SYSOLUTION

LCD ControllerL13

Product Specification

Version：Ver.1.0

Statement

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Update Record

No.	Version	Updates	Revision Date
1	Ver.1.0	Initial Release	2021.12.10

The document is subject to change without prior notice.

Product Introduction

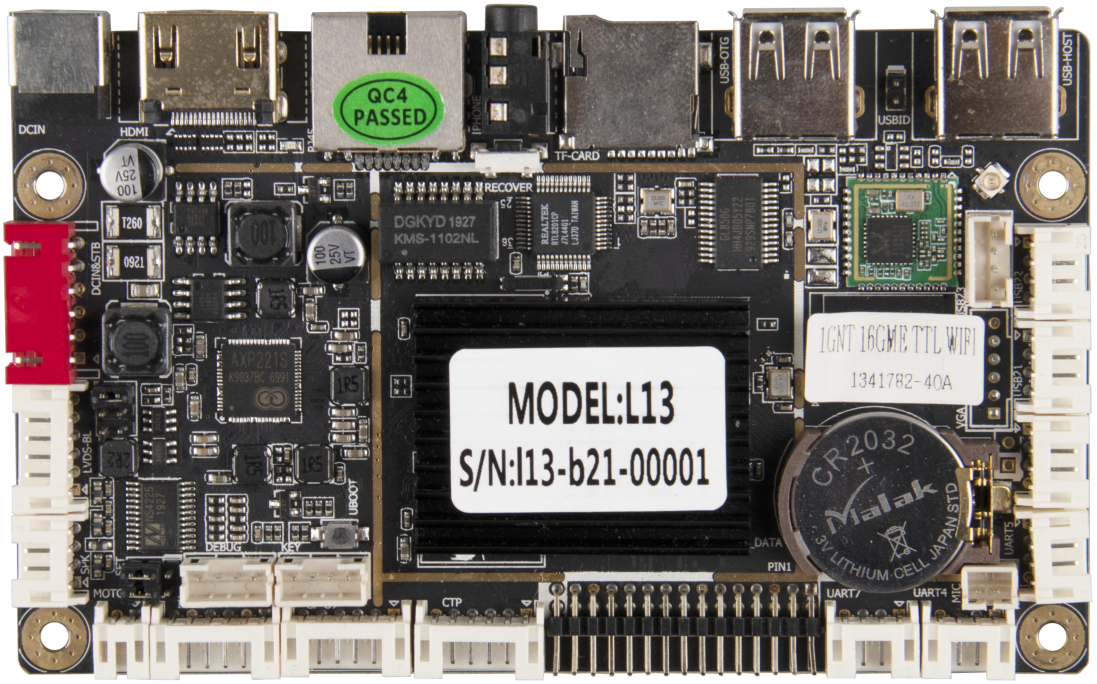
L13 adopts Allwinner A401 quarter core chip, with 4 ARMA kernel and Mail-400MP2 Graphics processing unit, the main frequency can achieve to 1.2GHz, can also compatible with almost all types of video and decoding capability.

With Android 7.1 operation system, standard 1GB RAM and 16G EMMCROM, supports dual channels LVDS ports, can directly drive 15-55inches LCD screen and also support big size infrared touch screen; the main interface uses horizontal socket to meet the ultra-thin requirements of products.

Functional Characteristics

1. Simplicity design: reserve common used interfaces, super thin and mini size design fits for super thin ads sign.
2. Highly integration: integrate TF card/USB/LVDS/HDMI/Ethernet/WIFI/infrared/serial port together, make the complete product more simple.
3. Rich of expand interfaces: 6 USB ports(2 standard USB, 4 built in sockets), 3 expand serial ports, 1 GPIO/ADC interface, can meet various types of external devices.
4. high quality definition: maximum support 1080P decoding and various LVDS signal
5. Complete functions: support horizontal and vertical screen, split screen, rolling text, switch schedule, USB import and so on.
6. Simple management: the management software very easy to use, simple to send ads and control terminals. Customer will know the play status through play log.

