

# LT8712SX --- Product Brief

## Type-C/DP1.4 to Dual-Port DP1.4/HDMI2.0 Converter with Audio

### 1. Features

#### ● USB Type-C

- Compliant with VESA DisplayPort Alt Mode on USB Type-C Standard 1.0b
- DP Alt Mode support pin assignment C, D and E
- Compliant with USB power delivery specification 3.1
- Compliant with USB Type-C cable and connector specification 1.3
- Built-in three CC logic and PD controller for charger and normal communication
- Support UFP and DFP data roles
- Support source, sink and DRP power roles
- Support USB Billboard

#### ● DP1.4a/eDP1.5 Receiver

- Compliant with DisplayPort specification 1.4a for 1.62Gbps, 2.7Gbps, 5.4Gbps and 8.1Gbps
- Compliant with Embedded DisplayPort specification version 1.5
- Support SSC(de-spreading)
- Support DisplayPort 1/2/4 lanes
- Support FEC
- Support ASSR for eDP
- Support HDCP 1.3/2.3
- Support HDCP repeater
- Support SST/MST mode
- Support recovery up to two different video displays
- Support RGB 6/8/10/12 bpc, YCbCr4:4:4/YCbCr4:2:2/YCbCr4:2:0 8/10/12 bpc
- Support up to 4K@144Hz RGB 6bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 12 bpc
- Support DSC pass-through
- Support HDR10
- Support Adaptive-Sync

- Support Horizontal Blanking Expansion

#### ● DP/DP++/HDMI Combo Transmitters

##### ▪ 2 x DP1.4a Transmitters

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- Compliant Embedded DisplayPort specification version 1.5
- Support DisplayPort 1/2/4 lanes
- Support HDCP 1.3/2.3
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- Support up to 4K@144Hz RGB 6bpc, YCbCr4:2:2 10 bpc or YCbCr4:2:0 12 bpc
- Support DSC pass-through
- Support HDR10
- Support FEC
- Support Adaptive-Sync
- Support ASSR for eDP
- Support Horizontal Blanking Expansion
- Support SSC
- Support Type-C output
- Support original stream pass through

##### ▪ 2 x HDMI2.0/DP++ Transmitters

- Compliant with HDMI2.0, HDMI1.4 and DVI1.0
- Integrated HDCP2.3 engine and HDCP1.4 engine
- Data rate up to 6Gbps
- Support TMDS scrambling for EMI/RFI reduction
- Support SCDC(Status and Control Data Channel)
- Support CEC ( only one port )
- 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
- **Digital Audio Outputs**
  - I2S and SPDIF interface
  - 8-channel LPCM or compressed audio
  - Sample rate up to 192kHz
- **DSC Decoder**
  - Compliant with DSC 1.2a
  - Support dual DSC decoder
  - Support up to hactive 4096
  - Support up to pixel clock 1.44GHz
  - Support 1/2/4 slices
  - Support color space RGB, YCbCr4:4:4, YCbCr4:2:2, and YCbCr4:2:0
  - Support color depth 8bit and 10bit
  - Support bpp precision 1/16 bit
  - Support dynamic refresh rate
- **Miscellaneous**
  - CSC: RGB <-> YCbCr4:4:4 <-> YCbCr4:2:2<-> YCbCr4:2:0
  - Integrated 100/400KHz I2C slave
  - Integrated microprocessor
  - External oscillator 27MHz, +/-50ppm
  - Embedded SPI flash for firmware and HDCP keys
  - Firmware update through SPI or I2C or USB interface
  - Power supply: 3.3V and 1.1V

Type-C/DP1.4/HDMI2.0/DP++ converter, with two configurable DP1.4/HDMI2.0 output interfaces and audio output interface. LT8712SX supports both the DisplayPort™ Single Stream Transport(SST )mode and Multi-Stream Transport (MST) mode. When receiving the multiple video/audio streams which are packetized and transmitted over a single DP link, LT8712SX recovers the packetized Multi-streams to multiple different video/audio streams. In SST mode, two TX interfaces output the same video stream/audio stream. Also, three CC controllers are included for CC communication to implement DP Alt Mode and power delivery function, one for upstream Type-C port one for downstream port, and the last for power delivery. On-chip USB3.0 switch is a high-speed bi-directional passive switch which provides flexible switching to accommodate connector flipping. Two digital audio output interfaces are available, including 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

## 2. General Description

The LT8712SX is a high performance Type-C/DP1.4 to

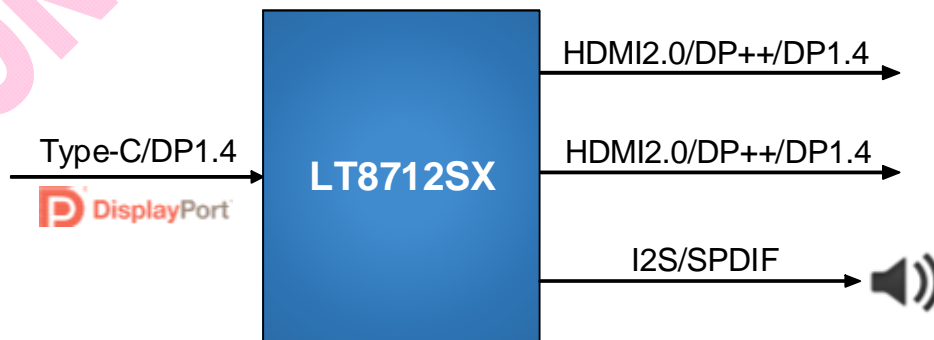


Figure 3.1. Application Diagram

## 4. Ordering Information

Table 4.1 Ordering Information

Product Name	Part Number	Product Status	Package	Bonding Wire	Grade	Operating Temperature Range	Stack Die Option	Packing Method	MPQ
LT8712SX	LT8712SX_U1Q02CED	Preview	QFN88 (10*10)Saw	Cu	E	-40°C to +85°C	D	Tray	1680 pcs

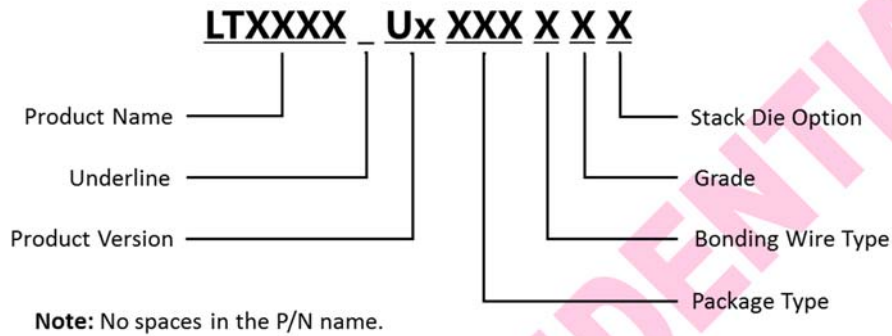


Figure 4.1 Part Number Naming Rules

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