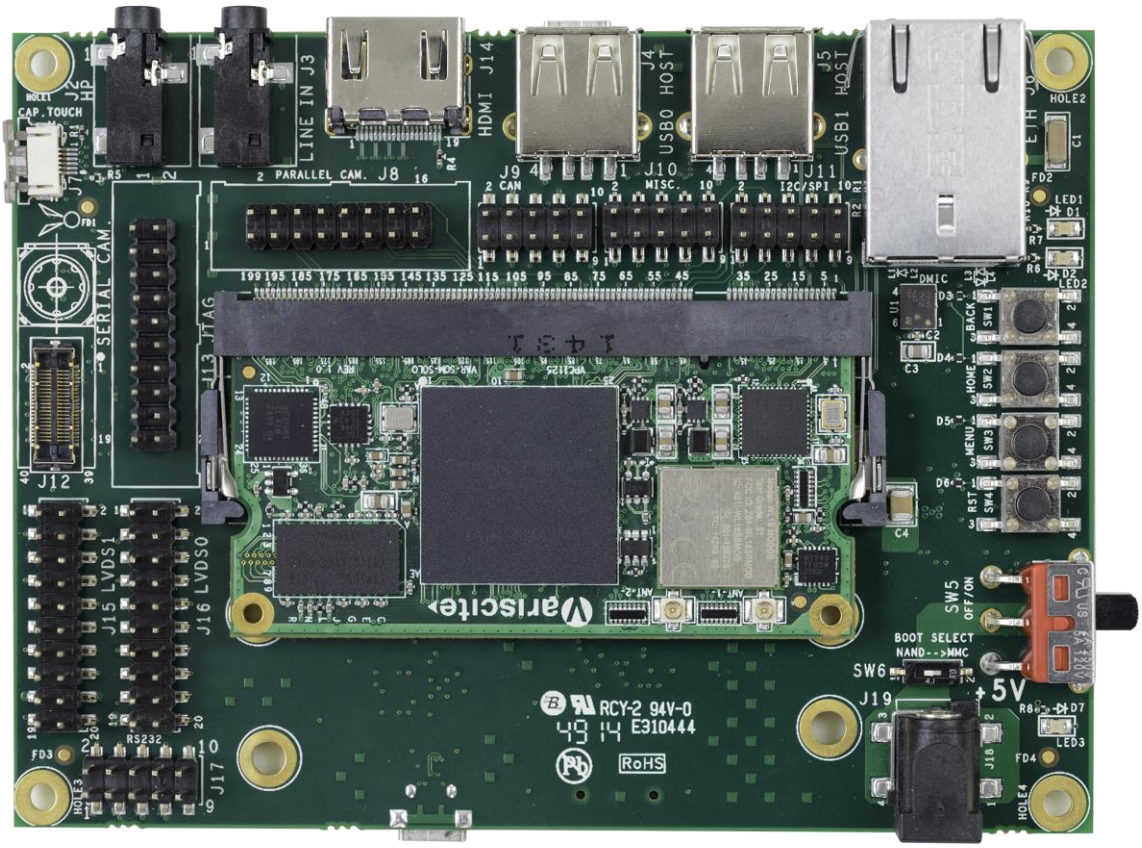
VARISCITE LTD

VAR-SOLOCustomBoard Datasheet

Carrier-board for the VAR-SOM-SOLO

V 1.1



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Revision History

Revision	Date	Notes
1.0	08/02/2015	Initial

Table of Contents

List of Tables

1 Overview

This chapter gives an overview of the VAR-SOLOCustomBoard.

1.1 General Information

The VAR-SOLOCustomBoard is a complete development board, utilizing all of VAR-SOM-SOLO System-on-Module's features. It is assembled with large variety of user and debug interfaces enabling it to serve as both a complete development kit or as a stand-alone end-product.

1.1.1 Supporting Variscite products

- VAR-SOM-SOLO
- 7" Capacitive touch LCD

1.1.2 Supporting O.S

- Linux BSP
- Android

1.1.3 Additional information

Board schematics as well as mechanical CAD data base is available to download at www.variscite.com,

For further information contact Variscite support at mailto:support@variscite.com.

