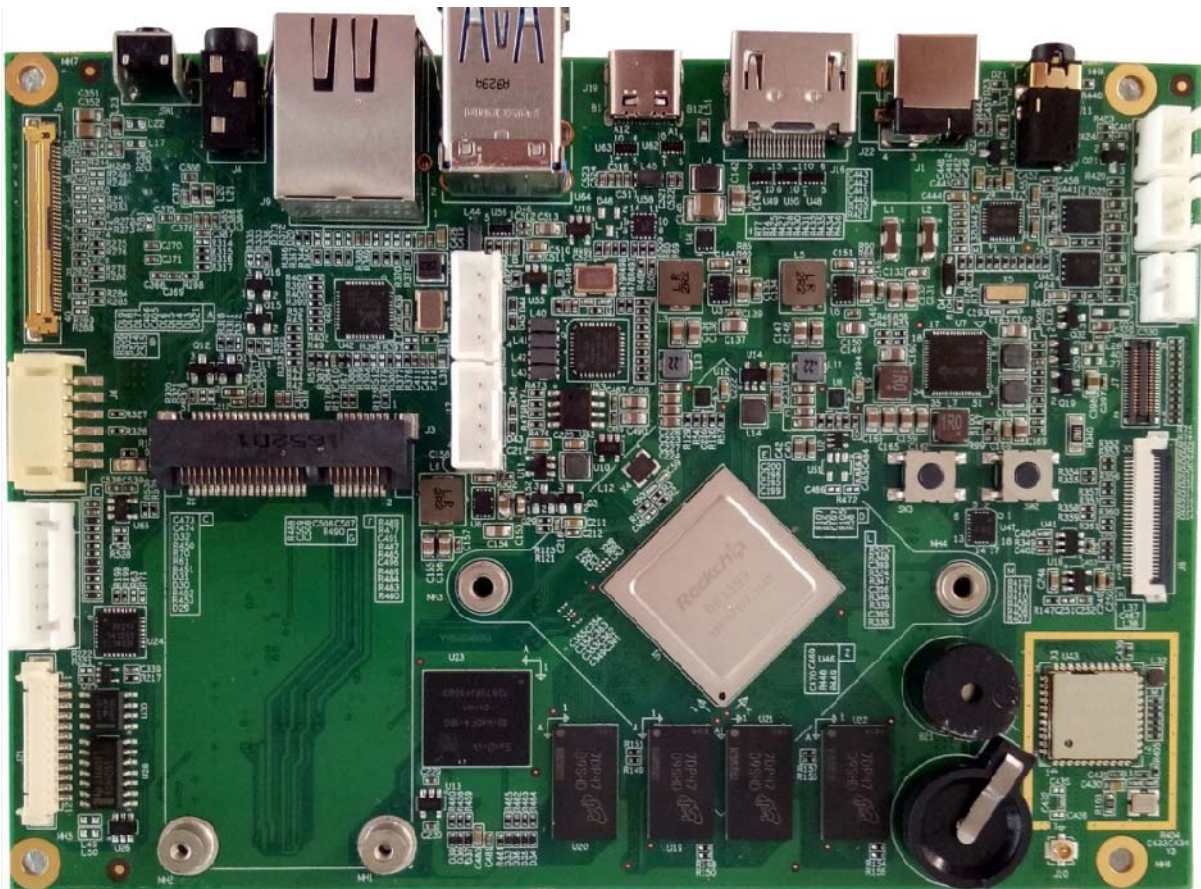


SBC-RK-3399 User's Manual (Hardware)



Chengdu Vantron Technology Ltd. Co.

Revision record

Date	Version	Change Description
2017-12-25	1.0	Initial Version

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1.1 Copyright Notice

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1.2 Notes

Applicable notes are listed in the following table:

Sign	Notice Type	Description
	Notice	Important information and regulations
	Caution	Caution for latent damage to system or harm to personnel

1.3 Statement

It is recommended to read and comply with this manual before operating board, which provides important guidance and helps decreasing the danger of injury, electric shock, fire, or any damage to the device.

1.4 Disclaimer

Vantron assumes no legal liability of accidents resulting from failure of conforming to the safety instructions.

1.5 Limitation of Liability/Non-warranty

For direct or indirect damage to this device or other devices of Vantron caused by failure of conforming to this manual or the safety instructions on device label, Vantron assumes neither warranty nor legal liability even if the device is still under warranty.

1.6 Safety Instructions

- ✧ Keep and comply with all operation instructions, warnings, and information.
- ✧ Pay attention to warnings on this device.
- ✧ Read the following precautions so as to decrease the danger of injury, electric shock, fire, or any damage to the device.

