

# *Unity X4\**

**MPMC8240**  
**MPMC8245**

**intelligence**  **everywhere**

**digital dna\***

**Schematic Notes**

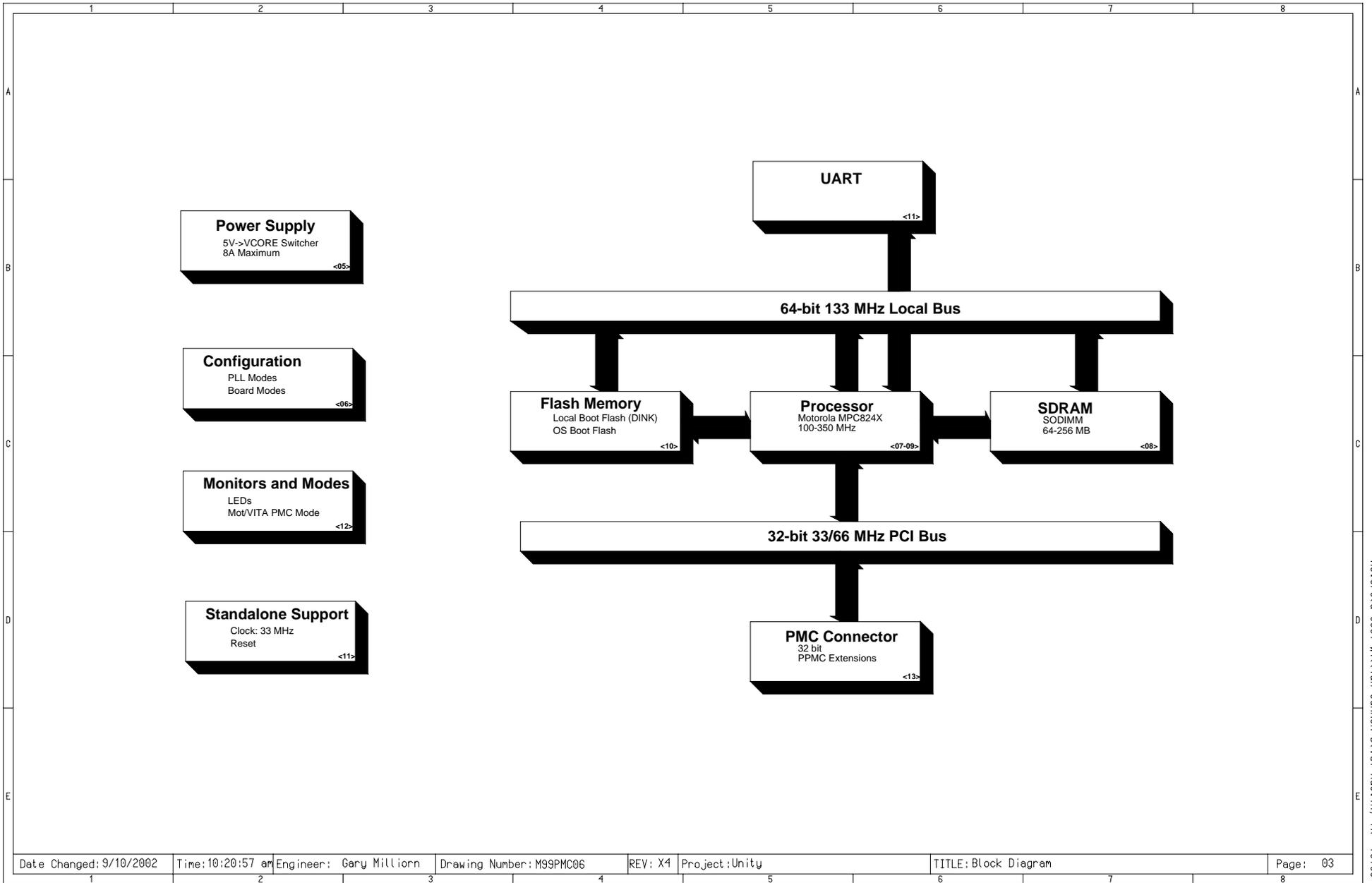
1. Unless otherwise specified:  
 All resistors are SMD0603, in ohms, 0.08W, +/-5%  
 All capacitors are SMD0603, in microfarads (uF), +/-20%.  
 All inductances are in microhenries (uH).  
 All ferrites are Z=50 ohms at 100 MHz.  
 All fuses are self-resetting polyswitch (PTC) devices.  
 Board impedance is 50-60 ohms.
2. Integrated circuits have default connections to power and ground unless explicitly shown otherwise. Global power connections are:  
 GND            VCC\_2.5V  
 VCC\_3.3V      VCORE  
 VCC\_5V
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. I've got good news! That gun you like is going to come back in style. All rights reserved.
5. The sheet-to-sheet cross reference format is:  
 Sheet -> VertZoneLetter HorizZoneNumber
6. Components with the label "No\_stuff" are not to be installed by default; they are for test or manufacturing purposes only.  
  

