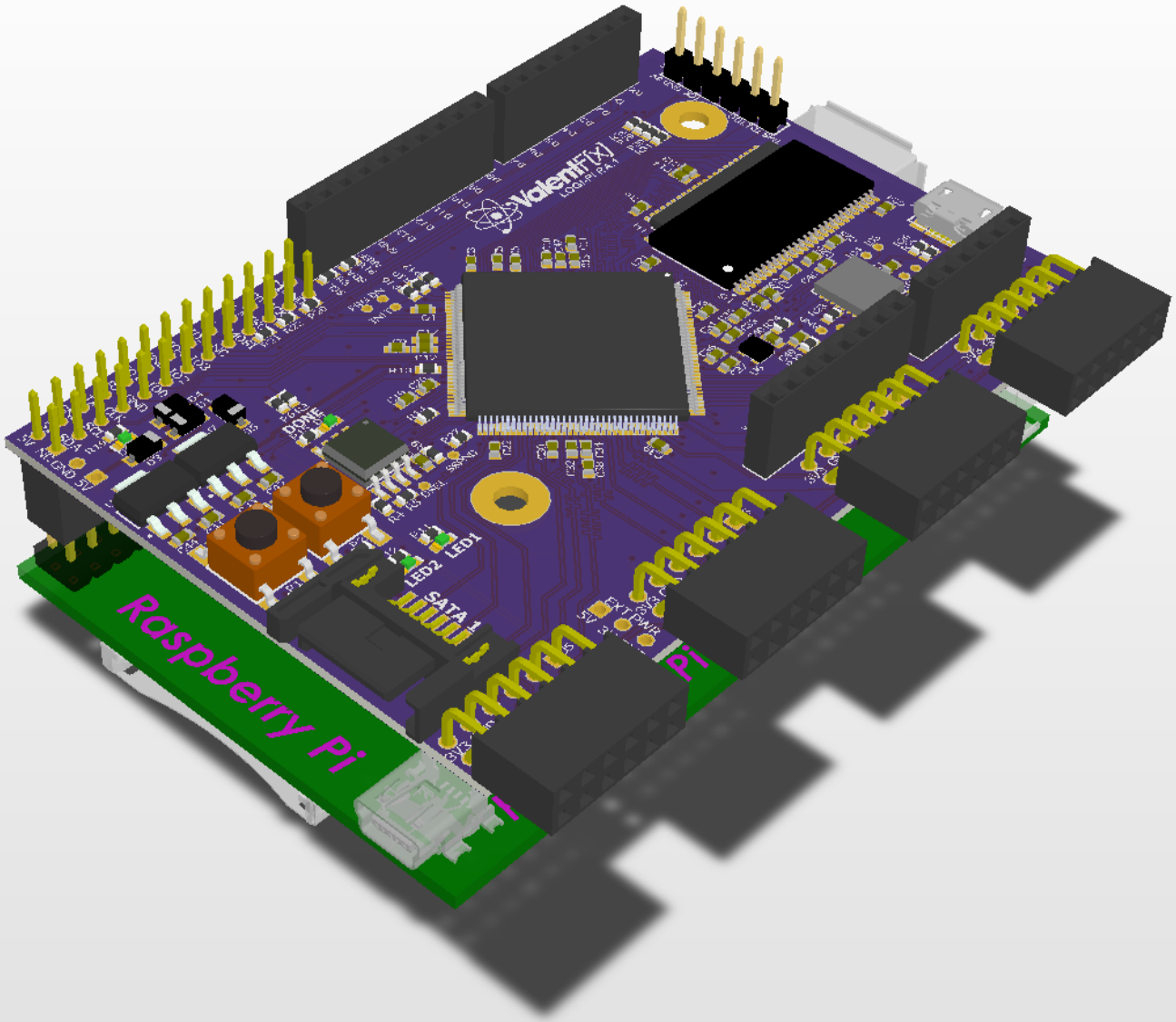
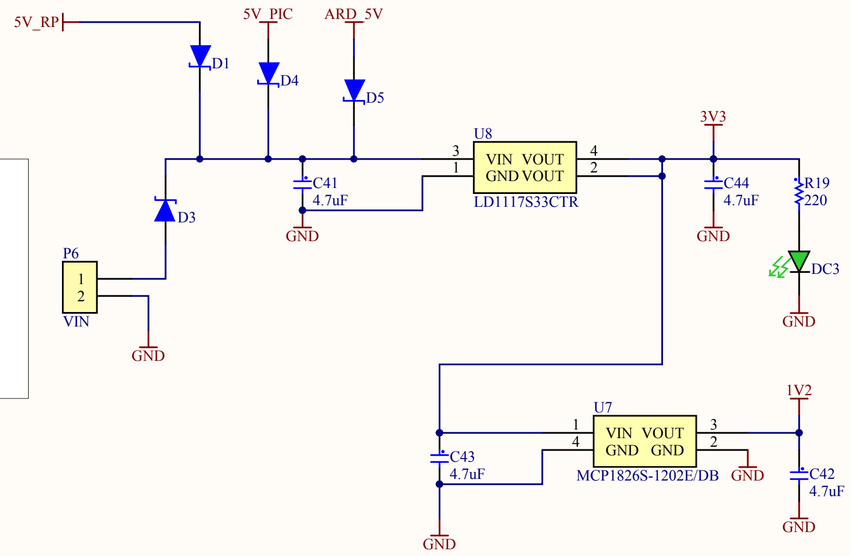
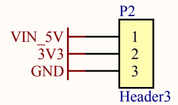

Raspberry Pi
LED2
LED1
SATA

Power: By Default Power will be supplied by the .
Raspberry Pi
Optionally power can be supplied through FPGA VIN header.



