

SoM-255G2

User Manual

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EMAC, Inc.

EMAC, inc.
EQUIPMENT MONITOR AND CONTROL
2390 EMAC Way, Carbondale, Illinois 62902
Phone: (618) 529-4525 Fax: (618) 457-0110
<http://www.emacinc.com>

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1 Introduction

This document provides information regarding EMAC's SoM-255G2 System-on-Module Carrier Board. The SoM-255G2 is a versatile SoM Carrier board ideal for evaluation and early development work. This Carrier works with all EMAC 200-pin SODIMM type SoMs although not all functionality of a particular module may be supported by the carrier board, and not all functionality of the carrier may be supported by all SOMs.

The SoM-255G2 provides access to virtually all of the 200-pin Module's I/O through on-board connectors as well as a number of additional I/O expansion blocks such as Digital I/O, Audio, and MMC/SD flash disk. Full schematics of the SoM-255G2 are provided giving the user a solid base with which to design their own SoM Carrier.

Although a good deal of customers will want a carrier that is unique and is designed specifically for their application, the SoM-255G2, when coupled with a SODIMM SoM makes for a powerful yet affordable Graphic User Interface (GUI) with USB and Ethernet capabilities. This allows the user to gather data and respond with control commands via the Internet. Enclosure and power supplies are available options for the SoM-255G2.

When a unique custom board is needed, the amount of design work required is greatly minimized by the SoM approach. The custom carrier designer does not have to worry about the processor, memory, and standard I/O functions and can concentrate on the I/O and dimensional aspects required for the application.

In situations where a custom carrier is required but the customer does not have the capability to design such a board in-house, EMAC's Custom to Order Services (COS) can be utilized. Using COS, the customer can select from a library of standard I/O blocks. These blocks can be put together quickly into a form-factor of the customer's choosing, providing prototypes in as little as 30 days.

1.1 Features

- **200-Pin SODIMM SoM Connector**
- **Inexpensive Open-Frame Design**
- **4x Serial Ports (3x RS232 & 1x RS232/422/485)**
- **2x 10/100/1000 BaseT Ethernet**
- **2x USB 2.0 (High Speed) Host Ports**
- **1x USB 2.0 (High Speed) OTG Port**
- **1x CAN-FD or 2.0B Port**
- **Socketed Battery**
- **1x μ SD/MMC Flash Card Socket**
- **1x I2S Audio CODEC with Line-out/Mic-in**
- **1x Audio Beeper**
- **System Reset Button**
- **Operating Voltage of 12 to 28 VDC**

- 800 X 480 (WVGA) or 1024 X 600 (WSVGA) LCD with LED Backlight
- Touchscreen Interface and Software Controlled Backlight, On/Off & Brightness
- Free Qt Creator IDE with GCC & GDB Development Tools
- 4x MIPI-CSI Lanes & MIPI-DSI
- Industrial Temperature Range -40°C to 85°C (limited by LCD)

1.2 On-Board Options

- Wireless-802.11b/g/n
- Bluetooth 5.1

2 Hardware

2.1 Specifications

LCD – 7” LCD (SoM-255G2-000)

- **Display Type:** 7” TFT Color LCD
- **Resolution:** 800 X 480 WVGA @ 262K Colors
- **Dot Pitch:** 0.19mm X 0.19mm
- **Luminance:** 800 (cd/m²)
- **Viewing Angle:**
 - θ-right: 65° (55°-min)
 - θ-left: 65° (55°-min)
 - θ-up: 55° (45°-min)
 - θ-down: 65° (55°-min)
- **Brightness:** Software Controlled
- **Backlight:** White LED (39 LEDs)
- **Durability:** Over one million touches
- **Wide Temperature range** -20°C to 70°C

LCD – 10.1” LCD (SoM-255G2-001)

- **Display Type:** 10.1” TFT Color LCD
- **Resolution:** 1024 X 600 WSVGA @ 262K Colors
- **Dot Pitch:** 0.22mm X 0.21mm
- **Luminance:** 460 (cd/m²)

