Ti60F225 DEVELOPMENT BOARD

CONTENTS

REVISION HISTORY

0.1	12/17/2020	KCLEE	Initial Creation
0.2	05/02/2021	Hanson	ES Release
0.3	18/06/2021	Hanson	Production Release
0.9	09/08/2021	Hanson	modify for offical release
1.0	07/09/2021	Hanson	modify Parts for offical release
1.1	07/10/2021	Hanson	update U5 with symbol F225 v1.1
1.2	06/12/2021	Hanson	update 74.25Mhz label
1.3	21/03/2022	Hanson	Fixes naming U28D, U27H
1.4	30/01/2026		Update default jumper for J8,J9,J10,J11

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Title: TABLE OF CONTENTS
Size: | Document Number: ETSB-00016-1 | Rev: 1.0
Date: Monday, March 21, 2022 | Sheet 1 of 14

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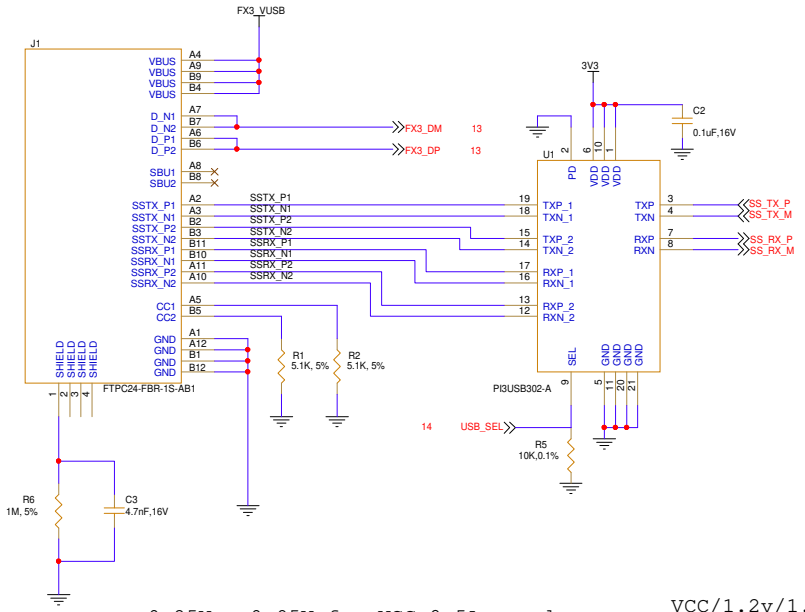
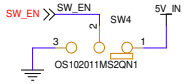
Title: BLOCK DIAGRAM

Size | Document Number: ETSB-00016-1 | Rev: 1.0

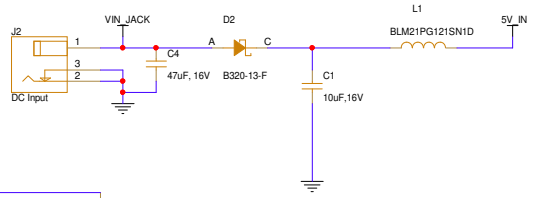
Date: Tuesday, September 07, 2021 | Sheet 2 of 14

USB Type-C Input (To FX3)

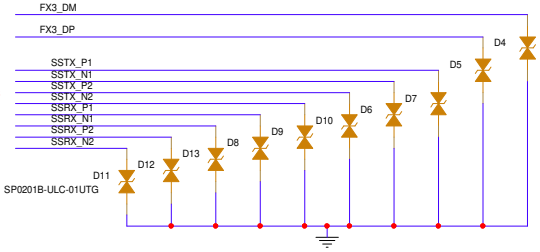




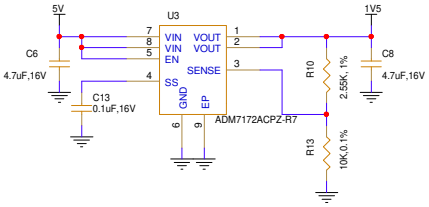
DC Power Connector 5v to 12v Input



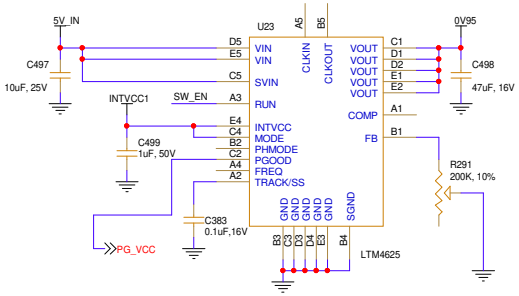
USB protection



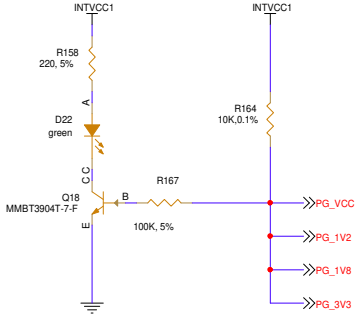
1.5V @ 500mA



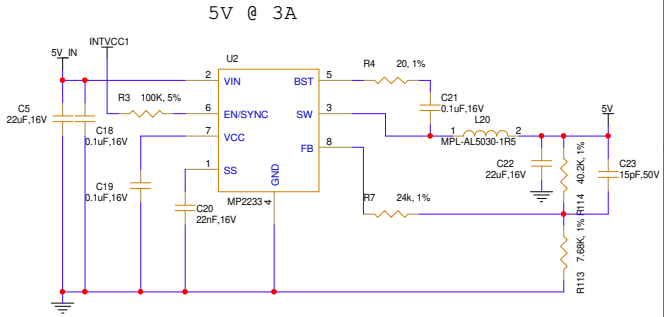
0.85V - 0.95V for VCC @ 5A supply



VCC/1.2v/1.8v/3.3v Power Good(OPEN-DRAIN)



