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VAR-EXT-CB8 Datasheet

Camera Extension Board for VAR-DT8MCustomBoard & SPEAR-MX8CustomBoard

V 1.x

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Revision History

Revision	Date	Notes
1.00	APR 17 2018	Preliminary
1.01	JUL 26 2018	Official Release
1.02	NOV 18 2018	Fix Revision History numbers. 1.1 – modify OV5645 to OV5640 1.1.2 – Remove TBD from Linux support

Table of Contents

List of Tables

1 Overview

This chapter gives an overview of the VAR-EXT-CB8.

1.1 General Information

The VAR-EXT-CB8 is a camera extension board for VAR-DT8MCustomBoard and SPEAR-MX8CustomBoard. It allows evaluation and easy integration between two OV5640 camera module and Variscite DART-MX8M and SPEAR-MX8 SoM.

VAR-EXT-CB8 Features:
- 2 x 5 Mega Pixel Camera module, based on OV5640 sensor.

1.1.1 Supporting Variscite products

- VAR-DT8MCustomBoard
- SPEAR-MX8CustomBoard

1.1.2 Supporting O.S

- Android
- Linux

1.1.3 Additional information

Board schematics is available to download at www.variscite.com,

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

1.2 VAR-EXT-CB8 features summary

- 1 x 60 PIN Card Edge Connector compatible with VAR-DT8MCustomBoard and SPEAR-MX8CustomBoard.
- 2 x JAL-MIPI-OV5640 V5.0 camera module