1 x Auxillary Power output Headers



Logo1
Valent Logo 750

Logo2
Valent Logo 1000

Title	Power Supply		
Revision:	RA.1	Sheet	1 of 7
Date:	9/30/2013	Engineer:	M. Jones

ValentF(X)
FI ECTRONICS INNOVATION

13 pins

GPIO_PINS
- IO1 — RP_SDA
- IO2 — RP_SCL
- IO3 — SYS_MISO
- IO4 — RP_TX
- IO5 — RP_RX
- IO6 — RP_GPIO_GCLK
- IO7 — RP_GPIO_GEN2
- IO8 — RP_GPIO_GEN3
- IO9
- IO10
- IO11 — RP_SPI_CE0N
- IO12 — RP_SPI_CE1N
- IO13

GPIO

SATA
- D1_N — SATA_D1_N
- D1_P — SATA_D1_P
- D2_N — SATA_D2_N
- D2_P — SATA_D2_P

SATA — SATA_D2_N

PMOD1
- PMOD1_1 — PMOD1_1
- PMOD1_2 — PMOD1_2
- PMOD1_3 — PMOD1_3
- PMOD1_4 — PMOD1_4
- PMOD1_7 — PMOD1_7
- PMOD1_8 — PMOD1_8
- PMOD1_9 — PMOD1_9
- PMOD1_10 — PMOD1_10

PMOD1

PMOD2
- PMOD2_1 — PMOD2_1
- PMOD2_2 — PMOD2_2
- PMOD2_3 — PMOD2_3
- PMOD2_4 — PMOD2_4
- PMOD2_7 — PMOD2_7
- PMOD2_8 — PMOD2_8
- PMOD2_9 — PMOD2_9_DIFF9_P
- PMOD2_10 — PMOD2_10_DIFF9_N

PMOD2

PMOD3
- PMOD_1 — PMOD3_1_DIFF7_P
- PMOD_2 — PMOD3_2_DIFF7_N
- PMOD_3 — PMOD3_3_DIFF5_P
- PMOD_4 — PMOD3_4_DIFF5_N
- PMOD_7 — PMOD3_7_DIFF8_P
- PMOD_8 — PMOD3_8_DIFF8_N
- PMOD_9 — PMOD3_9_DIFF6_P
- PMOD_10 — PMOD3_10_DIFF6_N

PMOD3

PMOD4
- PMOD_1 — PMOD4_1_DIFF3_P
- PMOD_2 — PMOD4_2_DIFF3_N
- PMOD_3 — PMOD4_3_DIFF1_P
- PMOD_4 — PMOD4_4_DIFF1_N
- PMOD_7 — PMOD4_7_DIFF4_P
- PMOD_8 — PMOD4_8_DIFF4_N
- PMOD_9 — PMOD4_9_DIFF2_P
- PMOD_10 — PMOD4_10_DIFF2_N

PMOD4

U3A — BANK 0 — XC6SLX9-3TQG144C

IO_L1P_HSWAPEN_0	144	RAM_S-D3_SD-WE
IO_L1N_VREF_0	143	RAM_S-D4_SD-CAS
IO_L2P_0	142	RAM_S-D5_SD-RAS
IO_L2N_0	141	RAM_S-D6_SD-CS
IO_L3P_0	140	RAM_S-D7_SD-BA0
IO_L3N_0	139	RAM_S-D2_SD-DQML
IO_L4P_0	138	RAM_S-D1_SD-DQ7
IO_L4N_0	137	RAM_S-D0_SD-DQ6
IO_L34P_GCLK19_0	134	RAM_S-CS_SD-DQ5
IO_L34N_GCLK18_0	133	RAM_S-A4_SD-DQ4
IO_L35P_GCLK17_0	132	RAM_S-A3_SD-DQ3
IO_L35N_GCLK16_0	131	RAM_S-A2_SD-DQ2
IO_L36P_GCLK15_0	127	RAM_S-A1_SD-DQ1
IO_L36N_GCLK14_0	126	RAM_S-A0_SD-DQ0
IO_L37P_GCLK13_0	124	OSC_FPGA
IO_L37N_GCLK12_0	123	PMOD2_3
IO_L62P_0	121	PMOD1_1
IO_L62N_VREF_0	120	PMOD1_7
IO_L63P_SCP7_0	119	PMOD1_2
IO_L63N_SCP6_0	118	PMOD1_8
IO_L64P_SCP5_0	117	PMOD1_9
IO_L64N_SCP4_0	116	PMOD1_4
IO_L65P_SCP3_0	115	PMOD1_10
IO_L65N_SCP2_0	114	PMOD2_1
IO_L66P_SCP1_0	112	PMOD2_7
IO_L66N_SCP0_0	111	PMOD2_2