1.7 Precautions

- ✧ Pay attention to the product labels/safety instructions printed on silk screens.
- ✧ Do not try repairing this product unless declared in this manual.
- ✧ Keep away from heat source, such as heater, heat dissipater, or engine casing.
- ✧ Do not insert other items into the slot (if any) of this device.
 - Keep the ventilation slot ventilated for cooling.
 - System fault may arise if other items are inserted into this device.
- ✧ Installation: ensure correct installation according to instructions from the manufacturer with recommended installation tools.
- ✧ Ensure ventilation and smoothness according to relevant ventilation standard.

1.8 Safety Instructions for Power Cables and Accessories



Proper power source only

Start only with power source that satisfies voltage label and the voltage necessary according to this manual. Please contact technical support personnel of Vantron for any uncertainty about the requirements of necessary power source.



Use tested power source

This product still contains a button lithium battery as a real-time clock after its external power source is removed and therefore should not be short-circuited during transportation or placed under high temperature.



Place cables properly:

Do not place cables at any place with extrusion danger.



Cleaning Instructions

- ✧ Please power off before cleaning the device.
- ✧ Do not use spray detergent.
- ✧ Clean with a damp cloth.
- ✧ Do not try cleaning exposed electronic components unless with a dust collector.
- ✧ Support for special fault: Power off and contact technical support personnel of Vantron in case of the following faults:
 - The device is damaged.
 - The temperature is excessively high.
 - Fault is still not solved after the operation according to the manual.

2 Over View

2.1 Introduction

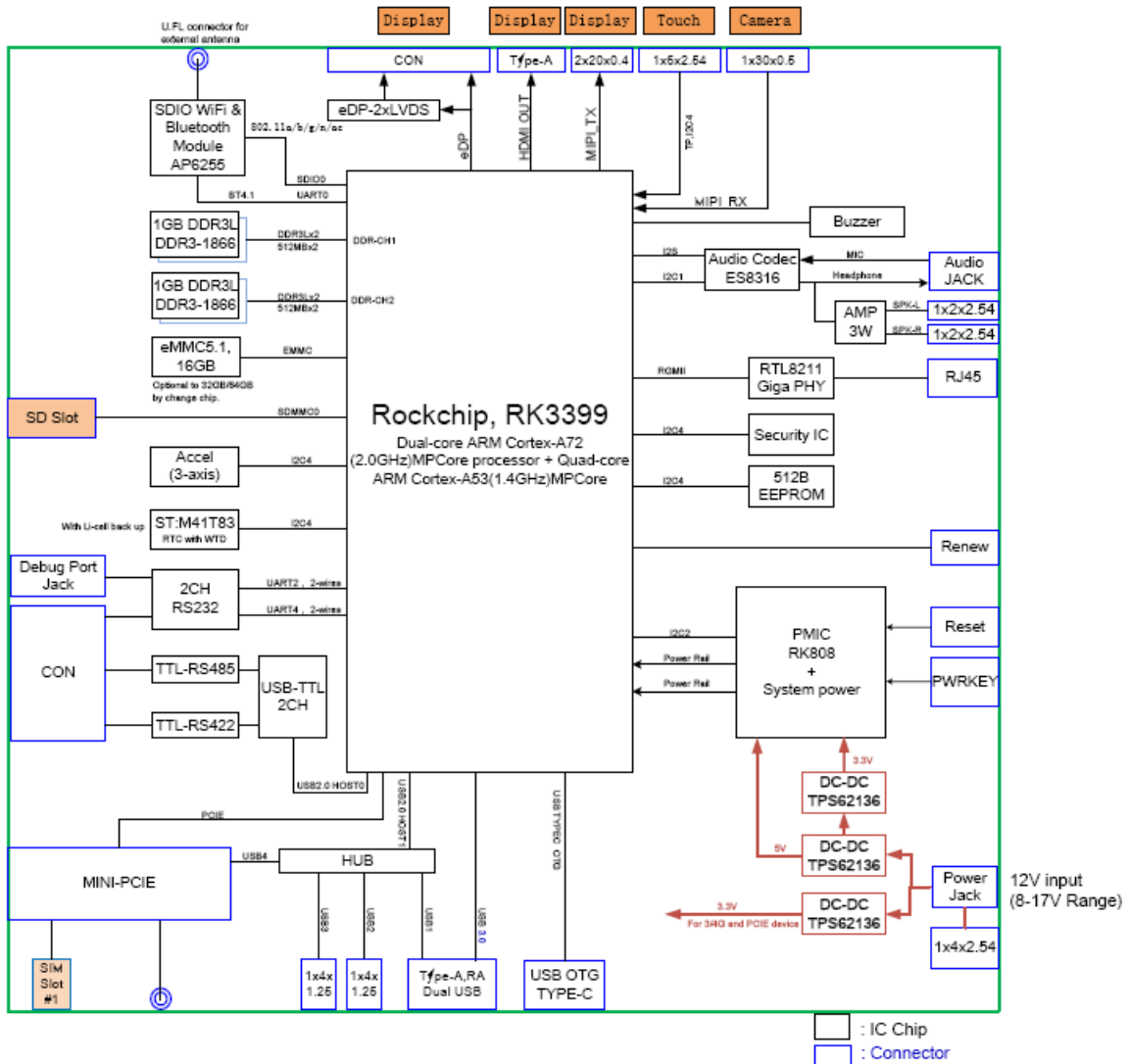
Vantron offers both ARM and ATOM based Single Boards Computer (SBC) platforms including Cirrus Logic EP9315, Marvell PXA255, PXA270, and PXA320, Intel IXP465, FreeScale iMX31, Imx53 , iMX6, Samsung S3C6410, TI OMAP35xx CortexA8 series, and Intel ATOM Z510 and Z530 processor boards. In addition to offering the standard SBCs, we also provide professional customization board design services. Our seamless project management, efficient error-free development process, strong fundamentals in technology, sufficient in human resources, and on-time delivery will guarantee the success in your project development.

