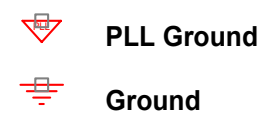
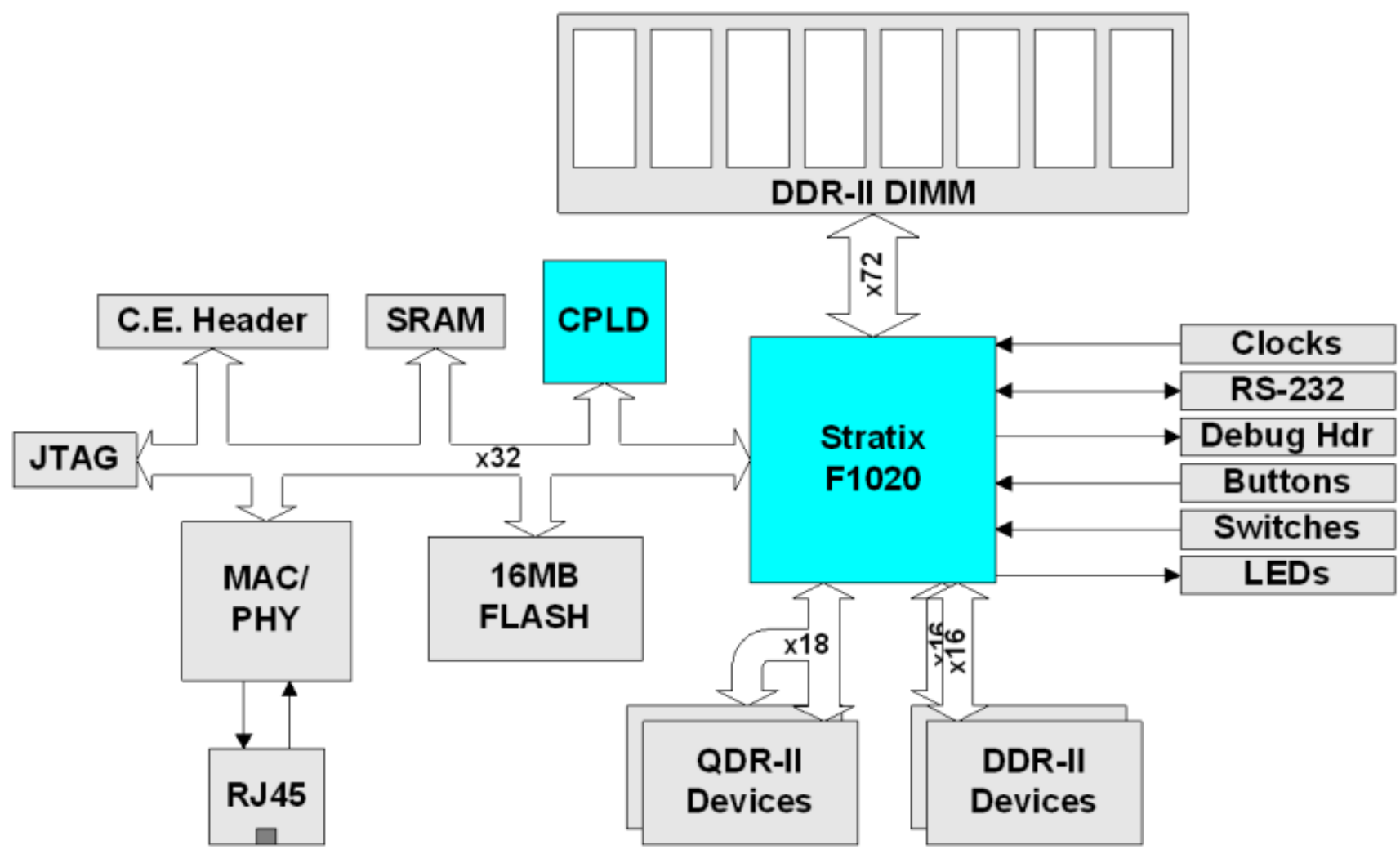


NOTES:

- 1. Project Drawing Numbers:
 - Raw PCB 100-0310112-01
 - Gerber Files 110-0310112-01
 - PCB Design Files 120-0310112-01
 - Assembly Drawing 130-0310112-01
 - Fab Drawing 140-0310112-01
 - Schematic Drawing 150-0310112-01
 - PCB Film 160-0310112-01
 - Bill of Materials 170-0310112-01
 - Schematic Design Files 180-0310112-01
 - Functional Specification 210-0310112-01
 - PCB Layout Guidelines 220-0310112-01
 - Assembly Rework 320-0310112-01

2. 824 Parts, 64 Library Parts, 810 Nets, 5225 Pins

Stratix Memory Board II Block Diagram



REV	DATE	PAGES	DESCRIPTION
A*	02/23/2004	All	Initial Design Release

PAGE	DESCRIPTION
1	Title, Notes, Block Diagram, Revision History
2	Stratix Package Top View
3	DDR-II SDRAM
4	QDR-II SRAM
5	DDR-II, QDR-II Terminations
6	Stratix Bank 7, 8 (QDRII/DDRII)
7	DDR-II DIMM
8	DDR-II DIMM Terminations
9	Stratix Bank 3, 4 (DDRII DIMM)
10	Stratix Clocks, Oscillators
11	Stratix Configuration, CPLD, JTAG
12	10/100 Ethernet Interface
13	SRAM, Flash
14	Stratix Banks 5, 6 (Shared Bus/7-Segment)
15	RS-232. Buttons, Switches
16	7-Segment Displays, LEDs
17	Santa Cruz Card, SMT Debug Headers
18	Stratix Banks 1, 2 (Proto1/RS-232/Switches/LEDs)
19	Stratix Power, Temp, Voltage, Current Sense
20	Power Supplies
21	Memory Decoupling
22	Stratix Decoupling, VTT Regulators
23	-
24	-
25	-

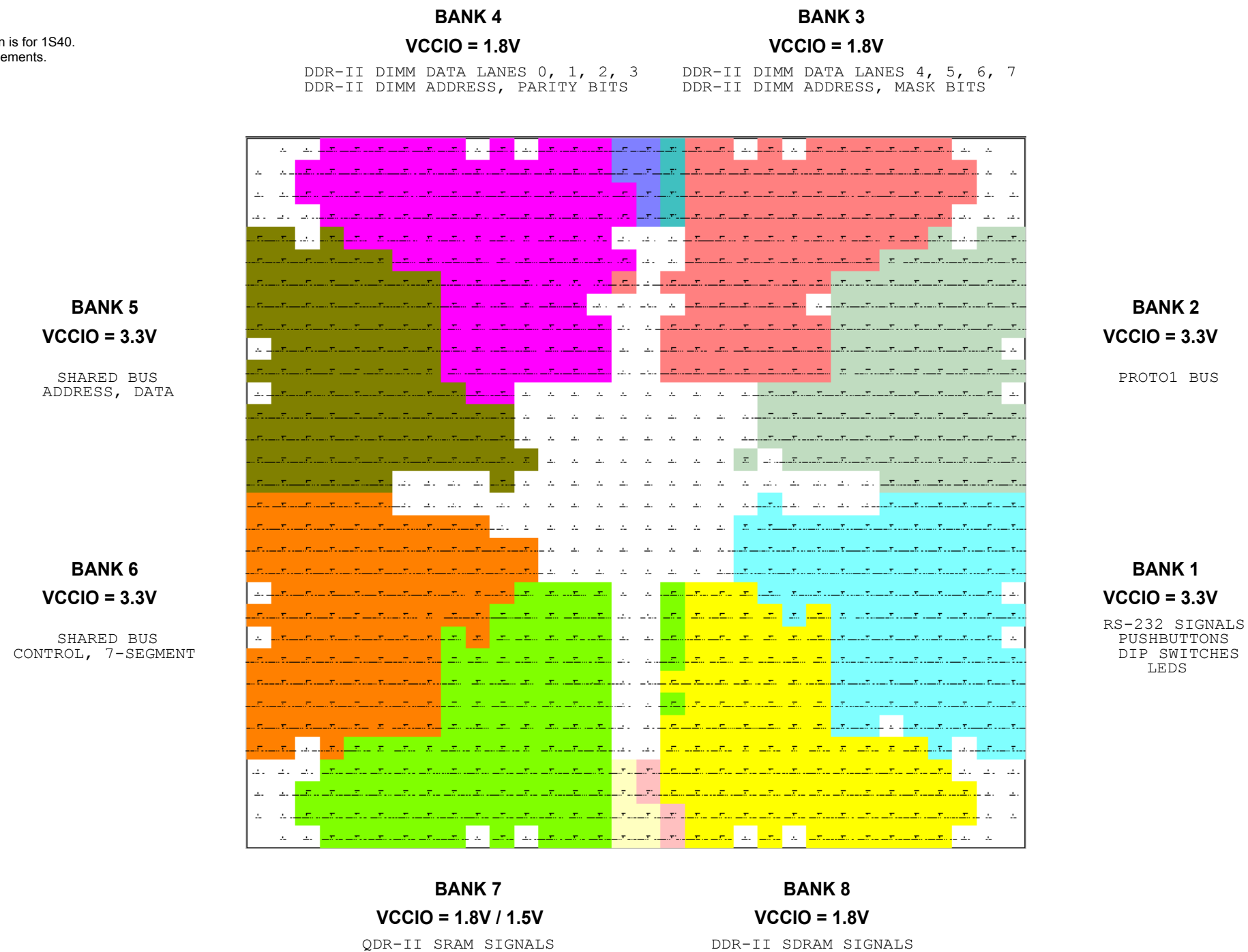


Notes:

1. Altera Stratix Schematic Symbol Breakdown:
 - (a) Bank1 - RS-232, Buttons, Switches
 - (b) Bank2 - Proto1 Bus
 - (c) Bank3 - DDR-II DIMM
 - (d) Bank4 - DDR-II DIMM
 - (e) Bank5 - Shared Bus Address, Data
 - (f) Bank6 - Shared Bus Control, 7-Segment
 - (g) Bank7 - QDR-II SRAM
 - (h) Bank8 - DDR-II SDRAM
 - (i) Configuration
 - (j) Clocks
 - (k) VCCint, GND
 - (l) VCCio, GND

2. Stratix devices can be 1S25, 1S40, 1S60 on this board. Symbol shown is for 1S40.
 1S60 Pro version does not use extra I/O of 1S60, just the extra logic elements.

Stratix F1020 Package Top View

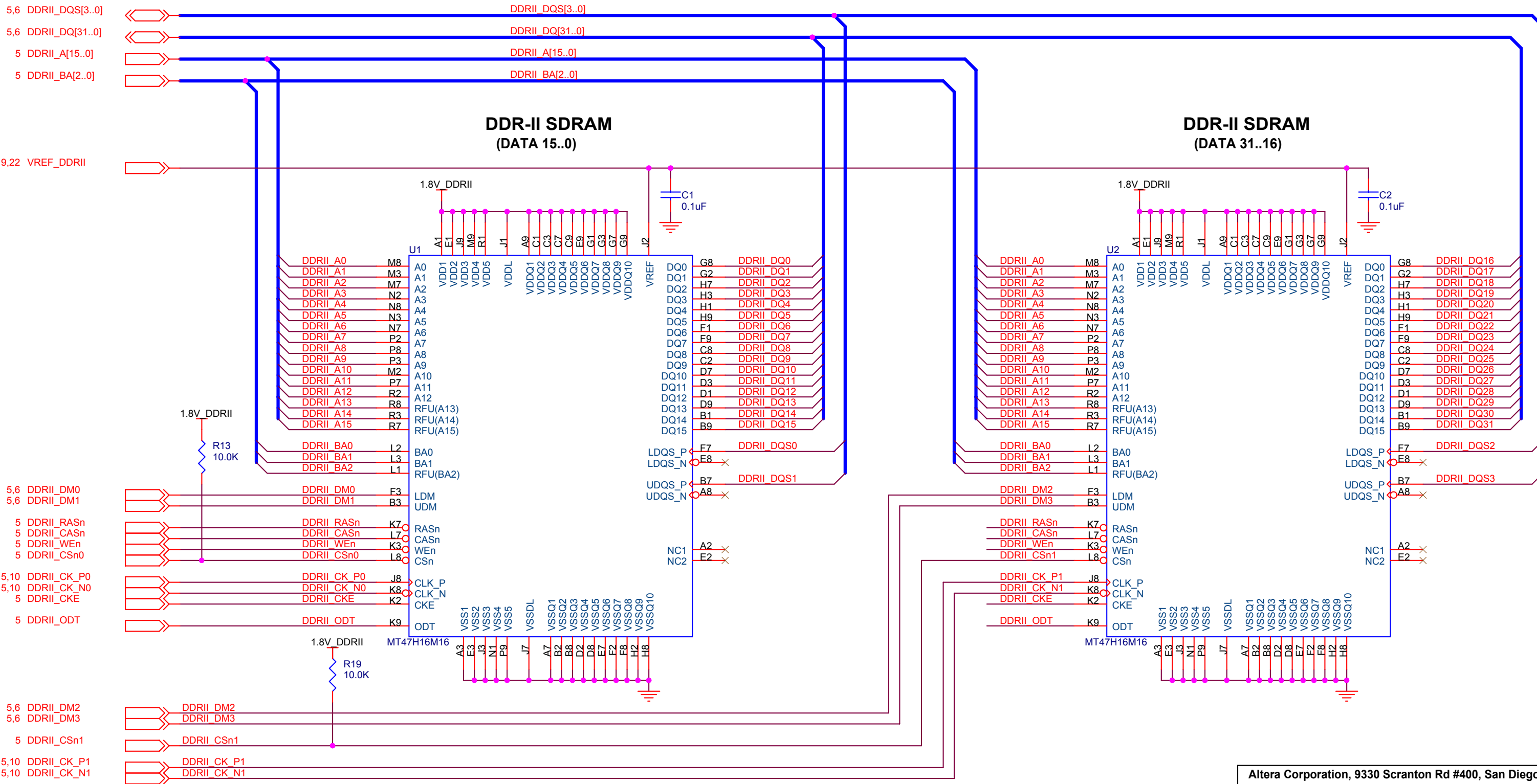


Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
Size B	Document Number 150-0216200-01	Rev A
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DDR-II SDRAM

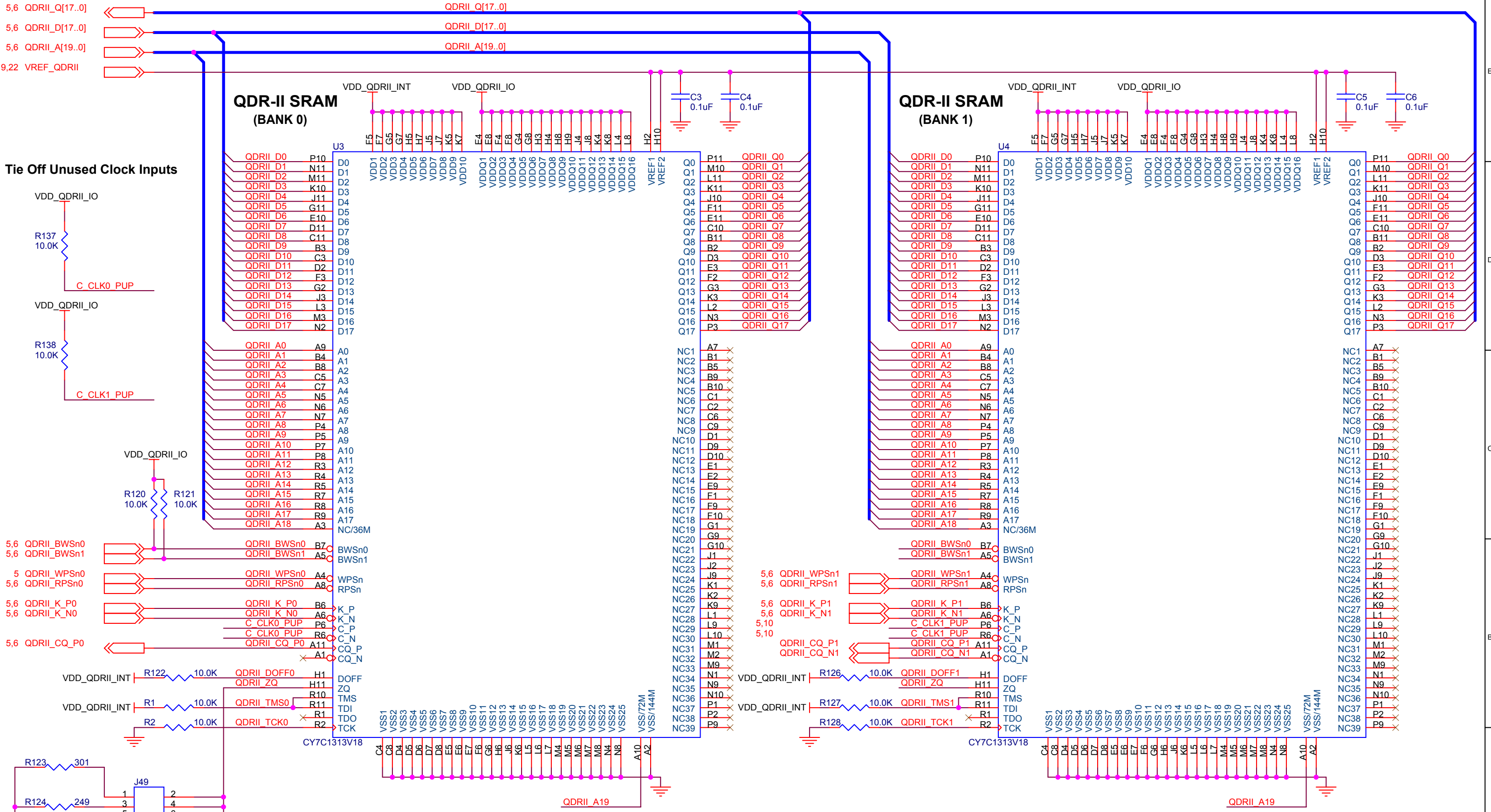
DDR-II Address/Control Y-via Test Points

V1	DDRII A0	V2	DDRII A8	V3	DDRII BA0
V4	DDRII A1	V5	DDRII A9	V6	DDRII BA1
V7	DDRII A2	V8	DDRII A10	V9	DDRII BA2
V10	DDRII A3	V11	DDRII A11	V14	DDRII RASn
V12	DDRII A4	V13	DDRII A12	V17	DDRII CASn
V15	DDRII A5	V16	DDRII A13	V20	DDRII WEn
V18	DDRII A6	V19	DDRII A14	V23	DDRII ODT
V21	DDRII A7	V22	DDRII A15	V79	DDRII CKE



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Title		
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QDR-II SRAM



