HRS DRAWING FOR REFERENCE

△數 COUNT	訂正事項 DESCRIPTION OF REVISIONS	擔當 B Y	檢圖 CHKD	年月日 DATE	△數 COUNT	訂正事項 DESCRIPTION OF REVISIONS	擔當 B Y	檢圖 CHKD	年月日 DATE
⚠ −	RE-5-1833	OCU	CDH	17.12.04	△				. .
△				. .	△				. .
△				. .	△				. .

RECOMMENDED PCB PATTERN
(RECOMMENDED METAL MASK = 0.1mm) (SCALE FREE)

No.1 Contact
LOCK PIN PAD
CONNECTOR LOCATION
LOCK PIN PAD
No.2 Contact
No.16 Contact

Number of Contact
CAVITY No
HRS MARK
POLARIZATION MARK

ACTUATOR OPEN)
ACTUATOR CLOSE)

NOTE
1. EMBOSS PACKING
2. LEAD CO-PLANARITY SHALL BE 0.08mm MAX
3. LOCK PIN CAN NOT BE USED FOR SIGNAL CONNECTION
   ALSO, IF GROUND WAS MOUNTED ON THE LOCK PIN PAD,
   IT WOULD BE OCCURED ELECTRICAL SHORT.
   PLEASE DO NOT MOUNTED GROUND ON THE LOCK PIN PAD.

3	PHOSPHOR BRONZE	(CONTACT AREA) Au 0.05μm MIN OVER Ni 1μm (LEAD AREA) Au 0.05μm MIN OVER Ni 1μm (OTHER) Ni PLATING 1μm MIN	5	PHOSPHOR BRONZE	Ni 1μm + SN 1μm MIN
2	PA9T(GP2450NH)	BLACK UL94-0	4	PHOSPHOR BRONZE	(CONTACT AREA) Au 0.05μm MIN OVER Ni 1μm (LEAD AREA) Au 0.05μm MIN OVER Ni 1μm (OTHER) Ni PLATING 1μm MIN
1	LCP(S475)	BLACK UL94-0			

CODE NO. (OLD)

	DRAWN	DESIGNED	CHECKED	APPROVED	RELEASED
	C.U.Oh	C.U.Oh	D.H.Cho	H.C.SONG	ENG 18.02.19 DEPT
	13.12.02	13.12.02	13.12.02	13.12.02	

DRAWING NO. EDC3-631612-80
PART NO. TF22-16S-0.175SHW (800)
SCALE 15:1
UNITS mm
HRS HIROSE KOREA CO.,LTD.
CODE NO CL 6540-0001-3-800
1/7

RECOMMENDED FPC (FREE)

3.725 ±0.05
2.625 ±0.015
0.55 ±0.05
0.35 ±0.015
0.175 ±0.015
0.33 ±0.05
(0.05)

0.17 ±0.015
8X
⊕ 0.015 Z
(0.055)
(0.055)

0.33 ±0.05
R 0.2
R 0.2 ±0.05

Z

1.3 ±0.1
1.2 ±0.1
1.17 ±0.05
0.75 ±0.05
0.6 ±0.1
0.3 ±0.1
0.1 ±0.1

0.65 ±0.1
0.05 ±0.1

15 min
0.55 ±0.05
R 0.15 ±0.05

0.12 ±0.02

No. 1 Contact
No. 16 Contact

0.5 min

STIFFNER

(0.1)
0.1 ±0.015
0.17 ±0.015
8X
⊕ 0.015 Z

0.055 ±0.015
0.1 ±0.015

HRS DRAWING FOR REFERENCE

FPC CONSTRUCTION (Recommended Specifications)

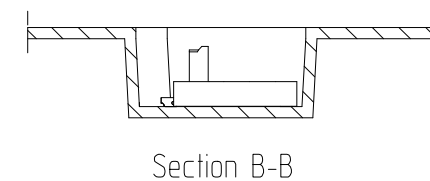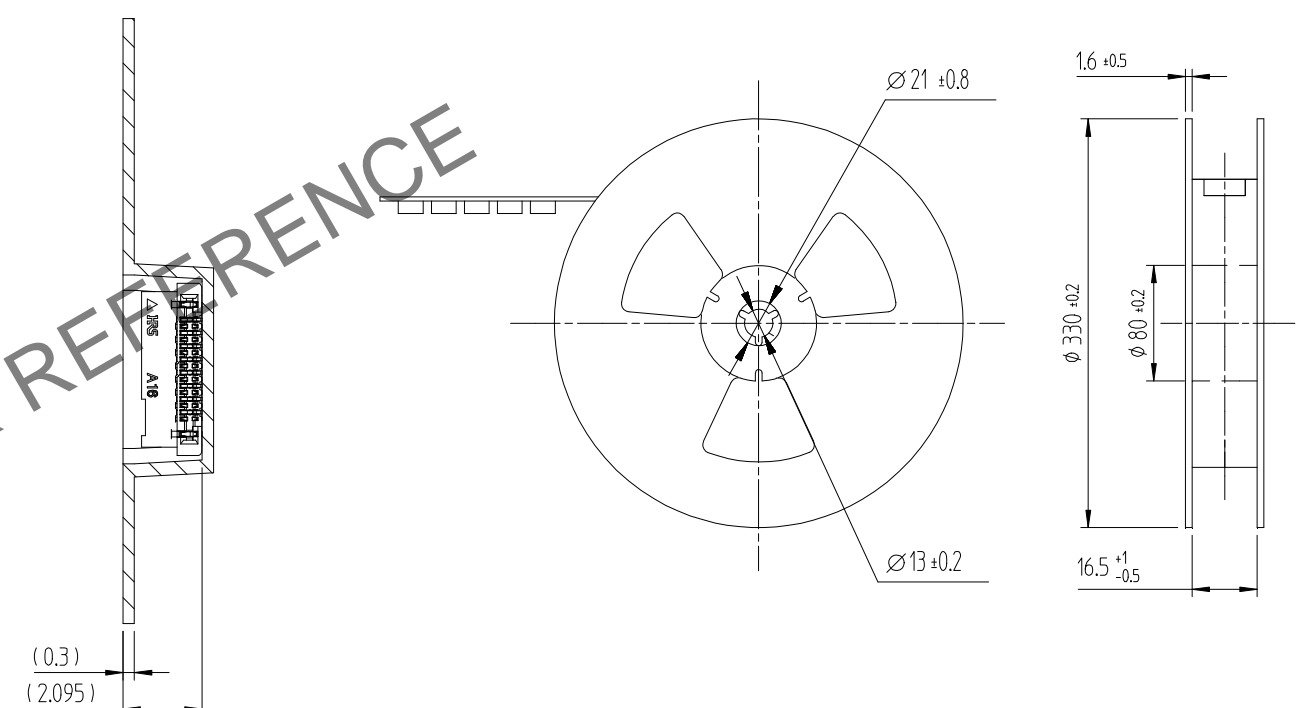| MATERIAL NAME	MATERIAL	THICKNESS[㎛]
COVERING FILM LAYER.	POLYAMIDE 1mile thick	25
COVER ADHESIVE		25
SURFACE TREATMENT	PLATING TREATMENT	(4)
COPPER FOIL	Cu 1/3 oz	12
BASE ADHESIVE		
BASE FILM	POLYAMIDE 1mil thick	25
REINFORCEMENT MATERIAL ADHESIVE	HEAT-HARDENED ADHESIVE	30
STIFFENER	POLYAMIDE 2mil thick	50

