1mm Pitch Wire-to-Board Connectors supporting LVDS signal
FX15 Series

Features
1. Space-saving
   Reduction in space is achieved by designing the contacts in 2-row staggered 1mm pitch on the mating side and on a single row 0.5mm pitch on the termination side (Fig.1).

2. Equal length transmission lines
   Contact configuration provides equal length transmission lines, which prevents LVDS signal loss within the connector.

3. Variations
   Availability of shielded and non-shielded types allows for design flexibility and cost reduction.

4. Self alignment and self-guiding
   Built-in guide posts allow secure self-alignment within ±1.5mm (Fig.2).

5. Secure and complete mating / unmating
   Side latch locking provides complete and secure mating, as well as easy unmating (Fig.3).

6.Enhanced shielding performance with FX15S
   Enlarged metal shields prevent intrusion and emission of electromagnetic interference, which enhances the integrity of the LVDS signal (Fig.4).

7. RoHS compliant
   All materials and substances used to produce this product comply with RoHS standards.

In cases where the application will demand a high level of reliability, such as automotive, please contact a company representative for further information.
**Product Specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contact resistance</td>
<td>60mΩ max. (Note 3)</td>
<td>1mA</td>
</tr>
<tr>
<td>2. Insulation resistance</td>
<td>500MΩ min.</td>
<td>100V DC</td>
</tr>
<tr>
<td>3. Withstanding voltage</td>
<td>No flashover or insulation breakdown.</td>
<td>300V AC/one minute</td>
</tr>
<tr>
<td>4. Insertion-Extraction force</td>
<td>2N min., 30N max.</td>
<td>With corresponding connector</td>
</tr>
<tr>
<td>5. Mating cycles</td>
<td>Contact resistance : 80mΩ max. (Note 3)</td>
<td>50 cycles</td>
</tr>
<tr>
<td>6. Vibration resistance</td>
<td>No electrical discontinuity of 1μs or more.</td>
<td>Frequency: 10 to 55 Hz, single amplitude of 0.75mm, 2 hours, 3 axis</td>
</tr>
<tr>
<td>7. Shock resistance</td>
<td>No electrical discontinuity of 1μs or more.</td>
<td>Acceleration of 480m/s², 11ms durations, sine half-wave waveform, 3 cycles, 3axis.</td>
</tr>
<tr>
<td>8. Humidity resistance</td>
<td>Contact resistance : 80mΩ max. No damage, cracks, or parts dislocation. (Note 3)</td>
<td>96 hours at 40°C, RH 90% to 95%</td>
</tr>
<tr>
<td>9. Temperature cycle</td>
<td>Contact resistance : 80mΩ max. (Note 3) Insulation resistance : 500MΩ min.</td>
<td>Temperature : -55°C → +15°C → +35°C → +85°C → +15°C to +35°C Time : 30 → 5 → 30 → 5 (Minutes) 5 cycles</td>
</tr>
<tr>
<td>10. Salt spray</td>
<td>Contact resistance : 80mΩ max. (Note 3) No corrosions</td>
<td>5% water solution for 48 hours.</td>
</tr>
</tbody>
</table>

**Note 1**: Includes temperature rise caused by current flow.

**Note 2**: The term "storage" refers to products stored for long period of time prior to mounting and use. Operating temperature and humidity range includes non-conducting condition of installed connectors in storage, shipment or during transportation.

