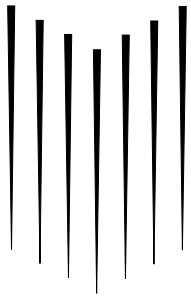

Valis*

MPC7450
MPC7451
MPC7455
MPC7457

intelligence everywhere

digital dna*

Date Changed: 5/15/2003	Time: 8:16:37 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Cover Story	Page: 01

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Schematic Notes

1. Unless otherwise specified:
   All resistors are SMD0603, in ohms, 0.08W, +/-5%
   All capacitors are SMD0603, in microfarads (uF), +/-20%.
   All inductances are in microhenries (uH).
   All ferrites are Z=50 ohms at 100 MHz.
   All fuses are self-resetting polyswitch (PTC) devices.
   Board impedance is 55 +/- 5 ohms.

2. Integrated circuits have default connections to power and ground unless explicitly shown otherwise. Global power connections are:

GND	VCACHE	VCACHE_IO
VCC_3.3	VCC_2.5	OVDD
VCC_5	VCORE	VCC_12

3. Part numbers used are for reference only; compatible parts may be used; refer to the bill of materials.

4. Motorola and the Motorola logo are registered trademarks of Motorola. PowerPC is a trademark of IBM. Other trademarks are the respective property of their respective copyright holders. There is no spoon. All rights reserved. No warranty is made, express or implied.

5. The sheet-to-sheet cross reference format is:
   Sheet "-" VertZoneLetter HorizZoneNumber

6. Components with the visible property "NO STUFF" are not to be installed by default; they are for test or manufacturing purposes only.

7. All buses follow big-endian bit numbering order (bit 0 is the most-significant bit), except where industry standards apply (i.e. PCI). Little-endian numbering is noted at the source component.

8. Team Valis is:
   Cindy Callis.....CAD/Layout
   Ivan Erickson.....Program Manager
   Gary Milliorn.....Hardware Design
   Tony Saucedo.....Purchasing
   Margarito Trevino.....Tech/Debug
   Gary Wojcik.....Grand Poobah

Valis*

REV	DATE	CHANGES
X1	00MAY01	Initial version
X2	01JUN11	See errata list.
X3	03JAN08	See errata list.

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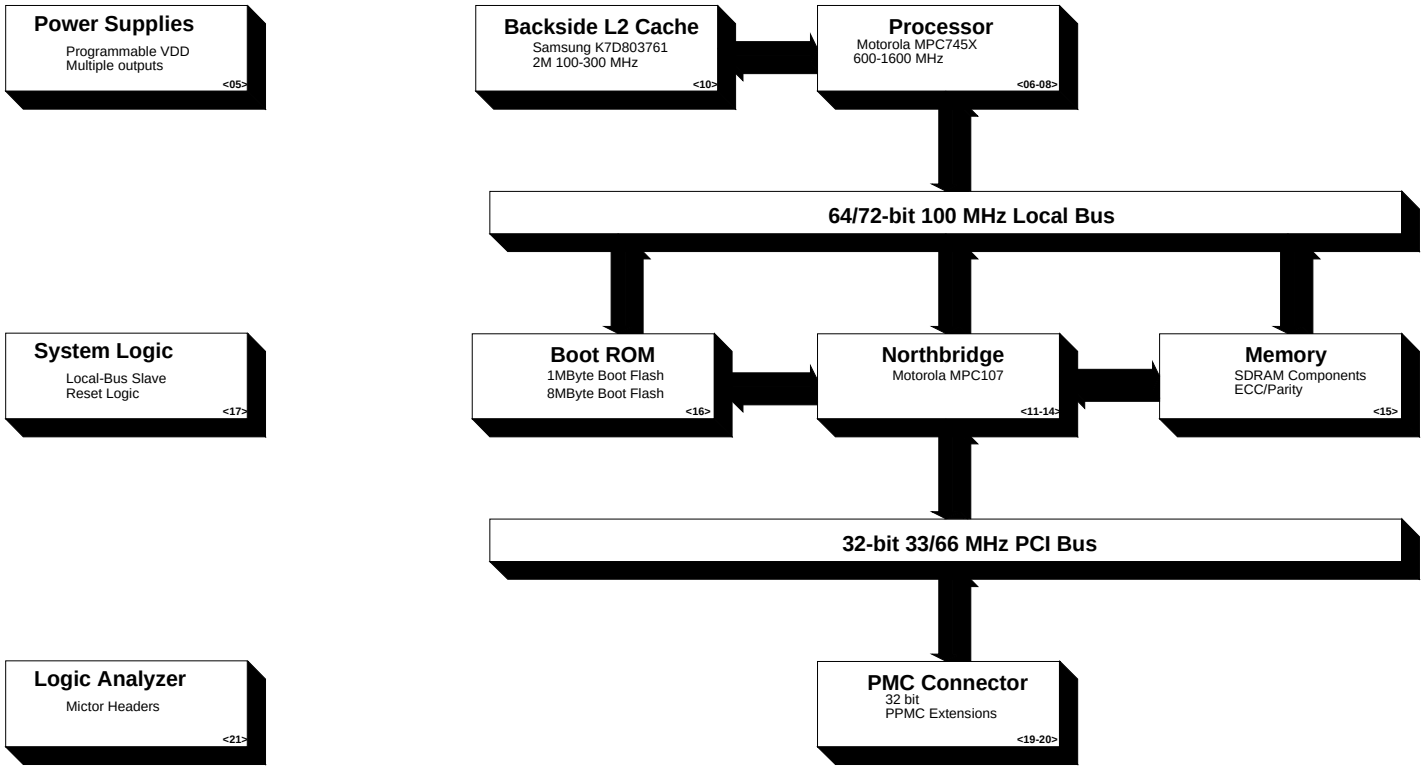

Date Changed: 5/15/2003	Time:8:24:09 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Block Diagram	Page: 03

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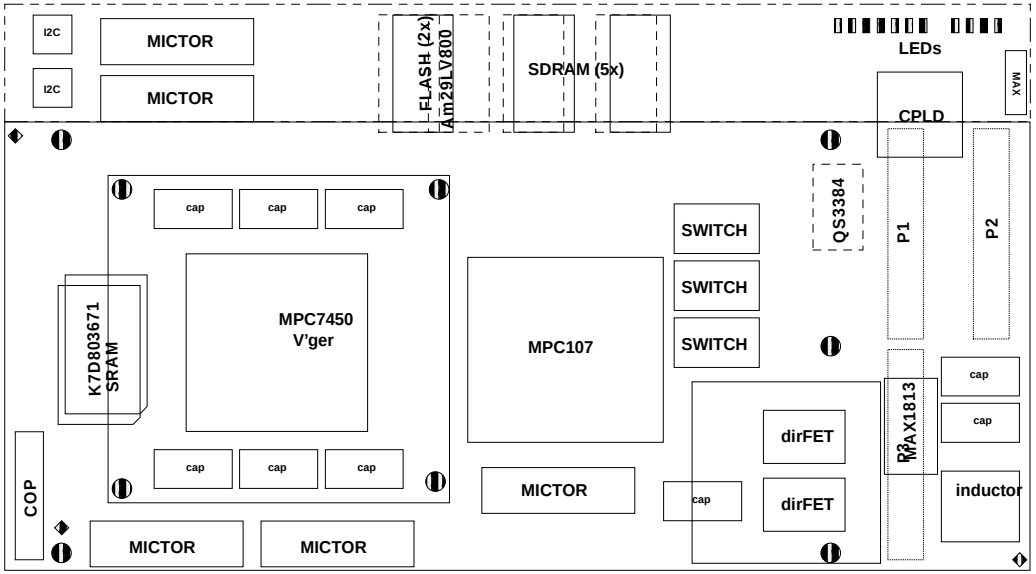
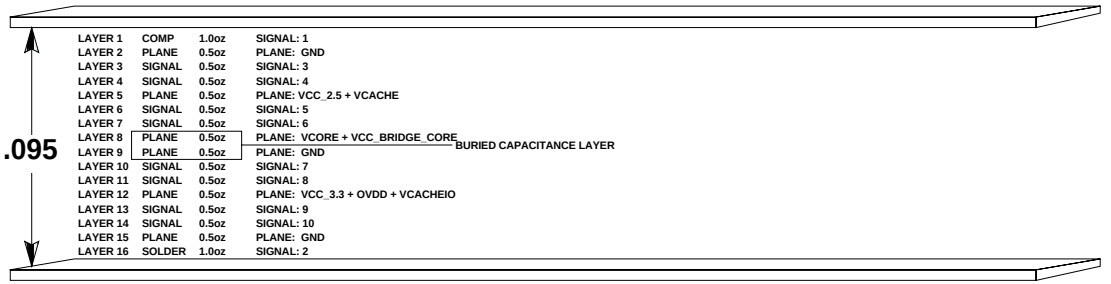
Layout/Routing Instructions

05	Place components approximately as shown on this page. Keep relative distances short and use heavy traces for everything. All power connections are to be made to a plane except sense lines.
06	Avoid routing traces, especially noisy ones, across CPUPLL bus.
07	Keep AVDD filter near CPU. Route all groups to equal lengths. L3RU (routed daisy-chain) L3RL (routed daisy-chain) L3CTL (routed as a T)
08	Place bypass caps as shown. Use two ground-attach vias.
09	Place COP connector in I/O area. Proximity to CPU is not a high priority. Insure that COP pin numbering matches view as shown on schematic (i.e. pin 1 and pin 16 are on opposite corners).
10	Place BGAs paired on top and bottom of board. Place within 2.5cm of MPC7450. Surround each component with bypass capacitors. Use thick trace (>=12mil) for VREF, 24mil for VCACHE.
11	Avoid routing traces, especially noisy ones, across MPC107 PLL bus. Do not swap order of MPC107 PLL switch connections. PCI clock input must be 2.5" (per specification).
12	
13	Keep AVDD/LAVDD filters near MPC107. Use heavy, short traces from filter to pins. Surround MPC107 with bypass caps to provide additional ground-return paths. Use two ground-attach vias. Connect VCC_PCI_C (PCI Clamp) using heavy trace, not a plane.
14	Place series termination resistors very near source (MPC107), < 2cm. Route SDRAM clocks to equal lengths, including SDRAM_SYNCOUT to SDRAM_SYNCIN path.
15	
16	Keep data bus length for ROM short.
17	
18	
19	Maximum trace length for PCI signals to MPC107 is 1.5" per the PCI specification.
20	
21	