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DIRECTION OF PULLING OUT

8 ±0.1   0.88 ±0.1   4 ±0.1

Ø 1.5 +0.1 0

1.75 ±0.1

7.5 ±0.1

16 ±0.3

TF22-16S

TF22-16S

A

B — B
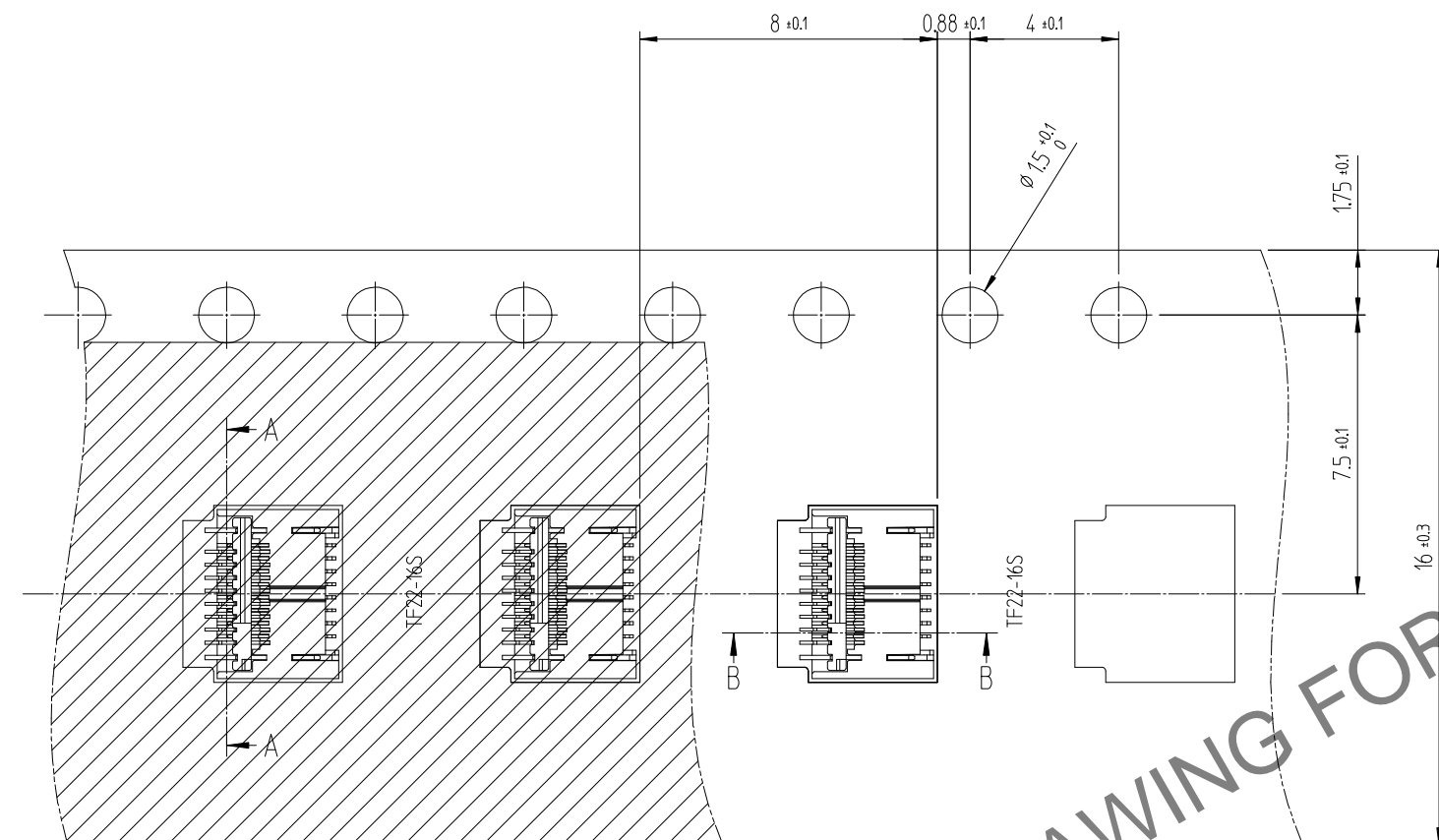
Section A-A

STYLE AND DIMENSION OF REEL(FREE)

