RGB2HD04 (RGB to HDMI) Adapter Instruction

V2.0 2026-01-25

Features

- Converts RGB TTL input signals to HDMI output, with max video bandwidth up to 297MHz.
- RGB input supports 720P@60Hz, 1080P@60Hz, 4K@30Hz and other resolutions.
- RGB input supports RGB888, RGB565, BT1120 and other formats.
- HDMI output complies with HDMI 1.4 standard.
- Supports I2S digital audio input, delivering audio via HDMI output.
- **Powered by AVDD (6V-12V) or DC 5V (4.75V-5.25V)**; typical power consumption: 70mA @ 5V.
- The board features point-to-point direct conversion without scaling. HDMI output resolution is identical to RGB input resolution.

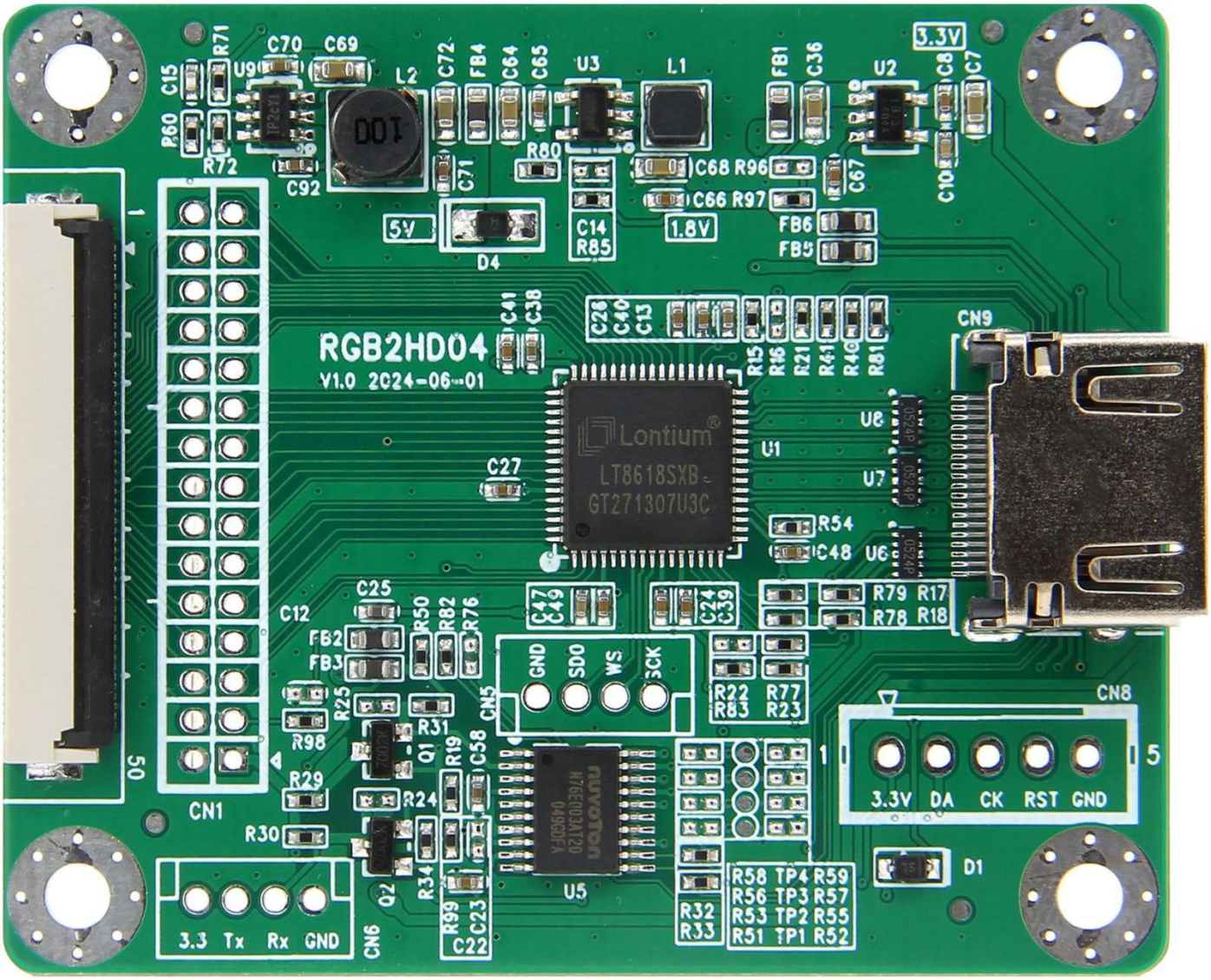

Figure 1: Board (6x5cm)

