



LCD Controller L50

Specification Product

Version: Ver.1.0

Statement

Dear user friend, thanks for choosing SHENZHEN SYSOLUTION TECHNOLOGY CO.,LTD (hereinafter referred to as Sysolution Technology) as your LED advertising equipment control system. The main purpose of this document is to help you quickly understand and use the product. We strive to be precise and reliable when writing the document, and the content may be modified or changed at any time without notice.

Copyright

The copyright of this document belongs to Sysolution Technology. Without the written permission of our company, no unit or individual may copy or extract the content of this article in any form.

Trademark



is a registered trademark of Sysolution Technology.

Certificate

It has certificates in the below:

1. CE、ROHS、FCC、iLAC-MRA、CNAS、APPLUS、Accrtdited Laboratory、Functions Test Report;
2. The information release platform has passed the third-level filing certificate of information system security of the Ministry of Public Security
3. The material of the platform has passed the registration certificate of the license for information network transmission of audio-visual programs;
4. Get Stable and qualified product certificate through national quality inspection.

If the product does not have the relevant certification of the country or region to which it

is sold, please contact the relevant personnel of Sysolution Technology for confirmation or treatment at the first time. Otherwise, if the relevant legal risk is caused, the customer shall bear it or Sysolution Technology has the right to recover.

Update Record

No.	Version	Updates	Revision Date
1	Ver.1.0	Initial Release	2024.09.03

The document is subject to change without prior notice.

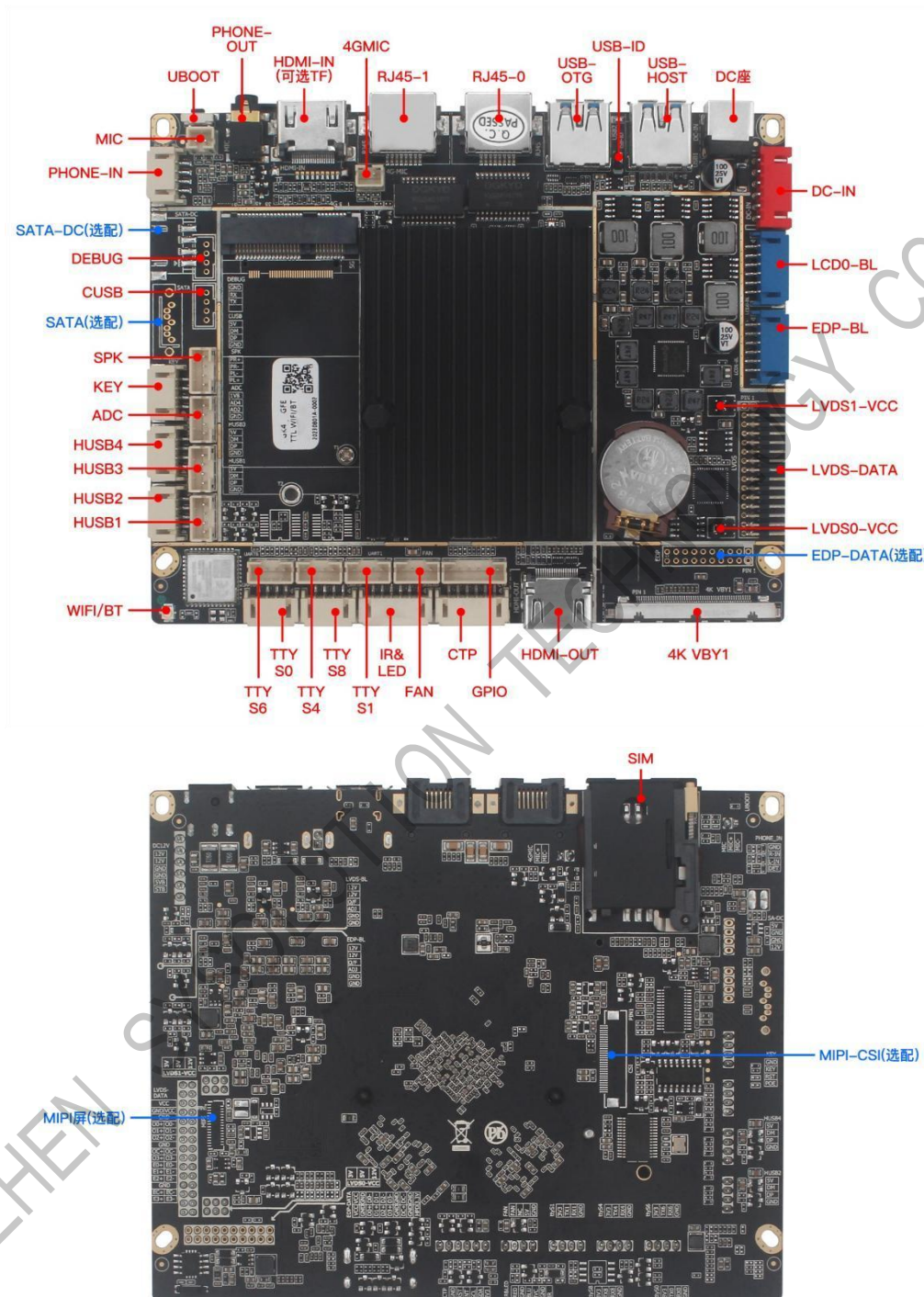
Product Introduction

The L50 adopts the high-performance and low-power eight core processor RK3588 from Ruixin Micro, equipped with the Android 12.0 system and a clock speed of up to 2.4GHz. The embedded 3D GPU makes RK3588 fully compatible with OpenGL ES 1.1/2.0/3.2, OpenCL 2.2, and Vulkan 1.2. Integrated with LVDS, MIPI, dual gigabit Ethernet, wifi, Bluetooth, 4G interface, 5G interface, 5W * 2 amplifier, TF card expansion, infrared remote control, serial/IO expansion, HDMI output, HDMI input, MIC, backlight power supply and other functions, greatly simplifying the overall design. Supporting the decoding of the vast majority of currently popular video and image formats, it can drive various TFT LCD displays, greatly simplifying the overall system design and providing stronger stability. It is widely used in AI intelligent fields such as AI servers, facial payment devices, security, healthcare, transportation, finance, industrial control, smart education, and smart retail.