PMOD2_3 — differential

FPGA EXT Oscillator: 50Mhz

U6 — ASDMB-50.000MHZ-LC-T
- OUT — 3
- VDD — 4
- EN — 1
- GND — 2

3V3

C40 .1uF

GND

49 IO after RAM, SATA, CFG, OSC

U3C — BANK 2 — XC6SLX9-3TQG144C

IO_L2P_CMPCLK_2	67	PB0
IO_L2N_CMPMOSI_2	66	SYS_MISO
IO_L12P_D1_MISO2_2	62	PMOD2_8
IO_L12N_D2_MISO3_2	61	PB1
IO_L13N_D10_2	59	LED1
IO_L14P_D11_2	58	LED0
IO_L14N_D12_2	57	RP_SDA
IO_L30P_GCLK1_D13_2	56	RP_SCL
IO_L30N_GCLK0_USERCCLK_2	55	RP_GPIO_GCLK
IO_L31P_GCLK31_D14_2	51	RP_TX
IO_L31N_GCLK30_D15_2	50	RP_RX
IO_L48P_D7_2	48	ARD_SCL
IO_L48N_RDWR_B_VREF_2	47	ARD_SDA
IO_L49P_D3_2	46	RP_GPIO_GEN2
IO_L49N_D4_2	45	RP_GPIO_GEN3
IO_L62P_D5_2	44	RP_SPI_CE0N
IO_L62N_D6_2	43	RP_SPI_CE1N
IO_L64P_D8_2	41	ARD_TX
IO_L64N_D9_2	40	ARD_RX

ARD_IO
- IO1
- IO2
- IO3
- IO4
- IO5
- IO6
- IO7
- IO8
- IO9
- IO10 — ARD_TX
- IO11 — ARD_RX
- IO12 — ARD_SCL
- IO13 — ARD_SDA
- IO14
- IO15
- IO16

ARD_IO

PIC
- TMS
- TCK
- TDO
- TDI
- IO1 — OSC_FPGA
- CLK_ALT

PIC

DIGITAL_IO
- IO1 — LED0
- IO2 — LED1 — LED1
- IO3 — PB1
- IO4 — PB0

DIGITAL_IO

differential

U3B — BANK 1 — XC6SLX9-3TQG144C

IO_L1P_1	105	PMOD2_9_DIFF9_P
IO_L1N_VREF_1	104	PMOD2_10_DIFF9_N
IO_L32P_1	102	PMOD2_4
IO_L32N_1	101	PMOD1_3
IO_L33P_1	100	PMOD3_7_DIFF8_P
IO_L33N_1	99	PMOD3_8_DIFF8_N
IO_L34P_1	98	PMOD3_1_DIFF7_P
IO_L34N_1	97	PMOD3_2_DIFF7_N
IO_L40P_GCLK11_1	95	PMOD3_9_DIFF6_P
IO_L40N_GCLK10_1	94	PMOD3_10_DIFF6_N
IO_L41P_GCLK9_IRDY1_1	93	PMOD3_3_DIFF5_P
IO_L41N_GCLK8_1	92	PMOD3_4_DIFF5_N
IO_L42P_GCLK7_1	88	PMOD4_7_DIFF4_P
IO_L42N_GCLK6_TRDY1_1	87	PMOD4_8_DIFF4_N
IO_L43P_GCLK5_1	85	PMOD4_1_DIFF3_P
IO_L43N_GCLK4_1	84	PMOD4_2_DIFF3_N
IO_L45P_1	83	PMOD4_9_DIFF2_P
IO_L45N_1	82	PMOD4_10_DIFF2_N
IO_L46P_1	81	PMOD4_3_DIFF1_P
IO_L46N_1	80	PMOD4_4_DIFF1_N
IO_L47P_1	79	SATA_D1_P
IO_L47N_1	78	SATA_D1_N
IO_L74P_AWAKE_1	75	SATA_D2_P