7. Most buses are big-endian (0 = MSB) and are indicated by declaring the bus name starting with the '0' element (i.e. A(0:31)). PCI and memory buses MAY be little-endian, and if so, are indicated with the MSB as the largest-numbered element first (i.e. AD(31:0)).
8. Components with the label "IF\_MPC8240" are only installed on UnityX4 with the MPC8240 processor, that is an MPMC8240. Components with the label "IF\_MPC8245" are only installed on UnityX4 with the MPC8245 processor, that is an MPMC8245.

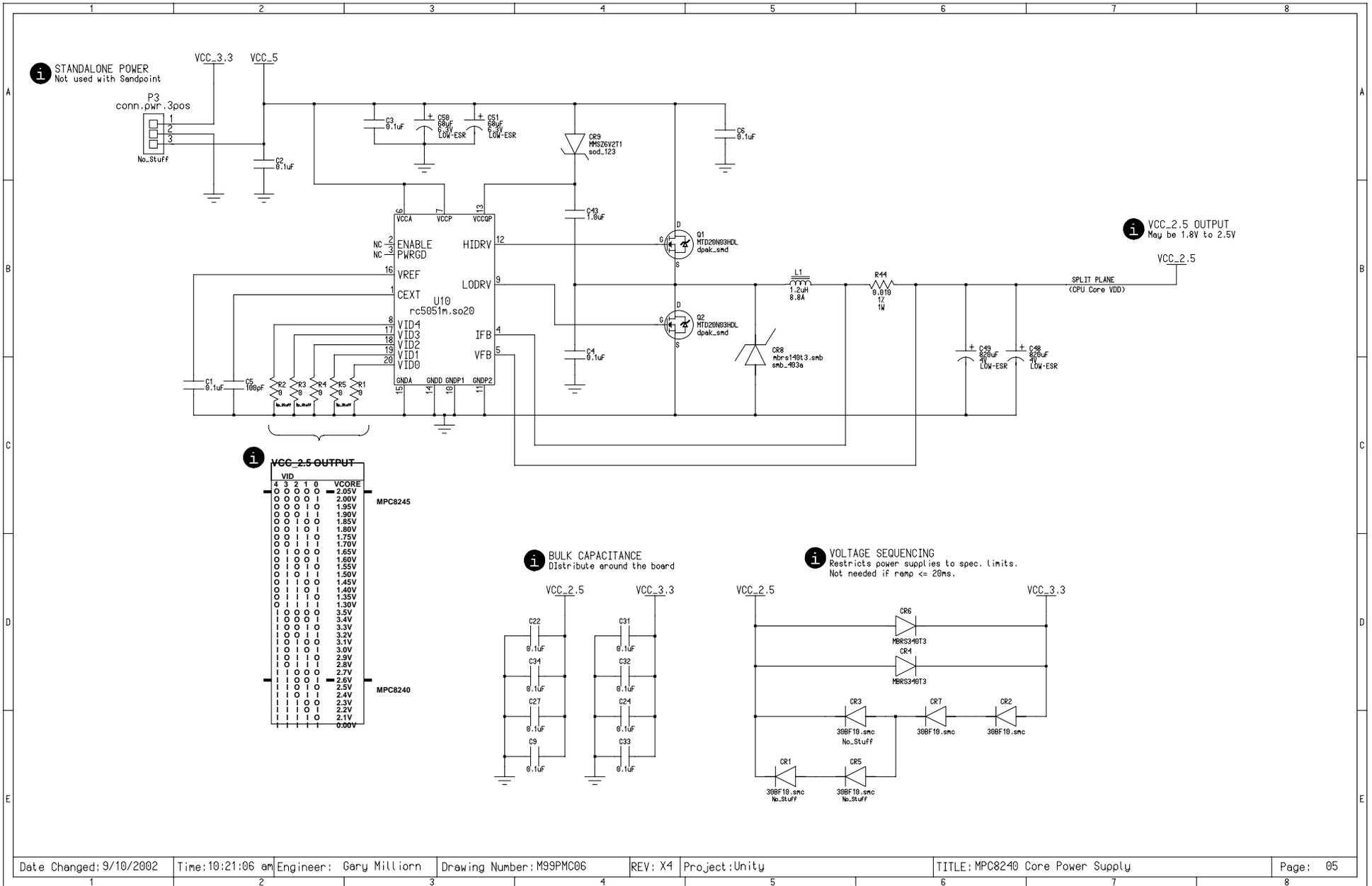
# Unity X4\*

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07	MPC8240 System Interface; I2C
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09	MPC8240 PCI Interface; Power
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11	UART; Standalone Support
12	Miscellany; LEDs; Mode Mux
13	PMC Connectors P1, P2

REV	DATE	CHANGES
X1	98APR22	Original
X2	98OCT04	Chip pinout changes; COP tweak.
X3	99OCT20	MPC8240 II Support; VITA PPMC changes; More Flash; I2C; Delete debug headers
X4	00FEB22	PCB Changes only.



1	2	3	4	5	6	7	8						
A	<h3>Layout/Routing Instructions</h3> <p><b>05</b> Use split power plane to connect VCC_2.5 from power supply to CPU core. Place 820 uF low-ESR capacitors near CPU. Place VID pulldown resistors in order shown. Use split power plane or very heavy traces for power path: +5V =&gt; MOSFET Qx =&gt; Inductor Lx =&gt; Low-Ohm Res. Rx =&gt; VCC_2.5 Plane Keep trace from 68 uF low-ESR capacitors within 2 cm of high-side MOSFET (Q2). Keep MOSFET gate drive lines &lt; 2 cm. Keep VCCA/VCCP attachment within 2 cm of input filter location. Keep VCC_2.5 power flowing point-to-point through MOSFETs, inductor, resistor and output filter capacitors. Use short traces throughout.