ALTERA Cyclone V SoC Development & Education Board (DE10-Standard)

Title: **DE10-Standard Board**

Size	Document Number	Rev
B	Cover Page	B

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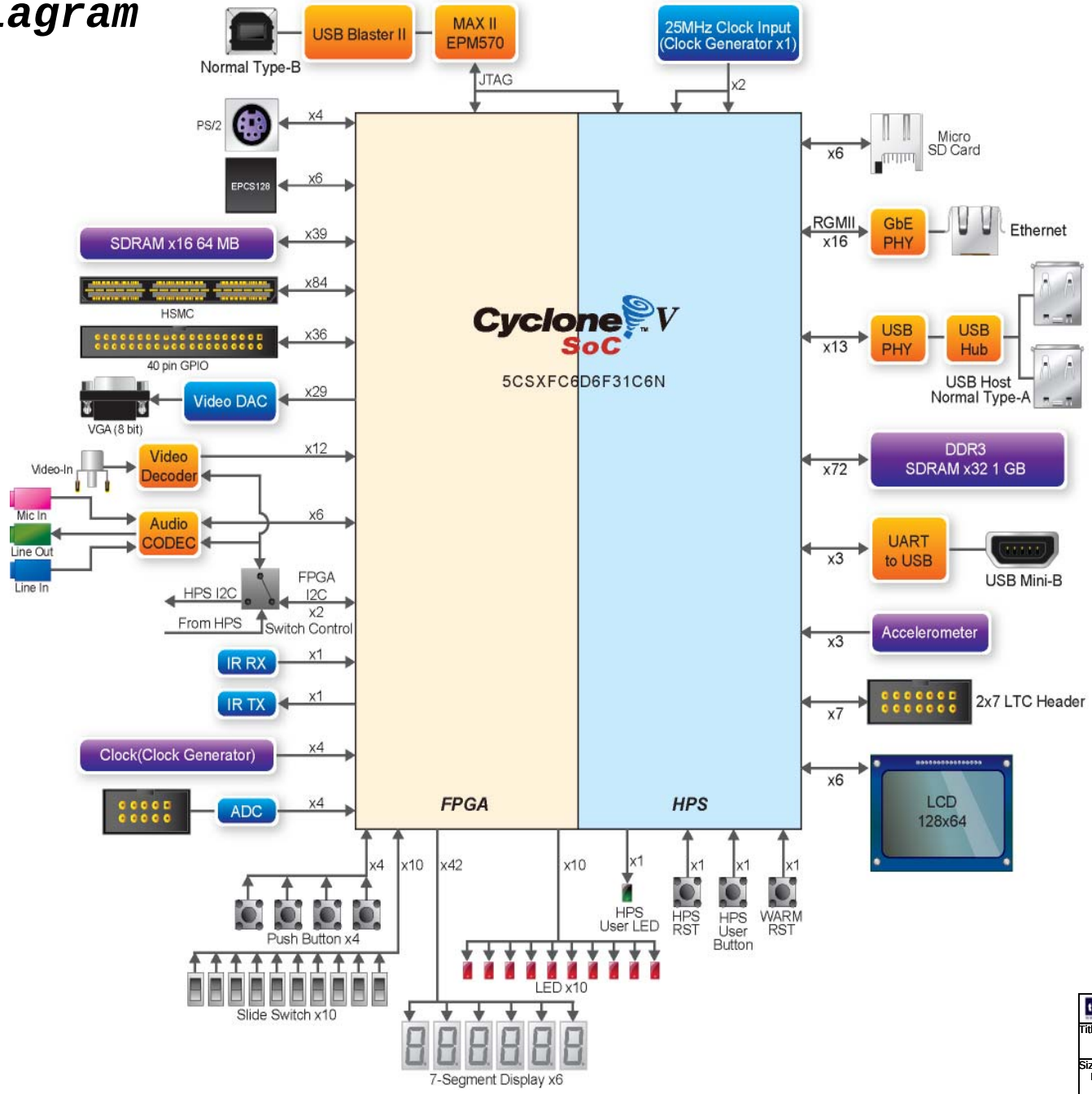
Block Diagram



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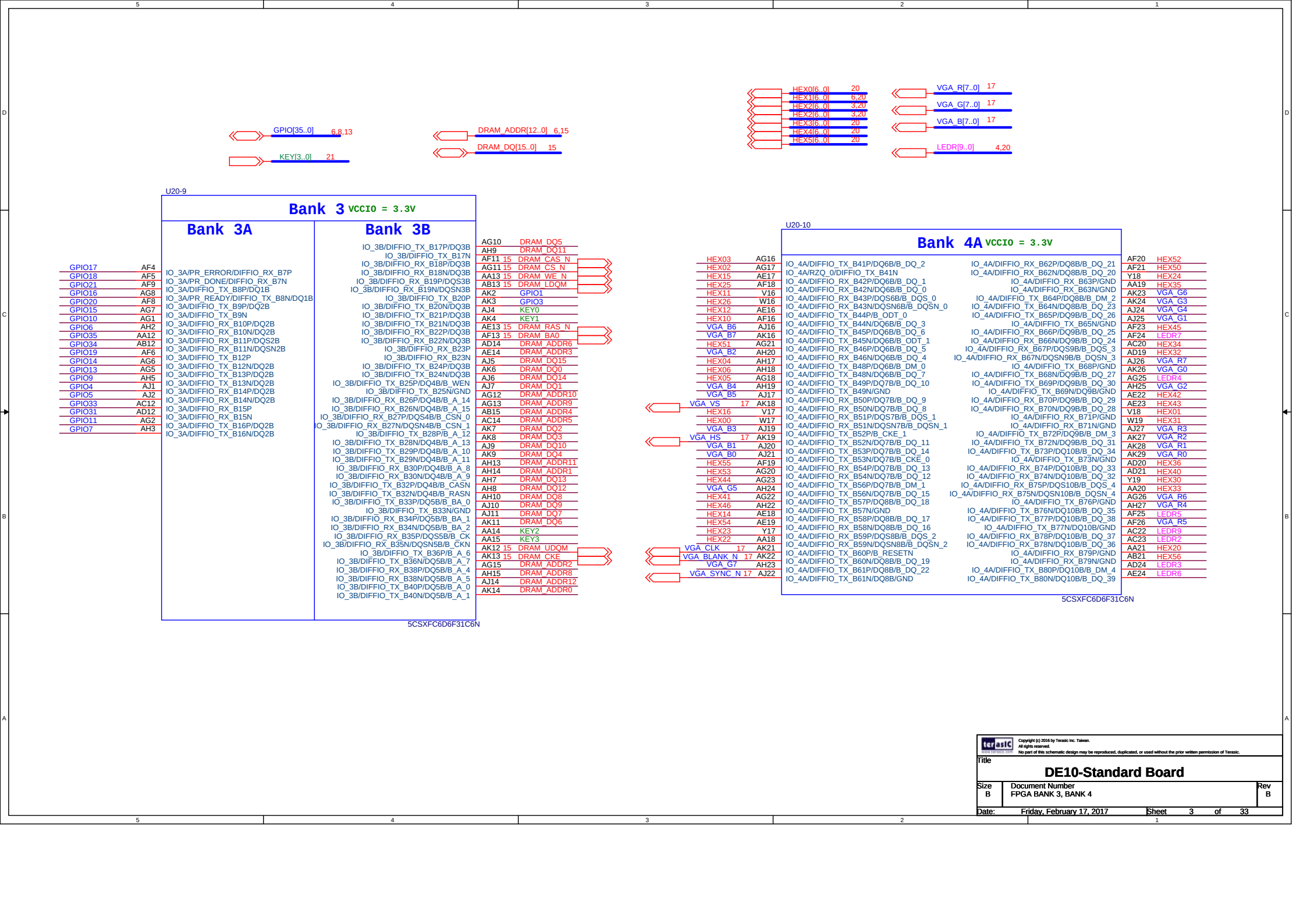
GPIO[35..0] 6,8,13
KEY[3..0] 21
DRAM_ADDR[12..0] 6,15
DRAM_DQ[15..0] 15
HEX0[6..0] 20
HEX1[6..0] 6,20
HEX2[6..0] 3,20
HEX3[6..0] 20
HEX4[6..0] 20
HEX5[6..0] 20
VGA_R[7..0] 17
VGA_G[7..0] 17
VGA_B[7..0] 17
LEDR[9..0] 4,20
U20-9
Bank 3 VCCIO = 3.3V
Bank 3A
Bank 3B
GPIO17 AF4
GPIO18 AF5
GPIO21 AF9
GPIO16 AG8
GPIO20 AF8
GPIO15 AG7
GPIO10 AG1
GPIO6 AH2
GPIO35 AA12
GPIO34 AB12
GPIO19 AF6
GPIO14 AG6
GPIO13 AG5
GPIO9 AH5
GPIO4 AJ1
GPIO5 AJ2
GPIO33 AC12
GPIO31 AD12
GPIO11 AG2
GPIO7 AH3
IO_3A/PR_ERROR/DIFFIO_RX_B7P
IO_3A/PR_DONE/DIFFIO_RX_B7N
IO_3A/DIFFIO_TX_B8P/DQ1B
IO_3A/PR_READY/DIFFIO_TX_B8N/DQ1B
IO_3A/DIFFIO_TX_B9P/DQ2B
IO_3A/DIFFIO_TX_B9N
IO_3A/DIFFIO_RX_B10P/DQ2B
IO_3A/DIFFIO_RX_B10N/DQ2B
IO_3A/DIFFIO_RX_B11P/DQS2B
IO_3A/DIFFIO_RX_B11N/DQSN2B
IO_3A/DIFFIO_TX_B12P
IO_3A/DIFFIO_TX_B12N/DQ2B
IO_3A/DIFFIO_TX_B13P/DQ2B
IO_3A/DIFFIO_TX_B13N/DQ2B
IO_3A/DIFFIO_RX_B14P/DQ2B
IO_3A/DIFFIO_RX_B14N/DQ2B
IO_3A/DIFFIO_RX_B15P
IO_3A/DIFFIO_RX_B15N
IO_3A/DIFFIO_TX_B16P/DQ2B
IO_3A/DIFFIO_TX_B16N/DQ2B
IO_3B/DIFFIO_TX_B17P/DQ3B
IO_3B/DIFFIO_TX_B17N
IO_3B/DIFFIO_RX_B18P/DQ3B
IO_3B/DIFFIO_RX_B18N/DQ3B
IO_3B/DIFFIO_RX_B19P/DQS3B
IO_3B/DIFFIO_RX_B19N/DQSN3B
IO_3B/DIFFIO_TX_B20P
IO_3B/DIFFIO_TX_B20N/DQ3B
IO_3B/DIFFIO_TX_B21P/DQ3B
IO_3B/DIFFIO_TX_B21N/DQ3B
IO_3B/DIFFIO_RX_B22P/DQ3B
IO_3B/DIFFIO_RX_B22N/DQ3B
IO_3B/DIFFIO_RX_B23P
IO_3B/DIFFIO_RX_B23N
IO_3B/DIFFIO_TX_B24P/DQ3B
IO_3B/DIFFIO_TX_B24N/DQ3B
IO_3B/DIFFIO_TX_B25P/DQ4B/B_WEN
IO_3B/DIFFIO_TX_B25N/GND
IO_3B/DIFFIO_RX_B26P/DQ4B/B_A_14
IO_3B/DIFFIO_RX_B26N/DQ4B/B_A_15
IO_3B/DIFFIO_RX_B27P/DQS4B/B_CSN_0
IO_3B/DIFFIO_RX_B27N/DQSN4B/B_CSN_1
IO_3B/DIFFIO_TX_B28P/B_A_12
IO_3B/DIFFIO_TX_B28N/DQ4B/B_A_13
IO_3B/DIFFIO_TX_B29P/DQ4B/B_A_10
IO_3B/DIFFIO_TX_B29N/DQ4B/B_A_11
IO_3B/DIFFIO_RX_B30P/DQ4B/B_A_8
IO_3B/DIFFIO_RX_B30N/DQ4B/B_A_9
IO_3B/DIFFIO_TX_B32P/DQ4B/B_CASN
IO_3B/DIFFIO_TX_B32N/DQ4B/B_RASN
IO_3B/DIFFIO_TX_B33P/DQ5B/B_BA_0
IO_3B/DIFFIO_TX_B33N/GND
IO_3B/DIFFIO_RX_B34P/DQ5B/B_BA_1
IO_3B/DIFFIO_RX_B34N/DQ5B/B_BA_2
IO_3B/DIFFIO_RX_B35P/DQS5B/B_CK
IO_3B/DIFFIO_RX_B35N/DQSN5B/B_CKN
IO_3B/DIFFIO_TX_B36P/B_A_6
IO_3B/DIFFIO_TX_B36N/DQ5B/B_A_7
IO_3B/DIFFIO_RX_B38P/DQ5B/B_A_4
IO_3B/DIFFIO_RX_B38N/DQ5B/B_A_5
IO_3B/DIFFIO_TX_B40P/DQ5B/B_A_0
IO_3B/DIFFIO_TX_B40N/DQ5B/B_A_1
AG10 DRAM_DQ5
AH9 DRAM_DQ11
AF11 15 DRAM_CAS_N
AG11 15 DRAM_CS_N
AA13 15 DRAM_WE_N
AB13 15 DRAM_LDQM
AK2 GPIO1
AK3 GPIO3
AJ4 KEY0
AK4 KEY1
AE13 15 DRAM_RAS_N
AF13 15 DRAM_BA0
AD14 DRAM_ADDR6
AE14 DRAM_ADDR3
AJ5 DRAM_DQ15
AK6 DRAM_DQ0
AJ6 DRAM_DQ14
AJ7 DRAM_DQ1
AG12 DRAM_ADDR10
AG13 DRAM_ADDR9
AB15 DRAM_ADDR4
AC14 DRAM_ADDR5
AK7 DRAM_DQ2
AK8 DRAM_DQ3
AJ9 DRAM_DQ10
AK9 DRAM_DQ4
AH13 DRAM_ADDR11
AH14 DRAM_ADDR1
AH7 DRAM_DQ13
AH8 DRAM_DQ12
AH10 DRAM_DQ8
AJ10 DRAM_DQ9
AJ11 DRAM_DQ7
AK11 DRAM_DQ6
AA14 KEY2
AA15 KEY3
AK12 15 DRAM_UDQM
AK13 15 DRAM_CKE
AG15 DRAM_ADDR2
AH15 DRAM_ADDR8
AJ14 DRAM_ADDR12
AK14 DRAM_ADDR0
5CSXFC6D6F31C6N
U20-10
Bank 4A VCCIO = 3.3V
HEX03 AG16
HEX02 AG17
HEX15 AE17
HEX25 AF18
HEX11 V16
HEX26 W16
HEX12 AE16
HEX10 AF16
VGA_B6 AJ16
VGA_B7 AK16
HEX51 AG21
VGA_B2 AH20
HEX04 AH17
HEX06 AH18
HEX05 AG18
VGA_B4 AH19
VGA_B5 AJ17
VGA_VS 17 AK18
HEX16 V17
HEX00 W17
VGA_B3 AJ19
VGA_HS 17 AK19
VGA_B1 AJ20
VGA_B0 AJ21
HEX55 AF19
HEX53 AG20
HEX44 AG23
VGA_G5 AH24
HEX41 AG22
HEX46 AH22
HEX14 AE18
HEX54 AE19
HEX23 Y17
HEX22 AA18
VGA_CLK 17 AK21
VGA_BLANK_N 17 AK22
VGA_G7 AH23
VGA_SYNC_N 17 AJ22
IO_4A/DIFFIO_TX_B41P/DQ6B/B_DQ_2
IO_4A/RZQ_0/DIFFIO_TX_B41N
IO_4A/DIFFIO_RX_B42P/DQ6B/B_DQ_1
IO_4A/DIFFIO_RX_B42N/DQ6B/B_DQ_0
IO_4A/DIFFIO_RX_B43P/DQS6B/B_DQS_0
IO_4A/DIFFIO_RX_B43N/DQSN6B/B_DQSN_0
IO_4A/DIFFIO_TX_B44P/B_ODT_0
IO_4A/DIFFIO_TX_B44N/DQ6B/B_DQ_3
IO_4A/DIFFIO_TX_B45P/DQ6B/B_DQ_6
IO_4A/DIFFIO_TX_B45N/DQ6B/B_ODT_1
IO_4A/DIFFIO_RX_B46P/DQ6B/B_DQ_5
IO_4A/DIFFIO_RX_B46N/DQ6B/B_DQ_4
IO_4A/DIFFIO_TX_B48P/DQ6B/B_DM_0
IO_4A/DIFFIO_TX_B48N/DQ6B/B_DQ_7
IO_4A/DIFFIO_TX_B49P/DQ7B/B_DQ_10
IO_4A/DIFFIO_TX_B49N/GND
IO_4A/DIFFIO_TX_B50P/DQ7B/B_DQ_9
IO_4A/DIFFIO_TX_B50N/DQ7B/B_DQ_8
IO_4A/DIFFIO_RX_B51P/DQS7B/B_DQS_1
IO_4A/DIFFIO_RX_B51N/DQSN7B/B_DQSN_1
IO_4A/DIFFIO_TX_B52P/B_CKE_1
IO_4A/DIFFIO_TX_B52N/DQ7B/B_DQ_11
IO_4A/DIFFIO_TX_B53P/DQ7B/B_DQ_14
IO_4A/DIFFIO_TX_B53N/DQ7B/B_CKE_0
IO_4A/DIFFIO_RX_B54P/DQ7B/B_DQ_13
IO_4A/DIFFIO_RX_B54N/DQ7B/B_DQ_12
IO_4A/DIFFIO_TX_B56P/DQ7B/B_DM_1
IO_4A/DIFFIO_TX_B56N/DQ7B/B_DQ_15
IO_4A/DIFFIO_TX_B57P/DQ8B/B_DQ_18
IO_4A/DIFFIO_TX_B57N/GND
IO_4A/DIFFIO_RX_B58P/DQ8B/B_DQ_17
IO_4A/DIFFIO_RX_B58N/DQ8B/B_DQ_16
IO_4A/DIFFIO_RX_B59P/DQS8B/B_DQS_2
IO_4A/DIFFIO_RX_B59N/DQSN8B/B_DQSN_2
IO_4A/DIFFIO_TX_B60P/B_RESETN
IO_4A/DIFFIO_TX_B60N/DQ8B/B_DQ_19
IO_4A/DIFFIO_TX_B61P/DQ8B/B_DQ_22
IO_4A/DIFFIO_TX_B61N/DQ8B/GND
IO_4A/DIFFIO_RX_B62P/DQ8B/B_DQ_21
IO_4A/DIFFIO_RX_B62N/DQ8B/B_DQ_20
IO_4A/DIFFIO_RX_B63P/GND
IO_4A/DIFFIO_RX_B63N/GND
IO_4A/DIFFIO_TX_B64P/DQ8B/B_DM_2
IO_4A/DIFFIO_TX_B64N/DQ8B/B_DQ_23
IO_4A/DIFFIO_TX_B65P/DQ9B/B_DQ_26
IO_4A/DIFFIO_TX_B65N/GND
IO_4A/DIFFIO_RX_B66P/DQ9B/B_DQ_25
IO_4A/DIFFIO_RX_B66N/DQ9B/B_DQ_24
IO_4A/DIFFIO_RX_B67P/DQS9B/B_DQS_3
IO_4A/DIFFIO_RX_B67N/DQSN9B/B_DQSN_3
IO_4A/DIFFIO_TX_B68P/GND
IO_4A/DIFFIO_TX_B68N/DQ9B/B_DQ_27
IO_4A/DIFFIO_TX_B69P/DQ9B/B_DQ_30
IO_4A/DIFFIO_TX_B69N/DQ9B/GND
IO_4A/DIFFIO_RX_B70P/DQ9B/B_DQ_29
IO_4A/DIFFIO_RX_B70N/DQ9B/B_DQ_28
IO_4A/DIFFIO_RX_B71P/GND
IO_4A/DIFFIO_RX_B71N/GND
IO_4A/DIFFIO_TX_B72P/DQ9B/B_DM_3
IO_4A/DIFFIO_TX_B72N/DQ9B/B_DQ_31
IO_4A/DIFFIO_TX_B73P/DQ10B/B_DQ_34
IO_4A/DIFFIO_TX_B73N/GND
IO_4A/DIFFIO_RX_B74P/DQ10B/B_DQ_33
IO_4A/DIFFIO_RX_B74N/DQ10B/B_DQ_32
IO_4A/DIFFIO_RX_B75P/DQS10B/B_DQS_4
IO_4A/DIFFIO_RX_B75N/DQSN10B/B_DQSN_4
IO_4A/DIFFIO_TX_B76P/GND
IO_4A/DIFFIO_TX_B76N/DQ10B/B_DQ_35
IO_4A/DIFFIO_TX_B77P/DQ10B/B_DQ_38
IO_4A/DIFFIO_TX_B77N/DQ10B/GND
IO_4A/DIFFIO_RX_B78P/DQ10B/B_DQ_37
IO_4A/DIFFIO_RX_B78N/DQ10B/B_DQ_36
IO_4A/DIFFIO_RX_B79P/GND
IO_4A/DIFFIO_RX_B79N/GND
IO_4A/DIFFIO_TX_B80P/DQ10B/B_DM_4
IO_4A/DIFFIO_TX_B80N/DQ10B/B_DQ_39
AF20 HEX52
AF21 HEX50
Y18 HEX24
AA19 HEX35
AK23 VGA_G6
AK24 VGA_G3
AJ24 VGA_G4
AJ25 VGA_G1
AF23 HEX45
AF24 LEDR7
AC20 HEX34
AD19 HEX32
AJ26 VGA_R7
AK26 VGA_G0
AG25 LEDR4
AH25 VGA_G2
AE22 HEX42
AE23 HEX43
V18 HEX01
W19 HEX31
AJ27 VGA_R3
AK27 VGA_R2
AK28 VGA_R1
AK29 VGA_R0
AD20 HEX36
AD21 HEX40
Y19 HEX30
AA20 HEX33
AG26 VGA_R6
AH27 VGA_R4
AF25 LEDR5
AF26 VGA_R5
AC22 LEDR9
AC23 LEDR2
AA21 HEX20
AB21 HEX56
AD24 LEDR3
AE24 LEDR6
5CSXFC6D6F31C6N
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Title
DE10-Standard Board
Size B
Document Number
FPGA BANK 3, BANK 4
Rev B
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TD_DATA[7..0] 8,18
SW[9..0] 6,21
LEDR[9..0] 3,20

