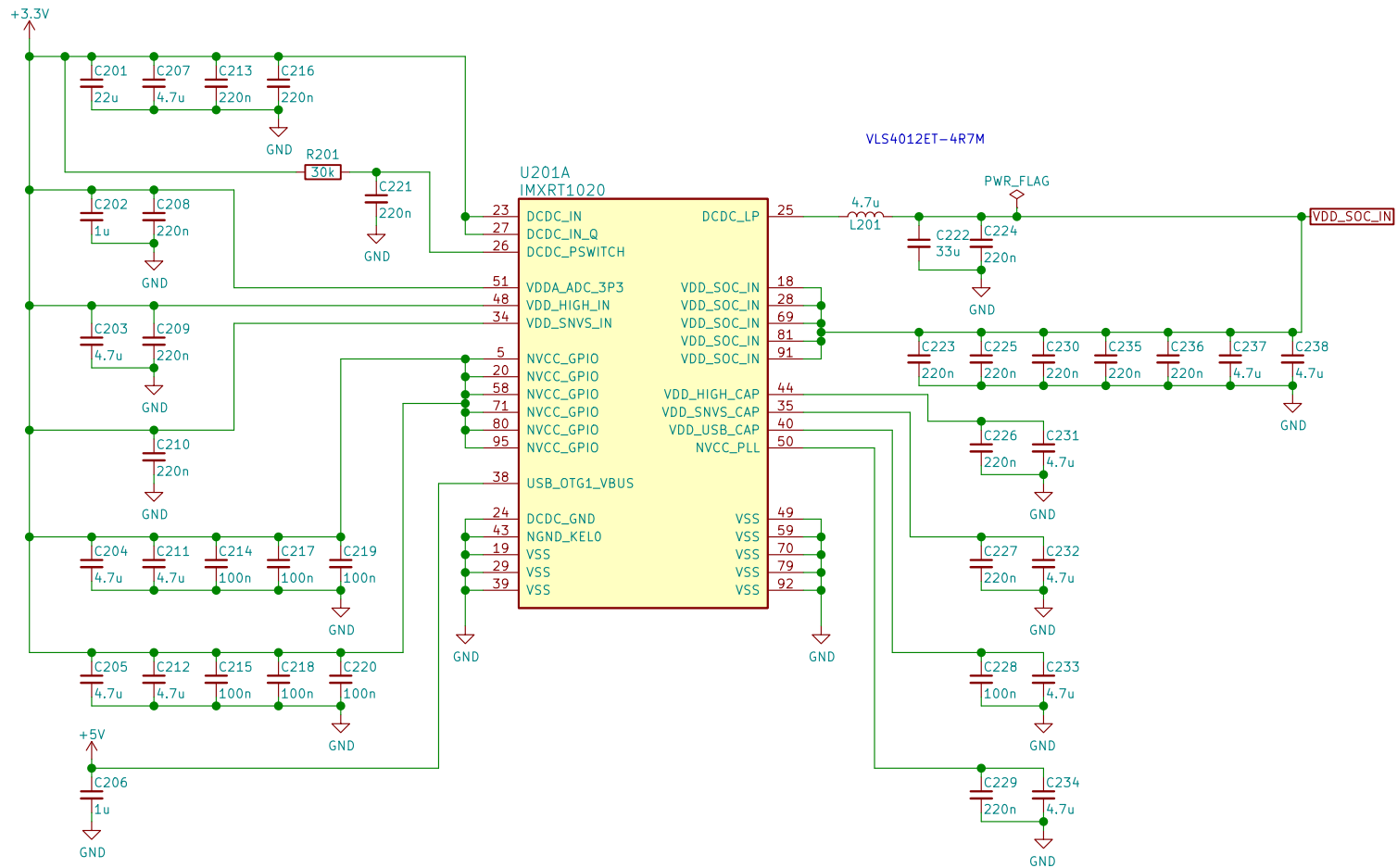


Designed by JOP CERN-OHL-W V2.0		
Sheet: / File: MiCE47.sch		
Title:		
Size: A4	Date: 2019	Rev: 1
KiCad E.D.A. kicad (5.1.5-81-g5fdc42420)		Id: 1/9