Ø 21 ±0.8

1.6 ±0.5

Ø 330 ±0.2

Ø 80 ±0.2

Ø 13 ±0.2

16.5 +1 -0.5

(0.3)
(2.095)

Section B-B

TRAILER   PORTION EQUIPPED WITH CONNECTORS   LEADER(400mm MIN)

EMPTY
(10 POCKET MIN)

EMBOSS TAPE

EMPTY
(10 POCKET MIN)

EMBOSS COVER TAPE
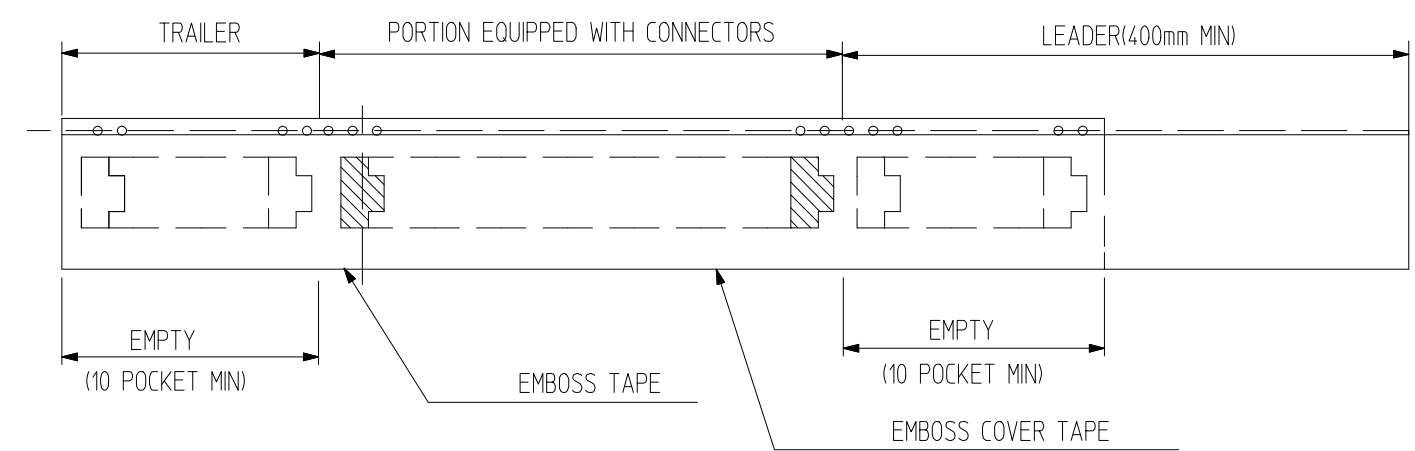
NOTE1.   1REEL: 5,000EA CONNECTORS

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This connector features small, thin and back flip design, requiring delicate and careful handling.
To prevent connector/FPC breakage and contact failure (mating failure, FPC pattern breakage, etc).
read through the instructions shown below and handle the connector properly.
Each values indicating here are for reference and may differ from standard value.

[Operation and Precautions]

1. Initial condition

Actuator does not have to be operated before inserting FPC,
as the connector is delivered with the actuator opened.

[Caution]

-Do not close the actuator before inserting FPC.
Closing the actuator without FPC could make the contact
gap smaller, which could increase the FPC insertion force.
-Do not insert FPC or operate actuator before mounting.

