

Project: *BW1098OBC*
Current Revision: *R1M0E1*

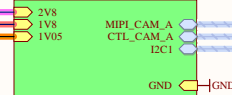
BW1098OBC Revision History:

Date	Revision	Reason for Change	Changes Implemented
10/21/2019	Initial release		
11/27/2019	R0M0E0 -> R1M0E1	1) Decoupling capacitors too close to OV9282 camera module body 2) Overlay on OV9282 camera module body too wide and should match outline of module body 3) Left/Right camera convention doesn't match verbiage in schematic	1) Moved C7, C8, C9 and C12 a bit farther from the J3 (Left) camera module. Moved C23 and C25 a bit farther away from J9 (Right) camera module. 2) Updated the overlay for right and left OV9282 camera modules so that it outlined the 3D Body layer. This should match the camera module body outline and make it easier to mount and align the modules. 3)

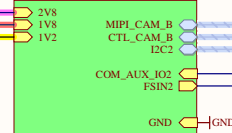
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BW1098OBC_Power_Supply.SchDoc



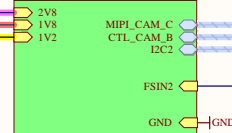
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BW1098OBC_IMX378.SchDoc



U_BW1098OBC_LEFT_OV9282
BW1098OBC_LEFT_OV9282.SchDoc



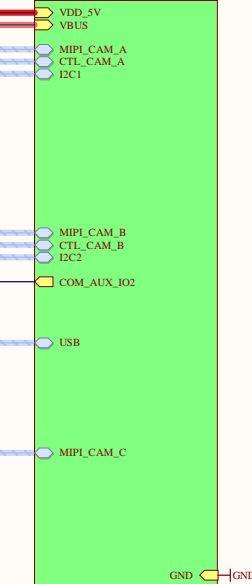
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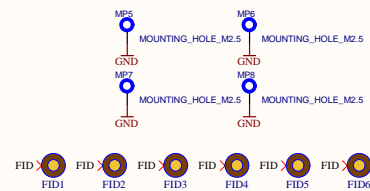
U_BW1098OBC_USB
BW1098OBC_USB.SchDoc



U_BW1098OBC_Connector
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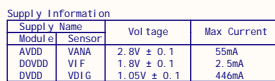


U_BW1098OBC_Project_Information
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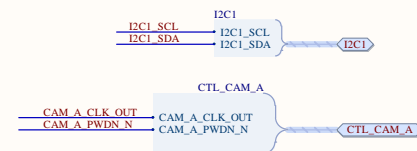
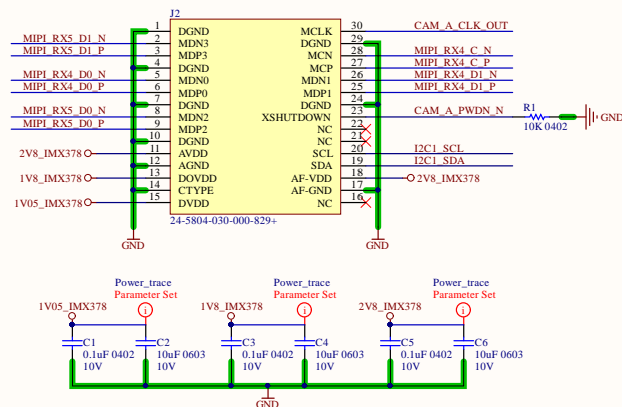
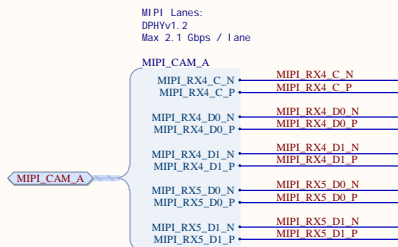
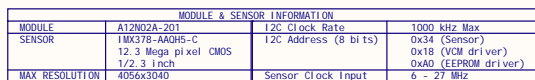


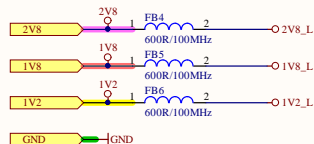
Title BW1098OBC			Laxson Holding 1925 Harmony Park Drive Westminster, CO 80234 United States	
Size: Tabloid	Number: DXXXX	Revision: R1M0E1	Sheet 2 of 8	
Date: 11/27/2019	Time: 11:17:11 AM	Drawn by: Brian Weinstein		

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Note: It is still a limitation that the clock source for the cameras must be shared between CAMA/C and CAMB/D.