Product Appearance



Product Parameter

Main hardware information	
CPU	Allwinnner A40I，Cortex-A7structure，main frequency 1.2G
RAM	DDR31G
ROM	EMMCFLASH16G(can expand to 32G)
Expand storage	Support 32GB TF card maximum
Decoding resolution	Maximum resolution 1920*1080
WiFi	Built in WIFI or WIFI/BT modem（choose either one），802.11b/g/n,default single WIFI modem
Operation system	Android7.1
Video format	Support AVI（H.264、DIVX、DIVX、XVID）,rm，rmvb，MKV（H.264、DIVX、DIVX、XVID），MOV，MP4（.H.264、MPEG、DIVX、XVID），DAT（VCD），VOB（DVD），PMP,MPEG，.MPG,，FLV（H.263，H.264），ASF，TS，TP，3GP，MPG and so on
Video output	Support maximum Single / dual 6-bit / 8-bit 1080plvds and hdmi1080p Full HD output
Audio format	Support MP3,WMA,MP2,OGG,AAC,M4A,MA4,FLAC,APE,3GP,WAV and song list function
Sound Record function	Support MP3,WMA formats

Image view	Support JPG、BMP、PNG、GIF and other image formats browse and support rotation / slide show, up to 3840 * 2160 resolution
Touch screen	Support USB capacitance, infrared touch screen (point control, fast point, Lingchang, CVT, etc.)
Other input devices	Support USB keyboard, mouse, IR remoter (only support turn on/off screen function of remoter)
Video function	Support USB camera
System special function	Bottom and upper hardware watchdog, timing switch, remote switch, system encryption, super standby
3G modem	Support USB3G/4G modem (connect through USB)

Interface And Definition

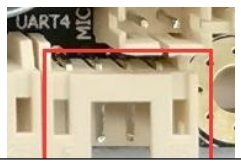
Built in socket definition in below:

CON45 UART0-TTL interface (2.00MM vertical socket)

NO,	Definition	Property	Description	
1	VCC-3.3V	Power output	VCC-3.3V	
2	UART0_TX	output	UART0_TX	
3	UART0_RX	input	UART0_RX	
4	GND	ground wire	ground wire	

1. Default function is for DEBUG。

CON34 UART-TTL/RS232 interface (2.00MMhorizontal socket)

NO,	Definition	Property	Description	
1	VCC-3.3V	Power output	VCC-3.3V	
2	UART_TX	output	Data output,	

			connect external device’ s RX pin	
3	UART_RX	input	Data input, connect external device’ s TX pin	
4	GND	ground wire	ground wire	

1. This serial port can be adjusted by hardware and configured in the form of TTL / RS232 for data connection with external devices.
2. Default use as TTL form output, port is UART4.

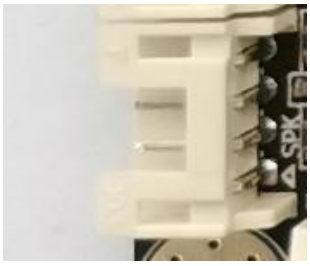
CON33/46 UART-TTL/RS232 interface (2.00MM horizontal socket)

NO,	Definition	Property	Description	
1	VCC-3.3V	Power output	VCC-3.3V	
2	UART_TX	output	Data output, connect external device’ s RX pin	
3	UART_RX	input	Data input, connect external device’ s TX pin	
4	GND	ground wire	ground wire	

1. This serial port can be adjusted by hardware and configured in the form of TTL / RS232 for data connection with external devices.

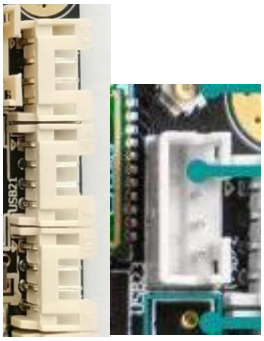
2. Default use as TTL form output, port is UART5, CON46’ s port is UART7.

CON41 SPK-OUT interface (2.00MM horizontal socket)

NO,	Definition	Property	Description	
1	LOUTP	L output positive	Horn power amplifier output positive	
2	LOUTN	L output negative	Horn power amplifier output negative	
3	ROUTN	R output negative	Horn power amplifier output negative	
4	ROUTP	R output positive	Horn power amplifier output positive	

1. This is dual speaker connection, when use single speaker, PIN 1 and PIN2 as one group, PIN3 and 4 is one group, do not make mistake.
2. Must connect the speaker in advance and then power on. Plug in or out when power on is forbidden. Default to use 8R speaker, do not use 4R.
3. Power Amplifier chip can support to 2*8R/5W maximum, pay attention to the matching range of the horn used. It is recommended that the rated power of the horn be more than 3W.

