GSV2501A

HDMI 2.0 Tx with Embedded MCU,

eARC/ARC Rx

August, 2022

Preliminary Product Specification

1. General Description

1.1 General Information

Gscoolink GSV2501A is a high-performance, low-power HDMI 2.0 transmitter with CEC, ARC Rx and eARC Rx. By integrating enhanced microcontroller based on RISC-V, GSV2501A has created a cost-effective solution that provides time-to-market advantages. GSV2501A's HDMI Transmitter supports up to 18Gbps (TMDS, 6G/3Lane). The superior architecture of GSV2501A provides economical smaller footprint solutions using QFN64, targeting applications of HomeAV and ProAV.

GSV2501A supports integrated video generator which is used to generate any timing format within HDMI 2.0 definition, such as 4K@60Hz, 4K@30Hz, 480i@60Hz. Flexible implementations of Audio Insertion, Audio Extraction and SPDIF to I2S conversion are supported in GSV2501A. Embedded CEC engine enables flexible remote control of the entire HDMI signal chain.

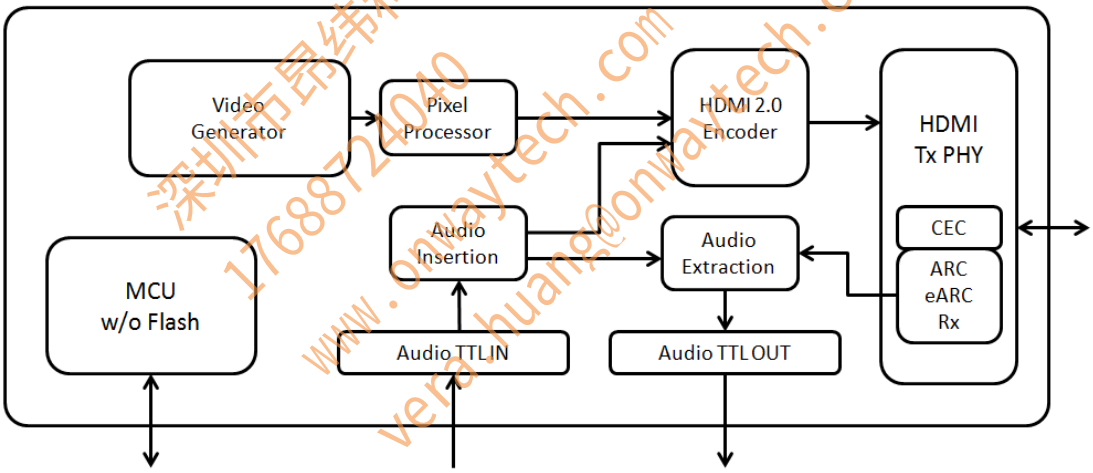


Figure 1. Top Diagram

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 HDMI Transmitter

- Compliant with HDMI 2.0b, HDMI 1.4b
- 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
- Hardware CEC Engine for Low Level protocol decoding
- 5V tolerance on DDC/HPD/CEC pins

1.2.2 Audio Input/Output

- I2S and SPDIF Audio Extraction from ARC/eARC Rx
- SPDIF/I2S/HBR/DSD/TDM Format Supported for Audio Extraction and Insertion
- SPDIF to I2S Conversion using single TTL bus in Bi-direction

1.2.3 System Features

- Optional External MCU (via I2C)/ Internal MCU mode for chip control
- Embedded MCU
- External pins of Flash QSPI interface
- External 25MHz Crystal required
- Available Pins for UART/Timer/GPIO
- Temperature Sensor Monitoring Circuit

1.3 Chip Application Modes

1.3.1 Audio Insertion and Audio Extraction Application

Using Internal video generator to generate any desired timing, with externally inserted audio, HDMI 2.0 output can be generated to HDMI Tx Output.

Meanwhile, with CEC engine support, audio extraction can be applicable from ARC and eARC Rx to Audio TTL output using SPDIF and I2S format.

