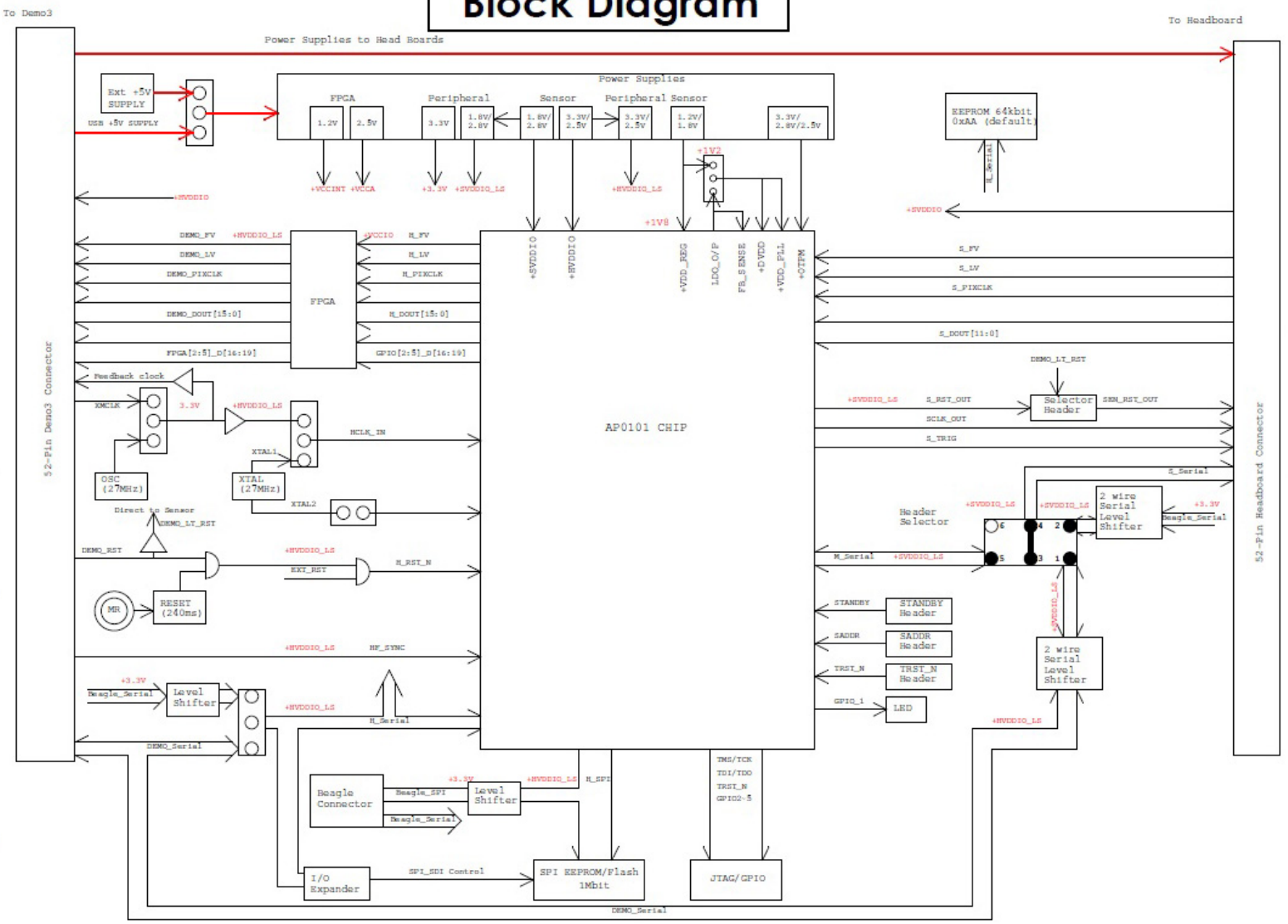
ON Semiconductor®

Schematic for the AP0101AT2L00XPGAH3-GEVB Evaluation Board

AP0101 HEADBOARD DEMO3 Card

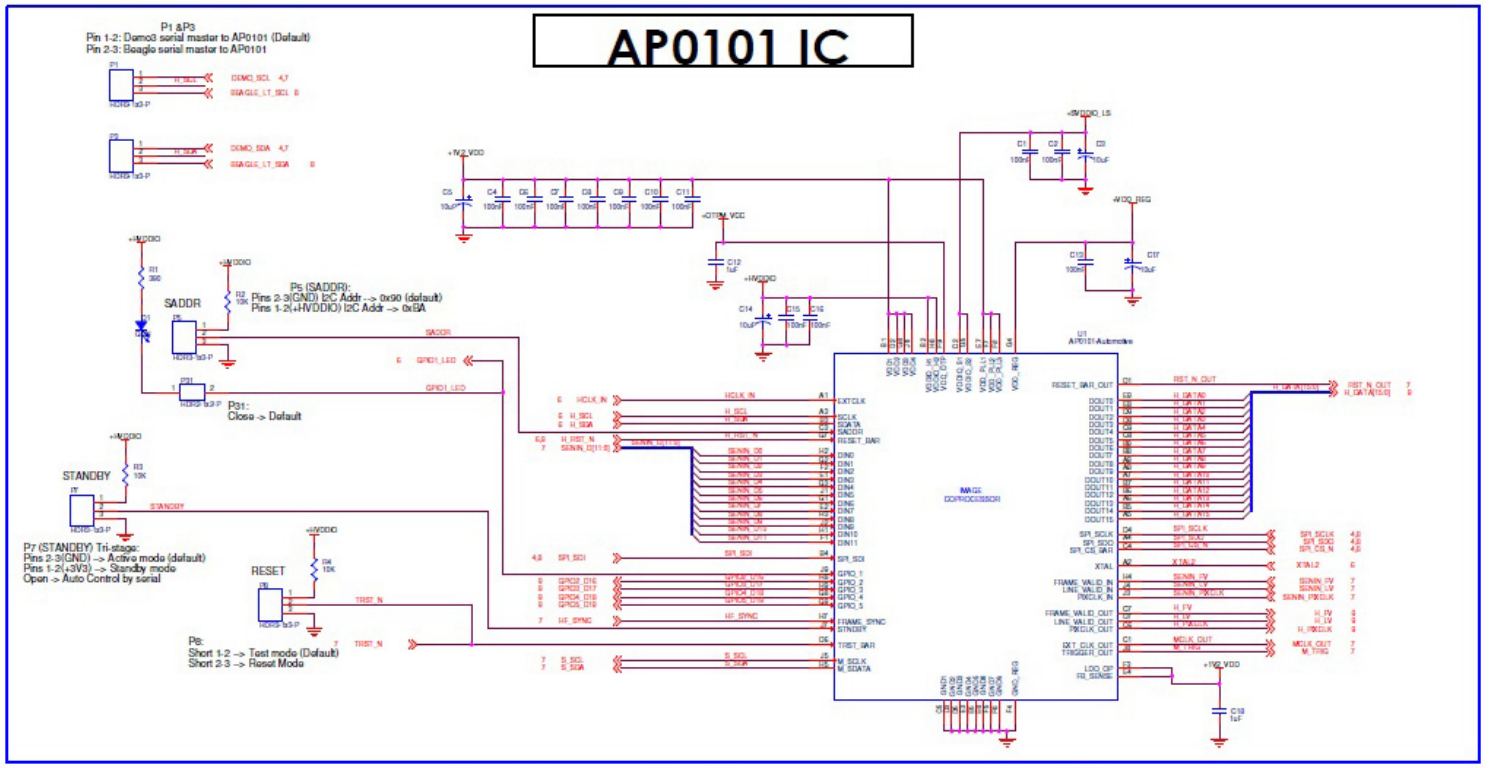
Rev	Who	Date	Description
Rev 0.0	skumar	06/02/15	Initial.Modified from AP0101_HEADBOARD Demo2
Rev 0.1	skumar	06/25/15	1. Added U58 Level shifter between Beagle and AP0101 2. Removed Header P62&P63 and replaced back with resistor R57&R58 3. Updated Block diagram
Rev 0.2	skumar	07/15/15	Deleted P2 and P4 (Removed the provision of external VDD supply for ISP) Text update and feedback clock connected to demo3 base board connector