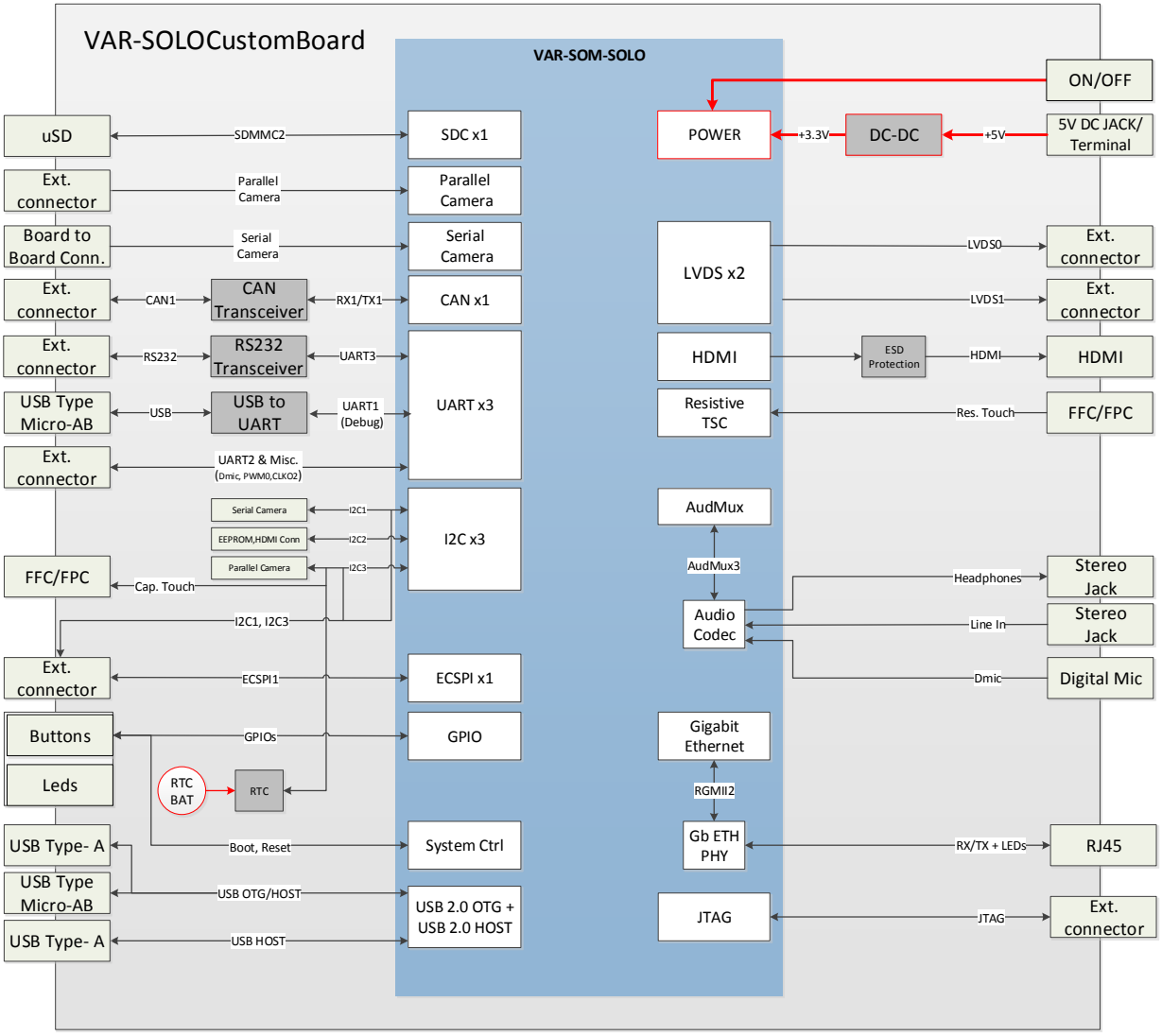
1.2 VAR-SOLOCustomBoard features summary

- SO-DIMM 200 PIN socket compatible with the VAR-SOM-SOLO
- Display
  - 18 bit LVDS Header supporting Variscite's 7" TFT capacitive touch LCD
  - 24 bit LVDS Header
  - HDMI Type A
- Touch panel interface
  - Capacitive - I2C based
  - Resistive 4-wIre FFC/FPC
- Ethernet
  - 10/100/1000BaseT – RJ45
- USB
  - USB2.0 OTG ,Type Micro AB + Type A (for Host only option)
  - USB2.0 Host Type A
- AUDIO
  - 3.5mm Headphones jack
  - 3.5mm Line in jack
  - Digital Microphone
- µSD-Card slot
- Camera
  - Serial interface - OV5640 MIPI CSI sensor
  - Parallel interface Header
- RS232 (UART3) Header
- CAN Bus
  - 1Mbit CAN bus Header
- Debug
  - USB debug (UART1) - Type Micro AB
  - ARM JTAG Header
- ISL12057 RTC
- Additional
  - UART2& Miscellaneous Header
  - SPI, I2C Header