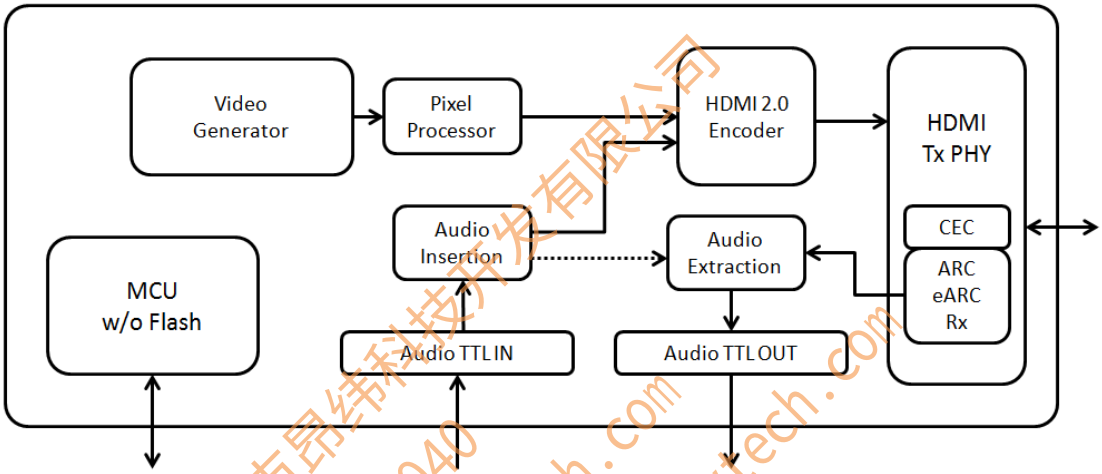


Figure 2. Audio Extraction and Insertion Functional Mode

1.3.2 Audio SPDIF to I2S conversion

While SPDIF input can be inserted into HDMI output, it can also be converted to I2S for Audio TTL output.

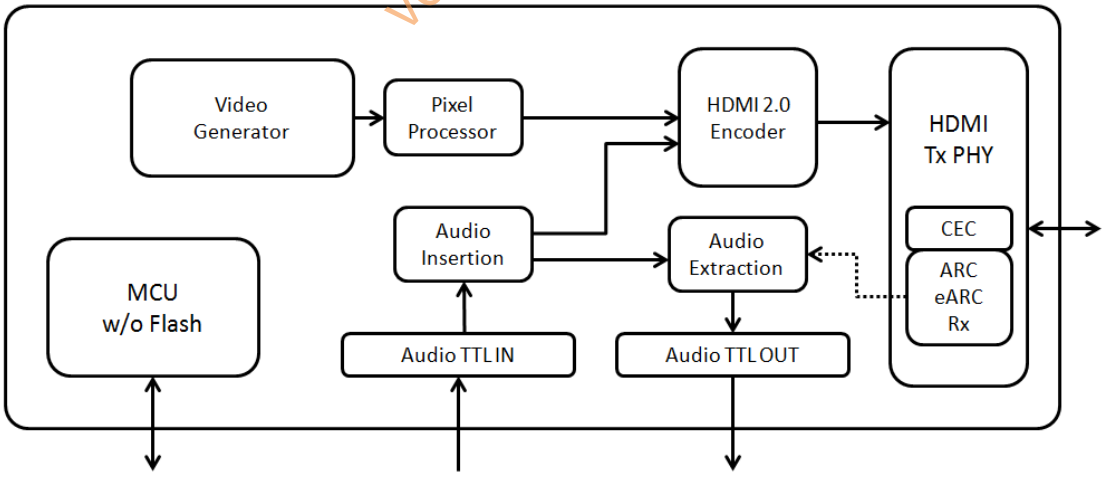


Figure 3. Audio Insertion SPDIF to I2S Application

2. Pin Description

2.1 Pin Diagram

QFN64 Pin definition is defined as below.

