



NetSC520 Demonstration Board Schematics

Elan™SC520 Microcontroller Demonstration Board With On-Board
Am79C973 10/100Mbps Ethernet and PC/104 and PC/104+ Expansion

27 SEPTEMBER 2000

NetSC520_Rev10.DSN

Schematic: 7200070-001
PC-Board: 1000070-001
Assembly: 0100070-001

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Title	NetSC520 Demonstration Board	
Size	Document Number	Rev
C	COVER	1.0
Date:	Wednesday, January 10, 2001	Sheet 1 of 14

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Pre-release Revisions

Rev 0.3 -- Original Release For Review

Rev 0.4 -- Original Release For PC-Board CAD and Build Services
 Deleted RN1, R42, R43
 Flipped RN2-5 180degrees to facilitate PC-Board Routing

Rev 0.5 -- 2nd CAD Release
 Deleted Resistor SIPs [RP5-7,RP13] and changed to SMD R-Packs [RN13-19]
 Deleted R3; C25,49-51,65-68,76-78,113-115,24,52,53,69,70; and TC6,15,23,27; and 2mm Jumpers Z12,13
 Added AMD P/N and Siliconhills parttype to all schematic components
 Changed J8 to match existng AMD P/N
 Changed J4 to newer 1241-120G2 part number
 Changed power supply resistor values to standard 1% values:
 R61,63,67=4.99K, 1%;
 R62=5.36K, 1%;
 R66=1.82K, 1%;
 R60=165, 1%

Added Pre-Release Revision Information

Added Testpoints [TP10-13] to unused SC520 pins [Sheet 4]

Added PCICLK0 offsheet connection [Sheet 9]

Revised Block Diagram [Sheet 3]

Corrected some part number errors

Fixed a net name error on Sheet 13; corrected net is PONLED2_5

Swapped signals on R-PAKs and R-NETs to facilitate PC-Board routing

Added Interplane Capacitors Between VCC12-VCC5 and VCC3-VCC_CPU Split Power Planes

Post-release Revisions

Rev 1.0 -- 1st Board Respin

Added 1.5K pullup to CFG2 [sheet 4 and 12]

Fixed RESET switch pinout error [sheet 14]

Removed pullups from GPA[0..25] bus [sheet 8]

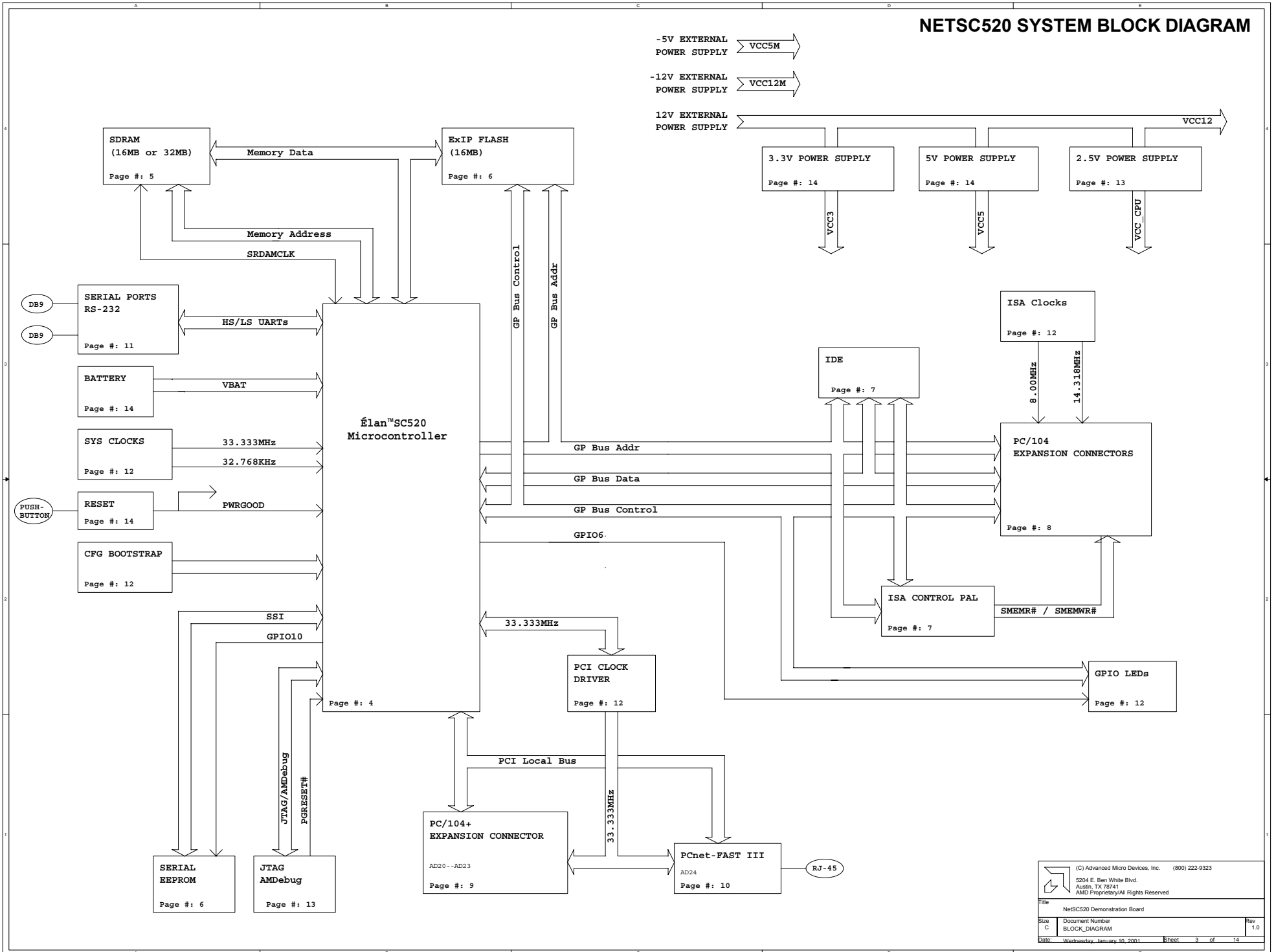
Made LEDs (vs GPIRQx) default population option and R58 a no-pop [sheet 13]

Fixed Ethernet SEEPROM wiring error [sheet 10]

