



LCD Display Controller Board

Specification V1.5

Model Name	STI-IDB06-K-V1.5
Release Date	2023-4-18
Release Version	V1.5

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Revision History

Revision	Date	Page	Description	Author
1.0	2020.9.16	All	First issued.	George
1.1	2020.11.12	4,7	Add external sensor interface	George
1.2	2021.3.8	8	Update keypad description	George
1.3	2021.10.10	4	Update appearance photograph	George
1.4	2022.8.15	4	Update appearance photograph	George
1.5	2023.4.18	3	Add audio description	George
1.5	2023.4.18	4	Update appearance photograph	George
1.5	2023.4.18	11	Update DC-DC description	George

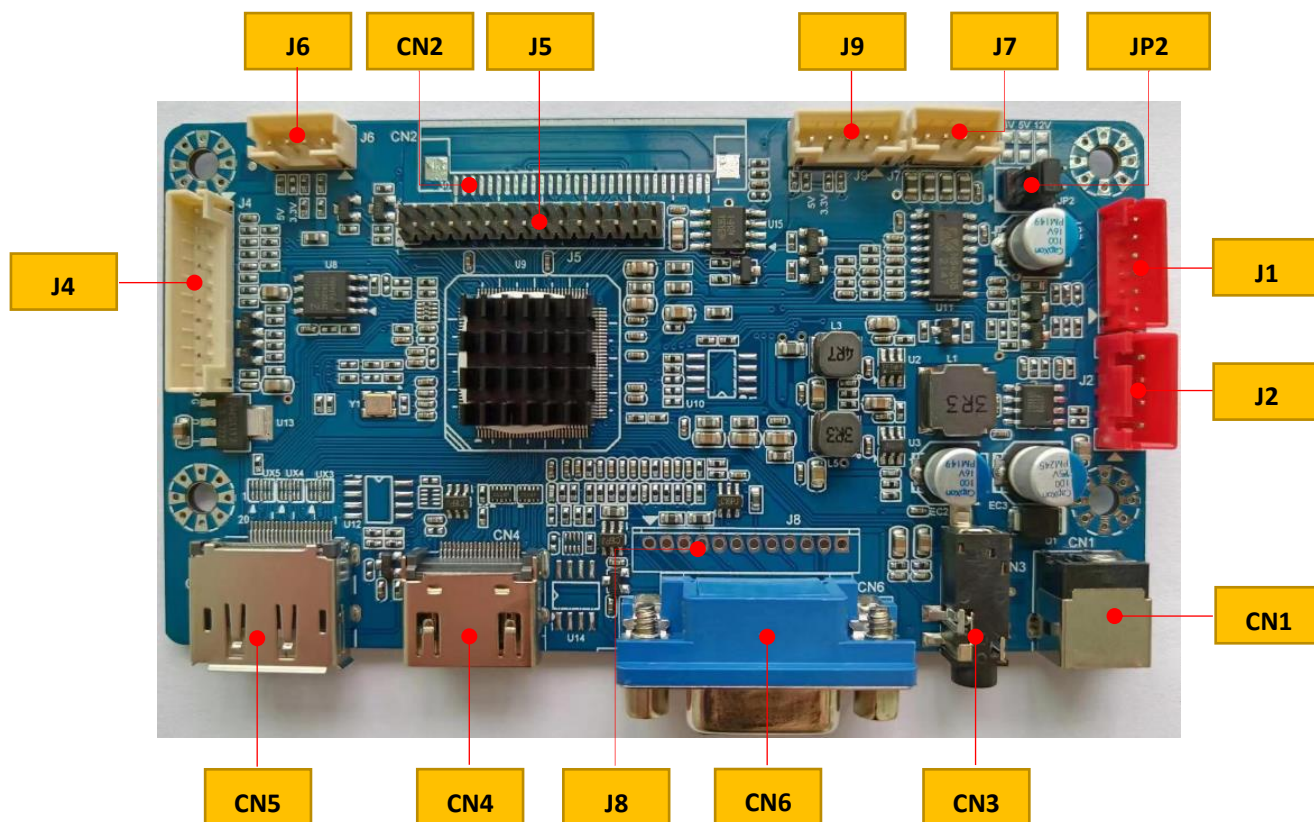
1. Features

- ✚ Resolution up to 1920x1200@60Hz
- ✚ Support 1-ch/2-ch 6-bit/8-bit LVDS panel
- ✚ Support 3.3V/5V/12V panel voltage
- ✚ 1*VGA input
- ✚ 1*HDMI1.4a input
- ✚ 1*DisplayPort 1.2 input
- ✚ Build-in 2x3W Class-D AMP at 4ohm
- ✚ Support Headphones output
- ✚ Support Keypad (5Key/6Key/7Key)
- ✚ Support IR remote controlling (NEC Code)
- ✚ 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 ADC)

