USB Type-C Connector
CX Series
USB from Hirose Electric: Standard connections, inspired solutions.

■ Overview
The CX series connector conforms to the next-generation USB standard “USB Type-C™”. It is expected to be widely adopted as a standard interface in various devices in the consumer, industrial machinery and automobile market.
※“USB Type-C™” is a registered trademark of USB Implementers Forum, INC

■ Features
1. Easy mating with reversible form factor
   The symmetrical design eliminates concern for backward insertion. Simply insert the plug in either direction.

2. Conforms to the USB type-C standard

3. USB 3.1 Gen2, 10Gbps high speed transmission
   USB Type-C can transfer data twice as fast compared to a conventional USB 3.0 (5Gbps), 10Gbps (Max.)
   Also, if alternate mode is applied, it becomes possible to meet various video transmission standards such as MHL and Display Port.

4. Clear tactile click (Excellent Retention)
   CX series has a superior “click feel” when mating and is designed to prevent incomplete mating.

5. Design for superior mechanical strength

6. Many varieties
   SMT+THR Hybrid type (Mid-mount) : Fig.1
   Waterproof (Mid-mount) : Fig.2
   Single-row SMT (Mid-mount/16PIN) : Fig.3
   Vertical (Top-mount) : Fig.4
   Double-row SMT (Top-mount) : Fig.5

7. Plug harness with slim overmold Type-C (C-to-C Type)
   : Fig.6

8. RoHS compliant, halogen-free product
   CX series is halogen-free product.
   (Maximum content of Br, Cl and Br+Cl total are 900ppm, 900ppm and 1500ppm, respectively.)
### Product Specifications

<table>
<thead>
<tr>
<th>Ratings</th>
<th>Rated Current</th>
<th>Specifications</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC 1.25A max. for each power pin (i.e. A1, A4, A9, A12, B1, B4, B5, B9, B12) DC 0.25A for the other pins</td>
<td>Rated Voltage</td>
<td>AC 20V</td>
<td></td>
</tr>
<tr>
<td>Operating Temp. Range</td>
<td>-40℃ to + 85℃ (Note 1, 2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Temp. Range</td>
<td>-10℃ to + 60℃</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contact resistance</td>
<td>40mΩ max.</td>
<td>Measured at 100mA (DC or 1000Hz)</td>
</tr>
<tr>
<td>2. Withstand voltage</td>
<td>No flashover or breakdown</td>
<td>100V AC / 1min.</td>
</tr>
<tr>
<td>3. Durability</td>
<td>Contact resistance : Increase by 10mΩ or less from the initial value</td>
<td>10,000 mating cycles</td>
</tr>
<tr>
<td>4. Overall insertion / Extraction forces</td>
<td>Insertion : 5<del>20N, Extraction : 8</del>20N</td>
<td>Measured with applicable connector</td>
</tr>
</tbody>
</table>

Note 1: Includes temperature rise caused by current flow.
Note 2: The above specifications are representative of this series. Please refer to product specsheet for detail each of products.
Note 3: The above specifications are representative of this series. Hirose does not guarantee specified performance when mating with other manufacturers’ parts.

### Materials / Finish

#### Receptacle

<table>
<thead>
<tr>
<th>Parts</th>
<th>Materials</th>
<th>Color/Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>LCP or Polyamide</td>
<td>Black/UL94V-0</td>
</tr>
<tr>
<td>Contact</td>
<td>Copper alloy</td>
<td>Mating part : Gold flash plating over Nickel-palladium plating Mounting part : Gold flash plating</td>
</tr>
<tr>
<td>Ground-plate</td>
<td>Stainless steel</td>
<td>-</td>
</tr>
<tr>
<td>Mid plate</td>
<td>Stainless steel</td>
<td>Nickel plating</td>
</tr>
<tr>
<td>Shell</td>
<td>Stainless steel</td>
<td>Nickel plating</td>
</tr>
</tbody>
</table>

#### Plug

<table>
<thead>
<tr>
<th>Parts</th>
<th>Materials</th>
<th>Color/Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulator</td>
<td>LCP or Polyamide</td>
<td>Black/UL94V-0</td>
</tr>
<tr>
<td>Contact</td>
<td>Copper alloy</td>
<td>Mating part: Gold flash plating over Nickel-palladium plating Mounting part: Gold flash plating</td>
</tr>
<tr>
<td>Lock spring</td>
<td>Stainless steel</td>
<td>Nickel plating</td>
</tr>
<tr>
<td>Ground spring</td>
<td>Stainless steel</td>
<td>Nickel plating</td>
</tr>
<tr>
<td>Shield</td>
<td>Stainless steel</td>
<td>Nickel plating</td>
</tr>
</tbody>
</table>

