

Universal Serial Bus (USB) Type-C Connectors and Cable Assemblies



More compact USB Type-C connectors offer greater PCB savings while enabling high-frequency mating in data, consumer and other I/O applications

Features and Benefits

| | |
|--|---|
| Support for 5.0A of power in plug and receptacles | Reduces battery-charging time by 64% versus micro-USB 2.0's current rating of 1.8A |
| Mid-plate connector 'tongue' design in receptacle | Ensures high reliability while preventing damage from connector abuse |
| High-temperature Nylon insert-mold receptacle housing | Increases connector strength to reduce potential shorting between mid-plate and terminals |
| Single-piece metal shell on cable plug | Provides easy identification and differentiation against non Type-C USB cables |
| Mylar between plug housing and shell | Prevents potential electrical shorting during mating |
| High normal force terminal design on plug | Stabilizes electrical performance while supporting higher current-carrying capacity with reduced temperature-rise |
| Availability of cable options meeting USB 2.0 and 3.1 speeds | Suits a variety of users depending on application requirements |



USB Type-C Interconnect Solutions

Applications

Data/Computing/Telecommunications/Networking

- Data centers
- Servers and Workstations
- Personal computers, note and tablet PCs
- Routers, switches, hubs

Consumer

- Smartphones
- Digital cameras and digital video recorders
- Power banks and mobile chargers
- Docking stations
- Adapters and dongles
- Home entertainment systems
- Home appliances
- Gaming devices

Automotive

- Infotainment systems
- Cigarette chargers

Industrial

- Security cameras
- Drones
- Office equipment
- Airplane entertainment systems
- In-room multi-port electric outlets



Customer Convenient Ports



Tablet PCs and Smartphones



Office equipment



Car infotainment systems



Drones

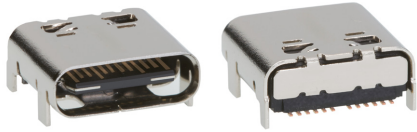


In-room multi-port electric outlets

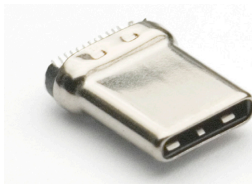
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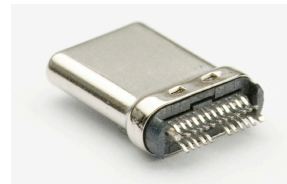
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Front and rear views of USB Type-C Connector
(Series 105450)



Front and rear views of USB Type-C Straddle-mount Cable Plug
(Series 105444)



Type C-to-A USB 2.0 Cables (480Mbps)
(68798-0001)



Type C-to-C USB 2.0 Cables (480Mbps)
(68798-0002)



Type C-to-C USB 3.1 Cables (Gen 1; 5Gbps)
(68798-0003)



Type C-to-C USB 3.1 Cables (Gen 2; 10Gbps)
(68798-0004)



Type C-to-A USB 2.0 Cables (480Mbps)
(68798-0005)



Type C-to-A USB 3.1 Cables (Gen 2; 10Gbps)
(68798-0006)

Comparison of Various Standard USB Receptacles

| | USB 2.0 Type-A | Mini-USB 2.0 | Micro-USB 2.0 | USB 3.0 Type-A | Micro-USB 3.0 | USB Type-C |
|--------------------------------------|----------------|------------------|------------------|----------------|-------------------|-------------------------|
| Circuits | 4 | 5 | 5 | 9 | 10 | 24 |
| No. of Rows | 1 | 1 | 1 | 2 | 1 | 2 |
| Pitch (mm) | 2.0/2.5 | 0.80 | 0.65 | 2.0/2.5 | 0.65 | 0.50 |
| Connector Width (without shell; mm) | 12.50 +/-0.10 | 6.90 +0.05/-0.04 | 6.90 +0.06/-0.02 | 12.50 +/-0.10 | 12.25 +0.06/-0.02 | 8.34 +0.06/-0.02 |
| Connector Height (without shell; mm) | 5.12 +/-0.10 | 3.10 +0.08/-0.02 | 1.85 +0.08/-0.02 | 5.12 +/-0.10 | 1.85 +0.08/-0.02 | 2.56 +/-0.04 |
| Receptacle Tongue Depth (mm) | 8.38 +/-0.08 | 4.60 +/-0.05 | 2.70 +0.05/-0.08 | 10.15 min. | 2.70 +0.05/-0.08 | 4.45 +/-0.10 |
| Connector Mating Depth (mm) | 8.88 +/-0.20 | 5.50 +0.10/0 | 3.50 +/-0.10 | 10.38 ref. | 3.50 +/-0.10 | 4.70 +/-0.20 |
| Connector Depth (mm) | ~15.26 | ~9 | 5.0-6.8 | ~16.50 | 5.0-6.8 | 7.90 |
| Data Rate | 480Mbps | 480Mbps | 480Mbps | 5.0Gbps | 5.0Gbps | 10.0Gbps (Gen 2) |
| Data Pairs | 1 | 1 | 1 | 2 | 2 | 3 |
| Durability (mating cycles) | 1,500 | 5,000 | 10,000 | 1,500 | 10,000 | 10,000 |
| Unmating Force (final) | 10N min. | 3N min. | 8 to 25N | 8N min. | 8 to 25N | 6 to 20N |
| Reversible | No | No | No | No | No | Yes |
| Current (power/signal) | 1.5A | 1.0A | 1.8 / 0.5A | 1.8 / 0.25A | 1.8 / 0.25A | 5.0 / 0.25 [†] |
| Terminal Insertion | Post-insert | Post-insert | Insert-mold | Post-insert | Insert-mold | Insert-mold |

