USB Type-C ENGINEERING CHANGE NOTICE

Title: Appendix C (TCDA) Update
Applied to: USB Type-C Specification Release 2.2, October 2022

Brief description of the functional changes proposed:
Updates Appendix C (USB Type-C Digital Audio) to now include and recommend USB Audio Device Class 4.0.

Benefits as a result of the proposed changes:
Bring TCDA in line with the latest audio class specifications.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
Does not impact existing products.

An analysis of the hardware implications:
Will impact HW design if a product is to take advantage of the latest USB Audio Class device class.

An analysis of the software implications:
Will impact SW design if a product is to take advantage of the latest USB Audio Class device class.

An analysis of the compliance testing implications:
Compliance testing relies on the USB-IF implementing an updated USB ADC product certification test program.

USB Type-C ENGINEERING CHANGE NOTICE

Actual Change Requested

(a) Appendix C

Redline changes:

Note: The proposed edited text below already considers changes related to deprecating Audio Adapter Accessory Mode approved with the Liquid Corrosion Mitigation ECN.

C USB Type-C Digital Audio

C.1 Overview

One of the goals of USB Type-C is to help reduce the number of I/O connectors on a host platform. One connector type that could be eliminated is the legacy 3.5 mm audio device jack. A USB Type-C digital audio solution based on native USB protocol is a simple solution and is interoperable with both the host platform and audio device being connected directly without the need for adapters and operates seamlessly through existing USB topologies (e.g., through hubs and docks).

This appendix is for the optional normative definition of digital audio support on USB Type-C-based products. Any USB Audio Class product, having either a USB Type-C plug or receptacle, and whether it is a host system, typically an audio source, and an audio device, typically an audio sink, shall meet the requirements of this appendix in addition to all other applicable USB specification requirements.

C.2 USB Type-C Digital Audio Specifications

USB Type-C Digital Audio (TCDA), when implemented per this specification, shall be compliant with either the USB Audio Device Class 1.0, 2.0 ~~or,~~ 3.0 or 4.0 specifications as listed below. While allowed, basing a TCDA on USB Audio Device Class 1.0 or USB Audio Device Class 3.0 is not recommended. ~~Given the number of benefits in terms of audio profile support, simplified enumeration and configuration, and improved low-power operation, use of the USB Audio Device Class 3.0 is *strongly recommended*.~~ As USB Audio Device Class 4.0 improves power efficiency by providing new selective configuration tools and supporting burst mode audio data transfers, supports new CODEC types and data formats for consumer audio applications, and provides numerous extensions to support various changes in the core specification, its use is *strongly recommended*.

USB Audio Device Class 1.0 (*not recommended*) including:

- USB Device Class Definition for Audio Devices, Release 1.0
- USB Device Class Definition for Audio Data Formats, Release 1.0
- USB Device Class Definition for Audio Terminal Types, Release 1.0

USB Audio Device Class 2.0 including:

- USB Device Class Definition for Audio Devices, Release 2.0
- USB Device Class Definition for Audio Data Formats, Release 2.0
- USB Device Class Definition for Audio Terminal Types, Release 2.0

USB Audio Device Class 3.0 (not recommended) including:

- USB Device Class Definition for Audio Devices, Release 3.0
- USB Device Class Definition for Audio Data Formats, Release 3.0

- USB Device Class Definition for Audio Terminal Types, Release 3.0
- USB Device Class Definition for Basic Audio Functions, Release 3.0

USB Audio Device Class 4.0 including:

- USB Device Class Definition for Audio Devices, Release 4.0

USB Audio Device Class 3.0 specifications now include the definition of basic audio function profiles (Basic Audio Device Definition, BADD). TCDA devices based on USB Audio Device Class 3.0 will implement one of the defined profiles. TCDA-capable hosts based on USB Audio Device Class 3.0 will recognize and typically implement all of the profiles that are relevant to the capabilities and usage models for the host.

TCDA devices shall fall into one of the following two configurations:

- a traditional VBUS-powered USB device that has a USB Type-C receptacle for use with a standard USB Type-C cable, or
- a VCONN-Powered USB Device (VPD) that has a captive cable with a USB Type-C plug (including thumb drive style products).

USB Type-C plug-based TCDA devices shall not be implemented as a variant of the USB Type-C Analog Audio Adapter Accessory (defined in Appendix A of earlier releases of this specification).