


2011/09/10 02:21:01 CAROL, TRIBBLE

DRAWING FOR REFERENCE: This is subject to change without notice

| APPLICABLE STANDARD   |                             |   |                           |                                |
|---|-----------------------------|---|---------------------------|--------------------------------|
| <br>RATING | OPERATING TEMPERATURE RANGE | -55 °C TO 85 °C <sup>(1)(2)</sup>                 | STORAGE TEMPERATURE RANGE | -10 °C TO 60 °C <sup>(3)</sup> |
|   | VOLTAGE                     | 60 V AC <sup>(5)</sup>                            | OPERATING HUMIDITY RANGE  | RH 85 % MAX <sup>(2)(4)</sup>  |
|   | CURRENT                     | 0.5 A <sup>(5)</sup>                              | STORAGE HUMIDITY RANGE    | RH 70 % MAX <sup>(3)(4)</sup>  |
|   | APPLICABLE CABLE            | AWG 36,40 THIN COAXIAL CABLE / FFC <sup>(6)</sup> |                           |                                |

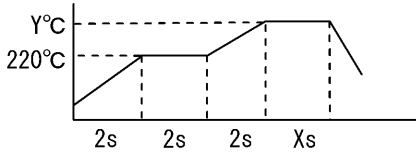
### SPECIFICATIONS

| ITEM | TEST METHOD | REQUIREMENTS | QT | AT |
|------|-------------|--------------|----|----|
|------|-------------|--------------|----|----|


|                     |                                       |                       |   |   |
|---------------------|---------------------------------------|-----------------------|---|---|
| <b>CONSTRUCTION</b> |                                       |                       |   |   |
| GENERAL EXAMINATION | VISUALLY AND BY MEASURING INSTRUMENT. | ACCORDING TO DRAWING. | x | x |
| MARKING             | CONFIRMED VISUALLY.                   |                       | x | x |

|                                 |                               |                            |   |  |
|---------------------------------|-------------------------------|----------------------------|---|--|
| <b>ELECTRIC CHARACTERISTICS</b> |                               |                            |   |  |
| CONTACT RESISTANCE              | 20 mV MAX, 1 mA(DC OR 1000Hz) | 80mΩ MAX. <sup>(7)</sup>   | x |  |
| INSULATION RESISTANCE           | 100 V DC.                     | 500 MΩ MIN.                | x |  |
| VOLTAGE PROOF                   | 200 V AC FOR 1 min.           | NO FLASHOVER OR BREAKDOWN. | x |  |

|                                   |   |   |   |  |
|-----------------------------------|---|---|---|--|
| <b>MECHANICAL CHARACTERISTICS</b> |   |   |   |  |
| INSERTION AND WITHDRAWAL FORCES   | MEASURED BY APPLICABLE CONNECTOR.   | INSERTION FORCE: 10.5 N MAX.<br>WITHDRAWAL FORCE: 1.05 N MIN.   | x |  |
| MECHANICAL OPERATION              | 50 TIMES INSERTIONS AND EXTRACTIONS.  | ① CONTACT RESISTANCE: NO VARIATION OF 20 mΩ OR MORE FROM INITIAL VALUE.<br>② NO DAMAGE, CRACK AND LOOSENESS OF PARTS. | x |  |
| VIBRATION                         | FREQUENCY 10 TO 55 Hz,<br>SINGL AMPLITUDE : 0.75 mm,<br>AT 2 h FOR 3 DIRECTION. | ① NO ELECTRICAL DISCONTINUITY OF 1 μs.<br>② NO DAMAGE, CRACK AND LOOSENESS OF PARTS.                                  | x |  |
| SHOCK                             | 490 m/s <sup>2</sup> , DURATION OF PULSE 11 ms<br>AT 3 TIMES FOR 3 DIRECTIONS.  |   | x |  |
| LOCK STRENGTH                     | MATE TO APPLICABLE CONNECTOR AND APPLY PULL FORCE HORIZONTALLY.                 | 30 N MIN.   | x |  |


|                                      |  |  |   |  |
|--------------------------------------|--|--|---|--|
| <b>ENVIRONMENTAL CHARACTERISTICS</b> |  |  |   |  |
| DAMP HEAT (STEADY STATE)             | EXPOSED AT 40±2 °C, 90 ~ 95 %, 96 h.   | ① CONTACT RESISTANCE: NO VARIATION OF 20 mΩ OR MORE FROM INITIAL VALUE.  | x |  |
| DRY HEAT                             | EXPOSED AT 85±2 °C, 96 h   |  |   |  |
| RAPID CHANGE OF TEMPERATURE          | TEMPERATURE -55→+5~+35→+85→+5~+35°C<br>TIME 30→ 5 MAX→ 30→5 MAX min.<br>UNDER 5 CYCLES.  | ② INSULATION RESISTANCE: 500 MΩ MIN.<br>③ NO DAMAGE, CRACK AND LOOSENESS OF PARTS.   | x |  |
| CORROSION SALT MIST                  | EXPOSED IN 5 % SALT WATER SPRAY FOR 48 h.  | ① CONTACT RESISTANCE:NO VARIATION OF 20 mΩ OR MORE FROM INITIAL VALUE.<br>② NO DEFECT SUCH AS CORROSION WHICH IMPAIRS THE FUNCTION OF CONNECTOR. | x |  |
| SULFUR DIOXIDE                       | EXPOSED IN 25 PPM FOR 96 h.<br>(TEST STANDARD: JIS C 60068)  |  | x |  |
| RESISTANCE TO SOLDERING HEAT         | 1)SOLDERING HEAT WELDER :<br>PRESSURIZATION:15±2N<br>(COAXIAL CABLE) HEATING Y:275±5°C, X:2±0.5 sec<br>(FFC) HEATING Y:265±5°C, X:2.5±0.5 sec<br><br> | NO DEFORMATION OF CASE OF EXCESSIVE LOOSENESS OF THE TERMINAL.   | x |  |
|                                      | 2) SOLDERING IRONS : 360°C MAX. FOR 3 sec.   |  | x |  |
| SOLDERABILITY                        | SOLDERED AT SOLDER TEMPERATURE 240±3°C FOR IMMERSION DURATION, 3 sec.  | A NEW UNIFORM COATING OF SOLDER SHALL COVER A MINIMUM OF 95 % OF THE SURFACE BEING IMMERSED.   | x |  |