CON39 USB-HOST interfae（3 2.00MM horizontal socket , 1 2.00MMhorizontal socket ）

NO,	Definition	Property	Description	
1	GND	GND	GND	
2	DP	Data positive	Data positive, connect external device’ s USB_DP pin	
3	DM	Data negative	Data negative, connect external device’ s USB_DM pin	
4	VCC-5V	Power output	Power cable	

CON23 KEY external socket interface （2.00MM horizontal socket)

NO,	Definition	Property	Description	
1	POWER	input	System startup button	
2	RESET	input	Reset signal interface	
3	KEY	input	KEY expand interface	
4	GND	ground wire	ground wire	

1. The configuration of keys can be adjusted according to the actual communication needs.

CON32 microphone input interface (2.00MM vertical socket)

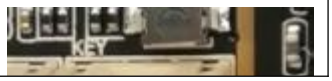
NO,	Definition	Property	Description	
1	MICP	Single input positive	Microphone positive	
2	RESET	Signal input negative	Microphone negative	

CON37 Power-DC12V-IN interface (2.54MM horizontal socket red)

NO,	Definition	Property	Description	
1	DC12V-IN	Power input	12V power input	
2	DC12V-IN	power input	12Vpower input	
3	GND	power ground wire	power ground wire	
4	GND	power ground wire	power ground wire	
5	5VSTB	Signal input	STB power input	
6	STB	Signal output	STB signal output	

1. When use built in power input, connect this socket。
2. STB function needs external power board,
3. Power voltage 12Vinput，can accept the use range 9V-14V, do not use the power adaptor which voltage bigger than this range.

CON43 GPIO socket interface (2.00MMhorizontal socket)

NO,	Definition	Property	Description	
1	GND	ground wire	ground wire	

2	PB14	input/output	PB14 port input/output	
3	PB15	input/output	PB15port input/output	
4	PB16	input/output	PB16port input/output	
5	PB17	input/output	PB17port input/output	
6	VCC-3.3V	power output	VCC-3.3V	

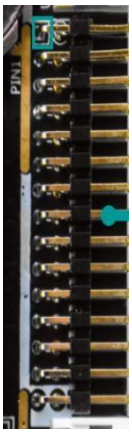
1. Can also config this interface into 4 GPIO through software, also can be set up as 1 TTL serial port and 1 I2C port.
2. Default config as GPIO.

CON42 KEY external socket interface (2.00MMvertical socket)

NO,	Definition	Property	Description	
1	POWER	input	System start up key	
2	RESET	input	Reset signal interface	
3	KEY	input	KEY expand interface (expand to 7 keys maximum)	
4	GND	ground wire	ground wire	

1. The configuration of keys can be adjusted according to the actual communication needs.

J53 LVDS signal output (double row 2.00MMhorizontal socket)

NO,	Definition	Property	Description	
1	LCDVCC-IN	power input	Lcd power output，can choose +3.3V/+5V/+12V through J55	 Notes: mark the pin 1 as the first pin
2	GND	power ground wire	power ground wire	
3	RXO0-	output	Pixel0NegativeData(Odd)	
4	RXO0+	output	Pixel0PositiveData (Odd)	
5	RXO1-	output	Pixel1NegativeData(Odd)	
6	RXO1+	output	Pixel1PositiveData (Odd)	
7	RXO2-	output	Pixel2NegativeData(Odd)	
8	RXO2+	output	Pixel2PositiveData (Odd)	
9	GND	ground wire	ground wire	
10	GND	ground wire	ground wire	

11	RXOC-	output	NegativeSampling Clock(Odd)	
12	RXOC+	output	PositiveSampling Clock(Odd)	
13	RXO3-	output	Pixel3NegativeData(Odd)	
14	RXO3+	output	Pixel3PositiveData (Odd)	
15	RXE0-	output	Pixel0NegativeData(Even)	
16	RXE0+	output	Pixel0PositiveData (Even)	
17	RXE1-	output	Pixel1NegativeData(Even)	
18	RXE1+	output	Pixel1PositiveData (Even)	
19	RXE2-	output	Pixel2NegativeData(Even)	
20	RXE2+	output	Pixel2PositiveData (Even)	
21	GND	ground wire	ground wire	
22	GND	ground wire	ground wire	
23	RXEC-	output	Negative Sampling Clock(Even)	
24	RXEC+	output	Positive Sampling Clock(Even)	

25	RXE3-	output	Pixel3NegativeData(Even)	
26	RXE3+	output	Pixel3PositiveData (Even)	

1. If need support RGB small size screen please tell us in advance, default support LVDS screen.
2. Can modify screen parameters through TF card easily.

