



# USB CONNECTOR APPLICATION GUIDE

TE Connectivity USB Product Portfolio

## Why TE USB Solutions?

| Customer Needs                       | Why TE USB Solutions?                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scalability                          | Comprehensive Portfolio: TE offers a complete range of USB connectors — from Type-A and Type-B to Mini A, B, and AB, Micro A, B, and AB, and USB Type-C — supporting USB 2.0 through USB4 standards with full backward compatibility. This broad offering helps enable customers to scale across generations, data rates, and applications with a unified solution. |
| Reliability & Ruggedness             | Reliable Design: Built to perform in demanding environments. IPX7/IPX8 waterproof and IPX4 splash-proof options help facilitate consistent performance under vibration, moisture, and temperature stress. EMI-shielded versions protect electronic equipment and systems from interference caused by electromagnetic fields.                                        |
| Design Flexibility                   | Configurable Options: Multiple pin counts, orientations, and mount styles (top, mid, flag) simplify system integration and reduce redesign effort across legacy applications and new platforms.                                                                                                                                                                     |
| High-Speed Data & Power Connectivity | Future-Ready Performance: Supports USB Power Delivery (PD) 3.1 (up to 240 W / 48 V) and USB4 (up to 40 Gbps) with alternate-mode video capabilities — delivering reliable, high-speed data transfer and efficient power delivery through a single, compact interface.                                                                                               |
| Supply Chain Assurance               | Global Manufacturing Footprint: Global, diverse manufacturing locations help minimize supply chain risk.                                                                                                                                                                                                                                                            |
| Trusted Partnership                  | Global Engineering & Support: Backed by decades of interconnect experience and USB-IF membership, TE provides responsive application support and collaborative design expertise worldwide.                                                                                                                                                                          |

## Designed for Diverse Markets

| Market                  | USB Use Case                      | TE Solutions                                              |
|-------------------------|-----------------------------------|-----------------------------------------------------------|
| Consumer Devices        | High-speed charging & data        | Up to 40 Gbps data transfer, up to PD 3.1 charging        |
| Industrial Automation   | Harsh environments                | Ruggedized design, sealed options                         |
| IoT & Smart Devices     | Compact, scalable design          | Low-profile and compact Mini-B, Micro-B, and USB Type-C   |
| Computing & Peripherals | Legacy applications compatibility | Full backward compatibility with previous USB generations |

**TE's comprehensive USB portfolio serves a wide range of markets — enabling reliable, scalable connectivity from high-speed consumer devices to rugged industrial systems**

## USB Standards

From helping to pioneer the first USB 1.0 connectors in the mid-1990s to delivering cutting-edge USB4 Gen 3 solutions today, TE Connectivity has been at the forefront of every major USB evolution. As a founding member of the USB-IF, TE has consistently participated in the industry's transition to faster data transfer speeds and more powerful charge capabilities, while supporting innovations like reversible USB Type-C interfaces and enhanced power delivery capabilities up to 240 W. Our comprehensive portfolio - from standard Type-A and Type-B to ruggedized, waterproof USB Type-C connectors — empowers designers with strong reliability, scalability, and flexibility for applications spanning consumer electronics, industrial automation, and next-generation IoT ecosystems.

| Standard              | USB 1.0<br>1996                                                                                          | USB 1.1<br>1998                                                                             | USB 2.0<br>2001                                                                                    | USB 2.0<br>Revised                                                                              | USB 3.0<br>2008                                                                                             | USB 3.1<br>2013 | USB 3.2<br>2017 | USB 4<br>2019 |
|-----------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------|-----------------|---------------|
| Maximum Transfer Rate | 12 Mbps                                                                                                  |                                                                                             | 480 Mbps                                                                                           |                                                                                                 | 5 Gbps                                                                                                      | 10 Gbps         | 20 Gbps         | 40 Gbps       |
| Type A Connector      | <br>Type-A<br>1.0 - 1.1 |                                                                                             | <br>Type-A<br>2.0 |                                                                                                 | <br>Type-A<br>SuperSpeed  |                 |                 |               |
| Type B Connector      |                                                                                                          | <br>Type-B |                                                                                                    |                                                                                                 | <br>Type-B<br>SuperSpeed |                 |                 |               |
| USB Type-C Connector  |                                                                                                          |                                                                                             |                                                                                                    | <br>Type-C   |                                                                                                             |                 |                 |               |
| Mini-A Connector      |                                                                                                          |                                                                                             | <br>Mini-A       |                                                                                                 |                                                                                                             |                 |                 |               |
| Mini-B Connector      |                                                                                                          |                                                                                             | <br>Mini-B      |                                                                                                 |                                                                                                             |                 |                 |               |
| Mini-AB Connector     |                                                                                                          |                                                                                             |                                                                                                    | <br>Mini-AB  |                                                                                                             |                 |                 |               |
| Micro-A Connector     |                                                                                                          |                                                                                             |                                                                                                    | <br>Micro-A  | <br>Micro-A SuperSpeed  |                 |                 |               |
| Micro-B Connector     |                                                                                                          |                                                                                             |                                                                                                    | <br>Micro-B  | <br>Micro-B SuperSpeed  |                 |                 |               |
| Micro-AB Connector    |                                                                                                          |                                                                                             |                                                                                                    | <br>Micro-AB | <br>Micro-AB SuperSpeed |                 |                 |               |

