SCM120 and SCB120

Freescale i.MX6 Series ARM-based SMARC System-on-Module and Baseboard

Hardware User's Manual

Disclaimers

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

June 2016, Version A4

Printed in Taiwan

ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

Trademarks Acknowledgments

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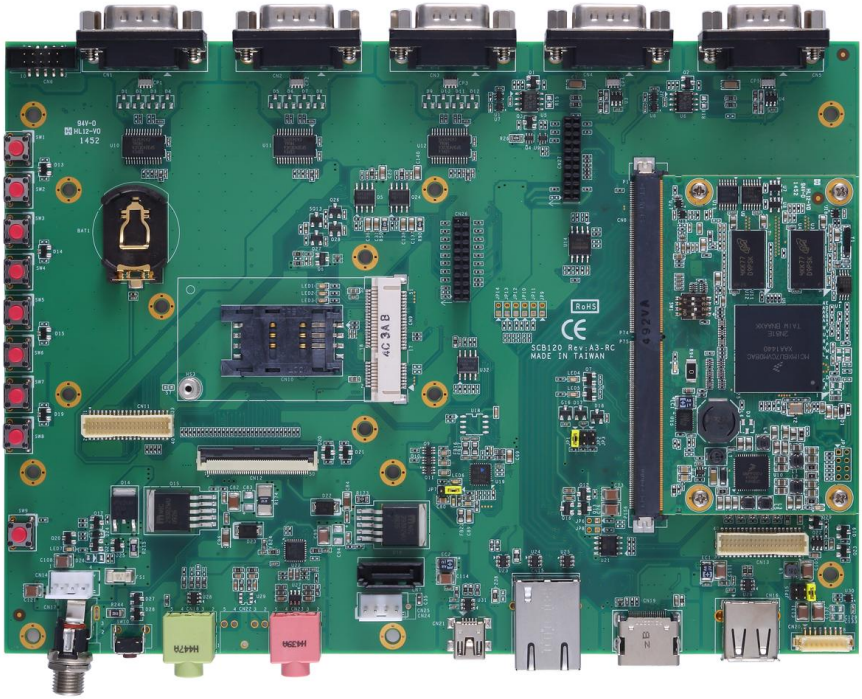
Chapter 1
Introduction



The SCM120 is a new SMARC module to support Freescale i.MX6 series SoCs. It integrates system memory, storage as eMMC/SDHC socket, TTL LCD, audio, USB host/client, UARTs, CANBus and various I/O features. Taking the low power consumption advantages of ARM RISC architecture, the SCM120 is extremely suitable to be deployed in the deeply embedded applications; such as HMI, data logger, extended temperature embedded controllers, etc.

1.1 Features

- Freescale i.MX6 family SoC information:

Feature	i.MX6Quad(800MHz) MCIMX6Q7CVT08A	i.MX6Quad(1.0GHz) MCIMX6Q5EYM10A	i.MX6DualLite(800MHz) MCIMX6U7CVM08A
On-chip RAM	DDR3 1066MHz 1GB	DDR3 1066MHz 1GB	DDR3 800MHz 1GB
Memory I/F	eMMC NAND Flash 4GB	eMMC NAND Flash 4GB	eMMC NAND Flash 4GB
Touchscreen	No	No	No
Ethernet	x1	x1	x1
Display	LVDS x2 24-bit TTL LCD HDMI x1	LVDS x2 24-bit TTL LCD HDMI x1	LVDS x2 24-bit TTL LCD HDMI x1
Storage	SATA x1 SD/SDHC x1	SATA x1 SD/SDHC x1	SD/SDHC x1
Mini PCIE	x1	x1	x1
USB 2.0	OTG HS with HS PHY x1 HS Host with HS PHY x1	OTG HS with HS PHY x1 HS Host with HS PHY x1	OTG HS with HS PHY x1 HS Host with HS PHY x1
Camera sensors	Serial port x1 Parallel port x1	Serial port x1 Parallel port x1	Serial port x1 Parallel port x1
CAN	x2	x2	x2
JTAG	x1	x1	x1
SPI	x2	x2	x2
I2C	x4	x4	x4
UART	RS-232 x2	RS-232 x2	RS-232 x2
GPIO	x8	x8	x8
Audio	Headphone x1 Mic-in x1	Headphone x1 Mic-in x1	Headphone x1 Mic-in x1
System Control	Buttons x2 (Power,Reset,)	Buttons x2 (Power,Reset,)	Buttons x2 (Power,Reset,)
Power	DC 5V, 5A CR2032 for Standby Power	DC 5V, 5A CR2032 for Standby Power	DC 5V, 5A CR2032 for Standby Power

- Onboard DDR3-1066 memory 1GB ,supports up to 2GB capacity
- Onboard eMMC flash as booting device
- One USB 2.0 ports and One Mini USB OTG port
- 24-bit TTL LCD
- 2 100/10 Base-T Ethernet
- IIS Audio

1.2 Specifications

- **CPU**
  - Freescale i.MX6 series SoC; default is i.MX6 DualLite
  - ARM Cortex A9™ CPU running at 1.2GHz.
  - 256KB integrated low power on-chip SRAM.
  - 64KB integrated mask-programmable on-chip ROM.

- **Boot ROM**
  - Linux kernel 3.0.35 compliant Android 4.3.1
    (Please contact your agent for detail shipping content).

- **System Memory**
  - 1GB Maximum up to 2GB DDR3-1066 memory.

- **USB Interface**
  - One USB 2.0 ports and One Mini USB OTG port OTG comply with USB Spec. Rev. 2.0.

- **Storage Interface**
  - One eMMC NAND flash chip on module; default is 4GB.
  - One SATA Connector on base serial-ATA to interface with hard disk drives.
  - One SD/SDHC Connector on base with up to 32GB capacity.
  - One Micro SD Connector on base with up to 32GB capacity(option)

- **Display**
  - Two LVDS channels, connectivity to displays with LVDS interface.
  - One parallel display ports, RGB Data of 18 or 24 bits.
  - One HDMI with up to 1920x1080 resolution.

- **Ethernet**
  - One 10/100/1000 Base-T with Freescale i.MX6 integrated MAC and Atheros AR8031 PHY, support IEEE std 1588-compatible hardware timestamp.
  - One 10/100 Base-T with AX88772B.
  - Compatible with IEEE std 802.3.

- **Audio**
  - Freescale IIS SGTL5000 codec for MIC-in/headphone via SMARC MXM interface.

- **Serial Port**
  - Two RS-232, with 4-wire(TX/RX/RTS/CTS)

- **CANBus**
  - Two 2.0B protocol-compatible Controller Area Network (CAN) via SMARC MXM interface.

- **Camera sensors**
  - MIPI CSI-2(2 lanes)
  - Parallel Camera port(8 bit)

- **I^2C**
  - Foru I^2C Master/Slave interfaces (up to 400kbps) connected to SMARC MXM interface.