</p> <p><b>06</b> Place slide switches in vertical orientation and do not swap PLL config pins.</p> <p><b>07</b> No special restrictions</p> <p><b>08</b> Place series termination resistors very near source, &lt; 1.5 cm. Route terminated traces using equal trace lengths towards SDRAM array. Route SDRAM_SYNC_OUT =&gt; SDRAM_SYNC_IN path to equal longest clock trace and add additional trace length per MPC8245 HW Spec. Route all control, address and data traces to equal lengths.</p> <p><b>09</b> Place PLL filters on bottom of PCB beneath MPC8240 Use short heavy traces on PLL filter power. Surround MPC8240 with bypass caps shown to provide additional ground-return paths; use two ground-attach vias. Place bulk capacitance near BGA IVDD and +3.3V ground planes.</p> <p><b>10</b> Place SODIMM socket within 3.5cm of MPC6xx (center-to-center).</p> <p><b>11</b> No special instructions.</p> <p><b>12</b> Place LEDs so they are visible on the top and legends are nearby.</p> <p><b>13</b> Maximum trace length for PCI signals to MPC8240 is 1.5" per the PCI specification.</p>							B	C	D	E	A	B
C								C	D	E	A	B	C
Date Changed: 9/10/2002	Time: 10:21:02 am	Engineer: Gary Milliom	Drawing Number: M99PMC06	REV: X3	Project: Unity	TITLE: Placement and Routing Instructions	Page: 04						
1	2	3	4	5	6	7	8						