Tie Off Unused Clock Inputs

5,6 QDRII_BWSn0
5,6 QDRII_BWSn1

5 QDRII_WPSn0
5,6 QDRII_RPSn0

5,6 QDRII_K_P0
5,6 QDRII_K_N0

5,6 QDRII_CQ_P0

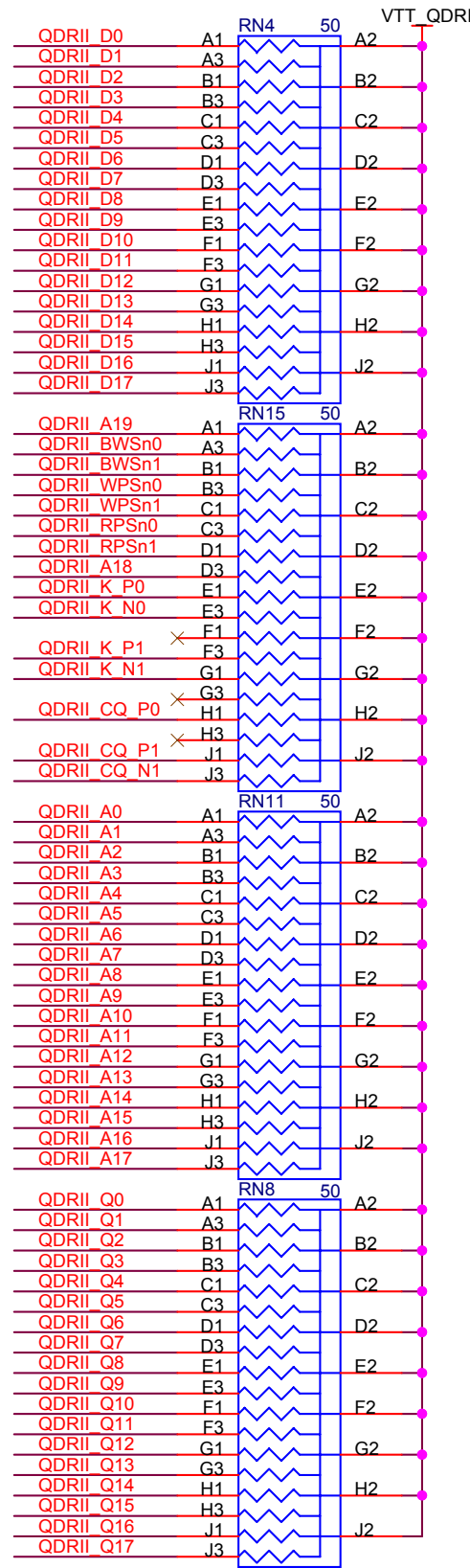
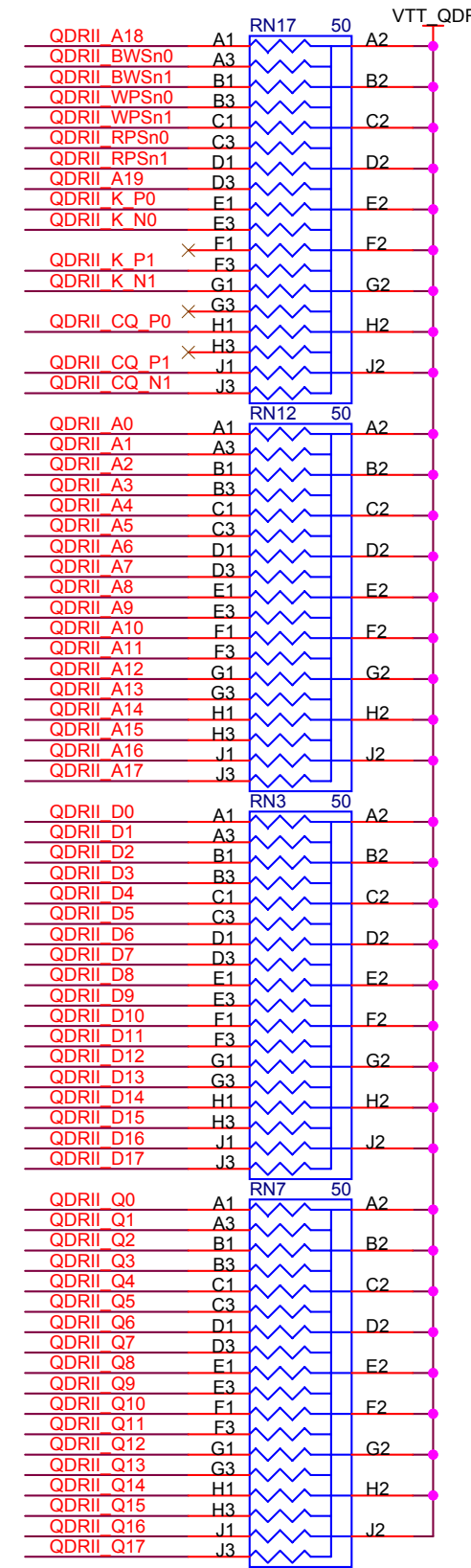
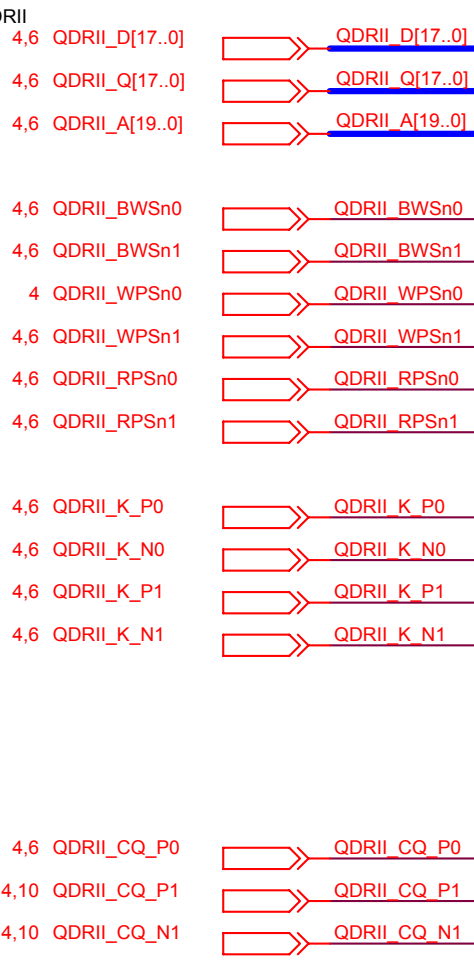
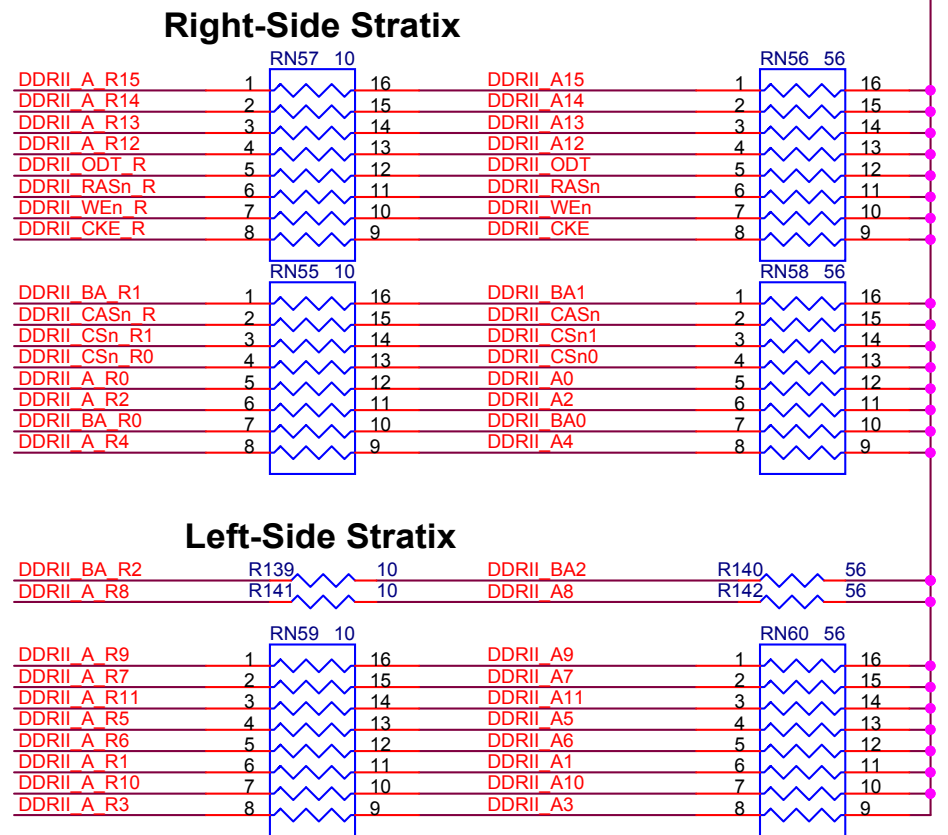
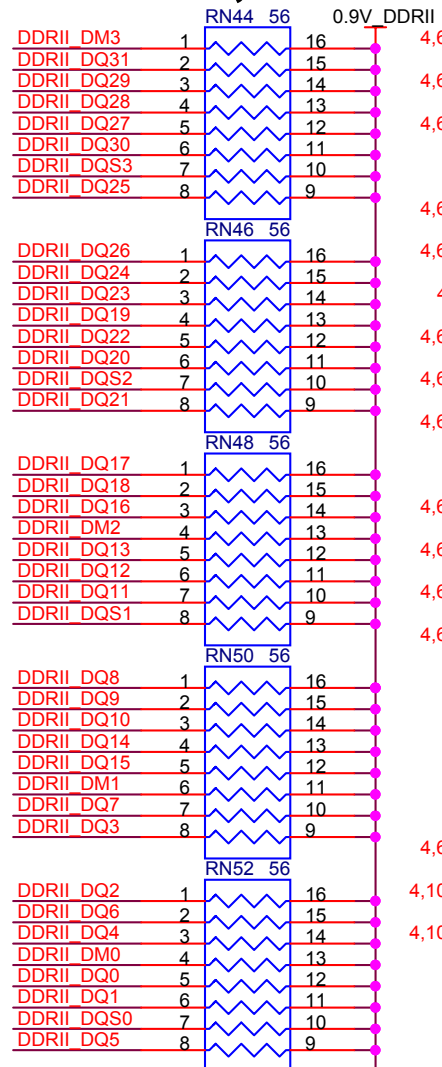
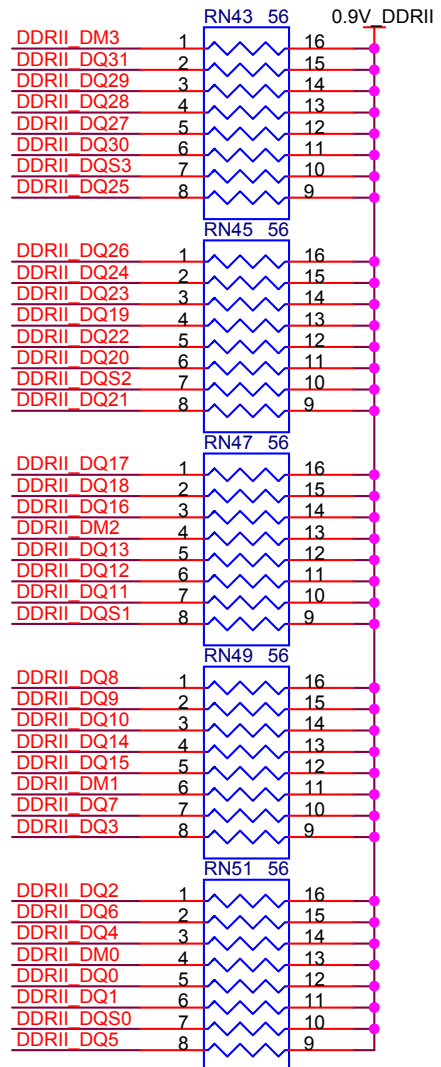
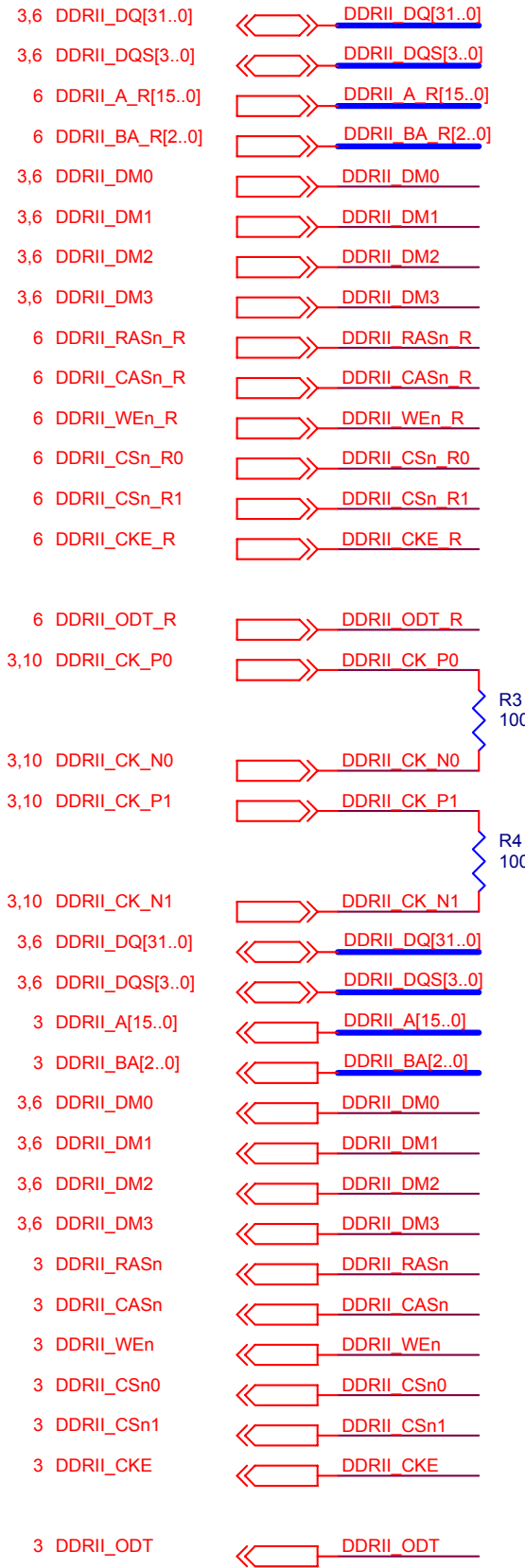
Impedance Selection Jumper

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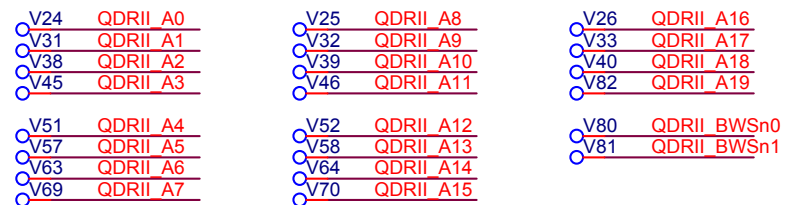
Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
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DDR-II, QDR-II Terminations

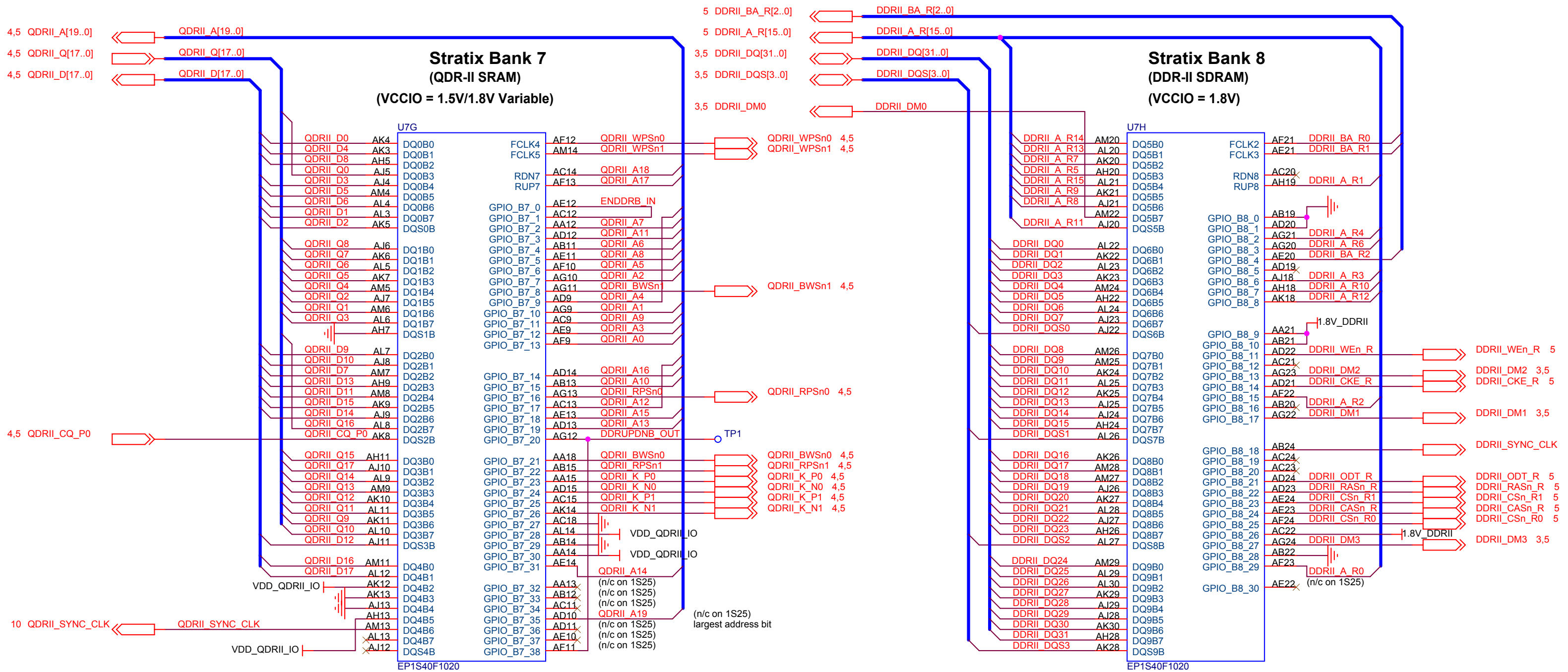
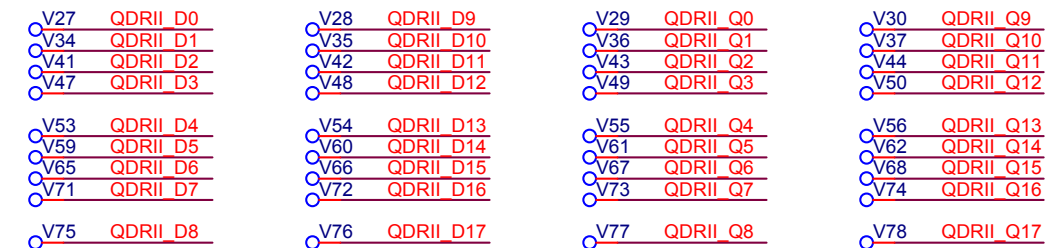


Stratix Bank 7, Bank 8

QDR-II Address/Control Y-via Test Points

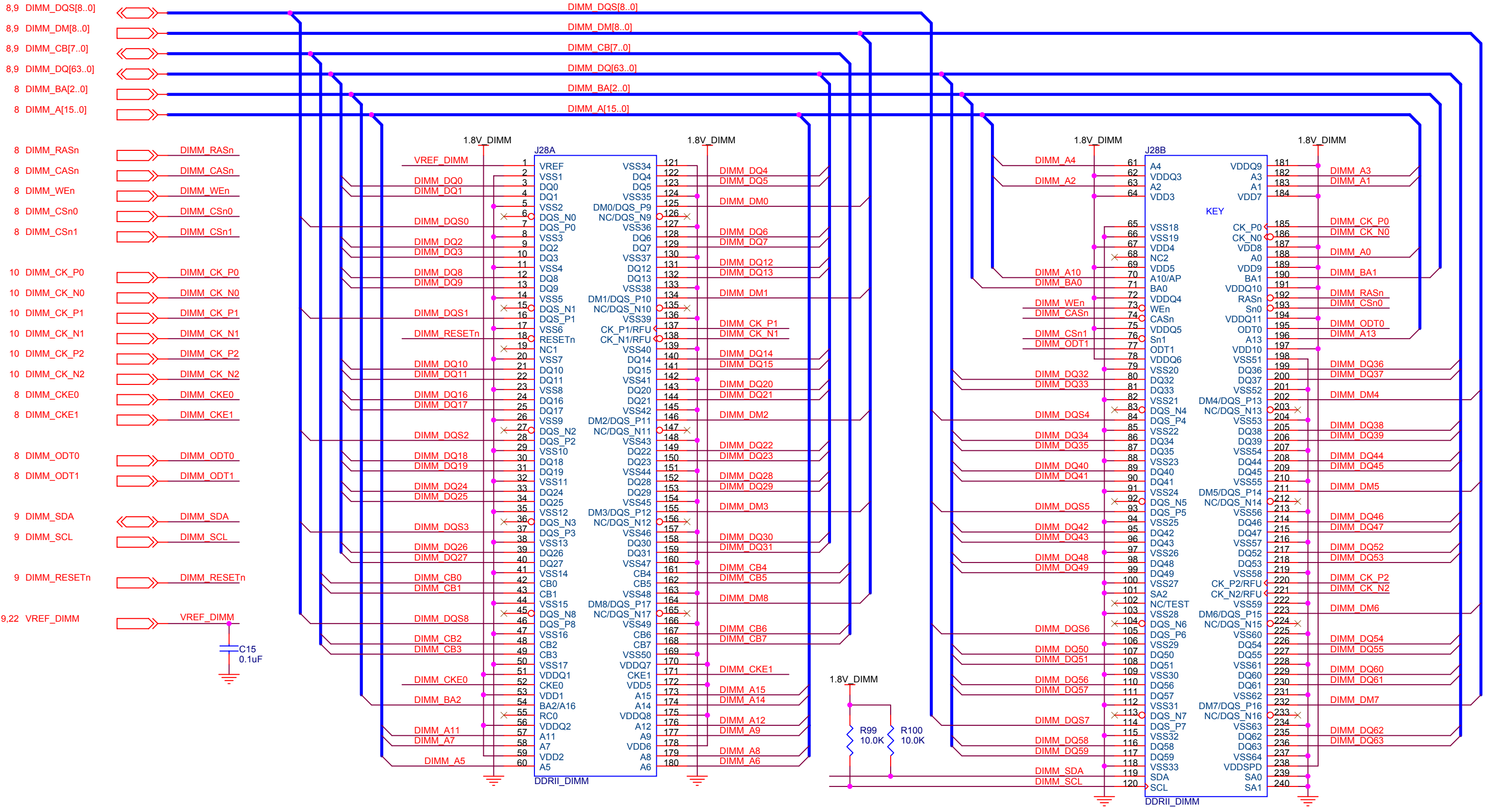


QDR-II Data Y-via Test Points



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Stratix Memory Board II		
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DDR-II SDRAM DIMM