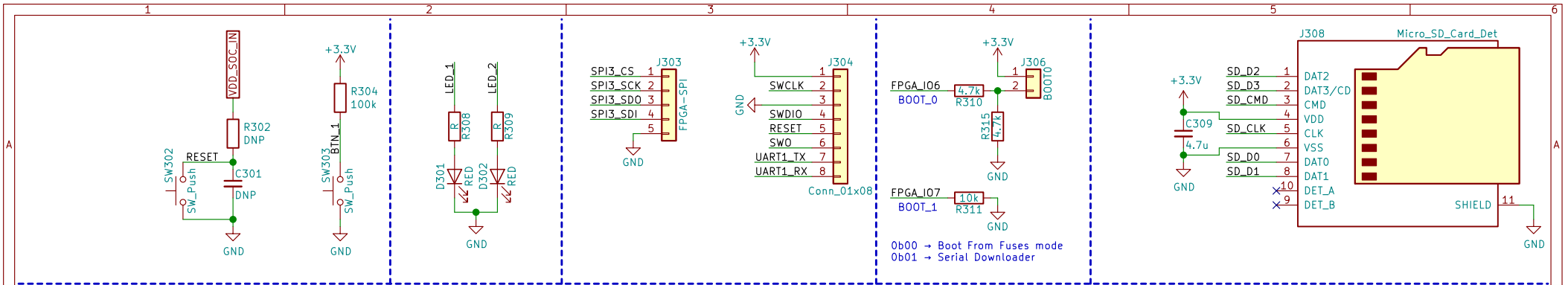
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Sheet: /Power Supply MCU/
File: mcu_power.sch

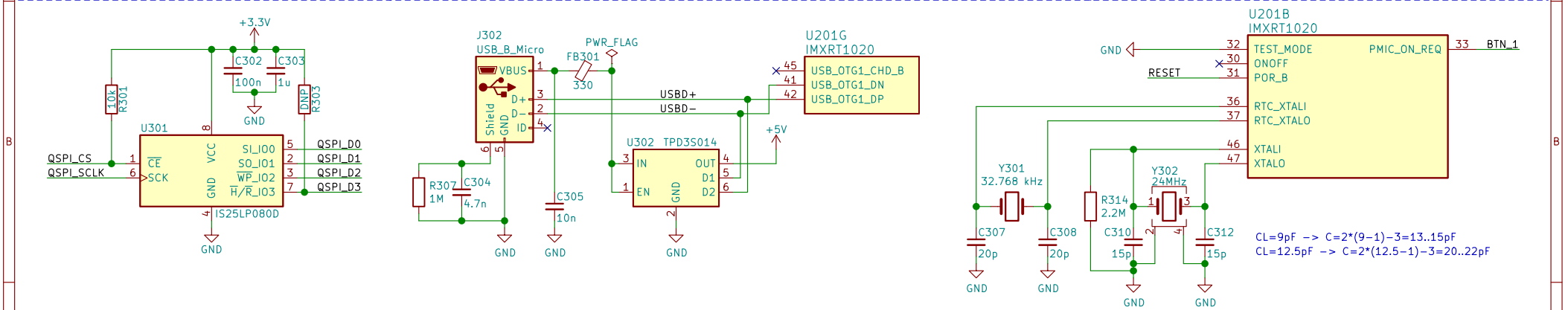
Title:

Size: A4 Date: 2019
KiCad E.D.A. kicad (5.1.5-81-g5fdc42420)