※ This is a halogen-free product. (Maximum content of Br, Cl and Br+Cl total are 900ppm and 1500ppm, respectively.)
Note: The above data is representative of this series. Data may vary according to specifications.
## Product Number Configurator

Refer to the chart below when determining the product specifications from the product number. Please select from the product numbers listed in this catalog when placing orders.

### Receptacle

| Series name | CX  
| Mounting type | 60 - Right angle wire soldering (PCB wire soldering)  
| 70 - Right angle Hybrid (SMT+THR)  
| 80 - Straight SMT (Vertical)  
| 90 - Right angle SMT  
| Board mounting | B - Top-mount  
| Style (Receptacle) | M - Mid-mount  
| Special | WD - Waterproof  
|  Blank - Standard  
| No. of serial | None or 1, 2, 3, ... (CX80, CX90 Series)  
| No. of contact | 16, 24  
| Contact type | P - Receptacle (Male contacts)  
| S - Plug (Female contacts)  
| No. of serial | None or 1, 2, 3, ... (CX70 Series only)  
| Plug components | UNIT - Plug unit  
| SLDA - Plug shell  
| Cable length | 1000mm  
| Harness Type | C - Type C-to-Type-C  

### Plug

| Series name | CX  
| Mounting type | 60 - Right angle Hybrid (SMT+THR)  
| 70 - Right angle Hybrid (SMT+THR)  
| 80 - Straight SMT (Vertical)  
| 90 - Right angle SMT  
| Board mounting | B - Top-mount  
| Style (Receptacle) | M - Mid-mount  
| Special | WD - Waterproof  
|  Blank - Standard  
| No. of serial | None or 1, 2, 3, ... (CX80, CX90 Series)  
| No. of contact | 16, 24  
| Contact type | P - Receptacle (Male contacts)  
| S - Plug (Female contacts)  
| No. of serial | None or 1, 2, 3, ... (CX70 Series only)  
| Plug components | UNIT - Plug unit  
| SLDA - Plug shell  
| Cable length | 1000mm  
| Harness Type | C - Type C-to-Type-C  

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### Product Variation

<table>
<thead>
<tr>
<th>PCB Mounting Type</th>
<th>Mounting Method</th>
<th>Product Name</th>
<th>3D Image</th>
<th>Size W x H x D (mm)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-mount</td>
<td>Right angle Hybrid (SMT+THR)</td>
<td>CX70M-24P1</td>
<td><img src="cx70m-24p1" alt="3D Image" /></td>
<td>11.40x3.66x8.35</td>
<td>5 page</td>
</tr>
<tr>
<td></td>
<td>Right angle (Double-row SMT)</td>
<td>CX70M-24P2</td>
<td><img src="cx70m-24p2" alt="3D Image" /></td>
<td>11.40x3.66x7.95</td>
<td>5 page</td>
</tr>
<tr>
<td>Receptacle</td>
<td>Right angle (Single-row SMT)</td>
<td>CX90MWD2-24P</td>
<td><img src="cx90mw2-24p" alt="3D Image" /></td>
<td>11.60x3.46x8.35</td>
<td>6 page</td>
</tr>
<tr>
<td></td>
<td>Vertical (SMT)</td>
<td>CX90M-16P</td>
<td><img src="cx90m-16p" alt="3D Image" /></td>
<td>11.00x2.96x6.55</td>
<td>6 page</td>
</tr>
<tr>
<td>Top-mount</td>
<td>Right angle (Double-row SMT)</td>
<td>CX90B1-24P</td>
<td><img src="cx90b1-24p" alt="3D Image" /></td>
<td>8.94x3.14x8.15</td>
<td>7 page</td>
</tr>
<tr>
<td>Plug Unit</td>
<td>Paddle Card</td>
<td>Double-row SMT</td>
<td>CX60-24S-UNIT</td>
<td><img src="cx60-24s-unit" alt="3D Image" /></td>
<td>8.25x2.40x11.10</td>
</tr>
<tr>
<td>Plug Shell</td>
<td>–</td>
<td>–</td>
<td>CX60-SLDA</td>
<td><img src="cx60-slda" alt="3D Image" /></td>
<td>10.25x4.40x23.35</td>
</tr>
<tr>
<td>Plug harness</td>
<td>–</td>
<td>–</td>
<td>CX60-24S-1000-C</td>
<td><img src="cx60-24s-1000-c" alt="3D Image" /></td>
<td>12.35x6.50x1000</td>
</tr>
</tbody>
</table>
## Receptacle