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Bank 5

Bank 5A
VCCIO = 3.3V

TD_DATA0	AG27	IO_5A/RZQ_1/DIFFIO_TX_R1P/DQ1R	
TD_HS 18	AH28	IO_5A/PR_REQUEST/DIFFIO_TX_R1N/DQ1R	
IRDA_RXD 22	W20	IO_5A/DIFFIO_RX_R4P/DQ1R	
ADC_CONVST 22	Y21	IO_5A/DIFFIO_RX_R4N/DQ1R	
AUD_ADCLRCK 19	AH29	IO_5A/CVP_CONFDONE/DIFFIO_TX_R3N/DQ1R	
IRDA_TXD 22	W21	IO_5A/DIFFIO_RX_R6P/DQS1R	
ADC_DIN 22	W22	IO_5A/DIFFIO_RX_R6N/DQSN1R	
PS2_DAT 22	AA25	IO_5A/DIFFIO_TX_R7P/DQ1R	
PS2_DAT2 22	AB26	IO_5A/DIFFIO_TX_R7N	
LEDR8	AB22	IO_5A/DIFFIO_RX_R8P/DQ1R	
LEDR1	AB23	IO_5A/DIFFIO_RX_R8N/DQ1R	
LEDR0	AA24	IO_5A/DIFFIO_RX_R9P	
PS2_CLK 22	AB25	IO_5A/DIFFIO_RX_R9N	
TD_DATA3	AE27	IO_5A/DIFFIO_TX_R10P/DQ2R	
TD_DATA2	AE28	IO_5A/DIFFIO_TX_R10N/DQ2R	
FPGA_I2C_SDAT 27	Y23	IO_5A/DIFFIO_RX_R11P/DQ2R	
FPGA_I2C_SCLK 27	Y24	IO_5A/DIFFIO_RX_R11N/DQ2R	
TD_VS 18	AG28	IO_5A/DIFFIO_TX_R12P/DQ2R	
TD_DATA1	AF28	IO_5A/DIFFIO_TX_R12N/DQ2R	
ADC_DOUT 22	V23	IO_5A/DIFFIO_RX_R13P/DQS2R	
ADC_SCLK 22	W24	IO_5A/DIFFIO_RX_R13N/DQSN2R	
AUD_DACDAT 19	AF29	IO_5A/DIFFIO_TX_R14P	
AUD_BCLK 19	AF30	IO_5A/DIFFIO_TX_R14N/DQ2R	
TD_DATA6	AD26	IO_5A/DIFFIO_RX_R15P/DQ2R	
TD_RESET_N 18	AC27	IO_5A/DIFFIO_RX_R15N/DQ2R	
AUD_XCK 19	AH30	IO_5A/DIFFIO_TX_R16P/DQ2R	
AUD_DACLRCK 19	AG30	IO_5A/DIFFIO_TX_R16N	

Bank 5B
VCCIO = HSMC_VCCIO

IO_5B/DIFFIO_RX_R17P	W25	SW4	
IO_5B/DIFFIO_RX_R17N	V25	SW5	
IO_5B/DIFFIO_TX_R18P/DQ3R	AC28	SW6	
IO_5B/DIFFIO_TX_R18N/DQ3R	AC29	SW8	
IO_5B/DIFFIO_RX_R19P/DQ3R	AB30	SW0	
IO_5B/DIFFIO_RX_R19N/DQ3R	AA30	SW9	
IO_5B/DIFFIO_TX_R20P/DQ3R	AB28	SW2	
IO_5B/DIFFIO_TX_R20N/DQ3R	AA28	HSMC_SCL	14
IO_5B/DIFFIO_TX_R24P/DQ3R	AD30	SW7	
IO_5B/RZQ_2/DIFFIO_TX_R24N	AC30	SW3	

5CSXFC6D6F31C6N

HPS_DDR3_ADDR[14..0] 16
HPS_DDR3_BA[2..0] 16
HPS_DDR3_DM[3..0] 16
HPS_DDR3_DQ[31..0] 16
HPS_DDR3_DQS_P[3..0] 16
HPS_DDR3_DQS_N[3..0] 16

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Bank 6

Bank 6B
VCCIO = 1.5V

	Y29	HPS_DDR/HPS_DQ_39	HPS_GPI13	Y28	
	V27	HPS_DDR/HPS_DQ_38	HPS_GPI12	V29	
	U25	HPS_DDR/HPS_DQ_37	HPS_GPI11	U20	
	T25	HPS_DDR/HPS_DQ_36	HPS_GPI10	T21	
	V28	HPS_DDR/HPS_DQ_35	HPS_GPI9	U28	
	U27	HPS_DDR/HPS_DQ_34	HPS_GPI8	T30	
	R24	HPS_DDR/HPS_DQ_33	HPS_GPI7	V20	
	W26	HPS_DDR/HPS_DQ_32	HPS_GPI6	P22	
	W27	HPS_DDR/HPS_DM_4	HPS_GPI5	P29	
	T24	HPS_DDR/HPS_DQS_4	HPS_GPI4	N30	
	T23	HPS_DDR/HPS_DQSN_4			
HPS_DDR3_DQ31	W29	HPS_DDR/HPS_DQ_31	HPS_DDR/HPS_DQ_23	R29	HPS_DDR3_DQ23
HPS_DDR3_DQ30	V30	HPS_DDR/HPS_DQ_30	HPS_DDR/HPS_DQ_22	N27	HPS_DDR3_DQ22
HPS_DDR3_DQ29	R26	HPS_DDR/HPS_DQ_29	HPS_DDR/HPS_DQ_21	P27	HPS_DDR3_DQ21
HPS_DDR3_DQ28	R27	HPS_DDR/HPS_DQ_28	HPS_DDR/HPS_DQ_20	P26	HPS_DDR3_DQ20
HPS_DDR3_DQ27	T28	HPS_DDR/HPS_DQ_27	HPS_DDR/HPS_DQ_19	N28	HPS_DDR3_DQ19
HPS_DDR3_DQ26	T29	HPS_DDR/HPS_DQ_26	HPS_DDR/HPS_DQ_18	N29	HPS_DDR3_DQ18
HPS_DDR3_DQ25	P25	HPS_DDR/HPS_DQ_25	HPS_DDR/HPS_DQ_17	T26	HPS_DDR3_DQ17
HPS_DDR3_DQ24	P24	HPS_DDR/HPS_DQ_24	HPS_DDR/HPS_DQ_16	U26	HPS_DDR3_DQ16
HPS_DDR3_DM3	W30	HPS_DDR/HPS_DM_3	HPS_DDR/HPS_DM_2	R28	HPS_DDR3_DM2
HPS_DDR3_DQS_P3	R22	HPS_DDR/HPS_DQS_3	HPS_DDR/HPS_DQS_2	R19	HPS_DDR3_DQS_P2
HPS_DDR3_DQS_N3	R21	HPS_DDR/HPS_DQSN_3	HPS_DDR/HPS_DQSN_2	R18	HPS_DDR3_DQS_N2
HPS_DDR3_RESET_N 16	P30	HPS_DDR/HPS_RESETN			

Bank 6A
VCCIO = 1.5V

	G25	HPS_DDR/HPS_A_15	HPS_GPI3	M22	
HPS_DDR3_ADDR14	H25	HPS_DDR/HPS_A_14	HPS_GPI2	N23	
HPS_DDR3_ADDR13	C29	HPS_DDR/HPS_A_13	HPS_GPI1	J26	
HPS_DDR3_ADDR12	B30	HPS_DDR/HPS_A_12	HPS_GPI0	M25	
HPS_DDR3_ADDR11	C30	HPS_DDR/HPS_A_11		M30	HPS_DDR3_DQ15
HPS_DDR3_ADDR10	D29	HPS_DDR/HPS_A_10	HPS_DDR/HPS_DQ_15	L28	HPS_DDR3_DQ14
HPS_DDR3_ADDR9	G26	HPS_DDR/HPS_A_9	HPS_DDR/HPS_DQ_14	M27	HPS_DDR3_DQ13
HPS_DDR3_ADDR8	H27	HPS_DDR/HPS_A_8	HPS_DDR/HPS_DQ_13	M26	HPS_DDR3_DQ12
HPS_DDR3_ADDR7	E28	HPS_DDR/HPS_A_7	HPS_DDR/HPS_DQ_12	K27	HPS_DDR3_DQ11
HPS_DDR3_ADDR6	F29	HPS_DDR/HPS_A_6	HPS_DDR/HPS_DQ_11	K29	HPS_DDR3_DQ10
HPS_DDR3_ADDR5	J27	HPS_DDR/HPS_A_5	HPS_DDR/HPS_DQ_10	L26	HPS_DDR3_DQ9
HPS_DDR3_ADDR4	J25	HPS_DDR/HPS_A_4	HPS_DDR/HPS_DQ_9	K26	HPS_DDR3_DQ8
HPS_DDR3_ADDR3	F30	HPS_DDR/HPS_A_3	HPS_DDR/HPS_DQ_8	M28	HPS_DDR3_DM1
HPS_DDR3_ADDR2	F28	HPS_DDR/HPS_A_2	HPS_DDR/HPS_DM_1	N25	HPS_DDR3_DQS_P1
HPS_DDR3_ADDR1	G30	HPS_DDR/HPS_A_1	HPS_DDR/HPS_DQS_1	N24	HPS_DDR3_DQS_N1
HPS_DDR3_ADDR0	F26	HPS_DDR/HPS_A_0	HPS_DDR/HPS_DQSN_1		
HPS_DDR3_CK_P 16	M23	HPS_DDR/HPS_CK	HPS_DDR/HPS_DQ_7	J29	HPS_DDR3_DQ7
HPS_DDR3_CK_N 16	L23	HPS_DDR/HPS_CKN	HPS_DDR/HPS_DQ_6	J30	HPS_DDR3_DQ6
			HPS_DDR/HPS_DQ_5	L24	HPS_DDR3_DQ5
HPS_DDR3_CAS_N 16	E27	HPS_DDR/HPS_CASN	HPS_DDR/HPS_DQ_4	L25	HPS_DDR3_DQ4
HPS_DDR3_RAS_N 16	D30	HPS_DDR/HPS_RASN	HPS_DDR/HPS_DQ_3	G28	HPS_DDR3_DQ3
			HPS_DDR/HPS_DQ_2	H30	HPS_DDR3_DQ2
HPS_DDR3_BA2	J23	HPS_DDR/HPS_BA_2	HPS_DDR/HPS_DQ_1	K22	HPS_DDR3_DQ1
HPS_DDR3_BA1	J24	HPS_DDR/HPS_BA_1	HPS_DDR/HPS_DQ_0	K23	HPS_DDR3_DQ0
HPS_DDR3_BA0	E29	HPS_DDR/HPS_BA_0	HPS_DDR/HPS_DM_0	K28	HPS_DDR3_DM0
			HPS_DDR/HPS_DQS_0	N18	HPS_DDR3_DQS_P0
HPS_DDR3_CS_N 16	H24	HPS_DDR/HPS_CSN_0	HPS_DDR/HPS_DQSN_0	M19	HPS_DDR3_DQS_N0
	K21	HPS_DDR/HPS_CSN_1			
			HPS_DDR/HPS_ODT_0	H28 16	HPS_DDR3_ODT
HPS_DDR3_WE_N 16	C28	HPS_DDR/HPS_WEN	HPS_DDR/HPS_ODT_1	H29	
R283 100 HPS_DDR3_RZQ	D27	HPS_RZQ_0		L29 16	HPS_DDR3_CKE
			HPS_DDR/HPS_CKE_0	L30	
			HPS_DDR/HPS_CKE_1		

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Title: **DE10-Standard Board**

Size	Document Number	Rev
B	FPGA BANK 5, BANK 6	B

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HPS_ENET_RX_DATA[3..0] 24
HPS_ENET_TX_DATA[3..0] 24
HPS_FLASH_DATA[3..0] 15
HPS_USB_DATA[7..0] 23

HSMC_RX_D_P[16..0] 14
HSMC_RX_D_N[16..0] 14
HSMC_D[3..0] 14
HSMC_CLKOUT_N[2..1] 6,14
HSMC_CLKOUT_P[2..1] 6,14
HSMC_TX_D_P[16..0] 14
HSMC_TX_D_N[16..0] 14

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Bank 7

Bank 7A
VCCIO = 3.3V

HPS_CLK_25 6
HPS_WARM_RST_N C27 11,12,27
HPS_RESET_N 11,27 F23
HPS_CLOCK1_25 D25
HPS_CLOCK2_25 F25
HPS_CLK_25
JTAG_TRST 11,12
VCC3P3
R290 4.7K A28
R282 4.7K F24
HPS_TDO 12 B28
HPS_TDI 12 B27
HPS_TCK 12 H22
HPS_TMS 12 A29

HPS_NRST
HPS_NPOR
HPS_CLK1
HPS_CLK2
HPS_TRST
HPS_PORSEL
HPS_TDO
HPS_TDI
HPS_TCK
HPS_TMS

CAN0_TX,CLKSEL0/CAN0_TX/UART0_TX/SPIM1_SS0/HPS_GPIO66
CAN0_RX/UART0_RX/SPIM1_MISO/HPS_GPIO65
I2C0_SCL/UART1_TX/SPIM1_MOSI/HPS_GPIO64
I2C0_SDA/UART1_RX/SPIM1_CLK/HPS_GPIO63
UART0_TX,CLKSEL1/UART0_TX/CAN0_TX/SPIM1_SS1/HPS_GPIO62
UART0_RX/CAN0_RX/SPIM0_SS1/HPS_GPIO61
SPIM0_SS0,BOOTSEL0/SPIM0_SS0/CAN1_TX/UART1_RTS/HPS_GPIO60
SPIM0_MISO/CAN1_RX/UART1_CTS/HPS_GPIO59
SPIM0_MOSI/I2C1_SCL/UART0_RTS/HPS_GPIO58
SPIM0_CLK/I2C1_SDA/UART0_CTS/HPS_GPIO57
TRACE_D7/SPIS1_MISO/I2C0_SCL/HPS_GPIO56
TRACE_D6/SPIS1_SS0/I2C0_SDA/HPS_GPIO55
TRACE_D5/SPIS1_MOSI/CAN1_TX/HPS_GPIO54
TRACE_D4/SPIS1_CLK/CAN1_RX/HPS_GPIO53
TRACE_D3/SPIS0_SS0/I2C1_SCL/HPS_GPIO52
TRACE_D2/SPIS0_MISO/I2C1_SDA/HPS_GPIO51
TRACE_D1/SPIS0_MOSI/UART0_TX/HPS_GPIO50
TRACE_D0/SPIS0_CLK/UART0_RX/HPS_GPIO49
TRACE_CLK/HPS_GPIO48

D24 26 HPS_SPIM_SS
E24 26 HPS_SPIM_MISO
D22 26 HPS_SPIM_MOSI
C23 26 HPS_SPIM_CLK
G22 HPS_CLOCKSEL1
B22 26 HPS_GSENSOR_INT
H20 HPS_LCM_SPIM_SS 28
B23
C22 HPS_LCM_SPIM_MOSI 28
A23 HPS_LCM_SPIM_CLK 28
E23 26,27 HPS_I2C1_SCLK
C24 26,27 HPS_I2C1_SDAT
G21 27 HPS_KEY
A24 27 HPS_LED
H23 26 HPS_I2C2_SCLK
A25 26 HPS_I2C2_SDAT
C25 25 HPS_UART_TX
B25 25 HPS_UART_RX
B26 27 HPS_I2C_CONTROL

Bank 7B
VCCIO = 3.3V

HPS_ENET_GTX_CLK 24 H19
HPS_ENET_TX_DATA0 F20
HPS_ENET_TX_DATA1 J19
HPS_ENET_TX_DATA2 F21
HPS_ENET_TX_DATA3 F19
HPS_ENET_RX_DATA0 A21
HPS_ENET_MDIO 24 E21
HPS_ENET_MDC 24 B21
HPS_ENET_RX_DV 24 K17
HPS_ENET_TX_EN 24 A20
HPS_ENET_RX_CLK 24 G20
HPS_ENET_RX_DATA1 B20
HPS_ENET_RX_DATA2 B18
HPS_ENET_RX_DATA3 D21
HPS_BOOTSEL2 D20

NAND_ALE/RGMII1_TX_CLK/QSPI_SS3/HPS_GPIO14
NAND_CE/RGMII1_TXD0/USB1_D0/HPS_GPIO15
NAND_CLE/RGMII1_TXD1/USB1_D1/HPS_GPIO16
NAND_RE/RGMII1_TXD2/USB1_D2/HPS_GPIO17
NAND_RB/RGMII1_TXD3/USB1_D3/HPS_GPIO18
NAND_DQ0/RGMII1_RXD0/HPS_GPIO19
NAND_DQ1/RGMII1_MDIO/I2C3_SDA/HPS_GPIO20
NAND_DQ2/RGMII1_MDC/I2C3_SCL/HPS_GPIO21
NAND_DQ3/RGMII1_RX_CTL/USB1_D4/HPS_GPIO22
NAND_DQ4/RGMII1_TX_CTL/USB1_D5/HPS_GPIO23
NAND_DQ5/RGMII1_RX_CLK/USB1_D6/HPS_GPIO24
NAND_DQ6/RGMII1_RXD1/USB1_D7/HPS_GPIO25
NAND_DQ7/RGMII1_RXD2/HPS_GPIO26
NAND_WP/RGMII1_RXD3/QSPI_SS2/HPS_GPIO27
NAND_WE,BOOTSEL2/NAND_WE/QSPI_SS1/HPS_GPIO28

QSPI_SS1/HPS_GPIO35
QSPI_CLK/HPS_GPIO34
QSPI_SS0,BOOTSEL1/QSPI_SS0/HPS_GPIO33
QSPI_IO3/USB1_NXT/HPS_GPIO32
QSPI_IO2/USB1_DIR/HPS_GPIO31
QSPI_IO1/USB1_STP/HPS_GPIO30
QSPI_IO0/USB1_CLK/HPS_GPIO29

C19 24 HPS_ENET_INT_N
D19 15 HPS_FLASH_DCLK
A18 15 HPS_FLASH_NCSO
E19 HPS_FLASH_DATA3
A19 HPS_FLASH_DATA2
H18 HPS_FLASH_DATA1
C20 HPS_FLASH_DATA0

Bank 7C
VCCIO = 3.3V

HPS_SD_CMD 25 F18
HPS_LCM_BK 28 B17
HPS_SD_DATA0 25 G18
HPS_SD_DATA1 25 C17
HPS_LTC_GPIO 26 H17
HPS_LCM_D_C 28 C18

SDMMC_CMD/USB0_D0/HPS_GPIO36
SDMMC_PWREN/USB0_D1/HPS_GPIO37
SDMMC_D0/USB0_D2/HPS_GPIO38
SDMMC_D1/USB0_D3/HPS_GPIO39
SDMMC_D4/USB0_D4/HPS_GPIO40
SDMMC_D5/USB0_D5/HPS_GPIO41

SDMMC_D3/USB0_NXT/HPS_GPIO47
SDMMC_D2/USB0_DIR/HPS_GPIO46
SDMMC_CCLK_OUT/USB0_STP/HPS_GPIO45
SDMMC_FB_CLK_IN/USB0_CLK/HPS_GPIO44
SDMMC_D7/USB0_D7/HPS_GPIO43
SDMMC_D6/USB0_D6/HPS_GPIO42

