onbon 仰邦科技

BX-3288L Android Motherboard

Specification

Version No.: V1.2 Release Date: 2024.9.20

Catalogs

Catalogs 1
Brief 1
About the software 1
Characterization 2
Function 3
Technical Specification 3
interface definition 4
Board Size 13
Notes 14

Brief

Thank you for purchasing our LCD commercial display motherboard. We hope you will enjoy experiencing the excellent performance of this product. The motherboard is designed to meet international and industry standards, but may still cause personal injury and property damage if not operated properly. In order to avoid possible dangers and to benefit as much as possible from your equipment, please follow the relevant instructions in this manual when installing and operating the product.

About the software

You may not alter, decompile, disassemble, decrypt, or reverse engineer the software installed on this product, and any of the above actions are illegal.

Characterization

- It is capable of playing 2K HD and 4K UHD videos in various formats and can handle complex interactive operations;
- Integrated Ethernet, Wi-Fi, TF expansion card, USB expansion port, IR remote control, HDMI2.0 output, eDP output, LVDS output, MIPI output, backlight control, microphone, audio output, amplifier and other functions, including all kinds of conventional sensor interfaces and RS485 environmental sensor interfaces, relay switches to simplify the whole design;
- Support LVDS/MIPI interface, can be connected to 2K HD LCD display;
- Support eDP/HDMI interface, can be connected to 4K UHD LCD display;
- Support various sizes and resolutions of cropping screen;
- Flexible 4G/5G options, optional GPS;
- Supports program playback screenshot monitoring function;
- Support SSL/TLS encryption protocol to ensure the security of communication information;
- Supports digital signature authentication technology to ensure correct and secure material transmission;
- Support Yangbang iLEDCloud/iLEDSys information release cloud platform (National Equal Protection Level 3 Certification), with strict program audit control system;
- It supports server/stand-alone mode switching, supports iLEDCloud WeChat applet, and supports mobile devices to conveniently complete the editing and publishing of information, while guaranteeing information security;
- Support logging function, including communication log and program playback log;
- Customized development: support database connection function, support connecting to mySQL, SQL server format database, get data automatically and display it;
- Customized development: support network data partition function, through the server-side URL to specify the field, dynamic access to JSON file data and JSON field values, support for 32 dynamic regions, support for real-time refresh of information.
- Stable communication without dropping, all communication interfaces and input/output interfaces are strictly anti-static and anti-surge design;
- Coated with UV three-proof adhesive, national standard double 85 protection level, dustproof, moisture-proof, anti-static, anti-salt spray;
- ℃ ~ -40 80℃ ambient temperature, 3.5V-5.5V wide voltage, 7*24 hours uninterrupted power, ≤0.3% failure rate.

Function

BX-3288L motherboard adopts Rexchip RK3288 program, the chip integrates quad-core Cortex-A17 and Mali-T764 high-performance quad-core GPU, the main frequency is up to 1.8GHz, with strong video processing capabilities, perfect support for 4K 2K@60fps Ultra HD decoding and 4K 2K HDMI Ultra HD output, with a wealth of expansion interfaces, is widely used in digital signage, touch interaction, security, medical, transportation, finance, industrial control, consumer electronics, entertainment systems, intelligent commercial display control field. It is widely used in digital signage, touch interaction, security, medical, transportation, finance, industrial control, consumer electronics, entertainment systems and other intelligent commercial display control fields.

