



LCD Display Controller Board Specification V1.0

Model Name	STI-IDB04-D V1.0
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Contents

1. Features.....	2
2. Specifications.....	3
3. Function Layout.....	4
4. Interface Definition.....	5
5. Mechanical Dimensions.....	11
6. Configuration and Precautions.....	12
7. Key Materials List.....	13

Revision History

Revision	Date	Page	Summary	Author
1.0	2022.10.10	All	First release.	George

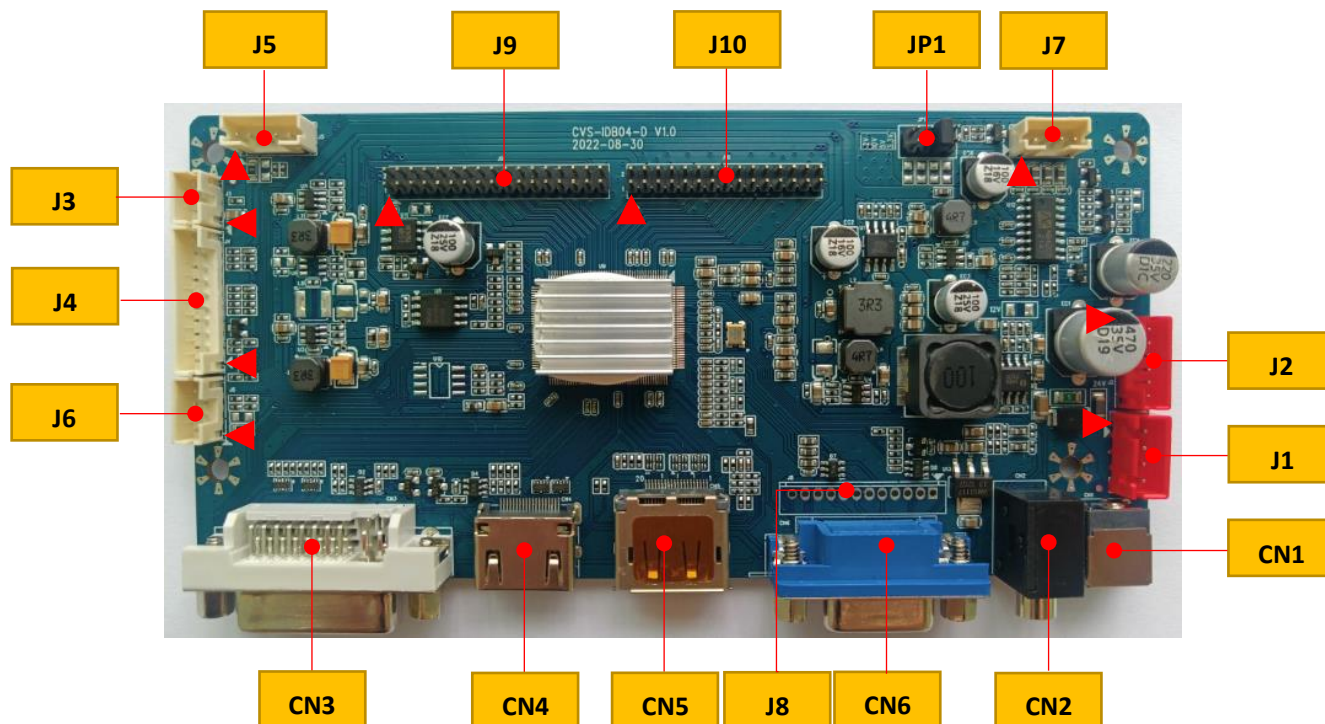
1. Features

- ✚ Support 1-Port/2-Port 6bit/8bit LVDS panel (Max. Resolution 1920x1200@60Hz)
- ✚ Support 4-Port 8bit LVDS panel (Max. Resolution 2560x1440@60Hz)
- ✚ Support 3.3V/5V/10V/12V panel voltage
- ✚ 1*VGA input
- ✚ 1*DVI input
- ✚ 1*HDMI1.4 input
- ✚ 1*DisplayPort 1.2 input
- ✚ Build-in 2x3W@4Ω Class-D AMP
- ✚ Support Audio input
- ✚ Support Keypad (5Key/6Key/7Key)
- ✚ Support IR Remote Controlling (NEC Code)
- ✚ 12V~24V DC power input
- ✚ Standby mode power consumption less than 0.5W
- ✚ Support DDC/CI/2B protocol
- ✚ Support UART protocol (TTL-Level)
- ✚ Support external sensor controlling (via I2C or GPIO)