U3D — BANK 3 — XC6SLX9-3TQG144C

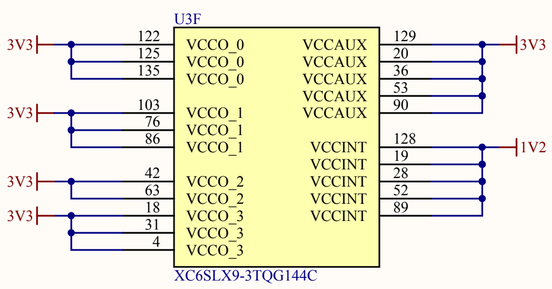
IO_L1P_3	35	RAM_S-A10_SD-A4
IO_L1N_VREF_3	34	RAM_S-A11_SD-A5
IO_L2P_3	33	RAM_S-A12_SD-A6
IO_L2N_3	32	RAM_S-A13_SD-A7
IO_L36P_3	30	RAM_S-A14_SD-A8
IO_L36N_3	29	RAM_S-A18_SD-A9
IO_L37P_3	27	RAM_S-D8_SD-A11
IO_L37N_3	26	RAM_S-D9_SD-A12
IO_L41P_GCLK27_3	24	RAM_S-D10_SD-CKE
IO_L41N_GCLK26_3	23	RAM_S-D11_SD-CLK
IO_L42P_GCLK25_TRDY2_3	22	RAM_S-D12_SD-DQMH
IO_L42N_GCLK24_3	21	RAM_S-D13_SD-NC
IO_L43P_GCLK23_3	17	RAM_S-D14_SD-DQ8
IO_L43N_GCLK22_IRDY2_3	16	RAM_S-D15_SD-DQ9
IO_L44P_GCLK21_3	15	RAM_S-BLE_SD-DQ10
IO_L44N_GCLK20_3	14	RAM_S-BHE_SD-DQ11
IO_L49P_3	12	RAM_S-OE_SD-DQ12
IO_L49N_3	11	RAM_S-A15_SD-DQ13
IO_L50P_3	10	RAM_S-A16_SD-DQ14
IO_L50N_3	9	RAM_S-A17_SD-DQ15
IO_L51P_3	8	RAM_S-A9_SD-A3
IO_L51N_3	7	RAM_S-A8_SD-A2
IO_L52P_3	6	RAM_S-A7_SD-A1
IO_L52N_3	5	RAM_S-A6_SD-A0
IO_L83P_3	2	RAM_S-A5_SD-A10
IO_L83N_VREF_3	1	RAM_S-WE_SD-BA1

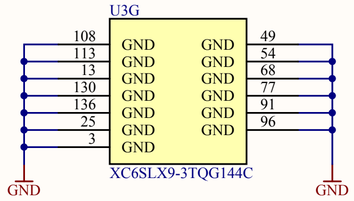
Harness
- RAM_S-CS_SD-DQ5 — RAM1
- RAM_S-WE_SD-BA1 — RAM2
- RAM_S-OE_SD-DQ12 — RAM3
- RAM_S-BLE_SD-DQ10 — RAM4
- RAM_S-BHE_SD-DQ11 — RAM5
- RAM_S-A0_SD-DQ0 — RAM6
- RAM_S-A1_SD-DQ1 — RAM7
- RAM_S-A2_SD-DQ2 — RAM8
- RAM_S-A3_SD-DQ3 — RAM9
- RAM_S-A4_SD-DQ4 — RAM10
- RAM_S-A5_SD-A10 — RAM11
- RAM_S-A6_SD-A0 — RAM12
- RAM_S-A7_SD-A1 — RAM13
- RAM_S-A8_SD-A2 — RAM14
- RAM_S-A9_SD-A3 — RAM15
- RAM_S-A10_SD-A4 — RAM16
- RAM_S-A11_SD-A5 — RAM17
- RAM_S-A12_SD-A6 — RAM18
- RAM_S-A13_SD-A7 — RAM19
- RAM_S-A14_SD-A8 — RAM20
- RAM_S-A15_SD-DQ13 — RAM21
- RAM_S-A16_SD-DQ14 — RAM22
- RAM_S-A17_SD-DQ15 — RAM23
- RAM_S-A18_SD-A9 — RAM24
- RAM_S-D0_SD-DQ6 — RAM25
- RAM_S-D1_SD-DQ7 — RAM26
- RAM_S-D2_SD-DQML — RAM27
- RAM_S-D3_SD-WE — RAM28
- RAM_S-D4_SD-CAS — RAM29
- RAM_S-D5_SD-RAS — RAM30
- RAM_S-D6_SD-CS — RAM31
- RAM_S-D7_SD-BA0 — RAM32
- RAM_S-D8_SD-A11 — RAM33
- RAM_S-D9_SD-A12 — RAM34
- RAM_S-D10_SD-CKE — RAM35
- RAM_S-D11_SD-CLK — RAM36
- RAM_S-D12_SD-DQMH — RAM37
- RAM_S-D13_SD-NC — RAM38
- RAM_S-D14_SD-DQ8 — RAM39
- RAM_S-D15_SD-DQ9 — RAM40

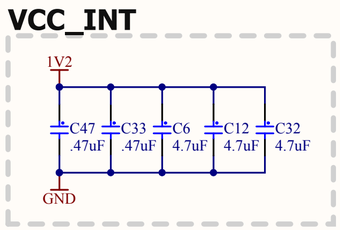
RAM

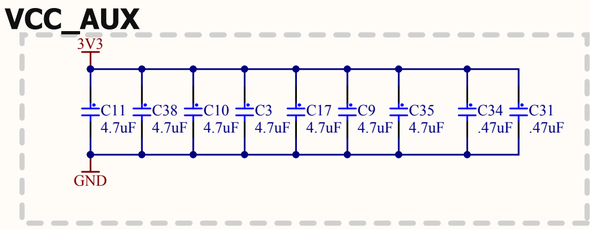
Title	FPGA Logic
Revision:	RA.1
Sheet	2 of 7
Date:	9/30/2013
Engineer:	M. Jones