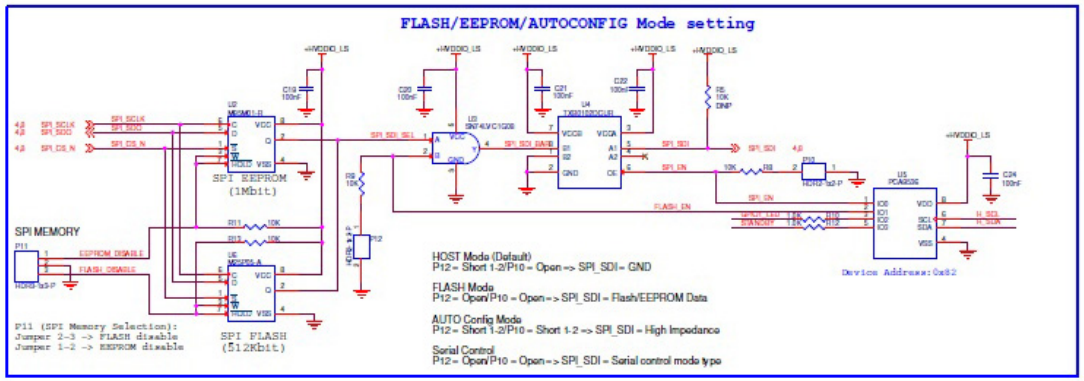
Block Diagram

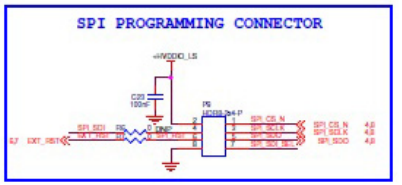


AP0101 IC PINOUT

	1	2	3	4	5	6	7	8	9
A	EXTCLK	XTAL	SCLK	SPI_SDO	DOUT[15]	DOUT[13]	DOUT[10]	DOUT[9]	DOUT[8]
B	VDD	VDDIO_H	SDATA	SPI_SDI	DOUT[14]	DOUT[12]	DOUT[11]	DOUT[7]	DOUT[6]
C	EXT_CLK_OUT	VDDIO_S	SADDR	SPI_CS_BAR	GND	PIXCLK_OUT	FV_OUT	DOUT[5]	DOUT[4]
D	RESET_BAR_OUT	VDD	GND	SPI_SCLK	GND	TRST_BAR	LV_OUT	DOUT[3]	DOUT[2]
E	DIN[3]	DIN[7]	GND	FB_SENSE	GND	GND	VDD_PLL	DOUT[1]	DOUT[0]
F	DIN[11]	DIN[2]	LDO_OP	GND_REG	GND	GND	VDD_PLL	VDD_PLL	VDDIO_OTPM
G	DIN[6]	DIN[1]	DIN[4]	VDD_REG	VDDIO_S	VDD	RESET_BAR	GPIO[4]	GPIO[5]
H	DIN[10]	DIN[0]	DIN[8]	FV_IN	M_SDATA	VDDIO_H	FRAME_SYNC	GPIO[2]	GPIO[3]
J	DIN[5]	DIN[9]	PIXCLK_IN	LV_IN	M_SCLK	VDD	STANDBY	TRIGGER_OUT	GPIO[1]

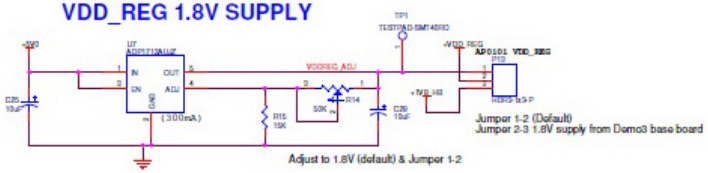

AP0101 IC
P1 &P3
Pin 1-2: Demo3 serial master to AP0101 (Default)
Pin 2-3: Beagle serial master to AP0101
P5 (SADDR):
Pins 2-3(GND) I2C Addr -> 0x90 (default)
Pins 1-2(+HVDDIO) I2C Addr -> 0x8A
SADDR
P31:
Close -> Default
STANDBY
P7 (STANDBY) Tri-stage:
Pins 2-3(GND) -> Active mode (default)
Pins 1-2(+3V3) -> Standby mode
Open -> Auto Control by serial
RESET
P8:
Short 1-2 -> Test mode (Default)
Short 2-3 -> Reset Mode
IMAGE PROCESSOR


FLASH/EEPROM/AUTOCONFIG Mode setting
SPI EEPROM (1Mbit)
SPI MEMORY
SPI FLASH (512Kbit)
P11 (SPI Memory Selection):
Jumper 2-3 -> FLASH disable
Jumper 1-2 -> EEPROM disable
HOST Mode (Default)
P12 = Short 1-2/P10 = Open => SPI_SDI = GND
FLASH Mode
P12 = Open/P10 = Open => SPI_SDI = Flash/EEPROM Data
AUTO Config Mode
P12 = Short 1-2/P10 = Short 1-2 => SPI_SDI = High Impedance
Serial Control
P12 = Open/P10 = Open => SPI_SDI = Serial control mode type
Device Address: 0x82

