LVDS2HD V2.5 User Manual

Translated by Ruby Zhang of Geekworm.com

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I. Features

1. Converts LVDS input signals to HDMI output, with a maximum bandwidth of 150MHz.
2. The LVDS input interface adopts the universal 30-pin connector FI-X30SSLA-HF, supporting dual 8-bit input; the original screen cable can be used directly.
3. Optional 36-pin 2.0 mm dual-row pin header input, supporting dual-link 10-bit.
4. Multiple options are reserved on the board, selectable via pull-down resistors:
   - 6Bit/8Bit/10Bit selection
   - Single-link/dual-link selection
   - JEIDA/VESA mapping selection
   - SPDIF/I2S audio input selection
5. **Supports not only standard HDMI signals but also other graphic format signals (non-standard formats)**. Common formats include: 1920×1200, 1920×1080, 1600×1200, 1280×1024, 1024×768, 1280×720, etc.
6. Supports LVDS signal de-spreading.
7. Powered by **5V** via the screen cable.

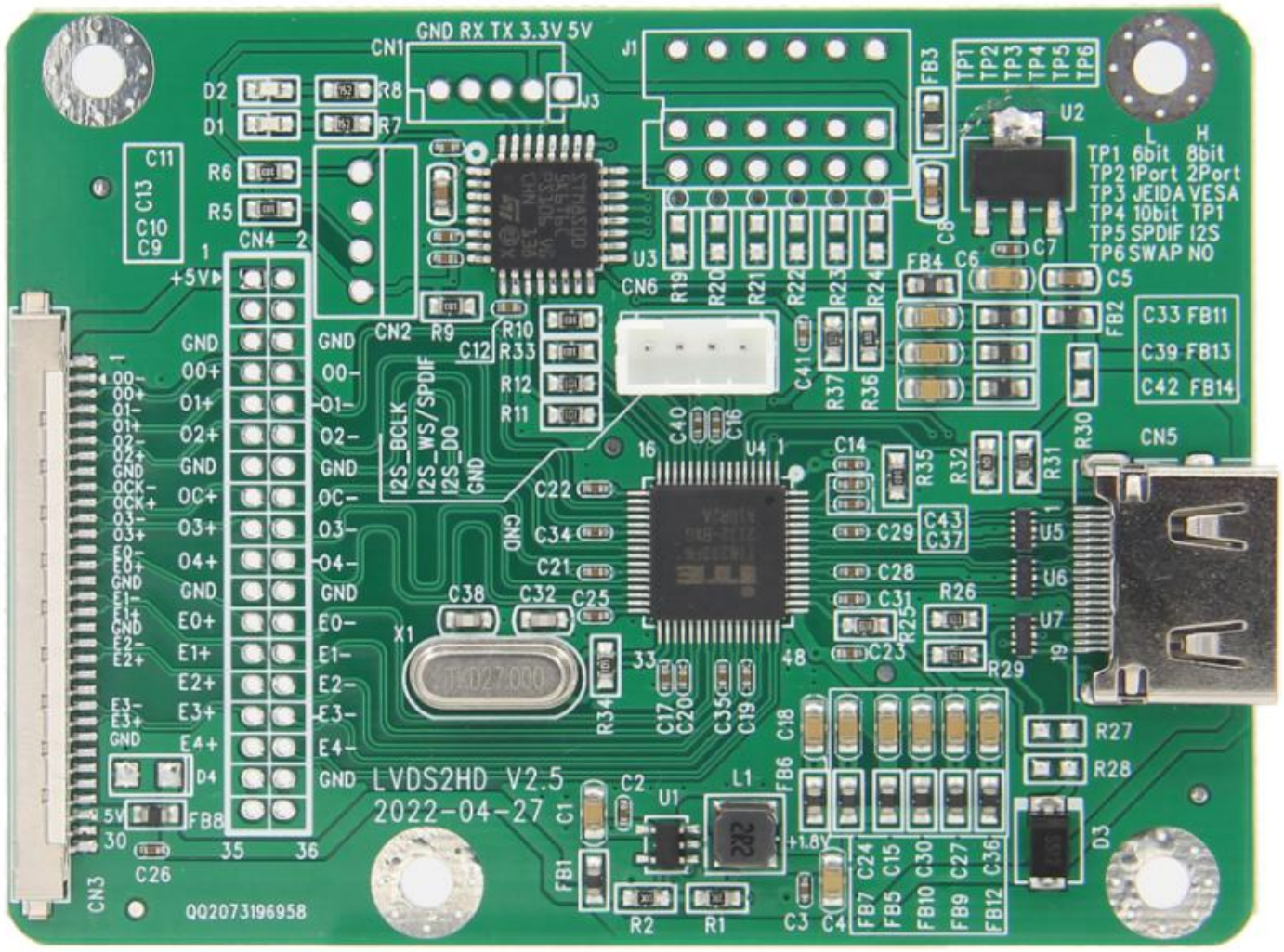

Figure 1: LVDS-to-HDMI v2.5 Board

II. Interface Definition

NOTE: The FI-X30SSLA-HF connector is pre-installed on the board by default; no dual-row pin header or CN6 is fitted. Please note this in your order if required.

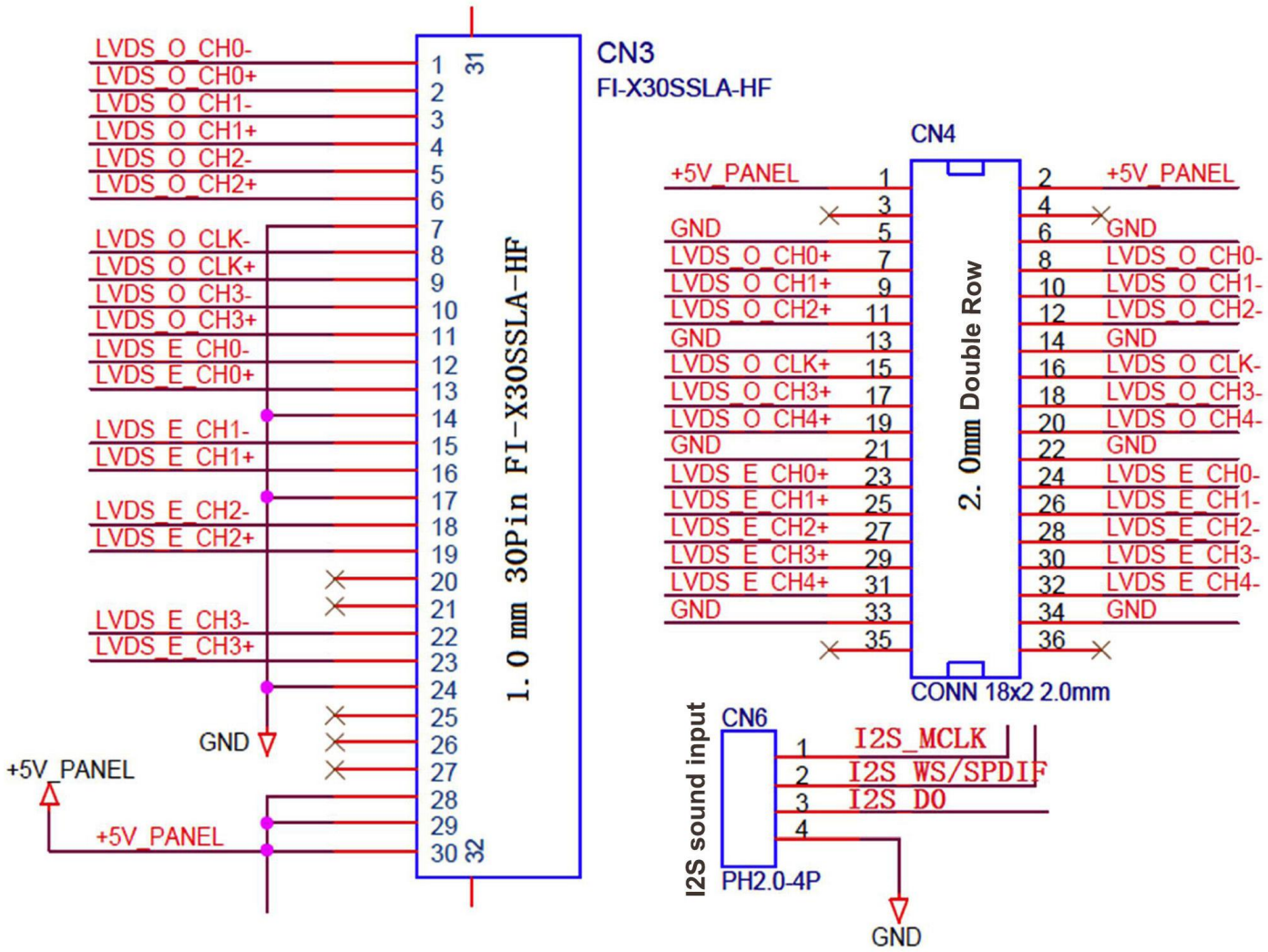

Figure 2: Interface Definition

III. Input Options

Test Points	Low Level (Short the Corresponding Resistor)	High Level (Default)
TP1	6-bit Input (R19)	8-bit Input
TP2	Single-link Input (R20)	Dual-link Input
TP3	JEIDA Mapping (R21)	VESA Mapping
TP5	SPDIF Audio Input (R23)	I2S Audio Input
TP6	Link Parity Swapping (R24)	Normal, No Swapping