## Application Categories

| Category     | Connector Types                                  | Data / Power Range             | Ideal Applications                     |
|--------------|--------------------------------------------------|--------------------------------|----------------------------------------|
| Legacy USB   | Type-A, Type-B                                   | Up to 5 Gbps / 4.5 W           | Computing, peripherals                 |
| Compact USB  | Mini USB A, B, and AB,<br>Micro USB A, B, and AB | Up to 5 Gbps / 9 W             | IoT, portable, handheld                |
| Next-Gen USB | USB Type-C                                       | Up to 40 Gbps / 240 W (PD 3.1) | Consumer, industrial, future platforms |



## Data & Power Performance Comparison

| Connector Type              | USB 2.0<br>(480 Mbps) | USB 3.0<br>(5 Gbps) | USB 3.1 Gen 1<br>(5 Gbps) | USB 3.1 Gen 2<br>(10 Gbps) | USB 3.2<br>(20 Gbps) | USB4<br>(40 Gbps) | Max Power<br>(PD) |
|-----------------------------|-----------------------|---------------------|---------------------------|----------------------------|----------------------|-------------------|-------------------|
| Type-A                      | ✓                     | ✓                   | ✓                         | ✓                          | ✓                    | -                 | 4.5 W             |
| Type-B                      | ✓                     | ✓                   | ✓                         | ✓                          | -                    | -                 | 4.5 W             |
| Mini-USB A, B,<br>and AB    | ✓                     | -                   | -                         | -                          | -                    | -                 | 2.5 W             |
| Micro-USB A,<br>B, and AB   | ✓                     | ✓                   | ✓                         | ✓                          | -                    | -                 | 9 W               |
| USB Type-C                  | ✓                     | ✓                   | ✓                         | ✓                          | ✓                    | ✓                 | 240 W             |
| Rugged USB<br>Type-C (IPX8) | ✓                     | ✓                   | ✓                         | ✓                          | ✓                    | ✓                 | 240 W             |

## USB Portfolio Selection Guide

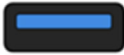
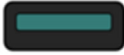
| Design Need                    | Recommended Connector                         | Why Choose This Type                |
|--------------------------------|-----------------------------------------------|-------------------------------------|
| Compact, space-limited design  | Micro-USB / USB Type-C                        | Low profile, supports power & data  |
| Rugged / waterproof            | USB Type-C IPX8 / Micro-USB IP68              | Sealed & EMI-shielded               |
| High power charging            | USB Type-C PD 3.1                             | Up to 240 W                         |
| Backward compatibility         | USB Type-A / USB Type-B                       | Legacy USB 1.1 – 3.2 support        |
| Cost-sensitive / legacy system | USB Type-A / USB Type-B<br>Mini/Micro-USB 2.0 | Proven track record, cost-effective |