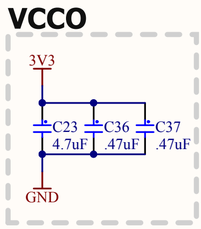
ValentF(X) ELECTRONICS INNOVATION

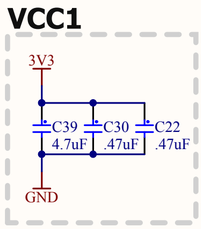


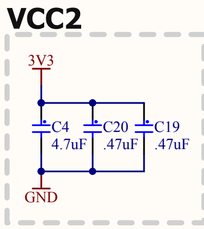


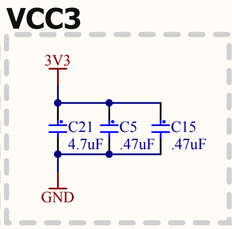




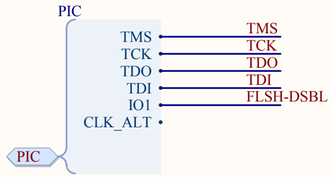


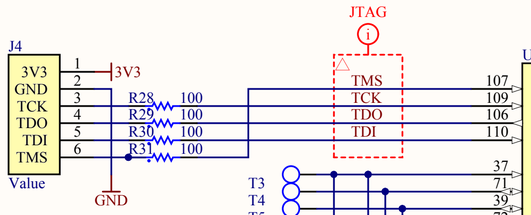


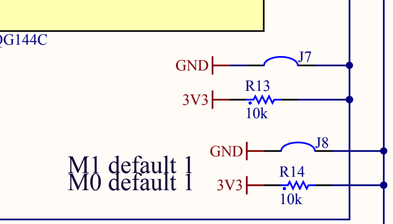




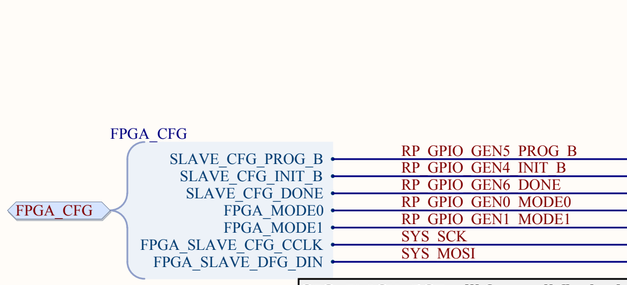
Decoupling cap configuration recommended by Xilinx UG393 (V1.2) for Spartan 6 power distribution







See Page 52 of UG380 V2.3. Pads for parallel CCLK Termination



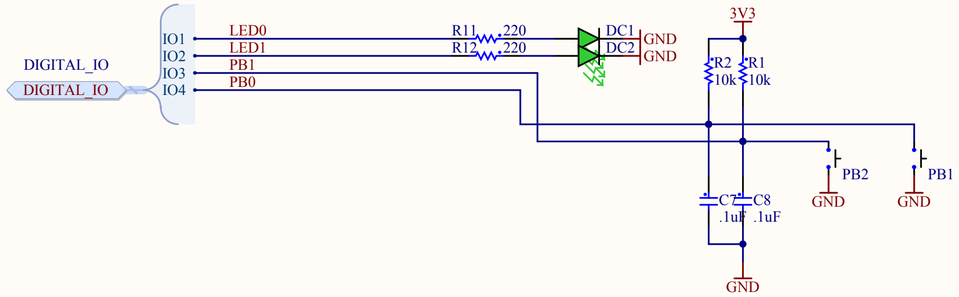
CFG_FLASH_RST will force all flash pins into HiZ removing any conflict while the BB is configuring FPGA

M[1:0] pull ups are set to select Self config by default. See UG380 p40 for pin descriptions.
01 = SelfConfig
11 = SlaveConfig

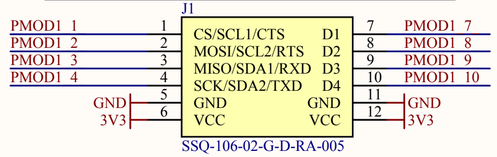
Title	FPGA Configuration		
Revision:	RA.1	Sheet	3 of 7
Date:	9/30/2013	Engineer:	M. Jones