Figure 3: Input Options

By default, TP1-TP6 on the board are all set to high level, meaning the LVDS input format is dual-link, 8Bit VESA.

For any other format, you need to short the corresponding resistors R19-R24 on the board.

IV. Mounting Dimensions

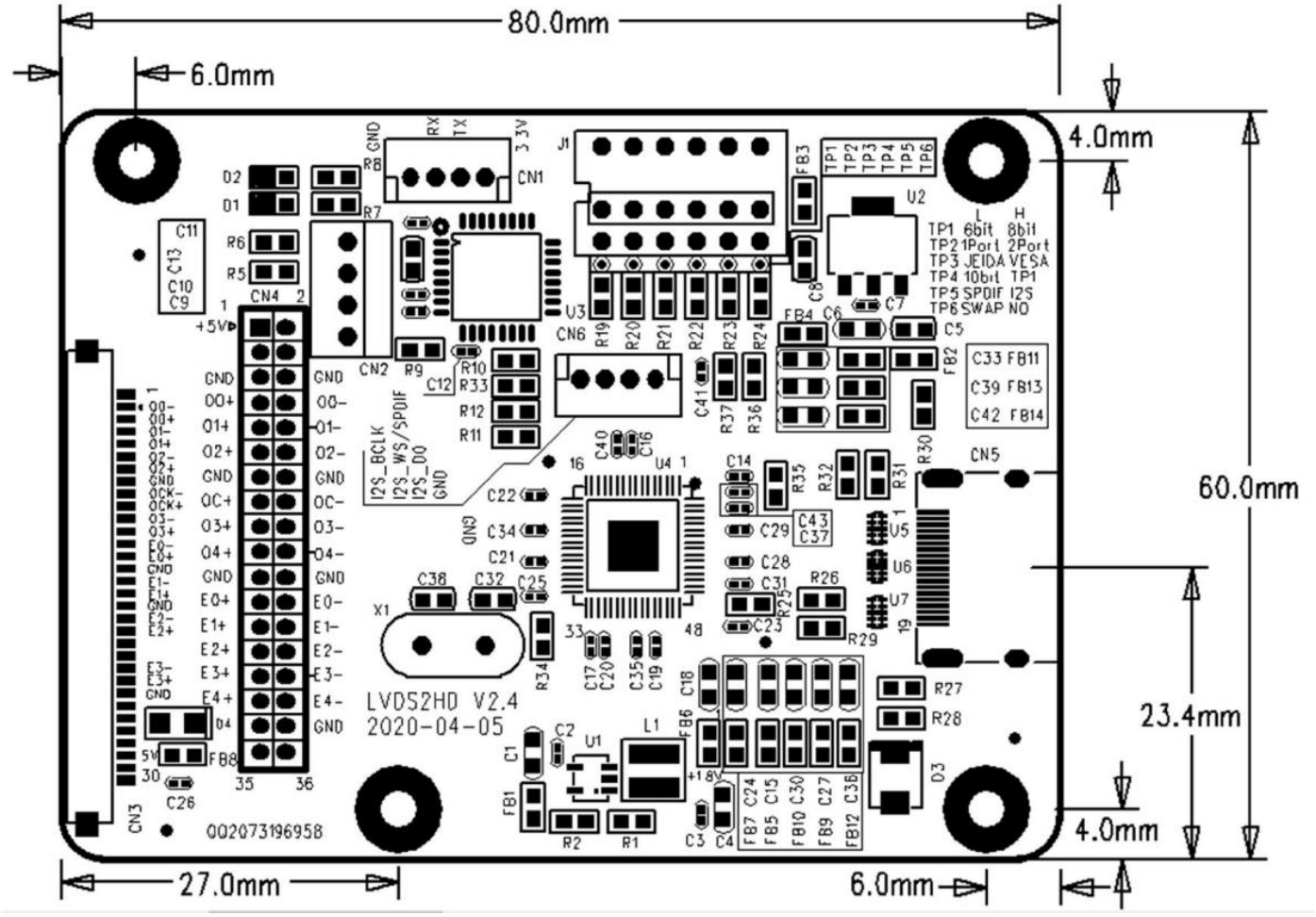

Figure 4: Mounting Dimensions

V. Debugging Notes

1. There are two LEDs on the board. After power-on, D1 blinks indicating the MCU is working properly. D2 stays on when the LVDS signal is received. If D2 does not light up, it means no LVDS signal is received - - check the wire sequence.