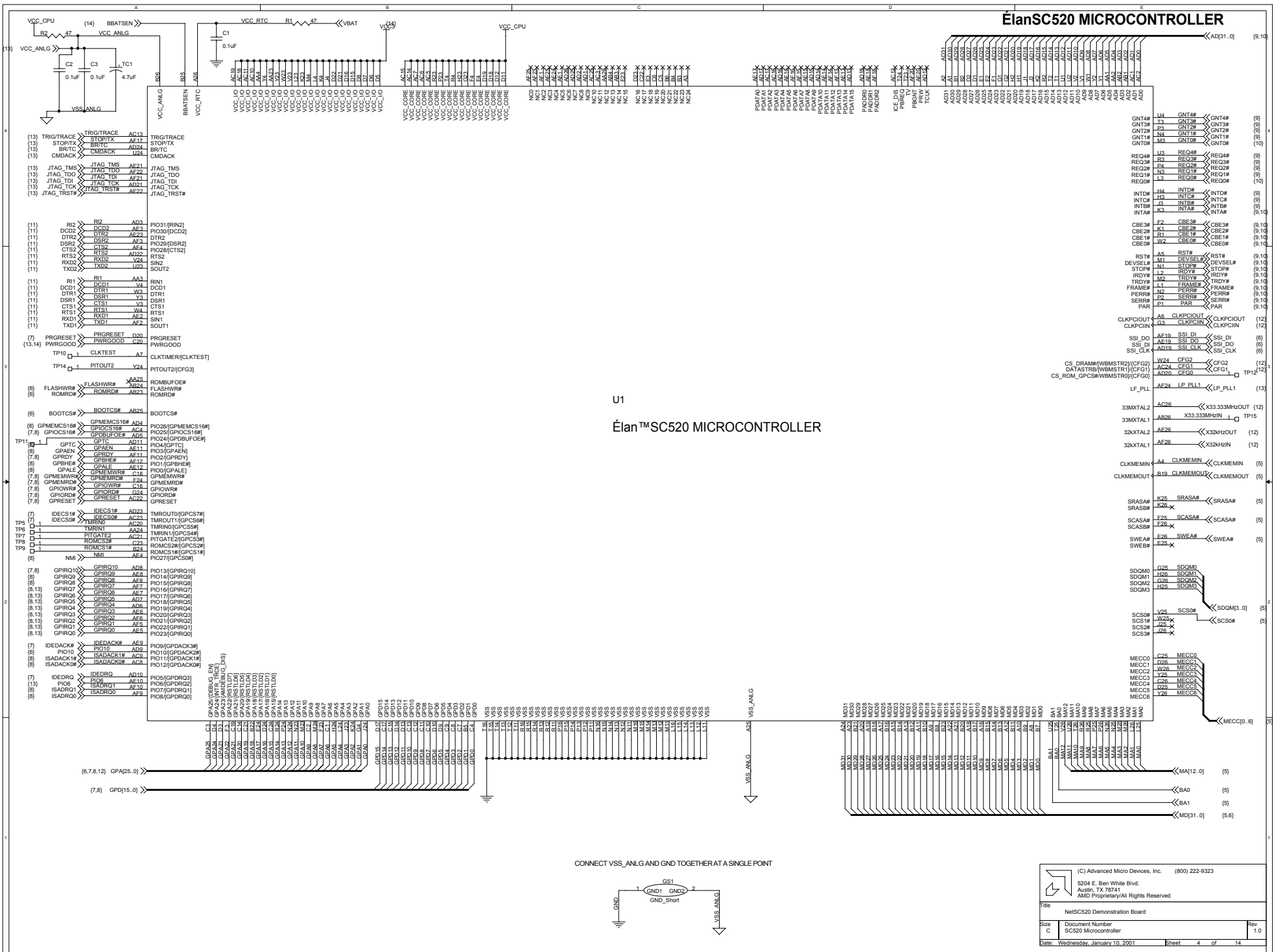
Replaces xtal/osc dual footprint with an oscillator only footprint with added enable pin support [sheet 12]

Cleaned-up some text typos and changes IDE Header Part Number [sheets 7, 9, and 10]