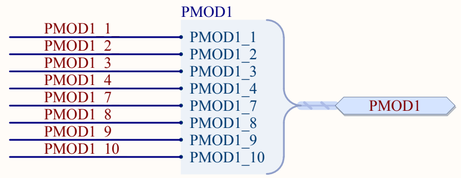
ValentF(X) ELECTRONICS INNOVATION

DIGITAL IO

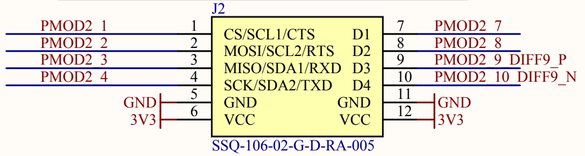


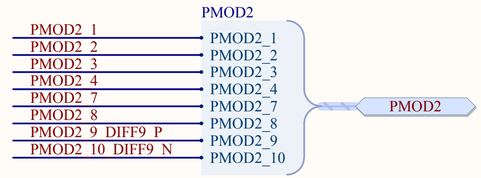
PMOD1



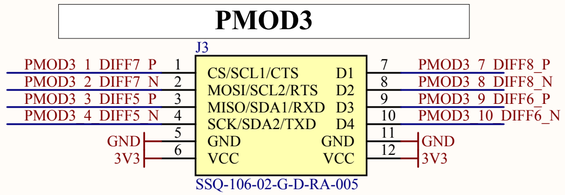


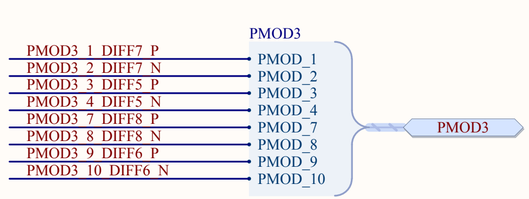
PMOD2

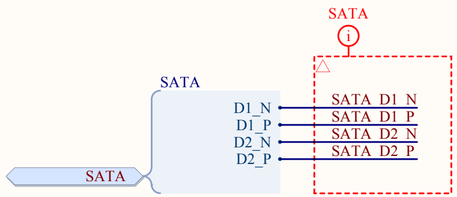


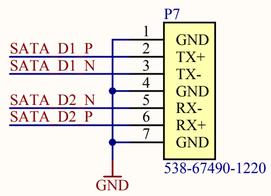


PMOD3

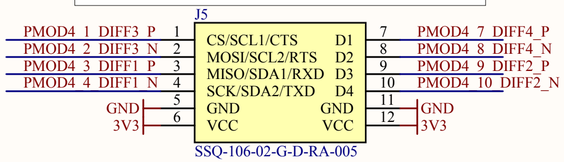


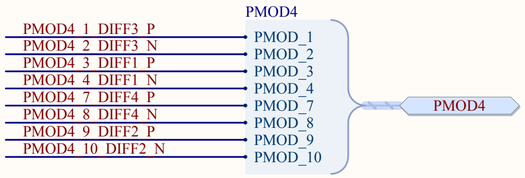






PMOD4





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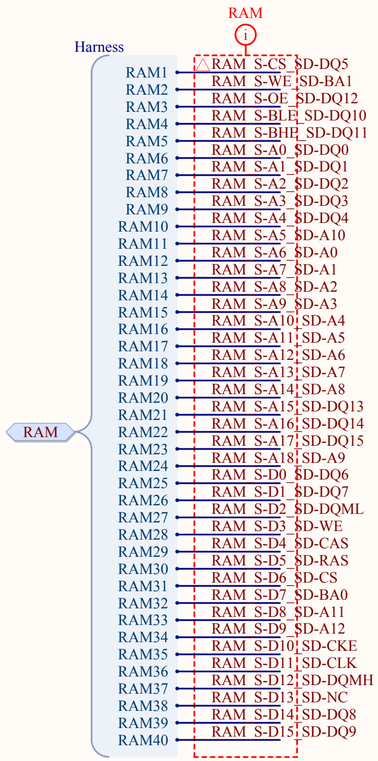
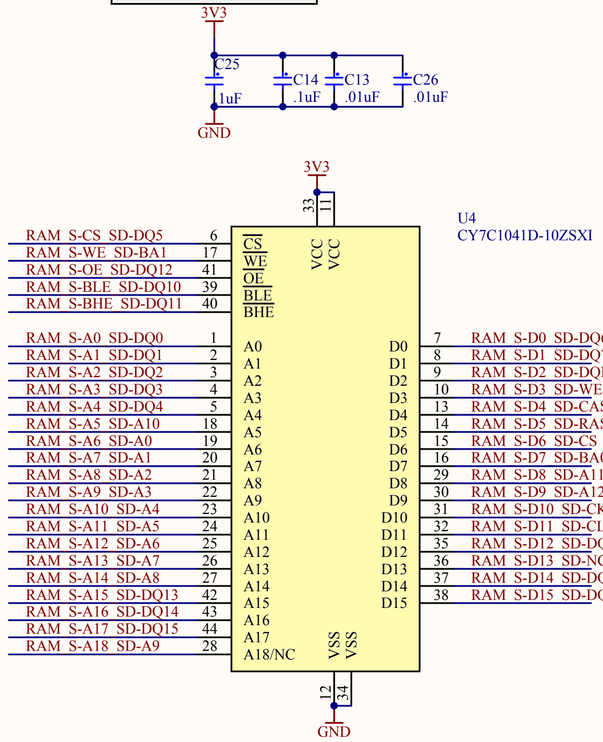


