LT8712EXI --- Product Brief

Type-C/DP1.2 to HD-DVI2.0/VGA Converter

1. 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 HD-DVI 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 HD-DVI signal compatible
- **Dual HD-DVI2.0 Transmitters**
  - Compliant with HD-DVI2.0, HD-DVI1.4 and DVI1.0
  - Dual HD-DVI ports
  - Integrated one HDCP2.2 engine and one HDCP1.4 engine, each for one HD-DVI transmitter
  - Data rate up to 6Gbps
  - Support UHD 4k@60Hz (RGB and YCbCr 4:4:4)
  - Support TMDS scrambling for EMI/RFI reduction
  - Support ACDC (Auxiliary and Control Data Channel)
  - Support CES (Consumer Electronics Service)
  - 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 HD-DVI transmitter bypass to support HD-DVI 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 QFN 14*14

2. General Description

The LT8712EXI is a high performance Type-C/DP1.2 to HD-DVI2.0/VGA converter, designed to connect a USB Type-C source or a DP1.2 source to a VGA sink and up to two HD-DVI2.0 sinks simultaneously.

The LT8712EXI integrates a DP1.2 compliant receiver (MST capable), a high-speed triple-channel video DAC and two HD-DVI2.0 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.

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.

3. Applications

- Docking Station
- Video Hub
- Dongle

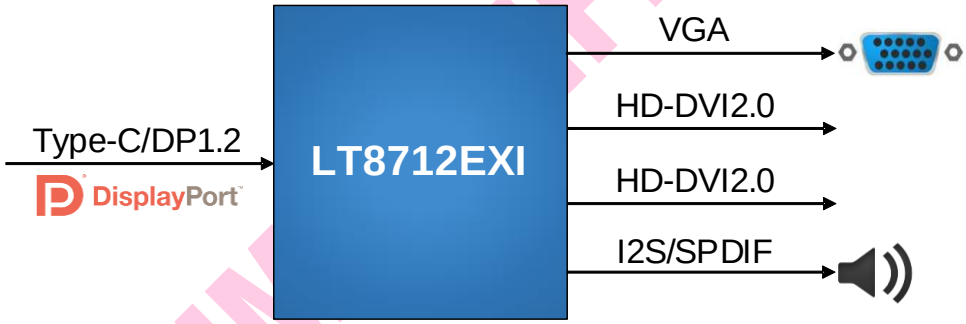

Figure 3.1 Application Diagram

4. Ordering Information

Table 4.1 Ordering Information

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

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