NETSC520 SYSTEM BLOCK DIAGRAM



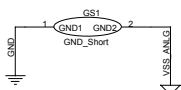
ElanSC520 MICROCONTROLLER



U1

Elan™SC520 MICROCONTROLLER

CONNECT VSS_ANLG AND GND TOGETHER AT A SINGLE POINT



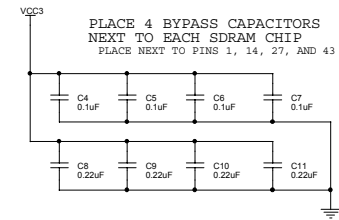
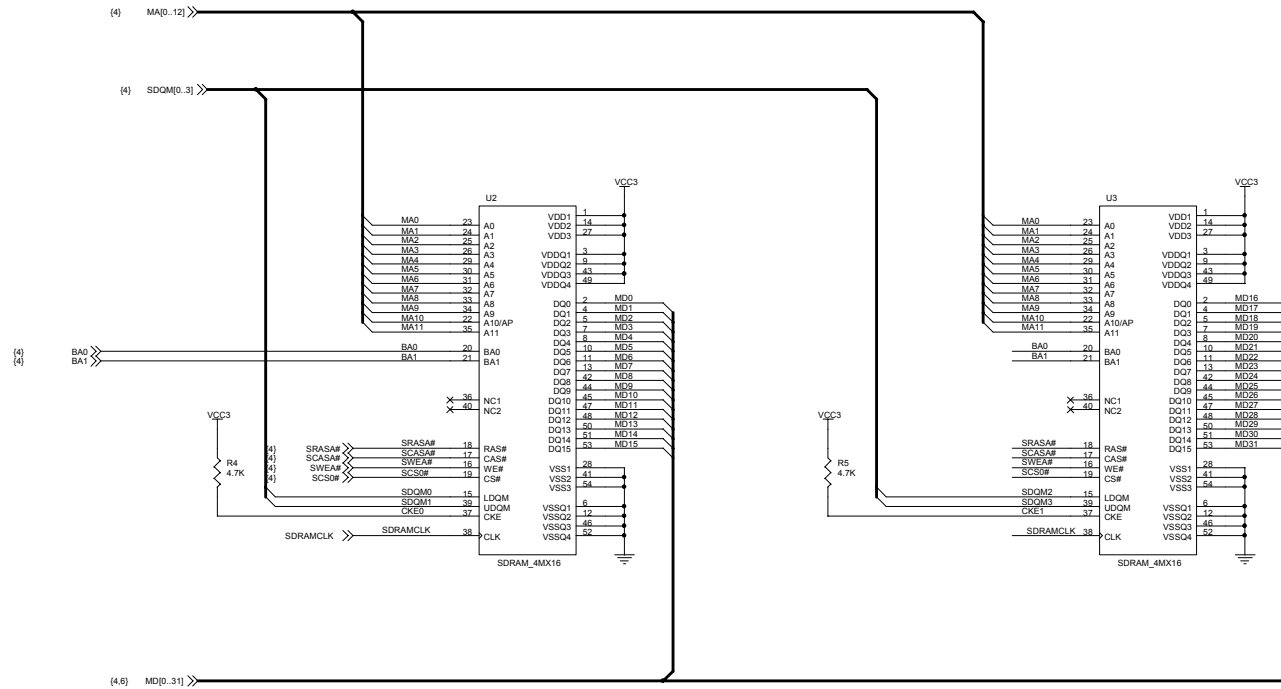
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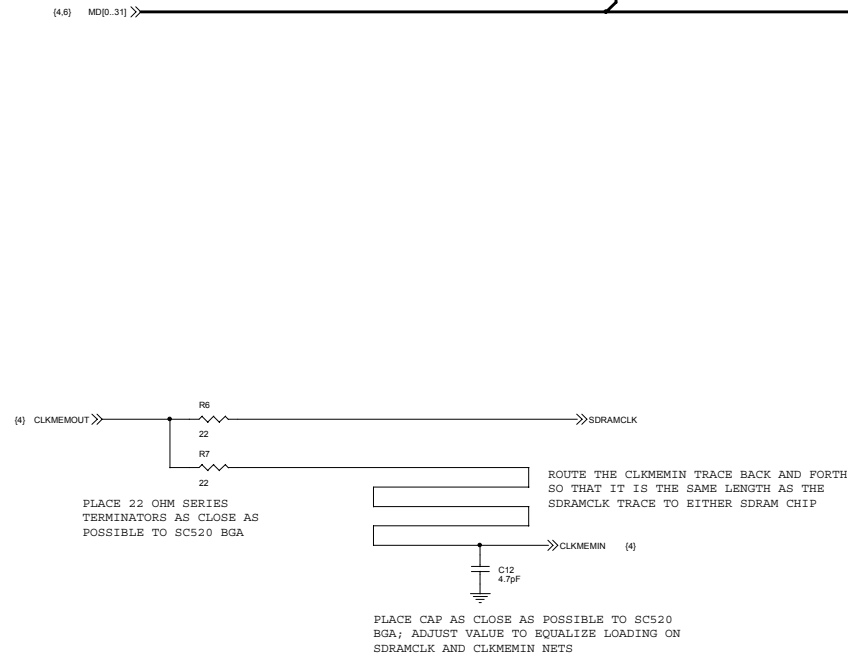
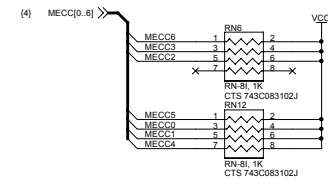
Size: Document Number: Rev 1.0
 C: SC520 Microcontroller

Date: Wednesday, January 10, 2001 Sheet 4 of 14

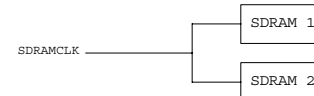
SDRAM MAIN MEMORY INTERFACE



PULL-UP UNUSED ECC BITS



ROUTE THE SDRAMCLK "T" STYLE SO THAT THE TRACE LENGTH TO EACH SDRAM CHIP IS THE SAME

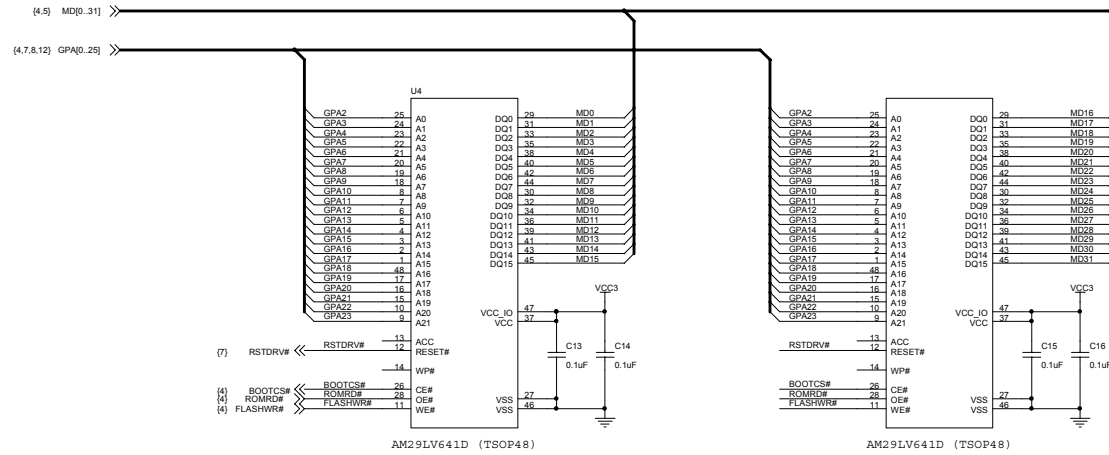


SDRAM POPULATION OPTIONS

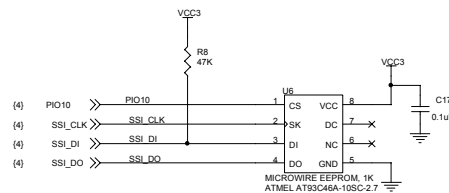
16MBYTE SDRAM	4MX16: SAMSUNG K4S641632C
32MBYTE SDRAM	8MX16: SAMSUNG KS281632M

NON-VOLATILE MEMORY

ExIP Flash Memory (16 MByte)