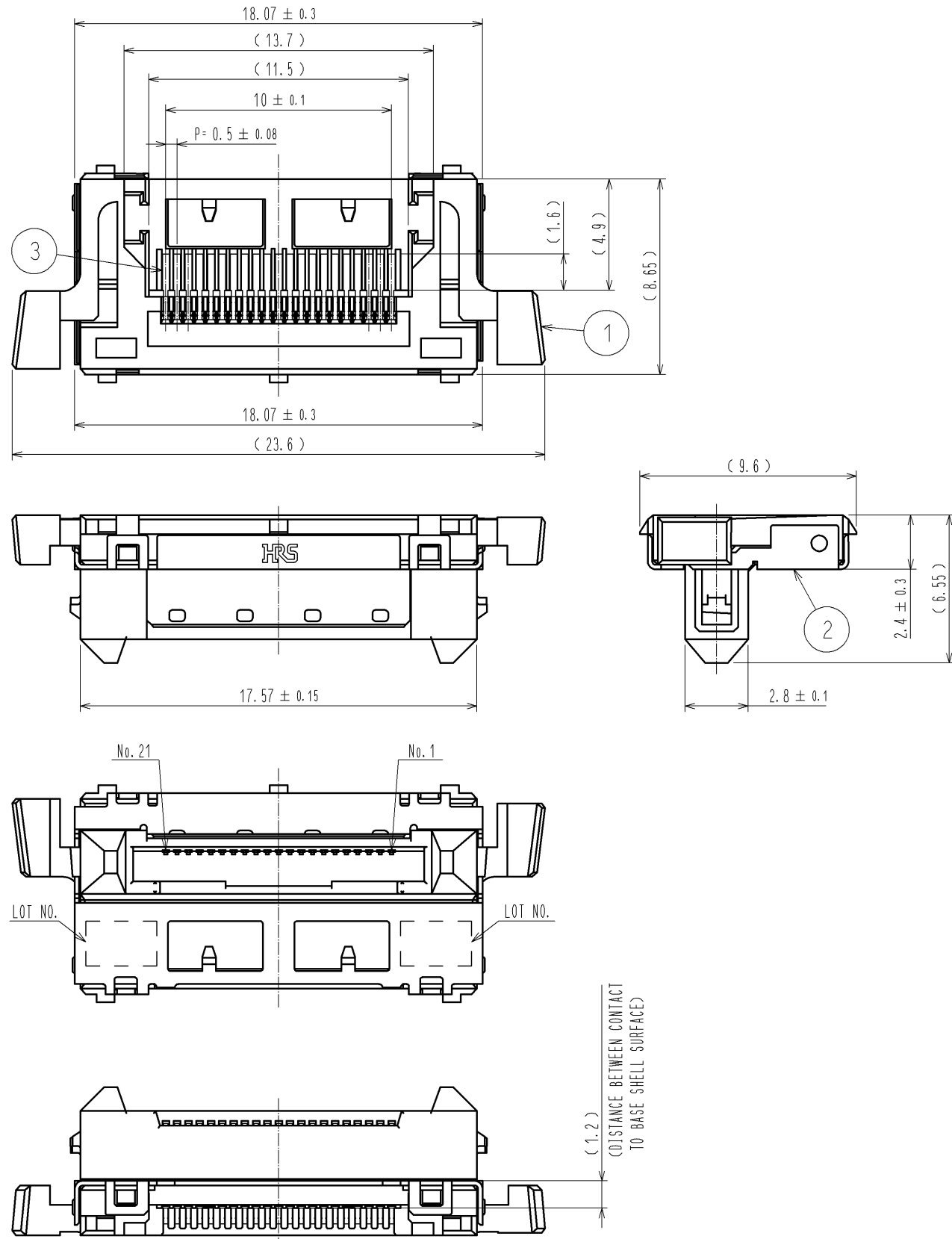
| COUNT | DESCRIPTION OF REVISIONS | DESIGNED    | CHECKED       | DATE     |
|-------|--------------------------|-------------|---------------|----------|
| 2     | DIS-F-004353             | KN. SHIBUYA | HT. YAMAGUCHI | 09.12.15 |

|   |          |               |          |
|---|----------|---------------|----------|
| <br>REMARKS<br>(1) INCLUDE TEMPERATURE RISE CAUSED BY CURRENT-CARRYING.<br>(2) OPERATING TEMPERATURE SHOULD BE -55 TO 40°C WHEN HUMIDITY EXCEEDS 80% RH.<br>(3) THE SPECIFICATION IS APPLIED TO THE PRE-ASSEMBLED COMPONENT AND THE CABLE ASSEMBLED PRODUCT BOTH IN DELIVERY AND STORAGE, BEFORE ASSEMBLED TO PCB.<br>(4) THERE MUST NOT BE DEWFALL.<br>(5) IT IS THE MAXIMUM VALUE OF CONNECTOR. CONFIRM THE SPECIFICATION OF THE CABLE.<br>(6) ONLY FFC THAT PROCESSES THE TERMINAL THAT WE SPECIFIED.<br>(7) DON'T INCLUDE CONDUCTOR RESISTANCE OF CABLE. | APPROVED | HS. OKAWA     | 08.05.24 |
|   | CHECKED  | HT. YAMAGUCHI | 08.05.24 |
|   | DESIGNED | TS. SHIBUYA   | 08.05.13 |
|   | DRAWN    | TS. SHIBUYA   | 08.05.13 |

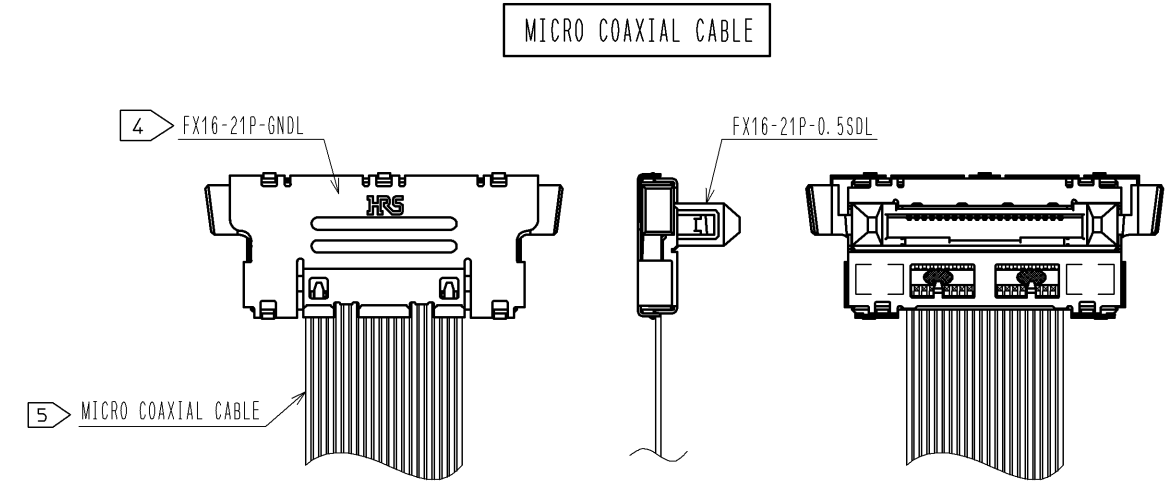
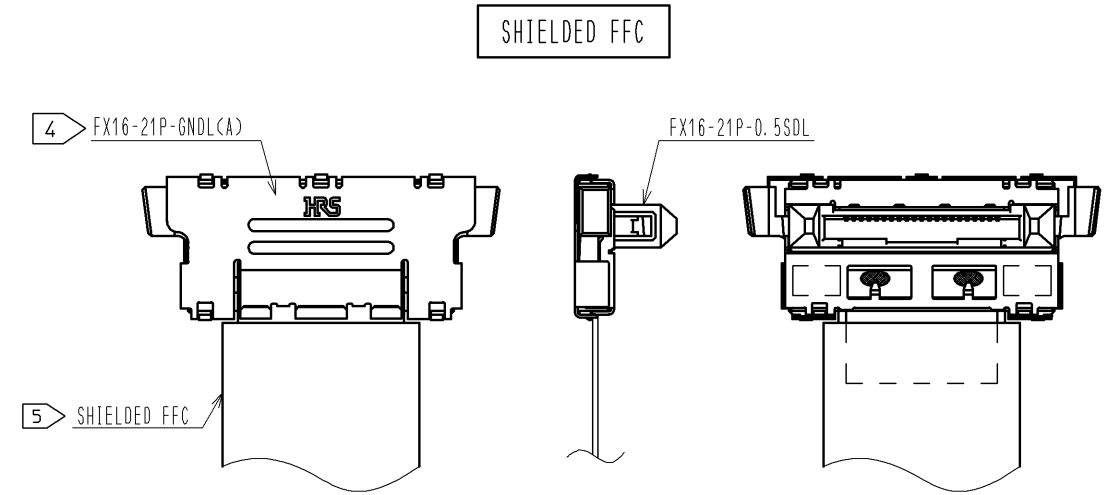
Unless otherwise specified, refer to JIS-C-5402.