- **SPI**
  - One SPI channel for 2 chip select via SMARC MXM interface.

- **GPIO**
  - Eight GPIO interfaces (up to 400kbps) via SMARC MXM interface with buttons.

- **Power**
  - +5V ± 5% DC-in.

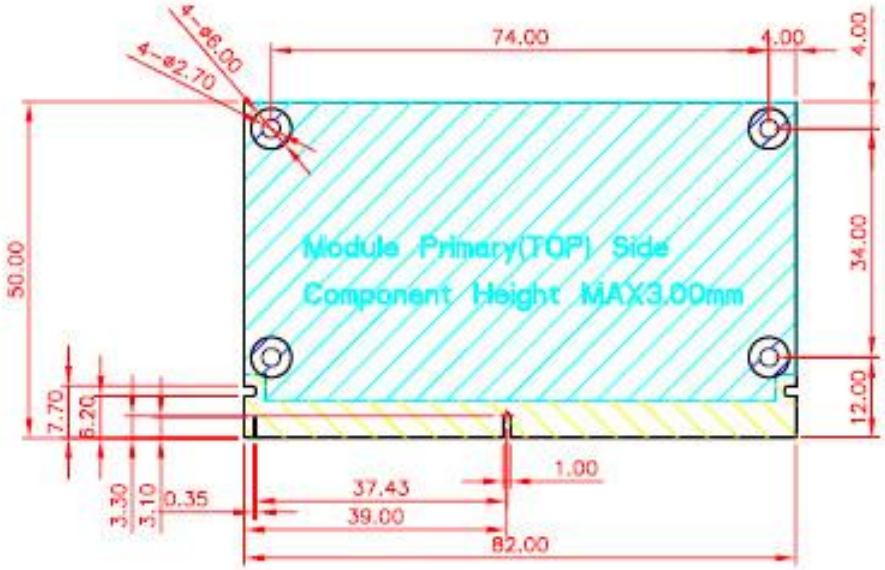
- **Form Factor**
  - 82mm x 50mm.
  - Thickness as 1.2mm ± 0.1mm.
  - SMARC specifications v2.0 compliant.

- **Environments**
  - Operating temperature with Imx6: -40 ~ 85ºC
  - Operating humidity: 10% RH ~ 85% RH relative humidity, non-condensing.

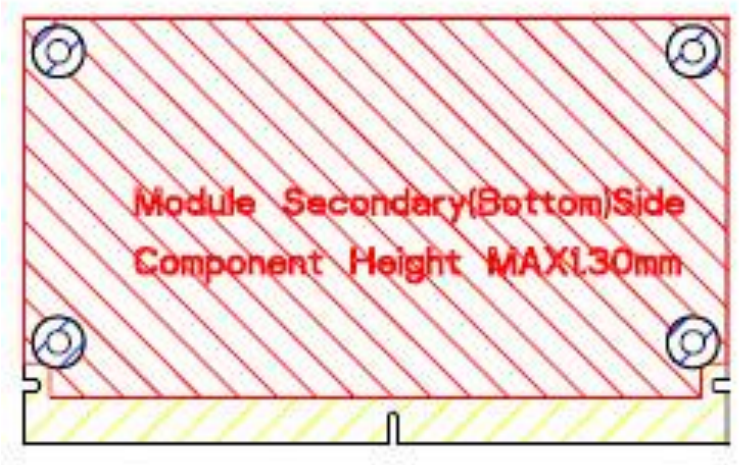
Note: ***All specifications and images are subject to change without notice.***