2. Specifications

Chipset	RTD25xx	
Target Market	Industrial Display	
OSD Language	English、Simplified Chinese	
Panel	Type	LED/LCD
	Voltage	3.3V/5V/10V/12V
	Interface	4-Port 8bit LVDS, Max. 2560x1600@60Hz
		1-Port/2-Port 6bit/8bit LVDS, Max. 1920x1200@60Hz
LED Backlight	Dimming	PWM/DC (Default is PWM)
Video Input	VGA	15P D-Sub, Max. resolution is 2048x1152@60Hz
		PH2.0mm 12P, Max. resolution is 2048x1152@60Hz
	DVI	24+5 DVI-I, Max. resolution is 1920x1200@60Hz
	HDMI 1.4	19P Type-A, Max. resolution is 2560x1440@60Hz
	DisplayPort 1.2	20P, Max. resolution is 2560x1440@60Hz
Audio	Line In	3.5mm phone jack
	Speaker	2x3W@4Ω (THD+N<10%@1KHz) (Power Supply: 5V, Audio Input: 0.5Vrms)
Power	Power Input	DC 12V~24V
	Normal Consumption	Max. 5W (Board Only)
	Standby Consumption	< 0.5W (Board Only)
User Key Function	Power、Menu、Right、Left、Exit (Default)	

3. Function Layout



▶ : 1st Pin

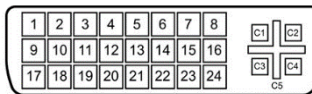
J1	Internal Power Input	XH2.54mm 4P
J2	Backlight Control	PH2.0mm 6P
J3	IR Receiver	PH2.0mm 3P
J4	Keypad	PH2.0mm 10P
J5	External Sensor Control	PH2.0mm 5P
J6	UART	PH2.0mm 4P
J7	Speaker	PH2.0mm 4P
J8	Internal VGA input	PH2.0mm 12P (optional)
J9	2-port LVDS Output	2x17Pin 2.0mm pitch
J10	2-port LVDS Output	2x15Pin 2.0mm pitch
CN6	VGA Signal Input	D-Sub 15P
CN5	DisplayPort Signal Input	DisplayPort 20P
CN4	HDMI Signal Input	HDMI Type-A 19P
CN3	DVI Signal Input	DVI-I 24+5P
CN2	Audio Input	3.5mm phone jack
CN1	External Power Input	2.0 DC Jack
JP1	Panel Voltage Select	2x4Pin 2.0mm pitch

4. Interface Definition

4.1 DVI Signal Input

Location - CN3: 24+5P

Pin assignment and definition:

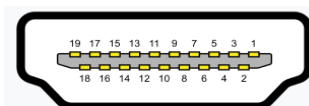


Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	Data2-	TMDS data2-	13	NC	
2	Data2+	TMDS data2+	14	+5V	+5V power supply
3	GND	Ground	15	GND	Ground
4	NC		16	HPD	Hot plug detection
5	NC		17	Data0-	TMDS data0-
6	DDC-SCL	IIC serial clock	18	Data0+	TMDS data0+
7	DDC-SDA	IIC serial data	19	GND	Ground
8	NC		20	NC	
9	Data1-	TMDS data1-	21	NC	
10	Data1+	TMDS data1+	22	GND	Ground
11	GND	Ground	23	Clock+	TMDS clock+
12	NC		24	Clock-	TMDS clock-
C1	NC		C4	NC	
C2	NC		C5	NC	
C3	NC				

4.2 HDMI Signal Input

Location - CN4: 19P Type-A

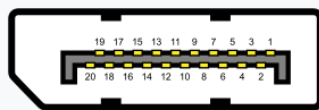
Pin assignment and definition:



Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	Data2+	TMDS data2+	11	GND	Ground
2	GND	Ground	12	Clock-	TMDS clock-
3	Data2-	TMDS data2-	13	CEC	CEC
4	Data1+	TMDS data1+	14	NC	NC
5	GND	Ground	15	DDC SCL	IIC serial clock
6	Data1-	TMDS data1-	16	DDC SDA	IIC serial data
7	Data0+	TMDS data0+	17	GND	Ground
8	GND	Ground	18	+5V	+5V
9	Data0-	TMDS data0-	19	HPD	Hot plug detection
10	Clock+	TMDS clock+			

4.3 DisplayPort Signal Input

Location - CN5: 20P

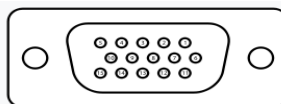


Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	ML_Lane 3 (n)	Lane 3 (negative)	11	GND	Ground
2	GND	Ground	12	ML_Lane 0 (p)	Lane 0 (positive)
3	ML_Lane 3 (p)	Lane 3 (positive)	13	CONFIG1	Connected to ground
4	ML_Lane 2 (n)	Lane 2 (negative)	14	CONFIG2	Connected to ground
5	GND	Ground	15	AUX CH (p)	Auxiliary CH (positive)
6	ML_Lane 2 (p)	Lane 2 (positive)	16	GND	Ground
7	ML_Lane 1 (n)	Lane 1 (negative)	17	AUX CH (n)	Auxiliary CH (negative)
8	GND	Ground	18	Hot Plug	Hot plug detection
9	ML_Lane 1 (p)	Lane 1 (positive)	19	Return	Return for power
10	ML_Lane 0 (n)	Lane 0 (negative)	20	DP_PWR	Power for connector

4.4 VGA Signal Input

Location - CN6: 15P Female D-Sub



Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	VGA_R+	RED video	9	VGA5V	VGA 5V
2	VGA_G+	GREEN video	10	GND	Ground
3	VGA_B+	BLUE video	11	GND	Ground
4	GND	Ground	12	DDC SDA	IIC serial data
5	GND	Ground	13	HSIN	Horizontal sync
6	VGA_R-	RED return	14	VSIN	Vertical sync
7	VGA_G-	GREEN return	15	DDC SCL	IIC serial clock
8	VGA_B-	BLUE return			

4.5 Power Input (External) Connector

Location - CN1: DC2.0 JACK (5.5*2.1mm)



4.6 Power Input (Internal) Connector

Location - J1: 4P wafer pitch = 2.54mm

Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	GND	Ground	3	VIN	DC 12V~24V power input
2	GND	Ground	4	VIN	DC 12V~24V power input

4.7 Backlight Control Connector

Location - J2: 6P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Parameter
1	VBL	Power supply for backlight	12V/24V DC power supply
2	VBL	Power supply for backlight	12V/24V DC power supply
3	EN	Backlight on/off control	High: > 4V, Low: < 1V
4	ADJ	PWM signal for dimming	DC 0~5V
5	GND	Ground	
6	GND	Ground	

4.8 IR Receiver Connector

Location - J3: 3P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	5V	DC +5V power supply	3	IR	IR signal input
2	GND	Ground			

4.9 Keypad Connector

Location - J4: 10P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Default	Pin No.	Symbol	Description	Default
1	K0	Key0 input	On/Off	6	K2	Key2 input	Left
2	LEDR	Red LED ctrl.	Red LED	7	K3	Key3 input	Auto
3	LEDG	Green LED ctrl.	Green LED	8	K4	Key4 input	Menu
4	GND	Ground	Ground	9	K5	Key5 input	Exit
5	K1	Key1 input	Right	10	K6	Key6 input	N/A

4.10 Sensor Control Connector

Location - J5: 5P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	VCC	DC +5V (or +3.3V) power supply	4	SCL	IIC Clock
2	GND	Ground	5	SDA	IIC Data
3	GPIO	GPIO port			

4.11 UART Connector

Location - J6: 4P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	VCC	DC +5V (or +3.3V) power supply	3	TX	UART Rx
2	RX	UART Rx	4	GND	Ground

4.12 Speaker Connector

Location - J7: 4P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	L+	Speaker output left ch+	3	R-	Speaker output right ch-
2	L-	Speaker output left ch-	4	R+	Speaker output right ch+