1Kbit Serial EEPROM (64x16) Synchronous Serial Interface--Microwire SEEPROM

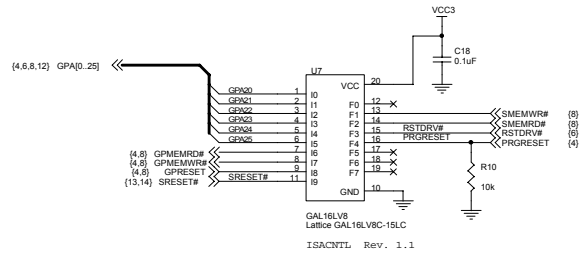


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Size: Document Number
C: Flash_MEM_CHIPS
Date: Wednesday, January 10, 2001 Sheet: 6 of 14 Rev: 1.0

IDE INTERFACE AND ISA CONTROL PAL

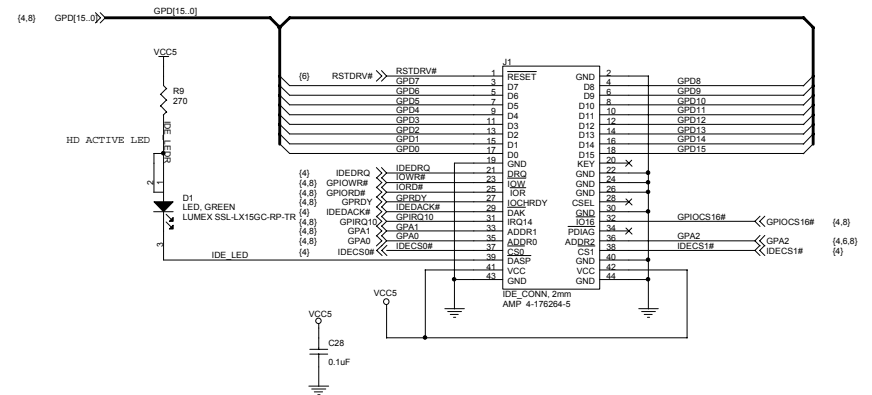
ISA CONTROL PAL



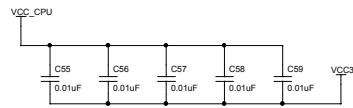
PAL EQUATIONS

$SMEMRD\# = \text{/GPA20} * \text{/GPA21} * \text{/GPA22} * \text{/GPA23} * \text{/GPA24} * \text{/GPA25} * \text{MEMRD\#}$;ASSERT SMSMRD# DURING AN ISA READ
 ;CYCLE TO ADDRESSES LESS THAN 1 MBYTE
 $SMEMWR\# = \text{/GPA20} * \text{/GPA21} * \text{/GPA22} * \text{/GPA23} * \text{/GPA24} * \text{/GPA25} * \text{MEMWR\#}$;ASSERT SMSMR# DURING AN ISA WRITE
 ;CYCLE TO ADDRESSES LESS THAN 1 MBYTE
 $RSTDRV\# = \text{/GPRESET}$;INVERT
 $PRGRESET = \text{/SRESET\#}$;INVERT

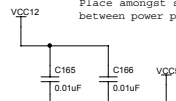
IDE INTERFACE (2.5" HARD DISK)



INTERPLANE CAPACITORS



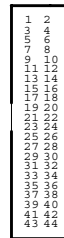
Place amongst signals where they cross between power planes.



LUMEX LED (SOT23)



Top View



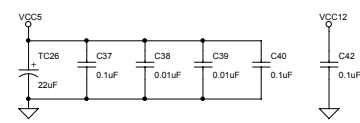
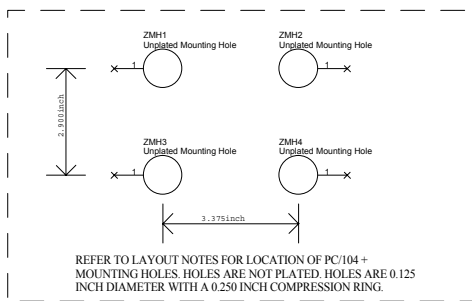
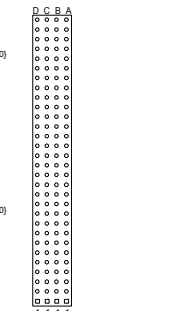
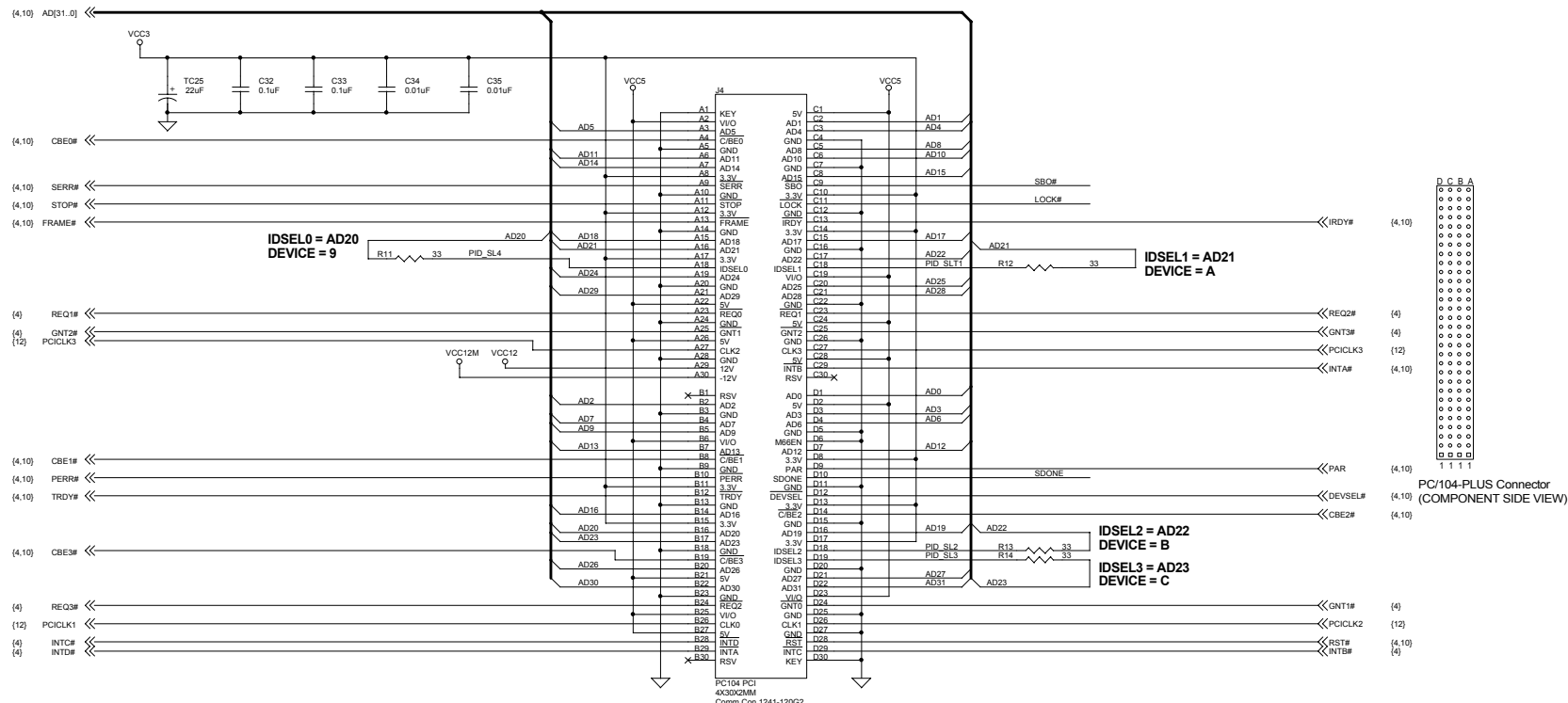
2mm IDE CONNECTOR
Top View

