FMC HDMI 2.1 Input/Output Module FH7621 User Manual

Rev1.0

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Version Record

Version	Date	Release By	Description
Rev 1.0	2024/4/16	Kathy Xia	First Release

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Part 1: Introduction to FMC to HDMI Module

FH7621 is a module that converts FMC interface to one HDMI 2.1 input and one HDMI 2.1 output. HDMI interface supports up to 8K@60Hz.

The FMC interface of the FH7621 is a standard HPC interface for connecting FPGA development boards and meets the VITA 57.1 standard. The connector model of FMC is ASP-134488-01.
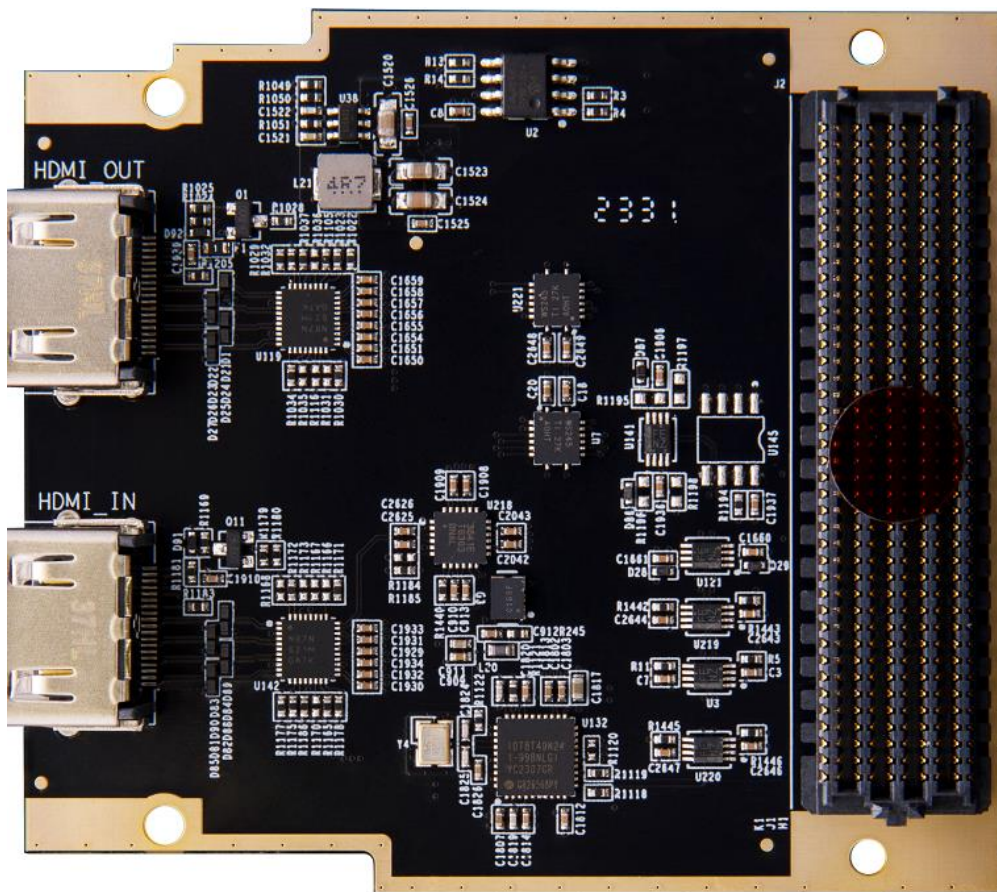
Photo of FH7621 module is as follows:

Figure 1: Physical drawing of FH7621 module

Part 1.1: Parameter Description of FH7621 module

The following are the detailed parameters of the FH7621 module:
  ➢ HPC connector
  ➢ 1-channel HDMI 2.1 video output interface, supporting up to 8K@60Hz output
  ➢ 1-channel HDMI 2.1 video input interface, supporting up to 8K@60Hz input, supporting data input of different formats.

