LCD Display Controller Board Specification

Model Name	BTP-LC-IDB06
Release Date	2024-2-26
Release Version	V1.0

Contents

Revision History

Revision	Date	Page	Description	Author
1.0	2023.5.16	All	First issued.	Sandy

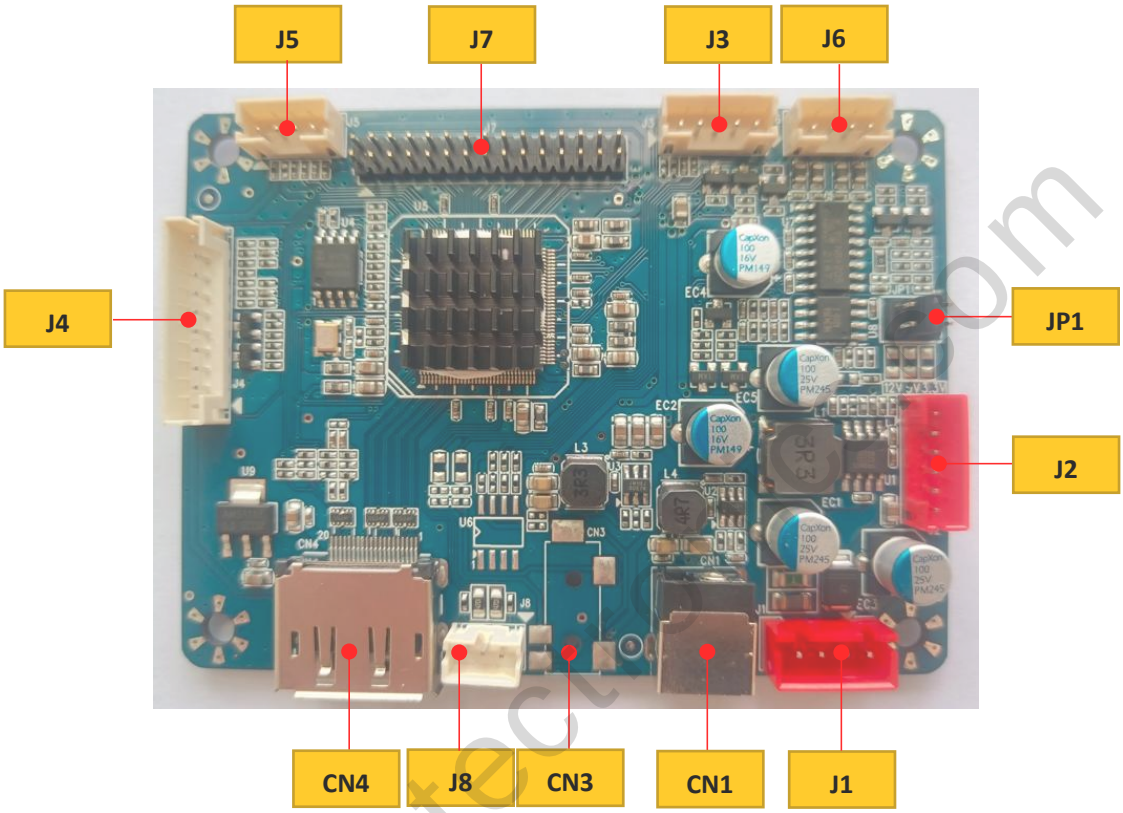
1. Features

- Resolution up to 1920x1200@60Hz
- Support 1-ch/2-ch 6-bit/8-bit LVDS panel
- Support 3.3V/5V/12V panel voltage
- 1*DisplayPort 1.2 input
- Build-in 2x3W Class-D AMP at 4ohm
- Support Headphones output (optional)
- Support keypad (5Key/6Key/7Key)
- Support IR remote controlling (NEC Code)
- DC-12V 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	IDB06	
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 Type	PWM/DC (Default is PWM)
Video Input	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 (optional)
Power	Power Input	DC-12V
	Normal Consumption	Max. 3W (Board Only)
	Standby Consumption	< 0.5W (Board Only)
OSD Key Function	Power、Menu、Right、Left、Exit (Default)	

3. Function Layout

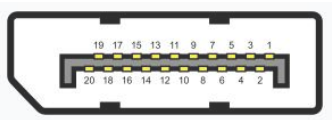


J1	Internal Power Input	XH2.54mm 4P
J2	Backlight Control	PH2.0mm 6P
J3	External Sensor Control	PH2.0mm 5P
J4	Keypad	PH2.0mm 10P
J5	UART	PH2.0mm 4P
J6	Speaker	PH2.0mm 4P
J7	LVDS Output	2x15Pin 2.0mm pitch
J8	ISP	PH2.0mm 3P
CN4	DisplayPort Signal Input	STD 20P
CN3	Headphones Output	3.5mm phone jack (optional)
CN1	DC Power Input	2.0 DC Jack
JP1	Panel Voltage Select	2x3Pin 2.0mm pitch

4. Interface Definition

4.1 DisplayPort Signal Input

Location - CN4: 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

4.2 Power Input (External) Connector

Location - CN1: DC2.0 Jack (6.0*2.0mm)

4.3 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	12V	DC 12V power input
2	GND	Ground	4	12V	DC 12V power input

4.4 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 power supply
2	12V	Power supply for backlight	+12V power supply
3	ENA	Backlight on/off control	High: > 4V, Low: < 1V
4	ADJ	PWM signal for dimming	DC 0~5V
5	GND	Ground	

