NOTES:

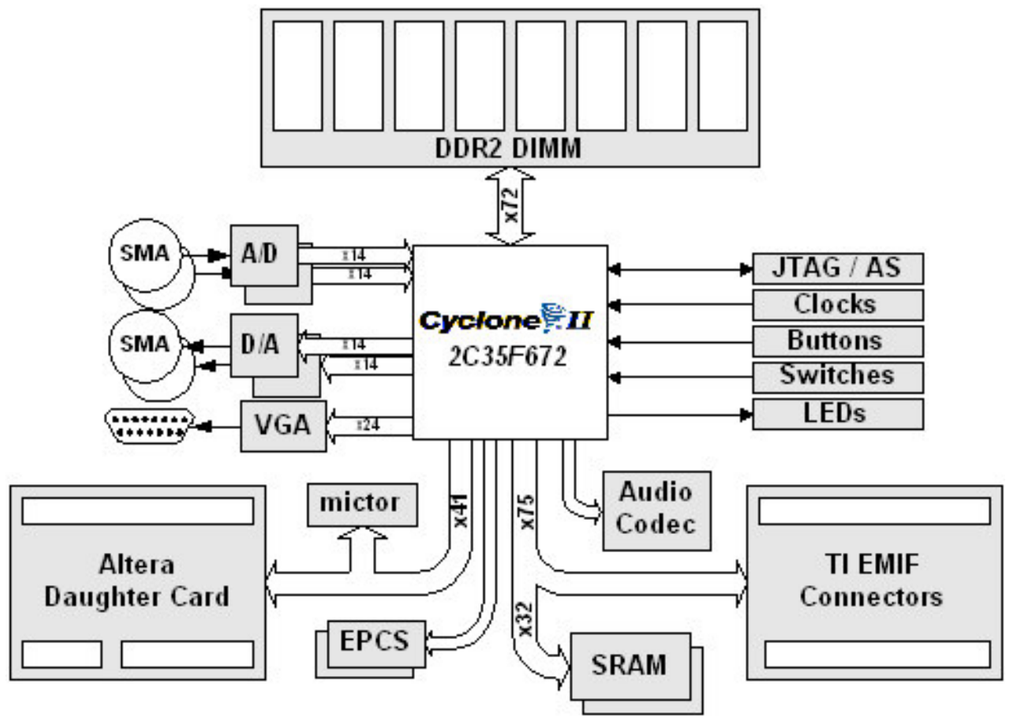
1. Project Drawing Numbers:

Raw PCB	100-0310202-B1
Gerber Files	110-0310202-B1
PCB Design Files	120-0310202-B1
Assembly Drawing	130-0310202-B1
Fab Drawing	140-0310202-B1
Schematic Drawing	150-0310202-B1
PCB Film	160-0310202-B1
Bill of Materials	170-0310202-B1
Schematic Design Files	180-0310202-B1
Functional Specification	210-0310202-B1
PCB Layout Guidelines	220-0310202-B1
Assembly Rework	320-0310202-B1

2. 894 Parts, 63 Library Parts, 874 Nets, 4299 Pins

REV	DATE	PAGES	DESCRIPTION
A	01/26/2005	-----	Released for Protoype Production
B	02/17/2005	-----	Fixed clock buffer U27 pinout. Fixed SSRAM U22 pinout to remove rework. Fixed EVM_CE2/CE3 short on TI EVM Interface. Fixed VTT Regulator U8 decoupling by adding ceramic output caps.

System Block Diagram



PAGE	DESCRIPTION
1	Title, Notes, Block Diagram, Revision History
2	FPGA Package I/O Diagram & Design Notes
3	Clock Circuitry
4	Cyclone II Banks 1 & 2
5	Cyclone II Banks 3 & 4
6	Cyclone II Banks 5 & 6
7	Cyclone II Banks 7 & 8
8	DDR2 DIMM
9	DDR2 Termination
10	Cyclone II Configuration Circuitry
11	ADC Channel A
12	ADC Channel B
13	DAC Channel A
14	DAC Channel B
15	Video DAC
16	AIC23 Audio Codec
17	Buttons, Switches, LEDs
18	SRAM, TI EVM Connectors
19	Altera Daughter Card & Mictor Connector
20	Cyclone II Power and Decoupling
21	Digital Power Supplies
22	Analog Power Supplies
23	-----
24	-----
25	-----

ADC Ground

DAC Ground

PLL Ground

Digital Ground

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Title: **Cyclone II DSP Board**

Size	Document Number	Rev
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Notes:

1. FPGA Schematic Symbol Breakdown:
   - (a) Bank1 - I/O
   - (b) Bank2 - I/O
   - (c) Bank3 - I/O
   - (d) Bank4 - I/O
   - (e) Bank5 - I/O
   - (f) Bank6 - I/O
   - (g) Bank7 - I/O
   - (h) Bank8 - I/O
   - (i) Configuration
   - (j) Clocks
   - (k) VCCint, GND
   - (l) VCCio, GND

2. PCB Supports 2C35 - 2C50 - 2C70 Migration

   No additional I/O of 2C35 or 2C50 used as the 2C70 has the fewest I/O of the group due to additional VCCINT,GND, and VREF pins on the larger 2C50 and 2C70 devices.

3. Some I/O pins are connected to 1.2V and GND. These are the additional VCC and GND pins of the larger 2C50 and 2C70.

   --- WARNING ---
   DO NOT DRIVE UNUSED I/O TO GND IN QUARTUS

   Leaving 1.2V-connected I/O pins as outputs driving GND causes high I/O current and increased temperature which can lead to device damage if left over a long period of time.

FPGA Package Top View

(2C70 Device Shown)

BANK 3

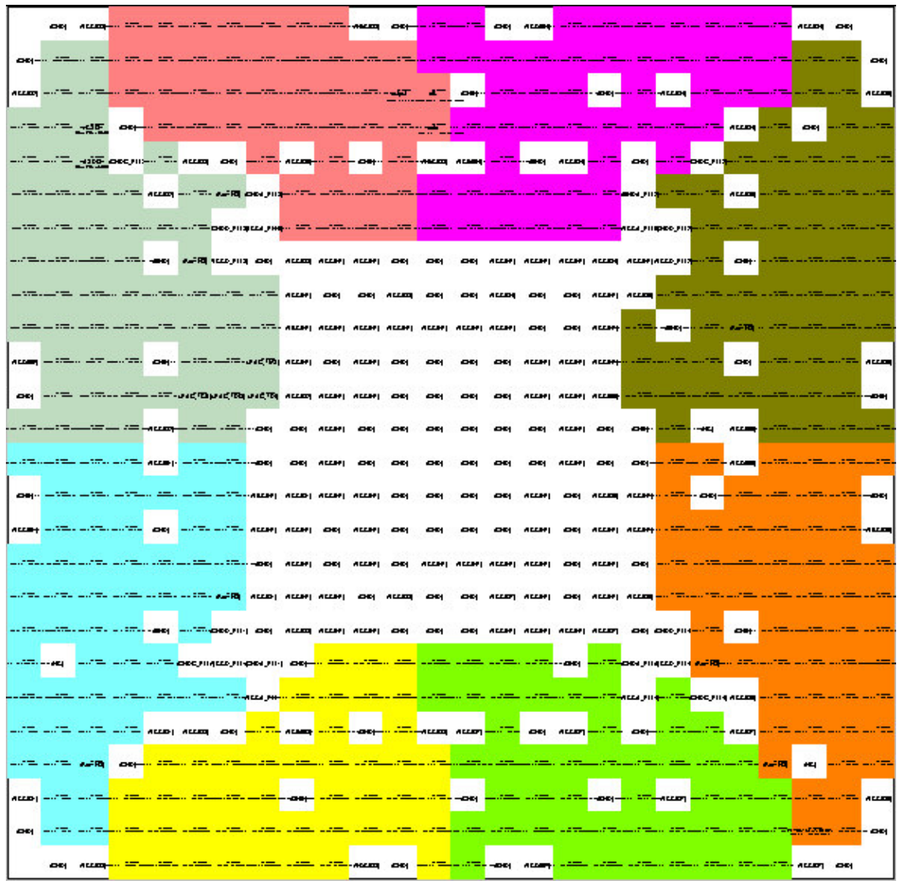
VCCIO = 1.8V

DDR2 DIMM DATA LANES
ADC Channel 2

BANK 4

VCCIO = 1.8V

DDR2 DIMM DATA LANES
ADC Channel 1
ADC Channel 2



BANK 2

VCCIO = 3.3V

Proto Bus
Video DAC
DAC Channel 1

BANK 5

VCCIO = 3.3V

Shared Bus
DAC Channel 2

BANK 1

VCCIO = 3.3V

DAC Channel 1
DAC Channel 2
Video DAC

BANK 6

VCCIO = 3.3V

Shared Bus
DAC Channel 1
DAC Channel 2
Video DAC

BANK 8

VCCIO = 1.8V

DDR2 DIMM DATA LANES, ADDRESS
Pushbuttons

BANK 7

VCCIO = 1.8V

DDR2 DIMM DATA LANES, CNTL, CLOCK
Pushbuttons
Dipswitch

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Title: **Cyclone II DSP Board**		
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Cyclone II Clocking

High-Speed Clock Source

(1) On-Board OSC
(2) Custom OSC
(3) SMA Input

3.3V L11 1.5A/330 3.3V_OSCB
C84 0.1uF C85 0.01uF C79 1uF
R134 10.0K
J18 TSW-103-07-L-S
U20 EN VCC GND OUT 100Mhz
On-Board OSC

PIN1-PIN2	100MHz CLK
PIN2-PIN3	Socket CLK

(Dual footprint with SMT and socketed half-can oscillator)

J20 EN VCC GND OUT 1108800
Custom OSC
R130 10.0K

PIN1-PIN2	Oscillator
PIN2-PIN3	SMA Input

J19 TSW-103-07-L-S

3.3V L9 1.5A/330 3.3V_CLK
C74 1uF C306 0.1uF C305 0.01uF
R121 10.0K
CLK_EN CLK_SEL CLK_OSC CLK_SMA
U16 OE SELA INA INB GND GND VDD VDD Q0 Q1 Q2 Q3 Q4 Q5 Q6 Q7
ICS552-02

CLKIN_TOP_R R122 33.2 CLKIN_TOP
CLKIN_BOT_R R123 33.2 CLKIN_BOT
PROTO_CLK_OSC_R R124 33.2 PROTO_CLK_OSC 19
CLK_OSC_ADCA_R R129 33.2
CLK_OSC_ADCB_R R128 33.2
CLK_OSC_DACA_R R127 33.2
CLK_OSC_DACB_R R126 33.2

U12J CYCLONE II, CLOCKS EP2C35_672FBGA

CLKIN_TOP	N2 CLK0_B2	PLL 3	PLL1_OUTp_B1 AA7 17 USER_LED7
EVM_CLKOUT2 18	N1 CLK1_B2		PLL1_OUTn_B1 AA6 17 USER_LED6
EVM_INUM0 18	P2 CLK2_B1		PLL2_OUTp_B5 F21 15 VGA_VSYNC
	P1 CLK3_B1		PLL2_OUTn_B5 F20 17 USER_LED2
CLKIN_BOT	N25 CLK4_B5	PLL 4	PLL3_OUTp_B2 E5 17 USER_LED0
EVM_IACK 18	N26 CLK5_B5		PLL3_OUTn_B2 F6 19 PROTO_IO3
EVM_RESET 18	P25 CLK6_B6		PLL4_OUTp_B6 V21 14 DAC_B_D4
EVM_AREn 18	P26 CLK7_B6		PLL4_OUTn_B6 V20 14 DAC_B_D3
AUDIO_DOUT 16	B13 CLK8_B4	PLL 2	
ADC_A_DCLK 11	A13 CLK9_B4		
ADC_B_DCLK 12	C13 CLK10_B3		
ADC_A_D7 11	D13 CLK11_B3		
USER_PB3 17	AE14 CLK12_B7	PLL 1	
DIMM_SYNC_CLK 7	AF14 CLK13_B7		
PROTO_CLKOUT 19	AD13 CLK14_B8		
USER_DIPSW0 17	AC13 CLK15_B8		

J17 LTI-SASF54GT SMA Input
R125 49.9

ADC Clock (from FPGA)

FPGA_TO_ADC_CLK 4
R238 95.3
R239 143 3.3V

ADC Clock SMA

J27 LTI-SASF54GT SMA_TO_ADC_CLK
R247 95.3
R248 143

DAC Clock (from FPGA)

FPGA_TO_DAC_CLK 4
R240 95.3
R241 143 3.3V

DAC Clock SMA

J26 LTI-SASF54GT SMA_TO_DAC_CLK
R251 95.3
R252 143

Channel A ADC Clock Select

CLK_OSC_ADCA
FPGA_TO_ADC_CLK
SMA_TO_ADC_CLK
J37 TSW-103-07-L-D
ADCA_ENC
R246 49.9

Channel B ADC Clock Select

CLK_OSC_ADCB
FPGA_TO_ADC_CLK
SMA_TO_ADC_CLK
J36 TSW-103-07-L-D
ADCB_ENC
R249 49.9

Channel A DAC Clock Select

CLK_OSC_DACA
FPGA_TO_DAC_CLK
SMA_TO_DAC_CLK
J35 TSW-103-07-L-D
DACA_ENC
R250 49.9

Channel B DAC Clock Select

CLK_OSC_DACB
FPGA_TO_DAC_CLK
SMA_TO_DAC_CLK
J34 TSW-103-07-L-D
DACB_ENC
R253 49.9

C400 0.1uF C399 0.01uF
U29 VCC OUT_LVTTL IN_LVTTL GND IN_LVPECL IN_LVPECL_n OUT_LVPECL OUT_LVPECL_n
SY10EPT28L

C397 0.1uF C398 0.01uF
U28 VCC OUT_LVTTL IN_LVTTL GND IN_LVPECL IN_LVPECL_n OUT_LVPECL OUT_LVPECL_n
SY10EPT28L

U27 1A GND 2A 1Y VCC 2Y
SN74LVC2G34DBV
DACA_CLK_R R39 33.2 13 DACA_CLK
DACB_CLK_R R42 33.2 14 DACB_CLK

C390 0.1uF C387 0.01uF

Channel A ADC Sample Clock

R237 130 R236 130
11 ADC_A_CLK_P
11 ADC_A_CLK_N
R245 82 R235 82

Channel B ADC Sample Clock

R262 130 R260 130
12 ADC_B_CLK_P
12 ADC_B_CLK_N
R261 82 R259 82

Channel A DAC Sample Clock

13 DACA_CLK

Channel B DAC Sample Clock

14 DACB_CLK

ALTERA®

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CYCLONE II BANKS 1 & 2

PROTO_IO[40..0] 3,19

PROTO_CARDSELn 19

VGA_R[7..0] 6,15

VGA_G[7..0] 15

VGA_B[7..0] 15

VGA_CLK 15

USER_LED[7..0] 3,6,10,17

DIG_MSB_B 17
DIG_MSB_D 17
DIG_MSB_E 17
DIG_MSB_F 17
DIG_MSB_DP 17

DIG_LSB_A 17
DIG_LSB_C 17
DIG_LSB_D 17
DIG_LSB_E 17
DIG_LSB_G 17
DIG_LSB_DP 17

FPGA_TO_ADC_CLK 3

DAC_B_D[13..0] 3,6,14

ADC_A_OE 11

FPGA_TO_DAC_CLK 3

DAC_A_D[13..0] 13

ADC_B_OE 12

AUDIO_BCLK 16
AUDIO_SCLK 16
AUDIO_MODE 16
AUDIO_CLK 16
AUDIO_SDIN 16

AUDIO_LRCIN 16

AUDIO_LRCOUT 16

ADC_SDATA 11,12

VGA_SYNCn 15

VGA_BLANKn 15

These pins are connected to VCCINT on 2C70.

These pins are connected to VCCINT on 2C70.

VCCIO = 3.3V

1.2V

U12A

CYCLONE II, BANK 1

DAC_A_D1	AA1	IO_1
AUDIO_MODE	AA2	IO_2
DIG_LSB_C	AA3	IO_3
VGA_G5	AA4	IO_4
DAC_A_D7	AA5	IO_5
DAC_A_D0	AB1	IO_8
AUDIO_LRCOUT	AB2	IO_9
AUDIO_CLK	AB3	IO_10
USER_LED5	AB4	IO_11
VGA_B0	AC1	IO_12
DIG_LSB_G	AC2	IO_13
USER_LED4	AC3	IO_14
AUDIO_SDIN	AD2	IO_15
DAC_A_D3	AD3	IO_16
VGA_SYNCn	AE2	IO_17
DAC_A_D2	AE3	IO_18
DAC_A_D13	P6	IO_19
DIG_LSB_DP	P7	IO_20
ADC_B_OE	R2	IO_21
AUDIO_SCLK	R4	IO_22
DAC_A_D12	R5	IO_23
VGA_G4	R6	IO_24
VGA_G2	R7	IO_25
	R8	IO_26
DAC_A_D5	T2	IO_27
FPGA_TO_ADC_CLK	T3	IO_28
VGA_CLK	T4	IO_29
VGA_G6	T6	IO_30
	T7	IO_31
	T8	IO_32
	T9	IO_33
	T10	IO_34
	U1	IO_35
	U2	IO_36
	U3	IO_37
	U4	IO_38
	U5	IO_39
	U6	IO_40
	U7	IO_41
	U9	IO_42
	U10	IO_43
	V1	IO_44
	V2	IO_45
	V3	IO_46
	V4	IO_47
	V5	IO_48
	V6	IO_49
	V7	IO_50
	W1	IO_51
	W2	IO_52
	W3	IO_53
	W4	IO_54
	W6	IO_55
	Y1	IO_56
	Y3	IO_58
	Y4	IO_59
	Y5	IO_60
	P3	IO_456
	P4	IO_457
	R3	IO_459

DIG_MSB_B
DIG_MSB_F
VGA_B7
DAC_A_D4
VGA_B6
VGA_G3
VGA_BLANKn
DAC_A_D11
DIG_LSB_D
PROTO_CARDSELn
DIG_MSB_DP
VGA_G7
DAC_A_D8
DAC_A_D9
DIG_LSB_E
VGA_B5
VGA_B3
VGA_B1
AUDIO_LRCIN
VGA_G1
ADC_SDATA
FPGA_TO_DAC_CLK
DAC_A_D6
DIG_MSB_D
DAC_A_D10
VGA_R6
VGA_G0

EP2C35_672FBGA

These pins are GND pins on 2C70.