Part 1.2: Block Diagram of FH7621 Module
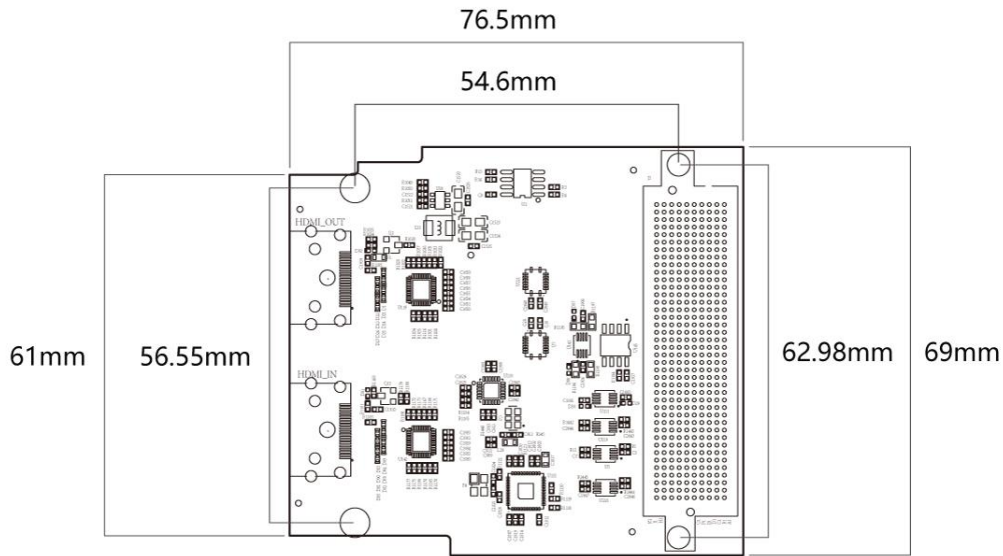

Figure 2: FH7621 Module Size Diagram

Part 2: Module Function Description

Part 2.1: FH7621 Module Functional block diagram

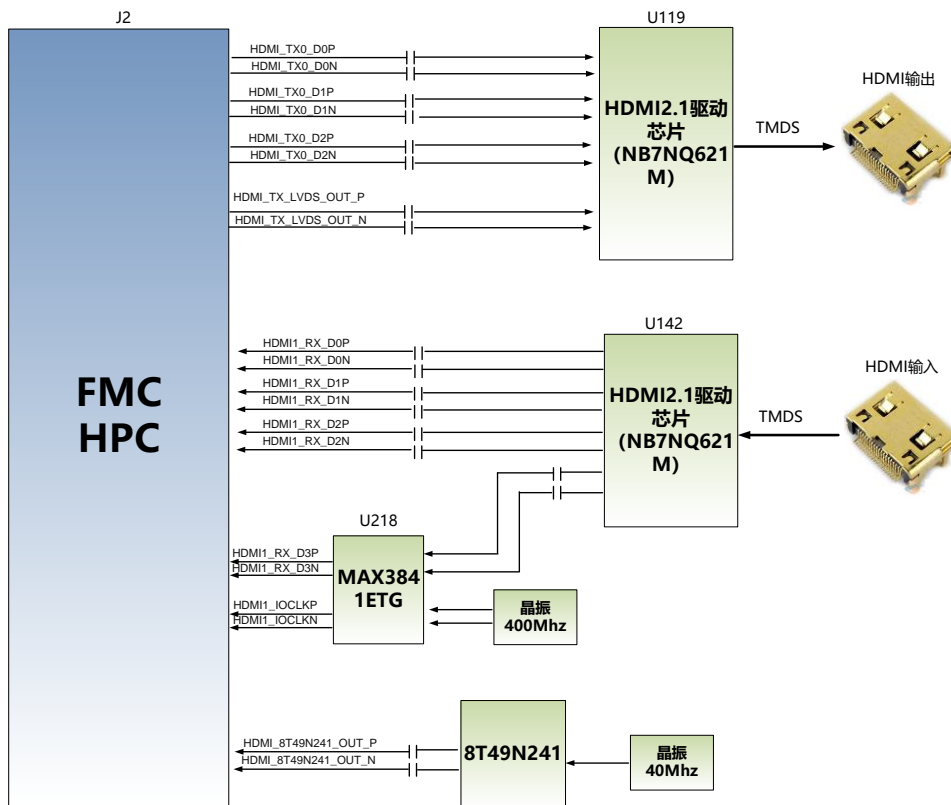The design block diagram of FH7621 module is as follows:

Figure 3: Block Diagram of FH7621 Module

The HMDI input and output driver chip is the NB7NQ621M chip of OnSemi, which supports HDMI 2.1 and DisplayPort V1.4, with a maximum speed of 12Gbps. Realize TMDS level conversion re-driver and receiver equalization function to increase the driving capability of the signal.