Chapter 2
Board and Pin Assignments

2.1 Board Dimensions and Fixing Holes

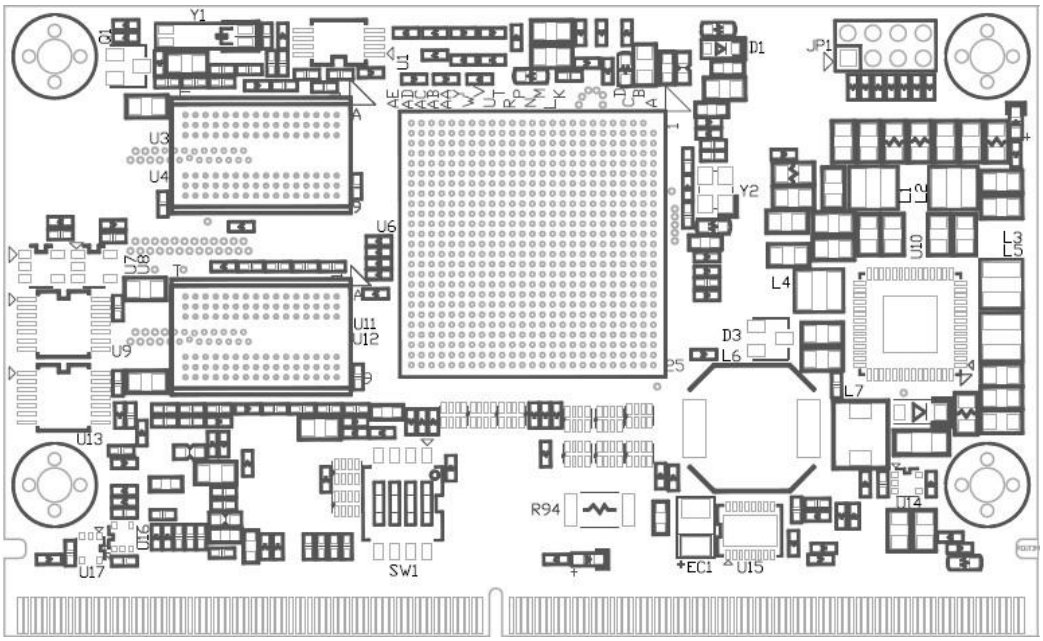


Top View

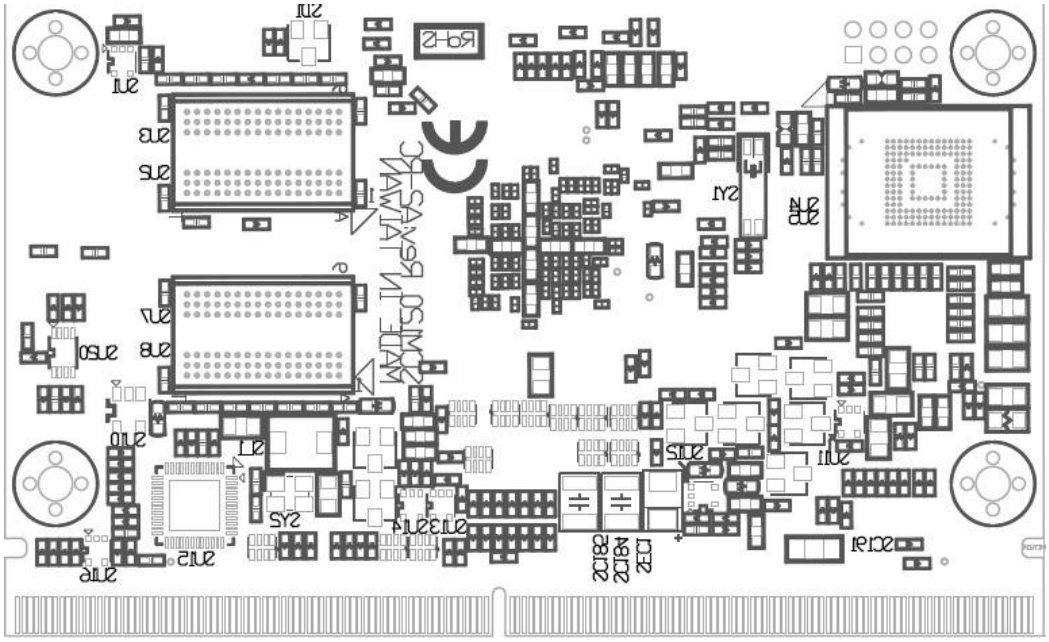


Bottom View

2.2 Board Layout



Top View



Bottom View

2.3 Installing Heatsink & Heatspreader

For thermal dissipation, the heatsink & heatspreader enable the SCM120 components to dissipate heat efficiently. All heat generating components are thermally conducted to the heatsink or heatspreader in order to avoid hot spots. Below procedures illustrate how to install the heatsink and heatspreader on SCM120.

2.3.1 Heatsink

1. The heatsink is designed for the SCM120 module. Before installing the heatsink to the CPU module, please ensure that the surface of the processor is clean and free of dust and finger oil. This is especially critical for SCM120 module that is with high CPU speed to ensure that the heatsink acts as a proper thermal interface for cooling solutions.

2. Please tear the sticker protector, place the heatsink on top of the processor chip. It makes even contact all around.

2.3.2 Heatspreader

1. The heatspreader is designed for the SCM120 module. The thermal pad on the heatspreader is designed to make contact with the necessary components on the SCM120 module. When mounting the heatspreader you must make sure that the thermal pads on the heatspreader make complete contact (no space between thermal pad and component) with the corresponding components on the SCM120 module. This is especially critical for SCM120 module that is with high CPU speed to ensure that the heat spreader acts as a proper thermal interface for cooling solutions.

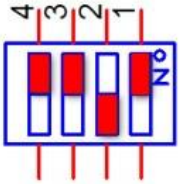
2. This CPU module has four assembly holes for installing heat spreader plate. Use the four screws to secure the heat spreader plate to the SCM120. Be careful not to over-tighten the screws.

2.4 Switch Settings

2.4.1 SWICH (SW1)

SCM120 jumpers are for boot mode selection

Function	Setting
Depend on base board (Default)	SW1(1.3,4) ON SW1(2) OFF



SCB120 jumpers are for boot mode selection.

Function	Setting
Serial Downloader Mode (For MFGTool)	JP1 Open JP2 Open JP3 Open
Boot from eMMC (Default)	JP1 Close JP2 Open JP3 Open
Boot from SD Card	JP1 Open JP2 Close JP3 Close

2.5 Connectors

2.5.1 JTAG Connector (JP1)

This board has a JTAG Connector (JP1) for interfacing JTAG ICE TOOL.

Pin	Signal	Pin	Signal
1	GEN_3V3	2	JTAG_TMS
3	JTAG_nTRST	4	JTAG_TCK
5	JTAG_TDI	6	JTAG_TDO
7	GND	8	POR_B

Chapter 3
SCB120 Baseboard

The SCB120 is a baseboard for SCM120 SoM. Connect this baseboard properly of SCM120. Its specifications and detailed information are given in this chapter.

3.1 SCB120 Specifications

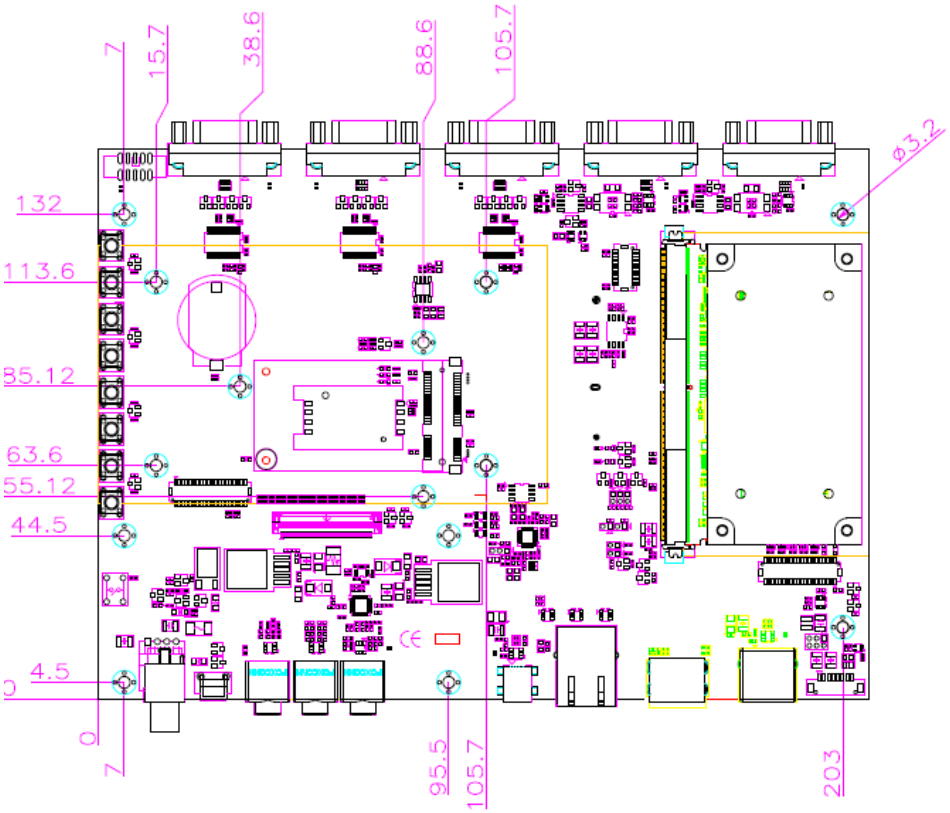
- **Size**
  - 210mm x 150mm

- **Features**
  - Support Audio jack (MIC-in/Headphone).
  - One SDHC Card socket.
  - One USB 2.0 Host and one OTG for Client.
  - Two RJ-45 interfaces, 1000-Mbps Ethernet MAC integrated in iMX6 and PHY as Atheros AR8031, the other one for 10/100 Base-T with AX88772B.
  - Serial Ports: Four RS-232 4-wire 3.3V TTL
  - Two CAN Bus with 2.0B protocol compliant.
  - HDMI 1.4
  - SATA 2.0
  - 2 x LVDS 24bit
  - 1 x TTL 24bit
  - Extension connector with 1 x RS-232(4-wire),2 x I2C(up to 400 kbps),1 x SPI(2 chip select)
  - User buttons for keypad and reset button.