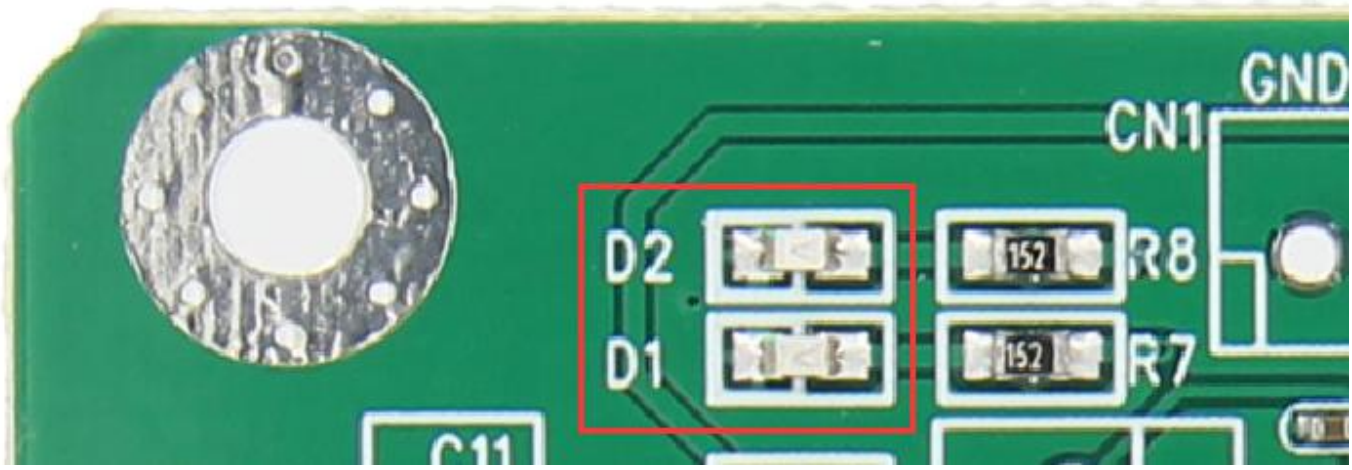

Figure 5: On-board LED

2. Before power-on, first confirm if LVDS is single-channel or dual-channel. Normally, 1080P signal is dual-channel, while

720P, 1366x768, 1024x768 and other resolutions are single-channel. For single-channel, short-circuit R20 on the board before powering on. (DIP switch (J1) can be installed for easier debugging.)