**i** STANDBY POWER  
Not used with Sandpoint

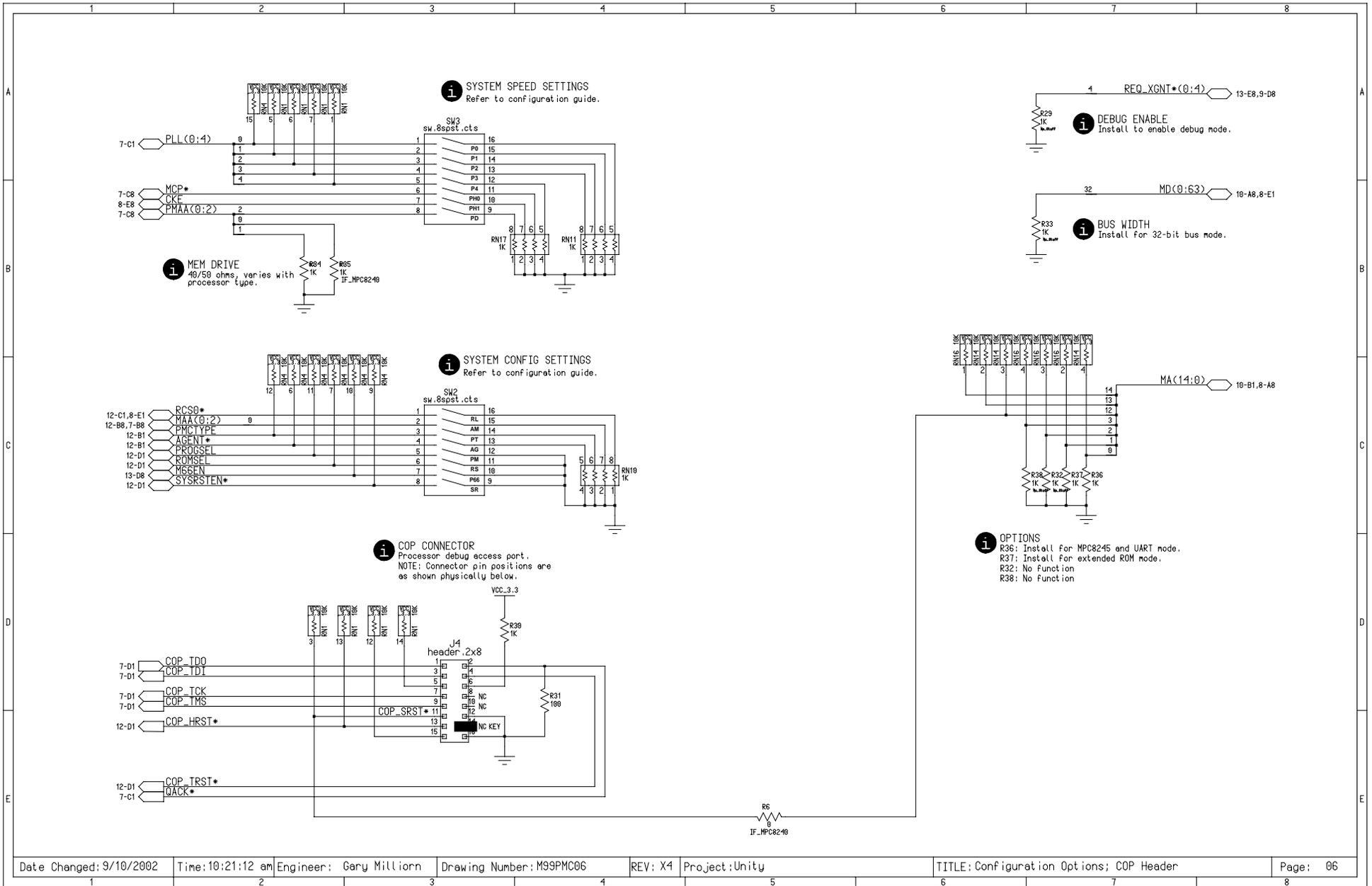
**i** VCC\_2.5 OUTPUT  
May be 1.8V to 2.5V

