

LFMXO5D PFR Board

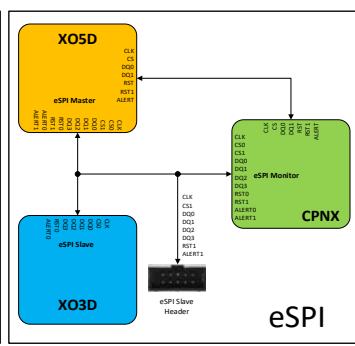
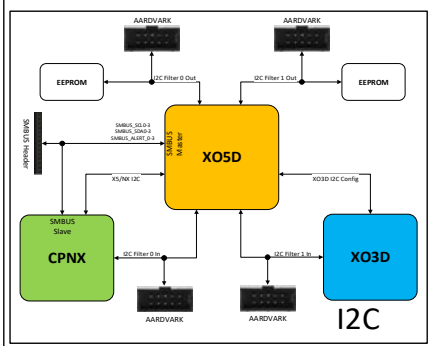
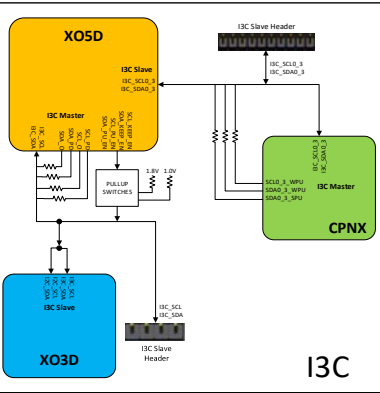
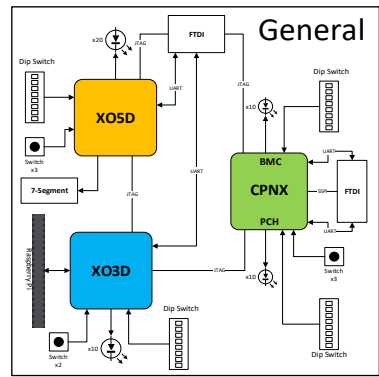
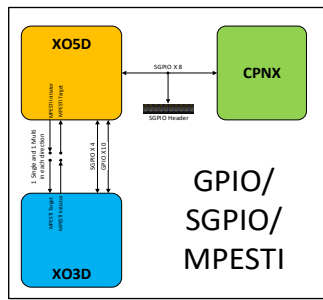
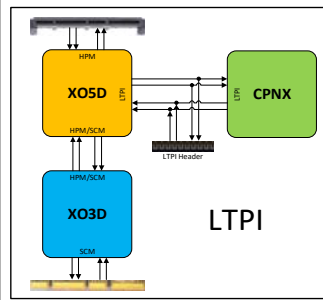
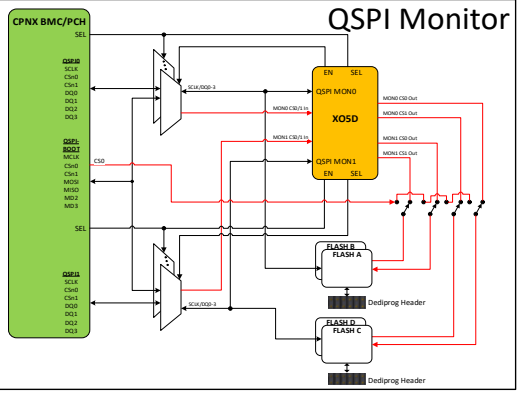
Rev - A.1

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|-----------------------------------|--------------------------|
| 01 - Title page | 17 - LCMXO3D BANK0 |
| 02 - Block diagram | 18 - LCMXO3D BANK1 |
| 03 - JTAG FTDI | 19 - LCMXO3D BANK2,3,4,5 |
| 04 - LFMXO5D Bank1 | 20 - LCMXO3D Power |
| 05 - LFMXO5D Bank0 | 21 - MPESTI |
| 06 - LFMXO5D Bank5,7 | 22 - BMC Flash |
| 07 - LFMXO5D Bank2,6 | 23 - PCH Flash |
| 08 - LFMXO5D Bank3,4,ADC | 24 - JTAG Chain |
| 09 - LFMXO5D Power | 25 - LEDs |
| 10 - Demo FTDI | 26 - DC-SCM Connectors |
| 11 - CertusPro-NX Bank1,5 (BMC) | 27 - I3C PU |
| 12 - CertusPro-NX Bank0 (BMC) | 28 - Power Regulators |
| 13 - CertusPro-NX Bank7 (BMC) | |
| 14 - CertusPro-NX Bank2,6 (PCH) | |
| 15 - CertusPro-NX Bank3,4,A (PCH) | |
| 16 - CertusPro-NX Power | |



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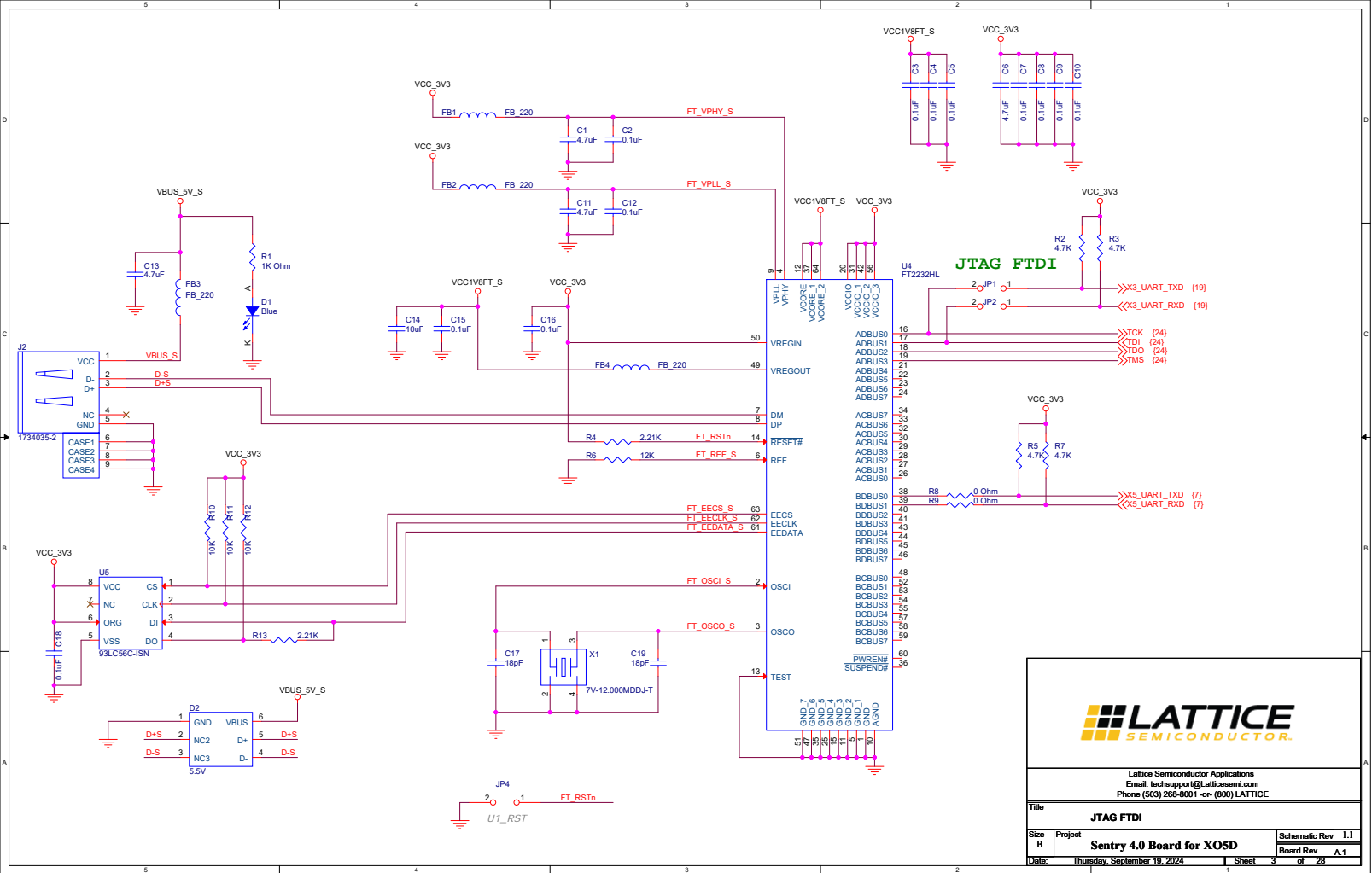
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Title page			
Size B	Project	Sentry 4.0 Board for XO5D	
Date:		Thursday, September 19, 2024	Sheet 1 of 28
		Schematic Rev	1.1
		Board Rev	A.1

