

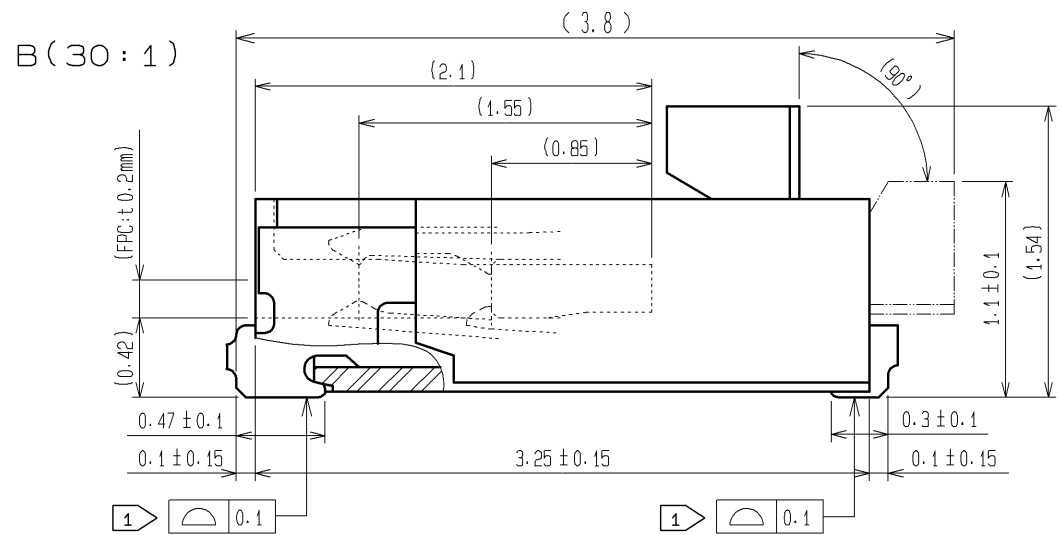
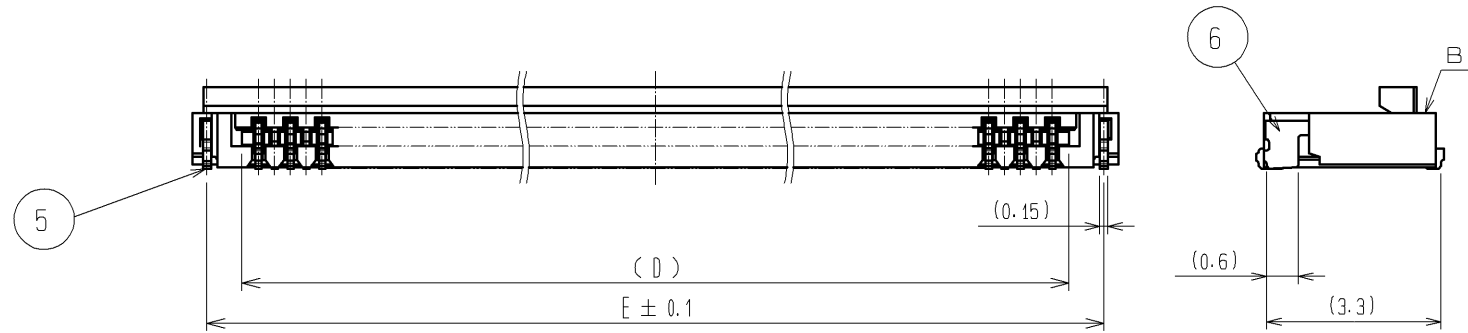
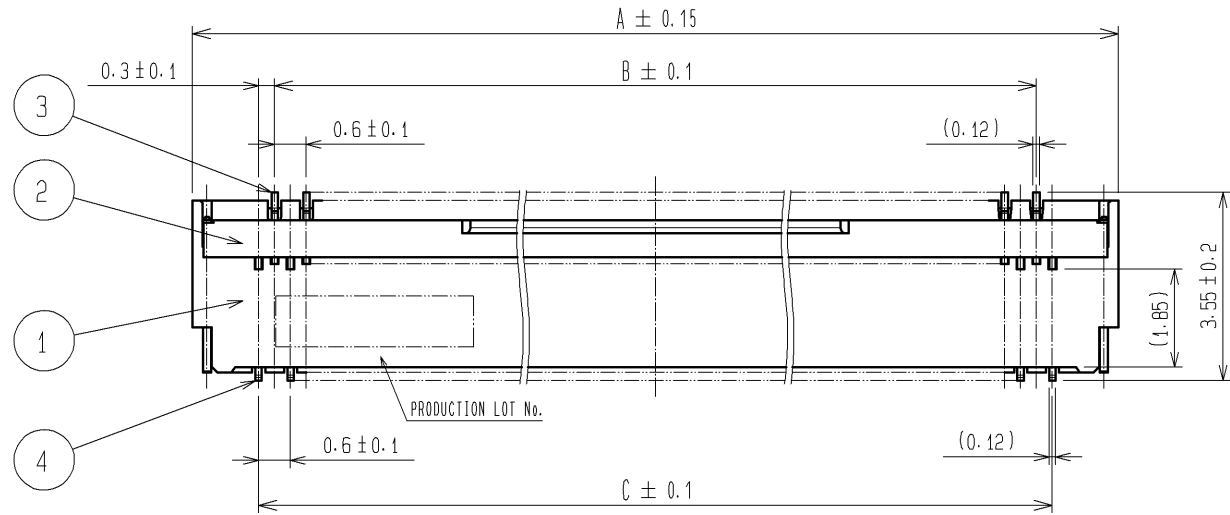
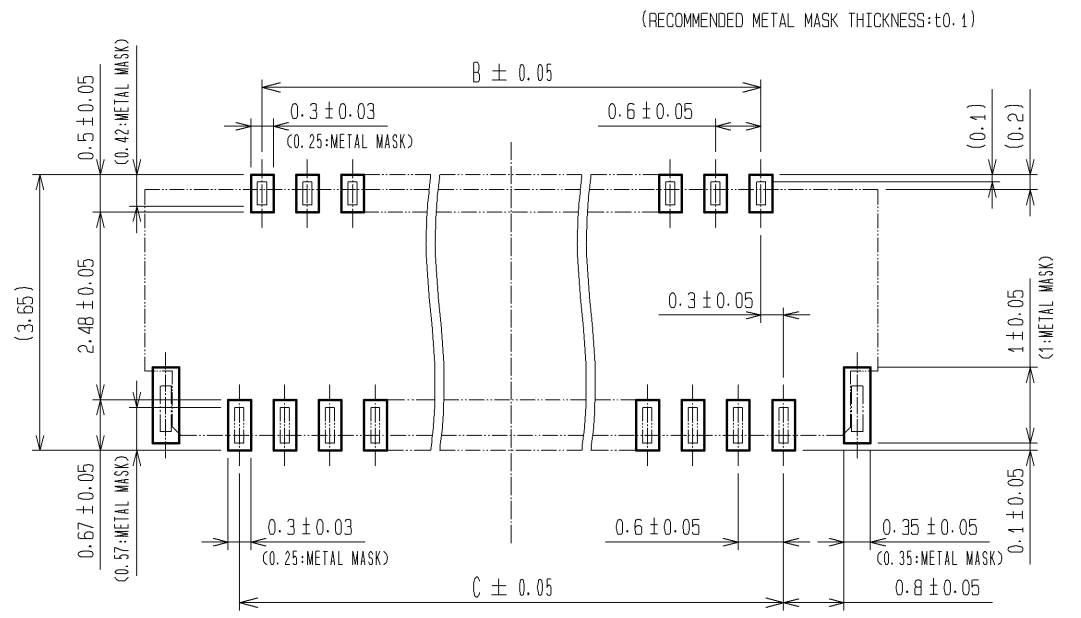