0 VREF
2 GND
4 VCCINT

These pins are connected to VCCINT on 2C70.

VCCIO = 3.3V

1.2V

U12B

CYCLONE II, BANK 2

VGA_B2	B2	IO_57
PROTO_IO12	C2	IO_63
PROTO_IO40	C3	IO_64
PROTO_IO14	D1	IO_65
PROTO_IO29	D2	IO_66
DIG_MSB_E	E1	IO_67
PROTO_IO28	E2	IO_68
PROTO_IO15	F1	IO_70
PROTO_IO13	F2	IO_71
AUDIO_BCLK	F3	IO_72
PROTO_IO9	F4	IO_73
ADC_A_OE	F7	IO_75
PROTO_IO16	G1	IO_76
PROTO_IO27	G2	IO_77
PROTO_IO11	G3	IO_78
PROTO_IO10	G4	IO_79
PROTO_IO8	G5	IO_80
PROTO_IO0	J5	IO_450
PROTO_IO37	J6	IO_451
PROTO_IO31	J7	IO_452
PROTO_IO7	J8	IO_453
	L10	IO_454
PROTO_IO4	L6	IO_470
	N9	IO_474
	G6	IO_81
	H6	IO_82
	K5	IO_87
	K6	IO_88
	K7	IO_89
	K8	IO_90
	H1	IO_91
	H2	IO_92
	H3	IO_93
	H4	IO_94
	J1	IO_95
	J2	IO_96
	J3	IO_97
	J4	IO_98
	K1	IO_99
	K2	IO_100
	K3	IO_101
	K4	IO_102
	L2	IO_103
	L3	IO_104
	L4	IO_105
	L7	IO_106
	L9	IO_107
	M2	IO_108
	M3	IO_109
	M4	IO_110
	M5	IO_111
	P9	IO_458

PROTO_IO2
PROTO_IO1
PROTO_IO32
PROTO_IO38
PROTO_IO6
PROTO_IO39
PROTO_IO18
VGA_B4
PROTO_IO26
PROTO_IO34
PROTO_IO19
PROTO_IO20
PROTO_IO17
PROTO_IO33
PROTO_IO21
DIG_LSB_A
PROTO_IO25
PROTO_IO35
PROTO_IO22
PROTO_IO30
PROTO_IO36
PROTO_IO5
PROTO_IO24
PROTO_IO23
DAC_B_D0
DAC_B_D1

EP2C35_672FBGA

These pins are GND pins on 2C70.

These pins are GND pins on 2C70.

0 VREF
3 GND
1 VCCINT

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CYCLONE II BANKS 3 & 4

DIMM_DQ[71..0] 7,8,9
DIMM_DQS[8..0] 7,8,9
DIMM_A_R[15..0] 7,9
DIMM_BA_R[2..0] 7,9
DIMM_DM[8..0] 7,8,9

DIMM_RASn_R 7,9
DIMM_CASn_R 7,9
DIMM_WEn_R 7,9
DIMM_CSn_R0 7,9
DIMM_CSn_R1 7,9
DIMM_CKE_R0 7,9
DIMM_CKE_R1 7,9
DIMM_ODT_R0 7,9
DIMM_ODT_R1 7,9

ADC_A_D[13..0] 3,10,11
ADC_A_OVR 11
ADC_B_D[13..0] 12
ADC_B_OVR 12

USER_DIPSW[7:0] 3,7,17

USER_RESETn 17,19

3.3V 3.3V

R233 1K

R258 1K

ADC_A_SEN 11
ADC_B_SEN 12

1.8V driving 3.3V logic must be driven as open-drain

VREF

VCCIO = 1.8V

1.2V

U12C

CYCLONE II, BANK 3

DIMM_DQ41	A10	IO_112	IO_141	H8	
DIMM_DM8	A4	IO_113	IO_142	H10	
DIMM_DQ70	A5	IO_114	IO_143	H11	
ADC_B_OVR	A6	IO_115	IO_144	H12	
ADC_A_D3	A8	IO_116	IO_145	J9	
ADC_A_D4	A9	IO_117	IO_146	J10	
DIMM_DQ69	B4	IO_118	IO_147	J13	
DIMM_DQ66	B5	IO_119	IO_148	K9	
DIMM_DQS8	B6	IO_120	IO_149	B8	DIMM_DQS4
			IO_150	C8	DIMM_DQ34
DIMM_DM5	B9	IO_121			
DIMM_DQ40	B10	IO_122	IO_151	C9	DIMM_DQ39
DIMM_DQ52	B11	IO_123	IO_152	D12	DIMM_DQ46
ADC_A_D6	B12	IO_124	IO_153	D8	DIMM_DQ33
DIMM_DQ65	C4	IO_125	IO_154	D9	DIMM_DQ35
			IO_155	E12	DIMM_DQ47
ADC_A_D1	C6	IO_127	IO_156	J11	
DIMM_DQ45	C10	IO_128	IO_157	J14	
ADC_A_D5	C11	IO_129	IO_158	A7	DIMM_DQ38
DIMM_DQS5	C12	IO_130	IO_159	B7	ADC_A_D2
			IO_160	C7	DIMM_DQ71
	D5	IO_131			
DIMM_DQ44	D10	IO_132	IO_161	D6	DIMM_DM4
	D11	IO_133	IO_162	D7	DIMM_DQ67
	E8	IO_134	IO_163	F10	DIMM_DQ37
	E10	IO_135	IO_164	F9	DIMM_DQ68
DIMM_DQ32	F11	IO_136	IO_165	G10	DIMM_DQ36
DIMM_DQ42	F12	IO_137			
DIMM_DQ64	G9	IO_138			
DIMM_DQ43	G11	IO_139			
DIMM_DM6	G12	IO_140			

EP2C35_672FBGA

4 VREF
6 GND
4 VCCINT

VREF

VCCIO = 1.8V

U12D

CYCLONE II, BANK 4

USER_RESETn	A14	IO_166	IO_201	E20	ADC_B_D11
DIMM_DQ61	A17	IO_167	IO_202	F13	
DIMM_DQ56	A18	IO_168	IO_203	F14	DIMM_DQ48
USER_DIPSW1	A19	IO_169	IO_204	F15	DIMM_DQ62
ADC_B_D6	A20	IO_170	IO_205	F16	DIMM_DQ63
			IO_206	F17	ADC_B_D0
ADC_A_D9	A21	IO_171	IO_207	F18	ADC_B_D8
ADC_A_D13	A22	IO_172	IO_208	G13	DIMM_DQ53
ADC_A_D10	A23	IO_173	IO_209	G14	DIMM_DQ51
DIMM_DQS6	B14	IO_174	IO_210	G15	DIMM_DQ59
DIMM_DQ54	B15	IO_175			
DIMM_DQ50	B16	IO_176	IO_211	G16	DIMM_DQ58
DIMM_DQ57	B17	IO_177	IO_212	G17	UNUSED I/O
ADC_A_SEN	B18	IO_178	IO_213	G18	ADC_B_D9
ADC_B_D4	B19	IO_179	IO_214	H15	
ADC_B_D5	B20	IO_180	IO_215	H16	
			IO_216	H17	1.2V
ADC_B_D7	B21	IO_181	IO_217	J16	
ADC_A_D8	B22	IO_182	IO_218	J17	
ADC_A_D11	B23	IO_183	IO_219	J18	
DIMM_DQ55	C15	IO_184	IO_220	K16	
DIMM_DM7	C16	IO_185			
DIMM_DQS7	C17	IO_186	IO_221	K17	
ADC_B_D3	C19	IO_187			
USER_DIPSW2	C21	IO_188			
ADC_A_D12	C22	IO_189			
USER_DIPSW3	C23	IO_190			
DIMM_DQ49	D14	IO_191			
ADC_A_OVR	D15	IO_192			
	D16	IO_193			
ADC_B_D1	D17	IO_194			
ADC_B_D2	D18	IO_195			
ADC_B_SEN	D19	IO_196			
ADC_B_D13	D20	IO_197			
ADC_B_D12	D21	IO_198			
DIMM_DQ60	E15	IO_199			
ADC_B_D10	E18	IO_200			

EP2C35_672FBGA

2 VREF
5 GND
4 VCCINT

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Title: **Cyclone II DSP Board**

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CYCLONE II BANKS 5 & 6

DAC_A_D[13..0] 4,13
DAC_B_D[13..0] 3,4,14

EVM_A[21..2] 18
EVM_D[31..0] 18
EVM_BEn[3..0] 18
EVM_INT[3..0] 18
EVM_CEn[3..2] 10,18
EVM_DX0 18
EVM_CNTL0 18
EVM_STAT0 18
EVM_DMAC0 18
EVM_AWEn 18

EVM_DR0 18
EVM_OEn 18
EVM_ARDY 18
EVM_CLKX0 18
EVM_FSX0 18
EVM_CLKR0 18
EVM_FSR0 18

USER_LED[7..0] 3,4,10,17
AUDIO_CSn 16
AUDIO_DIN 16
EVM_RESET 3,18

VGA_HSYNC 15
VGA_R[7..0] 4,15
VGA_B[7..0] 4,15

DIG_MSB_A 17
DIG_MSB_C 17
DIG_MSB_G 17
DIG_LSB_B 17
DIG_LSB_F 17
ADC_RESET 11,12
ADC_SCLK 11,12
ADC_B_SEN 5,12

EPCS_USER_CSn 10

SRAM_CLK 18
PROTO_CLKIN 19

VCCIO = 3.3V

1.2V

U12E
CYCLONE II, BANK 5

DAC_B_D5	B24	IO_222	IO_261	K24	EVM_A13
EVM_A20	B25	IO_223	IO_262	K25	EVM_A9
EVM_A18	C24	IO_224	IO_263	K26	EVM_A7
EVM_A16	C25	IO_225	IO_264	L19	EVM_D8
EVM_A14	D23	IO_226	IO_265	L20	EVM_STAT0
EVM_A12	D25	IO_227	IO_266	L21	EVM_D10
USER_LED3	E22	IO_228	IO_267	L23	EVM_INT3
EVM_A6	E24	IO_229	IO_268	L24	EVM_A3
EVM_A2	E25	IO_230	IO_269	L25	EVM_A5
EVM_A4	E26	IO_231	IO_270	M19	EVM_D2
			IO_271	M20	EVM_D6
EVM_BEn0	F23	IO_234	IO_272	M21	EVM_CNTL0
EVM_CLKX0	F24	IO_235	IO_273	M22	EVM_INT0
EVM_BEn2	F25	IO_236	IO_274	M23	EVM_BEn1
EVM_A21	F26	IO_237	IO_275	M24	EVM_BEn3
EVM_DX0	G21	IO_238	IO_276	M25	EVM_INT1
EVM_D28	G23	IO_239	IO_277	N18	
EVM_D30	G24	IO_240	IO_278	N20	EVM_D4
EVM_CLKR0	G25	IO_241	IO_279	N23	EVM_D31
EVM_A17	G26	IO_242	IO_280	N24	EVM_DMAC0
VGA_HSYNC	H19	IO_243	IO_281	P18	
EVM_D24	H21	IO_244			
EVM_D26	H23	IO_245			
EVM_A19	H24	IO_246			
EVM_DR0	H25	IO_247			
EVM_FSR0	H26	IO_248	IO_447	D26	EVM_A10
AUDIO_DIN	J20	IO_249	IO_448	E23	EVM_A8
	J21	IO_250	IO_449	G22	EVM_FSX0
EVM_D20	J22	IO_251			
EVM_D22	J23	IO_252			
EVM_CEn2	J24	IO_253			
EVM_A15	J25	IO_254			
EVM_A11	J26	IO_255			
	K18	IO_256			
EVM_D12	K19	IO_257			
EVM_D14	K21	IO_258			
EVM_D16	K22	IO_259			
EVM_D18	K23	IO_260			

EP2C35_672FBGA

0 VREF
2 GND
2 VCCINT

VCCIO = 3.3V

1.2V

U12F
CYCLONE II, BANK 6

EVM_D9	AA24	IO_282	IO_311	T25	DAC_B_D13
EVM_D5	AA25	IO_283	IO_312	U20	DAC_B_D2
EVM_D7	AA26	IO_284	IO_313	U21	VGA_R5
DIG_MSB_C	AB23	IO_285	IO_314	U22	EVM_D15
EVM_D29	AB24	IO_286	IO_315	U23	DIG_LSB_F
EVM_D1	AB25	IO_287	IO_316	U24	EVM_D19
EVM_D3	AB26	IO_288	IO_317	U25	DIG_LSB_B
VGA_R4	AC23	IO_289	IO_318	U26	EVM_D21
AUDIO_CSn	AC25	IO_290			
EVM_INT2	AC26	IO_291			
ADC_SCLK	AD24	IO_292	IO_321	V22	EVM_D0
VGA_R2	AD25	IO_293	IO_322	V23	EVM_AWEn
			IO_323	V24	DAC_B_D9
	P17		IO_324	V25	DAC_B_D12
DAC_B_D7	P23	IO_295	IO_325	V26	EVM_D17
EVM_D27	P24	IO_296	IO_326	W21	DIG_MSB_G
	R17	IO_297	IO_327	W23	EVM_ARDY
	R19	IO_298	IO_328	W24	EVM_D13
PROTO_CLKIN	R20	IO_299	IO_329	W25	DAC_B_D10
		IO_300	IO_330	W26	DAC_B_D11
EVM_D25	R24	IO_301			
SRAM_CLK	R25	IO_302	IO_331	Y21	DIG_MSB_A
	T17	IO_303	IO_332	Y22	VGA_R0
	T18	IO_304	IO_333	Y23	EPCS_USER_CSn
	T19	IO_305	IO_334	Y24	DAC_B_D8
VGA_R3	T20	IO_306	IO_335	Y25	VGA_R7
EVM_D23	T21	IO_307	IO_336	Y26	EVM_D11
VGA_R1	T22	IO_308			
DAC_B_D6	T23	IO_309			
ADC_RESET	T24	IO_310			
EVM_OEn	AA23	IO_460			

EP2C35_672FBGA

0 VREF
2 GND
4 VCCINT

Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121

Title
Cyclone II DSP Board

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CYCLONE II BANKS 7 & 8

DIMM_DQ[71..0] 5,8,9
DIMM_DQS[8..0] 5,8,9
DIMM_A_R[15..0] 9
DIMM_BA_R[2..0] 9
DIMM_DM[8..0] 5,8,9

DIMM_RASn_R 9
DIMM_CASn_R 9
DIMM_WEn_R 9
DIMM_CSn_R0 9
DIMM_CSn_R1 9
DIMM_CKE_R0 9
DIMM_CKE_R1 9
DIMM_ODT_R0 9
DIMM_ODT_R1 9

DIMM_CK_P[2..0] 8
DIMM_CK_N[2..0] 8
DIMM_SDA 8
DIMM_SCL 8
DIMM_RESETn 8

USER_PB[3..0] 3,17
USER_DIPSW[7:0] 3,5,17
PROTO_CLKIN 6,19
DIMM_SYNC_CLK 3

VCCIO = 1.8V

VREF

U12G
CYCLONE II, BANK 7
EP2C35_672FBGA

DIMM_DQ14	AA13	IO_337	IO_371	AE22	USER_PB2
	AA14	IO_338	IO_372	AE23	DIMM_ODT_R1
DIMM_DQ9	AA15	IO_339	IO_373	AF17	DIMM_DQ3
DIMM_DQ0	AA16	IO_340	IO_374	AF18	DIMM_DQ6
			IO_375	AF19	DIMM_DQS0
DIMM_WEn_R	AA17	IO_341	IO_376	AF20	DIMM_SDA
DIMM_SCL	AA18	IO_342	IO_377	AF21	DIMM_ODT_R0
			IO_378	AF22	DIMM_CSn_R0
DIMM_BA_R2	AB15	IO_344	IO_379	AF23	DIMM_BA_R1
DIMM_CSn_R1	AB18	IO_345	IO_380	U17	
DIMM_CK_P1	AB20	IO_346			
DIMM_SYNC_CLK	AB21	IO_347	IO_381	U18	
DIMM_DQ10	AC14	IO_348	IO_382	V17	
DIMM_DM0	AC15	IO_349	IO_383	V18	
	AC16	IO_350	IO_384	W15	
			IO_385	W16	
DIMM_DQ1	AC17	IO_351	IO_386	W17	
USER_PB0	AC18	IO_352	IO_387	W19	
DIMM_CKE_R1	AC19	IO_353	IO_388	Y13	DIMM_DQ12
USER_DIPSW5	AC20	IO_354	IO_389	Y14	DIMM_DQ13
DIMM_CK_P0	AC21	IO_355	IO_390	Y15	DIMM_DQ8
DIMM_CASn_R	AC22	IO_356			
UNUSED I/O	AD15	IO_357	IO_391	Y16	DIMM_DQ4
DIMM_DQ7	AD16	IO_358	IO_392	Y18	DIMM_BA_R0
DIMM_DQ5	AD17	IO_359			
DIMM_CK_N0	AD19	IO_360	IO_455	AA20	DIMM_CK_N2
DIMM_CK_N1	AD21	IO_361			
DIMM_CK_P2	AD22	IO_362			
DIMM_RESETn	AD23	IO_363			
DIMM_DQS1	AE15	IO_364			
USER_PB1	AE16	IO_365			
DIMM_DQ2	AE17	IO_366			
USER_DIPSW6	AE18	IO_367			
USER_DIPSW7	AE19	IO_368			
DIMM_RASn_R	AE20	IO_369			
DIMM_CKE_R0	AE21	IO_370			