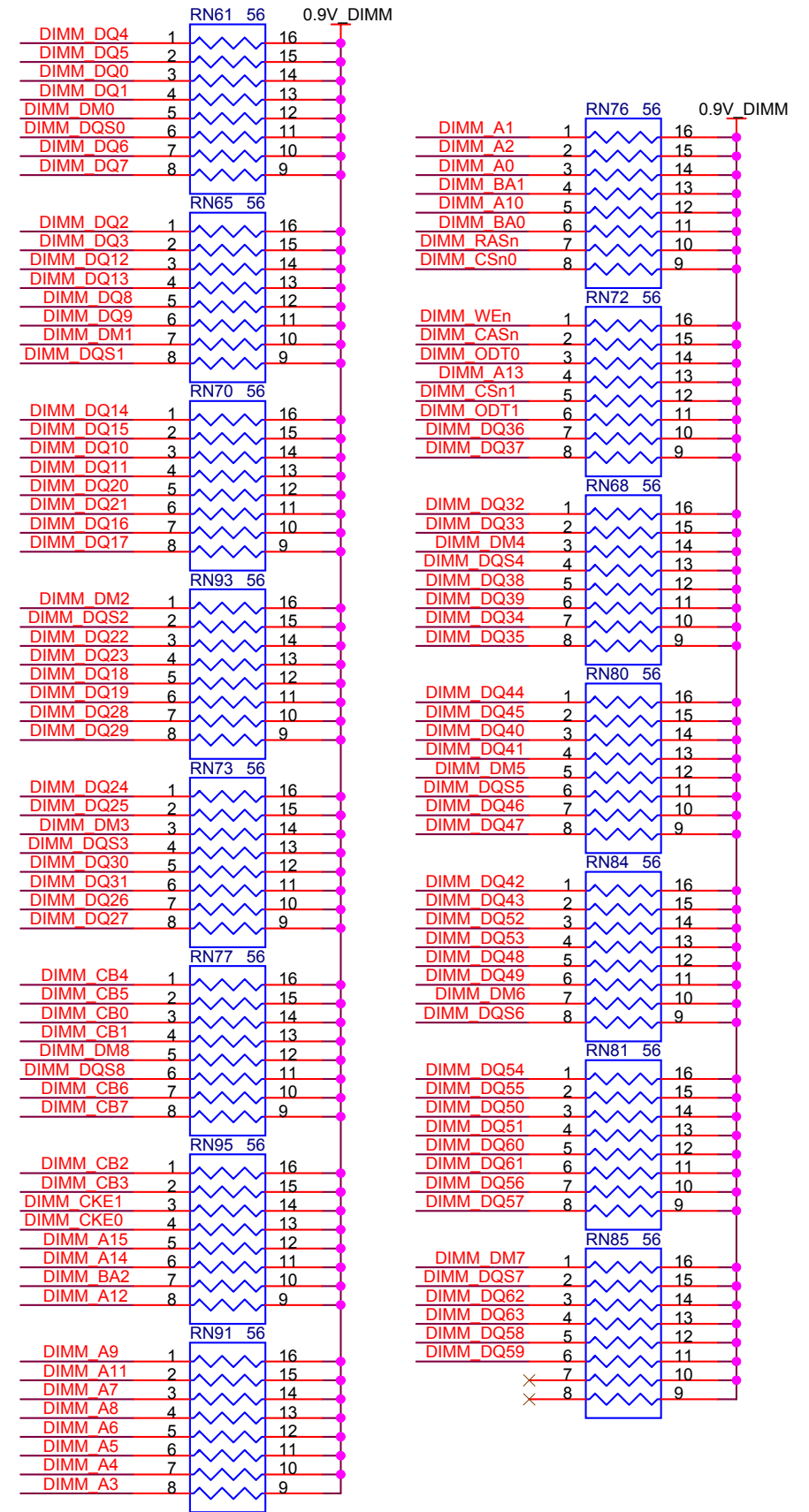
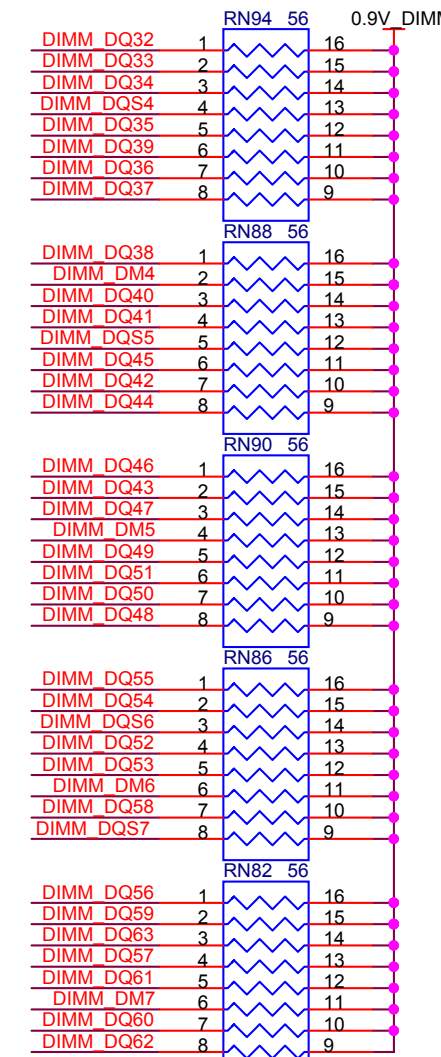
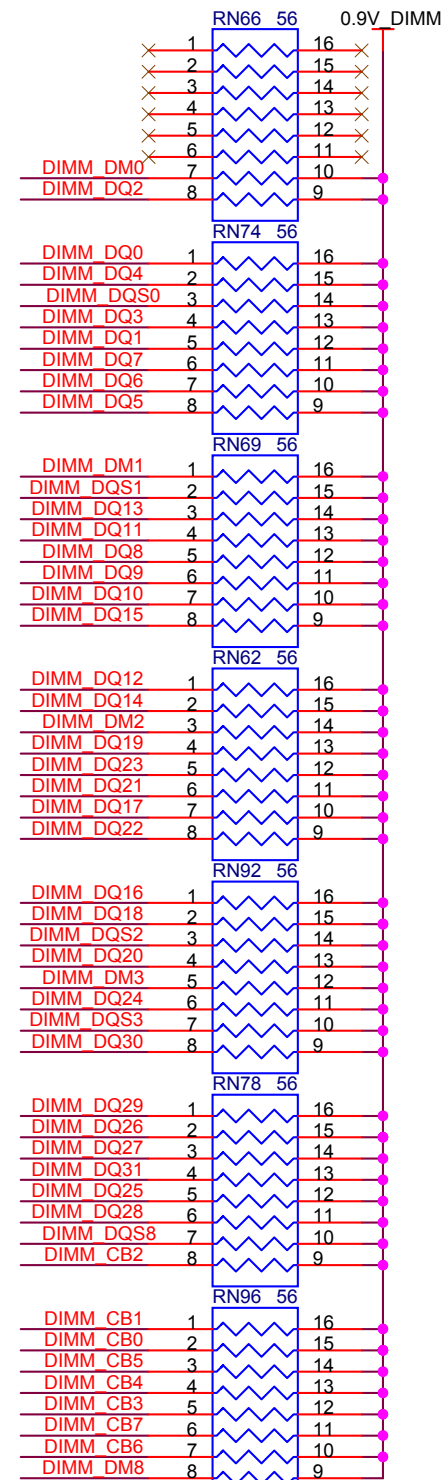
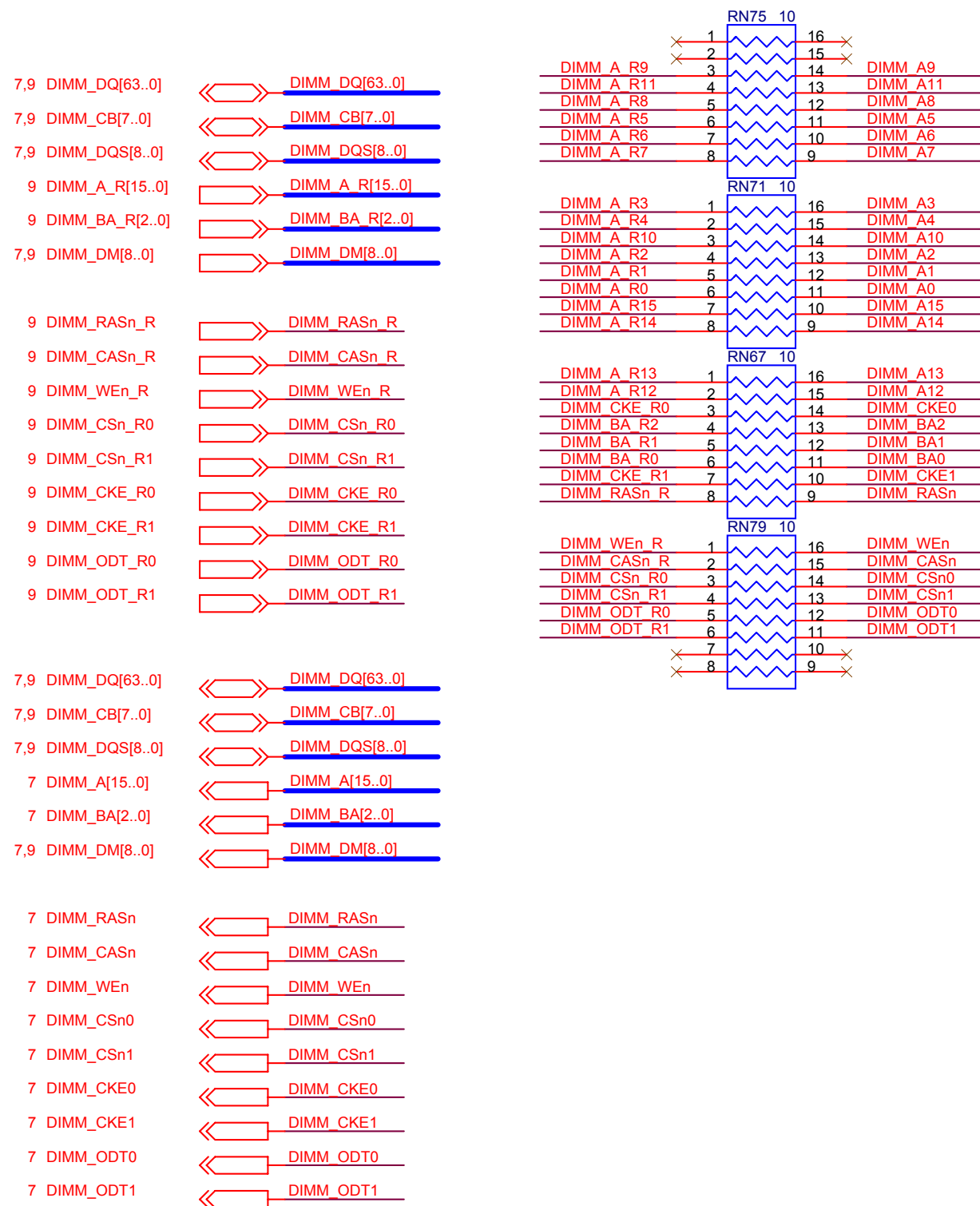


DDR-II SDRAM DIMM Terminations

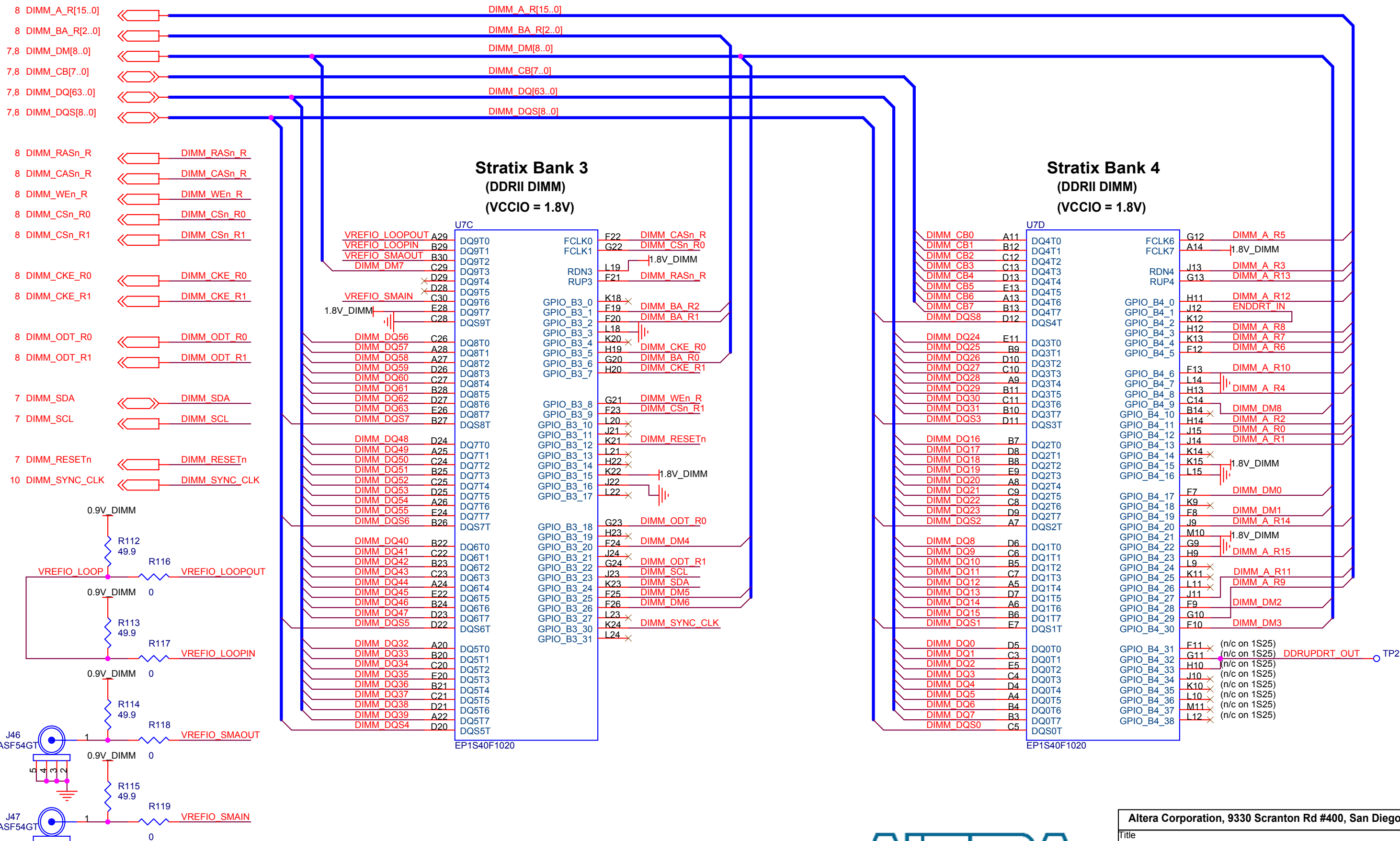
DIMM-Side Termination Resistors

Stratix-Side Termination Resistors

Stratix-Side Termination Resistors

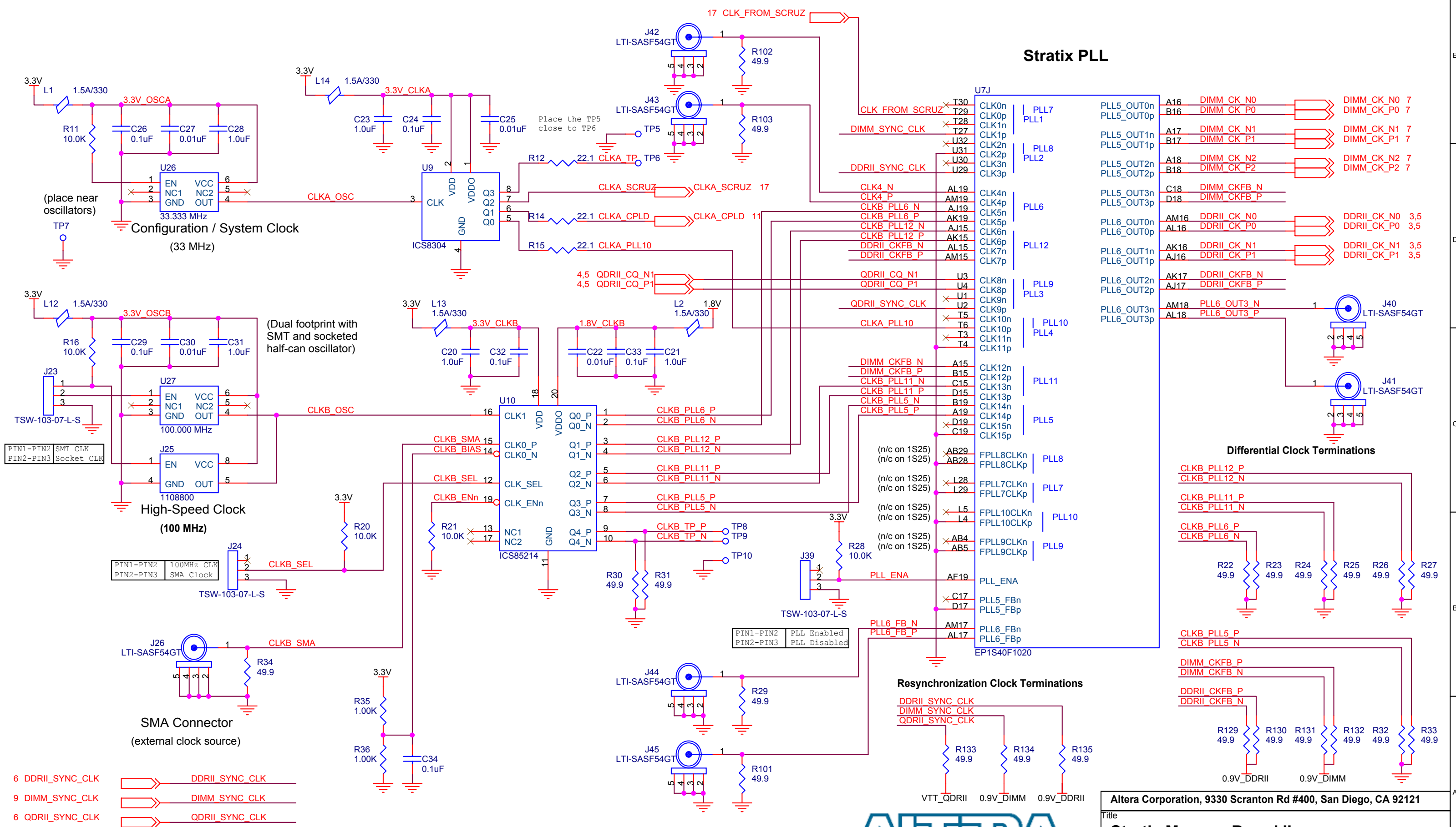


Stratix Bank 3, Bank 4



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Title: Stratix Memory Board II		
Size: B	Document Number: 150-0216200-01	Rev: A
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Stratix Clocks, Oscillators