6	GND	Ground	

4.5 Speaker Connector

Location - J6: 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+

4.6 Sensor Control Connector

Location - J3: 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	ADC	ADC port			

4.7 UART Connector

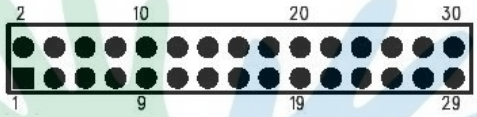
Location - J5: 4P wafer pitch = 2.0mm

Pin assignment and definition:

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

4.8 LVDS Interface Connector

Location - J7: 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+

4.9 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	Exit
3	LEDG	Green LED ctrl.	Green LED	8	K4	Key4 input	Menu
4	GND	Ground	Ground	9	K5	Key5 input	N/A
5	K1	Key1 input	Right	10	K6	Key6 input	N/A

4.10 ISP Connector

Location - J8: 3P wafer pitch = 2.0mm

Pin assignment and definition:

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	SCL	ISP Clock	3	GND	Ground
2	SDA	ISP Data			

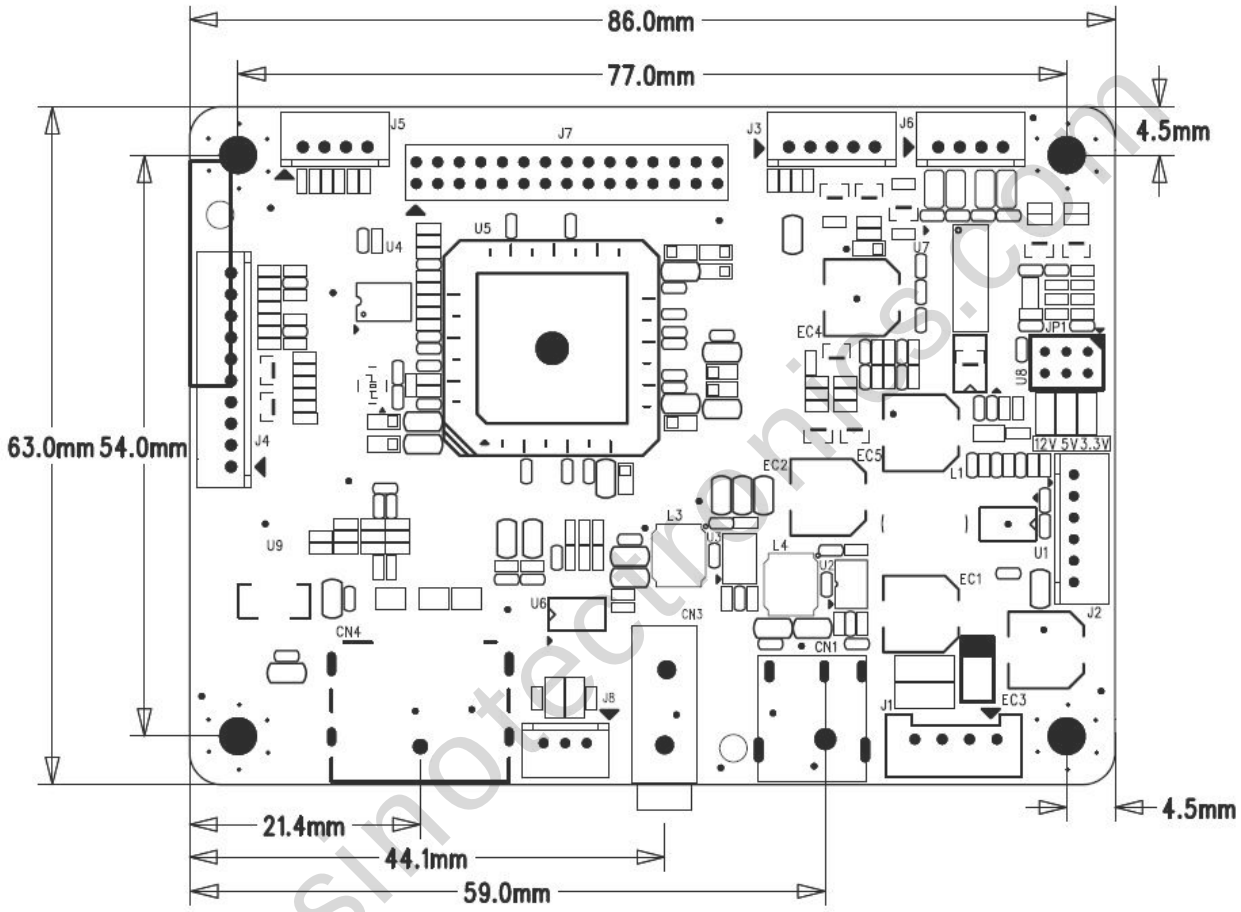
4.11 Headphones Output (optional)

Location – CN3: 3.5mm phone jack (PJ-328-5P)

4.12 Panel Voltage Selection

Location - JP1: 2x3P pitch = 2.0mm

5. Mechanical Dimensions



PCB Dimensions

- PCB Length = 86mm
- PCB Width = 63mm
- PCB Thickness = 1.6mm
- PCBA (PCB + Component) Thickness ≤ 15.0mm
- Screw Hole Diameter = 3.5mm

6. Configuration and Precautions

6.1 Temperature

- Storage: -30℃ ~ +80℃
- Operation: -20℃ ~ +70℃

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	SY8113	DC-DC	Silergy
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 86x63mm	JLC