



GSV1127

Type-C/DisplayPort 1.2/HDMI 1.4 to MIPI
CSI-2/LVDS Mixed Converter with
Embedded MCU

May, 2024

Product Specification

1. General Description

1.1 General Information

Gscoolink GSV1127 is a high-performance, low-power DisplayPort 1.2/ HDMI 1.4 to MIPI CSI-2/LVDS mixed converter. By integrating enhanced microcontroller, GSV1127 has created a cost-effective solution that provides time-to-market advantages. The DisplayPort Receiver supports up to 21.6Gbps (HBR2, 4-lane), HDMI Receiver supports up to 9Gbps (TMDS, 3G/3Lane). With embedded Channel Configuration (CC), Power Delivery (PD) controller and Billboard USB 2.0 controller, GSV1127 can support Type-C Alternate DisplayPort for Type-C to MIPI bridge application. The superior architecture of GSV1127 provides economical smaller footprint solutions using QFN64, targeting for low power embedded applications.

HDCP 1.4 is implemented in GSV1127 for its DisplayPort and HDMI port. Color Space Conversion, 420-444/422 Conversion, De-Interlacer and Downscaler are supported for flexible video processing. Audio Extraction of HDMI Rx and DisplayPort Rx is supported in GSV1127 for audio processing.

Within 4kV HBM tolerance, GSV1127's operation temperature range is -40 °C to 85 °C using automotive qualified process.

An internal Video Generator can be used to generate any uncompressed video timing defined in DisplayPort HBR2 bandwidth, such as 4K@30Hz, 1080P@60Hz, 480i@60Hz.

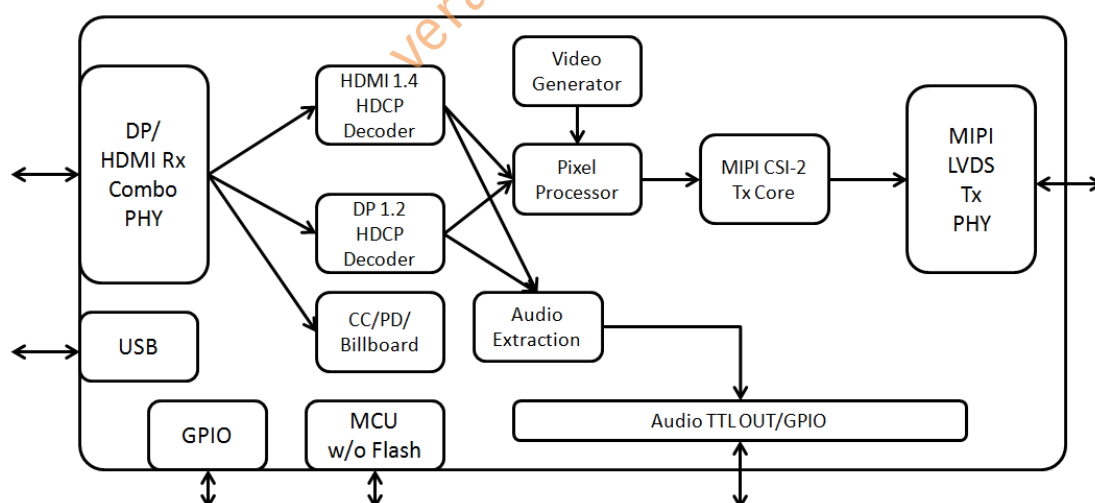


Figure 1. Top Diagram

The supported audio formats are listed in Table 1

Table 1. Supported Audio Format

Packet ID	Packet Type	Sampling Frequency (KHz)		
		32/44.1/48/88.2/ 96/176.4/192	256/352.8/384/ 512/705.6/768	64/128
0x02	Audio Sample Packet (LPCM and Compressed Audio)	Y		Y
0x07	One Bit Audio Sample Packet	Y		
0x08	DST Audio Packet	Y		
0x09	High Bit-rate Audio Stream Packet	Y	Y	

1.2 Features

1.2.1 DisplayPort Receiver

- Compliant with VESA DisplayPort 1.2a
- Compliant with HDCP 1.4
- Compliant with both DisplayPort and USB Type-C Alternative Mode
- Support HBR2, HBR and RBR (5.4/2.7/1.62 Gbps)
- Flexible 1/2/4 lane Main-Link configuration
- Programmable Adaptive Equalization
- Support Full-Link Training and No-Link Training
- Support High Dynamic Range (HDR) and Dynamic/Static Metadata
- Support Audio Extraction
- Support Horizontal Blanking Expansion up to 4K@60Hz format
- Embedded arbitrary EDID and MCCS
- Support Spread Spectrum Clock (SSC)
- 3D format support of frame sequential, stacked frame, side-by-side, top-to-bottom