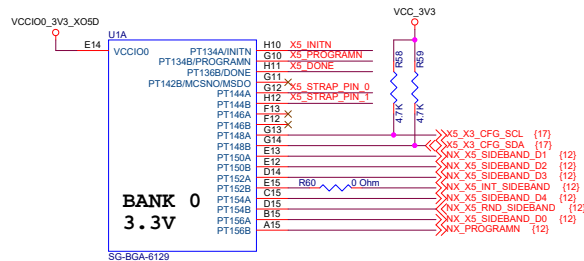


LATTICE
SEMICONDUCTOR

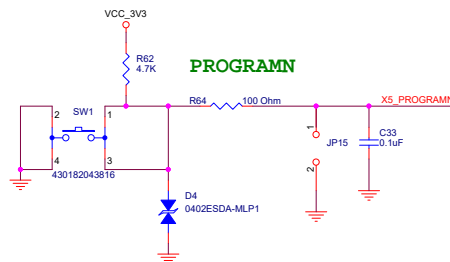
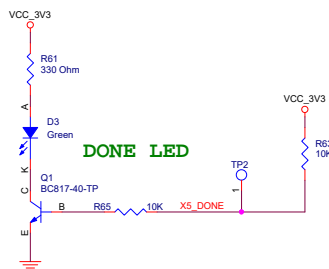
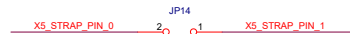
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Title			Block diagram
Size	Project	Sentry 4.0 Board for XOSD	
Date		Thursday, September 16, 2024	Sheet 2 of 28



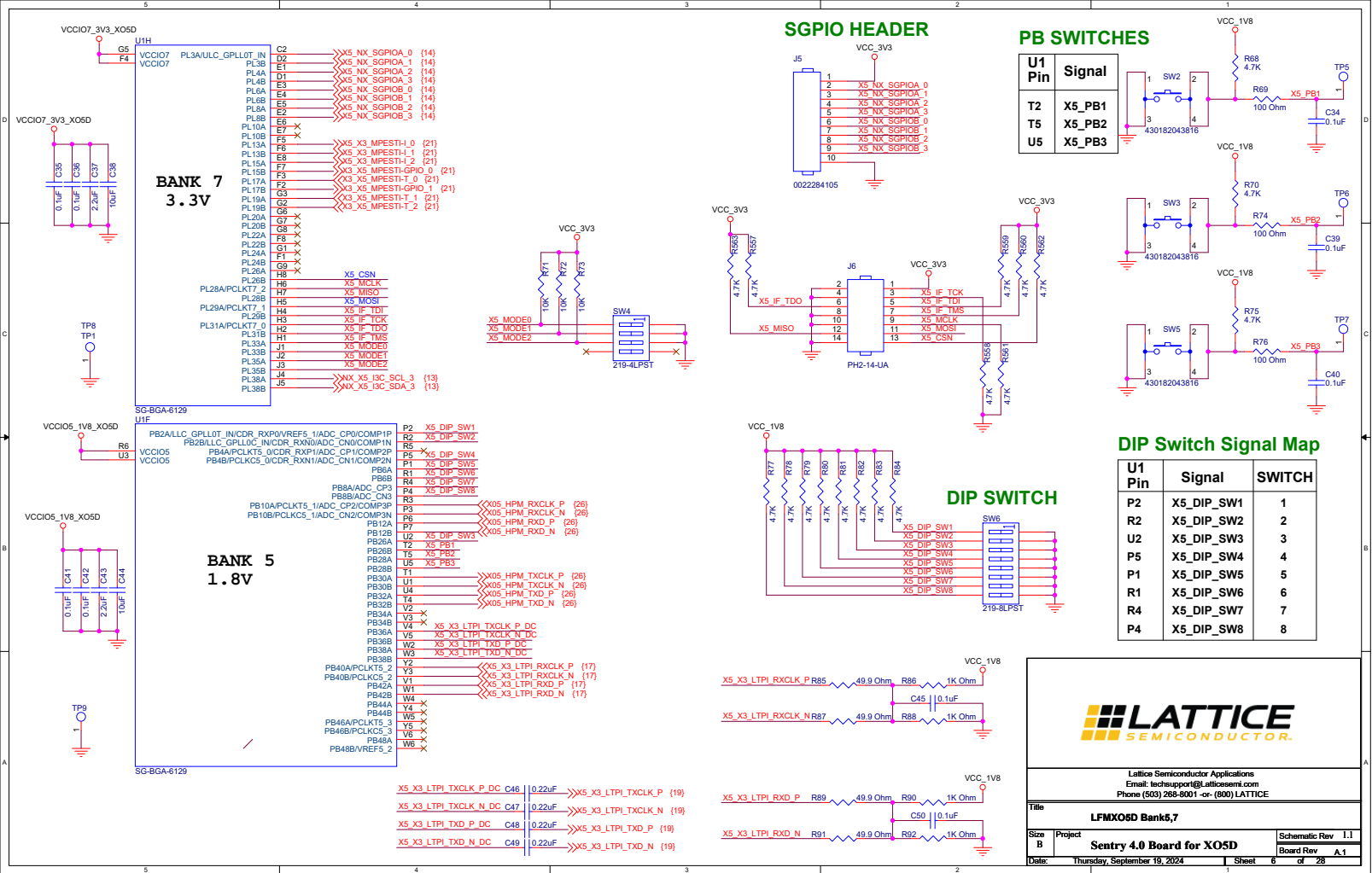


STRAP PIN HEADER



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Title		LFMX05D Bank0	
Size	Project	Sentry 4.0 Board for X05D	
Date:	Thursday, September 19, 2024	Sheet	5 of 28
Schematic Rev		1.1	
Board Rev		A.1	



BANK 2
3.3V

SG-BGA-6129

BANK 6
3.3V

SG-BGA-61:

3 DIGIT 7-SEGMENT DISPLAY

EEPROM

AARDVARK HEADER

SMBUS HEADER

VCC_3V3

VCC_3V3

J7

1

2

3

4

5

6

7

8

9

10

11

12

13

14

0022284144

QSPI_MON1_CS0	R113	0 Ohm	QSPI_MON1_CS0_I (23)
QSPI_MON1_CS1	R114	0 Ohm	QSPI_MON1_CS1_I (23)
QSPI_MON1_CLK	R117	0 Ohm	QSPI_MON1_FLASH_CLK (23)
QSPI_MON1_DQ0	R118	0 Ohm	QSPI_MON1_FLASH_DQ0 (23)
QSPI_MON1_DQ1	R119	0 Ohm	QSPI_MON1_FLASH_DQ1 (23)
QSPI_MON1_DQ2	R120	0 Ohm	QSPI_MON1_FLASH_DQ2 (23)
QSPI_MON1_DQ3	R121	0 Ohm	QSPI_MON1_FLASH_DQ3 (23)

Place these resistors as close to U21, U23 as possible to reduce stub

VCC_3V3

DNP

R250
R251
R252
R253
R254
R255
R256
R257
R258

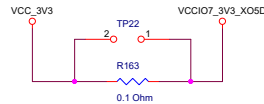
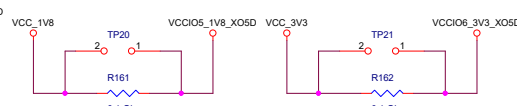
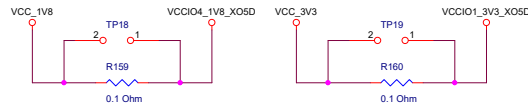
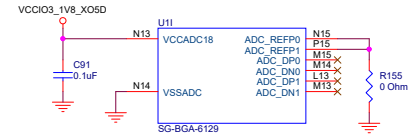
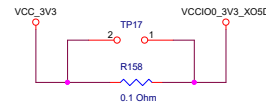
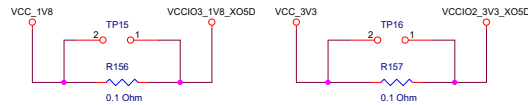
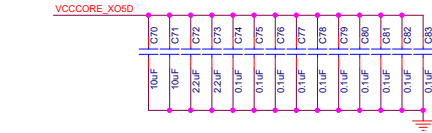
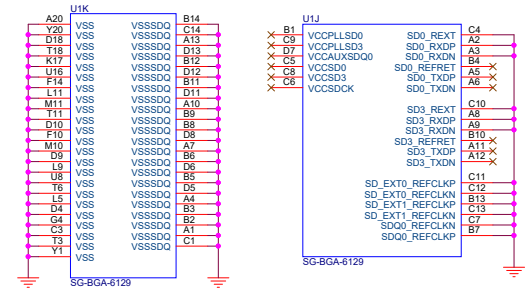
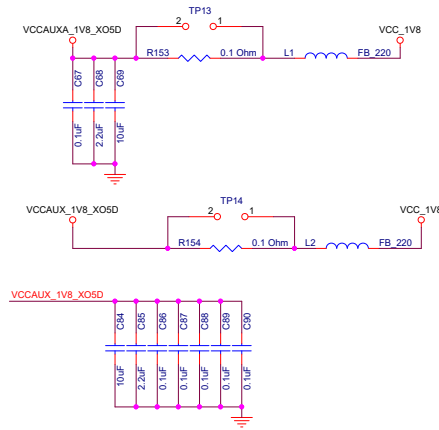
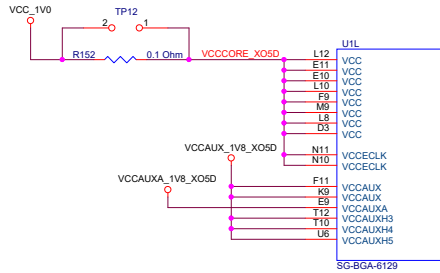
EEPROG WP
EEPROG ADDR_A0-R
EEPROG ADDR_A1-R
EEPROG ADDR_A2-R