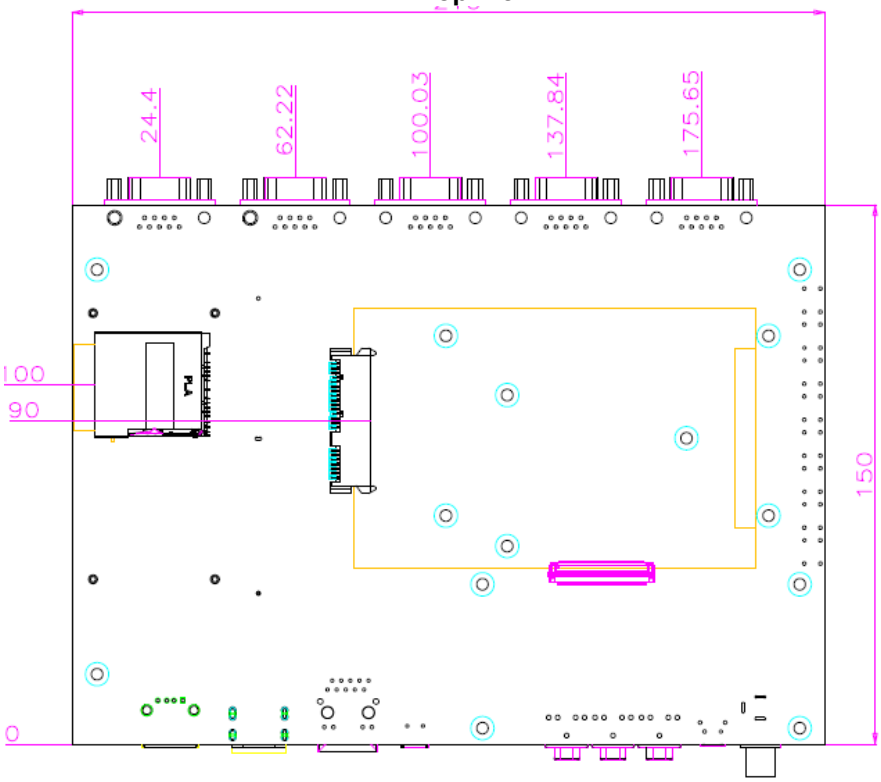
- **Power**
  - +5V ± 5% DC-in, over 1.7A.