- **Viewing Angle from Center:** From Top and Bottom, 40° min. (45° typ.), From Right, 10° min. (15° typ.), From Left, 30° min. (35° typ.)
- **Brightness:** Software Controlled
- **Backlight:** White LED (36 LEDs)
- **Durability:** Over one million touches
- **Wide Temperature range -20°C to 70°C**

Touchscreen Controller

- **Type:** 4 wire resistive touch
- **Resolution:** Continuous
- **Controller:** Part of SoM which is sold separately.

Ethernet Interface

- **Type:** 2x 10/100/1000 BaseT Ethernet
- **Interface:** 2x On-Board RJ-45 Connector

Solid-State Flash Disk

- **Removable:** µSD, MMC, or SDHC Flash Disk

Mechanical and Environmental

- **Dimensions:** 6.55" (L) X 4.15" (W) X 1.5" (H)
- **Weight:** 1.06 lbs.
- **Power Supply Voltage:** +12 to +28 VDC
- **Power Consumption:** Typical ~200 mA @ 24 VDC
- **Operating Temperature without LCD:** -40°C to 85°C (-40°F to 185°F)

Standard Parts Inventory (SoM-255G2-000)

- SoM-255G2 Assembly with 7" Touchscreen LCD
- Stainless-Steel Mounting Bracket
- Three Serial Port Cables
- Info Sheet with links to Manuals, Schematics, and Drivers

2.2 Jumper Configuration

Table 1 indicates the default jumper settings in case you want to revert back to the factory settings. Be sure to read all safety precautions before you begin any configuration procedure. See Appendix A for connector pinouts and Appendix B for Jumper Settings.

Table 1: Jumpers (see SoM manual for correct Boot settings)

Label	Function	Default
JB1	Boot0 Source Selection	Position A
JB2	Boot1 Source Selection	Position A
JB3	SOM Flash Protect or Boot Configuration	Position B
JB4	RTC Battery On/Off	ON
JB5	Serial Port-C RS422/485 Tx Enable	422
JB6	Serial Port-C RS232 or 422/485 Mode	232
JB7	Ethernet Primary Tap	OPN
JB8	External SPI Interface Voltage	5V
JB9	External I2C Interface Voltage	5V
JB10	RMII (3.3V) / RGMII (1.8V) Selection	RGMII 1.8V
JB11	CSI GPIO (3.3V or 1.8V)	3.3V

2.3 Power Connectors

The SoM-255G2 provides two power connectors. JK1 is a standard 5.5mm barrel jack with an inner diameter of 2.1mm with a center V+ connection. This jack allows for easy connection to a wall mount power supply (see SoM-255G2 product page for available power supply options). HDR1 is a three-pin TE Connectivity locking power connector (part number 640445-3) that mates with a TE Connectivity part number 3-640600-3 power connector. Using this power input provides for a more rugged/industrial locking connection. The SoM-255G2's power input uses a switching regulator and allows a voltage input of +12VDC to +28VDC.

The pinout for the HDR1 power connector is as follows:

Table 2: HDR1 Vin DC Connector

Pin	Signal
1	+Vin (+12VDC to 28VDC)
2	Chassis GND
3	System GND

2.4 Other Connectors

Table 2 lists the functions of the various connectors. See Appendix A for connector pinouts. Connector part numbers can be found in the schematics.