Actuator Open

- Open when delivered -
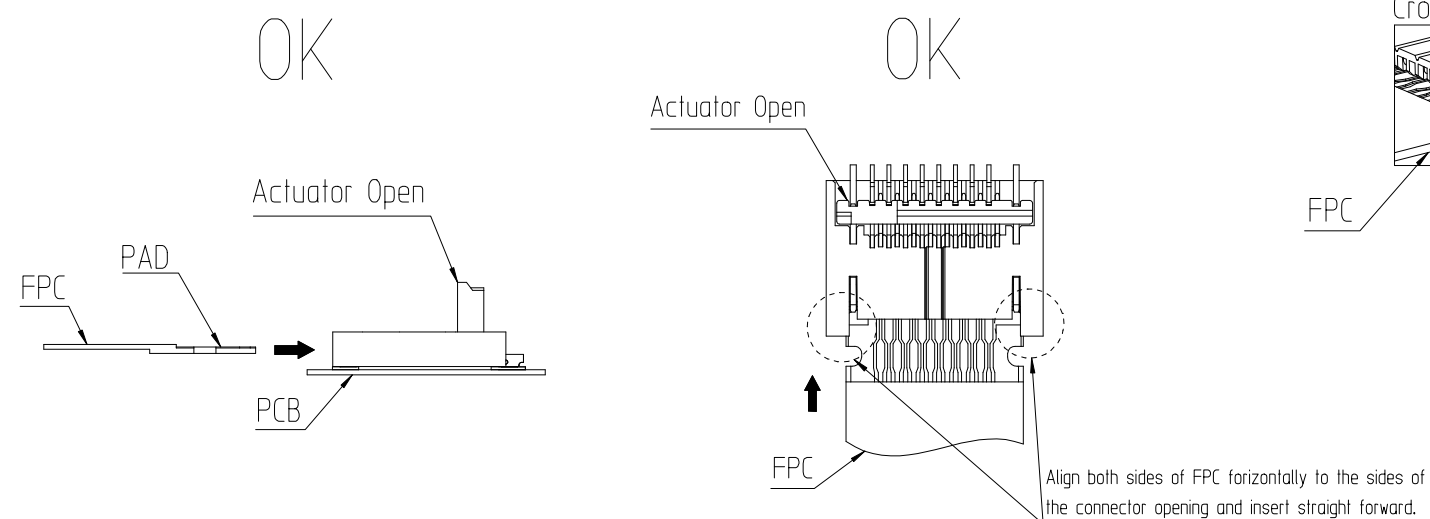
No FPC

Actuator Close

- Incorrect operation -
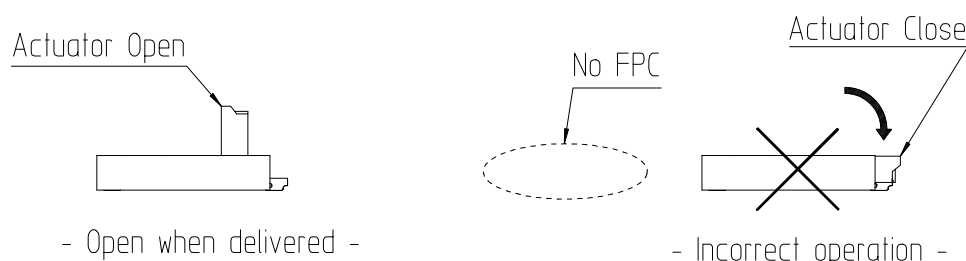
2. How to insert FPC

This connector has contacts on the top. Insert the FPC with the exposed conductors face up.

[Caution]

-Insert the FPC with the actuator opened.
-Do not insert the FPC with the conductor surface face down.
-Insert the FPC into the connector opening horizontally to the PCB plane.
Insert it properly to the very end.
-Do not twist the FPC to up and down, right and left or an angle.

OK

OK

FPC   PAD   Actuator Open

PCB

Actuator Open

FPC

Align both sides of FPC forizontally to the sides of
the connector opening and insert straight forward.

NG

FPC

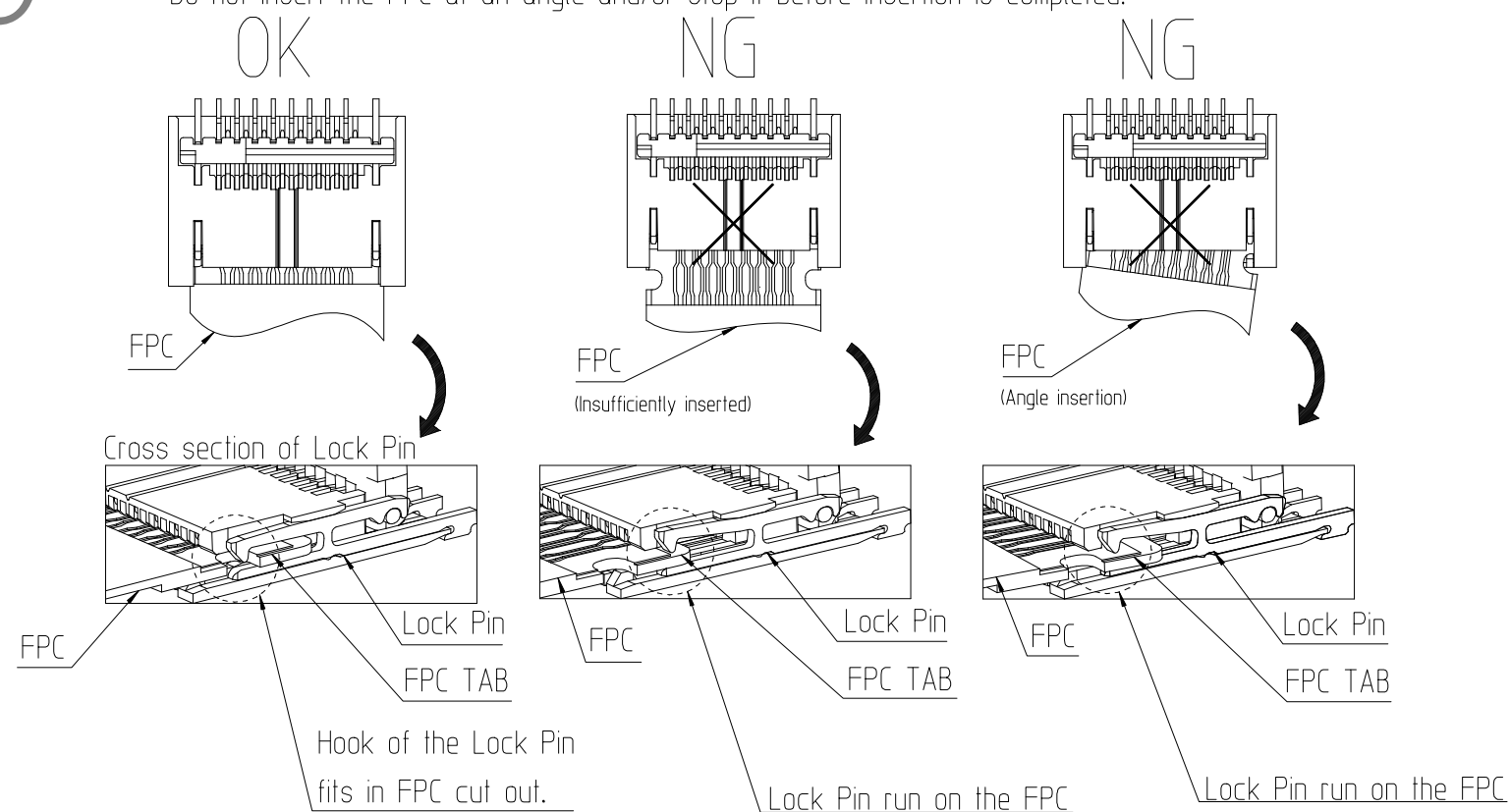Actuator Close

PCB

NG

FPC

Actuator Open

PCB

3. FPC insertion check

Make sure that the FPC tabs are located in proper position as shown in the figure below after FPC insertion.

[Caution]

Do not insert the FPC at an angle and/or stop it before insertion is completed.