B16 25 HPS_SD_DATA3
D17 25 HPS_SD_DATA2
A16 25 HPS_SD_CLK
E17 28 HPS_LCM_RST_n
E18 R91 DNI 0 24,27 HPS_ENET_RESET_N
G17 R108 DNI 0 23 HPS_USB_RESET

Bank 7D
VCCIO = 3.3V

HPS_USB_DATA0 E16
HPS_USB_DATA1 G16
HPS_USB_DATA2 D16
HPS_USB_DATA3 D14
HPS_USB_DATA4 A15
HPS_USB_STP 23 C15
HPS_USB_DIR 23 E14
HPS_USB_NXT 23 A14

RGMII0_TXD0/USB1_D0/HPS_GPIO1
RGMII0_TXD1/USB1_D1/HPS_GPIO2
RGMII0_TXD2/USB1_D2/HPS_GPIO3
RGMII0_TXD3/USB1_D3/HPS_GPIO4
RGMII0_RXD0/USB1_D4/HPS_GPIO5
RGMII0_RXD1/USB1_STP/HPS_GPIO11
RGMII0_RXD2/USB1_DIR/HPS_GPIO12
RGMII0_RXD3/USB1_NXT/HPS_GPIO13

RGMII0_TX_CLK/HPS_GPIO0
RGMII0_RX_CLK/USB1_CLK/HPS_GPIO10
RGMII0_RX_CTL/USB1_D7/HPS_GPIO8
RGMII0_TX_CTL/HPS_GPIO9
RGMII0_MDC/USB1_D6/I2C2_SCL/HPS_GPIO7
RGMII0_MDIO/USB1_D5/I2C2_SDA/HPS_GPIO6

F16
N16 23 HPS_USB_CLKOUT
M17 HPS_USB_DATA7
B15 25 HPS_CONV_USB_N
D15 HPS_USB_DATA6
C14 HPS_USB_DATA5

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Bank 8A
VCCIO = HSMC_VCCIO

HSMC_TX_D_P16 B13
HSMC_TX_D_N16 A13
HSMC_RX_D_P13 C13
HSMC_RX_D_N13 B12
HSMC_RX_D_P16 F15
HSMC_RX_D_N16 F14
HSMC_TX_D_P15 C12
HSMC_TX_D_N15 B11
HSMC_RX_D_P12 D11
HSMC_RX_D_N12 D10
HSMC_TX_D_P0 A9
HSMC_TX_D_N0 A8
HSMC_TX_D_P13 C7
HSMC_TX_D_N13 B7
HSMC_RX_D_P10 E9
HSMC_RX_D_N10 D9
HSMC_TX_D_P14 C8
HSMC_TX_D_N14 B8
HSMC_RX_D_P15 H14
HSMC_RX_D_N15 G13
HSMC_D0 C10
HSMC_D2 C9
HSMC_RX_D_P14 F13
HSMC_RX_D_N14 E13
HSMC_TX_D_P12 A6
HSMC_TX_D_N12 A5
HSMC_RX_D_P6 H8
HSMC_RX_D_N6 G8
HSMC_TX_D_P11 A4
HSMC_TX_D_N11 A3
HSMC_RX_D_P11 E12
HSMC_RX_D_N11 D12
HSMC_TX_D_P3 D6
HSMC_TX_D_N3 C5
HSMC_D1 H13
HSMC_D3 H12

IO_8A/DIFFIO_TX_T2P/DQ1T
IO_8A/DIFFIO_TX_T2N/DQ1T
IO_8A/DIFFIO_RX_T3P/DQ1T
IO_8A/DIFFIO_RX_T3N/DQ1T
IO_8A/DIFFIO_RX_T5P/DQS1T
IO_8A/DIFFIO_RX_T5N/DQSN1T
IO_8A/DIFFIO_TX_T6P
IO_8A/DIFFIO_RX_T6N/DQ1T
IO_8A/DIFFIO_RX_T7P/DQ1T
IO_8A/DIFFIO_RX_T7N/DQ1T
IO_8A/DIFFIO_TX_T8P/DQ1T
IO_8A/DIFFIO_TX_T8N
IO_8A/DIFFIO_TX_T10P/DQ2T
IO_8A/DIFFIO_TX_T10N/DQ2T
IO_8A/DIFFIO_RX_T11P/DQ2T
IO_8A/DIFFIO_RX_T11N/DQ2T
IO_8A/DIFFIO_TX_T12P/DQ2T
IO_8A/DIFFIO_TX_T12N/DQ2T
IO_8A/DIFFIO_RX_T13P/DQS2T
IO_8A/DIFFIO_RX_T13N/DQSN2T
IO_8A/DIFFIO_TX_T14P
IO_8A/DIFFIO_TX_T14N/DQ2T
IO_8A/DIFFIO_RX_T15P/DQ2T
IO_8A/DIFFIO_RX_T15N/DQ2T
IO_8A/DIFFIO_TX_T16P/DQ2T
IO_8A/DIFFIO_TX_T16N
IO_8A/DIFFIO_RX_T17P
IO_8A/DIFFIO_RX_T17N
IO_8A/DIFFIO_TX_T18P/DQ3T
IO_8A/DIFFIO_TX_T18N/DQ3T
IO_8A/DIFFIO_RX_T19P/DQ3T
IO_8A/DIFFIO_RX_T19N/DQ3T
IO_8A/DIFFIO_TX_T20P/DQ3T
IO_8A/DIFFIO_TX_T20N/DQ3T
IO_8A/DIFFIO_RX_T21P/DQS3T
IO_8A/DIFFIO_RX_T21N/DQSN3T

IO_8A/DIFFIO_TX_T22P
IO_8A/DIFFIO_TX_T22N/DQ3T
IO_8A/DIFFIO_RX_T23P/DQ3T
IO_8A/DIFFIO_RX_T23N/DQ3T
IO_8A/DIFFIO_TX_T24P/DQ3T
IO_8A/DIFFIO_TX_T24N
IO_8A/DIFFIO_RX_T25P
IO_8A/DIFFIO_RX_T25N
IO_8A/DIFFIO_TX_T26P/DQ4T
IO_8A/DIFFIO_TX_T26N/DQ4T
IO_8A/DIFFIO_RX_T27P/DQ4T
IO_8A/DIFFIO_RX_T27N/DQ4T
IO_8A/DIFFIO_TX_T28P/DQ4T
IO_8A/DIFFIO_TX_T28N/DQ4T
IO_8A/DIFFIO_RX_T29P/DQS4T
IO_8A/DIFFIO_RX_T29N/DQSN4T
IO_8A/DIFFIO_TX_T30P
IO_8A/DIFFIO_TX_T30N/DQ4T
IO_8A/DIFFIO_RX_T31P/DQ4T
IO_8A/DIFFIO_RX_T31N/DQ4T
IO_8A/DIFFIO_TX_T32P/DQ4T
IO_8A/DIFFIO_TX_T32N
IO_8A/DIFFIO_RX_T33P
IO_8A/DIFFIO_RX_T33N
IO_8A/DIFFIO_TX_T34P/DQ5T
IO_8A/DIFFIO_TX_T34N/DQ5T
IO_8A/DIFFIO_RX_T35P/DQ5T
IO_8A/DIFFIO_RX_T35N/DQ5T
IO_8A/DIFFIO_TX_T36P/DQ5T
IO_8A/DIFFIO_TX_T36N/DQ5T
IO_8A/DIFFIO_RX_T37P/DQS5T
IO_8A/DIFFIO_RX_T37N/DQSN5T
IO_8A/DIFFIO_TX_T38P
IO_8A/DIFFIO_TX_T38N/DQ5T
IO_8A/DIFFIO_RX_T39P/DQ5T
IO_8A/DIFFIO_RX_T39N/DQ5T
IO_8A/DIFFIO_TX_T40P/DQ5T
IO_8A/DIFFIO_TX_T40N

D5 HSMC_TX_D_P4
C4 HSMC_TX_D_N4
F11 HSMC_RX_D_P8
E11 HSMC_RX_D_N8
E8 HSMC_TX_D_P1
D7 HSMC_TX_D_N1
J7 HSMC_RX_D_P5
H7 HSMC_RX_D_N5
B2 HSMC_TX_D_P10
B1 HSMC_TX_D_N10
B6 HSMC_RX_D_P9
B5 HSMC_RX_D_N9
C3 HSMC_TX_D_P7
B3 HSMC_TX_D_N7
K12 HSMC_RX_D_P1
J12 HSMC_RX_D_N1
D2 HSMC_TX_D_P9
C2 HSMC_TX_D_N9
G12 HSMC_RX_D_P0
G11 HSMC_RX_D_N0
E4 HSMC_TX_D_P6
D4 HSMC_TX_D_N6
K7 HSMC_RX_D_P4
K8 HSMC_RX_D_N4
E3 HSMC_TX_D_P5
E2 HSMC_TX_D_N5
G10 HSMC_RX_D_P2
F10 HSMC_RX_D_N2
E1 HSMC_TX_D_P8
D1 HSMC_TX_D_N8
J10 HSMC_RX_D_P3
J9 HSMC_RX_D_N3
E7 HSMC_CLKOUT_P1
E6 HSMC_CLKOUT_N1
F9 HSMC_RX_D_P7
F8 HSMC_RX_D_N7
G7 HSMC_TX_D_P2
F6 HSMC_TX_D_N2

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Default Setting: BOOTSEL[2:0]=101 (Boot from SD CARD)
CLKSEL[1:0]=0

VCC3P3
SW16 DNI
SW-DIP12

R186 1K 1 12 HPS_LCM_SPIM_SS (BOOTSEL0) R167 10K
R164 1K 2 11 HPS_FLASH_NCSO (BOOTSEL1) R166 10K DNI
R163 1K 3 10 HPS_BOOTSEL2 (BOOTSEL2) R165 10K
R162 1K 4 9 HPS_SPIM_SS (CLOCKSEL0) R155 10K DNI
R153 1K 5 8 HPS_CLOCKSEL1 (CLOCKSEL1) R154 10K DNI
6 7

DNI R170 1K HPS_LCM_SPIM_SS (BOOTSEL0)
R169 1K HPS_FLASH_NCSO (BOOTSEL1)
DNI R168 1K HPS_BOOTSEL2 (BOOTSEL2)
R157 1K HPS_SPIM_SS (CLOCKSEL0)
R156 1K HPS_CLOCKSEL1 (CLOCKSEL1)

Title: DE10-Standard Board
Size: B
Document Number: FPGA BANK 7, BANK 8
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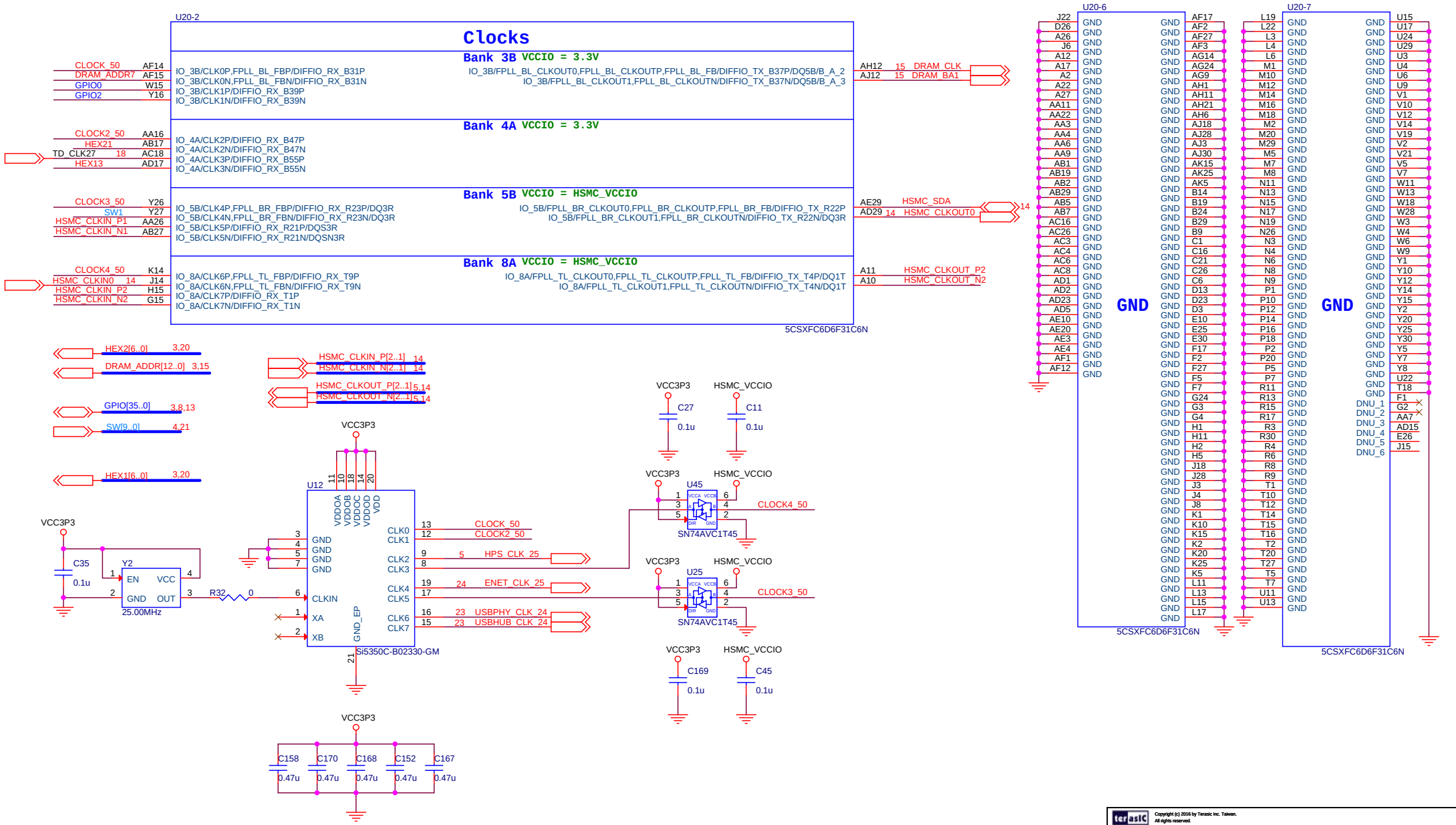

Title: **DE10-Standard Board**

Size	Document Number	Rev
B	FPGA Clocks & GND	B

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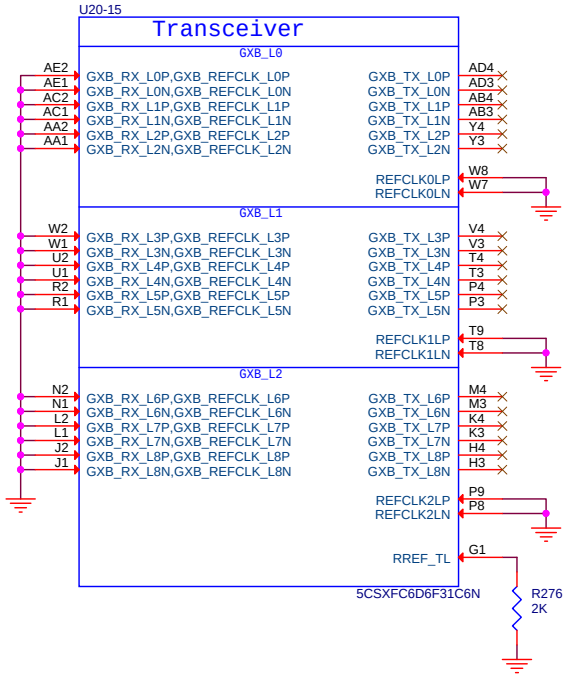

Title: **DE10-Standard Board**

Size	Document Number	Rev
B	Transceiver	B

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USB Blaster

FPGA_TDI 12
JTAG_TMS 12
JTAG_TCK 12
FPGA_TDO 12

R125 0 DNI JTAG_TCK
C80 33p 50V DNI
R126 1K

Design Note:
Optional termination resistor for DCLK

CAD Note:
Place near FPGA DCLK pin

VCC3P3
R132 10K DNI
R133 0 DNI
R131 1K DNI
C90 12p 50V DNI

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Configuration

Bank 3A VCCIO = 3.3V

TCK	JTAG_TCK	AC5
TMS	JTAG_TMS	V9
TDO	FPGA_TDO	AB9
TDI	FPGA_TDI	U8
DCLK	EPCQ_DCLK	U7
AS_DATA0,ASDO/DATA0	EPCQ_AS_DATA0	AE6
AS_DATA1/DATA1	EPCQ_AS_DATA1	AE5
AS_DATA2/DATA2	EPCQ_AS_DATA2	AE8
AS_DATA3/DATA3	EPCQ_AS_DATA3	AC7
NCSO/DATA4	EPCQ_NCSO	AB8
IO_3A/DATA5/DIFFIO_TX_B2N	GPIO24	AE9
IO_3A/DATA6/DIFFIO_RX_B1N/DQ1B	GPIO26	AE12
IO_3A/DATA7/DIFFIO_TX_B2P/DQ1B	GPIO28	AD9
IO_3A/DATA8/DIFFIO_RX_B1P/DQ1B	GPIO30	AD11
IO_3A/DATA9/DIFFIO_TX_B4N/DQ1B	GPIO22	AF10
IO_3A/DATA10/DIFFIO_RX_B3N/DQSN1B	GPIO29	AD10
IO_3A/DATA11/DIFFIO_TX_B4P	GPIO25	AE11
IO_3A/DATA12/DIFFIO_RX_B3P/DQS1B	GPIO32	AC9
IO_3A/DATA13/DIFFIO_TX_B6N/DQ1B	GPIO8	AH4
IO_3A/DATA14/DIFFIO_RX_B5N/DQ1B	GPIO23	AE7
IO_3A/DATA15/DIFFIO_TX_B6P/DQ1B	GPIO12	AG3
IO_3A/CLKUSR/DIFFIO_RX_B5P/DQ1B	GPIO27	AD7

Bank 5A VCCIO = 3.3V

IO_5A/INIT_DONE/DIFFIO_RX_R2P	AD25	TD_DATA7
IO_5A/CRC_ERROR/DIFFIO_RX_R2N	AC25 22	PS2_CLK2
IO_5A/DEV_OE/DIFFIO_TX_R5P	AE26	TD_DATA4
IO_5A/NCEO/DIFFIO_TX_R3P/DQ1R	AJ29 19	AUD_ADCDAT
IO_5A/DEV_CLRN/DIFFIO_TX_R5N/DQ1R	AD27	TD_DATA5

Bank 9A

CONF_DONE	L8	MSEL0
NSTATUS	K6	MSEL1
NCONFIG	G6	MSEL2
NCE	L7	MSEL3
MSEL0	L9	MSEL4
MSEL1		
MSEL2		
MSEL3		
MSEL4		

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VCC3P3_PGM
R172 10K FPGA_CONF_DONE F3
R171 10K FPGA_NSTATUS F4
R173 10K FPGA_NCONFIG J5
G5

