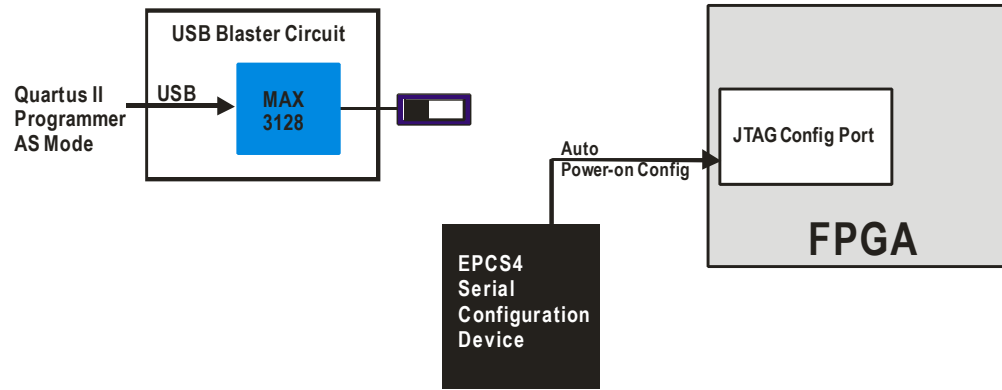
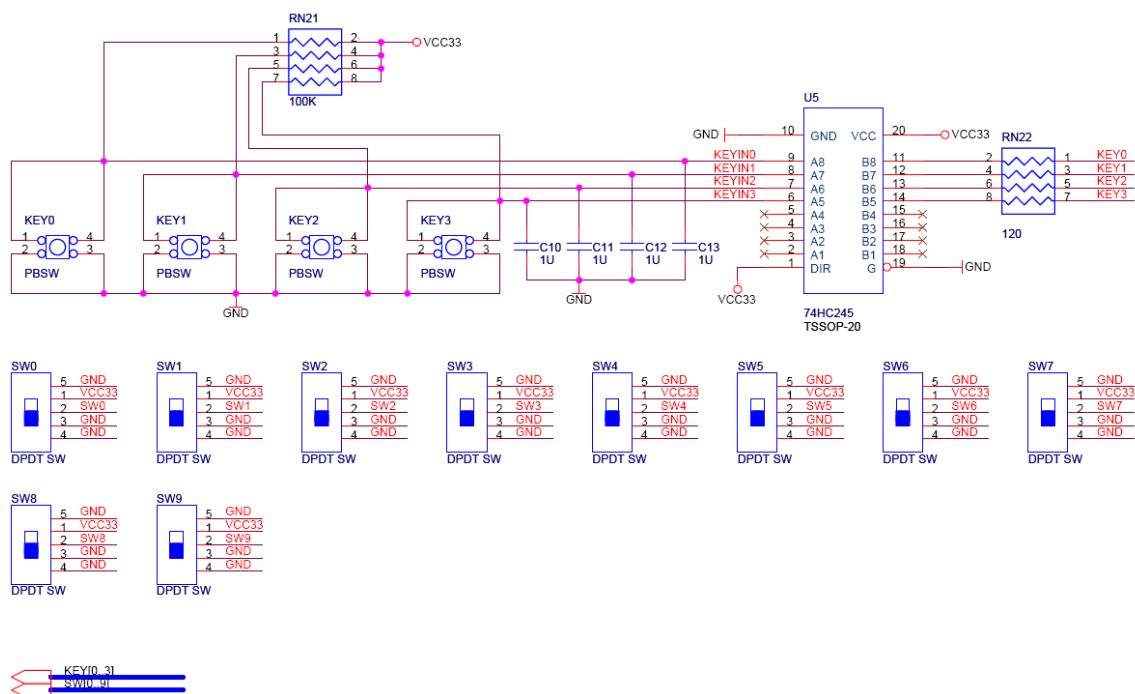
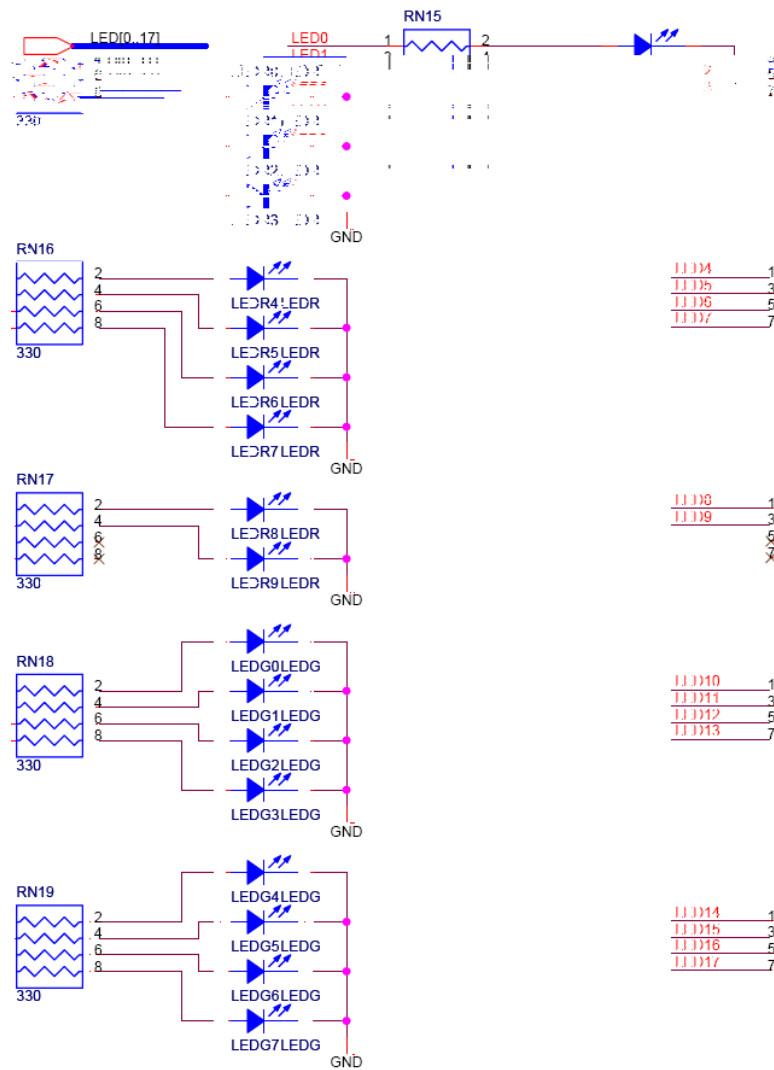