**Note 3**: Includes wire conductor resistance (12mm long).

**Materials / Finish**

**● Receptacle**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
<th>Finish</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>Polyamide</td>
<td>Color : Black</td>
<td>UL94V-0</td>
</tr>
<tr>
<td>Contact</td>
<td>Phosphor bronze</td>
<td>Contact area : Gold plated</td>
<td></td>
</tr>
<tr>
<td>Metal shell (shielded version only)</td>
<td>FX15S : Nickel silver</td>
<td>FX15S : Tin plated</td>
<td></td>
</tr>
<tr>
<td>Metal fittings (shielded version only)</td>
<td>Phosphor bronze</td>
<td>Selective gold flash plated</td>
<td></td>
</tr>
</tbody>
</table>

**● Plug**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
<th>Finish</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>Polyamide</td>
<td>Color : Black</td>
<td>UL94V-0</td>
</tr>
<tr>
<td>Contact</td>
<td>Phosphor bronze</td>
<td>Contact area : Gold plated</td>
<td></td>
</tr>
<tr>
<td>Metal shell (shielded version only)</td>
<td>Nickel silver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal latch locks (shielded version only)</td>
<td>Stainless steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal shell, metal latch locks (on micro coax version only)</td>
<td>Stainless steel</td>
<td>Nickel plated</td>
<td></td>
</tr>
</tbody>
</table>

**Product Number Structure**

**● Receptacle**

FX15 S - 31 S - 0.5 SH (***)

**● Plug**

FX15 S - 31 P - C

**● Crimp contact**

FX15 - 3032 PCF B
FX15 Series – Functional Diagram

Crimp contact

Plugs
- With shield, standard (FX15-31P-C)
- Without shield (FX15M-P-C)
- With shield, enhanced shielding (FX15S-P-C)
- Right angle, with shields (FX15S-S-0.5SH)
- Right angle, without shields (FX15M-S-0.5SH)

Receptacles
- Vertical, with shields (FX15-31S-0.5SV)
- With shield-standard (FX15-31P-C)
- Vertical, with shields (FX15S-P-0.5SD)
- Micro-coaxial cable (FX15S-P-0.5SD)
- With shield-standard (FX15-2830-PCFB)
- Vertical, with shields (FX15S-P-GND)
- With shield-standard (FX15-2830-PCFB)
- With shields—enhanced shielding 28 to 30 AWG (FX15SSW-31P-C)
- With shields—enhanced shielding PCB mounting pattern: VESA standard (FX15SSC-S-0.5SH)
- With shields—enhanced shielding PCB mounting pattern: VESA standard (FX15SSC-S-0.5SV)

Ground plate (FX15S-P-GND)

Micro-coaxial cable (FX15S-P-0.5SD)

Crimp contact (FX15-3032-PCFB)

Crimp contact (FX15-2830-PCFB)
## Plugs

### With shields (FX15-31P-C)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15-31P-C</td>
<td>575-2101-2</td>
<td>31</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note 1: Packaged in trays.
Note 2: Dimensions in parenthesis ( ) are reference dimensions.

### With shields, enhanced shielding (FX15S-**P-C)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15S-31P-C</td>
<td>575-2106-6</td>
<td>31</td>
<td>27</td>
<td>24.6</td>
<td>22.6</td>
<td>18.3</td>
<td>14</td>
<td>15</td>
<td>Yes</td>
</tr>
<tr>
<td>FX15S-41P-C</td>
<td>575-2107-9</td>
<td>41</td>
<td>32</td>
<td>29.6</td>
<td>27.6</td>
<td>23.3</td>
<td>19</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>FX15S-51P-C</td>
<td>575-2103-8</td>
<td>51</td>
<td>37</td>
<td>34.6</td>
<td>32.6</td>
<td>28.3</td>
<td>24</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Packaged in trays.
Note 2: Dimensions in parenthesis ( ) are reference dimensions.
FX15 Series 1mm Pitch Wire-to-Board Connectors supporting LVDS signal

● With shields – enhanced shielding
28 to 30 AWG (FX15SW-31P-C)

![Image of connector with shields]

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15SW-31P-C</td>
<td>575-2113-1</td>
<td>31</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note 1: Packaged in trays.
Note 2: Dimensions in parenthesis ( ) are reference dimensions.