|      |   |             |                |
|------|---|-------------|----------------|
| Note | QT:Qualification Test AT:Assurance Test X:Applicable Test | DRAWING NO. | ELC4-158269-00 |
|------|---|-------------|----------------|

|   |                           |          |                 |
|---|---------------------------|----------|-----------------|
|  | SPECIFICATION SHEET       | PART NO. | FX16-21P-0.5SDL |
|   | HIROSE ELECTRIC CO., LTD. | CODE NO. | CL575-3321-4-00 |



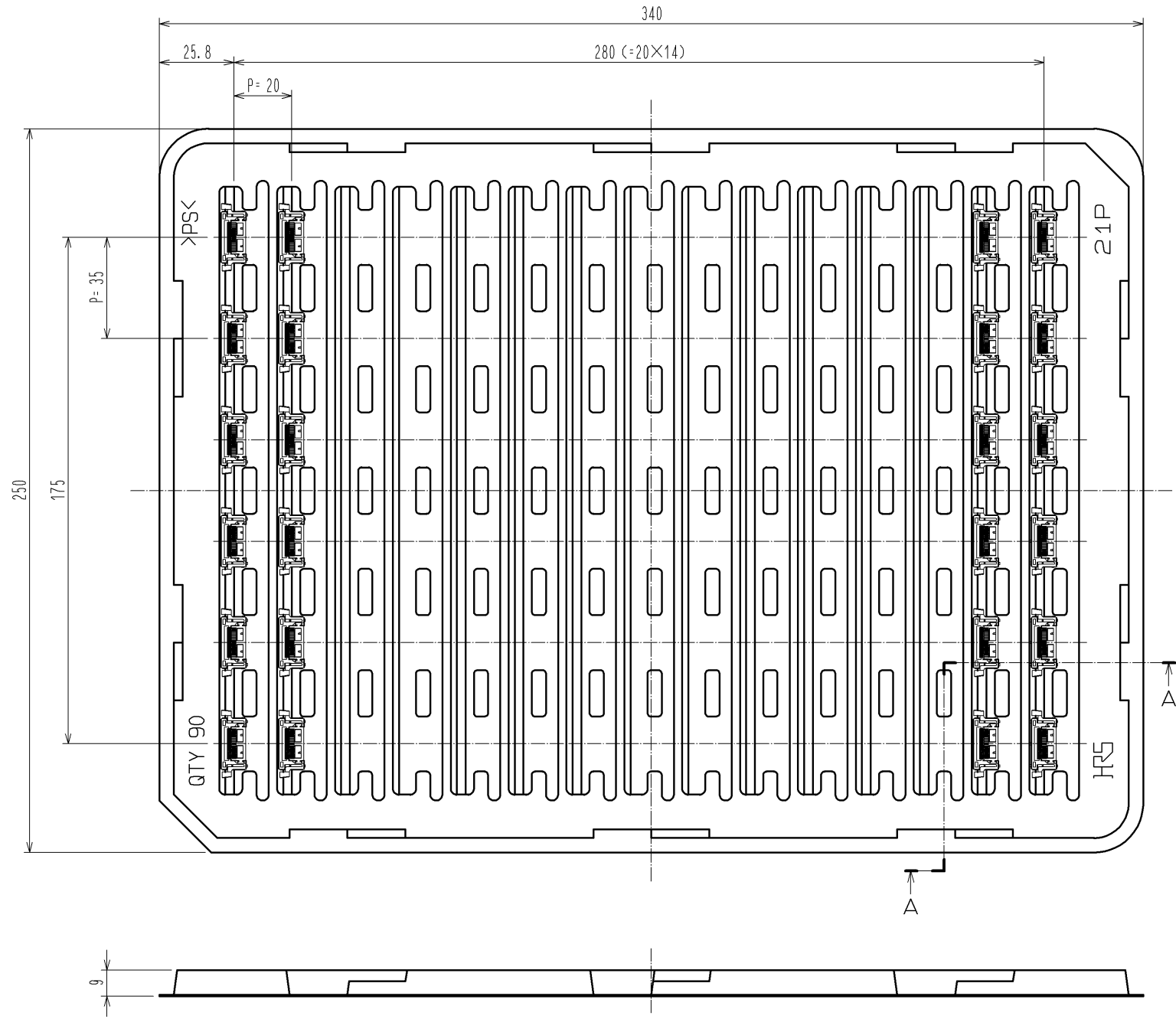
APPLICATION DIAGRAM (2:1)