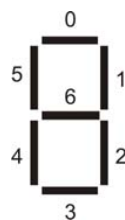
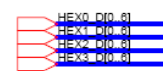
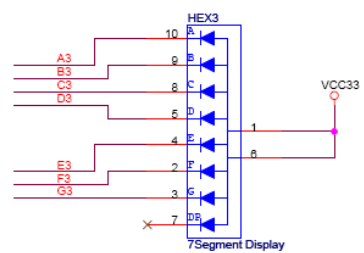
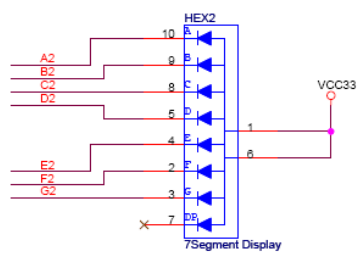
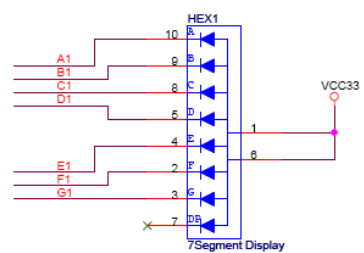
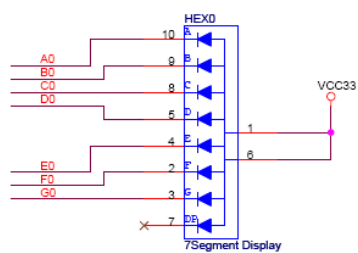
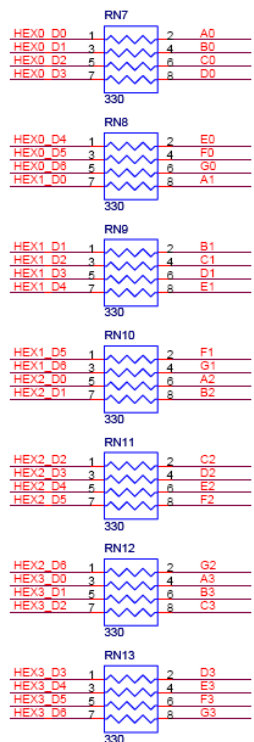


Signal Name	FPGA Pin No.	Description
SW[0]	PIN_L22	Toggle Switch[0]
SW[1]	PIN_L21	Toggle Switch[1]
SW[2]	PIN_M22	Toggle Switch[2]
SW[3]	PIN_V12	Toggle Switch[3]
SW[4]	PIN_W12	Toggle Switch[4]
SW[5]	PIN_U12	Toggle Switch[5]
SW[6]	PIN_U11	Toggle Switch[6]
SW[7]	PIN_M2	Toggle Switch[7]

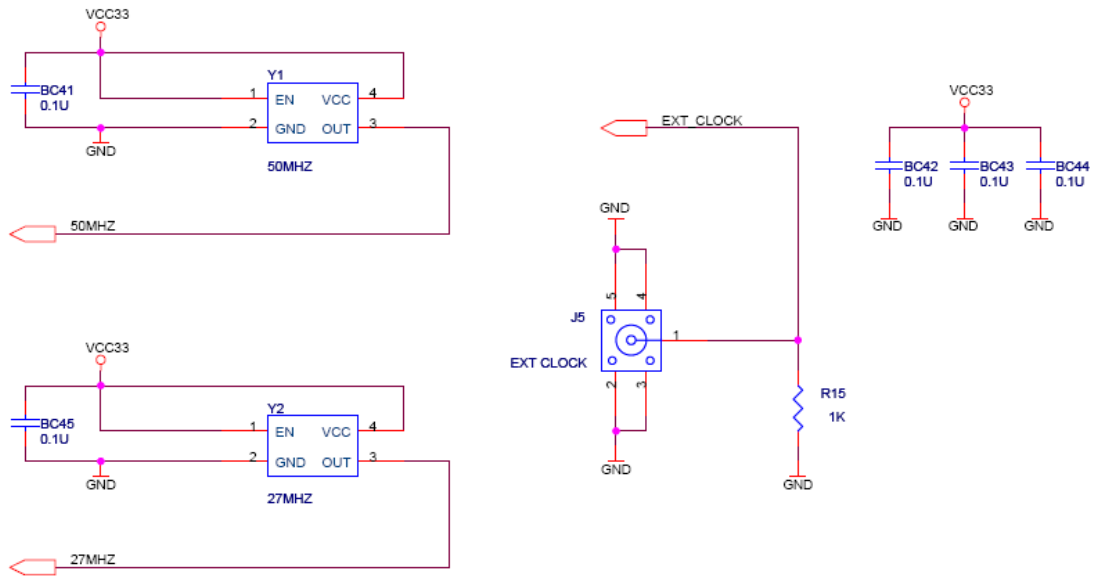
SW[8]	PIN_M1	Toggle Switch[8]
SW[9]	PIN_L2	Toggle Switch[9]