Functional features:

1. High integration: Integrating USB/LVDS/EDP/HDMI/Ethernet/WIFI/Bluetooth into one, simplifying the overall design and allowing for the insertion of TF cards.
2. High stability: In terms of hardware and software, adding our company's dedicated technology to ensure product stability can enable the final product to achieve 7 * 24-hour unmanned operation.
3. Rich expansion interfaces: a standard TYPE-C port (stacked with USB 3.0, choose one patch), 7 USB ports (5 pins, 2 standard USB 3.0), 5 expandable serial ports, GPIO/ADC ports, 1 SATA port, 1 4G port, 1 5G port, which can meet the requirements of various peripherals in the market
4. High definition: Supports up to 7680 × 4320 decoding (HDMI output) and LCD display screens with various LVDS/EDP interfaces
5. Fully functional: Supports horizontal and vertical screen playback, video split screen, scrolling subtitles, timed switch, USB data import, and other functions.
6. Convenient management: A user-friendly playlist backend management software that facilitates ad playback management and control. Play logs for easy understanding of playback status.

Product Appearance



Disclaimer: The above pictures were taken from a batch (a certain functional combination) of our company's baseboards. Due to the continuous updating and maintenance of the product, the actual shipped baseboards may not match the pictures. The sample received by the customer shall prevail.

Product Parameters

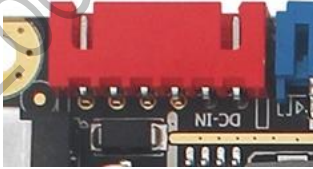
Main hardware parameters	
CPU	Eight core (quad core Cortex-A76, quad core Cortex-A55) 64 bit, with a maximum clock frequency of 2.4GHz
GPU	ARM Mali G610 3D GPU, support OpenGL ES 1.1/2.0/3.2, OpenCL 2.2, Vulkan 1.2
NPU	RKNN NPU,Maximum computing power up to 6 TOPS
RAM	8G
ROM	128G
Display	support EDP/HDMI 2.1/MIPI/LVDS/DP (TYPE-C)/V BY ONE 4K
OS	Android 12/Debian11optional
Play mode	Support multiple playback modes such as loop, timed, and interstitial playback
Media	support MPEG-1, MPEG-2, MPEG-4, H.263, H.264, H.265, VC-1, VP9, VP8, MVC, AV1
Power supply port	1 built-in 2.54MM 6P power input interface and 1 caliber 6.0MM core 2.0MM DC head interface
LVDS output	1 LVDS output interface, 30 PIN DuPont, can directly drive 50/60Hz multiple resolution LCD screens
MIPI output	1 MIPI output interface, 31 PIN FPC socket, supports up to 4K @ 60fps output
EDP output	1 EDP output interface, 20 PIN DuPont, supports up to 4K @ 60fps output

	(or choose V By One for output)
V By One output	1 channel V BY ONE output interface, supporting up to 4K @ 60fps output (with EDP only one output option)
HDMI output	1 Type A interface, supports HDMI TX 2.1, supports up to 8K @ 60fps output
HDMI input	1 Type A interface, supporting HDMI RX 2.0, with a maximum 4K @ 60fps video input (choose one patch with TF card)
TF card	Supports 16G/32G/64G/128G (as long as it is SD3.0, MMC ver4.51 protocol, larger capacity is also supported, and can choose one patch with HDMI input)
CTP interface	1-channel I2C touch screen interface
Remote and indicator	Support infrared remote control button control and device working status light indication
Serial port/expansion interface	5 TTL channels, 4 GPIO channels
Audio output	1 3.5mm headphone jack, 1 dual channel speaker output jack
Audio input	1 3.5mm headphone jack (US standard), 1 4P 2.0 socket LIN-IN jack
ACCELEROMETER	support, default no when ex-factory
RTC	Support and timed power on/off
USB	2 USB 3.0 (can delete 1 USB 3.0 and add 1 TYPE-C (compatible with DP1.4 output, up to 8K @ 30fps), 5 built-in USB sockets
OS update	Support local USB upgrade, wireless upgrade, and computer upgrade
Network	1. Dual port design, supporting 10/100/1000M adaptive Ethernet

	2. Built in WiFi, Bluetooth, WIFI supports hotspot sharing 3. Scalable 4G and 5G internet access
Dimension	140mm*112.5mm/±0.5mm, thickness1.6mm±10%
Working conditions	Temperature: -20 ° C-70 ° C, recommended 5 ° C~35 ° C, humidity: 10%~90%, no condensation

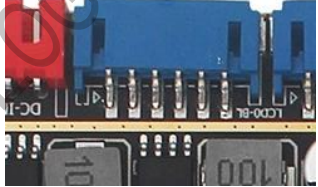
Definition Interface definition

DC-IN (Power horizontal socket 2.54MM red)

No.	definition	property	description	
1	DC12V-IN	power input	12V power input	
2	DC12V-IN	power input	12V power input	
3	GND	GND	GND	
4	GND	GND	GND	
5	5VSTB	signal input	STB power input	
6	STB	signal output	STB signal output	

1. When using the built-in power input, connect it to this socket;
2. The STB function requires external power board support to be used;
3. The power supply voltage is 12V input, and the acceptable range for use is between 9V-14V. Do not use power adapters that exceed this range;
4. The rated current of a single PIN socket is 2.5A, and the maximum current for a 2PIN socket is 5A. Please do not exceed this current.