Table 3: Connectors

Label	Function
CN1	7" LCD Backlight Connector
CN2	RS-232 Serial Port COM A
CN3	10" Touch Screen Connector
CN4	7" Touch Screen Connector
CN5	CAN Port
JK1	Vin DC Barrel Jack
JK3	Dual Ethernet RJ45
JK4	Dual USB Host Ports A & B
JK5	Audio Output Jack
JK7	USB OTG Port C
HDR1	Vin DC Connector
HDR2	RS-232 Serial Port COM D
HDR3	RS-232 Serial Port COM B / Console Port
HDR4	RS-232/422/485 Serial Port COM C
HDR5	Bulkhead USB Connector Port A & B
HDR6	LVDS Connector
HDR7	Misc. I/O Connector
HDR8	Misc. I/O Connector
HDR9	CSI Interface
HDR10	JTag/Debug
HDR11	DSI Interface
SOK1	Micro SD Card Socket
SOK2	200-Pin SoM Socket

2.5 Ethernet

The SoM-255G2 provides one 10/100/1000 BaseT Ethernet port from a MAC/PHY incorporated in the SOM (sold separately), and wired to the upper port of a dual RJ-45 connector (JK3). The speed depends on the SOM used. Jumper JB7 will need to be set for the necessary center tap connections, based on which SOM is installed. JB7 is typically set to 'OPN' for 1000 BaseT Ethernet and set to '3P3' for 10/100 BaseT Ethernet.

A second PHY is incorporated into the SOM-255G2 carrier for connection to a MAC on the SOM, when available. The second PHY is connected to the lower port of the dual RJ-45 connector, and its type is selected using Jumper JB10. For SOMs supporting an RGMII interface to the carrier at 1.8V, the second port will support 10/100/1000 Base T. For SOMs supporting an RMII interface to the carrier at 3.3V, the second port will support 10/100 Base T.

The Ethernet ports can be connected to a hub with a straight-through Ethernet cable, or to another computer via a crossover Ethernet cable.

Activity and Link LEDs are integrated into the RJ-45 Connector.

2.6 Serial Ports

The SoM-255G2 is equipped with four serial ports, one of which terminates to a male DB9 and the other three which terminate to 10-pin header connectors. Most product variations include three 10-pin header to male DB9 connector cables, giving easy access to these ports. Baud Rate, stop bits, etc. are all programmable for each port via software.

COM A (CN2) is a RS232 compatible port with a full complement of handshaking lines terminating to a DB-9 connector that allows communication with modems and other devices requiring hardware flow control.

Table 4: COM A Pinout (CN2)

Pin	Pin Description for DB9 Connector
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	Shield

COM B (HDR3) is an RS232 port terminating to a 10-pin header. This port offers handshake lines for most SOMs. This port is typically used as the console port.

Table 5: COM B Pinout (HDR3)

Pin	Pin Description for 10-pin Header	Pin Description for DB9 Adaptor
1	NC	NC
2	NC	RxD
3	RxD	TxD
4	RTS	NC
5	TxD	GND
6	CTS	NC
7	NC	RTS
8	NC	CTS
9	GND	NC
10	NC	N/A

COM C (HDR4) can be configured to RS232, RS422, or RS485 via two jumpers. To select RS232 set jumper JB6 to 232 (default). For RS422 set jumper JB6 to 4xx and jumper JB5 to 422. To select RS485, set jumper JB6 to 4xx and jumper JB5 to 485.

When using COM C in the RS422/485 mode, a terminating resistor ($\sim 120 \Omega$) is recommended on the two far ends of the network.

Table 6: COM C Pinout (HDR4)

Pin	Pin Description for 10-pin Header	Pin Description for DB9 Adaptor
1	422/485 Tx-	422/485 Tx-
2	NC	232 Rx, 422/485 Tx+
3	232 Rx, 422/485 Tx+	232 Tx, 422/485 Rx+
4	232 RTS	422/485 Rx-
5	232 Tx, 422/485 Rx+	GND
6	232 CTS	NC
7	422/485 Rx-	232 RTS
8	NC	232 CTS
9	GND	NC
10	NC	N/A

COM D (HDR2) is an RS232 port. This port offers no handshake lines. COM D is shared between Bluetooth and HDR2. When the Bluetooth interface is enabled by software, COM D's Rx/D will be multiplexed to the Bluetooth chip instead of to HDR2, however, the Tx/D line will remain connected to both. The Bluetooth interface requires RTS/CTS handshaking. The COM D handshaking lines are connected to the Bluetooth interface, but not to HDR2.