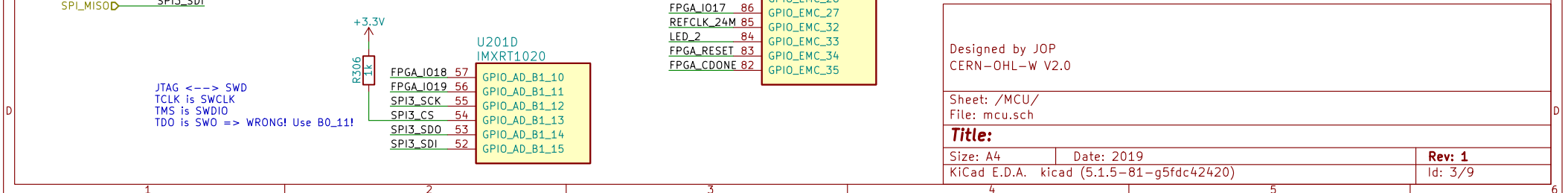
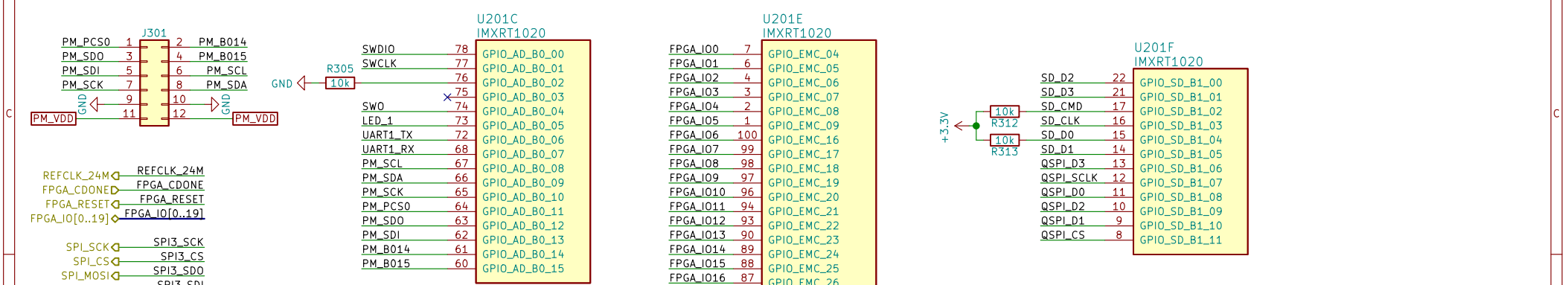
Rev: 1
Id: 2/9



0b00 → Boot From Fuses mode
 0b01 → Serial Downloader



$CL=9pF \rightarrow C=2*(9-1)-3=13..15pF$
 $CL=12.5pF \rightarrow C=2*(12.5-1)-3=20..22pF$



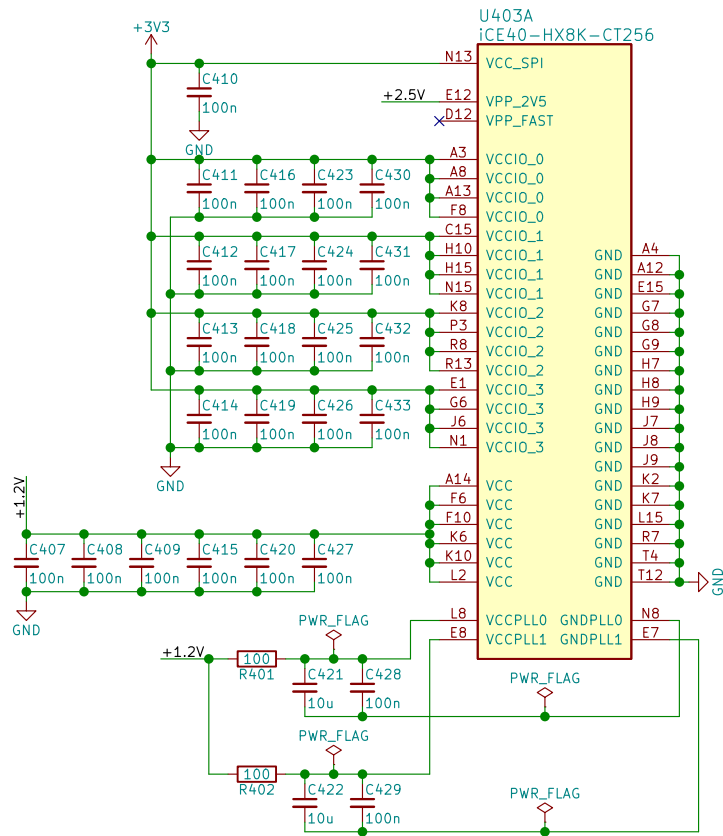
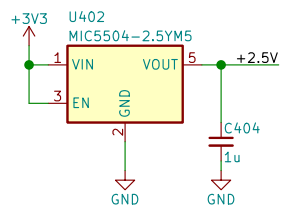
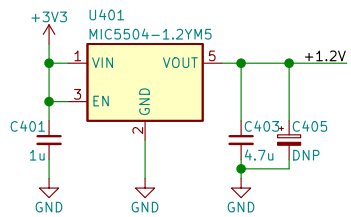
JTAG <--> SWD
 TCLK is SWCLK
 TMS is SWDIO
 TDO is SWO => WRONG! Use B0_11!