Based on idea of “Application Ready” products and services, our embedded computers have embedded basic operation system which includes the drivers of its interfaces. So it is easy to be used by adding your application software only. It can speed Time to Market of your products, and saving more cost.

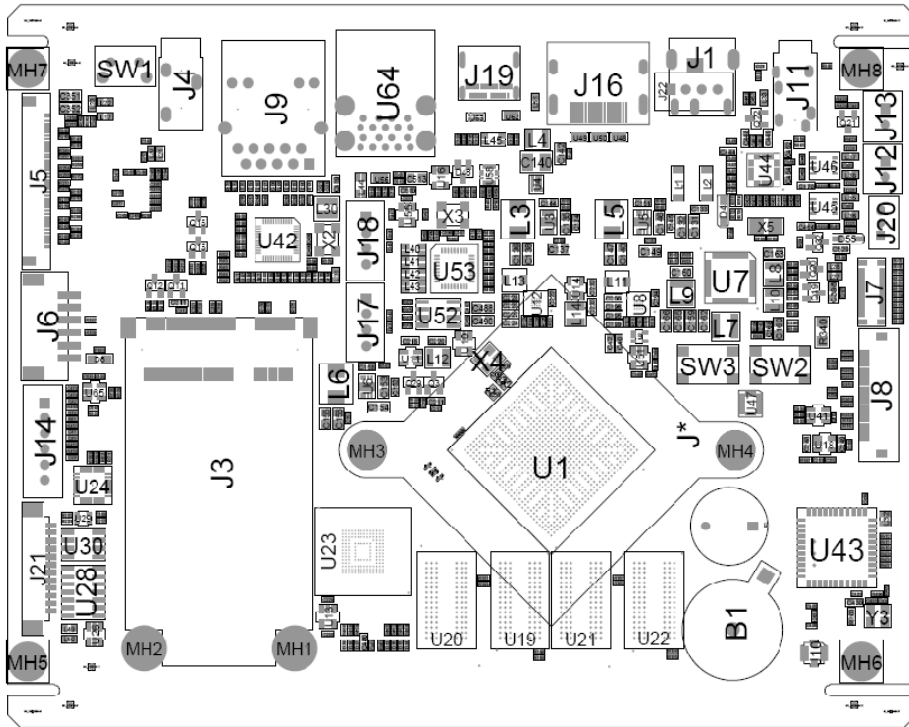
SBC-RK-3399 is an A9 processor based board. The CPU is Freescale IMX6D, 1GHz, Low Power Processor. It has pin out most of the extended bus, peripherals, GPIOs, and others. It is easy to customize connector board to meet different usage.

