GSV2201E

DisplayPort 1.4 to HDMI 2.0 Converter with Embedded MCU

May, 2023

Preliminary Product Specification

1. General Description

1.1 General Information

Gscoolink GSV2201E is a high-performance, low-power, USB Type-C Alternate Mode DisplayPort 1.4 to HDMI 2.0 converter. By integrating enhanced microcontroller and flash, GSV2201E has created a cost-effective solution that provides time-to-market advantages. The DisplayPort Receiver supports up to 32.4Gbps (HBR3, 4-lane) and HDMI Transmitter supports up to 18Gbps (TMDS, 6G3Lane). Integrated Power Delivery 3.0 controller handles Type-C CC interface for USB power management and DisplayPort mode entry. The superior architecture of GSV2201E provides economical smaller footprint solutions using QFN64, targeting application of Type-C Hub.

GSV2201E supports all DisplayPort SDP packets pass-through to HDMI output. HDCP 1.4 and HDCP 2.2/2.3 are implemented in GSV2201E for both DisplayPort Rx and HDMI Tx. Color Space Conversion, 444/422-420 Converter are supported at HDMI Tx in TMDS mode.

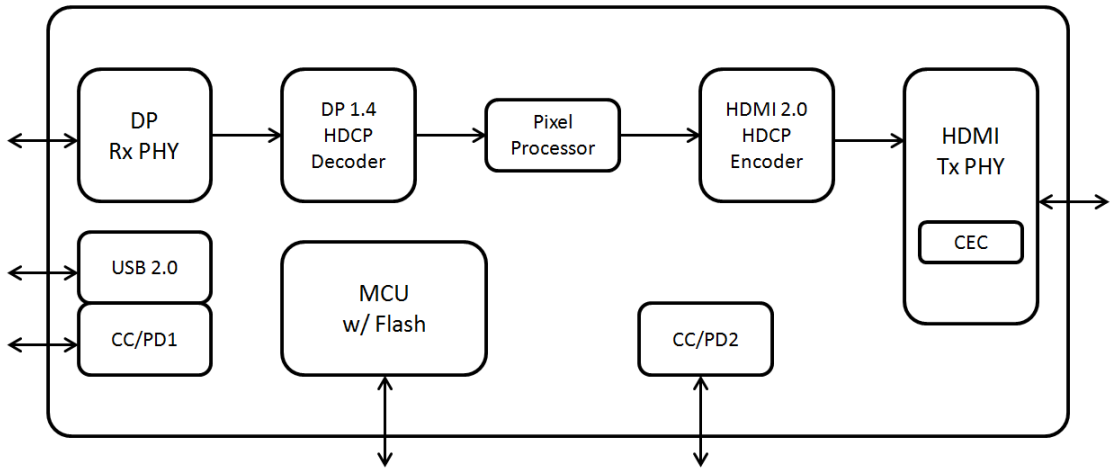


Figure 1. Top Diagram

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 1.4a
- Compliant with HDCP 2.2/2.3 and HDCP 1.4
- Support HBR3, HBR2, HBR and RBR (8.1/5.4/2.7/1.62 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 Horizontal Blanking Expansion up to 4K@60Hz format
- Support 4K120Hz YCbCr 4:2:0 timing
- Support Forward Error Correction (FEC)
- Embedded arbitrary EDID and MCCS
- Support Spread Spectrum Clock (SSC)

1.2.2 HDMI Transmitter

- Compliant with HDMI 2.0b, HDMI 1.4b
- Compliant with HDCP 2.2/2.3 and HDCP 1.4
- Data rate up to 18Gbps (TMDS 6Gbps/3 Lane)
- Programmable Voltage Swing, Slew-Rate and Pre-emphasis
- Support AC-coupling on TMDS
- Support Color Space Converter
- Support HDR (HDR10/HDR10+/Dolby Vision/HLG)
- Hardware CEC Engine for Low Level protocol decoding
- 5V tolerance on DDC/HPD/CEC pins

1.2.3 USB Type-C Interface

- Dual USB Power Delivery 3.0 Compliant controller
- 4 Configuration Channels (CC) with on-chip Rp/Rd resistors
- Dual Role Power Port (DRP)
- Fast Role Swap
- USB 2.0 Billboard Enumeration

1.2.4 System Features

- Embedded internal MCU and Flash
- External 25MHz Crystal required
- Available Pins for UART/Timer/GPIO
- Temperature Sensor Monitoring Circuit

2. Pin Description

2.1 Pin Diagram

QFN64 Pin definition is defined as below.