● Without shields (FX15M-**P-C)

![Image of connector without shields]

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15M-21P-C</td>
<td>575-2109-4</td>
<td>21</td>
<td>24.8</td>
<td>20.5</td>
<td>13.7</td>
<td>25.8</td>
<td>9</td>
<td>10</td>
<td>Yes</td>
</tr>
<tr>
<td>FX15M-31P-C</td>
<td>575-2108-1</td>
<td>31</td>
<td>29.8</td>
<td>25.5</td>
<td>18.7</td>
<td>30.8</td>
<td>14</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Note 1: Sold in 100 piece packages. Please order in full package quantities.
Note 2: Dimensions in parenthesis ( ) are reference dimensions.
Plug crimp contacts

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
<th>Quantity</th>
<th>Finish</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15-2830PCFB</td>
<td>575-2002-0</td>
<td>Reel</td>
<td>20,000 pcs/reel</td>
<td>Gold plated</td>
<td>Yes</td>
</tr>
<tr>
<td>FX15-3032PCFB</td>
<td>575-2003-3</td>
<td>Reel</td>
<td>20,000 pcs/reel</td>
<td>Gold plated</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Applicable cable (Tin plated, annealed copper wire)

FX15-2830PCFB

<table>
<thead>
<tr>
<th>Applicable wire size (Stranded wire conductor)</th>
<th>Jacket diameter</th>
<th>UL No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 AWG (7/0.127mm)</td>
<td>Ø0.56 to 0.72mm</td>
<td>1517</td>
</tr>
<tr>
<td>30 AWG (7/0.1mm)</td>
<td></td>
<td>1571</td>
</tr>
</tbody>
</table>

FX15-3032PCFB

<table>
<thead>
<tr>
<th>Applicable wire size (Stranded wire conductor)</th>
<th>Jacket diameter</th>
<th>UL No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 AWG (7/0.1mm)</td>
<td>Ø0.5 to 0.6mm</td>
<td>1516, 1571 (Note)</td>
</tr>
<tr>
<td>32 AWG (7/0.08mm)</td>
<td></td>
<td>1571</td>
</tr>
</tbody>
</table>

Wire strip length: 1.1 to 1.8mm

Note: When using wires other than those noted above, please contact Hirose for assistance.

Tools

<table>
<thead>
<tr>
<th>Item</th>
<th>Part No.</th>
<th>HRS No.</th>
<th>Applicable crimp contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicator</td>
<td>AP105-FX15-2830</td>
<td>901-4036-0</td>
<td>FX15-2830PCFB</td>
</tr>
<tr>
<td>Applicator</td>
<td>AP105-FX15-3032</td>
<td>901-4033-1</td>
<td>FX15-3032PCFB</td>
</tr>
<tr>
<td>Press unit</td>
<td>CM-105C</td>
<td>901-0001-0</td>
<td>_________________________</td>
</tr>
</tbody>
</table>
FX15 Series  1mm Pitch Wire-to-Board Connectors supporting LVDS signal

●Plug – Micro-coaxial cable (FX15S-**P-0.5SD)

![Image of micro-coaxial cable](image)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15S-41P-0.5SD</td>
<td>575-2110-3</td>
<td>41</td>
<td>31.9</td>
<td>29.6</td>
<td>27.57</td>
<td>20</td>
<td>Yes</td>
</tr>
<tr>
<td>FX15S-51P-0.5SD</td>
<td>575-2118-5</td>
<td>51</td>
<td>36.9</td>
<td>34.6</td>
<td>32.57</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

Note 1 : Packaged in trays.
Note 2 : Dimensions in parenthesis ( ) are reference dimensions.

●Ground plate for micro-coaxial cable type

![Image of ground plate](image)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15S-41P-GND</td>
<td>575-2111-6</td>
<td>41</td>
<td>29.2</td>
<td>30.06</td>
<td></td>
</tr>
<tr>
<td>FX15S-51P-GND</td>
<td>575-2117-2</td>
<td>51</td>
<td>34.2</td>
<td>35.06</td>
<td></td>
</tr>
</tbody>
</table>

Note 1 : Packaged in trays.
Note 2 : Dimensions in parenthesis ( ) are reference dimensions.

