VARISCITE LTD

VAR-EXT-CB105

CAN-Bus / RS485 / Serial Extension Board for VAR-xxCustomBoard

Data Sheet Rev 1.2

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Revision History

Revision	Date	Notes
1.0	04/11/2010	Initial release
1.1	4/1/2011	Extension Headers References designators update
1.2	25/3/2011	Rev 1.1 PCB updates

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1 Overview

This chapter gives a short overview of the VAR-EXT-CB105 extension board.

1.1 General Information

The VAR-EXT-CB105 extension board is an add-on board, which plugs into the VAR-xxCustomBoard extension connectors. The VAR-EXT-CB105 exposes more than 90% of the VAR-SOM-xx interfaces into 2.54mm pitch through-hole connectors. The VAR-EXT-CB105 standard headers provide a fast & easy way for adding additional custom hardware to the VAR-xxCustomBoard.

VAR-EXT-CB105 features:

1. RS232 Transceiver (DTE)
2. RS485 Transceiver
3. CAN BUS Transceiver
4. General purpose 1.8V to 3.3V level shifter
5. JTAG interface adapter

Supporting products:

- VAR-xxCustomBoard

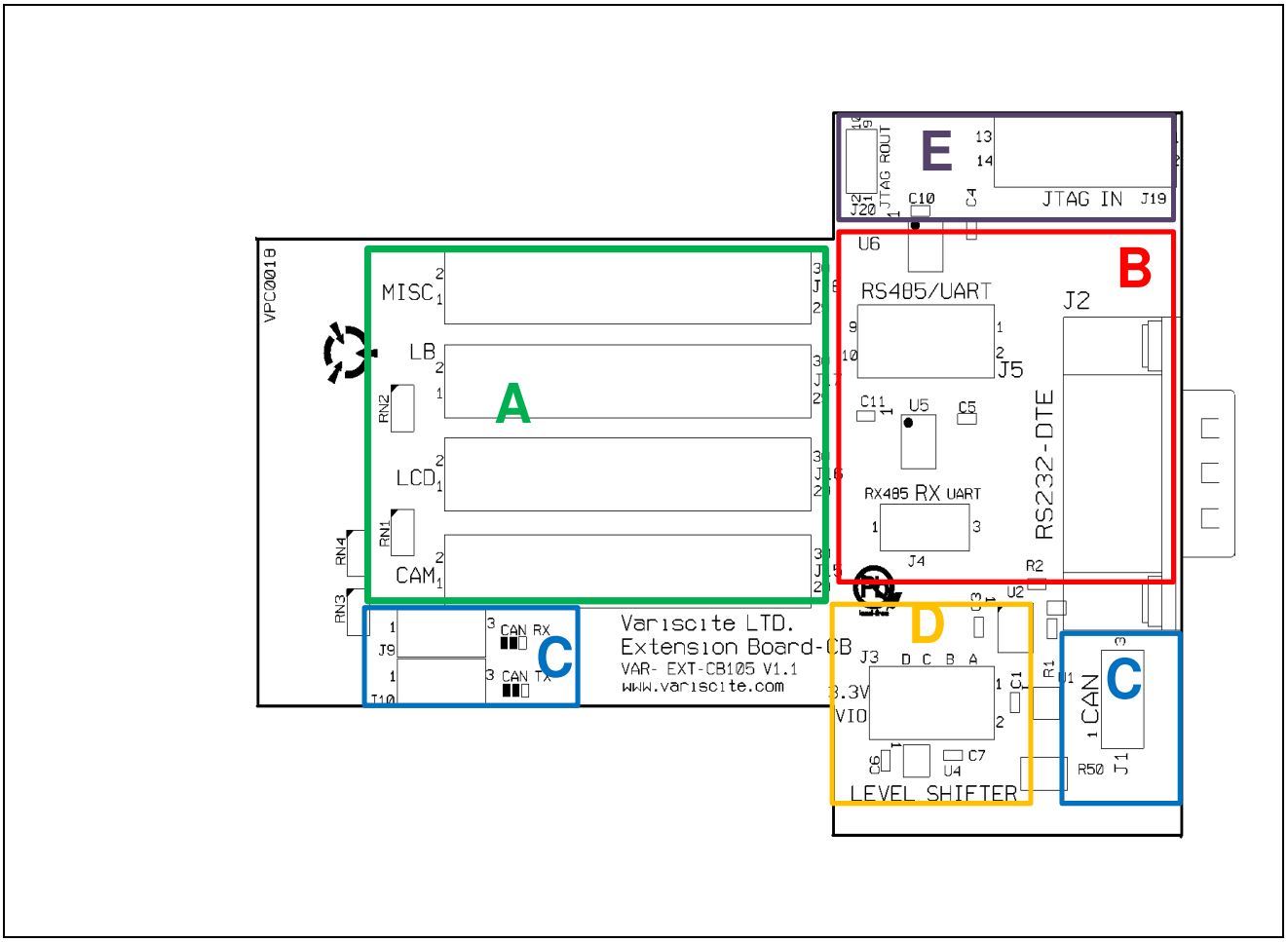
Contact support for further information: mailto:support@variscite.com.