FPGA_NCONFIG 11
FPGA_CONF_DONE 11

TD_DATA[7..0] 4,18

GPIO[35..0] 3,6,13

Fix MSEL[4:0]=10010 in AS Fast Mode

VCC3P3_PGM
SW10
SW-DIP12

1	12	MSEL0	R183 1K
2	11	MSEL1	R181 1K
3	10	MSEL2	R179 1K
4	9	MSEL3	R177 1K
5	8	MSEL4	R175 1K
6	7		

R182	0 DNI	MSEL0
R180	0 DNI	MSEL1
R178	0 DNI	MSEL2
R176	0 DNI	MSEL3
R174	0 DNI	MSEL4

VCC3P3
U40
VCC3P3
C65 0.1u 10V

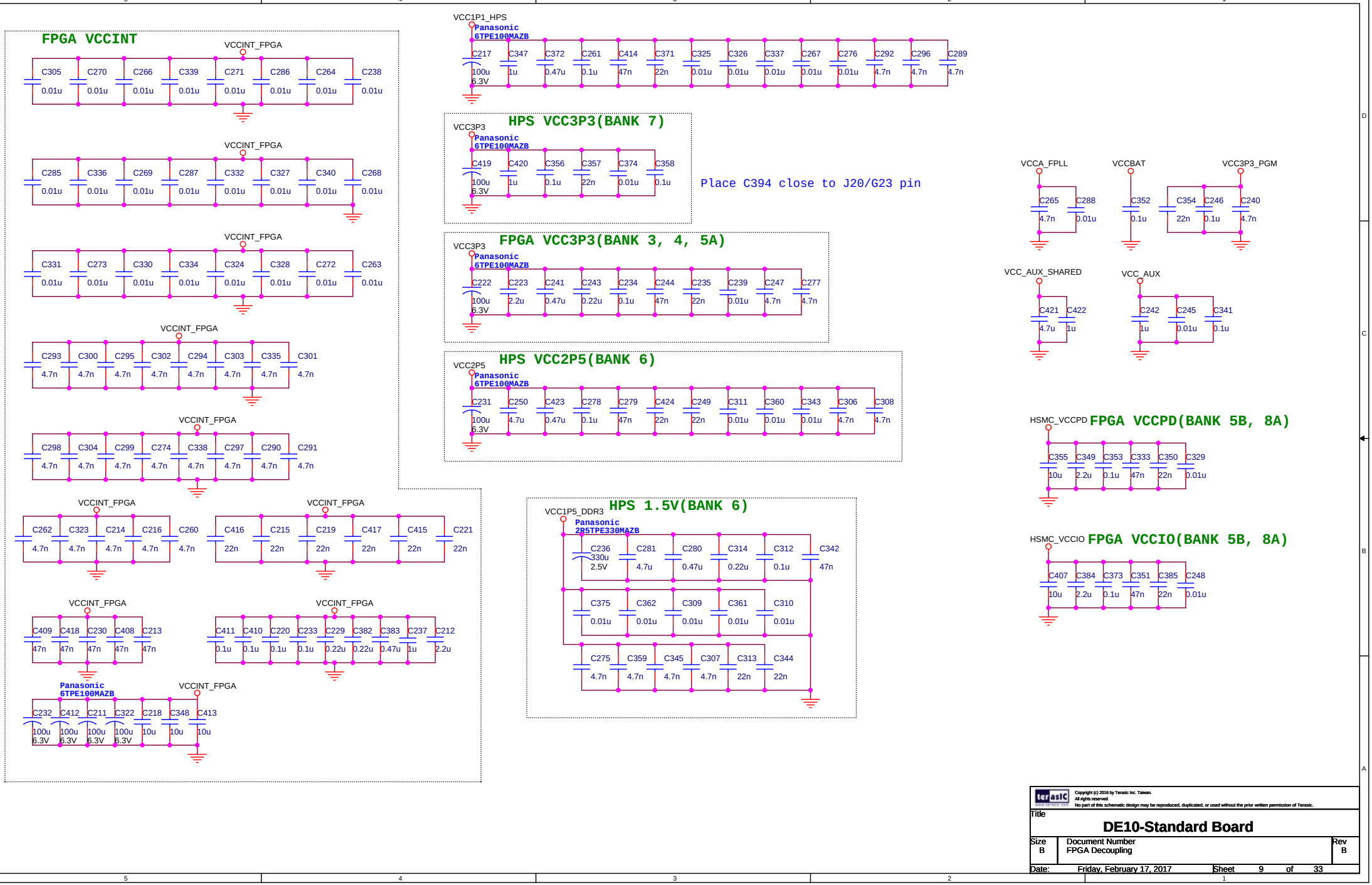
3	NC01	VCC 2	
4	NC02		DATA0 15 EPCQ_AS_DATA0
5	NC03		DATA1 8 EPCQ_AS_DATA1
6	NC04		DATA2 9 EPCQ_AS_DATA2
11	NC05		DATA3 1 EPCQ_AS_DATA3
12	NC06		DCLK 16 EPCQ_DCLK
13	NC07	GND 10	nCS 7 EPCQ_NCSO
14	NC08		

S25FL128SAGMFI011

Title: **DE10-Standard Board**

Size	Document Number	Rev
B	FPGA Configuration	B

Date: Friday, February 17, 2017 Sheet 8 of 33


FPGA VCCINT
VCCINT_FPGA
C305 C270 C266 C339 C271 C286 C264 C238
0.01u
C285 C336 C269 C287 C332 C327 C340 C268
C331 C273 C330 C334 C324 C328 C272 C263
C293 C300 C295 C302 C294 C303 C335 C301
4.7n
C298 C304 C299 C274 C338 C297 C290 C291
C262 C323 C214 C216 C260
C416 C215 C219 C417 C415 C221
22n
C409 C418 C230 C408 C213
47n
C411 C410 C220 C233 C229 C382 C383 C237 C212
0.1u 0.1u 0.1u 0.1u 0.22u 0.22u 0.47u 1u 2.2u
Panasonic
6TPE100MAZB
C232 C412 C211 C322 C218 C348 C413
100u 6.3V
10u
VCC1P1_HPS
C217 C347 C372 C261 C414 C371 C325 C326 C337 C267 C276 C292 C296 C289
100u 6.3V
1u 0.47u 0.1u 47n 22n 0.01u 0.01u 0.01u 0.01u 0.01u 4.7n 4.7n 4.7n
HPS VCC3P3(BANK 7)
VCC3P3
C419 C420 C356 C357 C374 C358
1u 0.1u 22n 0.01u 0.1u
Place C394 close to J20/G23 pin
FPGA VCC3P3(BANK 3, 4, 5A)
C222 C223 C241 C243 C234 C244 C235 C239 C247 C277
2.2u 0.47u 0.22u 0.1u 47n 22n 0.01u 4.7n
HPS VCC2P5(BANK 6)
VCC2P5
C231 C250 C423 C278 C279 C424 C249 C311 C360 C343 C306 C308
4.7u
HPS 1.5V(BANK 6)
VCC1P5_DDR3
C236 C281 C280 C314 C312 C342
330u 2.5V
4.7u 0.47u 0.22u 0.1u 47n
C375 C362 C309 C361 C310
0.01u
C275 C359 C345 C307 C313 C344
VCCA_FPLL
C265 C288
VCCBAT
C352
0.1u
VCC3P3_PGM
C354 C246 C240
22n 0.1u 4.7n
VCC_AUX_SHARED
C421 C422
1u
VCC_AUX
C242 C245 C341
0.01u
HSMC_VCCPD
FPGA VCCPD(BANK 5B, 8A)
C355 C349 C353 C333 C350 C329
10u 2.2u 0.1u 47n 22n 0.01u
HSMC_VCCIO
FPGA VCCIO(BANK 5B, 8A)
C407 C384 C373 C351 C385 C248
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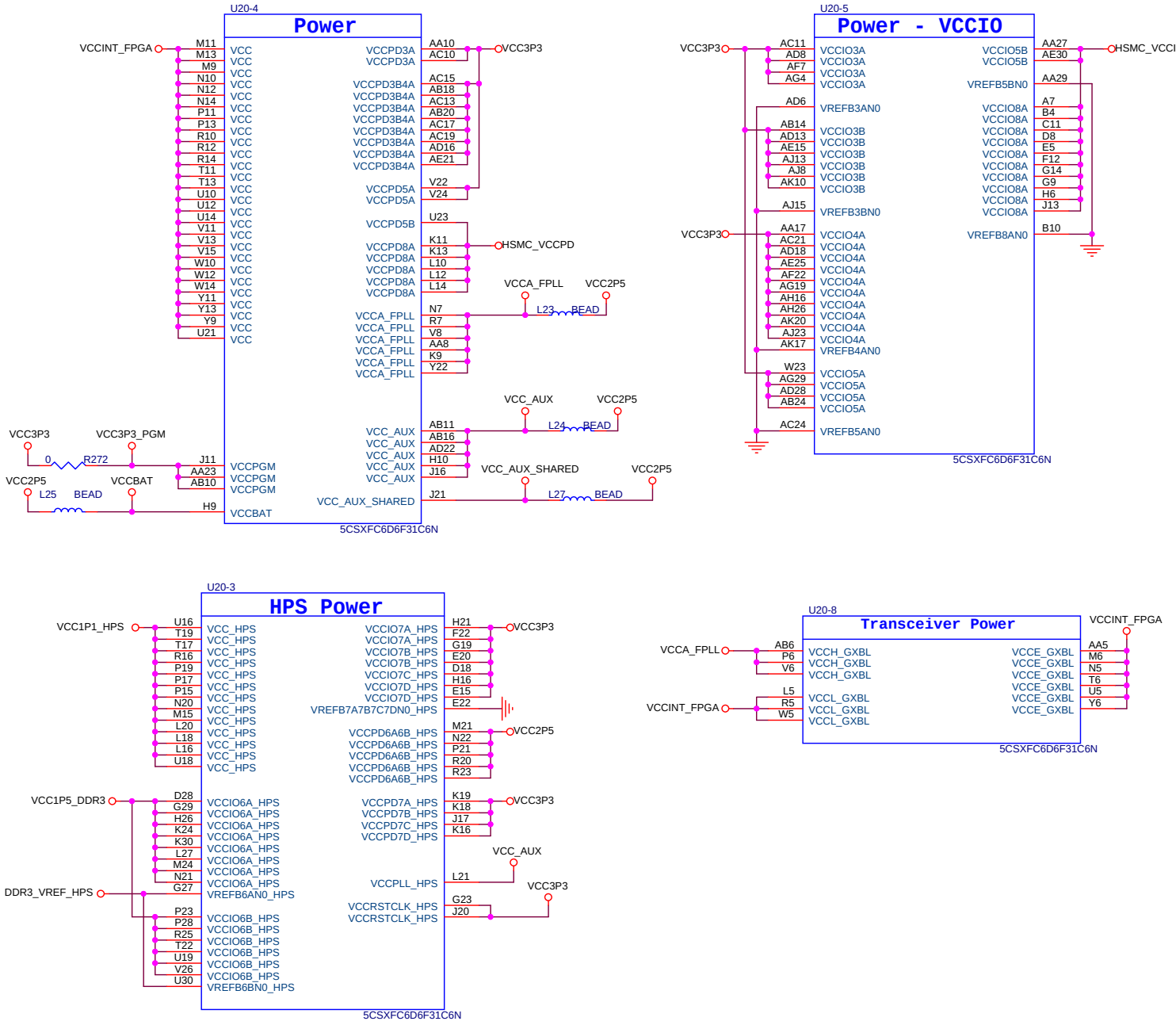
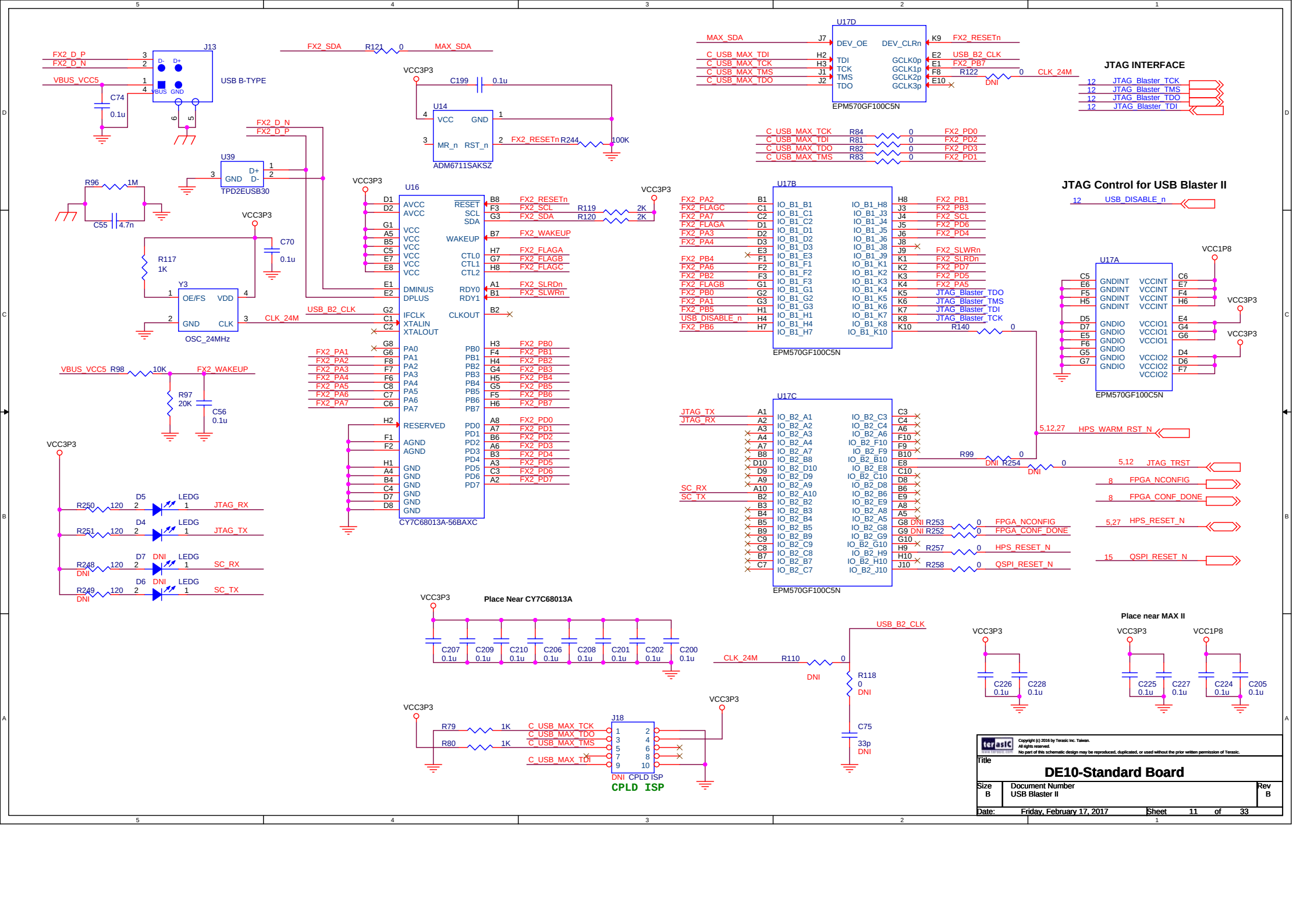
Title
DE10-Standard Board
Size B
Document Number
FPGA Decoupling
Rev B
Date: Friday, February 17, 2017
Sheet 9 of 33



Title: **DE10-Standard Board**

Size	Document Number	Rev
B	FPGA Power	B

Date: Friday, February 17, 2017 Sheet 10 of 33


JTAG INTERFACE
JTAG Control for USB Blaster II
USB B-TYPE
TPD2EUSB30
ADM6711SAKSZ
OSC_24MHz
EPM570GF100C5N
CY7C68013A-56BAXC
Place Near CY7C68013A
Place near MAX II
CPLD ISP
DE10-Standard Board
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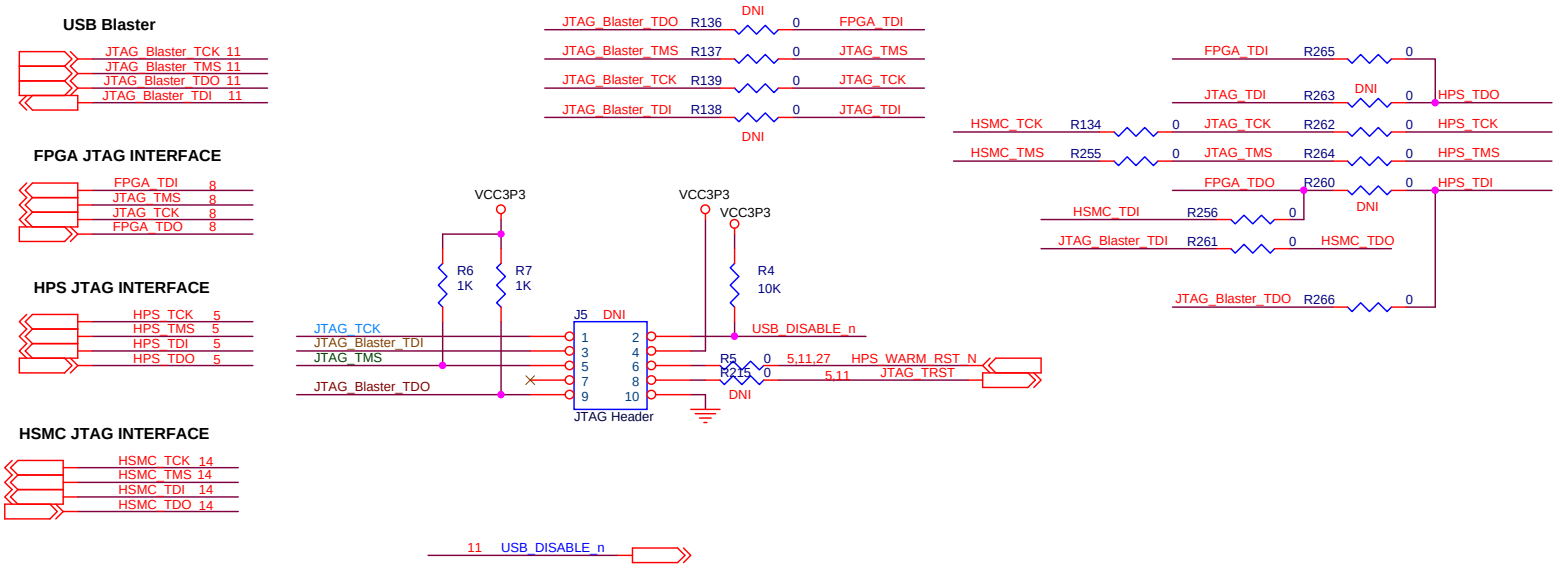
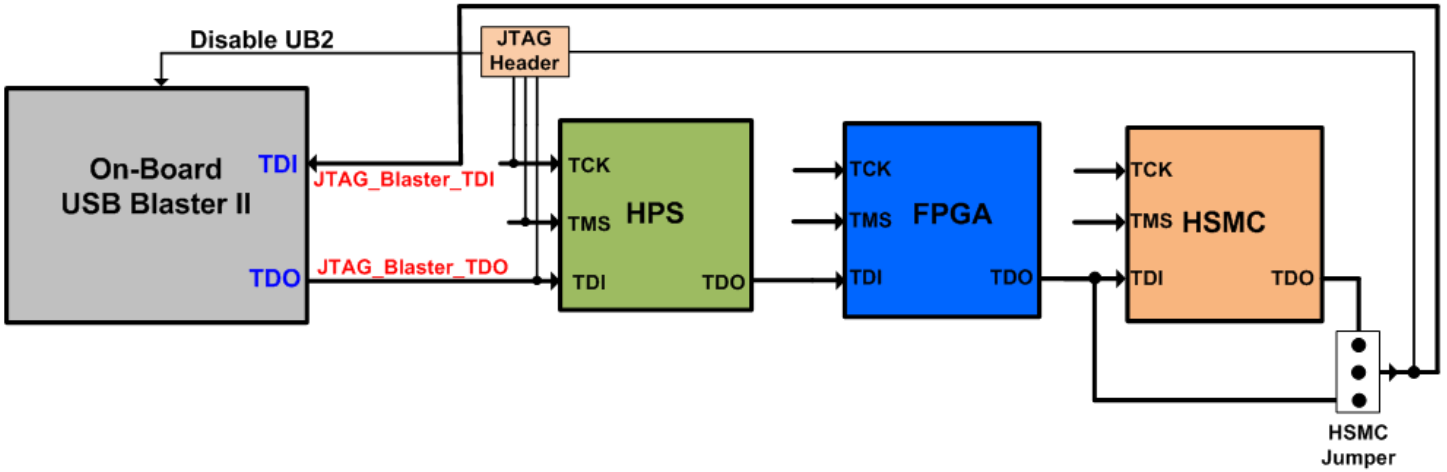
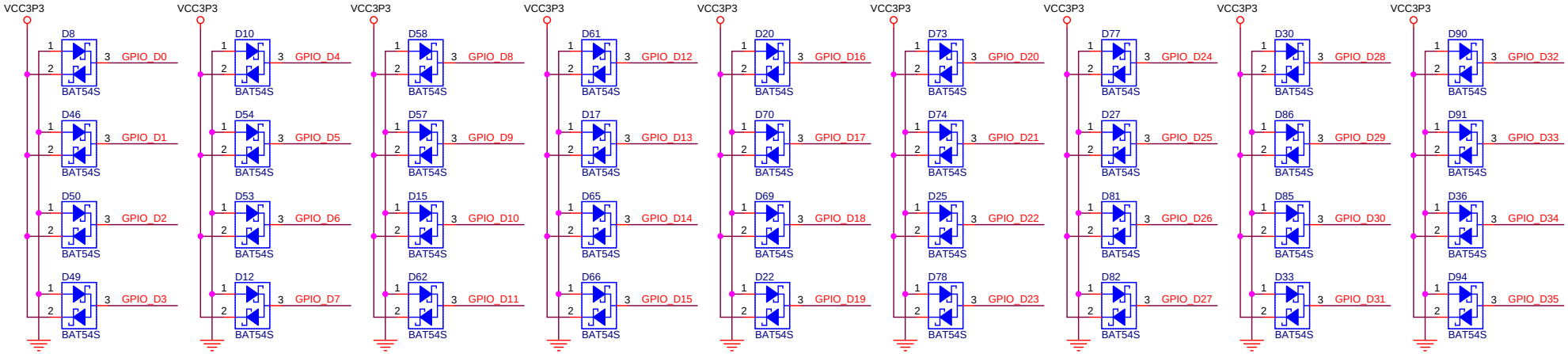
Size B
Document Number USB Blaster II
Rev B
Date: Friday, February 17, 2017
Sheet 11 of 33