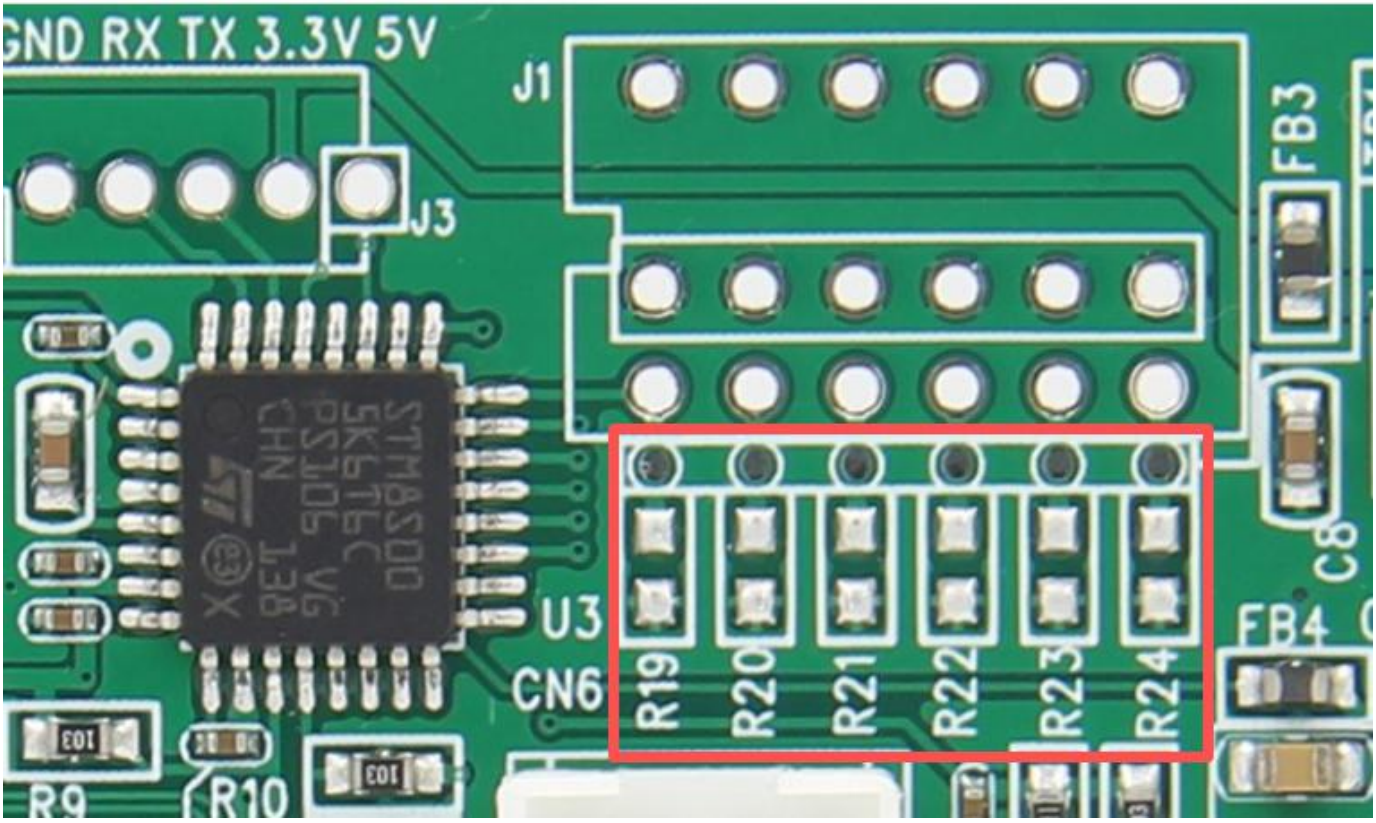

Figure 6: On-board Option Resistors

3. If D2 fails to light up and there's no HDMI output after power-on, the possible causes are:
   (1) Incorrect single/dual-channel configuration (R20);
   (2) Mismatched LVDS wire sequence;
   (3) Short-circuit R21 and retest (for VESA/JEIDA mapping);
   (4) Differential pair polarity (+/－) reversed (**Fix:** First swap only O2+/O2－ and OCLK+/OCLK－. If D2 lights up after swapping, polarity is correct; then swap all remaining twisted pairs).

Double-check to ensure correct wiring and configurations.

4. If D2 stays on with stable LVDS signal reception but the monitor still shows a black screen, verify if the monitor supports the current LVDS output resolution. HDMI signals are standard video formats (e.g., 1080P, 720P), and some TVs do not support non-standard resolutions such as 1366x768. In this case, convert the HDMI output to a DVI interface and input the signal via the monitor's DVI port.

5. If D2 flashes on and off, the issue may be caused by an excessive spread spectrum amplitude of the LVDS signal. While this solution supports clock spread spectrum, it has a certain amplitude limit – the LVDS signal cannot be received stably if the limit is exceeded. If the motherboard configuration is modifiable, disable the LVDS signal spread spectrum and retest.

6. If soldering is needed for testing due to mismatched connectors, differential pairs (+/－) must use twisted pairs, not loose wires.

7. If the cause cannot be identified, connect RX and GND of a USB-to-UART cable (typically CH340G) to TX and GND of CN1 on the board to view debug information, as shown below.