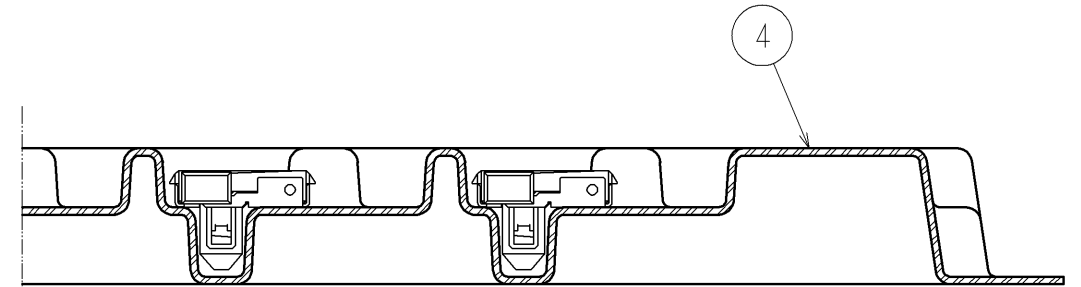
- NOTE
- 1 ( ) INDICATES A REFERENCE DIMENSION.
  - 2 MANUFACTURING PROCESS COULD LEAVE SCRATCH AND/OR PUNCH MARKS HAVING NO AFFECT ON THE PRODUCT PERFORMANCE. AND THE DARK SPOTS MIGHT OCCASIONALLY OCCUR ON MOLDED PLASTIC.
  - 3 THE CONNECTORS ARE DELIVERED IN TRAY PACKAGING.
  - 4 COVER SHELL IS SEPARATELY AVAILABLE.
  - 5 THE ACCEPTABLE CABLE OF THE CONNECTOR IS SHIELDED FFC OR MICRO COAXIAL CABLE: 36-40AWG. CABLE PREPARATION IS REQUIRED PRIOR TO CABLE ASSEMBLY. REFER TO PAGE 3 FOR THE RECOMMENDED CABLE PROCESS DIMENSIONS.
  - 6 REFER TO PAGE 4 FOR THE CABLE ASSEMBLY PROCEDURES AND PRECAUTIONS FOR HANDLING.

|                                      |           |                        |           |                          |          |             |          |                 |  |
|--------------------------------------|-----------|------------------------|-----------|--------------------------|----------|-------------|----------|-----------------|--|
| 4                                    | PS        | (TRAY)                 |           |                          |          |             |          |                 | CONTACT AREA: GOLD 0.1 $\mu$ m min       |
| 2                                    | STAINLESS | NICKEL 0.3 $\mu$ m min |           |                          |          |             |          |                 | TERMINAL AREA: TIN-PLATING 2 $\mu$ m min |
| 1                                    | PA        | BEIGE<br>UL94V-0       |           |                          |          |             |          |                 | UNDER PLATING: NICKEL 1 $\mu$ m min      |
| NO.                                  | MATERIAL  | FINISH                 | REMARKS   | NO.                      | MATERIAL | FINISH      | REMARKS  |                 |  |
| UNITS<br>mm                          |           | SCALE<br>4 : 1         | COUNT<br> | DESCRIPTION OF REVISIONS |          |             | DESIGNED | CHECKED         | DATE                                     |
| <b>HRS</b> HIROSE ELECTRIC CO., LTD. |           |                        |           | APPROVED : HS. OKAWA     | 10.11.26 | DRAWING NO. |          | EDC3-158269-01  |  |
|                                      |           |                        |           | CHECKED : HT. YAMAGUCHI  | 10.11.26 | PART NO.    |          | FX16-21P-0.5SDL |  |
|                                      |           |                        |           | DESIGNED : KN. SHIBUYA   | 10.11.26 | CODE NO.    |          | CL575-3321-4-00 |  |
|                                      |           |                        |           | DRAWN : YJ. ASAO         | 10.11.25 |             |          |                 |  |

DRAWING FOR PACKING (1:2)

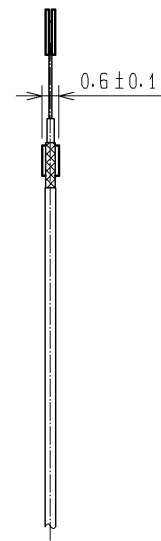
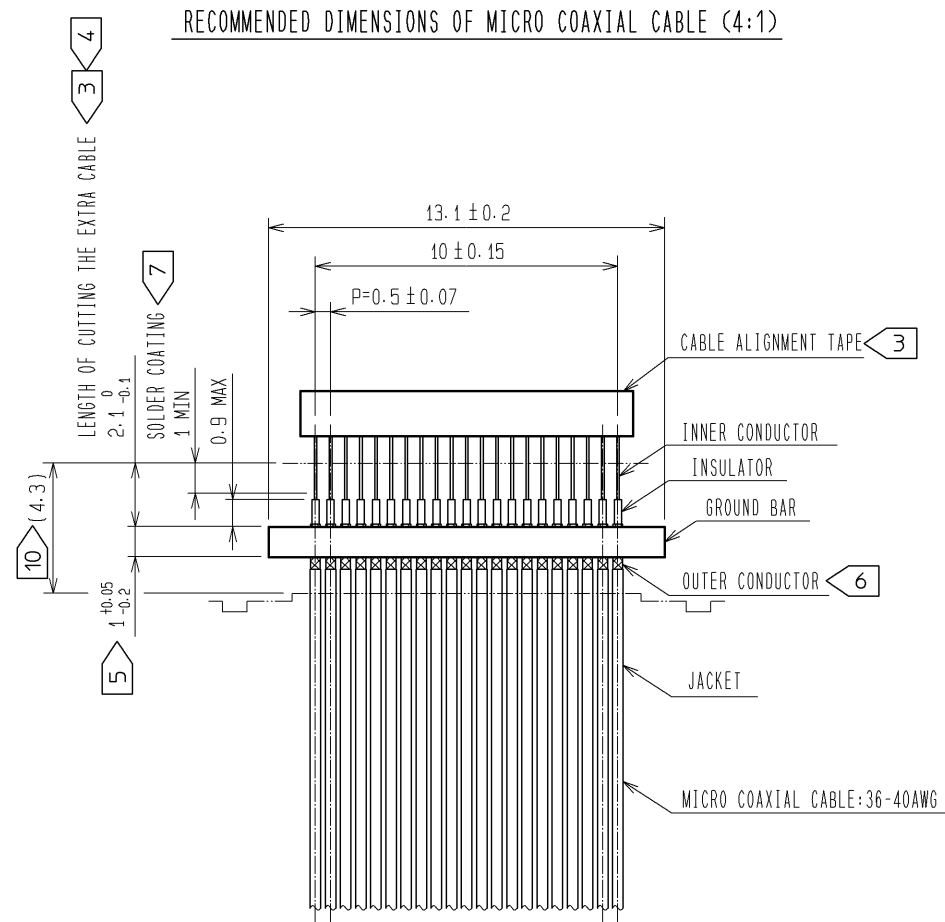


AA(2:1)