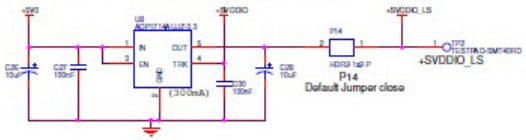

SPI PROGRAMMING CONNECTOR

Power

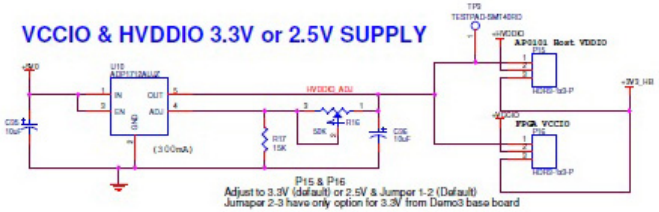
VDD_REG 1.8V SUPPLY



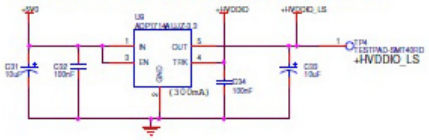
PERIPHERAL SVDDIO_LS SUPPLY



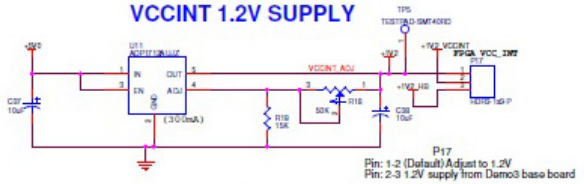
VCCIO & HVDDIO 3.3V or 2.5V SUPPLY



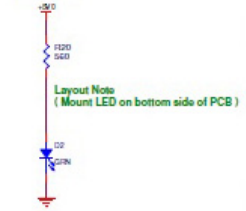
PERIPHERAL HVDDIO_LS SUPPLY



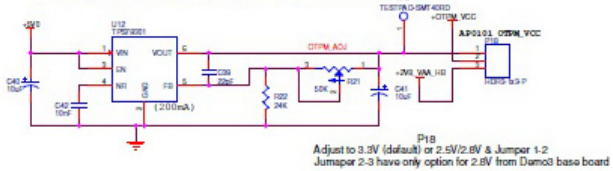
VCCINT 1.2V SUPPLY



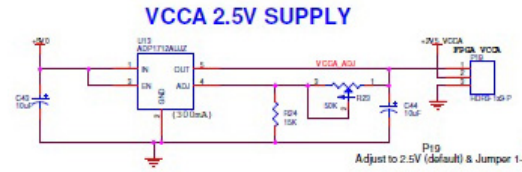
5V LED

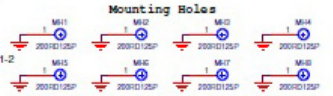