LCD0-BL (LVDS Screen backlight horizontal socket 2.00MM)

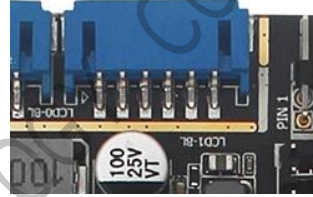
No.	definition	property	description	
1	BL-12V_IN	power output	12V backlight power output, the 12V power supply is directly	
2	BL-12V_IN	power output	connected to an external adapter, and the current size depends on the adapter's current	
3	ON / OFF	control output	Backlight board switch signal, high level valid	
4	ADJ	control output	PWM Control of LVDS Screen Brightness	
5	GND	GND	GND	
6	GND	GND	GND	

Pay attention to the order of the feet and do not connect them in reverse;

For models that do not require the use of the ADJ function, the ADJ can be directly suspended without connection or connected to ON/OFF to avoid screen dimming issues. Whether to connect the ADJ high or low should be determined by checking the screen specifications;

The definition of EDP backlight control interface is the same as above.

EDP-BL (LVDS screen backlight horizontal socket 2.00MM)

No.	definition	property	description	
1	BL-12V_IN	power output	12V backlight power output, the 12V power supply is directly connected to an external adapter, and the current size depends on the adapter's current	
2	BL-12V_IN	power output		
3	ON / OFF	control output	Backlight board switch signal, high level valid	
4	ADJ	control output	PWM Control of EDP Screen Brightness	
5	GND	GND	GND	
6	GND	GND	GND	

1. Pay attention to the order of the feet and do not connect them in reverse;
2. For models that do not require the use of the ADJ function, the ADJ can be directly suspended without connection or connected to ON/OFF to avoid screen dimming issues. Whether to connect the ADJ high or low should be determined by checking the screen specifications;
3. The definition of LVDS screen backlight control interface is the same as above.

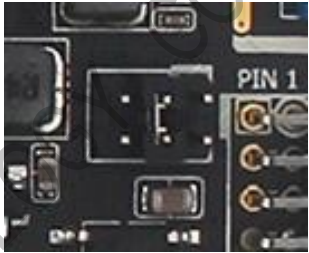
LVDS0-VCC (LVDS-Logic power input jump select vertical pin 2.00MM)

No.	definition	property	description	
1	BL-3.3V_IN	power input	3.3V power input, jump cap connection	
2	BL-VCC-O UT	Backlight output	LVDS_LOGIC power output	
3	BL-5.0V_IN	power input	5.0V power input, jump cap connection	
4	BL-VCC-O UT	Backlight output	LVDS_LOGIC power output	
5	BL-12V_IN	power input	12V power input, jump cap connection	
6	BL-VCC-O UT	Backlight output	LVDS_LOGIC power output	

After connecting the LCD screen, be sure to pay attention to the logic voltage required by the display screen, and jump the jump cap onto the corresponding voltage selection PIN pin, otherwise it is easy to burn out the display screen circuit. (Regarding the display screen voltage, please refer to the corresponding screen specification sheet) It is very important;

LVDS0-VCC mainly selects EDP screen and V BY ONE screen for power supply.

LVDS1-VCC (LVDS-Logic power input jump select vertical pin 2.00MM)

No.	definition	property	description	
1	BL-3.3V_IN	power input	3.3V power input, jump cap connection	
2	BL-VCC-O UT	Backlight output	LVDS_LOGIC power output	
3	BL-5.0V_IN	power input	5.0V power input, jump cap connection	
4	BL-VCC-O UT	Backlight output	LVDS_LOGIC power output	
5	BL-12V_IN	power input	12V power input, jump cap connection	
6	BL-VCC-O UT	Backlight output	LVDS_LOGIC power output	

1. After connecting the LCD screen, be sure to pay attention to the logic voltage required by the display screen, and jump the jump cap onto the corresponding voltage selection PIN pin, otherwise it is easy to burn out the display screen circuit. (Regarding the display screen voltage, please refer to the corresponding screen specification sheet) It is very important;

LVDS1-VCC mainly selects LVDS screen power supply.

USB-ID (Function jump selection vertical pin 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
2	OTG	OTG	USB function selection output	

UBOOT

No.	definition	property	description	
1	GND	GND	GND	
2	UBOOT	input	UBOOT function status selection	

1. Press and hold this button before turning on the device, and it will enter firmware UBOOT burning mode

WIFI/BT antenna sockets

No.	definition	property	description	
1	GND	GND	GND	
2	RF	signal input	WIFI,BT signal input	

1. Please note that the WIFI antenna mount is an IPEX-2 generation mount, and the external antenna rod should be matched with a 2nd generation female mount.
2. The connection and fixing pads between the antenna base and PCB are small. When disassembling, be careful to gently remove them to avoid pulling them out directly, which may cause the antenna base to separate from the PCB and cannot be repaired.