## USB Portfolio Selection Guide

| Design Need                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Why Choose This Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>USB Type-A</b><br>The most recognizable USB connector, commonly used in host devices like computers and hubs.<br><b>Key Features:</b> <ul style="list-style-type: none"> <li>• Data Rates: USB 1.1 (12 Mbps), USB 2.0 (480 Mbps), USB 3.0/3.1 Gen 1 (5 Gbps)</li> <li>• Form Factor: Rectangular, robust, single orientation</li> <li>• Use Cases: Keyboards, mice, printers, external drives, charging docks</li> </ul> <b>Benefits:</b> <ul style="list-style-type: none"> <li>• Broad compatibility and legacy support</li> <li>• Durable and widely adopted</li> </ul> | <b>USB Type-B</b><br>Typically used in peripheral devices like printers and scanners.<br><b>Key Features:</b> <ul style="list-style-type: none"> <li>• Data Rates: USB 2.0 (480 Mbps), USB 3.0 (5 Gbps)</li> <li>• Form Factor: Square with beveled corners</li> <li>• Use Cases: Printers, scanners, industrial control systems</li> </ul> <b>Benefits:</b> <ul style="list-style-type: none"> <li>• Secure connection for stationary devices</li> <li>• Supports high-current applications</li> </ul>                                                                                                                                                                                                                                                                                     |
| <b>Mini-USB Type A,B, and AB</b><br>An older compact connector used in early portable electronics.<br><b>Key Features:</b> <ul style="list-style-type: none"> <li>• Data Rates: USB 2.0 (480 Mbps)</li> <li>• Form Factor: Smaller than Type-B</li> <li>• Use Cases: Legacy cameras, MP3 players</li> </ul> <b>Benefits:</b> <ul style="list-style-type: none"> <li>• Compact for its time</li> <li>• Still found in legacy systems</li> </ul>                                                                                                                                | <b>Micro-USB Type A,B, and AB</b><br>Widely used for charging or transferring data in mobile devices before USB-C adoption.<br><b>Key Features:</b> <ul style="list-style-type: none"> <li>• Data Rates: USB 2.0 (480 Mbps), USB 3.0 (5 Gbps for Micro-B)</li> <li>• Form Factor: Ultra-compact</li> <li>• Use Cases: Smartphones, tablets, IoT devices</li> </ul> <b>Benefits:</b> <ul style="list-style-type: none"> <li>• Small footprint</li> <li>• Cost-effective</li> </ul>                                                                                                                                                                                                                                                                                                           |
| <b>USB Type-AB</b><br>Hybrid connector supporting both host and device roles, primarily in OTG (On-The-Go) applications.<br><b>Key Features:</b> <ul style="list-style-type: none"> <li>• Data Rates: USB 2.0 (480 Mbps)</li> <li>• Form Factor: Combines Type-A and Type-B</li> <li>• Use Cases: Mobile devices with OTG support</li> </ul> <b>Benefits:</b> <ul style="list-style-type: none"> <li>• Enables dual-role functionality</li> <li>• Useful in embedded systems</li> </ul>                                                                                       | <b>USB Type-C</b><br>The current standard for high-speed, high-power, and reversible connectivity. It marries power and data delivery with display connectivity. It has a small, oblong form factor that is reversible so the mating cable can be inserted in either orientation.<br><b>Key Features:</b> <ul style="list-style-type: none"> <li>• Data Rates: USB 2.0 to USB4 (up to 40 Gbps)</li> <li>• Power Delivery: Up to 240W (USB PD 3.1)</li> <li>• Form Factor: Slim, reversible</li> <li>• Use Cases: Laptops, smartphones, docking stations, VR headsets, SSDs</li> </ul> <b>Benefits:</b> <ul style="list-style-type: none"> <li>• Reversible and compact</li> <li>• Supports alternate modes (DisplayPort, HDMI)</li> <li>• High-speed and high-power capabilities</li> </ul> |

## USB Types - Speed Comparison

| USB Type      | Connector Types                                           | Maximum Data Transfer Speed | Recommended Cable Length |
|---------------|-----------------------------------------------------------|-----------------------------|--------------------------|
| USB 4.0       | USB Type-C                                                | 40 Gbps                     | 0.8m                     |
| USB 3.2       | USB Type-C                                                | 20 Gbps                     | 3m                       |
| USB 3.1 Gen 2 | USB-A, B, USB Type-C, Micro B                             | 10 Gbps                     | 3m                       |
| USB 3.1 Gen 1 | USB-A, B, USB Type-C, Micro B                             | 5 Gbps                      | 3m                       |
| USB 3.0       | USB-A, B, USB Type-C, Micro B                             | 5 Gbps                      | 3m                       |
| USB 2.0       | USB-A,B,C, Micro A, B, and AB, Mini A, B, and AB, Type-AB | 480 Mbps                    | 5m                       |
| USB 1.0       | USB-A,B                                                   | 12 Mbps                     | 3m                       |

| USB Color Convention                 |        |                                                                                     |
|--------------------------------------|--------|-------------------------------------------------------------------------------------|
| USB 1.0                              | White  |  |
| USB 2.0                              | Black  |  |
| USB 3.0                              | Blue   |  |
| USB 3.1                              | Teal   |  |
| Sleep or standby<br>Charging capable | Yellow |  |
|                                      | Red    |  |
|                                      | Orange |  |

## USB For Power Delivery

### High Power Levels

- Supports up to 240W (48V, 5A) enabling power-hungry devices like laptops and monitors.

### Dynamic Voltage and Current Profiles

- Adjustable voltage (5V–20V) and current negotiation for optimized power transfer.

### Bidirectional Power Flow

- Devices can act as power source or power sink, allowing flexible charging scenarios.

### Smart Power Negotiation

- Uses a communication protocol over CC pins to negotiate power requirements safely.

### Backward Compatibility

- Works with legacy USB standards while adding PD capabilities.

### Integrated Data and Power

- Single connector for high-speed data transfer and power delivery, reducing cable clutter.