VDD_OTPM 3.3V, 2.8V or 2.5V SUPPLY

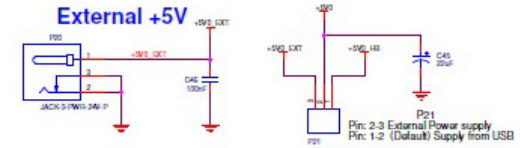


VCCA 2.5V SUPPLY

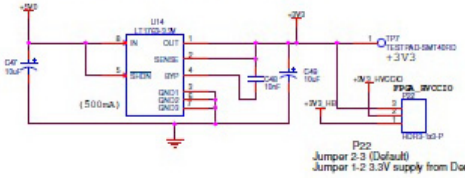


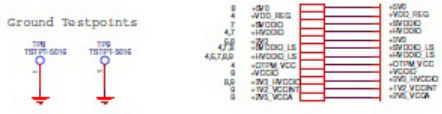


External +5V

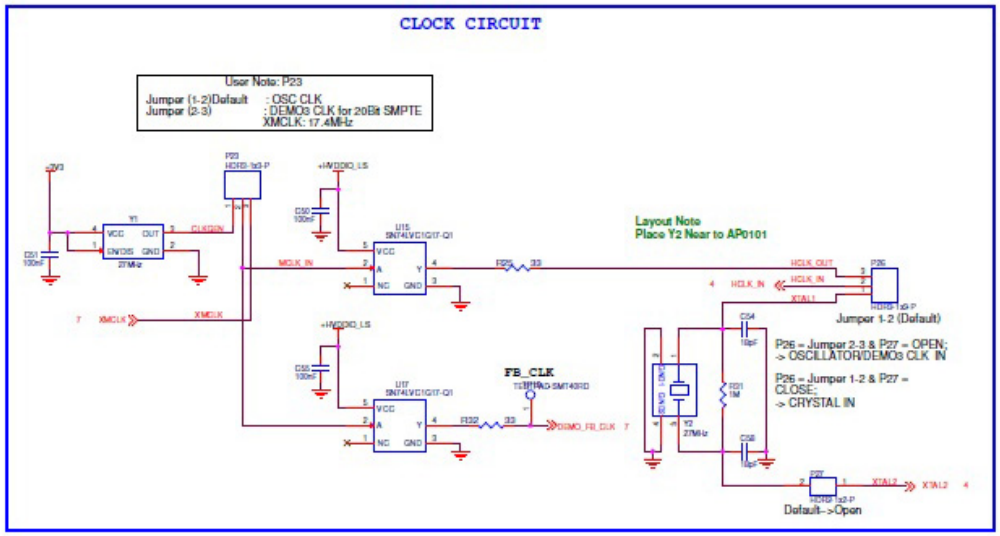


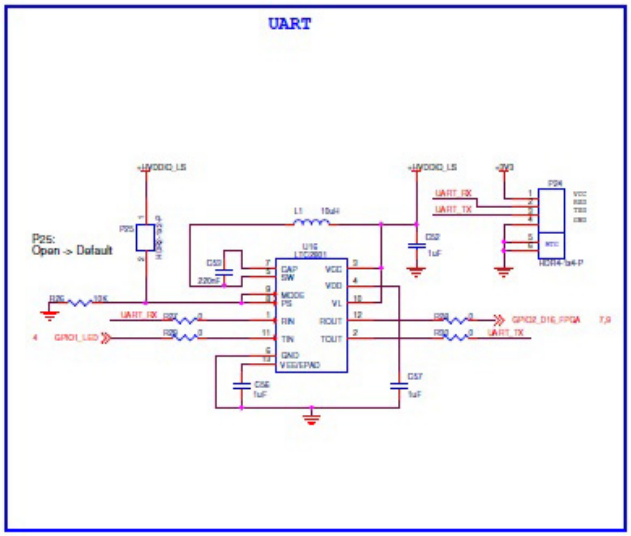
PERIPHERAL 3.3V SUPPLY

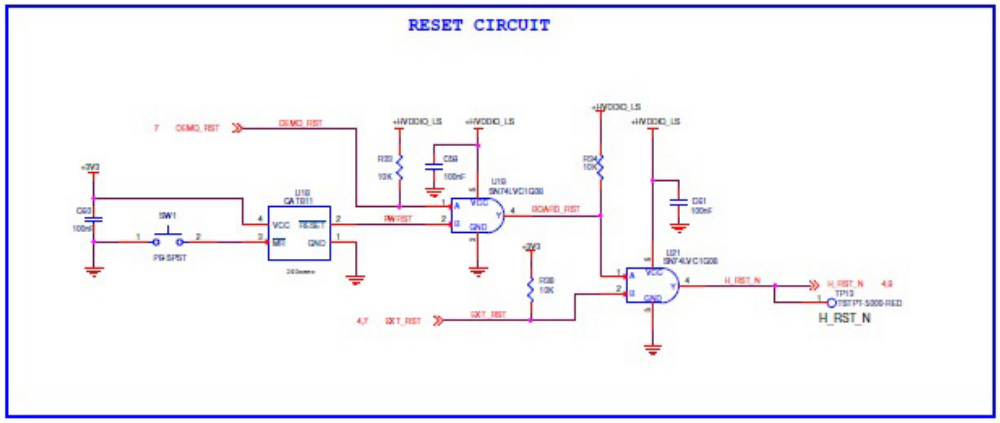


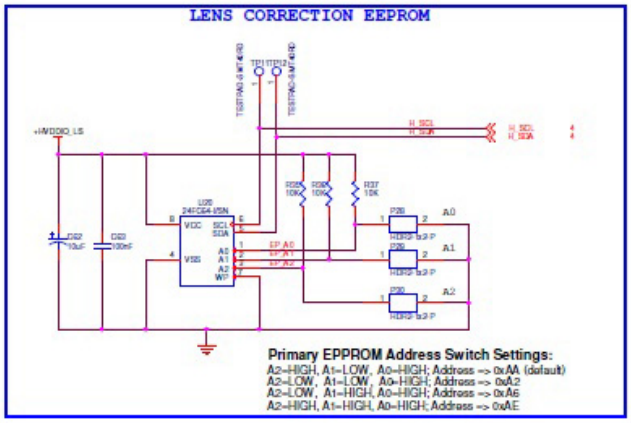


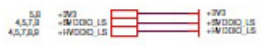
Clock/Reset/UART





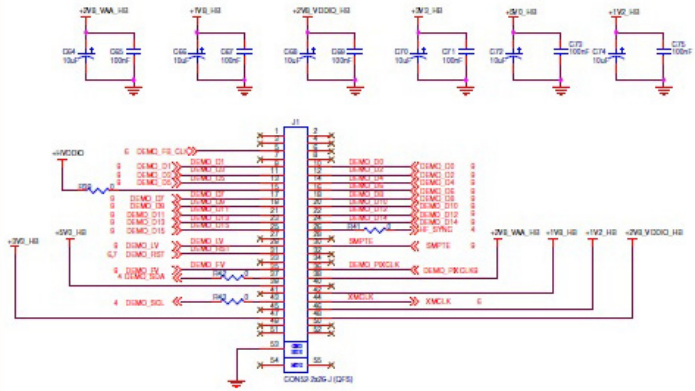