4G-MIC (Microphone vertical socket 2.00MM)

No.	definition	property	description	
1	MIC+	Mic head input+	Positive pole of microphone	
2	MIC-	Mic head input-	Negative pole of microphone	

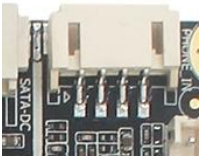
1. 4G call microphone head needs to be used in conjunction with a 4G module with call function.

MIC (Microphone vertical socket 2.00MM)

No.	definition	property	description	
1	MIC+	Mic head input+	Positive pole of microphone	
2	MIC-	Mic head input-	Negative pole of microphone	

2. 4G call microphone head needs to be used in conjunction with a 4G module with call function.

PHONE-IN (Headphone input horizontal socket 2.00MM)

No.	definition	property	description	
1	DET		Detecting Insertion	
2	L-IN	input	L audio input	
3	R-IN	input	R audio input	
4	GND		GND	

1. LINE-IN can input various audio signals;
2. Analog signals are prone to interference, please use shielded wires.

SPK (Speaker vertical socket 2.00MM)

No.	definition	property	description	
1	PL+	L Output positive	Speaker amplifier output positive	
2	PL-	L Output negative	Speaker amplifier output negative	
3	PR-	R Output negative	Speaker amplifier output negative	
4	PR+	R Output positive	Speaker amplifier output positive	

1. This is a dual speaker connection. When using a single speaker, PIN1 and PIN2 should be grouped together, and PIN3 and PIN4 should be grouped together. Do not confuse them;
2. When using the speaker, it is necessary to first connect the speaker before turning it on, and it is not allowed to use it with power on or unplugged. Default use of 8-ohm speakers;
3. Speaker interface power output characteristics (limited conditions: TA=25 °C, DC=12.0V);
4. The default power amplifier chip is 2 * 8 ohms/5W. Pay attention to the matching range of the speakers used, and it is recommended that the rated power of the speakers be above 3W. The chip can support a maximum of 2 * 8 ohms/10W (hardware parameters need to be changed).

KEY (External horizontal socket 2.00MM)

No.	definition	property	description	
1	POE	input	System power button	
2	RST	input	Reset signal interface	
3	KEY	input	KEY extension interface (can extend up to 7 buttons)	
4	GND	GND	GND	

1. The configuration of the buttons can be adjusted, subject to actual communication needs

CTP (Touch screen horizontal socket 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
2	RST	reset	CTP reset, can compatible GPIO/UART7-RX	
3	INT	interrupt	CTP interrupt, can compatible GPIO/UART7-TX	
4	SCL	I2C- SCL	I2C clock, can compatible GPIO/UART7-TX	
5	SDA	I2C-SDA	I2C data, can compatible GPIO/UART7-RX	
6	VCC-3.3V	power output	VCC-3.3V	

The default is CTP interface. When changing to GPIO port and serial port, software reconfiguration is required;

When using the serial port function, the serial port UART7 is on the same path inside the chip and can only be used as one of two options;

The CTP interface of the socket and the FPC interface of 6P are the same CTP interface, and can only be used as either one.

IR&LED (Remote control indicator light horizontal socket 2.00MM)

No.	definition	property	description	
1	RED	LED red light output	LPositive pole of LED light/system shutdown status indicator light	
2	GND	GND	power GND	
3	BLUE	LED blue light output	Positive pole/system operation status indicator light of LED light	
4	IVC	power input	remote power	
5	GND	GND	GND	
6	IR	signal input	IR signal input	

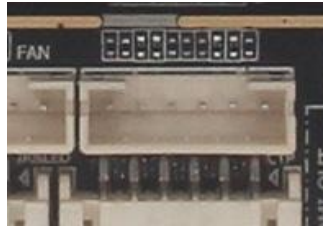
1. The indicator light defaults to using a common cathode LED light. If a common anode light is used, the common pin of the LED light can be connected to the third PIN as a power input when making an external extension cable. Note that after this connection, the status of the light will change and software configuration updates are required;

2. The remote control supports hard power on/off function, and the remote power button needs to be configured by software or matched with the remote control code value before it can be

used;

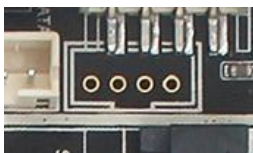
3. Regarding the remote control, it needs to be reconfigured to ensure that the buttons are available. If using a remote control that is not certified by our company, it is necessary to communicate with the business to confirm.

GPIO (Vertical socket 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
2	GPIO1	input/outputs	default GPIO , can compatible CTP's RST, CAN-RX or PWM1	
3	GPIO2	input/outputs	default GPIO , can compatible CTP's INT, CAN-TX or PWM0	
4	GPIO3	input/outputs	default GPIO , can compatible CTP's SDA or PWM8	
5	GPIO4	input/outputs	default GPIO , can compatible CTP's SCL,	
6	VCC-3.3V	power output	VCC-3.3V	

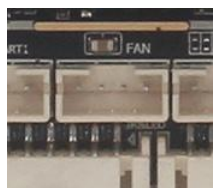
1. The default port is GPIO port. When used as a CTP or CAN port, software configuration is required separately;
2. Pull up 2.2K to 3.3V on 4 I/O motherboards.