●Applicable cable (Micro-coaxial cable)

<table>
<thead>
<tr>
<th>Wire size (Standed wire inner conductor)</th>
<th>Jacket diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 AWG (7/0.05mm)</td>
<td>0.3mm to 0.5mm</td>
</tr>
<tr>
<td>38 AWG (7/0.04mm)</td>
<td></td>
</tr>
<tr>
<td>40 AWG (7/0.03mm)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>23.1</td>
<td>20</td>
</tr>
<tr>
<td>51</td>
<td>28.1</td>
<td>25</td>
</tr>
</tbody>
</table>

●Cable preparation

![Image of cable preparation](image)
Receptacles

Vertical, with shielding (FX15-31S-0.5SV)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15-31S-0.5SV(**)</td>
<td>575-2201-7 **</td>
<td>31</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Recommended PCB mounting pattern and metal mask dimensions

Note 1: The co-planarity of the terminal leads is as follows:
- All signals and shield leads “c” and “d”: 0.1mm max.
- Shield leads “a”, “b”, “e” and “f”: 0.15mm max.

2: Area indicated by the crosshatched lines must be free of conductive traces or the conductive traces must be covered by resist film.
3: Packaged on tape-and-reel.
4: Dimensions in parenthesis ( ) are reference dimensions.
FX15 Series ● 1mm Pitch Wire-to-Board Connectors supporting LVDS signal

Right angle with shields – enhanced shielding (FX15S-**S-0.5SH)

Recommended PCB mounting pattern and metal mask dimensions

Note 1: The coplanarity of the terminal leads is 0.1mm max. for all signal leads and 0.15mm max. for the shield leads.

Note 2: Do not place any components in the area indicated. Placement of components in this area may affect mating and latch lock operation.

Note 3: Area indicated by the cross-hatched lines must be free of conductive traces or the conductive traces must be covered by resist film.

Note 4: The area marked [ ] indicates vacuum pick-and-place area for board placement with automatic equipment.

Note 5: Vacuum pick-up area

Note 6: Packaged on tape-and-reel.

Note 7: Dimensions in parenthesis ( ) are reference dimensions.
FX15 Series●1mm Pitch Wire-to-Board Connectors supporting LVDS signal

● Right angle, without shielding (FX15M-**S-0.5SH)

![Connector Image]

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15M-21S-0.5SH(**)</td>
<td>575-2309-3 **</td>
<td>21</td>
<td>10</td>
<td>22.4</td>
<td>9</td>
<td>10</td>
<td>17.9</td>
<td>10</td>
<td>35</td>
<td>Yes</td>
</tr>
<tr>
<td>FX15M-31S-0.5SH(**)</td>
<td>575-2308-0 **</td>
<td>31</td>
<td>15</td>
<td>27.4</td>
<td>14</td>
<td>15</td>
<td>22.9</td>
<td>15</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

[Specification Number : **, (**) ]
Blank : Embossed packaging (1,000 pcs/reel)
(30) : Embossed packaging (100 pcs/reel)

Recommended PCB mounting pattern and metal mask dimensions

Note 1 : The co-planarity of all terminal leads is 0.1mm max.
2 : Do not place any components in the area indicated. Placement of components in this area may affect mating and latch lock operation.
3 : Packaged on tape-and-reel.
Right angle with shields – enhanced shielding (FX15SC-**S-0.5SH)
PCB mounting pattern : VESA standard

Recommended PCB mounting pattern and metal mask dimensions

Note 1 : The coplanarity of the terminal leads is 0.1mm max.
2 : Do not place any components in the area indicated. Placement of components in this area may affect mating and latch lock operation.
3 : Area indicated by the cross-hatched lines must be free of conductive traces or the conductive traces must be covered by resist film.
4 : Packaged on tape-and-reel.
5 : Dimensions in parenthesis ( ) are reference dimensions.
Vertical with shields – enhanced shielding (FX15SC-**S-0.5SV)
PCB mounting pattern : VESA standard