Actuator Close

NG

FPC

Actuator Open

NG

FPC (Angled insertion)

OK

NG

NG

FPC

FPC
(Insufficiently inserted)

FPC
(Angle insertion)

Cross section of Lock Pin

FPC

Lock Pin

FPC TAB

Hook of the Lock Pin
fits in FPC cut out.

FPC

Lock Pin

FPC TAB

Lock Pin run on the FPC

FPC

Lock Pin

FPC TAB

Lock Pin run on the FPC

< INSTRUCTION MANUAL (1) >

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OK

NG

Close the actuator at the center

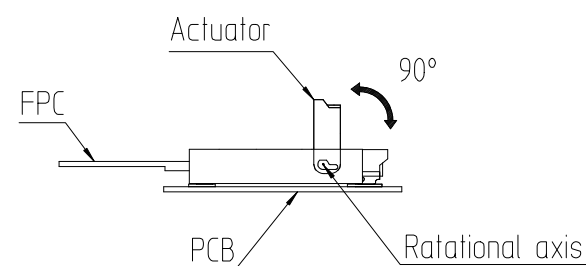Do not operate the actuator at one end only

4. How to lock

Apply load to rotate the actuator by 90 degree after inserting the FPC.

[Caution]
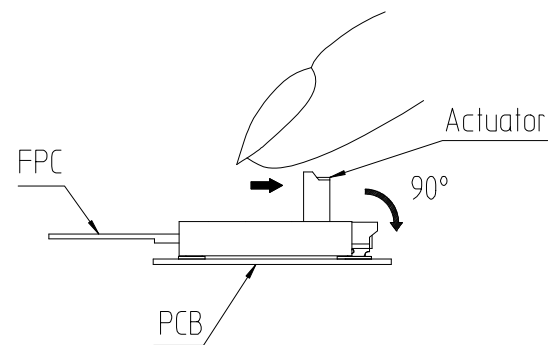
-The actuator rotates around the rotational axis as shown below.

-Do not rotate the actuator to the counter direction.

Do not pinch or pick the actuator to lift.

-Operate the actuator by hand without using sharp tool such as Tweezers.

-To close the actuator, operate at the center of the actuator.

-To close the actuator, do not operate the actuator at one end only.

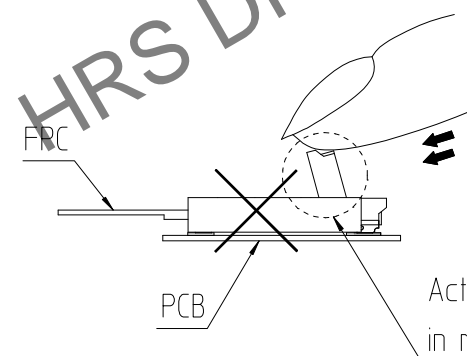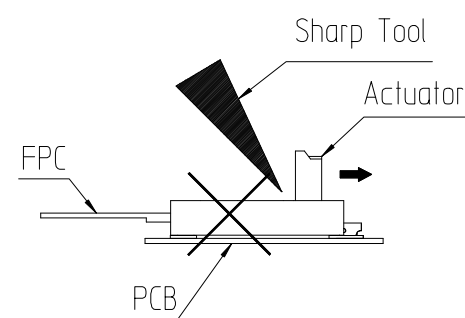-Do not apply excess force to the housing during the operation.

NG

Do not apply excess force to the CASE during the operation

[Actuator movable range]

(Side view)

Actuator

90°

FPC

PCB

Rotational axis
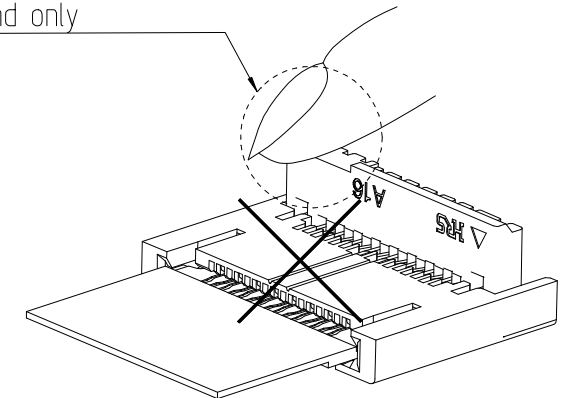
OK

FPC

Actuator

90°

PCB

NG

FPC

PCB

Actuator receives inappropriate force in reverse direction.

NG

Sharp Tool

Actuator

FPC

PCB

< INSTRUCTION MANUAL (2) >

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△

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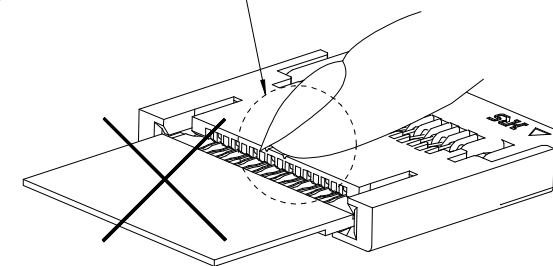
5. How to unlock

Slowly flip up the actuator to release the lock.

[Caution]

-The actuator is opened up to the movable limit, 90 degree.
Do not open the actuator beyond the specified degree or
apply excess force to the actuator.

-Open the actuator right above.
Do not attempt to open further or to open it by applying horizontal force as this may cause its damage.

-Please note that the connector is back flip style connector,
and opening for FPC insertion and the actuator face
the opposite direction. Do not try to lift the actuator at the FPC
insertion opening side.

-Operate the actuator by hand without using sharp tool such as Tweezers.

-To open the actuator, operate at the center of the actuator.