DEBUG (Serial port debugging vertical socket 2.00MM)

No.	definition	property	description	
1	NC	NC	NC	
2	DEBUG_TX	output	DEBUG_TX	
3	DEBUG_RX	input	DEBUG_RX	
4	GND	GND	GND	

1. Generally used as DEBUG;
2. The default is not to paste.

FAN (Fan horizontal socket 2.00MM)

No.	definition	property	description	
1	FAN	fan power	fan PWM output	
2	NC	NC	NC(Speed detection, temporarily unavailable)	
3	5V	5V	5V power output	
4	GND	GND	GND	

1. Please use a 5V fan for the fan;
2. Currently only supports two-wire fans, connected to FAN and GND.

ADC (Vertical socket 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
3	ADC-IN2	input	ADCsignal input	
4	ADC-IN4	input	ADCsignal input	
6	VCC-1.8V	power output	VCC-1.8V	

SATA-DC

No.	definition	property	description	
1	12V	SATA power output	12V	
2	GND	GND	GND	
3	GND	GND	GND	
4	5V	SATApower output	5V	

Pay attention to the order of the feet and do not connect them in reverse;

Default is not pasted (optional).

TTY0 (UART/RS232 horizontal socket 2.00MM)

No.	definition	property	description	
1	VCC-3.3V	power output	VCC-3.3V	
2	UART_TX0	data send	UART_TX, can compatible GPIO	
3	UART_RX0	data receive	UART_RX, can compatible GPIO	
4	GND	GND	GND	

1. The default output is in TTL format, which can be changed to RS232 by adding a chip with port number ttyS0;

2.The output voltage of 2.3V3 is 3.3V; The output current is 500MA;

3.When using it as a GPIO port, additional software configuration is required.

TTY54 (UART/RS232 vertical socket 2.00MM)

No.	definition	property	description	
1	VCC-3.3V	power output	VCC-3.3V	
2	UART_TX4	data send	UART_TX, can compatible GPIO,PWM0	
3	UART_RX4	data receive	UART_RX, can compatible GPIO,PWM1	
4	GND	GND	GND	

- 1.The default output is in TTL format, which can be changed to RS232 by adding a chip with port number ttyS4;
2. 3 V 3 output voltage is 3.3V; The output current is 500MA;
3. When using it as a GPIO port or PWM port, software configuration is required separately.

TTY56 (UART/RS232 vertical socket 2.00MM)

No.	definition	property	description	
1	VCC-3.3V	power output	VCC-3.3V	
2	UART_TX6	data send	UART_TX, can compatible GPIO,SCL	
3	UART_RX6	data receive	UART_RX, can compatible GPIO,SDA	
4	GND	GND	GND	

1. The default output is in TTL format, which can be changed to RS232 by adding a chip with port number ttyS6;
2. The output voltage of 3V3 is 3.3V; The output current is 500MA;
3. When using it as a GPIO port or I2C port, software configuration is required separately.

TTY58 (UART/RS232 Horizontal socket 2.00MM)

No.	definition	property	description	
1	VCC-3.3V	power output	VCC-3.3V	
2	UART_TX8	data send	UART_TX, can compatible GPIO	
3	UART_RX8	data receive	UART_RX, can compatible GPIO	
4	GND	GND	GND	

1. The default output is in TTL format, which can be changed to RS232 by adding a chip with port number ttyS8;
2. The output voltage of 2.3V3 is 3.3V; The output current is 500MA;

3. When using it as a GPIO port, additional software configuration is required. **TTYs1**

(UART/RS485 vertical socket 2.00MM)

No.	definition	property	description	
1	VCC-3.3V	power output	VCC-3.3V	
2	UART_TX8	data send	UART_TX, can compatible GPIO, SCL	
3	UART_RX8	data receive	UART_RX, can compatible GPIO, SDA, PWM13	
4	GND	GND	GND	

1. The default output is in TTL format, which can be changed to RS485 by adding a chip with port number ttyS1;
2. The output voltage of 3V3 is 3.3V; The output current is 500mA;
3. When using it as a GPIO port or PWM port, software configuration is required separately.

HUSB1 (vertical socket 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
2	DP	Data positive	Data is correct, connect the USB-DP pin of the external device	
3	DM	data negative	Negative data, connect USB-DM pin to external device	
4	5V	power output	5V power cable	

1. This USB is a USB port from the HUB, with an output current of 500MA.

HUSB2 (horizontal socket 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
2	DP	Data positive	Data is correct, connect the USB-DP pin of the external device	
3	DM	data negative	Negative data, connect USB-DM pin to external device	
4	5V	power output	5V power cable	

1. This USB is a USB port from the HUB, with an output current of 500MA.

HUSB3 (vertical socket 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
2	DP	Data positive	Data is correct, connect the USB-DP pin of the external device	
3	DM	data negative	Negative data, connect USB-DM pin to external device	
4	5V	power output	5V power cable	

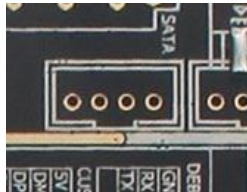
1. This USB is a USB port from the HUB, with an output current of 500MA.

HUSB4 (horizontal socket 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
2	DP	Data positive	Data is correct, connect the USB-DP pin of the external device	
3	DM	data negative	Negative data, connect USB-DM pin to external device	
4	5V	power output	5V power cable	

2. This USB is a USB port from the HUB, with an output current of 500MA.

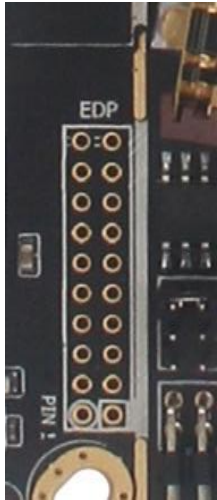
CUSB (vertical socket 2.00MM)

No.	definition	property	description	
1	GND	GND	GND	
2	DP	Data positive	Data is correct, connect the USB-DP pin of the external device	
3	DM	data negative	Negative data, connect USB-DM pin to external device	
4	VCC-5V	power output	5V power cable	

1. This USB port, which comes directly from the main control, is shared with the 4G module and M.2 interface. When using 4G or 5G modules, this USB port is not available;

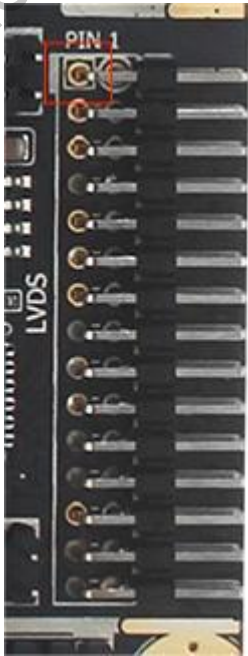
2. This seat is not pasted by default.