1.2V

2 VREF
4 GND
5 VCCINT

VCCIO = 1.8V

VREF

U12H
CYCLONE II, BANK 8
EP2C35_672FBGA

DIMM_DQ31	AA9	IO_393	IO_421	AE9	DIMM_DQ19
DIMM_DQ25	AA10	IO_394	IO_422	AE10	DIMM_DQ18
DIMM_DQ29	AA11	IO_395	IO_423	AE11	DIMM_A_R9
DIMM_DM1	AA12	IO_396	IO_424	AE12	DIMM_DQ15
DIMM_A_R7	AB8	IO_397	IO_425	AE13	DIMM_DQS2
DIMM_DQ24	AB10	IO_398	IO_426	AF4	USER_DIPSW4
DIMM_DQ20	AB12	IO_399	IO_427	AF5	DIMM_A_R4
			IO_428	AF6	DIMM_DQ30
DIMM_A_R14	AC5	IO_401	IO_429	AF7	DIMM_A_R13
DIMM_A_R6	AC6	IO_402	IO_430	AF8	UNUSED I/O
	AC7	IO_403	IO_431	AF9	DIMM_DQ23
DIMM_A_R1	AC8	IO_404	IO_432	AF10	DIMM_DQ22
DIMM_DM2	AC9	IO_405	IO_433	AF13	DIMM_A_R15
	AC10	IO_406	IO_434	U12	
DIMM_DQ16	AC11	IO_407	IO_435	V9	
	AC12	IO_408	IO_436	V10	
			IO_437	V11	
DIMM_A_R8	AD5	IO_410	IO_438	V13	
			IO_439	V14	
DIMM_A_R2	AD6	IO_411	IO_440	W8	
DIMM_A_R5	AD7	IO_412	IO_441	W10	
DIMM_DM3	AD8	IO_413	IO_442	W11	
DIMM_DQ17	AD10	IO_414	IO_443	W12	
DIMM_DQ21	AD11	IO_415	IO_444	Y10	DIMM_A_R3
DIMM_DQ11	AD12	IO_416	IO_445	Y11	DIMM_DQ28
DIMM_A_R0	AE4	IO_417	IO_446	Y12	DIMM_A_R12
DIMM_A_R10	AE5	IO_418			
DIMM_DQ26	AE6	IO_419	IO_461	AD4	DIMM_A_R11
DIMM_DQ27	AE7	IO_420	IO_462	AE8	DIMM_DQS3

1.2V

3 VREF
7 GND
4 VCCINT

Resynchronization Feedback Clock

VTT
R102 56
C201 0.1uF
J11 LTI-SASF54GT
1 DIMM_SYNC_CLK
5 4 3 2

SMA for External Clock Input / Eye Diagram Output
(secondary use)

Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121

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Size: B
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DDR2 SDRAM DIMM

5,7,9 DIMM_DQS[8..0]
5,7,9 DIMM_DM[8..0]
5,7,9 DIMM_DQ[71..0]
9 DIMM_BA[2..0]
9 DIMM_A[15..0]

9 DIMM_RASn
9 DIMM_CASn
9 DIMM_WEn
9 DIMM_CSn0
9 DIMM_CSn1

7 DIMM_CK_P[2..0]
7 DIMM_CK_N[2..0]

9 DIMM_CKE0
9 DIMM_CKE1

9 DIMM_ODT0
9 DIMM_ODT1

7 DIMM_SDA
7 DIMM_SCL

7 DIMM_RESETn

DIMM_DQS[8..0]
DIMM_DM[8..0]
DIMM_DQ[71..0]
DIMM_BA[2..0]
DIMM_A[15..0]
DIMM_RASn
DIMM_CASn
DIMM_WEn
DIMM_CSn0
DIMM_CSn1
DIMM_CK_P[2..0]
DIMM_CK_N[2..0]
DIMM_CKE0
DIMM_CKE1
DIMM_ODT0
DIMM_ODT1
DIMM_SDA
DIMM_SCL
DIMM_RESETn

VREF 1.8V 1.8V

J8A

1	VREF	VSS34	121		
2	VSS1	DQ4	122	DIMM_DQ4	
3	DQ0	DQ5	123	DIMM_DQ5	
4	DQ1	VSS35	124		
5	VSS2	DM0/DQS_P9	125	DIMM_DM0	
6	DQS_N0	NC/DQS_N9	126		
7	DQS_P0	VSS36	127		
8	VSS3	DQ6	128	DIMM_DQ6	
9	DQ2	DQ7	129	DIMM_DQ7	
10	DQ3	VSS37	130		
11	VSS4	DQ12	131	DIMM_DQ12	
12	DQ8	DQ13	132	DIMM_DQ13	
13	DQ9	VSS38	133		
14	VSS5	DM1/DQS_P10	134	DIMM_DM1	
15	DQS_N1	NC/DQS_N10	135		
16	DQS_P1	VSS39	136		
17	VSS6	CK_P1/RFU	137	DIMM_CK_P1	
18	RESETn	CK_N1/RFU	138	DIMM_CK_N1	
19	NC1	VSS40	139		
20	VSS7	DQ14	140	DIMM_DQ14	
21	DQ10	DQ15	141	DIMM_DQ15	
22	DQ11	VSS41	142		
23	VSS8	DQ20	143	DIMM_DQ20	
24	DQ16	DQ21	144	DIMM_DQ21	
25	DQ17	VSS42	145		
26	VSS9	DM2/DQS_P11	146	DIMM_DM2	
27	DQS_N2	NC/DQS_N11	147		
28	DQS_P2	VSS43	148		
29	VSS10	DQ22	149	DIMM_DQ22	
30	DQ18	DQ23	150	DIMM_DQ23	
31	DQ19	VSS44	151		
32	VSS11	DQ28	152	DIMM_DQ28	
33	DQ24	DQ29	153	DIMM_DQ29	
34	DQ25	VSS45	154		
35	VSS12	DM3/DQS_P12	155	DIMM_DM3	
36	DQS_N3	NC/DQS_N12	156		
37	DQS_P3	VSS46	157		
38	VSS13	DQ30	158	DIMM_DQ30	
39	DQ26	DQ31	159	DIMM_DQ31	
40	DQ27	VSS47	160		
41	VSS14	CB4	161	DIMM_DQ68	
42	CB0	CB5	162	DIMM_DQ69	
43	CB1	VSS48	163		
44	VSS15	DM8/DQS_P17	164	DIMM_DM8	
45	DQS_N8	NC/DQS_N17	165		
46	DQS_P8	VSS49	166		
47	VSS16	CB6	167	DIMM_DQ70	
48	CB2	CB7	168	DIMM_DQ71	
49	CB3	VSS50	169		
50	VSS17	VDDQ7	170		
51	VDDQ1	CKE1	171	DIMM_CKE1	
52	CKE0	VDD5	172		
53	VDD1	A15	173	DIMM_A15	
54	BA2/A16	A14	174	DIMM_A14	
55	RC0	VDDQ8	175		
56	VDDQ2	A12	176	DIMM_A12	
57	A11	A9	177	DIMM_A9	
58	A7	VDD6	178		
59	VDD2	A8	179	DIMM_A8	
60	A5	A6	180	DIMM_A6	

DDRII_DIMM

DIMM_DQ0 DIMM_DQ1 DIMM_DQS0 DIMM_DQ2 DIMM_DQ3 DIMM_DQ8 DIMM_DQ9 DIMM_DQS1 DIMM_RESETn DIMM_DQ10 DIMM_DQ11 DIMM_DQ16 DIMM_DQ17 DIMM_DQS2 DIMM_DQ18 DIMM_DQ19 DIMM_DQ24 DIMM_DQ25 DIMM_DQS3 DIMM_DQ26 DIMM_DQ27 DIMM_DQ64 DIMM_DQ65 DIMM_DQS8 DIMM_DQ66 DIMM_DQ67 DIMM_CKE0 DIMM_BA2 DIMM_A11 DIMM_A7 DIMM_A5

1.8V 1.8V

J8B

DIMM_A4	61	A4	VDDQ9	181	
	62	VDDQ3	A3	182	DIMM_A3
DIMM_A2	63	A2	A1	183	DIMM_A1
	64	VDD3	VDD7	184	
		KEY			
	65	VSS18	CK_P0	185	DIMM_CK_P0
	66	VSS19	CK_N0	186	DIMM_CK_N0
	67	VDD4	VDD8	187	
	68	NC2	A0	188	DIMM_A0
	69	VDD5	VDD9	189	
DIMM_A10	70	A10/AP	BA1	190	DIMM_BA1
DIMM_BA0	71	BA0	VDDQ10	191	
	72	VDDQ4	RASn	192	DIMM_RASn
DIMM_WEn	73	WEn	Sn0	193	DIMM_CSn0
DIMM_CASn	74	CASn	VDDQ11	194	
	75	VDDQ5	ODT0	195	DIMM_ODT0
DIMM_CSn1	76	Sn1	A13	196	DIMM_A13
DIMM_ODT1	77	ODT1	VDD10	197	
	78	VDDQ6	VSS51	198	
	79	VSS20	DQ36	199	DIMM_DQ36
DIMM_DQ32	80	DQ32	DQ37	200	DIMM_DQ37
DIMM_DQ33	81	DQ33	VSS52	201	
	82	VSS21	DM4/DQS_P13	202	DIMM_DM4
DIMM_DQS4	83	DQS_N4	NC/DQS_N13	203	
	84	DQS_P4	VSS53	204	
	85	VSS22	DQ38	205	DIMM_DQ38
DIMM_DQ34	86	DQ34	DQ39	206	DIMM_DQ39
DIMM_DQ35	87	DQ35	VSS54	207	
	88	VSS23	DQ44	208	DIMM_DQ44
DIMM_DQ40	89	DQ40	DQ45	209	DIMM_DQ45
DIMM_DQ41	90	DQ41	VSS55	210	
	91	VSS24	DM5/DQS_P14	211	DIMM_DM5
DIMM_DQS5	92	DQS_N5	NC/DQS_N14	212	
	93	DQS_P5	VSS56	213	
DIMM_DQ42	94	VSS25	DQ46	214	DIMM_DQ46
DIMM_DQ43	95	DQ42	DQ47	215	DIMM_DQ47
	96	DQ43	VSS57	216	
DIMM_DQ48	97	VSS26	DQ52	217	DIMM_DQ52
DIMM_DQ49	98	DQ48	DQ53	218	DIMM_DQ53
	99	DQ49	VSS58	219	
	100	VSS27	CK_P2/RFU	220	DIMM_CK_P2
	101	SA2	CK_N2/RFU	221	DIMM_CK_N2
	102	NC/TEST	VSS59	222	
	103	VSS28	DM6/DQS_P15	223	DIMM_DM6
DIMM_DQS6	104	DQS_N6	NC/DQS_N15	224	
	105	DQS_P6	VSS60	225	
DIMM_DQ50	106	VSS29	DQ54	226	DIMM_DQ54
DIMM_DQ51	107	DQ50	DQ55	227	DIMM_DQ55
	108	DQ51	VSS61	228	
DIMM_DQ56	109	VSS30	DQ60	229	DIMM_DQ60
DIMM_DQ57	110	DQ56	DQ61	230	DIMM_DQ61
	111	DQ57	VSS62	231	
	112	VSS31	DM7/DQS_P16	232	DIMM_DM7
DIMM_DQS7	113	DQS_N7	NC/DQS_N16	233	
	114	DQS_P7	VSS63	234	
DIMM_DQ58	115	VSS32	DQ62	235	DIMM_DQ62
DIMM_DQ59	116	DQ58	DQ63	236	DIMM_DQ63
	117	DQ59	VSS64	237	
	118	VSS33	VDDSPD	238	
DIMM_SDA	119	SDA	SA0	239	
DIMM_SCL	120	SCL	SA1	240	

DDRII_DIMM

1.8V
R91 10.0K
R89 10.0K

VTT
C55
0.1uF

TP1 TP2

Place near DIMM back-side on component side of PCB

Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121

Title: Cyclone II DSP Board

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DDR2 SDRAM DIMM Terminations

5,7,8 DIMM_DQ[71..0] — DIMM_DQ[71..0]
5,7,8 DIMM_DQS[8..0] — DIMM_DQS[8..0]
7 DIMM_A_R[15..0] — DIMM_A_R[15..0]
7 DIMM_BA_R[2..0] — DIMM_BA_R[2..0]
5,7,8 DIMM_DM[8..0] — DIMM_DM[8..0]
7 DIMM_RASn_R — DIMM_RASn_R
7 DIMM_CASn_R — DIMM_CASn_R
7 DIMM_WEn_R — DIMM_WEn_R
7 DIMM_CSn_R0 — DIMM_CSn_R0
7 DIMM_CSn_R1 — DIMM_CSn_R1
7 DIMM_CKE_R0 — DIMM_CKE_R0
7 DIMM_CKE_R1 — DIMM_CKE_R1
7 DIMM_ODT_R0 — DIMM_ODT_R0
7 DIMM_ODT_R1 — DIMM_ODT_R1
8 DIMM_A[15..0] — DIMM_A[15..0]
8 DIMM_BA[2..0] — DIMM_BA[2..0]
8 DIMM_RASn — DIMM_RASn
8 DIMM_CASn — DIMM_CASn
8 DIMM_WEn — DIMM_WEn
8 DIMM_CSn0 — DIMM_CSn0
8 DIMM_CSn1 — DIMM_CSn1
8 DIMM_CKE0 — DIMM_CKE0
8 DIMM_CKE1 — DIMM_CKE1
8 DIMM_ODT0 — DIMM_ODT0
8 DIMM_ODT1 — DIMM_ODT1

Cyclone II-Side Termination Resistors

	RN20A	1	16	10		
	RN20B	2	15	10		
DIMM_A_R9	RN23C	3	14	10	DIMM_A9	
DIMM_A_R11	RN20H	8	9	10	DIMM_A11	
DIMM_A_R8	RN20G	7	10	10	DIMM_A8	
DIMM_A_R5	RN20E	5	12	10	DIMM_A5	
DIMM_A_R6	RN20F	6	11	10	DIMM_A6	
DIMM_A_R7	RN20D	4	13	10	DIMM_A7	
DIMM_A_R3	RN20C	3	14	10	DIMM_A3	
DIMM_A_R4	RN21F	6	11	10	DIMM_A4	
DIMM_A_R10	RN21E	5	12	10	DIMM_A10	
DIMM_A_R2	RN21G	7	10	10	DIMM_A2	
DIMM_A_R1	RN21H	8	9	10	DIMM_A1	
DIMM_A_R0	RN21D	4	13	10	DIMM_A0	
DIMM_A_R15	RN23D	4	13	10	DIMM_A15	
DIMM_A_R14	RN21C	3	14	10	DIMM_A14	
DIMM_A_R13	RN23E	5	12	10	DIMM_A13	
DIMM_A_R12	RN22G	7	10	10	DIMM_A12	
DIMM_CKE_R0	RN22C	3	14	10	DIMM_CKE0	
DIMM_BA_R2	RN23A	1	16	10	DIMM_BA2	
DIMM_BA_R1	RN22B	2	15	10	DIMM_BA1	
DIMM_BA_R0	RN22F	6	11	10	DIMM_BA0	
DIMM_CKE_R1	RN22E	5	12	10	DIMM_CKE1	
DIMM_RASn_R	RN22D	4	13	10	DIMM_RASn	
DIMM_WEn_R	RN22H	8	9	10	DIMM_WEn	
DIMM_CASn_R	RN23F	6	11	10	DIMM_CASn	
DIMM_CSn_R0	RN23H	8	9	10	DIMM_CSn0	
DIMM_CSn_R1	RN23B	2	15	10	DIMM_CSn1	
DIMM_ODT_R0	RN23G	7	10	10	DIMM_ODT0	
DIMM_ODT_R1	RN22A	1	16	10	DIMM_ODT1	
	RN21A	1	16	10		
	RN21B	2	15	10		