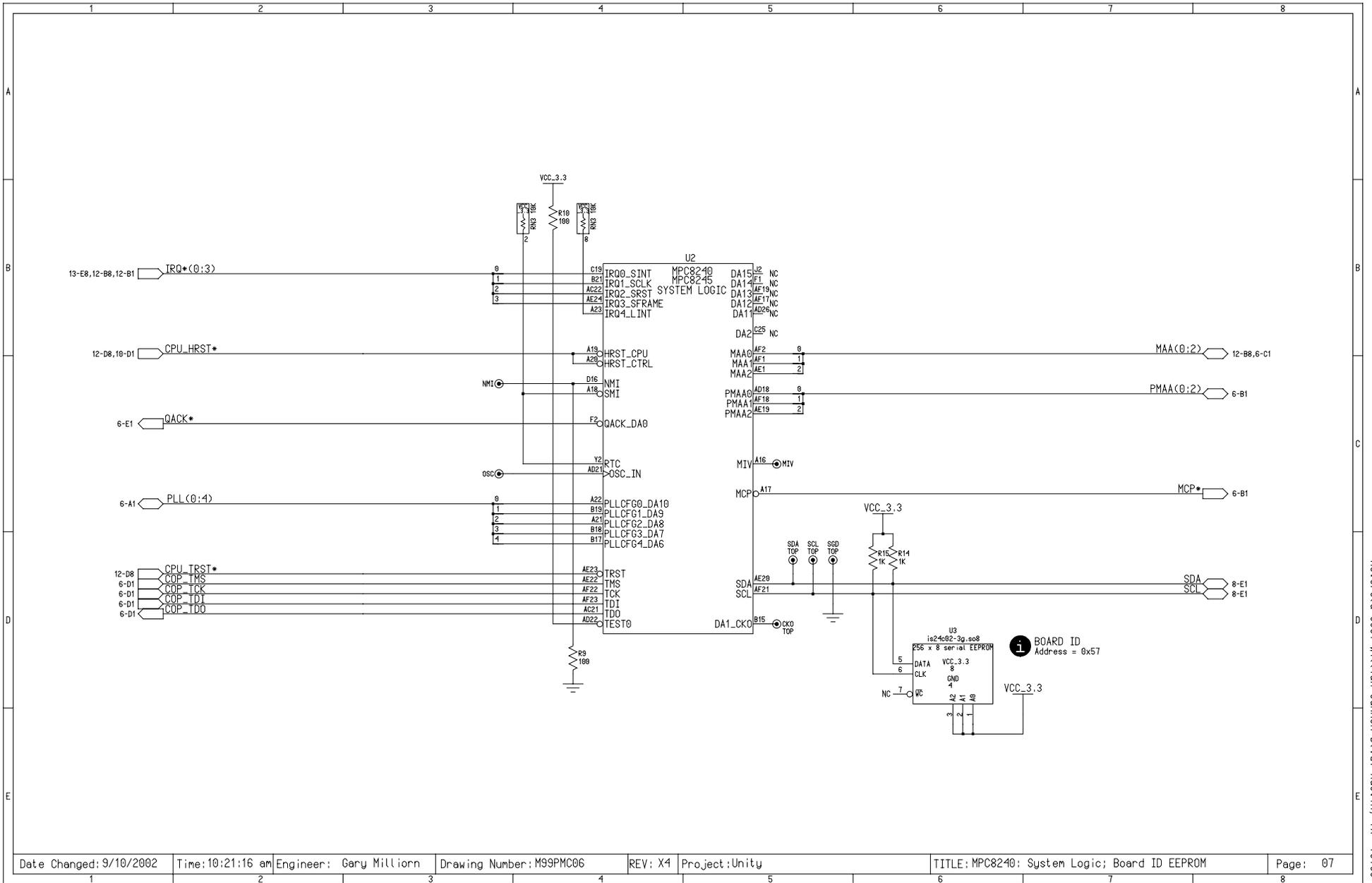
**i** VCC\_2.5 OUTPUT

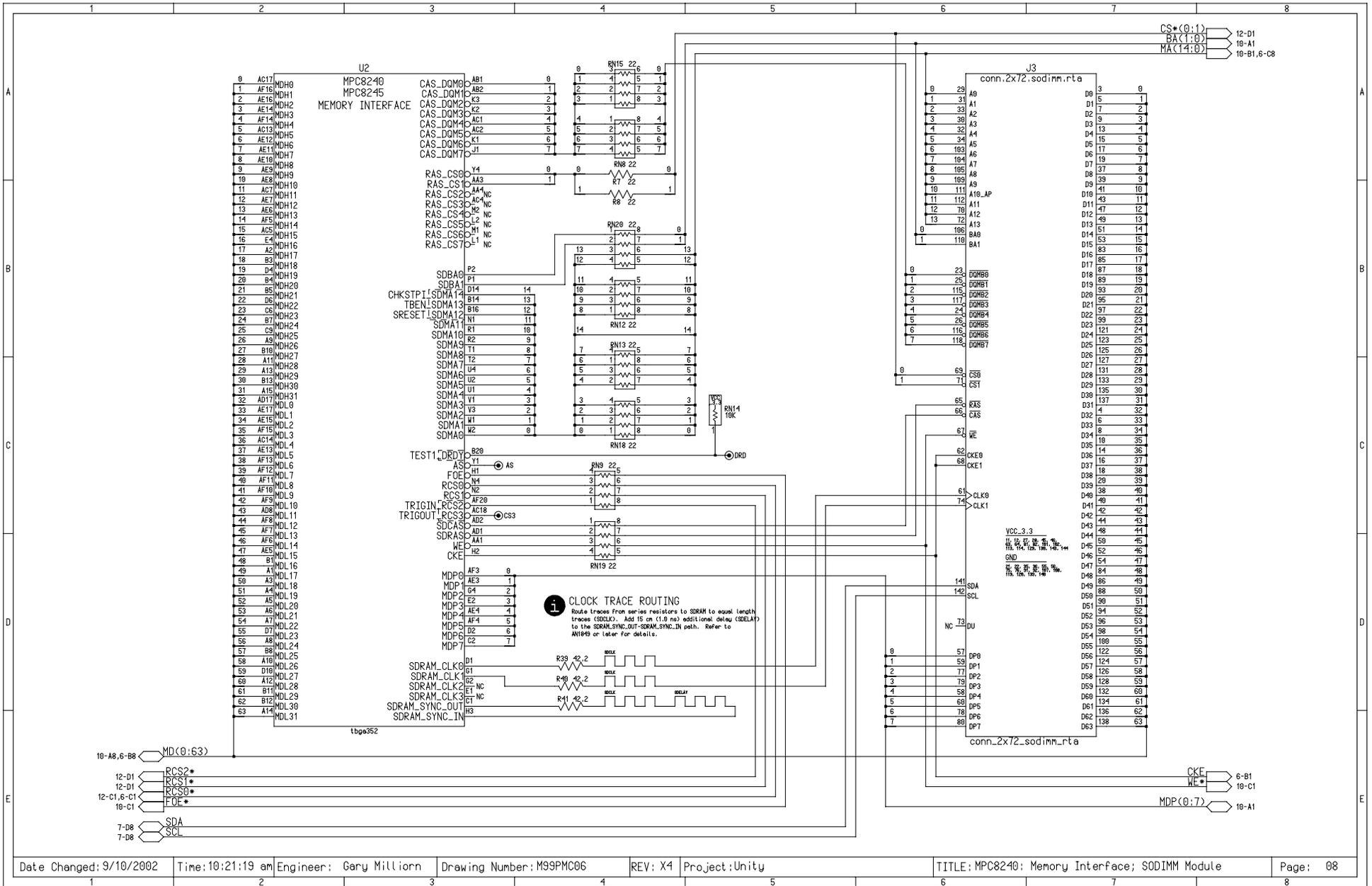
VID	VCORE
0	2.05V
0	2.00V
0	1.95V
0	1.90V
0	1.85V
0	1.80V
0	1.75V
0	1.70V
0	1.65V
0	1.60V
0	1.55V
0	1.50V
0	1.45V
0	1.40V
0	1.35V
0	1.30V
0	3.5V
0	3.4V
0	3.3V
0	3.2V
0	3.1V
0	3.0V
0	2.9V
0	2.8V
0	2.7V
0	2.6V
0	2.5V
0	2.4V
0	2.3V
0	2.2V
0	2.1V
0	0.00V