SRAM



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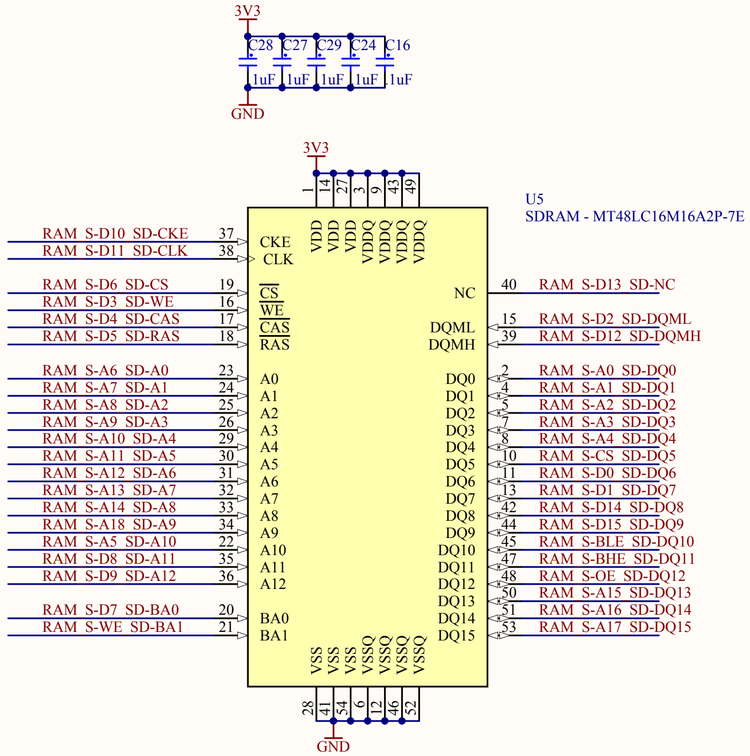

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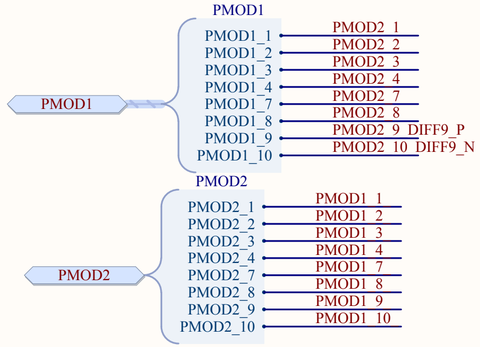
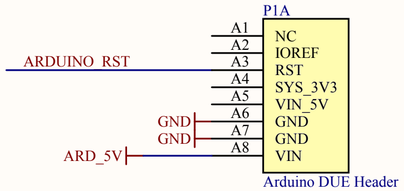
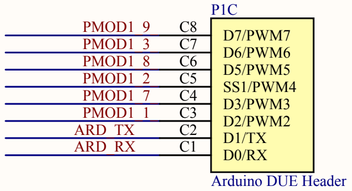
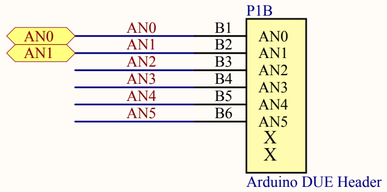
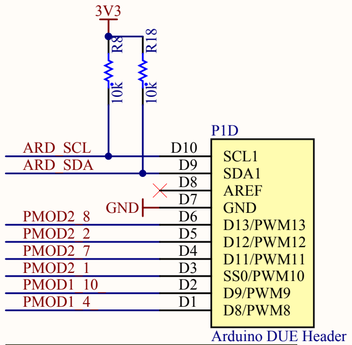
Arduino IO