EDP-DATA (Dual row EDP screen vertical socket 2.00MM)

No.	definition	property	description	
1	EDP-VCC_I N	power	LCD power	
2		input	supply, +3.3V/+5V/+12V optional, selected through LVDS0-VCC	
3	GND	GND	GND	
4				
5	EDP-TX0-	output	Display Port Lane 0 negative output	
6	EDP-TX0+	output	Display Port Lane 0 positive	
7	EDP-TX1-	output	Display Port Lane 1 negative	
8	EDP-TX1+	output	Display Port Lane 1 positive	
9	EDP-TX2-	output	Display Port Lane 2 negative	
10	EDP-TX2+	output	Display Port Lane 2 positive	
11	EDP-TX3-	output	Display Port Lane 3 negative	
12	EDP-TX3+	output	Display Port Lane 3 positive	
13	GND	GND	GND	
14	GND	GND	GND	
15	EDP-AUX-	output	Port AUX- channel negative	
16	EDP-AUX+	output	Port AUX+ channel positive	
17	GND	GND	GND	
18	GND	GND	GND	
19	+3.3V	output	power voltage output	
20	EDP-HPD	output	Screen hot plug detection	

1. This seat is not attached by default (optional).

LVDS-DATA (Dual row LVDS screen horizontal socket 2.00MM)

No.	definition	property	description	
1	LCDVCC-IN	power output	LCD power	
2			supply, +3.3V/+5V/+12V	
3			optional, selected through LVDS0-VCC	
4	GND	GND	GND	
5				
6				
7	RX00-	output	Pixel0 Negative Data (Odd)	 The red box marks the first leg
8	RX00+	output	Pixel0 Positive Data (Odd)	
9	RX01-	output	Pixel1 Negative Data (Odd)	
10	RX01+	output	Pixel1 Positive Data (Odd)	
11	RX02-	output	Pixel2 Negative Data (Odd)	
12	RX02+	output	Pixel2 Positive Data (Odd)	
13	GND	GND	GND	
14	GND	GND	GND	
15	RXOC-	output	Negative Sampling Clock (Odd)	
16	RXOC+	output	Positive Sampling Clock (Odd)	
17	RX03-	output	Pixel3 Negative Data (Odd)	
18	RX03+	output	Pixel3 Positive Data (Odd)	
19	RXE0-	output	Pixel0 Negative Data (Even)	
20	RXE0+	output	Pixel0 Positive Data (Even)	
21	RXE1-	output	Pixel1 Negative Data (Even)	
22	RXE1+	output	Pixel1 Positive Data (Even)	
23	RXE2-	output	Pixel2 Negative Data (Even)	
24	RXE2+	output	Pixel2 Positive Data (Even)	
25	GND	GND	GND	

26	GND	GND	GND
27	RXEC-	output	Negative Sampling Clock
28	RXEC+	output	Positive Sampling Clock (Even)
29	RXE3-	output	Pixel3 Negative Data (Even)
30	RXE3+	output	Pixel3 Positive Data (Even)

1. There is a starting position for pin 1 on the motherboard, please pay attention.

4K VBY1 interface

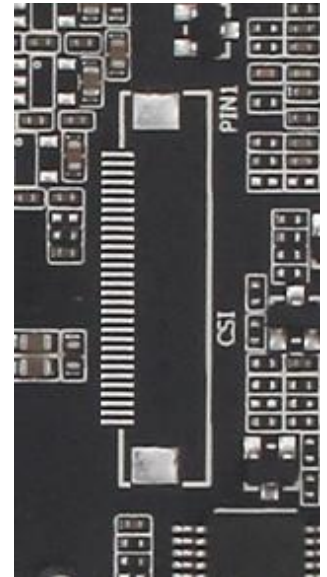
No.	definition	property	description
1	GND	GND	GND
2	VBX-7P	output	Pixel0 Positive Data
3	VBX-7N	output	Pixel0 Negative Data
4	GND	GND	GND
5	VBX-6P	output	Pixel1 Positive Data
6	VBX-6N	output	Pixel1 Negative Data
7	GND	GND	GND
8	VBX-5P	output	Pixel2 Positive Data
9	VBX-5N	output	Pixel2 Negative Data
10	GND	GND	GND
11	VBX-4P	output	Pixel3 Positive Data
12	VBX-4N	output	Pixel3 Negative Data
13	GND	GND	GND
14	VBX-3P	output	Pixel4 Positive Data
15	VBX-3N	output	Pixel4 Negative Data
16	GND	GND	GND
17	VBX-2P	output	Pixel5 Positive Data
18	VBX-2N	output	Pixel5 Negative Data
19	GND	GND	GND
20	VBX-1P	output	Pixel6 Positive Data
21	VBX-1N	output	Pixel6 Negative Data