**i** BULK CAPACITANCE  
Distribute around the board

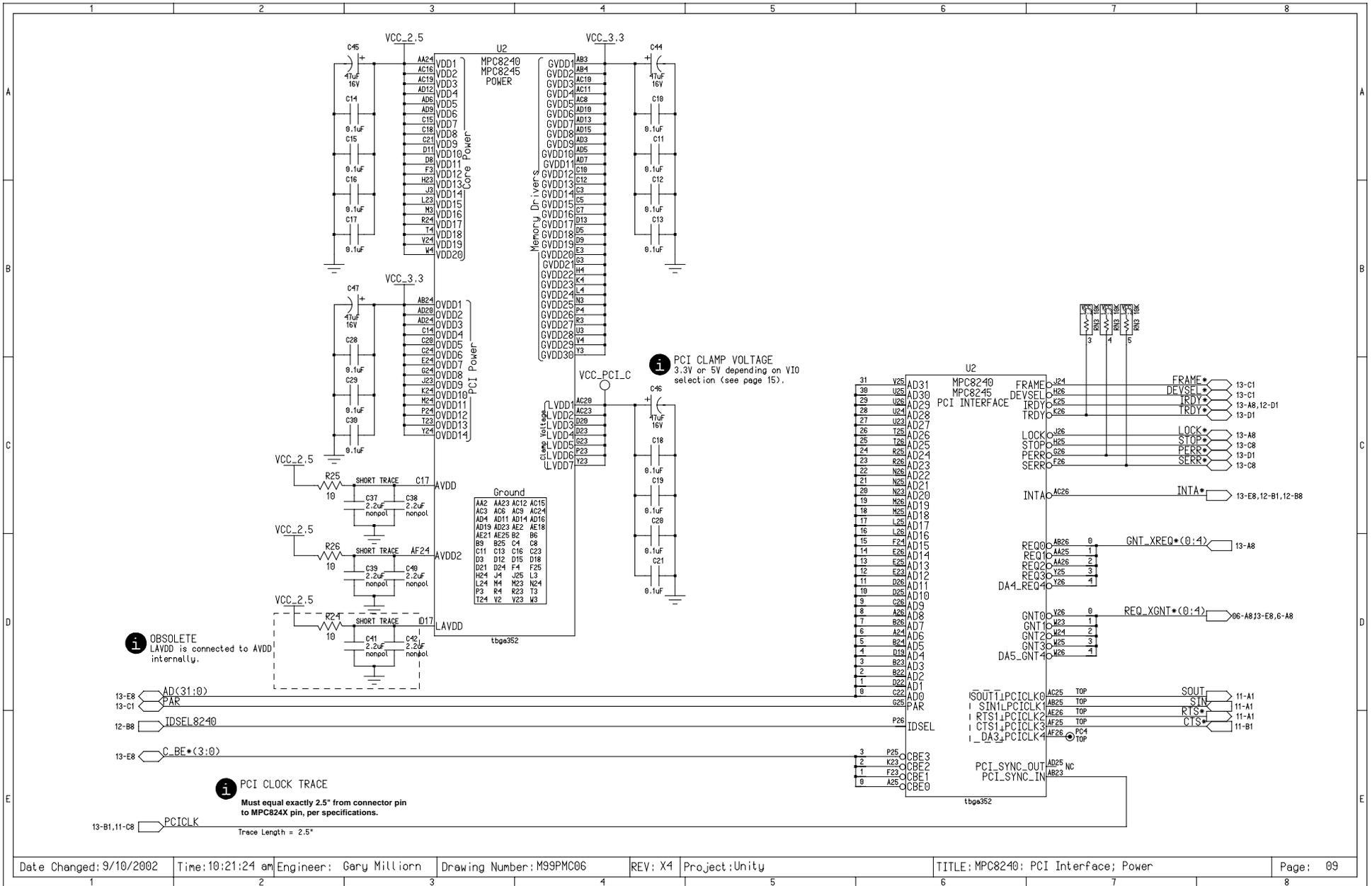
**i** VOLTAGE SEQUENCING  
Restricts power supplies to spec. limits.  
Not needed if ramp <= 20ms.