- Vertical with shields – enhanced shielding (FX15SC-**S-0.5SV)
  PCB mounting pattern : VESA standard

Recommended PCB layout and metal mask dimensions

- Recommended PCB layout and metal mask dimensions

Note

1: The coplanarity of the terminal leads is 0.1mm max.
2: Area indicated by the cross-hatched lines must be free of conductive traces or the conductive traces must be covered by resist film.
3: Packaged on tape-and-reel.
Packaging Specifications

- **Vertical, with shields** (FX15-31S-0.5SV)

- **Right angle, with shields-enhanced shielding** (FX15S-**S-0.5SH)

- **Right angle, without shields** (FX15M-**S-0.5SH)

- **Reel dimensions**

---

### Packaging Specifications

#### Vertical, with shields (FX15-31S-0.5SV)

- Part No.: FX15-31S-0.5SV(**)
- HRS No.: 575-2201-7 **
- No. of contacts: 31
- D: 44.5

#### Right angle, with shields-enhanced shielding (FX15S-**S-0.5SH)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15S-31S-0.5SH(**)</td>
<td>575-2306-5 **</td>
<td>31</td>
<td>20.3</td>
<td>40.5</td>
<td>44</td>
<td>44.5</td>
</tr>
<tr>
<td>FX15S-41S-0.5SH(**)</td>
<td>575-2307-8 **</td>
<td>41</td>
<td>26.3</td>
<td>52.5</td>
<td>56</td>
<td>56.5</td>
</tr>
<tr>
<td>FX15S-51S-0.5SH(**)</td>
<td>575-2303-7 **</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Right angle, without shields (FX15M-**S-0.5SH)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15M-21S-0.5SH(**)</td>
<td>575-2309-3 **</td>
<td>21</td>
<td>20.2</td>
<td>40.4</td>
<td>44</td>
<td>44.5</td>
</tr>
<tr>
<td>FX15M-31S-0.5SH(**)</td>
<td>575-2308-0 **</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FX15 Series 1mm Pitch Wire-to-Board Connectors supporting LVDS signal

- Right angle with shields – enhanced shielding (FX15SC-**S-0.5SH)
- Vertical with shields – enhanced shielding (FX15SC-**S-0.5SV)

Unreeling direction

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A ±0.1</th>
<th>B ±0.1</th>
<th>C ±0.3</th>
<th>Ø1.5 ±0.1</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15SC-41S-0.5SH(**)</td>
<td>575-2310-2 **</td>
<td>41</td>
<td>26.2</td>
<td>52.4</td>
<td>56</td>
<td>56.5</td>
<td>Yes</td>
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<tr>
<td>FX15SC-51S-0.5SH(**)</td>
<td>575-2311-5 **</td>
<td>51</td>
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<td></td>
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</tbody>
</table>

Unreeling direction

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>No. of contacts</th>
<th>A ±0.1</th>
<th>B ±0.1</th>
<th>C ±0.3</th>
<th>Ø1.5 ±0.1</th>
<th>RoHS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FX15SC-41S-0.5SV(**)</td>
<td>575-2205-8 **</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FX15SC-51S-0.5SV(**)</td>
<td>575-2204-5 **</td>
<td>51</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Reel dimensions

Unreeling direction
**Recommended temperature profile**

The temperature profile indicates the maximum temperature of the connector surfaces at the highest point from the PCB mounting surface.

---

**Washing Conditions**

### Organic Solvent Washing

<table>
<thead>
<tr>
<th>Solvent type</th>
<th>Room temperature washing</th>
<th>Heated washing</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPA (Isopropyl alcohol)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Water Type Washing

When using water type cleaning agents (e.g., terpene, and alkali saponifiers), select the cleaning agent based on the documentation issued by the various manufacturers of cleaning agents which describes the effects on metals and resins. Be careful that parts are not left with moisture remaining on them.