Part 2.2: Pin assignment for module FMC HPC

Only the signals of the interface are listed below. The signals of the power supply and GND are not listed. The specific user can refer to the schematic diagram.

FMC pin serial number	Network name	Explain
D4	HDMI1_8T49N241_OUT_P	Clock chip clock output positive
D5	HDMI1_8T49N241_OUT_N	Negative clock output of the clock chip
G6	HDMI1_REC_CLOCK_P	Reference clock input of the clock chip is positive
G7	HDMI1_REC_CLOCK_N	Negative reference clock input of the clock chip
G30	HDMI1_8T49N241_INT_ALM	Interrupt signal of clock chip
G31	HDMI1_8T49N241_LOL	LOSS of LOCK signal of clock chip
H31	HDMI1_8T49N241_RST_L	Reset signal of clock chip
H34	HDMI1_CLK_REC_SCL_L	I2C control clock of clock chip
H35	HDMI1_CLK_REC_SDA_L	I2C control data for the clock chip
G12	HDMI1_TX_DSCL	HDMI Output EDID Read/Write Clock
G13	HDMI1_TX_DSDA	HDMI output EDID read/write data
G15	HDMI1_RX_DSCL	HDMI Input EDID Read/Write Clock
G16	HDMI1_RX_DSDA	HDMI Input EDID Read/Write Data
H7	HDMI_RX_SCL_L	HDMI Input Device I2C Control Clock
H8	HDMI_RX_SDA_L	HDMI input device I2C control data
H10	HDMI_TX_SCL_L	HDMI Output Device I2C Control Clock
H11	HDMI_TX_SDA_L	HDMI Output Device I2C Control Data
H19	HDMI1_SNK_DET_N	HDMI input 5V power supply detection signal
H20	HDMI1_SNK_HDP	HDMI input HDP signal enabled
H29	HDMI1_RX_HPD_SRC_L	HDMI Input Device Hot Plug Detect Signal
H28	HDMI1_SRC_HPD_L	HDMI output HDP signal detection
G18	HDMI1_TX_HP_DEC_L	HDMI Output Hot Plug Detect Signal
B20	HDMI1_IOCLKP	HDMI Video Input Clock Positive
B21	HDMI1_IOCLKN	HDMI Video Input Clock Negative
B16	HDMI1_RX_D0P	HDMI Video Input Data 0 Positive
B17	HDMI1_RX_D0N	HDMI Video Input Data 0 Negative
A14	HDMI1_RX_D1P	HDMI Video Input Data 1 Positive
A15	HDMI1_RX_D1N	HDMI Video Input Data 1 Negative
B12	HDMI1_RX_D2P	HDMI Video Input Data 2 Positive
B13	HDMI1_RX_D2N	HDMI Video Input Data 2 Negative
A18	HDMI1_RX_D3P	HDMI Video Input Data 3 Positive
A19	HDMI1_RX_D3N	HDMI Video Input Data 3 Negative
B36	HDMI1_TX_D0P	HDMI Video Output Clock Positive
B37	HDMI1_TX_D0N	HDMI Video Output Clock Negative
A34	HDMI1_TX_D1P	HDMI Video Output Data 0 Positive
A35	HDMI1_TX_D1N	HDMI Video Output Data 0 Negative
B32	HDMI1_TX_D2P	HDMI Video Output Data 1 Positive
B33	HDMI1_TX_D2N	HDMI Video Output Data 1 Negative

A38	HDMI1_TX_D3P	HDMI Video Output Data 2 Positive
A39	HDMI1_TX_D3N	HDMI Video Output Data 2 Negative
H25	HDMI1_SEL_FRL	HDMI input 4K or 8K option

Table 1: Pin assignment for module FMC HPC