



LCD Display Controller Board Specification V1.0

Model Name	STI-IDB04-R V1.0
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Contents

1. Features.....	2
2. Specifications.....	3
3. Function Layout.....	4
4. Interface Definition.....	5
5. Mechanical Dimensions.....	10
6. Configuration and Precautions.....	11
7. Key Materials List.....	12

Revision History

Revision	Date	Page	Summary	Author
1.0	2022.6.10	All	First release.	George

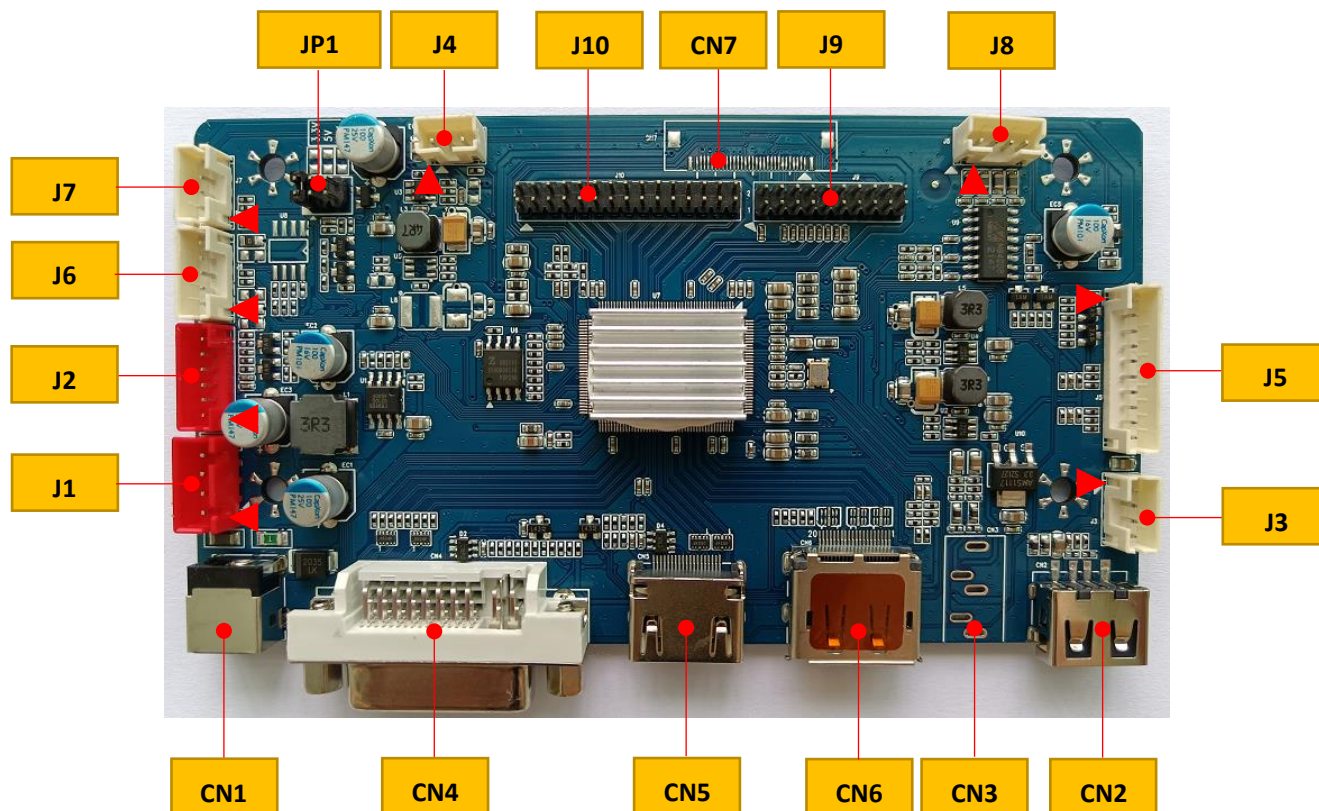
1. Features

- ✚ Support 2-Port 6bit/8bit LVDS panel (Max. Resolution 1920x1200@60Hz)
- ✚ Support 2-lane/4-lane eDP HBR panel (Max. Resolution 2560x1600@60Hz)
- ✚ Support 3.3V/5V/12V panel voltage
- ✚ 1*DVI input
- ✚ 1*HDMI1.4 input
- ✚ 1*DisplayPort 1.2 input
- ✚ Build-in 2x3W@4Ω Class-D AMP
- ✚ Support Audio input (Reserve)
- ✚ Support Keypad (5Key/6Key/7Key)
- ✚ Support IR Remote Controlling (NEC Code)
- ✚ Support USB bypass touch panel
- ✚ 12V 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/12V
	Interface	2-lane/4-lane eDP, Max. 2560x1600@60Hz
		2-Port 6bit/8bit LVDS, Max. 1920x1200@60Hz
LED Backlight	Dimming	PWM/DC (Default is PWM)
Video Input	DVI	24+5 DVI-I, Max. resolution is 1920x1080@60Hz
	HDMI 1.4	19P Type-A, Max. resolution is 1920x1080@60Hz
	DisplayPort 1.2	20P, Max. resolution is 1920x1080@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
	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

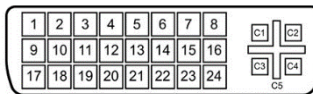
J1	Internal Power Input	XH2.54mm 4P
J2	Backlight Control	PH2.0mm 6P
J3	Touch	PH2.0mm 4P
J4	IR Receiver	PH2.0mm 3P
J5	Keypad	PH2.0mm 10P
J6	External Sensor Control	PH2.0mm 5P
J7	UART	PH2.0mm 4P
J8	Speaker	PH2.0mm 4P
J9	4-lane eDP Output	2x10Pin 2.0mm pitch
J10	2-port LVDS Output	2x15Pin 2.0mm pitch
CN7	2-lane eDP Output	I-PEX FPC 20455-030E-76 (optional)
CN6	DisplayPort Signal Input	DisplayPort 20P
CN5	HDMI Signal Input	HDMI Type-A 19P
CN4	DVI Signal Input	DVI-I 24+5P
CN3	Audio Input	3.5mm phone jack (optional)