5V @ 3A



Please contact for specify Vcc Low Current Power Up sequence

support@efinixinc.com

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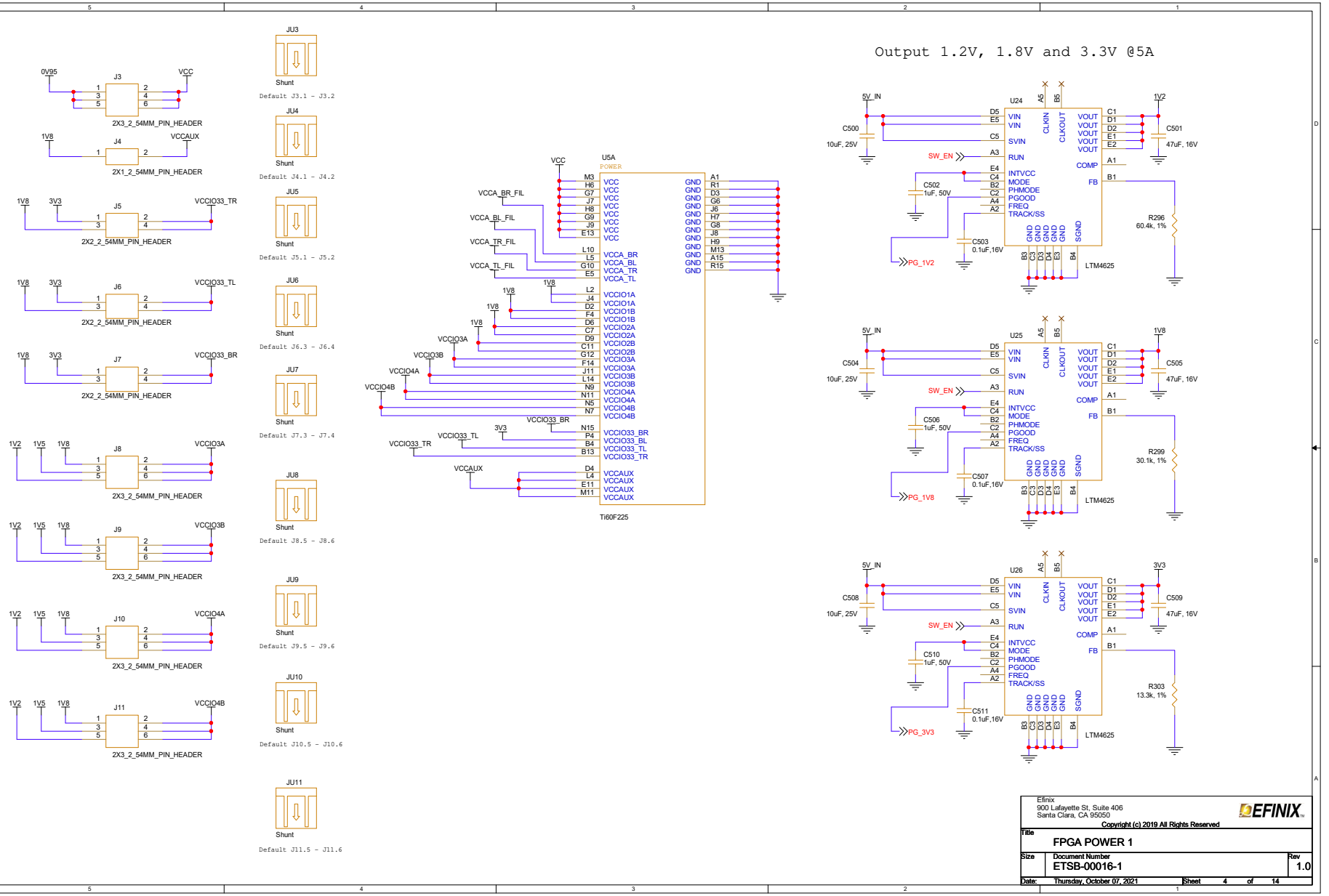
Title	POWER INPUT	
Size	Document Number ETSB-00016-1	Rev 1.0
Date: Monday, December 06, 2021	Sheet 3 of 14	


Output 1.2V, 1.8V and 3.3V @5A
0V95
VCC
J3
2X3_2_54MM_PIN_HEADER
1V8
VCCAUX
J4
2X1_2_54MM_PIN_HEADER
3V3
VCCIO33_TR
J5
2X2_2_54MM_PIN_HEADER
VCCIO33_TL
J6
VCCIO33_BR
J7
1V2
1V5
VCCIO3A
J8
VCCIO3B
J9
VCCIO4A
J10
VCCIO4B
J11
JU3
Shunt
Default J3.1 - J3.2
JU4
Default J4.1 - J4.2
JU5
Default J5.1 - J5.2
JU6
Default J6.3 - J6.4
JU7
Default J7.3 - J7.4
JU8
Default J8.5 - J8.6
JU9
Default J9.5 - J9.6
JU10
Default J10.5 - J10.6
JU11
Default J11.5 - J11.6
U5A
POWER
VCCA_BR_FIL
VCCA_BL_FIL
VCCA_TR_FIL
VCCA_TL_FIL
VCCIO4B
VCCIO4A
VCCIO3B
VCCIO3A
VCCIO33_BR
VCCIO33_TL
VCCIO33_TR
VCCAUX
Ti60F225
5V_IN
U24
U25
U26
C500
10uF, 25V
C501
47uF, 16V
C502
1uF, 50V
C503
0.1uF,16V
C504
C505
C506
C507
C508
C509
C510
C511
SW_EN
PG_1V2
PG_1V8
PG_3V3
R296
60.4k, 1%
R299
30.1k, 1%
R303
13.3k, 1%
LTM4625
1V2
3V3
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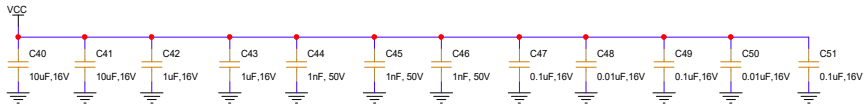
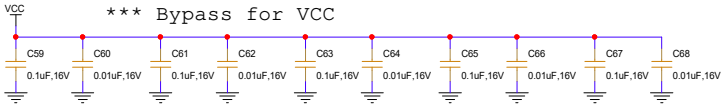
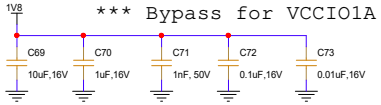
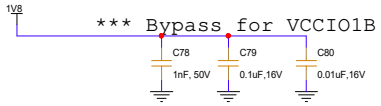
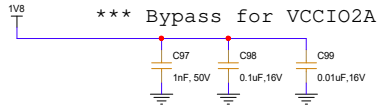
FPGA POWER 1
Size
Document Number
ETSB-00016-1
Rev
1.0
Date: Thursday, October 07, 2021
Sheet 4 of 14