1.3 Block Diagram
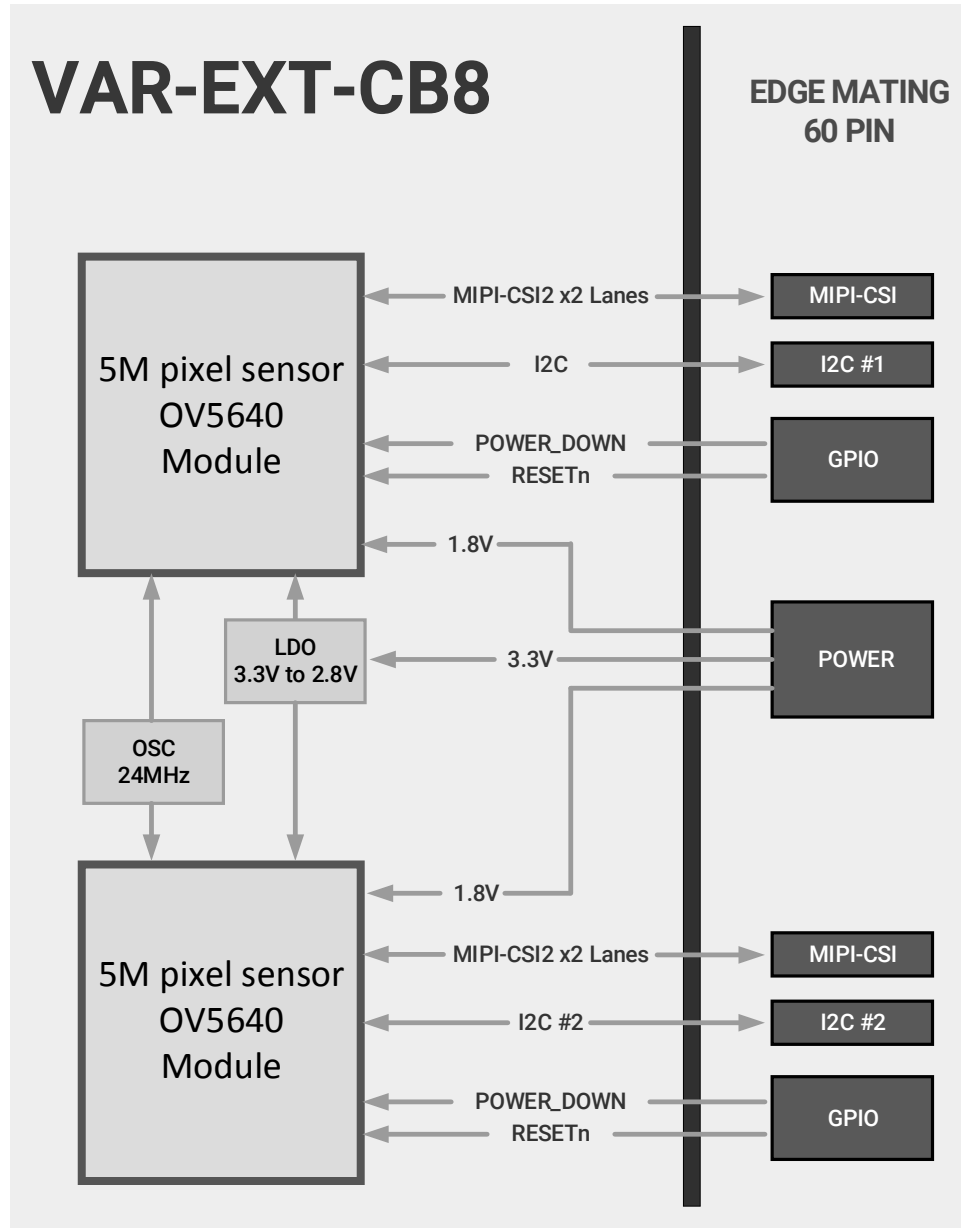
1.4 Board Layout

The VAR-EXT-CB8 physical dimensions are 42 x 31 mm.
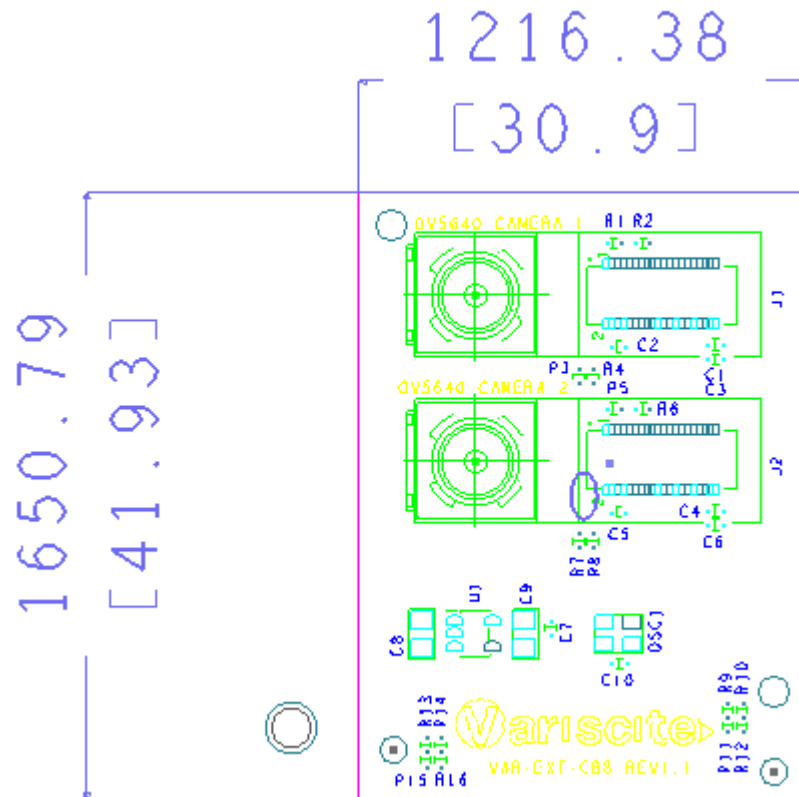
Detailed CAD files are available for download at www.variscite.com.

1.5 VAR-EXT-CB8 connectors

The below table lists all available connectors on the VAR-EXT-CB8, refer to chapter 2 for a more detailed description and Pin-out of each connector.

Table 1-1 VAR-EXT-CB8 connectors

Reference	Function	Type
J23	VAR-DT8MCustomBoard and SPEAR-MX8CustomBoard Mating connector	HSEC8-130-01-SM-DV-A
J1	JAL-MIPI-OV5640 V5.0 module mating connector for camera #1	Board to board, 90 pos., 0.4mm
J2	JAL-MIPI-OV5640 V5.0 module mating connector for camera #2	Board to board, 90 pos., 0.4mm

2 Detailed Description

2.1 Overview

This chapter details the VAR-EXT-CB8 features and external interfaces.

Please refer to the DART-MX8M / SPEAR-MX8 data sheets for more information.

Table 2-1 describes this chapter table header and acronyms used.

Table 2-1: Acronyms used on tables column header

Pin#	x	**Pin number on a connector**
Type		**Pin type & direction**
	I	INPUT
	O	OUTPUT
	DS	Differential Signal
	A	Analog
	P	Power
Signal		**VAR-EXT-CB8 schematic signal name**
Description		**Short Pin functionality description**

2.2 VAR-EXT-CB8 Interfaces

2.2.1 Camera Board PCB connector

The mated VAR-DT8MCustomBoard and SPEAR-MX8CustomBoard exports the DART-MX8M / SPEAR-MX8 dual 4-lane MIPI CSI serial camera interfaces to a 60POS 0.8mm PCB connector.
Mating Edge connector is SAMTEC P/N: HSEC8-130-01-SM-DV-A

Table 2-2: Mating Edge connector pin out (J23)