- **Mid-mount Type (Right angle Hybrid) - Length 8.35mm**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX70M-24P1</td>
<td>480-0304-0 0</td>
<td>1,500pcs/Reel</td>
</tr>
</tbody>
</table>

### Recommended PCB layout (Component side)

- **Mid-mount Type (Right angle Hybrid) - Length 7.95mm**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX70M-24P2</td>
<td>480-0329-0 0</td>
<td>1,500pcs/Reel</td>
</tr>
</tbody>
</table>

### Recommended PCB layout (Component side)
CX Series ● USB Type-C Connector

● Mid-mount type (Right angle Double-row SMT) - Waterproof (IPX8)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX90MWD2-24P</td>
<td>480-0609-00</td>
<td>1,500pcs/Reel</td>
</tr>
</tbody>
</table>

※ IPX8 waterproof (unmated) test condition: Immersed in 1.5 meter of water for 30 minutes

Recommended PCB layout (Component side)

● Mid-mount type (Right angle Single-row SMT) - 16 Pin

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX90M-16P</td>
<td>480-0513-00</td>
<td>1,600pcs/Reel</td>
</tr>
</tbody>
</table>

Recommended PCB layout (Component side)
**Top-mount type (Vertical SMT)**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX8081-24P</td>
<td>480-0625-0 00</td>
<td>600pcs/Reel</td>
</tr>
</tbody>
</table>

**Recommended PCB layout (Component side)**

![Diagram of PCB layout](image1)

**Top-mount type (Right angle Double-row SMT)**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX9091-24P</td>
<td>480-0497-0 00</td>
<td>1,500pcs/Reel</td>
</tr>
</tbody>
</table>

**Recommended PCB layout (Component side)**

![Diagram of PCB layout](image2)
Plug

Plug unit

Recommended PCB layout (Component side)

Plug Shell
Plug Harness

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>CX60-24S-1000-C</td>
<td>480-0618-0 00</td>
<td>1pcs/Vinyl bag</td>
</tr>
</tbody>
</table>

Dimensions:
- 620
- 3520
- 5480
- 5000
Receptacle Packaging Specification (JIS C 0806-3 compliant)

Emboss Carrier Tape Dimensions

- Part No. A B C
  - CX70M-24P1 24 11.5 12
  - CX70M-24P2 24 11.5 12
  - CX80B1-24P 24 11.5 16
  - CX90B1-24P 24 11.5 12
  - CX90MWD2-24P 24 11.5 12
  - CX90M-16P 24 11.5 12

Reel Dimensions

- Part No. D E
  - CX70M-24P1 30 26
  - CX70M-24P2 30 26
  - CX80B1-24P 30 26
  - CX90B1-24P 30 26
  - CX90MWD2-24P 30 26
  - CX90M-16P 30 26

Receptacle Recommended Solder Temperature Profile

The temperature profile is based on demonstrated conditions. In individual applications the actual temperature may vary, depending on solder paste type, volume/thickness and board size/thickness. Contact your solder paste and equipment manufacturer for specific recommendations.

Note 1: Reflow is allowed up to 2 times with the same conditions. Please allow the parts to return to the ambient temperature before the second run is started.

Note 2: The measured temperature is the temperature of the PCB surface around the connector leads.
Precautions

1. Please handle connectors with care. Excessive external force may damage the connectors.
2. To extract the plug, hold the plug body itself and remove straight from the receptacle. Do not pull on the cable to extract the plug as this may damage the connector.
3. Due to the assembly process there may be some abrasions on the surface of the receptacle. This will not have a negative impact on the performance of the product.
4. Due to external variances, the plating appearance on the surface of the receptacles may differ from lot to lot. This difference will not affect the performance of this product.
**USA:**  
**HIROSE ELECTRIC (U.S.A.), INC. HEADQUARTERS CHICAGO OFFICE**  
2300 Warrenville Road, Suite 150,  
Downers Grove, IL 60515  
Phone: +1-630-282-6700  
http://www.hirose.com/us/

