

USB Type-C Cables and Plugs – What Are My Options?



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The new USB Type-C standard is often called the “one cable to rule them all”; however, it is not quite that simple. There are multiple USB Type-C-to-Type-C cables and plugs, as well as several backwards-compatible options. In this blog post, we will only focus on Type-C-to-Type-C cable and plug options.

The [Universal Serial Bus Type-C Cable and Connector Specification Revision 1.1 \(April 3, 2015\)](#) defines these cable and plug types:

- USB Type-C receptacle for USB 2.0, USB 3.1, and full-featured platforms and devices
 - Supports currents up to 5A
- USB full-featured Type-C cable with a USB full-featured Type-C plug at both ends
 - Supports USB 2.0 and USB 3.1 Gen 1 or Gen 2 data operation
 - Supports full-featured applications (includes sideband use (SBU) wires)
 - Must be electronically marked
- USB 2.0 Type-C cable with a USB 2.0 Type-C plug at both ends
 - Supports USB 2.0 data operation (does not include USB 3.1 or SBU wires)
 - May be electronically marked (required if cable supports >3A)
- Captive cable with either a USB full-featured Type-C plug or USB 2.0 Type-C plug at one end
 - The other end of the cable is either soldered in place or uses a non-USB connector
- USB Type-C-to-USB legacy cables and adapters (see pages 19-20 of the specification)

From these definitions, you might ascertain that for Type-C-to-Type-C applications, there is only one option for the receptacle (the first bullet point) and two options for the plugs (full-featured Type-C and USB 2.0 Type-C) (the second and third bullet points). Additionally, there are six different types of Type-C-to-Type-C cables (3 USB versions and 2 current rating options); see [Table 1](#).

Table 1. USB Type-C Standard Cable Assemblies

Plug 1	Plug 2	USB Version	Cable Length	Current Rating	USB Power Delivery (BMC)	USB Type-C Electronically Marked
C	C	USB 2.0	≤ 4m	3A	Supported	Optional
				5A		Required
C	C	USB 3.1 Gen 1	≤ 2m	3A	Supported	Required
				5A		
C	C	USB 3.1 Gen 2	≤ 1m	3A	Supported	Required
				5A		

(Universal Serial Bus Type-C Cable and Connector Specification Revision 1.1 [April 3, 2015])

So how do you distinguish between the different types of Type-C-to-Type-C cables? The USB Implementers Forum (USB-IF) has come up with a solution. They use the symbols shown in [Figure 1](#) to advertise data operation. Additionally, cables are required to be electronically marked if they are either full-featured and/or rated at more than 3A current. Electronically marked cables use USB PD to provide the cable's characteristics. Thus, a system can then communicate to the user the cable's data rate and current-carrying capabilities. As of right now, there is no standard USB logo that can be added to cables to indicate their current-carrying capabilities.

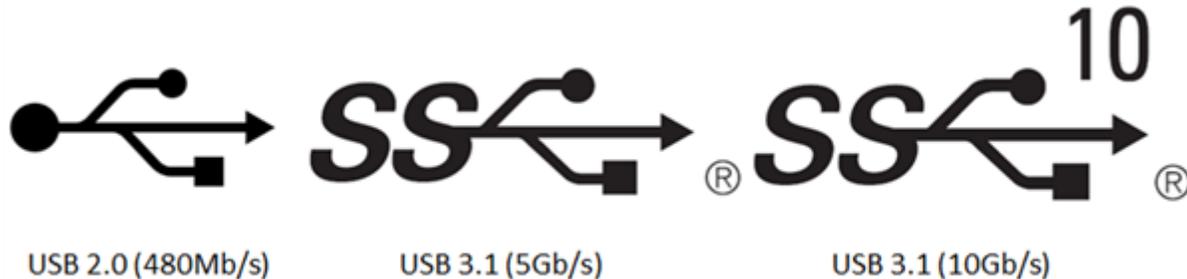


Figure 1. Cable Symbols Denoting Data Rate

(USB Implementers Forum)

Type-C-to-Type-C cables can be either passive or active. Active cables include additional electronics to condition the data path signals; passive cables do not. For example, active cables are often used to support longer cable lengths.

TI offers many solutions for USB Type-C applications, ranging from the [TUSB320](#) to the [TPS65982](#). TUSB320 can be used for Type-C applications that only require USB 2.0 data operation. It contains configuration channel logic to determine port attach and detach, cable orientation, role detection and port control for Type-C current mode (supports $\leq 3A$ current advertisement and detection). TPS65982 can be used for full-featured applications. It contains the functionality of the TUSB320 as well as the USB power delivery management needed to support alternate modes, USB 3.1 Gen 1 and Gen 2 data rates, and USB PD contracts to support $\leq 100W$.

Additional Resources

- Learn more about [Type-C lingo](#)
- Read about how USB Type-C will [make life easier](#)
- View TI's entire portfolio of [USB Type-C host and peripheral solutions](#)

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