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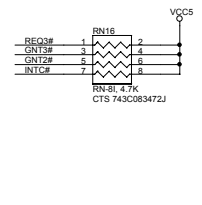
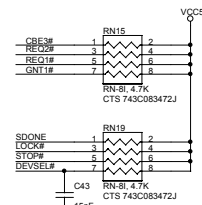
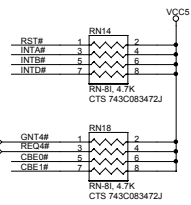
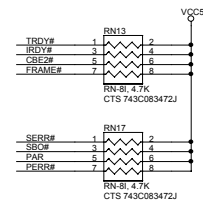
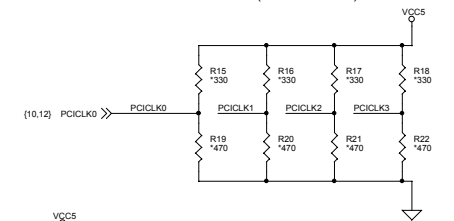
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Size: Document Number
C: PAL and IDE Interface
Rev: 1.0
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PC/104+ INTERFACE

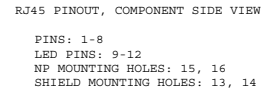
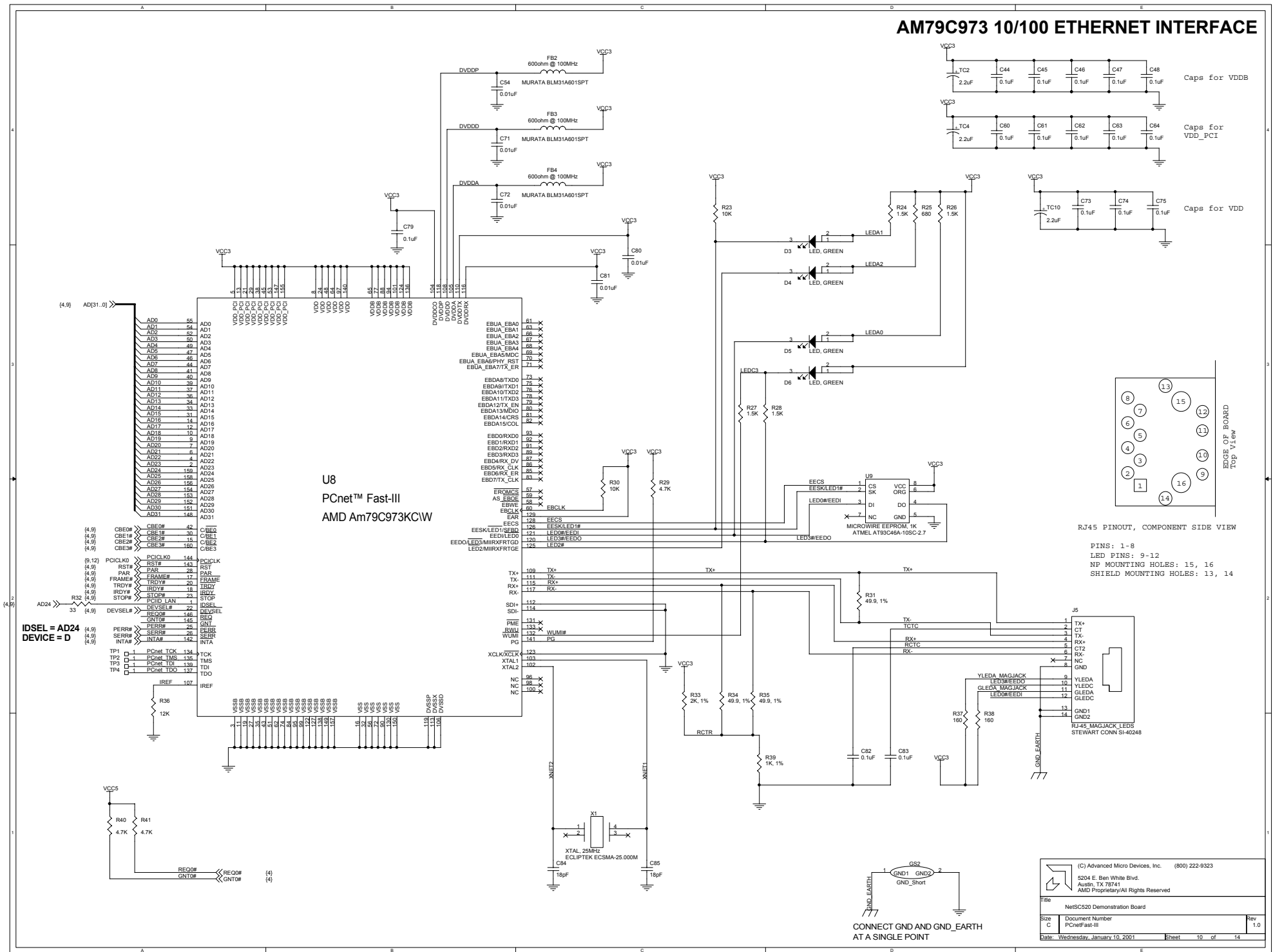
PCI INTERFACE