CN2	USB	USB2.0 Type-A
CN1	External Power Input	2.0 DC Jack
JP1	Panel Voltage Select	2x3Pin 2.0mm pitch

4. Interface Definition

4.1 DVI Signal Input

Location - CN4: 24+5P

Pin assignment and definition:

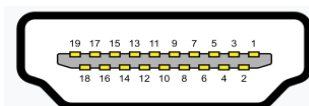


Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	Data2-	TMDS data2-	13	NC	
2	Data2+	TMDS data2+	14	+5V	+5V power supply
3	GND	Ground	15	GND	Ground
4	NC		16	HPD	Hot plug detection
5	NC		17	Data0-	TMDS data0-
6	DDC-SCL	IIC serial clock	18	Data0+	TMDS data0+
7	DDC-SDA	IIC serial data	19	GND	Ground
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 - CN5: 19P Type-A

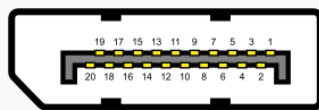
Pin assignment and definition:



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 - CN6: 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 Power Input (External) Connector

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



4.5 Power Input (Internal) Connector

Location - J1: 4P wafer pitch = 2.54mm

Pin assignment and definition:

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

4.6 Backlight Control Connector

Location - J2: 6P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Parameter
1	12V	Power supply for backlight	+12V DC power supply
2	12V	Power supply for backlight	+12V 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	
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4.7 Touch Panel Connector

Location - J3: 4P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	USB-5V	USB +5V	3	D+	USB data+
2	D-	USB data-	4	GND	Ground

4.8 IR Receiver Connector

Location - J4: 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 - J5: 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 - J6: 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 - J7: 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	TXD	UART Rx
2	RXD	UART Rx	4	GND	Ground

4.12 Speaker Connector

Location - J8: 4P wafer pitch = 2.0mm

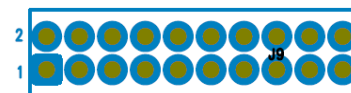
Pin assignment and definition:

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 4-lane eDP Interface Connector

Location - J9: 2x10P pitch = 2.0mm

Pin assignment and definition:

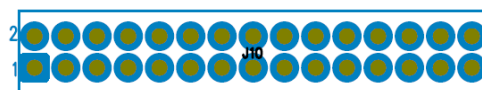


Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	VCC	Power supply for panel	11	LANE3-	Signal Link Negative Lane3
2	VCC	Power supply for panel	12	LANE3+	Signal Link Positive Lane3
3	GND	Ground	13	GND	Ground
4	GND	Ground	14	GND	Ground
5	LANE0-	Signal Link Negative Lane0	15	AUX-	Signal Aux Negative Ch.
6	LANE0+	Signal Link Positive Lane0	16	AUX+	Signal Aux Positive Ch.
7	LANE1-	Signal Link Negative Lane1	17	GND	Ground
8	LANE1+	Signal Link Positive Lane1	18	GND	Ground
9	LANE2-	Signal Link Negative Lane2	19	HPD	Hot plug detection
10	LANE2+	Signal Link Positive Lane2	20	GND	Ground

4.14 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	TXOC+	LVDS odd clock channel+
2	VCC	Power supply for panel	17	TXO3-	LVDS odd channel 3-

3	VCC	Power supply for panel	18	TXO3+	LVDS odd channel 3+
4	GND	Ground	19	TXE0-	LVDS even channel 0-
5	GND	Ground	20	TXE0+	LVDS even channel 0+
6	GND	Ground	21	TXE1-	LVDS even channel 1-
7	TXO0-	LVDS odd channel 0-	22	TXE1+	LVDS even channel 1+
8	TXO0+	LVDS odd channel 0+	23	TXE2-	LVDS even channel 2-
9	TXO1-	LVDS odd channel 1-	24	TXE2+	LVDS even channel 2+
10	TXO1+	LVDS odd channel 1+	25	GND	Ground
11	TXO2-	LVDS odd channel 2-	26	GND	Ground
12	TXO2+	LVDS odd channel 2+	27	TXEC-	LVDS even clock channel-
13	GND	Ground	28	TXEC+	LVDS even clock channel+
14	GND	Ground	29	TXE3-	LVDS even channel 3-
15	TXOC-	LVDS odd clock channel-	30	TXE3+	LVDS even channel 3+