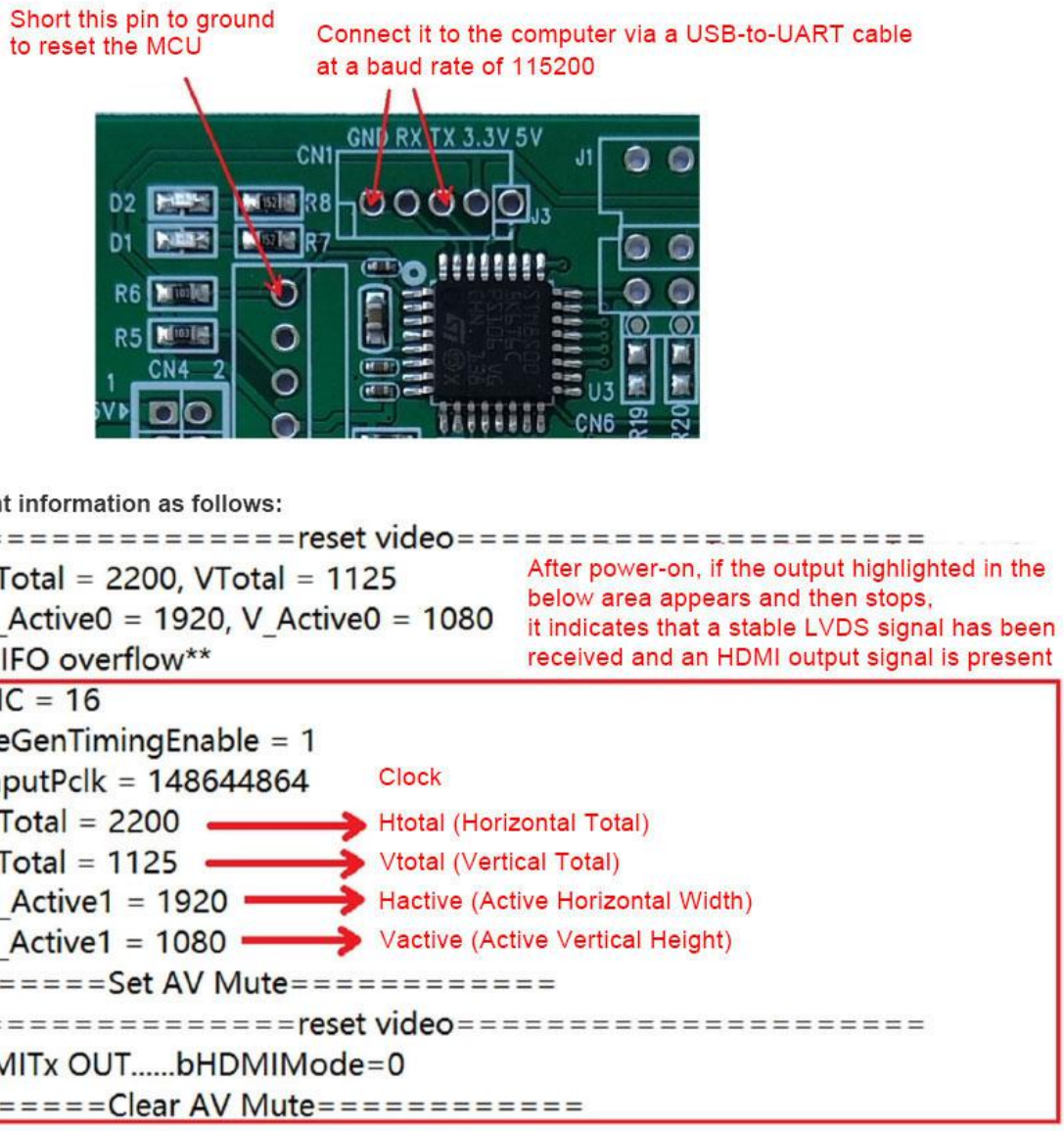

Figure 7: Debug Information

If the debug print scrolls continuously, the cause is definitely unstable LVDS signals, resulting in changes to the 5 parameters shown above:

(1) Ensure LVDS differential pairs use twisted pairs and are free from interference.

(2) If InputPclk fluctuates, check if SSC (Spread Spectrum Clocking) is enabled; disable it for testing if possible.

(3) If HTotal or VTotal fluctuates, check the synchronization mode in software settings (usually Freerun or FrameLock). For LVDS-to-HDMI output, the mode must be Freerun with fixed HTotal/VTotal. For direct LVDS display, HTotal/VTotal may vary within a limited range without affecting the image. **Thus, LVDS working for direct display does not guarantee valid LVDS-to-HDMI output.**

8. If stable timing is observed via the serial port but still no HDMI output, use a multimeter to check the DC level at the HDMI output port, as shown below:

● If the voltages on the 8 pins of the HDMI connector and the lower end of R31 (refer to the figure) are within the normal range, but the connected monitor still shows no image, the monitor may not support this resolution. TV HDMI ports usually support 720P, 1080P, etc., and do not support graphics card resolutions such as 1024 × 768 or custom arbitrary resolutions. If the LVDS output resolution is 1024 × 768 or similar, test with the monitor's DVI port using an HDMI-to-DVI cable.