Cyclone II-Side Termination Resistors

DIMM_DQ71	R18			DNI		
DIMM_DQ64	R15			DNI		
DIMM_DQ0	RN33G	7	10	DNI		
DIMM_DQ4	RN33H	8	9	DNI		
DIMM_DQS0	RN33C	3	14	DNI		
DIMM_DQ3	RN31G	7	10	DNI		
DIMM_DQ1	RN33F	6	11	DNI		
DIMM_DQ7	RN31H	8	9	DNI		
DIMM_DQ6	RN33B	2	15	DNI		
DIMM_DQ5	RN33E	5	12	DNI		
DIMM_DM1	RN31B	2	15	DNI		
DIMM_DQS1	RN31A	1	16	DNI		
DIMM_DQ13	RN31D	4	13	DNI		
DIMM_DQ11	RN29F	6	11	DNI		
DIMM_DQ8	RN31E	5	12	DNI		
DIMM_DQ9	RN31C	3	14	DNI		
DIMM_DQ10	RN29G	7	10	DNI		
DIMM_DQ15	RN29E	5	12	DNI		
DIMM_DQ12	RN31F	6	11	DNI		
DIMM_DQ14	RN29H	8	9	DNI		
DIMM_DM2	RN27H	8	9	DNI		
DIMM_DQ19	RN27C	3	14	DNI		
DIMM_DQ23	RN27D	4	13	DNI		
DIMM_DQ21	RN29B	2	15	DNI		
DIMM_DQ17	RN29A	1	16	DNI		
DIMM_DQ22	RN27F	6	11	DNI		
DIMM_DQ16	RN29C	3	14	DNI		
DIMM_DQ18	RN27E	5	12	DNI		
DIMM_DQS2	RN27G	7	10	DNI		
DIMM_DQ20	RN29D	4	13	DNI		
DIMM_DM3	RN25E	5	12	DNI		
DIMM_DQ24	RN25H	8	9	DNI		
DIMM_DQS3	RN25F	6	11	DNI		
DIMM_DQ30	RN25D	4	13	DNI		
DIMM_DQ29	RN27A	1	16	DNI		
DIMM_DQ26	RN25C	3	14	DNI		
DIMM_DQ27	RN25B	2	15	DNI		
DIMM_DQ31	RN25A	1	16	DNI		
DIMM_DQ25	RN25G	7	10	DNI		
DIMM_DQ28	RN27B	2	15	DNI		
DIMM_DQS8	RN24E	5	12	DNI		
DIMM_DQ66	RN24C	3	14	DNI		
DIMM_DQ65	RN24H	8	9	DNI		
DIMM_DQ2	RN33A	1	16	DNI		
DIMM_DQ69	RN24F	6	11	DNI		
DIMM_DQ68	RN24G	7	10	DNI		
DIMM_DQ67	RN24A	1	16	DNI		
DIMM_DM0	RN33D	4	13	DNI		
DIMM_DQ70	RN24B	2	15	DNI		
DIMM_DM8	RN24D	4	13	DNI		
DIMM_DQ55	RN32D	4	13	DNI		
DIMM_DQ54	RN32F	6	11	DNI		
DIMM_DQS6	RN32G	7	10	DNI		
DIMM_DQ52	RN30D	4	13	DNI		
DIMM_DQ53	RN30C	3	14	DNI		
DIMM_DM6	RN32H	8	9	DNI		
DIMM_DQ58	RN34A	1	16	DNI		
DIMM_DQS7	RN34E	5	12	DNI		
DIMM_DQ32	RN26F	6	11	DNI		
DIMM_DQ33	RN26E	5	12	DNI		
DIMM_DQ34	RN26A	1	16	DNI		
DIMM_DQS4	RN26C	3	14	DNI		
DIMM_DQ35	RN28H	8	9	DNI		
DIMM_DQ39	RN28G	7	10	DNI		
DIMM_DQ36	RN26G	7	10	DNI		
DIMM_DQ37	RN26H	8	9	DNI		
DIMM_DQ38	RN26B	2	15	DNI		
DIMM_DM4	RN26D	4	13	DNI		
DIMM_DQ40	RN28D	4	13	DNI		
DIMM_DQ41	RN28C	3	14	DNI		
DIMM_DQS5	RN28A	1	16	DNI		
DIMM_DQ45	RN28E	5	12	DNI		
DIMM_DQ42	RN30F	6	11	DNI		
DIMM_DQ44	RN28F	6	11	DNI		
DIMM_DQ46	RN30G	7	10	DNI		
DIMM_DQ43	RN30E	5	12	DNI		
DIMM_DQ47	RN30H	8	9	DNI		
DIMM_DM5	RN28B	2	15	DNI		
DIMM_DQ49	RN30A	1	16	DNI		
DIMM_DQ51	RN32C	3	14	DNI		
DIMM_DQ50	RN32E	5	12	DNI		
DIMM_DQ48	RN30B	2	15	DNI		
DIMM_DQ56	RN34G	7	10	DNI		
DIMM_DQ59	RN34B	2	15	DNI		
DIMM_DQ63	RN34C	3	14	DNI		
DIMM_DQ57	RN34H	8	9	DNI		
DIMM_DQ61	RN32A	1	16	DNI		
DIMM_DM7	RN34F	6	11	DNI		
DIMM_DQ60	RN32B	2	15	DNI		
DIMM_DQ62	RN34D	4	13	DNI		

The following resistors can be installed for Class II Termination:

RN24, RN25, RN26, RN27, RN28, RN29, RN30, RN31, RN32, RN33, RN34, R15, R18

VTT — C254 2.2uF, C362 2.2uF, C192 2.2uF, C209 2.2uF

VTT — C307 0.01uF, C294 0.01uF, C260 0.01uF, C324 0.01uF, C199 0.01uF, C193 0.01uF, C205 0.01uF, C206 0.01uF, C207 0.01uF, C271 0.01uF, C304 0.01uF, C318 0.01uF, C354 0.01uF
VTT — C272 0.01uF, C194 0.01uF, C195 0.01uF, C196 0.01uF, C197 0.01uF, C200 0.01uF, C198 0.01uF, C202 0.01uF, C204 0.01uF, C203 0.01uF, C224 0.01uF, C282 0.01uF

DIMM-Side Termination Resistors

DIMM_DQ4	RN19H	8	9	56		
DIMM_DQ5	RN19G	7	10	56		
DIMM_DQ0	RN19F	6	11	56		
DIMM_DQ1	RN19D	4	13	56		
DIMM_DM0	RN19E	5	12	56		
DIMM_DQS0	RN19C	3	14	56		
DIMM_DQ6	RN19B	2	15	56		
DIMM_DQ7	RN19A	1	16	56		
DIMM_DQ2	RN18H	8	9	56		
DIMM_DQ3	RN18G	7	10	56		
DIMM_DQ12	RN18F	6	11	56		
DIMM_DQ13	RN18E	5	12	56		
DIMM_DQ8	RN18D	4	13	56		
DIMM_DQ9	RN18C	3	14	56		
DIMM_DM1	RN18B	2	15	56		
DIMM_DQS1	RN18A	1	16	56		
DIMM_DQ14	RN17H	8	9	56		
DIMM_DQ15	RN17F	6	11	56		
DIMM_DQ10	RN17G	7	10	56		
DIMM_DQ11	RN17E	5	12	56		
DIMM_DQ20	RN17C	3	14	56		
DIMM_DQ21	RN17B	2	15	56		
DIMM_DQ16	RN17D	4	13	56		
DIMM_DQ17	RN17A	1	16	56		
DIMM_DM2	RN16H	8	9	56		
DIMM_DQS2	RN16G	7	10	56		
DIMM_DQ22	RN16E	5	12	56		
DIMM_DQ23	RN16D	4	13	56		
DIMM_DQ18	RN16F	6	11	56		
DIMM_DQ19	RN16C	3	14	56		
DIMM_DQ28	RN16B	2	15	56		
DIMM_DQ29	RN16A	1	16	56		
DIMM_DQ24	RN15H	8	9	56		
DIMM_DQ25	RN15F	6	11	56		
DIMM_DM3	RN15G	7	10	56		
DIMM_DQS3	RN15E	5	12	56		
DIMM_DQ30	RN15D	4	13	56		
DIMM_DQ31	RN15B	2	15	56		
DIMM_DQ26	RN15C	3	14	56		
DIMM_DQ27	RN15A	1	16	56		
DIMM_DQ68	RN14H	8	9	56		
DIMM_DQ69	RN14G	7	10	56		
DIMM_DQ64	RN14F	6	11	56		
DIMM_DQ65	RN14E	5	12	56		
DIMM_DM8	RN14D	4	13	56		
DIMM_DQS8	RN14C	3	14	56		
DIMM_DQ70	RN14A	1	16	56		
DIMM_DQ71	RN14B	2	15	56		
DIMM_DQ66	RN13H	8	9	56		
DIMM_DQ67	RN13G	7	10	56		
DIMM_CKE1	RN13F	6	11	56		
DIMM_CKE0	RN13E	5	12	56		
DIMM_A15	RN13C	3	14	56		
DIMM_A14	RN13B	2	15	56		
DIMM_BA2	RN13D	4	13	56		
DIMM_A12	RN13A	1	16	56		
DIMM_A9	RN12H	8	9	56		
DIMM_A11	RN12G	7	10	56		
DIMM_A7	RN12F	6	11	56		
DIMM_A8	RN12E	5	12	56		
DIMM_A6	RN12D	4	13	56		
DIMM_A5	RN12C	3	14	56		
DIMM_A4	RN12B	2	15	56		
DIMM_A3	RN12A	1	16	56		
DIMM_A1	RN11H	8	9	56		
DIMM_A2	RN11G	7	10	56		
DIMM_A0	RN11F	6	11	56		
DIMM_BA1	RN11D	4	13	56		
DIMM_A10	RN11E	5	12	56		
DIMM_BA0	RN11C	3	14	56		
DIMM_RASn	RN11B	2	15	56		
DIMM_CSn0	RN11A	1	16	56		
DIMM_WEn	RN10H	8	9	56		
DIMM_CASn	RN10G	7	10	56		
DIMM_ODT0	RN10F	6	11	56		
DIMM_A13	RN10D	4	13	56		
DIMM_CSn1	RN10E	5	12	56		
DIMM_ODT1	RN10C	3	14	56		
DIMM_DQ36	RN10A	1	16	56		
DIMM_DQ37	RN10B	2	15	56		
DIMM_DQ32	RN9H	8	9	56		
DIMM_DQ33	RN9G	7	10	56		
DIMM_DM4	RN9F	6	11	56		
DIMM_DQS4	RN9E	5	12	56		
DIMM_DQ38	RN9D	4	13	56		
DIMM_DQ39	RN9C	3	14	56		
DIMM_DQ34	RN9B	2	15	56		
DIMM_DQ35	RN9A	1	16	56		
DIMM_DQ44	RN8G	7	10	56		
DIMM_DQ45	RN8H	8	9	56		
DIMM_DQ40	RN8F	6	11	56		
DIMM_DQ41	RN8D	4	13	56		
DIMM_DM5	RN8E	5	12	56		
DIMM_DQS5	RN8C	3	14	56		
DIMM_DQ46	RN8B	2	15	56		
DIMM_DQ47	RN8A	1	16	56		
DIMM_DQ42	RN7H	8	9	56		
DIMM_DQ43	RN7G	7	10	56		
DIMM_DQ52	RN7F	6	11	56		
DIMM_DQ53	RN7E	5	12	56		
DIMM_DQ48	RN7D	4	13	56		
DIMM_DQ49	RN7C	3	14	56		
DIMM_DM6	RN7B	2	15	56		
DIMM_DQS6	RN7A	1	16	56		
DIMM_DQ54	RN6H	8	9	56		
DIMM_DQ55	RN6F	6	11	56		
DIMM_DQ50	RN6G	7	10	56		
DIMM_DQ51	RN6E	5	12	56		
DIMM_DQ60	RN6C	3	14	56		
DIMM_DQ61	RN6B	2	15	56		
DIMM_DQ56	RN6D	4	13	56		
DIMM_DQ57	RN6A	1	16	56		
DIMM_DM7	RN5H	8	9	56		
DIMM_DQS7	RN5G	7	10	56		
DIMM_DQ62	RN5E	5	12	56		
DIMM_DQ63	RN5D	4	13	56		
DIMM_DQ58	RN5F	6	11	56		
DIMM_DQ59	RN5C	3	14	56		
	RN5B	2	15	56		
	RN5A	1	16	56		

DIMM Memory Decoupling

VTT — CN16 0.1uF, CN9 0.1uF, CN2 0.1uF, CN20 0.1uF, CN19 0.1uF, CN15 0.1uF, CN18 0.1uF, CN23 0.1uF, CN26 0.1uF
VTT — CN3 0.1uF, CN8 0.1uF, CN25 0.1uF, CN24 0.1uF, CN17 0.1uF, CN11 0.1uF, CN21 0.1uF, CN1 0.1uF
VTT — CN6 0.1uF, CN10 0.1uF, CN5 0.1uF, CN4 0.1uF, CN14 0.1uF, CN12 0.1uF, CN13 0.1uF, CN7 0.1uF, C65 0.1uF

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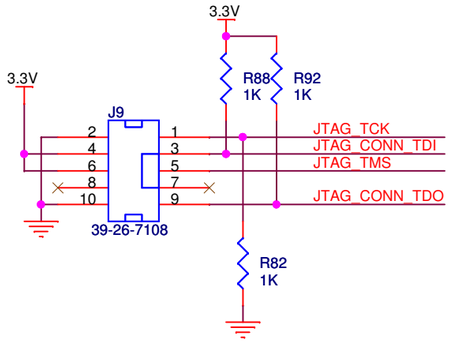
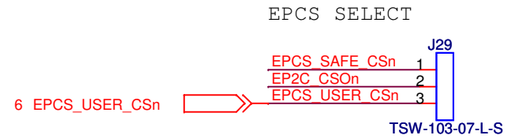
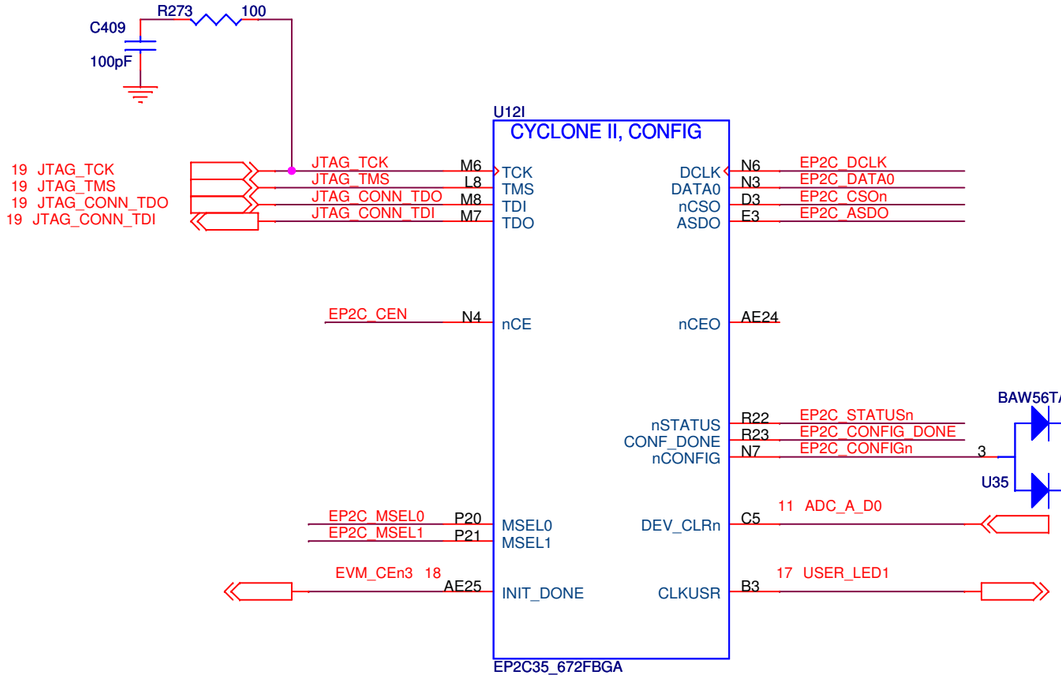
CONFIGURATION CIRCUITRY

RIGHT ANGLE JTAG HEADER

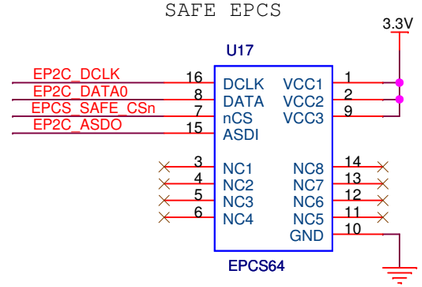


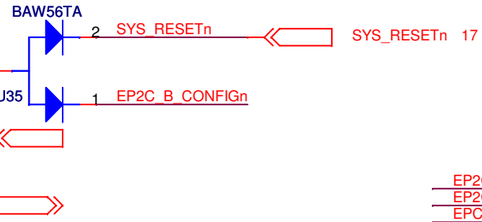
EPCS SELECT



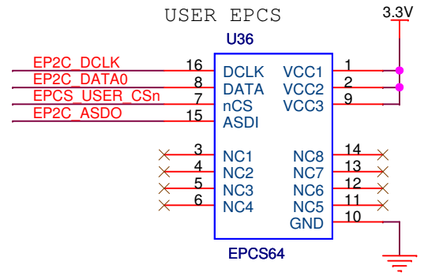


SAFE EPCS

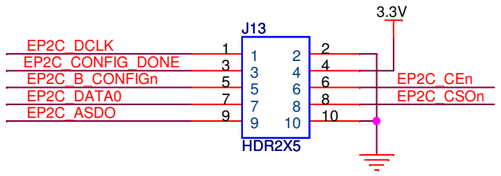


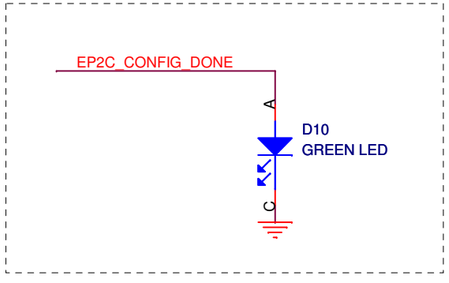


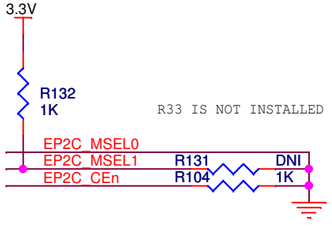
USER EPCS

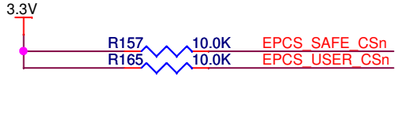


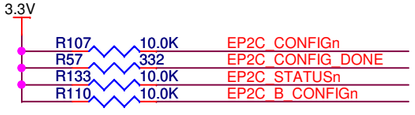
SURFACE MOUNT ACTIVE SERIAL HEADER











ALTERA

Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121

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ADC Channel A

ADC_SCLK 6,12
ADC_SDATA 4,12
ADC_A_SEN 5

ADC_A_CLK_P 3
ADC_A_CLK_N 3

ADC_A_OE 4
ADC_A_OVR 5
ADC_RESET 6,12

ADC_A_DCLK 3
ADC_A_D[13..0] 3,5,10

RN36A 1 16 33
RN36B 2 15 33
RN36C 3 14 33 ADC_A_D13 ADC_A_R_D13
RN36D 4 13 33 ADC_A_D12 ADC_A_R_D12
RN36E 5 12 33 ADC_A_D11 ADC_A_R_D11
RN36F 6 11 33 ADC_A_D10 ADC_A_R_D10
RN36G 7 10 33 ADC_A_D9 ADC_A_R_D9
RN36H 8 9 33 ADC_A_D8 ADC_A_R_D8

