

# LT8712EXC --- Product Brief

## Type-C/DP1.2 to HDMI2.0/VGA Converter

### Features

#### USB Type-C

Compliant with VESA DisplayPort Alt Mode on USB Type-C Standard V1.0  
Compliant with USB Power Delivery Specification R2.0, V1.0  
Compatible with USB Type-C Cable and Connector Specification R1.2  
Built-in dual CC controllers for charger and normal communication  
Flexible USB Type-C switching for USB3.0 5Gbps and DisplayPort Alt Mode up to 5.4Gbps  
Compliant with HDMI 1.4b Alt Mode on USB Type-C Specification V1.0

#### DP1.2 Receiver

Compliant with VESA DP1.2  
Support 1.62/2.7/5.4Gbps  
Support 1/2/4 lanes  
Support SSC  
1Mbps AUX channel  
Compliant with HDCP1.3  
SST/MST mode  
Adaptive receiver equalization for PCB, cable and connector losses  
Support lane swap(arbitrarily) and polarity inversion(independent)  
Receiver PHY is HDMI signal compatible

#### HDMI2.0 Transmitter

Compliant with HDMI2.0, HDMI1.4 and DVI1.0  
Compliant with HDCP2.2 and HDCP1.4  
Data rate up to 6Gbps  
Support UHD 4k@60Hz(RGB and YCbCr 4:4:4)  
Support TMDS scrambling for EMI/RFI reduction  
Support SCDC(Status and Control Data Channel)

Support CEC

AC-couple capable

Support channel swap(arbitrarily) and polarity inversion(independent)

Programmable transmitter swing and pre-emphasis

5V tolerance DDC/HPD I/Os

#### Triple-Channel Video DAC

Compliant with VESA VSIS1.2

200MSPS throughput and WUXGA timing support

Support CSC(Color Space Conversion) between RGB and YCbCr 4:4:4, YCbCr 4:4:4 and YCbCr 4:2:2

Amplitude calibration

YPbPr output capable

R/B swappable

Support separate SYNC or embedded SYNC (SOG/SOY)

Load sensing

5V tolerance DDC I/Os

#### Digital Audio Outputs

I2S and SPDIF interface

8-channel LPCM or compressed audio

Sample rate up to 192kHz

#### Miscellaneous

DP receiver to HDMI transmitter bypass to support HDMI Alt Mode

Internal or external oscillator

Integrated microprocessor

Embedded SPI flash for firmware and HDCP keys

GPIOs for VBUS/VCONN/AUX and other system controls

Integrated 100/400kHz I2C slave

Firmware update through SPI, AUX or I2C interface

Low power consumption

Power supply: 3.3V for I/O and 1.2V for core

ESD 4kV HBM

Temperature Range: -40 ~ +85

Package: 88-pin QFN 10\*10

## Description

The LT8712EXC is a high performance Type-C/DP1.2 to HDMI2.0/VGA converter, designed to connect a USB Type-C source or a DP1.2 source to a VGA sink and an HDMI2.0 sink simultaneously.

The LT8712EXC integrates a DP1.2 compliant receiver (MST capable), a high-speed triple-channel video DAC and an HDMI2.0 compliant transmitter. Also, two CC controllers are included for CC communication to implement DP Alt Mode and power delivery function, one for upstream Type-C port and another for downstream port. On-chip USB3.0 switch is a high-speed bi-directional passive switch which provides flexible switching to

accommodate connector flipping. This switch also handles muxing between 2-ch data / 2-ch video and all 4-ch video.

Two digital audio output interfaces are available, I2S and SPDIF. Both support 8-ch LPCM or compressed audio at maximum 192kHz sample rate.

The device is capable of automatic operation which is enabled by an integrated microprocessor that uses an embedded SPI flash for firmware storage. System control is also available through the use of a dedicated configuration I2C slave interface.

## Applications

Docking Station  
Video Hub  
Dongle



Figure 1. Application Diagram

## Ordering Information

Part Number	Operating Temperature Range	Package	Packing Method
LT8712EXC	-40° C to +85° C	QFN88 (10*10)	Tray

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