

LT6912 --- Product Brief

HDMI2.0 to HDMI2.0 and Quad-Port LVDS & MIPI DSI/CSI with Audio

1. Features

● HDMI2.0 Receiver

- Compliant with HDMI2.0b, HDMI1.4 and DVI1.0
- Compliant with HDCP2.2 and HDCP1.4
- Data rate up to 6Gbps
- Adaptive receiver equalization
- Support 4k@60Hz
- Supported 3D formats:
 - For HDMI -> HDMI: all 3D formats
 - For HDMI -> LVDS:
 - ✧ Direct 3D output: frame packing (progressive)
 - ✧ 2-way 2D L/R output: side-by-side (half/full), line alternative
 - For HDMI -> MIPI:
 - ✧ frame packing (progressive), side-by-side (half/full), top-and-bottom, line alternative
- Supported video formats:
 - For HDMI -> HDMI:
 - ✧ CSC disabled: all video formats
 - ✧ CSC enabled: 24-bit RGB/YCbCr4:4:4, 16/20/24-bit YCbCr4:2:2
 - For HDMI -> LVDS:
 - ✧ CSC disabled: 24-bit RGB
 - ✧ CSC enabled: 24-bit YCbCr4:4:4, 16/20/24-bit YCbCr4:2:2
 - For HDMI -> MIPI:
 - ✧ CSC disabled: 24/30/36-bit RGB, 16/20/24-bit YCbCr4:2:2, 8-bit YCbCr4:2:0
 - ✧ CSC enabled: 24-bit RGB/YCbCr4:4:4, 16/20/24-bit YCbCr4:2:2
- Integrated EDID shadow

● HDMI2.0 Transmitter

- Compliant with HDMI2.0b, HDMI1.4 and DVI1.0

- No HDCP encryption
- Data rate up to 6Gbps
- On-die back termination
- Programmable transmitter swing and pre-emphasis
- Support 4k@60Hz
- 3D support: all 3D formats
- Supported video formats:
 - CSC disabled: all video formats
 - CSC enabled: 24-bit RGB/YCbCr4:4:4, 16/20/24-bit YCbCr4:2:2

● Single/Dual/Quad-Port LVDS Transmitter

- Compatible with VESA and JEIDA standard
- 1/2/4 configurable ports
- 1 clock lane and 3/4 configurable data lanes per port
- 1.2Gbps per data lane
- Programmable transmitter swing
- 6-bit and 8-bit color depth
- 3D support: direct 3D output, 2-way 2D L/R output

● Single/Dual/Quad-Port MIPI DSI/CSI Transmitter

- Compliant with DCS1.1, D-PHY1.2 & DSI1.3 & CSI-2 1.3
- 1/2/4 configurable ports
- 1 clock lane and 1/2/3/4 configurable data lanes per port
- 80Mbps~2Gbps per data lane
- Programmable transmitter swing and pre-emphasis
- 3D support: two ports simultaneously transmitting L and R frames or odd-L/even-R alternative pixels
- DSI support both burst mode and non-burst mode
- DSI support video formats:
 - CSC disabled: Packed 16/18/24/30/36-bit RGB, Loosely Packed 18-bit RGB, Packed 16/24-bit YCbCr4:2:2, Loosely Packed 20-bit YCbCr4:2:2, Packed 12-bit YCbCr4:2:0

- CSC enabled: Packed 16/18/24-bit RGB, Loosely Packed 18-bit RGB, Packed 16-bit YCbCr4:2:2
- CSI support video formats:
 - CSC disabled: RGB565/666/888, YUV422 8/10-bit, Legacy YUV420 8-bit
 - CSC enabled: RGB565/666/888, YUV422 8-bit
- Maximum 64 pixels overlap for each half
- Video stream copy mode for each port

● Digital Audio Output

- I2S interface supporting 2-channel audio, with sample rates of 32~192 kHz and sample sizes of 16~24 bits
- SPDIF interface supporting PCM, Dolby Digital, DTS digital audio at up to 192kHz frame rate
- IEC60958 or IEC61937 compatible

● Miscellaneous

- CSC: RGB <-> YUV444 <-> YUV422, support 8-bit only
- Integrated CEC controller (no command parsing)
- External oscillator
- Integrated microprocessor
- Embedded SPI flash for firmware and HDCP keys
- GPIOs for system controls
- Integrated 100/400kHz I2C slave
- Firmware update through SPI or I2C interface

4k@60Hz video. Also HDCP2.2 is supported for data decryption (no data encryption).

