

Type-C USB 3.2 Gen 2 2M/5M Active Cable

Passive Cable vs Active Cable

Passive Cable: Without signal transduction or re-timer IC, the transmission distances are limited by the limits of the cable conductor and the structure of the cable.



Active Cable: With signal transduction or re-timer IC, cable length can be lengthened depending on the signal loss compensation capability of IC and cable specification.



Why Choose Active Cable?

With higher demands on video or data transmission rates, the maximum length of passive cable has mainly been shortened, as shown in the USB spec table below:

Table 3-1 USB Type-C Standard Cable Assemblies

Cable Ref	Plug 1	Plug 2	USB Version	Nominal Cable Length ²	Current Rating	USB Power Delivery	USB Type-C Electronically Marked
CC2-3	C	C	USB 2.0	≤ 4 m	3 A	Supported (SPR only)	Optional
CC2-5 ¹					5 A		Required
CC2-5E					5 A	Supported (SPR & EPR)	Required
CC3G1-3	C	C	USB 3.2 Gen1 and USB4 Gen2	≤ 2 m	3 A	Supported (SPR only)	Required
CC3G1-5 ¹					5 A		
CC3G1-5E					5 A	Supported (SPR & EPR)	Required
CC3G2-3	C	C	USB 3.2 Gen2 and USB4 Gen2	≤ 1 m	3 A	Supported (SPR only)	Required
CC3G2-5 ¹					5 A		
CC3G2-5E					5 A	Supported (SPR & EPR)	Required
CC4G3-3	C	C	USB4 Gen3	≤ 0.8 m	3 A	Supported (SPR only)	Required
CC4G3-5 ¹					5 A		
CC4G3-5E					5 A	Supported (SPR & EPR)	Required

	DP 2.0	DP 1.4
Data Rate	UHBR10 (10Gbps) UHBR13.5 (13.5Gbps) UHBR20 (20Gbps)	HBR3 (8.1Gbps), HBR2, HBR, RBR
Encoding	RS-FEC 128b/132b	RS-FEC (Option) 8b/10b
CDR	5MHz	15MHz for HBR3 10MHz for HBR2/HBR 5.4MHz for RBR
Tx FFE	3-tap FFE (P0~P15) Swing 0~3 Pre-emphasis 0~3	
Rx EQ	Optimized CTLE setting + 1-tap DFE	Optimized CTLE setting + 3-tap DFE
Cable Type	DP8K cable USB Gen1 cable (2m)	Tethered USB-C cable TBT USB-C cable (0.8m) USB Gen1 cable (2m)
Feature	DSC (Display Stream Compression) HDR (High Dynamic Range) PR (Panel Replay)	

Adding Re-timer IC

The maximum length of USB 3.2 Gen 2 SPEC passive cable is 1M; after adding a re-timer IC, the cable length can be significantly lengthened to 5M to 7M

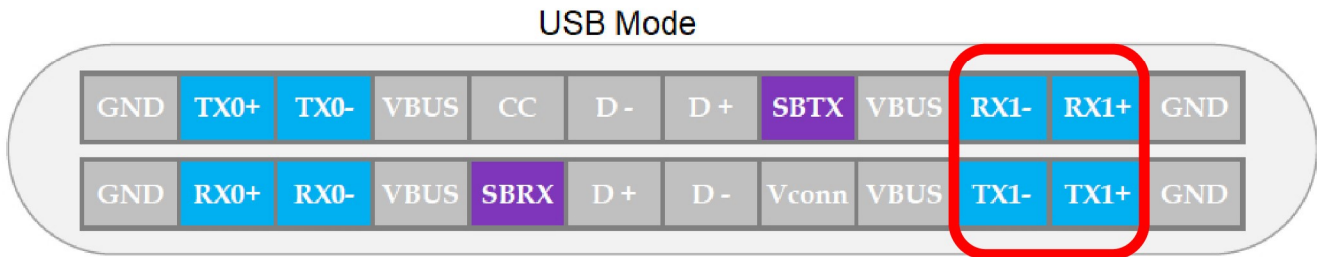
Applications

The Type-C USB 3.2 Gen 2 2M/5M Active Cable can be applicable for the audio/video/data/power transmissions:

1. VR Devices: Between VR Headset, Streaming Box, PC
2. Data Storage Devices: Between PC, SSD/Server

Type C active cable

1. 2 Lanes USB 3.2 gen2 (Bidirectional) **USB 3.2 Gen2 Only**



Two Lanes USB 3.2 Gen2 Only Product Planning:

1. 1. 2M Type-C USB Gen2 Cable
2. 2. 5M Type-C USB Gen2 Cable



Specification

Type - C	
Model Name	(TBD)
Interface	USB 3.2 Gen 2 x1 (10Gbps) Type C
Application	USB 3.2 Gen 2 x1 only + USB2.0 Bidirectional
Power	USB BUS power 20V@3A
E-Marker	Supported
TID	Type C Plug & E-Marker
Cable Length	2M or 5M
Certification	CE/ FCC (TBD)

VR HMD Application

2M Type-C Active Cable: Use to connect PC to a streaming device.
(Signal transmission)

5M Type-C Active Cable: Use to connect a streaming device to a VR headset.
(Signal transmission & Power delivery)

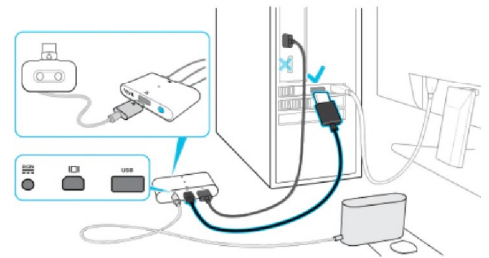
VR HMD Headset



Streaming Device



Connection Structure



Long-distance Device Applications

Regular a USB 3.2 Gen 2 passive cable length' s limit is 1M (3 ft.); a longer cable length will further aggravate the problems of cable signal loss and propagation delay.

Since the demands on VR devices, 4K/8K UHD TVs, and video game consoles have increased, higher cable transmission rates are required for better audio/video/data streaming quality and performance.

PC

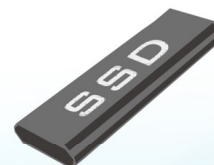
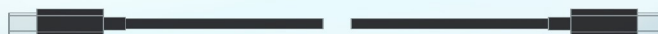


Storage Devices

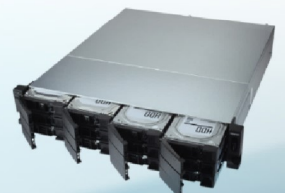
1M Passive Cable



Over 1M Active Cable



SSD




Drawing & Specification

PM Contact Window

 Charles Yu

 ext.1360

 charles.yu@mecimex.com

RD Contact Window

 Kevin Chu

 ext.1368

 Kevin_Chu@mecimex.com