| APPLICABLE STANDARD  |   |                          |   |                                     |   |
|--|---|--------------------------|---|-------------------------------------|---|
| RATING   | OPERATING TEMPERATURE RANGE   | -55°C TO +85°C           | STORAGE TEMPERATURE RANGE   | -10°C TO +50°C(PACKED CONDITION)    |   |
|  | VOLTAGE   | 30V AC/DC                | OPERATING OR STORAGE HUMIDITY RANGE   | RELATIVE HUMIDITY 90%MAX(NOT DEWED) |   |
|  | CURRENT   | 0.2A                     | APPLICABLE CABLE  | t=0.2±0.03mm, GOLD PLATED           |   |
| SPECIFICATIONS   |   |                          |   |                                     |   |
| ITEM   | TEST METHOD   |                          | REQUIREMENTS  | QT                                  | AT  |
| CONSTRUCTION   |   |                          |   |                                     |   |
| GENERAL EXAMINATION  | VISUALLY AND BY MEASURING INSTRUMENT.   |                          | ACCORDING TO DRAWING.   | ×                                   | ×   |
| MARKING  | CONFIRMED VISUALLY.   |                          |   | ×                                   | ×   |
| ELECTRIC CHARACTERISTICS                                       |   |                          |   |                                     |   |
| VOLTAGE PROOF  | 90V AC FOR 1 min.   |                          | NO FLASHOVER OR BREAKDOWN.  | ×                                   | ×   |
| INSULATION RESISTANCE  | 100V DC.  |                          | 50MΩ MIN.   | ×                                   | ×   |
| CONTACT RESISTANCE   | AC 20mV MAX (1KHz), 1mA.  |                          | 100mΩ MAX.<br>INCLUDING FPC BULK RESISTANCE (L=12mm)  | ×                                   | ×   |
| MECHANICAL CHARACTERISTICS                                     |   |                          |   |                                     |   |
| VIBRATION  | FREQUENCY 10 TO 55 Hz, HALF AMPLITUDE<br>0.75 mm FOR 10 CYCLES IN 3 DIRECTIONS.                 |                          | ① NO ELECTRICAL DISCONTINUITY OF 1 μs.<br>② CONTACT RESISTANCE: 100mΩ MAX.<br>③ NO DAMAGE, CRACK AND LOOSENESS OF PARTS.                              | ×                                   | —   |
| SHOCK  | 981 m/s <sup>2</sup> , DURATION OF PULSE 6ms AT 3 TIMES<br>IN 3 DIRECTIONS.                     |                          |   | ×                                   | —   |
| MECHANICAL OPERATION   | 10 TIMES INSERTIONS AND EXTRACTIONS.  |                          | ① CONTACT RESISTANCE: 100mΩ MAX.<br>② NO DAMAGE, CRACK AND LOOSENESS OF PARTS.  | ×                                   | —   |
| FPC RETENSION FORCE  | MEASURED BY APPLICABLE FPC.<br>(THICKNESS OF FPC SHALL BE t=0.20mm<br>AT INITIAL CONDITION.)    |                          | DIRECTION OF INSERTION:<br>0.15N × NUMBER OF CONTACTS MIN.<br>(note 1)  | ×                                   | —   |
| ENVIRONMENTAL CHARACTERISTICS                                  |   |                          |   |                                     |   |
| CORROSION SALT MIST  | EXPOSED AT 35±2°C, 5% SALT WATER SPRAY<br>FOR 96h.  |                          | ① CONTACT RESISTANCE: 100mΩ MAX.<br>② NO DAMAGE, CRACK AND LOOSENESS OF PARTS.<br>③ NO EVIDENCE OF CORROSION WHICH AFFECTS TO OPERATION OF CONNECTOR. | ×                                   | —   |
| RAPID CHANGE OF TEMPERATURE                                    | TEMPERATURE -55→+15 TO +35→+85→+15 TO +35 °C<br>TIME 30 → 2~3 → 30 → 2~3 min<br>UNDER 5 CYCLES. |                          |   | ×                                   | —   |
| DAMP HEAT (STEADY STATE)                                       | EXPOSED AT 40±2°C,<br>RELATIVE HUMIDITY 90 TO 95%, 96h.   |                          | ① CONTACT RESISTANCE: 100mΩ MAX.<br>② INSULATION RESISTANCE: 50MΩ MIN.<br>③ NO DAMAGE, CRACK AND LOOSENESS OF PARTS.                                  | ×                                   | —   |
| DAMP HEAT,CYCLIC   | EXPOSED AT -10 TO +65 °C<br>RELATIVE HUMIDITY 90 TO 96 %<br>10 CYCLES, TOTAL 240h.              |                          |   | ×                                   | —   |
|  | COUNT   | DESCRIPTION OF REVISIONS | DESIGNED  | CHECKED                             | DATE  |
|  |   |                          |   |                                     |   |
| REMARK   |   |                          | APPROVED  | MO.ISHIDA                           | 08.07.07  |
|  |   |                          | CHECKED   | NM.NISHIMATSU                       | 08.07.07  |
|  |   |                          | DESIGNED  | SU.SUNAGA                           | 08.07.04  |
| Unless otherwise specified, refer to JIS C 5402.               |   |                          | DRAWN   | SU.SUNAGA                           | 08.07.04  |
| Note QT:Qualification Test AT:Assurance Test X:Applicable Test |   |                          | DRAWING NO.   |                                     | ELC4-157632-00  |
| <b>HRS</b>   | SPECIFICATION SHEET   |                          | PART NO.  | FH39-**S-0.3SHW                     |   |
|  | HIROSE ELECTRIC CO., LTD.   |                          | CODE NO.  | CL580                               |  1/2 |