For LVDS output, LT6912 can be configured as single-port, dual-port or quad-port LVDS with 1 high-speed clock lane, and 3~4 high-speed data lanes operating at maximum 1.2Gbps/lane, which can support a total bandwidth of up to 19.2Gbps.

For MIPI DSI/CSI output, LT6912 features configurable single-port, dual-port or quad-port MIPI DSI/CSI with 1 high-speed clock lane, and 1~4 high-speed data lanes operating at maximum 2Gbps/lane, which can support a total bandwidth of up to 32Gbps. LT6912 supports burst mode DSI video data transferring.

LT6912 supports flexible video data mapping path for 2D and 3D applications.

Two digital audio output interfaces are available, I2S and SPDIF. The I2S interface supports 2-ch LPCM and the SPDIF interface supports 2-ch LPCM or compressed audio, both 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 configuration I2C slave interface.

2. General Description

The LT6912 is a high performance HDMI2.0 to HDMI and LVDS & MIPI converter.

Both the HDMI2.0 input and output support data rate up to 6Gbps which provides sufficient bandwidth for

3. Applications

- Display
- Video Conferencing

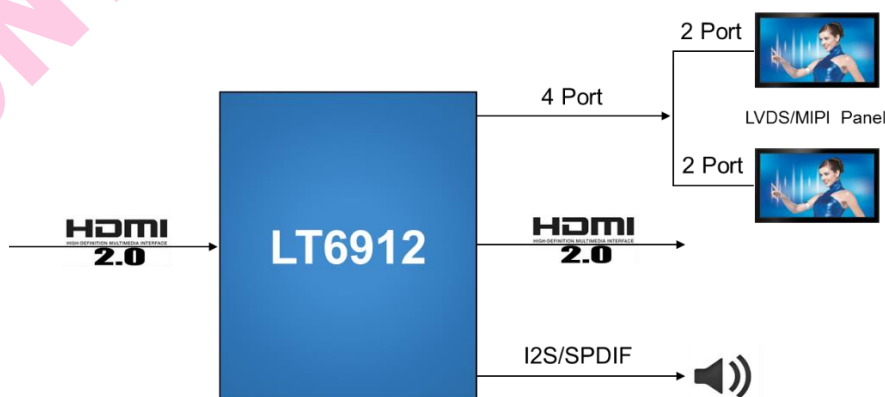


Figure 3.1 Application Diagram

4. Ordering Information

Table 4.1 Ordering Information

Part Number	Product Version	Product Status	Operating Temperature Range	Package	Packing Method	MPQ
LT6912	U4	Preview	-40°C to +85°C	QFN128 (14*14)	Tray	1190pcs

LONTIUM CONFIDENTIAL

Copyright © 2024-2025 Lontium Semiconductor Corporation, All rights reserved.

Lontium Semiconductor Proprietary & Confidential

This document and the information it contains belong to Lontium Semiconductor. Any review, use, dissemination, distribution or copying of this document or its information outside the scope of a signed agreement with Lontium is strictly prohibited.

LONTIUM DISCLAIMS ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THOSE OF NONINFRINGEMENT, MERCHANTABILITY, TITLE AND FITNESS FOR A PARTICULAR PURPOSE. CUSTOMERS EXPRESSLY ASSUME THEIR OWN RISK IN RELYING ON THIS DOCUMENT.

LONTIUM PRODUCTS ARE NOT DESIGNED OR INTENDED FOR USE IN LIFE SUPPORT APPLIANCES, DEVICES OR SYSTEMS WHERE A MALFUNCTION OF A LONTIUM DEVICE COULD RESULT IN A PERSONAL INJURY OR LOSS OF LIFE.

Lontium assumes no responsibility for any errors in this document, and makes no commitment to update the information contained herein. Lontium reserves the right to change or discontinue this document and the products it describes at any time, without notice. Other than as set forth in a separate, signed, written agreement, Lontium grants the user of this document no right, title or interest in the document, the information it contains or the intellectual property in embodies.

Trademarks

Lontium™ 龙迅™ and ClearEdge™ is a registered trademark of Lontium Semiconductor. All other brand names, product names, trademarks, and registered trademarks contained herein are the property of their respective owners.

Visit our corporate web page at: www.lontiumsemi.com

Technical support: support@lontium.com

Sales: sales@lontium.com