### Enhanced Safety

- Built-in protections for over-voltage, over-current, and thermal events.

| PD Specification | Maximum Power | Maximum Voltage | Maximum Current |
|------------------|---------------|-----------------|-----------------|
| USB 2.0          | 2.5 W         | 5 V             | 500 mA          |
| USB 3.0 and 3.1  | 4.5 W         | 5 V             | 900 mA          |
| USB BC 1.2       | 7.5 W         | 5 V             | 1.5 A           |
| USB Type-C 1.2   | 15 W          | 5 V             | 3 A             |
| USB PD 3.0       | 100 W         | 5/9/15/20 V     | 5 A             |
| USB PD 3.1       | 240 W         | 28/36/48 V      | 5 A             |
| USB4             | 240 W         | 48V             | 5 A             |

## USB Portfolio Features

- Complete family of board mount receptacles, including various orientations and PCB mounting styles
- Consolidates serial parallel, keyboards, mice and game ports
- Compatible with asynchronous and isochronous data transfer methods
- Polarized for proper orientation
- Plug and Play capability
- Hot pluggable, permitting attaching or detaching peripherals without power down or reboot
- Allows for charging



## USB Type-A Connectors

USB Type A connectors are the original and one of the most widely recognized USB connector types. Introduced in the mid-1990s with the USB 1.0 specification, they have become a universal standard for connecting devices to host systems like computers, TVs, and chargers.



### Key Features

- **Shape:** Flat and rectangular
- **Orientation:** Non-reversible
- **Pin Count:**
  - 4 pins for USB 1.1 and 2.0
  - 9 pins for USB 3.0 and above (extra pins for faster data transfer)
- **Versions Supported:**
  - USB 1.1: 12 Mbps
  - USB 2.0: 480 Mbps
  - USB 3.x: Up to 20 Gbps (with USB 3.2 Gen 2x2)

Newer versions are all backward compatible with older USB versions

### Advantages

- Universally supported across platforms
- Durable and simple design

### Common Applications

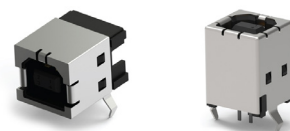
- Data transfer between host and device
- Connecting peripherals:
  - Keyboards
  - Mice
  - Printers
  - Flash drives
  - External hard drives
  - Game controllers
- Charging and data transfer:
  - Smartphones
  - Tablets
  - Cameras

## USB Type-A Connectors Featured Items

| Part Number                 | Detailed Description                                                | USB Type | USB Version | Termination Method to PCB | Body Orientation          | Number of Positions | Housing Color | Centerline (Pitch) | PCB Thickness Recommended | Packaging Method | Pictures                                                                              |
|-----------------------------|---------------------------------------------------------------------|----------|-------------|---------------------------|---------------------------|---------------------|---------------|--------------------|---------------------------|------------------|---------------------------------------------------------------------------------------|
| <a href="#">292303-1</a>    | USB TYPE A CONNECTOR, RIGHT ANGLE, T/H                              | A        | 2.0         | Through Hole - Solder     | Right Angle               | 4                   | Black         | 2 mm<br>[.078 in]  | 1.57 mm<br>[.062 in]      | Box & Tube, Tube |    |
| <a href="#">292303-4</a>    | USB TYPE A CONNECTOR, RIGHT ANGLE, T/H                              | A        | 2.0         | Through Hole - Solder     | Right Angle               | 4                   | Black         | 2 mm<br>[.078 in]  | 1.57 mm<br>[.062 in]      | Box & Tube, Tube |    |
| <a href="#">292303-9</a>    | USB TYPE A CONNECTOR, RIGHT ANGLE, SMT, OFFSET, NATURAL             | A        | 2.0         | Surface Mount             | Right Angle               | 4                   | Natural       | 2 mm<br>[.078 in]  | 1.2 mm<br>[.047 in]       | Box & Tray, Reel |    |
| <a href="#">292336-1</a>    | USB TYPE A CONNECTOR, FLAG, T/H                                     | A        | 2.0         | Through Hole - Solder     | Perpendicular Right Angle | 4                   | Black         | 2 mm<br>[.078 in]  | 1.57 mm<br>[.062 in]      | Box & Tube, Tube |    |
| <a href="#">1-1734775-1</a> | USB TYPE A CONNECTOR, FLAG, T/H, 1.8A                               | A        | 2.0         | Through Hole - Solder     | Perpendicular Right Angle | 4                   | Black         | 2 mm<br>[.078 in]  | 1.6 mm<br>[.063 in]       | Box & Tray, Tray |    |
| <a href="#">1775690-2</a>   | USB TYPE A CONNECTOR, VERTICAL, T/H, 2.5A                           | A        | 2.0         | Through Hole - Solder     | Vertical                  | 4                   | Black         | 2 mm<br>[.078 in]  | 1.6 mm<br>[.062 in]       | Box & Tray, Tray |    |
| <a href="#">1932258-1</a>   | USB 3.0 TYPE A CONNECTOR, RIGHT ANGLE, T/H                          | A        | 3.0         | Through Hole - Solder     | Right Angle               | 9                   | Blue          | 2 mm<br>[.078 in]  | 1.6 mm<br>[.063 in]       | Box & Tray, Tray |   |
| <a href="#">5353928-1</a>   | USB TYPE A CONNECTOR, RIGHT ANGLE, SMT, OFFSET, PANEL               | A        | 2.0         | Surface Mount             | Right Angle               | 4                   | White         | 2 mm<br>[.078 in]  | 1 mm<br>[.039 in]         | Tape & Reel      |  |
| <a href="#">5787617-1</a>   | USB TYPE A RECEPTACLE ASSEMBLY, RIGHT ANGLE, STACKED, T/H           | A        | 2.0         | Through Hole - Solder     | Right Angle               | 8                   | Black         | 2 mm<br>[.078 in]  | 1.57 mm<br>[.062 in]      | Box, Box & Tray  |  |
| <a href="#">5787745-1</a>   | USB TYPE A RECEPTACLE ASSEMBLY W/ SHIELD, RIGHT ANGLE, STACKED, T/H | A        | 2.0         | Through Hole - Solder     | Right Angle               | 8                   | Black         | 2 mm<br>[.078 in]  | 1.57 mm<br>[.062 in]      | Box & Tray, Tray |  |
| <a href="#">1734366-1</a>   | USB TYPE A CONNECTOR, VERTICAL, T/H                                 | A        | 2.0         | Through Hole - Solder     | Vertical                  | 4                   | Black         | 2 mm<br>[.078 in]  | 1.6 mm<br>[.063 in]       | Box & Tray, Tray |  |