| SPECIFICATIONS   |   |   |                |                 |   |
|--|---|---|----------------|-----------------|---|
| ITEM   | TEST METHOD   | REQUIREMENTS  | QT             | AT              |   |
| DRY HEAT   | EXPOSED AT $85 \pm 2^{\circ}\text{C}$ , 96h.  | ① CONTACT RESISTANCE: $100\text{m}\Omega$ MAX.<br>② NO DAMAGE, CRACK AND LOOSENESS OF PARTS.  | ×              | —               |   |
| COLD   | EXPOSED AT $-55 \pm 3^{\circ}\text{C}$ , 96h.   |   | ×              | —               |   |
| SURPHUR DIOXIDE<br>[JIS C 0090]  | EXPOSED AT $40 \pm 2^{\circ}\text{C}$ ,<br>RELATIVE HUMIDITY $80 \pm 5\%$ ,<br>$25 \pm 5$ ppm FOR 96h.  | ① CONTACT RESISTANCE: $100\text{m}\Omega$ MAX.<br>② NO DAMAGE, CRACK AND LOOSENESS OF PARTS.<br>③ NO EVIDENCE OF CORROSION WHICH AFFECTS TO OPERATION OF CONNECTOR. | ×              | —               |   |
| HYDROGEN SULPHIDE<br>[JIS C 0092]  | EXPOSED AT $40 \pm 2^{\circ}\text{C}$ ,<br>RELATIVE HUMIDITY $80 \pm 5\%$ ,<br>10 TO 15 ppm FOR 96h.  |   | ×              | —               |   |
| SOLDERABILITY  | SOLDERED AT SOLDER TEMPERATURE, $235 \pm 5^{\circ}\text{C}$<br>FOR IMMERSION DURATION, $2 \pm 0.5$ sec.   | A NEW UNIFORM COATING OF SOLDER SHALL COVER A MINIMUM OF 95 % OF THE SURFACE BEING IMMersed.  | ×              | —               |   |
| RESISTANCE TO SOLDERING HEAT   | 1) REFLOW SOLDERING:<br>PEAK TMP. $250^{\circ}\text{C}$ MAX.<br>REFLOW TMP. $230^{\circ}\text{C}$ MIN WITHIN 60 sec.<br>2) SOLDERING IRONS:<br>TMP. $350 \pm 10^{\circ}\text{C}$ FOR $5 \pm 1$ sec. | NO DEFORMATION OF CASE OF EXCESSIVE LOOSENESS OF THE TERMINALS.   | ×              | —               |   |
| <p><b>(note1)</b></p> <p>IF PULL FORCE IN VERTICAL DIRECTION COULD BE APPLIED TO THE FPC,<br/>SECURE THE FPC TO PCB OR SOMETHING FIXED.</p> <p>DO NOT CLOSE THE ACTUATOR BEFORE INSERTING FPC EVEN AFTER THE CONNECTOR IS MOUNTED ONTO A PCB. CLOSING THE ACTUATOR WITHOUT FPC COULD MAKE THE CONTACT GAP SMALLER, WHICH INCREASES THE FPC INSERTION FORCE.</p> <p>THIS CONNECTOR HAS CONTACT POINTS ON BOTH TOP AND BOTTOM.</p> |   |   |                |                 |   |
| Note QT:Qualification Test AT:Assurance Test X:Applicable Test   |   | DRAWING NO.   | ELC4-157632-00 |                 |   |
| <b>HRS</b>   | SPECIFICATION SHEET   |   | PART NO.       | FH39-**S-0.3SHW |   |
|  | HIROSE ELECTRIC CO., LTD.   |   | CODE NO.       | CL580           |  2/2 |