Table 7: COM D Pinout (HDR2)

Pin	Pin Description for 10-pin Header	Pin Description for DB9 Adaptor
1	NC	NC
2	NC	RxD
3	RxD	TxD
4	NC	NC
5	TxD	GND
6	NC	NC
7	NC	NC
8	NC	NC
9	GND	NC
10	NC	N/A

2.7 CAN

The SoM-255G2 CAN port (CN5) utilizes a transceiver that can support CAN FD or CAN 2.0B. The protocol (speed) used will depend on the CAN controller built into the SOM. (sold separately). The pinout for the CN5 CAN Connector is as follows:

Table 8: CAN Pinout (CN5)

Pin	Signal
1	GND
2	CAN_L
3	CAN_H

2.8 USB

The SoM-255G2 provides two USB 2.0 high-speed host ports (JK4 – Ports A & B). USB Port A and Port B can also be accessed from the bulkhead connector (HDR5). EMAC can provide a cable (CAB-40-004) to access these ports. In addition to the two USB Host ports, the SoM-255G2 provides a USB On-the-Go (OTG) port (JK7). This port can be used as either a USB Host or USB Device port.

Note: When sizing a power supply, make sure to allow for USB Device consumption. A device can potentially draw 500mA.

2.9 Wi-Fi / Bluetooth [optional]

The SoM-255G2 utilizes the TI WiLink8 Dual Band Industrial Module (part # WL1837MODGIMOCR).

Features:

- IEEE 802.11 a/b/g/n radio
 - 2.4 GHz & 5GHz band
 - Bit rates up to 80 Mbps (TCP) or 100Mbps (UDP)
- Hardware support for WEP, TKIP, AES, WPA and WPA2 encryption
- Bluetooth 5.1 & BLE
- Refer to TI Datasheet for more information.

EMAC provides an antenna kit included with the Wi-Fi option: 2.4GHz Duck Antenna RP-SMA and U.FL (IPEX) to RP-SMA male pigtail cable that plugs into the Wi-Fi Module's integrated U.FL Connector.

2.10 Audio

The SoM-255G2 provides Audio Line-Out and microphone connection through a 3.5mm TRRS (4 wire Tip-Ring-Ring-Sleeve) audio jack, (JK5) wired according with the CTIA/AHJ Standard. The processor interfaces to the Audio CODEC through its I²S interface. Command control of the CODEC is done using the processor's I²C interface. The CODEC is the NXP SGTL5000XNLA3, which is a High Performance 24-bit Low Power Stereo CODEC offering superior sound quality.

2.11 LCD Brightness

The SoM-255G2 offers software controllable LCD brightness via the PWM signal on the LVDS Connector. The LED backlight can be turned on or off via the SoM's GPIO-0. This will allow for screensaver software to automatically turn off the backlight when the unit is not being used and turn on the backlight when LCD interaction proceeds.

2.12 I/O Expansion

The SoM-255G2 provides access to additional SoM I/O lines on connector HDR7. See Table 9. This 44-pin dual row header contains GPIO lines, SPI bus, I²C bus, A/D lines, interrupts and power pins. Signal names listed in the table below are the SoM names as defined in the SoM-200 pin specification. Note that not all SoMs will have the same set of features available on this header. The SPI bus voltage is selected using jumper JB8. The I2C bus voltage is selected using jumper JB9. The A/D input full scale voltage is determined by the installed SOM. GPIO and interrupt pins are 3.3V.

HDR8 provides access to PWM outputs. See Table 10.

