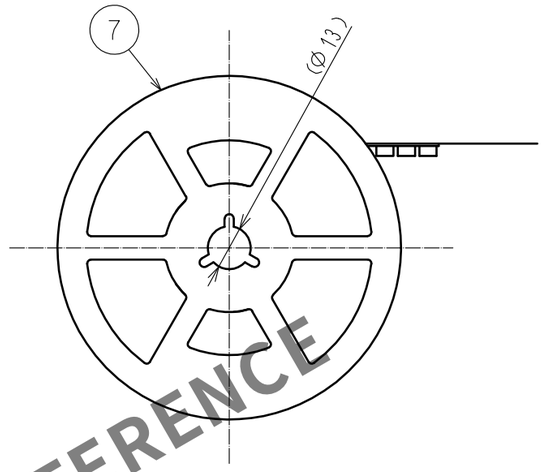


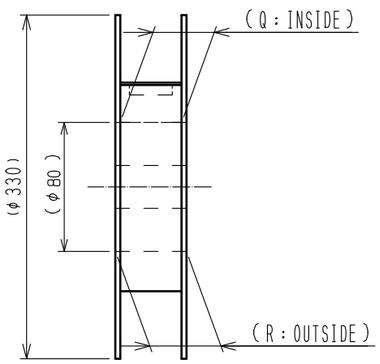
TAPE WIDTH:24mm MAX

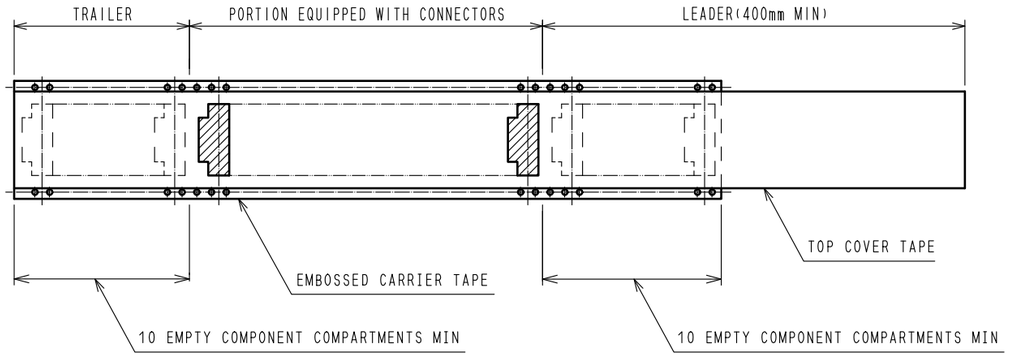




REEL DIMENSION (FREE)