With reversible plugging capabilities, the USB Type-C connector is smallest in pitch (0.50mm) but big (5.0A) in current-carrying capacity. Above the rest (of preceding USB standards), Type-C connectors feature maximum data throughput (10Gbps) and, with similar-end USB 3.1 Type-C cables, enables power charging in either direction.

[†]Remark: Current values for Type-C Connector comprise the following:

5A max. for total VBUS pins (Pin A4, A9, B4, B9)

1.25A max. for Vconn (B5 of plug) with return path through the corresponding GND pins (Pin A1, A12, B1, B12)

0.25A min. for all other contacts

Specifications

Connector and Plug

Reference Information

Packaging: Tape and Reel
 Mates With: Series 105450 receptacle with Type-C cables or cable plug
 Series 105444 cable plug with Series 105450 receptacle
 Terminal Used: Copper Alloy
 Designed In: Millimeters
 RoHS: Yes
 Halogen Free: Yes
 Glow Wire Compliant: No

Electrical

Voltage (max.): 30V (DC/AC) max.
 Current (max.): 5.0A
 Contact Resistance: 40 (initial) max.; 50 milliohms after test
 Dielectric Withstanding Voltage: 100 VAC
 Insulation Resistance: 100 Megohms min.

Mechanical

Contact Retention to Housing: Insert-mold
 Mating Force: 5 to 20N
 Unmating Force: 8 to 20N (1-30 cycles); 6 to 20N (after 10,000 insertion/extraction cycles)
 Durability (min.): 10,000 cycles

Physical

Housing: High Temperature Nylon (HTN) (receptacle) LCP (plug)
 Contact: Copper Alloy
 Plating: Contact Area — Gold Flash over 0.76µm Palladium/Nickel (Pd/Ni) (receptacle) — 0.76µm Gold (plug)
 Solder Tail Area — 0.05µm Gold (Au) min. (receptacle) — 3.05µm Matte Tin (Sn) min. (plug)
 Underplating — 2µm Nickel (Ni) min. overall
 PCB Thickness: 0.60 to 0.70mm (receptacle); 0.80mm (plug)
 Operating Temperature: -30 to +85°C

Cable Assemblies

Reference Information

Packaging: Bag
 Mates With: Type-C (series 105450) receptacle or USB 2.0 Type A receptacle (105057 and 48416)
 Designed In: Millimeters
 RoHS: Yes
 Halogen Free: No
 Glow Wire Compliant: No

Electrical

Voltage (max.): 30 Volts DC max.
 Current (max.): 3.0A
 Contact Resistance (max.): 40 milliohms (initial); 50 milliohms after test
 Insulation Resistance: 10 Megohms
 Dielectric Withstanding Voltage: 100 VAC

Mechanical

Mating Force: 5 to 20N
 Unmating Force: 8 to 20N (1-30 insertion/extraction cycles); 6 to 20N (after 10,000 insertion/extraction cycles)
 Durability (min.): 10,000

Physical

Housing: LCP
 Contact: Copper Alloy
 Plating: Contact Area — 0.76µm Gold min
 Solder Tail Area — 3.05µm Matte Tin min
 Underplating — 2.03µm Nickel overall
 Operating Temperature: -10 to +50°C

Ordering Information

Connector and Plug

| Part No. | Component | Circuits | Mounting Style | Termination |
|-----------------------------|------------------------|----------|----------------|------------------------------------|
| 105450-0101 | Right Angle Receptacle | 24 | Top-mount | SMT with 4 Through-hole soldertabs |
| 105444-0001 | Right Angle Cable Plug | 22 | Straddle-mount | SMT |

Cable Assemblies

| Part No. | Classification | End-to-End Cable Connectors (Cable Length) | Cable Speed | Cable Color |
|----------------------------|----------------|--|----------------|-------------|
| 68798-0002 | Standard | Type C-to-C USB 2.0 (1m) | 480Mbps | Black |
| 68798-0003 | | Type C-to-C USB 3.1 (1m) | 5Gbps (Gen 1) | Black |
| 68798-0004 | | Type C-to-C USB 3.1 (0.8m) | 10Gbps (Gen 2) | Black |
| 68798-0001 | Legacy | Type C-to-A USB 2.0 (1m) | 480Mbps | Black |
| 68798-0005 | | Type C-to-A USB 2.0 (1m) | 480Mbps | White |
| 68798-0006 | | Type C-to-A USB 3.1 (0.6m) | 10Gbps (Gen 2) | Black |