Signal Name	FPGA Pin No.	Description
KEY[0]	PIN_R22	Pushbutton[0]
KEY[1]	PIN_R21	Pushbutton[1]
KEY[2]	PIN_T22	Pushbutton[2]
KEY[3]	PIN_T21	Pushbutton[3]

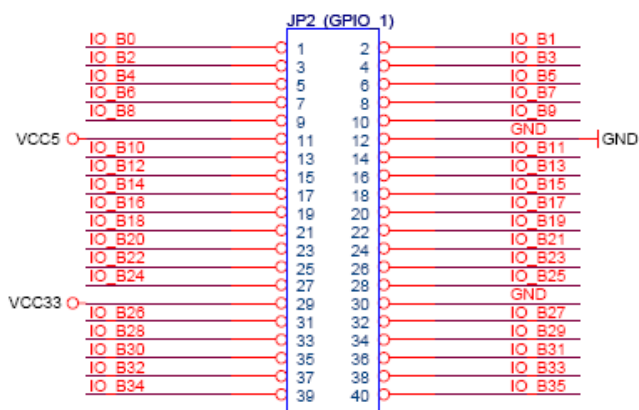
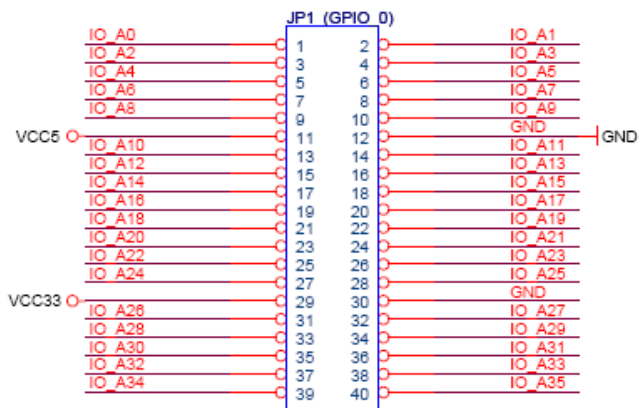
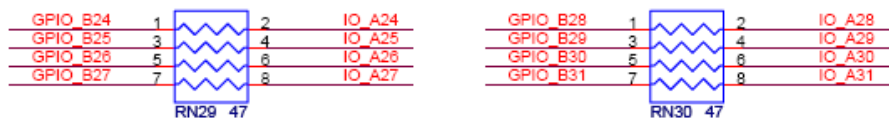
Signal Name	FPGA Pin No.	Description
LEDR[0]	PIN_R20	LED Red[0]
LEDR[1]	PIN_R19	LED Red[1]
LEDR[2]	PIN_U19	LED Red[2]
LEDR[3]	PIN_Y19	LED Red[3]
LEDR[4]	PIN_T18	LED Red[4]
LEDR[5]	PIN_V19	LED Red[5]
LEDR[6]	PIN_Y18	LED Red[6]
LEDR[7]	PIN_U18	LED Red[7]
LEDR[8]	PIN_R18	LED Red[8]
LEDR[9]	PIN_R17	LED Red[9]
LEDG[0]	PIN_U22	LED Green[0]
LEDG[1]	PIN_U21	LED Green[1]
LEDG[2]	PIN_V22	LED Green[2]
LEDG[3]	PIN_V21	LED Green[3]
LEDG[4]	PIN_W22	LED Green[4]
LEDG[5]	PIN_W21	LED Green[5]
LEDG[6]	PIN_Y22	LED Green[6]
LEDG[7]	PIN_Y21	LED Green[7]