4.15 2-lane eDP Interface Connector

Location - CN7: I-PEX FPC 30P pitch = 0.5mm

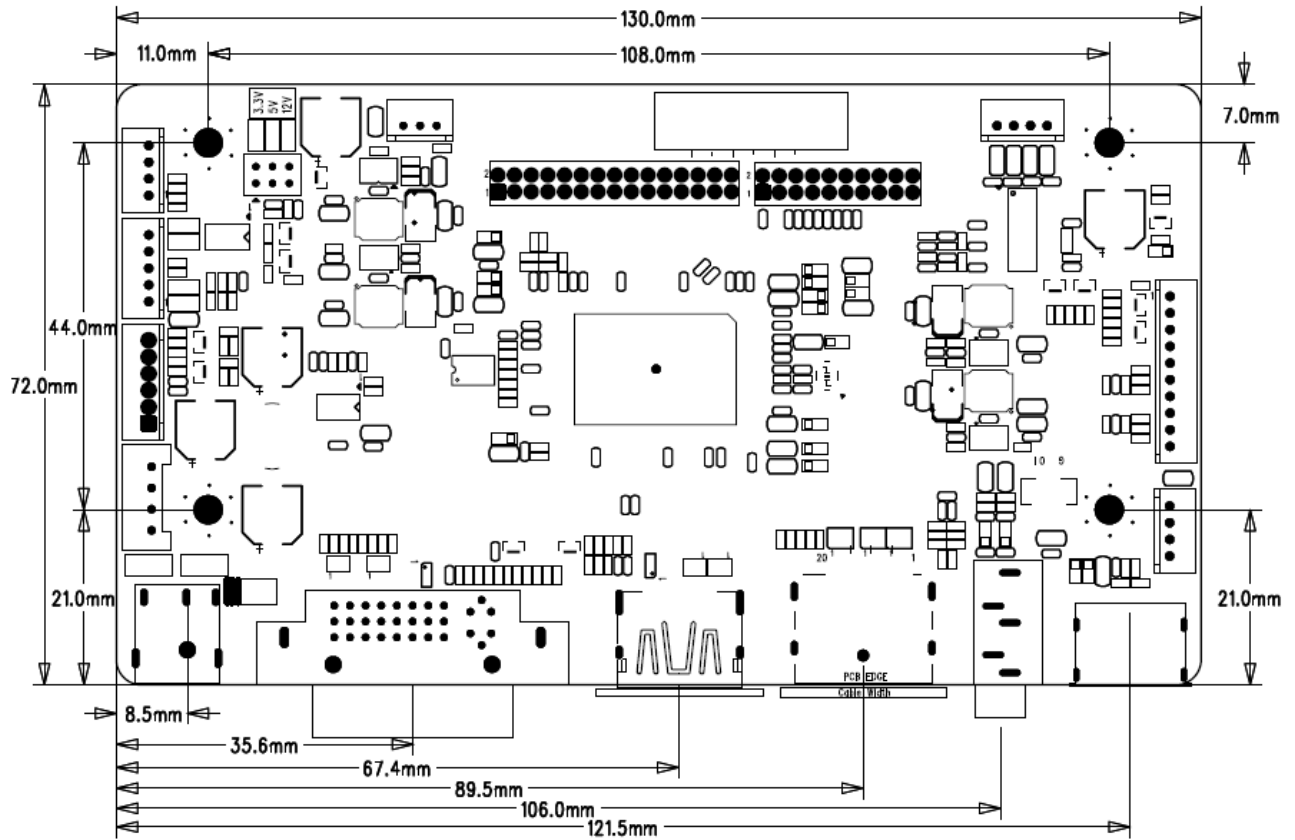
Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	NC	No connection	16	GND	Ground
2	GND	Ground	17	HPD	Hot plug detection
3	LANE1-	Signal Link Negative Lane1	18	GND	Ground
4	LANE1+	Signal Link Positive Lane1	19	GND	Ground
5	GND	Ground	20	GND	Ground
6	LANE0-	Signal Link Negative Lane0	21	GND	Ground
7	LANE0+	Signal Link Positive Lane0	22	BL_EN	LED Backlight Control
8	GND	Ground	23	BL_PWM	PWM signal for dimming
9	AUX+	Signal Aux Positive Ch.	24	NC	No connection
10	AUX-	Signal Aux Negative Ch.	25	NC	No connection
11	GND	Ground	26	VLED	LED backlight power
12	VCC	Power supply for panel	27	VLED	LED backlight power
13	VCC	Power supply for panel	28	VLED	LED backlight power
14	NC	No connection	29	VLED	LED backlight power
15	GND	Ground	30	NC	No connection

4.16 Panel Voltage Select

Location - JP1: 2x3P pitch = 2.0mm Jumper

5. Mechanical Dimensions



PCB Dimensions

- ✚ PCB Length = 130.0mm
- ✚ PCB Width = 72.0mm
- ✚ PCB Thickness = 1.6mm
- ✚ PCBA (PCB + Component) Thickness $\leq 15.0\text{mm}$
- ✚ 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	FR8205	DC-DC	Fitipower
3	FR9855	DC-DC	Fitipower
4	JW5052	DC-DC	JoulWatt
5	ZB25VQ80	SPI flash	Zbit
6	NS4205	Class-D AMP	Nsiway
7	X32251431818MSB4SI	SMD Crystal	YXC
8	PM101M025E077PTR PM101M016E058PTR	Solid Capacitor	CapXon
9	T491B107K010AT	TAN Capacitor	KEMET
10	PCB	1.6mm FR-4 E=4.2 ±10% 2-Layers 1.0oz 130.0x72.0mm	JLC