6 PER REEL:2000 CONNECTORS.

7 SEE DIMENSION TABLE IN THE APPENDIX.

HRS DRAWING FOR REFERENCE

<DRAWING FOR PACKING>

DRAWING NO.	EDC3-150229-11
PART NO.	FH12-**S-0.5SH(55)
CODE NO.	CL586

PART NO.	CODE NO.	NUMBER OF CONTACT	DIMENSION TABLE OF CONNECTOR, FPC, FFC, PCB MOUNTING PATTERN AND STENCIL PATTERN								DIMENSION TABLE OF DRAWING FOR PACKING △1							
			A	B	C	D	E	F	G	H	K	L	M	N	P	Q	R	S
FH12- 6S-0.5SH(55)	CL586-0582-5-55	6	2.5	6.1	3.57	7.1	4.9	4.5	8.1	3.5	16	—	7.5	7.8	3.5	17.4	21.4	2.5
FH12- 8S-0.5SH(55)	CL586-0744-5-55	8	3.5	7.1	4.57	8.1	5.9	5.5	9.1	4.5	16	—	7.5	8.8	4.5	17.4	21.4	3.5
FH12-10S-0.5SH(55)	CL586-0522-3-55	10	4.5	8.1	5.57	9.1	6.9	6.5	10.1	5.5	16	—	7.5	9.8	5.5	17.4	21.4	4
FH12-11S-0.5SH(55)	CL586-0600-5-55	11	5	8.6	6.07	9.6	7.4	7	10.6	6	16	—	7.5	10.3	6	17.4	21.4	4
FH12-12S-0.5SH(55)	CL586-0704-0-55	12	5.5	9.1	6.57	10.1	7.9	7.5	11.1	6.5	24	—	11.5	10.8	6.5	25.4	29.4	4
FH12-13S-0.5SH(55)	CL586-0549-0-55	13	6	9.6	7.07	10.6	8.4	8	11.6	7	24	—	11.5	11.3	7	25.4	29.4	4
FH12-14S-0.5SH(55)	CL586-0533-0-55	14	6.5	10.1	7.57	11.1	8.9	8.5	12.1	7.5	24	—	11.5	11.8	7.5	25.4	29.4	4
FH12-15S-0.5SH(55)	CL586-0523-6-55	15	7	10.6	8.07	11.6	9.4	9	12.6	8	24	—	11.5	12.3	8	25.4	29.4	4
FH12-16S-0.5SH(55)	CL586-0531-4-55	16	7.5	11.1	8.57	12.1	9.9	9.5	13.1	8.5	24	—	11.5	12.8	8.5	25.4	29.4	4
FH12-17S-0.5SH(55)	CL586-0606-1-55	17	8	11.6	9.07	12.6	10.4	10	13.6	9	24	—	11.5	13.3	9	25.4	29.4	4
FH12-18S-0.5SH(55)	CL586-0530-1-55	18	8.5	12.1	9.57	13.1	10.9	10.5	14.1	9.5	24	—	11.5	13.8	9.5	25.4	29.4	4
FH12-19S-0.5SH(55)	CL586-0534-2-55	19	9	12.6	10.07	13.6	11.4	11	14.6	10	24	—	11.5	14.3	10	25.4	29.4	4
FH12-20S-0.5SH(55)	CL586-0524-9-55	20	9.5	13.1	10.57	14.1	11.9	11.5	15.1	10.5	24	—	11.5	14.8	10.5	25.4	29.4	4
FH12-22S-0.5SH(55)	CL586-0532-7-55	22	10.5	14.1	11.57	15.1	12.9	12.5	16.1	11.5	24	—	11.5	15.8	11.5	25.4	29.4	4
FH12-24S-0.5SH(55)	CL586-0521-0-55	24	11.5	15.1	12.57	16.1	13.9	13.5	17.1	12.5	24	—	11.5	16.8	12.5	25.4	29.4	4
FH12-25S-0.5SH(55)	CL586-0692-3-55	25	12	15.6	13.07	16.6	14.4	14	17.6	13	24	—	11.5	17.3	13	25.4	29.4	4
FH12-26S-0.5SH(55)	CL586-0576-2-55	26	12.5	16.1	13.57	17.1	14.9	14.5	18.1	13.5	24	—	11.5	17.8	13.5	25.4	29.4	4
FH12-28S-0.5SH(55)	CL586-0612-4-55	28	13.5	17.1	14.57	18.1	15.9	15.5	19.1	14.5	32	28.4	14.2	18.8	14.5	33.4	37.4	4
FH12-30S-0.5SH(55)	CL586-0525-1-55	30	14.5	18.1	15.57	19.1	16.9	16.5	20.1	15.5	32	28.4	14.2	19.8	15.5	33.4	37.4	4
FH12-32S-0.5SH(55)	CL586-0681-7-55	32	15.5	19.1	16.57	20.1	17.9	17.5	21.1	16.5	32	28.4	14.2	20.8	16.5	33.4	37.4	4
FH12-33S-0.5SH(55)	CL586-0520-8-55	33	16	19.6	17.07	20.6	18.4	18	21.6	17	32	28.4	14.2	21.3	17	33.4	37.4	4
FH12-34S-0.5SH(55)	CL586-0617-8-55	34	16.5	20.1	17.57	21.1	18.9	18.5	22.1	17.5	32	28.4	14.2	21.8	17.5	33.4	37.4	4
FH12-35S-0.5SH(55)	CL586-0740-4-55	35	17	20.6	18.07	21.6	19.4	19	22.6	18	44	40.4	20.2	22.3	18	45.4	49.4	4
FH12-36S-0.5SH(55)	CL586-0526-4-55	36	17.5	21.1	18.57	22.1	19.9	19.5	23.1	18.5	44	40.4	20.2	22.8	18.5	45.4	49.4	4
FH12-40S-0.5SH(55)	CL586-0527-7-55	40	19.5	23.1	20.57	24.1	21.9	21.5	25.1	20.5	44	40.4	20.2	24.8	20.5	45.4	49.4	4
FH12-45S-0.5SH(55)	CL586-0528-0-55	45	22	25.6	23.07	26.6	24.4	24	27.6	23	44	40.4	20.2	27.3	23	45.4	49.4	4
FH12-50S-0.5SH(55)	CL586-0529-2-55	50	24.5	28.1	25.57	29.1	26.9	26.5	30.1	25.5	44	40.4	20.2	29.8	25.5	45.4	49.4	4
FH12-53S-0.5SH(55)	CL586-0595-7-55	53	26	29.6	27.07	30.6	28.4	28	31.6	27	44	40.4	20.2	31.3	27	45.4	49.4	4