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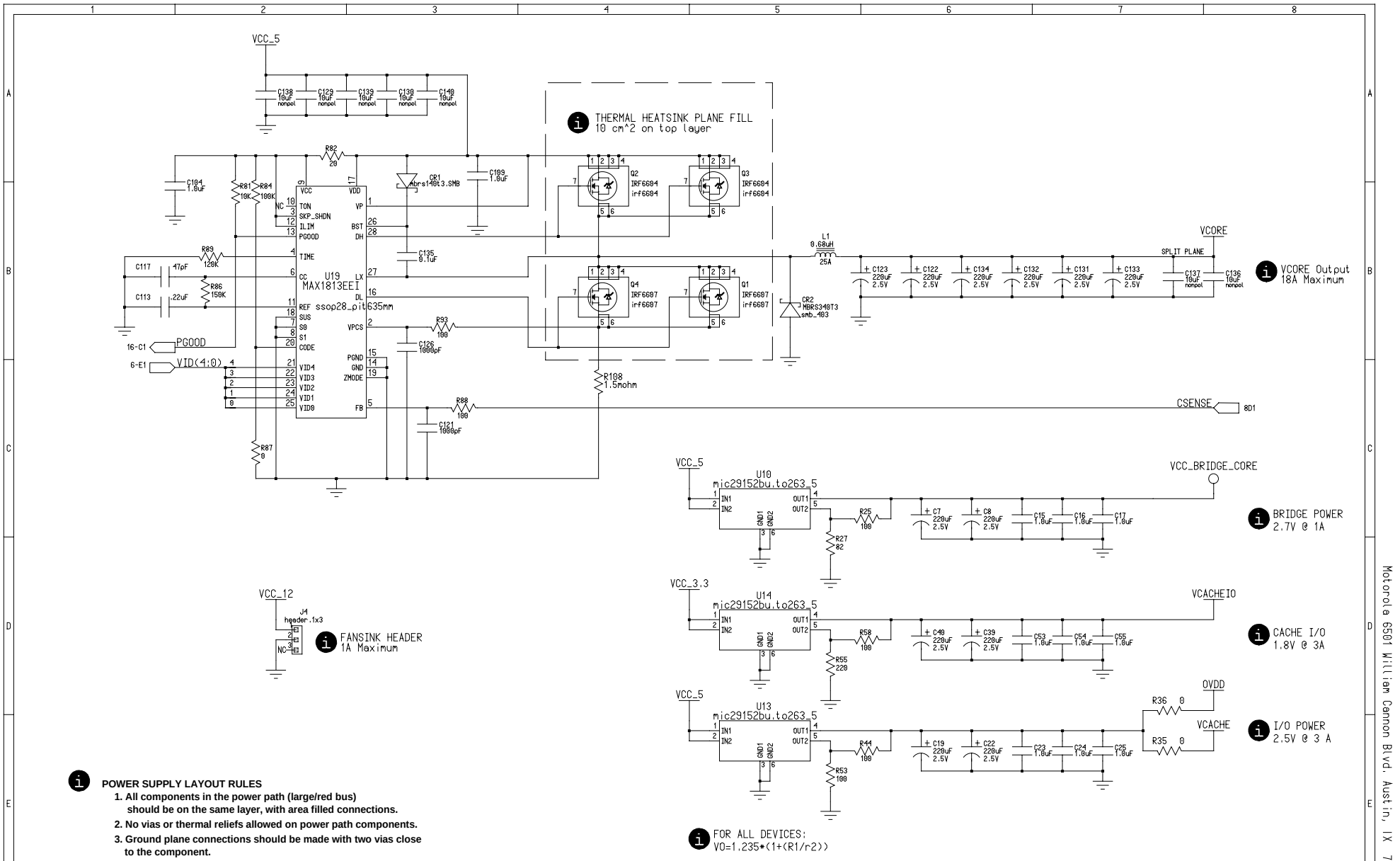
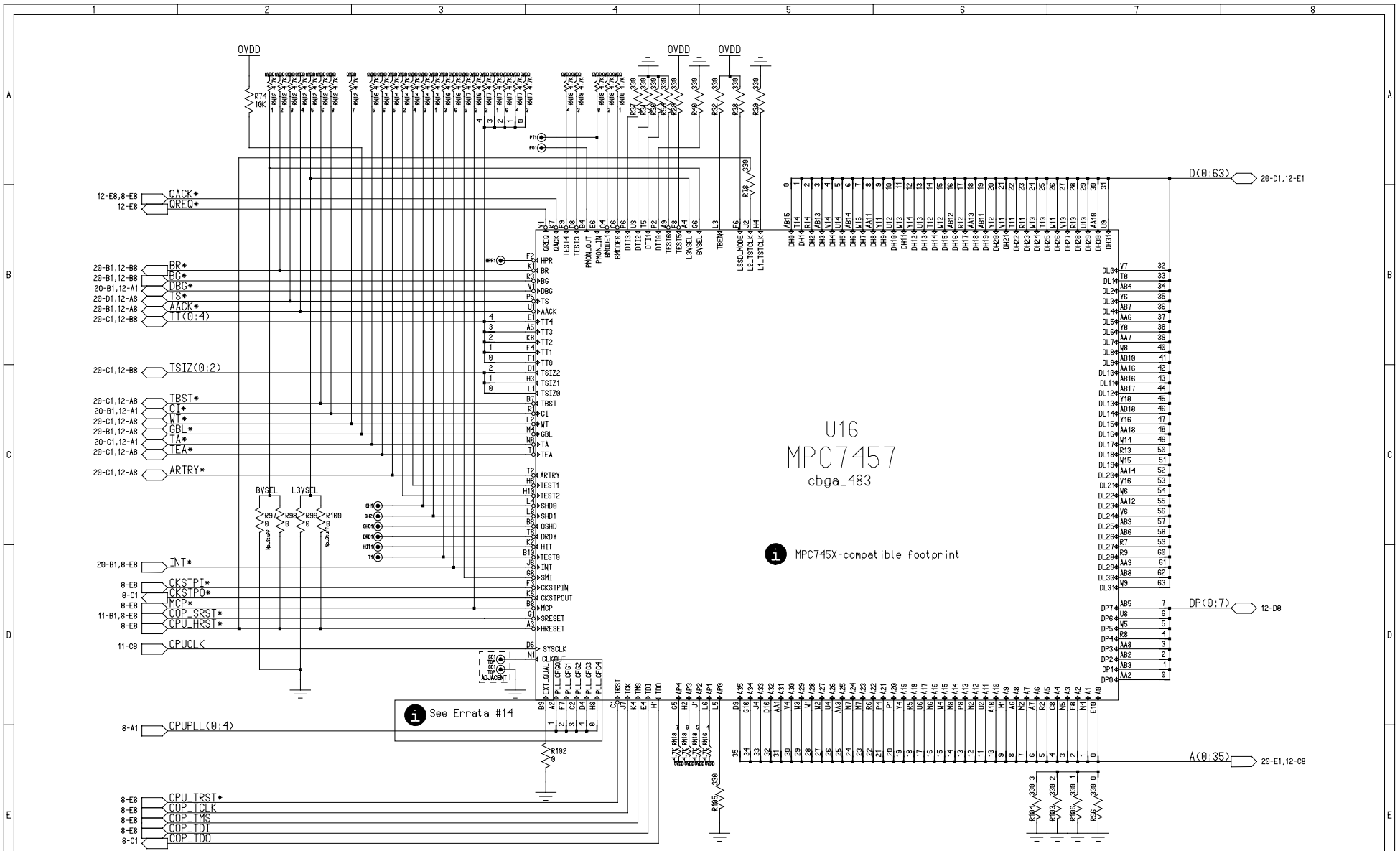
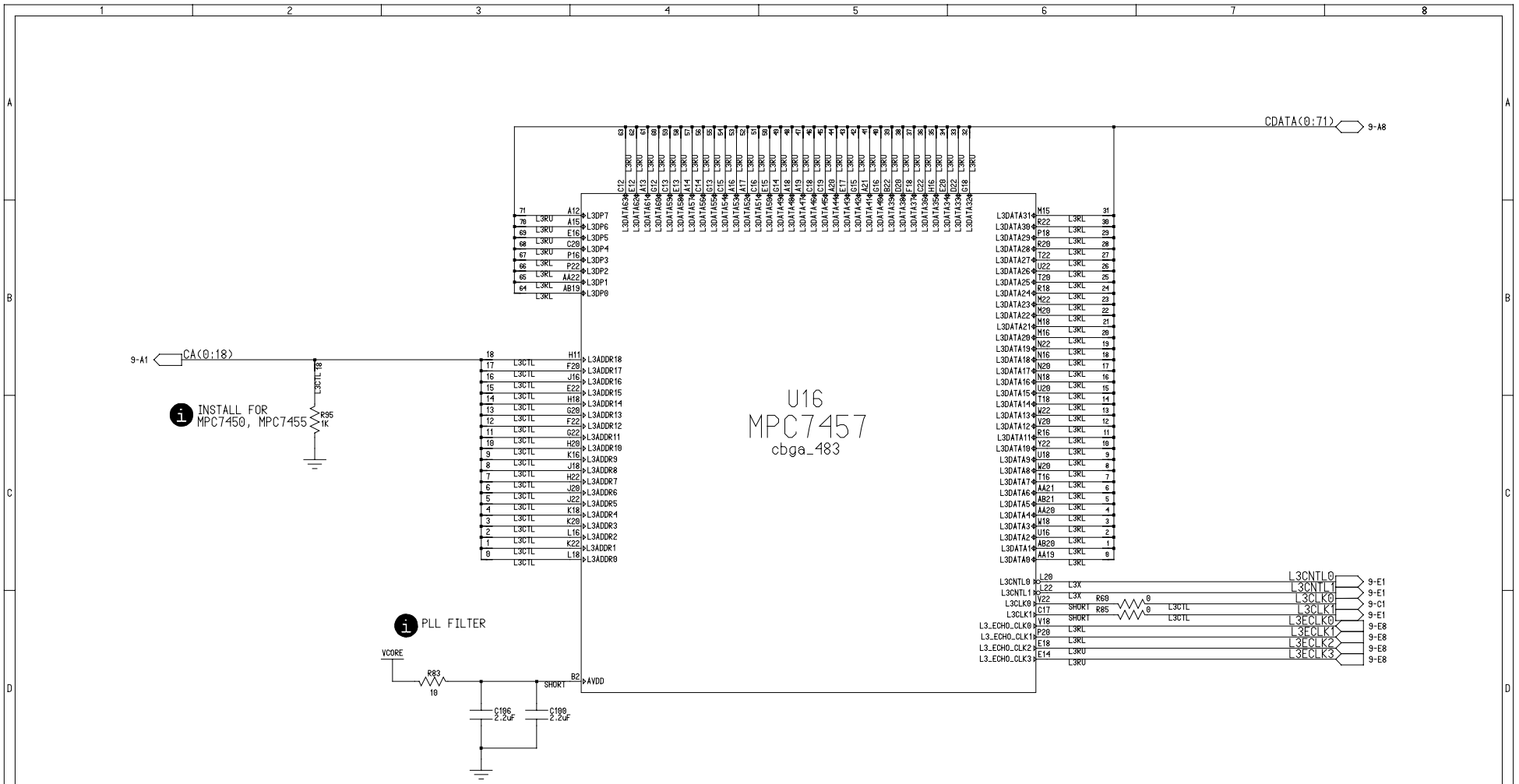


Date Changed: 5/15/2003	Time: 8:27:03 am	Engineer: Gary Milliorn	Drawing Number: M02VALIS	REV: X3	Project: Valis	TITLE: Processor Core and IO Power Supplies	Page: 05



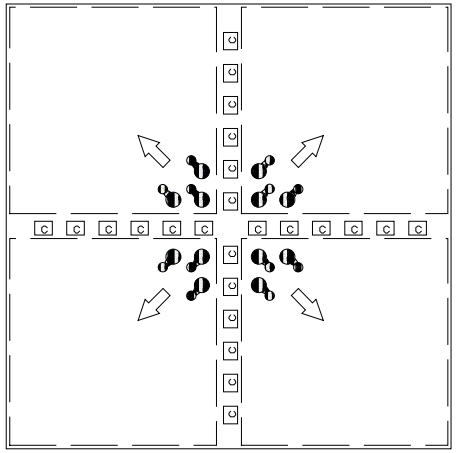
Date Changed: 5/15/2003	Time: 9:49:14 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Motorola MPC745X PowerPC Processor	Page: 06



Date Changed: 5/15/2003	Time: 9:50:50 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Motorola MPC745X L3 Cache Interface	Page: 07

CPU POWER BYPASS CAPS
Keep near CPU.

CBGA483 ESCAPE PATTERN
and CAPACITOR PLACEMENT



U16
MPC7457
mpc745x.power.3of3.cbga483

VCACHEIO

C81 0.1uF, C80 0.1uF, C76 0.1uF, C68 0.1uF, C108 0.1uF, C95 0.1uF, C105 0.1uF

C82 0.1uF, C112 0.1uF, C102 0.1uF, C115 0.1uF, C116 0.1uF, C45 0.1uF, C111 0.1uF

B13, B15, B17, B19, B21, D12, D14, D16, D18, D21, E19, F13, F15, F17, F21, G19, H12, H14, H17, H21, J19, K17, K21, L19, M17, M21, N19, P17, P21, R15, R19, T17, T21, U19, V17, V21, W19, Y21

GVDD

SEE ERRATA #16

R94 0 No_Stuff

5C8 CSENSE

J8 VDDSENSE1
G11 VDDSENSE2

GROUND
See mapfile

VDD (Core)

J9, J11, J13, J15, K10, K12, K14, L9, L11, L13, L15, M10, M12, M14, N9, N11, N13, N15, P10, P12, P14

VCORE

C128 0.1uF, C85 0.1uF, C86 0.1uF, C127 0.1uF, C77 0.1uF, C96 0.1uF

C98 0.1uF, C84 0.1uF, C69 0.1uF, C103 0.1uF, C87 0.1uF, C83 0.1uF

OVDD (I/O)

B3, C5, C7, C10, D2, E3, E9, F5, G3, G9, H7, J5, K3, L7, M5, N3, P7, R4, T3, U5, U7, U11, U15, V3, V9, V13, Y2, Y5, Y7, Y10, Y17, Y19, AA1, AA15

OVDD

C59 0.1uF, C90 0.1uF, C89 0.1uF, C88 0.1uF, C35 0.1uF, C37 0.1uF, C36 0.1uF, C46 0.1uF

C41 0.1uF, C48 0.1uF, C69 0.1uF, C91 0.1uF, C47 0.1uF, C38 0.1uF, C66 0.1uF, C70 0.1uF

Date Changed: 5/15/2003	Time: 9:52:33 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Motorola MPC745X Power	Page: 08