PCI Clock Terminators (Place Near Load)

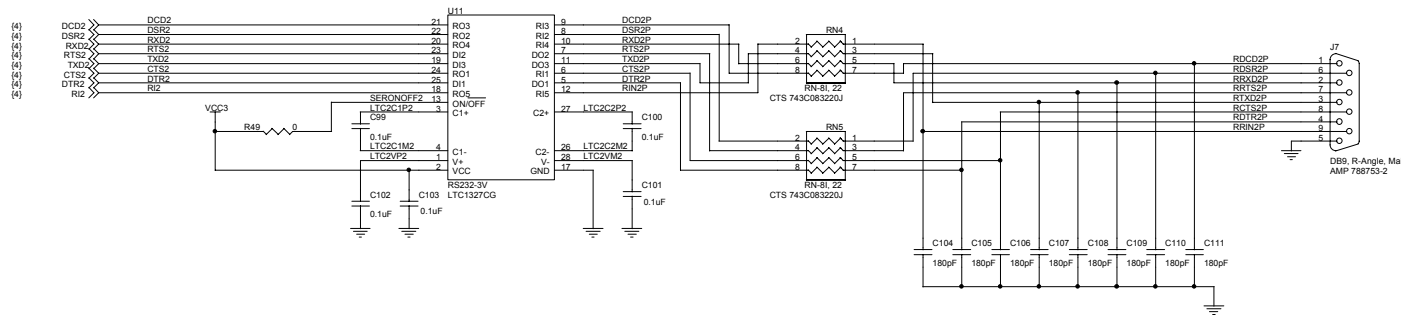
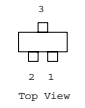
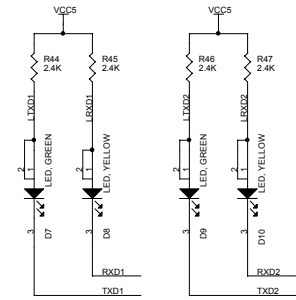
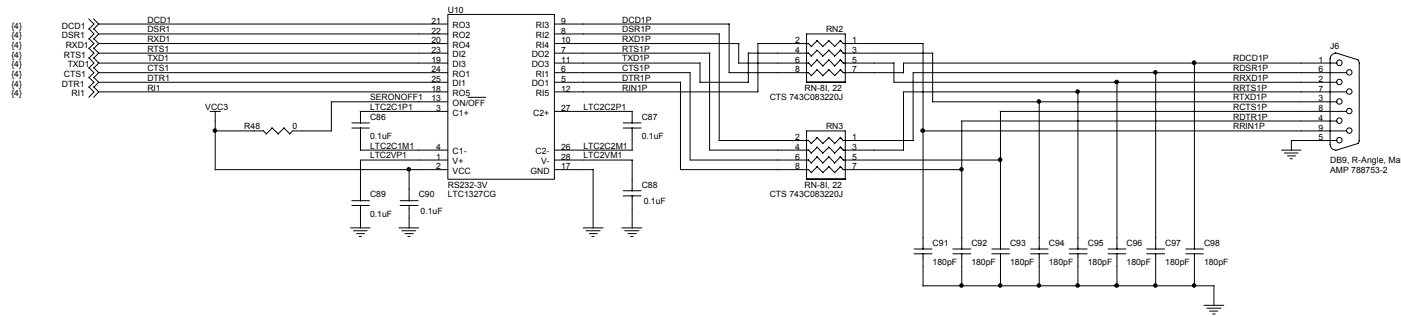


AM79C973 10/100 ETHERNET INTERFACE



CONNECT GND AND GND_EARTH
AT A SINGLE POINT

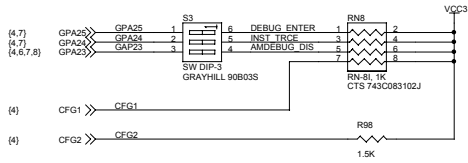
SERIAL PORTS (RS-232)



SYSTEM CLOCKS AND POWER-ON BOOTSTRAP

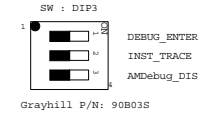
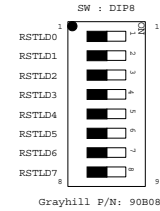
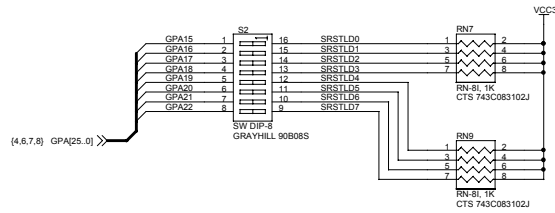
SC520 POWER-UP BOOTSTRAP

- BOOT FROM 181FT BOOTROM CONTROLLED FLASH ROM
- BOOT ROM ON MD[0..31] BUS
- USER CAN SET AMDebug CONFIGURATION



SC520 POWER-ON RESET LATCHED DATA

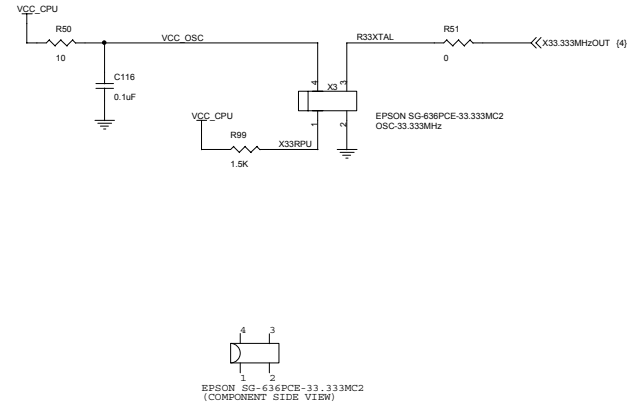
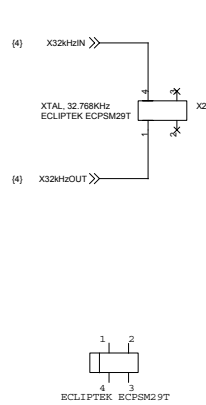
- USER CAN SELECT CODE LATCHED AT RESET