Technical Specification

***UART factory default TTL, optional 232 or 485 devices**

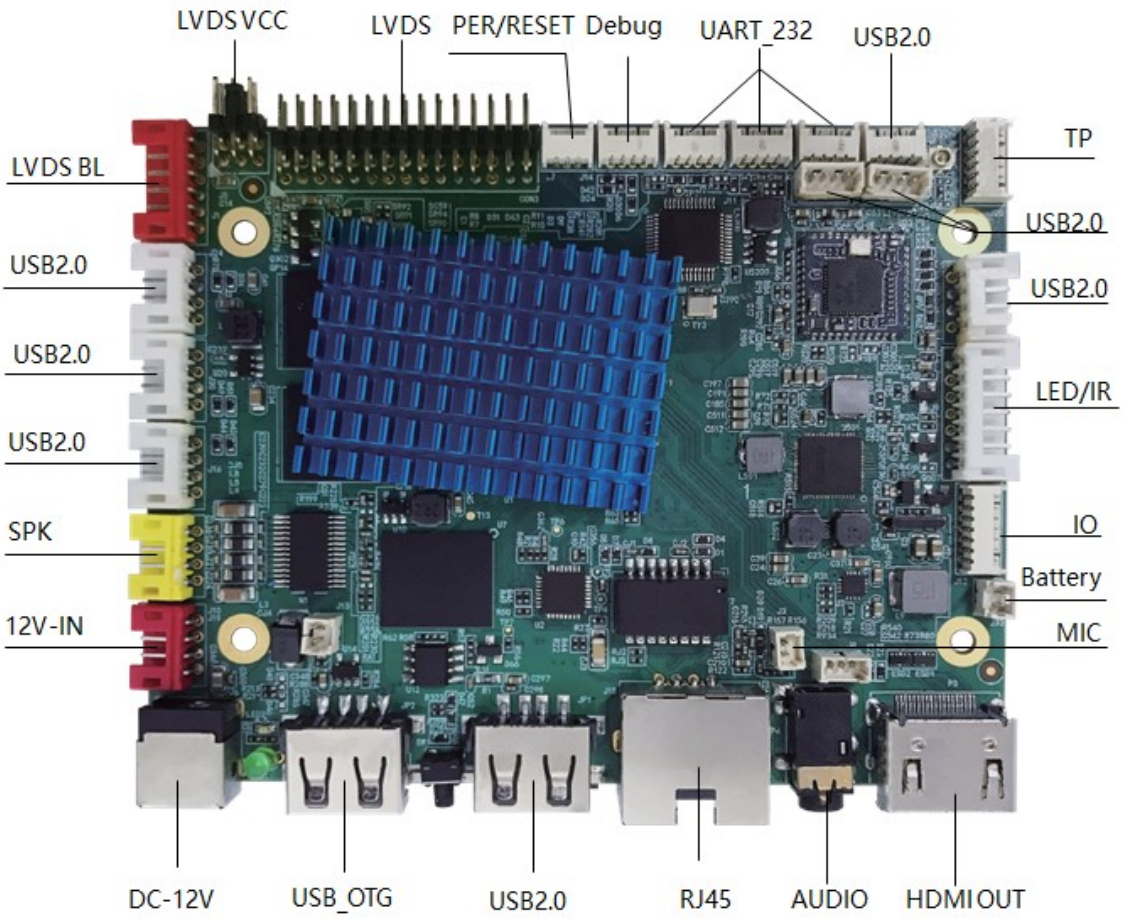
Basic Information	Chip	RK3288	**Serial/GPIO**	Serial Port	4 serial ports: 1 TTL Debug 3-way TTL/RS232
	Architecture	Cortex-A17		GPIO port	5-way IO input/output control Can do key scanning control
	GPU	Mali-T764	**Audio**	Bluetooth speaker	Supported
	Cores	Quad-core		MIC Input	Supported
	CPU Frequency	1.8GHz		Headphone Input	Supported
	System	Android 7.1.2		Amplifier Interface	8Ω6W dual audio amplifier outputs
	Hard Decoding	Support 4K 10bits H.265/H.	**Storage**	USB port	9 USB ports 1 channel USB_OTG, 8 channel USB2.0
	random access memory (RAM)	2GB as standard			
	stockpile	32GB as standard		Extended Storage	Self-ejecting TF card socket Supports 128GB storage capacity
display interface	dimorphic	dual screen with different displays	**Others**	watchdog function	Hardware watchdog support
	LVDS output interface	Support 1080P@60Hz			
	EDP output interface	Support 1080P@60Hz			
	HDMI output	1 channel 4K@30Hz		infrared	be in favor of