HRS DRAWING FOR REFERENCE

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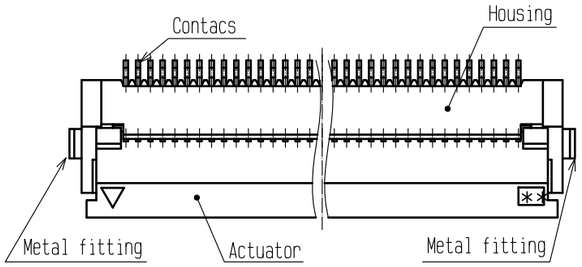
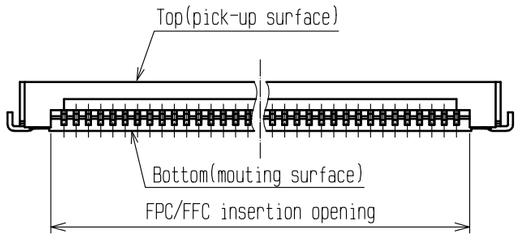
HRS DRAWING FOR REFERENCE

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.

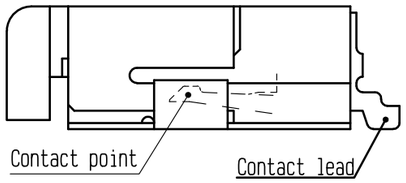
[Connector Part Nomenclature]



《Top view》



《Front view》



《Contact view》

[Operation and Precautions]

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

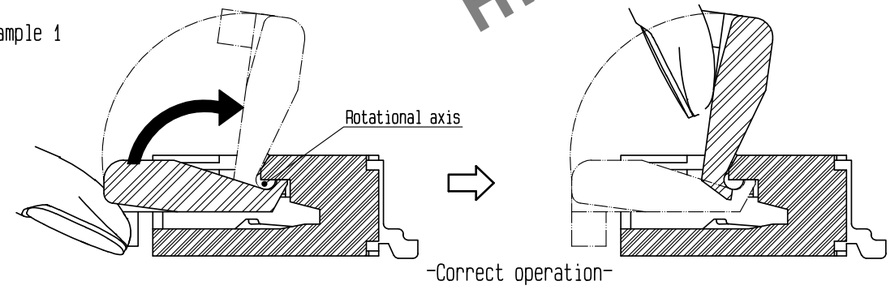
   [Caution]
   -Do not insert FPC/FFC or operate actuator before mounting.

2. How to unlock (Before inserting FPC/FFC)

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

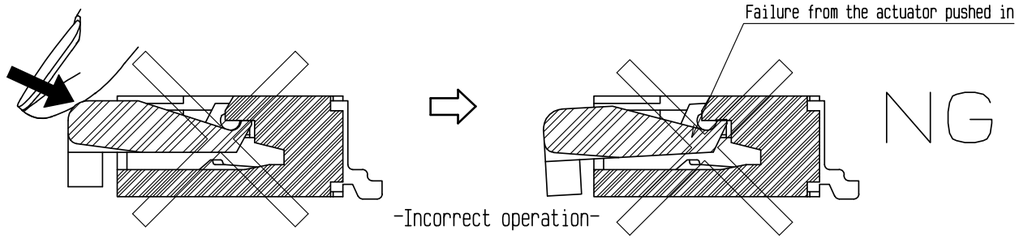
   [Caution]
   -Do not apply extra force to the connector while rotating the actuator as the illustration shows.(example 2)
   -Open the actuator by carefully lifting it at the center.(example 3)
   -Do not lift the actuator at one end only.(example 4)
   -The actuator must be operated by hand only.
    Do not insert any tools or fingernails into the connector.(example 5, 6)
   -The actuator rotates 100 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