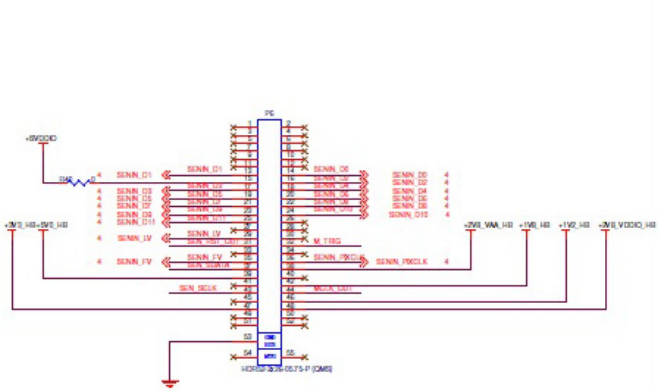


External Interface

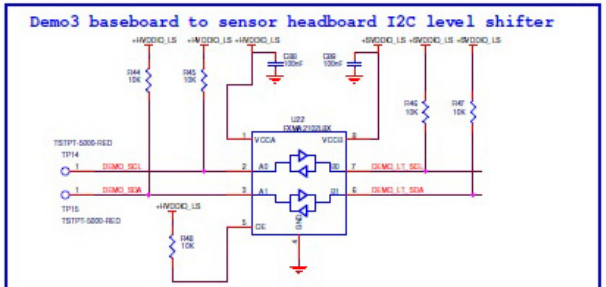
Demo3 Baseboard interface connector



Demo3 Headboard interface connector

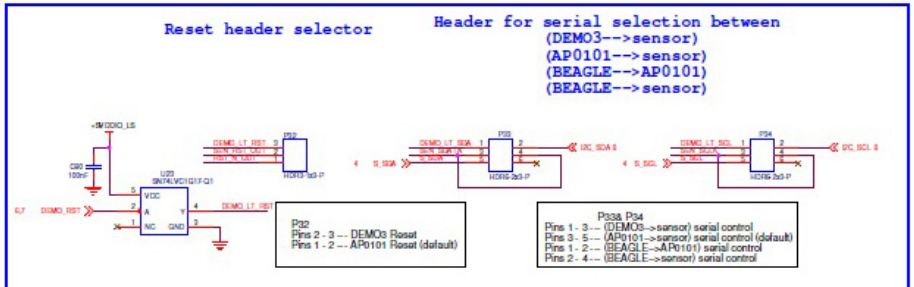


Demo3 baseboard to sensor headboard I2C level shifter

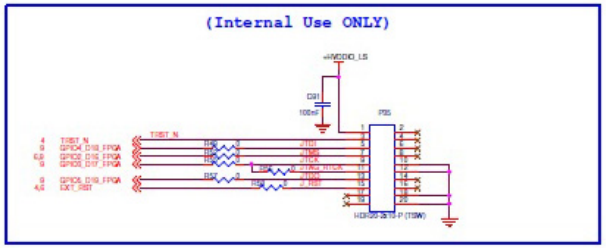


Reset header selector

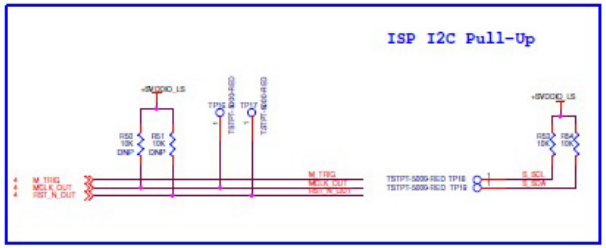
Header for serial selection between
(DEMO3-->sensor)
(AP0101-->sensor)
(BEAGLE-->AP0101)
(BEAGLE-->sensor)