- General purpose LEDS, Buttons

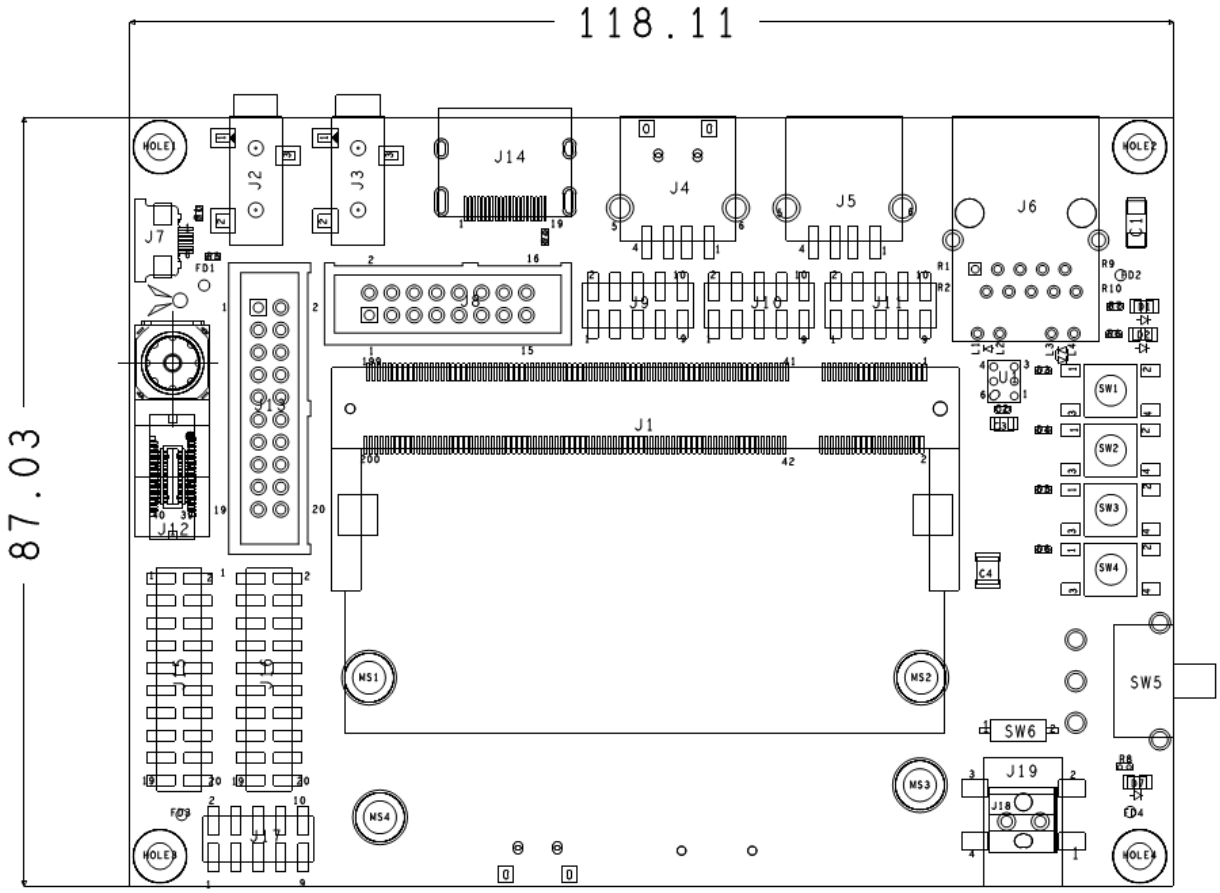
- Power
  - 5V DC Input. - 2.0mm DC jack / 2 pin Terminal Block
  - RTC Backup battery - CR1225 Battery Holder

1.3 Block Diagram



1.4 Board Layout

The VAR-SOLOCustomBoard's physical dimensions are 118 x 87 mm.



Detailed CAD files are available for download at www.variscite.com.

1.5 VAR-SOLOCustomBoard connectors

The below table lists all available connectors on the VAR-SOLOCustomBoard, refer to chapter 2 for a more detailed description and Pin-out of each connector.

Reference	Function	Type
J1	VAR-SOM-SOLO Connector	SO-DIMM 200 Pin Socket
J2	Headphones	Audio Jack 3.5 mm
J3	Line In	Audio Jack 3.5 mm
J4	USB Host	USB Type A
J5	USB Host	USB Type A
J6	10/100/1000Mbps Port	RJ-45
J7	Capacitive Touch Panel I/F	FFC/FPC 6-pin
J8	Parallel Camera I/F	Header, 8x2, 2.54mm
J9	CAN Bus	Header SMT 5x2, 2.54mm
J10	UART2 & Miscellaneous	Header SMT, 5x2, 2.54mm
J11	SPI,I2C	Header SMT, 5x2, 2.54mm
J12	Serial Camera sensor OV5640 Conn	Board to Board, 40Pos, 0.5mm
J13	JTAG	Header, 10x2, 2.54mm
J14	HDMI	HDMI Type A Conn
J15	LVDS1	Header SMT, 10x2, 2.54mm
J16	LVDS0	Header SMT, 10x2, 2.54mm
J17	RS232	Header SMT, 5x2, 2.54mm
J18	Power In	2 Pin Terminal Block
J19	Power In	DC In Jack 2.0 mm
J100	USB OTG	USB Type micro AB
J101	Resistive Touch Panel I/F	FFC/FPC 4-pin
J102	SD-MMC	uSD Connector
J103	USB Debug	USB Type micro AB
JBT100	RTC Battery Holder	CR1225 Battery Holder

Table 1-1 VAR-SOLOCustomBoard connectors

2 Detailed Description

2.1 Overview

This chapter details the VAR-SOLOCustomBoard's features and external interfaces, some of which are driven directly by the VAR-SOM-SOLO. Please refer to the VAR-SOM-SOLO data sheet for more information regarding those interfaces.