Signal Name	FPGA Pin No.	Description
HEX0[0]	PIN_J2	Seven Segment Digit 0[0]
HEX0[1]	PIN_J1	Seven Segment Digit 0[1]
HEX0[2]	PIN_H2	Seven Segment Digit 0[2]
HEX0[3]	PIN_H1	Seven Segment Digit 0[3]
HEX0[4]	PIN_F2	Seven Segment Digit 0[4]
HEX0[5]	PIN_F1	Seven Segment Digit 0[5]
HEX0[6]	PIN_E2	Seven Segment Digit 0[6]
HEX1[0]	PIN_E1	Seven Segment Digit 1[0]
HEX1[1]	PIN_H6	Seven Segment Digit 1[1]
HEX1[2]	PIN_H5	Seven Segment Digit 1[2]
HEX1[3]	PIN_H4	Seven Segment Digit 1[3]
HEX1[4]	PIN_G3	Seven Segment Digit 1[4]
HEX1[5]	PIN_D2	Seven Segment Digit 1[5]
HEX1[6]	PIN_D1	Seven Segment Digit 1[6]
HEX2[0]	PIN_G5	Seven Segment Digit 2[0]
HEX2[1]	PIN_G6	Seven Segment Digit 2[1]
HEX2[2]	PIN_C2	Seven Segment Digit 2[2]
HEX2[3]	PIN_C1	Seven Segment Digit 2[3]
HEX2[4]	PIN_E3	Seven Segment Digit 2[4]
HEX2[5]	PIN_E4	Seven Segment Digit 2[5]
HEX2[6]	PIN_D3	Seven Segment Digit 2[6]
HEX3[0]	PIN_F4	Seven Segment Digit 3[0]
HEX3[1]	PIN_D5	Seven Segment Digit 3[1]
HEX3[2]	PIN_D6	Seven Segment Digit 3[2]
HEX3[3]	PIN_J4	Seven Segment Digit 3[3]
HEX3[4]	PIN_L8	Seven Segment Digit 3[4]
HEX3[5]	PIN_F3	Seven Segment Digit 3[5]
HEX3[6]	PIN_D4	Seven Segment Digit 3[6]



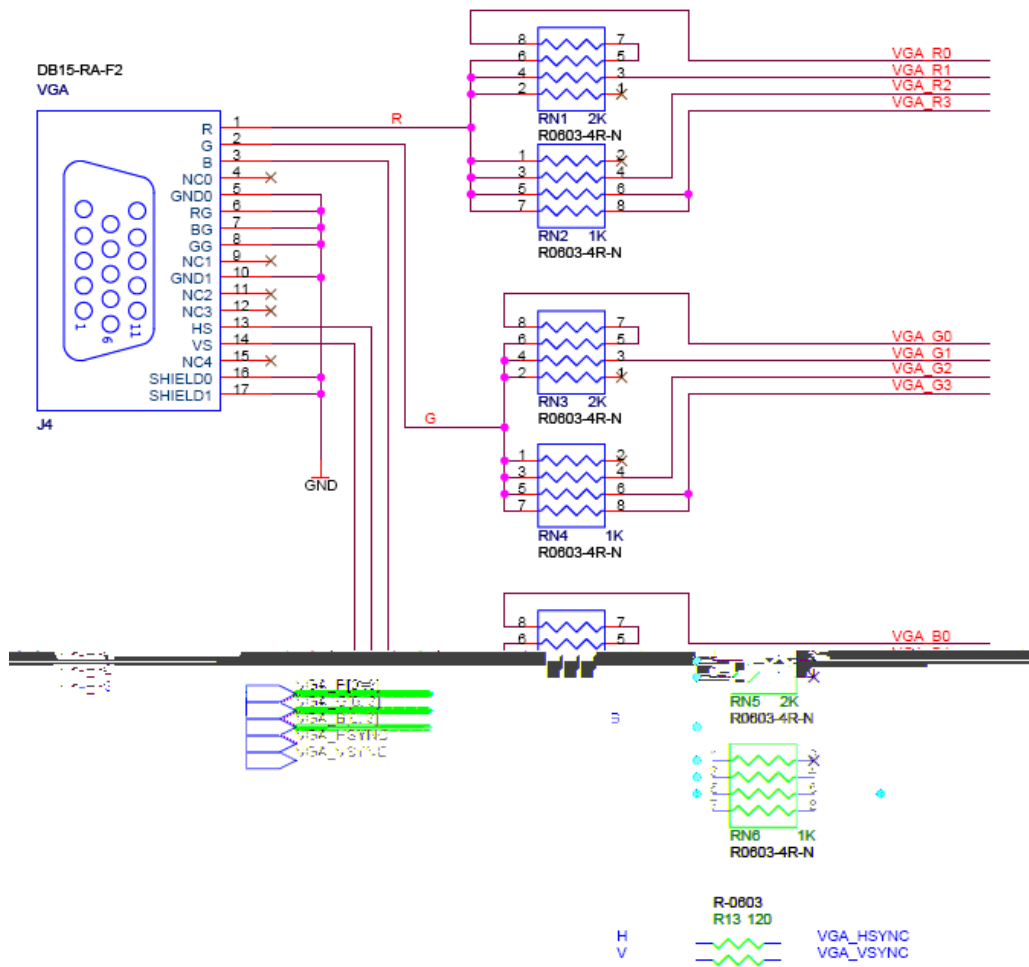
Signal Name	FPGA Pin No.	Description
CLOCK_27	PIN_D12, PIN_E12	27 MHz clock input
CLOCK_50	PIN_L1	50 MHz clock input
CLOCK_24	PIN_A12, PIN_B12	24 MHz clock input from USB Blaster
EXT_CLOCK	PIN_M21	External (SMA) clock input



Signal Name	FPGA Pin No.	Description
GPIO_0[0]	PIN_A13	GPIO Connection 0[0]