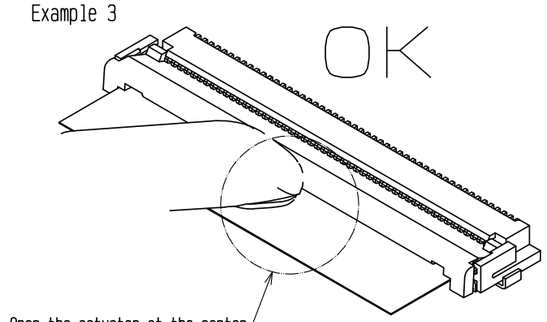
-Correct operation-

Example 2



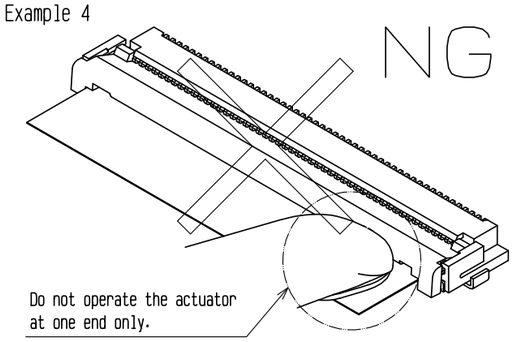
-Incorrect operation-

Example 3



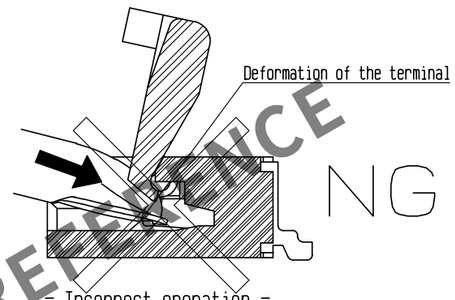
-Incorrect operation-

Example 4



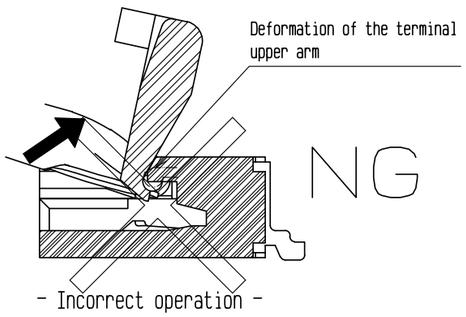
- Incorrect operation -

Example 5



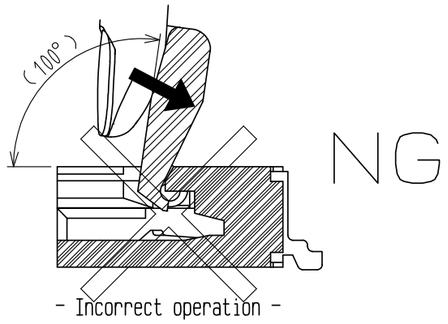
- Incorrect operation -

Example 6



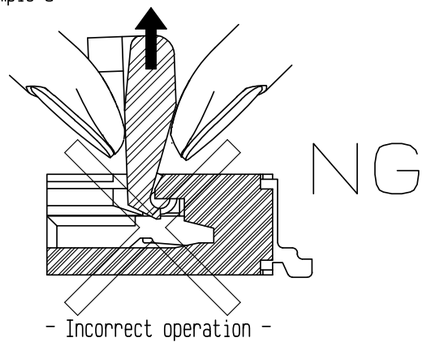
- Incorrect operation -

Example 7



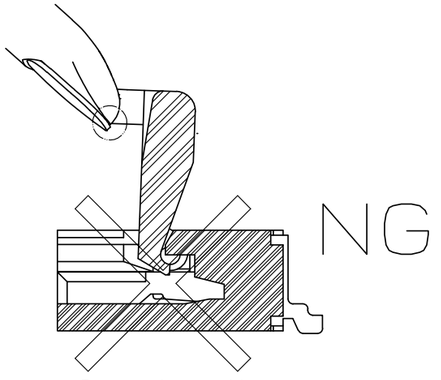
- Incorrect operation -

Example 8



- Incorrect operation -

Example 9



- Incorrect operation -

<INSTRUCTION MANUAL(1)> ⚠1

HRS	DRAWING NO.	EDC3-150229-11
	PART NO.	FH12-**S-0.5SH(55)
	CODE NO.	CL586 ⚠1 6/9

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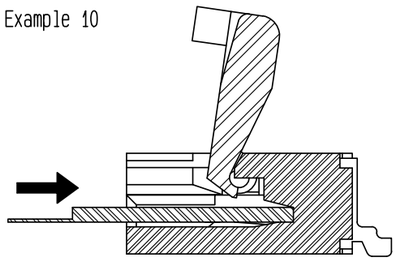
HRS DRAWING FOR REFERENCE

3. How to insert FPC/FFC

This connector has contact point on the bottom.
Ithout tabs, insert the FPC/FFC horizontally along the surface.

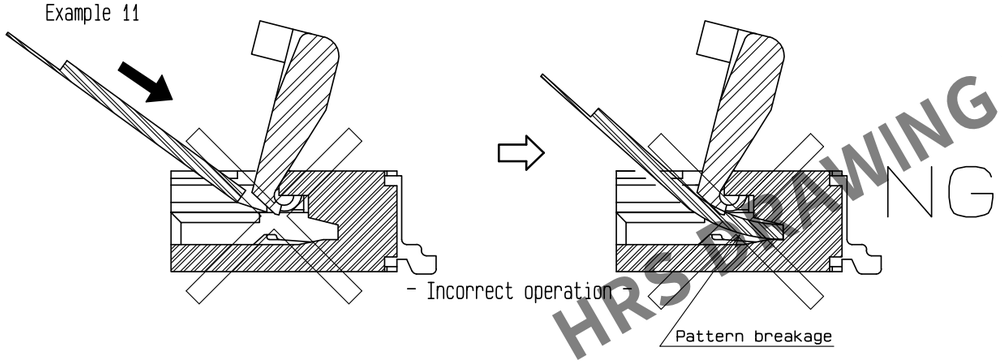
[Caution]
-Do not insert the FPC/FFC with the conductor surface face up.
-Insert the FPC/FFC properly to the very end.
-Do not insert the FPC/FFC at an angle. (example 11)
-Insert the FPC/FFC with the actuator opened. (example 12)
-Do not twist the FPC/FFC to up and down, right and left or an angle.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