Interface definition

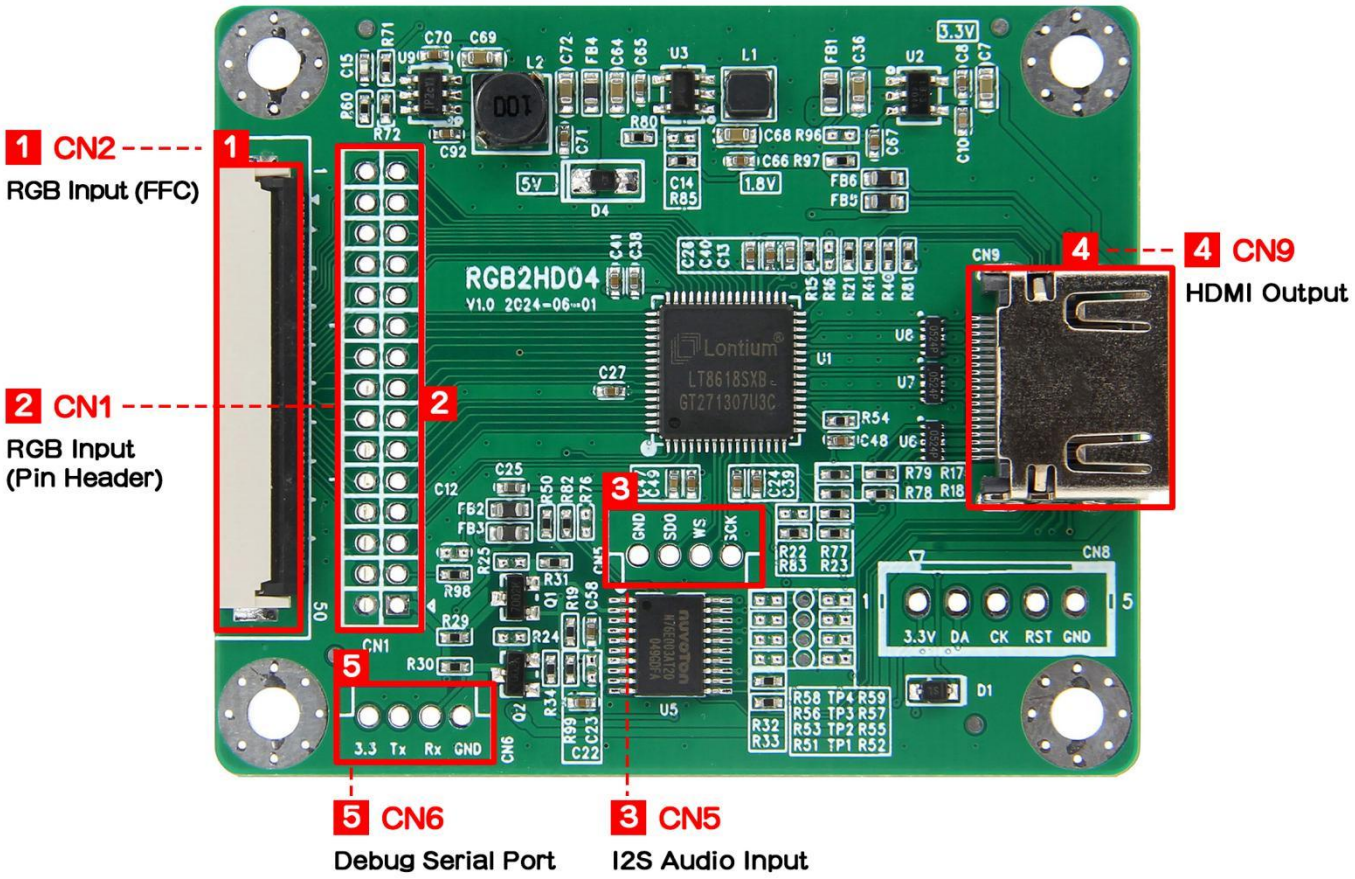

Figure 2: Interfaces

1. **CN2:** 0.5mm 50-Pin FFC connector, top contact, RGB input (default input port)

Pin No.	RGB888	RGB565	BT1120	Pin No.	RGB888	RGB565	BT1120
1	NC	NC	NC	26	G1	G4	Y1
2	NC	NC	NC	27	G0	G3	Y0
3	NC	NC	NC	28	R7	G2	X
4	NC	NC	NC	29	R6	G1	X
5	GND	GND	GND	30	R5	G0	X
6	NC	NC	NC	31	R4	R4	X
7	NC	NC	NC	32	R3	R3	X
8	NC	NC	NC	33	R2	R2	X
9	DE	DE	X	34	R1	R1	X
10	VS	VS	X	35	R0	R0	X
11	HS	HS	X	36	GND	GND	GND
12	B7	X	C7	37	PIXCLK	PIXCLK	PIXCLK
13	B6	X	C6	38	GND	GND	GND
14	B5	X	C5	39	NC	NC	NC
15	B4	X	C4	40	NC	NC	NC