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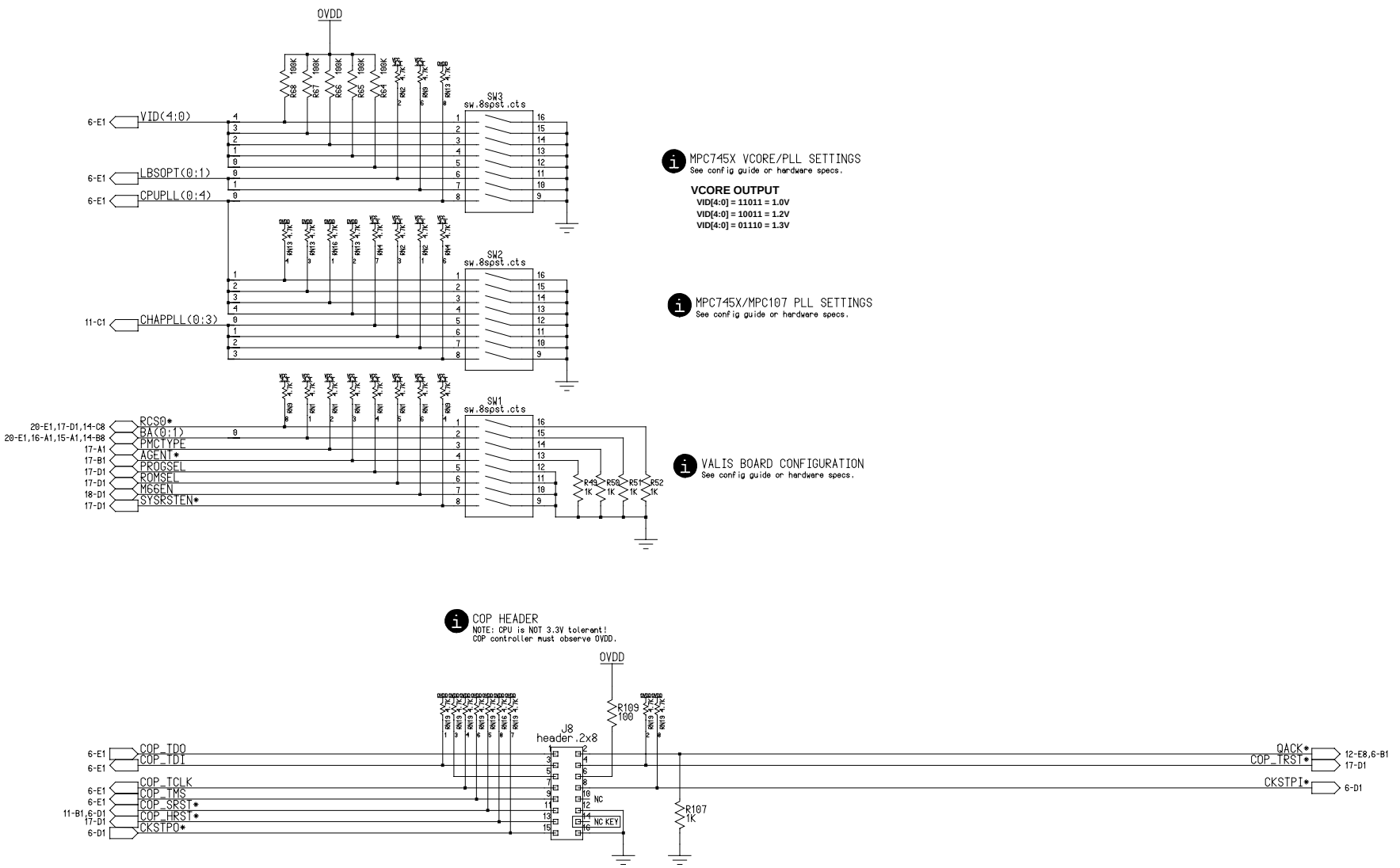
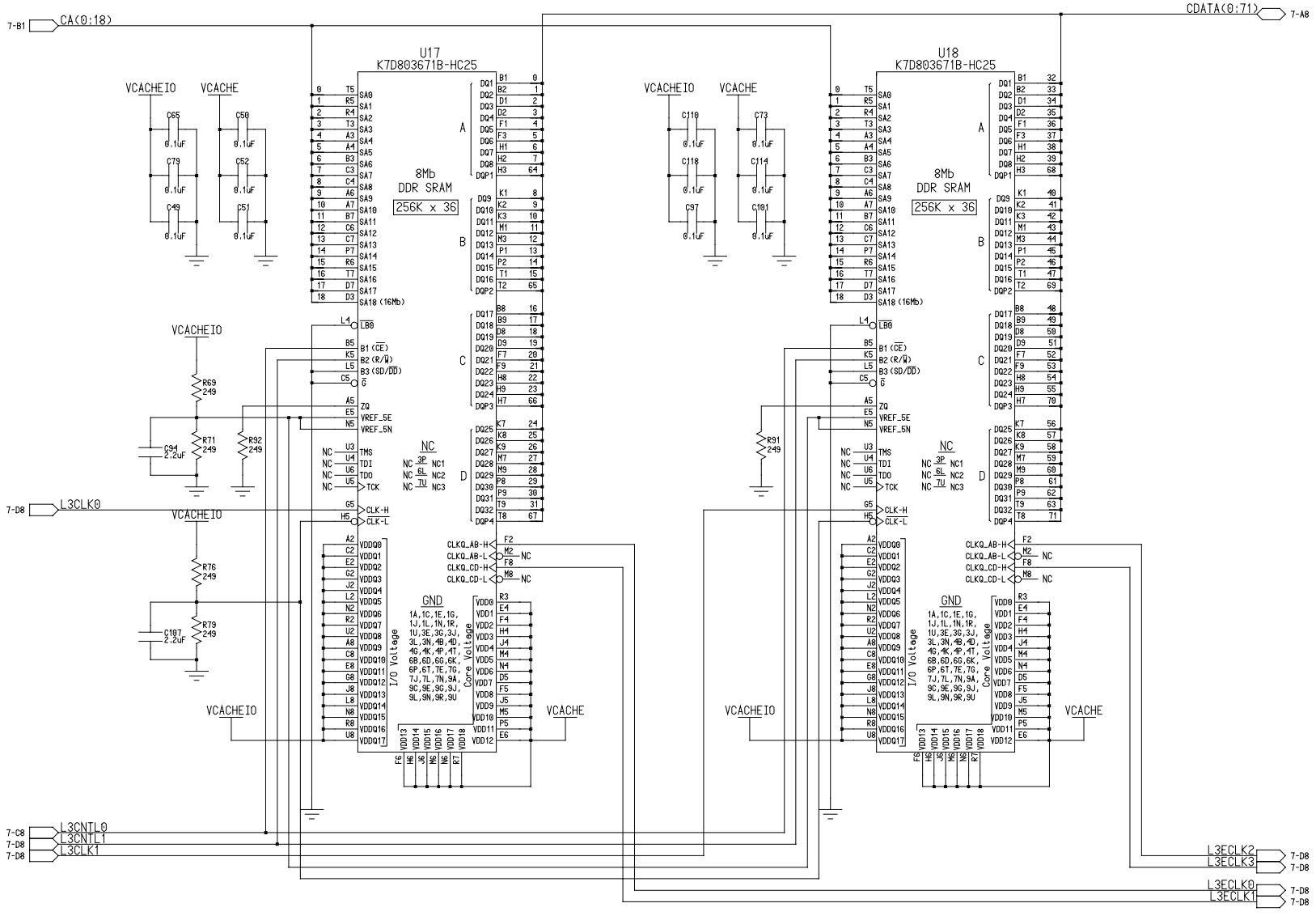


Date Changed: 5/15/2003	Time: 9:55:56 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Valis Configuration and COP Interface	Page: 09



Date Changed: 5/15/2003	Time: 9:56:54 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: L3Cache SRAM	Page: 10

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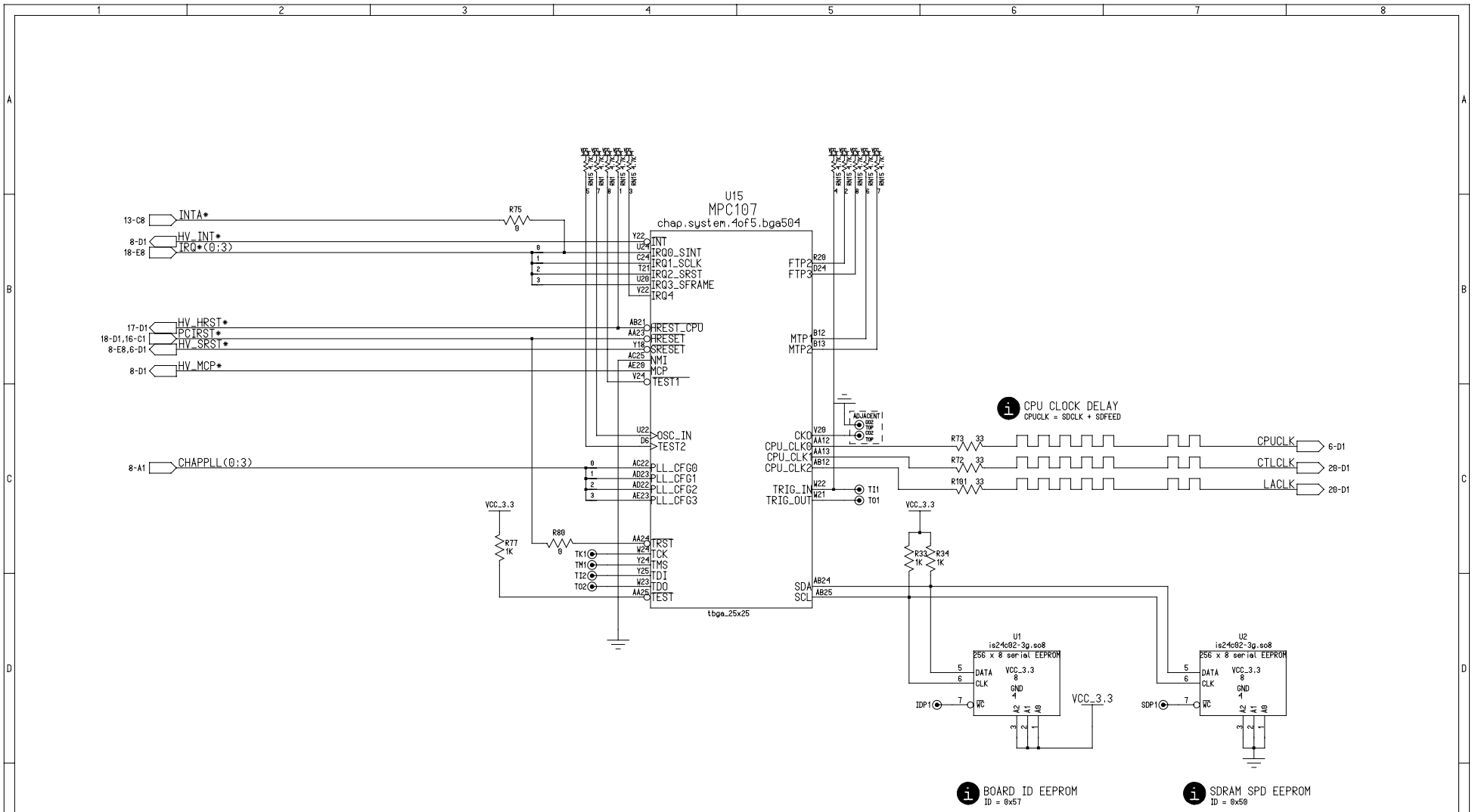
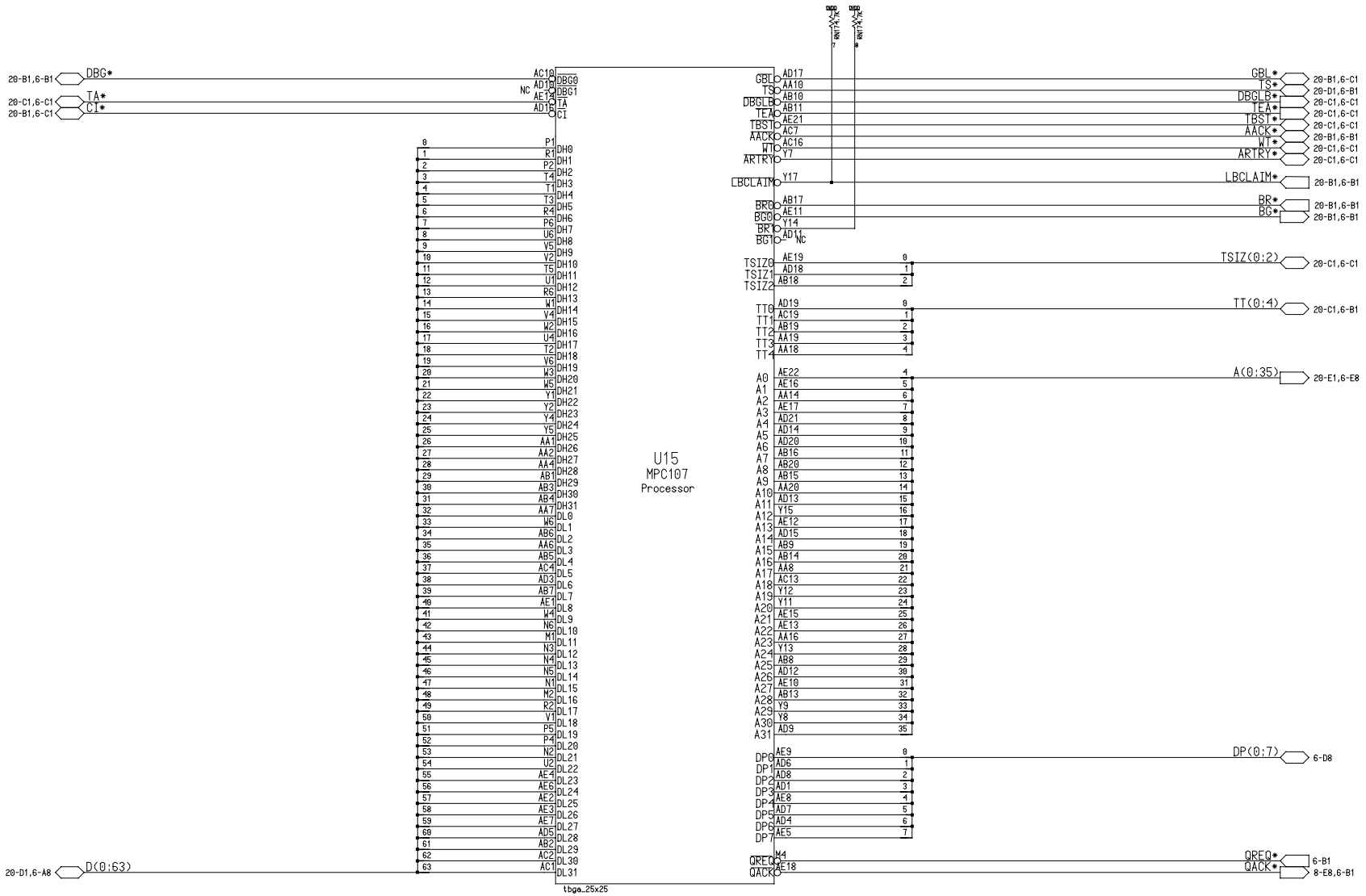