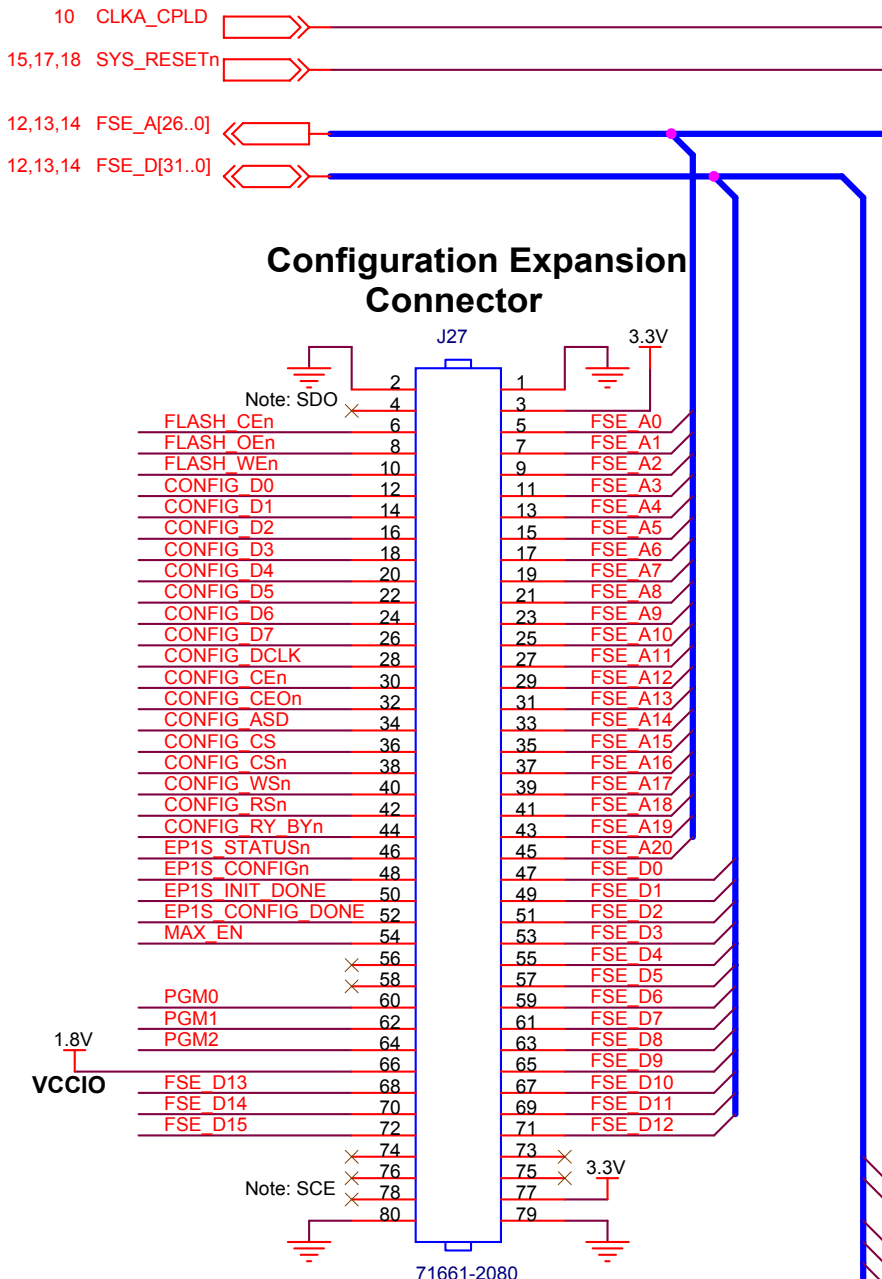


- 6 DDRII_SYNC_CLK → DDRII_SYNC_CLK
- 9 DIMM_SYNC_CLK → DIMM_SYNC_CLK
- 6 QDRII_SYNC_CLK → QDRII_SYNC_CLK

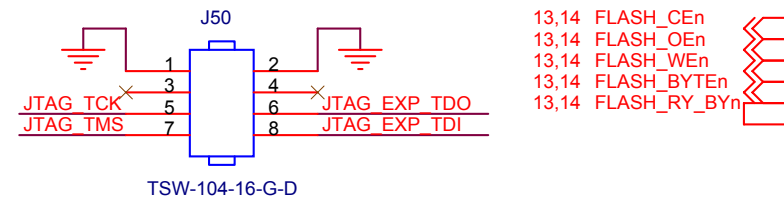


Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
Size	Document Number	Rev
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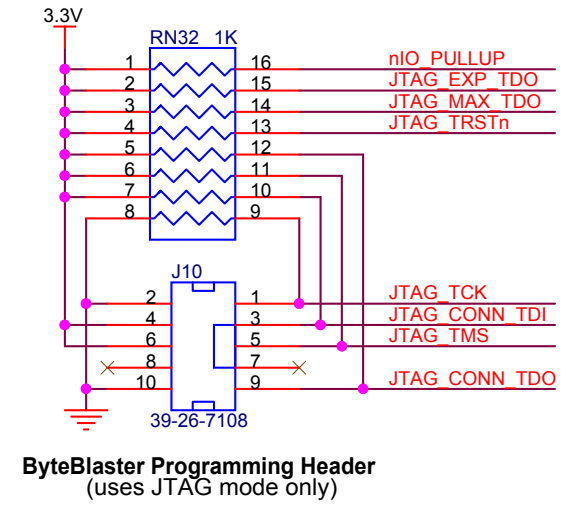
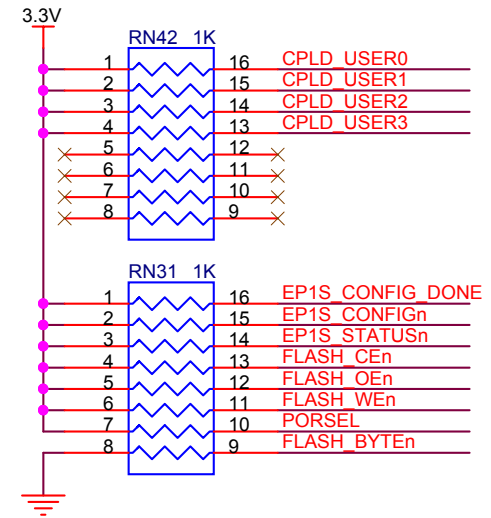
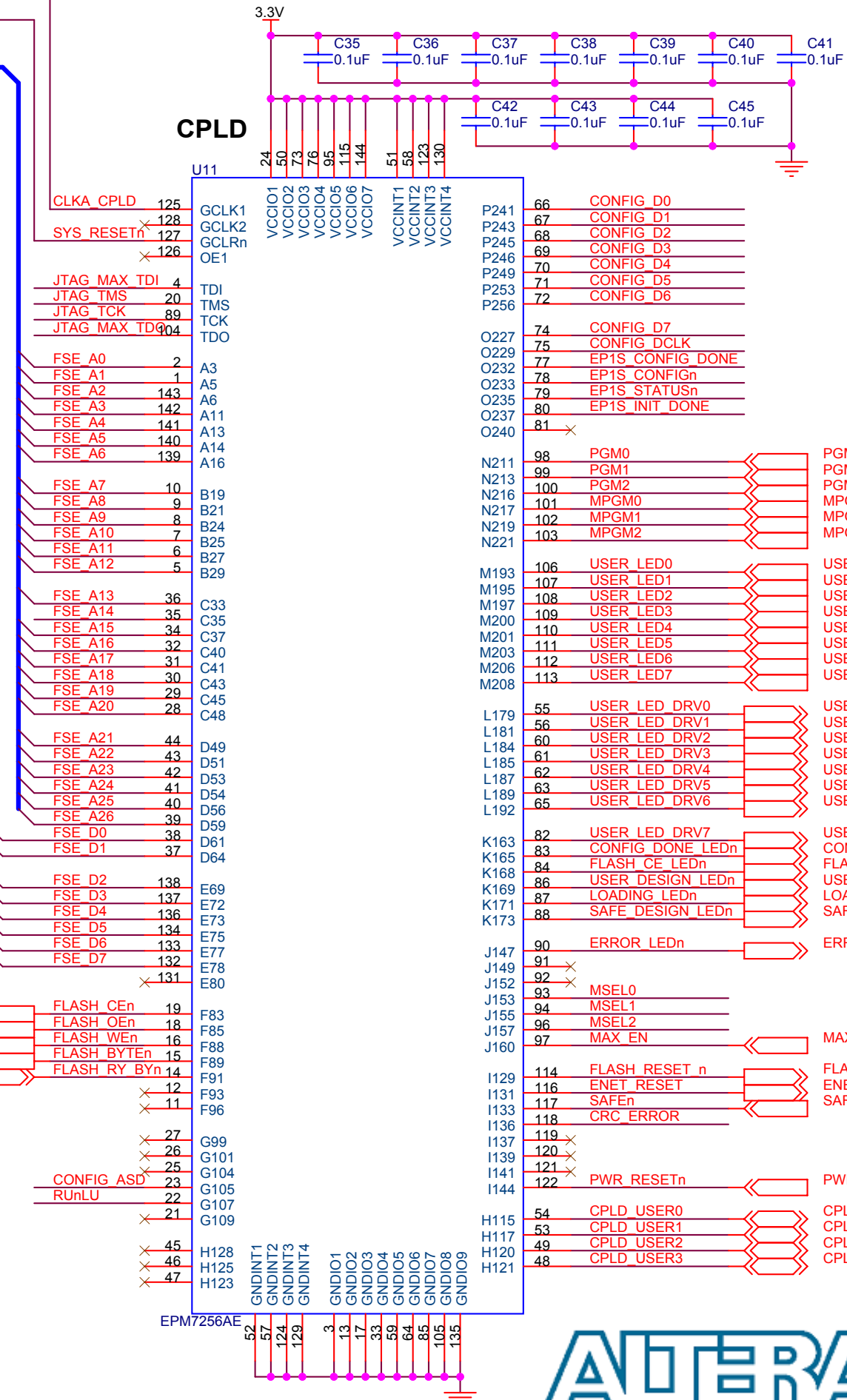
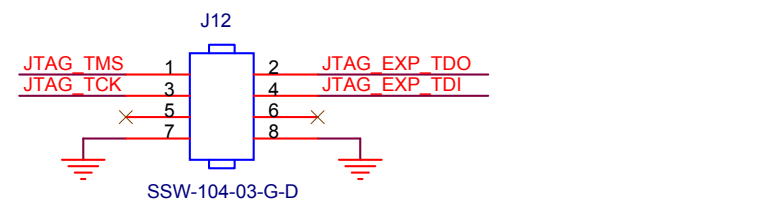
Stratix Configuration, CPLD, JTAG



Configuration Expansion JTAG Master

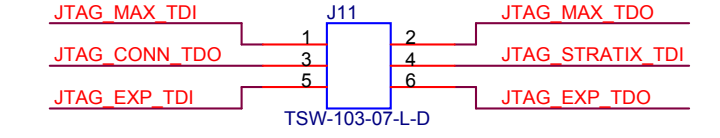


Configuration Expansion JTAG Slave

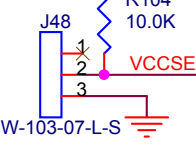
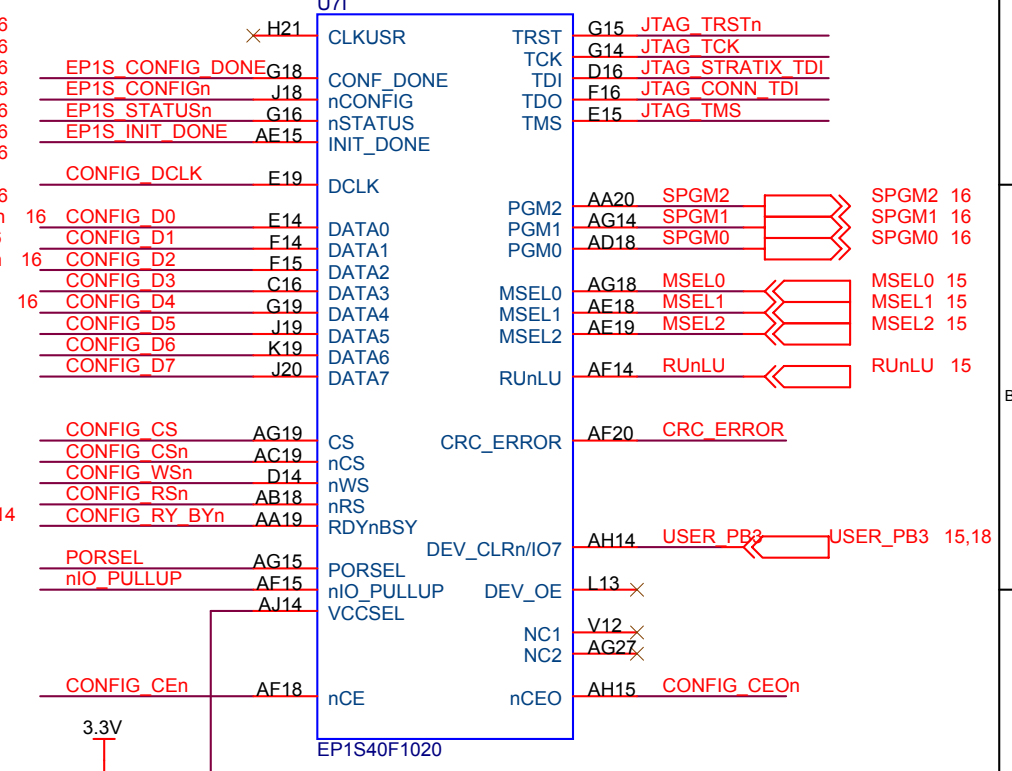


JTAG Bypass Jumpers

DEVICES IN CHAIN	SHUNT ONE	SHUNT TWO
Stratix	PIN3-PIN4	-N/A-
MAX & Stratix	PIN1-PIN3	PIN2-PIN4
EXP & Stratix	PIN3-PIN5	PIN4-PIN6



Stratix Configuration



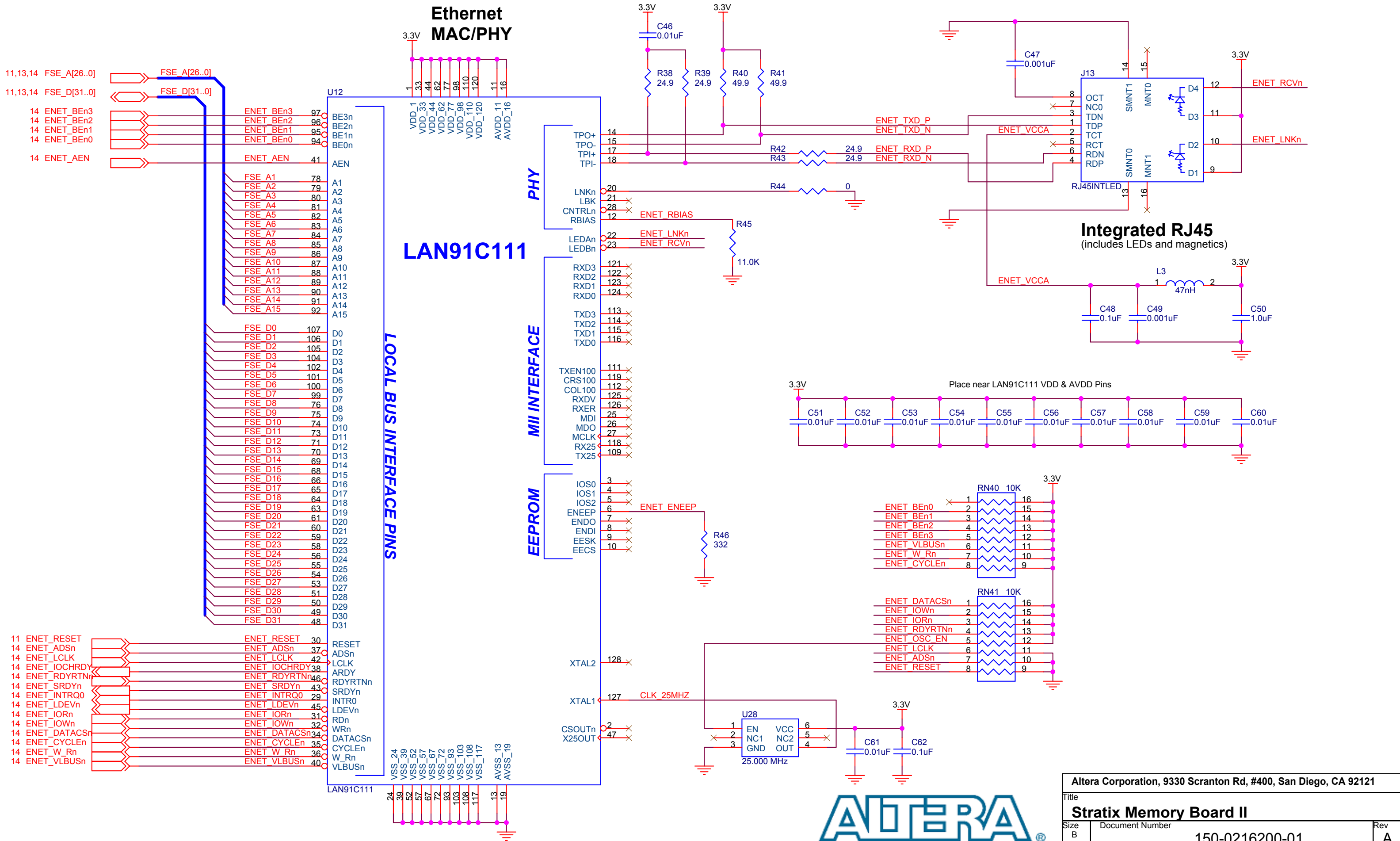
Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121