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Title			LFMX05D Bank2,6		
Size B	Project	Sentry 4.0 Board for X05D		Schematic Rev 1.1	
				Board Rev A.1	
Date: Thursday, September 19, 2024		Sheet 7		of 28	

FPGA POWER



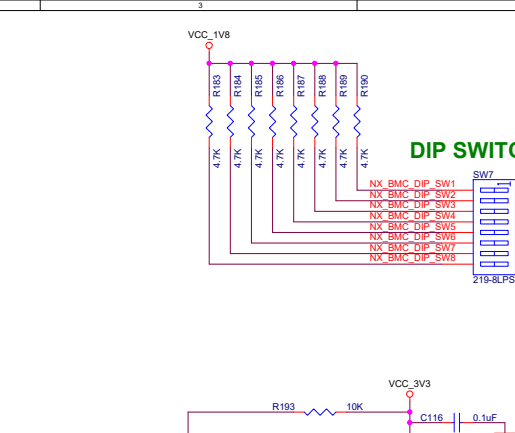
LFMX05D-100-BBG400 DEVICE

U8 LFMXO5D-100-BBG400



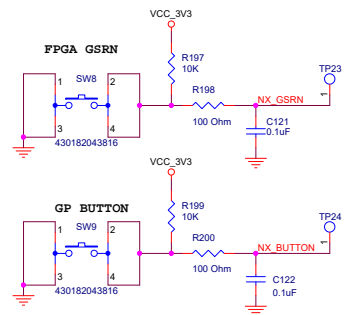
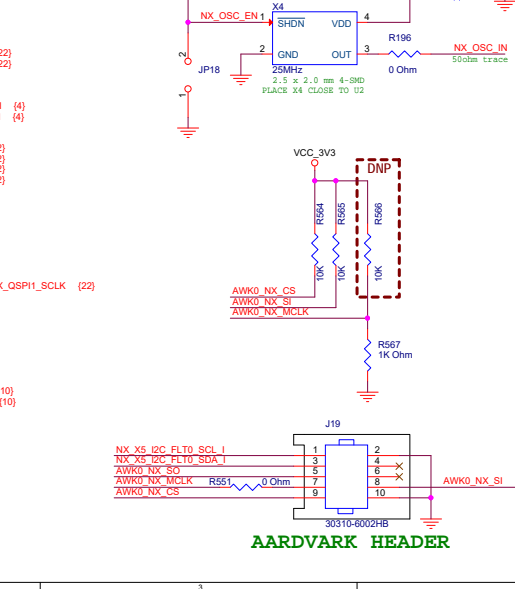
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Title			
LFXM05D Power			
Size B	Project	Sentry 4.0 Board for XO5D	
		Schematic Rev	1.1
		Board Rev	A.1
Date:	Thursday, September 19, 2024	Sheet	9 of 28

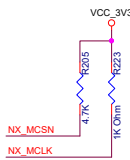
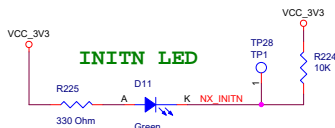
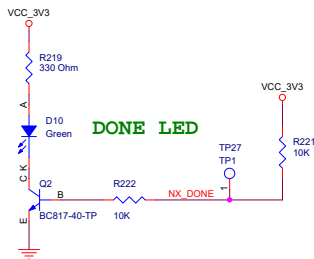
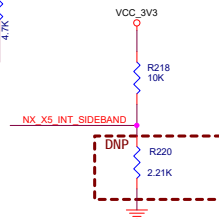
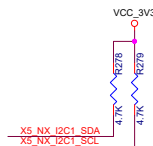
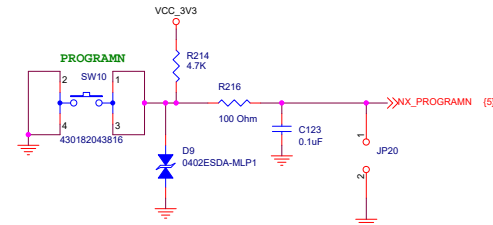
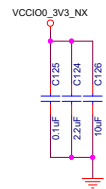
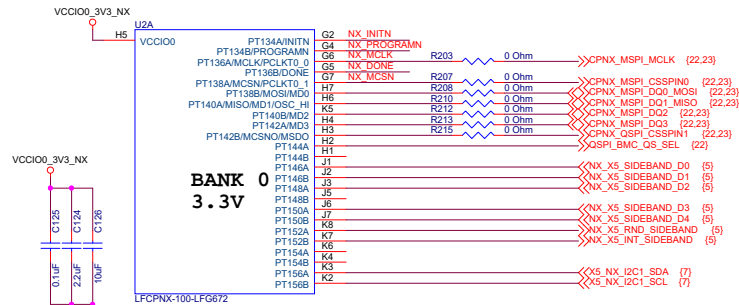


Switch Signal Map

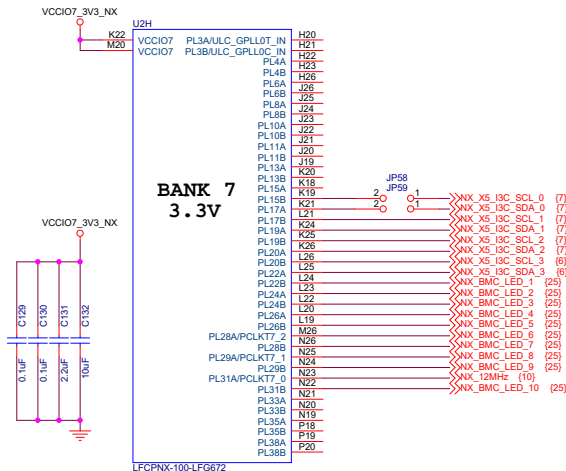
U2 Pin	Signal	SWITCH
V24	NX_BMC_DIP_SW1	1
V25	NX_BMC_DIP_SW2	2
V23	NX_BMC_DIP_SW3	3
V22	NX_BMC_DIP_SW4	4
U26	NX_BMC_DIP_SW5	5
W26	NX_BMC_DIP_SW6	6
W24	NX_BMC_DIP_SW7	7
W23	NX_BMC_DIP_SW8	8

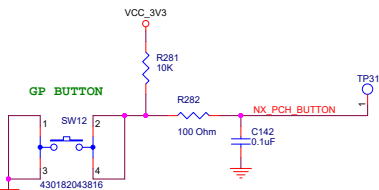
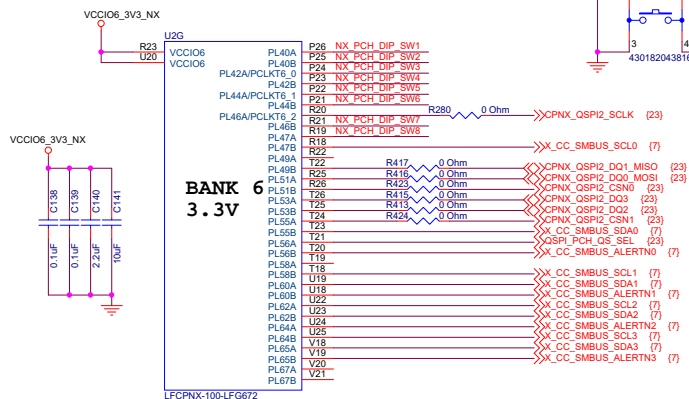
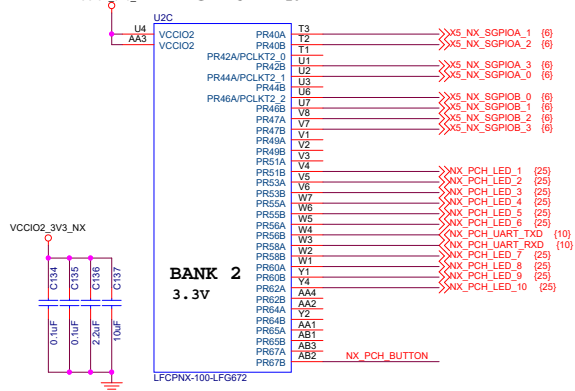


			
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Title			
CentryPro-NX Bank1,5 (BMC)			
Size	Project	Schematic Rev	
B		1.1	
Sentry 4.0 Board for XO5D		Board Rev	
Date: Thursday, September 18, 2024		Sheet	11 of 28 A.1



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CertusPro-NX Bank0 (BMC)		
Title		
Size B	Project Sentry 4.0 Board for XO5D	Schematic Rev 1.1
		Board Rev A.1
Date: Thursday, September 16, 2024	Sheet 12	of 28