Table 9: I/O Expansion Pinout (HDR7)

Pin	Signal	Pin	Signal
1	3.3V	2	3.3V
3	GPIO1	4	GPIO4
5	GPIO2	6	GPIO5
7	GPIO3	8	GPIO6
9	IRQ0	10	GPIO7
11	IRQ1	12	IRQ2
13	OSC0	14	GND
15	OSC1	16	GND
17	ADC4	18	GPIO8
19	ADC5	20	GPIO9
21	ADC6	22	GPIO10
23	ADC7	24	GND
25	SPI_MISO	26	GND
27	SPI_MOSI	28	GND
29	SPI_CLK	30	GND
31	SPI_CS3	32	GND
33	SPI_CS1	34	GND
35	I ² C_DAT	36	GND
37	I ² C_CLK	38	GND
39	SoM_RSTO#	40	GND
41	5V_VCC	42	5V_VCC
43	GND	44	GND

Table 10: I/O Expansion Pinout (HDR8)

Pin	Signal	Pin	Signal
1	PWM0	2	3.3V
3	PWM1	4	3.3V
5	PWM2	6	GND
7	PWM3	8	GND
9	GND	10	GND

2.13 Real-Time Clock

The SoM-255G2 is equipped with an external battery for backing up the module's Real-Time Clock (RTC). Drivers to access the RTC are incorporated in the operating system. Jumper JB4 should be placed in the ON position in order to retain system time when powered down.

2.14 Reset

The SoM-255G2 provides a Reset Button (PB1). Pressing this button will cause the system to reset.

3 Software

The SoM-255G2 offers a wide variety of software support from both open source and proprietary sources. All of EMAC's SoM Modules are supported by Linux.

For more information on Linux Software Support, please visit the EMAC Wiki Software Section at:

http://wiki.emacinc.com/wiki/Product_wiki

3.1 Das U-Boot

EMAC utilizes Das U-Boot for its ARM based products. U-Boot is an open source/cross-architecture platform independent bootloader. It supports reading and writing to the flash, auto-booting, environmental variables, and TFTP. Das U-boot can be used to upload and run and/or reflash the OS or to run stand-alone programs without an OS. Products are shipped with a valid MAC address installed in flash in the protected U-boot environmental variable "ethaddr". At boot time U-Boot automatically stores this address in a register within the MAC, which effectively provides it to any OS loaded after that point.

3.2 Embedded Linux

EMAC Open Embedded Linux (EMAC OE Linux) is an open-source Linux distribution for use in embedded systems. The EMAC OE Linux Build is based on the Open Embedded (www.openembedded.org) and Yocto (www.yoctoproject.org) Linux build systems. Open Embedded is a superior Linux distribution for embedded systems. Custom Linux builds are also available on request.

The distribution contains everything a user could expect from a standard Linux kernel: powerful networking features, advanced file system support, security, debugging utilities, and countless other features.

The basic root file system includes:

- Busybox
- Hotplugging support

- APM utilities for power management
- Openssh SSH server
- lighttpd HTTP server
- JIFS2 or EXT4 file system with utilities

3.2.1 Linux with Xenomai Real Time Extensions

Xenomai provides real time extensions to the kernel and can be used to schedule tasks with hard deadlines and μ s latencies. The Xenomai build is an additional module that can be added to the standard Linux kernel and is available for a one-time inexpensive support/installation fee.

<http://www.xenomai.org/>

3.2.2 Linux Packages

EMAC provides support for many Linux Packages such as: PHP, SQLite, Perl, SNMP, DHCP Server, etc. As with the Xenomai Package, other Packages can be added to the standard Linux file system and are available for a one-time inexpensive support/installation fee.

3.2.3 Linux Patches

In addition to standard Embedded Linux support, EMAC has released a number of patches and device drivers from the open-source community and from internal EMAC engineering into its standard distribution. Along with kernel patches, EMAC provides the binaries for the kernel and root file system.

3.3 Qt Creator

Qt Creator is a cross-platform IDE (Integrated Development Environment) tailored to the needs of Qt developers but works well for Headless applications as well. EMAC provides sample code as projects that can be imported into Qt Creator. Qt Creator supports remote deployment and source debugging.