The following list describes this chapter table's column header:

Pin#:
Pin Number of the specific connector

VAR-SOLOCustomBoard Signal:
VAR-SOLOCustomBoard schematic signal name

Type:
Pin Type & Direction:

- I – In
- O – Out
- DS – Differential Signal
- P – Power
- A – Analog

Description:
Short Pin functionality description

2.2 VAR-SOLOCustomBoard Interfaces

2.2.1 VAR-SOM-SOLO

The VAR-SOM-SOLO features a standard SO-DIMM 200 Pin Socket to connect with the VAR-SOM-SOLO System-om-module. Please refer to the VAR-SOM-SOLO module data sheet For a complete signal description and pin-out.

2.3 Standard External Interfaces

2.3.1 USB HOST & OTG

The VAR-SOM-SOLO drives USB Host to a Host Connector and USB OTG to both Host and OTG connectors. For using USB OTG as Host only via Host connector configure it to Host mode by assembling resistor R100 with 0R short resistor.

2.3.1.1 USB HOST Connector Pin-out (J5)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	USB_H1_VBUS	P	+5V power supply. 500ma max
2	USB_HOST_DN_C	DSI/O	USB Data Negative
3	USB_HOST_DP_C	DSI/O	USB Data Positive
4	DGND	P	Digital ground

Table 2-1 USB Host Connector Connector Pin-out (J5)

2.3.1.2 USB OTG to HOST Connector Pin-out (J4)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	USB_OTG_VBUS	P	+5V power supply. 500ma max
2	USB_OTG_DM_C	DSI/O	USB Data Negative
3	USB_OTG_DP_C	DSI/O	USB Data Positive
4	DGND	P	Digital ground

Table 2-2 USB OTG to Host Connector Connector Pin-out (J4)

2.3.1.3 USB OTG to OTG Connector Pin-out (J100)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	USB_OTG_VBUS	P	5V in/out (Client/host)
2	USB_OTG_DM_C	DSI/O	USB Data Negative
3	USB_OTG_DP_C	DSI/O	USB Data Positive
4	USB_OTG_ID	I	USB OTG ID signal (‘1’ - Device mode)
5	DGND	P	Digital ground

Table 2-3 USB OTG to OTG connector Pin-out (J100)

2.3.2 uSD Card

uSD Card interface is driven by the SDMMC2 interface of the of the VAR-SOM-SOLO.

2.3.2.1 uSD card slot Connector Pin-out (J102)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	SDMMC2_DAT2	IO	MMC Parallel Data2
2	SDMMC2_DAT3	IO	MMC Parallel Data3
3	SDMMC2_CMD	IO	MMC command
4	BASE_PER_3V3	P	Peripherals Power supply 3.3V
5	SDMMC2_CLK	O	MMC Clock
6	DGND	P	Digital ground
7	SDMMC2_DAT0	IO	MMC Parallel Data0
8	SDMMC2_DAT1	IO	MMC Parallel Data1
9	SDMMC2_CD	IO	MMC Card Detect
10	DGND	P	Digital ground
11	DGND	P	Digital ground
12	DGND	P	Digital ground
13	DGND	P	Digital ground

Table 2-4 uSD Card slot Connector Pin-out (J102)

2.3.3 Ethernet

The VAR-SOLOCustomBoard exposes a Gigabit Ethernet interface to a standard RJ45 Ethernet jack connector with integrated magnetics driven by an On-SOM Gigabit Ethernet PHY connected to the i.MX6 SOLO RGMII interface.
Please refer to the VAR-SOM-SOLO datasheet for more information.