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 CERN-OHL-W V2.0

Sheet: /MCU/
 File: mcu.sch

Title:

Size: A4	Date: 2019	Rev: 1
KiCad E.D.A. kicad (5.1.5-81-g5fdc42420)		Id: 3/9



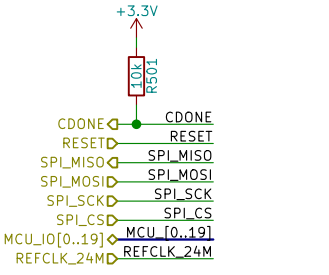
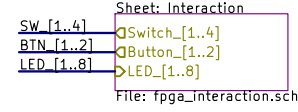
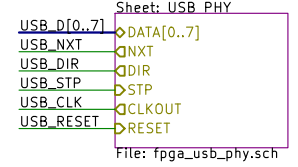
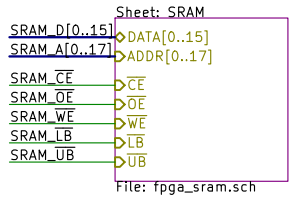
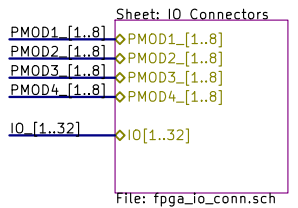
Designed by JOP
CERN-OHL-W V2.0

Sheet: /Power Supply FPGA/
File: fpga_power.sch

Title:

Size: A4 Date: 2019
KiCad E.D.A. kicad (5.1.5-81-g5f5dc42420)

Rev: 1
Id: 4/9



U403B
ICE40-HX8K-CT256

PMOD1_7	C14	IOT_168
MCU_7	B15	IOT_169
PMOD1_8	D13	IOT_170
MCU_9	B14	IOT_171
MCU_4	C12	IOT_172
	XE11	IOT_173
MCU_5	C13	IOT_174
MCU_6	A16	IOT_176
MCU_8	A15	IOT_177
MCU_10	B13	IOT_178
	XE10	IOT_179
MCU_2	C11	IOT_180
MCU_3	D11	IOT_181
MCU_11	B12	IOT_182
MCU_14	B10	IOT_183
MCU_12	B11	IOT_184
MCU_0	C10	IOT_185
MCU_15	A10	IOT_186
MCU_13	A11	IOT_187
MCU_1	D10	IOT_190
	XC9	IOT_191
	XE9	IOT_192
	XD9	IOT_193
MCU_17	A9	IOT_194
	XJ13	IOT_196
	XE8	IOT_197_GBIN1
REFCLK_24M	C8	IOT_198_GBIN0
	XE7	IOT_199
MCU_16	B9	IOT_200
MCU_19	D8	IOT_203
PMOD3_1	B8	IOT_205
PMOD3_2	A7	IOT_206
MCU_18	C7	IOT_207
PMOD3_3	B7	IOT_208
PMOD3_5	B6	IOT_209
PMOD3_7	C6	IOT_210
PMOD3_6	D7	IOT_211
PMOD3_4	A6	IOT_212
PMOD3_8	D6	IOT_213
	XA5	IOT_214
	XE6	IOT_215
	XB4	IOT_216
USB_D6	A2	IOT_218
PMOD4_2	D5	IOT_219
USB_D5	A1	IOT_220
PMOD4_1	C5	IOT_221
PMOD4_3	C4	IOT_222
USB_D7	B3	IOT_223
PMOD4_5	D4	IOT_224
	XE5	IOT_225
PMOD4_6	D3	IOT_226
PMOD4_4	C3	IOT_227