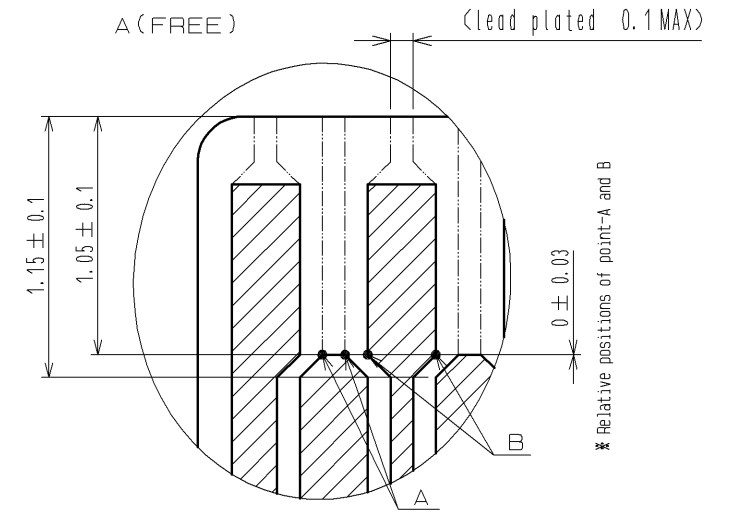
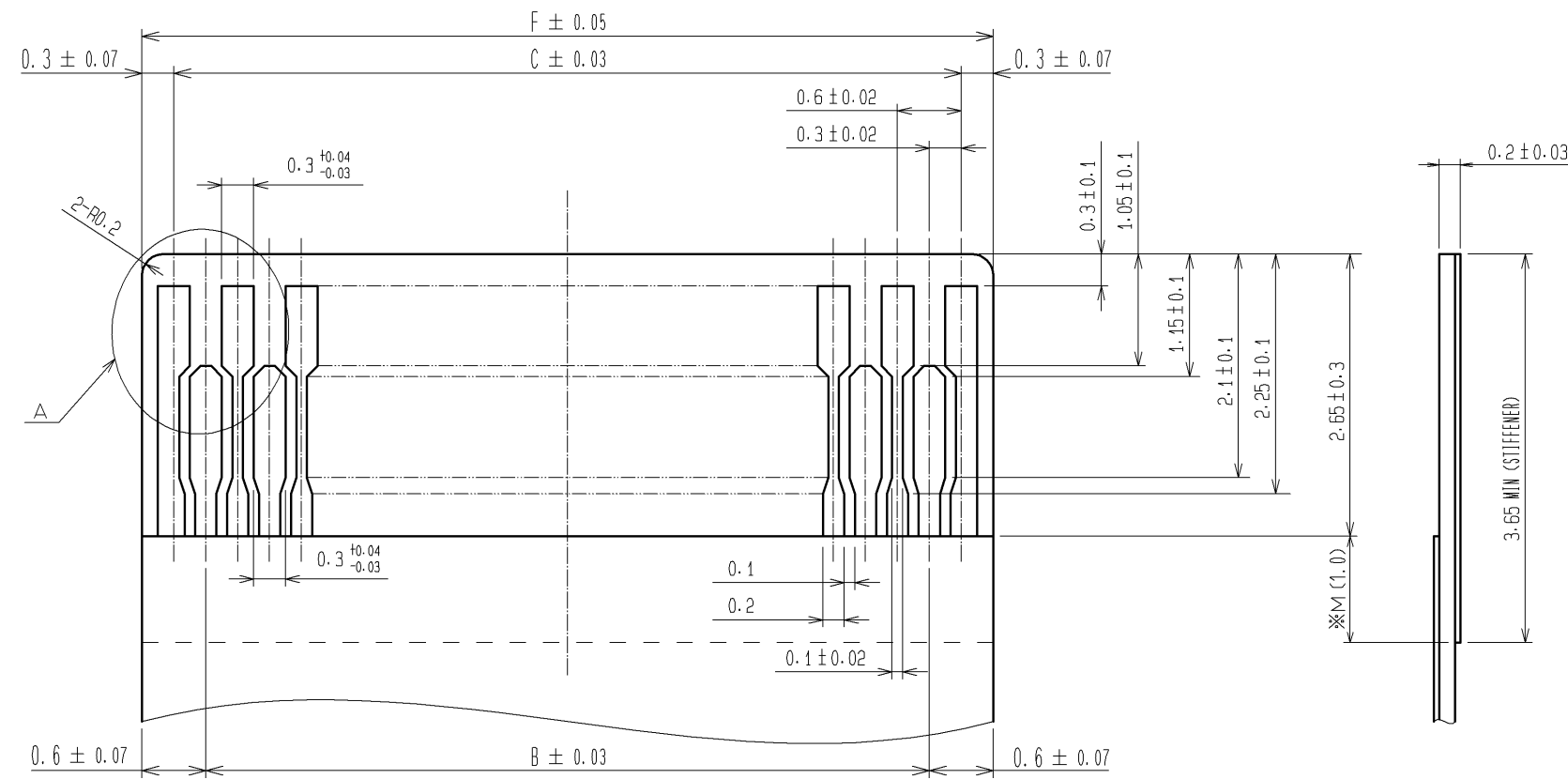
RECOMMENDED LAND PATTERN (SCALE: FREE)



- NOTE
- LEAD CO-PLANARITY INCLUDING REINFORCED METAL FITTINGS SHALL BE 0.1 MAX.
  - TO BE DELIVERED WITH TAPE AND REEL PACKAGES. SEE ATTACHED PACKAGING SPECIFICATIONS FOR DETAILS.
  - NOTE THAT PREVENTIVE HOLE FOR SINK MARK COULD BE ADDED FOR IMPROVEMENT. THE QUALITY REMAINS GOOD, EVEN WITH THE DARK SPOTS, WHICH COULD OCCASIONALLY OCCUR ON MOLDED PLASTIC.

| 4                         | PHOSPHOR BRONZE | (CONTACT AREA: LEAD) GOLD 0.05µm MIN OVER NICKEL 1µm MIN (OTHER) NICKEL PLATING 1µm MIN | 10  | (CONNECTOR)                       |   |
|---------------------------|-----------------|---|---|-----------------------------------|---|
| 3                         | PHOSPHOR BRONZE | (CONTACT AREA: LEAD) GOLD 0.05µm MIN OVER NICKEL 1µm MIN (OTHER) NICKEL PLATING 1µm MIN | 9   | POLYSTYRENE                       |   |
| 2                         | PA              | BLACK UL94V-0   | 8   | POLYESTER                         |   |
| 1                         | LCP             | BEIGE UL94V-0   | 7   | POLYSTYRENE                       |   |
|                           |                 |   | 6   | PHOSPHOR BRONZE (PLATED MATERIAL) | TIN PLATING (REFLOW FINISHED) 1µm MIN OVER COPPER 0.5µm MIN |
|                           |                 |   | 5   | PHOSPHOR BRONZE (PLATED MATERIAL) | TIN PLATING (REFLOW FINISHED) 1µm MIN OVER COPPER 0.5µm MIN |
| NO.                       | MATERIAL        | FINISH . REMARKS  | NO.   | MATERIAL                          | FINISH . REMARKS  |
| UNITS                     | mm              | SCALE 7 : 1   | COUNT 5   | DESCRIPTION OF REVISIONS          | DESIGNED SG.MASAKI  |
|                           |                 |   |   | DIS-F-004375                      | CHECKED NM.NISHIMATSU                                       |
|                           |                 |   |   | APPROVED : RI.TAKAYASU 08.05.28   | DATE 09.11.30   |
|                           |                 |   |   | CHECED : NM.NISHIMATSU 08.05.28   |   |
|                           |                 |   |   | DESIGNED : SU.SUNAGA 08.05.26     |   |
|                           |                 |   |   | DRAWN : SU.SUNAGA 08.05.26        |   |
| HIROSE ELECTRIC CO., LTD. |                 |   | DRAWING NO. EDC3-157632-01<br>PART NO. FH39- * * S-0.3SHW<10><br>CODE NO. CL580 |                                   |   |