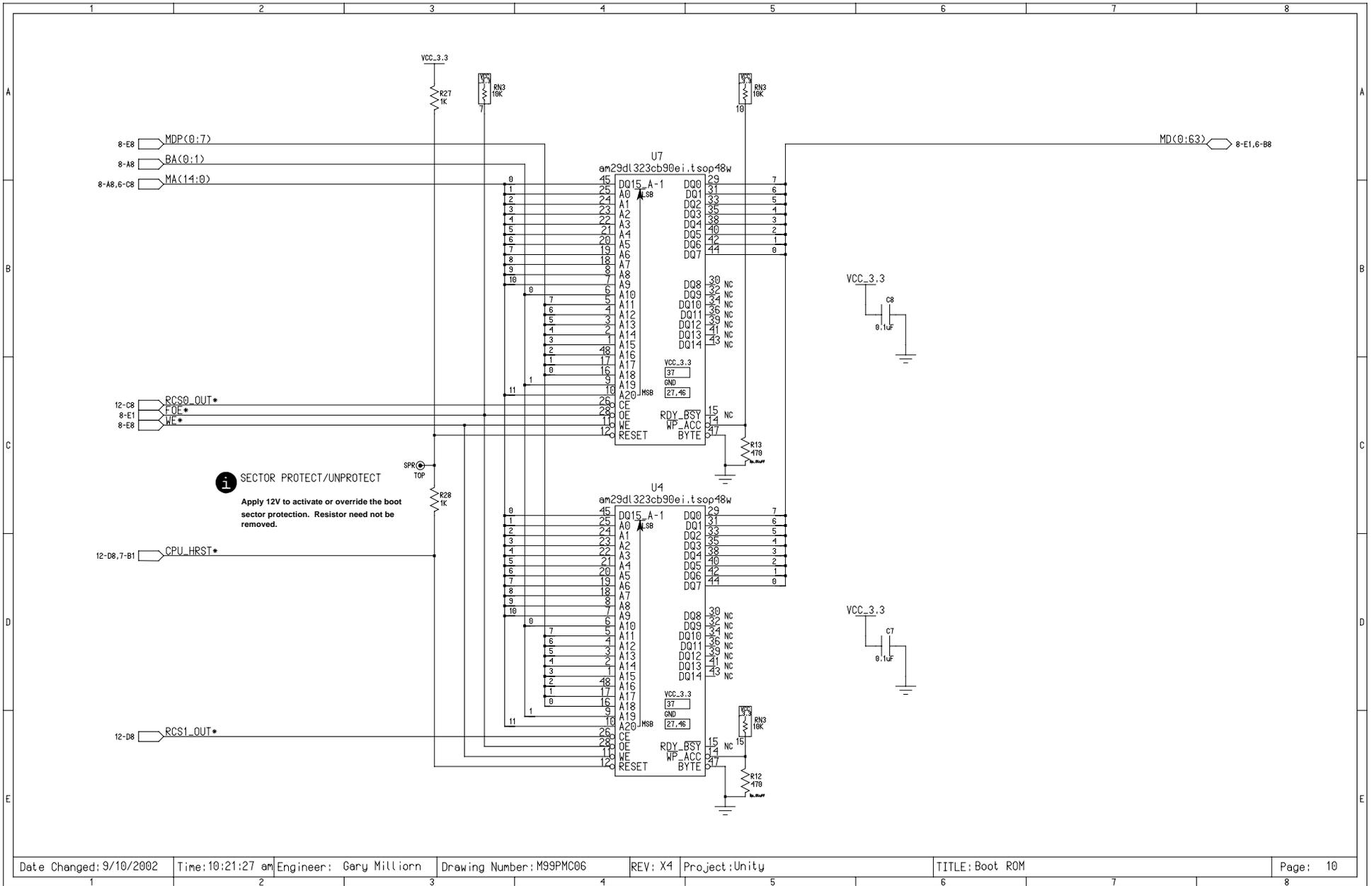


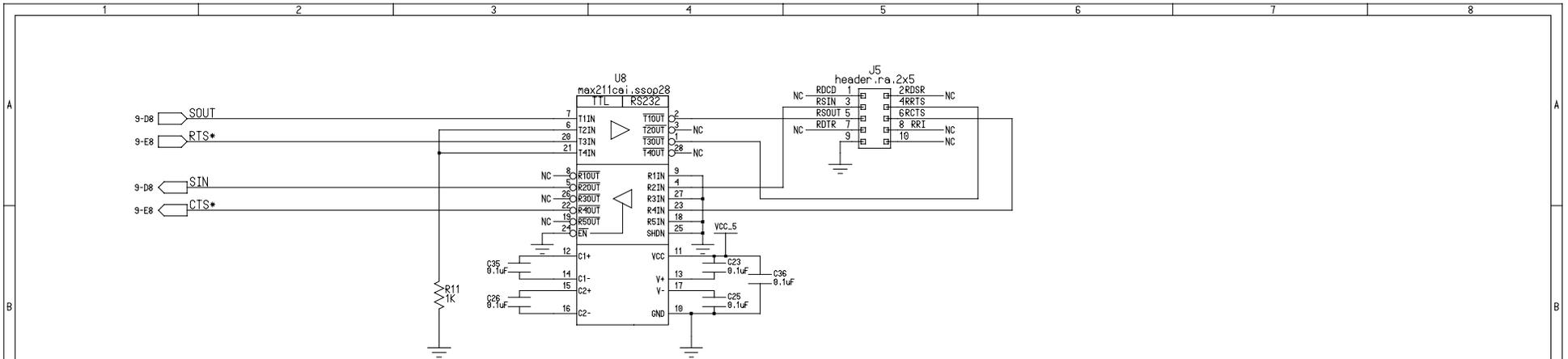




Motorola 6501 Milliam Cannon Blvd., Austin, TX 78735







**STANDALONE CLOCK**  
Install oscillator or socket for stand-alone operation.



**STANDALONE RESET**  
Local reset for stand-alone mode.