2. Specifications

Chipset	RTD25xx	
Target Market	Industrial Display	
OSD Language	English、Simplified Chinese	
Panel	Voltage	3.3V/5V/12V
	Interface	1-ch/2-ch 6-bit/8-bit LVDS
	Max. Resolution	1920x1200@60Hz
LED Backlight	Dimming	PWM/DC (Default is PWM)
Video Input	VGA	15P D-Sub, Max. resolution is 1920x1080@60Hz
		PH2.0mm 12P, Max. resolution is 1920x1080@60Hz
	HDMI 1.4a	19P Type-A, Max. resolution is 1920x1080@60Hz
	DisplayPort 1.2	20P, Max. resolution is 1920x1080@60Hz
Audio Output	Speaker	2x3W Class-D AMP@4Ω (THD+N<10%@1KHz) (Power Supply: 5V, Audio Input: 0.5Vrms)
	Headphones	3.5mm phone jack
Power	Power Input	DC 12V
	Normal Consumption	Max. 3W (Board Only)
	Standby Consumption	< 0.5W (Board Only)
User Key Function	Power、Menu、Right、Left、Exit、Auto (Default)	

3. Function Layout



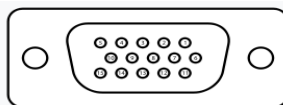
J1	Backlight Control	PH2.0mm 6P
J2	Internal Power Input	XH2.54mm 4P
J4	Keypad	PH2.0mm 10P
J5	LVDS Output	2x15Pin 2.0mm pitch
J6	UART	PH2.0mm 4P
J7	Speaker	PH2.0mm 4P
J8	Internal VGA input	PH2.0mm 12P (optional)
J9	External Sensor Control	PH2.0mm 5P
CN6	VGA Signal Input	D-Sub 15P
CN5	DisplayPort Signal Input	
CN4	HDMI Signal Input	HDMI Type-A 19P
CN3	Headphone Output	3.5mm phone jack
CN2	LVDS Output	1.0mm pitch FPC
CN1	External Power Input	2.0 DC Jack
JP2	Panel Voltage Select	2x3Pin 2.0mm pitch

4. Interface Definition

4.1 VGA Signal Input

Location - CN6: 15P Female D-Sub

Pin assignment and definition:

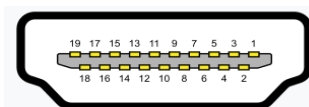


Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	VGA_R+	RED video	9	VGA5V	VGA 5V power supply
2	VGA_G+	GREEN video	10	GND	Ground
3	VGA_B+	BLUE video	11	GND	Ground
4	GND	Ground	12	DDC SDA	IIC serial data
5	GND	Ground	13	HSIN	Horizontal sync
6	VGA_R-	RED return	14	VSIN	Vertical sync
7	VGA_G-	GREEN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

4.2 HDMI Signal Input

Location - CN4: 19P Type-A

Pin assignment and definition:

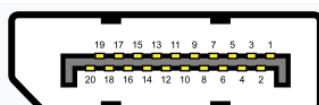


Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	Data2+	TMDS data2+	11	GND	Ground
2	GND	Ground	12	Clock-	TMDS clock-
3	Data2-	TMDS data2-	13	CEC	CEC
4	Data1+	TMDS data1+	14	NC	NC
5	GND	Ground	15	DDC SCL	IIC serial clock
6	Data1-	TMDS data1-	16	DDC SDA	IIC serial data
7	Data0+	TMDS data0+	17	GND	Ground
8	GND	Ground	18	+5V	+5V power supply
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 Power Input (External) Connector

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



4.5 Power Input (Internal) Connector

Location - J2: 4P wafer pitch = 2.54mm

Pin assignment and definition:

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

4.6 Backlight Control Connector

Location - J1: 6P wafer pitch = 2.0mm

Pin assignment and definition:

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

4.7 Speaker Connector

Location - J7: 4P wafer pitch = 2.0mm

Pin assignment and definition:

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

4.8 Sensor Control Connector

Location - J9: 5P wafer pitch = 2.0mm

Pin assignment and definition:

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

4.9 UART Connector

Location - J6: 4P wafer pitch = 2.0mm

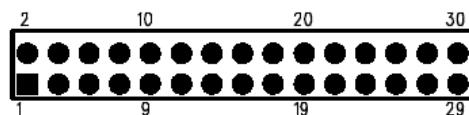
Pin assignment and definition:

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

4.10 LVDS Interface Connector

Location - J5: 2x15P pitch = 2.0mm

Pin assignment and definition:



Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	VCC	Power supply for panel	16	TOC+	LVDS odd clock channel+
2	VCC	Power supply for panel	17	TO3-	LVDS odd channel 3-
3	VCC	Power supply for panel	18	TO3+	LVDS odd channel 3+
4	GND	Ground	19	TE0-	LVDS even channel 0-
5	GND	Ground	20	TE0+	LVDS even channel 0+
6	GND	Ground	21	TE1-	LVDS even channel 1-
7	TO0-	LVDS odd channel 0-	22	TE1+	LVDS even channel 1+
8	TO0+	LVDS odd channel 0+	23	TE2-	LVDS even channel 2-
9	TO1-	LVDS odd channel 1-	24	TE2+	LVDS even channel 2+
10	TO1+	LVDS odd channel 1+	25	GND	Ground
11	TO2-	LVDS odd channel 2-	26	GND	Ground