Date Changed: 5/15/2003	Time: 9:57:59 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: MPC107: System Interface	Page: 11



Date Changed: 5/15/2003	Time: 9:59:16 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: MPC107: Processor Interface	Page: 12

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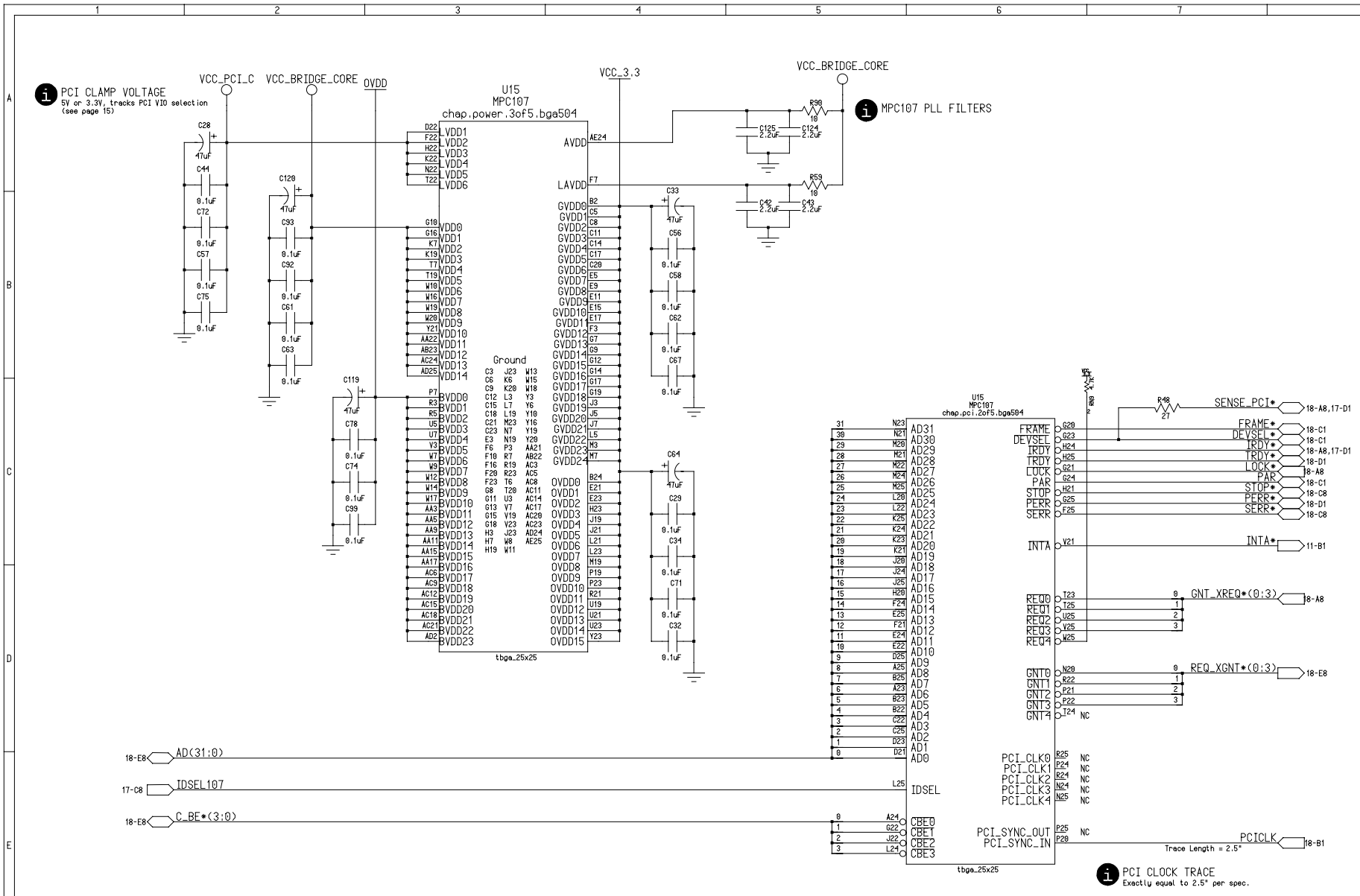

Date Changed: 5/15/2003	Time: 10:01:21 am	Engineer: Gary Milliorn	Drawing Number: M02VALIS	REV: X3	Project: Valis	TITLE: MPC107: PCI Interface, Power	Page: 13

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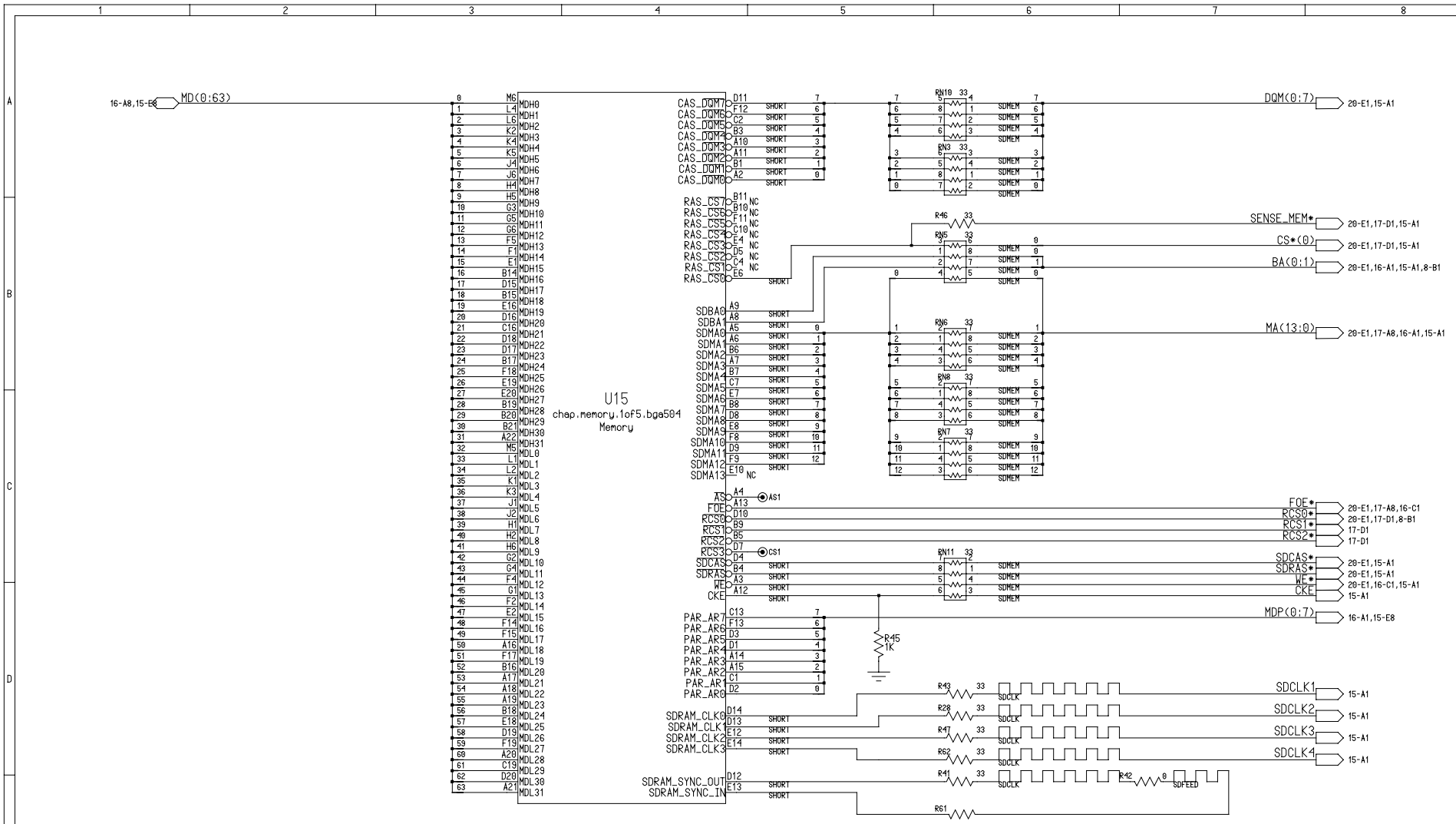

Date Changed: 5/15/2003	Time: 10:02:25 am	Engineer: Gary Milliorn	Drawing Number: M02VALIS	REV: X3	Project: Valis	TITLE: MPC107: Memory Interface	Page: 14

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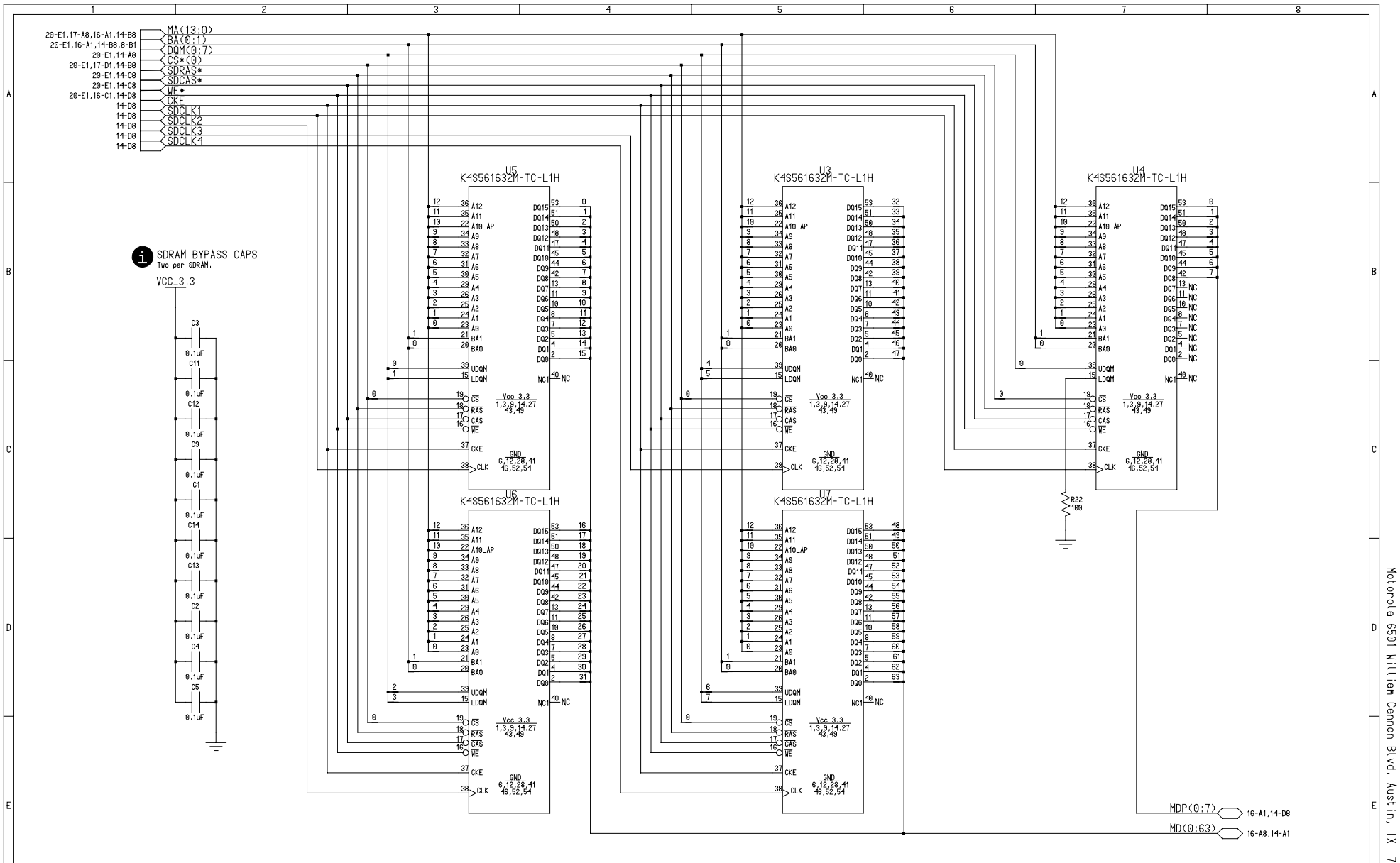

