

# USB Type-C ENGINEERING CHANGE NOTICE

## Title: Allow Gen1 USB-C to Legacy Cables

Applied to: USB Type-C Specification Release 2.2, Oct 2022

### Brief description of the functional changes proposed:

Relax the performance requirements for USB Type-C to Legacy USB Cable Assemblies to allow USB 3.1 Gen1 maximum performance on a legacy cable. Define AC3G1-3 and CμB3G1-3, 5Gbps (Gen1) capable legacy cable variants of USB-A to USB-C and USB-C to USB Micro-B respectively, at up to 2m.

### Benefits as a result of the proposed changes:

Many peripherals with USB-C receptacles are still built for Gen1 performance maximum, and often the length of the cable is more important for a good user experience. As an example, the existing ~1m practical limit for a 10Gbps Gen2 cable makes it challenging for a Gen1 webcam on top of a monitor to reach a PC. Many A-to-C Gen1 cables are made today and bundled with products but cannot be certified if they're not defined in the spec. Allowing them would open the door for these >1m cables to be certified, and improve quality overall.

### An assessment of the impact to the existing revision and systems that currently conform to the USB specification:

None.

### An analysis of the hardware implications:

None. Existing host controller hardware already does link training and drops down to Gen1 appropriately.

### An analysis of the software implications:

None.

### An analysis of the compliance testing implications:

Legacy cable compliance testing must be expanded to test for Gen1 speed instead of Gen2 if the manufacturer claims only Gen1 performance.

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## Actual Change Requested

### (a). Section 3.1.1 Compliant USB Type-C to Legacy Cable Assemblies

#### From Text:

Table 3-2 summarizes the USB Type-C legacy cable assemblies along with the primary differentiating characteristics. The cable lengths listed in the table are informative and represents the practical length based on cable performance requirements. [USB 3.2](#) Type-C legacy cables assemblies that only offer performance up to [USB 3.1](#) Gen1 are not allowed by this specification. All USB Type-C to legacy cable assemblies are only defined specific to [USB 2.0](#) and [USB 3.2](#) as there are no USB Type-C to legacy cables that are uniquely applicable to [USB4](#).

For USB Type-C legacy cable assemblies that incorporate [Rp](#) termination, the value of this termination is required to be specified to the Default setting of [USB Type-C Current](#) even though the cable assemblies are rated for 3 A. The [Rp](#) termination in these cables is intended to represent the maximum current of a compliant legacy USB host port, not the current rating of the cable itself. The cable current rating is intentionally set to a higher level given that there are numerous non-standard power chargers that offer more than the Default levels established by the [USB 2.0](#) and [USB 3.1](#) specifications.

**Table 3-2 USB Type-C Legacy Cable Assemblies**

Cable Ref	Plug 1 <sup>3</sup>	Plug 2 <sup>3</sup>	USB Version	Cable Length	Current Rating
<a href="#">AC2-3</a>	USB 2.0 Standard-A	USB 2.0 Type-C <sup>1</sup>	<a href="#">USB 2.0</a>	≤ 4 m	3 A
<a href="#">AC3G2-3</a>	USB 3.1 Standard-A	USB Full-Featured Type-C <sup>1</sup>	<a href="#">USB 3.1 Gen2</a>	≤ 1 m	3 A
<a href="#">CB2-3</a>	USB 2.0 Type-C <sup>2</sup>	USB 2.0 Standard-B	<a href="#">USB 2.0</a>	≤ 4 m	3 A
<a href="#">CB3G2-3</a>	USB Full-Featured Type-C <sup>2</sup>	USB 3.1 Standard-B	<a href="#">USB 3.1 Gen2</a>	≤ 1 m	3 A
<a href="#">CmB2</a>	USB 2.0 Type-C <sup>2</sup>	USB 2.0 Mini-B	<a href="#">USB 2.0</a>	≤ 4 m	500 mA
<a href="#">CuB2-3</a>	USB 2.0 Type-C <sup>2</sup>	USB 2.0 Micro-B	<a href="#">USB 2.0</a>	≤ 2 m	3 A
<a href="#">CuB3G2-3</a>	USB Full-Featured Type-C <sup>2</sup>	USB 3.1 Micro-B	<a href="#">USB 3.1 Gen2</a>	≤ 1 m	3 A

Notes:

1. USB Type-C plugs associated with the “B” end of a legacy adapter cable are required to have  $R_p$  ( $56\text{ k}\Omega \pm 5\%$ ) termination incorporated into the plug assembly – see Section 4.5.3.2.2.
2. USB Type-C plugs associated with the “A” end of a legacy adapter cable are required to have  $R_d$  ( $5.1\text{ k}\Omega \pm 20\%$ ) termination incorporated into the plug assembly – see Section 4.5.3.2.1.
3. Refer to Section 3.7.5.3 for the mated resistance and temperature rise required for the legacy plugs.

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<a href="#">AC3G1-3</a>	USB 3.1 Standard-A	USB Full-Featured Type-C <sup>1</sup>	<a href="#">USB 3.1 Gen1</a>	≤ 2 m	3 A
<a href="#">AC3G2-3</a>	USB 3.1 Standard-A	USB Full-Featured Type-C <sup>1</sup>	<a href="#">USB 3.1 Gen2</a>	≤ 1 m	3 A
<a href="#">CB2-3</a>	USB 2.0 Type-C <sup>2</sup>	USB 2.0 Standard-B	<a href="#">USB 2.0</a>	≤ 4 m	3 A
<a href="#">CB3G2-3</a>	USB Full-Featured Type-C <sup>2</sup>	USB 3.1 Standard-B	<a href="#">USB 3.1 Gen2</a>	≤ 1 m	3 A
<a href="#">CmB2</a>	USB 2.0 Type-C <sup>2</sup>	USB 2.0 Mini-B	<a href="#">USB 2.0</a>	≤ 4 m	500 mA
<a href="#">CuB2-3</a>	USB 2.0 Type-C <sup>2</sup>	USB 2.0 Micro-B	<a href="#">USB 2.0</a>	≤ 2 m	3 A
<a href="#">CuB3G1-3</a>	USB Full-Featured Type-C <sup>2</sup>	USB 3.1 Micro-B	<a href="#">USB 3.1 Gen1</a>	≤ 2 m	3 A
<a href="#">CuB3G2-3</a>	USB Full-Featured Type-C <sup>2</sup>	USB 3.1 Micro-B	<a href="#">USB 3.1 Gen2</a>	≤ 1 m	3 A

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