RECOMMENDED FPC (SCALE:FREE)



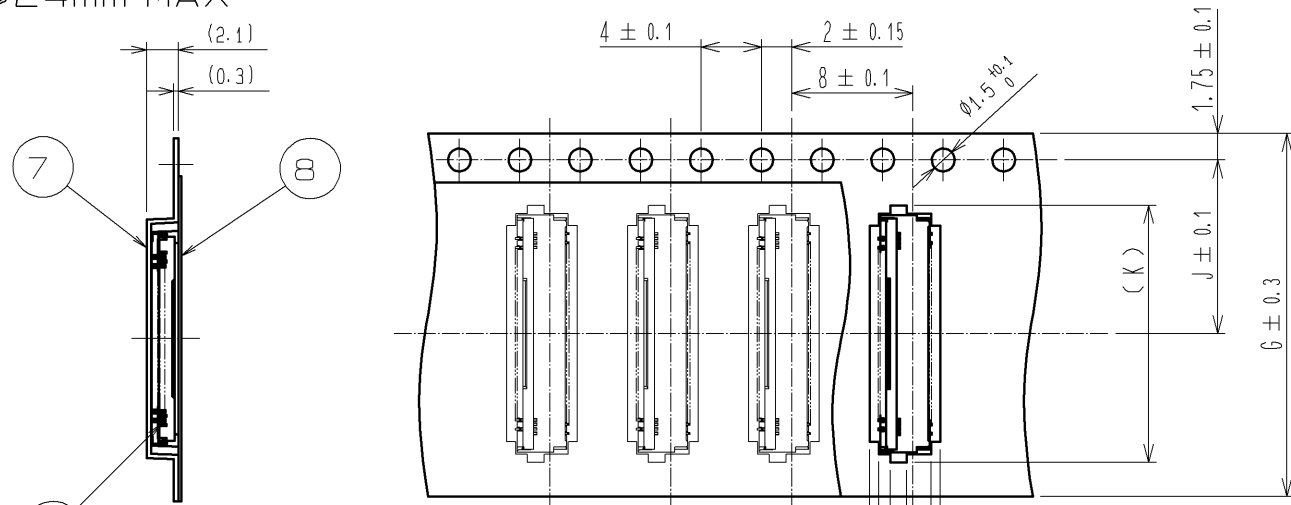
\* Dimension M must be 0.5mm minimum when the stiffener is shorter than 3.65mm.

FPC CONSTRUCTION Recommended Specifications

| MATERIAL NAME                   | MATERIAL   | THICKNESS(μm) |
|---------------------------------|--|---------------|
| COVERING FILM LAYER.            | POLYIMIDE 1mil thick.                              | 25            |
| COVER ADHESIVE                  |  | 25            |
| SURFACE TREATMENT               | 1μm to 5μm NICKEL UNDERPLATED<br>0.2μm GOLD PLATED | (5)           |
| COPPER FOIL                     | Cu 1 oz  | 35            |
| BASE ADHESIVE                   | HEAT-HARDENED ADHESIVE                             | 25            |
| BASE FILM                       | POLYIMIDE 1mil thick                               | 25            |
| REINFORCEMENT MATERIAL ADHESIVE | HEAT-HARDENED ADHESIVE                             | 40            |
| STIFFENER                       | POLYIMIDE 3mil thick                               | 75            |

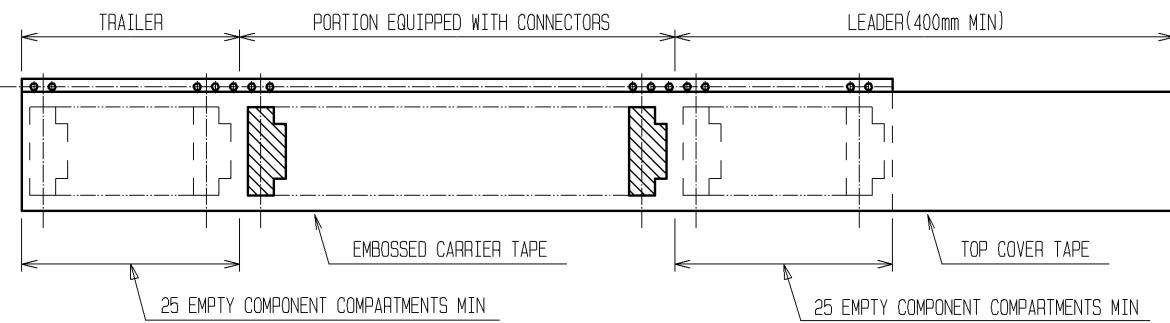
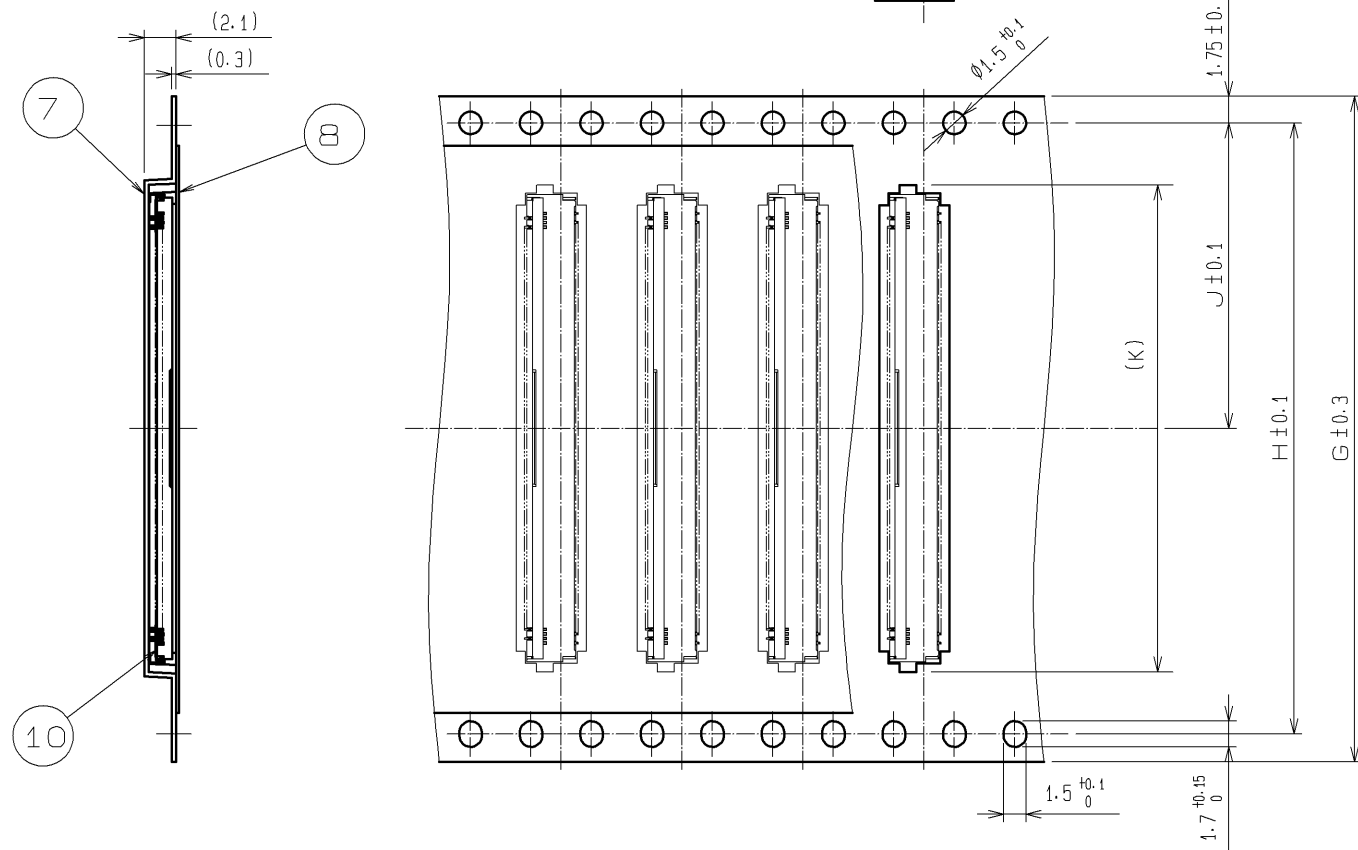
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| <b>HRS</b> | DRAWING NO. | EDC3-157632-01      |
|            | PART NO.    | FH39-**S-0.3SHW(10) |
|            | CODE NO.    | CL580               |
|            |             | 2/6                 |