1.2 Related Documents

Document	Location
VAR-SOM-xx data sheet	See latest version on http://www.variscite.com
VAR-xxCustomBoard data sheet	See latest version on http://www.variscite.com

2 Detailed Description

2.1 VAR-EXT-CB105 Layout & Connectors



2.1.1 IO & BUS Extenders (Section A)

The VAR-EXT-CB105 features four 15x2, 2.54mm, standard header connectors. The four headers expose the VAR-SOM-xx modules IOs and interfaces, including:

- LCD interface
- CMOS Sensor Interface
- SPI,I2C Serial BUS
- MMC
- Local BUS (when supported in SOM connector)
- UARTs
- GPIOs

Detailed pin out can be found in section 3.1 Extension Headers

2.1.2 RS-232/3.3V Level UART (Section B)

Two Full UART interfaces are available using the VAR-EXT-CB105:

1. D-Type male connector , RS232 levels
2. 5x2, 3.3V IO level header.

Detailed pin-out can be found in section 3.2 UARTS

2.1.3 RS485 Level UART (Section B)

RS485 level UART port is exposed by a 5x2 Header.

Detailed pin out can be found in section 3.2 UARTS

2.1.4 CAN BUS (Section C)*

The VAR-EXT-CB105 features a standard CAN BUS interface based on the LTC2858-2 transceiver. The CAN BUS signals are available on a 3-pin header.
Detailed pin out can be found in section 3.3 CAN BUS

* Available only for Supportting VAR-SOM- xx modules .

2.1.5 1.8v -> 3.3v level Translation (Section D)

The VAR-EXT-CB105 features on board, 4 channels Bi-directional 3.3V to VIO level translator. The signals are available on 2x5 pin header.
Detailed pin out can be found in section 3.4 General Purpose Level Shifter

2.1.6 JTAG Adaptor (Section E)

The VAR-EXT-CB105 features an on board 2x7 pin, 2.54mm pitch JTAG connector to 2x5 pin, 1.27mm JTAG connector converter.
Detailed pin out can be found in section 3.5 JTAG Connectors

3 Connectors Pinout

3.1 Extension Headers

3.1.1 Extension Header J16 – LCD Interface

PIN#	VAR-SOM-OM3X Signal Name	VAR-SOM-MX25 Signal Name	VAR-SOM-AM35X5 Signal Name
1	VIO	VIO	VIO
2	DSS_D0 (J10 set to 2-3)	CAN TX (J10 set to 1-2)	CAN TX (J10 set to 1-2)
3	DSS_D1 (J10 set to 2-3)	CAN_RX1 (J9 set to 1-2)	CAN_RX (J9 set to 1-2)
4	DSS_D2	LCD_D0	DSS_D2
5	DSS_D3	LCD_D1	DSS_D3
6	DSS_D4	LCD_D2	DSS_D4
7	DSS_D5	LCD_D3	DSS_D5
8	DSS_D6	LCD_D4	DSS_D6
9	DSS_D7	LCD_D5	DSS_D7
10	DSS_D8	CSPI1_RDY	DSS_D8
11	DSS_D9	LCD_16	GND
12	DSS_D10	LCD_D6	DSS_D10
13	DSS_D11	LCD_D7	DSS_D11
14	DSS_D12	LCD_D8	DSS_D12
15	DSS_D13	LCD_D9	DSS_D13
16	DSS_D14	LCD_D10	DSS_D14
17	DSS_D15	LCD_D11	DSS_D15
18	DSS_D16	NC	DSS_D16
19	DSS_D17	GPIO4[6]	DSS_D17
20	DSS_D18	LCD_D12	DSS_D18
21	DSS_D19	LCD_D13	DSS_D19
22	DSS_D20	LCD_D14	DSS_D20
23	DSS_D21	LCD_D15	DSS_D21
24	DSS_D22	LCD_D16	DSS_D22
25	DSS_D23	LCD_D17	DSS_D23
26	DSS_PCLK	LCD_PCLK	DSS_PCLK
27	DSS_VSYNC	LCD_VSYNC	DSS_VSYNC
28	DSS_HSYNC	LCD_HSYNC	GPIO_126
29	GND	GND	GND
30	DSS_ACBIAS	LCD_DRDY	DSS_ACBIAS