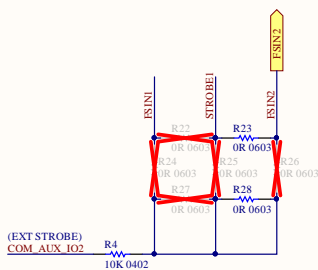
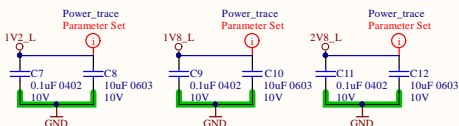
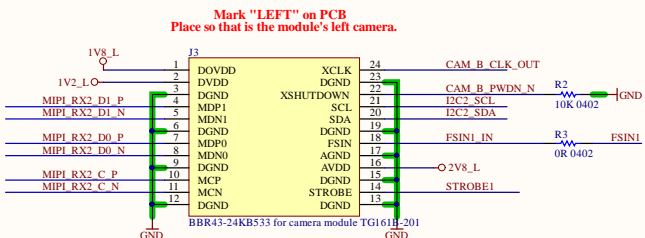
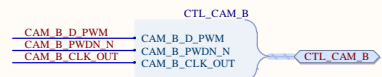
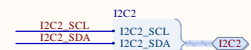
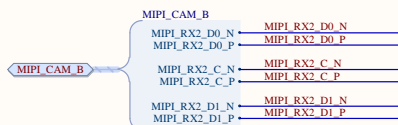




Place FBs and caps close to their associated camera connector.

MODULE & SENSOR INFORMATION			
MODULE	TG161B-201 OR AN01V32-0JG	I2C Clock Rate	400 kHz Max
SENSOR	OV9282-G44A B&W 1 Mega pixel CMOS 1/4 inch	I2C Address (8 bits)	0xC0(W) 0xC1(R)
MAX RESOLUTION	1280X800	Sensor Clock Input	6 - 64 MHz (24 MHz typ.)

Supply Information			
Module	Sensor	Voltage	Max Current
DOVDD	VDD-IO	1.8V	2.5mA
DVDD	VDD-D	1.2V	52mA
AVDD	VDD-A	2.8V	24mA



PCB NOTE: Add below diagram to the PCB

Supported Modes of Operation

- NO SYNC
- NORMAL
- TIMING MASTER
- TIMING SLAVE

Jumper configuration for FSIN and STROBE pins

Used for configuring the STROBE signal direction between the camera boards by using jumpers. A strobe signal may drive FSIN signal for waking up a sensor from its low power mode. See the "Supported Modes of Operation" note for supported jumper settings.

- "NO SYNC" is the mode in which none of the camera modules is excited by any strobe signal.
- "NORMAL" mode means STROBE mechanism works only among the stereo cameras themselves. In this mode, CAM1 strobe is connected to the CAM2 FSIN input.
- "TIMING MASTER" mode means CAM1 STROBE signal drives the EXT_STROBE signal as well as the CAM2 FSIN input. EXT_STROBE signal circulates among the other camera ports so that one camera module can manage the timing of all cameras within the system.
- "TIMING SLAVE" mode uses external strobe signal which is driven externally by another camera. In this mode, CAM1 and CAM2 are excited by the EXT_STROBE signal.

Note that, at most only one camera can be in the "TIMING MASTER" mode at a time. STROBE generation and FSIN reception should be configured via software.

Because the stereo pair of OV9282 modules hard wired to CAM_B no additional reset circuitry is required to account for different conditions. This means that "CAM1" (Left) is reset via CAM_PWDN, and "CAM2" (Right), is reset via CAM_PWM. This also means that the signal CAM_AUX_IO1 is no longer required here, as that was only possible if the stereo pair were connected to CAM_C or CAM_D.