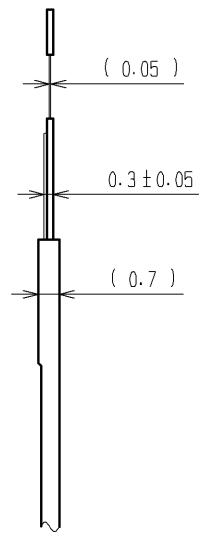
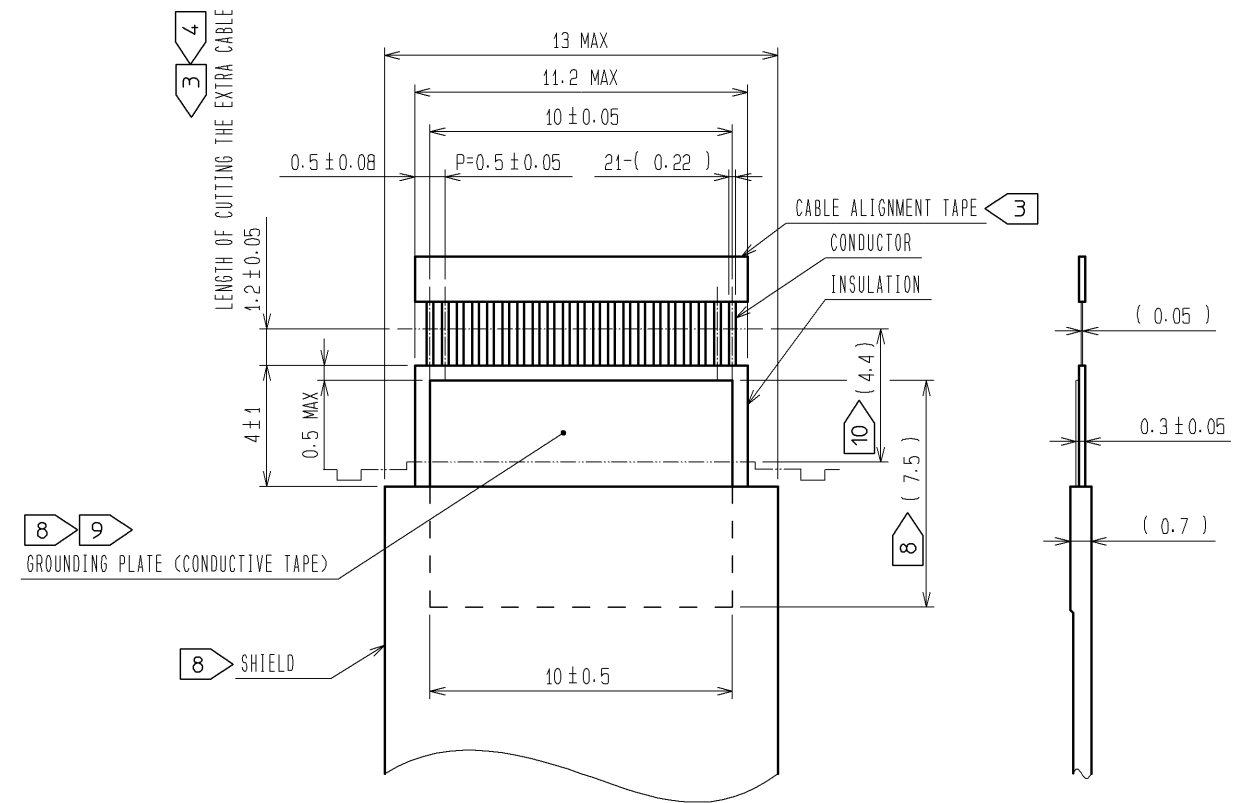


NOTE 1 ONE TRAY CONTAINS 90 CONNECTORS.  
 2 THE DIMENSIONS ARE REFERENCE.

|            |             |                 |  |
|------------|-------------|-----------------|--|
| <b>HRS</b> | DRAWING NO. | EDC3-158269-01  |  |
|            | PART NO.    | FX16-21P-0.5SDL |  |
|            | CODE NO.    | CL575-3321-4-00 |  |
|            |             |                 |  |



RECOMMENDED DIMENSIONS OF FFC (BOTH SIDES SHIELDED CABLE) (4:1)



- NOTE 1 ( ) INDICATES A REFERENCE DIMENSION.  
 2 SOLDERING TO THE CONNECTOR AT ONCE BY USING PULSE HEAT IS RECOMMENDED.  
 3 TO PREVENT CONDUCTOR DEFORMATION, CUT THE CABLE ALIGNMENT TAPE AT THE SPECIFIED POSITION JUST BEFORE THE CABLE ASSEMBLY.  
 4 MINIMAL LENGTH 2.0 mm IS A RECOMMENDED DIMENSION AND ALLOWED TO BE CHANGED IF NECESSARY, AS LONG AS ENSURING GOOD SOLDERABILITY.  
 5 WIDTH OF GROUND BAR SHALL BE 1.05 mm MAX. INCLUDING MISALIGNMENT OF OVERLAPPING, FLUSH BY CUTTING, SIDE DROP OR SOLDERING. USING AN INADEQUATE CABLE WILL INTERFERE THE ASSEMBLY TO THE CONNECTOR. FORCEFUL ASSEMBLY AND SOLDERING COULD CAUSE MIS-SOLDERING TO DEFECTIVE PRODUCT.  
 6 MINIMIZE THE LENGTH OF OUTER CONDUCTOR BEYOND THE GROUND BAR.  
 7 PRE-SOLDER AND COAT THE INNER CONDUCTOR AT THE CABLE END.

- 8 OVERLAP FFC SHIELD AND GROUNDING PLATE, SO THAT THEY ARE ELECTRICALLY CONNECTED. OVERLAP DIMENSION IS OPTIONAL.  
 9 USE SOLDERABLE CONDUCTIVE TAPE FOR THE GROUNDING PLATE (RECOMMENDATION: TIN PLATED COPPER TAPE).  
 10 SHOWS THE CABLE ASSEMBLY POSITION AND THE CABLE LENGTH FITTING INTO THE CONNECTOR WHEN THE CABLE IS CUT AT THE RECOMMENDED CUTTING POSITION OF EXTRA CABLE LENGTH.

|            |             |                 |
|------------|-------------|-----------------|
| <b>HRS</b> | DRAWING NO. | EDC3-158269-01  |
|            | PART NO.    | FX16-21P-0.5SDL |
|            | CODE NO.    | CL575-3321-4-00 |

Cautions for soldering

1. Recommended solder

Flux cored solder (Lead-free: Sn-3Ag-0.5Cu)