GPIO_0[1]	PIN_B13	GPIO Connection 0[1]
GPIO_0[2]	PIN_A14	GPIO Connection 0[2]
GPIO_0[3]	PIN_B14	GPIO Connection 0[3]
GPIO_0[4]	PIN_A15	GPIO Connection 0[4]
GPIO_0[5]	PIN_B15	GPIO Connection 0[5]
GPIO_0[6]	PIN_A16	GPIO Connection 0[6]
GPIO_0[7]	PIN_B16	GPIO Connection 0[7]
GPIO_0[8]	PIN_A17	GPIO Connection 0[8]
GPIO_0[9]	PIN_B17	GPIO Connection 0[9]
GPIO_0[10]	PIN_A18	GPIO Connection 0[10]
GPIO_0[11]	PIN_B18	GPIO Connection 0[11]
GPIO_0[12]	PIN_A19	GPIO Connection 0[12]
GPIO_0[13]	PIN_B19	GPIO Connection 0[13]
GPIO_0[14]	PIN_A20	GPIO Connection 0[14]
GPIO_0[15]	PIN_B20	GPIO Connection 0[15]
GPIO_0[16]	PIN_C21	GPIO Connection 0[16]
GPIO_0[17]	PIN_C22	GPIO Connection 0[17]
GPIO_0[18]	PIN_D21	GPIO Connection 0[18]
GPIO_0[19]	PIN_D22	GPIO Connection 0[19]
GPIO_0[20]	PIN_E21	GPIO Connection 0[20]
GPIO_0[21]	PIN_E22	GPIO Connection 0[21]
GPIO_0[22]	PIN_F21	GPIO Connection 0[22]
GPIO_0[23]	PIN_F22	GPIO Connection 0[23]
GPIO_0[24]	PIN_G21	GPIO Connection 0[24]
GPIO_0[25]	PIN_G22	GPIO Connection 0[25]
GPIO_0[26]	PIN_J21	GPIO Connection 0[26]
GPIO_0[27]	PIN_J22	GPIO Connection 0[27]
GPIO_0[28]	PIN_K21	GPIO Connection 0[28]
GPIO_0[29]	PIN_K22	GPIO Connection 0[29]
GPIO_0[30]	PIN_J19	GPIO Connection 0[30]
GPIO_0[31]	PIN_J20	GPIO Connection 0[31]
GPIO_0[32]	PIN_J18	GPIO Connection 0[32]
GPIO_0[33]	PIN_K20	GPIO Connection 0[33]
GPIO_0[34]	PIN_L19	GPIO Connection 0[34]
GPIO_0[35]	PIN_L18	GPIO Connection 0[35]
GPIO_1[0]	PIN_H12	GPIO Connection 1[0]
GPIO_1[1]	PIN_H13	GPIO Connection 1[1]

GPIO_1[2]	PIN_H14	GPIO Connection 1[2]
GPIO_1[3]	PIN_G15	GPIO Connection 1[3]
GPIO_1[4]	PIN_E14	GPIO Connection 1[4]
GPIO_1[5]	PIN_E15	GPIO Connection 1[5]
GPIO_1[6]	PIN_F15	GPIO Connection 1[6]
GPIO_1[7]	PIN_G16	GPIO Connection 1[7]
GPIO_1[8]	PIN_F12	GPIO Connection 1[8]
GPIO_1[9]	PIN_F13	GPIO Connection 1[9]
GPIO_1[10]	PIN_C14	GPIO Connection 1[10]
GPIO_1[11]	PIN_D14	GPIO Connection 1[11]
GPIO_1[12]	PIN_D15	GPIO Connection 1[12]
GPIO_1[13]	PIN_D16	GPIO Connection 1[13]
GPIO_1[14]	PIN_C17	GPIO Connection 1[14]
GPIO_1[15]	PIN_C18	GPIO Connection 1[15]
GPIO_1[16]	PIN_C19	GPIO Connection 1[16]
GPIO_1[17]	PIN_C20	GPIO Connection 1[17]
GPIO_1[18]	PIN_D19	GPIO Connection 1[18]
GPIO_1[19]	PIN_D20	GPIO Connection 1[19]
GPIO_1[20]	PIN_E20	GPIO Connection 1[20]
GPIO_1[21]	PIN_F20	GPIO Connection 1[21]
GPIO_1[22]	PIN_E19	GPIO Connection 1[22]
GPIO_1[23]	PIN_E18	GPIO Connection 1[23]
GPIO_1[24]	PIN_G20	GPIO Connection 1[24]
GPIO_1[25]	PIN_G18	GPIO Connection 1[25]
GPIO_1[26]	PIN_G17	GPIO Connection 1[26]
GPIO_1[27]	PIN_H17	GPIO Connection 1[27]
GPIO_1[28]	PIN_J15	GPIO Connection 1[28]
GPIO_1[29]	PIN_H18	GPIO Connection 1[29]
GPIO_1[30]	PIN_N22	GPIO Connection 1[30]
GPIO_1[31]	PIN_N21	GPIO Connection 1[31]
GPIO_1[32]	PIN_P15	GPIO Connection 1[32]
GPIO_1[33]	PIN_N15	GPIO Connection 1[33]
GPIO_1[34]	PIN_P17	GPIO Connection 1[34]
GPIO_1[35]	PIN_P18	GPIO Connection 1[35]