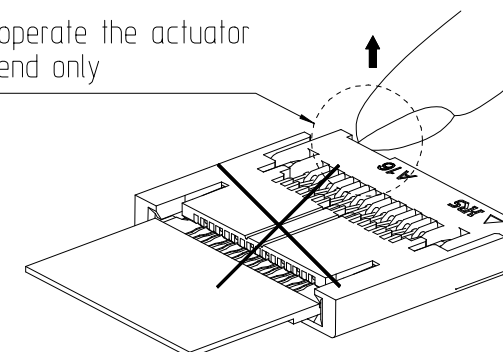-To open the actuator, do not operate the actuator at one end only.
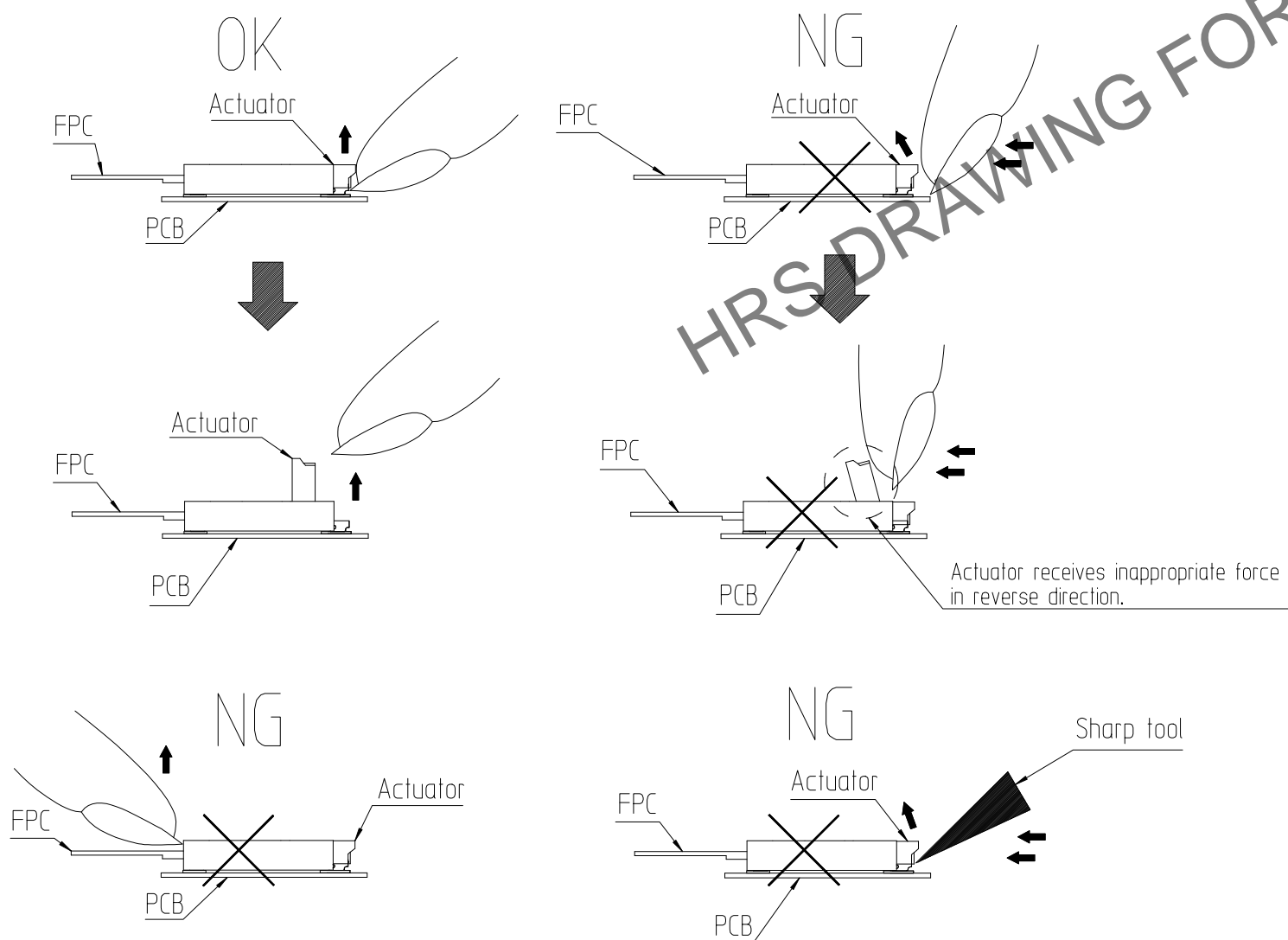
OK