◎24mm MAX

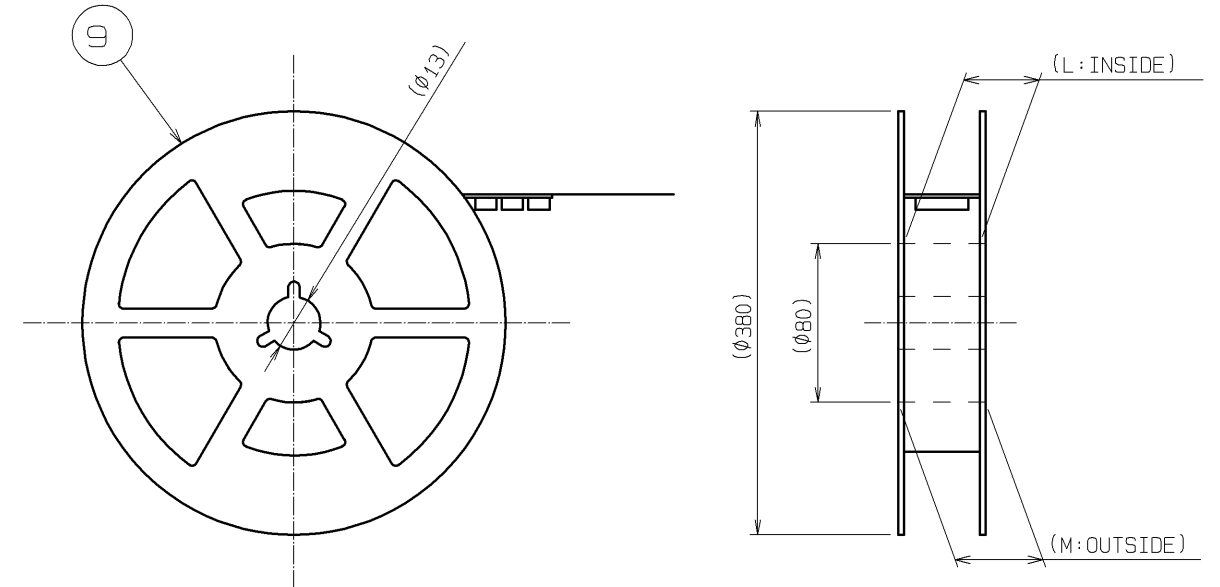


DIRECTION OF UNREELING

◎32mm MIN



REEL DIMENSION (FREE)



- NOTE 4 THE DIMENSIONS IN PARENTHESES ARE FOR REFERENCE.  
 5 PER REEL : 5000 CONNECTORS.  
 6 REFER TO JIS C 0806  
 (PACKAGING OF COMPONENTS FOR AUTOMATIC HANDLING.)

DRAWING FOR PACKING

|            |             |                     |
|------------|-------------|---------------------|
| <b>HRS</b> | DRAWING NO. | EDC3-157632-01      |
|            | PART NO.    | FH39-**S-0.3SHW(10) |
|            | CODE NO.    | CL580               |
|            |             | 3/6                 |