Title: **Stratix Memory Board II**

Size B | Document Number: 150-0216200-01 | Rev: A

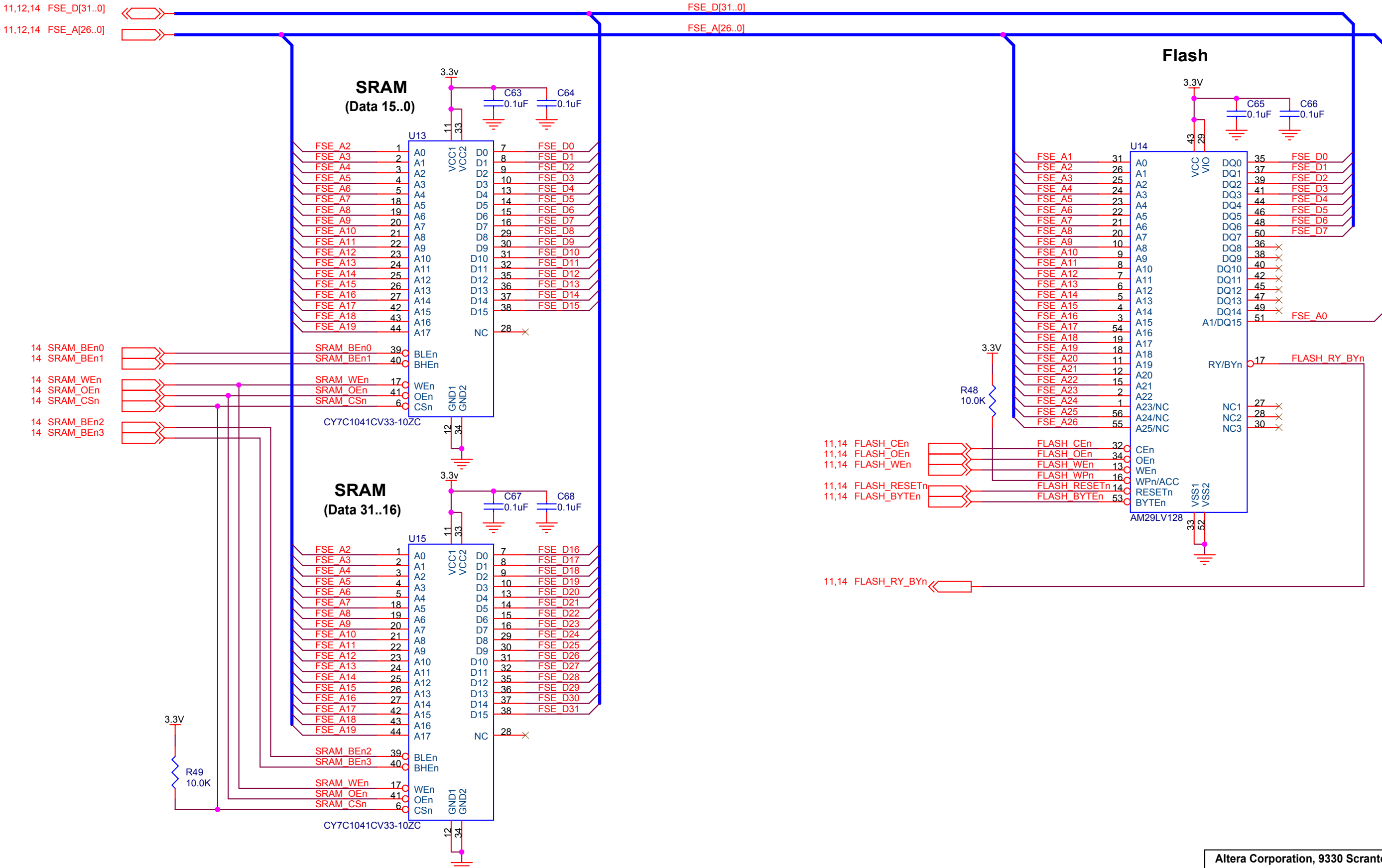
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10/100 Ethernet Interface



Altera Corporation, 9330 Scranton Rd, #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
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SRAM, Flash



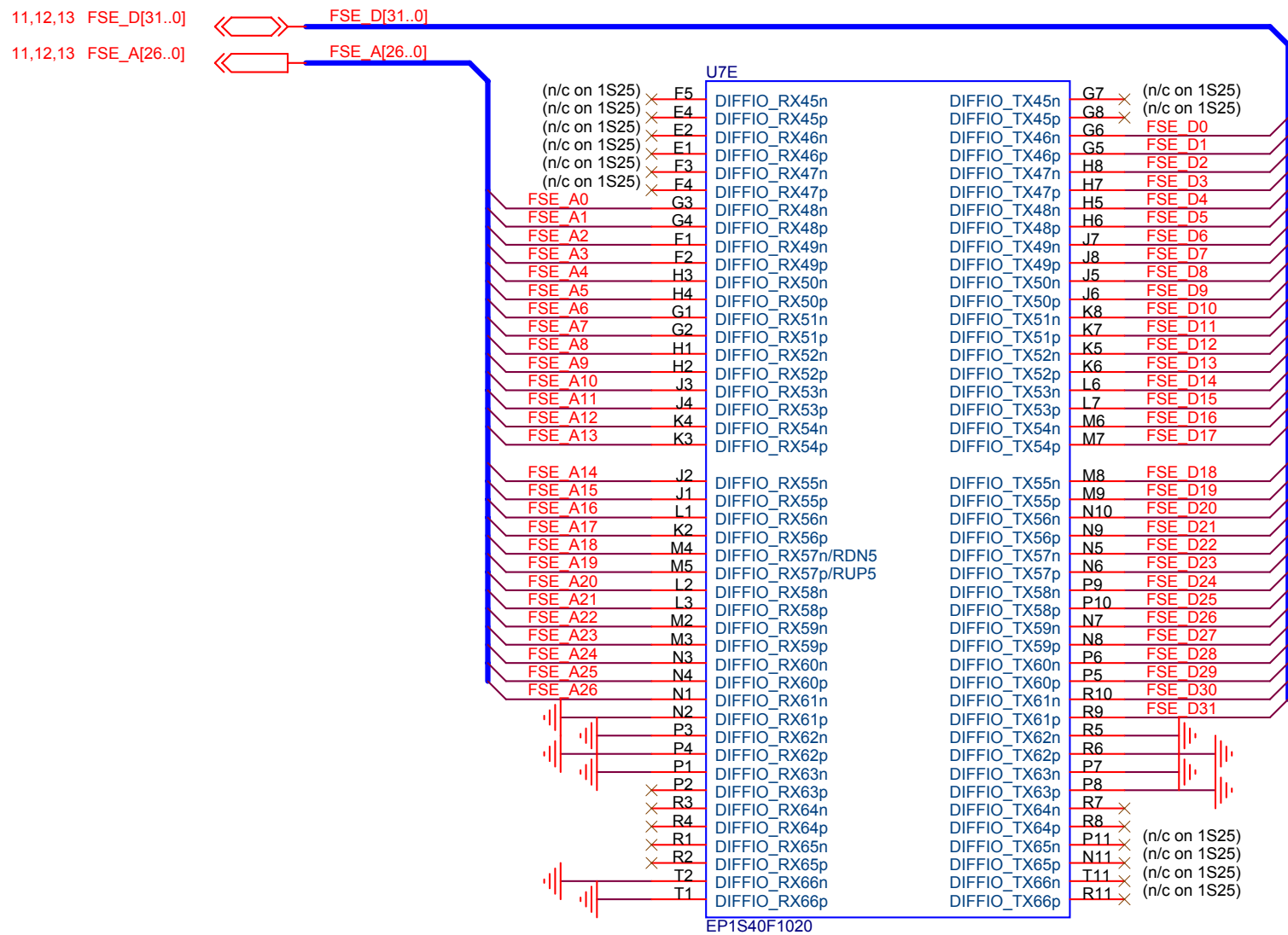
One bank of 256K x 32 SRAM (two 256K x 16 parts in parallel) = 1Mbyte of SRAM



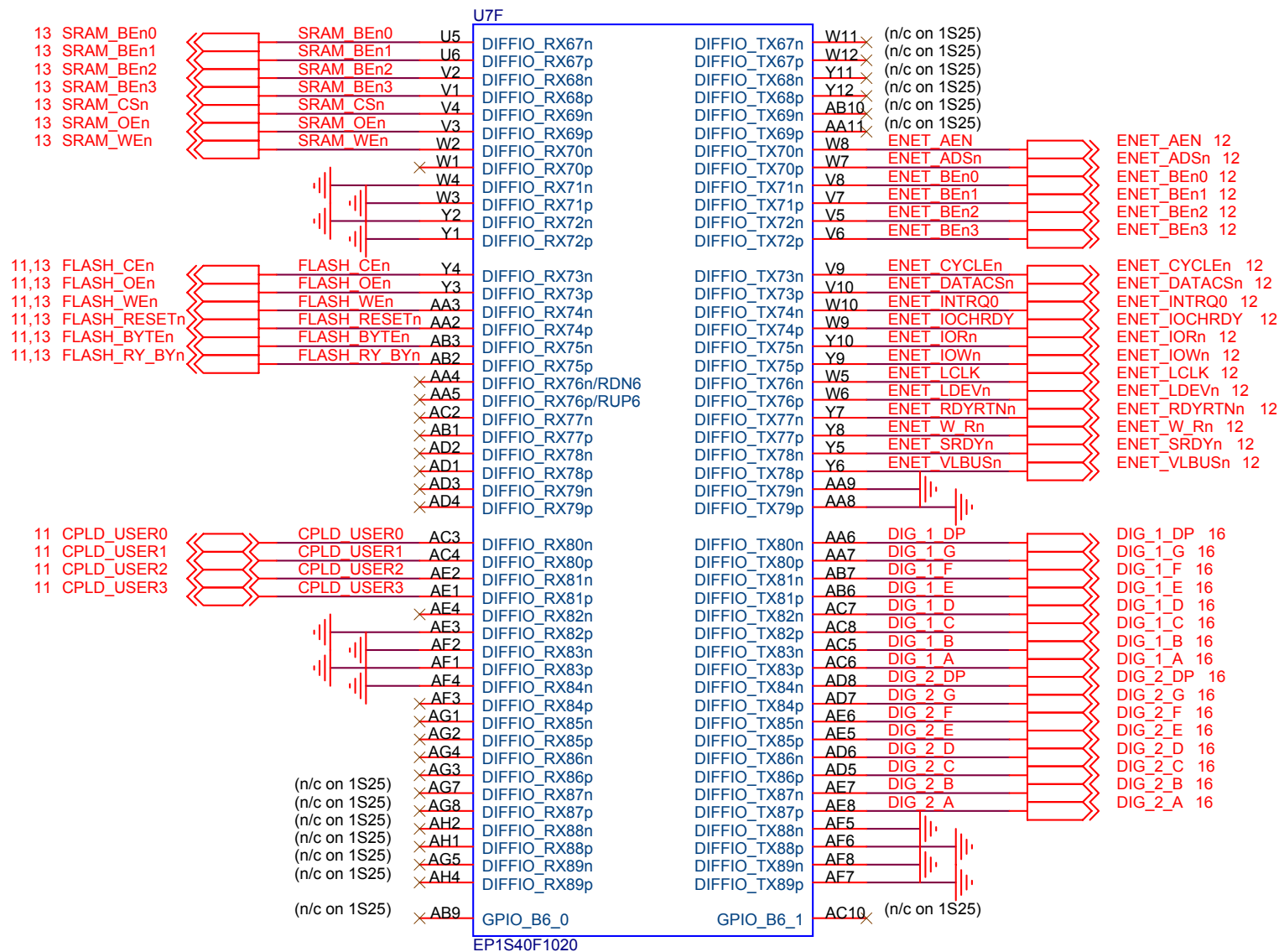
Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
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Stratix Bank 5, Bank 6

Stratix Bank 5
(Shared Bus Address and Data 3.3V LVTTTL)



Stratix Bank 6
(Shared Bus Control 3.3V LVTTTL)

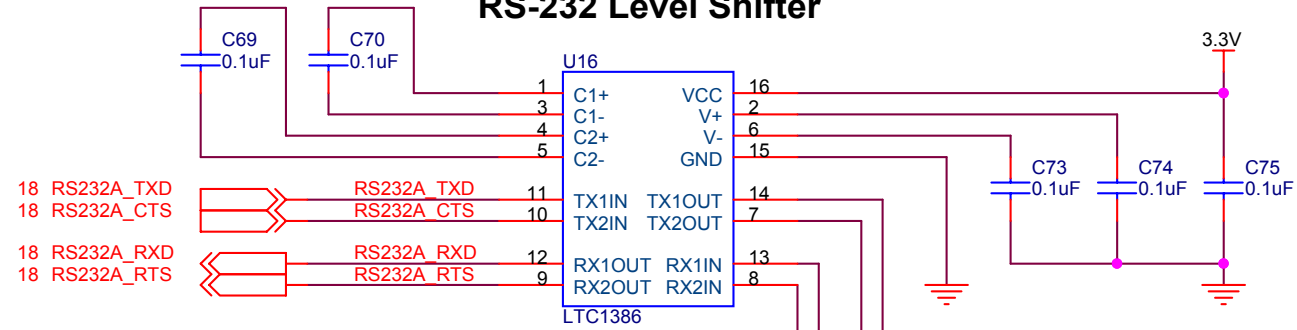


Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
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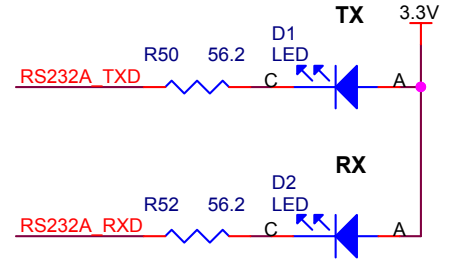