Example 10



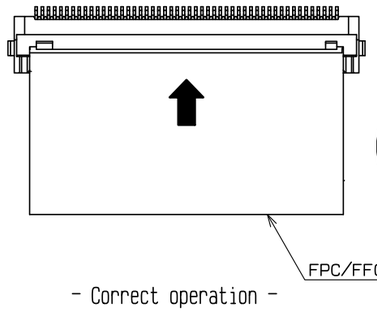
- Correct operation -

Example 11



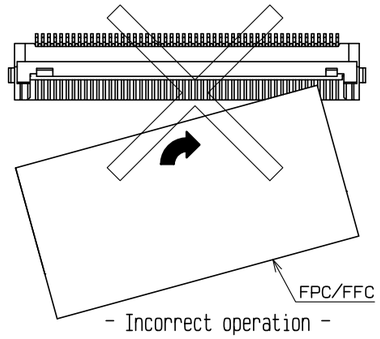
- Incorrect operation -

Example 12



- Correct operation -

Example 13



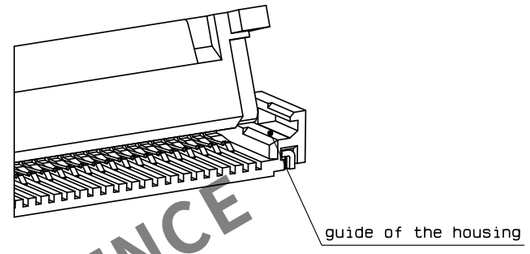
- Incorrect operation -

4. FPC/FFC insertion check

Make sure that the FPC/FFC is not riding up on the guide of the housing. (example 14)
If the actuator is locked while the FPC/FFC is riding up on the guide,
the actuator may come off or be damaged.

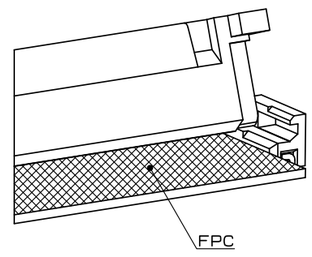
[Caution]
-Do not insert FPC/FFC shallowly or at an angle. (example 15)

<FPC/FFC not inserted>

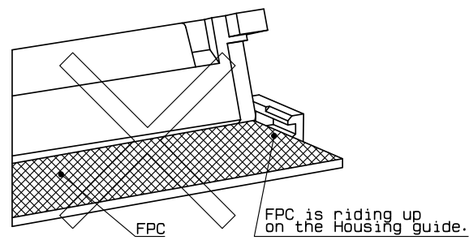


Example 14

<Normal FPC insertion state>

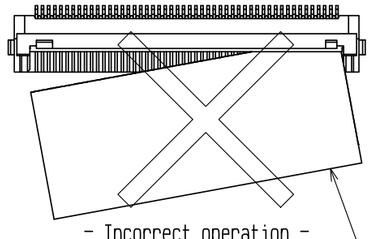


<FPC ride up state>



- Incorrect operation -

Example 15



- Incorrect operation -

<INSTRUCTION MANUAL(2)> △1

HRS	DRAWING NO.	EDC3-150229-11
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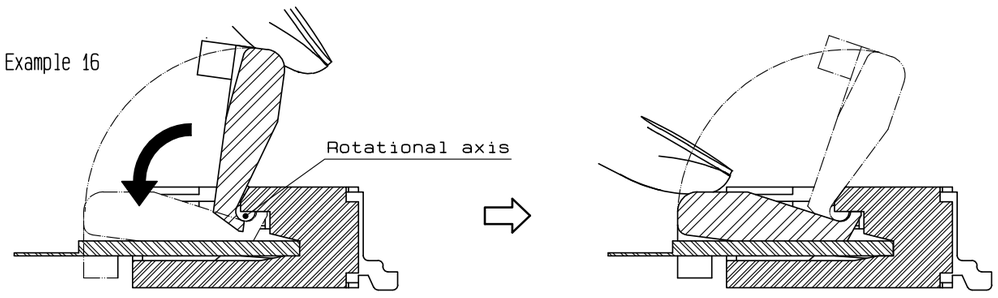
5. How to lock

The actuator rotates on its axis as shown below.
Apply load to rotate the actuator after inserting the FPC/FFC. (example 16)