RN35A 1 16 33 ADC_A_D7 ADC_A_R_D7
RN35B 2 15 33 ADC_A_D6 ADC_A_R_D6
RN35C 3 14 33 ADC_A_D5 ADC_A_R_D5
RN35D 4 13 33 ADC_A_D4 ADC_A_R_D4
RN35E 5 12 33 ADC_A_D3 ADC_A_R_D3
RN35F 6 11 33 ADC_A_D2 ADC_A_R_D2
RN35G 7 10 33 ADC_A_D1 ADC_A_R_D1
RN35H 8 9 33 ADC_A_D0 ADC_A_R_D0

ADC CHANNEL A

U26 ADS5520

1	DRGND	48	DRGND
2	SCLK	47	D3
3	SDATA	46	D2
4	SEN	45	D1
5	AVDD	44	D0
6	AGND	43	CLKOUT
7	AVDD	42	DRGND
8	AGND	41	OE
9	AVDD	40	DFS
10	CLKP	39	AVDD
11	CLKM	38	AGND
12	AGND	37	AVDD
13	AGND	36	AGND
14	AGND	35	RESET
15	AVDD	34	AVDD
16	AGND	33	AVDD

65 PAD_GND, 64 OVR, 63 D13, 62 D12, 61 D11, 60 D10, 59 DRGND, 58 DRVDD, 57 DRGND, 56 D9, 55 D8, 54 D7, 53 D6, 52 D5, 51 D4, 50 DRGND, 49 DRVDD

17 CM, 18 AGND, 19 INP, 20 INM, 21 AGND, 22 AVDD, 23 AGND, 24 AVDD, 25 AGND, 26 AVDD, 27 AGND, 28 AVDD, 29 REFP, 30 REFM, 31 IREF, 32 AGND

ADC_A_OVR
VCCA_ADC
3.3V
ADC_A_R_D13 ADC_A_R_D12 ADC_A_R_D11 ADC_A_R_D10
ADC_A_R_D9 ADC_A_R_D8 ADC_A_R_D7 ADC_A_R_D6 ADC_A_R_D5 ADC_A_R_D4
ADC_SCLK
ADC_SDATA
ADC_A_SEN
ADC_A_CLK_P C143 0.01uF
ADC_A_CLK_N C144 0.01uF
ADC_A_R_D3 ADC_A_R_D2 ADC_A_R_D1 ADC_A_R_D0 ADC_A_DCLK
ADC_A_OE ADC_A_DFS
ADC_RESET
ADC_A_CM R271 1
ADC_A_INP
ADC_A_INM
ADC_A_IREF
ADC_A_REFM
ADC_A_REFP

ADC CHANNEL A

J32 LTI-SASF54GT
ADC_A_IN
R200 Do Not Install DNI
T3 TC4-1W
T2 TC4-1W
C136 0.01uF
ADC_A_CM
R37 1 ADC_A_INM
R38 24.9
C139 0.01uF
C135 10pF
R41 24.9
R40 1 ADC_A_INP

J30 Position	Data Output Format
Pin 1-2	2's Complement data valid falling edge
Pin 3-4	Straight Binary data valid falling edge
Pin 5-6	2's Complement data valid rising edge
Pin 7-8	Straight Binary data valid rising edge

3.3V
R168 1.0K
R167 1.0K
R166 1.0K
ADC_A_DFS
J30 HDR2X4

ADC_A_D1 R201 10.0K
ADC_A_D0 R202 10.0K
ADC_A_IREF R30 56K
ADC_A_REFM R33 1 C124 0.1uF
ADC_A_REFP R34 1 C125 0.1uF

ADC A DECOUPLING CAPS

ANALOG POWER
VCCA_ADC
C146 10uF (6.3V)
C384 C381 C380 C377 C116 C115 C114 C113 C145 C142 C141 C140 0.1uF

DIGITAL POWER
3.3V
C117 10uF (6.3V)
C378 C129 C166 C109 0.1uF 0.01uF 0.001uF

CLKBUF
3.3V
C118 0.1uF

Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121

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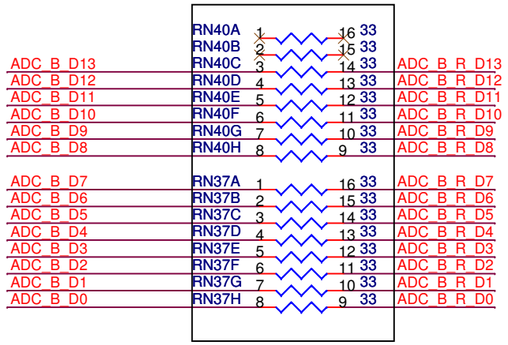
ADC Channel B

ADC_SCLK 6,11
ADC_SDATA 4,11
ADC_B_SEN 5

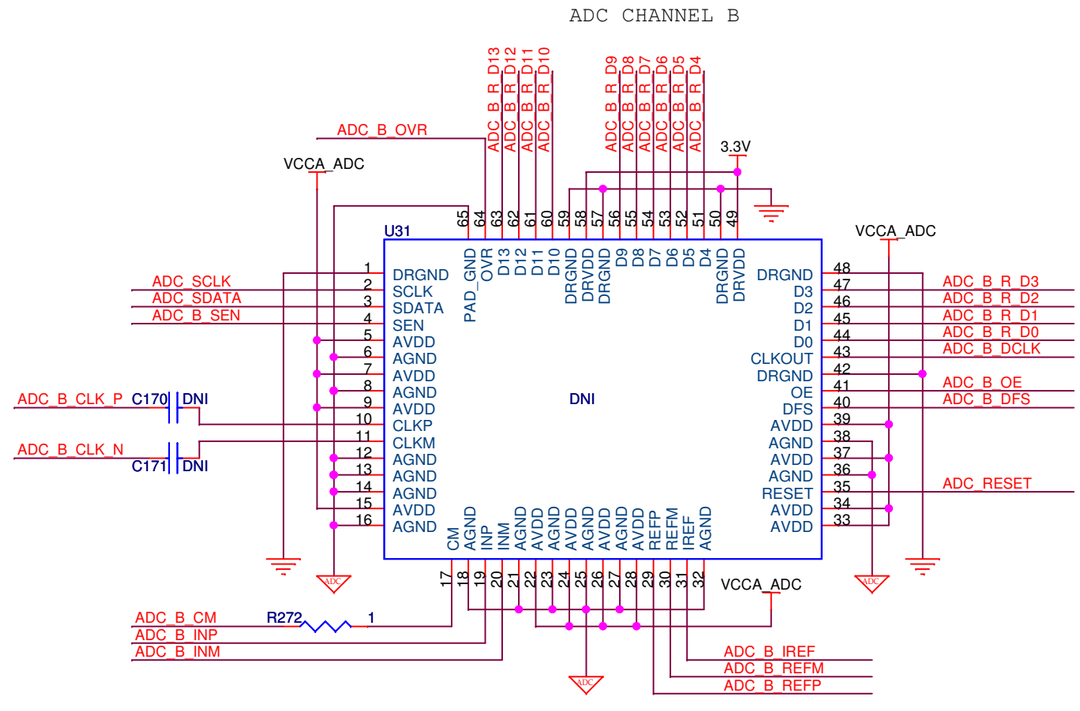
ADC_B_CLK_P 3
ADC_B_CLK_N 3

ADC_B_OE 4
ADC_B_OVR 5
ADC_RESET 6,11

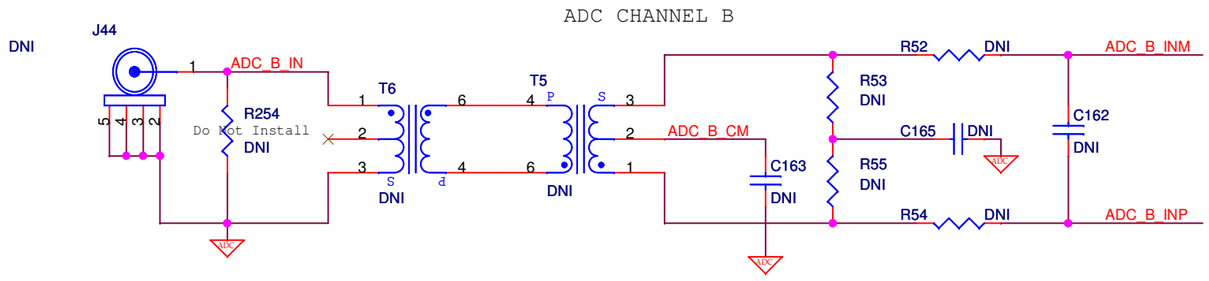
ADC_B_DCLK 3
ADC_B_D[13..0] 5



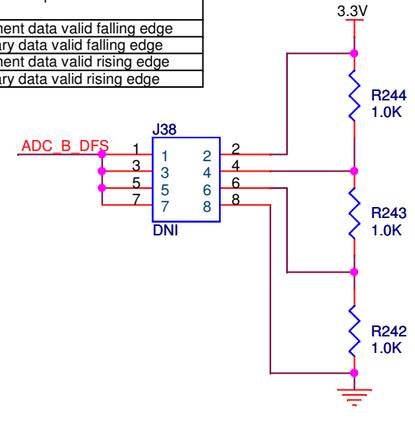
ADC CHANNEL B



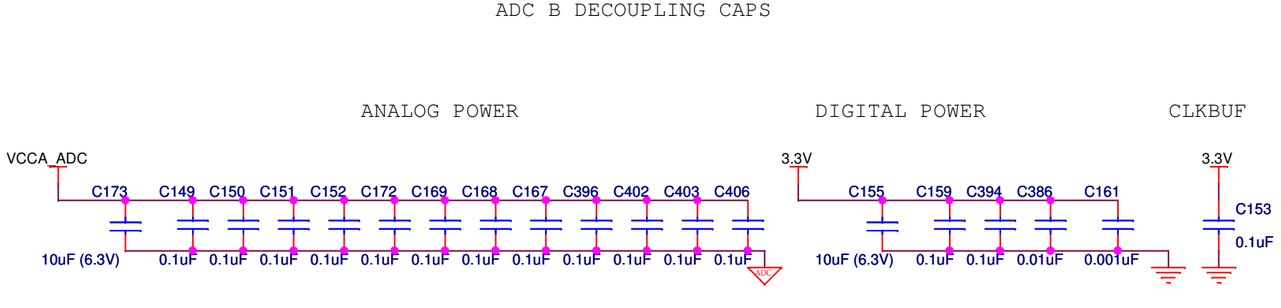
ADC CHANNEL B

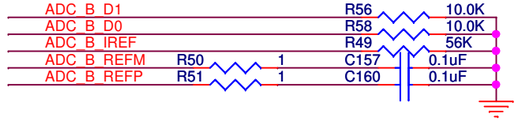


J38 Position	Data Output Format
Pin 1-2	2's Complement data valid falling edge
Pin 3-4	Straight Binary data valid falling edge
Pin 5-6	2's Complement data valid rising edge
Pin 7-8	Straight Binary data valid rising edge



ADC B DECOUPLING CAPS





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DAC CHANNEL A

4 DAC_A_D[13..0] — DAC_A_D[13..0]

3 DACA_CLK — DACA_CLK

PLACE NEXT TO CYCLONE II

DAC_A_D13 RN2A 1 16 33 R_DAC_A_D13 1
DAC_A_D12 RN2B 2 15 33 R_DAC_A_D12 2
DAC_A_D11 RN2C 3 14 33 R_DAC_A_D11 3
DAC_A_D10 RN2D 4 13 33 R_DAC_A_D10 4
DAC_A_D9 RN2E 5 12 33 R_DAC_A_D9 5
DAC_A_D8 RN2F 6 11 33 R_DAC_A_D8 6
DAC_A_D7 RN2G 7 10 33 R_DAC_A_D7 7
DAC_A_D6 RN2H 8 9 33 R_DAC_A_D6 8
DAC_A_D5 RN1A 1 16 33 R_DAC_A_D5 9
DAC_A_D4 RN1B 2 15 33 R_DAC_A_D4 10
DAC_A_D3 RN1C 3 14 33 R_DAC_A_D3 11
DAC_A_D2 RN1D 4 13 33 R_DAC_A_D2 12
DAC_A_D1 RN1E 5 12 33 R_DAC_A_D1 13
DAC_A_D0 RN1F 6 11 33 R_DAC_A_D0 14
RN1G 7 10 33
RN1H 8 9 33

U25

D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0
NC 25
DGND 26
+VD 27
+VA 24
BW 19
IOUT 22 — DAC_A_IOUTp
IOUTn 21 — DAC_A_IOUTn
BYP 23
CLK 28 — DACA_CLK
FSA 18
REF_IN 17
INTn_EXT 16
PD 15
AGND 20

DAC904

3.3V

C389 1uF
C405 0.01uF
C137 0.001uF

L25 Ferrite Bead 33ohm

VCCA_DAC

C379 0.01uF
C383 0.1uF
C385 0.1uF
C388 1uF
C382 10uF (6.3V)
C375 0.1uF
C376 10uF (6.3V)

C123 0.1uF
C130 0.1uF
C119 0.1uF
R25 2.0K

R31 49.9
R35 49.9

ADT1-1WT T1

C126 DNI

DAC_A_OUT

J31 LTI-SASF54GT

DAC_A_IOUTn — TP4

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DAC CHANNEL B

3,4,6 DAC_B_D[13..0] — DAC_B_D[13..0]

3 DACB_CLK — DACB_CLK

PLACE NEXT TO CYCLONE II

DAC_B_D13 RN4A 1 16 33 R_DAC_B_D13 1
DAC_B_D12 RN4B 2 15 33 R_DAC_B_D12 2
DAC_B_D11 RN4C 3 14 33 R_DAC_B_D11 3
DAC_B_D10 RN4D 4 13 33 R_DAC_B_D10 4
DAC_B_D9 RN4E 5 12 33 R_DAC_B_D9 5
DAC_B_D8 RN4F 6 11 33 R_DAC_B_D8 6
DAC_B_D7 RN4G 7 10 33 R_DAC_B_D7 7
DAC_B_D6 RN4H 8 9 33 R_DAC_B_D6 8
DAC_B_D5 RN3A 1 16 33 R_DAC_B_D5 9
DAC_B_D4 RN3B 2 15 33 R_DAC_B_D4 10
DAC_B_D3 RN3C 3 14 33 R_DAC_B_D3 11
DAC_B_D2 RN3D 4 13 33 R_DAC_B_D2 12
DAC_B_D1 RN3E 5 12 33 R_DAC_B_D1 13
DAC_B_D0 RN3F 6 11 33 R_DAC_B_D0 14
RN3G 7 10 33
RN3H 8 9 33

U30

D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0 NC DGND
+VD +VA BW IOUT IOUTn BYP CLK FSA REF_IN INTn_EXT PD AGND
27 24 19 22 21 23 28 18 17 16 15 20 25 26

DNI

L26 DNI

VCCA_DAC — 1 — 2 — VCCA_DAC

C393 DNI, C395 DNI, C404 DNI, C407 DNI, C401 DNI, C391 0.1uF, C392 10uF (6.3V)

3.3V

C408 1uF, C102 0.01uF, C164 0.001uF

C154 DNI

DAC_B_OUTp
DAC_B_IOUTn
DACB_CLK

C158 DNI
C147 DNI
R46 DNI
R47 DNI
R48 DNI
C156 DNI

T4 DNI

DAC_B_OUT — J43 DNI

DAC_B_IOUTn — TP3

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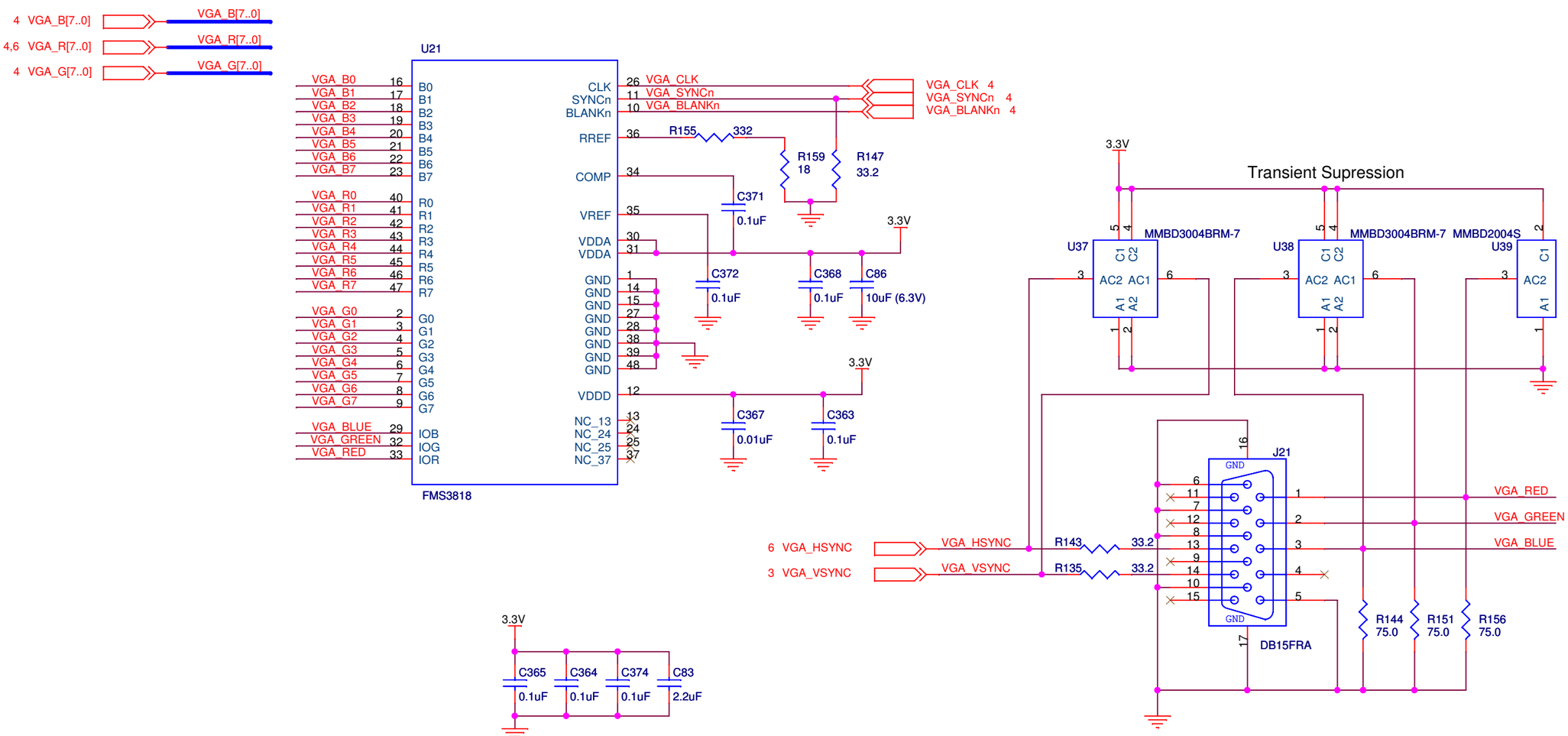
VIDEO DAC