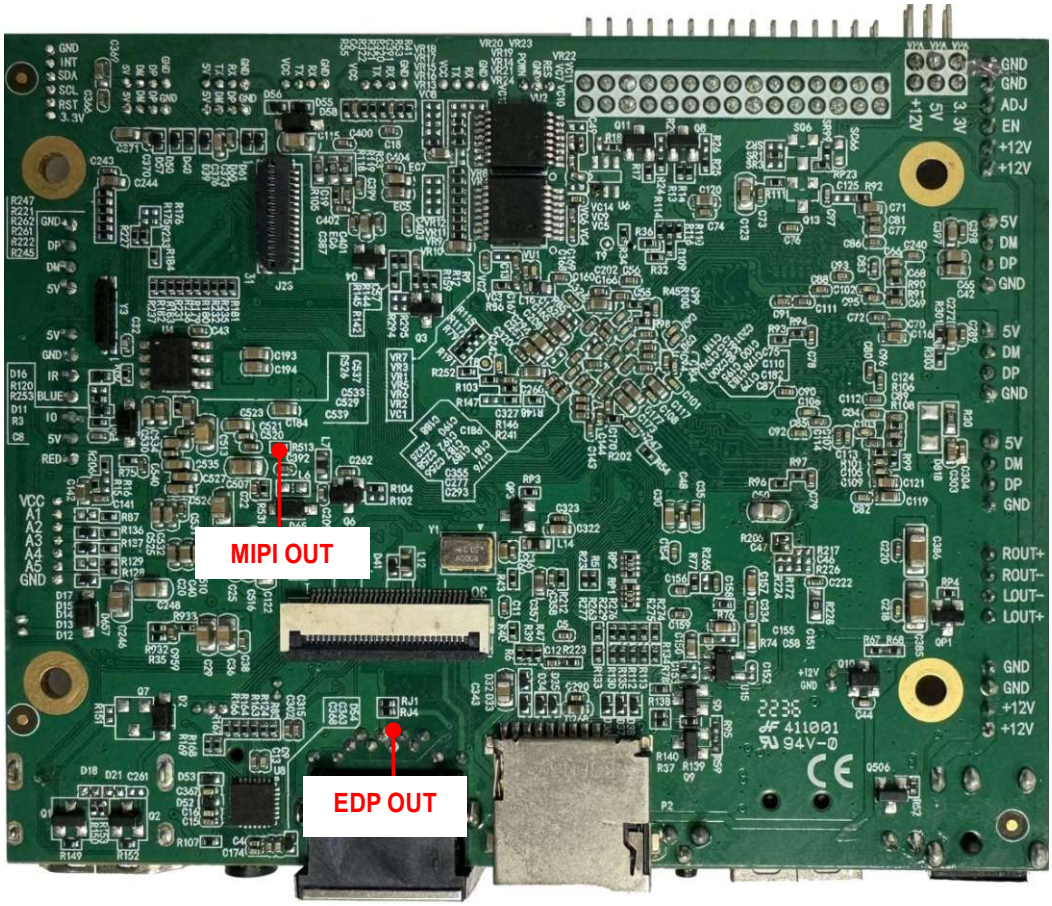
	MIPI output	Support 1080P@60Hz		remote	
network function	Ethernet	1 rj45: 1000m/100m/10m Ethernet Adaptive		timer switching on/off	be in favor of
	WIFI	be in favor of		multilingual	be in favor of
	4G	External USB 4G module		secondary development	Support: Provide API interface documentation
	bluetooth	be in favor of			

- Wet, salt spray environments and outdoor applications can be added with a triple-proof coating process.

interface definition

The front and back interfaces of the board are shown below:





Description:

JP1: USB 2.0 socket
USB2.0 horizontal plug standard, Type A standard socket.