3 SBC-RK-3399 Hardware Instructions

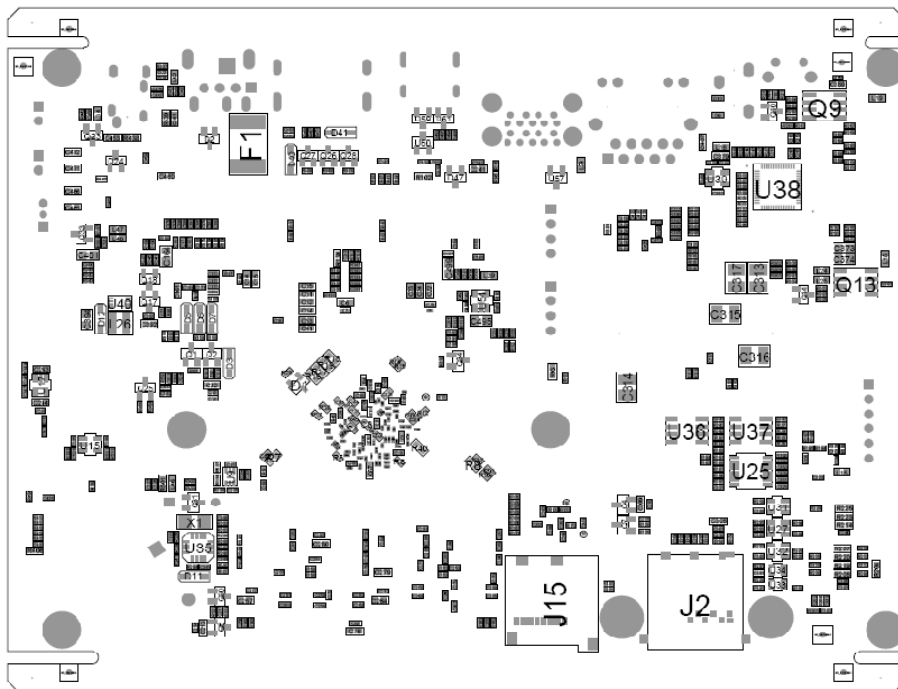
3.1 Board Diagram



3.2 Board Assembly Drawing

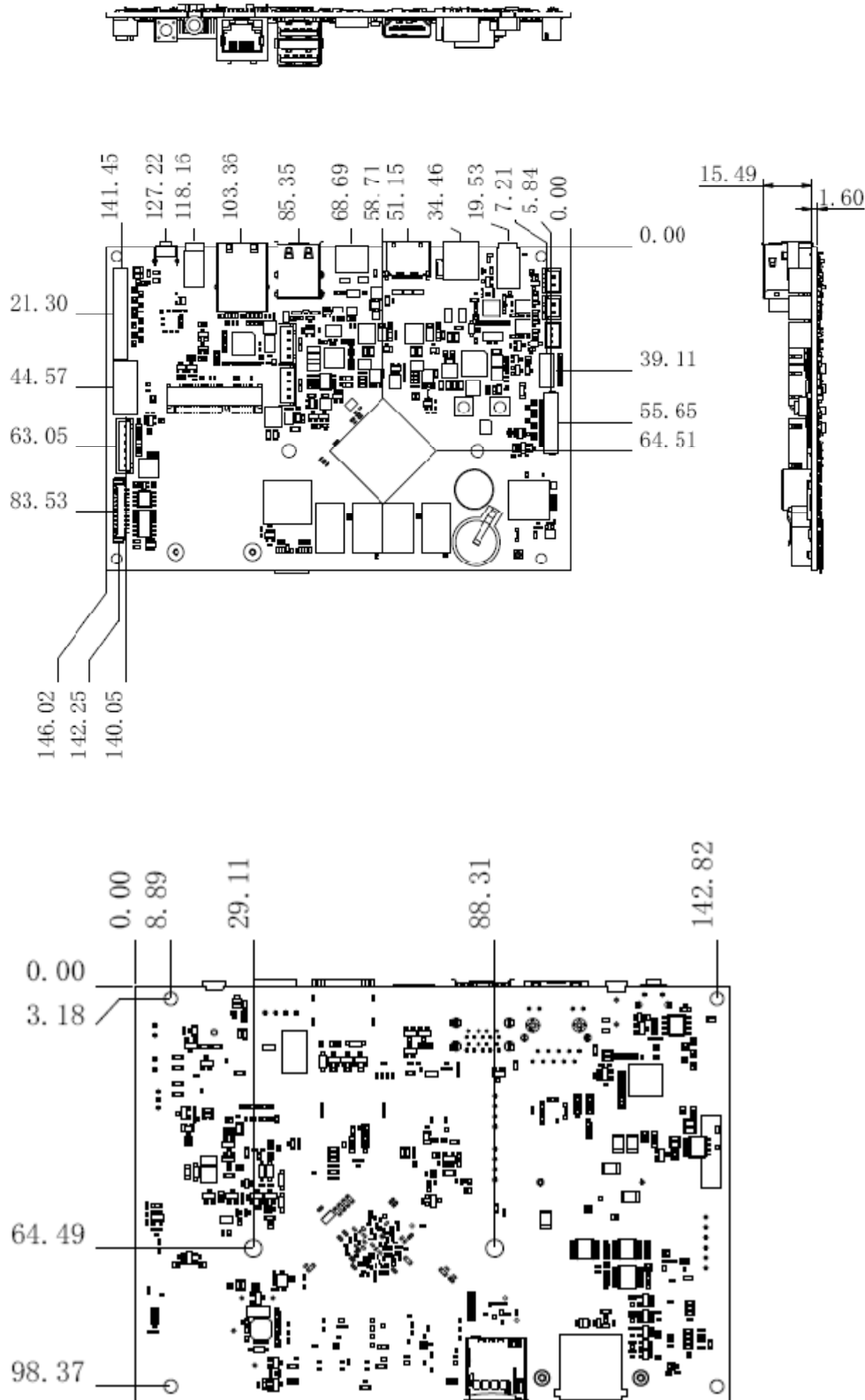


Top view



Bottom view

3.3 Board Structure



4 Hardware Description

This chapter describe the hardware Features include, switch, jumper, connector and PIN function

The interface description ought to consult the connector sketch map. And attach necessary message such as picture. Indicate the figure, PIN1 and match jack

4.1 Identify connector

This section describe how to find the position of connector and PIN1 on SBC-RK-3399 single computer board.

4.1.1 Position of connector

As Figure 3.2 show the main part and connector position of SBC-RK-3399.

4.1.2 Confirm the pin direction

there is the pin number order in all Vantron's product, this picture at right indicate each pin's number, that message as show on the top side(component side) of main board. on double row connector, one side is naming odd number and another side is naming even number. Please according to below method to confirm the Pin1 of connector and jumper:



1. Usually, there is any number and mark at side of connector in main board, such as trigonal mark, dot and number "1" all indicate the pin1 of connector
2. About the hole connector, you can see pin number on the reversed side