BANK 0

U403C
ICE40-HX8K-CT256

IO_20	R14	IOR_109
IO_18	R15	IOR_110
IO_19	P14	IOR_111
IO_16	P15	IOR_112
IO_15	P16	IOR_113
	XM13	IOR_114
	XM14	IOR_115
	XL12	IOR_116
IO_14	N16	IOR_117
	XL13	IOR_118
	XL14	IOR_119
PMOD2_1	L14	IOR_120
	XM16	IOR_121
IO_12	M16	IOR_122
	XJ10	IOR_123
IO_13	M15	IOR_126
	XJ11	IOR_127
	L16	IOR_128
IO_11	L16	IOR_129
PMOD2_3	K13	IOR_130
PMOD2_2	K14	IOR_131
IO_8	J15	IOR_133
IO_10	K15	IOR_134
IO_9	K16	IOR_136
PMOD2_4	J14	IOR_137
	XJ12	IOR_138
PMOD2_5	J13	IOR_139
IO_7	J16	IOR_140_GBIN3
PMOD2_6	H13	IOR_141_GBIN2
	XH11	IOR_142
IO_6	H16	IOR_143
PMOD2_7	H14	IOR_144
IO_5	G16	IOR_145
	XG12	IOR_146
IO_4	G15	IOR_147
	XN10	IOR_148
	XG10	IOR_149
IO_3	G11	IOR_150
	XF15	IOR_151
IO_2	F15	IOR_152
PMOD2_8	G14	IOR_153
IO_1	E16	IOR_154
PMOD1_2	G13	IOR_155
SW_1	D16	IOR_156
	XG12	IOR_157
	XF14	IOR_158
PMOD1_1	F14	IOR_160
	XD15	IOR_161
SW_2	D15	IOR_162
	XE12	IOR_165
PMOD1_4	E14	IOR_166
SW_3	C16	IOR_167
PMOD1_3	F13	
SW_4	B16	
PMOD1_5	E13	
PMOD1_6	D14	

BANK 1

U403D
ICE40-HX8K-CT256

SRAM_A16	N6	IOB_52
SRAM_D14	T1	IOB_53
SRAM_A5	P4	IOB_54
SRAM_D13	R2	IOB_55
SRAM_A13	N5	IOB_56
SRAM_D12	T2	IOB_57
SRAM_A15	P5	IOB_58
SRAM_D11	R3	IOB_59
SRAM_D8	R5	IOB_60
SRAM_D9	T3	IOB_61
SRAM_D10	R4	IOB_63
SRAM_WE	M7	IOB_64
SRAM_A7	N7	IOB_66
SRAM_D1	P6	IOB_67
SRAM_D7	M8	IOB_68
SRAM_LB	T5	IOB_69
SRAM_UB	R6	IOB_71
SRAM_D5	P8	IOB_72
SRAM_OE	T6	IOB_73
	XL9	IOB_74
SRAM_A3	T7	IOB_75
SRAM_A0	T8	IOB_76
SRAM_A11	P7	IOB_77
SRAM_A6	N9	IOB_78
SRAM_A1	T9	IOB_79
SRAM_D6	M9	IOB_80
FPGA_CLK	R9	IOB_81_GBIN5
	XK9	IOB_82_GBIN4
	XP9	IOB_83
SRAM_A2	R10	IOB_84
	XL10	IOB_85
	XP10	IOB_86
	XN10	IOB_87
SRAM_A4	T10	IOB_88
SRAM_D0	T11	IOB_89
SRAM_D3	T15	IOB_91
SRAM_D2	T14	IOB_92
	XM11	IOB_93
SRAM_CE	T13	IOB_94
	XN12	IOB_98
	XL11	IOB_99
SRAM_D4	T16	IOB_100
	XM12	IOB_101
IO_17	R16	IOB_102
	XK11	IOB_103_CBSELO
	XP13	IOB_104_CBSEL1
SPI_MISO	P12	IOB_105_SDO
SPI_MOSI	P11	IOB_106_SDI
SPI_SCK	R11	IOB_107_SCK
SPI_CS	R12	IOB_108_SS
CDONE	M10	
RESET	N11	