Note: ***All specifications and images are subject to change without notice.***

3.2 SCB120 Dimensions and Fixing Holes

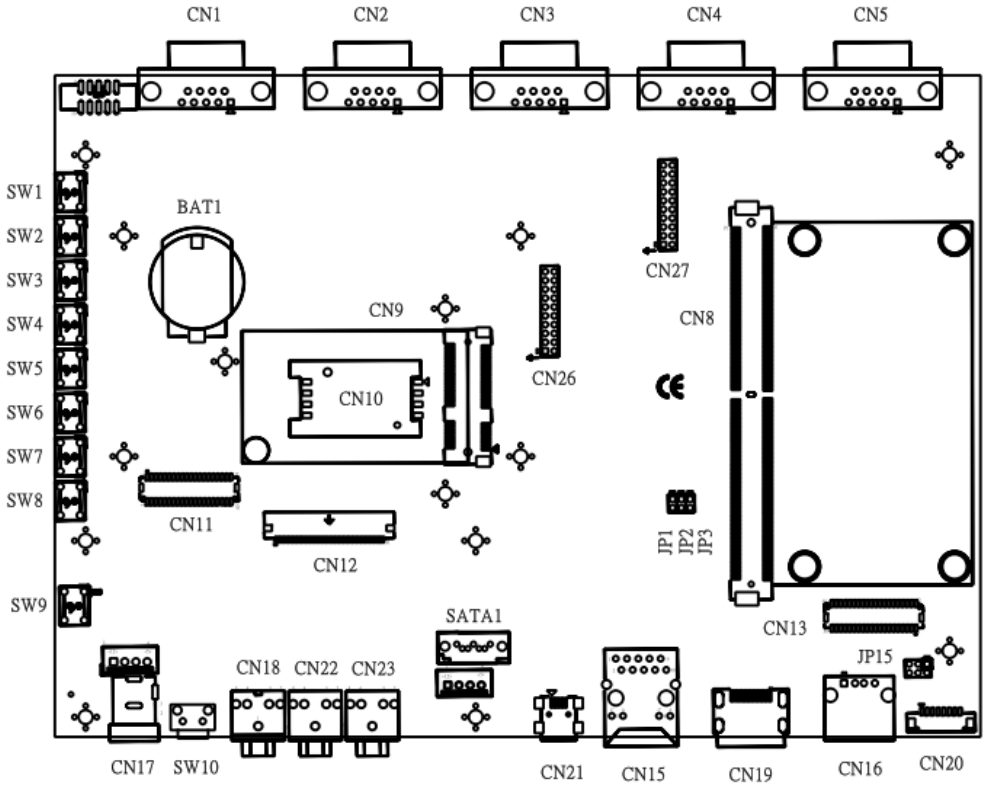


Top View

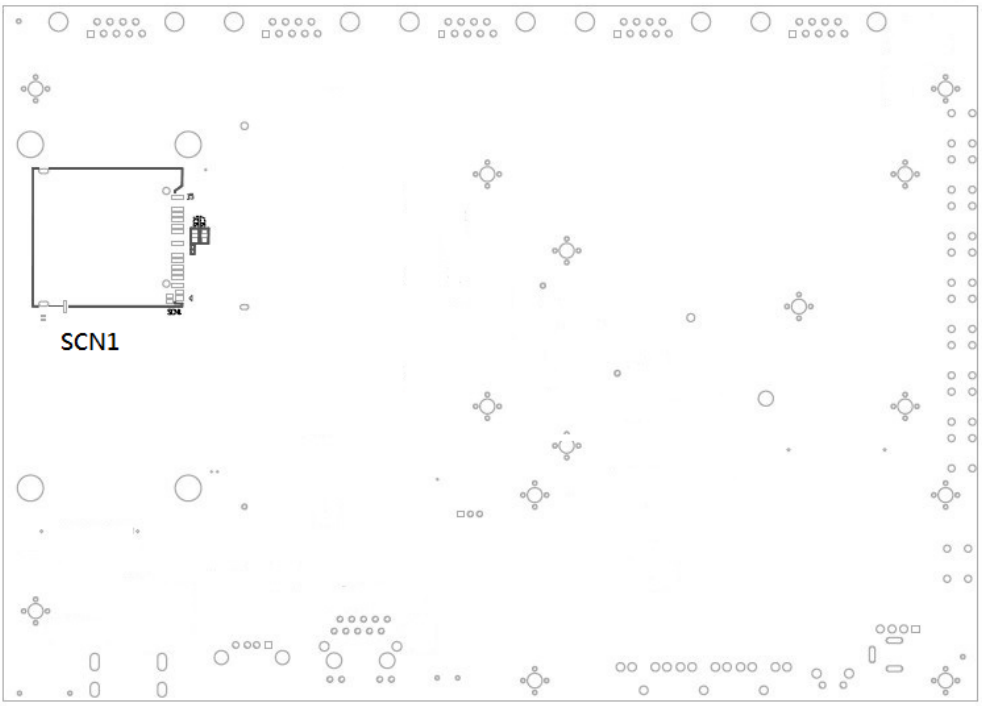


Bottom View

3.3 SCB120 Board Layout



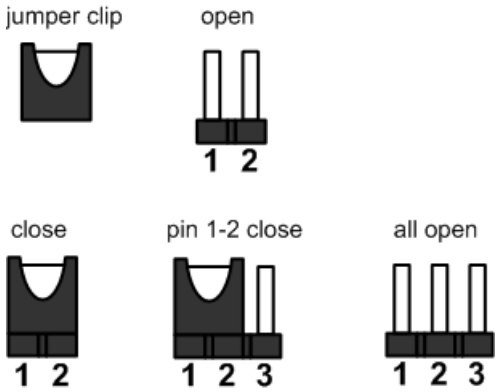
Top View



Bottom View

3.4 Jump setting

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. The following illustration shows how to set up jumper.



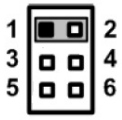
Below you can find a summary table of all jumpers and onboard default settings.

Jumper	Description	Jumper Setting
JP15	LVDS Voltage Selection Default: +3.3V	1-2 close

3.4.1 LVDS Voltage Selection (JP15)

The board supports voltage selection for flat panel displays. JP15 is used to set LVDS connector (CN20) pin 1~6 LCD_PWR to +3.3V or +5V or +12V voltage level.

Function	JP2 Setting
+3.3V level (Default)	1-2 close
+5V level	3-4 open
+12V level	5-6 open



3.4.2 Boot Mode Selection (JP1~JP3)

These jumpers are for boot mode selection.

Function	Setting
Copy image to eMMC (Default) Must wait 30 sec	JP1 Open JP2 Open JP3 Open
Boot to OS (SCM120 eMMC)	JP1 Close JP2 Open JP3 Open
Boot to OS (SCB120 SD Card)	JP1 Open JP2 Close JP3 Close

3.4.3 Touch Panel Wire Selection (JP7)

Function	JP2 Setting
4,8 Wire	1-2 close
5 Wire	2-3 close

3.5 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

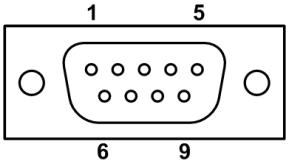
Connector	Description
CN2	COM3 Connector
CN3	COM2 Connector
CN4	CAN1 Interface Connector
CN5	CAN2 Interface Connector
CN6	COM1 Box Header
CN8	MXM Connector
CN9	PCI-Express Mini Card Connector
CN11	Expansion Connector
CN12	50-pin ZIF for TTL LCD+T/S from baseboard
CN13	LVDS Connector
CN15	Ethernet Port 0 Connector
CN16	USB Port Host Connector
CN17	DC Jack Power Connector
CN18	Audio Headphone Jack
CN19	HDMI Connector
CN20	Inverter Connector
CN21	Mini USB OTG Port Host/Device Connector
CN23	Audio MIC-in Jack
CN26	Camera Parallel port
CN27	Camera Serial port
SCN1	SDHC/MMC Card Socket
SATA1	SATA & SATA Power Connector
SW1	User Button for Keypad
SW2	User Button for Keypad
SW3	User Button for Keypad
SW4	User Button for Keypad
SW5	User Button for Keypad
SW6	User Button for Keypad
SW7	User Button for Keypad
SW8	User Button for Keypad
SW9	User Button for Keypad
SW10	Reset Button

3.5.1 COM3 Connector (CN2)

These is standard 9-pin D-Sub connectors for interfacing to serial ports.

Pin	Signal
1	N.C.
2	COM3_RX
3	COM3_TX
4	N.C.
5	GND
6	N.C.
7	COM3_RTS
8	COM3_CTS
9	N.C.

CN2 (for COM3)

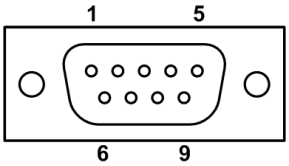


3.5.2 COM2 Connector (CN3)

These is standard 9-pin D-Sub connectors for interfacing to serial ports.

Pin	Signal
1	N.C.
2	COM2_RX
3	COM2_TX
4	N.C.
5	GND
6	N.C.
7	COM2_RTS
8	COM2_CTS
9	N.C.

CN3 (for COM2)

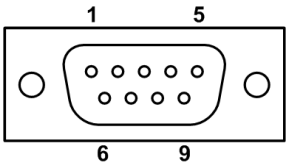


3.5.3 CAN Interface Connectors (CN4 and CN5)

These are standard 9-pin D-Sub connectors for interfacing to CAN network.

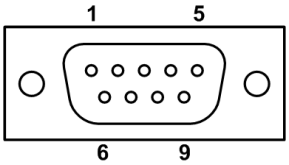
Pin	Signal
1	N.C.
2	CAN1_L
3	GND
4	N.C.
5	N.C.
6	N.C.
7	CAN1_H
8	N.C.
9	N.C.

CN4 (for CAN1)



Pin	Signal
1	N.C.
2	CAN2_L
3	GND
4	N.C.
5	N.C.
6	N.C.
7	CAN2_H
8	N.C.
9	N.C.

CN5 (for CAN2)

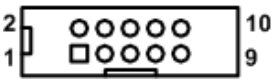


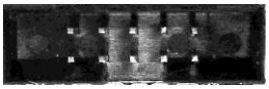
3.5.4 COM1 Box Header (CN6)

This is a 2x5 pin 2.0 pitch box header for interfacing to serial ports.

Pin	Signal
1	N.C.
2	N.C.
3	COM1_RX
4	N.C.
5	COM1_TX
6	N.C.
7	N.C.
8	XXX
9	GND
10	N.C.

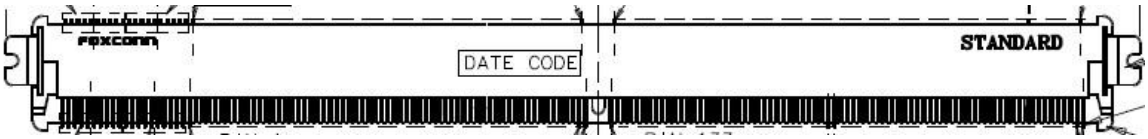
CN6 (for COM1)





3.5.5 MXM Connector (CN7)

This SMT type 0.50mm [.020”] pitch, 314-pin MXM connector is available in 2 different heights (5.5mm and 7.8mm) for maximum flexibility.