● If the multimeter shows abnormal voltage on any pin in the figure, first verify the HDMI cable. If the cable is good, the board hardware is faulty, likely damaged by static electricity.

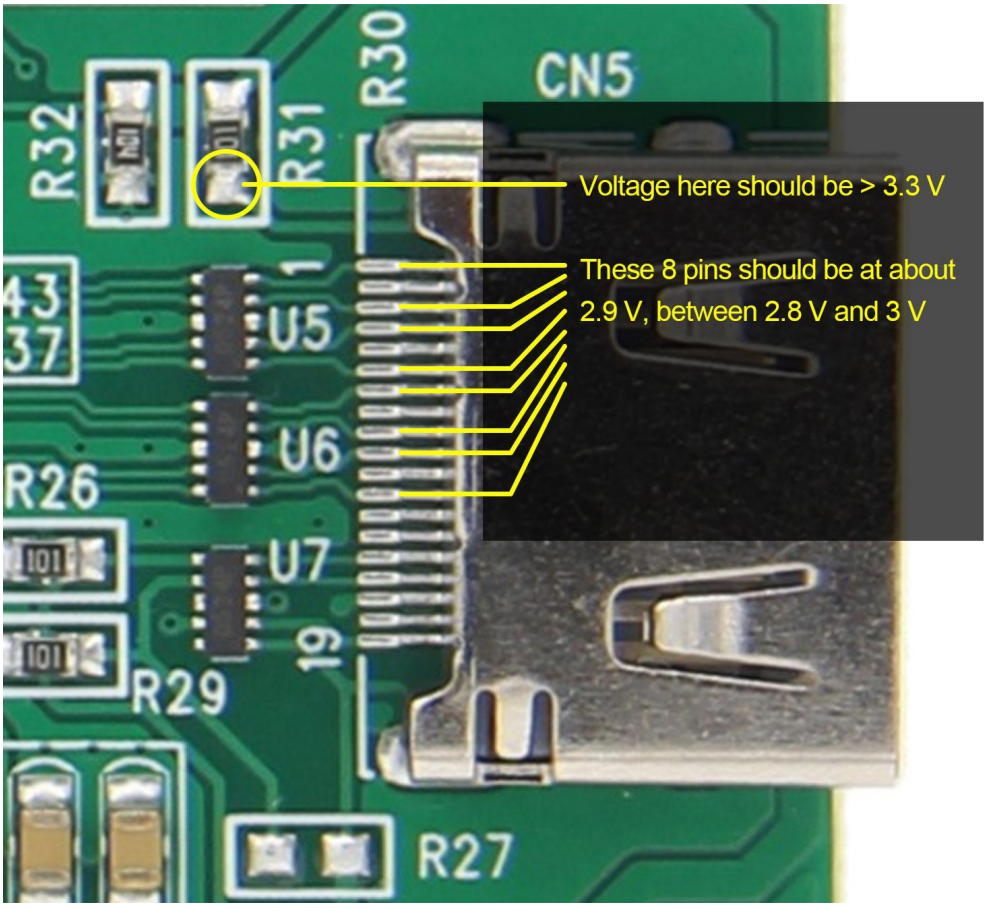

Figure 8: HDMI output DC level

VI. Supplied LVDS Cable and Definition

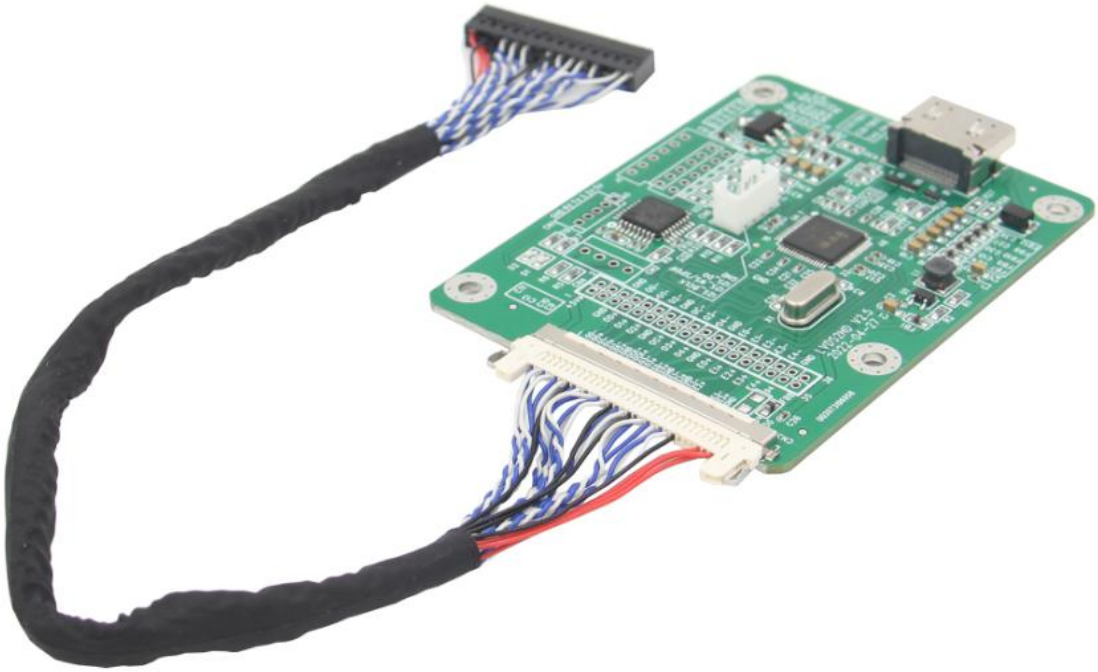

Figure 9: LVDS-to-HDMI Cable