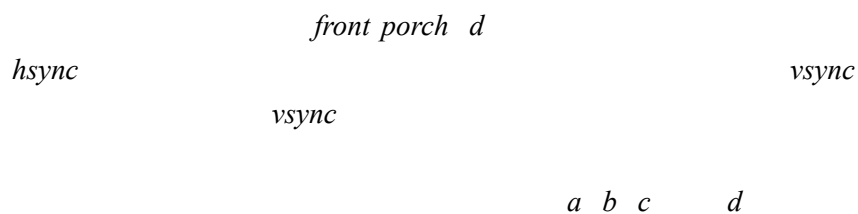
a

hsync

back porch b

hsync

c



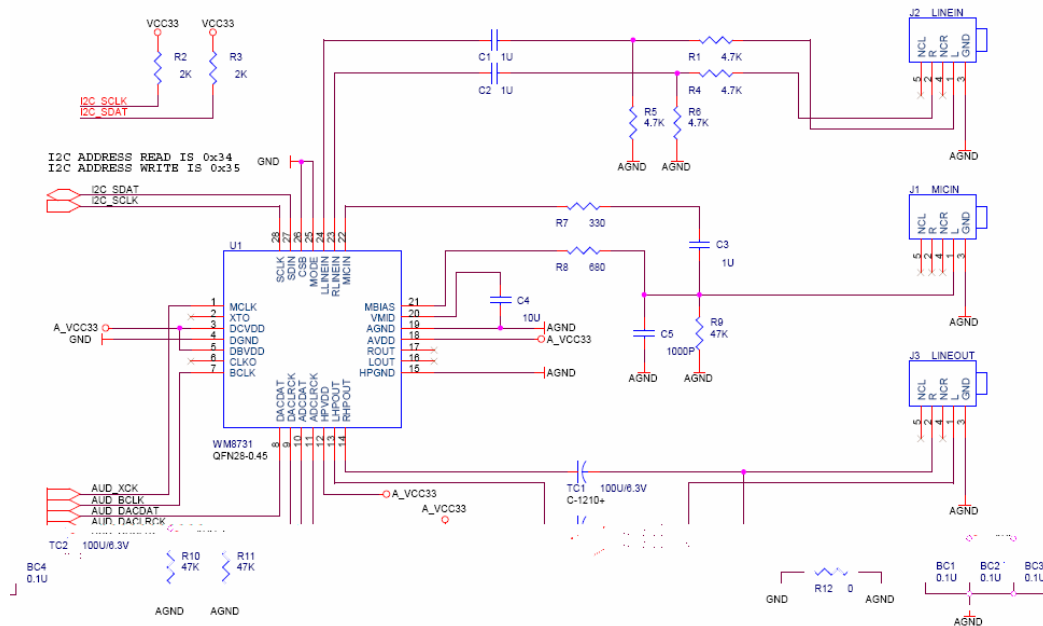
VGA mode		Horizontal Timing Spec				
Configuration	Resolution(HxV)	a(us)	b(us)	c(us)	d(us)	Pixel clock(Mhz)
VGA(60Hz)	640x480	3.8	1.9	25.4	0.6	25 (640/c)

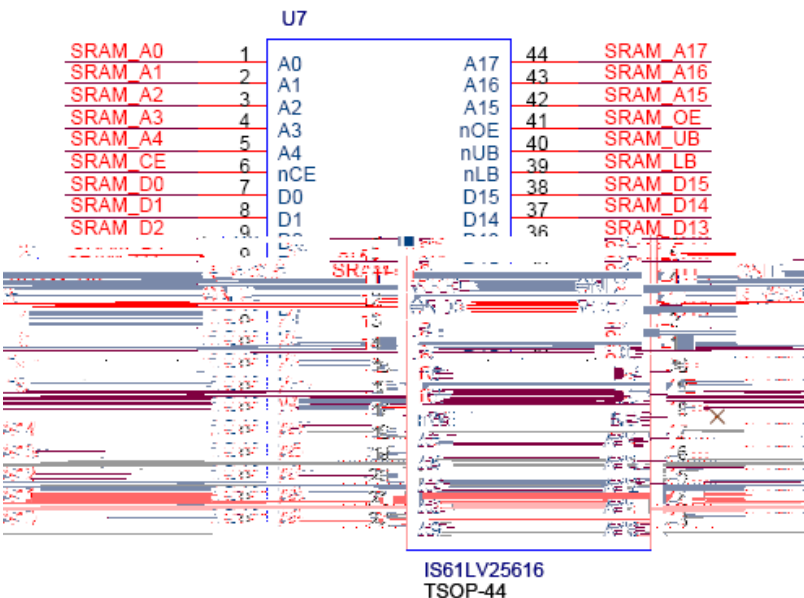
VGA mode		Vertical Timing Spec			
Configuration	Resolution (HxV)	a(lines)	b(lines)	c(lines)	d(lines)
VGA(60Hz)	640x480	2	33	480	10