P-Pin	Primary (Top) Side	S-Pin	Secondary (Bottom) Side
		S1	CSI0_VSYNC
P1	N.C	S2	CSI0_HSYNC
P2	GND	S3	GND
P3	CSI_CLK0P	S4	CSI0_PIXCLK
P4	CSI_CLK0N	S5	I2C1_SCL
P5	PCAM_DE	S6	CAM_MCK
P6	PCAM_MCK	S7	I2C1_SDA
P7	CSI_D0P	S8	CSI0_D2
P8	CSI_D0N	S9	CSI0_D3
P9	GND	S10	GND
P10	CSI_D1P	S11	CSI0_D4
P11	CSI_D1N	S12	CSI0_D5
P12	GND	S13	GND
P13	CSI_D2P	S14	CSI0_D6
P14	CSI_D2N	S15	CSI0_D7
P15	GND	S16	GND
P16	CSI0_D0	S17	AFB0_OUT
P17	CSI0_D1	S18	AFB1_OUT
P18	GND	S19	AFB2_OUT
P19	Q7_MDI_3N	S20	AFB3_IN
P20	Q7_MDI_3P	S21	AFB4_IN
P21	RGMII_LED_10_100_N	S22	AFB5_IN
P22	RGMII_LED_1000_N	S23	AFB6_PTIO
P23	Q7_MDI_2N	S24	AFB7_PTIO
P24	Q7_MDI_2P	S25	GND
P25	RGMII_LED_ACT_N	S26	N.C
P26	Q7_MDI_1N	S27	N.C
P27	Q7_MDI_1P	S28	N.C
P28	N.C	S29	N.C
P29	Q7_MDI_0N	S30	SD3_DATA4
P30	Q7_MDI_0P	S31	SD3_DATA5
P31	CSPI1_CS1	S32	SD3_DATA6
P32	GND	S33	SD3_DATA7
P33	SD3_WP	S34	GND
P34	SD3_CMD	S35	N.C
P35	SD3_CD_B	S36	N.C
P36	Q7_SD3_CLK	S37	N.C
P37	N.C	S38	AUD_MCK
P38	GND	S39	AUD3_TXFS
P39	SD3_DATA0	S40	AUD3_RXD

Pin	Signal	Pin	Signal
P40	SD3_DATA1	S41	AUD3_TXD
P41	SD3_DATA2	S42	Q7_AUD3_TXC
P42	SD3_DATA3	S43	N.C
P43	CSPI1_CS0	S44	N.C
P44	CSPI1_CLK	S45	N.C
P45	CSPI1_MISO	S46	N.C
P46	CSPI1_MOSI	S47	GND
P47	GND	S48	I2C3_SCL
P48	Q7_SATA_TXP	S49	I2C3_SDA
P49	Q7_SATA_TXN	S50	N.C
P50	GND	S51	N.C
P51	Q7_SATA_RXP	S52	N.C
P52	Q7_SATA_RXN	S53	N.C
P53	GND	S54	SATA_DEVSLP
P54	ECSPI2_CS0	S55	N.C
P55	ECSPI2_CS1	S56	N.C
P56	ECSPI2_CLK	S57	PCAM_ON_CSI0#
P57	ECSPI2_MISO	S58	N.C
P58	ECSPI2_MOSI	S59	N.C
P59	GND	S60	N.C
P60	USB_OTG_DP	S61	GND
P61	USB_OTG_DN	S62	LVDS1_TX0_P
P62	USB_OTG_OC	S63	LVDS1_TX0_N
P63	OTG_VBUS	S64	GND
P64	USB_OTG_ID	S65	LVDS1_TX1_P
P65	USB_HOST_DP	S66	LVDS1_TX1_N
P66	USB_HOST_DN	S67	GND
P67	USB_H1_OC	S68	LVDS1_TX2_P
P68	GND	S69	LVDS1_TX2_N
P69	N.C	S70	GND
P70	N.C	S71	INC_LVDS1_TX3_P
P71	N.C	S72	INC_LVDS1_TX3_N
P72	N.C	S73	GND
P73	N.C	S74	LVDS1_CLK_P
P74	N.C	S75	LVDS1_CLK_N
	<Key>		***<Key>***
P75	PCIE_RST_B	S76	N.C
P76	N.C	S77	N.C
P77	N.C	S78	N.C
P78	N.C	S79	N.C
P79	GND	S80	GND
P80	N.C	S81	N.C
P81	N.C	S82	N.C
P82	GND	S83	GND
P83	Q7_CLK1_P	S84	N.C
P84	Q7_CLK1_N	S85	N.C
P85	GND	S86	GND
P86	PCIE_RXP	S87	N.C
P87	PCIE_RXM	S88	N.C
P88	GND	S89	GND

Pin	Signal	Pin	Signal
P89	Q7_PCIE_TXP	S90	N.C
P90	Q7_PCIE_TXM	S91	N.C
P91	GND	S92	GND
P92	HDMI_D2P	S93	DISP0_DAT 0
P93	HDMI_D2N	S94	DISP0_DAT 1
P94	GND	S95	DISP0_DAT 2
P95	HDMI_D1P	S96	DISP0_DAT 3
P96	HDMI_D1N	S97	DISP0_DAT 4
P97	GND	S98	DISP0_DAT 5
P98	HDMI_D0P	S99	DISP0_DAT 6
P99	HDMI_D0N	S100	DISP0_DAT 7
P100	GND	S101	GND
P101	HDMI_CLKP	S102	DISP0_DAT 8
P102	HDMI_CLKN	S103	DISP0_DAT 9
P103	GND	S104	DISP0_DAT 10
P104	HDMI_HPD	S105	DISP0_DAT 11
P105	HDMI_DDC_CLK_IN	S106	DISP0_DAT 12
P106	HDMI_DDC_DAT_IN	S107	DISP0_DAT 13
P107	HDMI_CEC_IN	S108	DISP0_DAT 14
P108	CSI0_PWN	S109	DISP0_DAT 15
P109	CSI_PWN	S110	GND
P110	CSI0_RST_B	S111	DISP0_DAT 16
P111	CSI_RST_B	S112	DISP0_DAT 17
P112	CPU_PIN_E15	S113	DISP0_DAT 18
P113	CSI_PWM	S114	DISP0_DAT 19
P114	CHG_KEY_A	S115	DISP0_DAT 20
P115	CHG_KEY_B	S116	DISP0_DAT 21
P116	CHG_KEY_C	S117	DISP0_DAT 22
P117	CHG_KEY_D	S118	DISP0_DAT23
P118	CHG_KEY_E	S119	GND
P119	CHG_KEY_F	S120	DISP0_DRDY
P120	GND	S121	DISP0_VSYNCH
P121	I2C_PM_CK	S122	DISP0_HSYNCH
P122	I2C_PM_DAT	S123	DISP0_CLK
P123	BOOT_SEL0#	S124	GND
P124	BOOT_SEL1#	S125	LVDS0_TX0_P
P125	BOOT_SEL2#	S126	LVDS0_TX0_N
P126	KEY_VOL_DN	S127	DISP0_CNTRST
P127	PWRON	S128	LVDS0_TX1_P
P128	KEY_VOL_UP	S129	LVDS0_TX1_N
P129	CHG_UART2_TX	S130	GND
P130	CHG_UART2_RX	S131	LVDS0_TX2_P
P131	CHG_UART2_RTS	S132	LVDS0_TX2_N
P132	CHG_UART2_CTS	S133	DISP0_PWR_EN
P133	GND	S134	LVDS0_CLK_P
P134	UART1_TX	S135	LVDS0_CLK_N
P135	UART1_RX	S136	GND