**USA:**  
**HIROSE ELECTRIC (U.S.A.), INC. SAN JOSE OFFICE**  
2841 Junction Ave, Suite 200  
San Jose, CA 95134  
Phone: +1-408-253-9640  
Fax: +1-408-253-9641  
http://www.hirose.com/us/

**USA:**  
**HIROSE ELECTRIC (U.S.A.), INC. DETROIT OFFICE (AUTOMOTIVE)**  
17197 N. Laurel Park Drive, Suite 253,  
Livonia,(6,5),(991,991)MI 48152  
Phone: +1-734-542-9963  
Fax: +1-734-542-9964  
http://www.hirose.com/us/

**THE NETHERLANDS:**  
**HIROSE ELECTRIC EUROPE B.V.**  
Hogeheilweg #8 1101 CC Amsterdam Z-O  
Phone: +31-20-6557460  
Fax: +31-20-6557469  
http://www.hirose.com/eu/

**GERMANY:**  
**HIROSE ELECTRIC EUROPE B.V. NUREMBERG OFFICE**  
Neuheimerstrasse 22-26, 90411 Nurnberg  
Phone: +49-911 32 68 89 63  
Fax: +49-911 32 68 89 69  
http://www.hirose.com/eu/

**GERMANY:**  
**HIROSE ELECTRIC ELECTRIC EUROPE B.V. HANOVER OFFICE**  
Bayernstr. 3, Haus C 30885 Langenhagen, Germany  
Phone: +49-511 97 82 61 30  
Fax: +49-511 97 82 61 35  
http://www.hirose.com/eu/

**UNITED KINGDOM:**  
**HIROSE ELECTRIC EUROPE BV (UK BRANCH)**  
4 Newton Court, Kelvin Drive, Knowhill,  
Milton Keynes, MK5 8NH  
Phone: +44-1908 202050  
Fax: +44-1908 202058  
http://www.hirose.com/eu/

**CHINA:**  
**HIROSE ELECTRIC (CHINA) CO., LTD. (SHANGHAI, HEADQUARTERS)**  
18, Enterprise Center Tower 2, 209# Gong He Road, Jing’an District, Shanghai, CHINA 200070  
Phone: +86-21-6391-3355  
Fax: +86-21-6391-3335  
http://www.hirose.com/cn/

**HONG KONG:**  
**HIROSE ELECTRIC HONGKONG TRADING CO., LTD.**  
Room 1001, West Wing, Tsim Sha Tsui Centre, 66 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong  
Phone: +852-2803-5338  
Fax: +852-2591-6560  
http://www.hirose.com/hk/

**SINGAPORE:**  
**HIROSE ELECTRIC SINGAPORE PTE. LTD.**  
03, Anson Road, #20-01, Springleaf Tower,  
Singapore 079909  
Phone: +65-6324-6113  
Fax: +65-6324-6123  
http://www.hirose.com.sg/

**INDIA:**  
**HIROSE ELECTRIC SINGAPORE PTE. LTD. BANGALORE LIASON OFFICE**  
Unit No-403, 4th Floor, No-84, Barton Centre, Mahatma Gandhi (MG) Road, Bangalore 560 001, Karnataka, India  
Phone: +91-80-4120 1807  
Fax: +91-80-4120 9908  
http://www.hirose.com/sg/

**MALAYSIA:**  
**PENGAM REPRESENTATIVE OFFICE**  
73-3-1, Ideal@The One, Jalan Mahsuri, Bayan Lepas Penang, 11950, Malaysia  
Phone: +604-648-5536  
http://www.hirose.com/malaysia/

**THAILAND:**  
**BANGKOK OFFICE (REPRESENTATIVE OFFICE)**  
Unit 4703, 47th Fl., 1 Empire Tower, South Sathorn Road, Yanawa, Sathorn, Bangkok 10120 Thailand  
Phone: +66-2-686-1255  
Fax: +66-2-686-3433  
http://www.hirose.com/th/

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**HIROSE ELECTRIC CO., LTD.**  
2-6-3, Nakagawa Chuo-ku, Tsuchi-Ku, Yokohama-Shi 224-8540, JAPAN  
TEL: +81-45-620-3526 Fax: +81-45-591-3726  
http://www.hirose.com  
http://www.hirose-connectors.com