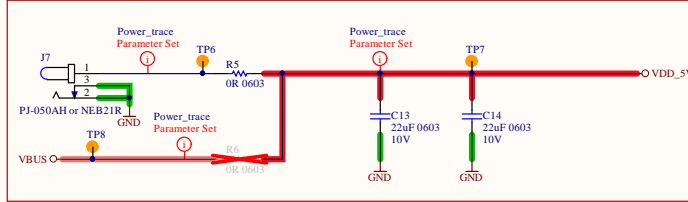
OV9282 sensor I2C address may be changed via I2C protocol. Therefore, in order to assign different I2C address to the sensors on the same I2C bus, one needs to hold the reset the all sensors except one and assign a unique I2C address to the active sensor. This routine should be applied for all sensors in the initialization routine.

CAMERA CONNECTOR: RESET CONNECTION TABLE				
CAM NO	CAM_A	CAM_B	CAM_C	CAM_D
CAM 1	CAM_PWDN	CAM_PWDN	CAM_PWDN	CAM_PWDN
CAM 2	CAM_PWM	CAM_PWM	CAM_AUX_IO1	CAM_AUX_IO1

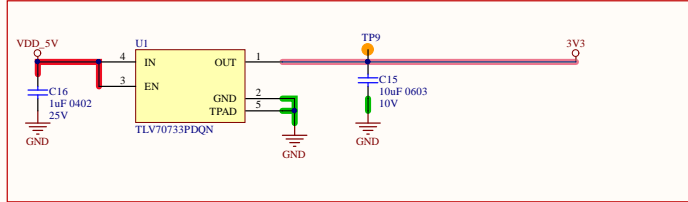
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Size:	Tabloid	Number: DXXXX	Revision: R1M0E1
Date:	11/27/2019	Time: 11:17:12 AM	Sheet 4 of 8
Drawn by:	Brian Weinstein		

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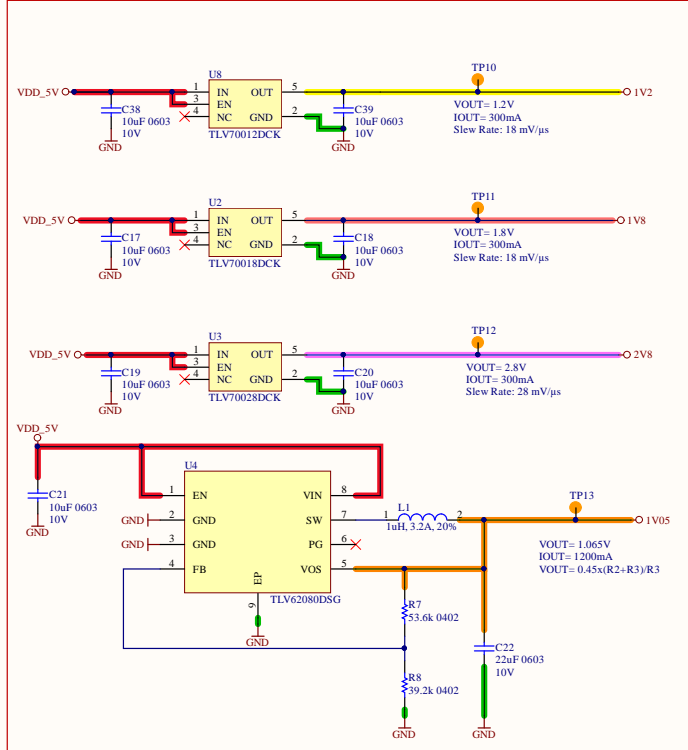
POWER INPUT