3.1.2 Extension Header J15 – CAM & I2C

PIN #	VAR-SOM-OM3X Signal Name	VAR-SOM-MX25 Signal Name	VAR-SOM-AM35X5 Signal Name
1	VIO	VIO	VIO
2	VCC_3V3	VCC_3V3	VCC_3V3
3	CAM_D0	NC	CAM_D0
4	VCC_3V3	VCC_3V3	VCC_3V3
5	CAM_D1	NC	CAM_D1
6	NC	NC	NC
7	CAM_D2	CSI_D2	CAM_D2
8	NC	NC	NC
9	CAM_D3	CSI_D3	CAM_D3
10	NC	NC	NC
11	CAM_D4	CSI_D4	CAM_D4
12	NC	NC	NC
13	CAM_D5	CSI_D5	CAM_D5
14	I2C3_SDA	I2C1_SDA	I2C3_SDA
15	CAM_D6	CSI_D6_MMC2_CMD	CAM_D6
16	I2C3_SCL	I2C1_SCL	I2C3_SCL
17	CAM_D7	CSI_D7_MMC2_CLK	CAM_D7
18	CAM_PCLK	CSI_PIXCLK_MMC2_DAT3	CAM_PCLK
19	CAM_D8	CSI_D8	GND
20	NC	NC	NC
21	CAM_D9	CSI_D9	NC
22	CAM_XCLKA	CSI_MCLK_MMC2_DAT0	GND
23	CAM_D10	NC	CAM_D10
24	CAM_STROBE	CSPI_CS1	CAM_STROBE
25	CAM_D11	NC	CAM_D11
26	CAM_WEN	NC	CAM_WEN
27	CAM_VS	CSI_VSYNC_MMC2_DAT1	CAM_VS
28	CAM_HS	CSI_HSYNC_MMC2_DAT2	CAM_HS
29	GND	GND	GND
30	CAM_FLD	CAM_FLD	CAM_FLD

3.1.3 Extension Header J17 – Local Bus

PIN #	VAR-SOM-OM35 Signal Name	VAR-SOM-MX25 Signal Name	VAR-SOM-AM35X5 Signal Name
1	LB_IO_0	NC	LB_IO_0
2	LB_IO_1	NC	LB_IO_1
3	LB_IO_2	NC	LB_IO_2
4	LB_IO_3	NC	LB_IO_3
5	LB_IO_4	NC	LB_IO_4
6	LB_IO_5	NC	LB_IO_5
7	LB_IO_6	NC	LB_IO_6
8	LB_IO_7	NC	LB_IO_7
9	LB_IO_12	NC	LB_IO_12
10	LB_IO_9	NC	LB_IO_9
11	LB_IO_14	NC	LB_IO_14
12	LB_IO_11	NC	LB_IO_11
13	LB_IO_A1	NC	LB_IO_A1
14	LB_IO_13	NC	LB_IO_13
15	LB_IO_A3	NC	LB_IO_A3
16	LB_IO_15	NC	LB_IO_15
17	LB_IO_A5	NC	LB_IO_A5
18	LB_IO_A2	NC	LB_IO_A2
19	LB_IO_A7	NC	LB_IO_A7
20	LB_IO_A4	NC	LB_IO_A4
21	LB_IO_8	NC	LB_IO_8
22	LB_IO_A6	NC	LB_IO_A6
23	LB_IO_10	NC	LB_IO_10
24	LB_nCS3	NC	LB_nCS3
25	LB_RE_OE_N	NC	LB_RE_OE_N
26	LB_nADV_ALE	NC	LB_nADV_ALE
27	LB_WE_N	3V3	LB_WE_N
28	LB_CLE	NC	LB_CLE
29	LB_WAIT0	NC	LB_WAIT0
30	LB_CLK	PWM1	LB_CLK