### Washing Precautions

Residual flux or cleaning agent on the contacts when washing with organic solvents or water type cleaners can give rise to the deterioration of electrical performance. In this regard it is important to check whether a thorough washing has been performed.

---

**HRS test conditions**

- **Test board**: Glass epoxy 40mm×30mm×1mm thick
- **Solder method**: Reflow
- **Solder composition**: Paste 96.5%Sn/3%Ag/0.5%Cu
- **Metal mask**: 0.12mm thick
- **Reflow cycles**: 2 cycles

The temperature profile is based on the above 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.
Precautions and recommendations

◆ Wire termination
  The following documents will be needed in order to perform the cable terminations.
  1. Basic cable termination and crimp requirements (general explanations).
  2. Contact crimp termination machine instruction manual (Explanation of the press)
  3. Applicator parts installation table (Applicator installation explanation)
  4. Crimp conditions table (Crimp height/Tensile strength standard values)
  5. Crimp quality fundamentals manual (Bell-mouth dimensions, bent up, bent down, rolling, etc.)
  * Correct cable preparation and crimp termination is based on understanding and following the procedures in the above documents.

◆ Insertion of the crimp contacts in the housing
  Crimp contacts are inserted in the housing as illustrated below.
  Exercising caution when inserting, align the retention tab of the contact with the corresponding molded-in lance in the housing’s contact cavity and push the contacts in.
  Make sure that the contact is fully inserted and the retention tab clears the molded-in lance.

◆ Verify that the retention tabs clear the molded-in lances as shown on the illustration below.
  Light pull on the wire, with force NOT EXCEEDING 3N will also verify the correct contact insertion.

◆ Removal of the contacts
  Using sharp-pointed tool of appropriate size gently lift the molded-in tab and pull-out the terminated contacts.
  Exercising caution as NOT to damage the molded-in lance.
  Should the damage occur, the entire housing will need to be replaced.
Precautions and recommendations

[Soldering precautions related to FX15S-**P-C connectors]

◆Grounding Methods of the ground wire or shields for the cable assemblies
① Solder the ground wire or the shields ONLY in the areas specifically designated for this purpose, as shown on the illustrations below.
② Observe the soldering iron tip temperature and soldering time specified.
③ Do not apply excessive force to the connector by pressing it with the tip of a soldering iron.
④ Do not splatter the flux from the solder core.

(Ground harness examples)
Precautions and recommendations

◆ Plug – micro-coaxial cable

Cautions for soldering

1. For the micro coaxial cable assembled to this connector, cable alignment process as shown in “Recommended cable” on the page 1 is required before assembly.

① Width of ground bar shall be 1.05mm 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 and damage the product.

② Minimize the length of outer conductor beyond the ground the bar.

③ Length of cutting the extra cable should be 2.1mm Max. Any longer cable may cause contact with the connector during assembly and could damage the product. Recommended minimum length is 2.0mm, but this can be altered as long as good soldering ability is maintained.

④ Pre-solder and coat the inner conductor at the cable end.

2. Recommended solder for the assembly is flux cored solder with 0.2mm dia. (Lead-free: Sn-3Ag-0.5Cu), 21mm length. If additional flux is used, make sure to prevent wicking onto the contact area. Wicking onto the contact area will cause the contacts to fail.

3. Before soldering the cable and connector with a cable assembly machine, check the points to avoid below.

① Misalignment of cable end to the terminals in pitch direction
② Excessive floating of cable end

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

The optimum conditions for soldering can vary depending on cable type and length, and solder type. Be sure to check the recommended temperate profile and adjust the conditions accordingly.

<table>
<thead>
<tr>
<th>Solder tip pressurization</th>
<th>13~17N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>265±5°C</td>
</tr>
<tr>
<td>Duration</td>
<td>3~4 sec</td>
</tr>
</tbody>
</table>

265°C
250°C
Idling 50°C

220°C

Pre-heating
Heating

Duration of pressure application

2s 1s 2s 3-4s
Precautions and recommendations

5. After soldering, check that no defect is found at soldered area. Examples of correct soldered and defective soldered state are shown below.