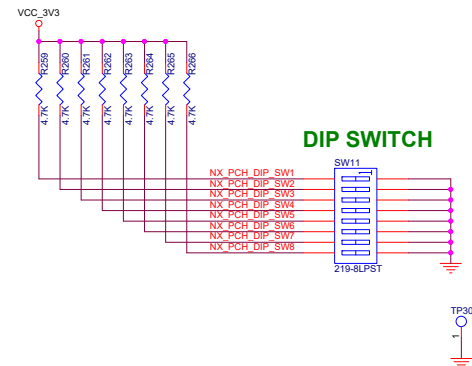


LEDs Signal Map

U2 Pin	Signal	LED
V4	NX_PCH_LED_1	D37
V5	NX_PCH_LED_2	D48
V6	NX_PCH_LED_3	D39
W7	NX_PCH_LED_4	D40
W6	NX_PCH_LED_5	D52
W5	NX_PCH_LED_6	D52
W2	NX_PCH_LED_7	D43
W1	NX_PCH_LED_8	D53
Y1	NX_PCH_LED_9	D44
Y4	NX_PCH_LED_10	D54

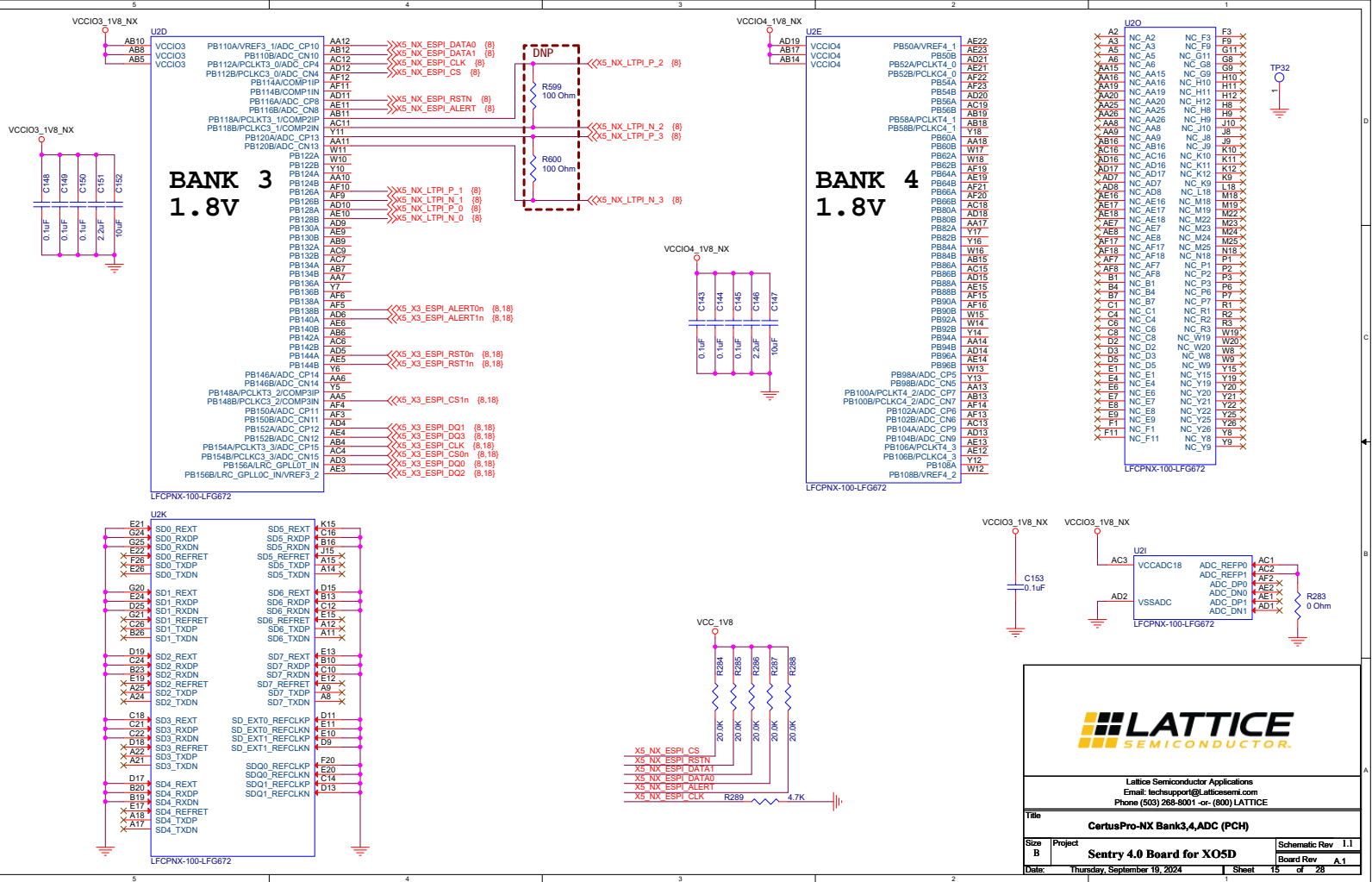
Switch Signal Map

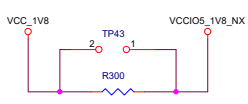
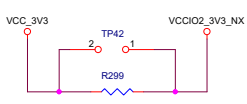
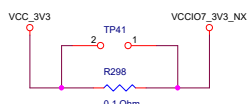
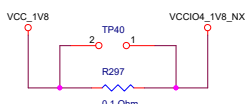
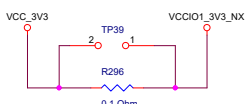
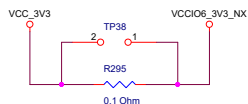
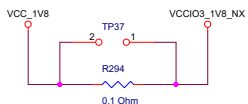
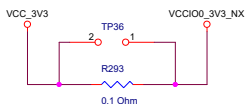
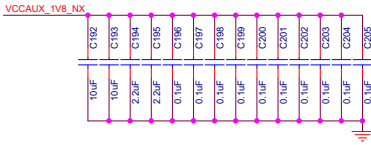
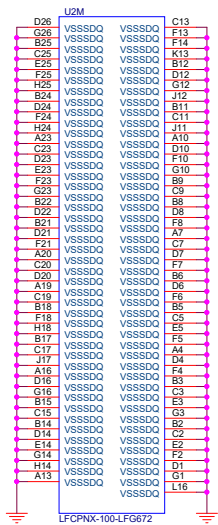
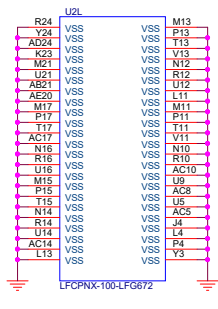
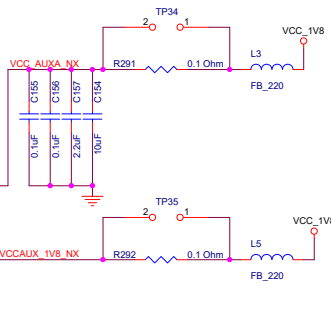
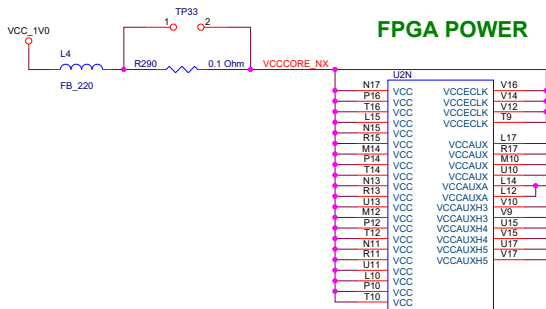
U2 Pin	Signal	SWITC
P26	NX_PCH_DIP_SW1	1
P25	NX_PCH_DIP_SW2	2
P24	NX_PCH_DIP_SW3	3
P23	NX_PCH_DIP_SW4	4
P22	NX_PCH_DIP_SW5	5
P21	NX_PCH_DIP_SW6	6
R21	NX_PCH_DIP_SW7	7
R19	NX_PCH_DIP_SW8	8