Date Changed: 5/15/2003	Time: 10:03:45 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: SDR DRAM Memory Bank (w/Parity/ECC)	Page: 15

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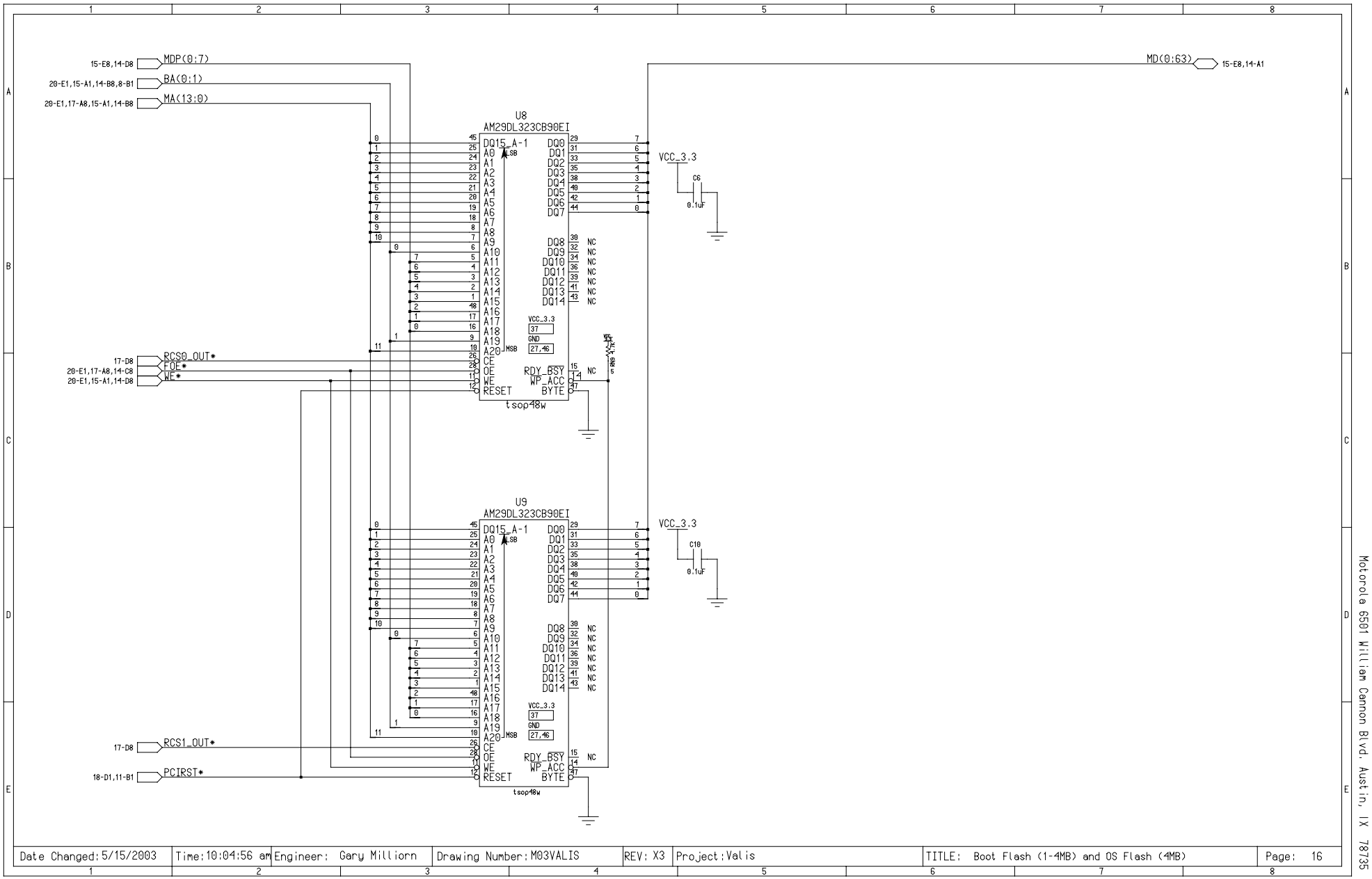

Date Changed: 5/15/2003	Time: 10:04:56 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Boot Flash (1-4MB) and OS Flash (4MB)	Page: 16

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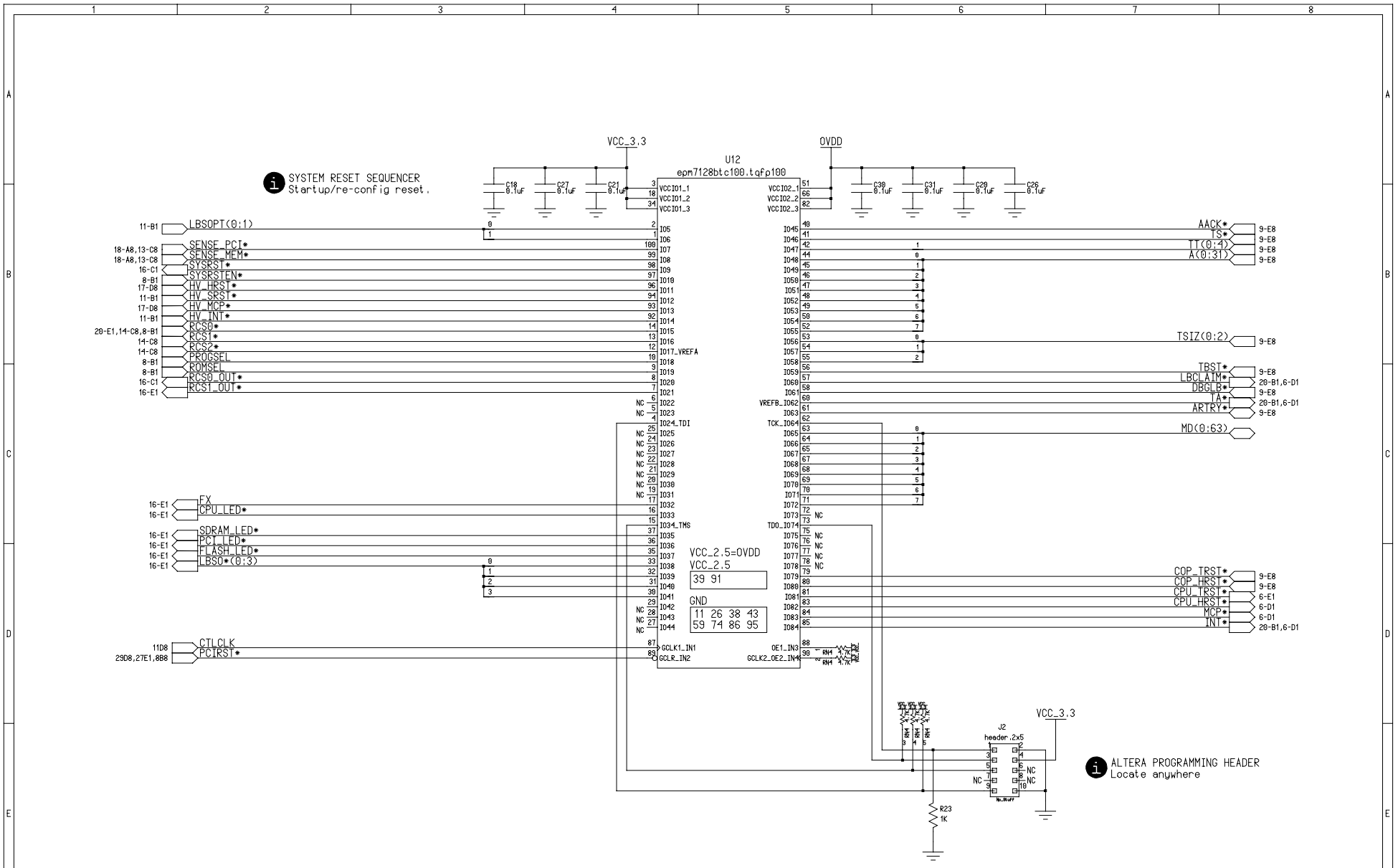
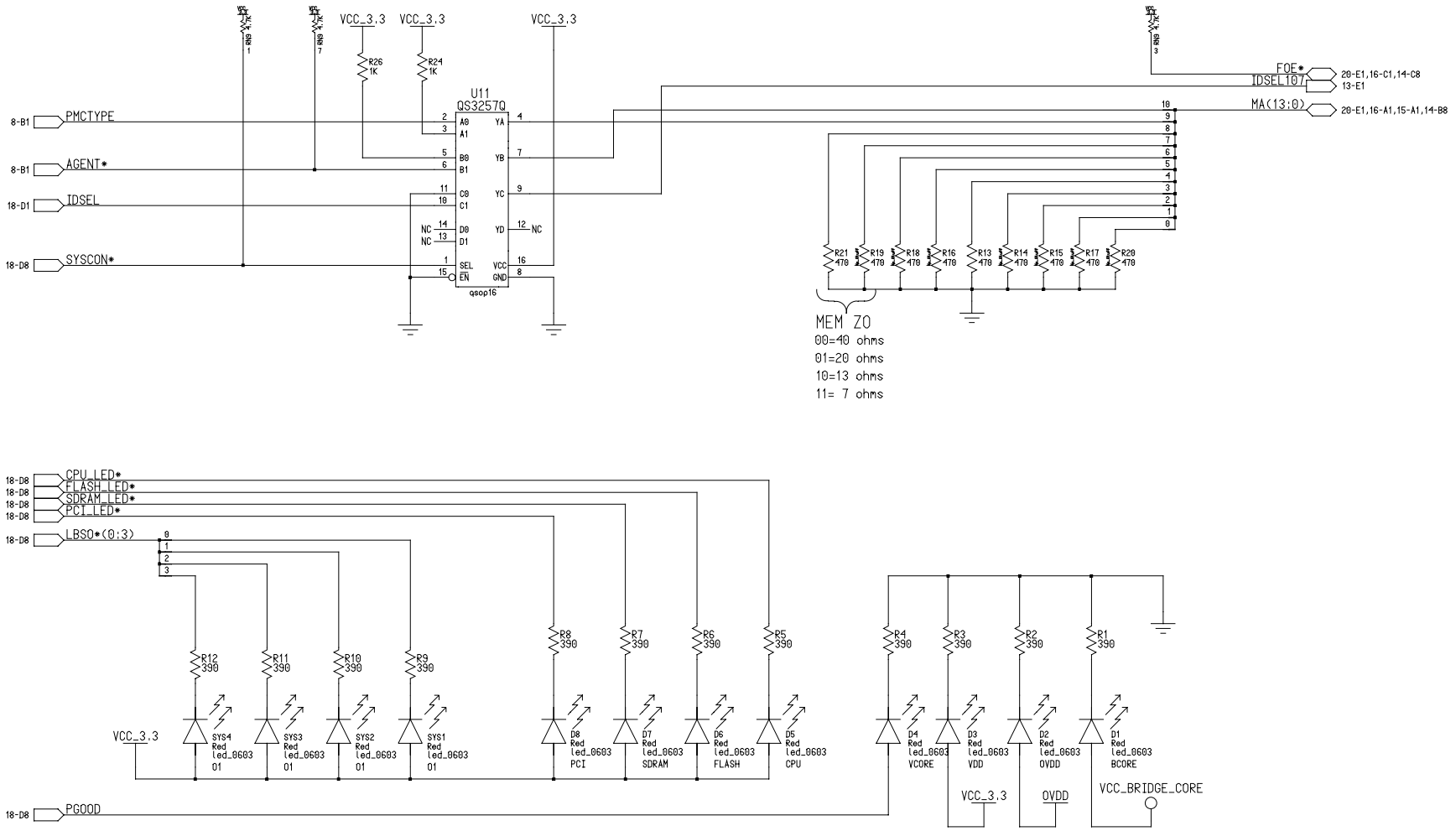


Date Changed: 5/15/2003	Time: 10:05:58 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Board Control Logic and Local-Bus Slave Option	Page: 17



Date Changed: 5/15/2003	Time: 10:07:07 am	Engineer: Gary Milliorn	Drawing Number: M02VALIS	REV: X3	Project: Valis	TITLE: LEDs and PrPMC Interface Logic.	Page: 18