16	B3	X	C3	41	NC	NC	NC
17	B2	X	C2	42	NC	NC	NC
18	B1	X	C1	43	AVDD	AVDD	AVDD
19	B0	X	C0	44	NC	NC	NC
20	G7	B4	Y7	45	NC	NC	NC
21	G6	B3	Y6	46	NC	NC	NC
22	G5	B2	Y5	47	NC	NC	NC
23	G4	B1	Y4	48	GND	GND	GND
24	G3	B0	Y3	49	NC	NC	NC
25	G2	G5	Y2	50	NC	NC	NC

Note: X = Not applicable for the corresponding format; NC = No connection. AVDD: 6V~12V power supply; GND: Ground.

2. **CN1:** 2.0mm pitch, 2×15 30-Pin dual row header, RGB input (header unmounted by default)

Pin No.	RGB888	RGB565	BT1120	Pin No.	RGB888	RGB565	BT1120
1	5V	5V	5V	16	G1	G4	Y1
2	GND	GND	GND	17	G2	G5	Y2
3	PIXCLK	PIXCLK	PIXCLK	18	G3	B0	Y3
4	DE	DE	X	19	G4	B1	Y4
5	HS	HS	X	20	G5	B2	Y5
6	VS	VS	X	21	G6	B3	Y6
7	R0	R0	X	22	G7	B4	Y7
8	R1	R1	X	23	B0	X	C0
9	R2	R2	X	24	B1	X	C1
10	R3	R3	X	25	B2	X	C2
11	R4	R4	X	26	B3	X	C3
12	R5	G0	X	27	B4	X	C4
13	R6	G1	X	28	B5	X	C5
14	R7	G2	X	29	B6	X	C6
15	G0	G3	Y0	30	B7	X	C7

3. **CN5:** PH2.0mm 4Pin straight header, I2S audio input (connector unmounted by default)

Pin No.	Name	Description
1	SCLK	I2S bit clock
2	WS	I2S word select
3	SD0	I2S data
4	GND	Ground

4. **CN9:** Standard HDMI Type A female connector, HDMI signal output

5. **CN6:** PH2.0mm 4Pin straight header, serial port for parameter configuration

Pin No.	Name	Description
1	VDD33	3.3V power, do not connect
2	UART_Tx	UART transmit data
3	UART_Rx	UART receive data
4	GND	Ground