JP2: USB OTG Socket
Standard TypeA horizontal socket, this interface instantly power on the default firmware burning port, can be connected to a PC computer for software burning; into the Android can be set through the software for USB ADB debugging port or ordinary USB Host interface

J16: USB 2.0 port (single row 2.0mm)		
pin	**name of ports**	**descriptive**
1	GND	digital land
2	DP	USB differential data+
3	DM	USB Differential Data-
4	5V	5V Output

J17: USB 2.0 port (single row 2.0mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	DP	USB differential data+
3	DM	USB Differential Data-
4	5V	5V Output

J24: USB 2.0 port (single row 2.0mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	DP	USB differential data+
3	DM	USB Differential Data-
4	5V	5V Output

J26: USB 2.0 port (single row 2.0mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	DP	USB differential data+
3	DM	USB Differential Data-
4	5V	5V Output

J28: USB 2.0 port (single row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	DP	USB differential data+
3	DM	USB Differential Data-
4	5V	5V Output

Note: This interface is the CPU internal straight-through USB port, cameras and other high-speed devices are recommended to use this independent interface.

J30: USB 2.0 port (single row 2.0mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	DP	USB differential data+
3	DM	USB Differential Data-
4	5V	5V Output

J35: USB 2.0 port (single row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	DP	USB differential data+
3	DM	USB Differential Data-
4	5V	5V Output

J4: Data serial port 1 (single row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	RX	Data reception (TTL or RS-232 level)
3	TX	Data transmission (TTL or RS-232 level)
4	VCC	Power output (default 3.3V, optional 5V)

Note: The default is TTL 3.3V level, which can be configured to RS-232 level (RS-232 level for soldering VU1), and the corresponding software programming device node is ttyS1.

J11: Data Serial Ports 2 (Single Row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	RX	Data reception (TTL or RS-232 level)
3	TX	Data transmission (TTL or RS-232 level)
4	VCC	Power output (default 3.3V, optional 5V)

Note: (1) The default is TTL 3.3V level, which can be configured to RS-232 level (RS-232 level for soldering VU1), and the corresponding software programming device node is ttyS2; (2) The built-in serial port 2 is the system debugging information output port, and the startup information will be outputted from this serial port in the first 5 seconds after power-on.

J2: Data serial port 3 (single row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	RX	Data reception (TTL or RS-232 level)
3	TX	Data transmission (TTL or RS-232 level)
4	VCC	Power output (default 3.3V, optional 5V)

Note: The default is TTL 3.3V level, which can be configured to RS-232 level (RS-232 level for soldering VU2), and the corresponding software programming device node is ttyS3.

J14: Data Serial Ports 4 (Single Row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	RX	Data reception (TTL or RS-232 level)

3	TX	Data transmission (TTL or RS-232 level)
4	VCC	Power output (default 3.3V, optional 5V)

Note: The default is TTL 3.3V level, which can be configured to RS-232 level (RS-232 level for soldering VU2), and the corresponding software programming device node is ttyS4.

P2: TF card holder
TF card standard socket

P3: HDMI Socket
HDMI Standard Socket

P4: Four-section headset socket
Four-s  shown), suppo

J1: Backlight control connector (single row 2.0mm)		
pin	**name (of a thing)**	**descriptive**
1	12V	If the current exceeds 2A, it is recommended to connect an external 12V power supply.
2	12V	If the current exceeds 2A, it is recommended to connect an external 12V power supply.
3	EN	Default output 5V
4	ADJ	3.3V square wave (1KHz frequency)
5	GND	POWER GROUND
6	GND	POWER GROUND

J3: Microphone Connector (Single Row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	audioground
2	MIC	Mono microphone input

J5: LVDS voltage interface
LVDS drive screen jumper interface (double row of 2.0mm-square holes for 1 foot). 1 and 2 feet jumper cap shorted J23 VLCD for 12V, 3 and 4 feet jumper cap shorted J23 VLCD for 5V, 5 and 6 feet jumper cap shorted J23 VLCD for 3.3 V. Be careful not to jump to the wrong location or it will result in damage to the LCD screen and the motherboard circuitry.

J6: Power input socket
DC-12V power socket. Inner positive and outer negative. Inner core diameter 2.0mm, outer ring hole diameter 5.5mm.