<http://wiki.qt.io/Main>

3.4 ARM EABI Cross Compiler

The popular open source GCC compiler has a stable build for the ARM family. EMAC uses the 4.9.1 version of the ARM EABI compiler. The Embedded Linux kernel and EMAC Qt Creator projects use this compiler for building ARM stand alone, and OS specific binaries. The EMAC Qt Creator provides source level debugging over Ethernet or serial using gdbserver. The Linux binaries for the ARM EABI cross compiler are available online along with the SDK. See the EMAC wiki for further information.

A. Appendix A: Connector Pinouts

For mating connector part numbers, refer to the schematics.

A.1 CN1 - 7" LCD Backlight Connector

Pin	Signal
1	Switching GND
2	VOUT

A.2 CN2 - Serial Port COM A

See section 2.6

A.3 CN3 - 10" Touch Screen Connector

Pin	Signal
1	Y+
2	X-
3	Y-
4	X+
5	GND
6	GND

A.4 CN4 - 7" Touch Screen Connector

Pin	Signal
1	Y+
2	X-
3	Y-
4	X+
5	GND
6	GND

A.5 CN5 - CAN Port

See section 2.7

A.6 JK1 - Vin DC Barrel Jack

JK1 is a standard 5.5mm barrel jack with an inner diameter of 2.1mm with a center V+ connection. See section 2.3

Pin	Signal
1 (Center)	+Vin (+12VDC to 28VDC)
2 (Barrel)	GND

A.7 JK4 - Dual USB Host Ports A & B

USB A and B are Type-A connector with the normal pinout (left to right) of GND, Data+, Data-, 5VDC.

A.8 JK5 - Audio Output Jack

3.5mm TRRS audio connector.

Pin	Signal
Tip	Left output
Ring 1	Right output
Ring 2	Return (Ground)
Sleeve	Microphone input

A.9 JK7 - USB OTG Port C

USB C is a 2.0 Type-C. Pins A1 through A12 are left to right across the top. Pins B1 through B12 are right to left across the bottom.

Pin	Signal	Pin	Signal
A1	GND	B12	GND
A2	NC	B11	NC
A3	NC	B10	NC
A4	VBUS	B9	VBUS
A5	CC1	B8	NC
A6	DATA+	B7	DATA-
A7	DATA-	B6	DATA+
A8	NC	B5	CC2
A9	VBUS	B4	VBUS
A10	NC	B3	NC
A11	NC	B2	NC
A12	GND	B1	GND

A.10 HDR1 - Vin DC Connector

See section 2.3

A.11 HDR2 - Serial Port COM D

See section 2.6

A.12 HDR3 - Serial Port COM B

See section 2.6

A.13 HDR4 - Serial Port COM C

See section 2.6

A.14 HDR5 - Bulkhead USB Connector Port A & B

Pin	Signal	Pin	Signal
1	HostA_PWR	2	HostB_PWR
3	HostA_DATA-	4	HostB_DATA-
5	HostA_DATA+	6	HostB_DATA+
7	GND	8	GND
9	Chassis_GND	10	NC

A.15 HDR6 - LVDS Connector

Pin	Signal	Pin	Signal
1	Chassis_GND	2	Chassis_GND
3	3.3V	4	3.3V
5	(Red-) LVDS_A0-	6	(Red+) LVDS_A0+
7	GND	8	GND
9	(Green-) LVDS_A1-	10	(Green+) LVDS_A1+
11	GND	12	GND
13	(Blue-) LVDS_A2-	14	(Blue+) LVDS_A2+
15	GND	16	GND
17	Clock-	18	Clock+
19	LVDS_5V	20	LVDS_5V
21	Brightness	22	GND
23	I ² C_Data	24	I ² C_Clock
25	3.3V	26	LVDS_5V
27	NC	28	NC
29	NC	30	NC
31	GND	32	GND
33	NC	34	NC

A.16 HDR7 - Miscellaneous I/O Connector

See section 2.12

A.17 HDR8 – Miscellaneous I/O Connector

See section 2.12

A.18 SOK1 - MicroSD Card Socket

The MicroSD Card socket has the standard pinout shown below 1 through 8, right to left. A card detect input is included also.