Interface Pinout Schematic

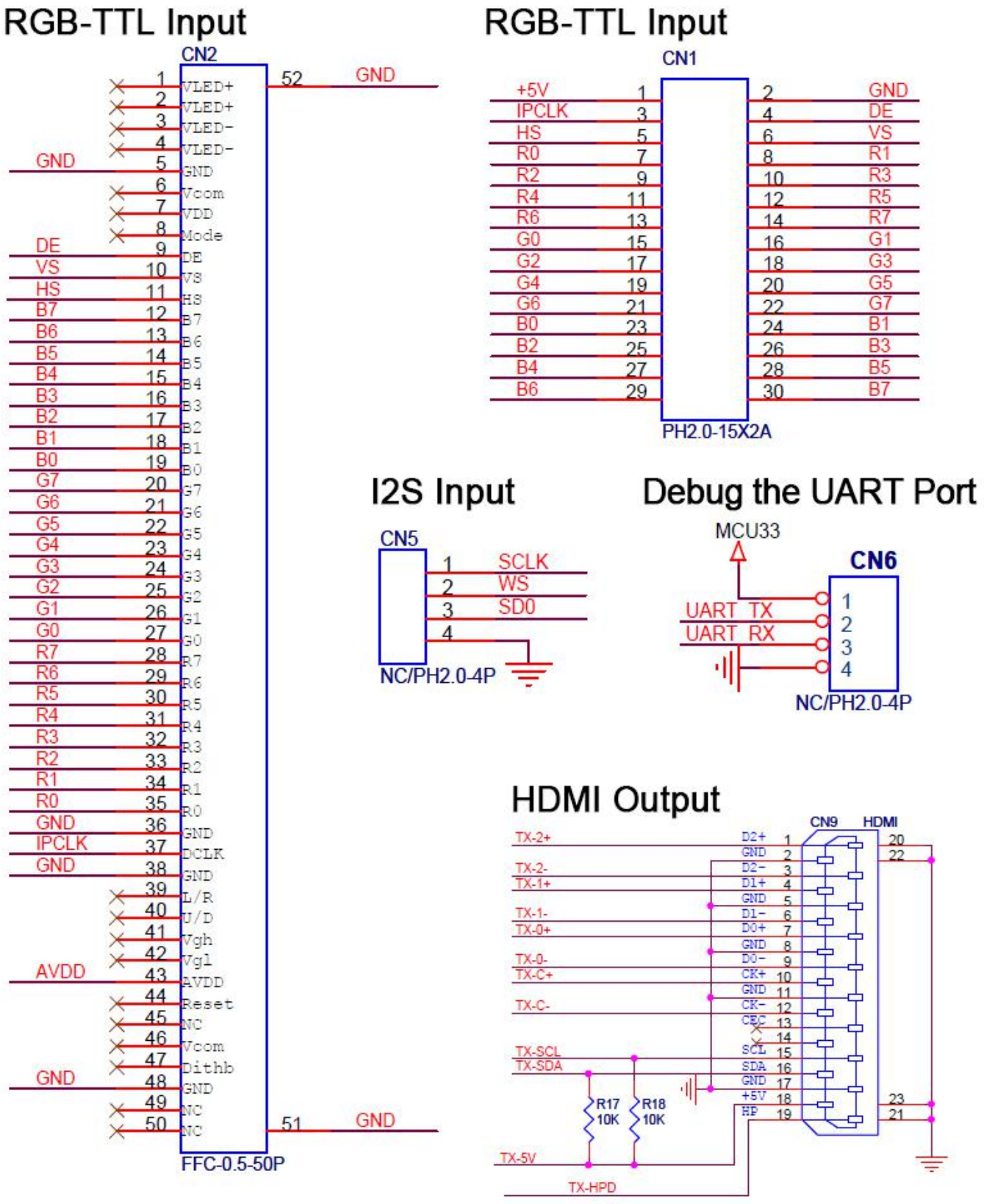

Figure 3: Interface Pinout Diagram

Note: The conversion board can be powered by 10V (6V-12V) input via Pin 43 of CN2, or 5V (4.75V-5.25V) input via Pin 1 of CN1.