BANK 2

U403E
ICE40-HX8K-CT256

PMOD4_7	E4	IOL_1A
USB_D4	B2	IOL_1B
	XE5	IOL_2A
USB_D3	B1	IOL_2B
USB_D1	C1	IOL_3A
USB_D2	C2	IOL_3B
BTN_1	F4	IOL_4A
USB_D0	D2	IOL_4B
	XG5	IOL_5A
USB_NXT	D1	IOL_5B
IO_31	G4	IOL_6A
PMOD4_8	E3	IOL_6B
	XH5	IOL_7A
USB_CLK	E2	IOL_7B
IO_32	G3	IOL_8A
BTN_2	F3	IOL_8B
IO_30	H3	IOL_9A
USB_DIR	F2	IOL_9B
	XH6	IOL_10A
USB_STP	F1	IOL_10B
IO_29	H4	IOL_11A
USB_RESET	G2	IOL_11B
IO_27	J4	IOL_12A
LED_1	H2	IOL_12B
IO_28	J5	IOL_13A
	XG1	IOL_13B_GBIN7
IO_26	J3	IOL_14A_GBIN6
LED_2	H1	IOL_14B
LED_4	J2	IOL_15A
LED_3	J1	IOL_15B
LED_5	K1	IOL_16A
IO_25	K3	IOL_16B
IO_22	L4	IOL_17A
LED_6	L1	IOL_17B
IO_24	K4	IOL_18A
LED_7	M1	IOL_18B
	XL6	IOL_19A
IO_23	L3	IOL_19B
	XK5	IOL_20A
LED_8	M2	IOL_20B
	XL7	IOL_21A
SRAM_A9	N2	IOL_21B
	XM6	IOL_22A
IO_21	M3	IOL_22B
	XL5	IOL_23A
SRAM_A14	N3	IOL_23B
SRAM_A8	P1	IOL_24A
SRAM_A10	M4	IOL_24B
SRAM_D15	P2	IOL_25A
	XM5	IOL_25B
SRAM_A12	R1	IOL_26A
SRAM_A17	N4	IOL_26B

BANK 3

Do not use GBIN* pins for SRAM IO.
This could cause problems (according to the Blackice people).