JTAG Chain

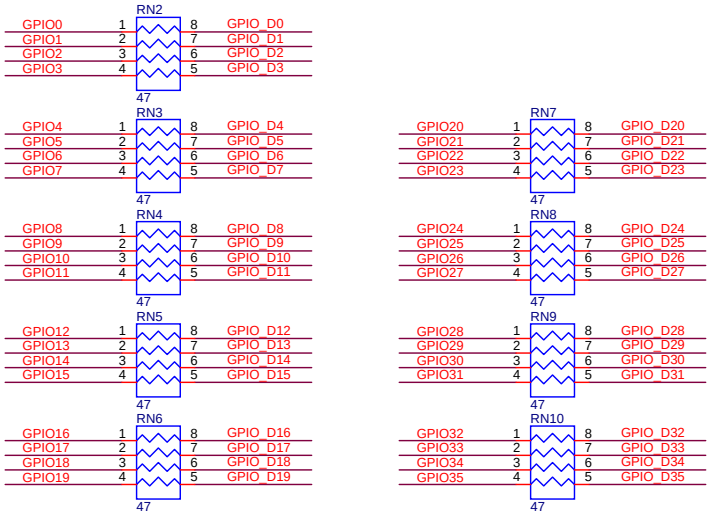


Title	DE10-Standard Board	
Size B	Document Number JTAG Chain	Rev B
Date: Friday, February 17, 2017	Sheet 12 of 33	

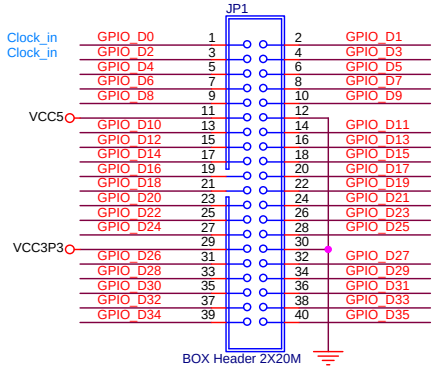


GPIO 0

GPIO[35..0] 3,6,8



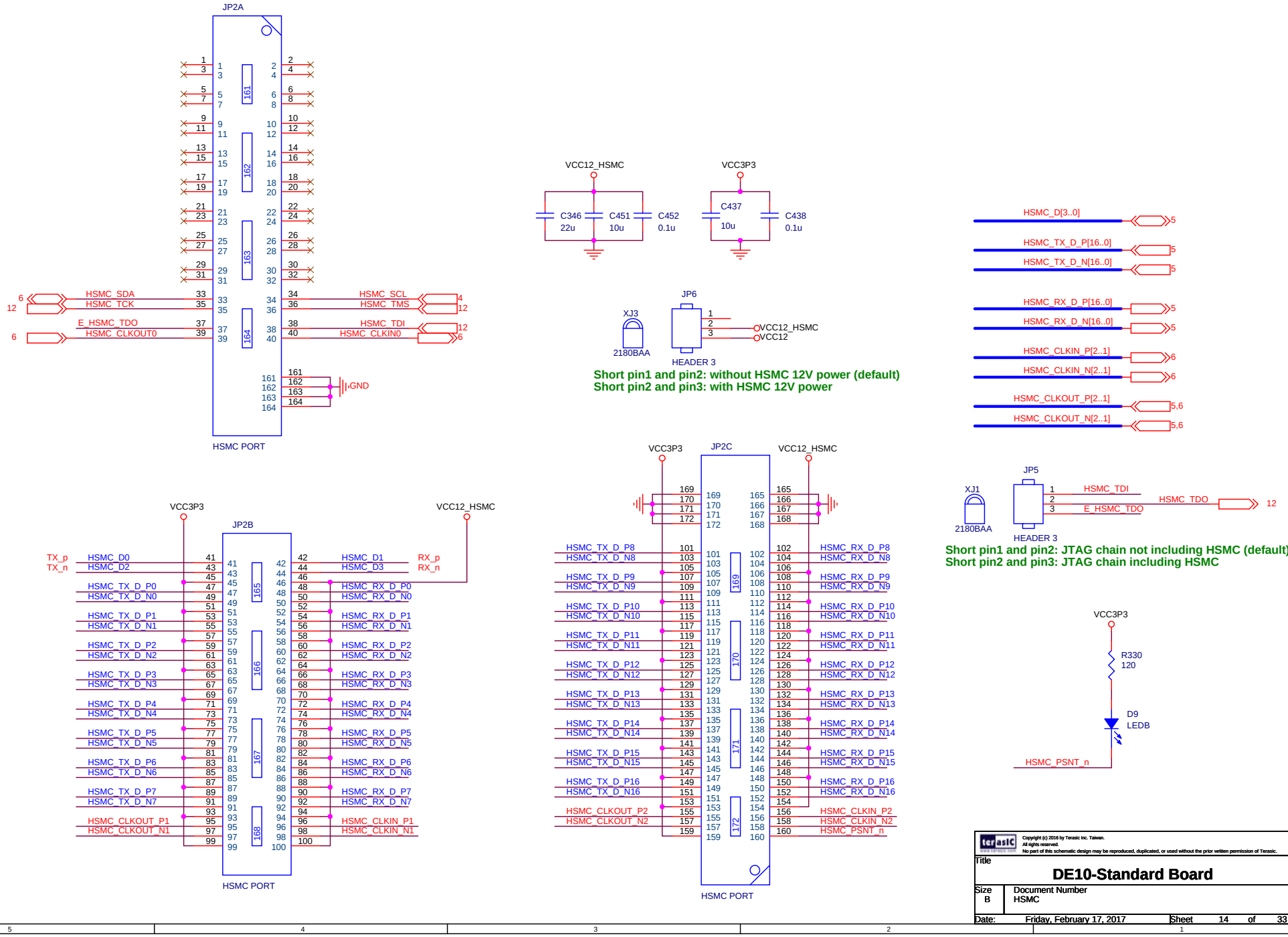
GPIO



Title: **DE10-Standard Board**

Size	Document Number	Rev
B	GPIO	B

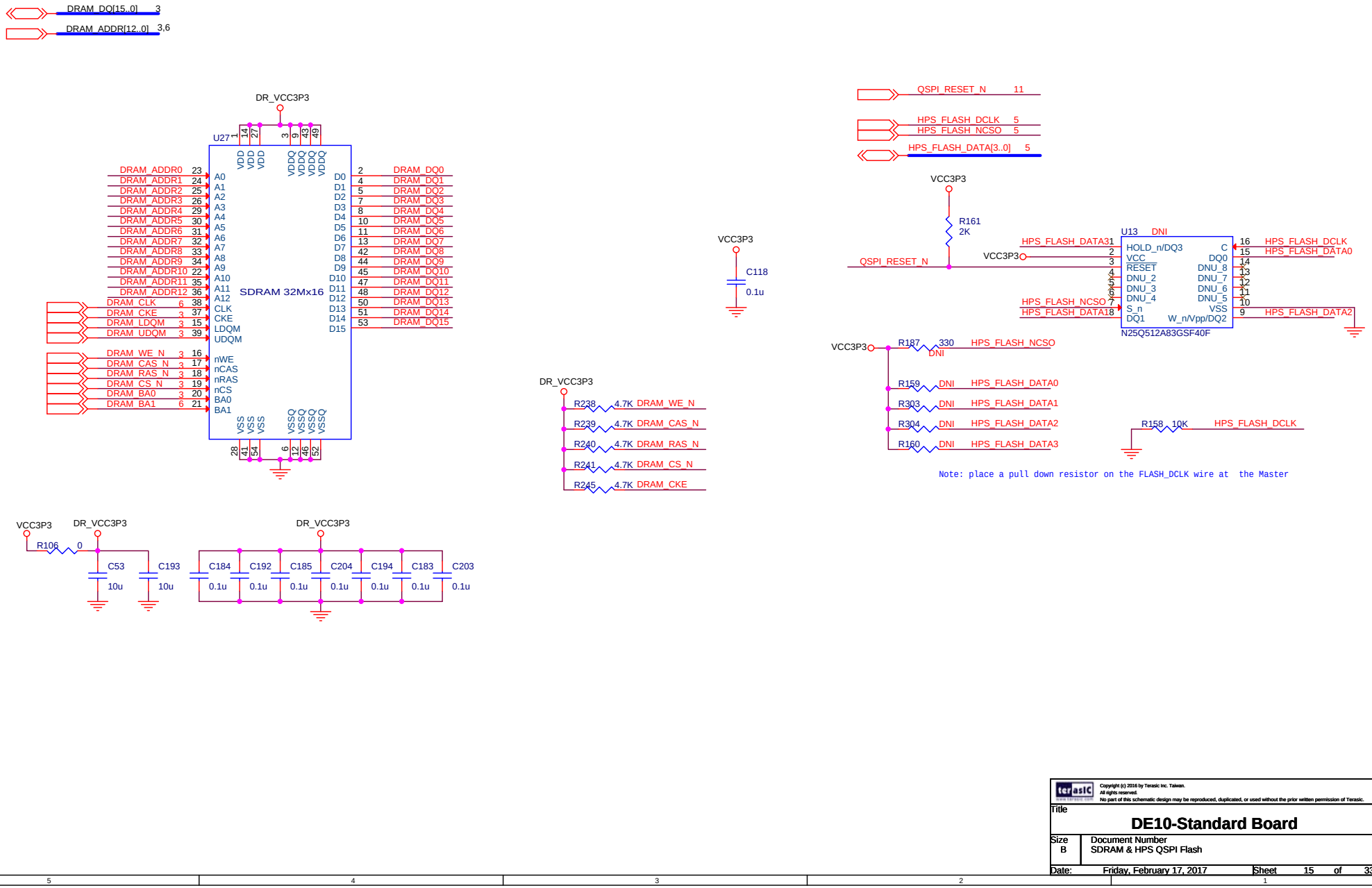
Date: Friday, February 17, 2017 Sheet 13 of 33



Title: **DE10-Standard Board**

Size	Document Number	Rev
B	HSMC	B

Date: Friday, February 17, 2017 Sheet 14 of 33


DRAM_DQ[15..0] 3
DRAM_ADDR[12..0] 3,6
DR_VCC3P3
U27
SDRAM 32Mx16
DRAM_ADDR0 23
DRAM_ADDR1 24
DRAM_ADDR2 25
DRAM_ADDR3 26
DRAM_ADDR4 29
DRAM_ADDR5 30
DRAM_ADDR6 31
DRAM_ADDR7 32
DRAM_ADDR8 33
DRAM_ADDR9 34
DRAM_ADDR10 22
DRAM_ADDR11 35
DRAM_ADDR12 36
DRAM_CLK 6 38
DRAM_CKE 3 37
DRAM_LDQM 3 15
DRAM_UDQM 3 39
DRAM_WE_N 3 16
DRAM_CAS_N 3 17
DRAM_RAS_N 3 18
DRAM_CS_N 3 19
DRAM_BA0 3 20
DRAM_BA1 6 21
DRAM_DQ0 2
DRAM_DQ1 4
DRAM_DQ2 5
DRAM_DQ3 7
DRAM_DQ4 8
DRAM_DQ5 10
DRAM_DQ6 11
DRAM_DQ7 13
DRAM_DQ8 42
DRAM_DQ9 44
DRAM_DQ10 45
DRAM_DQ11 47
DRAM_DQ12 48
DRAM_DQ13 50
DRAM_DQ14 51
DRAM_DQ15 53
VCC3P3
C118
0.1u
DR_VCC3P3
R238 4.7K DRAM_WE_N
R239 4.7K DRAM_CAS_N
R240 4.7K DRAM_RAS_N
R241 4.7K DRAM_CS_N
R245 4.7K DRAM_CKE
VCC3P3
DR_VCC3P3
R106 0
C53 10u
C193 10u
DR_VCC3P3
C184 0.1u
C192 0.1u
C185 0.1u
C204 0.1u
C194 0.1u
C183 0.1u
C203 0.1u
QSPI_RESET_N 11
HPS_FLASH_DCLK 5
HPS_FLASH_NCSO 5
HPS_FLASH_DATA[3..0] 5
VCC3P3
R161 2K
QSPI_RESET_N
U13 DNI
HPS_FLASH_DATA31
VCC3P3
HPS_FLASH_NCSO
HPS_FLASH_DATA18
HOLD_n/DQ3
VCC
RESET
DNU_2
DNU_3
DNU_4
S_n
DQ1
C
DQ0
DNU_8
DNU_7
DNU_6
DNU_5
VSS
W_n/Vpp/DQ2
HPS_FLASH_DCLK
HPS_FLASH_DATA0
HPS_FLASH_DATA2
N25Q512A83GSF40F
VCC3P3
R187 330 DNI HPS_FLASH_NCSO
R159 DNI HPS_FLASH_DATA0
R303 DNI HPS_FLASH_DATA1
R304 DNI HPS_FLASH_DATA2
R160 DNI HPS_FLASH_DATA3
R158 10K HPS_FLASH_DCLK
Note: place a pull down resistor on the FLASH_DCLK wire at the Master
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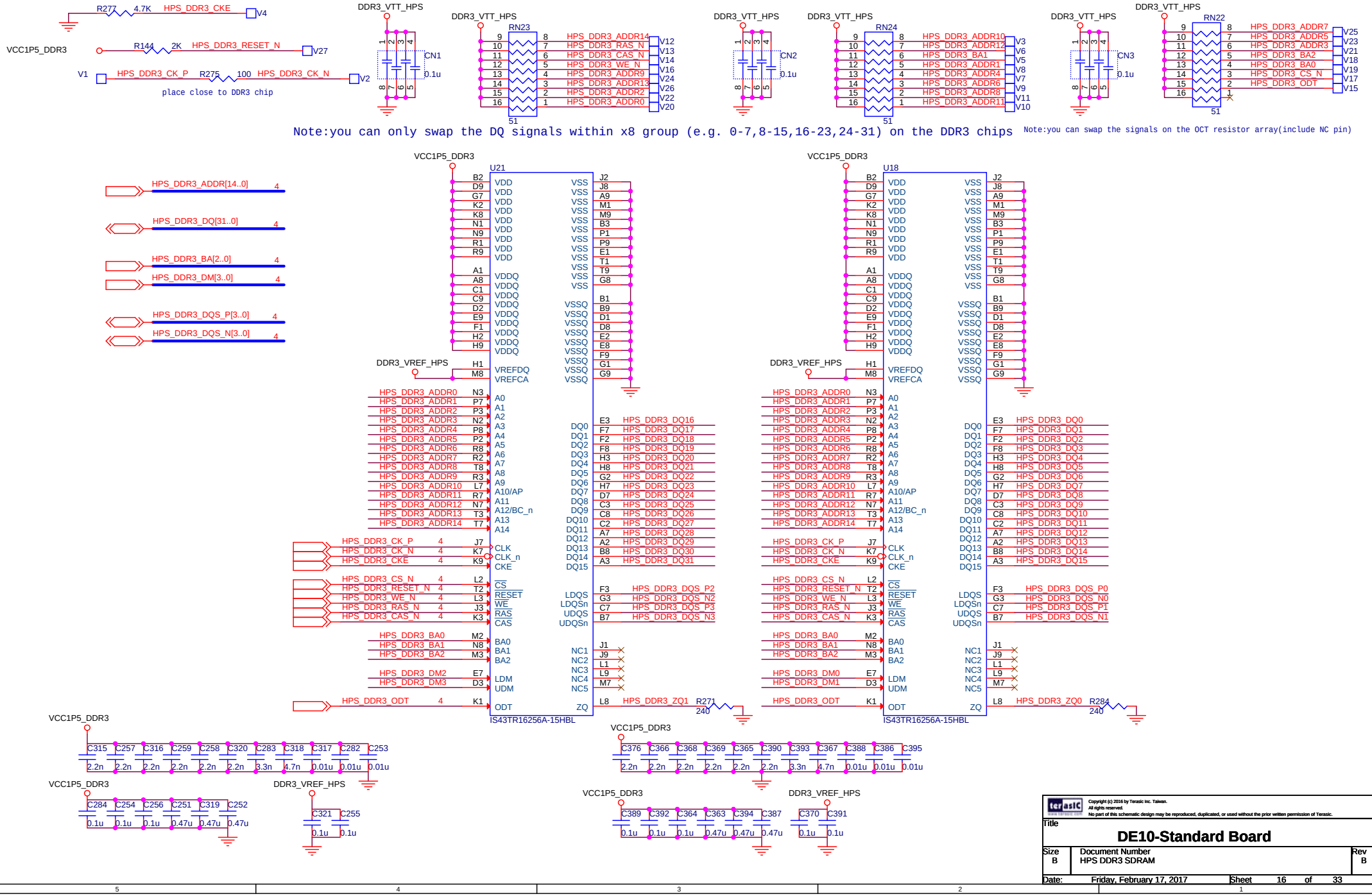
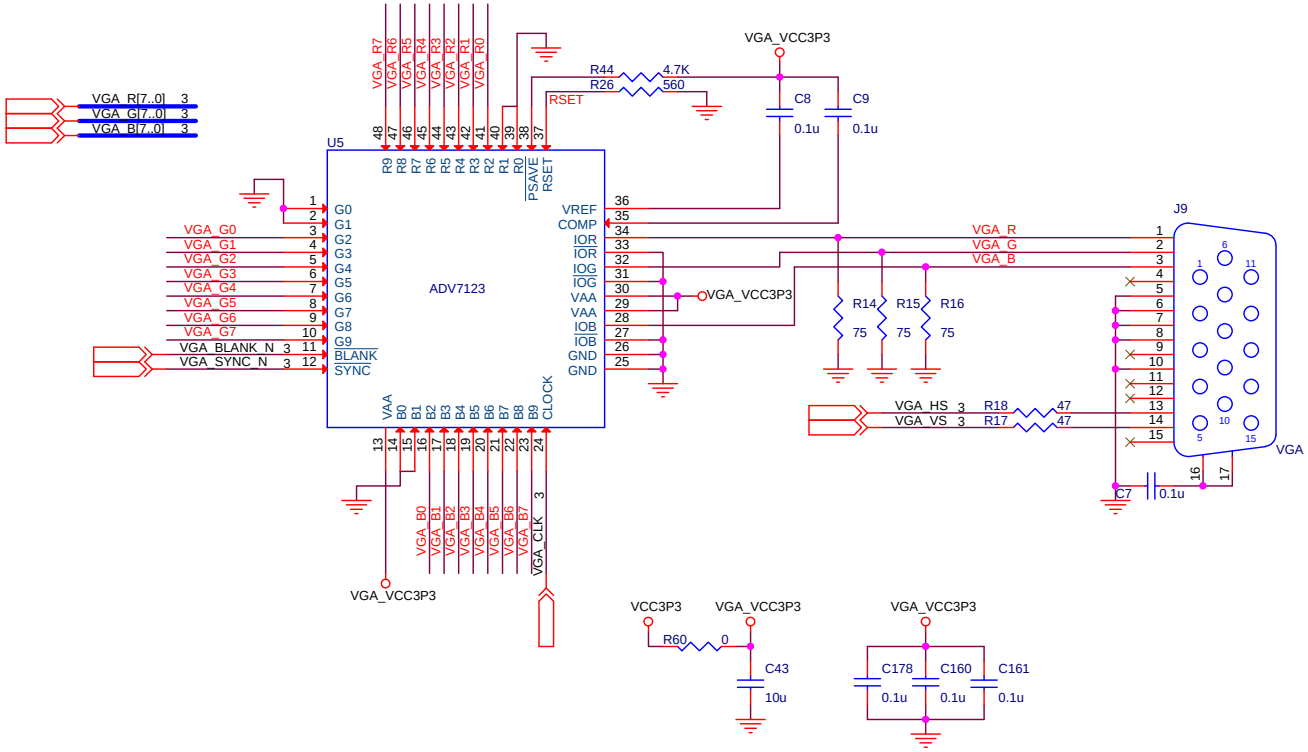
Title
DE10-Standard Board
Size B
Document Number
SDRAM & HPS QSPI Flash
Rev B
Date: Friday, February 17, 2017
Sheet 15 of 33