2.3.3.1 10/100/1000BaseT RJ45 Connector Pin-out (J6)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
R1	GETH_TR0P	DSI/O	Bi-directional pair 0 positive
R2	GETH_TR0N	DSI/O	Bi-directional pair 0 negative
R3	GETH_TR1P	DSI/O	Bi-directional pair 1 positive
R4	GETH_TR1N	DSI/O	Bi-directional pair 1 negative
R5	TRCT1	O	Bias capacitor
R6	TRCT2	O	Bias capacitor
R7	GETH_TR2P	DSI/O	Bi-directional pair 2 positive
R8	GETH_TR2N	DSI/O	Bi-directional pair 2 negative
R9	GETH_TR3P	DSI/O	Bi-directional pair 3 positive
R10	GETH_TR3N	DSI/O	Bi-directional pair 3 negative
L1	GETH_LED2	I	PHY LED 2 (see Table 2-7)
L2	BASE_PER_3V3	P	Anode of LED 2
L3	BASE_PER_3V3	P	Anode of LED 1
L4	GETH_LED1	I	PHY LED 1 (see Table 2-7)
SH1	EARTH	P	EARTH
SH2	EARTH	P	EARTH

Table 2-5 10/100/100BaseT RJ45 Connector Pin-out (J6)

LED1	LED2	Status
Off	Off	Link off
Blinking	Off	
On	Off	1G link
On	Blinking	
On	On	Speed OK

Table 2-6 RJ-45 Led configuration

2.3.4 AUDIO

The VAR-SOLOCustomBoard features two 3.5mm jacks for audio interfaces.

- Headphone
- Line in

The Headphones signals are driven by the VAR-SOM-SOLO, while the Line in signals are driven to the VAR-SOM-SOLO. The VAR-SOLOCustomBoard also features an on-board stereo Digital Microphone (section 2.4.1).
Please refer to the VAR-SOM-SOLO data sheet for complete audio codec information.

2.3.4.1 Headphone jack Connector Pin-out (J2)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	DGND	AP	Audio Ground
2	HPLOUT_C	AO	Headphone out left
3	HPROUT_C	AO	Headphone out right

Table 2-7 Headphone Jack Connector Pin-out (J2)

2.3.4.2 Line In jack Connector Pin-out (J3)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	DGND	AP	Audio Ground
2	LINEIN1_LP_C	AI	Line in Left input
3	LINEIN1_RP_C	AI	Line in Right input

Table 2-8 Line In Jack Connector Pin-out (J3)

2.3.5 RS232 -DTE

The VAR-SOM-SOLO exports the 4 line UART3 interface to the VAR-SOLOCustomBoard. Which are driven by an on-board RS232 Transceiver and exported to a standard 10 pin Header. This connector serves as a DTE interface for connecting third party DCE devices.

2.3.5.1 RS232 Connector Pin- out (J17)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1			
2	RS232_RX	I	UART3 Receive
3	RS232_TX	O	UART3 Transmit
4	BASE_PER_3V3	P	Peripherals Power supply 3.3V
5	DGND	P	Digital Ground
6			

7	RS232_RTS	O	UART3 CTS
8	RS232_CTS	I	UART3 RTS
9			
10			

Table 2-9 RS232 Connector Pin-out (J17)

2.3.6 Serial Camera

The VAR-SOLOCustomBoard hosts a MIPI CSI camera sensor OmniVision OV5640 driven by the VAR-SOM-SOLO. The on board camera connector is a Hirose conn plug 40POS 0.4mm, FX12B-40P-0.4SV, suggest mating connector is Hirose Electric, FX12B-40S-0.4SV.

2.3.6.1 Serial Camera Connector Pin-out (J12)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	DGND	P	Digital Ground
2	DGND	P	Digital Ground
3			
4	BASE_PER_2V8	P	Camera Power supply 2.8V
5	I2C_A_SDA_18	IO	Sensor I2C Data
6	BASE_PER_1V8	P	Auto Focus Power down
7	I2C_A_SCL_18	O	Sensor I2C Clock
8	BASE_PER_2V8	P	Camera Power supply 2.8V
9	BASE_PER_1V8	P	Sensor reset
10	I2C_A_SDA_18	IO	Auto Focus I2C Data
11			
12	I2C_A_SCL_18	O	Auto Focus I2C Clock
13			
14			
15			
16	CSI_D1P	DSI	Camera Data 1 Positive
17	DGND	P	Sensor Power Down
18	CSI_D1M	DSI	Camera Data 1 Negative
19			
20	DGND	P	Digital Ground
21			
22	CSI_CLK0P	DSI	Camera Clock Positive
23			
24	CSI_CLK0M	DSI	Camera Clock Negative
25			
26	DGND	P	Digital Ground
27			
28	CSI_D0P	DSI	Camera Data 0 Positive
29			

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
30	CSI_D0M	DSI	Camera Data 0 Negative
31			
32	DGND	P	Digital Ground
33			
34	MIPI_CSI-2_CLK_18	O	Camera Clock
35			
36			
37			
38	BASE_PER_1V8	P	Camera Power supply 1.8V
39			
40	DGND	P	Digital Ground

Table 2-10 Serial Camera Connector Pin-out (J12)

2.3.7 Parallel Camera Interface (J8)

The VAR-SOLOCustomBoard exposes a Parallel camera interface routed directly to the processor's CSI0 pins.