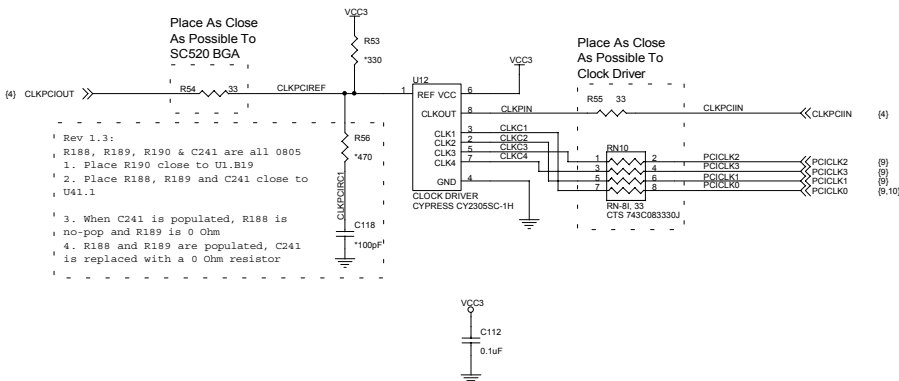
COMPONENTS TO INCLUDE IN B.O.M. FOR ASSEMBLED BOARDS

Z1 BOM Include PC104 Standoff Comm Con HW-PC600P	Z7 BOM Include PC104 Standoff Nut Comm Con HW-PC440NP	Z4 BOM Include 2mm Jumper Samtec 2SN-BK	Z17 BOM Include Power Supply Eipac W4012-750
Z6 BOM Include PC104 Standoff Comm Con HW-PC600P	Z11 BOM Include PC104 Standoff Nut Comm Con HW-PC440NP	Z9 BOM Include 2mm Jumper Samtec 2SN-BK	
Z10 BOM Include PC104 Standoff Comm Con HW-PC600P	Z15 BOM Include PC104 Standoff Nut Comm Con HW-PC440NP	Z5 BOM Include PLCC20 SOCKET, W/ POSTS SAMTEC PLCC-020-TA	
Z14 BOM Include PC104 Standoff Comm Con HW-PC600P	Z3 BOM Include 2mm Jumper Samtec 2SN-BK	Z16 BOM Include 12mm 3V Lithium Battery Panasonic BR1225	
Z2 BOM Include PC104 Standoff Nut Comm Con HW-PC440NP	Z8 BOM Include 2mm Jumper Samtec 2SN-BK		

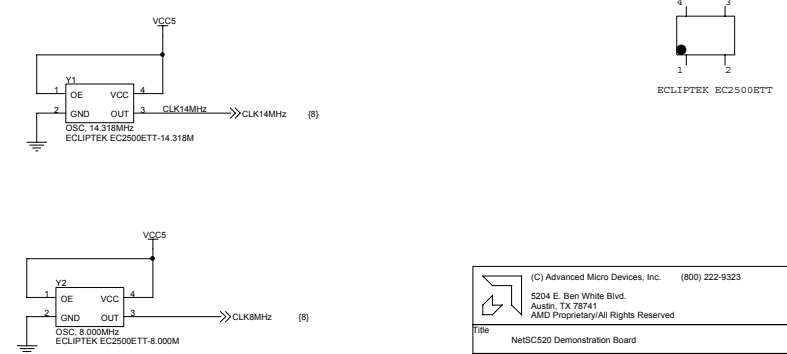
SC520 32KHz and 33MHz CRYSTALS



PCI Clock Driver



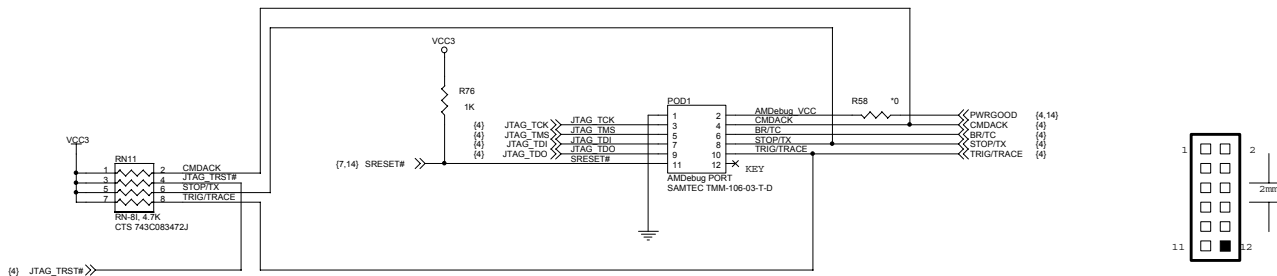
ISA Clocks



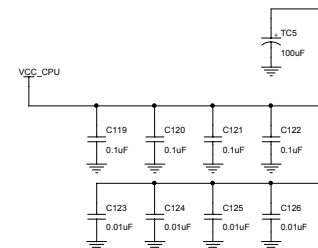
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CPU POWER, AMDebug, CPU DECOUPLING, RTC PLL LOOP FILTER, AND GPIO LED

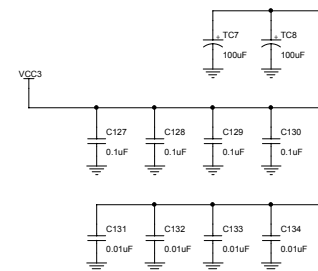
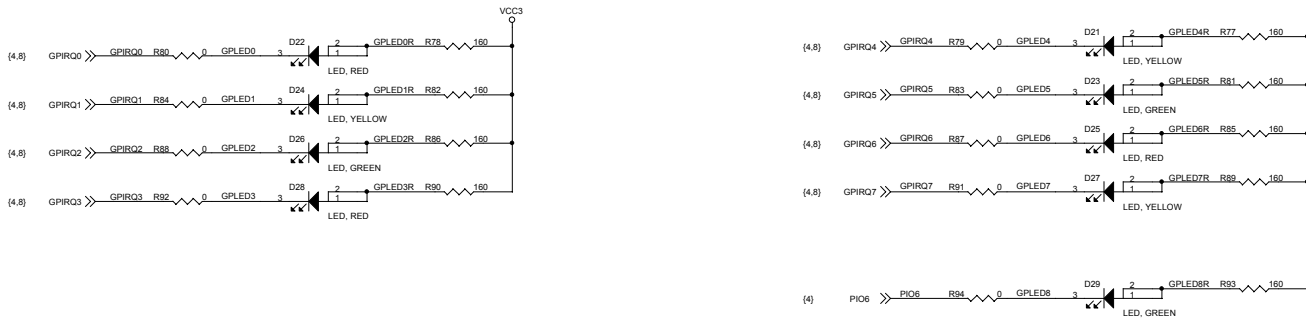
JTAG & AMDebug Port