1.2.2 HDMI Receiver

- Compliant with HDMI 1.4b
- Compliant with HDCP 1.4 in repeater/receiver mode
- Data rate up to 9Gbps (TMDS 3Gbps/3 Lane)
- Programmable Adaptive Equalization
- Support High Dynamic Range (HDR) and Dynamic/Static Metadata
- Embedded arbitrary EDID (up to 512 bytes)

- 5V tolerance on DDC/HPD pins
- 3D format support of frame packing, side-by-side, top-and-bottom

1.2.3 MIPI CSI-2 Transmitter

- Support MIPI CSI-2 v3.0 version transmission using D-PHY interface
- Support 2.5G bps 1/2/3/4-lane MIPI D-PHY Out
- Programmable output swing , slew-rate and pre-emphasis
- CSI-2 Lane Reassignment and Polarity Flip
- Support RGB888, RGB666, RGB565, RGB555, RGB444
- Support YUV 4:2:2 8-bit, 10-bit, 12-bit
- Support YUV 4:2:0 legacy 8-bit
- Support burst and non-burst mode

1.2.4 Single-Port LVDS Transmitter

- LVDS, supports video format up to 1080p@60Hz 12-bit
- Compatible with series FPGAs' LVDS standard (6 pairs in maximum)
 - Programmable output swing, slew-rate, common voltage and pre-emphasis
 - SDR/DDR/xN (N = 1~7) LVDS Clock transmitter with configurable output phase
 - Data rate up to 1.5Gbps per lane
 - Differential HS/VS/DE available
 - Embedded SAV/EAV mode supported
- Compatible with VESA and JEIDA standards
 - Single -Port LVDS Transmitter
 - Programmable output swing , slew-rate , common voltage and pre-emphasis
 - Data rate up to 1.5Gbps per lane

1.2.5 USB Type-C DisplayPort Alternative Mode Receiver

- Compliant with USB Type-C 1.1/1.0 Specification
- Compliant with USB Power Delivery 3.0 Specification
- Programmable USB Type-C Channel Configuration function
- Support Billboard in USB 2.0

1.2.6 Pixel Processor

- Color Space conversion
- YCbCr 444-420 timing conversion
- Downscaler with fixed horizontal and vertical 2 ratio for 4K to 2K conversion
- Deinterlacer for interlaced timing

1.2.7 Audio Output

- I2S and SPDIF Audio Extraction from HDMI Rx/ DisplayPort Rx /Type-C Rx
- SPDIF/I2S/HBR/DSD/TDM Format Supported for Audio Extraction

1.2.8 System Features

- Optional External MCU (via I2C)/ Internal MCU mode
- Embedded MCU using External Flash
- External 25MHz Crystal required
- Available Pins for UART/Timer/GPIO control from embedded MCU
- Mailbox feature for external MCU access on chip function status
- Temperature Sensor Monitoring Circuit

2. Pin Description

2.1 Pin Diagram

QFN64 Pin definition is defined as below.