3.1.4 Extension Header J18 – SPI, MMC & ADC

PIN #	VAR-SOM-OM35 Signal Name	VAR-SOM-MX25 Signal Name	VAR-SOM-AM35X5 Signal Name
1	VIO	VIO	VIO
2	MsSPI2_CLK	CSPI_CLK	GND
3	MMC1_CD	MMC1_CD	MMC1_CD
4	MsSPI2_SIMO	CSPI_MOSI	GND
5	MMC1_CLKO	MMC1_CLKO	MMC1_CLKO
6	MsSPI2_SOMI	CSPI_MISO	GND
7	MMC1_CMD	MMC1_CMD	MMC1_CMD
8	MsSPI2_CS0	CSPI_CS0	DSS_D0
9	MMC1_DAT0	MMC1_DAT0	MMC1_DAT0
10	GPIO28	GPIO3_16	SYS_CLKOU2
11	MMC1_DAT1	MMC1_DAT1	MMC1_DAT1
12	McBSP1_CLKR	NC	GND
13	MMC1_DAT2	MMC1_DAT2	MMC1_DAT2
14	McBSP1_FSR	GND	McBSP1_FSR
15	MMC1_DAT3	MMC1_DAT3	MMC1_DAT3
16	McBSP1_DX	SSI5_STXD	McBSP1_DX
17	KPD.R4	GPIO4[8]	KPD.R4
18	McBSP1_DR	SSI5_SRXD	McBSP1_DR
19	HP_LOUT	HP_LOUT	HP_LOUT
20	McBSP1_FSX	SSI5_STXFS	McBSP1_FSX
21	HP_ROUT	HP_ROUT	HP_ROUT
22	McBSP1_CLKX	SSI5_SCK	McBSP1_CLKX
23	CODEC_AUXADC1	CODEC_AUXADC1	CODEC_AUXADC1
24	KPD.C4	NC	KPD.C4
25	CODEC_AUXADC2	CODEC_AUXADC2	CODEC_AUXADC2
26	KPD.C5	NC	KPD.C5
27	AGND	#N/A	AGND
28	PWM0	LCD_CONTRAST	PWM0
29	GND	GND	GND
30	RESET_OUT_N	RESET_OUT_N	RESET_OUT_N

3.2 UARTs

3.2.1 RS232 connectors assignment

Connector	VAR-SOM-xM3x	VAR-SOM-MX25
5x2 Header UART A (J5)	UART 2	UART 2
D-Type 9 Male (DTE) UART B	UART 1	UART 3

3.2.2 RS232 connectors pin out

3.2.2.1 RS232 – male D-Type 9 (DTE) – J2

Pin #	Signal	Description
1	NC	
2	RX	Serial Data in
3	TX	Serial Data Out
4	NC	
5	GND	
6	NC	
7	RTS	Request to Send - Out
8	CTS	Clear To Send - In
9	NC	

3.2.2.2 3.3V Levels UART & RS485 – 2x5 Header – J5

Pin #	Signal	Description
1	NC	
2	RX	Serial Data in
3	TX	Serial Data Out
4	Z	RS-485 Tx Signal Negative
5	GND	
6	A	RS-485 Tx Signal
7	RTS	Request to Send - Out
8	CTS	Clear To Send - In
9	B	RS-485 Rx Signal Negative
10	Y	RS-485 Tx Signal

3.3 CAN BUS - J1

Pin #	Signal
1	CANL
2	CANH
3	GND

3.4 General Purpose Level Shifter

Pin #	Pin Function
1	1.8V – I/O A
2	3.3V – I/O A
3	1.8V – I/O B
4	3.3V – I/O B
5	1.8V – I/O C
6	3.3V – I/O C
7	1.8V – I/O D
8	3.3V – I/O D
9	GND
10	VCC 3V3

3.5 JTAG Connectors

3.5.1 JTAG Out (J20)

Pin #	Pin Function
1	TDO
2	EMU1
3	nTRST
4	EMU0
5	TDS
6	NC
7	TDI
8	NC
9	TCK
10	GND

3.5.2 JTAG In(J19)

Pin #	Pin Function
1	TMS
2	nTRST
3	TDI
4	GND
5	VIO
6	NC
7	TDO
8	GND

9	RTCK
10	GND
11	TCK
12	GND
13	EMU0
14	EMU1

4 Jumper Configuration

Jumper	Pin Short	Function
J4	1-2	RS-485 RX drives VAR-xxxxCustomBoard J15 pin 5 (UARTx Rx) signal
	2-3	J5.2 - UART Rx drives VAR-xxxxCustomBoard J15 pin 5 (UARTx Rx) signal
J9	1-2	CAN Transceiver's RX signal Is connected to VAR-xxxxCustomBoard J16 pin 4
	2-3	J16 PIN 3 Is connected to VAR-xxxxCustomBoard J16 pin 4
J10	1-2	CAN Transceiver's TX signal Is connected to VAR-xxxxCustomBoard J16 pin 2
	2-3	J16 PIN 2 Is connected to VAR-xxxxCustomBoard J16 pin 2

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