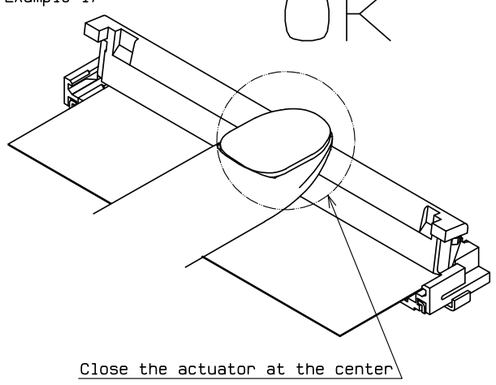
[Caution]
-Close the actuator by carefully operating it at the center. (example 17)
-Do not operate the actuator at one end only. (example 18)
-The actuator must be operated by hand only.
Do not insert any tools or fingernails into the connector.
-Do not try to rotate the actuator further towards the 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 16



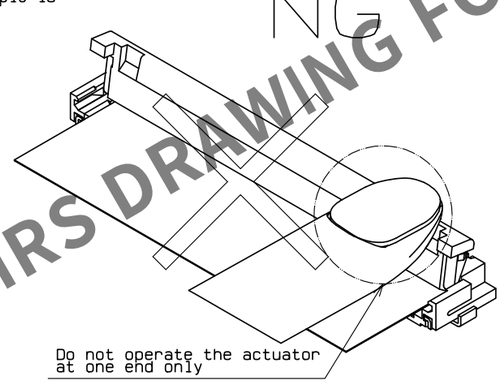
- Correct operation -

Example 17



- Correct operation -

Example 18



- Incorrect operation -

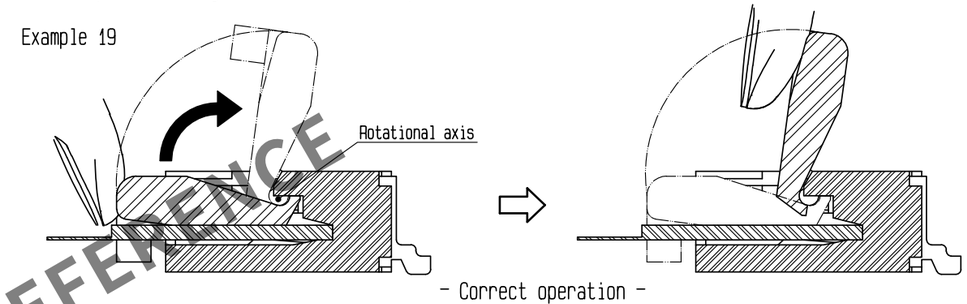
6. Mating confirmation of the FPC/FFC
After the actuator is closed, please check if the actuator is parallel to the PCB mounting surface.
Please keep the actuator stress free while it is near its 0° position.
Any extra stress on actuator may lead to contact deformation.

7. How to unlock

Slowly flip up the actuator to release the lock. (example 19)

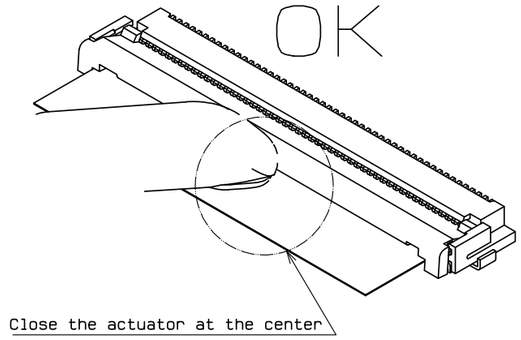
[Caution]
-Open the actuator by carefully lifting it at the center. (example 20)
-Do not lift the actuator at one end only. (example 21)
-Do not apply excessive force to the actuator in the direction parallel to the actuator while unlocking the actuator.
-The actuator must be operated by hand only.
Do not insert any tools or fingernails into the connector.
-The actuator rotates 100 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 22)
-Do not attempt to dislodge the actuator. (example 23)