## USB Portfolio Features

USB Type B is one of the original USB connector types, designed primarily for connecting peripheral devices to a host (like a computer). This connector style is most seen on devices like printers, scanners, and external hard drives.



### Key Features

- **Shape:** Square with a slight bevel on the top corners
- **Pin Count:** 4 pins (USB 1.1/2.0), 9 pins (USB 3.0+)
- **Orientation:** Non-reversible
- **Speed Support:**
  - **USB 1.1:** 12 Mbps
  - **USB 2.0:** 480 Mbps
  - **USB 3.0+:** Up to 5 Gbps (with additional pins)

### Advantages

- Durable and secure connection
- Designed for high-power peripherals
- Still used in professional and industrial equipment

### Common Applications

- Printers and scanners
- Audio interfaces
- External hard drives
- Industrial and lab equipment
- USB hubs (device-side)

### Variants

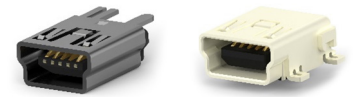
- Standard USB Type-B: For USB 1.1 and 2.0 devices
- USB 3.0 Type B: Larger, with extra pins for faster data transfer
- Powered-B: For devices that require more power

## USB Type-B Connectors Featured Items

| Part Number               | Detailed Description                               | USB Type | USB Version | Termination Method to PCB | Body Orientation | Number of Positions | Housing Color | Centerline (Pitch) | PCB Thickness Recommended | Packaging Method | Pictures                                                                              |
|---------------------------|----------------------------------------------------|----------|-------------|---------------------------|------------------|---------------------|---------------|--------------------|---------------------------|------------------|---------------------------------------------------------------------------------------|
| <a href="#">292304-1</a>  | USB TYPE B CONNECTOR, R/A, T/H                     | B        | 2.0         | Through Hole - Solder     | Right Angle      | 4                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |  |
| <a href="#">292304-2</a>  | USB TYPE B CONNECTOR, R/A, T/H                     | B        | 2.0         | Through Hole - Solder     | Right Angle      | 4                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |  |
| <a href="#">292317-4</a>  | USB TYPE B CONNECTOR, R/A, T/H                     | B        | 2.0         | Through Hole - Solder     | Right Angle      | 4                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |  |
| <a href="#">5787834-1</a> | USB TYPE B CONNECTOR, VERTICAL, T/H                | B        | 2.0         | Through Hole - Solder     | Vertical         | 4                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |  |
| <a href="#">5788336-1</a> | USB TYPE B CONNECTOR, VERTICAL, T/H                | B        | 2.0         | Through Hole - Solder     | Vertical         | 4                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |  |
| <a href="#">1734517-1</a> | USB TYPE B CONNECTOR, VERTICAL, SMT, GROUND FINGER | B        | 2.0         | Surface Mount             | Vertical         | 4                   | Black         | 2.5 mm [.098 in]   | 1 mm [.039 in]            | Tape & Reel      |  |

## Mini USB Type A,B, and AB Connectors

Mini USB (Mini Universal Serial Bus) is a smaller USB interface introduced in the early 2000s, primarily used for compact and portable electronic devices. It was part of the USB 2.0 standard and served as a predecessor to the Micro USB connector.