3. Download the SBC-RK-3399 mechanism from Vantron technology sustain or Vantron net site: www.vantrontech.com

4.2 Switch, Buttons, Jumpers, LEDs

This section describes the setting of switch, controller, LED on SBC-RK-3399 board.

4.2.1 Reset button

SW1: Recovery button for firmware update.

SW2: Power ON/OFF button.

SW3: Reset button.

4.2.2 B1, RTC Battery

B1 is for RTC Battery. The suggest part is BR1225A from PANASONIC.

4.3 Connectors Description

This table is the respective describe valid signal of connector on SBC-RK-3399 board.

Figure type:

N/C	Not connect
GND	Ground
/	active low signal
+	Positive of difference signal
-	negative of difference signal

Signal type:

I	Input
O	Output
IO	input/output
P	Power or ground
A	Analog
OD	Open drain

4.3.1 J1, Power IN port

2mmd,6mmd,3A,24V,M,NoLock,RA,-25~85°C,THR,RoHS

(HITCONN: DC-044A-2.0-PU)

Pin	Name	Type	Description
2	EXGND	P	Ground
3	NC		
4	DC_IN	P	Type 12V power input (Range:8-16V)

4.3.2 J2, SIM card slot

Micro,Push-Push,6P,WDT,SMT,RoHS (CSCONN: CSI06127135002)

4.3.3 J3, MINI-PCIE connector

Mini,52P,0.8mm,6.8mmH,WDT,SMT,RoHS (TYCO: 2041262-1)

Support kinds of 3G/4G module with USB interface

4.3.4 J4, Debug port

3.6mm,3Pole,1Port,F,RA,CMT,THR,RoHS (KBIT: PJ-320F)

Matched debug cable PN: YC1083R035

4.3.5 J5, LCD display port

1x40,0.5mm,0.5A,1.05mm,M,RA,WDT,SMT,RoHS (JAE: HD1S040HA1)