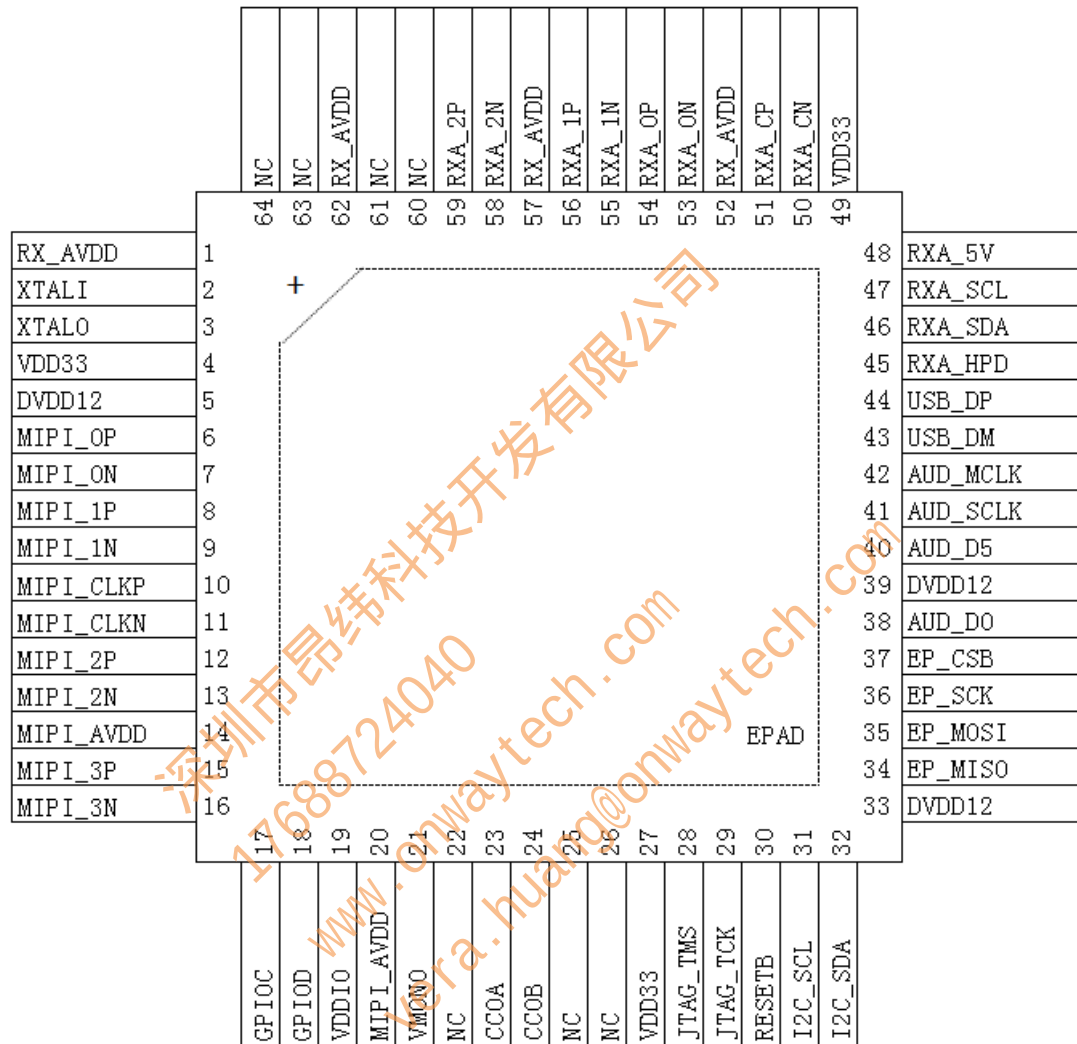


Figure 4. GSV1127 QFN64 Pin Diagram

2.2 QFN64 Pin Description

Table 4. QFN64 Pin Description

Pin Name	Direction	Pin No.	Description
HDMI RX Pins			
RXA_5V	I	48	HDMI: RX 5V Detection PAD DP: RX DP Detection PAD

4. Package Information

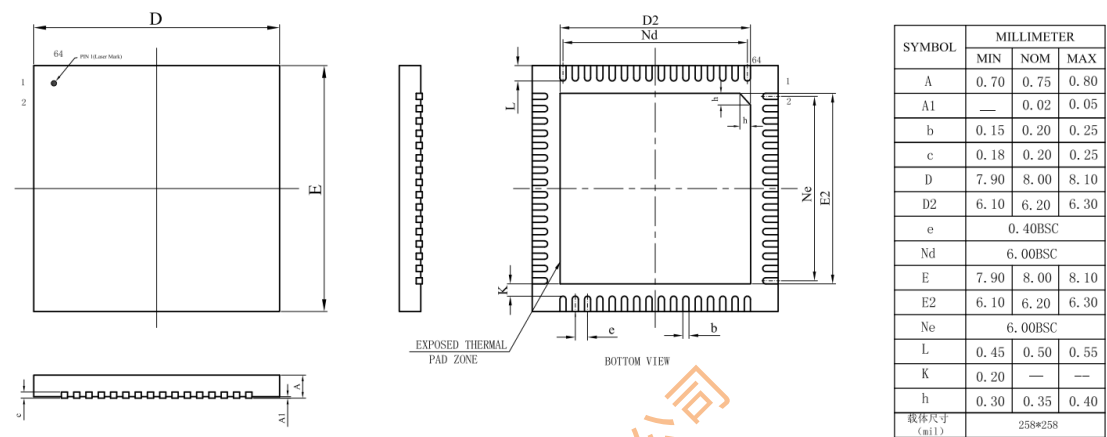


Figure 8. Package Dimensions (QFN64)

5. Ordering Guide

Table 14. Ordering Information

Part Number.	Temperature Range	Package Description	Packing Type
GSV1127	-40°C to +85°C	QFN64	Tray

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