### Key Features

- **Shape:** Trapezoidal, slightly larger than Micro USB
- **Pin Count:** 5 pins (including an ID pin for USB On-The-Go)
- **Versions:**
  - **Mini-A:** Rare, used for USB OTG hosts
  - **Mini-B:** Most common, used for peripherals
  - **Mini-AB:** Hybrid port supporting both Mini-A and Mini-B
- **Data Speed:** Up to 480 Mbps (USB 2.0)
- **Power Delivery:** Typically up to 2.5W

### Common Applications

- Digital cameras
- MP3 players
- GPS devices
- External hard drives
- Game controllers
- Development boards

### Advantages

- Compact and portable
- Supports both data transfer and charging

## USB Type-B Connectors Featured Items

| Part Number               | Detailed Description                                    | USB Type | USB Version | Termination Method to PCB | Body Orientation | Number of Positions | Housing Color | Centerline (Pitch) | PCB Thickness Recommended | Packaging Method | Pictures |
|---------------------------|---------------------------------------------------------|----------|-------------|---------------------------|------------------|---------------------|---------------|--------------------|---------------------------|------------------|----------|
| <a href="#">1734035-2</a> | MINI USB CONNECTOR, TYPE B, RIGHT ANGLE, SMT            | B        | 2.0         | Surface Mount             | Right Angle      | 5                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |          |
| <a href="#">1734205-1</a> | MINI USB CONNECTOR, TYPE B, PLUG. CABLE-KIT             | B        | 2.0         | Not Available             | Not Available    | 5                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |          |
| <a href="#">1734327-2</a> | MINI USB CONNECTOR, TYPE A, RIGHT ANGLE, SMT            | A        | 2.0         | Surface Mount             | Right Angle      | 5                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |          |
| <a href="#">1734328-2</a> | MINI USB CONNECTOR AB RIGHT ANGLE, RECEPTACLE, SMT, T&R | AB       | 2.0         | Surface Mount             | Right Angle      | 5                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Tape & Reel      |          |
| <a href="#">1734510-1</a> | MINI USB CONNECTOR, TYPE B, RIGHT ANGLE, T/H            | B        | 2.0         | Through Hole - Solder     | Right Angle      | 5                   | Black         | 2.5 mm [.098 in]   | 1.57 mm [.062 in]         | Box & Tray,Tray  |          |
| <a href="#">1734753-1</a> | MINI USB CONNECTOR, TYPE B, VERTICAL, T/H               | B        | 2.0         | Through Hole - Solder     | Vertical         | 5                   | Black         | 2.5 mm [.098 in]   | 1 mm [.039 in]            | Tape & Reel      |          |

## Micro-USB Type A,B, and AB Connectors

Micro USB connectors are compact USB connectors introduced as part of the USB 2.0 specification. They were designed to replace Mini-USB Type A,B, and AB connectors, becoming the standard for many portable devices prior to the introduction of USB-C connectors.



### Key Features

- **Shape:** Smaller and flatter than Mini USB, with a trapezoidal profile
- **Pin Count:** 5 pins (including an ID pin for USB On-The-Go)
- **Versions:**
  - Micro-A
  - Micro-B
  - Micro-AB
- **Speed:** Up to 480 Mbps (USB 2.0), 5 Gbps (USB 3.0 Micro-B)
- **Power Delivery:** Up to 9W (USB 2.0), higher with USB battery charging spec

### Common Applications

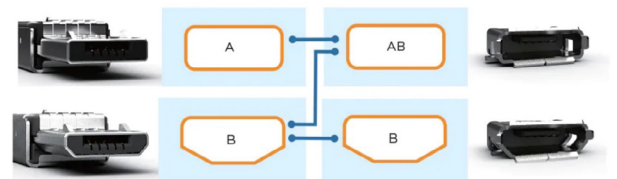
- Smartphones and tablets (especially Android devices prior to USB Type-C)
- Power banks, headphones and speakers
- Digital cameras
- External hard drives
- Development boards

### Advantages

- Compact and lightweight
- Widely adopted across many device categories
- Supports both data transfer and charging
- USB On-The-Go (OTG) support for host-device switching

## MATING TYPE

- **Type A** plugs are typically used for connection to “master” devices.
- **Type B** plugs are used for connections to “slave” devices.
- **Type AB Receptacle:** The device itself either features a receptacle that can accept only Type B (slave) plugs or both Type A and Type B plugs (device can function as master or slave).