J7: Switch and reset interface (single row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	PW	One-touch power on/off signaling
2	GND	digital land
3	RES	Hardware reset signal

J8: Audio Line Out		
pin	**name (of a thing)**	**descriptive**
1	AL	Stereo Output Left Channel
2	GND	audioground
3	AR	Stereo output right channel

J9: Remote control - IR-LED connector (single row 2.0mm)		
pin	**name (of a thing)**	**descriptive**
1	5VS	5V Standby power output
2	GND	digital land
3	IR	5V level infrared remote control input signal
4	IO	3.3V Level GPIO Input Signal
5	GREEN	Operation indicator signal (external green light)
6	5VS	5V Standby power output
7	RED	Standby indicator signal (external red light)

J10: Speaker connector (single row 2.0mm)		
pin	**name (of a thing)**	**descriptive**
1	OUTP_R	Speaker right channel +
2	OUTN_R	Horn right channel-
3	OUTN_L	Horn left channel-
4	OUTP_L	Speaker left channel +

J12: Pushbutton and switch connector (single row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	3V3	3.3V power supply output
2	KI	Button 1 (corresponds to GPIO 260)
3	K2	Button 2 (corresponds to GPIO261)

4	K3	Key 3 (corresponds to GPIO 263)
5	K4	Button 4 (corresponds to GPIO 264)
6	K5	Button 5 (corresponds to GPIO265)
7	GND	digital land

Note: All KIO signals can be adjusted for regular GPIO use (electrical average of 3.3V) via a separate software version; by default K1 Volume +/K2 Volume -/K3 Standby/K4 Exit/K5 Main Screen.

J18: Ethernet RJ45 socket
Ethernet RJ45 standard socket.

J19: DC-12V input connector (single row 2.0mm)		
pin	**name (of a thing)**	**descriptive**
1	12V	DC power input (9~15V)
2	12V	DC power input (9~15V)
3	GND	POWER GROUND
4	GND	POWER GROUND

J20: I2C bus interface (single row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	INT	Interrupt input (3.3V level)
3	SDA	I2C bus data signal
4	SCL	I2C bus clock signal
5	RST	Reset output (3.3V level)
6	3V3	3.3V supply output
J23: MIPI Output Connector (FPC-0.3mm 31-Pin)		
pin	**name (of a thing)**	**descriptive**
1	LED+	LED Anode
2	LED+	LED Anode
3	LED+	LED Anode
4	NC	unconnected
5	LED-	LED cathode
6	LED-	LED cathode
7	LED-	LED cathode
8	LED-	LED cathode
9	GND	digital land
10	GND	digital land
11	MIPI_D2P	+MIPI differential data output
12	MIPI_D2N	-MIPI differential data output
13	GND	digital land

14	MIPI_D1P	+MIPI differential data output
15	MIPI_D1N	-MIPI differential data output
16	GND	digital land
17	MIPI_CKP	+MIPI differential clock output
18	MIPI_CKN	-MIPI differential clock output
19	GND	digital land
20	MIPI_D0P	+MIPI differential data output
21	MIPI_D0N	-MIPI differential data output
22	GND	digital land
23	MIPI_D3P	+MIPI differential data output
24	MIPI_D3N	-MIPI differential data output
25	GND	digital land
26	VDD-1V8	Power supply output 1.8V (default not connected, need to solder Rxx0R resistor)
27	RESET	Reset signal (1.8V level)
28	GND	digital land
29	VDD-1V8	Power supply output 1.8V
30	VDD-3V3	Power supply output 3.3V
31	VDD-3V3	Power supply output 3.3V

J25: eDP output FPC connector (FPC-0.35m 30-Pin)		
pin	**name (of a thing)**	**descriptive**
1	NC	unconnected
2	GND	digital land
3	EDP_TX1N	TX1-Differential Data Output
4	EDP_TX1P	TX1+ differential data output
5	GND	digital land
6	EDP_TX0N	TX0-Differential data output
7	EDP_TX0P	TX0+ differential data output
8	GND	digital land
9	EDP_AUXP	AUX + differential auxiliary channels
10	EDP_AUXN	AUX-Differential Auxiliary Channel
11	GND	digital land
12	LCD_VCC	Logic power supply (3.3V or 5V)
13	LCD_VCC	Logic power supply (3.3V or 5V)
14	NC	unconnected
15	GND	digital land
16	GND	digital land
17	NC	unconnected