2.3.7.1 Parallel Camera Connector Pin-Out (J8)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	BASE_PER_3V3	P	Peripherals Power supply 3.3V
2	CSI0_DAT12	I	Camera Data12 signal
3	CSI0_DAT13	I	Camera Data13 signal
4	CSI0_VSYNC	I	Camera Vsync signal
5	CSI0_DAT14	I	Camera Data14 signal
6	CSI0_DATA_EN/USER_BUT	O	Camera enable routed to GPIO5[20] see note (*)
7	CSI0_DAT15	I	Camera Data15 signal
8	CSI0_HSYNC	I	Camera Hsync signal
9	CSI0_DAT16	I	Camera Data16 signal
10	I2C3_SCL	O	I2C camera control routed to I2C3
11	CSI0_DAT17	I	Camera Data17 signal
12	I2C3_SDA	IO	I2C camera control routed to I2C3
13	CSI0_DAT18	I	Camera Data18 signal
14	CSI0_PIXCLK	I	Camera Pixel Clock signal
15	CSI0_DAT19	I	Camera Data19 signal
16	DGND	P	Digital Ground

Table 2-11 Parallel Camera Connector Pin-out (J8)

Note: (*) The signal is multiplexed and can be used alternatively for User button SW1 purpose.

2.3.8 LVDS

The VAR-SOLOCustomBoard exposes a dual LVDS interface driven by the VAR-SOM-SOLO. LVDS1 is a 3 balanced pair interface for connecting to Variscite's standard 7" Capacitive touch LCD screen, LVDS2 is a 4 balanced pair. Both are exposed to a standard 20 pin Header.

2.3.8.1 LVDS1 Connector Pin-out (J15)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	BASE_PER_3V3	P	Peripherals Power supply 3.3V
2	BASE_PER_3V3	P	Peripherals Power supply 3.3V
3	DGND	P	Digital ground
4	DGND	P	Digital ground
5	LVDS1_TX0_N	DSO	LVDS lane 0, negative signal
6	LVDS1_TX0_P	DSO	LVDS lane 0, positive signal
7	DGND	P	Digital ground
8	LVDS1_TX1_N	DSO	LVDS lane 1, negative signal
9	LVDS1_TX1_P	DSO	LVDS lane 1, positive signal
10	DGND	P	Digital ground
11	LVDS1_TX2_N	DSO	LVDS lane 2, negative signal
12	LVDS1_TX2_P	DSO	LVDS lane 2, positive signal
13	DGND	P	Digital ground
14	LVDS1_CLK_N	DSO	LVDS clock, negative signal
15	LVDS1_CLK_P	DSO	LVDS clock, positive signal
16	DGND	P	Digital ground
17	VCC_5V	P	VLED +5V Power supply
18	VCC_5V	P	VLED +5V Power supply
19	PWM_BACKLIGHTEN	O	Backlight brightness control
20	DGND	P	Digital ground

Table 2-12 LVDS1 Connector Pin-out (J15)

2.3.8.2 LVDS0 Connector Pin-out (J16)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	BASE_PER_3V3	P	Peripherals Power supply 3.3V
2	BASE_PER_3V3	P	Peripherals Power supply 3.3V
3	DGND	P	Digital ground
4	DGND	P	Digital ground
5	LVDS0_TX0_N	DSO	LVDS lane 0, negative signal
6	LVDS0_TX0_P	DSO	LVDS lane 0, positive signal
7	DGND	P	Digital ground
8	LVDS0_TX1_N	DSO	LVDS lane 1, negative signal
9	LVDS0_TX1_P	DSO	LVDS lane 1, positive signal

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
10	DGND	P	Digital ground
11	LVDS0_TX2_N	DSO	LVDS lane 2, negative signal
12	LVDS0_TX2_P	DSO	LVDS lane 2, positive signal
13	DGND	P	Digital ground
14	LVDS0_CLK_N	DSO	LVDS clock, negative signal
15	LVDS0_CLK_P	DSO	LVDS clock, positive signal
16	DGND	P	Digital ground
17	LVDS0_TX3_N	P	LVDS lane 3, negative signal
18	LVDS0_TX3_P	P	LVDS lane 3, positive signal
19	VCC_5V	O	VLED +5V Power supply
20	PWM_BACKLIGHTEN	P	Backlight brightness control

Table 2-13 LVDS0 Connector Pin-out (J16)

2.3.9 Resistive/Capacitive Touch

The VAR-SOM-SOLO provides a capacitive Touch interface exposed to a FFC/FPC connector for connecting to Variscite's standard 7" Capacitive touch LCD screen.
The VAR-SOM-SOLO also drives a Touch screen controller for resistive touch interface capability. The Touch interface signals are exposed to a FFC/FPC connector.