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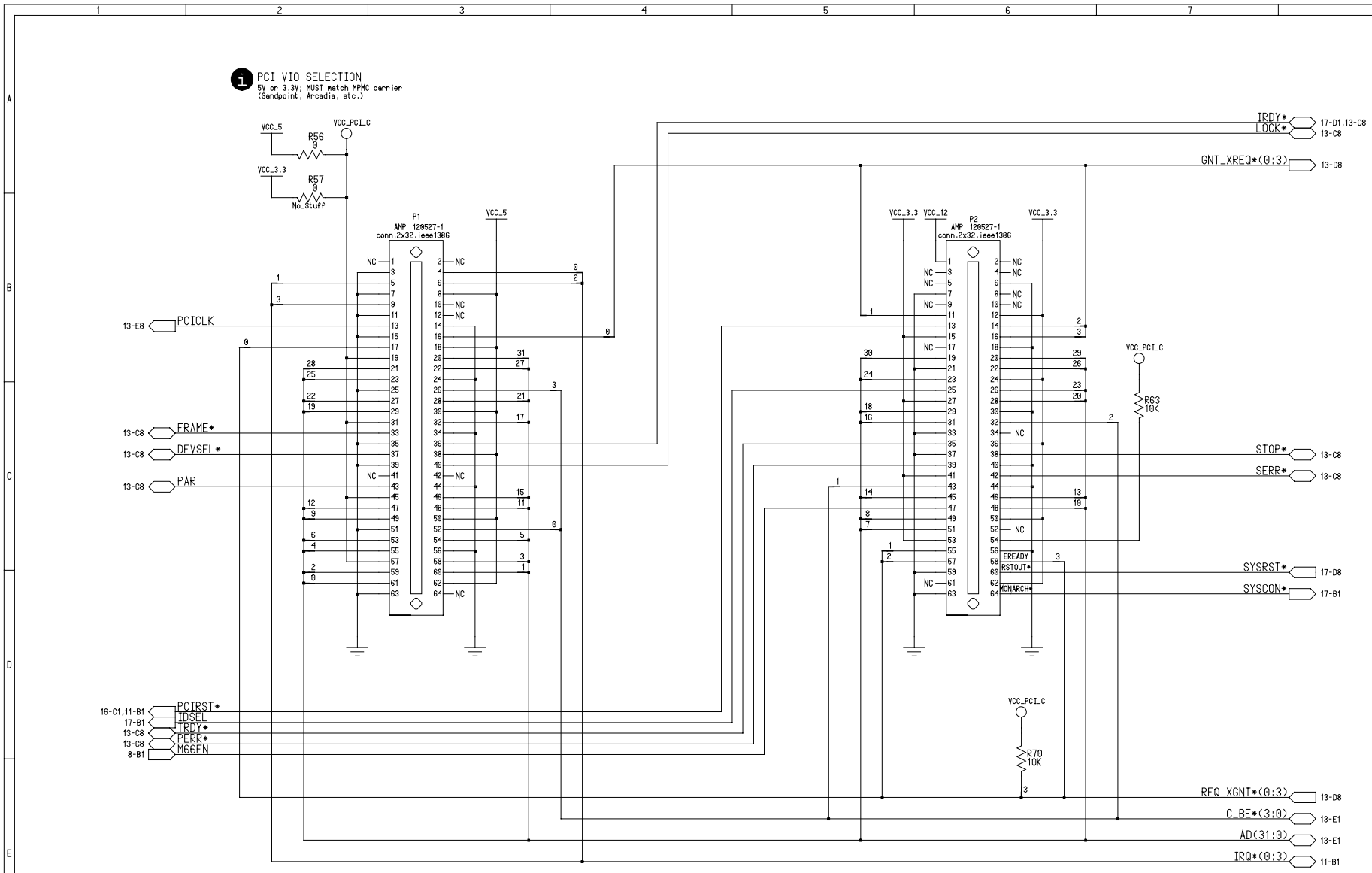
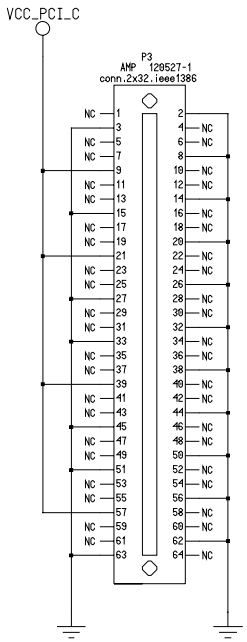


Date Changed: 5/15/2003	Time: 10:08:10 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: PrPMC Connectors P1, P2	Page: 19



Date Changed: 5/15/2003	Time: 10:08:55 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: PrPMC Connector P3	Page: 20

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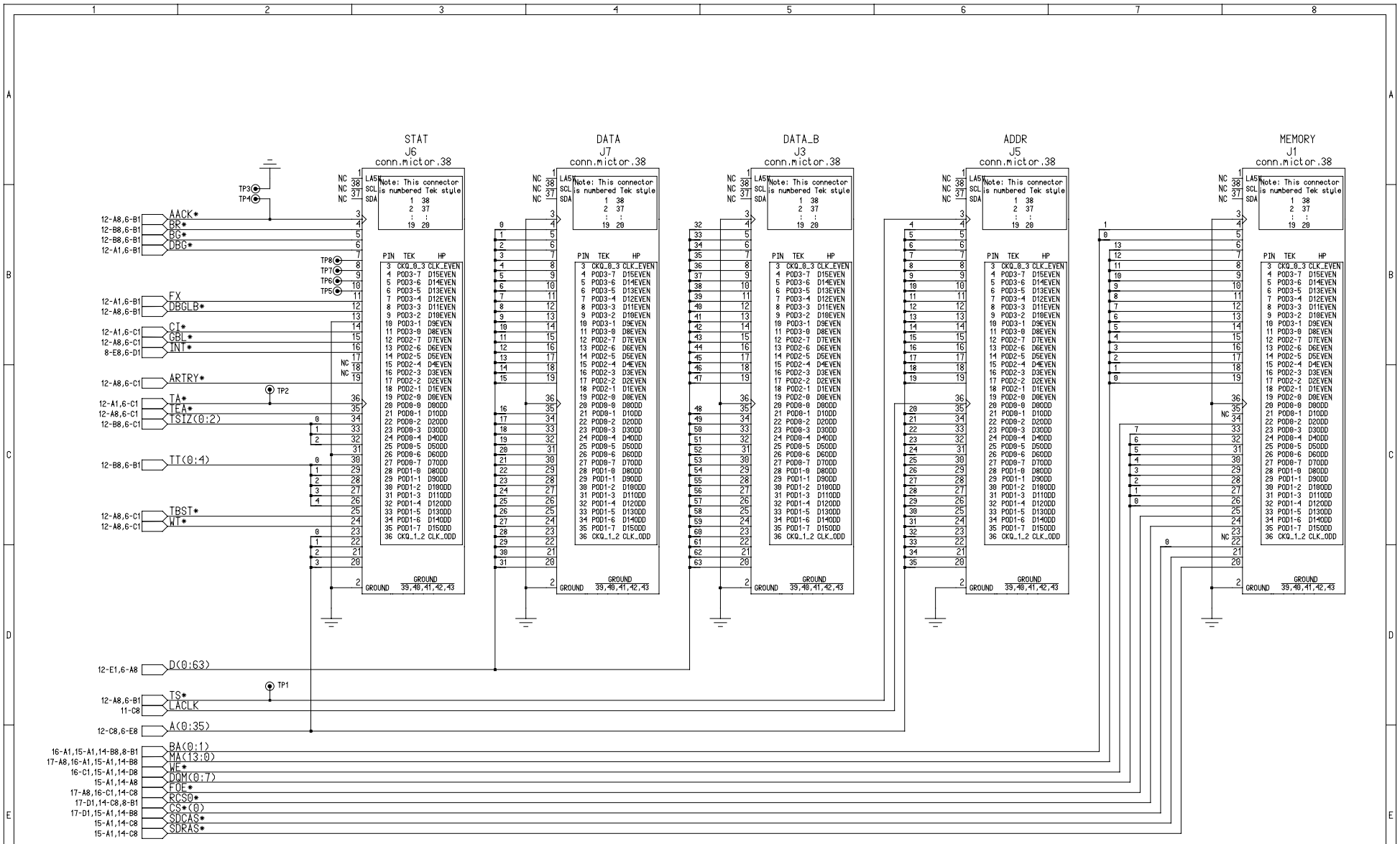

Date Changed: 5/15/2003	Time: 10:09:46 am	Engineer: Gary Milliorn	Drawing Number: M03VALIS	REV: X3	Project: Valis	TITLE: Logic Analyzer Headers	Page: 21

NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE
A(6)	21E1	17B8	A(18)	AD(15)	AD(17)	21E1	CA(18)	CDATA(7)	CDATA(23)	CDATA(58)	CDATA(2)	CKE	CPU_HRST*	12E1	12E1	12E1	12E1	12E1
6E8	A(35)	21E1	6E8	13E1	13E1	BG*	7B1	7A8	7A8	7A8	7A8	14D8	6D1	21D1	21D1	21D1	21D1	21D1
12C8	6E8	A(23)	12C8	19E8	19E8	6B1	10A1	10A8	10A8	10A8	10A8	15A1	17D8	D(50)	D(1)	D(37)	D(15)	D(3)
17B8	12C8	6E8	17B8	AD(3)	AD(7)	12B8	CA(13)	CDATA(39)	CDATA(40)	CDATA(57)	CDATA(1)	CKSTPI*	CPU_LED*	6A8	6A8	6A8	6A8	6A8
21E1	21E1	12C8	21E1	13E1	13E1	21B1	7B1	7A8	7A8	7A8	7A8	6D1	17C2	12E1	12E1	12E1	12E1	12E1
A(5)	A(19)	17B8	A(9)	19E8	19E8	BR*	10A1	10A8	10A8	10A8	10A8	9E8	18C1	21D1	21D1	21D1	21D1	21D1
6E8	6E8	21E1	6E8	AD(4)	AD(13)	6B1	CA(9)	CDATA(38)	CDATA(70)	CDATA(56)	CDATA(0)	CKSTPO*	CPU_TRST*	D(35)	D(9)	D(36)	D(31)	D(2)
12C8	12C8	A(13)	12C8	13E1	13E1	12B8	7B1	7A8	7A8	7A8	7A8	6D1	6E1	6A8	6A8	6A8	6A8	6A8
17B8	17B8	6E8	17B8	19E8	19E8	21B1	10A1	10A8	10A8	10A8	10A8	9E1	17D8	12E1	12E1	12E1	12E1	12E1
21E1	21E1	12C8	21E1	AD(11)	AD(6)	CA(10)	CA(5)	CDATA(37)	CDATA(20)	CDATA(67)	CDATA(69)	COP_HRST*	CS*(0)	21D1	21D1	21D1	21D1	21D1
A(7)	A(32)	17B8	A(19)	13E1	19E8	7B1	7B1	7A8	7A8	7A8	7A8	9E1	14B8	D(63)	D(41)	D(28)	D(14)	D(0)
6E8	6E8	21E1	6E8	19E8	19E8	10A1	10A1	10A8	10A8	10A8	10A8	17D8	15A1	6A8	6A8	6A8	6A8	6A8
12C8	12C8	A(12)	12C8	AD(29)	AD(20)	CA(7)	CA(14)	CDATA(36)	CDATA(19)	CDATA(31)	CDATA(47)	COP_SRST*	21E1	12E1	12E1	12E1	12E1	12E1
17B8	21E1	6E8	17B8	13E1	13E1	7B1	7B1	7A8	7A8	7A8	7A8	6D1	CSENSE	21D1	21D1	21D1	21D1	21D1
21E1	A(31)	12C8	21E1	19E8	19E8	10A1	10A1	10A8	10A8	10A8	10A8	9E1	5C8	D(6)	D(5)	D(60)	D(17)	D(56)
A(3)	6E8	17B8	A(14)	AD(23)	AD(19)	CA(6)	CA(0:18)	CDATA(35)	CDATA(53)	CDATA(30)	CDATA(27)	COP_TCLK	8D1	6A8	6A8	6A8	6A8	6A8
6E8	12C8	21E1	6E8	13E1	13E1	7B1	7B1	7A8	7A8	7A8	7A8	6E1	CTLCLK	12E1	12E1	12E1	12E1	12E1
12C8	17B8	A(17)	12C8	19E8	19E8	10A1	10A1	10A8	10A8	10A8	10A8	9E1	11C8	21D1	21D1	21D1	21D1	21D1
17B8	21E1	6E8	17B8	AD(25)	AD(26)	CA(3)	CDATA(71)	CDATA(34)	CDATA(52)	CDATA(29)	CDATA(26)	COP_TDI	17D2	D(61)	D(10)	D(26)	D(29)	D(8)
21E1	A(29)	12C8	21E1	13E1	13E1	7B1	7A8	7A8	7A8	7A8	7A8	6E1	C_BE*(2)	6A8	6A8	6A8	6A8	6A8
A(2)	6E8	17B8	A(0:31)	19E8	19E8	10A1	10A8	10A8	10A8	10A8	10A8	9D1	13E1	12E1	12E1	12E1	12E1	12E1
6E8	12C8	21E1	17B8	AD(12)	AD(0)	CA(2)	CDATA(63)	CDATA(33)	CDATA(16)	CDATA(28)	CDATA(44)	COP_TDO	19E8	21D1	21D1	21D1	21D1	21D1
12C8	17B8	A(16)	A(0:35)	13E1	19E8	7B1	7A8	10A8	10A8	10A8	10A8	9E1	C_BE*(3)	D(45)	D(34)	D(24)	D(25)	D(52)
17B8	21E1	6E8	6E8	19E8	19E8	10A1	CDATA(60)	CDATA(32)	CDATA(65)	CDATA(25)	CDATA(43)	COP_TMS	13E1	6A8	6A8	6A8	6A8	6A8
21E1	A(11)	12C8	12C8	AD(21)	AD(31:0)	CA(1)	7A8	7A8	7A8	7A8	7A8	6E1	19E8	12E1	12E1	12E1	12E1	12E1
A(1)	6E8	17B8	21E1	13E1	13E1	7B1	10A8	10A8	10A8	10A8	10A8	9E1	C_BE*(1)	21D1	21D1	21D1	21D1	21D1
6E8	12C8	AACK*	6B1	19E8	19E8	10A1	CDATA(59)	CDATA(46)	CDATA(49)	CDATA(24)	CDATA(66)	COP_TRST*	13E1	D(43)	D(33)	D(7)	D(54)	D(27)
12C8	17B8	A(30)	12A8	AD(24)	AGENT*	CA(0)	7A8	7A8	7A8	7A8	7A8	9D8	19E8	6A8	6A8	6A8	6A8	6A8
17B8	21E1	6E8	17B8	13E1	9C1	7B1	10A8	10A8	10A8	10A8	10A8	17D8	C_BE*(0)	12E1	12E1	12E1	12E1	12E1
21E1	A(20)	12C8	21B1	19E8	18B1	10A1	CDATA(68)	CDATA(45)	CDATA(48)	CDATA(22)	CDATA(0:7)	CPUCLK	13E1	21D1	21D1	21D1	21D1	21D1
A(0)	6E8	17B8	AD(10)	AD(27)	ARTRY*	CA(17)	7A8	7A8	7A8	7A8	7A8	6D1	C_BE*(3:0)	D(47)	D(46)	D(40)	D(44)	D(0:63)
6E8	12C8	21E1	13E1	13E1	6C1	7B1	10A8	10A8	10A8	10A8	10A8	11C8	13E1	6A8	6A8	6A8	6A8	6A8
12C8	17B8	A(26)	19E8	19E8	12A8	10A1	CDATA(17)	CDATA(42)	CDATA(13)	CDATA(21)	CHAPPLL(0)	CPUPLL(2)	19E8	12E1	12E1	12E1	12E1	12E1
17B8	21E1	6E8	AD(14)	AD(5)	17C8	CA(16)	7A8	7A8	7A8	7A8	9B1	6E1	D(1)	21D1	21D1	21D1	21D1	21D1
21E1	A(15)	12C8	13E1	13E1	21C1	10A1	10A8	10A8	10A8	10A8	11C1	9B1	6A8	D(23)	D(59)	D(42)	D(55)	DBG*
A(4)	6E8	17B8	13E1	19E8	BA(0)	CA(15)	CDATA(15)	CDATA(41)	CDATA(12)	CDATA(18)	CHAPPLL(3)	CPUPLL(3)	12E1	6A8	6A8	6A8	6A8	6B1
6E8	12C8	21E1	19E8	AD(18)	9C1	7B1	7A8	7A8	7A8	7A8	9B1	6E1	21D1	12E1	12E1	12E1	12E1	12A1
12C8	17B8	A(25)	AD(30)	13E1	14B8	10A1	CDATA(14)	CDATA(55)	CDATA(62)	CDATA(6)	CHAPPLL(2)	CPUPLL(4)	21D1	D(18)	D(58)	D(53)	D(13)	DBGLB*
17B8	21E1	6E8	13E1	19E8	15A1	CA(12)	7A8	7A8	7A8	7A8	9B1	6E1	D(22)	6A8	6A8	6A8	6A8	12A8
A(27)	A(22)	12C8	AD(1)	AD(2)	16A1	7B1	10A8	10A8	10A8	10A8	11C1	9B1	12E1	12E1	12E1	12E1	12E1	17C8
6E8	6E8	17B8	13E1	13E1	21E1	10A1	CDATA(54)	CDATA(61)	CDATA(9)	CDATA(5)	CHAPPLL(1)	CPUPLL(1)	21D1	D(30)	D(48)	D(39)	D(21)	21B1
12C8	12C8	21E1	19E8	19E8	BA(1)	CA(11)	7A8	7A8	7A8	7A8	9B1	6E1	D(20)	6A8	6A8	6A8	6A8	DEVSEL*
17B8	17B8	A(24)	AD(28)	9C1	14B8	7B1	10A8	10A8	10A8	10A8	11C1	9B1	12E1	12E1	12E1	12E1	12E1	13C8
21E1	21E1	6E8	13E1	19E8	15A1	10A1	CDATA(51)	CDATA(9)	CDATA(4)	CHAPPLL(0:3)	CPUPLL(0)	6E1	21D1	D(62)	D(49)	D(19)	D(12)	19C1
A(28)	6E8	12C8	AD(31)	AD(9)	16A1	CA(8)	7A8	7A8	7A8	7A8	9B1	9B1	6A8	6A8	6A8	6A8	6A8	DP(6)
A(34)	6E8	17B8	13E1	19E8	21E1	7B1	10A8	10A8	10A8	10A8	11C1	11C1	12E1	12E1	12E1	12E1	12E1	6D8
6E8	12C8	21E1	AD(22)	AD(16)	BA(0:1)	10A1	CDATA(50)	CDATA(64)	CDATA(8)	CDATA(3)	CPUPLL(0:4)	CI*	21D1	D(4)	D(32)	D(16)	D(57)	12D8
12C8	17B8	A(8)	13E1	19E8	9C1	CA(4)	7A8	7A8	7A8	7A8	6E1	6C1	D(54)	6A8	6A8	6A8	6A8	DP(2)
21E1	A(21)	6E8	AD(8)	14B8	7B1	10A8	10A8	10A8	10A8	10A8	9B1	12A1	6A8	6A8	6A8	6A8	6A8	6D8
A(33)	6E8	17B8	13E1	15A1	10A1	10A8	10A8	10A8	10A8	10A8	9B1	21B1	6A8	6A8	6A8	6A8	6A8	12D8
6E8	12C8	21E1	19E8	16A1	10A1	10A8	10A8	10A8	10A8	10A8	9B1	21B1	6A8	6A8	6A8	6A8	6A8	12D8

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NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE	NET SH-ZONE
DP(7)	21E1	19D1	10E8	16A1	MA(13)	MD(4)	15E8	17C8	MD(60)	15E8	17C8	16A1	QACK*	SDCLK3	TS*	12B8
6D8	DQM(0:7)	IDSEL107	LACLK	18A8	14B8	14A1	16A8	MD(12)	14A1	16A8	MD(50)	MDP(0)	6B1	14D8	6B1	17B8
12D8	14A8	13E1	11C8	21E1	15A1	15E8	17C8	15E8	15E8	17C8	14A1	14D8	9D8	15A1	12A8	21C1
DP(4)	15A1	18A8	21D1	MA(9)	16A1	16A8	MD(13)	16A8	16A8	12E8	15E8	15E8	12E8	SDCLK4	17B8	VID(0)
6D8	21E1	INT*	LBCLAIM*	14B8	18A8	17C8	14A1	16A8	17C8	QREQ*	16A1	16A8	6B1	14D8	21D1	5C1
12D8	FLASH_LED*	6D1	12B8	15A1	21E1	MD(5)	15E8	17C8	MD(57)	16A8	MDP(5)	14D8	12E8	15A1	TSIZ(0)	9A1
DP(1)	17D2	17D8	17C8	16A1	MA(6)	14A1	16A8	MD(44)	14A1	15E8	16A1	MDP(1)	14D8	SDRAM_LED*	6C1	VID(4)
6D8	18C1	21B1	LBSO*(1)	18A8	14B8	17C8	17C8	MD(8)	14A1	15E8	16A8	15E8	16A1	17C2	12B8	5C1
12D8	FOE*	INTA*	17D2	21E1	15A1	MD(7)	14A1	15E8	16A8	MD(43)	17C8	16A8	16A1	18C1	17B8	9A1
DP(0)	14C8	11B1	18C1	MA(3)	16A1	16A8	14A1	17C8	17C8	14A1	MDP(1)	17C8	21E1	SDRAS*	21C1	VID(2)
6D8	16C1	13C8	LBSO*(0)	14B8	18A8	MD(7)	14A1	15E8	MD(56)	15E8	14D8	MD(18)	16A8	14C8	TSIZ(2)	5C1
12D8	18A8	IRDY*	17D2	15A1	21E1	14A1	17C8	16A8	16A8	17C8	15E8	14A1	17C8	17B2	6C1	9A1
DP(5)	21E1	13C8	18C1	16A1	MA(11)	15E8	17C8	MD(27)	MD(24)	15E8	16A1	15E8	21E1	21E1	12B8	VID(3)
6D8	FRAME*	19A8	LBSO*(3)	18A8	14B8	16A8	MD(17)	14A1	15E8	16A8	MD(40)	16A8	RCS0_OUT*	16C1	17B8	5C1
12D8	13C8	IRQ*(2)	17D2	21E1	15A1	17C8	14A1	15E8	16A8	14A1	15E8	MDP(2)	14D8	17C2	21C1	9A1
DP(3)	19C1	11B1	18C1	MA(9)	16A1	MD(17)	14A1	15E8	16A8	MD(38)	17C8	16A8	15E8	RCS1*	17B2	VID(1)
6D8	FX	19E8	LBSO*(2)	14B8	18A8	14A1	15E8	16A8	17C8	14A1	MDP(4)	16A1	14C8	SENSE_PCI*	6C1	5C1
12D8	17C2	IRQ*(1)	17D2	15A1	21E1	15E8	16A8	MD(23)	MD(25)	15E8	14D8	MD(46)	17B2	13C8	12B8	9A1
DP(0:7)	21B1	11B1	18C1	16A1	MA(13:0)	16A8	17C8	14A1	15E8	16A8	15E8	14A1	RCS1_OUT*	17B2	17B8	VID(4:0)
6D8	GBL*	19E8	LBSO*(0:3)	18A8	14B8	17C8	MD(30)	14A1	16A8	17C8	16E1	15E8	16E1	SERR*	21C1	5C1
12D8	6C1	IRQ*(3)	17D2	21E1	15A1	14A1	15E8	16A8	MD(37)	14A1	17C2	16A1	17C2	13C8	TSIZ(0:2)	9A1
DQM(7)	12A8	11B1	18C1	MA(1)	14B8	16A1	15E8	17C8	14A1	15E8	MDP(0:7)	16A8	RCS2*	19C8	6C1	WE*
14A8	21B1	19E8	LBSOPT(1)	14B8	18A8	18A8	16A8	MD(10)	14A1	15E8	14D8	17C8	14C8	STOP*	12B8	14D8
15A1	GNT_XREQ*(3)	IRQ*(0)	9A1	15A1	21E1	MCP*	MD(63)	17C8	15E8	16A8	15E8	MD(35)	17B2	13C8	17B8	15A1
21E1	13D8	11B1	17B2	16A1	6D1	17D8	14A1	14A1	16A8	17C8	16A1	14A1	REQ_XGNT*(1)	19C8	21C1	16C1
DQM(4)	19A8	IRQ*(0:3)	LBSOPT(0)	18A8	21E1	MD(2)	15E8	17C8	MD(34)	15E8	PAR	15E8	13D8	SYSCON*	TT(1)	21E1
14A8	GNT_XREQ*(0)	11B1	9A1	MA(2)	14B8	14A1	16A8	MD(19)	16A8	17C8	13C8	17C8	19E8	18B1	6B1	WT*
15A1	13D8	19E8	17B2	15A1	16A1	15E8	16A8	14A1	17C8	MD(33)	19C1	MD(42)	REQ_XGNT*(2)	19D8	12B8	6C1
21E1	19A8	IRQ*(3:0)	LBSOPT(0:1)	14B8	15A1	16A8	17C8	15E8	15E8	16A8	14A1	15E8	13D8	SYSRST*	17B8	12A8
DQM(5)	GNT_XREQ*(1)	19E8	9A1	15A1	16A1	MD(62)	14A1	15E8	16A8	17C8	MD(36)	16A8	19E8	17B2	21C1	21C1
14A8	13D8	L3CLK0	17B2	16A1	16A8	17C8	15E8	16A8	MD(21)	14A1	14A1	17C8	REQ_XGNT*(0)	19D8	TT(0)	
15A1	19A8	7D8	LOCK*	18A8	17C8	MD(1)	14A1	16A8	17C8	15E8	15E8	19B1	13D8	SYSRSTEN*	6B1	
21E1	GNT_XREQ*(2)	19C1	13C8	21E1	MD(0)	14A1	15E8	16A8	MD(33)	14A1	PCIRST*	11B1	19E8	9C1	12B8	
DQM(3)	13D8	L3CLK1	19A8	MA(12)	14A1	15E8	16A8	17C8	15E8	16A8	16A8	16E1	REQ_XGNT*(3)	17B2	17B8	
14A8	19A8	7D8	M66EN	14B8	15E8	16A8	MD(32)	14A1	16A8	17C8	MD(54)	17D2	13D8	TA*	21C1	
15A1	GNT_XREQ*(0:3)	19E1	9C1	15A1	16A8	17C8	15E8	16A8	MD(15)	15E8	14A1	19D1	19E8	6C1	TT(2)	
21E1	13D8	L3CNTL0	19D1	16A1	17C8	MD(6)	14A1	16A8	17C8	PCI_LED*	REQ_XGNT*(0:3)	12A1	6B1			
DQM(6)	19A8	7C8	MA(10)	14B8	18A8	21E1	MD(0)	14A1	15E8	16A8	MD(0:63)	17D2	13D8	17C8	12B8	
14A8	HV_HRST*	L3CNTL1	15A1	16A1	MA(4)	15E8	16A8	17C8	MD(41)	14A1	15E8	18C1	19E8	21C1	17B8	
15A1	11B1	7D8	16A1	18A8	14B8	16A8	17C8	MD(55)	15E8	16A8	14A1	PERR*	ROMSEL	TBST*	21C1	
21E1	17B2	19E1	18A8	21E1	15A1	17C8	MD(59)	14A1	15E8	16A8	MD(22)	15E8	13C8	9C1	TT(4)	
DQM(0)	HV_INT*	L3ECLK0	21E1	MA(7)	16A1	MD(6)	14A1	15E8	MD(9)	16A8	14A1	16A8	19D1	17C2	6B1	
14A8	11B1	7D8	MA(7)	14B8	21E1	15E8	16A8	17C8	14A1	17C8	15E8	17C8	PGOOD	SDCAS*	12B8	
15A1	HV_MCP*	L3ECLK1	14B8	MA(5)	14B8	MD(3)	14A1	15E8	MD(61)	16A8	16A8	MDP(6)	5B1	14C8	17B8	
21E1	11B1	7D8	15A1	17C8	14A1	15E8	16A8	17C8	14A1	17C8	17C8	14D8	18E1	15A1	21C1	
DQM(2)	17B2	19E8	16A1	MD(3)	14A1	15E8	16A8	MD(31)	14A1	15E8	MD(20)	15E8	PMCTYPE	21E1	TT(3)	
14A8	HV_SRST*	L3ECLK2	19A8	14A1	15E8	16A8	17C8	14A1	15E8	16A8	14A1	16A8	9C1	SDCLK1	6B1	
15A1	11B1	7D8	21E1	16A1	15E8	16A8	MD(14)	14A1	15E8	16A8	MD(52)	17C8	19A1	12A8	12B8	
21E1	17B2	19E8	MA(8)	18A8	16A8	17C8	14A1	15E8	16A8	17C8	14A1	14D8	PROGSEL	21C1	17B8	
DQM(1)	IDSEL	19E8	14B8	21E1	17C8	MD(14)	14A1	15E8	MD(47)	15E8	MD(51)	15A1	9C1	SDCLK2	21C1	
14A8	18B1	L3ECLK3	15A1			14A1	16A8	14A1	16A8	16A8	MDP(3)	17B2	14D8	13C8	TT(3:4)	
15A1		7D8									14D8		15A1	19D1	6B1	
											15E8					