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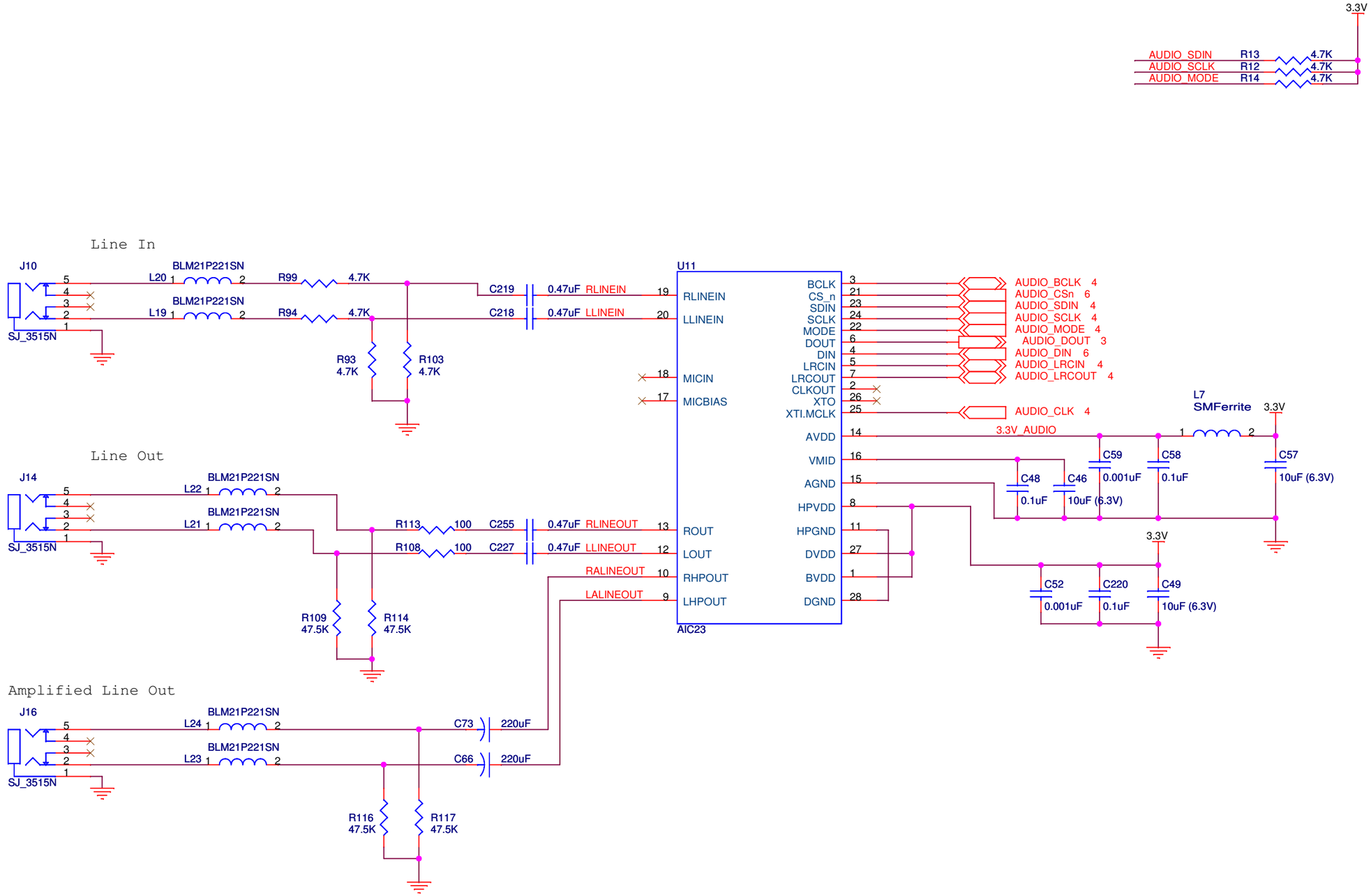
AIC23 AUDIO CODEC



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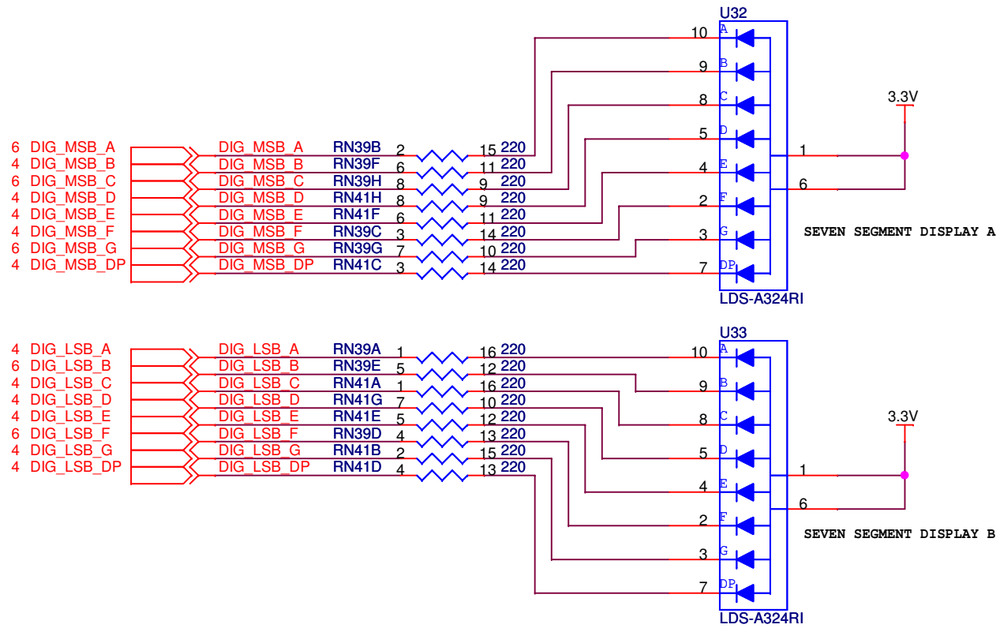
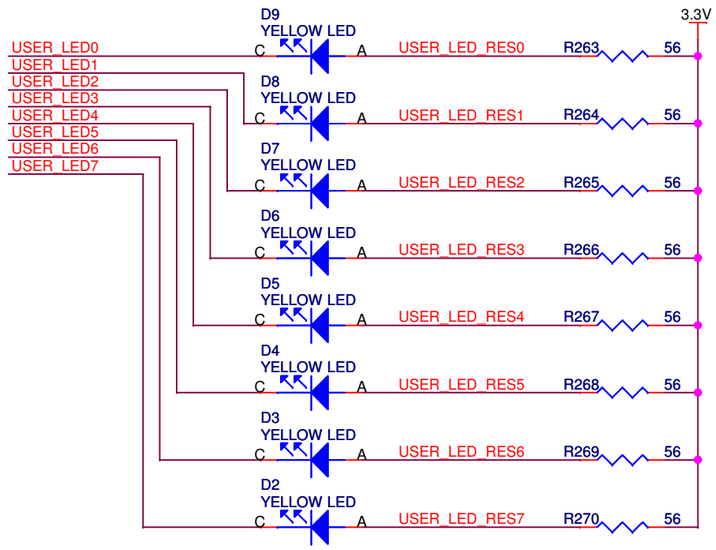
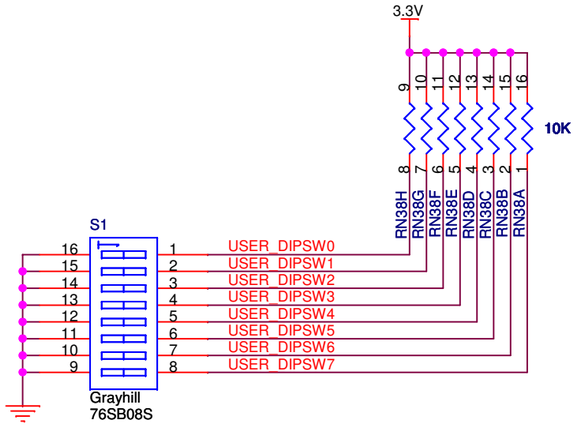
USER IO

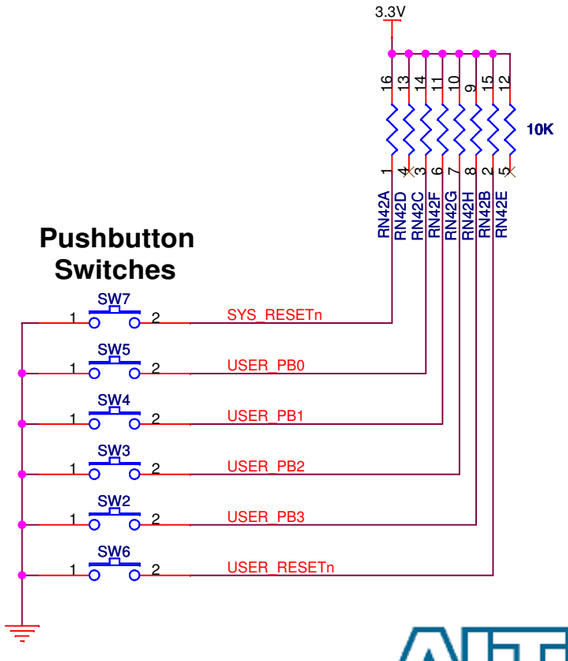
7-Segment Displays

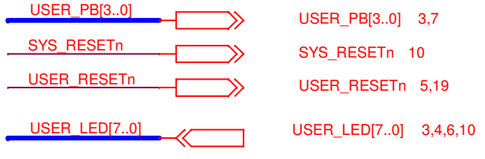


User LEDs









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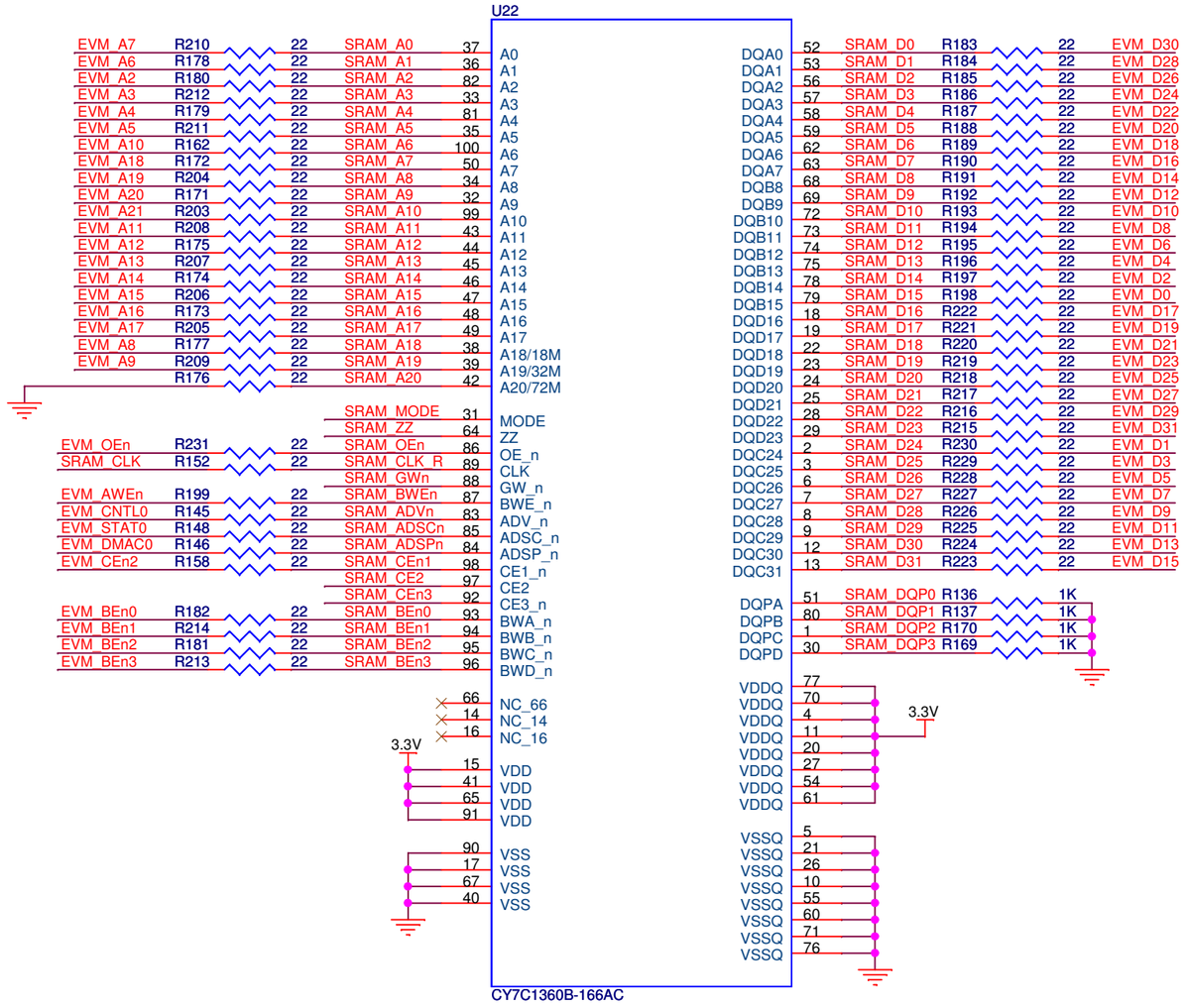
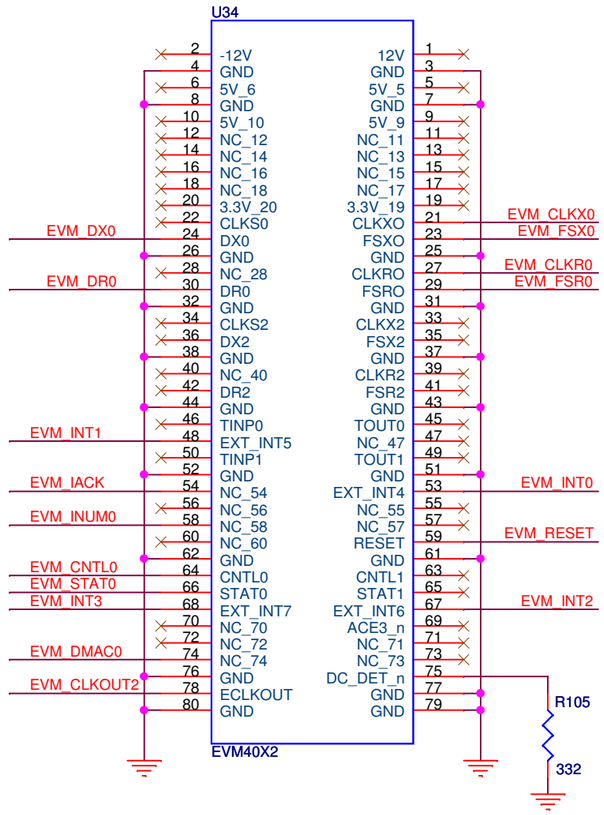
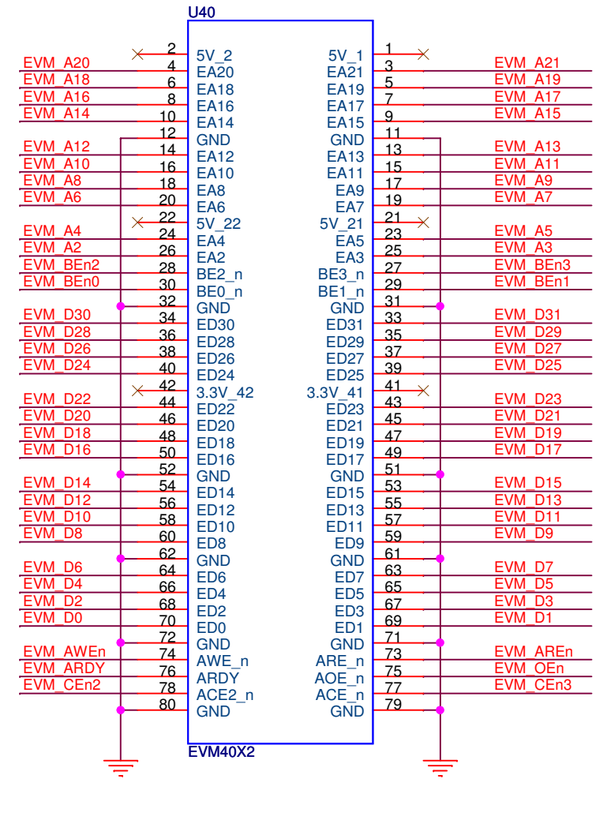
SSRAM, TI EVM Connectors