Pin	Signal	Pin	Signal
P136	UART3_TXD	S137	INC_LVDS0_TX3_P
P137	UART3_RXD	S138	INC_LVDS0_TX3_N
P138	CHG_UART3_RTS	S139	I2C2_SCL
P139	CHG_UART3_CTS	S140	I2C2_SDA
P140	N.C	S141	DISP0_PWM
P141	N.C	S142	N.C
P142	GND	S143	GND
P143	CAN1_TX	S144	N.C
P144	CAN1_RX	S145	Q7_WDOG_B
P145	KEY_COL4	S146	PCIE_WAKE_B
P146	KEY_ROW4	S147	VCC_RTC
P147	5V_IN	S148	N.C
P148	5V_IN	S149	Q7_PWRBTN_N
P149	5V_IN	S150	N.C
P150	5V_IN	S151	N.C
P151	5V_IN	S152	N.C
P152	5V_IN	S153	N.C
P153	5V_IN	S154	3V3_ENABLE
P154	5V_IN	S155	N.C
P155	5V_IN	S156	N.C
P156	5V_IN	S157	N.C
		S158	VDD_IO_SEL#

3.5.6 Mini Card Socket (CN9)

Pin	Signal	Pin	Signal
1	PCIE_WAKE_B	2	MPCIE_3V3
3	TP34	4	GND
5	TP35	6	MPCIE_1V5
7	TP36	8	PCIE_UIM_PWR
9	GND	10	PCIE_UIM_DATA
11	Q7_CLK1_N	12	PCIE_UIM_CLK
13	Q7_CLK1_P	14	PCIE_UIM_RST
15	GND	16	PCIE_UIM_VPP
17	UIM_C8	18	GND
19	UIM_C4	20	PCIE_DIS_B
21	GND	22	PCIE_RST_B
23	PCIE_RXM	24	MPCIE_3V3
25	PCIE_RXP	26	GND
27	GND	28	MPCIE_1V5
29	GND	30	I2C3_SCL
31	Q7_PCIE_TXM	32	I2C3_SDA
33	Q7_PCIE_TXP	34	GND
35	GND	36	USB_DM2
37	GND	38	USB_DP2
39	MPCIE_3V3	40	GND
41	MPCIE_3V3	42	LED_WWAN#
43	GND	44	LED_WLAN#
45	TP38	46	LED_WPAN#
47	TP39	48	MPCIE_1V5
49	TP40	50	GND
51	TP41	52	MPCIE_3V3
53	N.C	54	N.C
55	N.C	56	N.C

3.5.7 Expansion Connector (CN11)

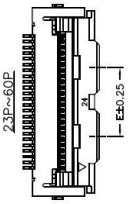
This board also has a expansion connector (CN11) from baseboard

Pin	Signal	Pin	Signal
1	AUX_5V	2	AUX_5V
3	AUX_5V	4	AUX_5V
5	AUX_5V	6	AUX_5V
7	GND	8	GND
9	GEN_3V3	10	GEN_3V3
11	GEN_3V3	12	GEN_3V3
13	GEN_3V3	14	GEN_3V3
15	GND	16	GND
17	N.C.	18	I2C1_SDA
19	N.C.	20	I2C1_SCL
21	N.C.	22	GND
23	N.C.	24	I2C3_SDA
25	GND	26	I2C3_SCL
27	CSPI1_CS1	28	GND
29	CSPI1_CS0	30	CHARGER_PRSNT#
31	CSPI1_MISO	32	CARRIER_STBY#
33	CSPI1_MOSI	34	BATLOW#
35	CSPI1_CLK	36	TEST#
37	GND	38	GND
39	GND	40	GND

3.5.8 50-pin ZIF Connector (CN12)

This board also has a 50-pin ZIF connector (CN12) for interfacing TTL LCD and touch screen from baseboard.

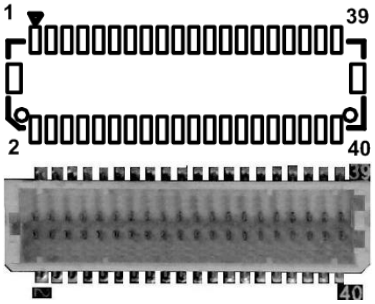
Pin	Signal	Pin	Signal
1	GND	2	GND
3	GEN_3V3	4	GEN_3V3
5	DISP0_DAT16	6	DISP0_DAT17
7	DISP0_DAT18	8	DISP0_DAT19
9	DISP0_DAT20	10	DISP0_DAT21
11	DISP0_DAT22	12	DISP0_DAT23
13	DISP0_DAT8	14	DISP0_DAT9
15	DISP0_DAT10	16	DISP0_DAT11
17	DISP0_DAT12	18	DISP0_DAT13
19	DISP0_DAT14	20	DISP0_DAT15
21	DISP0_DAT0	22	DISP0_DAT1
23	DISP0_DAT2	24	DISP0_DAT3
25	DISP0_DAT4	26	DISP0_DAT5
27	DISP0_DAT6	28	DISP0_DAT7
29	GND	30	DISP0_CLK
31	DISP0_CNTRST	32	DISP0_HSYNCH
33	DISP0_VSYNCH	34	DISP0_DRDY
35	N.C.	36	N.C.
37	GND	38	GND
39	TS_XP	40	TS_YP
41	TS_XN	42	TS_YN
43	N.C.	44	N.C.
45	N.C.	46	LEDB-
47	LEDB+	48	GND
49	GND	50	GND



3.5.9 LVDS Connector (CN13)

This board has a 40-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-40VS-B 40-pin connector for LVDS interface. Pin 1~6 VCCM can be set to +3.3V, +5V or +12V level by setting JP2 (see section 2.3.2).