22	GND	GND	GND
23	VBX-0P	output	Pixel7 Positive Data
24	VBX-0N	output	Pixel7 Negative Data
25	GND	GND	GND
26	LOCKN-O	output	CLOCK
27	HTPDN	output	TCON
28	SEL		TCON
29	AGP		TCON
30	SCN-EN		TCON
31	Bit-SEL		TCON
32	LD-EN2		TCON
33	BOE-SCL		TCON
34	BOE-SDA		TCON
35	2D/3D		TCON
36	L/R-IN		TCON
37	L/R OUT		TCON
38			NC
39	GND	GND	GND
40	GND	GND	GND
41	GND	GND	GND
42	GND	GND	GND
43			NC
44	VCC-VX1	power	power
45	VCC-VX1	power	power
46	VCC-VX1	power	power
47	VCC-VX1	power	power
48	VCC-VX1	power	power
49	VCC-VX1	power	power
50	VCC-VX1	power	power
51	VCC-VX1	power	power

MIPI-CSI (MIPI camera 30PIN 0.5MM Clamshell)

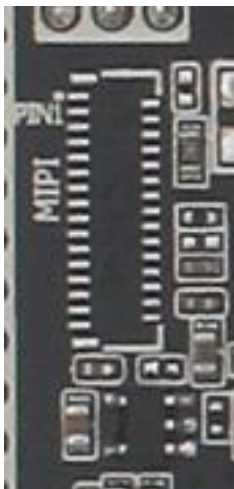
No.	definition	property	description	
1	NC			
2	VDD28	28V	VDD28Vpower	
3	VDD12	12V	VDD12Vpower	
4	VDD18	18V	VDD18Vpower	
5	NC			
6	GND	GND	GND	
7	VDD28	28V	VDD28Vpower	
8	GND	GND	GND	
9	SDA	output	SDA signal	
10	SCL	output	SCL signal	
11	RST	GND	reset signal	
12	PWDN	output	power enable	
13	GND	GND	GND	
14	MLCK	output	I2S group inside signal	
15	GND	GND	GND	
16	DP3	output	mipi data channel 3 positive	
17	DN3	output	mipi data channel 3 negative	
18	GND	GND	GND	
19	DP2	output	mipi data channel 2 positive	
20	DN2	output	mipi data channel 2 negative	
21	GND	GND	GND	
22	DP1	output	mipi data channel 1 positive	
23	DN1	output	mipi data channel 1 negative	
24	GND	GND	GND	



25	CLKP	output	mipi clock channel positive	
26	CLKN	output	mipi clock channel negative	
27	GND	GND	GND	
28	DP0	output	mipi data channel 0 positive	
29	DN0	output	mipi data channel 0 negative	
30	GND	GND	GND	

1. Default 30 PIN 0.5mm flip cover type;
2. This seat is not attached by default (optional).

MIPI (LCD screen signal output socket)

No.pr	definition	property	description	
1	LEDA+	output	MIPI Positive PIN pin for backlight power supply of LCD	
2	LEDA+	output		
3	LEDA+	output		
4	NC	/	/	
5	LEDK-	output	MIPI Negative PIN pin for backlight power supply of LCD	
6	LEDK-	output		
7	LEDK-	output		
8	LEDK-	output		
9	GND	GND	GND	
10	GND	GND	GND	
11	TDP2	output	MIPI signal TX2+	
12	TDN2	output	MIPI signal TX2-	
13	GND	GND	GND	
14	TDP1	output	MIPI signal TX1+	
15	TDN2	output	MIPI signal TX1-	

16	GND	GND	GND
17	TCP	output	MIPI clock TXC+
18	TCN	output	MIPI clock TXC-
19	GND	GND	GND
20	TDP0	output	MIPI signal TX0+
21	TDN0	output	MIPI signal TX0-
22	GND	GND	GND
23	TDP3	output	MIPI signal TX3+
24	TDN3	output	MIPI signal TX3-
25	GND	GND	GND
26	VDDIO	output	power 1.8v
27	RESET	output	reset signal
28	GND	GND	GND
29	VDDIO	output	power 1.8v
30	VDD	power	power 3.3v (Even)
31	VDD	power	power 3.3v (Odd)

1. MIPI LCD screens are connected in the form of FPC sockets, and the extension cable of the LCD screen is required to not exceed 15CM;
2. Pay attention to the PIN definition of the socket, which must be consistent before connection and use, otherwise screen burn-in may occur;
3. The FPC socket has a double row 31P 0.3mm spacing, please refer to the socket file for specific packaging;
4. No load voltage 22V, constant current 90mA;
5. This seat is not attached by default (optional).

The following are the built-in socket interfaces definition

DC socket → standard 12V round head 6.0mm aperture, 2.0mm inner needle, positive inside and negative outside

Earphone Stand → Standard 3.5mm External Earphone Stand

HDMI → Two standard A-type HDNI sockets (note silk screen distinction between HDMI output and HDMI input, optional TF socket for HDMI input)

RJ45 → Two standard gigabit RJ45 sockets

SIM → Standard SIM Large Card Interface

USB-OTG → Standard USB3.0 Large Horizontal Socket Definition (OTG or HOST function can be set in system settings)

USB-HOST → Standard USB 3.0 large socket

SATA → Standard SATA Interface Definition (This socket is not attached by default, optional)

4G interface → Standard 4G-PCIE interface definition

5G Interface → Standard 5G-M.2 Interface Definition

Note 1: The total current on the 7 USB ports should not exceed 2.0A (CUSB, HUSB3, HUSB4 are the same 5V, USB-OTG, USB-HOST, HUSB1, HUSB2 are the same 5V). When connecting multiple USB ports, allocate power reasonably;

2: Please do not exceed 1A for the total output current on 3.3V;

3: The INT and GND at the bottom of the motherboard are short circuited, which is for the remote control learning function. If you need it, you can contact our business to obtain the DXF structure diagram.