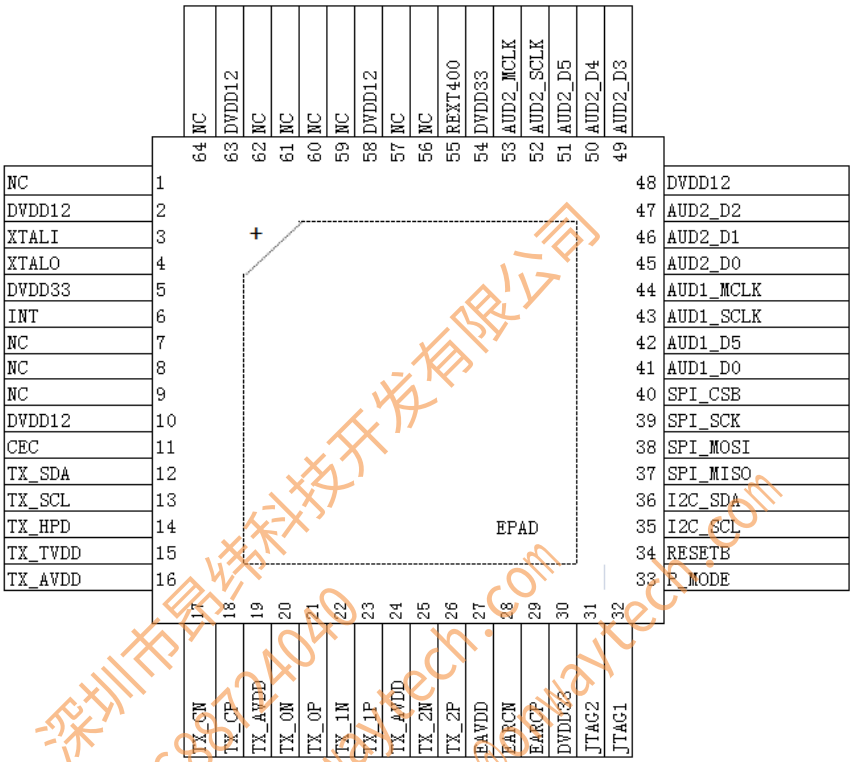


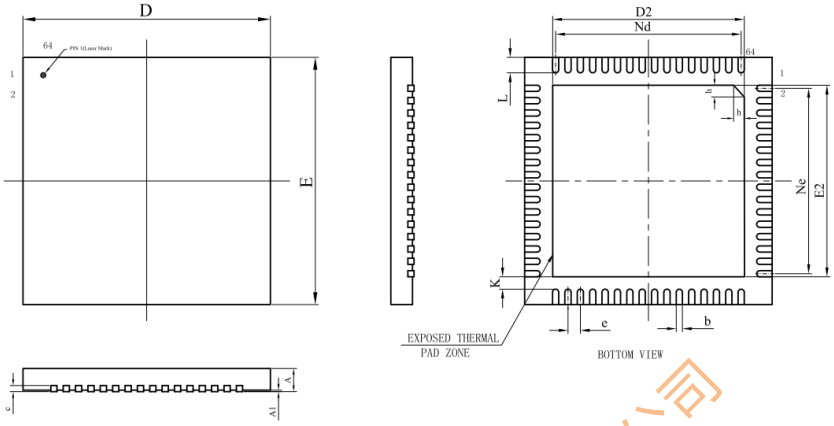
Figure 4. GSV2501A QFN64 Pin Diagram

2.2 Pin Description

Table 8. QFN64 Pin Description

Pin Name	Direction	Pin No.	Description
Power/Ground Pins			
DVDD12	Power	2,10,48, 58,63,	Digital 1.2V voltage power supply
DVDD33	Power	5,30,54,	Digital 3.3V voltage power supply
TX_TVDD	Power	15	Analog 3.3V voltage power supply for TX Port
TX_AVDD	Power	16,19,24,	Analog 1.2V voltage power supply for TX Port
EAVDD	Power	27	EARC 1.2V voltage power supply

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 11. Package Dimensions (QFN64)

5. Ordering Guide

Table 12. Ordering Information

Part Number.	Temperature Range	Package Description	Packing Type
GSV2501A	−20°C to +85°C	QFN64	Tray