2.3.9.1 Capacitive Touch Panel Connector Pin-out (J7)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	RESET	O	Reset signal
2	I2C3_SDA	IO	I2C3 data signal
3	I2C3_SCL	O	I2C3 data clock
4	GPIO_5_17	I	Interrupt signal connected to GPIO5[17]
5	BASE_PER_3V3	P	Peripherals Power supply 3.3V
6	DGND	P	Digital ground
7	DGND	P	Digital ground
8	DGND	P	Digital ground

Table 2-14 Capacitive Touch Panel Connector Pin-out (J7)

2.3.9.2 Resistive Touch Panel Connector Pin-out (J101)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	TS_X-	AI	Touch Screen X Minus
2	TS_Y+	AI	Touch Screen Y Plus
3	TS_X+	AI	Touch Screen X Plus
4	TS_Y-	AI	Touch Screen Y Minus

5	DGND	P	Digital ground
6	DGND	P	Digital ground

Table 2-15 Resistive Touch Panel Connector Pin-out (J101)

2.3.10 HDMI

The VAR-SOLOCustomBoard features an HDMI connector to interface with an external monitor. HDMI signals are driven by the VAR-SOM-SOLO.

2.3.10.1 HDMI Connector Pin-out (J14)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	HDMI_D2P	DSO	HDMI Data 2 positive
2	DGND	P	Digital ground
3	HDMI_D2M	DSO	HDMI Data 2 negative
4	HDMI_D1P	DSO	HDMI Data 1 positive
5	DGND	P	Digital ground
6	HDMI_D1M	DSO	HDMI Data 1 negative
7	HDMI_D0P	DSO	HDMI Data 0 positive
8	DGND	P	Digital ground
9	HDMI_D0M	DSO	HDMI Data 0 negative
10	HDMI_CLKP	DSO	HDMI Clock positive
11	DGND	P	Digital ground
12	HDMI_CLKM	DSO	HDMI Clock negative
13	HDMICONN_CEC	IO	CEC signal
14			
15	HDMICONN_SCL	O	HDMI I2C Data
16	HDMICONN_SDA	IO	HDMI I2C Clock
17	DGND	P	Digital ground
18	5V_HDMI	P	+5V Power supply
19	HDMICONN_HPD	I	Hot Plug detect signal

Table 2-16 HDMI Connector Pin-out (J14)

2.3.11 CAN Bus

The VAR-SOM-SOLO exports a CAN Bus interface to the VAR-SOLOCustomBoard.
The signals are driven by an on-board CAN Bus Transceiver and exported to a standard 10 pin Header.

2.3.11.1 CAN Bus Connector Pin- out (J9)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	CANL1	DSI/O	CAN1 L Differential signal
2	CANH1	DSI/O	CAN1 H Differential signal
3	DGND	P	Digital Ground
4	DGND	P	Digital Ground
5			
6			
7			
8			
9			
10			

Table 2-17 CAN Bus Connector Pin-out (J9)

2.3.12 USB - Debug

The VAR-SOM-SOLO exposed the debug UART1 interface to the VAR-SOLOCustomBoard.
The signals are driven by an on-board UART-to-USB Bridge and exposed to a Micro USB connector.

2.3.12.1 USB Debug Connector Pin-out (J103)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	DEBUG_VBUS_C	P	5V power input
2	USB_DEBUG_DM_C	DSI/O	USB Data Negative
3	USB_DEBUG_DP_C	DSI/O	USB Data Positive
4	DGND	P	Digital ground
5	DGND	P	Digital ground

Table 2-18 USB Debug Connector Pin-out (J103)

2.3.13 Miscellaneous

The VAR-SOLOCustomBoard exports the VAR-SOM-SOLO UART2 interface along with Additional miscellaneous signals to a standard 10 pin Header.

2.3.14 Miscellaneous Header Pin-out (J10)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	BASE_PER_3V3	P	Peripherals Power supply 3.3V
2	PWM_BACKLIGHTEN	O	Backlight brightness control
3	CLKO2	O	Reference Clock 2 signal
4	DMIC_CLK	O	Digital microphone Clock
5	DMIC_DATA	I	Digital microphone Data
6	UART2_TXD	O	UART2 Transmit signal
7	UART2_CTS	O	UART2 Clear to Send signal
8	UART2_RTS	I	UART2 Ready to Send signal
9	UART2_RXD	I	UART2 Receive signal
10	DGND	P	Digital Ground

Table 2-19 Miscellaneous Header Pin-out (J10)

2.3.15 I2C/SPI

The VAR-SOLOCustomBoard exports the VAR-SOM-SOLO I2C/SPI signals through a standard 10 pin Header.