12	TO2+	LVDS odd channel 2+	27	TEC-	LVDS even clock channel-
13	GND	Ground	28	TEC+	LVDS even clock channel+
14	GND	Ground	29	TE3-	LVDS even channel 3-
15	TOC-	LVDS odd clock channel-	30	TE3+	LVDS even channel 3+

4.11 Keypad Connector

Location - J4: 10P wafer pitch = 2.0mm

Pin assignment and definition:

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

4.12 Internal VGA Signal Input

Location - J8: 12P pitch = 2.0mm

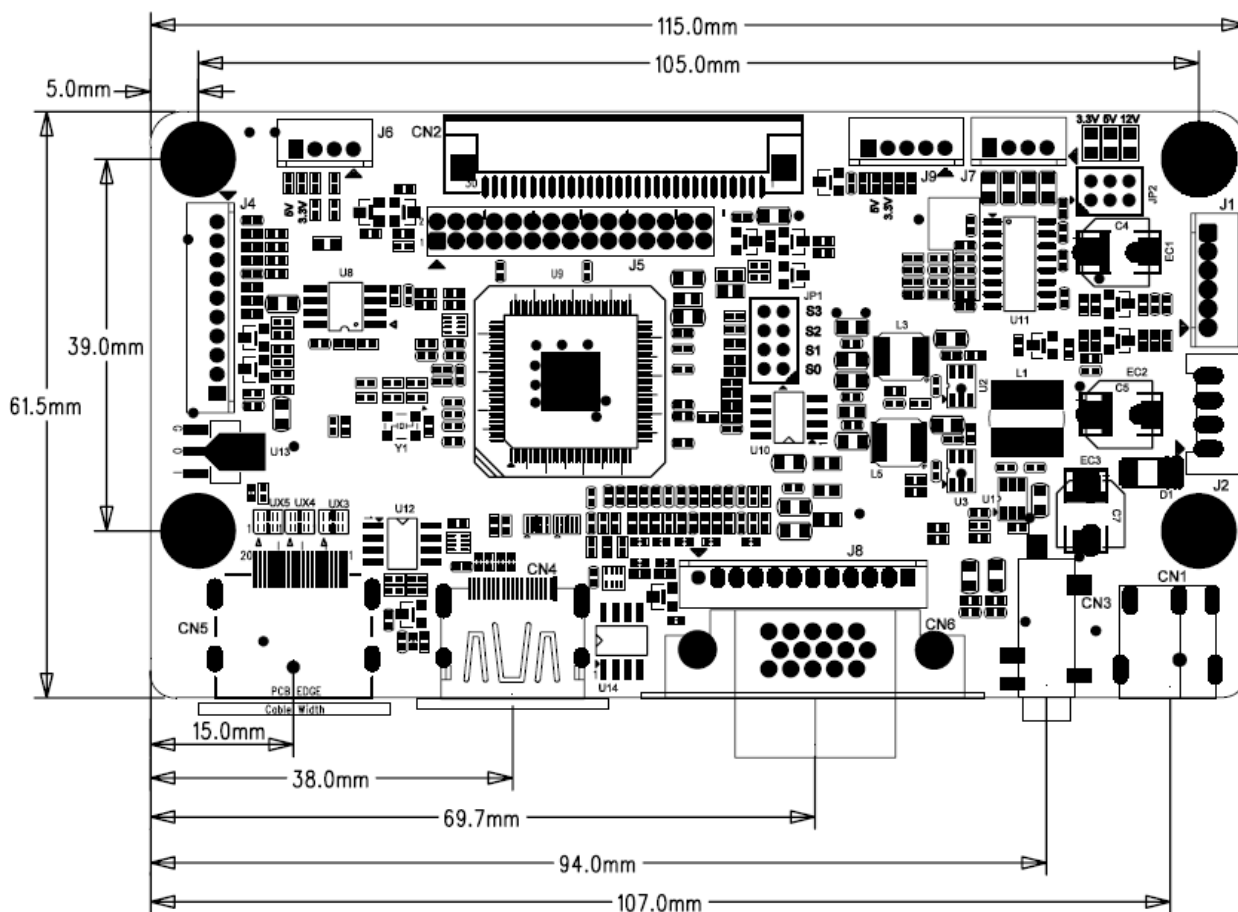
Pin assignment and definition:

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

4.13 Panel Voltage Select

Location - JP2: 2x3P pitch = 2.0mm

5. Mechanical Dimensions



PCB Dimensions

- ✚ PCB Length = 115.0mm
- ✚ PCB Width = 61.5mm
- ✚ 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: $-30^{\circ}\text{C} \sim +80^{\circ}\text{C}$
- ✚ Operation: $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$

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	SY8120	DC-DC	Silergy
3	FR8205	DC-DC	Fitipower
4	FR9855	DC-DC	Fitipower
5	ZB25VQ80	SPI flash	Zbit
6	NS4205	Class-D AMP	Nsiway
7	X32251431818	SMD Crystal	YXC
8	PM101M016/25	Solid Capacitor	CapXon
9	PCB	1.6mm FR-4 E=4.2 ±10% 2-Layers 1.0oz 115.0x61.5mm	ZXH