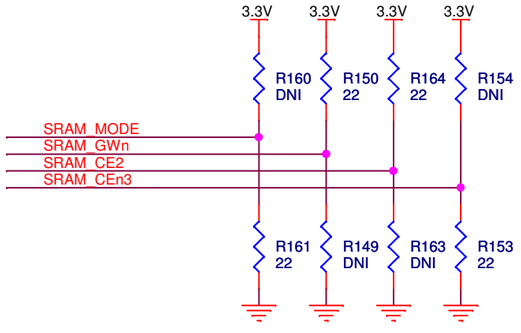




6,10 EVM_CEn[3..2] EVM_CEn[3..2]
6 EVM_BEn[3..0] EVM_BEn[3..0]
6 EVM_A[21..2] EVM_A[21..2]
6 EVM_D[31..0] EVM_D[31..0]
6 EVM_INT[3..0] EVM_INT[3..0]

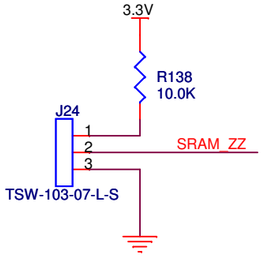
6 EVM_CLKX0 EVM_CLKX0
6 EVM_FSX0 EVM_FSX0
6 EVM_CLKR0 EVM_CLKR0
6 EVM_FSR0 EVM_FSR0

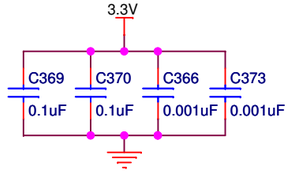
6 SRAM_CLK SRAM_CLK
6 EVM_DX0 EVM_DX0
3 EVM_IACK EVM_IACK
3 EVM_INUM0 EVM_INUM0
6 EVM_CNTL0 EVM_CNTL0
6 EVM_STAT0 EVM_STAT0
6 EVM_DMAC0 EVM_DMAC0
3 EVM_CLKOUT2 EVM_CLKOUT2
3 EVM_RESET EVM_RESET
6 EVM_AWEn EVM_AWEn
6 EVM_OEn EVM_OEn
3 EVM_AREn EVM_AREn
6 EVM_DR0 EVM_DR0
6 EVM_ARDY EVM_ARDY



Default SRAM Settings

MODE =	Linear Burst (GND)
GWn =	Global Write Disable (VCC)
CE2 =	Always Enabled (VCC)
CEn3 =	Always Enabled (GND)
ZZ =	Always Enabled (jumper GND)





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Altera Daughter Card, Mictor Connector

Altera Daughter Card

5V — R21 0 — INSTALLED — PROTO_3_3V_5V
3.3V — R20 DNI — NOT INSTALLED

J22 (HDR2X7)

B_PROTO_IO40	3	4	B_PROTO_IO29
B_PROTO_IO30	5	6	B_PROTO_IO31
B_PROTO_IO32	7	8	B_PROTO_IO33
B_PROTO_IO34	9	10	B_PROTO_IO35
B_PROTO_IO36	11	12	B_PROTO_IO37
B_PROTO_IO38	13	14	B_PROTO_IO39

J15 (HDR2X20)

B_PROTO_RESETn	1	2	
B_PROTO_IO0	3	4	B_PROTO_IO1
B_PROTO_IO2	5	6	B_PROTO_IO3
B_PROTO_IO4	7	8	B_PROTO_IO5
B_PROTO_IO6	9	10	B_PROTO_IO7
B_PROTO_IO8	11	12	B_PROTO_IO9
B_PROTO_IO10	13	14	B_PROTO_IO11
B_PROTO_IO12	15	16	B_PROTO_IO13
B_PROTO_IO14	17	18	B_PROTO_IO15
B_PROTO_IO16	19	20	
B_PROTO_IO17	21	22	
B_PROTO_IO18	23	24	
B_PROTO_IO19	25	26	
B_PROTO_IO21	27	28	B_PROTO_IO20
B_PROTO_IO22	29	30	B_PROTO_IO23
B_PROTO_IO24	31	32	
B_PROTO_IO25	33	34	
B_PROTO_IO27	35	36	B_PROTO_IO26
B_PROTO_IO28	37	38	B_PROTO_CARDSELn
	39	40	

3.3V — R115 10.0K

3.3V, DC_IN — J23 (HDR2X10)

PROTO_CLK_OSC	1	2	
PROTO_CLKIN	3	4	
PROTO_CLKOUT	5	6	
	7	8	
	9	10	
	11	12	
	13	14	
	15	16	
	17	18	
	19	20	

3.3V — R141 95.3 — R142 143
3.3V — R139 95.3 — R140 143

3.3V — C361 0.1uF, C358 0.1uF, C360 0.1uF, C357 0.1uF, C359 0.1uF
5V — C91 0.1uF

3,4 PROTO_IO[40..0] — PROTO_IO[40..0]
6 PROTO_CLKIN — PROTO_CLKIN
3 PROTO_CLK_OSC — PROTO_CLK_OSC
3 PROTO_CLKOUT — PROTO_CLKOUT
4 PROTO_CARDSELn — PROTO_CARDSELn
5,17 USER_RESETn — USER_RESETn — R19 0 — PROTO_RESETn

Altera Daughter Card Voltage Limiters

(for 5V compatibility)

U13 (PI5C3384)

B_PROTO_IO0	3	2	PROTO_IO0
B_PROTO_IO1	4	5	PROTO_IO1
B_PROTO_IO2	7	6	PROTO_IO2
B_PROTO_IO3	8	9	PROTO_IO3
B_PROTO_IO4	11	10	PROTO_IO4
B_PROTO_IO5	14	15	PROTO_IO5
B_PROTO_IO6	17	16	PROTO_IO6
B_PROTO_IO7	18	19	PROTO_IO7
B_PROTO_IO8	21	20	PROTO_IO8
B_PROTO_IO9	22	23	PROTO_IO9

U15 (PI5C3384)

B_PROTO_IO20	3	2	PROTO_IO20
B_PROTO_IO21	4	5	PROTO_IO21
B_PROTO_IO22	7	6	PROTO_IO22
B_PROTO_IO23	8	9	PROTO_IO23
B_PROTO_IO24	11	10	PROTO_IO24
B_PROTO_IO25	14	15	PROTO_IO25
B_PROTO_IO26	17	16	PROTO_IO26
B_PROTO_IO27	18	19	PROTO_IO27
B_PROTO_IO28	21	20	PROTO_IO28
B_PROTO_IO29	22	23	PROTO_IO29

U14 (PI5C3384)

B_PROTO_IO10	3	2	PROTO_IO10
B_PROTO_IO11	4	5	PROTO_IO11
B_PROTO_IO12	7	6	PROTO_IO12
B_PROTO_IO13	8	9	PROTO_IO13
B_PROTO_IO14	11	10	PROTO_IO14
B_PROTO_IO15	14	15	PROTO_IO15
B_PROTO_IO16	17	16	PROTO_IO16
B_PROTO_IO17	18	19	PROTO_IO17
B_PROTO_IO18	21	20	PROTO_IO18
B_PROTO_IO19	22	23	PROTO_IO19

U18 (PI5C3384)

B_PROTO_IO30	3	2	PROTO_IO30
B_PROTO_IO31	4	5	PROTO_IO31
B_PROTO_IO32	7	6	PROTO_IO32
B_PROTO_IO33	8	9	PROTO_IO33
B_PROTO_IO34	11	10	PROTO_IO34
B_PROTO_IO35	14	15	PROTO_IO35
B_PROTO_IO36	17	16	PROTO_IO36
B_PROTO_IO37	18	19	PROTO_IO37
B_PROTO_IO38	21	20	PROTO_IO38
B_PROTO_IO39	22	23	PROTO_IO39

U19 (PI5C3384)

	24	VCC	4.3V
	3	A0	
	4	A1	
	7	A2	
	8	A3	
	11	A4	
B_PROTO_RESETn	14	A5	PROTO_RESETn
B_PROTO_IO40	17	A6	PROTO_IO40
B_PROTO_CARDSELn	18	A7	PROTO_CARDSELn
	21	A8	
	22	A9	
	2	B0	
	5	B1	
	6	B2	
	9	B3	
	10	B4	
	15	B5	
	16	B6	
	19	B7	
	20	B8	
	23	B9	
	1	BEA-	
	13	BEB-	

5V — D13 — MMSD701T1

Mictor Connector

(pinned out for FS2 hardware trace module)

3.3V — R96 4.7K

J12 (MICTOR_HDR)

	1	5VDC	SCL 2
	3	GND	SDA 4
PROTO_CLKOUT R95 0 MICTOR_PLDCLK	5	CLKE	CLKO 6 — MICTOR_TR_CLK R106 0 PROTO_CLKOUT
PROTO_IO24	7	D15E	D15O 8 — PROTO_IO13
PROTO_IO23	9	D14E	D14O 10 — PROTO_IO12
10 JTAG_CONN_TDI — R97 0 MICTOR_TDO	11	D13E	D13O 12 — MICTOR_PWR1 R111 0
PROTO_IO22	13	D12E	D12O 14 — MICTOR_PWR2 R112 0
10 JTAG_TCK — R100 0 MICTOR_TCK	15	D11E	D11O 16 — PROTO_IO11
10 JTAG_TMS — R98 0 MICTOR_TMS	17	D10E	D10O 18 — PROTO_IO10
10 JTAG_CONN_TDO — R101 0 MICTOR_TDI	19	D9E	D9O 20 — PROTO_IO9
MICTOR_TRST (n/c)	21	D8E	D8O 22 — PROTO_IO8
PROTO_IO21	23	D7E	D7O 24 — PROTO_IO7
PROTO_IO20	25	D6E	D6O 26 — PROTO_IO6
PROTO_IO19	27	D5E	D5O 28 — PROTO_IO5
PROTO_IO18	29	D4E	D4O 30 — PROTO_IO4
PROTO_IO17	31	D3E	D3O 32 — PROTO_IO3
PROTO_IO16	33	D2E	D2O 34 — PROTO_IO2
PROTO_IO15	35	D1E	D1O 36 — PROTO_IO1
PROTO_IO14	37	D0E	D0O 38 — PROTO_IO0
	39		GND1
	40		GND2
	41		GND3
	42		GND4
	43		GND5

3.3V — C222 0.1uF, C221 0.001uF

3.3V — PROTO_IO19 R120 1K
PROTO_IO22 R118 4.7K
PROTO_IO16 R119 4.7K

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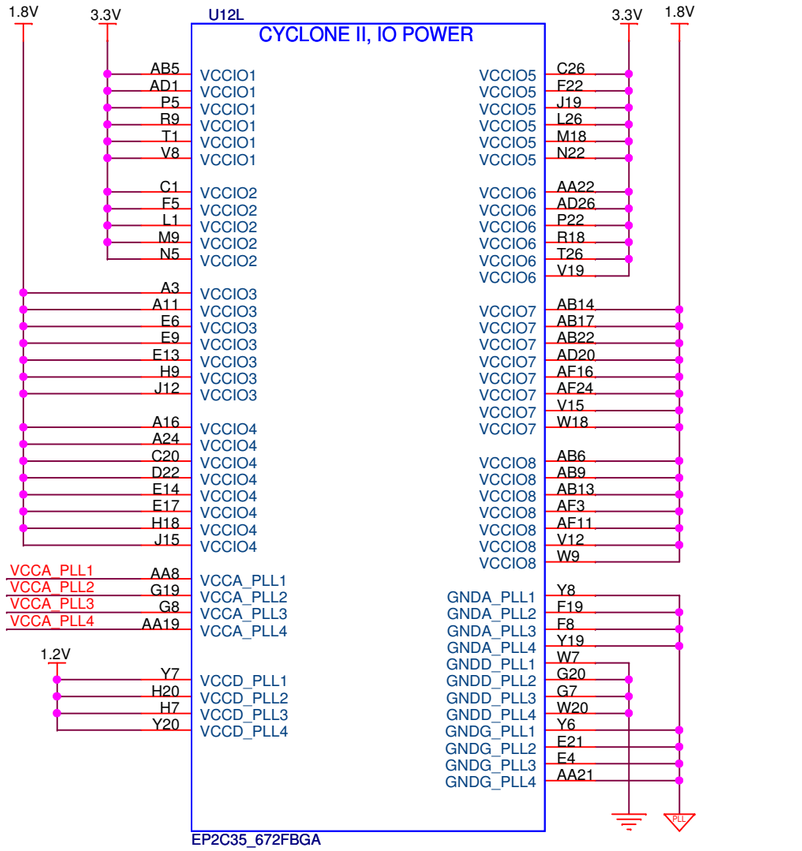
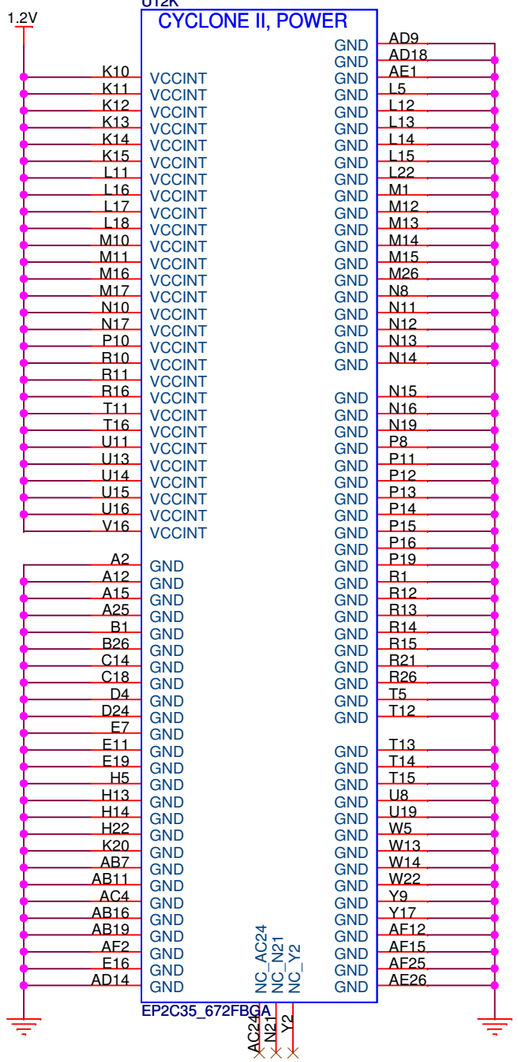
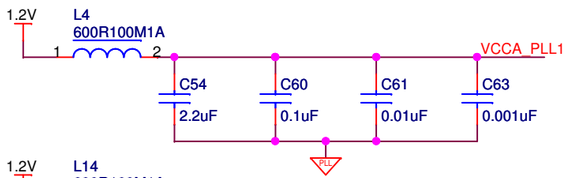
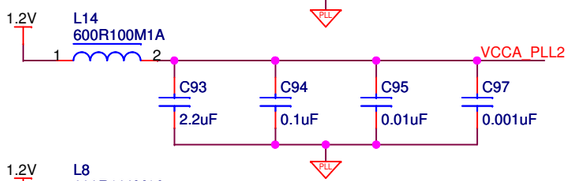
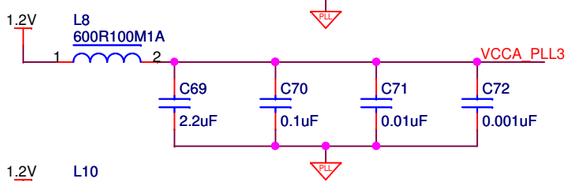
Cyclone II Power & Decoupling