2.3.15.1 I2C/SPI Header Pin-out (J11)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	BASE_PER_3V3	P	Peripherals Power supply 3.3V
2	CSPI1_SCLK	O	SPI Clock signal
3	CSPI1_CS0	O	SPI Chip Select 0 signal
4	CSPI1_SIMO	O	SPI SIMO signal
5	I2C3_SCL	O	I2C3 Clock signal
6	CSPI1_SOMI	I	SPI SOMI signal
7	I2C1_SDA	IO	I2C1 Data signal
8	I2C3_SDA	IO	I2C3 Data signal
9	I2C1_SCL	O	I2C1 Clock signal
10	DGND	P	Digital Ground

Table 2-20 I2C/SPI Header Pin-out (J11)

2.3.16 JTAG

The VAR-SOLOCustomBoard exposes an ARM JTAG interface to through a standard 20 pin Header.

2.3.16.1 JTAG Connector Pin-out (J13)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	JTAG_VREF	P	JTAG Voltage reference
2	BASE_PER_3V3	P	Peripherals Power supply 3.3V
3	JTAG_TRSTB	I	JTAG Test Reset
4	DGND	P	Digital ground
5	JTAG_TDI	I	JTAG Test Data In
6	DGND	P	Digital ground
7	JTAG_TMS	I	JTAG Test Mode Select
8	DGND	P	Digital ground
9	JTAG_TCK	I	JTAG Test Clock
10	DGND	P	Digital ground
11	JTAG_RTCK	O	JTAG Return Test Clock
12	DGND	P	Digital ground
13	JTAG_TDO	O	JTAG Test Data Out
14	DGND	P	Digital ground
15	JTAG_NSRST	I	JTAG System Reset
16	DGND	P	Digital ground
17	JTAG_DE	I	JTAG Debug Request
18	DGND	P	Digital ground
19	JTAG_DACK	O	JTAG Debug Acknowledge
20	DGND	P	Digital ground

Table 2-21 JTAG Connector Pin-out (J13)

2.4 User Interfaces

2.4.1 Digital Microphone

U1 is an on board Digital Microphones connected directly to VAR-SOM-SOLO Digital Audio lines.

2.4.2 LED Indications

2.4.2.1 Power-On LED (D7)

Led D7 indicates that the VCC_5V DC IN power rail of the VAR-SOLOCustomBoard is on.

2.4.2.2 GP LEDs (D1, D2)

LEDs D1, D2 are General purpose functionality LEDs controlled by VAR-SOM-SOLO' GPIOs.

2.4.3 Control Buttons

2.4.3.1 User Buttons (SW1, SW2, SW3)

SW1, SW2, and SW3 are User Buttons connected to the VAR-SOM-SOLO' GPIOs for general purpose. In android release they can serve as Back, Home & Menu Buttons respectively.

2.4.3.2 Boot Select (SW6)

The Boot select switch SW6 sets the VAR-SOM-SOLO's boot source & sequence.
Refer to the VAR-SOM-SOLO module data sheet for detailed Boot description.

Position	Logic Level	Boot Source
ON	'0'	External (MMC)
OFF	'1'	Internal (NAND)

Table 2-22 Boot Select modes (SW6)

2.4.3.3 ON/OFF Button (SW5)

The Power ON/OFF button SW5 Enables/Disables the DC Power input to the VAR-SOLOCustomBoard.

2.4.3.4 Reset Button (SW4)

SW4 is the System hardware-reset button.

2.4.4 Power Input

The VAR-SOLOCustomBoard is powered by a +5V power supply, connected either through a 2.0 mm power plug or alternatively through a 2 pin Terminal block.

2.4.4.1 DC-in Jack Pin-out (J19)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	DGND	P	Digital ground
2	DGND	P	Digital ground
3	PWR_IN	P	+5V power input
4	PWR_IN	P	+5V power input

Table 2-23 DC-in Jack Pin-out (J19)

2.4.4.2 DC-in 2 pin Terminal Block Pin-out (J18)

Pin #	VAR-SOLOCustomBoard Signal	Type	Description
1	DGND	P	Digital ground
2	PWR_IN	P	+5V power input

Table 2-24 DC-in 2 pin Terminal Block Pin-out (J18)

2.4.4.3 RTC Backup Battery (JBT100)

The VAR-SOLOCustomBoard features JBT100, a CR1225 battery holder for powering the On board ISL12057IUZ RTC Module.

3 Electrical Environmental Specifications

3.1 Absolute maximum electrical specifications

	Min	Max
Main Power supply, DC-IN	-0.3V	6

Table 3-1 Absolute maximum electrical specifications

3.2 Operational electrical specifications

	Min	Max
Main Power supply, DC-IN	4.8V	5.2V

Table 3-2 Operational electrical specifications

4 Environmental specifications

	Min	Max
Commercial operating temperature range	0^0C	+70^0C
MTBF	>10000hrs	
Shock resistance	50G / 20 ms	
Relative humidity, Operational	10%	90%
Relative humidity, Storage	5%	95%
Vibration	20G / 0 - 600 Hz	

Table 4-1 Environmental specifications

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