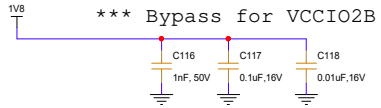


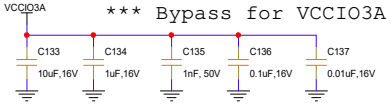


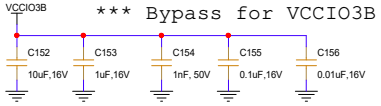


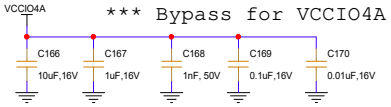


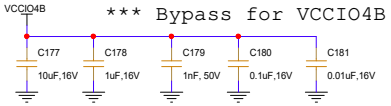


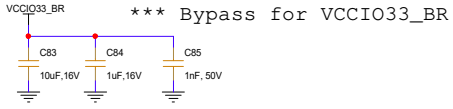


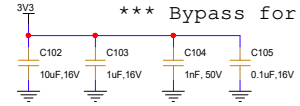


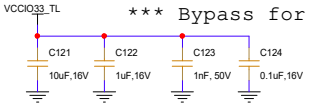


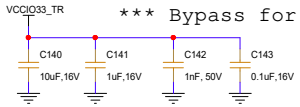


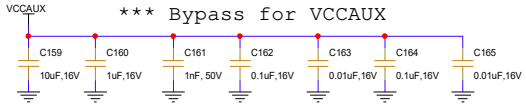


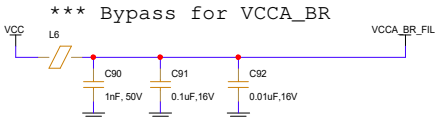


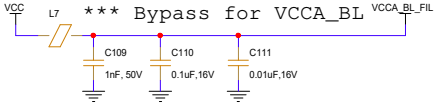


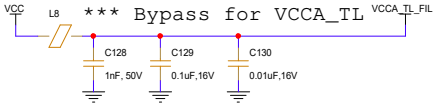


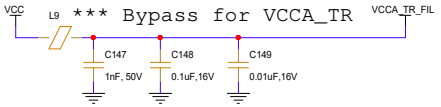


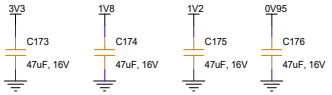












***Each set of 0.1uF and 0.01uF place close to each pair of BGA ball for all VCCIO

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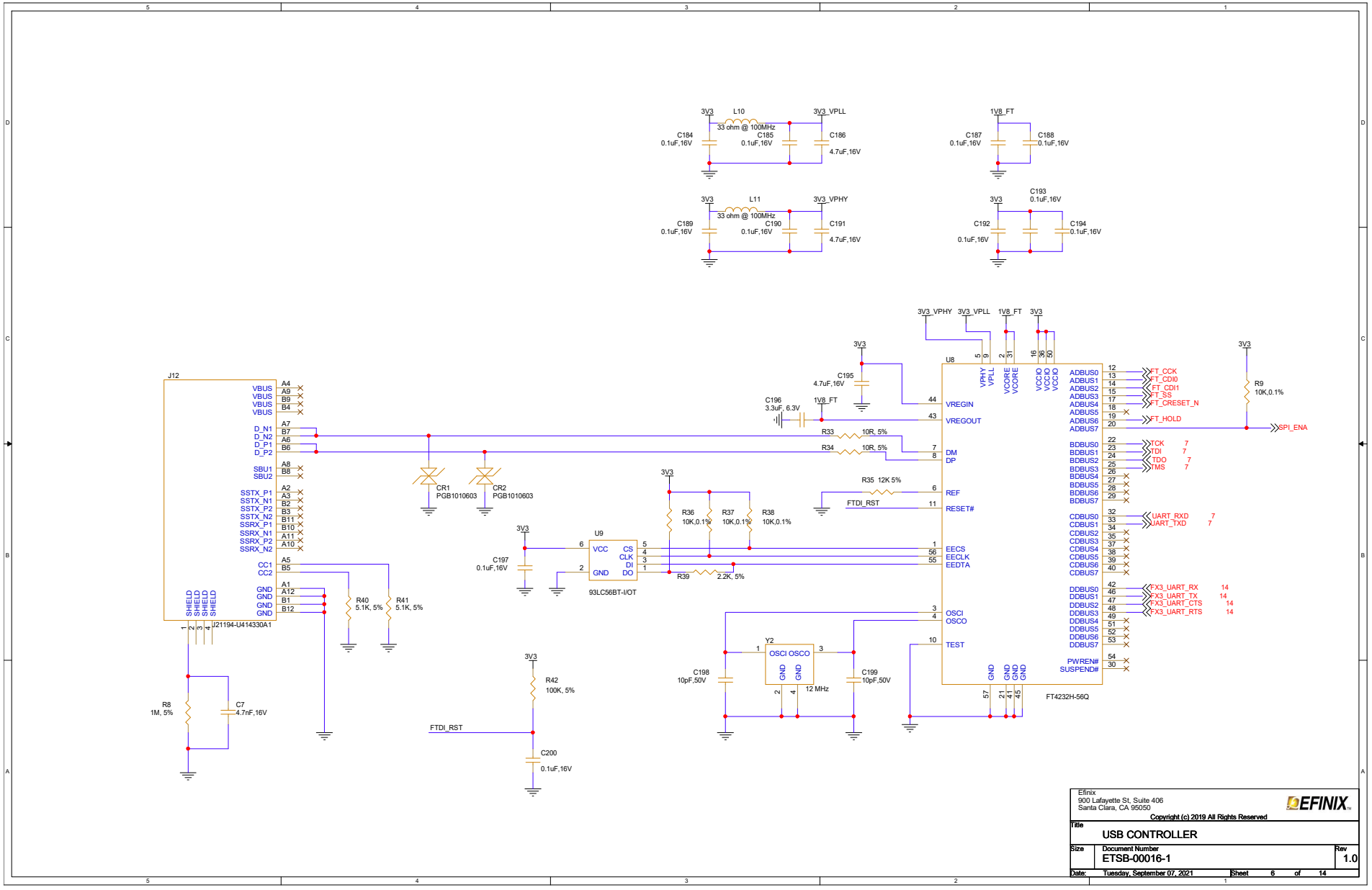
Title: FPGA POWER 2

Size | Document Number: ETSB-00016-1 | Rev: 0.1

Date: Tuesday, September 07, 2021 | Sheet 5 of 14



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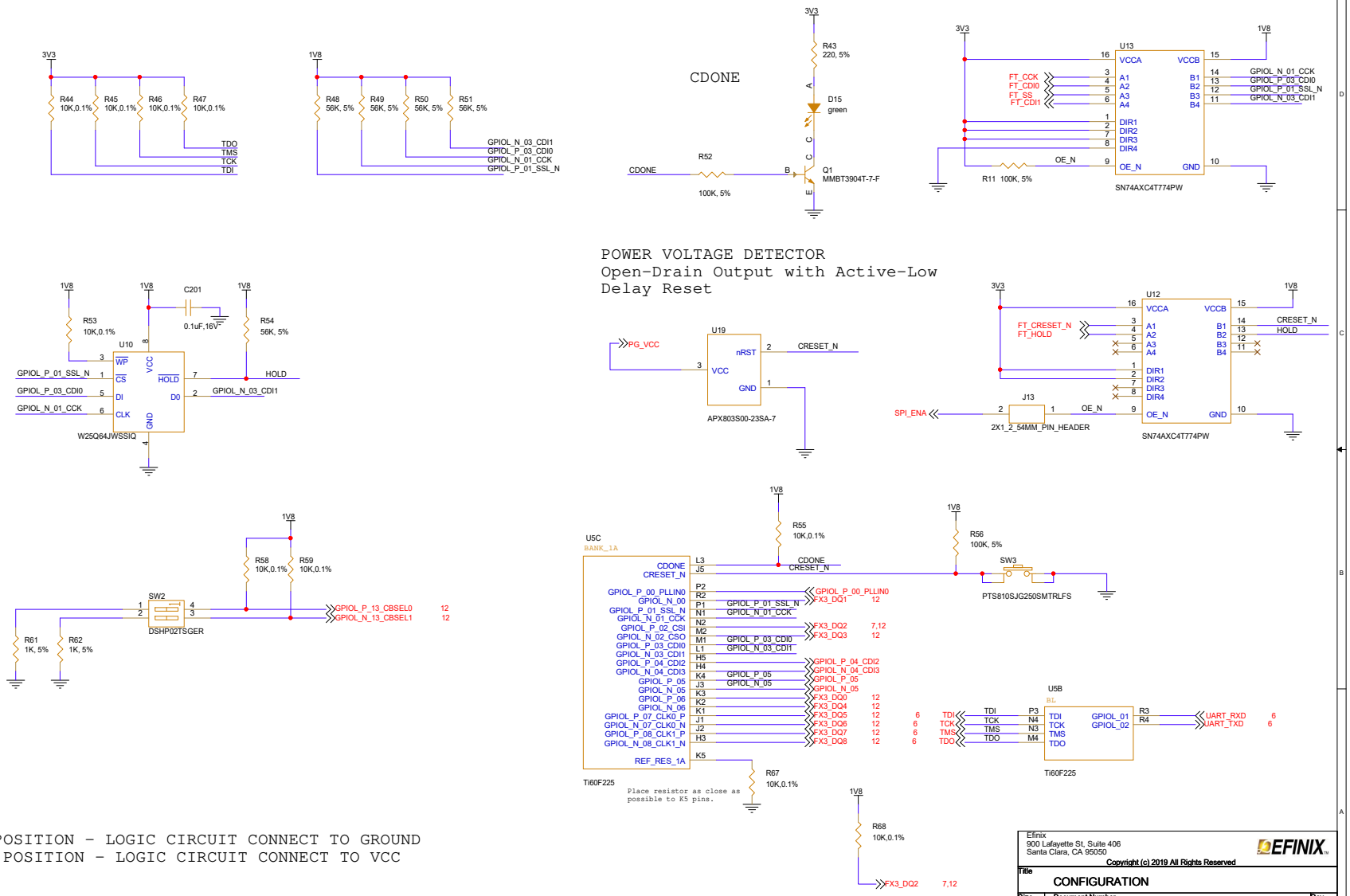
Title: USB CONTROLLER