Debug Serial Port

1. Connect CN6 on the board to your PC using a USB to UART cable (commonly used CH340G), as shown below.

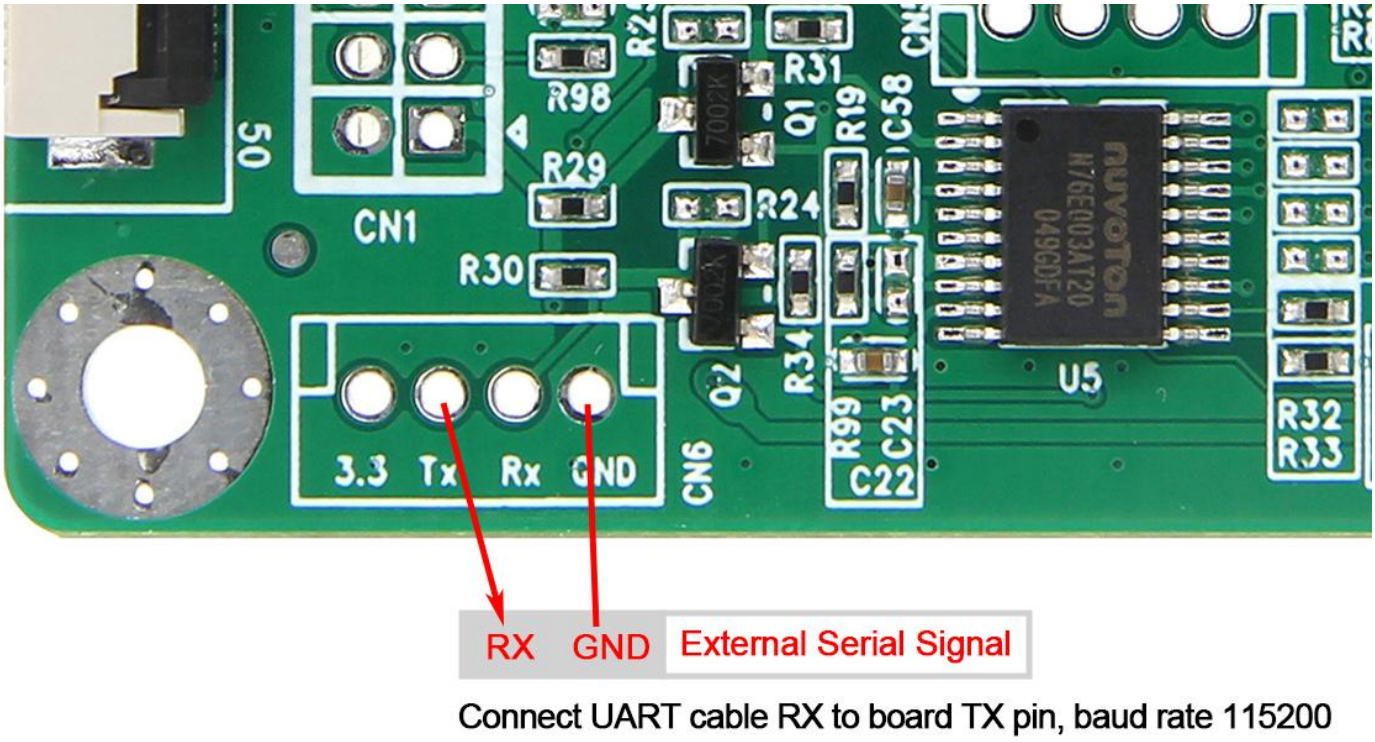

Figure 4: Serial Port Connection

2. Configure the serial port assistant as shown below; baud rate: 115200.

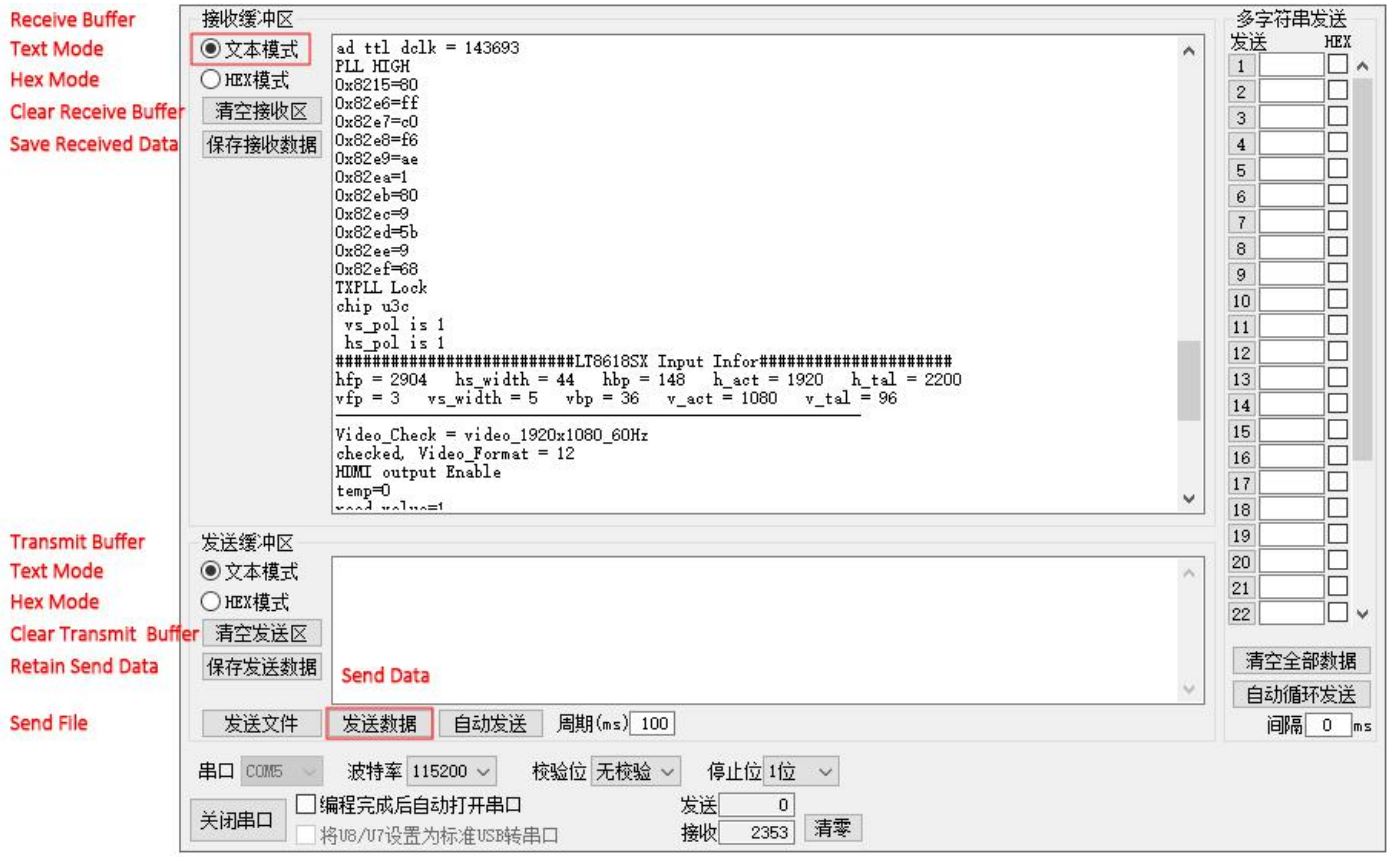

Figure 5: Serial port settings