J55 LVDS-LOGICpower input skip socket (2.00MM vertical pin)

NO,	Definition	Property	Description	
1	BL-3.3V_IN	power input	3.3Vpower input, Jump cap connection	
2	BL-VCC-OUT	Back light output	LVDS_LOGICpower output	
3	BL-5.0V_IN	power input	5.0Vpower input, Jump cap connection	
4	BL-VCC-OUT	Back light output	LVDS_LOGICpower output	
5	BL-12V_IN	power input	12Vpower input, Jump cap connection	
6	BL-VCC-OUT	Back light output	LVDS_LOGIC power	

			output	

1. When selecting this power, be sure to pay attention to the logic voltage required by the display, and then jump the cap to the corresponding voltage selection pin , otherwise it is easy to burn the display circuit. (for the display voltage, please refer to the corresponding screen specification) Very important.

CON22 Backlight inverter control interface (2.00MMhorizontal socket)

NO,	Definition	Property	Description	
1	BL-12V_IN	power input	12Vback light power output, 12Vpower directly connect external adaptor, The amount of current depends on the current of the adapter	
2	BL-12V_IN	back light input		
3	ON/OFF	Control output	back light panel switch signal, high level active, setup by software	
4	ADJ	Control output	LVDS screen brightness control	

5	GND	power ground wire	power ground wire	
6	GND	power ground wire	power ground wire	

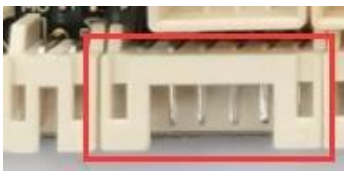
1. Pay attention to the pin order, can not connect inverse.
2. If no need to use ADJ function, can directly make it empty or connect to ON/OFF, so that to avoid screen dim problem. Need check screen datasheet to decide the ADJ high or low.

J56 USBOTG function skip socket (2.00MM vertical pin)

NO,	Definition	Property	Description	
1	GND	ground wire	ground wire	
2	OTG-SEL	Select pin	USB function select output	

1. After the jump cap is connected, the external USB port (j12) is the USB-Host function, and if it is not connected, it is the usb-drv function.
2. if you are debugging DEBUG with J12 interface, please remove this jumper cap. For example, when connecting devices such as the mouse, the jump cap must be connected, which is connected by default.

CON40 dual color LED and IR interface (2.00MMhorizontal socket)

NO,	Definition	Property	Description	
1	LED_RED	output	LED light 's positive is the system off status indicator	
2	GND	Power GND	power ground	

			wire	
3	LED_BLUE	output	LED light’ s positive is the system running status indicator	
4	IRVCC-3V3	power input	Infrared power output	
5	GND	power GND	power ground wire	
6	IR-IN	Signal input	IR signal input	

CON47 VGA video output interface (2.00MMvertical socket) reserve interface (optional)

NO,	Definition	Property	Description
1	VGA-R	output	VGAR signal channel output
2	VGA-G	output	VGAG signal channeloutput
3	VGA-B	output	VGAB signal channeloutput
4	VGA-HSYNC	output	VGA line scan signal channeloutput
5	VGA-VSYNC	output	VGA field scan signal channeloutput
6	GND	power GND	power ground wire

1. After the jump cap is connected, the external USB port (j12) is the USB-Host function, and if it is not connected, it is the usb-drv function.

built-in socket interface definition in below:

1. J15 standard TF card interface.

2. J16 standard 100m RJ45 socket definition.

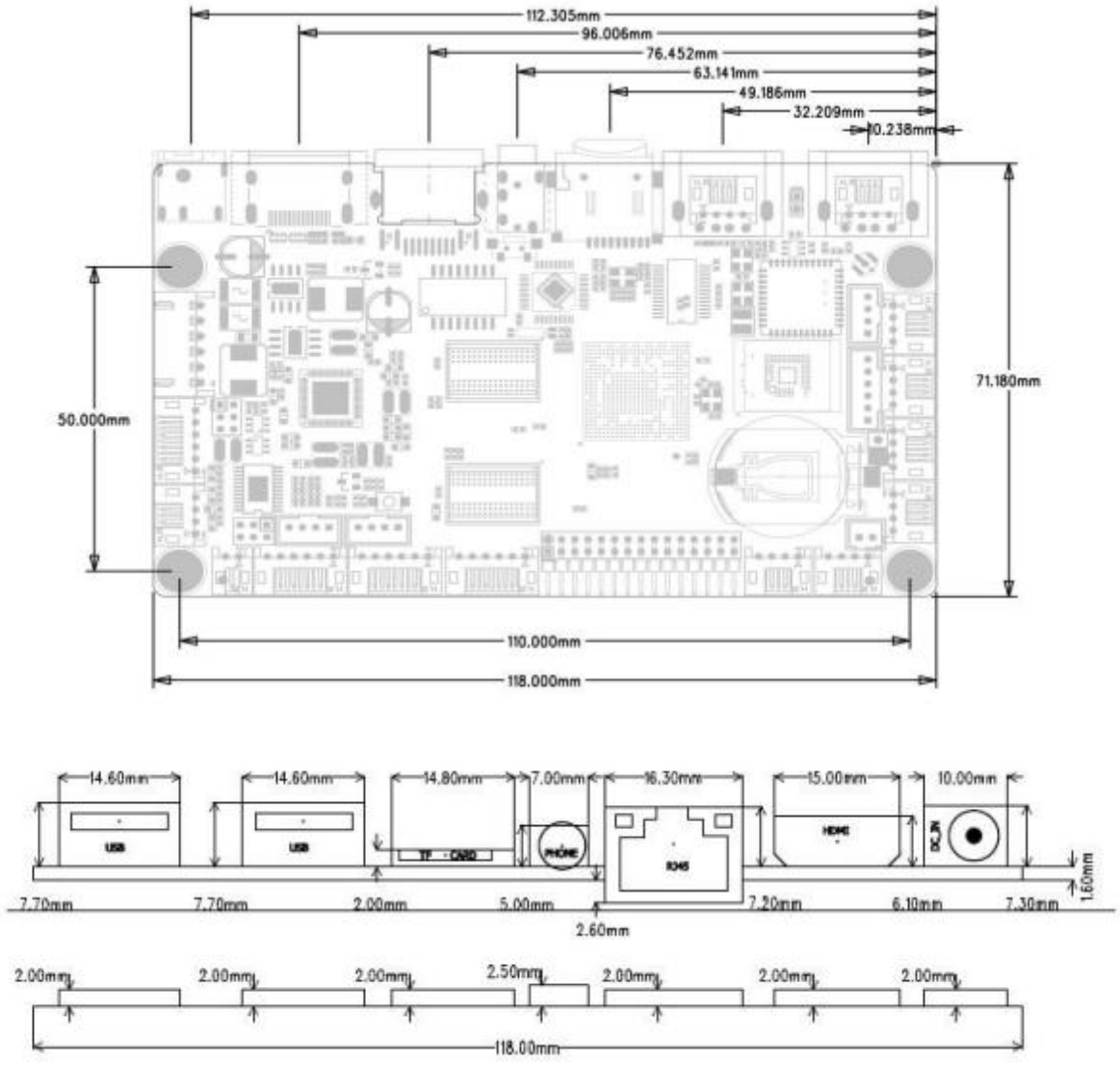
3. J20 standard USB2.0 big port horizontal socket definition.

4. JJ8 standard A type HDMI socket definition.

5. J12 standard USB2.0 big port horizontal socket definition.

6. J59 standard external microphone sound source socket definition .

Dimensional Drawing



L13

PCB：6 layer board

dimension：73.19mm*118mm,thickness1.6mm

Screw hole size：ϕ3mmx5mm

Working Environment

Type	Parameters
Power input	12V
Consumption	≦2.5W,when not connect horn/lcd /back light inverter/USB devices
Working temperature	-20℃～70℃.recommend 5℃～35℃
Working humidity	10%～90%，no condensation
Stock temperature	-20℃～70℃，recommend stock in normal atmospheric temperature

Note

1. during the assembly process, pls turn off power.
2. Must wear ESD tools such as ESD wrist strap,when touching the PCBA mainborad.
3. When external equipment is connected to mainborad,must to check strictly the PIN definition ,do not make mistake for connection.
4. During installing and fixing process, make sure the structure is all good, avoid the board deformation issues.
5. Please keep in mind that choose the correct power voltage and current, pay attention to the first PIN position when installing LCD screen.
6. When installing LCD Screen,must pay attention back light voltage and whether the current within the power range of the power adapter.
7. When connecting external devices, need check level match and power current amount
8. When install serial port, need to figure out the serial port type of the device, TX and RX PIN order correct or not
9. Consider the complete power, after connection done, how much for the complete consumption, power supply enough or not.