Example 19



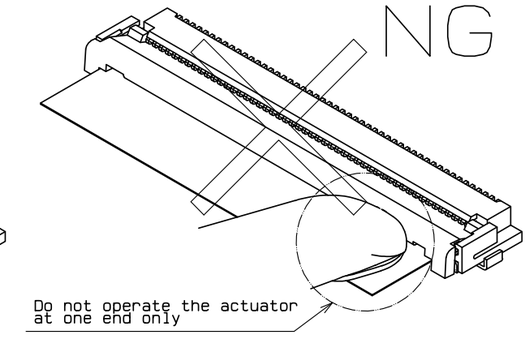
- Correct operation -

Example 20



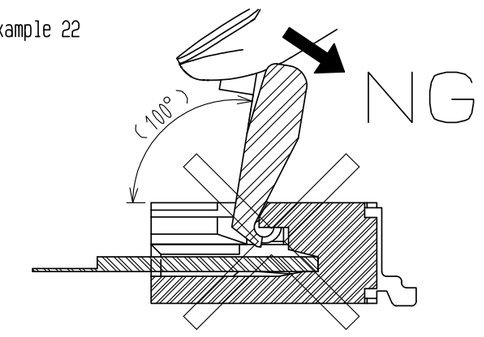
- Correct operation -

Example 21



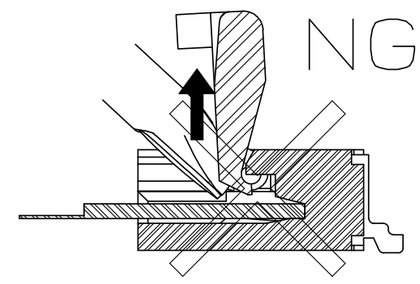
- Incorrect operation -

Example 22



- Incorrect operation -

Example 23



- Incorrect operation -

HRS DRAWING FOR REFERENCE

<INSTRUCTION MANUAL (3)> ⚠1

HRS	DRAWING NO.	EDC3-150229-11
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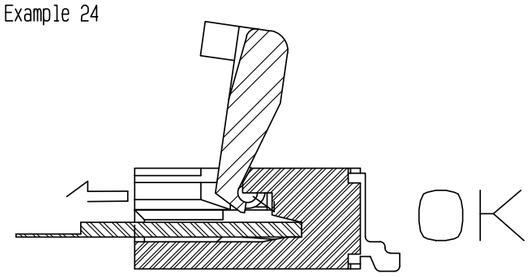
8. How to remove FPC/FFC

Pull out the FPC/FFC horizontally along the PCB mounting surface.(example 24)

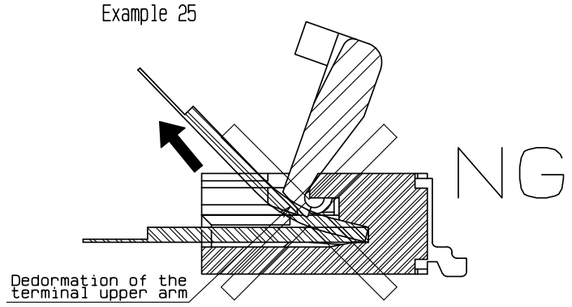
[Caution]
-Do not withdraw the FPC/FFC at extreme(inclined towards vertical) angle.(example 25)
-Do not attempt to pull the FPC/FFC without unlocking the actuator.(example 26)

Example 24



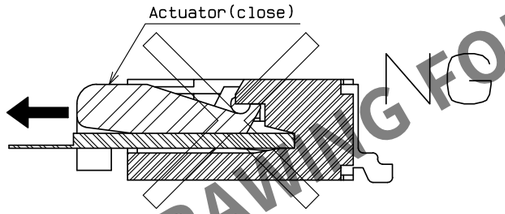
- Correct operation -

Example 25



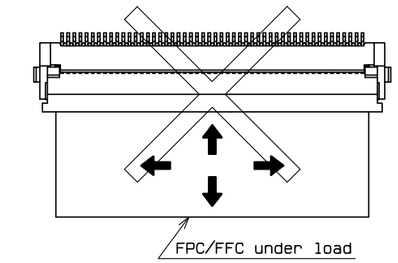
- Incorrect operation -

Example 26

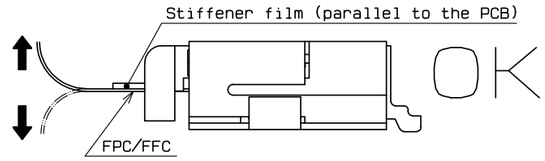


- Incorrect operation -

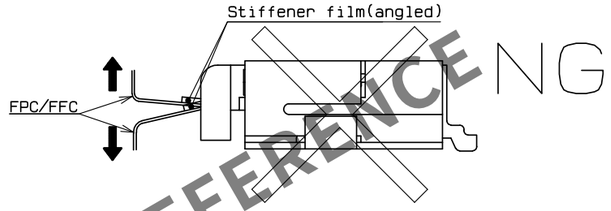
Example 27



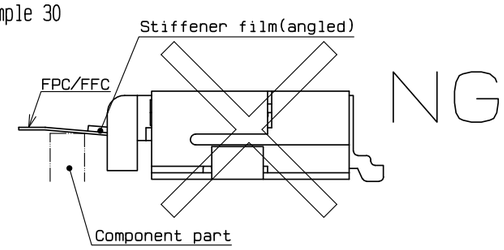
Example 28



Example 29



Example 30



[Precautions for component layout]