Title
DE10-Standard Board

Size	Document Number	Rev
B	HPS DDR3 SDRAM	B

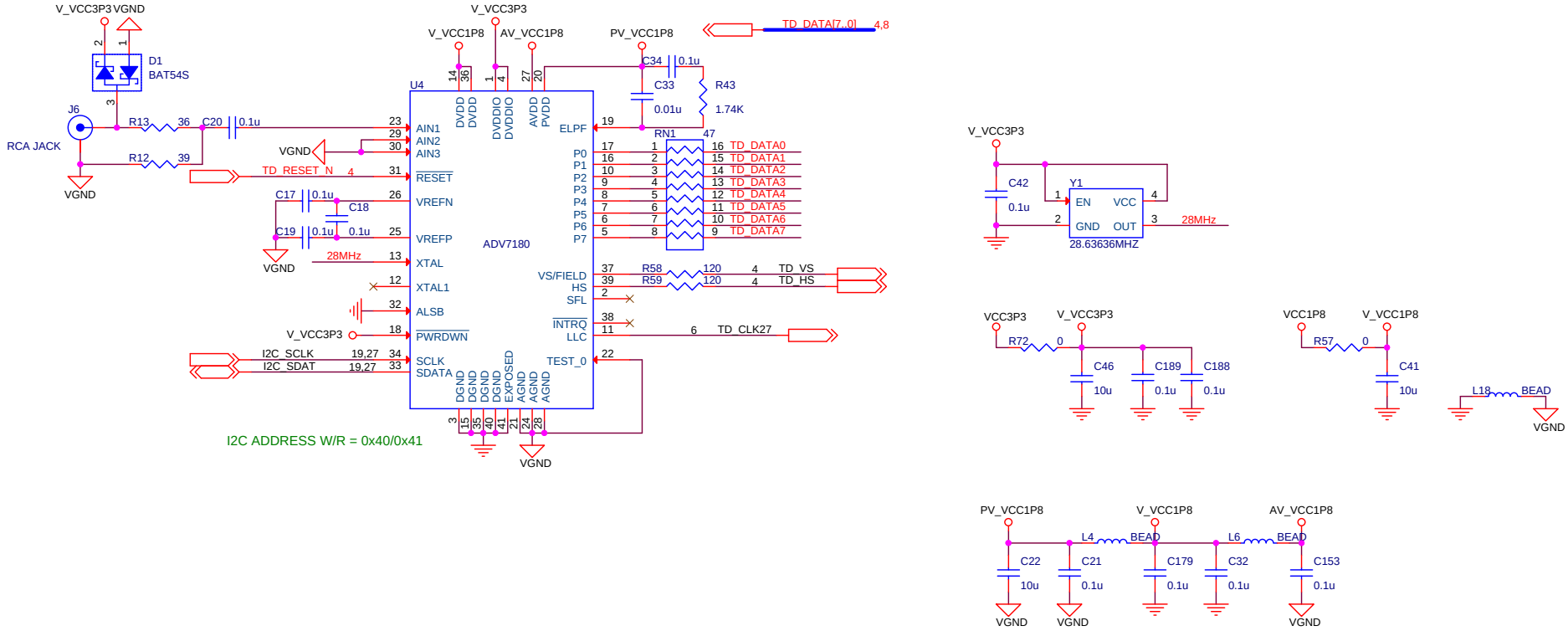
Date: Friday, February 17, 2017 Sheet 16 of 33



Title
DE10-Standard Board

Size	Document Number	Rev
B	ADV7123 VGA	B

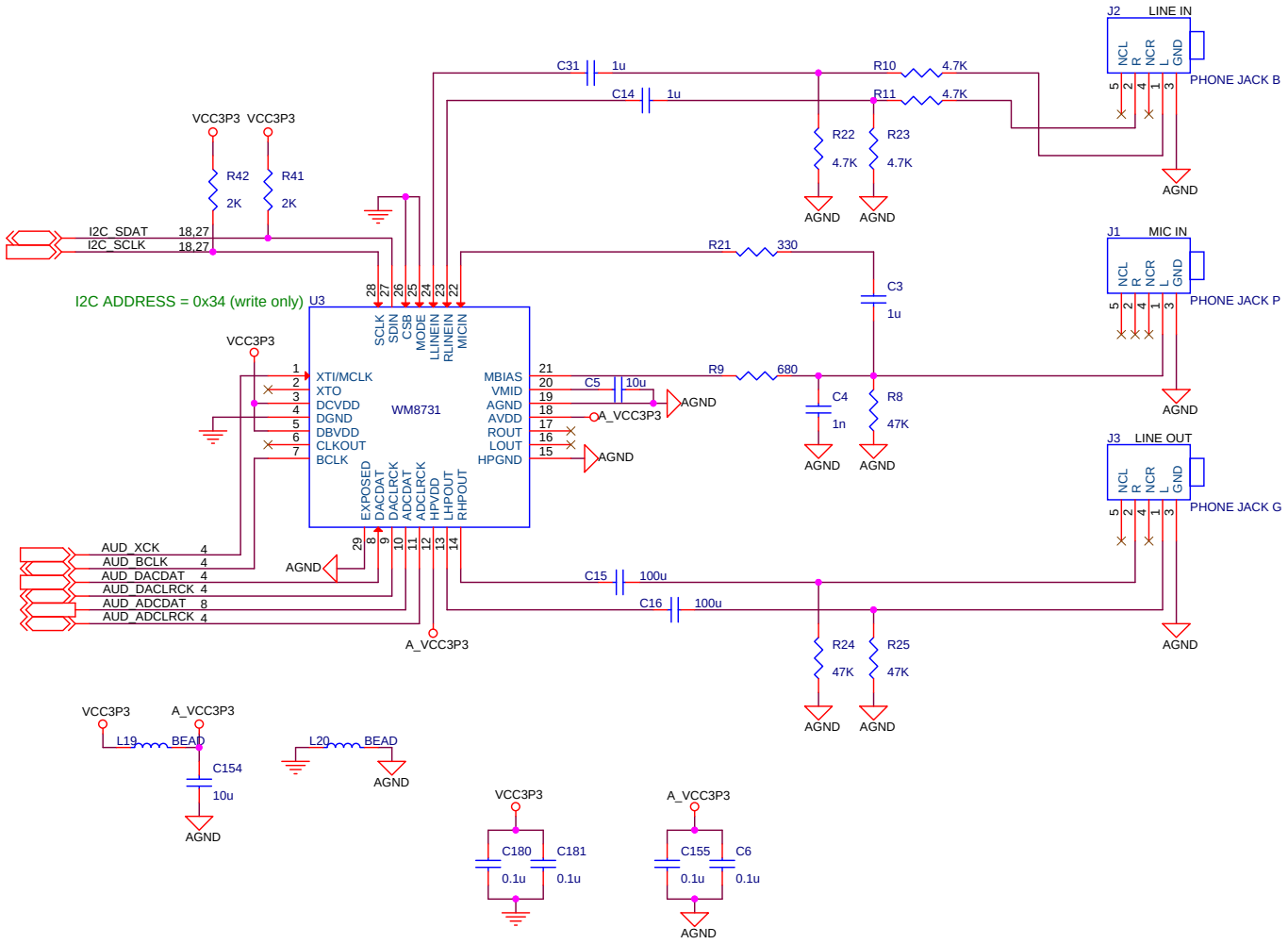
Date: Friday, February 17, 2017 Sheet 17 of 33



Title
DE10-Standard Board

Size	Document Number	Rev
B	ADV7180 Video Decoder	B

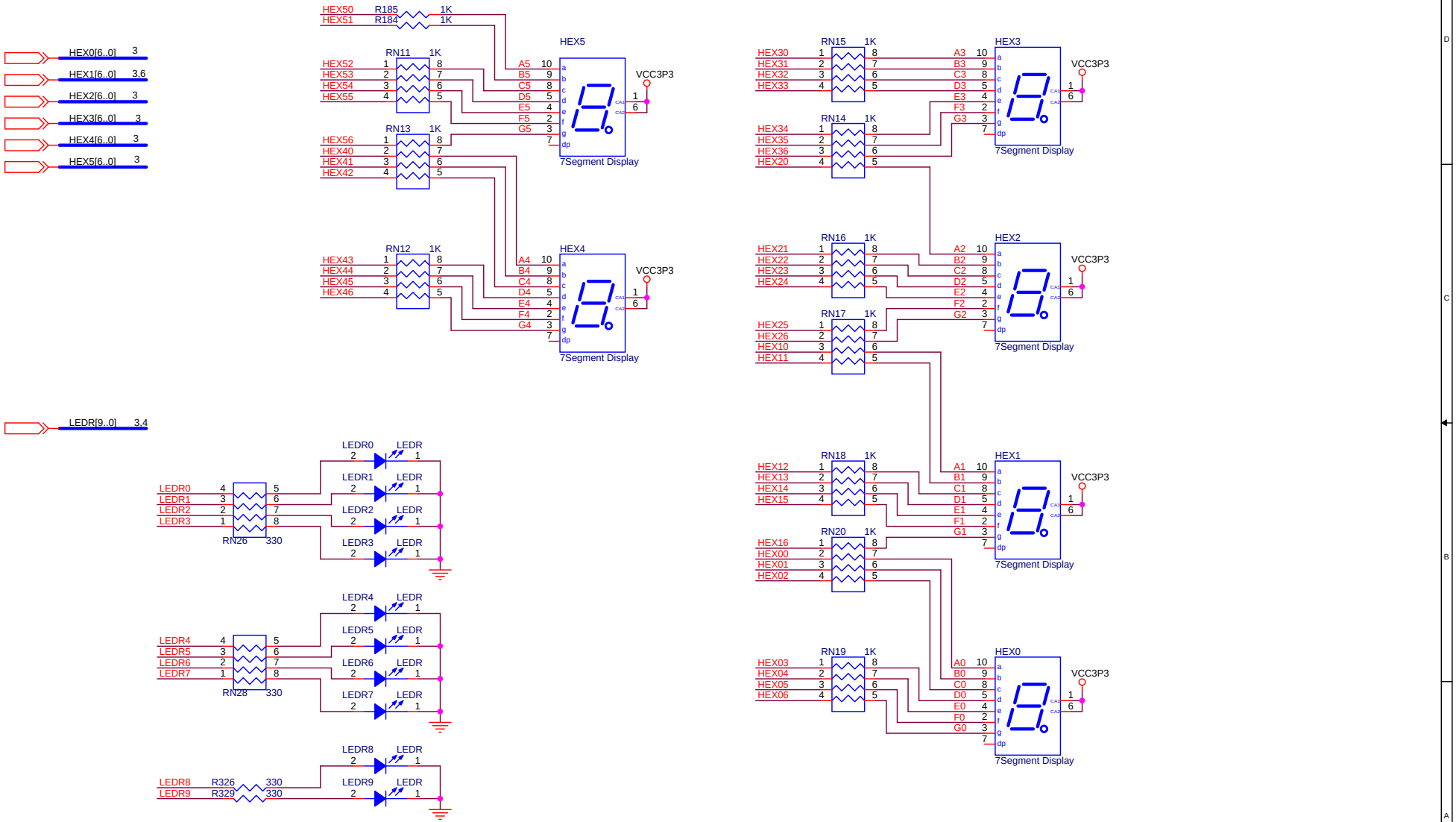
Date: Friday, February 17, 2017 Sheet 18 of 33



Title
DE10-Standard Board

Size	Document Number	Rev
B	Audio CODEC	B

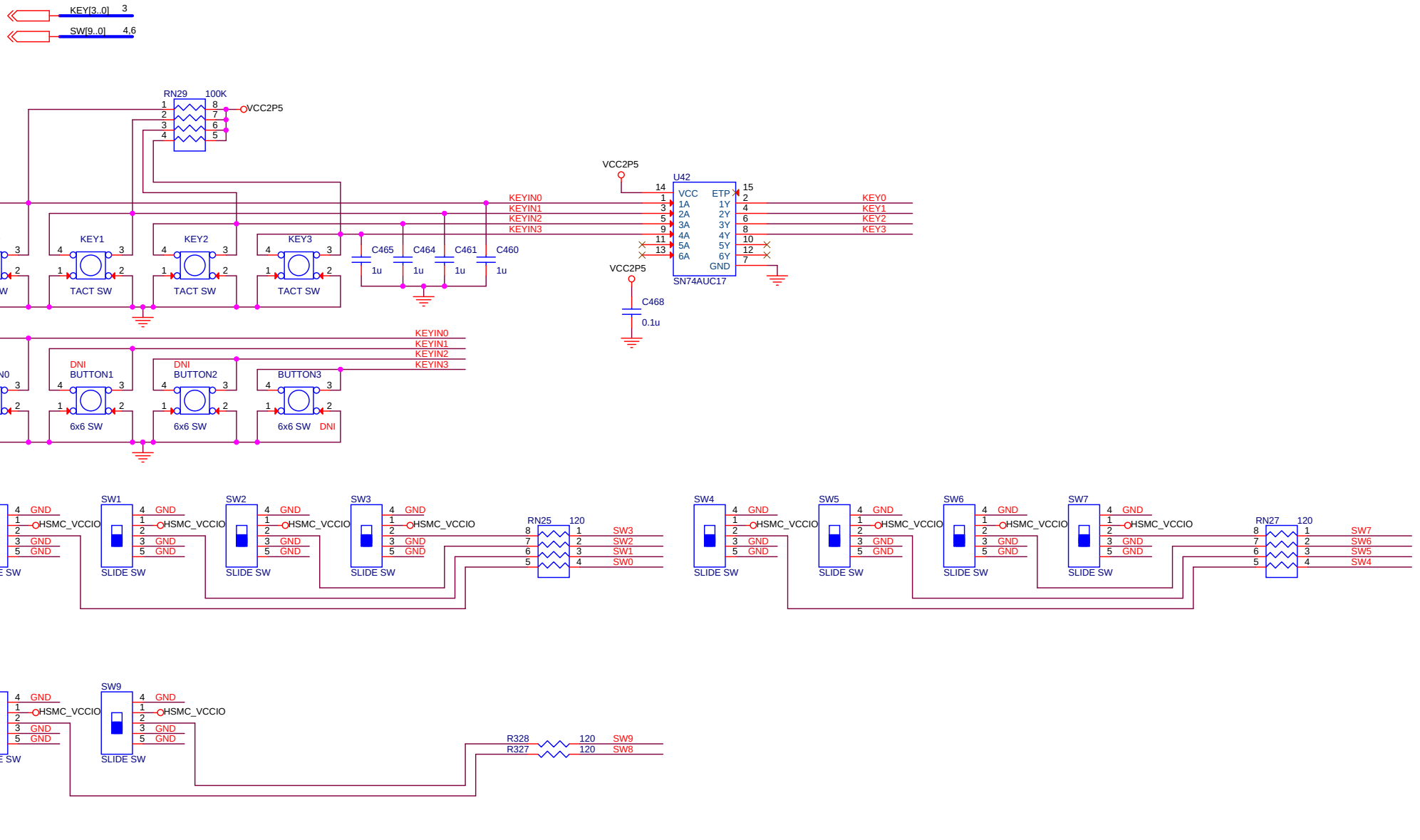
Date: Friday, February 17, 2017 Sheet 19 of 33



Title
DE10-Standard Board

Size	Document Number	Rev
B	7-Segment Display, LED	B

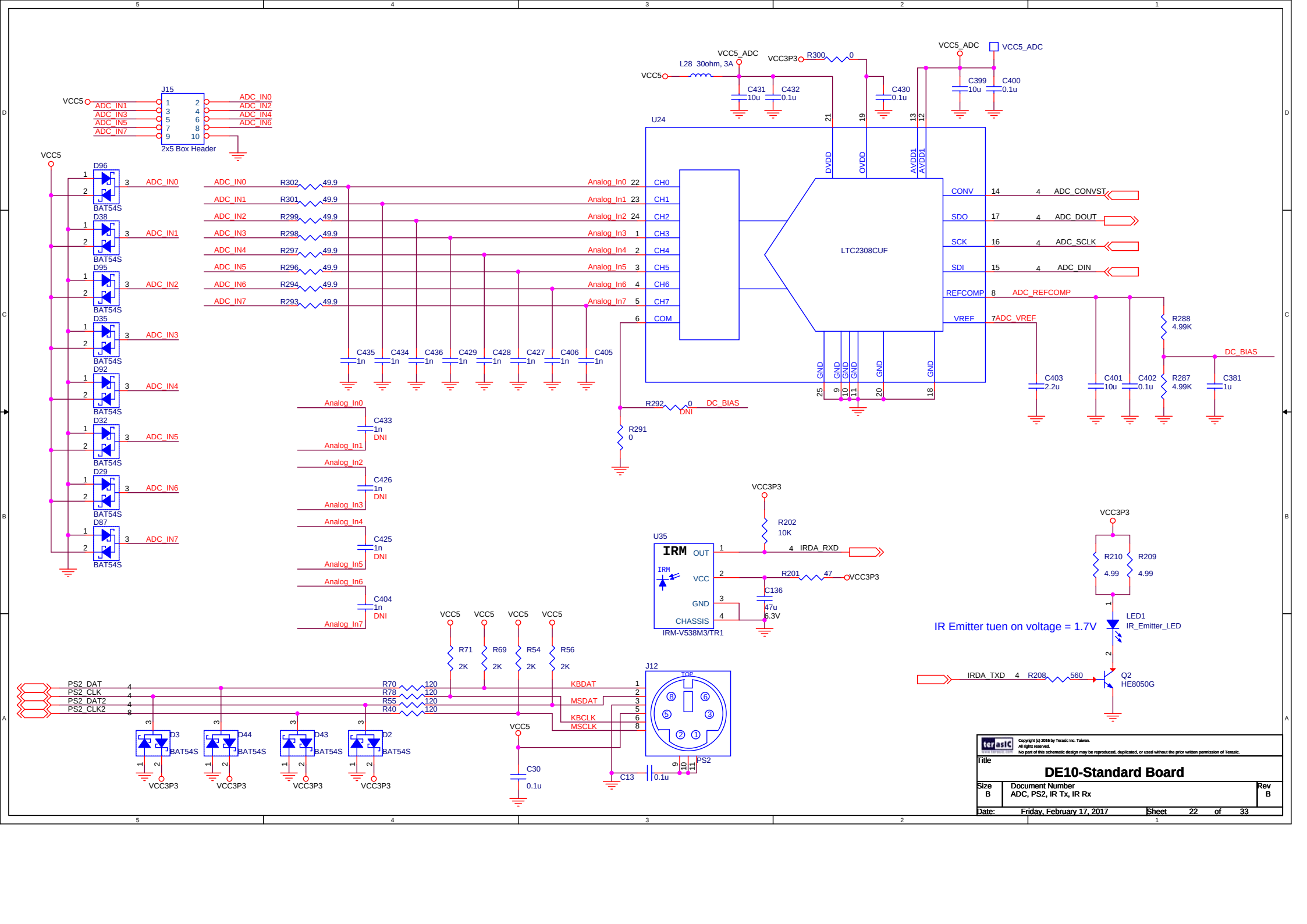
Date: Friday, February 17, 2017 Sheet 20 of 33