Micro coaxial cable · · · 0.15 mm dia. Length 10.5 mm

FFC · · · 0.1 mm dia. Length 10.5 mm

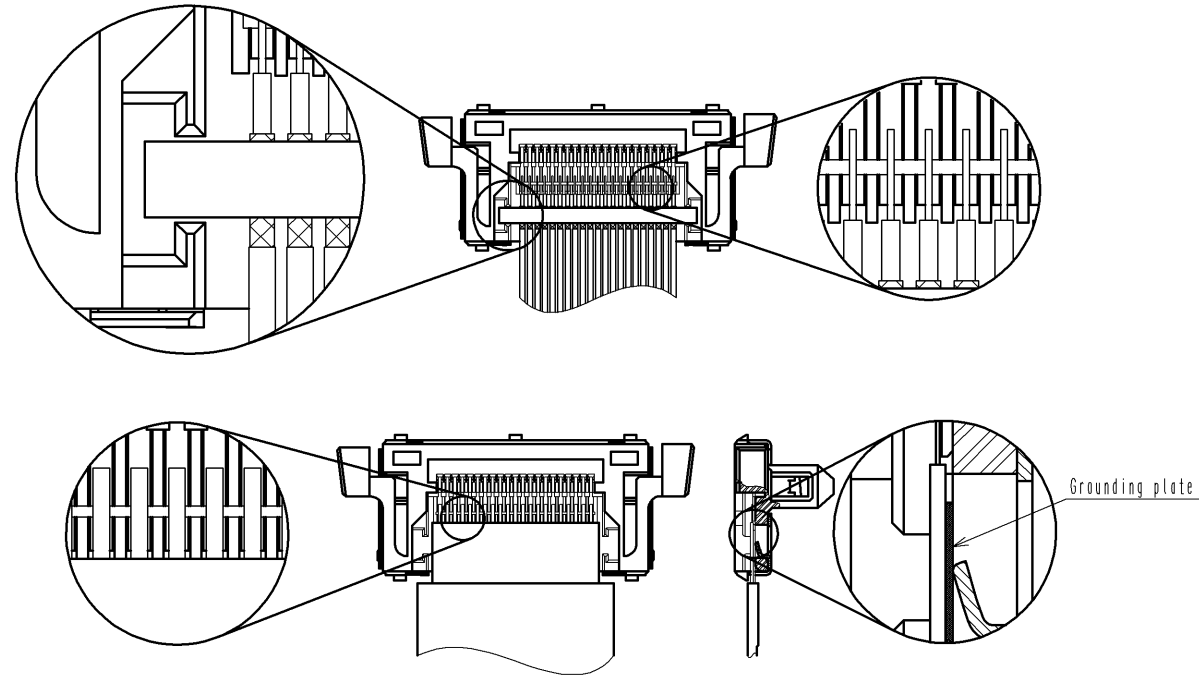
If you consider using additional flux, please pay enough attention not to have flux wicking to the contact area. Flux wicking to the contact area will cause contact failure.

2. Setting the cable

Set the conductors as each conductor is placed at the center of the contact.

In case of micro coaxial cable, set it as the metal bar fits in the guide on the connector.

In case of FFC, set it as the grounding plate side faces to the connector.

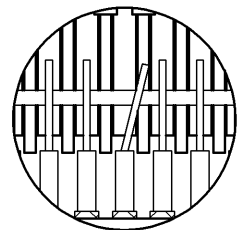


3. Place the cable to the connector and check the below points before soldering by pulse heat.

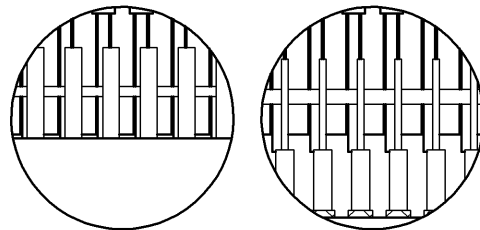
- Transformation of conductor
- Misalignment of conductor to the terminals in pitch direction
- Excessive floating of conductor

The above could cause soldering failure and/or solder bridge.

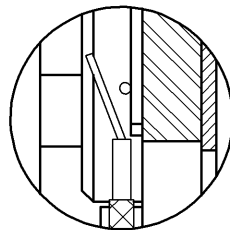
Transformation of conductor



Misalignment in pitch direction



Floating

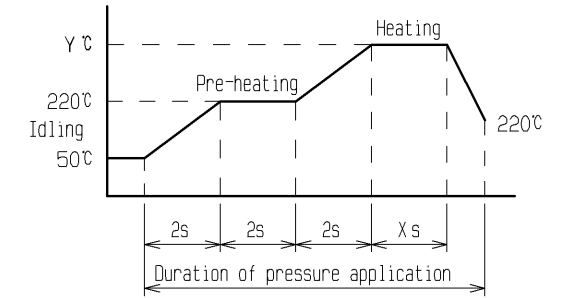


4. Follow the recommended temperature profile shown below for the soldering.

The optimum condition could vary depending on various factors including type of cable and its length, solder type. Therefore refer to the recommended temperature profile and optimize the condition if necessary.

|                           |           |
|---------------------------|-----------|
| Solder tip pressurization | 13 ~ 17 N |
|---------------------------|-----------|

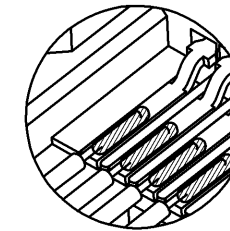
| heating         | Micro coaxial cable | FFC          |
|-----------------|---------------------|--------------|
| Temperature (Y) | 275± 5 °C           | 265± 5 °C    |
| Duration (X)    | 2± 0.5 sec          | 2.5± 0.5 sec |



5. After soldering, check that no defect is found at soldered area.

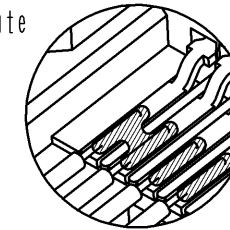
Examples of correct soldered and defective soldered state are shown below.

Correct soldering

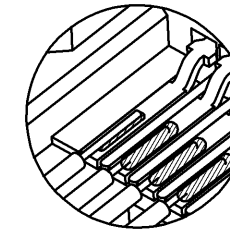


Conductors are placed at the center of the contact, and whole area is equally wetted.

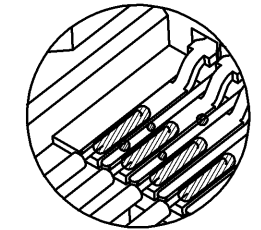
Defective soldered state



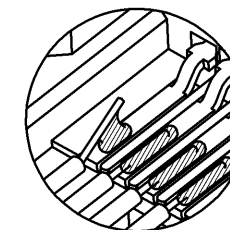
Solder bridge



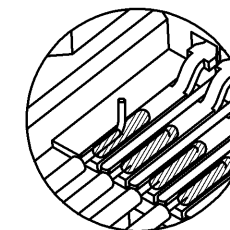
Solder shortage



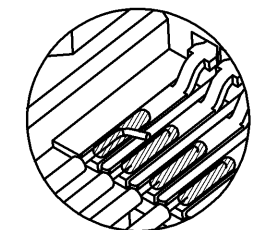
Solder ball dispersion



Floating



Conductor sticking out



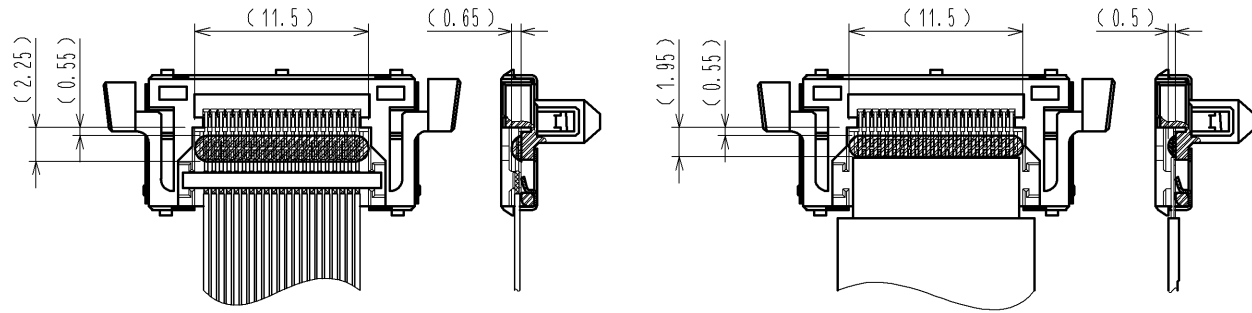
The conductor approaches to the adjacent contact