Pin	Name	Type	Description
1	LCD_VDD	P	LCD digital power supply +3.0V (OPT +5V)
2	LCD_VDD	P	LCD digital power supply +3.0V (OPT +5V)
3	LCD_VDD	P	LCD digital power supply +3.0V (OPT +5V)
4	SEL68	O	LVDS 6/8bit select
5	EDP_TX0N/LVDS_A_D0-	O	EDP/LVDSA data
6	EDP_TX0P/LVDS_A_D0+	O	EDP/LVDSA data
7	GND	P	Ground
8	EDP_TX1N/LVDS_A_D1-	O	EDP/LVDSA data
9	EDP_TX1P/LVDS_A_D1+	O	EDP/LVDSA data
10	GND	P	Ground
11	EDP_TX2N/LVDS_A_D2-	O	EDP/LVDSA data
12	EDP_TX2P/LVDS_A_D2+	O	EDP/LVDSA data
13	GND	P	Ground
14	EDP_TX3N/LVDS_A_CLK-	O	EDP data/LVDSA clock
15	EDP_TX3P/LVDS_A_CLK+	O	EDP data/LVDSA clock
16	GND	P	Ground
17	EDPAUXN/LVDS_A_D3-	O	EDP/LVDSA data
18	EDPAUXP/LVDS_A_D3+	O	EDP/LVDSA data
19	eDP_HPD	I	EDP detect
20	LVDS_B_D0-	O	LVDSB data
21	LVDS_B_D0+	O	LVDSB data

22	GND	P	Ground
23	LVDS_B_D1-	O	LVDSB data
24	LVDS_B_D1+	O	LVDSB data
25	GND	P	Ground
26	LVDS_B_D2-	O	LVDSB data
27	LVDS_B_D2+	O	LVDSB data
28	GND	P	Ground
29	LVDS_B_CLK-	O	LVDSB clock
30	LVDS_B_CLK+	O	LVDSB clock
31	GND	P	Ground
32	LVDS_B_D3-	O	LVDSB data
33	LVDS_B_D3+	O	LVDSB data
34	PANEL_BKLTEN	O	LCD backlight enable signal
35	PANEL_BKLTCTL	O	LCD backlight PWM signal
36	LVDS_DDC_CLK	O	I2C clock
37	LVDS_DDC_DATA	IO	I2C data
38	LCD_BLK	P	LCD backlight power supply +12V (OPT +5V)
39	LCD_BLK	P	LCD backlight power supply +12V (OPT +5V)
40	LCD_BLK	P	LCD backlight power supply +12V (OPT +5V)

4.3.6 J6, Optional backlight control port

1x6,2.0mm,2A,5.5mmH,M,RA,-20~85°C,SMT,RoHS (JST: S6B-PH-SM4-TB(LF)(SN))

Pin	Name	Type	Description
1	LCD_BLK	P	LCD backlight power supply +12V (OPT +5V)
2	LCD_BLK	P	LCD backlight power supply +12V (OPT +5V)
3	PANEL_BKLTEN	O	Backlight ON/OFF control
4	PANEL_BKLTCTL	O	PWM control
5	GND	P	Ground
6	GND	P	Ground

4.3.7 J7, MIPI display connector

2x20,0.4x0.8mm,0.3A,1mmH,M,Vert,WDT,SMT,RoHS (PANASONIC: AXT540124)

Pin	Name	Type	Description
1	GND	P	Ground
2	LCD_LED+	P	LCD backlight anode
3	GND	P	Ground
4	LCD_LED+	P	LCD backlight anode
5	MIPI_TX0_D3P	O	MIPI data
6	GND	P	Ground
7	MIPI_TX0_D3N	O	MIPI data
8	LCD_LED-	P	LCD backlight cathode
9	GND	P	Ground
10	LCD_LED-	P	LCD backlight cathode
11	MIPI_TX0_D2P	O	MIPI data
12	LCD_LED-	P	LCD backlight cathode
13	MIPI_TX0_D2N	O	MIPI data
14	LCD_LED-	P	LCD backlight cathode
15	GND	P	Ground
16	LCD_LED-	P	LCD backlight cathode
17	MIPI_TX0_CLKP	O	MIPI clock
18	LCD_LED-	P	LCD backlight cathode
19	MIPI_TX0_CLKN	O	MIPI clock
20	LCD_MIPI_RST	O	Reset signal for LCD
21	GND	P	Ground
22	IO2_A3	IO	General IO
23	MIPI_TX0_D1P	O	MIPI data
24	IO2_A4	IO	General IO
25	MIPI_TX0_D1N	O	MIPI data
26	GND	P	Ground
27	GND	P	Ground
28	VCC_LCD_1V8	P	+1.8V power for LCD
29	MIPI_TX0_D0P	O	MIPI data
30	VCC_LCD_1V8	P	+1.8V power for LCD
31	MIPI_TX0_D0N	O	MIPI data
32	GND	P	Ground
33	GND	P	Ground
34	LCD_VSYS	P	+3.3V power for LCD (OPT +5V)