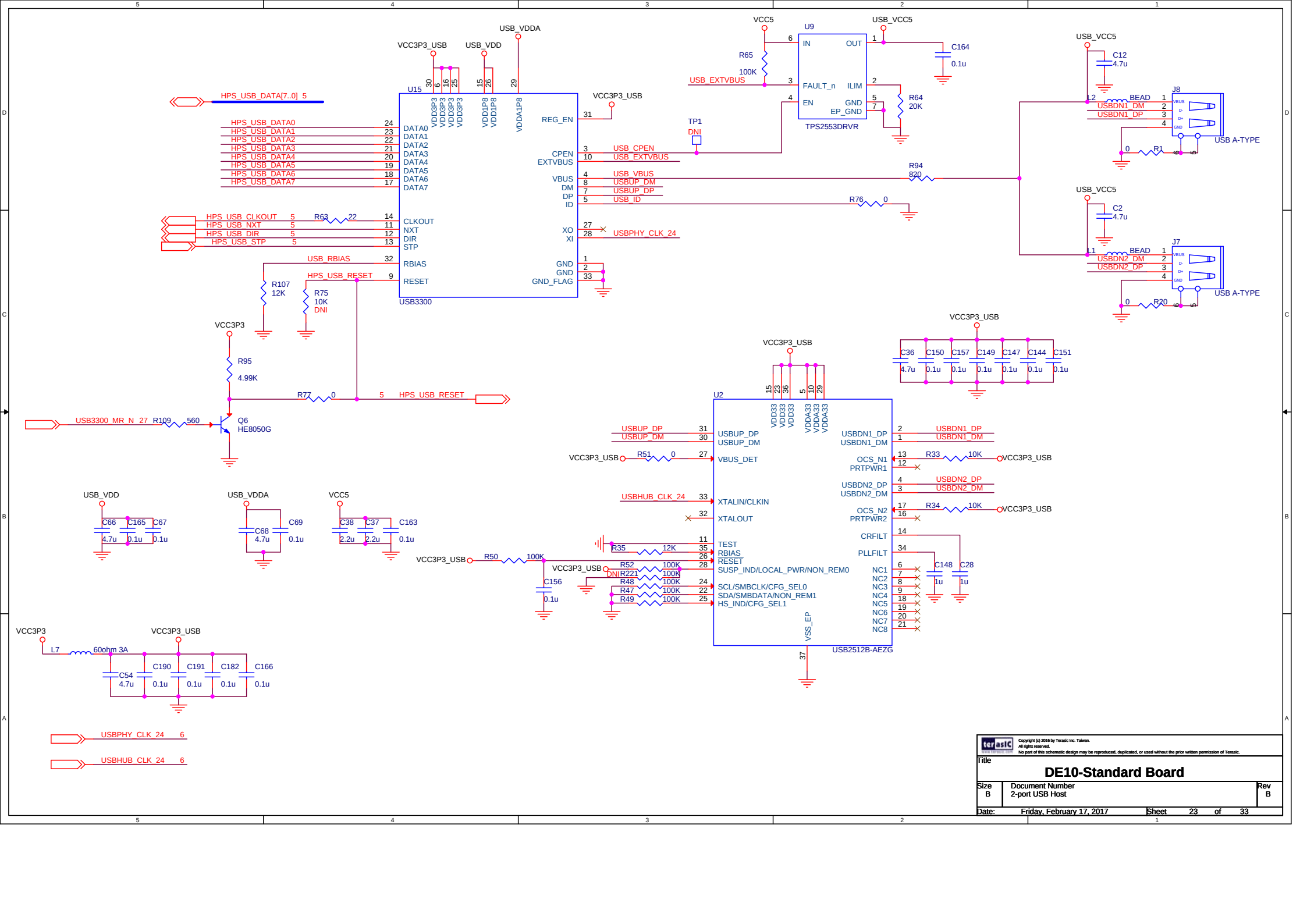


Title
DE10-Standard Board

Size	Document Number	Rev
B	FPGA BUTTON, Switch	B

Date: Friday, February 17, 2017 Sheet 21 of 33

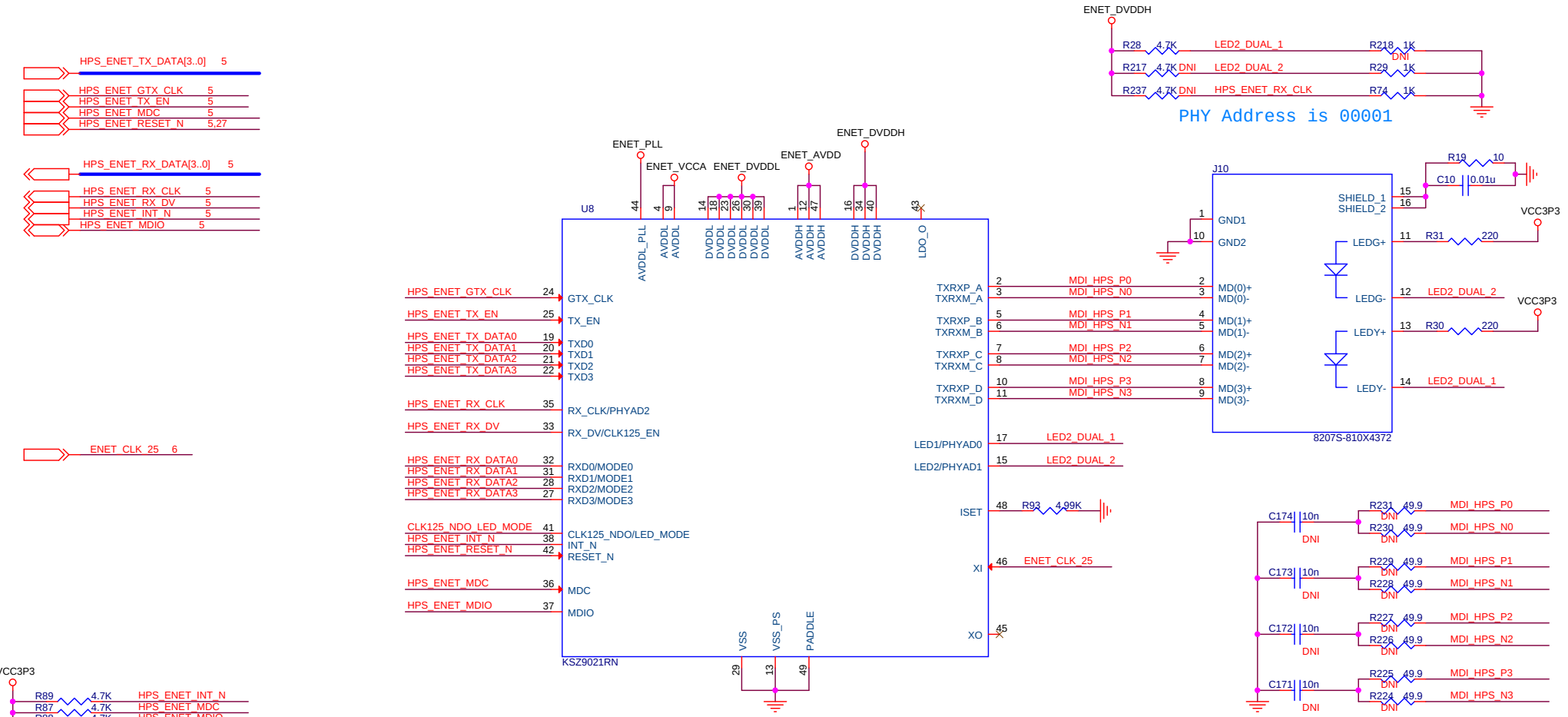

J15
2x5 Box Header
U24
LTC2308CUF
DVDD
OVDD
AVDD1
CONV
SDO
SCK
SDI
REFCOMP
VREF
CH0
CH1
CH2
CH3
CH4
CH5
CH6
CH7
COM
GND
ADC_CONVST
ADC_DOUT
ADC_SCLK
ADC_DIN
ADC_REFCOMP
ADC_VREF
DC_BIAS
VCC5
VCC5_ADC
VCC3P3
L28 30ohm, 3A
R300
C430
C431
C432
C399
C400
R288
R287
C381
C401
C402
C403
R291
R292
DNI
D96
D38
D95
D35
D92
D32
D29
D87
BAT54S
R302
R301
R299
R298
R297
R296
R294
R293
C435
C434
C436
C429
C428
C427
C406
C405
C433
C426
C425
C404
U35
IRM
IRM-V538M3/TR1
R202
R201
C136
IRDA_RXD
R71
R69
R54
R56
R70
R78
R55
R40
J12
PS2
KBDAT
MSDAT
KBCLK
MSCLK
C30
C13
R210
R209
LED1
IR_Emitter_LED
IR Emitter tuen on voltage = 1.7V
IRDA_TXD
R208
Q2
HE8050G
Title
DE10-Standard Board
Size B
Document Number
ADC, PS2, IR Tx, IR Rx
Rev B
Date: Friday, February 17, 2017
Sheet 22 of 33



Title: **DE10-Standard Board**

Size	Document Number	Rev
B	2-port USB Host	B

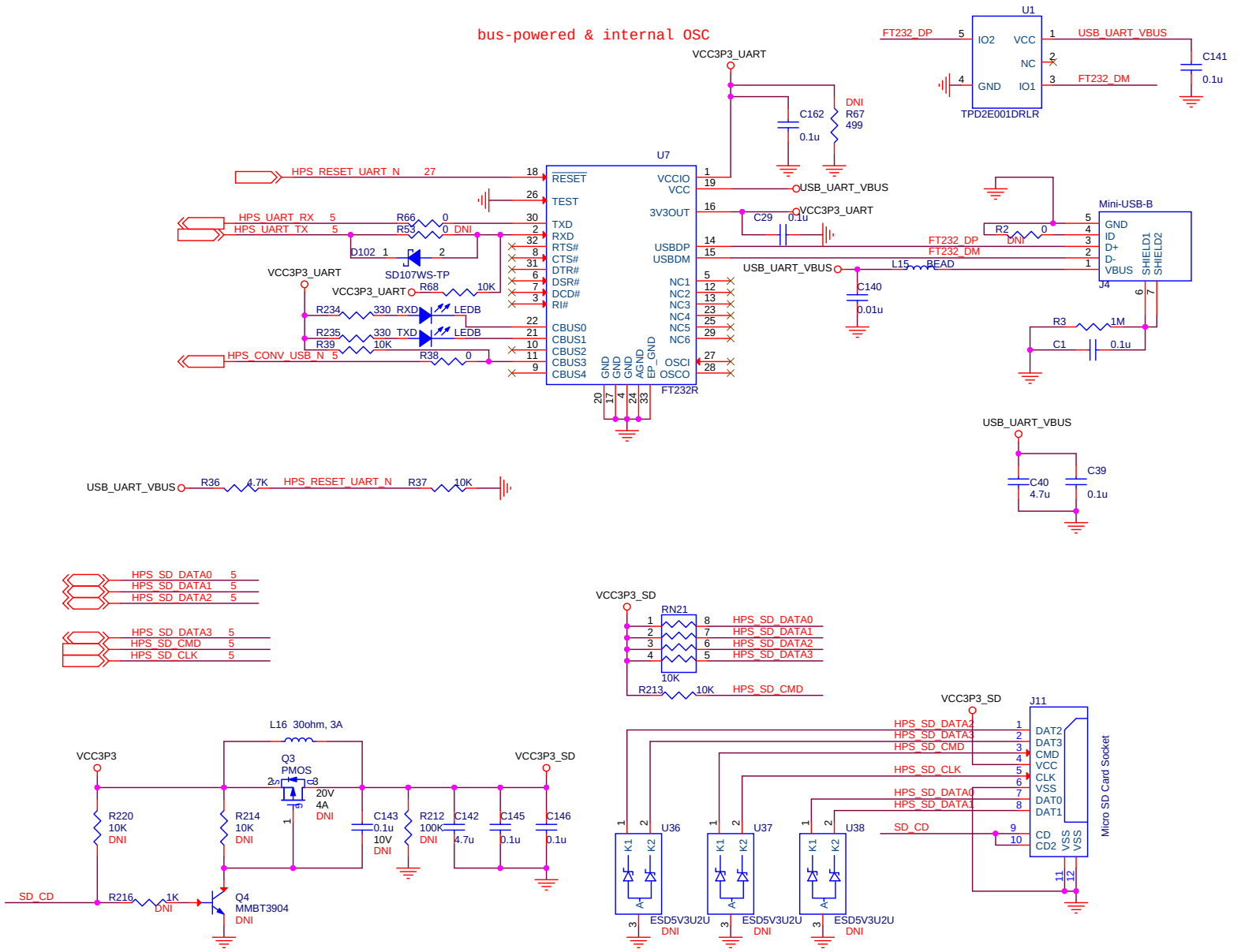
Date: Friday, February 17, 2017 Sheet 23 of 33



Title: **DE10-Standard Board**

Size	Document Number	Rev
B	1 Gagabit Ethernet	B

Date: Friday, February 17, 2017 Sheet 24 of 33



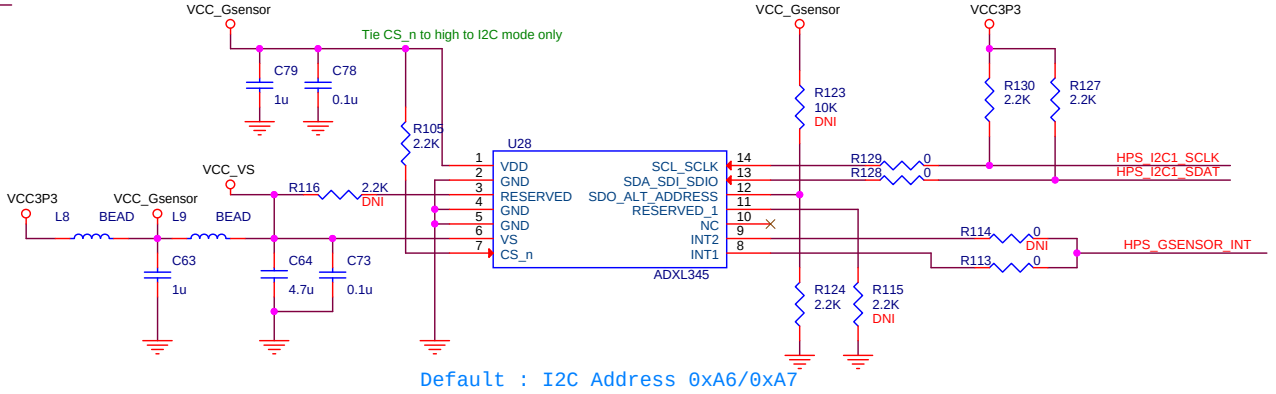
Title
DE10-Standard Board

Size	Document Number	Rev
B	UART to USB, SD CARD	B

Date: Friday, February 17, 2017 Sheet 25 of 33

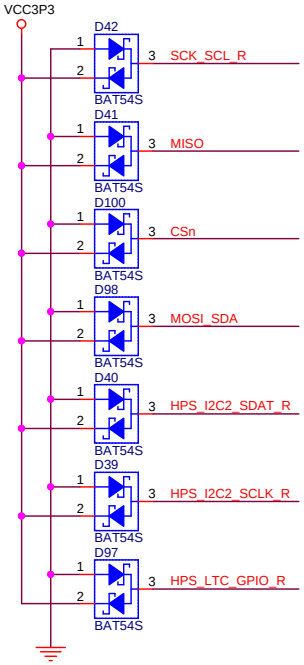
HPS_I2C1_SDAT 5,27
HPS_I2C1_SCLK 5,27
HPS_GSENSOR_INT 5

Digital Accelerometer

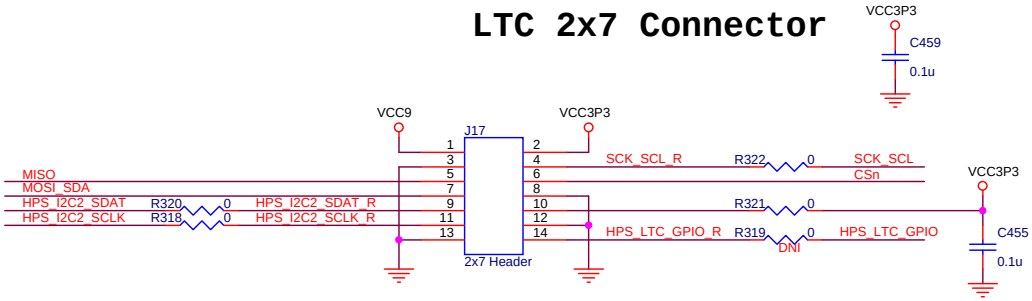


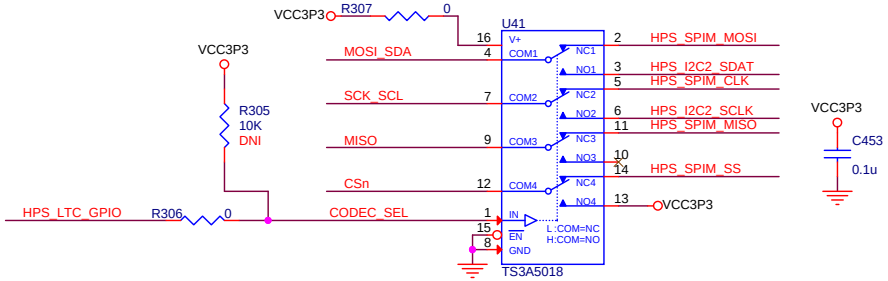
Default : I2C Address 0xA6/0xA7

HPS_I2C2_SCLK 5
HPS_I2C2_SDAT 5
HPS_SPIM_MOSI 5
HPS_SPIM_CLK 5
HPS_SPIM_SS 5
HPS_SPIM_MISO 5
HPS_LTC_GPIO 5

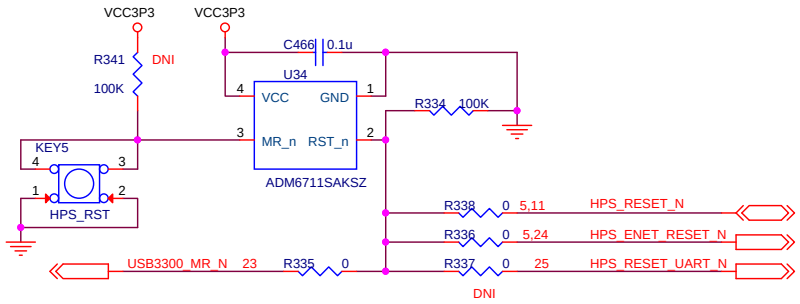


LTC 2x7 Connector



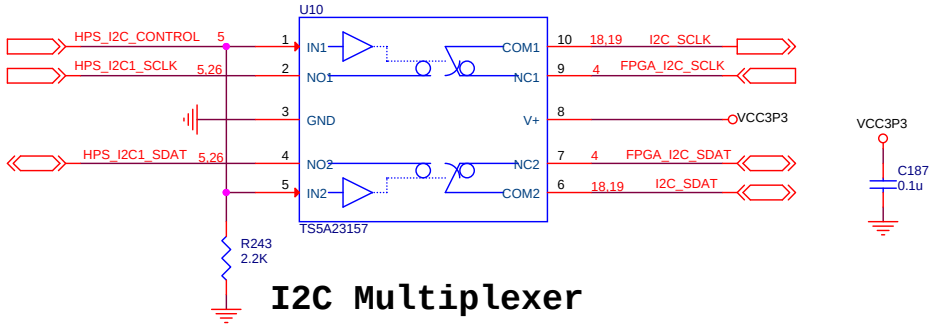


Title	DE10-Standard Board	
Size B	Document Number Accelerometer, LTC Connector	Rev B
Date: Friday, February 17, 2017	Sheet 26 of 33	

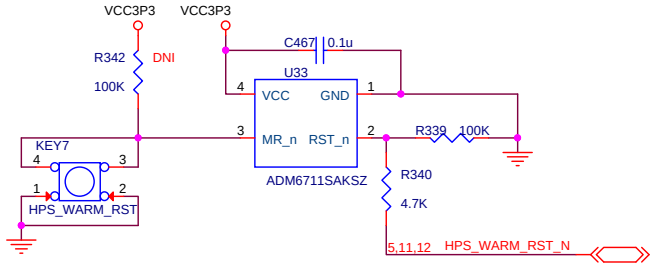


HPS Cold Reset

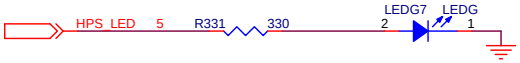
LOW --> NC to/from COM = ON and NO to/from COM = OFF
HIGH --> NC to/from COM = OFF and NO to/from COM = ON



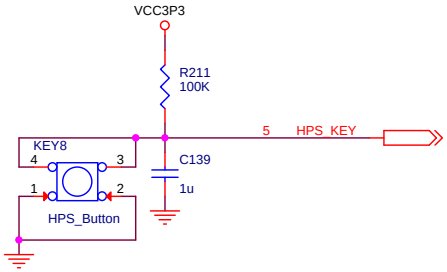
I2C Multiplexer



HPS Warm Reset

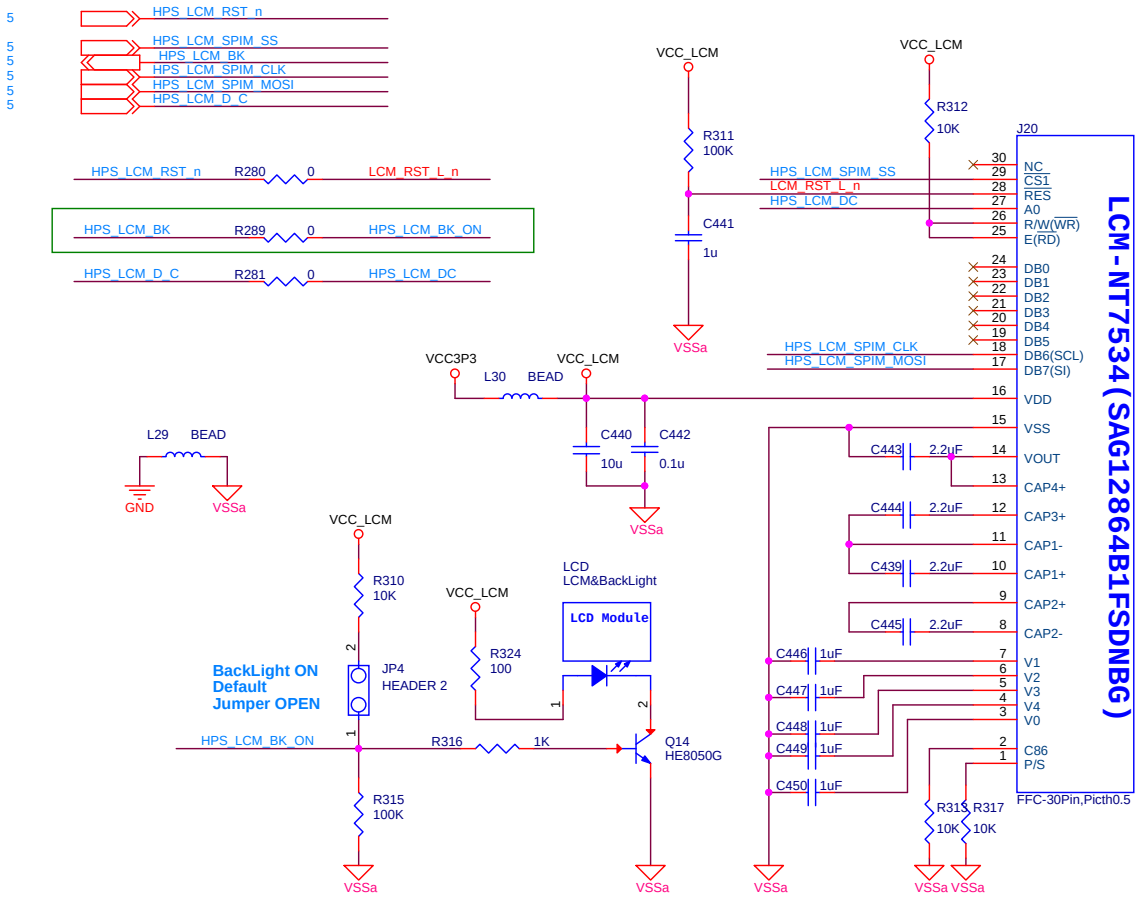


HPS User LED



HPS User Button

Title	DE10-Standard Board	
Size B	Document Number I2C Multiplexer, HPS BUTTON, HPS LED	Rev B
Date: Friday, February 17, 2017	Sheet 27 of 33	



