

USB Type-C ENGINEERING CHANGE NOTICE

Title: USB2 Stubs for Alternate Modes

Applied to: USB Type-C Specification Release 1.1, April 3, 2015

Brief description of the functional changes:
Adds text to chapter 5 (Alternate Modes) to clarify that while the second pair of D+/D- can be reassigned on direct-attach accessories, the stub presented when not in the alternate mode cannot degrade USB2 signalling on devices that short the two pairs together.

Benefits as a result of the changes:
Currently, accessories with alternate modes that reassign the second pair of D+/D- may not function properly in USB2 mode with devices that short the receptacle pins to implement polarity switching.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
If the shorted stub case was not considered, such devices may now be out of spec (but they weren't necessarily interoperable before).

An analysis of the hardware implications:
Muxes on accessories that implement such alternate modes may need to be moved to the paddle card, or more complex termination may need to be used.

An analysis of the software implications:
None

An analysis of the compliance testing implications:
Compliance testing should explicitly test USB2 with a marginal eye and the pairs of D+ and D- shorted at the receptacle to ensure that any introduced stubs on the accessory do not make the link unusable.

USB Type-C ENGINEERING CHANGE NOTICE

Actual Change

(a). Section 5.1.2.2, Page 166

Add paragraph before “When in an Alternate Mode, activity on the SBU lines...”:

Direct connect applications shall ensure that any stubs introduced by repurposing the extra D+/D- pairs do not interfere with USB communication with compliant hosts that short the pairs of pins together on the receptacle. This can be ensured by placing the alternate mode switch close to the plug, by adding inductors to eliminate the stubs at USB2 frequencies, by AC-terminating the long stubs to remove reflections at the cost of attenuated signal, or by other means.