3. Apply signal and power to the conversion board, then check the serial port print information as shown below.

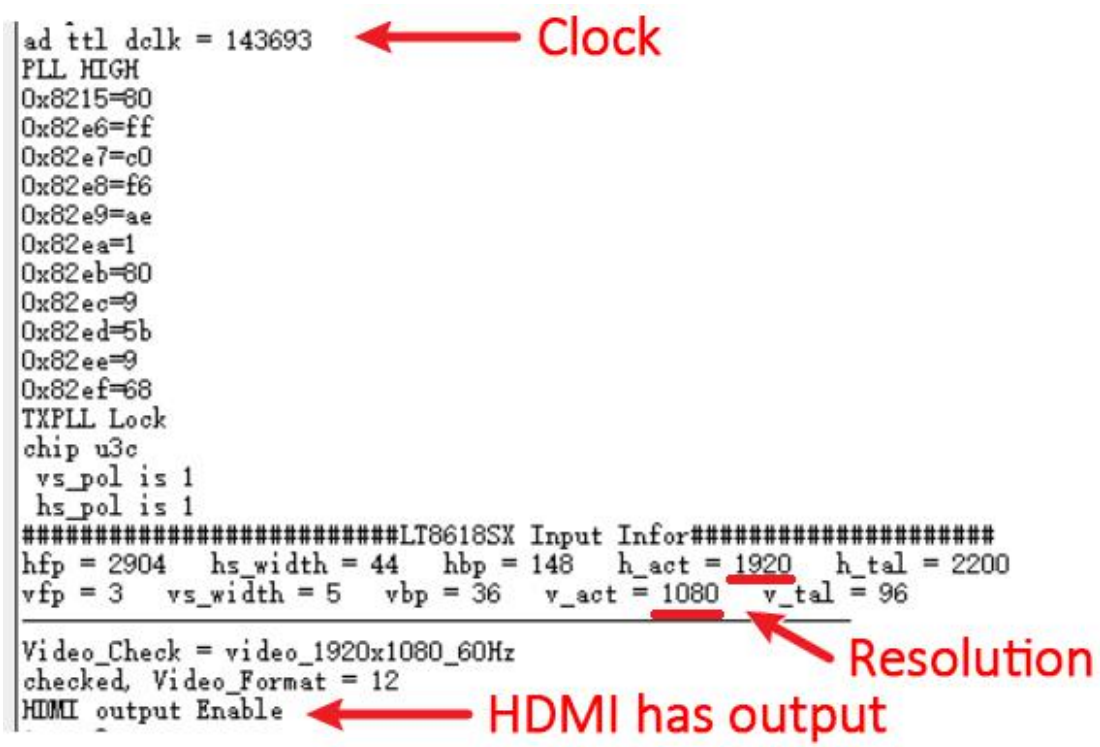

Figure 6: Serial Debug Print

Signal Input Format Configuration

The RGB input format can be configured by soldering resistor R52 or R55 on the board. Refer to the figure below for the positions of R52 and R55.