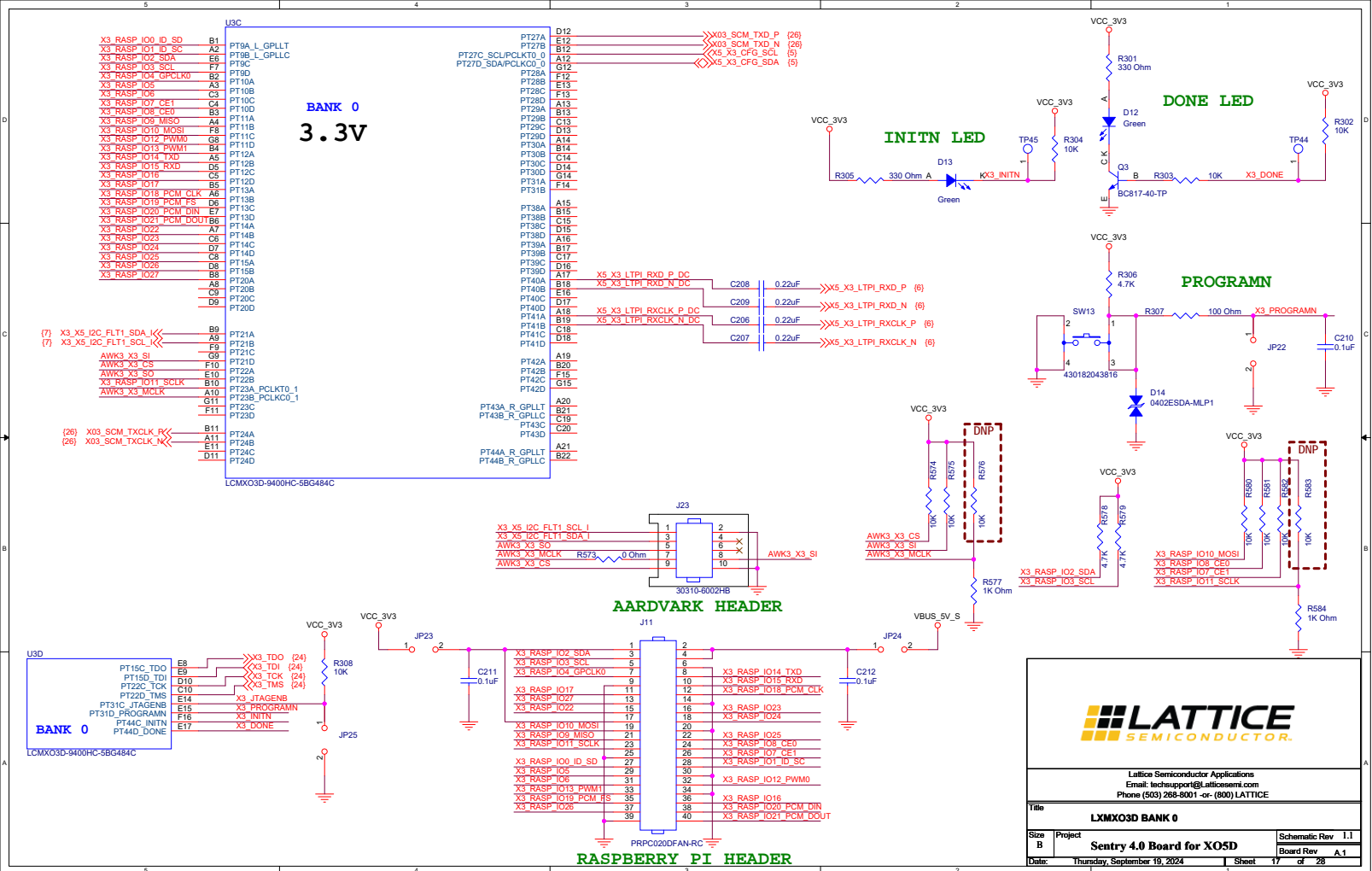
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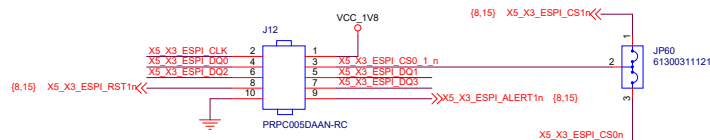
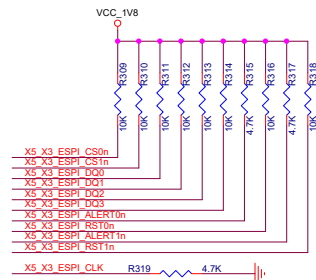
Title			
CertusPro-NX Bank2,6 (PCH)			
Size B	Project	Sentry 4.0 Board for XO5D	
		Schematic Rev	1.1
		Board Rev	A.1
Date:	Thursday, September 10, 2024	Sheet	14 of 28





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Title	CertusPro-NX Power	
Size B	Project	Sentry 4.0 Board for X05D
Date:	Thursday, September 16, 2024	Sheet 16 of 28
	Board Rev	A.1





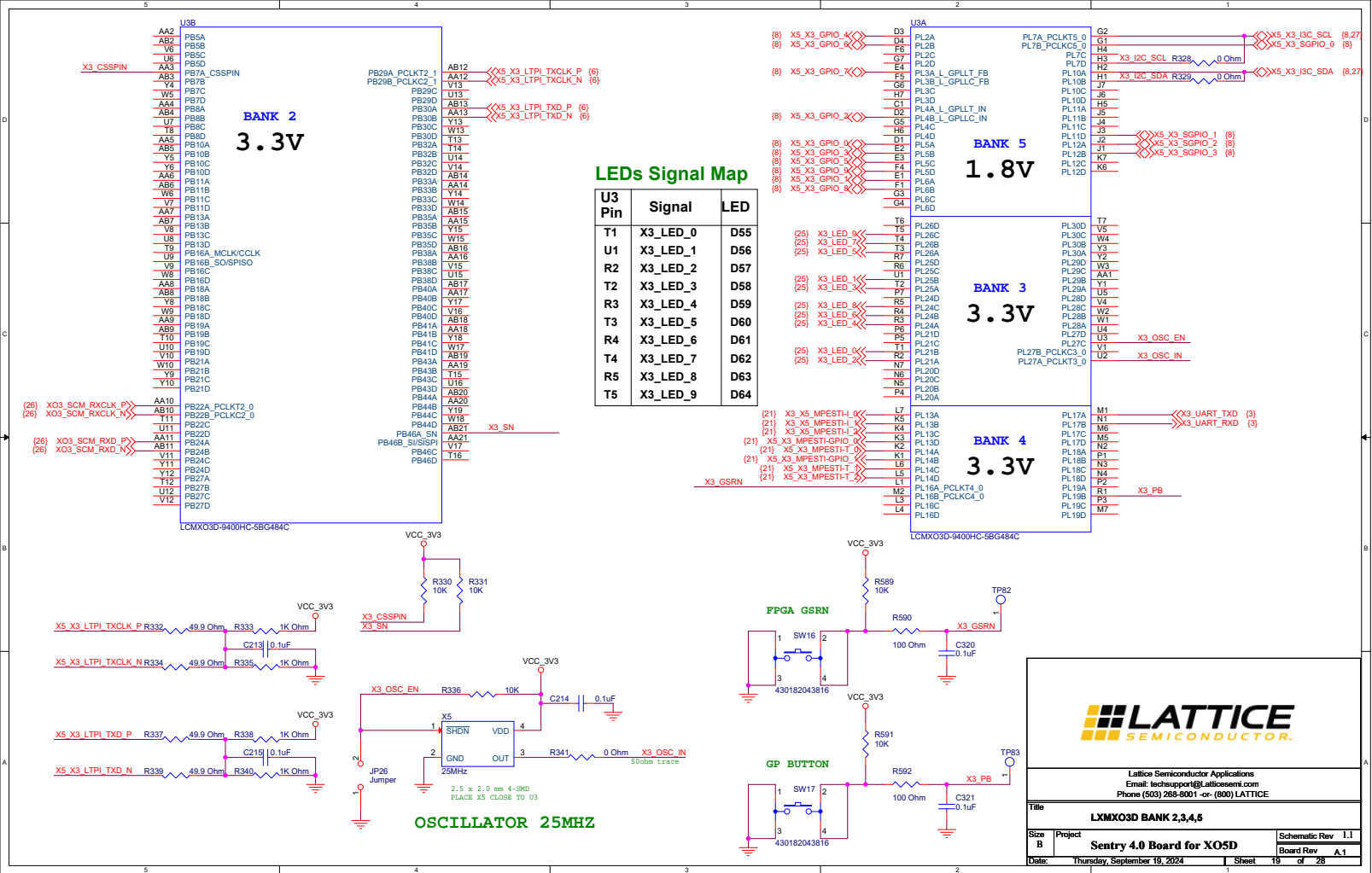
The diagram illustrates the DIP switch control logic. A pull-up network is connected to VCC_I78. The network consists of a series of 4.7K resistors (R320-R327) connected to the switches. The switches are labeled X3_DIP SW1 through X3_DIP SW8. The output of the switches is connected to the 219-SL P5 pin.