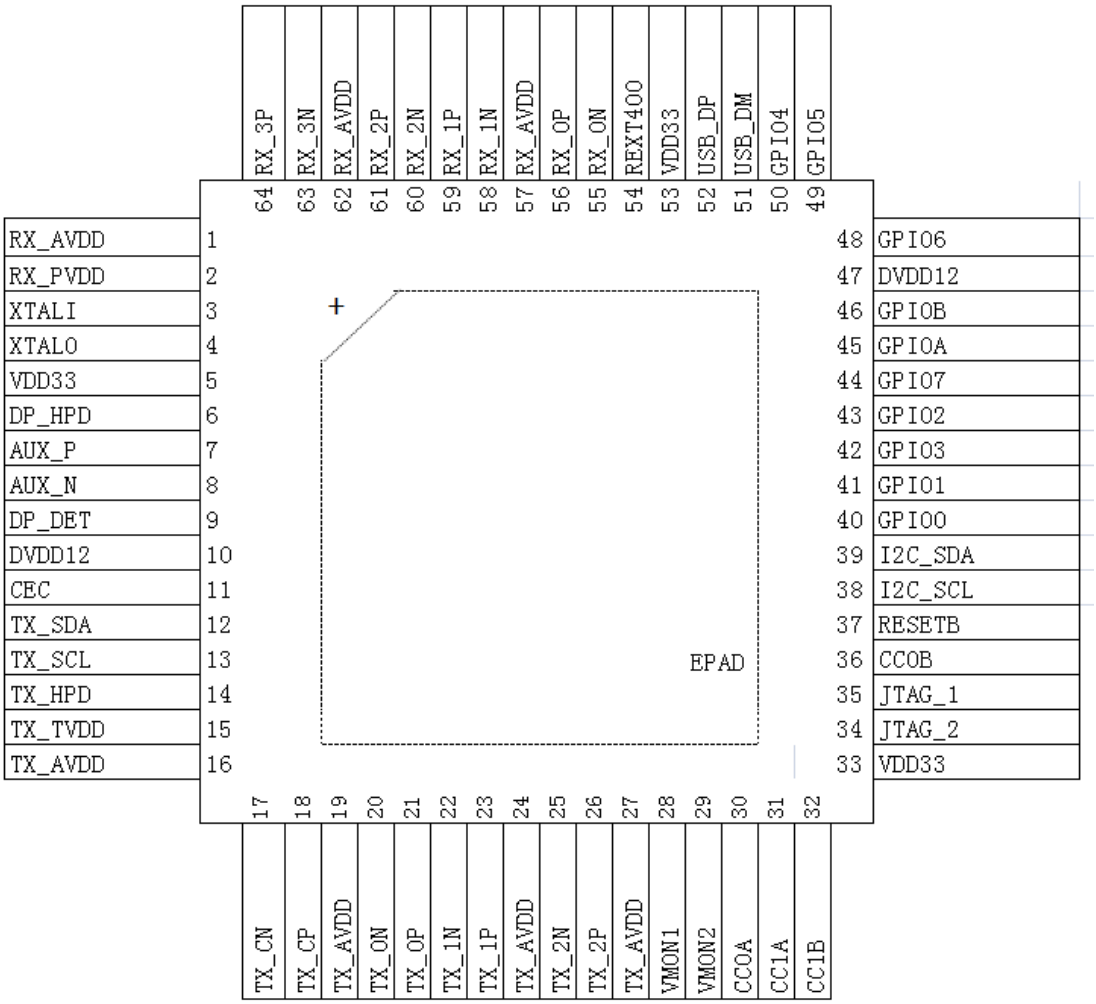


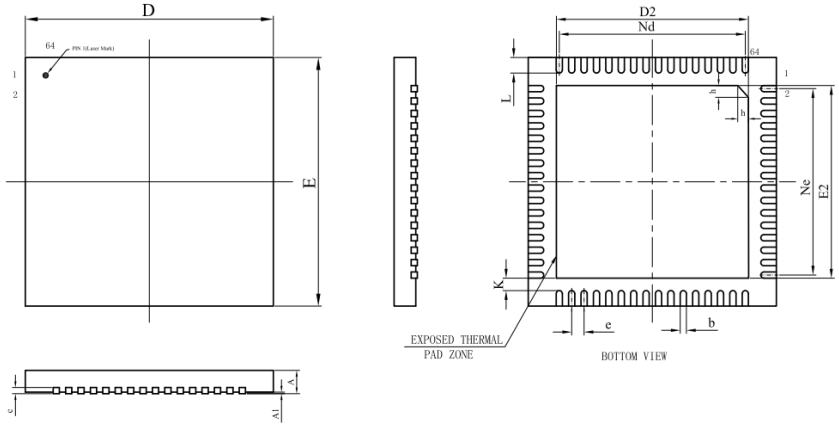
Figure 3. GSV2201E QFN64 Pin Diagram

2.2 Pin Description

Table 2. QFN64 Pin Description

Pin Name	Direction	Pin No.	Description
DisplayPort Rx Pins			
DP_DET	I	9	RX DP Detection PAD Alternate 1: GPIO16

4. Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	—	0.02	0.05
b	0.15	0.20	0.25
c	0.18	0.20	0.25
D	7.90	8.00	8.10
D2	6.10	6.20	6.30
e	0.40BSC		
Nd	6.00BSC		
E	7.90	8.00	8.10
E2	6.10	6.20	6.30
Ne	6.00BSC		
L	0.45	0.50	0.55
K	0.20	—	—
h	0.30	0.35	0.40
载体尺寸 (mil)	258*258		

Figure 7. Package Dimensions (QFN64)

5. Ordering Guide

Table 6. Ordering Information

Part Number.	Temperature Range	Package Description	Packing Type
GSV2201E	−20°C to +85°C	QFN64	Tray