RS-232, Buttons, Switches

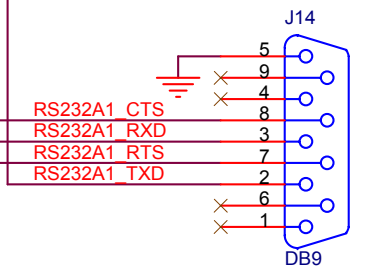
RS-232 Level Shifter



RS-232 CH A Activity LEDs

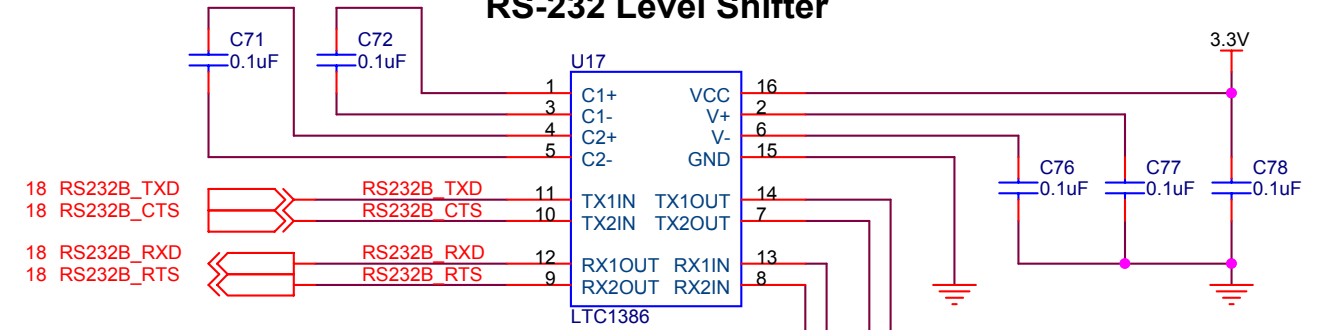


FEMALE RS232 CONNECTOR

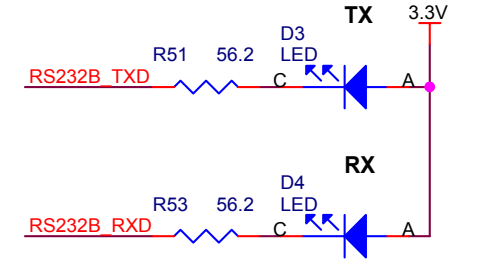


Channel A

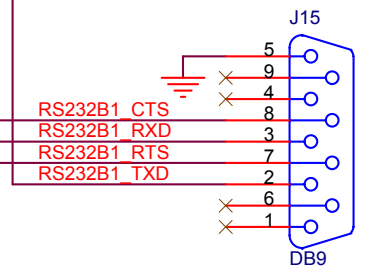
RS-232 Level Shifter



RS-232 CH B Activity LEDs

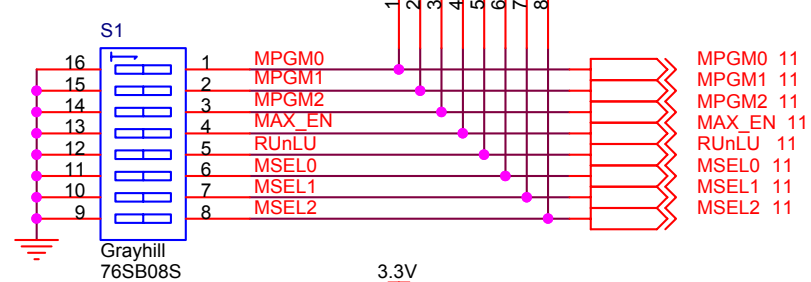


FEMALE RS232 CONNECTOR

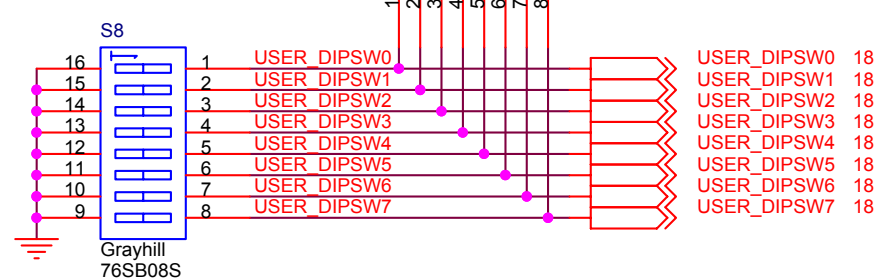


Channel B

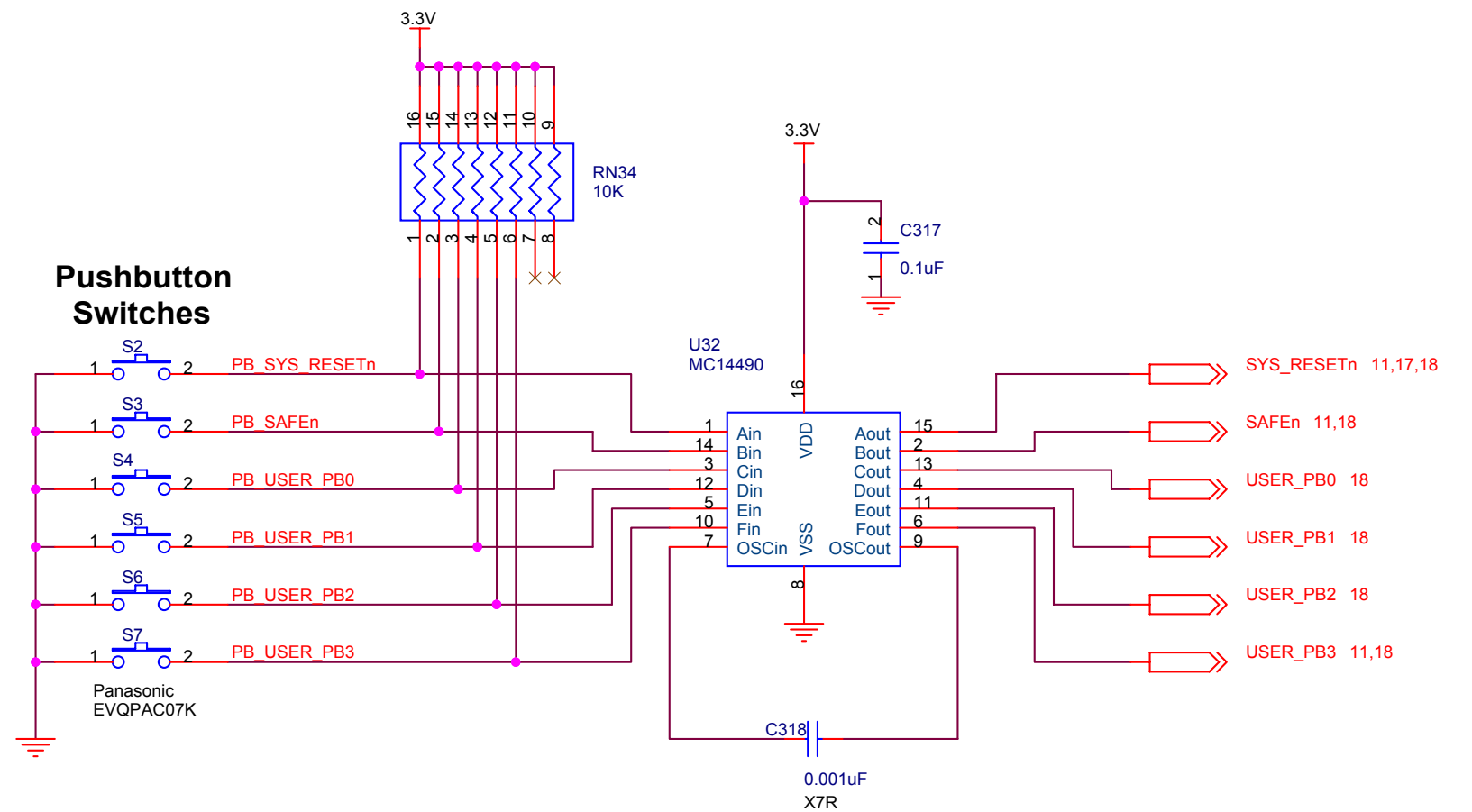
Board Setting DIP Switches



User DIP Switches



Pushbutton Switches

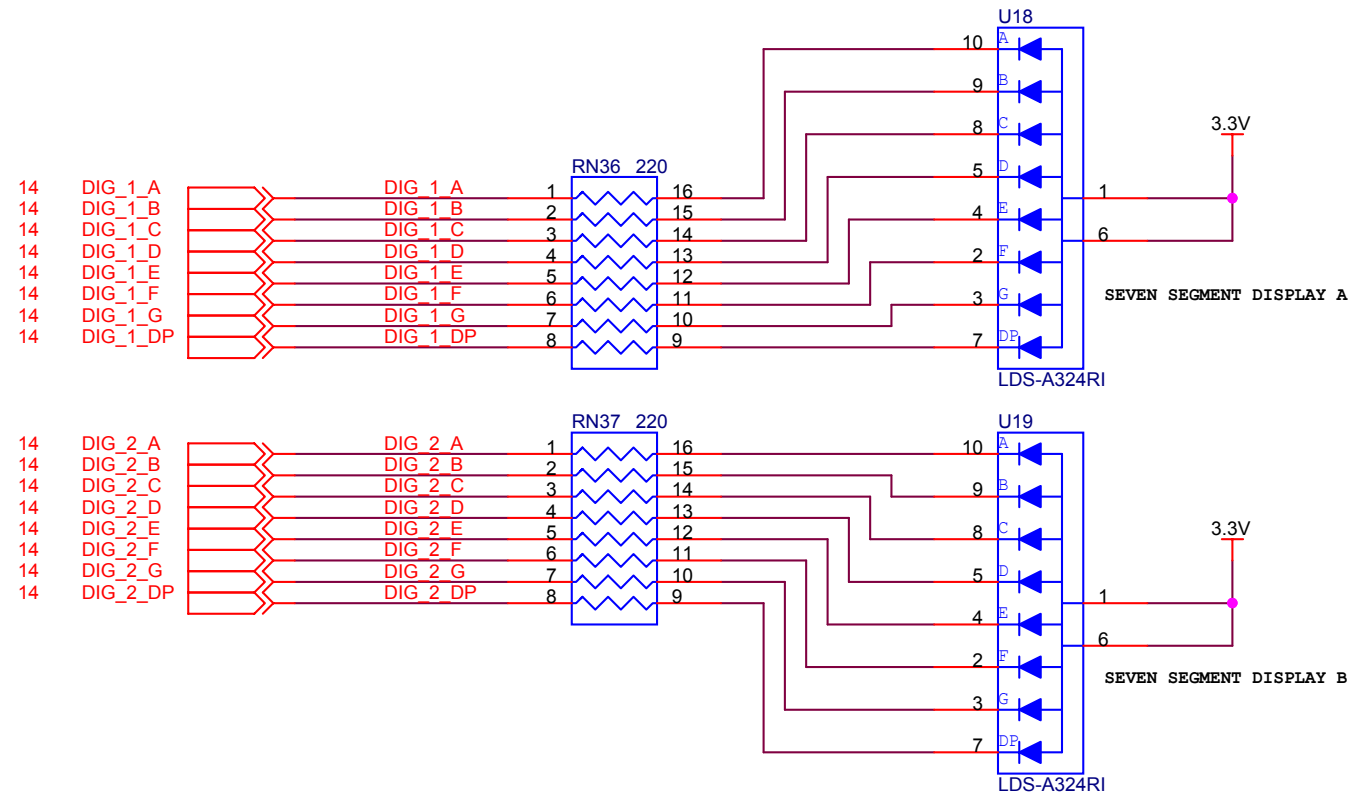


Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
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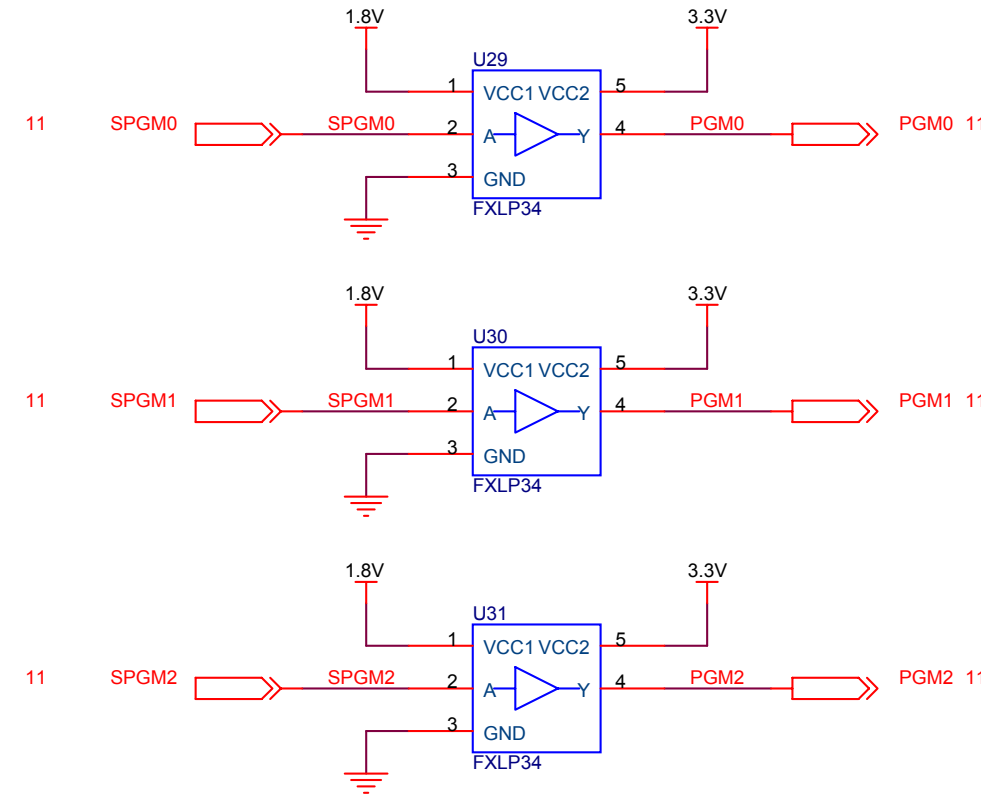


7-Segment Displays & LEDS

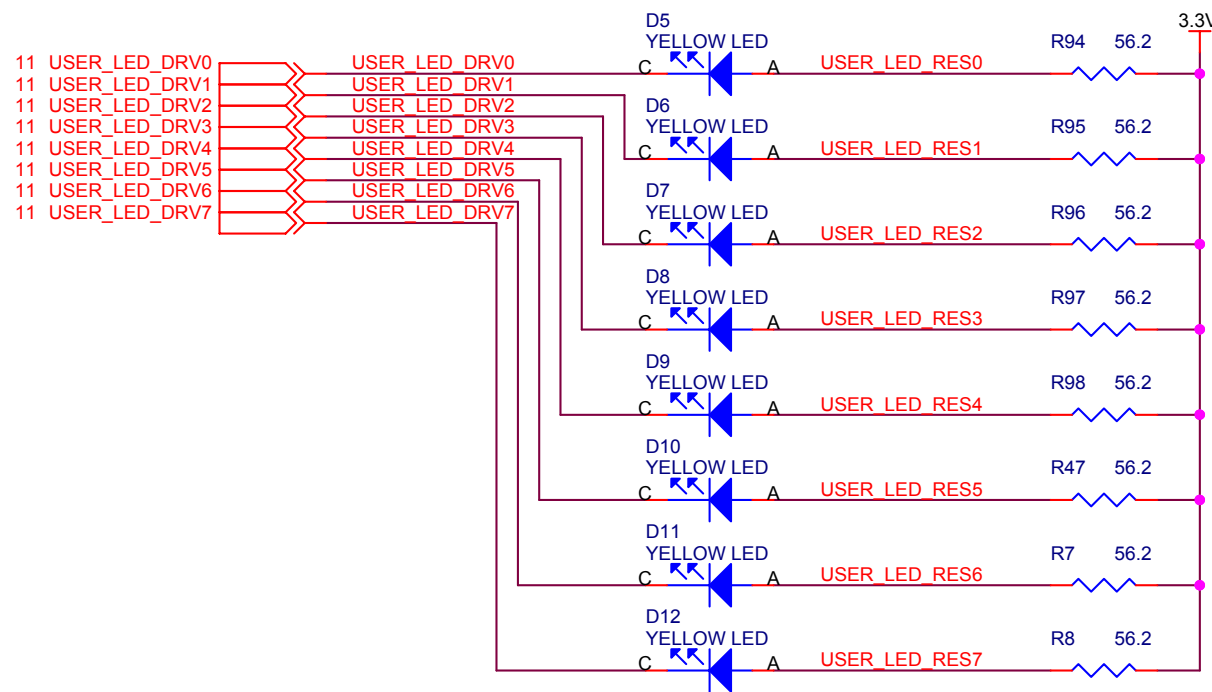
7-Segment Displays



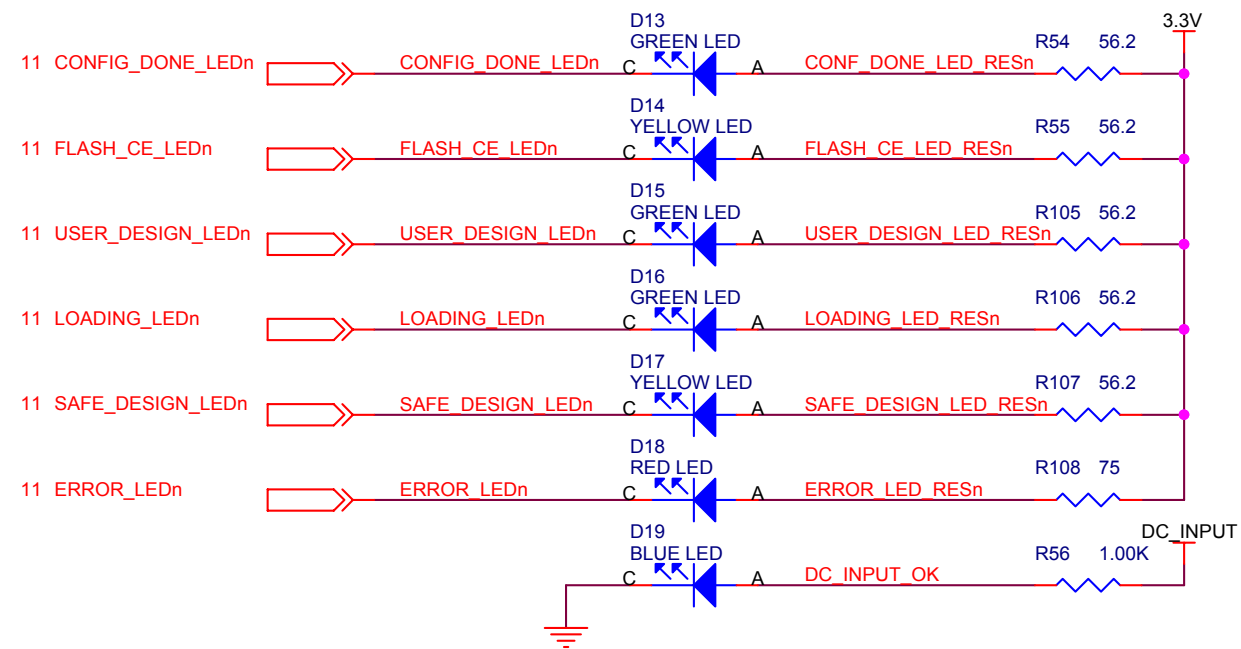
1.8V to 3.3V Translators



User LEDs

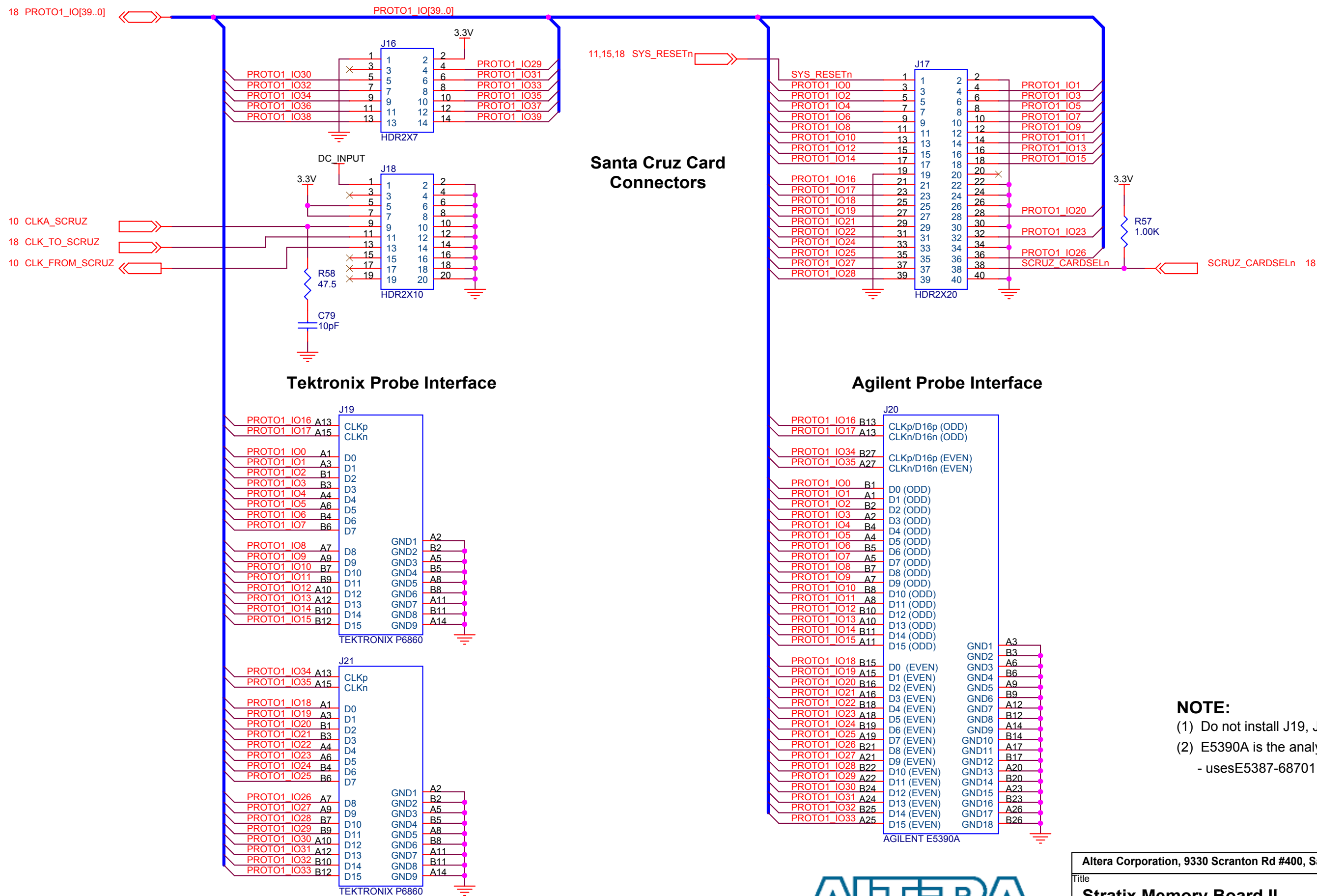


Power & Config LEDs



Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
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Santa Cruz Card, Debug Connectors



NOTE:
 (1) Do not install J19, J20, J21
 (2) E5390A is the analyzer probe
 - uses E5387-68701 retention module

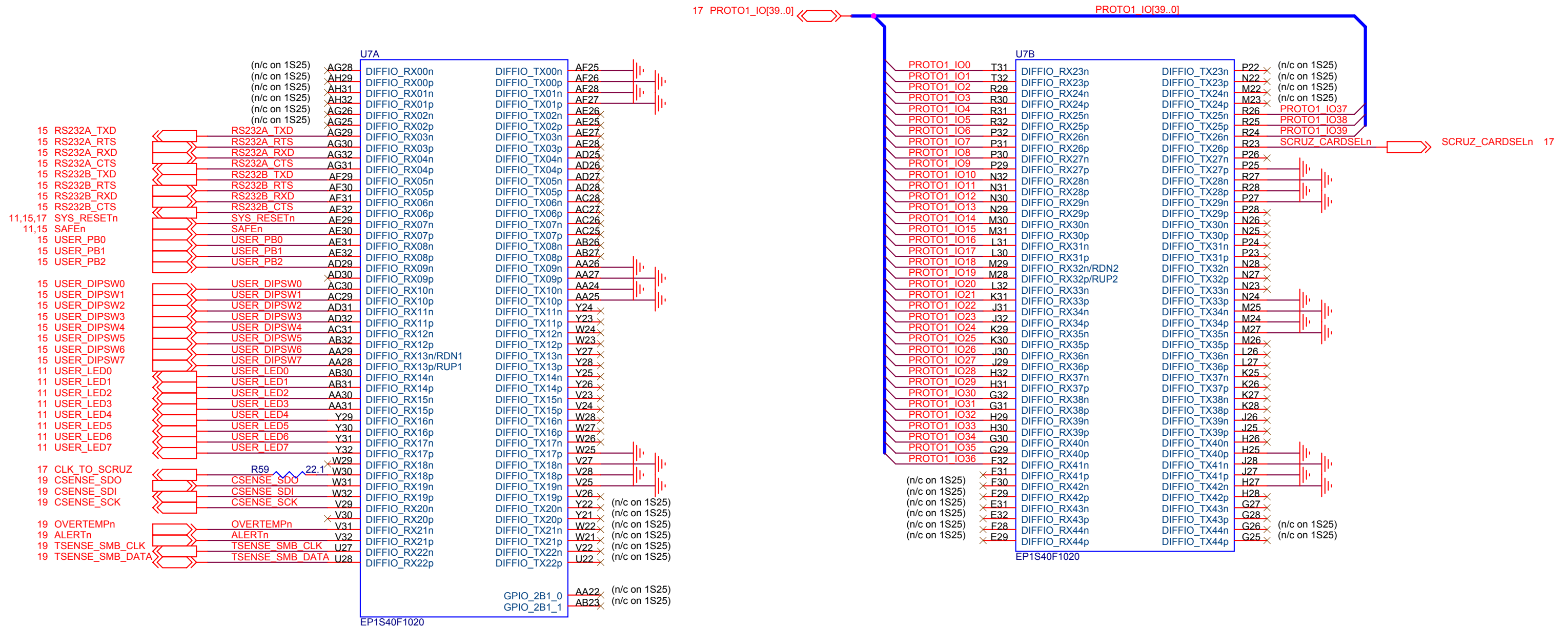


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Title Stratix Memory Board II		
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Stratix Bank 1, Bank 2