\*Note: The figures shown in this page are solely for the instruction purpose. Therefore, the appearance could differ from the actual connectors. Refer to the drawing for the actual design (sheet 1).

|            |             |                 |
|------------|-------------|-----------------|
| <b>HRS</b> | DRAWING NO. | EDC3-158269-01  |
|            | PART NO.    | FX16-21P-0.5SDL |
|            | CODE NO.    | CL575-3321-4-00 |
|            |             | △ 4/6           |

**Cautions for potting process**

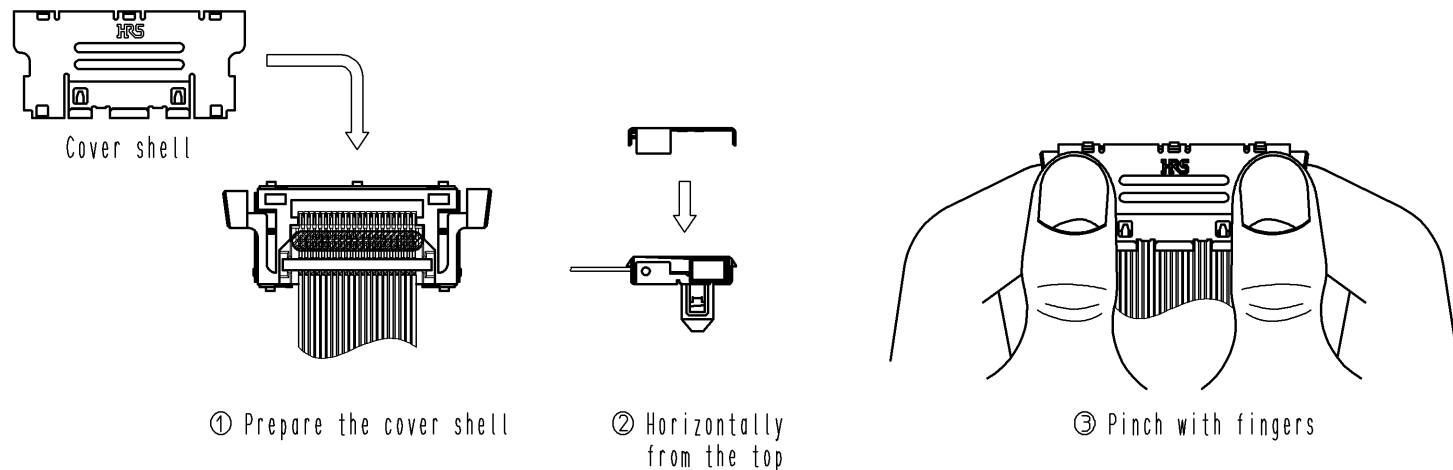
1. Protect the soldered area by UV cured resin or any equivalent (referred to as 'potting' hereafter). In order to prevent insulating failure caused by metal adhering, cable breakage during cabling and other troubles.
2. Apply 3033 manufactured by THREEBOND CO., LTD. or any equivalent product for potting. Follow the instruction of potting manufacture's for the condition of UV exposure.
3. Refer to the following conditions for the potting area.



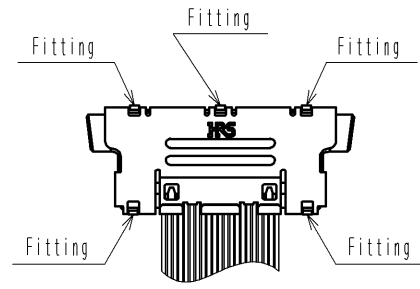
4. Use extreme care for the handling after soldering to the end of potting process not to apply stress to the cable. otherwise, cable could be broken. Exercise extreme caution during the process so that no resin flows or adheres to the contact area.

**Cautions for cover shell assembly**

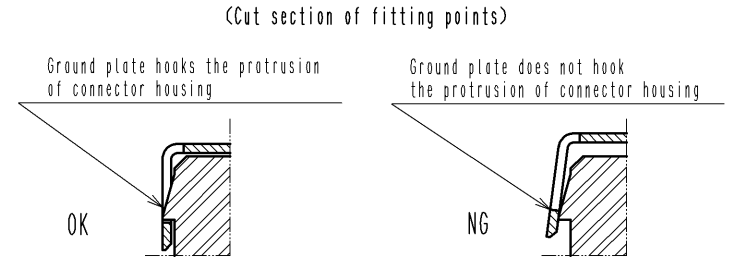
1. Attach a cover shell separately provided after the cable assembly process.  
For micro coaxial cabla : FX16-21P-GNDL  
For FFC : FX16-21P-GNDL(A)
2. Place the cover shell onto the connector horizontally and pinch two components from top and bottom with fingers.



3. Check the five fitting points after assembly and make sure that they are all correctly fitted together.

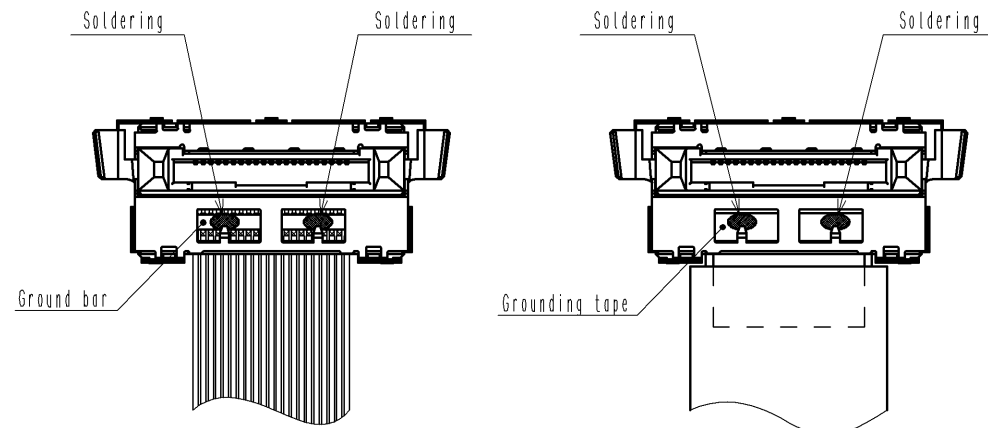


**How to check fitting points**



**Soldering to ground plate**

1. Solder down the metal bar of the cable and ground plate after the assembly of ground plate in order to enhance the grounding performance and robustness against cable stroke to up and down direction.



2. Excess solder and/or excess heating could cause cable and connector deformation and/or melt.

Cable assembly process is completed.