Pin	Signal
1	Data2
2	Data3
3	CMD
4	3.3V
5	SCLK
6	GND
7	Data0
8	Data1

A.19 200-pin SoM Socket (SOK2)

See the 200-pin SoM Pin Specification and Schematics.

B. Appendix B: Jumper Settings

(See SoM Manual for correct Boot Jumper settings)

B.1 JB1 (Boot0 Source Selection)

Jumper	Position	Setting
Pins 1 & 2	B	Line Pulled High
Pins 2 & 3*	A	Line Pulled Low

*Default Setting

B.2 JB2 (Boot1 Source Selection)

Jumper	Position	Setting
Pins 1 & 2	B	Line Pulled High
Pins 2 & 3*	A	Line Pulled Low

*Default Setting

B.3 JB3 (SOM Flash Protech or Boot Configuration)

Jumper	Position	Setting
Pins 1 & 2*	B	Resident Flash Enable
Pins 2 & 3	A	Resident Flash Disable

*Default Setting

B.4 JB4 (RTC Battery Enable)

Jumper	Position	Setting
Pins 1 & 2	OFF	Disable Battery Backup
Pins 2 & 3*	ON	Enable Battery Backup

*Default Setting

B.5 JB5 (RS485/RS422 Select)

This setting is effective when JB6 is set as 4xx.

Jumper	Position	Setting
Pins 1 & 2	485	Select RS485
Pins 2 & 3*	422	Select RS422

*Default Setting

B.6 JB6 (RS232/RS4xx Select)

Jumper	Position	Setting
Pins 1 & 2*	232	Select RS232
Pins 2 & 3	4xx	Select either RS422 or RS485

*Default Setting

B.7 JB7 (Ethernet Center Tap)

Some older SOMs will require 3.3V on the ethernet center tap. Most newer SOMs will not. Setting this jumper incorrectly can affect the proper operation of more than just the ethernet interface. This jumper is for the upper RJ45 port.

Jumper	Position	Setting
Pins 1 & 2*	OPN	Not connected to 3.3V
Pins 2 & 3	3P3	Connected to 3.3V

*Default Setting

B.8 JB8 (External SPI Interface Voltage)

For SPI devices that are connected through HDR7.

Jumper	Position	Setting
Pins 1 & 2*	5V	Select 5V SPI Interface
Pins 2 & 3	3V	Select 3.3V SPI Interface

*Default Setting

B.9 JB9 (External I2C Interface Voltage)

For I2C devices that are connected through HDR7

Jumper	Position	Setting
Pins 1 & 2*	5V	Select 5V I2C Interface
Pins 2 & 3	3V	Select 3.3V I2C Interface

*Default Setting

B.10 JB10 (RMII/RGMII Selection)

The Phy on the carrier is provisioned to accept RMII at 3.3V, or RGMII at 1.8V from the SOM. Refer to the manual for the SOM for the correct setting. The Phy on the carrier is connected to the lower RJ45 port.

Jumper	Position	Setting
Pins 1 & 2	3.3V RMII	Select RMII interface at 3.3V
Pins 2 & 3*	1.8V RGMII	Select RGMII at 1.8V

*Default Setting

B.11 JB11 (CSI Signal)

This jumper sets the logic level of the GPIOs accompanying the CSI signals in the CSI connector. Set this jumper according to the specifications of the connected camera.

Jumper	Position	Setting
Pins 1 & 2*	3.3V	Select 3.3V
Pins 2 & 3	1.8V	Select 1.8V

*Default Setting

C. Appendix C: Mechanical Drawing