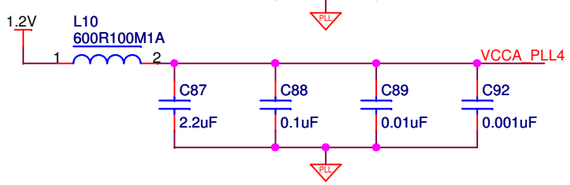


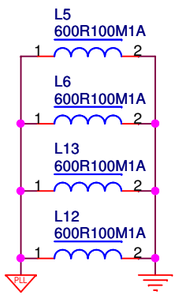


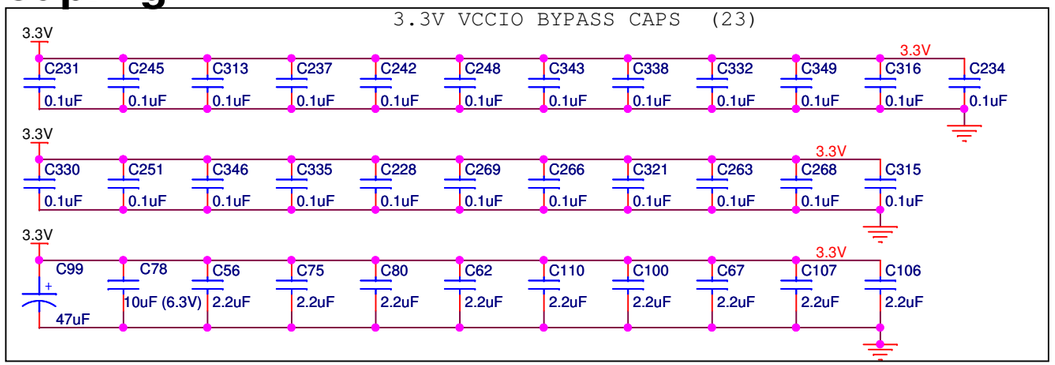


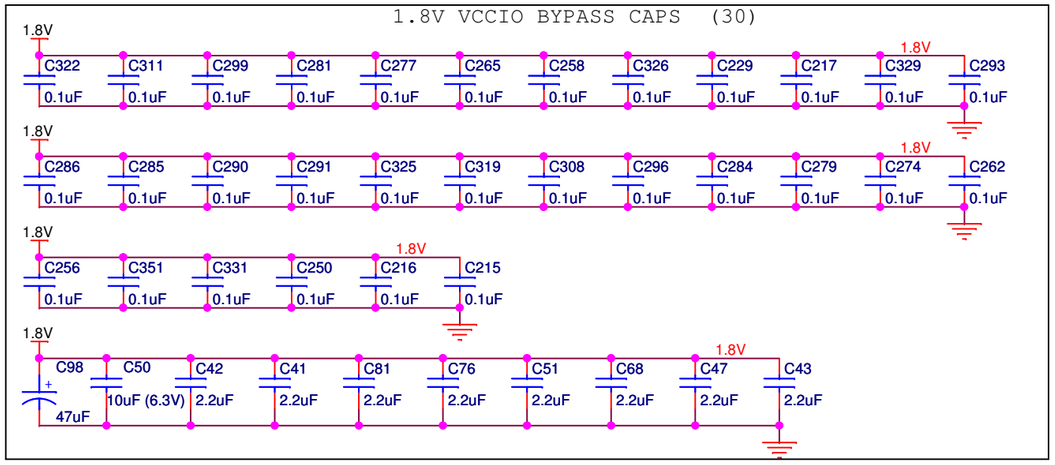


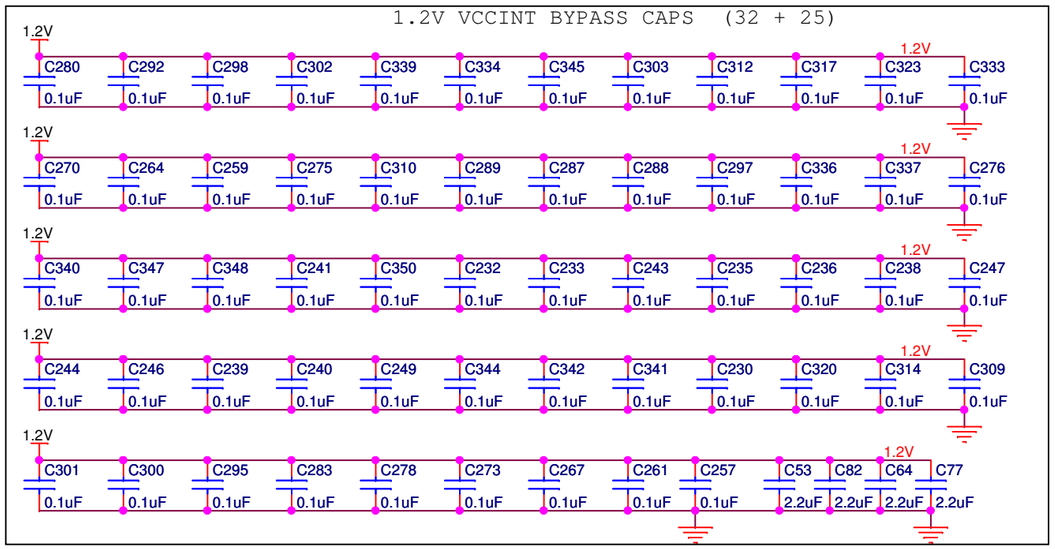












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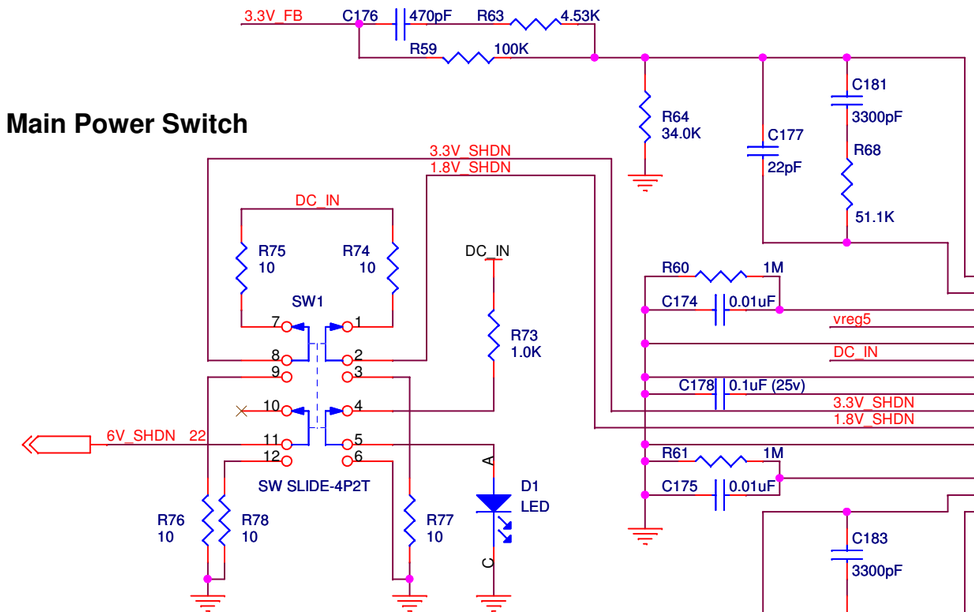
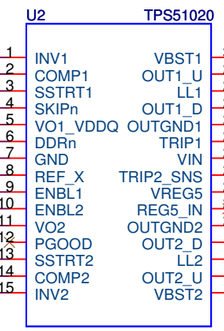
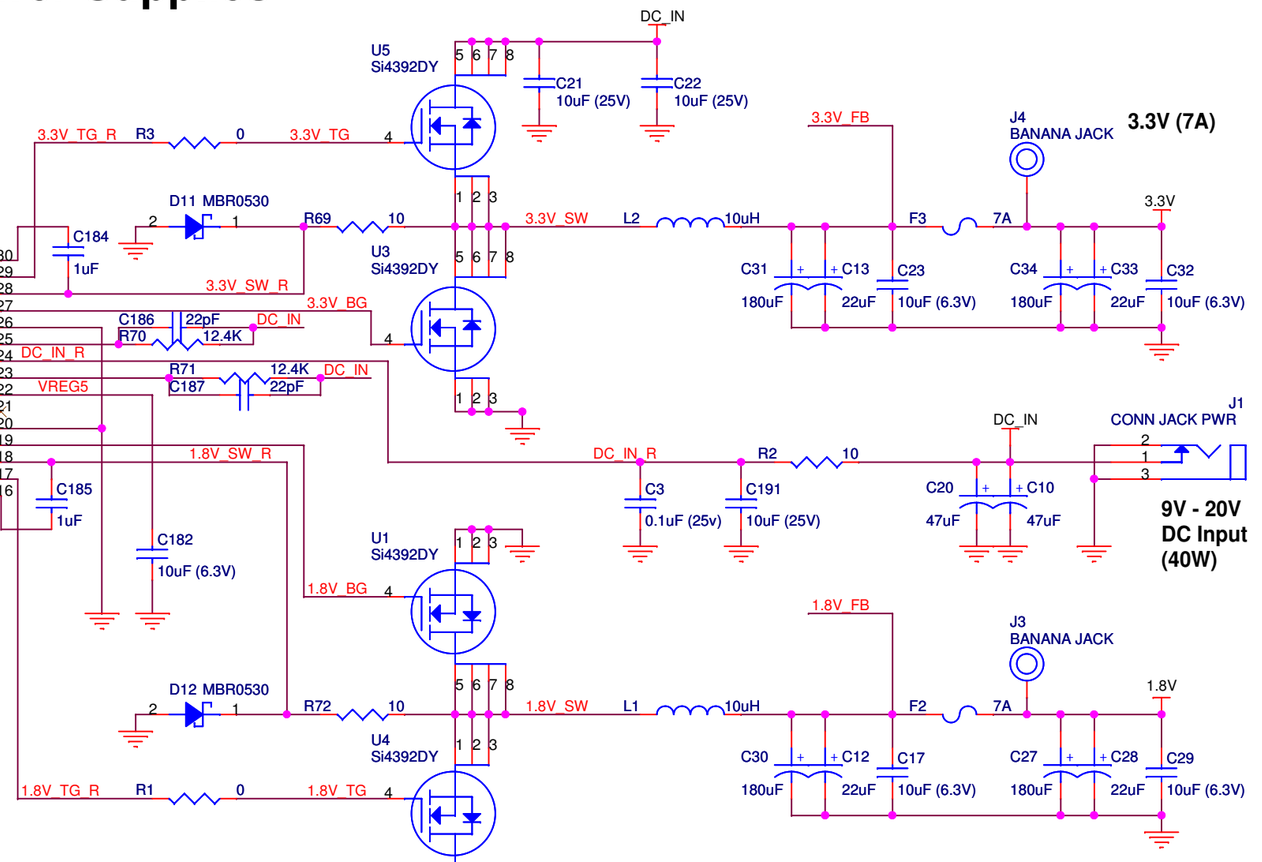
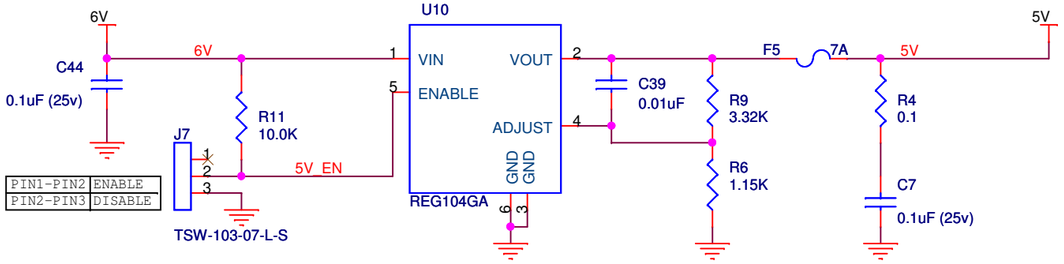
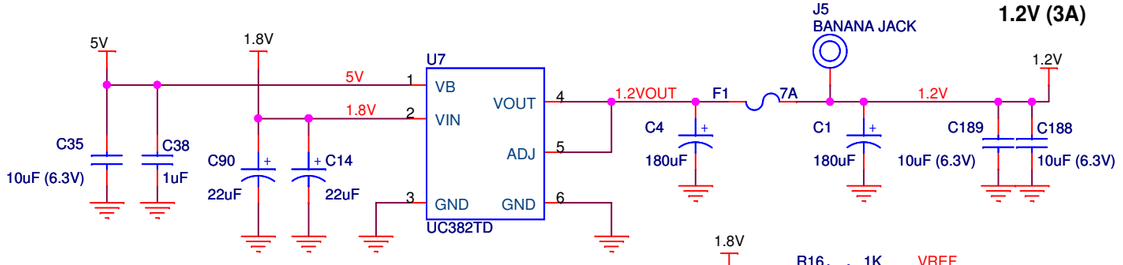
Main Power Switch

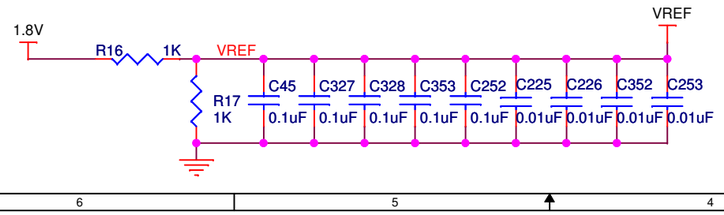


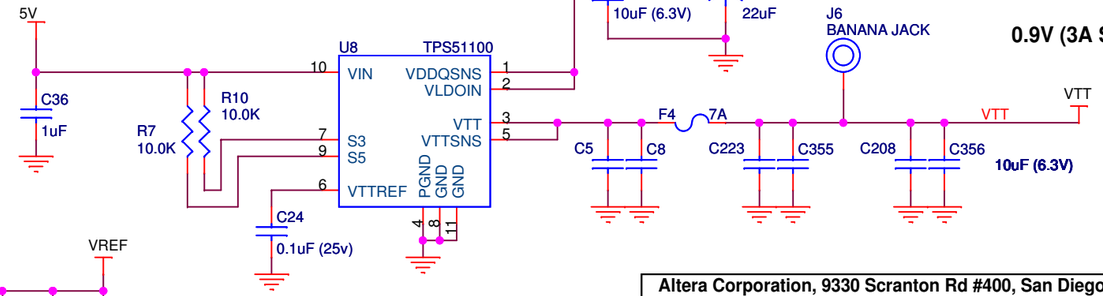












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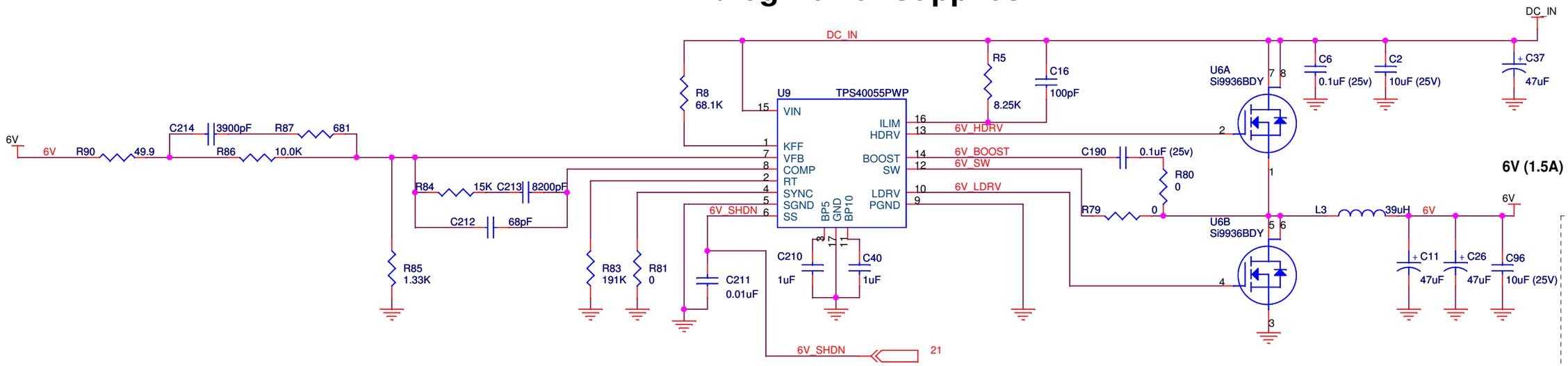

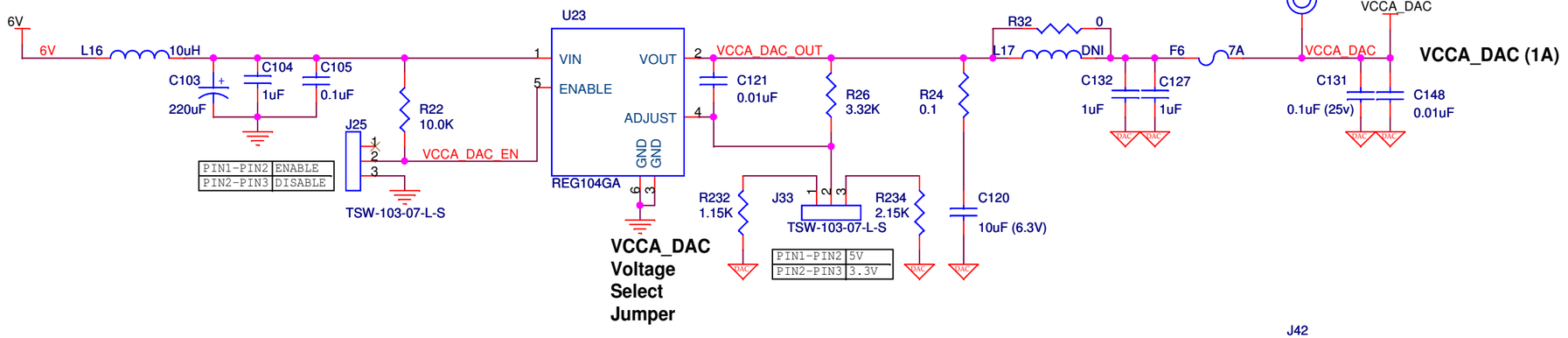

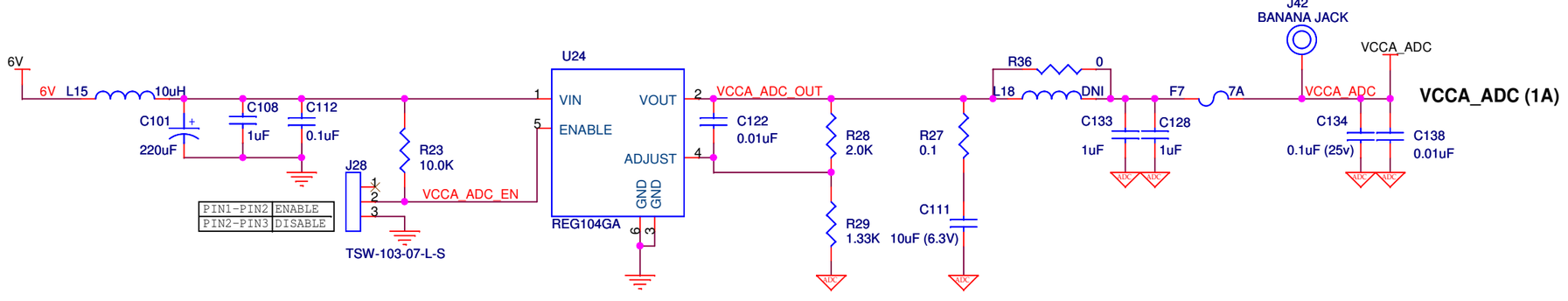

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