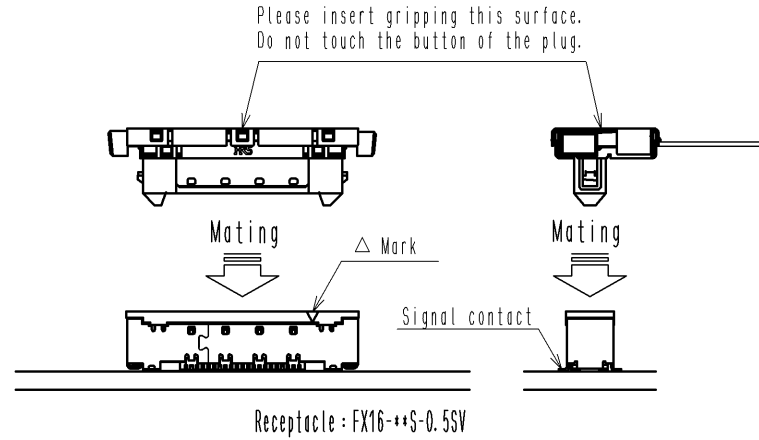
\*Note: The figures shown in this page are solely for the instruction purpose. Therefore, the appearance could differ from the actual connectors. Refer to the drawing for the actual design (sheet 1).

|            |             |                 |
|------------|-------------|-----------------|
| <b>HRS</b> | DRAWING NO. | EDC3-158269-01  |
|            | PART NO.    | FX16-21P-0.5SDL |
|            | CODE NO.    | CL575-3321-4-00 |
|            |             | 5/6             |

Handling instructions

1. Insertion to on-board connector

The connector mating is keyed. Align the marks as shown in the figure for mating. Insert the connector completely until they are locked at both ends.



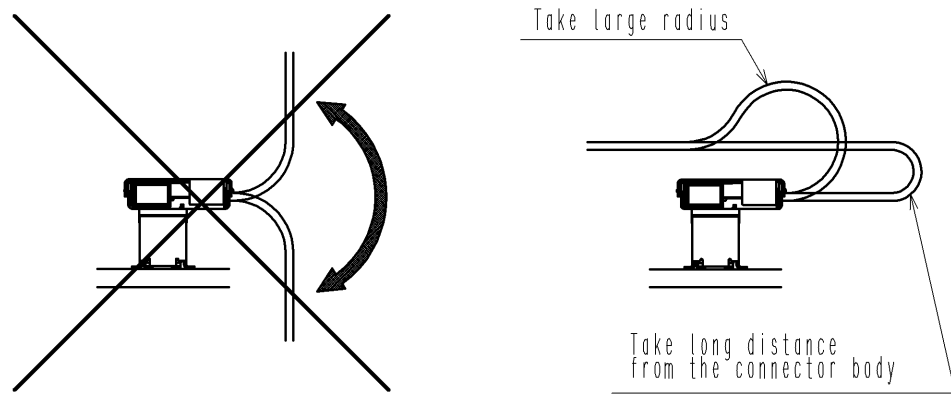
The connectors have a reverse-insertion prevention structure, however, the connectors may be damaged when inserted reversely with the force of 25 N or more. Avoid a forceful insertion, and make sure to confirm that the connectors are aligned with the marks before the mating operation.

2. After mating

Carefully wire cables, so that excessive force will not be applied to the mated connectors. Pulling the cable with the force of 20 N or more may damage the connectors. It may also cause cable breakage. Take a caution to avoid pulling the cables.

Repetitive cable strokes could also cause cable breakage as well. Do not use the connector under the environment of repetitive cable strokes.

Take enough bend radius and/or distance from the connector for the cable not to apply stress to the connector base when the application requires cable bend back.



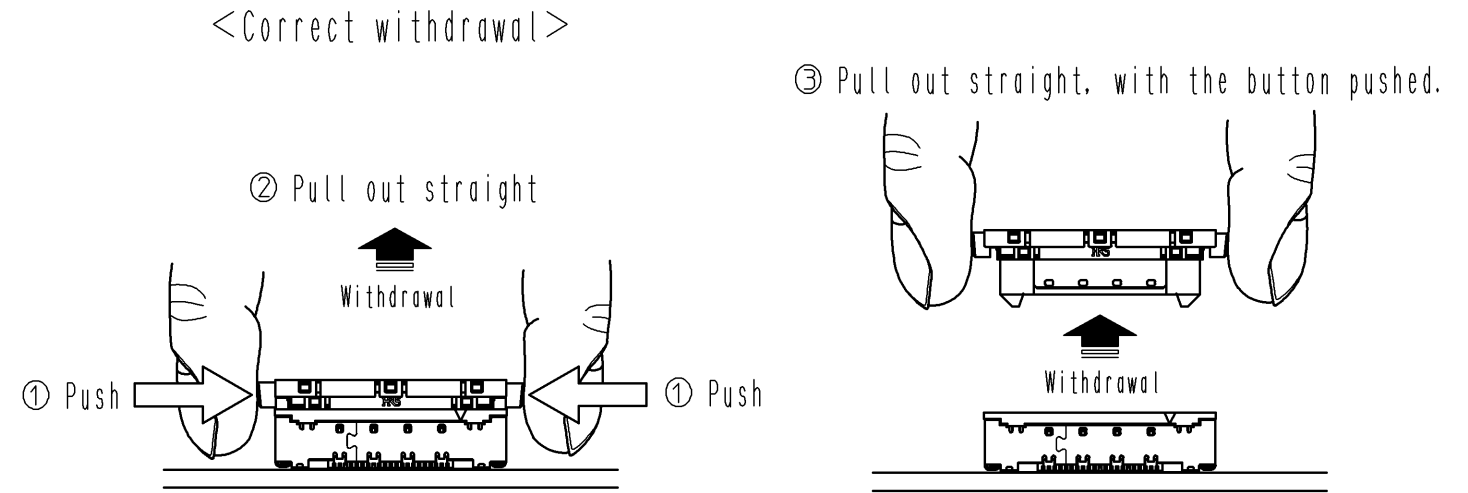
Repetitive cable strokes

Application of cable bend back

\*Note : The connectors shown in this page are drawn for the instruction purpose, therefore, the appearance differs from the actual connectors. Please confirm the connector configuration on the connector drawing (SHEET 1).

3. Withdrawal from on-board connector

The connectors are locked while they are mated. In order to unmate the connectors, pull out straight, with the button pushed to release the lock. At this time, do not pull the cable. Also, avoid the withdrawal in angle, which may damage the connectors.



③ Pull out straight, with the button pushed.

<Incorrect withdrawal>

|            |             |                 |     |
|------------|-------------|-----------------|-----|
| <b>HRS</b> | DRAWING NO. | EDC3-158269-01  | 6/6 |
|            | PART NO.    | FX16-21P-0.5SDL |     |
|            | CODE NO.    | CL575-3321-4-00 |     |
|            |             |                 |     |