Open the actuator at the center
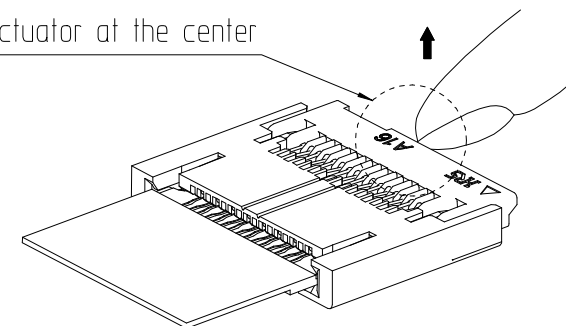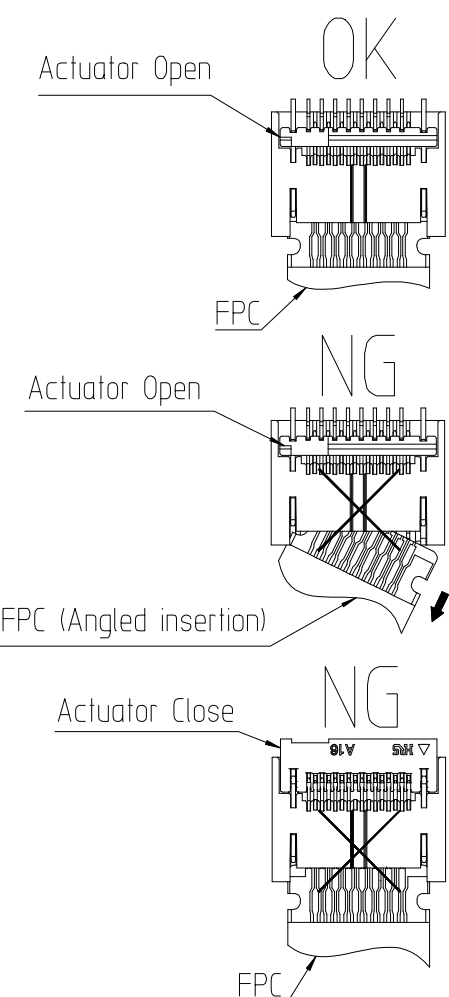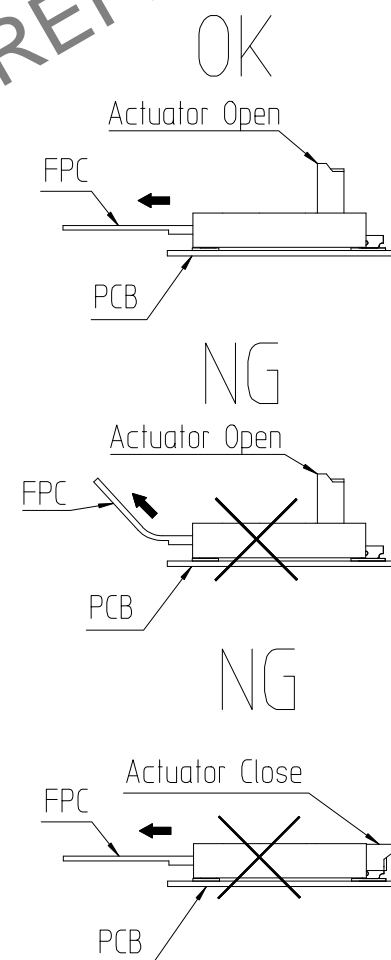
NG

Do not operate the actuator
at one end only

6. How to remove FPC

After rotating the actuator to the fully opened position carefully withdraw the FPC
pulling out at 30 degree angle to the PCB mounting surface.

[Caution]

-This connector has a temporary FPC holding structure with chucking metals.
For FPC removal, do not pull out the FPC horizontally.

-Do not attempt to pull the FPC without unlocking the actuator.

HRS DRAWING FOR REFERENCE

OK

Actuator
FPC
PCB

Actuator
FPC
PCB

NG

NG

Actuator
FPC
PCB

Actuator receives inappropriate force
in reverse direction.

FPC
Actuator
PCB

OK

Actuator Open
FPC
PCB

NG

Actuator Open
FPC
PCB

NG

Actuator Close
FPC
PCB

OK

Actuator Open
FPC

NG

Actuator Open
FPC (Angled insertion)

NG

Actuator Close
FPC

NG

FPC
Actuator
PCB

Sharp tool

< INSTRUCTION MANUAL (3) >

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[Precautions for design]

1. During FPC wiring, ensure that stress is not applied directly to the connector.
   Do not bend the FPC excessively near the connector during use, or it may cause
   contact failure or FPC breakage.
   Stabilizing the FPC is recommended.

2. Keep a sufficient FPC insertion space in the stage of the layout in order to avoid
   incorrect FPC insertion.
   Appropriate FPC length and component layout are recommended for assembly ease.
   Too short FPC length makes assembly difficult.

3. Follow the recommended PCB mounting pattern, stencil opening design and the FPC design.

4. Make adjustments with the FPC manufacturer for FPC bending performance and wire breakage.

5. Keep spaces for the actuator movement and its operation for PCB design and component layout.

[FPC routing after connection]

Depending on a FPC rounding, a load is applied to the connector, and a contact failure may occur.

To prevent a failure, take the following notes into a consideration during mechanism design.

[Caution]
-Avoid applying forces to FPC in vertical or horizontal directions.
 In addition, avoid pulling up and down on the FPC.
-When fixing FPC after FPC cabling, avoid pulling FPC, and route the wire FPC with slack.
 In this regard, the stiffener is parallel to the PCB.
-Do not mount other components touching to the FPC underneath the FPC stiffener.