Size | Document Number: ETSB-00016-1 | Rev: 1.0

Date: Tuesday, September 07, 2021 | Sheet 6 of 14



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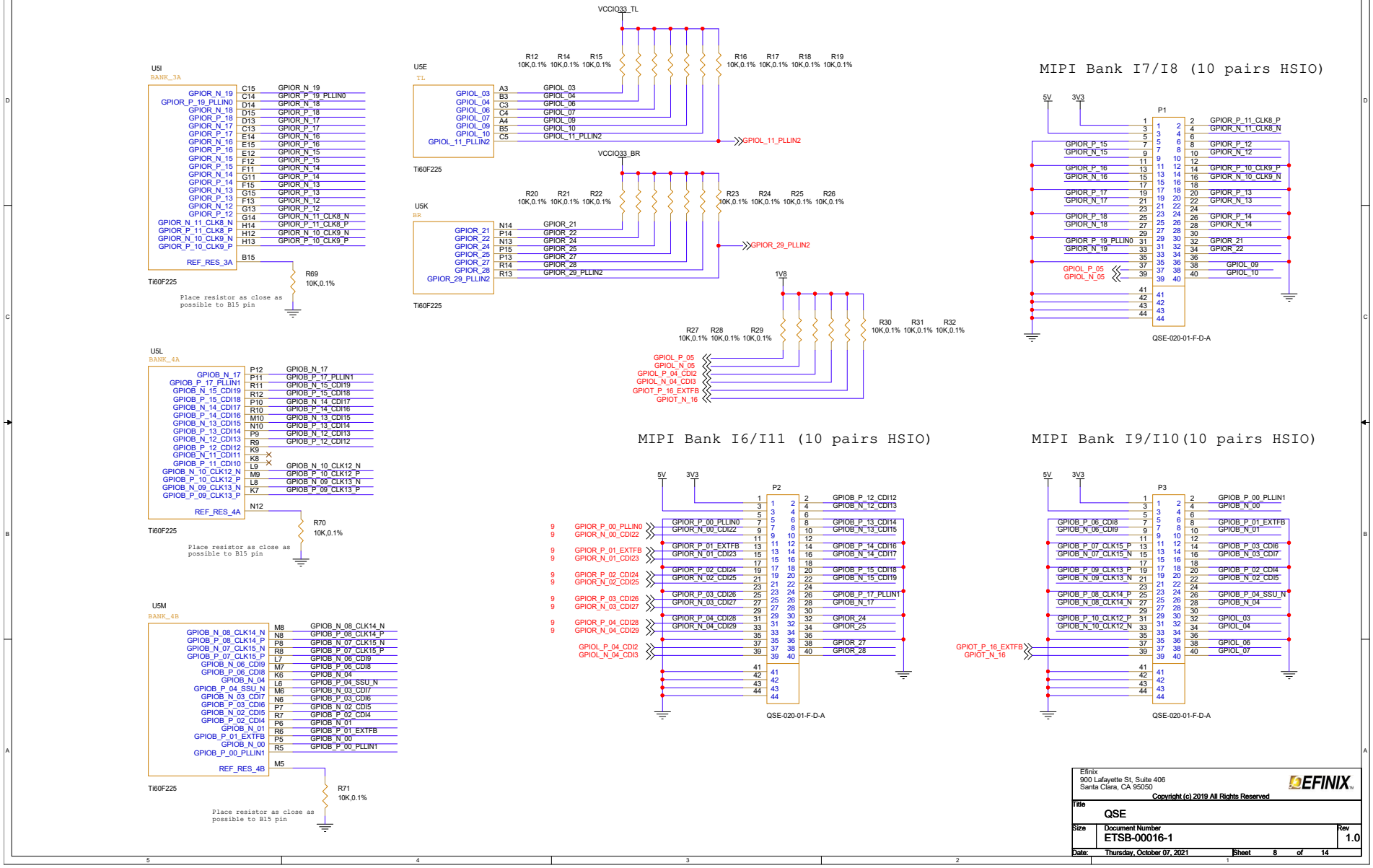
Title	CONFIGURATION	
Size	Document Number ETSB-00016-1	Rev 1.0
Date: Thursday, October 07, 2021	Sheet 7 of 14	