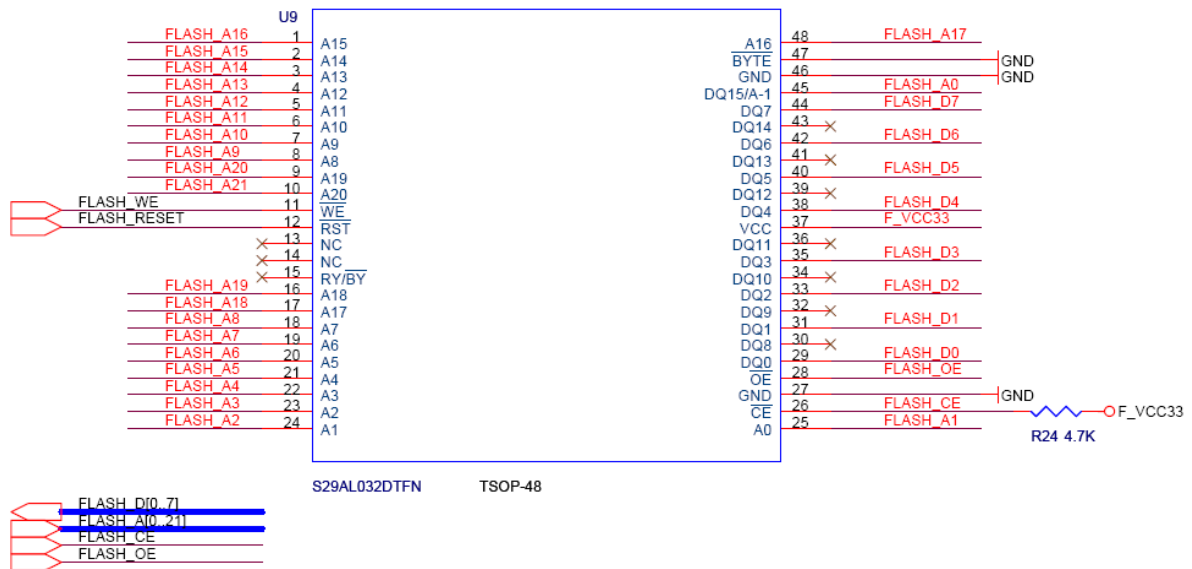
Signal Name	FPGA Pin No.	Description
VGA_R[0]	PIN_D9	VGA Red[0]
VGA_R[1]	PIN_C9	VGA Red[1]
VGA_R[2]	PIN_A7	VGA Red[2]
VGA_R[3]	PIN_B7	VGA Red[3]
VGA_G[0]	PIN_B8	VGA Green[0]
VGA_G[1]	PIN_C10	VGA Green[1]
VGA_G[2]	PIN_B9	VGA Green[2]
VGA_G[3]	PIN_A8	VGA Green[3]

VGA_B[0]	PIN_A9	VGA Blue[0]
VGA_B[1]	PIN_D11	VGA Blue[1]
VGA_B[2]	PIN_A10	VGA Blue[2]
VGA_B[3]	PIN_B10	VGA Blue[3]
VGA_HS	PIN_A11	VGA H_SYNC
VGA_VS	PIN_B11	VGA V_SYNC

Datasheet







Signal Name	FPGA Pin No.	Description
DRAM_ADDR[0]	PIN_W4	SDRAM Address[0]
DRAM_ADDR[1]	PIN_W5	SDRAM Address[1]
DRAM_ADDR[2]	PIN_Y3	SDRAM Address[2]
DRAM_ADDR[3]	PIN_Y4	SDRAM Address[3]
DRAM_ADDR[4]	PIN_R6	SDRAM Address[4]
DRAM_ADDR[5]	PIN_R5	SDRAM Address[5]
DRAM_ADDR[6]	PIN_P6	SDRAM Address[6]
DRAM_ADDR[7]	PIN_P5	SDRAM Address[7]
DRAM_ADDR[8]	PIN_P3	SDRAM Address[8]
DRAM_ADDR[9]	PIN_N4	SDRAM Address[9]
DRAM_ADDR[10]	PIN_W3	SDRAM Address[10]
DRAM_ADDR[11]	PIN_N6	SDRAM Address[11]
DRAM_DQ[0]	PIN_U1	SDRAM Data[0]
DRAM_DQ[1]	PIN_U2	SDRAM Data[1]
DRAM_DQ[2]	PIN_V1	SDRAM Data[2]
DRAM_DQ[3]	PIN_V2	SDRAM Data[3]
DRAM_DQ[4]	PIN_W1	SDRAM Data[4]
DRAM_DQ[5]	PIN_W2	SDRAM Data[5]
DRAM_DQ[6]	PIN_Y1	SDRAM Data[6]

DRAM_DQ[7]	PIN_Y2	SDRAM Data[7]
DRAM_DQ[8]	PIN_N1	SDRAM Data[8]
DRAM_DQ[9]	PIN_N2	SDRAM Data[9]
DRAM_DQ[10]	PIN_P1	SDRAM Data[10]
DRAM_DQ[11]	PIN_P2	SDRAM Data[11]
DRAM_DQ[12]	PIN_R1	SDRAM Data[12]
DRAM_DQ[13]	PIN_R2	SDRAM Data[13]
DRAM_DQ[14]	PIN_T1	SDRAM Data[14]
DRAM_DQ[15]	PIN_T2	SDRAM Data[15]
DRAM_BA_0	PIN_U3	SDRAM Bank Address[0]
DRAM_BA_1	PIN_V4	SDRAM Bank Address[1]
DRAM_LDQM	PIN_R7	SDRAM Low-byte Data Mask
DRAM_UDQM	PIN_M5	SDRAM High-byte Data Mask
DRAM_RAS_N	PIN_T5	SDRAM Row Address Strobe
DRAM_CAS_N	PIN_T3	SDRAM Column Address Strobe
DRAM_CKE	PIN_N3	SDRAM Clock Enable
DRAM_CLK	PIN_U4	SDRAM Clock
DRAM_WE_N	PIN_R8	SDRAM Write Enable
DRAM_CS_N	PIN_T6	SDRAM Chip Select