| PART NUMBER           | CODE NUMBER     | NUMBER OF CONTACT | DIMENSION OF CONNECTOR, FPC, LAND PATTERN AND METAL MASK |      |      |       |       |      | DIMENSION OF DRAWING FOR PACKING |      |      |      |      |      |
|-----------------------|-----------------|-------------------|--|------|------|-------|-------|------|----------------------------------|------|------|------|------|------|
|                       |                 |                   | A  | B    | C    | D     | E     | F    | G                                | H    | J    | K    | L    | M    |
| △ FH39-25S-0.3SHW(10) | CL580-1806-8-10 | 25                | 9.7  | 6.6  | 7.2  | 7.83  | 9.15  | 7.8  | 24                               | -    | 11.5 | 11   | 25.4 | 29.4 |
| △ FH39-27S-0.3SHW(10) | CL580-1805-5-10 | 27                | 10.3   | 7.2  | 7.8  | 8.43  | 9.75  | 8.4  | 24                               | -    | 11.5 | 11.6 | 25.4 | 29.4 |
| △ FH39-29S-0.3SHW(10) | CL580-1807-0-10 | 29                | 10.9   | 7.8  | 8.4  | 9.03  | 10.35 | 9    | 24                               | -    | 11.5 | 12.2 | 25.4 | 29.4 |
| △ FH39-33S-0.3SHW(10) | CL580-1803-0-10 | 33                | 12.1   | 9    | 9.6  | 10.23 | 11.55 | 10.2 | 24                               | -    | 11.5 | 13.4 | 25.4 | 29.4 |
| FH39-39S-0.3SHW(10)   | CL580-1800-1-10 | 39                | 13.9   | 10.8 | 11.4 | 12.03 | 13.35 | 12   | 24                               | -    | 11.5 | 15.2 | 25.4 | 29.4 |
| FH39-45S-0.3SHW(10)   | CL580-1802-7-10 | 45                | 15.7   | 12.6 | 13.2 | 13.83 | 15.15 | 13.8 | 32                               | 28.4 | 14.2 | 17   | 33.4 | 37.4 |
| FH39-51S-0.3SHW(10)   | CL580-1801-4-10 | 51                | 17.5   | 14.4 | 15   | 15.63 | 16.95 | 15.6 | 32                               | 28.4 | 14.2 | 18.8 | 33.4 | 37.4 |

△ DELETION

|            |             |                     |
|------------|-------------|---------------------|
| <b>HRS</b> | DRAWING NO. | EDC3-157632-01      |
|            | PART NO.    | FH39-**S-0.3SHW(10) |
|            | CODE NO.    | CL580               |
|            |             | △ 4/6               |

This connector features small, thin and back flip design, requiring delicate and careful handling.  
Read through the instructions shown below and handle the connector properly.

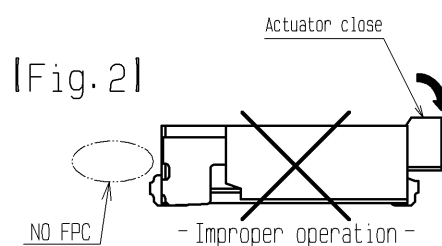
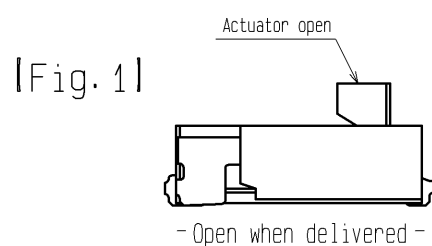
[Operation and Precautions]

1. Initial condition

Actuator does not have to be operated before inserting FPC, as the connector is delivered with the actuator opened. [See Fig.1]

[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. [See Fig.2]

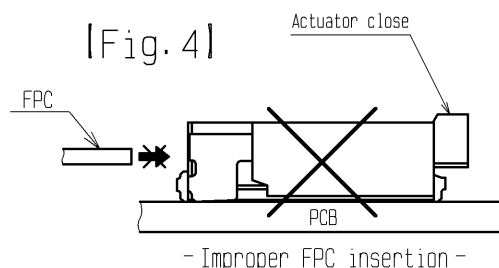
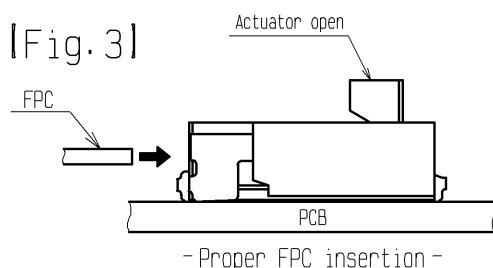


2. How to insert FPC

Insert the FPC into the connector opening horizontally to the board plane. Insert it properly to the very end.

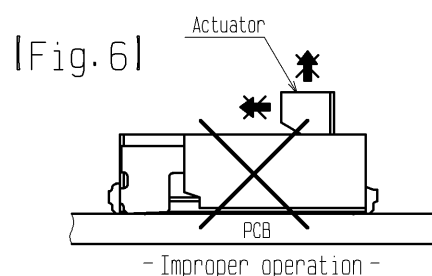
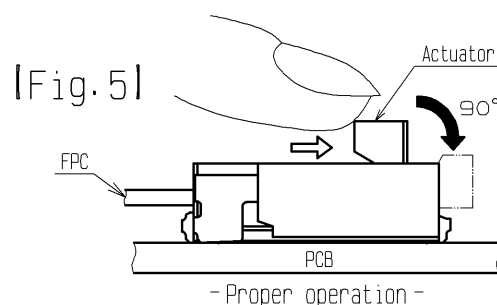
[Caution]

- Insert the FPC with the actuator opened. [See Fig.3, Fig.4]
- Twisting the FPC to up and down, right and left or an angle could cause contact deformation and contact failure.



3. How to lock

Apply load to rotate the actuator by 90 degree after inserting the FPC. [See Fig.5]



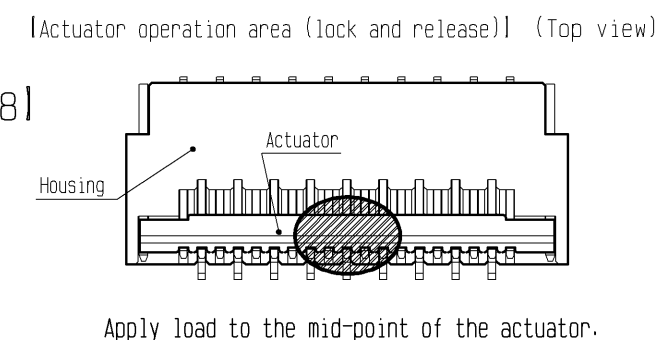
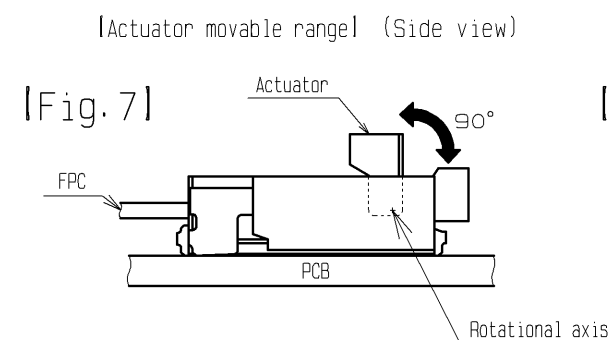
[Caution]

- The actuator rotates around the rotational axis. [See Fig.7]
- Do not rotate the actuator to the counter direction. Do not pinch or pick the actuator to lift. Otherwise, it may break. [See Fig.6]
- Apply load to the mid-point on the actuator to rotate it. [See Fig.8]
- Do not apply excess force to the housing during the operation.