[ Cautions for potting process ]

1. Protect the soldered area by UV cured resin (referred as “potting” hereafter), in order to prevent cable breakage during cabling and other issues.

2. Apply 3033 manufactured by THREEBOND CO., LTD. or any equivalent product for potting. Follow the instruction of the potting manufacturer for UV curing exposure.

3. Refer to the following conditions the potting area.

4. Use extreme care in handling the soldered and potted assembly. Too much stress applied to the cable could break it.
Precautions and recommendations

[ Cautions for ground plate assembly ]

1. Attach a ground plate separately provided as FX15S-41P-GND after the cable assembly process.
2. Place the ground plate onto the connector horizontally and pinch the two components from top and bottom with your fingers.

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

[ Soldering to ground plate ]

1. Solder down the metal bar of the cable and ground plate after the assembly of the ground plate to enhance grounding capability and to protect against vertical cable pulling forces.
Precautions and recommendations

◆ Packaging of the complete cable assemblies
Exercise caution as not to tangle, twist or deform the complete cable assemblies when packaging. Special care should be taken NOT to apply any excessive stress to the individual wires. When removing the cable assemblies from the packaging do not pull on the wires. Make sure that the latch-locks are not interfering with packaging.

◆ Mating of the connectors
These connectors have a built in polarizing feature and will NOT mate when reversed. Do NOT try and force them together. Align the connectors as shown on the illustration below and fully insert the plug into the receptacle. Confirm that both latch-locks are fully engaged.

Additionally, this connector is equipped with reverse-insertion preventing mechanism, but a forced mating with a minimum force of 25N could damage the connector. Avoid any inappropriate mating, and perform the mating operation after checking the above-mentioned polarity indication.

◆ Treatment after mating has been completed
After mating, please take care to prevent any stress or load on the connector during the routing of cables. If a load of a minimum of 5N is applied on the cable, the cable (crimp contact) could come off. Further, if the entire cable is pulled with a minimum force of 20N, the connector could be broken. Please take extra care not to pull the cable and cause cable disconnection.

If you use a small gauge coaxial plug, a repeated rotation could also cause cable disconnection. Do not use the cable by rotating it repeatedly. The rotation times should be limited to a maximum of 10 even if rotation is required for routing. If your use requires folding back of the cable over the base of the connector, make sure to maintain a large turn-back radius away from the connector base.
## Precautions and recommendations

**Handling of Connectors after Mating**  
Do not apply excessive force to the connectors when routing the cable after mating. Pulling on the entire cable with a force of 20N or greater can damage the connector. Please take care not to pull the cable.

**Un-mating of the connectors**  
Equally depress both sides of the latch-locks as shown on the illustration and pull the plug straight out. Do not pull on the cables!

<table>
<thead>
<tr>
<th>Press</th>
<th>Press</th>
<th>Press</th>
</tr>
</thead>
</table>

1. Press
2. Pull straight back.

![Illustration of connector un-mating](image)
Technical Information (FX15S Series)

- Eye Pattern Waveforms (700MHz)

![Eye Pattern Waveforms (700MHz)](image)

- Shielding Effectiveness (Shielding Characteristics Comparison Using a 2-chamber Shielded Room)
  
  Measured shielding effectiveness for frequencies from 100MHz to 2GHz.
  
  Shielded connectors show noise suppression of 10dB to 20dB, when compared with connectors without the shields.

![Shielding Effectiveness Graph](image)

Notes:
The measurement value of “Without plug-side shields + Without receptacle-side shields” are taken as the zero level of the graph vertical axis dB.

The respective results express the noise suppression effect (dB) as a relative comparison value to the “without shields” condition as the reference.
FX15 Series 1mm Pitch Wire-to-Board Connectors supporting LVDS signal

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