Signal Name	FPGA Pin No.	Description
SRAM_ADDR[0]	PIN_AA3	SRAM Address[0]
SRAM_ADDR[1]	PIN_AB3	SRAM Address[1]
SRAM_ADDR[2]	PIN_AA4	SRAM Address[2]
SRAM_ADDR[3]	PIN_AB4	SRAM Address[3]
SRAM_ADDR[4]	PIN_AA5	SRAM Address[4]
SRAM_ADDR[5]	PIN_AB10	SRAM Address[5]
SRAM_ADDR[6]	PIN_AA11	SRAM Address[6]
SRAM_ADDR[7]	PIN_AB11	SRAM Address[7]
SRAM_ADDR[8]	PIN_V11	SRAM Address[8]
SRAM_ADDR[9]	PIN_W11	SRAM Address[9]
SRAM_ADDR[10]	PIN_R11	SRAM Address[10]
SRAM_ADDR[11]	PIN_T11	SRAM Address[11]
SRAM_ADDR[12]	PIN_Y10	SRAM Address[12]
SRAM_ADDR[13]	PIN_U10	SRAM Address[13]

SRAM_ADDR[14]	PIN_R10	SRAM Address[14]
SRAM_ADDR[15]	PIN_T7	SRAM Address[15]
SRAM_ADDR[16]	PIN_Y6	SRAM Address[16]
SRAM_ADDR[17]	PIN_Y5	SRAM Address[17]
SRAM_DQ[0]	PIN_AA6	SRAM Data[0]
SRAM_DQ[1]	PIN_AB6	SRAM Data[1]
SRAM_DQ[2]	PIN_AA7	SRAM Data[2]
SRAM_DQ[3]	PIN_AB7	SRAM Data[3]
SRAM_DQ[4]	PIN_AA8	SRAM Data[4]
SRAM_DQ[5]	PIN_AB8	SRAM Data[5]
SRAM_DQ[6]	PIN_AA9	SRAM Data[6]
SRAM_DQ[7]	PIN_AB9	SRAM Data[7]
SRAM_DQ[8]	PIN_Y9	SRAM Data[8]
SRAM_DQ[9]	PIN_W9	SRAM Data[9]
SRAM_DQ[10]	PIN_V9	SRAM Data[10]
SRAM_DQ[11]	PIN_U9	SRAM Data[11]
SRAM_DQ[12]	PIN_R9	SRAM Data[12]
SRAM_DQ[13]	PIN_W8	SRAM Data[13]
SRAM_DQ[14]	PIN_V8	SRAM Data[14]
SRAM_DQ[15]	PIN_U8	SRAM Data[15]
SRAM_WE_N	PIN_AA10	SRAM Write Enable
SRAM_OE_N	PIN_T8	SRAM Output Enable
SRAM_UB_N	PIN_W7	SRAM High-byte Data Mask
SRAM_LB_N	PIN_Y7	SRAM Low-byte Data Mask
SRAM_CE_N	PIN_AB5	SRAM Chip Enable

Signal Name	FPGA Pin No.	Description
FL_ADDR[0]	PIN_AB20	FLASH Address[0]
FL_ADDR[1]	PIN_AA14	FLASH Address[1]
FL_ADDR[2]	PIN_Y16	FLASH Address[2]
FL_ADDR[3]	PIN_R15	FLASH Address[3]
FL_ADDR[4]	PIN_T15	FLASH Address[4]
FL_ADDR[5]	PIN_U15	FLASH Address[5]
FL_ADDR[6]	PIN_V15	FLASH Address[6]
FL_ADDR[7]	PIN_W15	FLASH Address[7]

FL_ADDR[8]	PIN_R14	FLASH Address[8]
FL_ADDR[9]	PIN_Y13	FLASH Address[9]
FL_ADDR[10]	PIN_R12	FLASH Address[10]
FL_ADDR[11]	PIN_T12	FLASH Address[11]
FL_ADDR[12]	PIN_AB14	FLASH Address[12]
FL_ADDR[13]	PIN_AA13	FLASH Address[13]
FL_ADDR[14]	PIN_AB13	FLASH Address[14]
FL_ADDR[15]	PIN_AA12	FLASH Address[15]
FL_ADDR[16]	PIN_AB12	FLASH Address[16]
FL_ADDR[17]	PIN_AA20	FLASH Address[17]
FL_ADDR[18]	PIN_U14	FLASH Address[18]
FL_ADDR[19]	PIN_V14	FLASH Address[19]
FL_ADDR[20]	PIN_U13	FLASH Address[20]
FL_ADDR[21]	PIN_R13	FLASH Address[21]
FL_DQ[0]	PIN_AB16	FLASH Data[0]
FL_DQ[1]	PIN_AA16	FLASH Data[1]
FL_DQ[2]	PIN_AB17	FLASH Data[2]
FL_DQ[3]	PIN_AA17	FLASH Data[3]
FL_DQ[4]	PIN_AB18	FLASH Data[4]
FL_DQ[5]	PIN_AA18	FLASH Data[5]
FL_DQ[6]	PIN_AB19	FLASH Data[6]
FL_DQ[7]	PIN_AA19	FLASH Data[7]
FL_OE_N	PIN_AA15	FLASH Output Enable
FL_RST_N	PIN_W14	FLASH Reset
FL_WE_N	PIN_Y14	FLASH Write Enable