4.13 Internal VGA Signal Input

Location - J8: 12P pitch = 2.0mm

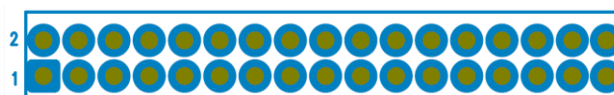
Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	GND	Ground	7	G	Green Video
2	VS	Vertical sync	8	GND	Ground
3	HS	Horizontal sync	9	B	Blue Video
4	GND	Ground	10	GND	Ground
5	R	Red Video	11	SDA	IIC serial data
6	GND	Ground	12	SCL	IIC serial clock

4.14 4-port LVDS Interface Connector

Location - J9: 2x17P pitch = 2.0mm

Pin assignment and definition:

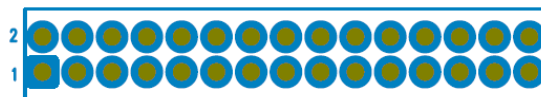


Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	VCC	Power supply for panel	18	TXA3+	LVDS A channel 3+
2	VCC	Power supply for panel	19	TXB0-	LVDS B channel 0-
3	VCC	Power supply for panel	20	TXB0+	LVDS B channel 0+
4	GND	Ground	21	TXB1-	LVDS B channel 1-
5	GND	Ground	22	TXB1+	LVDS B channel 1+
6	GND	Ground	23	TXB2-	LVDS B channel 2-
7	TXA0-	LVDS A channel 0-	24	TXB2+	LVDS B channel 2+
8	TXA0+	LVDS A channel 0+	25	GND	Ground
9	TXA1-	LVDS A channel 1-	26	GND	Ground
10	TXA1+	LVDS A channel 1+	27	TXBC-	LVDS B channel clock-
11	TXA2-	LVDS A channel 2-	28	TXBC+	LVDS B channel clock+
12	TXA2+	LVDS A channel 2+	29	TXB3-	LVDS B channel 3-
13	GND	Ground	30	TXB3+	LVDS B channel 3+
14	GND	Ground	31	SCL	IIC clock
15	TXAC-	LVDS A channel clock-	32	SDA	IIC data
16	TXAC+	LVDS A channel clock+	33	CTRL1	Control1
17	TXA3-	LVDS A channel 3-	34	CTRL2	Control2

4.15 LVDS Interface Connector

Location - J10: 2x15P pitch = 2.0mm

Pin assignment and definition:



Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	VCC	Power supply for panel	16	TXCC+	LVDS C channel clock+
2	VCC	Power supply for panel	17	TXC3-	LVDS C channel 3-
3	VCC	Power supply for panel	18	TXC3+	LVDS C channel 3+
4	GND	Ground	19	TXD0-	LVDS D channel 0-
5	GND	Ground	20	TXD0+	LVDS D channel 0+
6	GND	Ground	21	TXD1-	LVDS D channel 1-
7	TXC0-	LVDS C channel 0-	22	TXD1+	LVDS D channel 1+
8	TXC0+	LVDS C channel 0+	23	TXD2-	LVDS D channel 2-
9	TXC1-	LVDS C channel 1-	24	TXD2+	LVDS D channel 2+
10	TXC1+	LVDS C channel 1+	25	GND	Ground
11	TXC2-	LVDS C channel 2-	26	GND	Ground
12	TXC2+	LVDS C channel 2+	27	TXDC-	LVDS D channel clock-
13	GND	Ground	28	TXDC+	LVDS D channel clock+