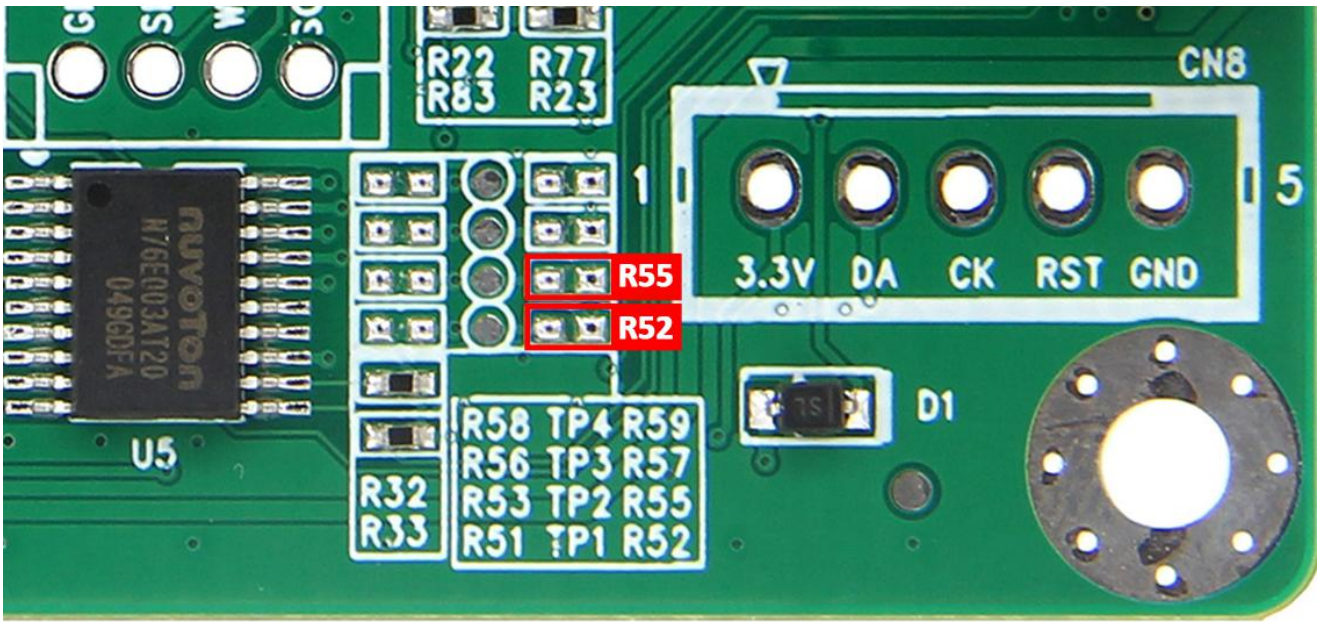

Figure 7: Configuration Resistor

Input format configuration is shown in the table below:

Resistor R55	Resistor R52	TP2/TP1 Level	RGB Input Format
Not attached	Not attached	HH	**RGB888 (Default)**
Not attached	Attach 0 Ω	HL	RGB565
Attach 0 Ω	Don't care	LX	BT1120-16bit

- The board is factory-default set to RGB888 input. If other input formats are needed, please leave a note when placing your order. Any format change after shipment shall be completed by yourself following the table above.
- When using RGB565 input format, the RGB888 configuration is also compatible. Connect RGB signals to R[7:3], G[7:2], B[7:3]; leave the low bits R[2:0], G[1:0], B[2:0] floating or grounded.
- For RGB666 input format, wire connection can follow the same method above. Leave the low bits R[1:0], G[1:0], B[2:0] floating or grounded.

Mounting Dimensions

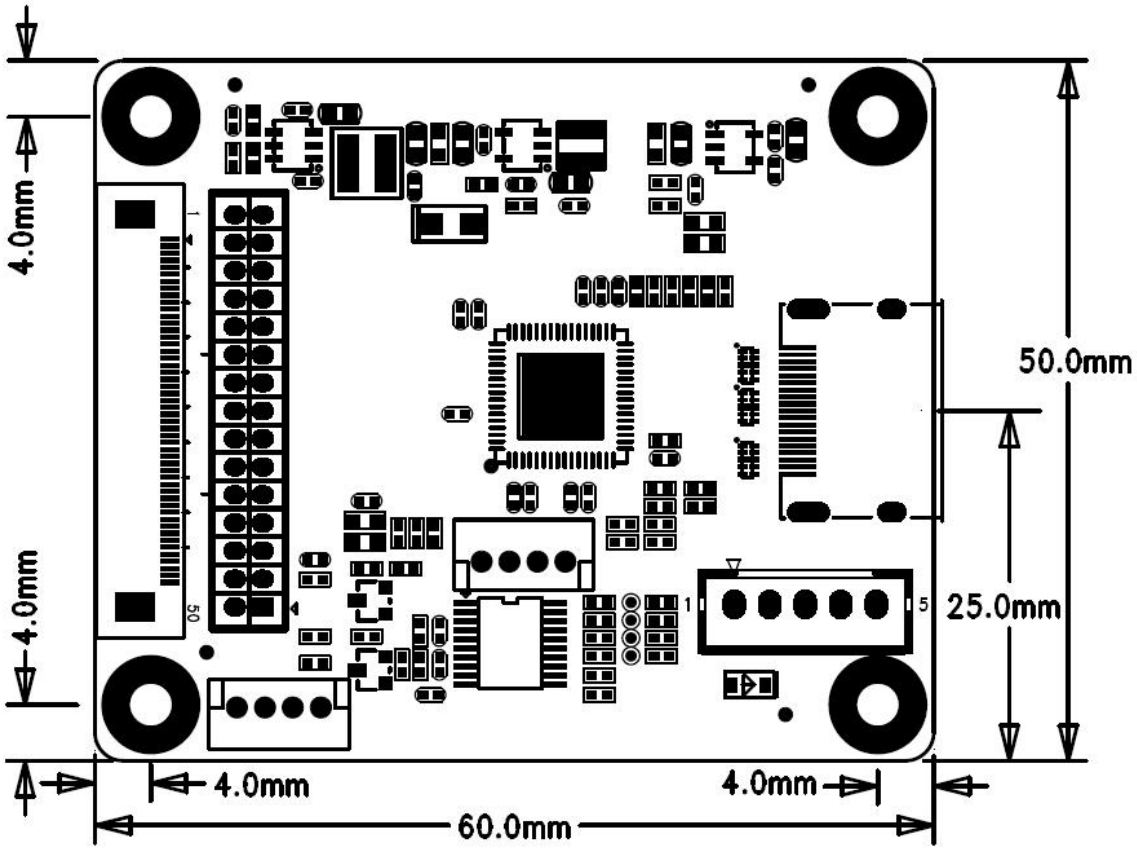

Figure 8: Mounting Dimensions (PCB thickness: 1.2mm; four mounting holes inner diameter: 3.2mm.)