VCC_CPU Decoupling

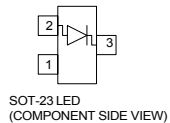
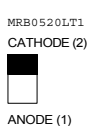
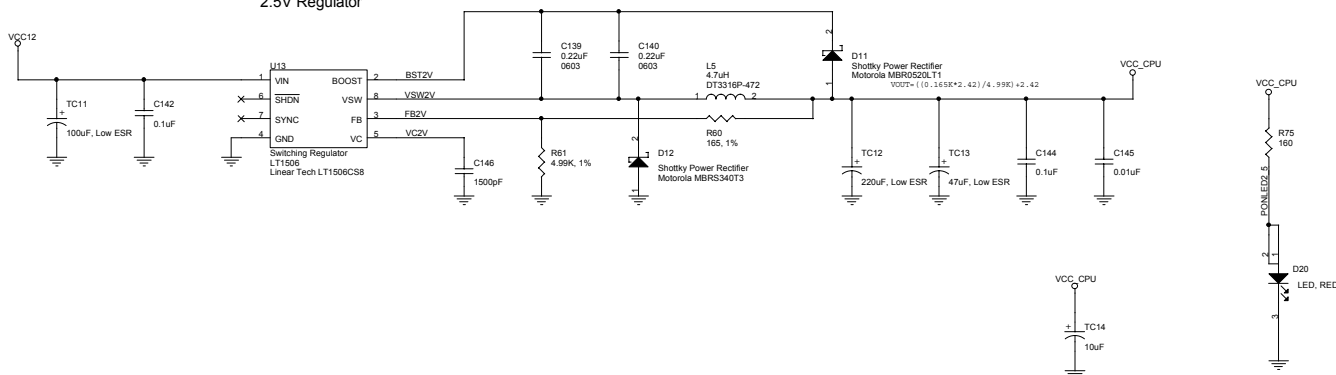


GPIO CONTROLLED LEDs



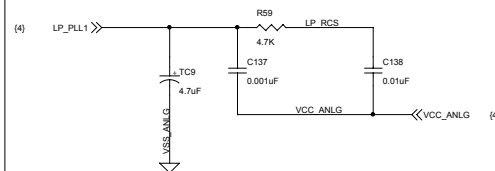
Place the above Caps under the BGA (Back side of the board)

2.5V Regulator



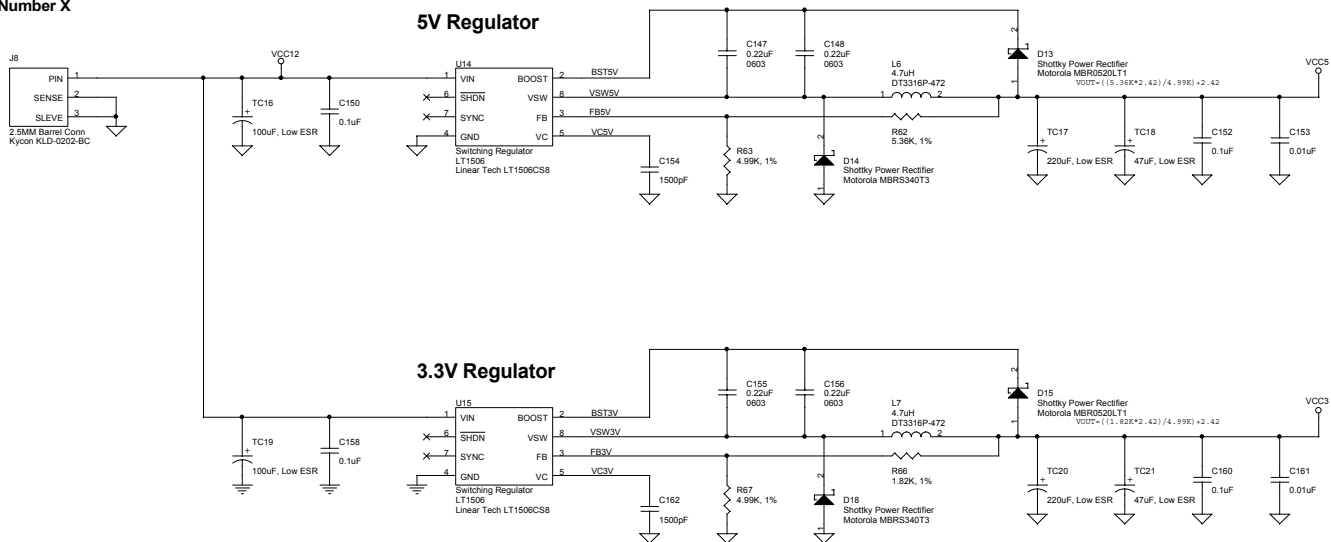
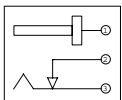
PLL Loop Filter

(PLACE CLOSE TO BUS20 BGA)

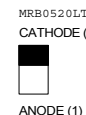
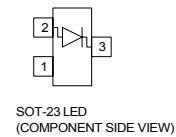
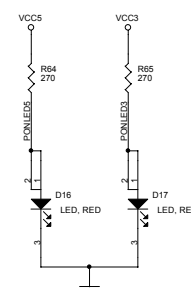


RESET, MAIN POWER, AND BACKUP BATTERY

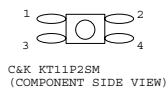
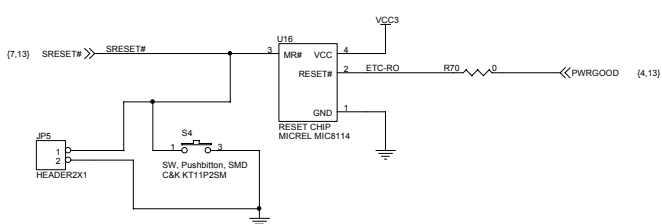
Power Connector
Use 12V Power Cube
Mfg X/ Part Number X



Power LEDs



System Reset Control



RTC VBAT Power

(PLACE CLOSE TO SC520 BGA)