14	GND	Ground	29	TXD3-	LVDS D channel 3-
15	TXCC-	LVDS C channel clock-	30	TXD3+	LVDS D channel 3+

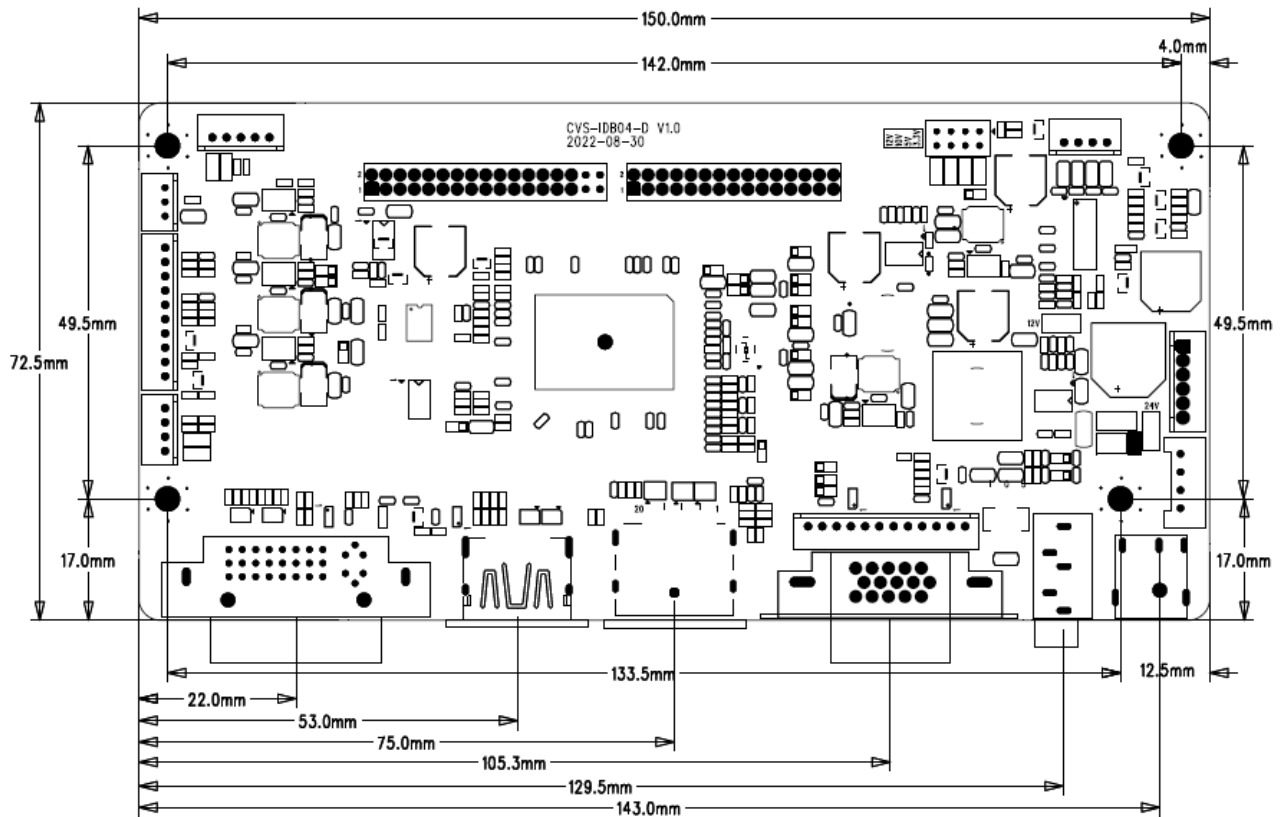
4.16 Panel Voltage Select

Location - JP1: 2x4P pitch = 2.0mm Jumper

4.17 Audio Input Connector

Location - CN2: 3.5mm phone jack

5. Mechanical Dimensions



PCB Dimensions

- ✚ PCB Length = 150.0mm
- ✚ PCB Width = 72.5mm
- ✚ PCB Thickness = 1.6mm
- ✚ PCBA (PCB + Component) Thickness $\leq$ 15.0mm
- ✚ Screw Hole Diameter = 3.5mm

6. Configuration and Precautions

6.1 Temperature

✚ Storage: -20°C~+70°C

✚ Operation: 0°C~+40°C

6.2 Humidity

✚ Storage: 5%~95% (non-condensing)

✚ Operation: 10%~90% (non-condensing)

6.3 Altitude

✚ Storage: 20000ft (Max.)

✚ Operation: 10000ft (Max.)

7. Key Materials List

No.	Part Number	Function Description	Vendor
1	RTD25xx	Scaler	Realtek
2	EUP3270	DC-DC	EUTECH
3	FR8205	DC-DC	Fitipower
4	FR9855	DC-DC	Fitipower
5	SY8120	DC-DC	Silergy
6	ZB25VQ80	SPI flash	Zbit
7	NS4205	Class-D AMP	Nsiway
8	X32251431818MSB4SI	SMD Crystal	YXC
9	PCB	1.6mm FR-4 E=4.2 ±10% 2-Layers 1.0oz 150.0x72.5mm	JLC