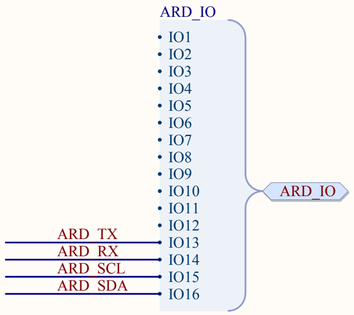


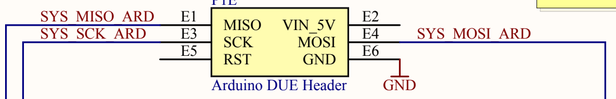


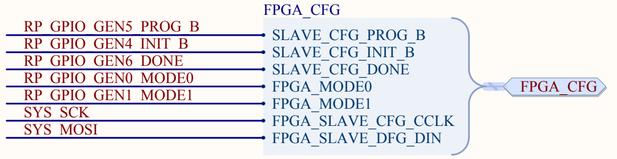




SHARE EXTRA ARDUINO PINS WITH GENERAL PMOD PINS

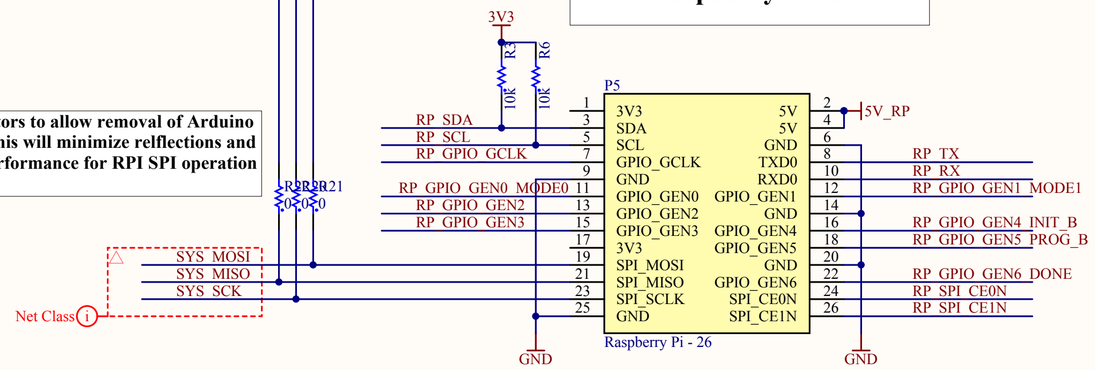


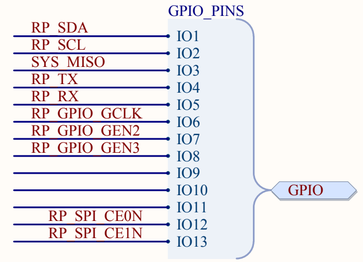




Raspberry Pi IO

0 ohm resistors to allow removal of Arduino SPI pins. This will minimize relflections and optimize performance for RPI SPI operation





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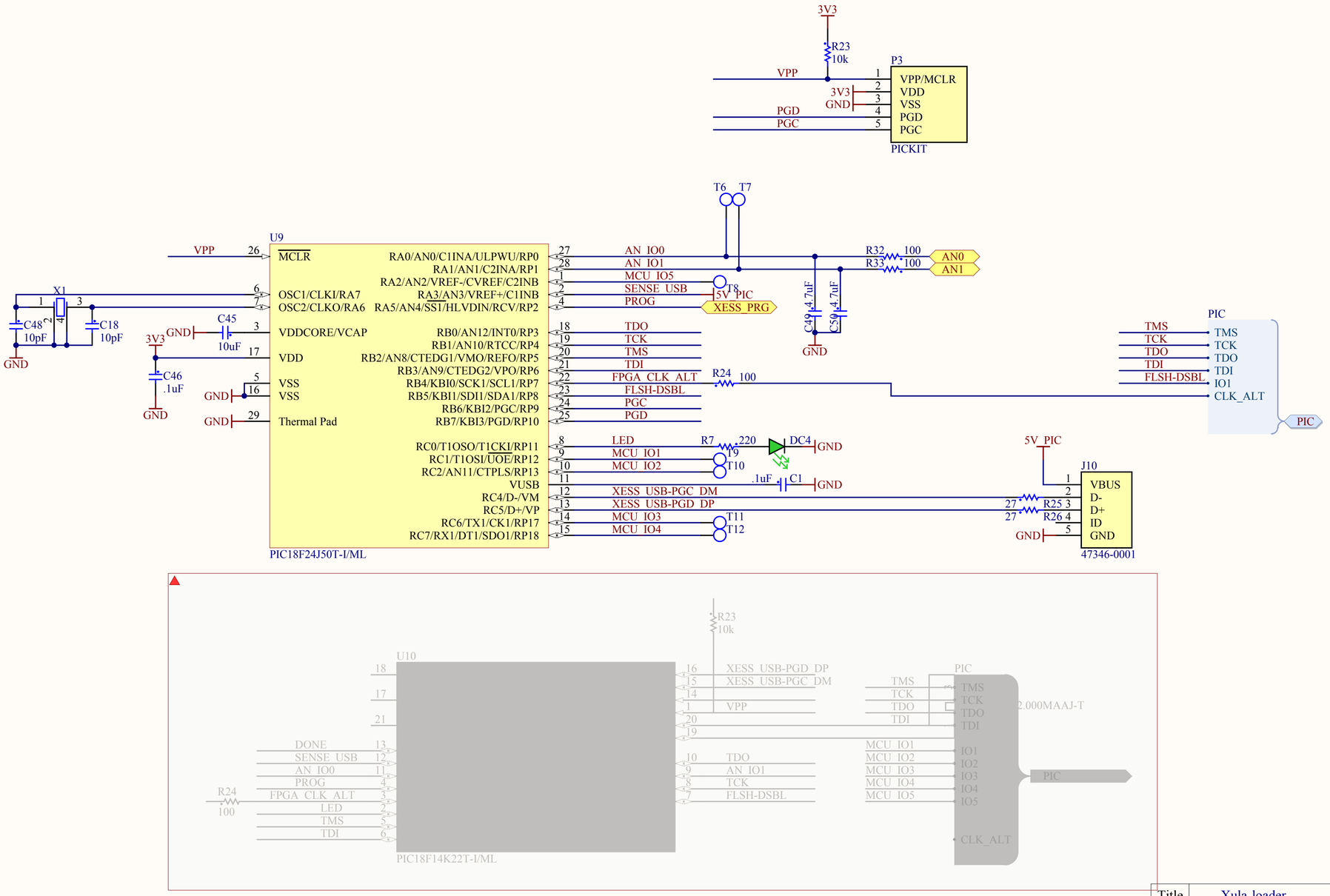

Title	Xula-loader		
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