

LT8712EX --- 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 (for package LT8712EXI only)
- 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

● Dual HDMI2.0 Transmitters

- Compliant with HDMI2.0, HDMI1.4 and DVI1.0
- Dual HDMI ports
- Integrated one HDCP2.2 engine and one HDCP1.4 engine, each for one HDMI transmitter
- 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
- Downstream receiver sensing
- 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°C to +85°C
- Package: 128-pin LQFP 14*14 for LT8712EX and 128-pin QFN 14*14 for LT8712EXI

Description

The LT8712EX 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 up to two HDMI2.0 sinks simultaneously.

The LT8712EX integrates a DP1.2 compliant receiver (MST capable), a high-speed triple-channel video DAC and two HDMI2.0 compliant transmitters. 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. Note that the USB switch is only available on package LT8712EXI.

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

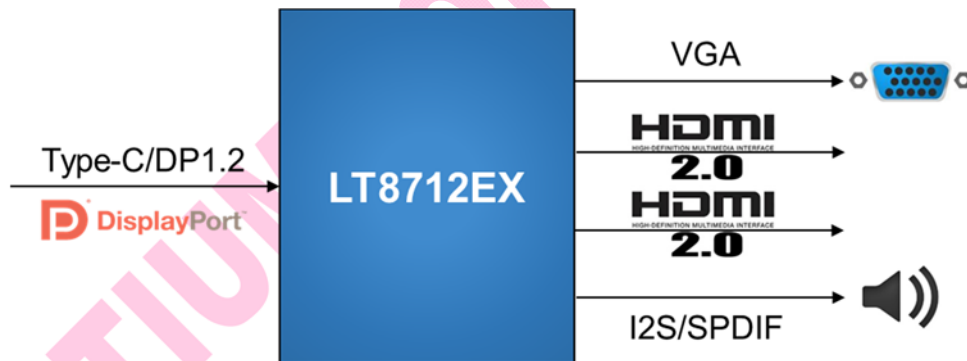


Figure 1. Application Diagram

Ordering Information

Part Number	Operating Temperature Range	Package	Packing Method
LT8712EX	-40°C to +85°C	LQFP128 (14*14)	Tray
LT8712EXI	-40°C to +85°C	QFN128 (14*14)	Tray

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