Working Parameters

Electronic device materials				
PCB	FR4 6-layer gold-plated impedance board TG150 matte black lead-free, halogen-free and environmentally friendly			
Electronic materials	Lead free environmentally friendly materials (original positive products, compliant with ROHS requirements)			
technology	Lead free, environmentally friendly production process (compliant with ISO9001 production quality management system requirements)			
Electrical parameters (bare card)				
parameters	minimum value	standard value	maximum value	unit
working voltage	9	12V	14	V
working current				mA
turn-off current				mA
Mainboard power				W
Speaker output power (8R speaker)				W
RTC working				uA

current				
USB output current(5V) *1				mA
UART output current (3.3V) *2				mA
Ambient Temperature	-10	ordinary temperature	70	°C
storage temperature	-20	ordinary temperature	80	°C

Be careful

1. * 1 * 2 is the sum of the output power of the same voltage on the motherboard. The specific output power on each interface socket is subject to the interface description.
2. Based on the overall working conditions, the entire machine operates in environments beyond its limits, and its performance cannot be fully guaranteed in terms of quality.
3. The value of the working current is based on the latest firmware, and subsequent firmware updates may result in slight differences in the magnitude of the working current, which belongs to the positive normal range. The specific firmware before product shipment shall prevail.

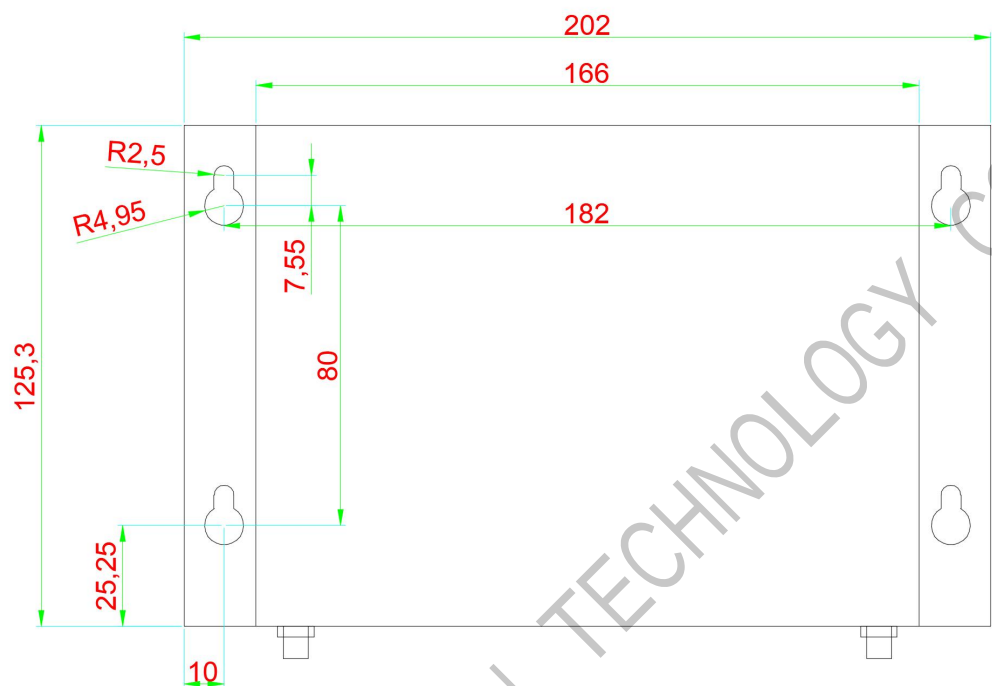
140.000mm
137.000mm
125.339mm
111.699mm
93.818mm
76.355mm
55.832mm
35.920mm
21.580mm
11.00mm
3.000mm
3.268mm
98.508mm
112.500mm

ZC-3588A V1.0
2023.01.29

10.00mm
14.60mm
14.60mm
14.50mm
14.50mm
15.00mm
7.00mm
7.00mm
7.30mm
7.70mm
7.70mm
8.60mm
1.40mm
2.00mm
5.00mm
3.50mm
140.00mm

Screw hole specifications: $\phi 3.0\text{mm} \times 4 / \pm 10\%$

Size diagram with box



Unit: mm

Notes

1. During the assembly process, please be careful not to operate, connect or wire with electricity on;
2. When touching the PCBA motherboard, it is necessary to wear static electricity protection tools such as static electricity wristbands (covers);
3. When connecting external devices to the motherboard, it is necessary to strictly check the PIN definition and avoid any errors or reversals in connection;
4. During the installation and fixation process, it is strictly prohibited to cause deformation of the board due to various reasons;
5. During the installation process, it is strictly prohibited to stack multiple boards together or to have short circuits with other peripherals;
7. During the installation process, do not tie sensitive signal cables with power cables, such as WIFI antennas/data cables, etc;
8. When installing an LCD screen, be sure to pay attention to the selection of screen voltage, the magnitude of current, and the position of the first foot;
9. When installing an LCD screen, be sure to pay attention to whether the backlight voltage and current are within the power range of the power adapter;
10. When connecting peripheral devices, pay attention to the level matching of peripheral data and whether the current size meets the requirements;
11. When installing a serial port, pay attention to the type of serial device being connected and whether the pins of TX and RX are reversed;
12. Consider the overall power, what is the overall power after the entire device is connected,

and whether the power supply is sufficient.

SHENZHEN SYSOLUTION TECHNOLOGY CO., LTD