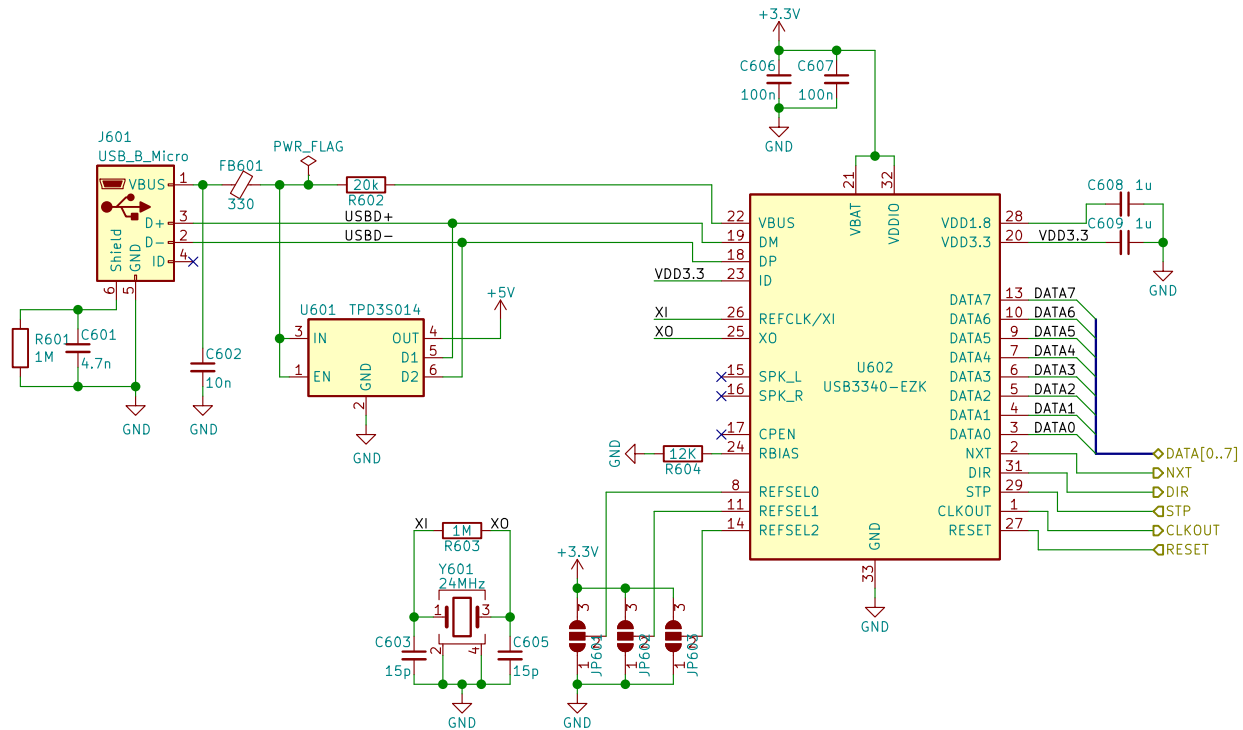
Designed by JOP
CERN-OHL-W V2.0

Sheet: /FPGA/
File: fpga.sch

Title:

Size: A4 Date: 2019
KiCad E.D.A. kicad (5.1.5-81-g5fcd42420)

Rev: 1
Id: 5/9



$CL = 9pF$
 $Cx = 2 \cdot (9pF - 1pF) - 3pF = 13pF..15pF$

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 CERN-OHL-W V2.0

Sheet: /FPGA/USB PHY/
 File: fpga_usb_phy.sch

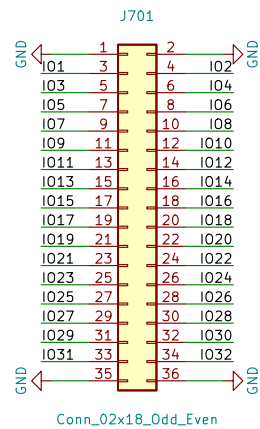
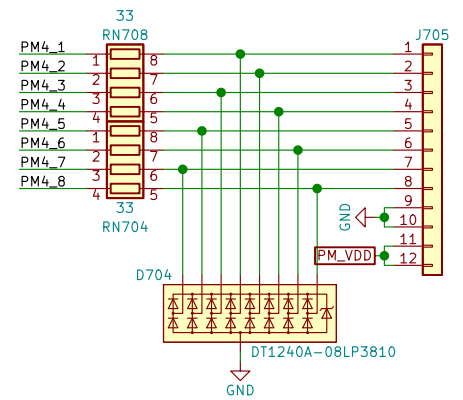
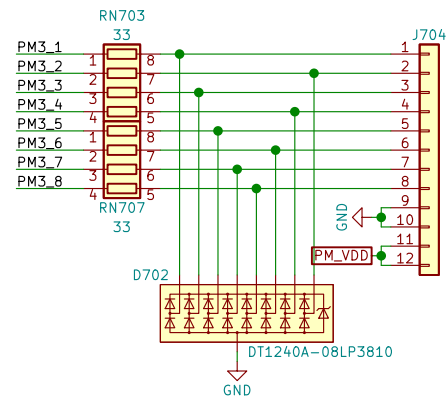
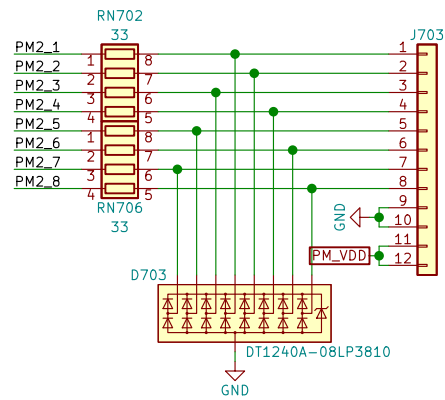
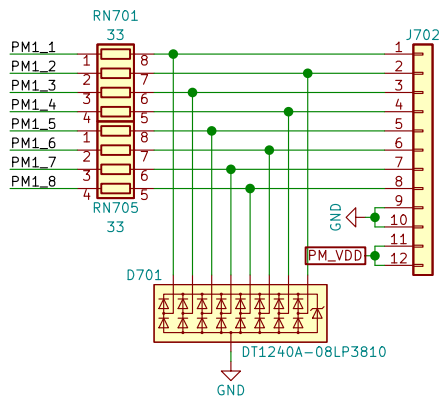
Title:

Size: A4 Date: 2019
 KiCad E.D.A. kicad (5.1.5-81-g5f5dc42420)

Rev: 1
 Id: 6/9

PMOD1_[1..8] ◊ PM1_[1..8]
 PMOD2_[1..8] ◊ PM2_[1..8]
 PMOD3_[1..8] ◊ PM3_[1..8]
 PMOD4_[1..8] ◊ PM4_[1..8]

IO[1..32] ◊ IO[1..32]



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Sheet: /FPGA/IO Connectors/
File: fpga_io_conn.sch

Title:

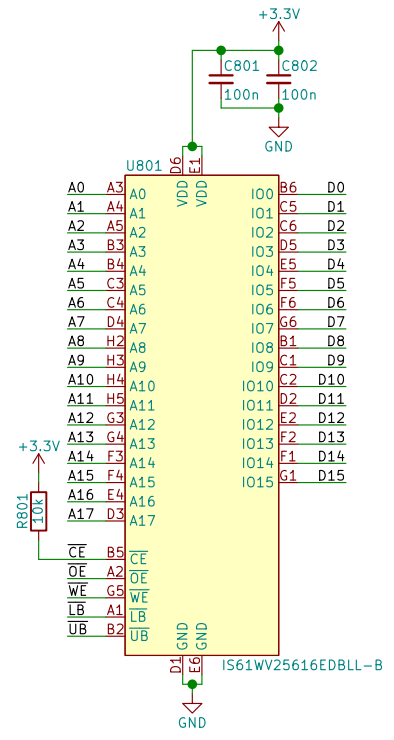
Size: A4 Date: 2019
KiCad E.D.A. kicad (5.1.5-81-g5fdc42420)

Rev: 1
Id: 7/9

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ADDR[0..17] D A[0..17]
DATA[0..15] D D[0..15]
CE D CE
OE D OE
WE D WE
LB D LB
UB D UB




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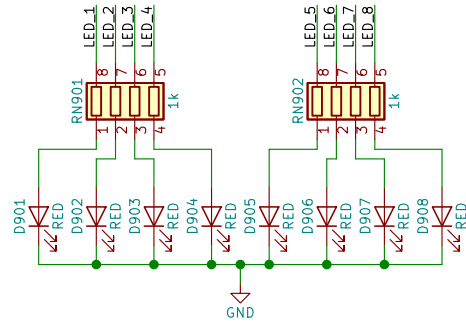
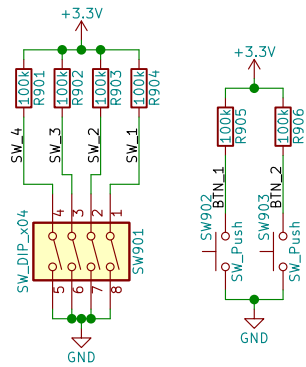


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Sheet: /FPGA/SRAM/
File: fpga_sram.sch

Title:	
Size: A4	Date: 2019
KiCad E.D.A. kicad (5.1.5-81-g5fdc42420)	
Rev: 1	
Id: 8/9	

Switch_[1..4]  SW [1..4]
 Button_[1..2]  BTN [1..2]
 LED_[1..8]  LED [1..8]



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Sheet: /FPGA/Interaction/
 File: fpga_interaction.sch

Title:

Size: A4 Date: 2019
 KiCad E.D.A. kicad (5.1.5-81-g5fdc42420)

Rev: 1
 Id: 9/9