35	I2C_SDA_MIPI0	IO	I2C data
36	LCD_VSYS	P	+3.3V power for LCD (OPT +5V)
37	I2C_SCL_MIPI0	O	I2C clock
38	LCD_VSYS	P	+3.3V power for LCD (OPT +5V)
39	GND	P	Ground
40	GND	P	Ground

4.3.8 J8, MIPI camera port

1x30x0.5mm,0.3mmTH,Bot,RA,-25~85°C,SMT,RoHS (LZR: FPC0512-30RL-TAX)

Pin	Name	Type	Description
1	VCC3V3_S3	P	+3.3V power supply for camera (OPT +2.8V)
2	AVDD2V8_DVP	P	+2.8V power supply for camera
3	VCC1V8_DVP	P	+1.8V power supply for camera
4	VCC1V8_DVP	P	+1.8V power supply for camera
5	I2C_SCL_CAM	O	I2C clock
6	I2C_SDA_CAM	IO	I2C data
7	NC	NC	Not connect
8	VCC1V5_DVP	P	+1.5V power supply for camera
9	MIPI_CAM_RST	O	Reset signal for camera
10	GND	P	Ground
11	MIPI_MCLK	O	Main clock for camera
12	GND	P	Ground
13	MIPI_RX0_D3N	I	MIPI data
14	MIPI_RX0_D3P	I	MIPI data
15	GND	P	Ground
16	MIPI_RX0_D2N	I	MIPI data
17	MIPI_RX0_D2P	I	MIPI data
18	GND	P	Ground
19	MIPI_CAM_PWN	O	Power down signal for camera
20	NC	NC	Not connect
21	NC	NC	Not connect
22	MIPI_RX0_D0N	I	MIPI data

23	MIPI_RX0_D0P	I	MIPI data
24	GND	P	Ground
25	MIPI_RX0_CLKN	I	MIPI clock
26	MIPI_RX0_CLKP	I	MIPI clock
27	GND	P	Ground
28	MIPI_RX0_D1N	I	MIPI data
29	MIPI_RX0_D1P	I	MIPI data
30	GND	P	Ground

4.3.9 J9, 10/100/1000M Ethernet port

10/100/1000,MAG,2LED,1Port,SHLD,F,RA,-40~85°C,THR,RoHS

(UNE: U50(02-02)G8-09-A122-B12)

4.3.10 J10, RF antenna for WiFi&BT

50R,6GHz,N/A,F,Vert,WDT,SMT,RoHS (HIROSE: U.FL-R-SMT(01))

4.3.11 J11, Audio Port

3.6mm,4Pole+1Switch,1Port,F,RA,CMT,THR,RoHS (HITCONN: PJ-3106H-1)

Standard audio jack with Headphone and MIC

4.3.12 J12, Speaker right port

Support 2.5W/4Ω speaker

1x2,2.5mm,3A,7mmH,M,Vert,-25~85°C,THR,RoHS (NSXD: S2501WV-2P)

Pin	Name	Type	Description
1	SPK-R+	O	
2	SPK-R-	O	

4.3.13 J13, Speaker left port

Support 2.5W/4 Ω speaker

1x2,2.5mm,3A,7mmH,M,Vert,-25~85°C,THR,RoHS (NSXD: S2501WV-2P)

Pin	Name	Type	Description
1	SPK-L+	O	
2	SPK-L-	O	

4.3.14 J14, I2C port for capacitive touch

1x6,2.5mm,3A,7mmH,M,Vert,WDT,THR,RoHS (NSXD: S2501WV-6P)

Pin	Name	Type	Description
1	VCC3V0_TOUCH	P	+3.0V power supply for TP
2	I2C_SDA_TP	IO	I2C data
3	I2C_SCL_TP	O	I2C clock
4	TOUCH_RST_L	O	Reset signal for TP
5	TOUCH_INT_L	I	Interrupt for TP
6	GND	P	Ground

4.3.15 J15, Micro SD slot

Micro,Push-Push,NoWP,WDT,SMT,RoHS (PROCONN: MSPN09-A0-2000)

4.3.16 J16, HDMI Port

Type A, NoFLN, F, RA, -20~85°C, SMT, RoHS (MOLEX: 47151-1001)

4.3.17 J17, Internal USB port

1x4, 2.5mm, 3A, 7.0mmH, M, Vert, IND, THR, RoHS (ATOM: AWF-2540104-D08)

Pin	Name	Type	Description
1	USBH3_VCC	P	USB power
2	USBH3-	IO	USB data-
3	USBH3+	IO	USB data+
4	GND	P	Ground