U5I
BANK_3A
GPIOR_N_19
GPIOR_P_19_PLLIN0
GPIOR_N_18
GPIOR_P_18
GPIOR_N_17
GPIOR_P_17
GPIOR_N_16
GPIOR_P_16
GPIOR_N_15
GPIOR_P_15
GPIOR_N_14
GPIOR_P_14
GPIOR_N_13
GPIOR_P_13
GPIOR_N_12
GPIOR_P_12
GPIOR_N_11_CLK8_N
GPIOR_P_11_CLK8_P
GPIOR_N_10_CLK9_N
GPIOR_P_10_CLK9_P
REF_RES_3A
B15
R69
10K,0.1%
Ti60F225
Place resistor as close as possible to B15 pin
U5E
TL
GPIOL_03
GPIOL_04
GPIOL_06
GPIOL_07
GPIOL_09
GPIOL_10
GPIOL_11_PLLIN2
A3
B3
C3
C4
A4
B5
C5
GPIOL_11_PLLIN2
Ti60F225
VCCIO33_TL
R12 10K,0.1%
R14 10K,0.1%
R15 10K,0.1%
R16 10K,0.1%
R17 10K,0.1%
R18 10K,0.1%
R19 10K,0.1%
U5K
BR
GPIOR_21
GPIOR_22
GPIOR_24
GPIOR_25
GPIOR_27
GPIOR_28
GPIOR_29_PLLIN2
N14
P14
N13
P15
P13
R14
R13
GPIOR_29_PLLIN2
Ti60F225
VCCIO33_BR
R20 10K,0.1%
R21 10K,0.1%
R22 10K,0.1%
R23 10K,0.1%
R24 10K,0.1%
R25 10K,0.1%
R26 10K,0.1%
1V8
R27 10K,0.1%
R28 10K,0.1%
R29 10K,0.1%
R30 10K,0.1%
R31 10K,0.1%
R32 10K,0.1%
GPIOL_P_05
GPIOL_N_05
GPIOL_P_04_CDI2
GPIOL_N_04_CDI3
GPIOT_P_16_EXTFB
GPIOT_N_16
MIPI Bank I7/I8 (10 pairs HSIO)
5V
3V3
P1
GPIOR_P_11_CLK8_P
GPIOR_N_11_CLK8_N
GPIOR_P_15
GPIOR_N_15
GPIOR_P_12
GPIOR_N_12
GPIOR_P_16
GPIOR_N_16
GPIOR_P_10_CLK9_P
GPIOR_N_10_CLK9_N
GPIOR_P_17
GPIOR_N_17
GPIOR_P_13
GPIOR_N_13
GPIOR_P_18
GPIOR_N_18
GPIOR_P_14
GPIOR_N_14
GPIOR_P_19_PLLIN0
GPIOR_N_19
GPIOR_21
GPIOR_22
GPIOL_P_05
GPIOL_N_05
GPIOL_09
GPIOL_10
QSE-020-01-F-D-A
U5L
BANK_4A
GPIOB_N_17
GPIOB_P_17_PLLIN1
GPIOB_N_15_CDI19
GPIOB_P_15_CDI18
GPIOB_N_14_CDI17
GPIOB_P_14_CDI16
GPIOB_N_13_CDI15
GPIOB_P_13_CDI14
GPIOB_N_12_CDI13
GPIOB_P_12_CDI12
GPIOB_N_11_CDI11
GPIOB_P_11_CDI10
GPIOB_N_10_CLK12_N
GPIOB_P_10_CLK12_P
GPIOB_N_09_CLK13_N
GPIOB_P_09_CLK13_P
REF_RES_4A
N12
R70
10K,0.1%
Ti60F225
Place resistor as close as possible to B15 pin
MIPI Bank I6/I11 (10 pairs HSIO)
P2
GPIOR_P_00_PLLIN0
GPIOR_N_00_CDI22
GPIOR_P_01_EXTFB
GPIOR_N_01_CDI23
GPIOR_P_02_CDI24
GPIOR_N_02_CDI25
GPIOR_P_03_CDI26
GPIOR_N_03_CDI27
GPIOR_P_04_CDI28
GPIOR_N_04_CDI29
GPIOL_P_04_CDI2
GPIOL_N_04_CDI3
GPIOB_P_12_CDI12
GPIOB_N_12_CDI13
GPIOB_P_13_CDI14
GPIOB_N_13_CDI15
GPIOB_P_14_CDI16
GPIOB_N_14_CDI17
GPIOB_P_15_CDI18
GPIOB_N_15_CDI19
GPIOB_P_17_PLLIN1
GPIOB_N_17
GPIOR_24
GPIOR_25
GPIOR_27
GPIOR_28
QSE-020-01-F-D-A
MIPI Bank I9/I10(10 pairs HSIO)
P3
GPIOB_P_00_PLLIN1
GPIOB_N_00
GPIOB_P_06_CDI8
GPIOB_N_06_CDI9
GPIOB_P_01_EXTFB
GPIOB_N_01
GPIOB_P_07_CLK15_P
GPIOB_N_07_CLK15_N
GPIOB_P_03_CDI6
GPIOB_N_03_CDI7
GPIOB_P_09_CLK13_P
GPIOB_N_09_CLK13_N
GPIOB_P_02_CDI4
GPIOB_N_02_CDI5
GPIOB_P_08_CLK14_P
GPIOB_N_08_CLK14_N
GPIOB_P_04_SSU_N
GPIOB_N_04
GPIOB_P_10_CLK12_P
GPIOB_N_10_CLK12_N
GPIOL_03
GPIOL_04
GPIOT_P_16_EXTFB
GPIOT_N_16
GPIOL_06
GPIOL_07
QSE-020-01-F-D-A
U5M
BANK_4B
GPIOB_N_08_CLK14_N
GPIOB_P_08_CLK14_P
GPIOB_N_07_CLK15_N
GPIOB_P_07_CLK15_P
GPIOB_N_06_CDI9
GPIOB_P_06_CDI8
GPIOB_N_04
GPIOB_P_04_SSU_N
GPIOB_N_03_CDI7
GPIOB_P_03_CDI6
GPIOB_N_02_CDI5
GPIOB_P_02_CDI4
GPIOB_N_01
GPIOB_P_01_EXTFB
GPIOB_N_00
GPIOB_P_00_PLLIN1
REF_RES_4B
M5
R71
10K,0.1%
Ti60F225
Place resistor as close as possible to B15 pin
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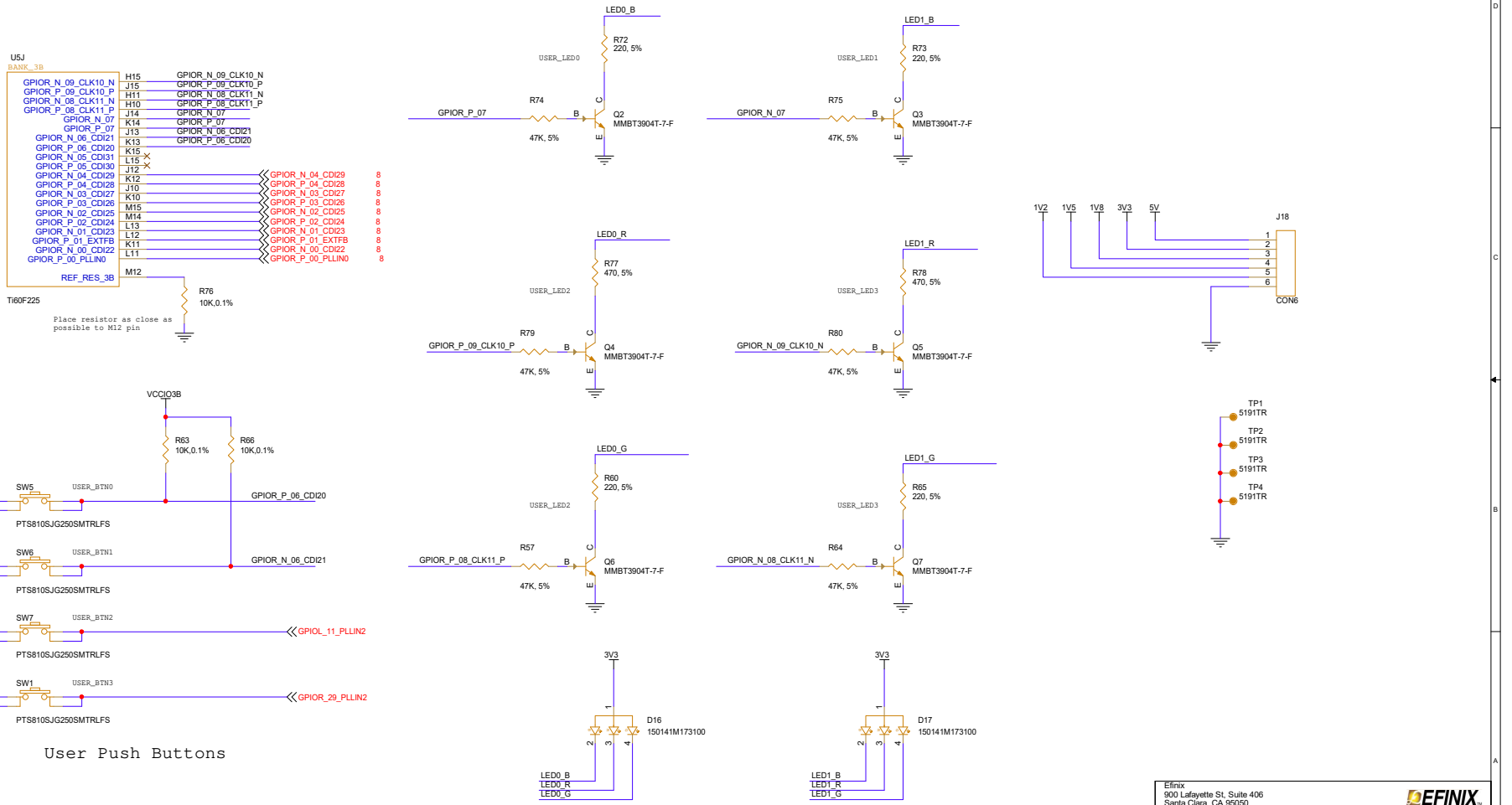
Title
QSE
Size
Document Number
ETSB-00016-1
Rev
1.0
Date: Thursday, October 07, 2021
Sheet 8 of 14

User LEDs



User Push Buttons

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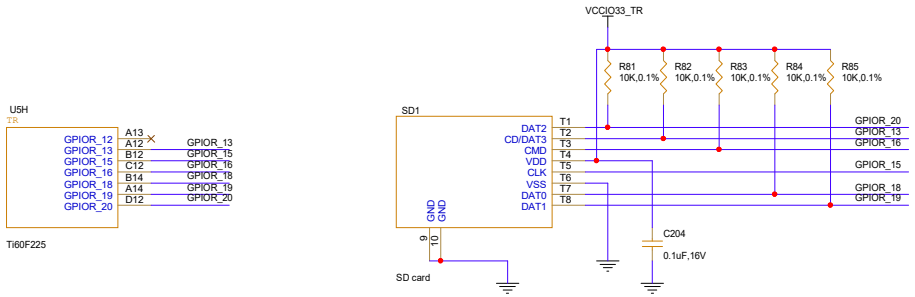
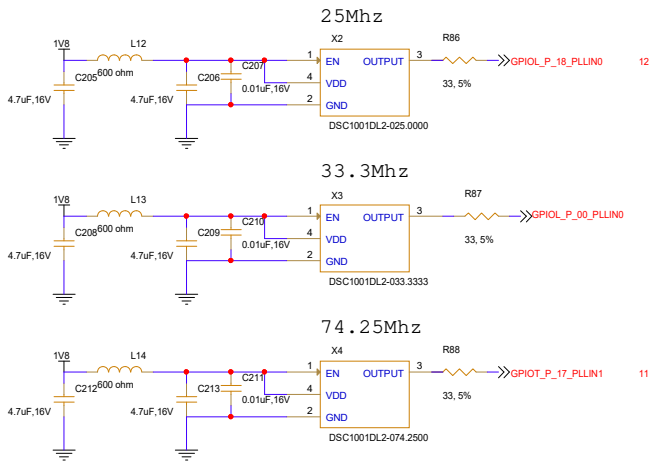
Title	PMOD, USER I/O	
Size	Document Number ETSB-00016-1	Rev 1.0
Date: Thursday, October 07, 2021	Sheet 9 of 14	