18	BL_GND	Backlit LED Ground
19	BL_GND	Backlit LED Ground
20	BL_GND	Backlit LED Ground
21	BL_GND	Backlit LED Ground
22	BL_EN	Backlight Enable
23	BL_PWM	Backlight Brightness PWM
24	NC	unconnected
25	NC	unconnected
26	BL_POWER	Backlight power supply (12V)
27	BL_POWER	Backlight power supply (12V)
28	BL_POWER	Backlight power supply (12V)
29	BL_POWER	Backlight power supply (12V)
30	NC	unconnected

Note: The eDP screen cable can be used with a reversed adapter cable, as determined by the screen's manual.

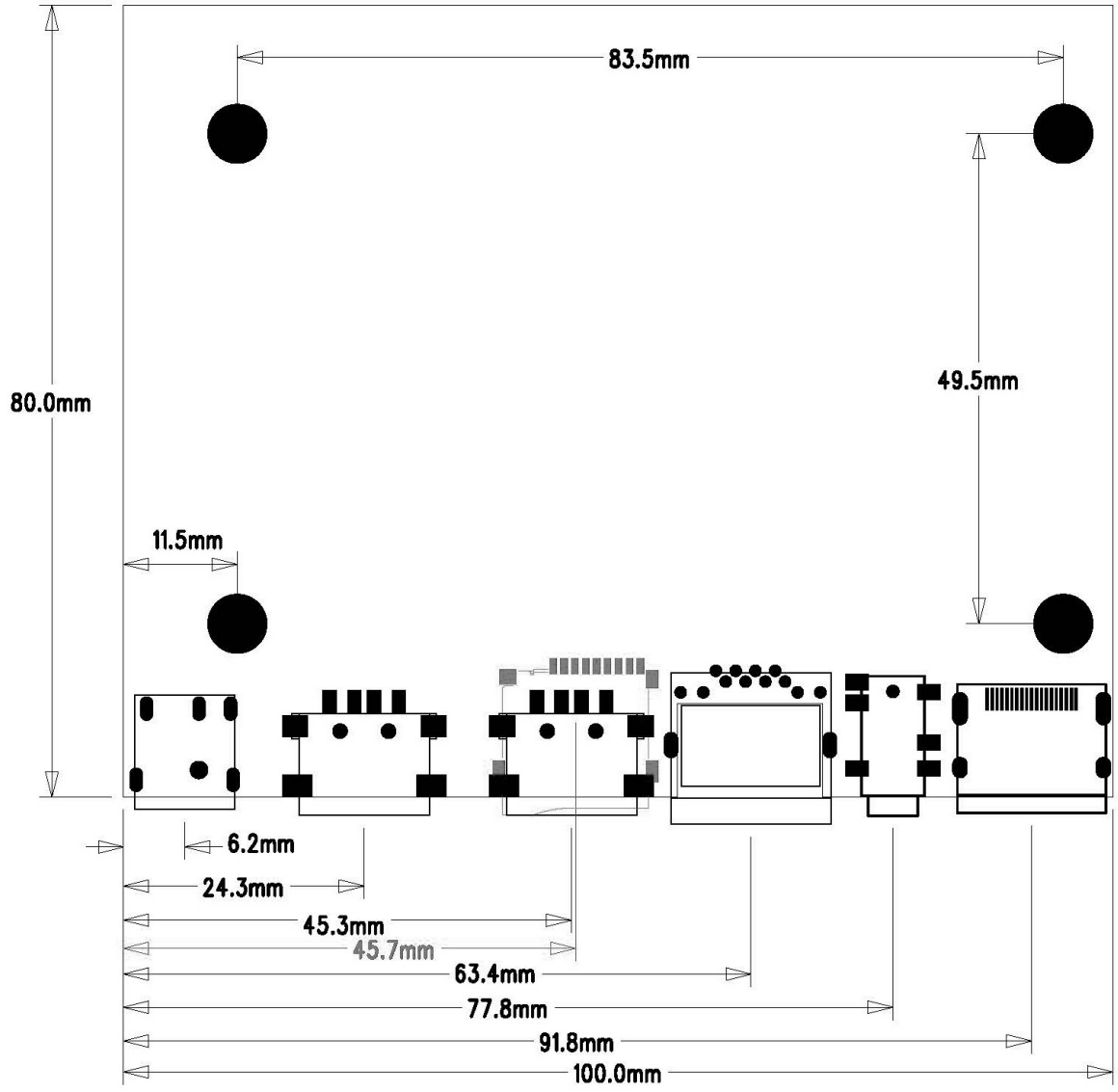
J33: Real Time Clock RTC Battery Connector (Single Row 1.25mm)		
pin	**name (of a thing)**	**descriptive**
1	GND	digital land
2	3V7	Battery 3.7V supply pin