White flat plug: 1 mm 30-pin, plugs directly into the LVDS2HD adapter board connector.

Black connector: 2.0 mm dual-row 30-pin (Signal definition shown below. **Note:** 3 red wires are 5V power supply; 4 black wires are GND. The left figure shows 7 GND pins, but only 4 are used; the other 3 pins are empty)

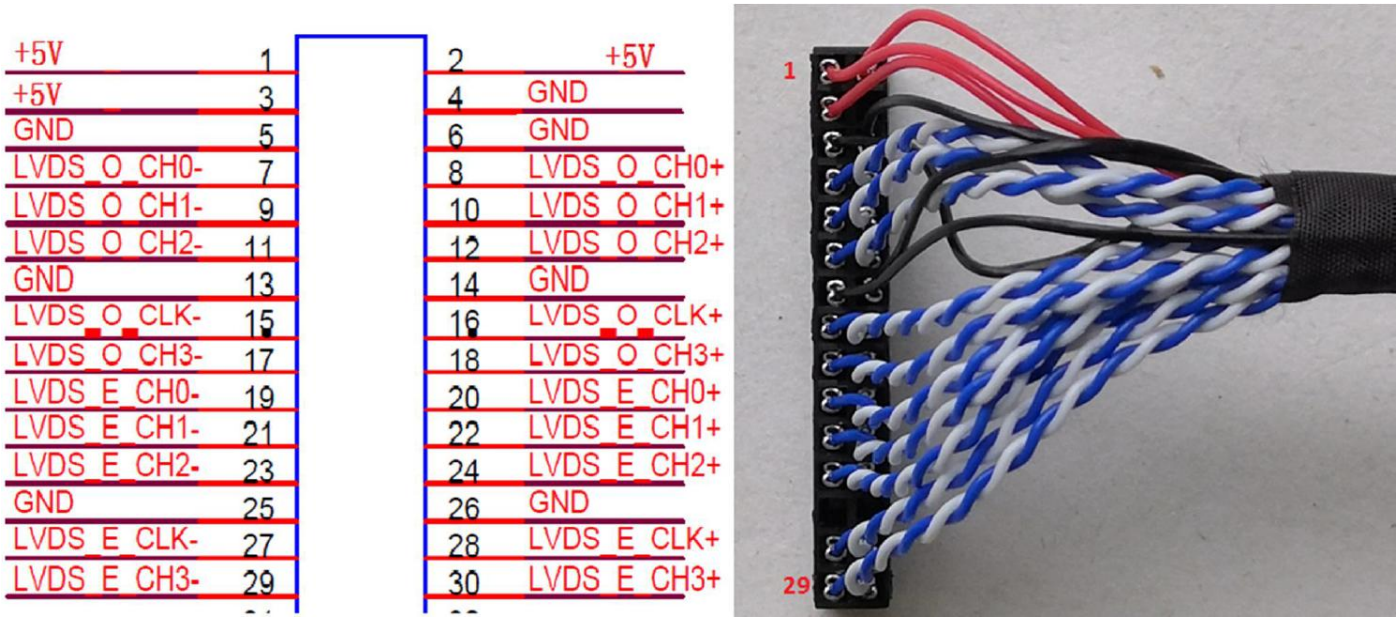

Figure 10: Signal Definition