Pin #	Camera Board Signal	Type	Description
1	VCC_3V3	P	Camera Power supply 3.3V
2	DGND	P	Digital Ground
3	VCC_3V3	P	Camera Power supply 3.3V
4	CSI_P2_I2C_SDA	IO	I2C Data for Camera 2
5	VCC_1V8	P	Camera Power supply 1.8V
6	CSI_P2_I2C_SCL	IO	I2C Clk for Camera 2
7	VCC_1V8	P	Camera Power supply 1.8V
8	DGND	P	Digital Ground
9	DGND	P	Digital Ground
10	CSI_P2_PWDN	O	Power down control; Active Low;
11	CSI_P1_D0_P	DSI	CSI Port1 Lane0; Positive
12	CSI_P2_RST	O	Reset control; Active Low;
13	CSI_P1_D0_N	DSI	CSI Port1 Lane0; Negative
14			
15	DGND	P	Digital Ground
16			
17	CSI_P1_CK_P	DSI	CSI Port1 Clock; Positive
18	DGND	P	Digital Ground
19	CSI_P1_CK_N	DSI	CSI Port1 Clock; Negative
20	CSI_P2_MCLK	I	Optional reference clock source. *Note: Available on SPEAR-MX8CustomBoard only!*
21	DGND	P	Digital Ground
22	DGND	P	Digital Ground
23	CSI_P1_D1_P	DSI	CSI Port1 Lane1; Positive
24			
25	CSI_P1_D1_N	DSI	CSI Port1 Lane1; Negative
26			
27	DGND	P	Digital Ground
28	DGND	P	Digital Ground
29			
30			

Pin #	Camera Board Signal	Type	Description
31			
32			
33	DGND	P	Digital Ground
34	DGND	P	Digital Ground
35			
36	CSI_P2_D1_N	DSI	CSI Port2 Lane1; Negative
37			
38	CSI_P2_D1_P	DSI	CSI Port2 Lane1; Positive
39	DGND	P	Digital Ground
40	DGND	P	Digital Ground
41	CSI_P1_MCLK	I	Optional reference clock source. *Note: Available on SPEAR-MX8CustomBoard only!*
42	CSI_P2_CK_N	DSI	CSI Port2 Clock; Negative
43	DGND	P	Digital Ground
44	CSI_P2_CK_P	DSI	CSI Port2 Clock; Positive
45			
46	DGND	P	Digital Ground
47			
48	CSI_P2_D0_N	DSI	CSI Port2 Lane0; Negative
49	CSI_P1_RST	O	Reset control; Active Low;
50	CSI_P2_D0_P	DSI	CSI Port2 Lane0; Positive
51	CSI_P1_PWDN	O	Power down control; Active Low;
52	DGND	P	Digital Ground
53	DGND	P	Digital Ground
54	VCC_1V8	P	Camera Power supply 1.8V
55	CSI_P1_I2C_SCL	IO	I2C #2 Clock
56	VCC_1V8	P	Camera Power supply 1.8V
57	CSI_P1_I2C_SDA	IO	I2C #2 Data
58	VCC_3V3	P	Camera Power supply 3.3V
59	DGND	P	Digital Ground
60	VCC_3V3	P	Camera Power supply 3.3V

2.2.2   OV5640 V5.0 5 Mega Pixel camera module connector

The VAR-EXT-CB8 features two 5 Mega Pixel camera modules based on OV5640 sensor. The mating connector is Hirose DF30FC-40DS-0.4V(82).

Table 2-3: Camera Module mating connector pin out (J1) (J2)

Pin #	CustomBoard Signal	Type	Description
1	DGND	P	Digital Ground
2	DGND	P	Digital Ground
3			
4	VCC_2V8	P	Camera 2.8V
5	I2C_SDA_CAM	IO	I2C data *Note: Signal level is 1.8V*
6			
7	I2C_SCL_CAM	I	I2C clock *Note: Signal level is 1.8V*
8	VCC_2V8	P	Camera 2.8V
9	RSTn	I	Camera Reset control; Active low *Note: Signal level is 1.8V*
10			
11			
12			
13			
14			
15			
16	CSI_D1_P	I	Camera MIPI-CSI Lane 1; Positive
17	PWRDOWN	I	Camera power down control; Active high *Note: Signal level is 1.8V*
18	CSI_D1_N	I	Camera MIPI-CSI Lane 1; Positive
19			
20	DGND	P	Digital Ground
21			
22	CSI_CK_P	I	Camera MIPI-CSI Clock; Positive
23			
24	CSI_CK_N	I	Camera MIPI-CSI Clock; Negative
25			
26	DGND	P	Digital Ground
27			
28	CSI_D0_P	I	Camera MIPI-CSI Lane 0; Positive
29			
30	CSI_D0_N	I	Camera MIPI-CSI Lane 0; Negative
31			
32	DGND	P	Digital Ground
33			

Pin #	CustomBoard Signal	Type	Description
34	MCLK	I	Refence clock *Note: Signal level is 1.8V*
35			
36			
37			
38	VCC_1V8	P	Camera 1.8V
39			
40	DGND	P	Digital Ground

3 Environmental specifications

Table 3-1: Environmental Specification

	Min	Max
Commercial operating temperature range	0^0C	$+70^0C$
MTBF	>10kHRS	
Relative humidity, Operational	10%	90%
Relative humidity, Storage	5%	95%

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