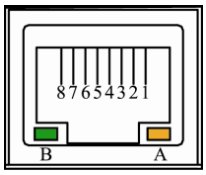
Pin	Signal	Pin	Signal
1	LCMVDD	2	LCMVDD
3	LCMVDD	4	LCMVDD
5	LCMVDD	6	LCMVDD
7	I2C2_SDA	8	I2C2_SCL
9	GND	10	GND
11	INC_LVDS1_3_N	12	LVDS1_0_N
13	INC_LVDS1_3_P	14	LVDS1_0_P
15	GND	16	GND
17	LVDS1_CLKN	18	LVDS1_1_N
19	LVDS1_CLKP	20	LVDS1_1_P
21	GND	22	GND
23	LVDS0_0_N -	24	LVDS1_2_N
25	LVDS0_0_P	26	LVDS1_2_P
27	GND	28	GND
29	LVDS0_1_N	30	INC_LVDS0_3_N
31	LVDS0_1_P	32	INC_LVDS0_3_P
33	GND	34	GND
35	LVDS0_2_N	36	LVDS0_CLKN
37	LVDS0_2_P	38	LVDS0_CLKP
39	GND	40	GND



3.5.10 Ethernet Port Internal LEDs Connector (CN15)

CN15 is the RJ-45 connector is for Ethernet. Just plug in one end of the cable and connect the other end to a 1000/100/10-Base-T hub.

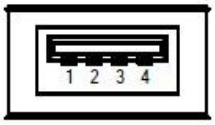
Pin	Signal
1	Q7_MDI_0P
2	Q7_MDI_0N
3	Q7_MDI_1P
4	Q7_MDI_1N
5	Q7_MDI_2P
6	Q7_MDI_2N
7	Q7_MDI_3P
8	Q7_MDI_3N
A	Active LED (Yellow)
B	100 LAN LED (Green)/1000 LAN LED (Orange)



3.5.11 USB Port Host Connector (CN16)

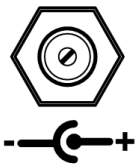
The board comes with one Universal Serial Bus (compliant with USB 2.0 (480Mbps)) connector which is for adapting to USB peripherals such as keyboard, mouse, etc.

Pin	USB Port Host
1	USB_HOST_VBUS (+5V level)
2	USB_HOST_DN
3	USB_HOST_DP
4	GND



3.5.12 DC Jack Power Connector (CN17)

This is a DC power jack with lock. Firmly insert at least 40W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting the power jack.



3.5.13 Audio Headphone Jack (CN18)

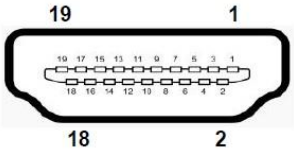
The board comes with one audio headphone jack.

Pin Color	Signal
Green	Headphone

3.5.14 HDMI Connector (CN19)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable. Its interface is available through connector CN19.

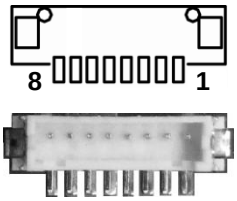
Pin	Signal	Pin	Signal
1	HDMI DATA2+	2	GND
3	HDMI DATA2-	4	HDMI DATA1+
5	GND	6	HDMI DATA1-
7	HDMI DATA0+	8	GND
9	HDMI DATA0-	10	HDMI Clock+
11	GND	12	HDMI Clock-
13	N.C.	14	N.C.
15	HDMI SCL	16	HDMI SDA
17	GND	18	+5V
19	HDMI_HTPLG		



3.5.15 Inverter Connector (CN20)

The CN20 is a DF13-8S-1.25V 8-pin connector for inverter. We strongly recommend you to use the matching DF13-8S-1.25C connector to avoid malfunction.

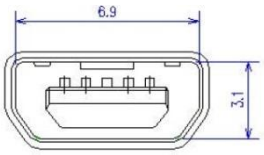
Pin	Signal
1	VBL1 (+12V level)
2	VBL1 (+12V level)
3	VBL2 (+5V level)
4	N.C.
5	GND
6	GND
7	GND
8	VBL Brightness Control



3.5.16 Mini USB OTG Port Host/Device Connector (CN21)

USB On-The-Go, often abbreviated USB OTG, is a specification that allows USB devices such as digital audio players or mobile phones to act as a host, allowing other USB devices like a USB flash drive, mouse, or keyboard to be attached to them. Unlike conventional USB systems, USB OTG systems can drop the hosting role and act as normal USB devices when attached to another host.

Pin	USB Port Host/Device
1	USB_OTG_VBUS (+5V level)
2	USB_OTG_DN
3	USB_OTG_DP
4	USB_OTG_ID
5	GND



3.5.17 Audio MIC IN Jack (CN23)

The board comes with one audio MIC-in jack.

Pin Color	Signal
Pink	MIC IN

3.5.18 Camera Parallel port (CN26)

Pin	Signal	Pin	Signal
1	DVDD_1.5V	2	GND
3	DOVDD_1.8V	4	AVDD_2.8V
5	D3	6	D2
7	D5	8	D4
9	D7	10	D6
11	D9	12	D8
13	VSYNCH	14	PIXCLK
15	MCK	16	HSYNCH
17	Pwn	18	Reset
19	I2C data	20	I2C clock

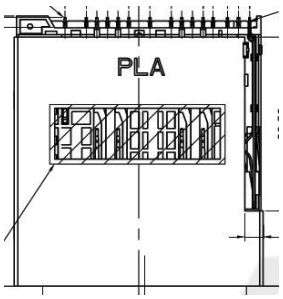
3.5.19 Camera Serial port (CN27)

Pin	Signal	Pin	Signal
1	DVDD_1.5V	2	GND
3	DOVDD_1.8V	4	AVDD_2.8V
5	N.C	6	N.C
7	MDP0	8	MDN0
9	MCP	10	MCN
11	MDP1	12	MDN1
13	N.C	14	N.C
15	MCK	16	N.C
17	Pwn	18	Reset
19	I2C data	20	I2C clock

3.5.20 SDHC/MMC Card Socket (SCN1)

This board has a SDHC/MMC Caed Socket.

Pin	Signal
1	WP SW
2	CD_SW
3	DAT1
4	DAT0
5	DAT7
6	VSS2
7	DAT6
8	CLK
9	VCC/VDD
10	VSS1
11	DAT5
12	CMD
13	DAT4
14	DAT3
15	DAT2
16	GND
17	GND
18	GND



3.5.21 User Button for Keypad (SW1~SW9)

The board comes with eight push buttons for keypad, see table below.
SW1

Push Button	Description
SW1	KEY_VOL_UP
SW2	KEY_VOL_DN
SW3	CHG_KEY_A
SW4	CHG_KEY_B
SW5	CHG_KEY_C
SW6	CHG_KEY_D
SW7	CHG_KEY_E
SW8	CHG_KEY_F
SW9	Q7_PWRBTN_N

3.5.22 Reset Button (SW10)

The SW10 is the reset button that reboot your system.

Reset Button	Description
SW10	Reboot system