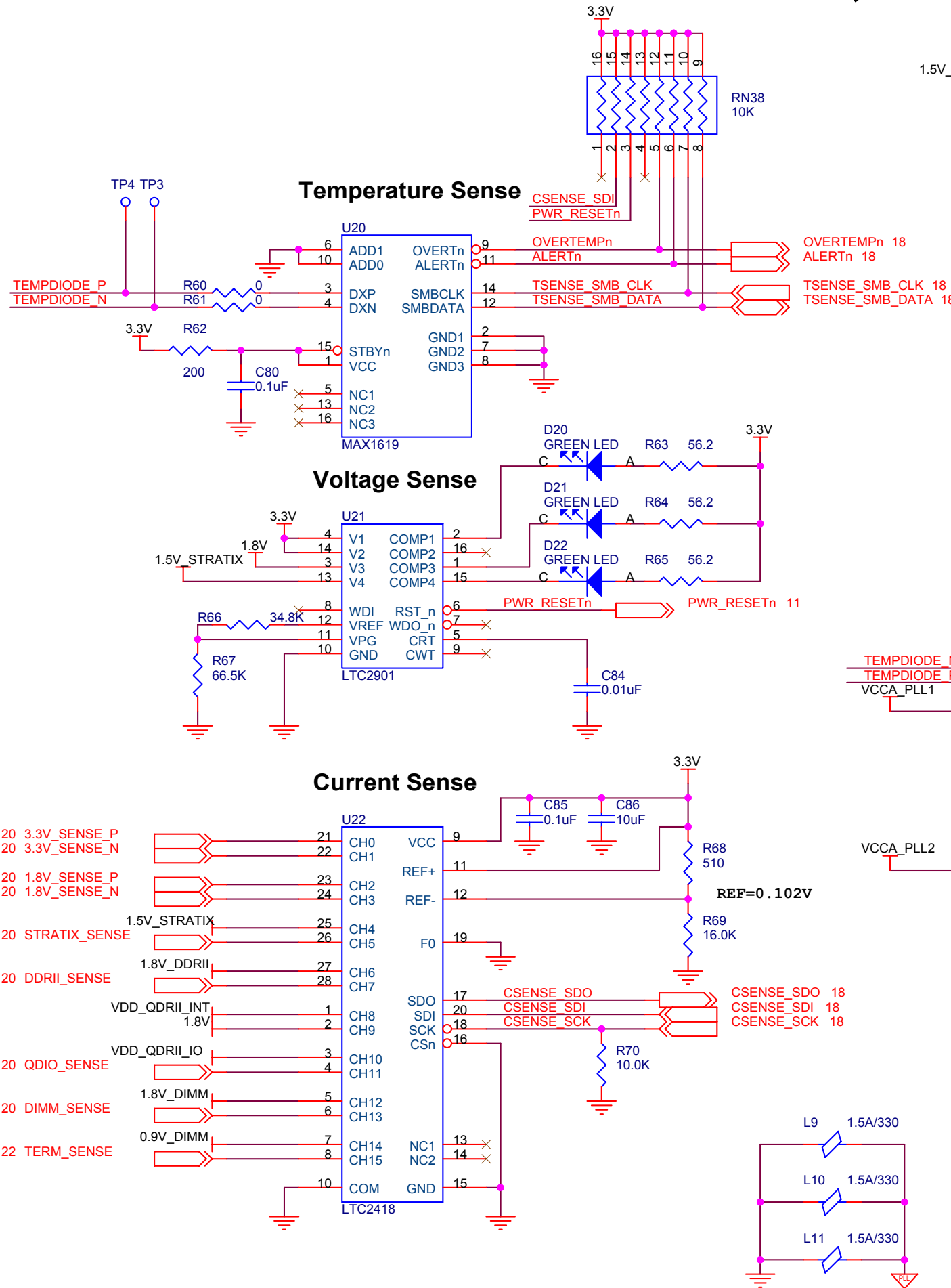
Stratix Bank 1
(RS-232, Pushbuttons, Switches, LEDs 3.3V LVTTTL)

Stratix Bank 2
(PROTO1 Bus 3.3V LVTTTL)

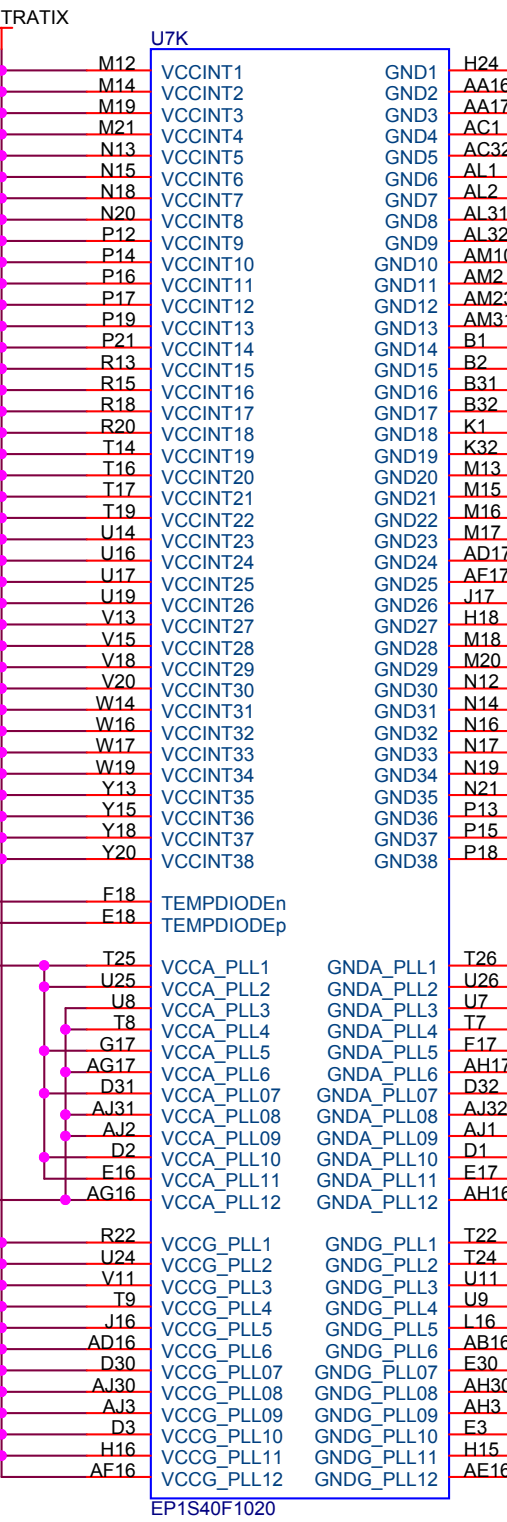


Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
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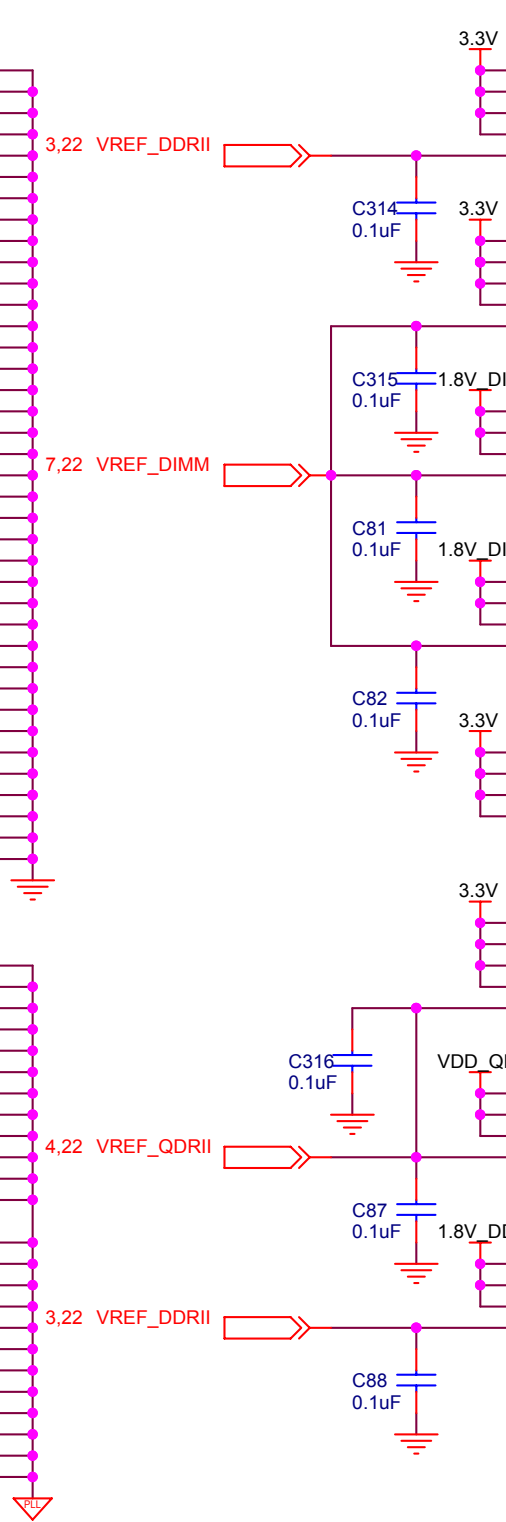
Stratix Power, Temp, Voltage, Current Sense



Stratix Internal Power



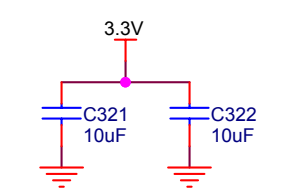
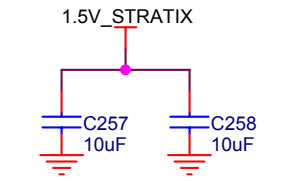
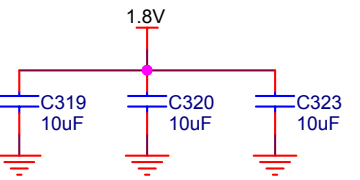
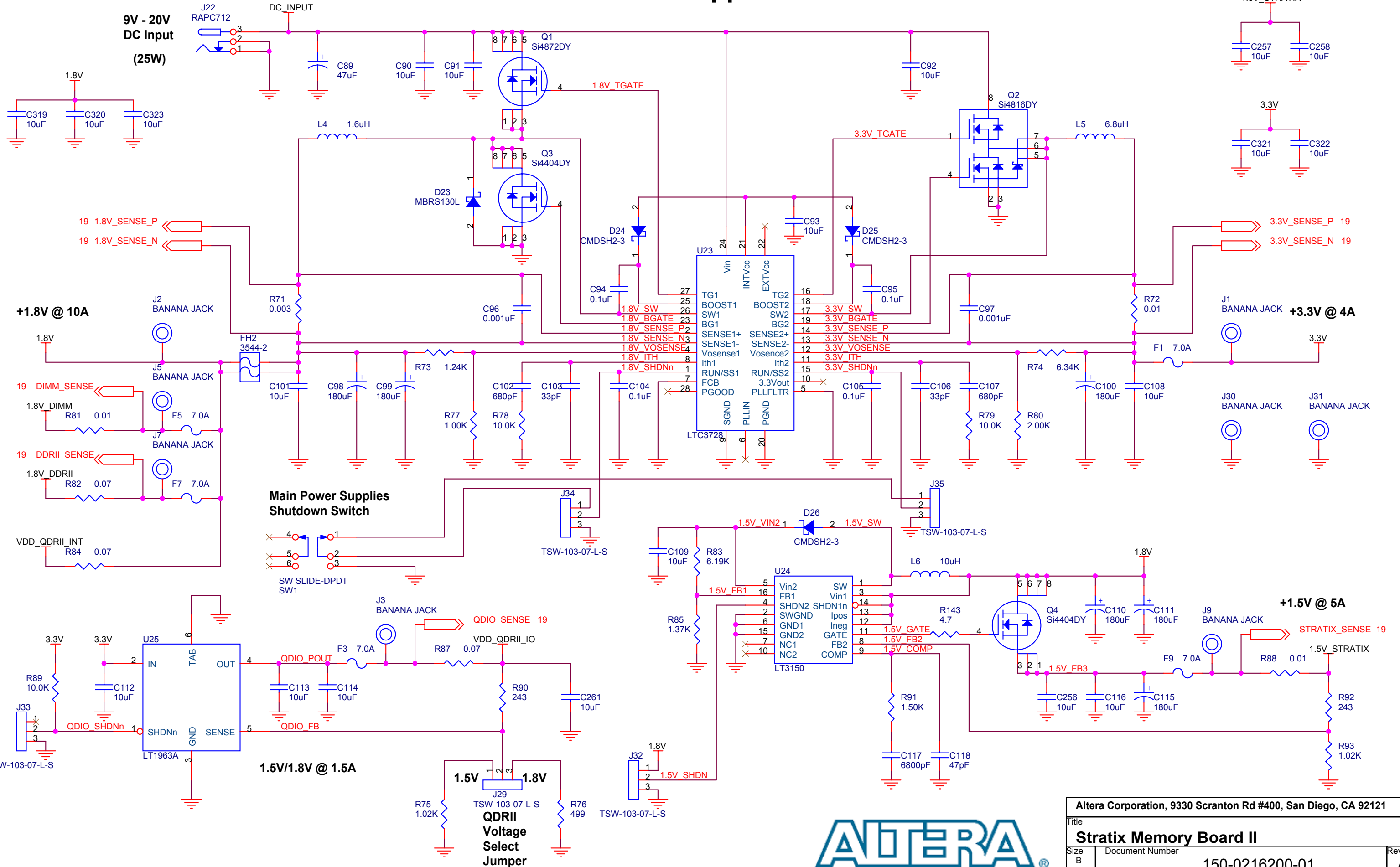
Stratix IO Power



Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
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Power Supplies

9V - 20V
DC Input
(25W)



+1.8V @ 10A

+3.3V @ 4A

+1.5V @ 5A

Main Power Supplies
Shutdown Switch

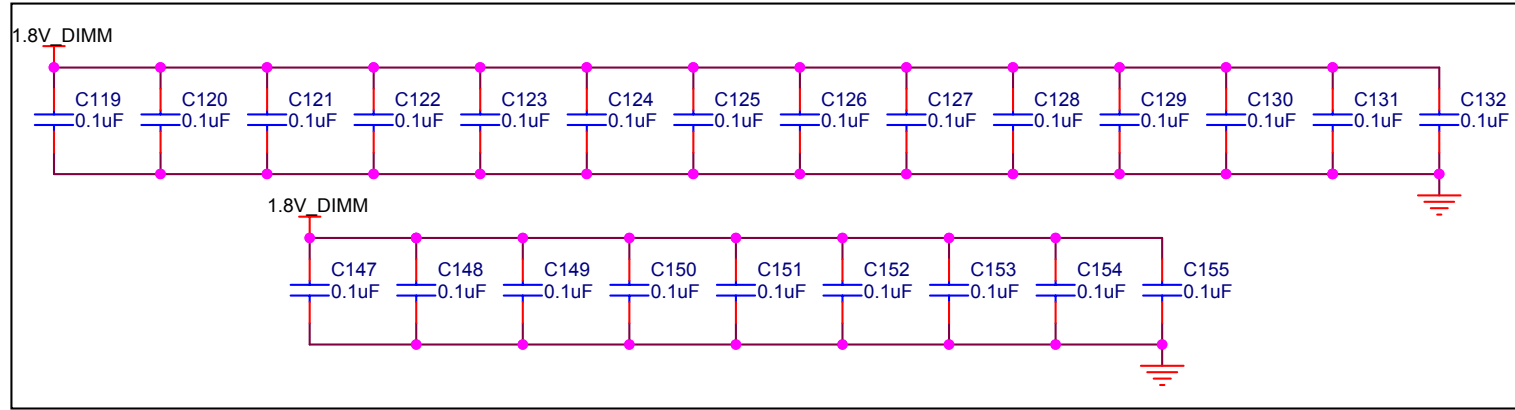
QDRII
Voltage
Select
Jumper



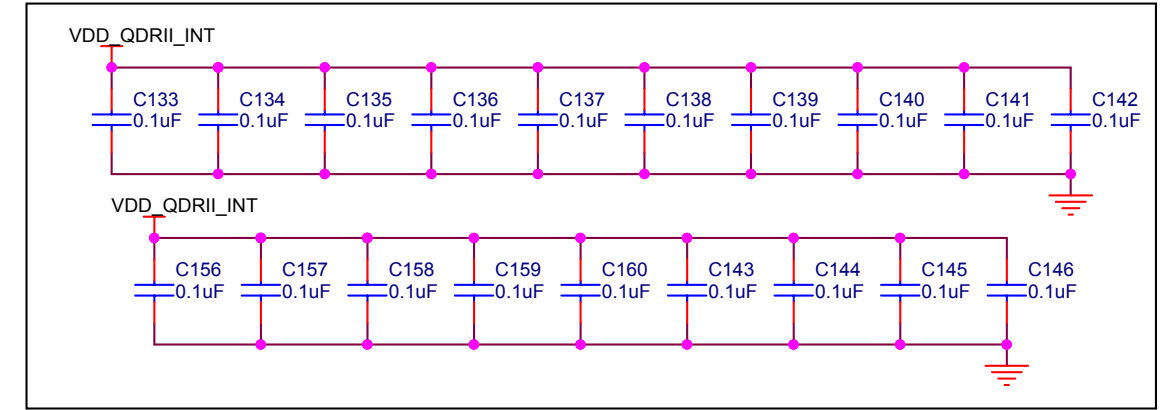
Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title Stratix Memory Board II		
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Memory Decoupling