CON3: LVDS connector (double row 2.0mm)			
pin	**name (of a thing)**	**pin**	**name (of a thing)**
1	VLCD	2	VLCD
3	VLCD	4	GND
5	GND	6	GND
7	RXO0-	8	RXO0+
9	RXO1-	10	RXO1+
11	RXO2-	12	RXO2+
13	GND	14	GND
15	RXOC-	16	RXOC+
17	RXO3-	18	RXO3+
19	RXE0-	20	RXE0+
21	RXE1-	22	RXE1+
23	RXE2-	24	RXE2+
25	GND	26	GND
27	RXEC-	28	RXEC+
29	RXE3-	30	RXE3+

SW1: burn-in key
Directly insert the small burn-in button, first press and hold and then power on for about 3 seconds and then release it to enter the burn-in mode.

Board Size

The PCB size of the board is 100mm*80mm, the diameter of the fixing holes is 3.0mm, and the dimensions of its mounting holes are parameterized as shown in the figure below:



Notes

Please note the following key points when assembling and using the motherboard:

- ~ The working temperature of this product: 0°~70°, relative humidity: 10% 90%.
- Storage temperature of this product: -40°~70°.
- Anti-static treatment is required during assembly and transportation of the whole machine.
- The connection cable for the interface of this board must not be too long, otherwise the signal quality may be affected.
- It is strictly forbidden to deform the board by twisting or heavy pressure when the whole machine is assembled.
- Short circuits between the bare board and other peripherals are strictly prohibited.
- When connecting external LVDS or eDP LCD screen, pay attention to whether the voltage and current of the drive screen meet the requirements, and pay attention to the direction of pin 1 of the screen cable socket.
- When connecting an external LVDS or eDP LCD, pay attention to whether the backlight voltage and current meet the requirements. The LCD backlight power is at 20W.

Above that it is recommended to use a separate power board for backlight power.

- When connecting peripheral devices to USB, GPIO, serial port, I2C, HDMI and other interfaces, pay attention to whether the IO level and current of the peripheral devices meet the requirements. When using the power supply pin on the motherboard connector to supply power to the peripheral, the current of the regular power supply pin is strictly prohibited from exceeding 100mA, and the current of the USB power supply pin is strictly prohibited from exceeding 500mA. serial port connection to the peripheral also requires level matching (3.3V TTL level, RS-232 level, and RS-485 level).
- The communication module section is at least 5 mm away from the metal housing to avoid signal interference.

Shanghai ONBON Technology Co.,ltd (Headquarters)

Address: 7 Floor, Tower 88, 1199#, North Qinzhou Road, Xuhui District, Shanghai City, China
Tel（wechat): +86-15921814956 +86-15800379719 +86-15850351852
Email: onbon@onbonbx.com
Website: www.onbonbx.com

iLEDCloud
Website: http://www.iledcloud.com/