U3 Pin	Signal	SWITCH
E22	X3_DIP_SW1	1
F22	X3_DIP_SW2	2
G22	X3_DIP_SW3	3
E21	X3_DIP_SW4	4
G21	X3_DIP_SW5	5
E20	X3_DIP_SW6	6
G20	X3_DIP_SW7	7
E19	X3_DIP_SW8	8

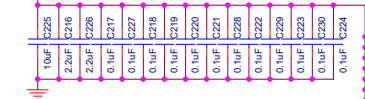


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Title			
LXM XO3D BANK 1			
Size B	Project	Sentry 4.0 Board for XO5D	
		Schematic Rev. 1.1	
Date: Thursday, September 19, 2024		Sheet	18 of 28
		Board Rev.	A.1



XO3D_CORE



XO3D_VCCIO_5



XO3D_VCCIO_4



XO3D_VCCIO_3



XO3D_VCCIO_2



U3F
K10
K11
K12
K13
L11
L12
M11
M12
N10
N11
N12
N13
VCC1
VCC2
VCC3
VCC4
VCC5
VCC6
VCC7
VCC8
VCC9
VCC10
VCC11
VCC12

F3
J8
K8
L8
M8
N8
P8
R9
R10
R11
R12
R13
R14
W7
W11
W16
VCCIO_5_1
VCCIO_5_2
VCCIO_5_3
VCCIO_4_1
VCCIO_4_2
VCCIO_4_3
VCCIO_3_1
VCCIO_3_2
VCCIO_3_3
VCCIO_2_1
VCCIO_2_2
VCCIO_2_3
VCCIO_2_4
VCCIO_2_5
VCCIO_2_6
VCCIO_2_7
VCCIO_2_8
VCCIO_2_9
VCCIO_1_1
VCCIO_1_2
VCCIO_1_3
VCCIO_1_4
VCCIO_1_5
VCCIO_1_6
VCCIO_1_7
VCCIO_1_8
VCCIO_1_9
VCCIO_0_1
VCCIO_0_2
VCCIO_0_3
VCCIO_0_4
VCCIO_0_5
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VCCIO_0_7
VCCIO_0_8
VCCIO_0_9

LCMXO3D-9400HC-5BG484C

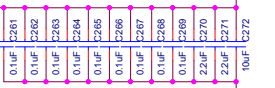
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J15
K15
L15
M15
M18
N15
P15
V20
VCCIO_1_1
VCCIO_1_2
VCCIO_1_3
VCCIO_1_4
VCCIO_1_5
VCCIO_1_6
VCCIO_1_7
VCCIO_1_8
VCCIO_1_9
VCCIO_0_1
VCCIO_0_2
VCCIO_0_3
VCCIO_0_4
VCCIO_0_5
VCCIO_0_6
VCCIO_0_7
VCCIO_0_8
VCCIO_0_9

C7
C12
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33
C34
C35
C36
C37
C38
C39
C40
C41
C42
C43
C44
C45
C46
C47
C48
VCCIO_1_1
VCCIO_1_2
VCCIO_1_3
VCCIO_1_4
VCCIO_1_5
VCCIO_1_6
VCCIO_1_7
VCCIO_1_8
VCCIO_1_9
VCCIO_0_1
VCCIO_0_2
VCCIO_0_3
VCCIO_0_4
VCCIO_0_5
VCCIO_0_6
VCCIO_0_7
VCCIO_0_8
VCCIO_0_9

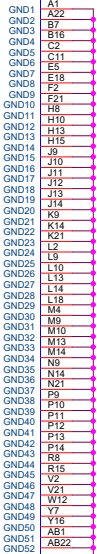
XO3D_VCCIO_1



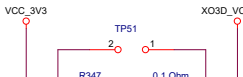
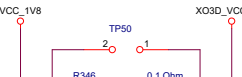
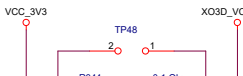
XO3D_VCCIO_0



U3F

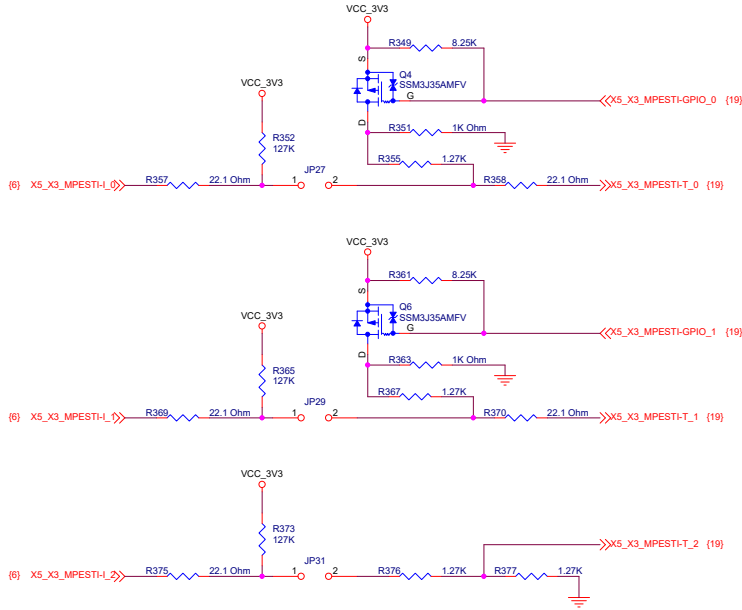


LCMXO3D-9400HC-5BG484C

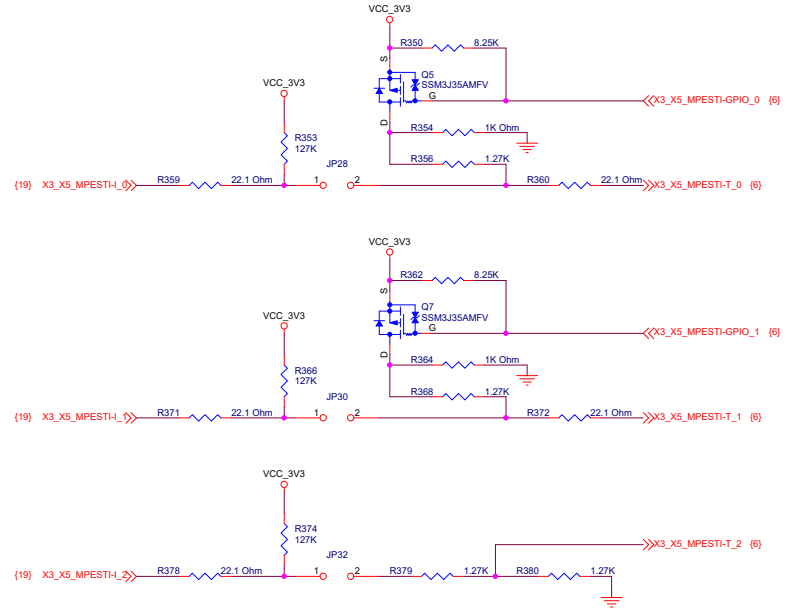


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Title LCMXO3D Power		
Size B	Project Sentry 4.0 Board for XO5D	Schematic Rev 1.1
Date: Thursday, September 16, 2024	Sheet 20	Board Rev A.1

XO5D TO XO3D

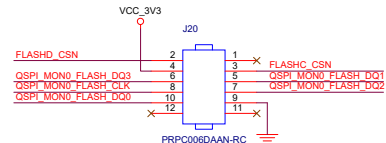
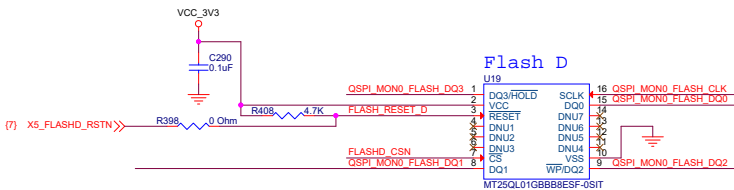
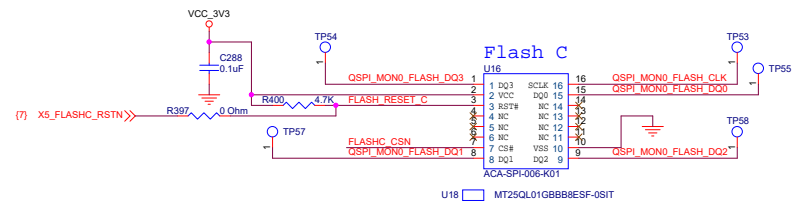
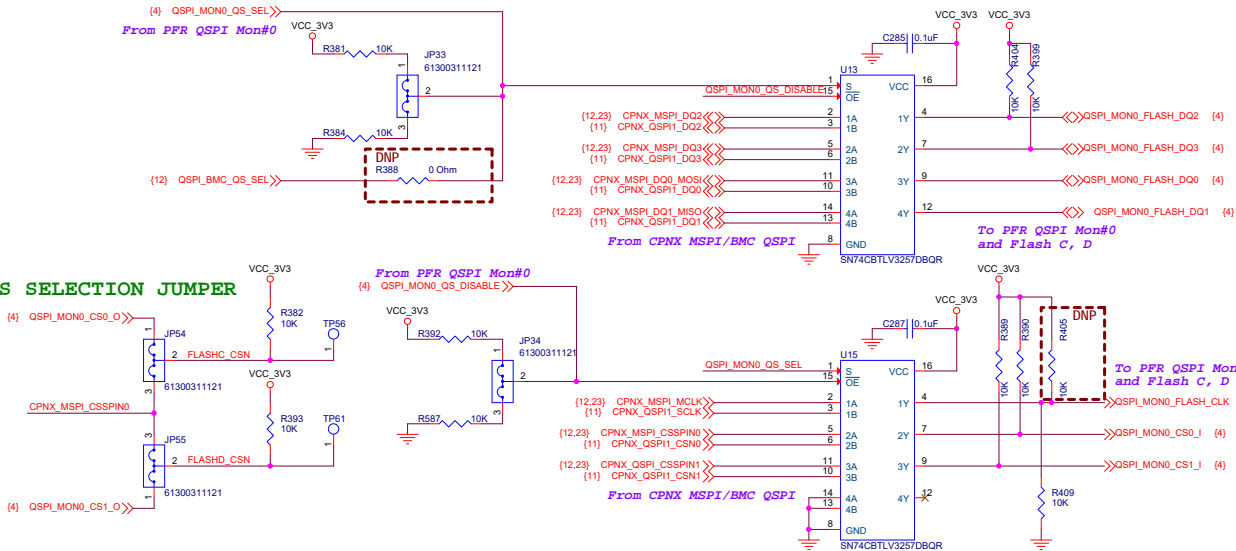
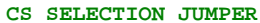