Title: **DE10-Standard Board**

Size	Document Number	Rev
B	LCD	B

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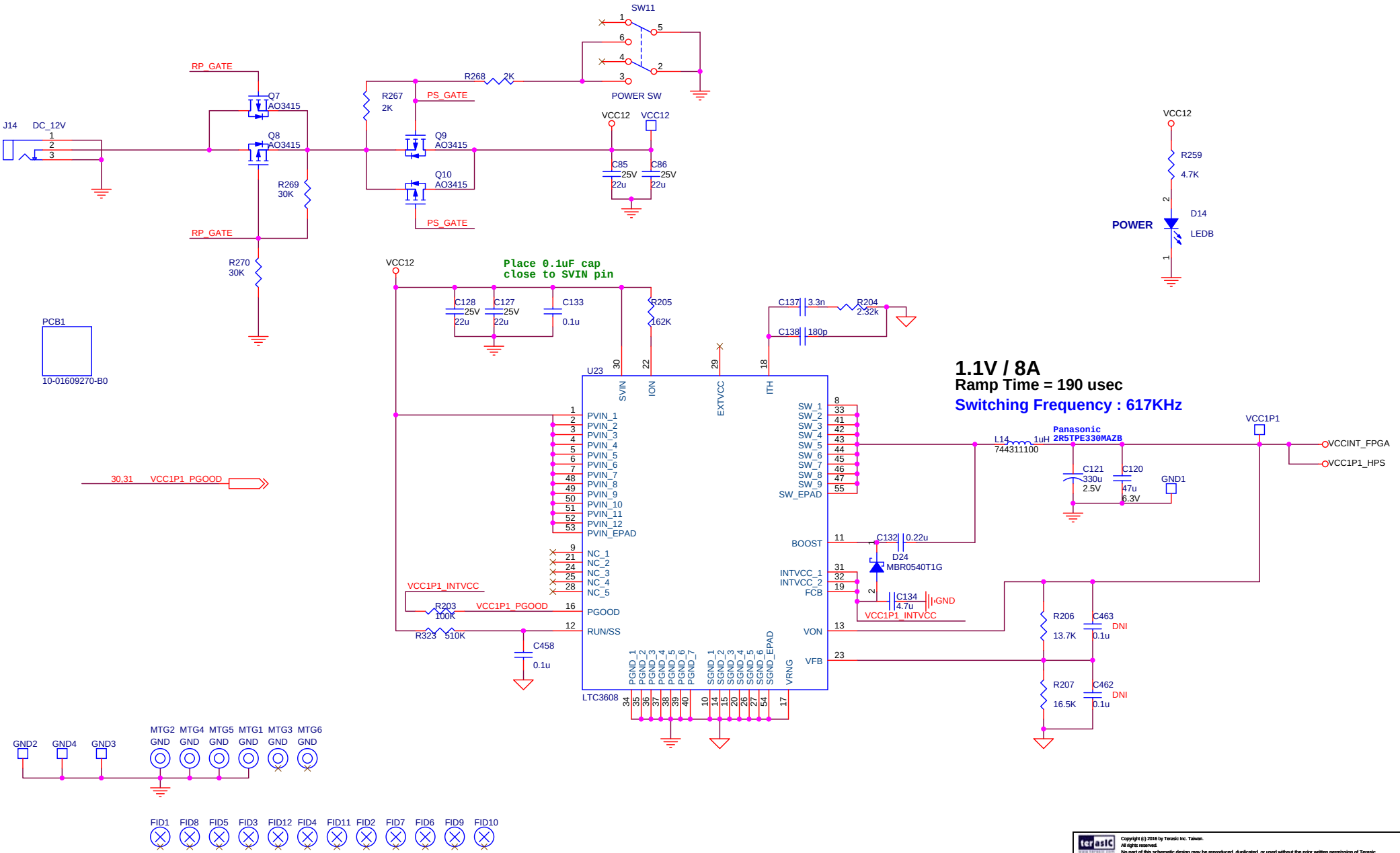

Title: **DE10-Standard Board**

Size	Document Number	Rev
B	Power - 1.1V	B

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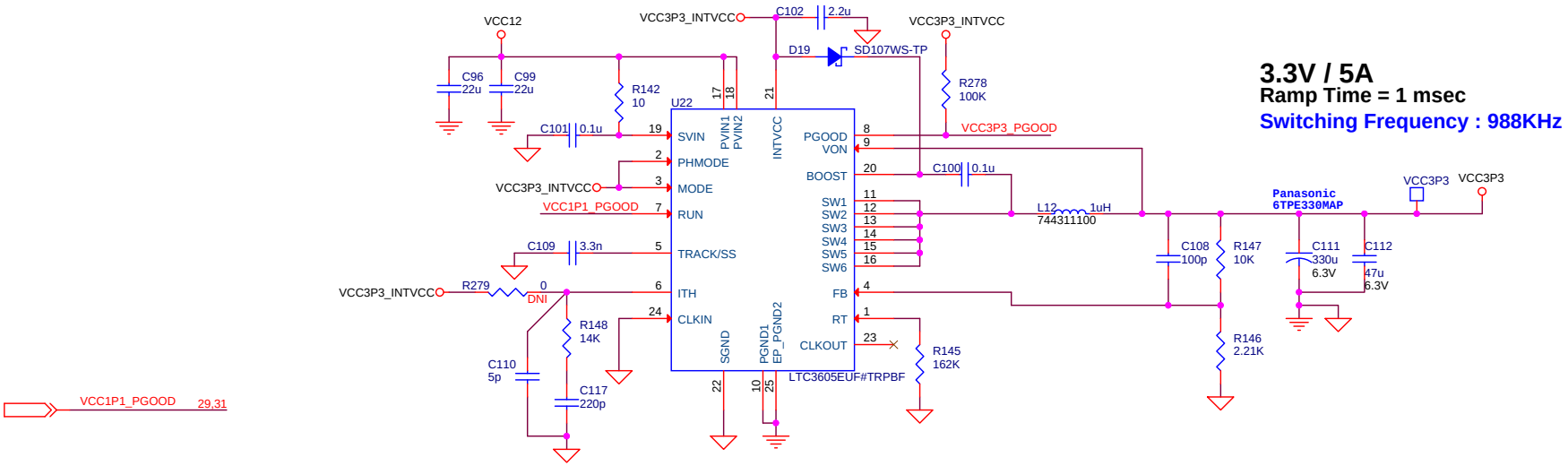
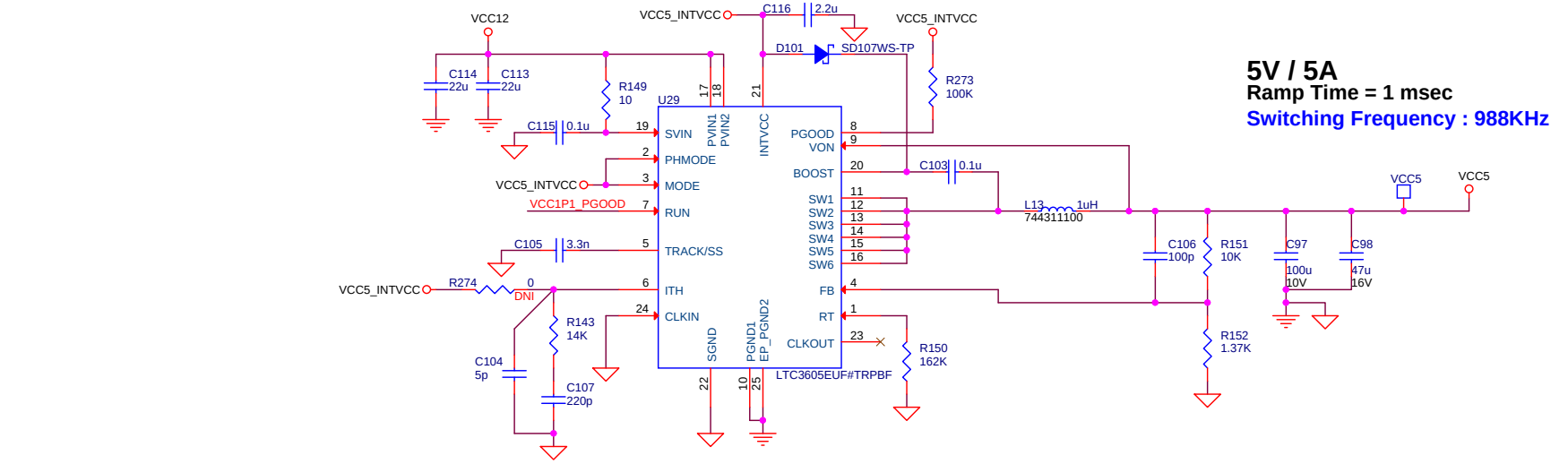


3.3V / 5A
Ramp Time = 1 msec
Switching Frequency : 988KHz



5V / 5A
Ramp Time = 1 msec
Switching Frequency : 988KHz

Title: **DE10-Standard Board**

Size	Document Number	Rev
B	Power - 5V, 3.3V	B

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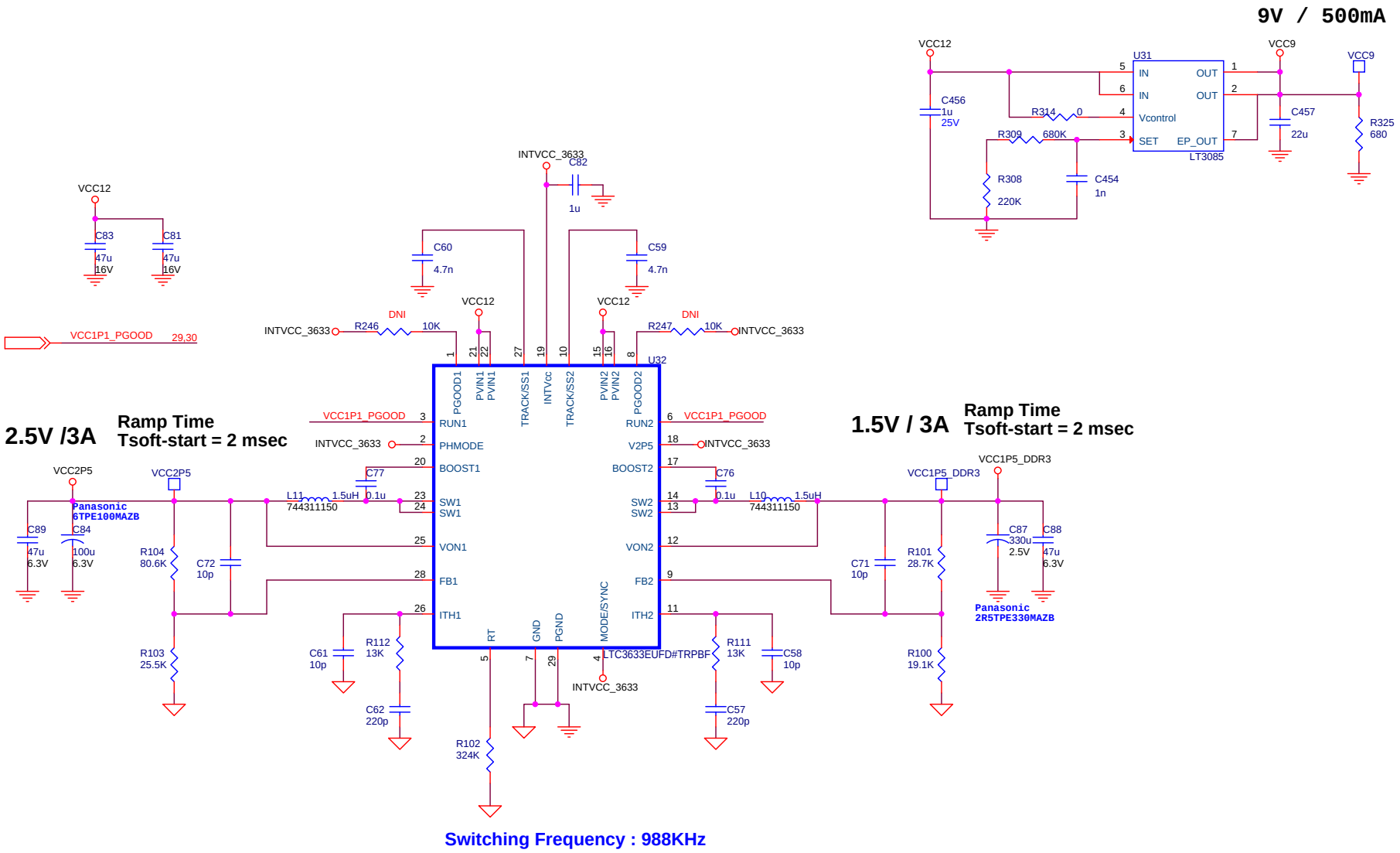

Title	DE10-Standard Board	
Size B	Document Number Power - 9V, 2.5V, 1.5V	Rev B
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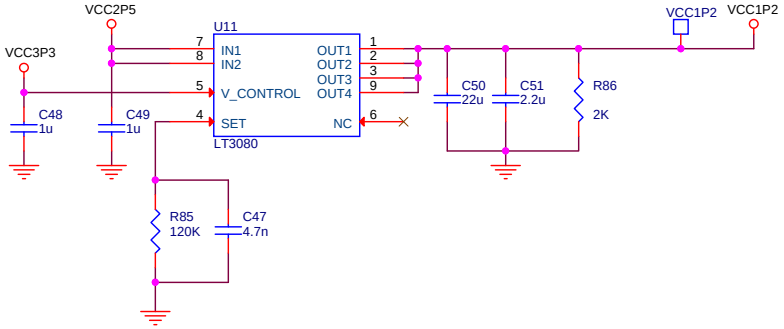
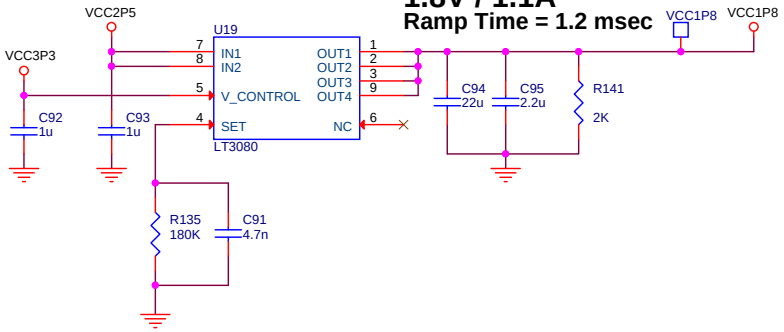
1.2V / 1.1A

Ramp Time = 0.8msec

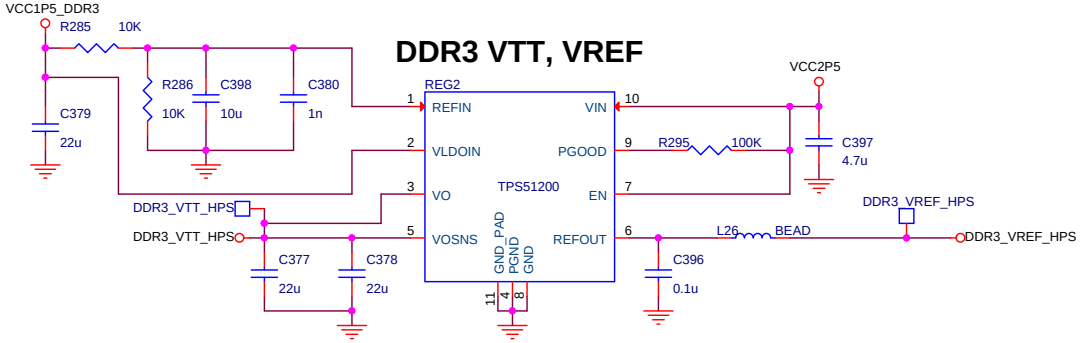


1.8V / 1.1A

Ramp Time = 1.2 msec



DDR3 VTT, VREF



Title: **DE10-Standard Board**

Size	Document Number	Rev
B	Power - 1.2V, 1.8V, DDR3 VREF, DDR3 VTT	B

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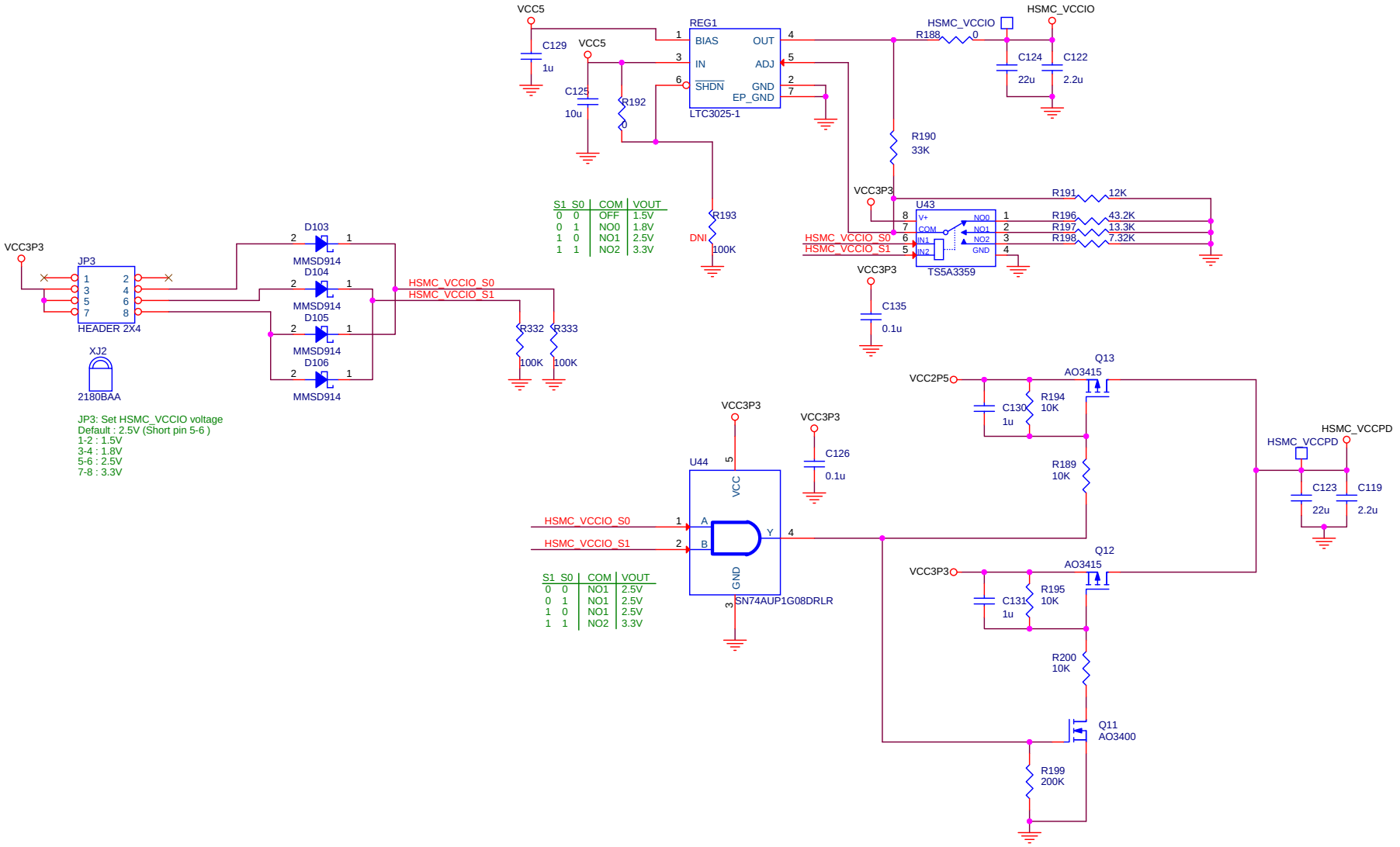
HSMC_VCCIO / 0.5A

Adjustable: 3.3/2.5/1.8/1.5 V
Default: 2.5V



Title: **DE10-Standard Board**

Size	Document Number	Rev
B	Power - VCCIO_HSMC & HSMC_VCCPD	B

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