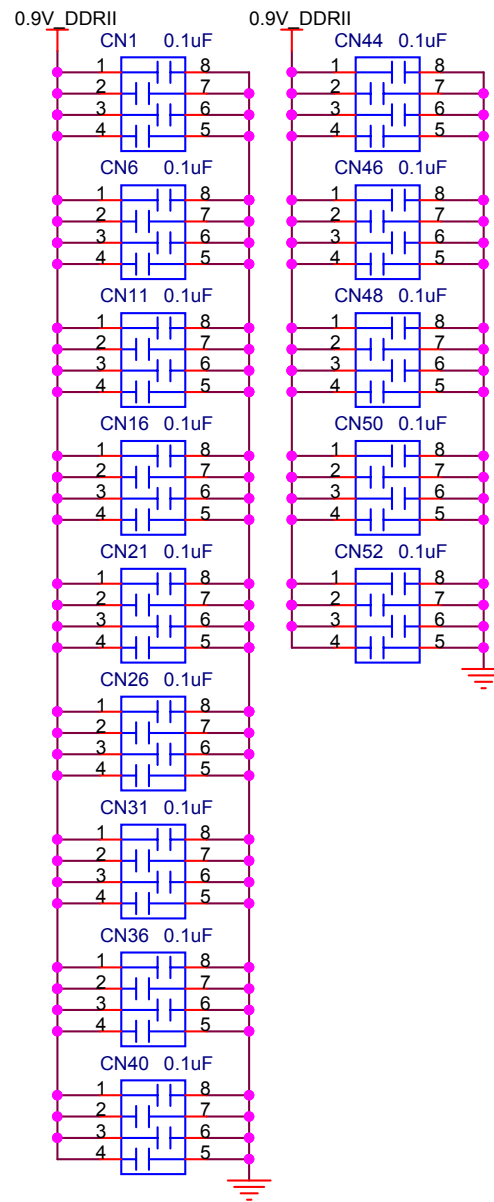
DIMM VDD & VDDQ



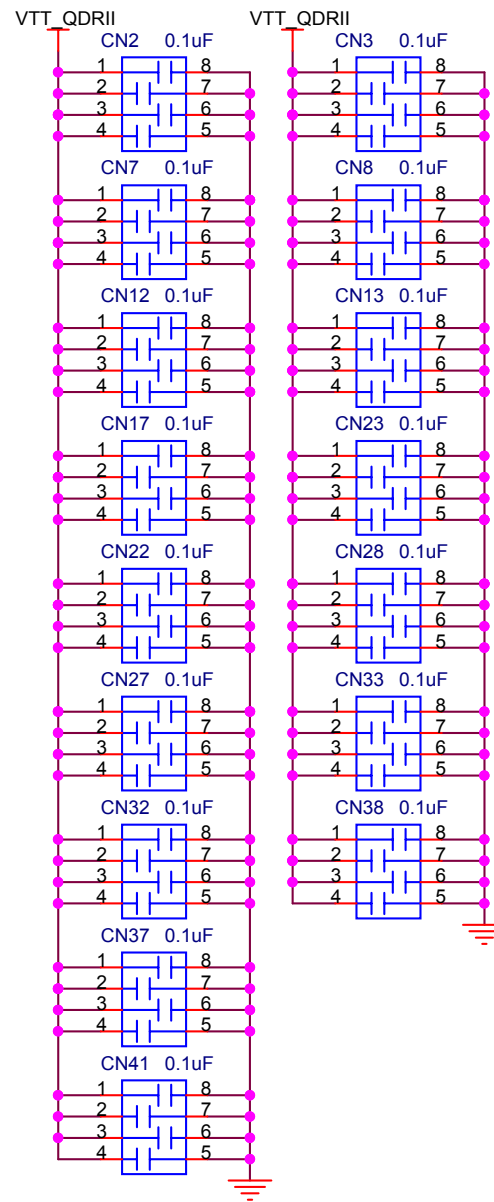
QDRII INT



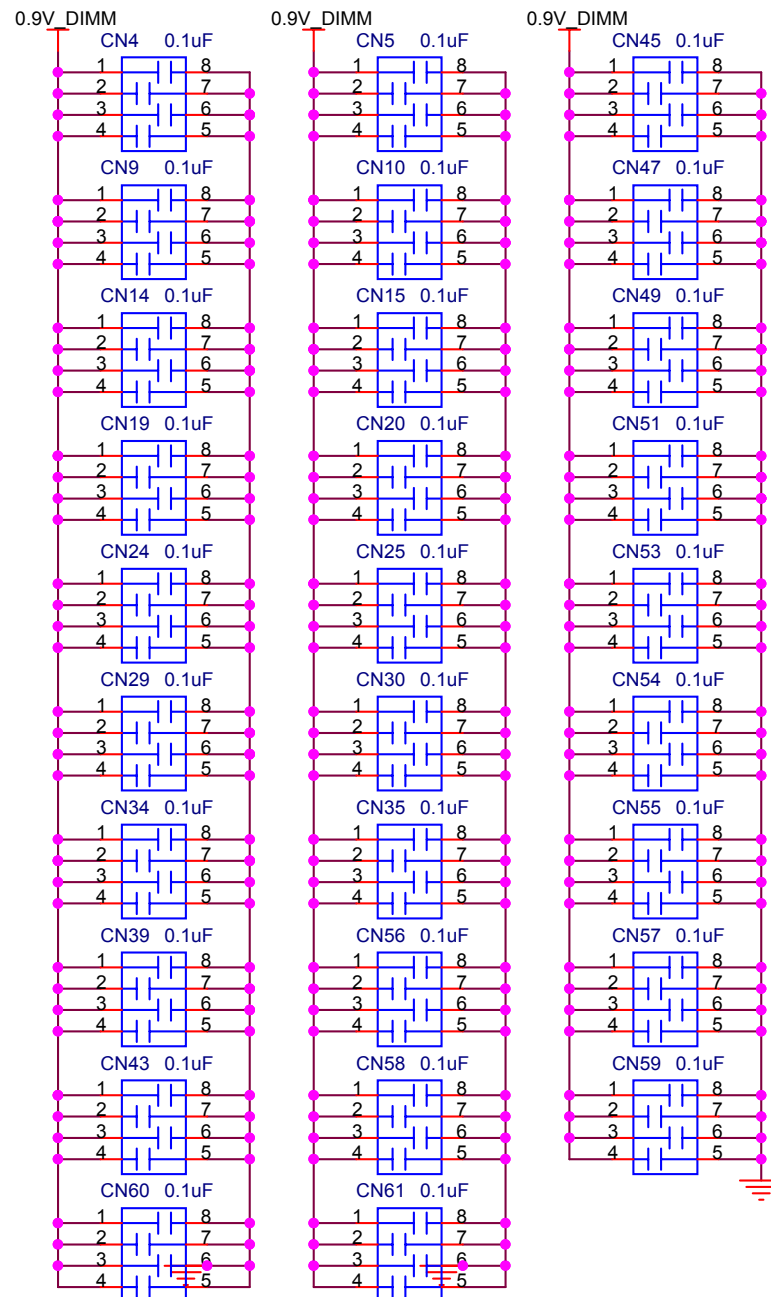
DDRII Terminations



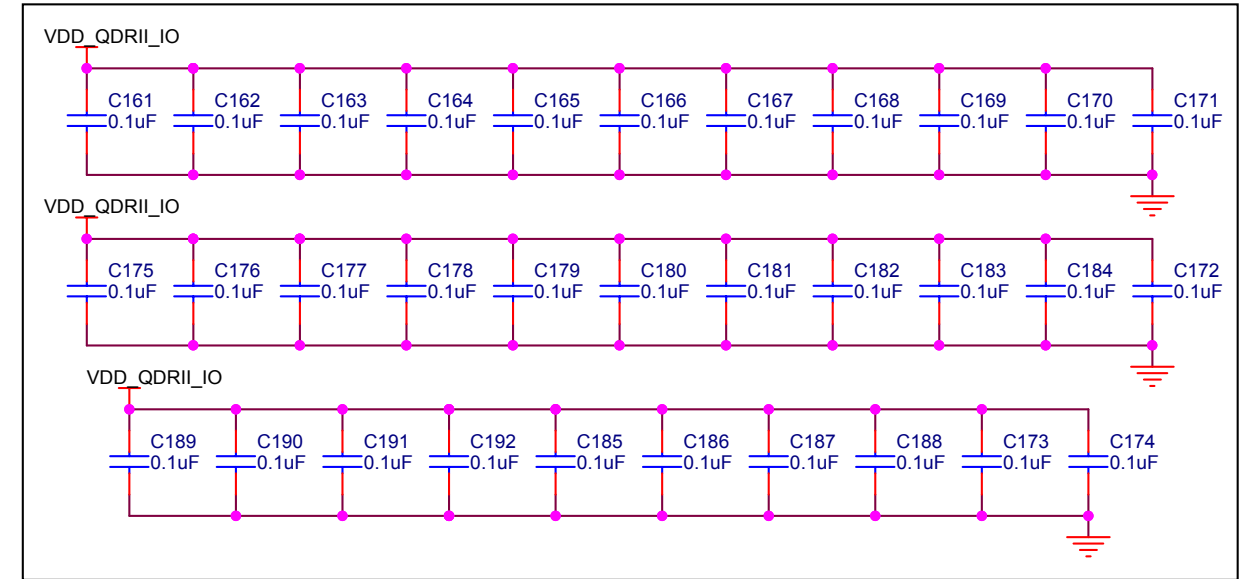
QDRII Terminations



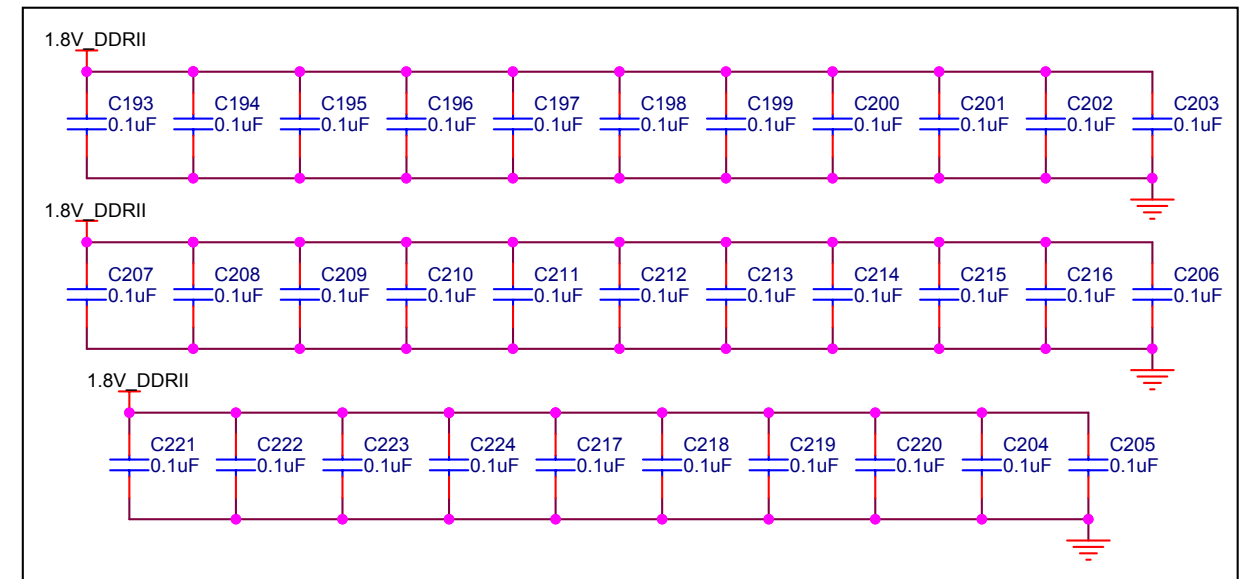
DIMM Terminations



QDRII IO



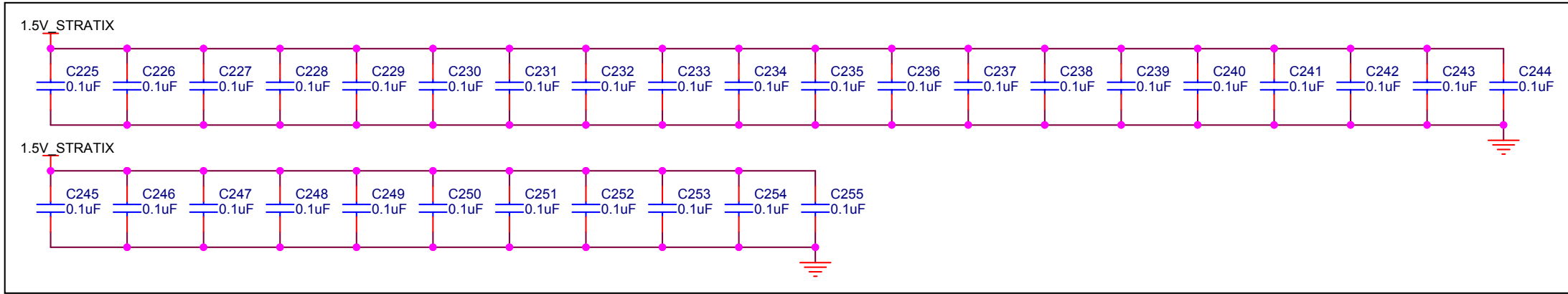
DDRII_VDD & VDDQ



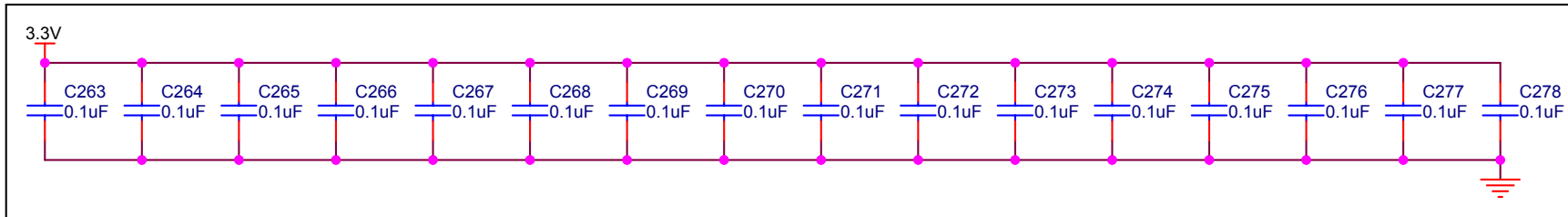
Altera Corporation, 9330 Scranton Rd #400, San Diego, CA 92121		
Title		
Stratix Memory Board II		
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Stratix Decoupling, VTT Regulators

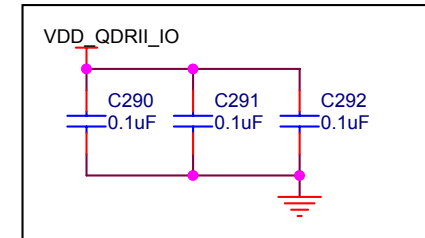
Stratix VCCINT



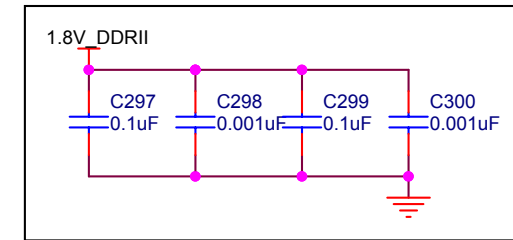
Stratix VCCIO Banks 1, 2, 5, 6



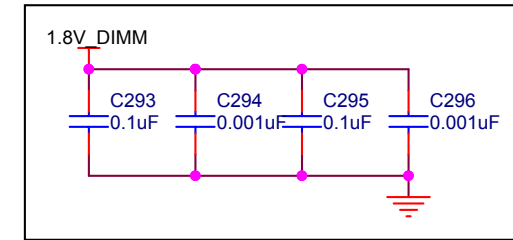
Stratix VCCIO Bank 8



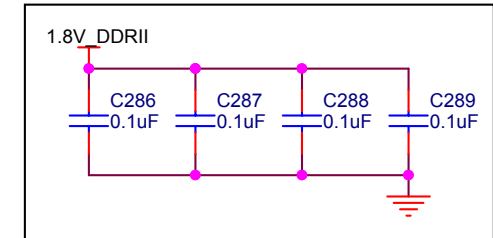
Stratix VCC PLL6 OUT A, B



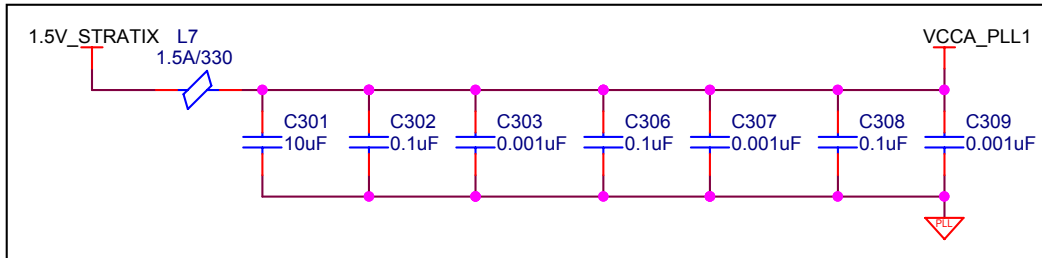
Stratix VCC PLL5 OUT A, B



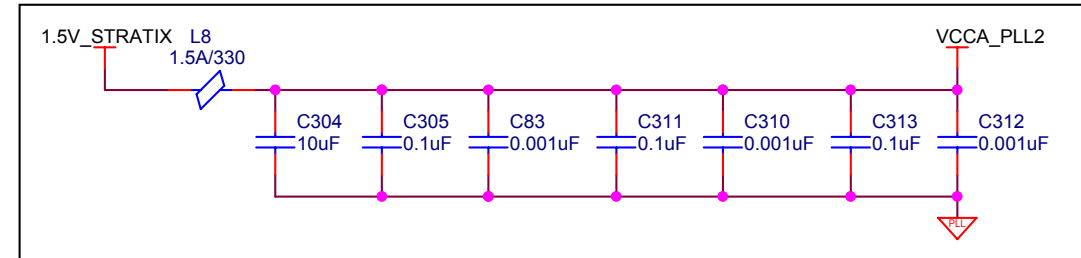
Stratix VCCIO Bank 7



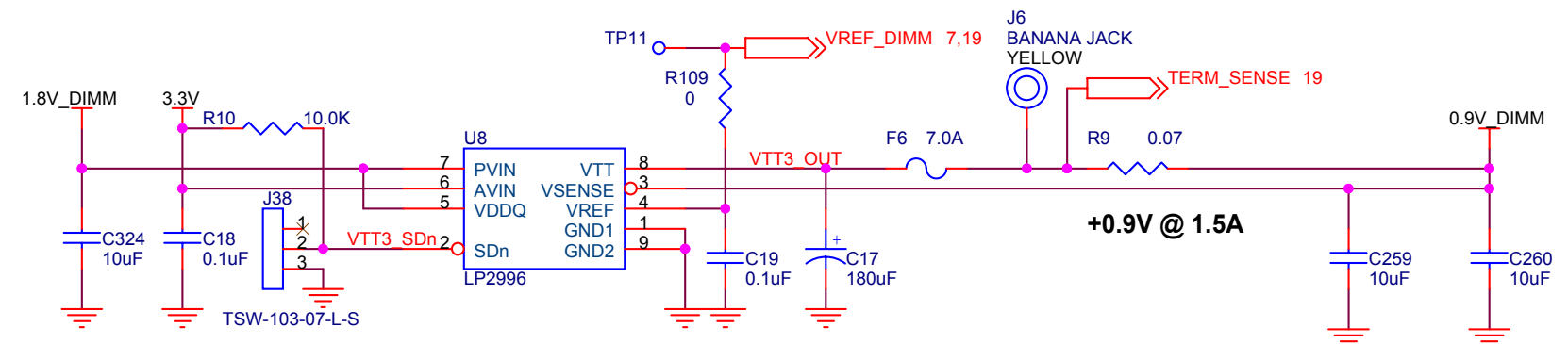
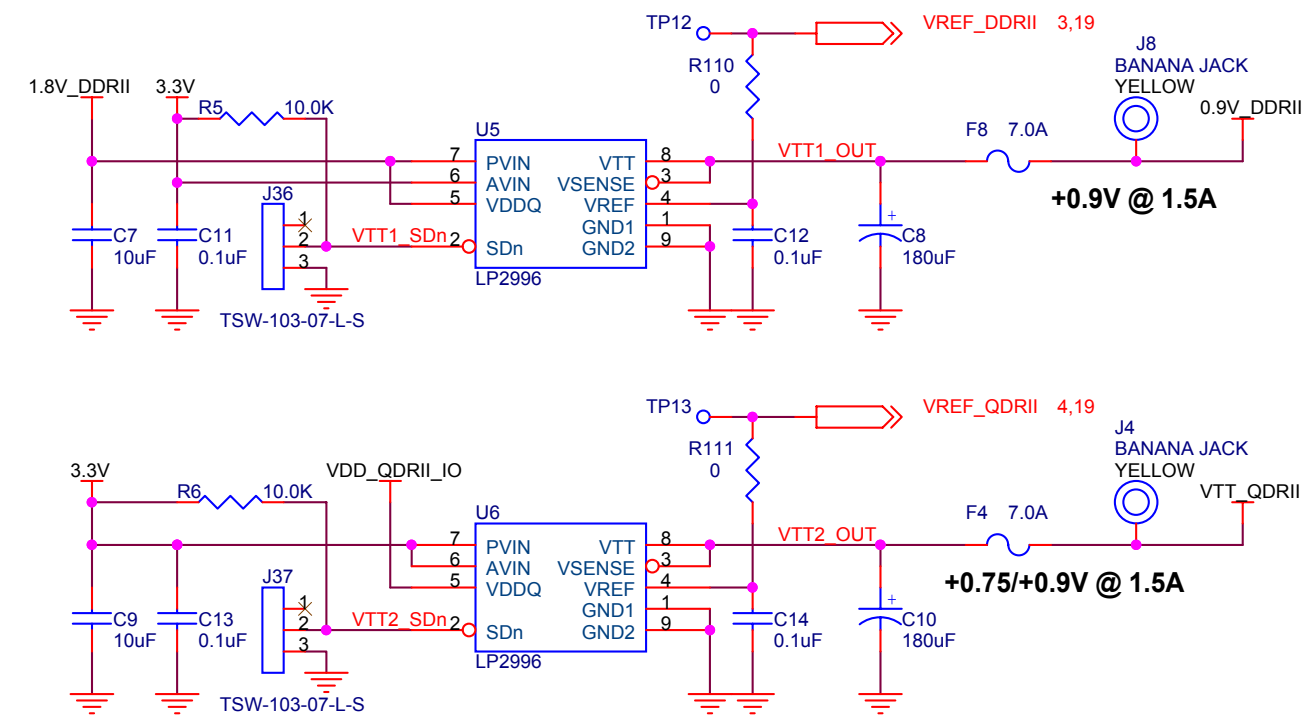
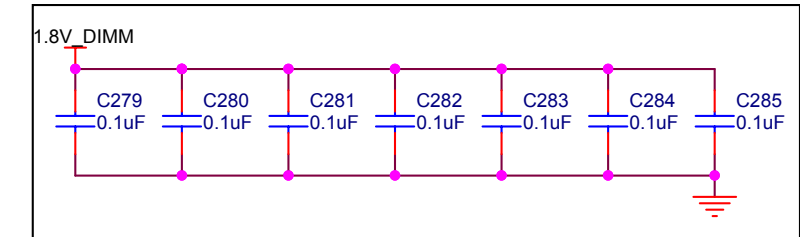
Stratix VCCA PLL 1, 2, 5, 7, 10, 11



Stratix VCCA PLL 3, 4, 6, 8, 9, 12



Stratix VCCIO Banks 3, 4



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