[Prohibited acts]

Do not operate the side end of the actuator, or it may twist the actuator and cause half mating.

-Please operate both ends at the same time when you cannot operate the vicinity of the center part.



4. How to remove FPC (How to unlock)

Slowly flip up the actuator to release the lock and remove the FPC.

[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. [See Fig.9]
- To open the actuator, operate at the mid-point of the actuator. [See Fig.8]
- Please note that the connector is back flip style connector, and the opening for FPC insertion and the actuator face the opposite direction. Do not try to lift the actuator at the FPC insertion opening side. [See Fig.10]

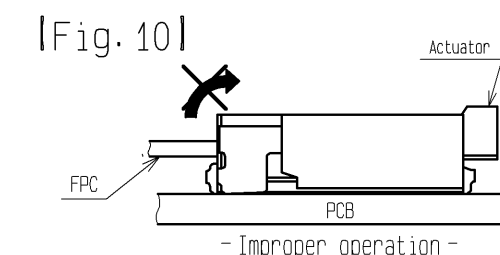
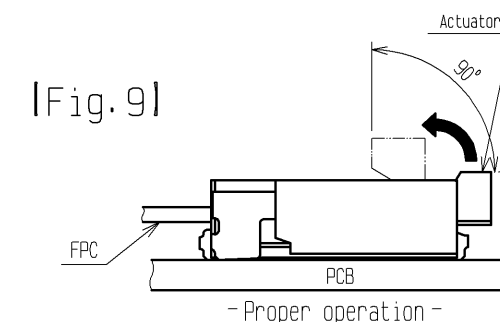
[Prohibited acts]

Do not lift up the side end of the actuator, or it may twist the actuator and cause breakage.

-Please operate both ends at the same time when you cannot operate the vicinity of the center part.

[Prohibited acts]

Do not pull out the FPC with the actuator locked. When FPC is pulled out with the actuator locked, it causes the contact deformation and contact failure.



INSTRUCTION MANUAL

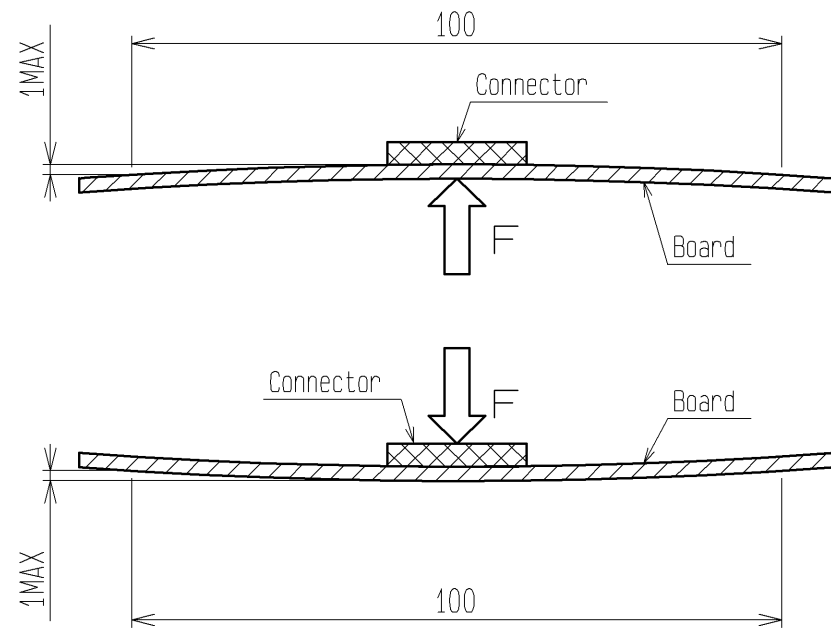
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| <b>HRS</b> | DRAWING NO. | EDC3-157632-01      |
|            | PART NO.    | FH39-**S-0.3SHW(10) |
|            | CODE NO.    | CL580               |
|            |             | 5/6                 |

This connector features small, thin and back flip design, requiring delicate and careful handling. Read through the instructions shown below and handle the connector properly.

#### [Instructions for mounting on the board]

1. Warp of board  
Minimize warp of the board as much as possible.  
Lead co-planarity including reinforced metal fittings is 0.1 mm or less.  
Too much warp of the board may result in a soldering failure.
2. Load to connector  
Do not apply mechanical stress to the connector before mounting on the board.  
Otherwise, the connector may be broken.  
Do not insert the FPC or operate the connector before mounting.
3. Load to board  
-Splitting a large board into several pieces  
-Screwing the board  
Avoid the handling described above so that no force is applied on the board during the assembly process.  
Otherwise, the connector may become defective.
4. 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 board size/thickness.  
Consult your solder paste and equipment manufacturer for specific recommendations.
5. Amount of bend of board  
The bend of a 100-mm wide board should be 1 mm or less. [See Fig. 11]  
The bend of board could apply stress on the connector and it may become defective.

[Fig. 11]



#### [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 layout, FPC design and the metal mask opening 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.

#### [Other instructions]

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

#### [Prohibited acts]

1. Do not perform manual soldering with the FPC inserted into the connector.
2. Do not heat the connector excessively.  
Be very careful not to let the soldering iron contact any parts other than connector leads.  
Otherwise, the connector may be deformed or melt.
3. Do not apply excessive solder (or flux).  
If excessive solder (or flux) is applied 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 metal fittings may hinder actuator rotation, resulting in breakage of the connector.

#### INSTRUCTION MANUAL

**HRS**

|             |                     |
|-------------|---------------------|
| DRAWING NO. | EDC3-157632-01      |
| PART NO.    | FH39-**S-0.3SHW(10) |
| CODE NO.    | CL580               |