Connection Example

1. Connect the industrial control board

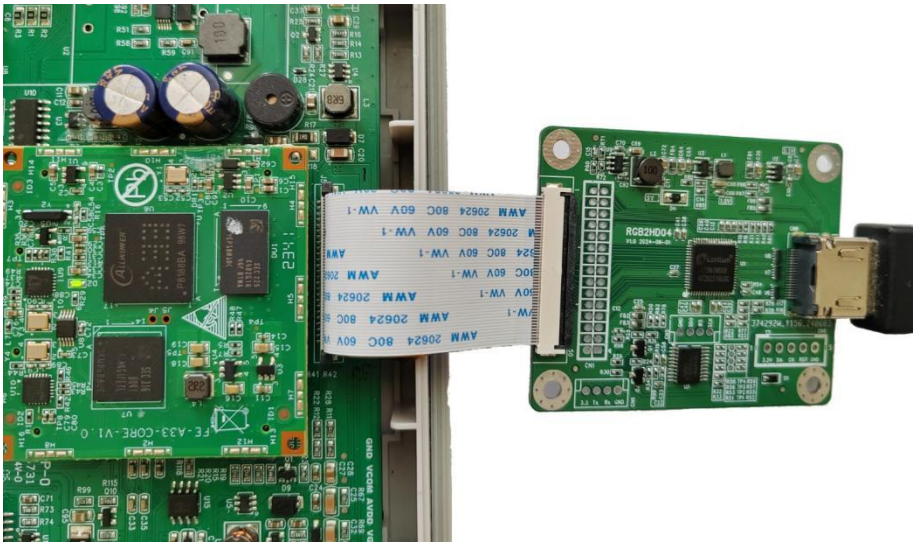

Figure 9: Connection Example 1

2. Connect the HDMI to RGB conversion board

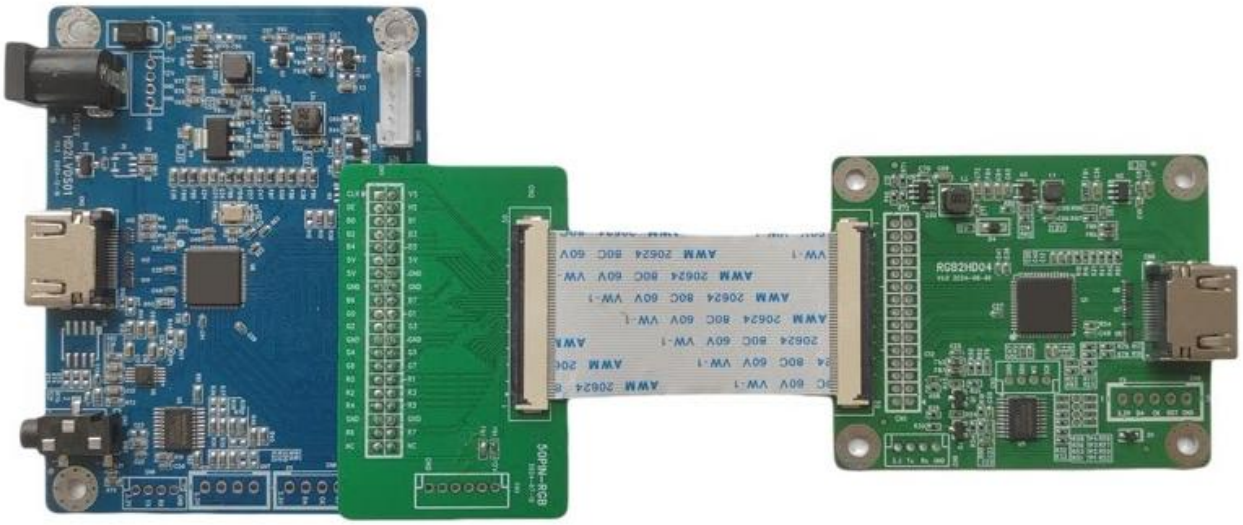

Figure 10: Connection Example 2

3. Connect the distribution board

Figure 11: Connection Example 3