REFDES	GND	OVDD	VCC_3.3
J1 J3 J5 J6 J7 RN1 RN2 RN4 RN9 RN15 RN12 RN13 RN14 RN16 RN17 RN18 RN19 U1 U2 U3 U4 U5 U6 U7 U8 U9 U12 U15 U16 U17 U18	39 40 41 42 43 4 54 52 46 41 28 12 6 27 46 11 26 38 43 59 74 86 95 C3 C6 C9 C12 C15 C18 C21 C23 E3 F6 F10 F16 F20 F23 G8 G11 G13 G15 G18 H3 H7 H19 J23 K6 K20 L3 L7 L19 M23 N7 N19 P3 R7 R19 R23 T6 T20 U3 V7 Y19 V23 W8 W11 W13 W15 W18 Y3 Y6 Y10 Y16 Y19 Y20 AA21 AB22 AC3 AC5 AC8 AC11 AC14 AC17 AC20 AC23 AD24 AE25 A22 B12 B14 B16 B18 B20 C21 D13 D15 D17 D19 E21 F10 F12 F14 F16 F19 G17 G21 H13 H15 H19 J17 J21 K15 K19 L17 L21 M19 N17 N21 P15 P19 R17 R21 T15 T19 U17 U21 V19 W17 W21 Y20 AB22 J10 J12 J14 K9 K11 K13 L10 L12 L14 M9 M11 M13 N10 N12 N14 P9 P11 P13 B1 B5 C3 C9 D7 E2 E5 G4 G7 H5 J3 K5 M3 M6 P3 T4 T7 T9 T13 V2 V5 V8 V12 V15 W7 Y3 Y9 Y13 Y15 AA5 AA17 AB1 C1 A1 E1 G1 J1 L1 N1 R1 U1 E3 G3 J3 L3 N3 B4 D4 G4 K4 P4 T4 B6 D6 G6 K6 P6 T6 E7 G7 J7 L7 N7 A9 C9 E9 G9 J9 L9 N9 R9 U9	9 10 39 91	9 10 8 49 43 27 14 9 3 1 37

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REFDES	SH-ZONE
AS1	14C4

REFDES	SH-ZONE
C1	15C2
C2	15D2
C3	15B2
C4	15D2
C5	15D2
C6	16B5
C7	5C6
C8	5C6
C9	15C2
C10	16D5
C11	15C2
C12	15C2
C13	15D2
C14	15D2
C15	5C6
C16	5C7
C17	5C7
C18	17B3
C19	5E6
C20	17B6
C21	17B4
C22	5E6
C23	5E6
C24	5E7
C25	5E7
C26	17B6
C27	17B4
C28	13A2
C29	13C4
C30	17B5
C31	17B6
C32	13D4
C33	13B4
C34	13C4
C35	8D6
C36	8E6
C37	8E6
C38	8E6
C39	5D6
C40	5D6
C41	8C6
C42	13B5
C43	13B5
C44	13A2
C45	8C4
C46	8E6

REFDES	SH-ZONE
C47	8D6
C48	8D6
C49	10B2
C50	10A2
C51	10B2
C52	10B2
C53	5D6
C54	5D7
C55	5D7
C56	13B4
C57	13B2
C58	13B4
C59	8C6
C60	8D6
C61	13B2
C62	13B4
C63	13B2
C64	13C4
C65	10A2
C66	8E6
C67	13B4
C68	8B4
C69	8B6
C70	8E6
C71	13D4
C72	13B2
C73	10A5
C74	13C2
C75	13B2
C76	8B4
C77	8B6
C78	13C2
C79	10B2
C80	8B4
C81	8B4
C82	8B4
C83	8C6
C84	8B6
C85	8B6
C86	8B6
C87	8B6
C88	8D6
C89	8D6
C90	8D6
C91	8D6
C92	13B2
C93	13B2
C94	10C2
C95	8C4
C96	8C6
C97	10B5

REFDES	SH-ZONE
C98	8B6
C99	13C2
C100	7D3
C101	10B5
C102	8B4
C103	8B6
C104	5B1
C105	8C4
C106	7D3
C107	19D2
C108	8B4
C109	5B3
C110	19A5
C111	8C4
C112	8B4
C113	5B1
C114	10B5
C115	8B4
C116	8B4
C117	5B1
C118	10B5
C119	13C2
C120	13B2
C121	5C3
C122	5B6
C123	5B5
C124	13A5
C125	13A5
C126	5B3
C127	8B6
C128	8B6
C129	5A2
C130	5A3
C131	5B7
C132	5B6
C133	5B7
C134	5B6
C135	5B3
C136	5B8
C137	5B7
C138	5A2
C139	5A2
C140	5A3

REFDES	SH-ZONE
CO1	6D3
CO2	11C5

REFDES	SH-ZONE
CR1	5A3
CR2	5B5

REFDES	SH-ZONE
CS1	14C4

REFDES	SH-ZONE
D1	18D6
D2	18D6
D3	18D6
D4	18D5
D5	18D5
D6	18D5
D7	18D4
D8	18D4

REFDES	SH-ZONE
DRD1	6C3

REFDES	SH-ZONE
GO1	6D3
GO2	11C5

REFDES	SH-ZONE
HIT1	6D3

REFDES	SH-ZONE
HPR1	6B3

REFDES	SH-ZONE
IDP1	11D6

REFDES	SH-ZONE
J1	21D8
J2	17E6
J3	21D5
J4	5D2
J5	21D6
J6	21D2
J7	21D4
J8	9E4

REFDES	SH-ZONE
L1	5B5

REFDES	SH-ZONE
P1	19D3
P2	19D6
P3	20D3

REFDES	SH-ZONE
P11	6A4

REFDES	SH-ZONE
PO1	6A4

REFDES	SH-ZONE
Q1	5B4
Q2	5B4
Q3	5B4
Q4	5B4

REFDES	SH-ZONE
R1	18D6
R2	18D6
R3	18D6
R4	18D5
R5	18D5
R6	18D5
R7	18D4
R8	18D4
R9	18D3
R10	18D3
R11	18D2
R12	18D2
R13	18B6
R14	18B6
R15	18B6
R16	18B6
R17	18B6
R18	18B6
R19	18B5
R20	18B7
R21	18B5
R22	15C7
R23	17E6
R24	18A3
R25	5C5
R26	18A3
R27	5D5
R28	14D6
R29	6A4
R30	6A4
R31	6A4
R32	6A5
R33	11D5
R34	11D6
R35	5E7
R36	5D7
R37	6A4
R38	6A5
R39	6A5
R40	6A4
R41	14E6
R42	14E7
R43	14D6
R44	5E5
R45	14D5
R46	14B6
R47	14D6
R48	13C7
R49	9C4
R50	9C4
R51	9C4
R52	9C4
R53	5E5
R54	6A4
R55	5D5
R56	19A2
R57	19B2
R58	5D5
R59	13A5
R60	7D6
R61	14E6
R62	14D6
R63	19C7
R64	9A3
R65	9A3
R66	9A2
R67	9A2
R68	9A2
R69	19C2
R70	19E6
R71	10C2
R72	11C6
R73	11C6
R74	6A2
R75	11B3
R76	19D2
R77	11C3
R78	6B5
R79	19D2
R80	11C3
R81	5A2
R82	5A2
R83	7D3
R84	5A2
R85	7D6
R86	5B2
R87	5C2
R88	5C3
R89	5B2
R90	13A5
R91	19C5
R92	19C2
R93	5B3
R94	8D5
R95	7C2
R96	6E7
R97	6C2
R98	6C2
R99	6C2
R100	6C2
R101	11C6
R102	6E4
R103	6E7
R104	6E6
R105	6E5
R106	6E7
R107	9E4
R108	5C4
R109	9D4

REFDES	SH-ZONE
RN1	11A4
RN1	9C2
RN1	9C3
RN1	9C3
RN1	9C3
RN1	9C3
RN1	11A4
RN1	9C2
RN2	9B3
RN2	9B3
RN2	9A3
RN3	14A6
RN4	17D5
RN4	9B3
RN4	17E6
RN4	9B3
RN4	17D5
RN4	17E6
RN4	17E6
RN5	14B5
RN6	14B5
RN7	14C5
RN8	14C5
RN9	13C6
RN9	9C3
RN9	9A3
RN9	16C4
RN9	18A2
RN9	18A7
RN9	18A3
RN9	9C2
RN10	14A6
RN11	14D6
RN12	6A2
RN12	6A2
RN12	6A2
RN12	6A2
RN12	6A2
RN12	6A2
RN12	6A2
RN13	9A3
RN13	9B3
RN13	9B2
RN13	9B2
RN14	6A3
RN14	6A3
RN14	6A3
RN14	6A3
RN14	6A3
RN14	6A3

REFDES	SH-ZONE
RN15	11A5
RN15	11A5
RN15	11A5
RN15	11A5
RN15	11A4
RN15	11A4
RN15	11A4
RN15	11A5
RN16	6A3
RN16	9D3
RN16	6A3
RN16	9B2
RN16	6E5
RN16	6A3
RN16	6A3
RN17	6A3
RN17	12A5
RN17	6A3
RN17	6A3
RN17	6A3
RN17	6A3
RN17	12A5
RN18	6E4
RN18	6A4
RN18	6A4
RN18	6A4
RN18	6E4
RN18	6A4
RN19	9D3
RN19	9D3
RN19	9D4
RN19	9D3
RN19	9D3
RN19	9D4
RN19	9D3

REFDES	SH-ZONE
SDP1	11D7

REFDES	SH-ZONE
SH1	6C3
SH2	6C3

REFDES	SH-ZONE
SHO1	6C3

REFDES	SH-ZONE
SW1	9C3
SW2	9B3
SW3	9B3

REFDES	SH-ZONE
SYS1	18D3
SYS2	18D3
SYS3	18D2
SYS4	18D2

REFDES	SH-ZONE
T1	6D3

REFDES	SH-ZONE
TI1	11C5
TI2	11D4

REFDES	SH-ZONE
TK1	11C4

REFDES	SH-ZONE
TM1	11C4

REFDES	SH-ZONE
TO1	11C5
TO2	11D4

REFDES	SH-ZONE
TP1	21D2
TP2	21C2
TP3	21B2
TP4	21B2
TP5	21B2
TP6	21B2
TP7	21B2
TP8	21B2

REFDES	SH-ZONE
U1	11D6
U2	11D7
U3	15C5
U4	15C7
U5	15C3
U6	15E3
U7	15E5
U8	16C3
U9	16E3
U10	5C5
U11	18B3
U12	17D4
U13	5E5
U14	5D5
U15	12E4
U15	14E3
U15	11D4
U15	13E5
U15	13D3
U16	6D4
U16	8D5
U16	7D3
U17	10D3
U18	10D5
U19	5C2

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