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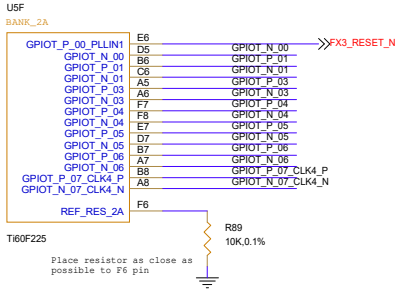
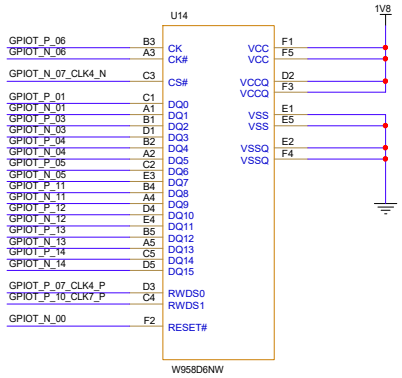
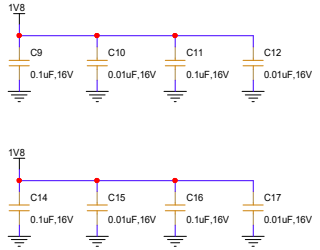
Title: SD CARD & USER CLOCK

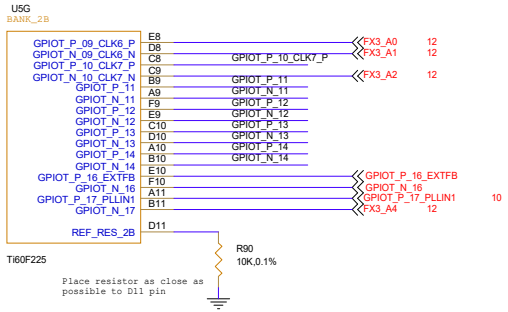
Size | Document Number: ETSB-00016-1 | Rev: 1.0

Date: Monday, March 21, 2022 | Sheet 10 of 14









Place one capacitor to each power pin

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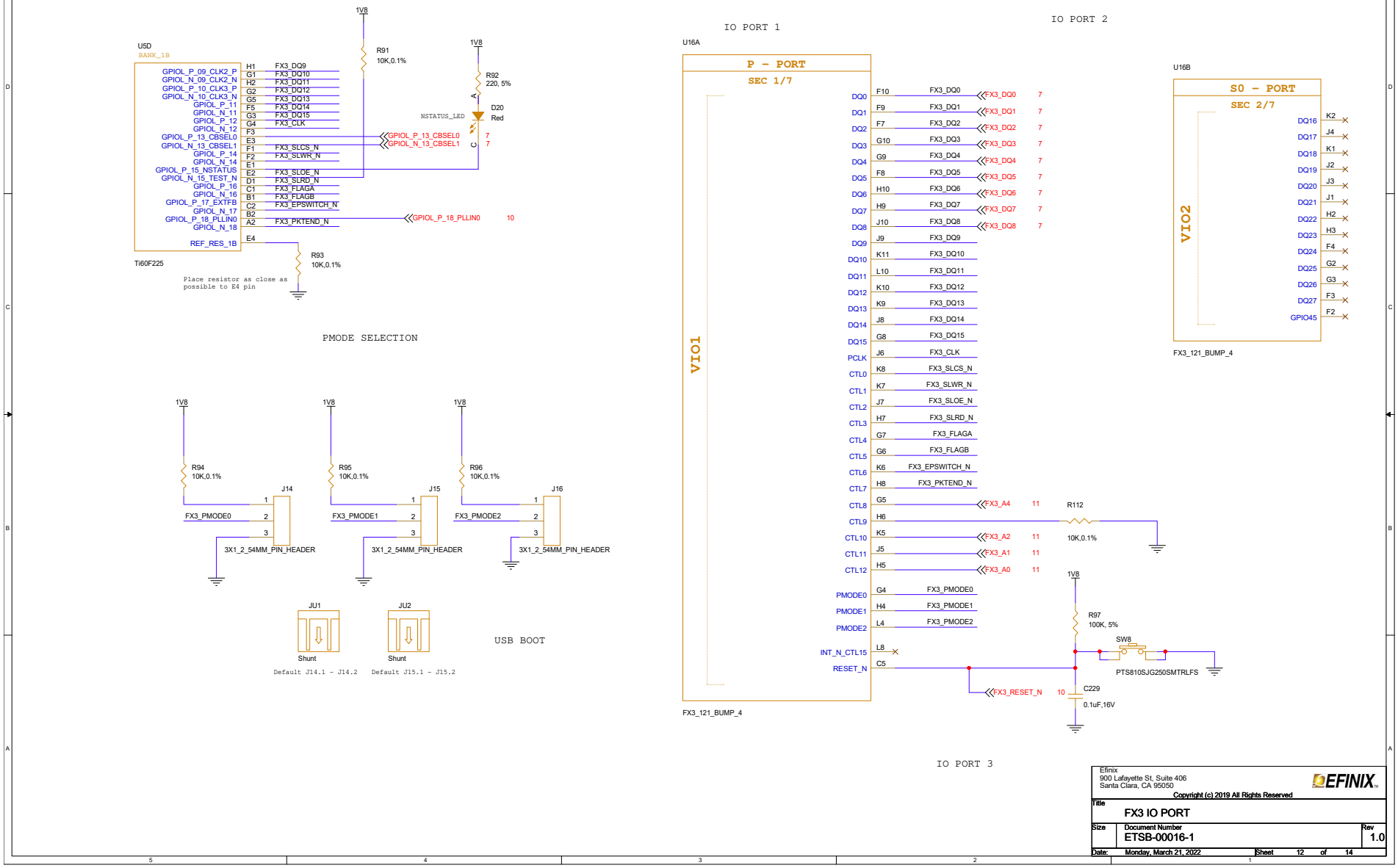
Title: HYPERRAM