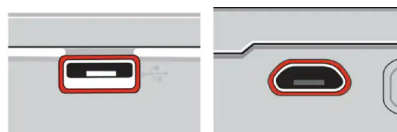
## MOUNT TYPE



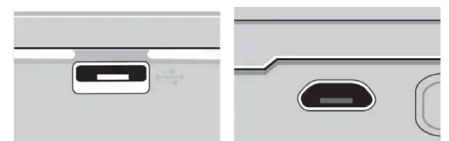
## SEALING



## FLANGE



## FLANGELESS



## Micro-USB Type A,B, and AB Connectors Featured Items

| Part Number               | Detailed Description                 | USB Type | USB Version | Termination Method to PCB | Body Orientation    | Number of Positions | Housing Color | Centerline (Pitch) | PCB Thickness Recommended | Packaging Method | Pictures                                                                              |
|---------------------------|--------------------------------------|----------|-------------|---------------------------|---------------------|---------------------|---------------|--------------------|---------------------------|------------------|---------------------------------------------------------------------------------------|
| <a href="#">1932788-1</a> | MICRO USB CONNECTOR, TYPE B, REVERSE | B        | 2.0         | Surface Mount             | Reverse Right Angle | 5                   | Black         | .65 mm [.025 in]   | Hold-Down                 | Tape & Reel      |    |
| <a href="#">1981568-1</a> | MICRO USB CONNECTOR, TYPE B          | B        | 2.0         | Surface Mount             | Right Angle         | 5                   | Black         | .65 mm [.025 in]   | SMT Hold-Down             | Tape & Reel      |    |
| <a href="#">2108877-1</a> | MICRO USB CONNECTOR, TYPE B, IP68    | B        | 2.0         | Surface Mount             | Right Angle         | 5                   | Black         | .65 mm [.025 in]   | Hold-Down                 | Tape & Reel      |    |
| <a href="#">2134536-2</a> | MICRO USB CONNECTOR, TYPE A/B, GRAY  | AB       | 2.0         | Surface Mount             | Right Angle         | 5                   | Gray          | .65 mm [.025 in]   | Straight Leg              | Tape & Reel      |    |
| <a href="#">2174507-2</a> | MICRO USB CONNECTOR, TYPE B          | B        | 2.0         | Surface Mount             | Right Angle         | 5                   | Black         | .65 mm [.025 in]   | SMT Hold-Down             | Tape & Reel      |    |
| <a href="#">2013499-1</a> | MICRO USB CONNECTOR, TYPE B          | B        | 2.0         | Surface Mount             | Right Angle         | 5                   | Black         | .65 mm [.025 in]   | Straight Leg              | Tape & Reel      |    |
| <a href="#">1981584-1</a> | MICRO USB CONNECTOR, TYPE A/B, GRAY  | AB       | 2.0         | Surface Mount             | Right Angle         | 5                   | Gray          | .65 mm [.025 in]   | SMT Hold-Down             | Tape & Reel      |  |

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## USB Type-C Connectors

USB Type-C connectors, often referred to simply as USB-C, is the latest and most versatile USB connector standard, combining power and data delivery with display connectivity. It has rapidly become the universal connector for modern electronics due to its compact design, high-speed capabilities, and reversible plug orientation.



### Key Features

- **Shape:** Small, oval, and symmetrical
- **Orientation:** Reversible (can be plugged in either way)
- **Pin Count:** 6/16/24 pins
- **Speed Support:**
  - USB 2.0: 480 Mbps
  - USB 3.2: Up to 20 Gbps
  - USB 4.0: Up to 40 Gbps
- **Power Delivery:** Up to 240W (48V, 5A)
- **Video Output:** Supports DisplayPort, HDMI, and Thunderbolt protocols

### Advantages

- Reversible design for ease of use
- High-speed data transfer
- High power delivery for fast charging and for powering laptops
- Universal compatibility across many device types
- Supports alternate modes like video output and Thunderbolt

### Common Applications

High speed signal version

- Laptops & ultrabooks
- External SSDs & NVMe drives
- 4K/8K monitors & docking stations
- VR/AR headsets & gaming consoles
- High-performance industrial automation

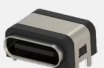
### Low speed signal version

- Smartphones & tablets
- Printers & scanners
- IoT devices & sensors
- Basic industrial control systems

### Charge-Only version

- Wireless earbuds & accessories
- Power banks & charging docks
- Hubs and Adapters
- Portable medical devices