NG

OK

FPC Stiffener

PCB

NG

Stiffener

PCB

NG

FPC Stiffener

Component Part

PCB
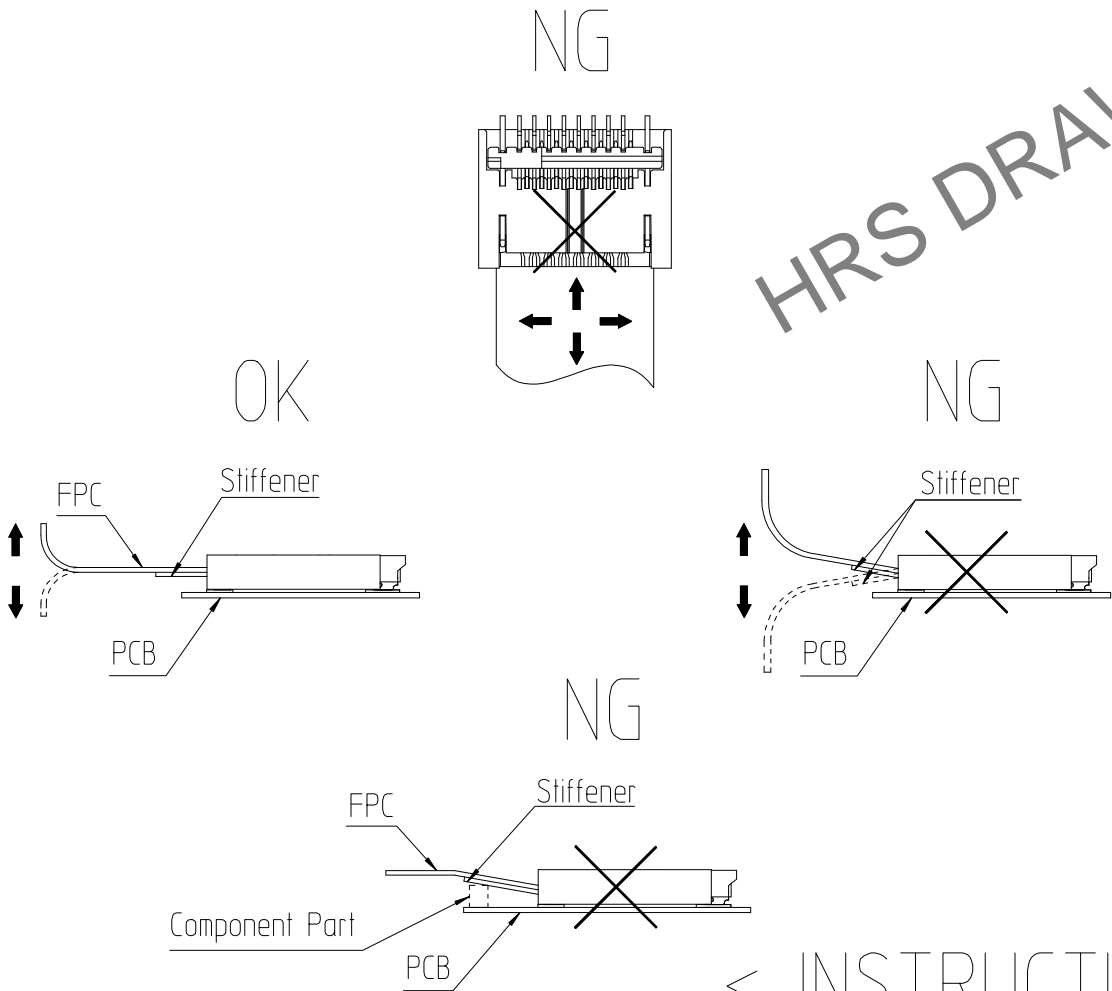
[Instructions for mounting on the PCB]

♦ Mounting Connector
  Mounting according to the recommended PCB pattern.
  If CONTACT is mounted on the PCB lock pin pad, signal connection is not possible.
♦ Warp of PCB
  Minimize warp of the PCB as much as possible.
  Lead co-planarity including reinforced chucking metals is 0.1 mm or less.
  Too much warp of the PCB may result in a soldering failure.
♦ Flexible board design
  Please make sure to put a stiffener on the backside of the flexible board.
  We recommend a glass epoxy material with the thickness of 0.3mm MIN.
♦ Load to connector
  Do not add 0.5N or greater external force when unreel or pick and place the connector etc,
  or it may get broken.
  In addition, do not insert the FPC or operate the connector before mounting.
♦ Reflow temperature profile
  Apply reflow temperature profile within the specified conditions.
  In individual applications, the actual temperature may vary,
  depending on solder paste type, volume/thickness and PCB size/thickness.
  Consult your solder paste and equipment manufacturer for specific recommendations.

[INSTAUCTIONS FOR PCB HANDLING AFTER MOUNTING THE CONNECTOR]

♦ Load to PCB
  - Splitting a large PCB into several pieces
  - Screwing the PCB
  Avoid the handling described above so that no force is exerted on the PCB during the assembly process.
  Otherwise, the connector may become defective.

♦ Amount of Warp
  The warp of a 100mm wide PCB should be 0.5 mm or less.
  The warp of PCB suffers stress on connector and the connector may become defective.

0.5 MAX   100   Connector

PCB

Connector   PCB

0.5 MAX   100
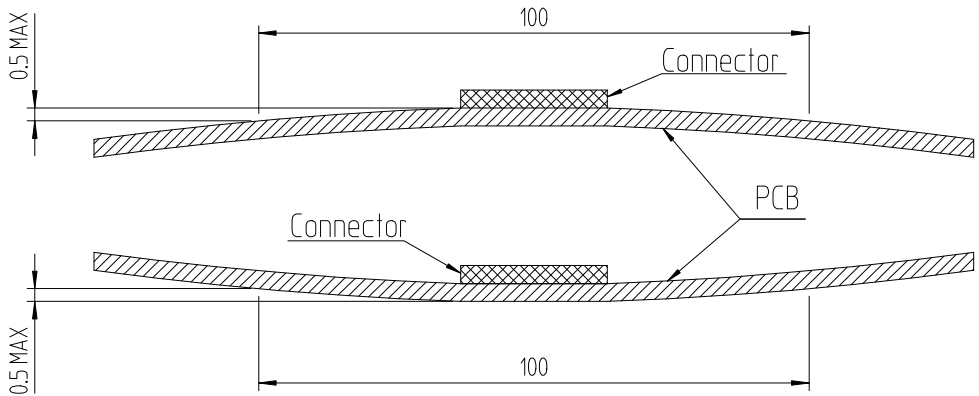
[Other instructions]

♦ Instructions on manual soldering
  Follow the instructions shown below when soldering the connector manually during repair work, etc.

  1. Do not perform manual soldering with the FPC inserted into the connector.

  2. Do not heat the connector excessively. Be very careful not let the soldering iron contact
     any parts other than connector leads. Otherwise, the connector may be deformed or melt.

  3. Do not supply excessive solder (or flux).
     If excessive solder (or flux) is supplied on the terminals, solder or flux may adhere to the contacts
     or rotating parts of the actuator, resulting in poor contact or a rotation failure of the actuator.
     Supplying excessive solder to the chucking metals may hinder actuator rotation,
     resulting in breakage of the connector.

< INSTRUCTION MANUAL (4) >

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