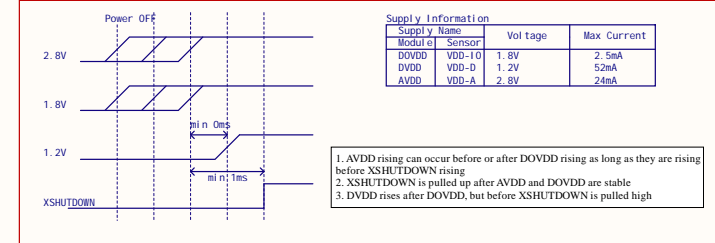
3.3V USB SW POWER



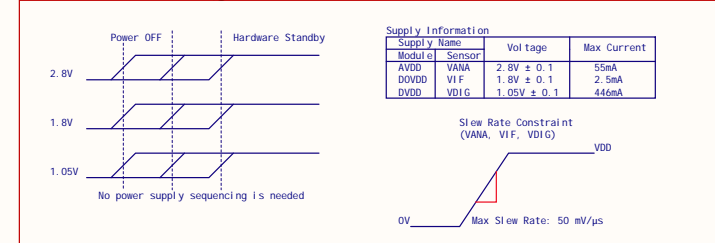
POWER SUPPLIES FOR CAMERA MODULES



OV9282 POWER REQUIREMENTS



IMX378 POWER REQUIREMENTS



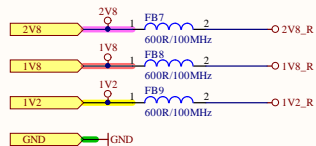
POWER SEQUENCING REQUIREMENTS:

The BW1099 module handles its own power sequencing on-board.

The camera modules have their own power sequencing requirements. The OV9282 have requirements for sequencing, and the IMX378 has a max slew rate requirement. See above.

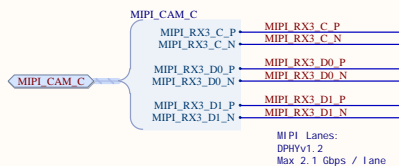
FAN CONTROLLER



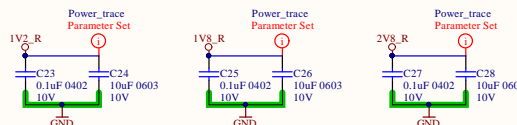
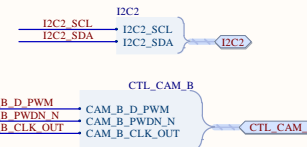
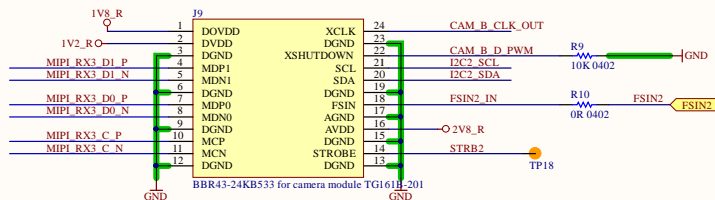


MODULE & SENSOR INFORMATION			
MODULE	TG161B-201 OR AN01V32-0J6	I2C Clock Rate	400 kHz Max
SENSOR	OV9282-GA4A B&W 1 Mega pixel CMOS 1/4 inch	I2C Address (8 bits)	0xC0(W) 0xC1(R)
MAX RESOLUTION	1280X800	Sensor Clock Input	6 - 64 MHz (24 MHz typ.)

Supply Information			
Module	Sensor	Vol tage	Max Current
DOVDD	VDD-10	1.8V	2.5mA
DVDD	VDD-D	1.2V	52mA
AVDD	VDD-A	2.8V	24mA



Mark "RIGHT" on PCB
Place so that this is the module's right camera.



Because the stereo pair of OV9282 modules hard wired to CAM_B (below) no additional reset circuitry is required to account for different conditions. This means that "CAM1" (Left) is reset via CAM_PWDN, and "CAM2" (Right), is reset via CAM_PWM. This also means that the signal CAM_AUX_I01 is no longer required here, as that was only possible if the stereo pair were connected to CAM_C or CAM_D

OV9282 sensor I2C address may be changed via I2C protocol. Therefore, in order to assign different I2C address to the sensors on the same I2C bus, one needs to hold the reset the all sensors except one and assign a unique I2C address to the active sensor. This routine should be applied for all sensors in the initialization routine.

CAMERA CONNECTOR RESET CONNECTION TABLE				
CAM NO	CAM_A	CAM_B	CAM_C	CAM_D
CAM 1	CAM_PWDN	CAM_PWDN	CAM_PWDN	CAM_PWDN
CAM 2	CAM_PWM	CAM_PWM	CAM_AUX_I01	CAM_AUX_I01