XO3D TO XO5D



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Title		
MPESTI		
Size B	Project	Schematic Rev 1.1
Sentry 4.0 Board for XO5D		Board Rev A.1
Date:	Thursday, September 18, 2024	Sheet 21 of 28

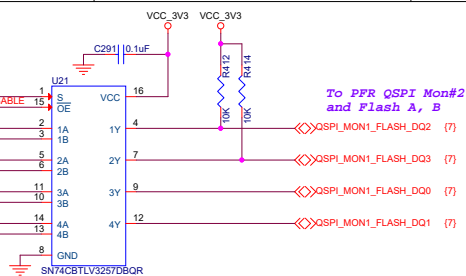
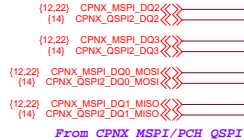
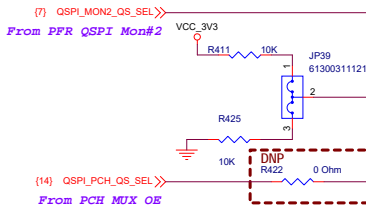


DEDIPROG HEADER

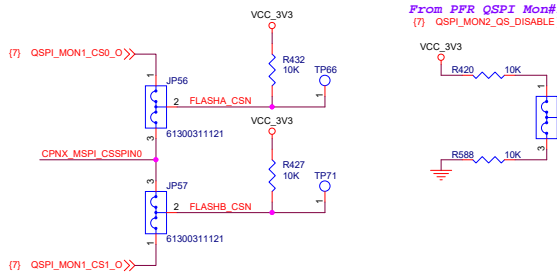


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Title			
BMC Flash			
Size	Project	Schematic Rev	
B	Sentry 4.0 Board for XO5D	1.1	
		Board Rev	
		A.1	
Date:	Thursday, September 19, 2024	Sheet	22 of 28

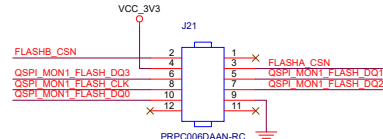
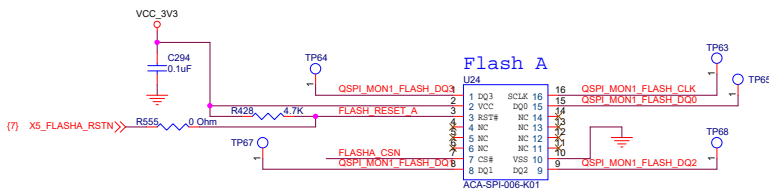
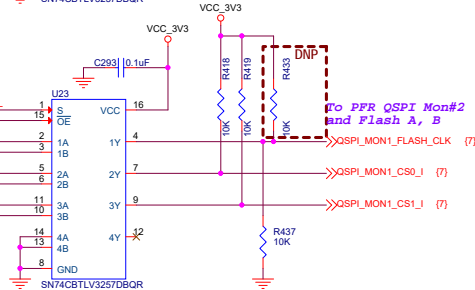
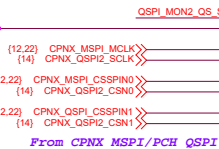
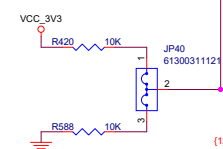


CS SELECTION JUMPER

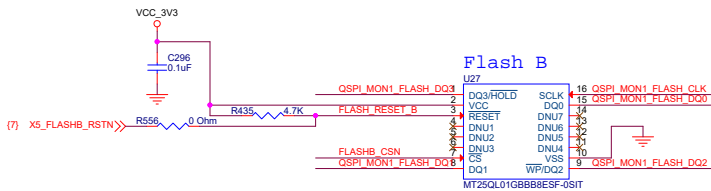


From PFR QSPI Mon#2

(7) QSPI_MON2_OS_DISABLE

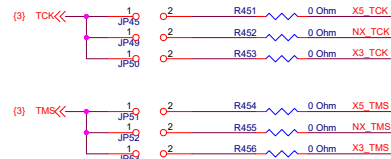
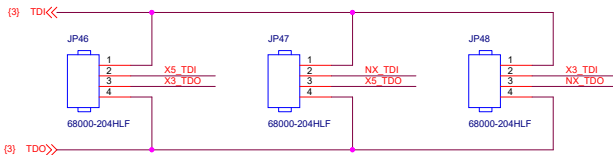
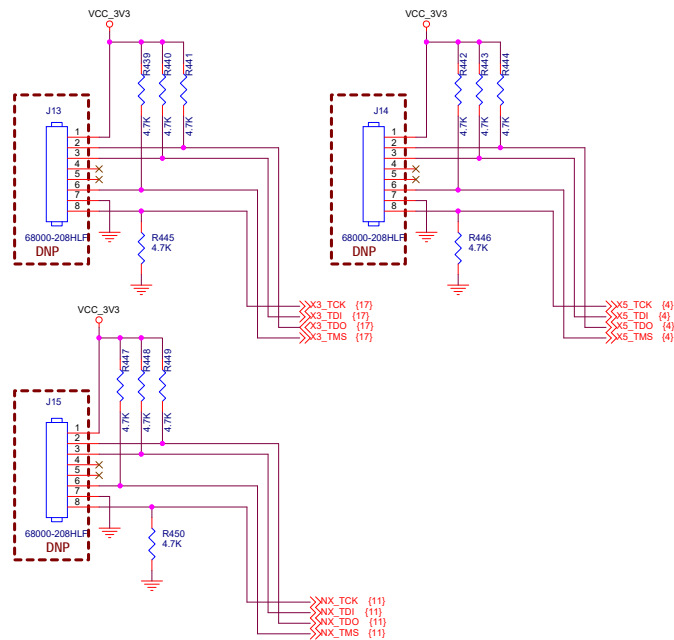


DEDIPROG HEADER



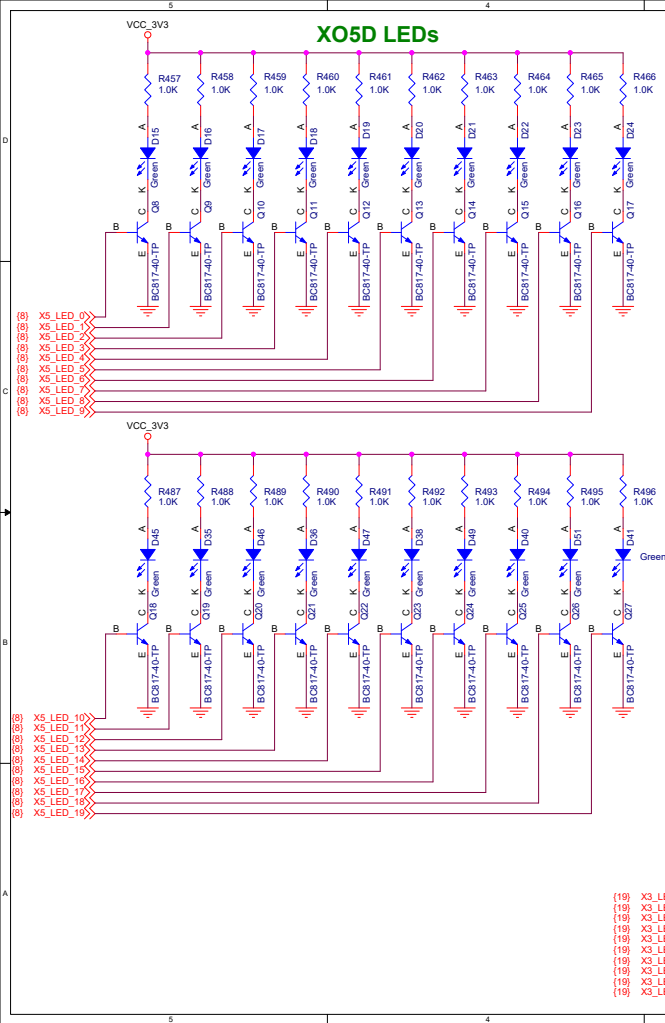
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Title			PCH Flash	
Size	Project	Sentry 4.0 Board for XO5D		Schematic Rev 1.1
Date:	Thursday, September 16, 2024	Sheet	23 of 28	Board Rev A.1



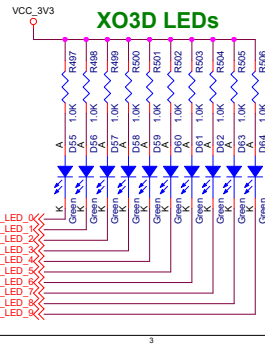
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Title			JTAG Chain	
Size	Project	Sentry 4.0 Board for XO5D		Schematic Rev
B				1.1
Date	Thursday, September 15, 2024	Sheet	24	of 28
				Board Rev A.1