Size | Document Number: ETSB-00016-1 | Rev: 1.0

Date: Thursday, October 07, 2021 | Sheet 11 of 14


IO PORT 1
IO PORT 2
U5D
BANK_1B
Ti60F225
Place resistor as close as possible to E4 pin
R91
10K,0.1%
R92
220, 5%
D20
Red
NSTATUS_LED
R93
10K,0.1%
PMODE SELECTION
R94
10K,0.1%
R95
10K,0.1%
R96
10K,0.1%
J14
J15
J16
3X1_2_54MM_PIN_HEADER
JU1
JU2
Shunt
Default J14.1 - J14.2
Default J15.1 - J15.2
USB BOOT
U16A
P - PORT
SEC 1/7
VIO1
FX3_121_BUMP_4
U16B
S0 - PORT
SEC 2/7
VIO2
R112
10K,0.1%
R97
100K, 5%
SW8
PTS810SJG250SMTRLFS
C229
0.1uF,16V
IO PORT 3
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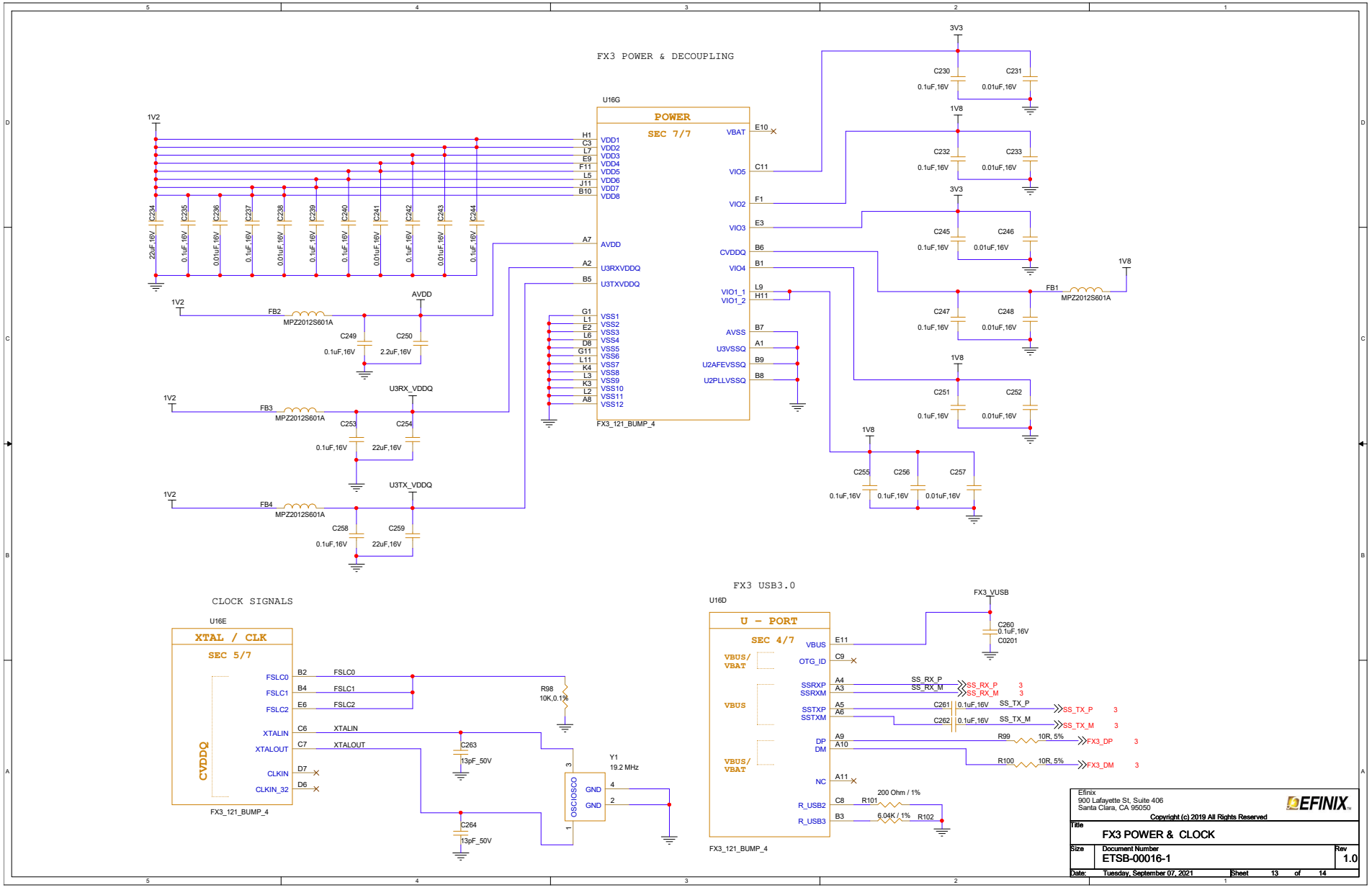
FX3 IO PORT
Size
Document Number
ETSB-00016-1
Rev
1.0
Date: Monday, March 21, 2022
Sheet 12 of 14


FX3 POWER & DECOUPLING
U16G
POWER
SEC 7/7
FX3_121_BUMP_4
CLOCK SIGNALS
U16E
XTAL / CLK
SEC 5/7
FX3_121_BUMP_4
FX3 USB3.0
U16D
U - PORT
SEC 4/7
FX3_121_BUMP_4
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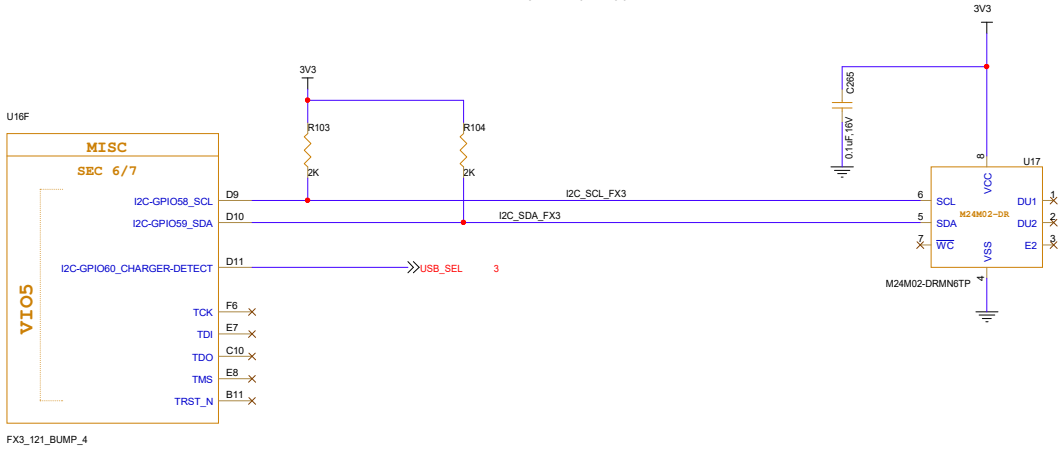
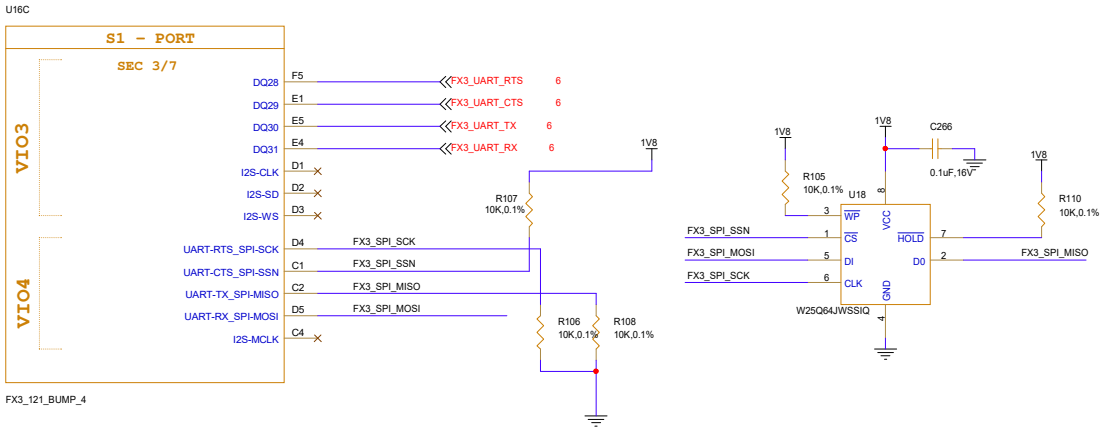
Size
Document Number
ETSB-00016-1
Rev
1.0
Date: Tuesday, September 07, 2021
Sheet 13 of 14

I2C EEPROM BOOT



SPI BOOT



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Title: FX3 EEPROM & SPI BOOT