## USB Type-C Connectors Featured Items

| Part Number               | Detailed Description                            | USB Type | USB Version | Termination Method to PCB          | Body Orientation          | Number of Positions | Housing Color | PCB Mount Location | PCB Mount Retention Type | Packaging Method | Pictures                                                                              |
|---------------------------|-------------------------------------------------|----------|-------------|------------------------------------|---------------------------|---------------------|---------------|--------------------|--------------------------|------------------|---------------------------------------------------------------------------------------|
| <a href="#">2129691-2</a> | USB3.1 TYPE-C RECEPTACLE MID-MOUNT 0.485 HYBRID | C        | 3.1 Gen 1   | Surface Mount, Through Hole-Solder | Right Angle               | 16                  | Black         | Mid Mount          | Straight Legs            | Tape & Reel      |    |
| <a href="#">2295018-2</a> | SPLASH PROOF USB TYPE C RECEPTACLE, DUAL SMT    | C        | 3.1 Gen 1   | Surface Mount                      | Right Angle               | 24                  | Black         | Mid Mount          | SMT + Through Hole       | Tape & Reel      |    |
| <a href="#">2305018-2</a> | USB TYPE C, RECEPTACLE IPX8 ON BOARD DUAL SMT   | C        | 3.1 Gen 2   | Surface Mount                      | Right Angle               | 16                  | Black         | Top Mount          | SMT + Through Hole       | Reel             |    |
| <a href="#">2329418-2</a> | USB TYPE C, REC IPX8 ON BOARD WITH COVER        | C        | 3.1 Gen 2   | Surface Mount                      | Right Angle               | 16                  | Black         | Top Mount          | SMT + Through Hole       | Reel             |    |
| <a href="#">2337857-1</a> | VERTICAL USB TYPE-C RECEPTACLE                  | C        | 3.1 Gen 1   | Surface Mount                      | Vertical                  | 16                  | Black         | Top Mount          | SMT + Through Hole       | Tape & Reel      |    |
| <a href="#">2345986-1</a> | USB TYPE C 3.1 TOP MOUNT DUAL SMT 1.63CH        | C        | 3.1 Gen 2   | Surface Mount                      | Right Angle               | 24                  | Black         | Top Mount          | Guide Post               | Reel             |    |
| <a href="#">2366738-1</a> | USB TYPE C CONNECTOR                            | C        | 3.1 Gen 2   | Surface Mount                      | Perpendicular Right Angle | 24                  | Black         | Top Mount          | Guide Post               | Reel & Box       |   |
| <a href="#">2340901-1</a> | USB Type C 2.0 RECEPTACLE Mid-Mount One Row     | C        | 2.0         | Surface Mount                      | Right Angle               | 24                  | Black         | Mid Mount          | Straight Leg             | Reel             |  |
| <a href="#">2479774-1</a> | USB C Charge-only, 6 Pin, Top, 1u GF            | C        | 2.0         | Through Hole - Solder              | Right Angle               | 6                   | Black         | Top Mount          | Solder Peg               | Reel             |  |
| <a href="#">2480790-1</a> | USB C Charge-only, 6 Pin, Vertical, Long        | C        | 2.0         | Through Hole - Solder              | Vertical                  | 6                   | Black         | Top Mount          | Solder Peg               | Reel             |  |
| <a href="#">2495154-1</a> | USB TYPE C 6P WATERPROOF DIP+SMT CONN           | C        | 2.0         | Surface Mount                      | Perpendicular Right Angle | 6                   | Black         | Top Mount          | Guide Post               | Tape & Reel      |  |
| <a href="#">2495155-1</a> | USB TYPE C RECEPTACLE 16P WATERPROOF DIP        | C        | 2.0         | Surface Mount                      | Perpendicular Right Angle | 16                  | Black         | Top Mount          | Guide Post               | Tape & Reel      |  |
| <a href="#">2495698-1</a> | USB TYPE C PLUG SMT MIDDLE MOUNT RIGHT ANGLE    | C        | 2.0         | Surface Mount                      | Perpendicular Right Angle | 24                  | Black         | Top Mount          | Plug                     | Piece/Reel       |  |
| <a href="#">2495699-1</a> | USB TYPE C PLUG 24P SMT VERTICAL MOUNT          | C        | 2.0         | Surface Mount                      | Perpendicular Right Angle | 24                  | Black         | Top Mount          | Plug                     | Piece/Reel       |  |
| <a href="#">2495701-1</a> | USB TYPE C PLUG 24P VERTICAL MOUNT              | C        | 2.0         | Surface Mount                      | Perpendicular Right Angle | 24                  | Black         | Top Mount          | Plug                     | Piece/Reel       |  |
| <a href="#">2495709-1</a> | USB TYPE C RECEPTACLE 24P IPX7                  | C        | 3.0         | Surface Mount                      | Perpendicular Right Angle | 24                  | Black         | Top Mount          | Guide Post               | Piece/Reel       |  |
| <a href="#">2495712-1</a> | USB TYPE C RECEPTACLE 24P IPX7                  | C        | 3.0         | Surface Mount                      | Perpendicular Right Angle | 24                  | Black         | Top Mount          | Guide Post               | Piece/Reel       |  |
| <a href="#">2498754-1</a> | USB FLAG TYPE C RECEPTACLE 16P                  | C        | 2.0         | Surface Mount                      | Perpendicular Right Angle | 16                  | Black         | Top Mount          | Guide Post               | Tape & Reel      |  |

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