While the FPC/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 FPC/FFC along/perpendicular to the direction of FPC/FFC insertion.(example 27)
Avoid pushing/pulling the FPC/FFC upwards/downwards.
-If the FPC/FFC has to be curled/bended in your cabling design,
please keep enough degree of freedom in your design to keep the FPC/FFC tension free.
In this regard, the stiffener should be parallel to the PCB.(example 28)
-If the FPC/FFC has to be curled/bended in your cabling design, do not curl/bend the FPC/FFC area near the connector.
This may lead to conduction failure or FPC/FFC breakage.(example 29)
It is recommended to keep the FPC/FFC fixed to avoid applying stress through the FPC/FFC to the connector.
-Do not mount other components underneath the FPC/FFC stiffener which may interfere with the connection.(example 30)
-Follow the recommended FPC/FFC design.
Please consult with the FPC/FFC manufacturer about FPC/FFC bending performance and wire breakage strength while making design.
-Keep sufficient operating space for FPC/FFC insertion during layout design in order to avoid incorrect FPC/FFC insertion.
Please keep enough FPC/FFC length and component layout space for assembly during design process.
FPC/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 FPC/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.
-Apply reflow temperature profile within the specified conditions.
For specific applications, the recommended temperature may vary depending on
type/ volume/thickness of solder paste and size/thickness of PCB.
Please consult with your solder paste and equipment manufacturer for specific recommendations.
-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 FPC/FFC, please make sure to put a stiffener
on the backside of the FPC/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.

HRS DRAWING FOR REFERENCE

<INSTRUCTION MANUAL(4)> ⚠1

HRS	
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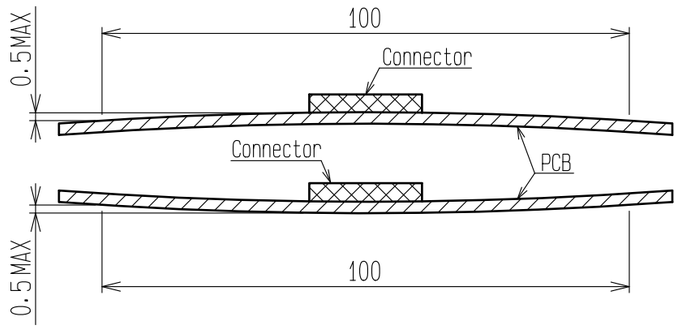
HRS DRAWING FOR REFERENCE

Instructions for PCB handling after mounting the connector

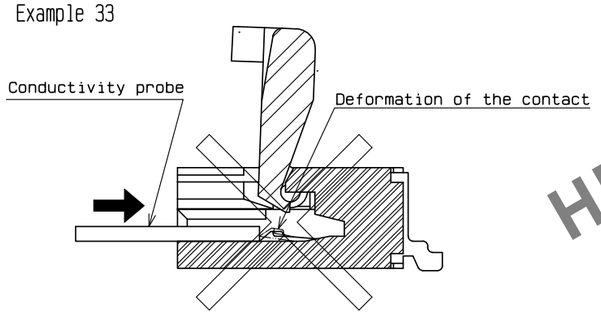
Follow the instructions shown below when mounting on the PCB.

[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.
- 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 FPC/FFC.

Example 32



Example 33



- Incorrect operation -

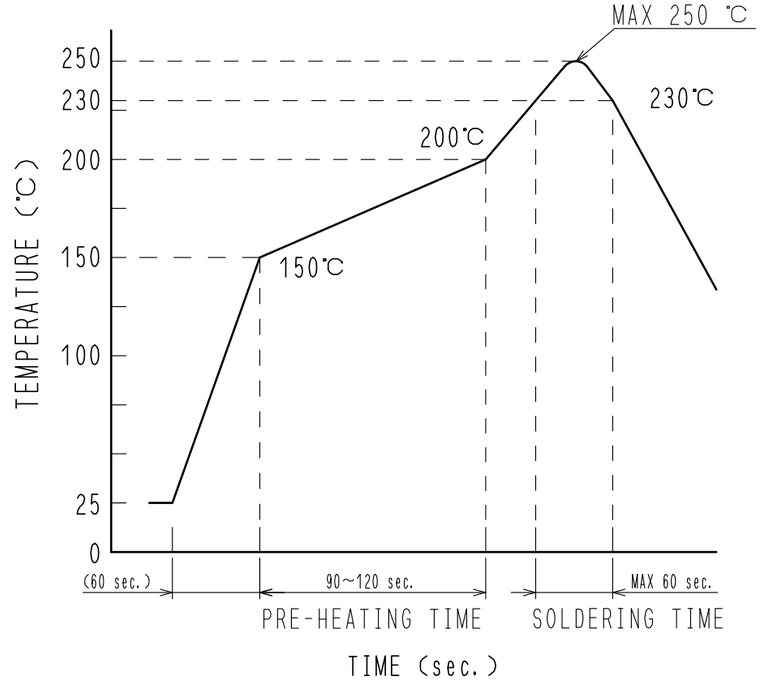
Instructions on manual soldering

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

[Caution]
- Do not perform manual soldering with the FPC/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.



△1
<Recommended reflow temperature profile>

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