LEDs Signal Map

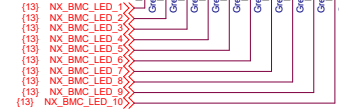
U1 Pin	Signal	LED
R14	X5_LED_0	D15
R15	X5_LED_1	D16
N16	X5_LED_2	D17
P16	X5_LED_3	D18
M17	X5_LED_4	D19
M16	X5_LED_5	D20
P19	X5_LED_6	D21
P20	X5_LED_7	D22
P17	X5_LED_8	D23
P18	X5_LED_9	D24
W10	X5_LED_10	D45
P12	X5_LED_11	D35
R12	X5_LED_12	D46
P11	X5_LED_13	D36
V12	X5_LED_14	D47
W11	X5_LED_15	D38
V11	X5_LED_16	D49
U12	X5_LED_17	D40
W13	X5_LED_18	D51
W12	X5_LED_19	D41



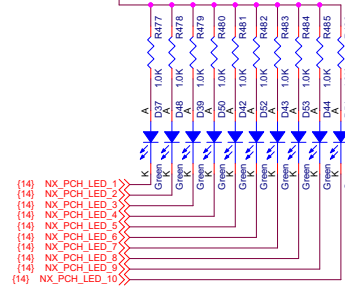
LEDs Signal Map

U3 Pin	Signal	LED
T1	X3_LED_0	D55
U1	X3_LED_1	D56
R2	X3_LED_2	D57
T2	X3_LED_3	D58
R3	X3_LED_4	D59
T3	X3_LED_5	D60
R4	X3_LED_6	D61
T4	X3_LED_7	D62
R5	X3_LED_8	D63
T5	X3_LED_9	D64

CPNX BMC LEDs



CPNX PCH LEDs



LEDs Signal Map

U2 Pin	Signal	LED
L24	NX_BMC_LED_1	D25
L23	NX_BMC_LED_2	D26
L22	NX_BMC_LED_3	D27
L20	NX_BMC_LED_4	D28
L19	NX_BMC_LED_5	D29
M26	NX_BMC_LED_6	D30
N26	NX_BMC_LED_7	D31
N25	NX_BMC_LED_8	D32
N24	NX_BMC_LED_9	D33
N22	NX_BMC_LED_10	D34

LEDs Signal Map

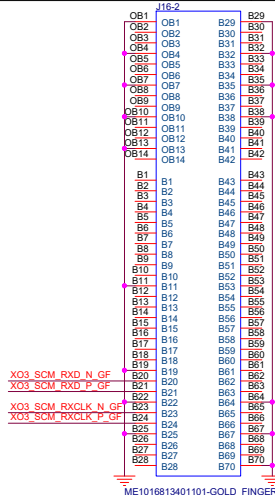
U21 pin	Signal	LED
V4	NX_PCH_LED_1	D37
V5	NX_PCH_LED_2	D48
V6	NX_PCH_LED_3	D39
W7	NX_PCH_LED_4	D50
W6	NX_PCH_LED_5	D42
W5	NX_PCH_LED_6	D52
W2	NX_PCH_LED_7	D43
W1	NX_PCH_LED_8	D53
Y1	NX_PCH_LED_9	D44
Y4	NX_PCH_LED_10	D54



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Title			
LEDs			
Size B	Project	Sentry 4.0 Board for XO5D	
Date:		Thursday, September 16, 2024	Sheet 25 of 28
		Board Rev	A.1

XO5D HPM

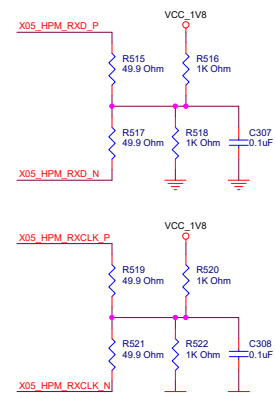
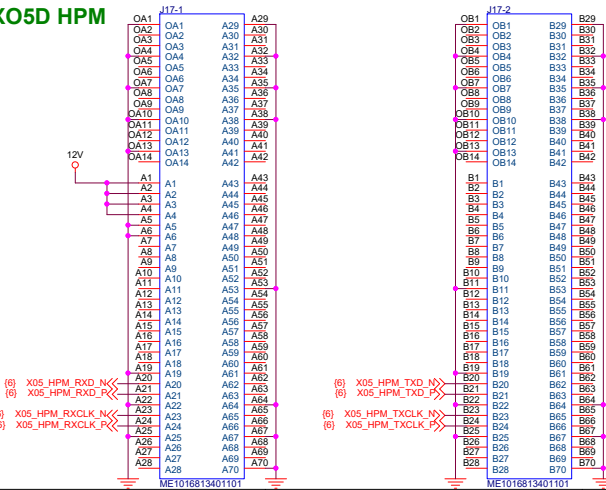


TX Section:

- TXD_P:** X03_SCM_TXD_P >> C297 || 0.22uF >> X03_SCM_TXD_P_GF
- TXD_N:** X03_SCM_TXD_N >> C298 || 0.22uF >> X03_SCM_TXD_N_GF
- TXCLK_P:** X03_SCM_TXCLK_P >> C299 || 0.22uF >> X03_SCM_TXCLK_P_GF
- TXCLK_N:** X03_SCM_TXCLK_N >> C301 || 0.22uF >> X03_SCM_TXCLK_N_GF

RX Section:

- RXCLK_P:** X03_SCM_RXCLK_P >> C302 || 0.22uF >> X03_SCM_RXCLK_P
- RXCLK_N:** X03_SCM_RXCLK_N >> C303 || 0.22uF >> X03_SCM_RXCLK_N
- RXD_P:** X03_SCM_RXD_P >> C304 || 0.22uF >> X03_SCM_RXD_P
- RXD_N:** X03_SCM_RXD_N >> C306 || 0.22uF >> X03_SCM_RXD_N



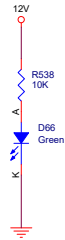
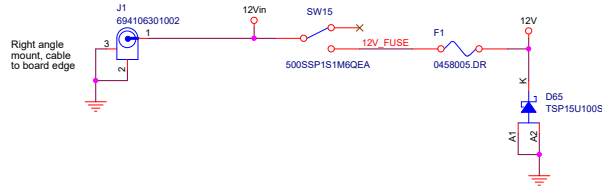
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Title			
DC-SCM Connectors			
Size B	Project	Sentry 4.0 Board for XO5D	
		Schematic Rev 1.1	
		Board Rev	A.1
Date:	Thursday, September 19, 2024	Sheet	26 of 28



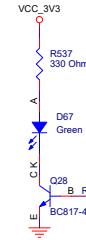
Title			
I3C PU			
Size	Project	Schematic Rev	
B	Sentry 4.0 Board for XO5D	1.1	
		Board Rev	
Date:	Thursday, September 19, 2024	Sheet	27 of 28
			A.1

+12V POWER INPUT

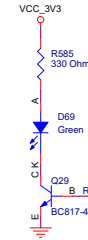


12V

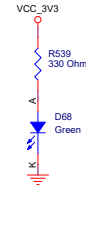
Power On LED Indications



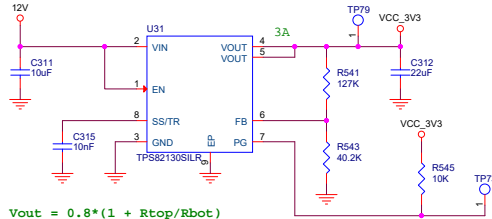
1.0V



1.8V

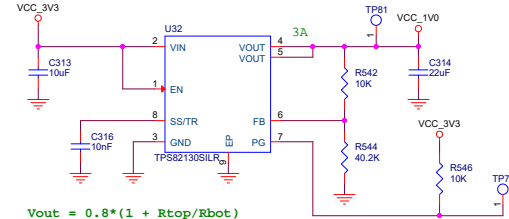


3.3V



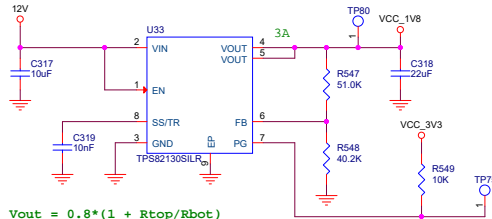
$$V_{out} = 0.8 * (1 + R_{top}/R_{bot})$$

$$0.8(1 + 127K/40.2K) = 3.33V$$



$$V_{out} = 0.8 * (1 + R_{top}/R_{bot})$$

$$0.8(1 + 10K/40.2K) = 1.0V$$



$$V_{out} = 0.8 * (1 + R_{top}/R_{bot})$$

$$0.8(1 + 51K/40.2K) = 1.81V$$



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Title				
Power Regulators				
Size	Project			Schematic Rev
B	Sentry 4.0 Board for XO5D			1.1
				Board Rev
				A.1
Date:	Thursday, September 19, 2024		Sheet	28 of 28