(Internal Use ONLY)

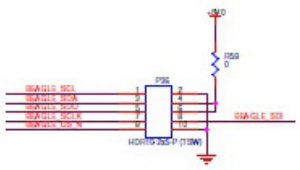


ISP I2C Pull-Up

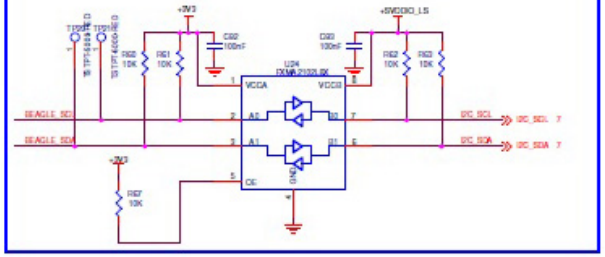


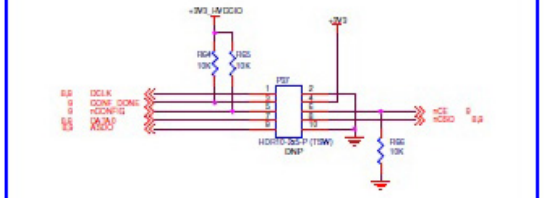
BEAGLE/FPGA EXT I/F

BEAGLE interface connector

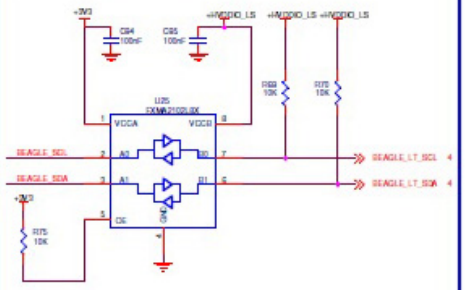


BEAGLE I2C Level shifter

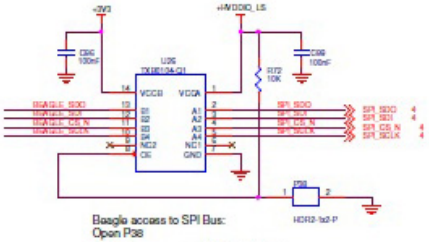




Beagle to AP0101 Adaptor board
I2C level shifter



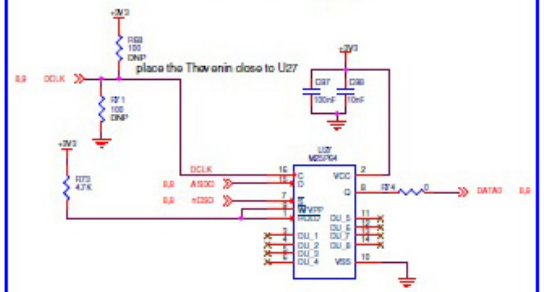
BEAGLE SPI Level shifter

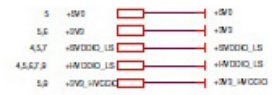


Beagle access to SPI Bus:
Open P38

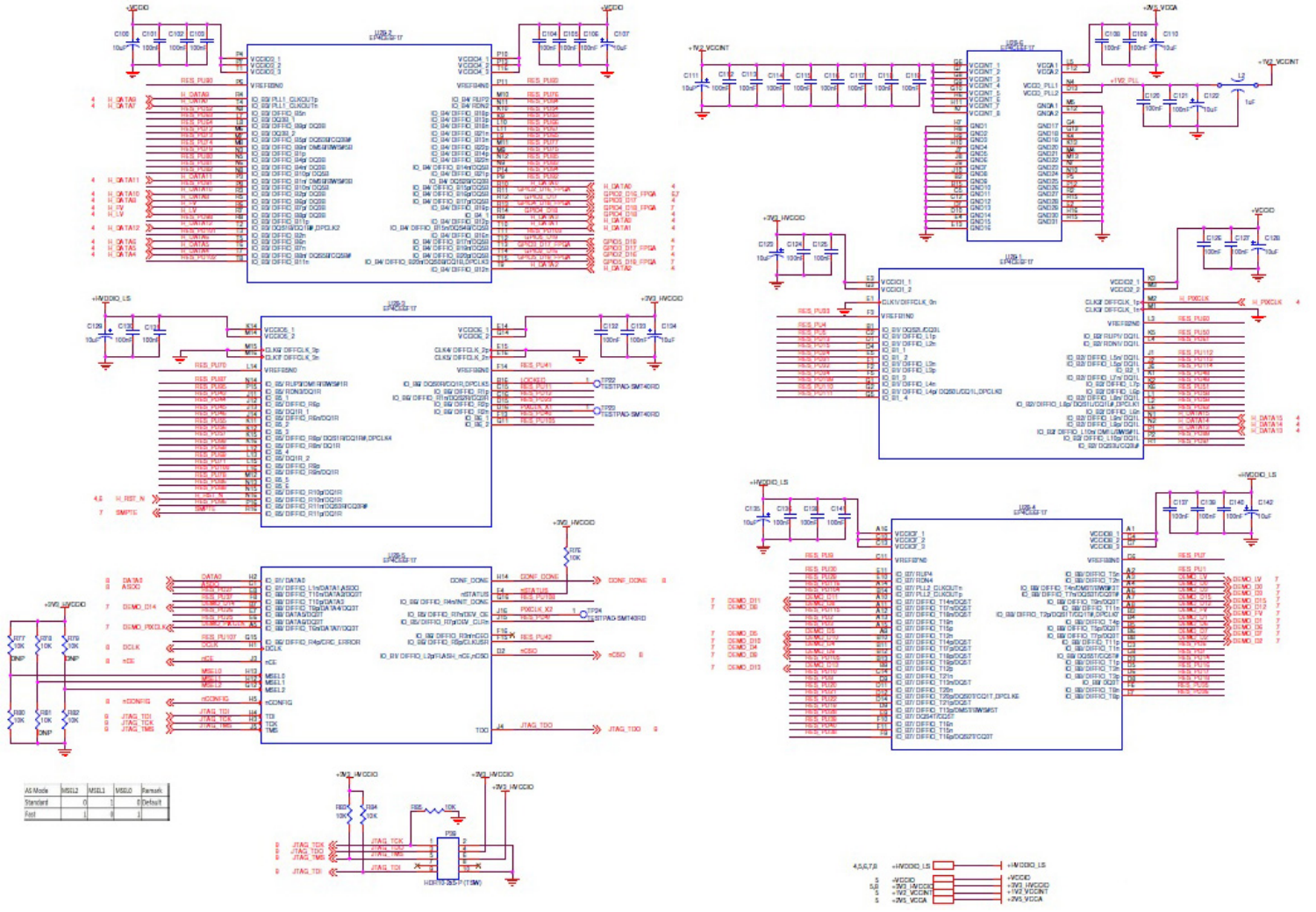
Beagle no access to SPI Bus (Default):
Close P38 --> Pin 1-2

FPGA Memory I/F





FPGA Interface



Configuration Setting

Beagle Serial configuration						
Header	Pin condition				Signal condition	Remark
	P33	P34	P1	P3		
P33/P34 &P1/P3	Short 1-3	Short 1-3	Short 1-2	Short 1-2	DEMO3_Serial => Sensor_Serial/AP0101_Serial	Demo3 Master control ISP & headboard sensor
	Short 1-2	Short 1-2	Short 2-3	Short 2-3	Beagle_Serial => Sensor_Serial/AP0101_Serial	Beagle Master control ISP & headboard sensor
	Short 3-5	Short 3-5	N/A	N/A	AP0101_Serial => Sensor_Serial	AP0101 Master control headboard sensor
	Auto configuration					
Header	Pin condition				Signal condition	Remark
P38	Short 1-2				Disable U26	Beagle no access to SPI Bus
P12/P10	P12=Short 1-2/P10=Open				HOST Mode(SPI_SDI=>GND)	
	P12=Open 1-2/P10=Open				Flash Mode(SPI_SDI=Flash/EEPROM Data)	
	P12=Short 1-2/P10=Short 1-2				Auto-Config(SPI_SDI=High Impedance)	