4.3.18 J18, Internal USB port

1x4, 2.5mm, 3A, 7.0mmH, M, Vert, IND, THR, RoHS (ATOM: AWF-2540104-D08)

Pin	Name	Type	Description
1	USBH2_VCC	P	USB power
2	USBH2-	IO	USB data-
3	USBH2+	IO	USB data+
4	GND	P	Ground

4.3.19 J19, USB Type-C port

3.1, Type C, 1Port, F, RA, -30~85°C, SMT, RoHS (MOLEX: 1054500101)

Standard USB type-C

4.3.20 J20, FAN port

1x3, 2.0mm, 2A, 6mmH, M, Vert, WDT, THR, RoHS

(JST: B3B-PH-K-S(LF)(SN))

Pin	Name	Type	Description
1	VCC_FAN	P	+5V power supply for FAN (OPT +12V)

2	FAN_PWM	O	Speed adjust for FAN
3	GND	P	Ground

4.3.21 J21, COM Port

1x12,1.25mm,1A,3.4mmH,M,RA,WDT,SMT,RoHS

(MOLEX: 53261-1271)

Pin	Name	Type	Description
1	UART4_T	P	RS232 data transmit
2	UART4_R	O	RS232 data receive
3	GND	P	Ground
4	RS485_A	O	RS485 data+
5	RS485_B	P	RS485 data-
6	GND	O	Ground
7	RS422_TX+	P	RS422 data transmit+
8	RS422_RX+	O	RS422 data receive+
9	RS422_TX-	P	RS422 data transmit-
10	RS422_RX-	O	RS422 data receive-
11	GND	P	Ground
12	Power	NC	NC, OPT +5V or +3.3V power supply

4.3.22 J22, Optional power input port

1x4,2.5mm,3A,7.0mmH,M,Vert,IND,THR,RoHS

(ATOM: AWF-2540104-D08)

Pin	Name	Type	Description
1	DC_IN	P	Type 12V power input (Range:8-16V)
2	DC_IN	P	Type 12V power input (Range:8-16V)

3	EXGND	P	Ground
4	EXGND	P	Ground

4.3.23 U64,USB Host port

3.0,Type A,2Port,F,RA,CMT,THR,RoHS

(FOXCONN: UEA1112C-8HK1-4H)

Up: USB3.0 Host

Down: USB2.0 Host

4.4 Hardware Operation Notes

- a. Power prepare: Please confirm the power input is 12V. And the reference current is 1A. Make sure the power input positive is not reversed.
- b. Environment: For the assembled or debug platform, be sure there hasn't any risk of circuit shortness for the board. And make sure the anti static is done well.
- c. Debug message view: Using COM port on P3 (COM1) to view the debug message. It will show the boot message. In PC side, communication hyper terminal or other serial software tools can be used. The debug port setting is: baud rate 115,200bps, NO hardware control, no ODD/EVEN checking, 1 Stop bit. Suggest use a cross cable, in two Female header.

5 Tips



Waste Disposal

It is recommended to disassemble the device before abandoning it in conformity with local regulations. Please ensure that the abandoned batteries are disposed according to local regulations on waste disposal. Do not throw batteries into fire (explosive) or put in common waste canister. Products or product packages with the sign of "explosive" should not be disposed like household waste but delivered to specialized electrical & electronic waste recycling/disposal center. Proper disposal of this sort of waste helps avoiding harm and adverse effect upon surroundings and people's health. Please contact local organizations or recycling/disposal center for more recycling/disposal methods of related products.

Comply with the following safety tips:



Do not use in combustible and explosive environment

Keep away from combustible and explosive environment for fear of danger.



Keep away from all energized circuits.

Operators should not remove enclosure from the device. Only the group or person with factory certification is permitted to open the enclosure to adjust and replace the structure and components of the device. Do not change components unless the power cord is removed. In some cases, the device may still have residual voltage even if the power cord is removed. Therefore, it is a must to remove and fully discharge the device before contact so as to avoid injury.



Unauthorized changes to this product or its components are prohibited.

In the aim of avoiding accidents as far as possible, it is not allowed to replace the system or change components unless with permission and certification. Please contact the technical department of Vantron or local branches for help.



Pay attention to caution signs.

Caution signs in this manual remind of possible danger. Please comply with relevant safety tips below each sign. Meanwhile, you should strictly conform to all safety tips for operation environment.



Notice

Considering that reasonable efforts have been made to assure accuracy of this manual, Vantron assumes no responsibility of possible missing contents and information, errors in contents, citations, examples, and source programs.

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