Size | Document Number: ETSB-00016-1 | Rev: 1.0

Date: Tuesday, September 07, 2021 | Sheet 14 of 14

EFINIX®

Item	Quantity	Reference	Part	PCB Footprint
1	2	CR1,CR2	PGB1010603	TVS0603
2	13	C1,C40,C41,C69,C83,C102,C121,C133,C140,C152,C159, C166,C177	10uF,16V	C0805
3	73	C2,C9,C11,C13,C14,C16,C18,C19,C21,C47,C49,C51,C59,C61,C63, C65,C67,C72,C79,C91,C98,C105,C110,C117,C124,C129,C136,C143, C148,C155,C162,C164,C169,C180,C184,C185,C187,C188,C189, C190,C192,C193,C194,C197,C200,C201,C204,C229,C230,C232, C235,C237,C239,C240,C242,C244,C245,C247,C249,C251,C253, C255,C256,C258,C260,C261,C262,C265,C266,C383,C503,C507,C511	0.1uF,16V	C0201
4	2	C3,C7	4.7nF,16V	C0402
5	9	C4,C173,C174,C175,C176,C498,C501,C505,C509	47uF, 16V	C1210
6	5	C5,C22,C234,C254,C259	22uF,16V	C1206
7	11	C6,C8,C186,C191,C195,C205,C206,C208,C209,C212,C213	4.7uF,16V	C0603
8	38	C10,C12,C15,C17,C48,C50,C60,C62,C64,C66,C68,C73,C80,C92,C99, C111,C118,C130,C137,C149,C156,C163,C165,C170,C181,C207,C210, C211,C231,C233,C236,C238,C241,C243,C246,C248,C252,C257	0.01uF,16V	C0201
9	1	C20	22nF,16V	C0201
10	1	C23	15pF,50V	C0402
11	12	C42,C43,C70,C84,C103,C122,C134,C141,C153,C160,C167,C178	1uF,16V	C0402
12	20	C44,C45,C46,C71,C78,C85,C90,C97,C104,C109,C116,C123,C128, C135,C142,C147,C154,C161,C168,C179	1nF, 50V	C0402
13	1	C196	3.3uF, 6.3V	C1206
14	2	C198,C199	10pF,50V	C0402
15	1	C250	2.2uF,16V	C0402
16	2	C263,C264	13pF_50V	C0402
17	4	C497,C500,C504,C508	10uF, 25V	C0805
18	4	C499,C502,C506,C510	1uF, 50V	C0805
19	1	D2	B320-13-F	DO-SMC
20	10	D4,D5,D6,D7,D8,D9,D10,D11,D12,D13	SP0201B-ULC-01UTG	TVS-0201DFN
21	2	D15,D22	green	LED-0603
22	2	D16,D17	150141M173100	SFTW_3528_150141M173100
23	1	D20	Red	LED-0603
24	4	FB1,FB2,FB3,FB4	MPZ2012S601A	L0805

25	11	JU1,JU2,JU3,JU4,JU5,JU6,JU7,JU8,JU9,JU10,JU11	Shunt	Jumper
26	1	J1	FTPC24-FBR-1S-AB1	USB-TYPEC-FTPC24-FBR
27	1	J2	PJ-037BH-SMT	DC-PJ-037BH-SMT
28	5	J3,J8,J9,J10,J11	2X3_2_54MM_PIN_HEADER	SIP2-2.54
29	2	J4,J13	2X1_2_54MM_PIN_HEADER	CON2X2-2.54A
30	3	J5,J6,J7	2X2_2_54MM_PIN_HEADER	CON3X2-2.54A
31	1	J12	J21194-U414330A1	USB-TYPEC-FTPC16-FBR
32	3	J14,J15,J16	3X1_2_54MM_PIN_HEADER	SIP3-2.54
33	1	J18	6X1_2_54MM_PIN_HEADER	SIP6-2.54
34	1	L1	BLM21PG121SN1D	L0805
35	4	L6,L7,L8,L9	220 ohm	L0402
36	2	L10,L11	33 ohm @ 100MHz	L0402
37	3	L12,L13,L14	600 ohm	L0402
38	1	L20	MPL-AL5030-1R5	L252012-GSLQ252012MP
39	3	P1,P2,P3	QSE-020-01-F-D-A	CON20X2-QSE02001XXXDA-2HOLD
40	8	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q18	MMBT3904T-7-F	SOT523-EBC
41	4	R1,R2,R40,R41	5.1K, 5%	R0402
42	7	R3,R11,R42,R52,R56,R97,R167	100K, 5%	R0402
43	1	R4	20, 1%	R0402
44	66	R5,R9,R12,R13,R14,R15,R16,R17,R18,R19,R20,R21,R22,R23,R24, R25,R26,R27,R28,R29,R30,R31,R32,R36,R37,R38,R44,R45,R46, R47,R53,R55,R58,R59,R63,R66,R67,R68,R69,R70,R71,R72,R73, R76,R77,R78,R81,R82,R83,R84,R85,R89,R90,R91,R93,R94,R95, R96,R98,R105,R106,R107,R108,R110,R112,R164	10K,0.1%	R0402
45	2	R6,R8	1M, 5%	R0402
46	3	R7,R60,R65	24k, 1%	R0402
47	1	R10	2.55K, 1%	R0402
48	4	R33,R34,R99,R100	10R, 5%	R0402
49	1	R35	12K 5%	R0402
50	1	R39	2.2K, 5%	R0402
51	7	R43,R92,R158	220, 5%	R0402
52	5	R48,R49,R50,R51,R54	56K, 5%	R0402
53	6	R57,R64,R74,R75,R79,R80	47K, 5%	R0402
54	2	R61,R62	1K, 5%	R0402
55	3	R86,R87,R88	33, 5%	R0402

56	1	R101	200 Ohm / 1%	R0402
57	1	R102	6.04K / 1%	R0402
58	2	R103,R104	2K	R0402
59	1	R113	7.68K, 1%	R0402
60	1	R114	40.2K, 1%	R0402
61	1	R291	200K, 10%	3362P-1-204LF
62	1	R296	60.4k, 1%	R0402
63	1	R299	30.1k, 1%	R0402
64	1	R303	13.3k, 1%	R0402
65	1	SD1	SD card	SD-FG-MCD-111643
66	6	SW1,SW3,SW5,SW6,SW7,SW8	PTS810SJG250SMTRLFS	SW-4.2X3.2-PTS810
67	1	SW2	DSHP02TSGER	SW-SMD4-1.27-DSHP
68	1	SW4	OS102011MS2QN1	SW-3P-SPDT-OS102011MS2QN1
69	4	TP1,TP2,TP3,TP4	5191TR	test point
70	1	U1	PI3USB302-A	TQFN20-4.5X2.5-.5TH3X1
71	1	U2	MP2233	TSOT23
72	1	U3	ADM7172ACPZ-R7	DFN8-3X3-.5TH2.4X1.6
73	1	U5	Ti60F225ES	BGA225-1010-.65-SOCKET
74	1	U8	FT4232H-56Q	QFN56-0808-.5TH5.9
75	1	U9	93LC56BT-I/OT	SOT23-6
76	2	U10,U18	W25Q64JWSSIQ	SO8-6-1.27
77	2	U12,U13	SN74AXC4T774PW	tssop16-065-5_1x4_5x1_2mm
78	1	U14	W958D6NW	WLCSP30
79	1	U16	CYUSB3014-BZXC	BGA121-1010-.8
80	1	U17	M24M02-DRMN6TP	SO8-6-1.27
81	1	U19	APX803S00-23SA-7	SOT-23-3
82	4	U23,U24,U25,U26	LTM4625	BGA25
83	1	X2	DSC1001DL2-025.0000	CRY-2520-4P
84	1	X3	DSC1001DL2-033.3333	CRY-2520-4P
85	1	X4	DSC1001DL2-074.2500	CRY-2520-4P
86	1	Y1	19.2 MHz	CRY-3225-4P
87	1	Y2	12 MHz	CRY-3225-4P

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