1. ALL RESISTANCE VALUES ARE IN OHMS, 0.1 WATT +/- 5%.
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS.
3. ALL CRYSTALS & OSCILLATOR VALUES ARE IN HERTZ.

REV	ZONE	ECN	DESCRIPTION OF CHANGE	CK APPD / DATE	ENG APPD / DATE
I		355571	PRODUCTION RELEASED	12/13/04	?

SCHEMATIC,MLB,Q45A ("Rous")

01/21/05

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91*	65	USB HOST INTERFACE	USB
92	66	USB DEVICE INTERFACE	
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95*	68	PCM3052 AUDIO CODEC	AUDIO
96*	69	LINE IN AMP	
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103*	74	S/PDIF TRANSMITTER	

* PAGES WHERE MASTER PAGE IS IN A DIFFERENT SCHEMATIC

DIMENSIONS ARE IN MILLIMETERS
XX ± ____
X.XX ± ____
X.XXX ± ____
ANGLES ± ____
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

METRIC

DRAFTER		DESIGN CK	
ENG APPD		MFG APPD	
QA APPD		DESIGNER	
RELEASE		SCALE	NONE

MATERIAL/FINISH NOTED AS APPLICABLE | SIZE D

Apple Computer Inc.

TITLE: SCH,MLB,IMG5

DRAWING NUMBER 051-6482 | REV. I

SHT 1 OF 103

FREQUENCIES LISTED ARE MAXIMUM DATA TRANSFER RATES SUPPORTED BY U3LITE

U2900
CPU
NEO 10S
PAGE 29

32-BIT
APPLE PI
ELASTIC INTERFACE
1.2V/900MHZ

U1300
SMU
PAGE 13

U1301
RTC
PAGE 13

J5900, J5901
J5902, J5903
17",20" INVERTER
TMDS
EXT VGA
PAGE 59

U5400, U5401
FRAME
BUFFER A
PAGE 54

64-BIT
FRAME BUFFER
2.6V/540MHZ

U4900
GPU
NV18B/NV34
PAGE 49

32-BIT
8X AGP
0.8V/533MHZ
4X = 1.5V
I/O = 1.5V

APPLE PI
PAGE 28

AGP
PAGE 48

U3
U3LITE
CORE
PAGE 22

MAIN MEMORY
PAGE 37

64/128-BIT
MAIN MEMORY
2.6V/400MHZ

SERIES
TERM
PAGE 38

J4000
J4001
DIMMS
PAGE 40

PARALLEL
TERM
PAGES 44&45

64-BIT
FRAME BUFFER
2.6V/540MHZ

U5500, U5501
FRAME
BUFFER B
PAGE 55

MISC
PAGE 24

HYPERTRANSPORT
PAGE 60

8-BIT
HYPERTRANSPORT
1.2V/400MHZ
CONTROL = 2.5V

U2600
PULSAR
POWER
PAGE 26
CLOCKS
PAGE 27

I2C
PAGE 18

J6400
J6401
J6402
HT
DEBUG
PAGE 64

J9210/J9220/J9230
USB
CONNECTORS
PAGE 92

J9400
MICRODASH MODEM
CONNECTOR
PAGE 94

To Shasta
SCCA

J9240
BLUETOOTH
CONNECTOR
PAGE 92

USB
PAGE 91

U7700
USB 2.0
uPD720101
PCI
PAGE 77

U7500
BOOTROM
PAGE 75

J7600
AIRPORT
EXTREME
CONNECTOR
PAGE 76

EDUCATION: NOT USED
GOOD,BETTER,BEST: HARD DRIVE

JXXXX
SATA
CONNECTOR
PAGE 83

SATA/150
1.2V/1.5GHZ

SATA1
SATA
PAGE 80

HYPERTRANSPORT
PAGE 62

U2300

PCI
PAGE 74

32-bit PCI (5V-3.3V/33MHz)

J8302
SATA DEV
CONNECTOR
PAGE 83

FOR DEVELOPMENT ONLY

SATA/150
1.2V/1.5GHZ

SATA2

SHASTA

GPIO/PCI64
PAGE 25

EDUCATION: HARD DRIVE
GOOD,BETTER,BEST: OPTICAL

J8301
UATA
CONNECTOR
PAGE 83

UATA/133
3.3V/133MHZ

UATA
PAGE 80

CORE
PAGE 23

NCs
PAGE 91

J9401
CTL-LESS /
SOFT MODEM
CONNECTOR
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ETHERNET
PAGE 84

FIREWIRE
PAGE 88

I2S
PAGE 25
I2S0
SCCA I2S1
SCCB I2S2

GMII (3.3V/125MHz) 8-bit Tx & 8-bit Rx

1394 OHCI (3.3V/98MHz) 8-bit Tx/Rx

U9500
AUDIO CODEC
PCM3052
PAGE 95

S/PDIF

OPTICAL OUT

J9803
COMBO OUT
CONNECTOR
PAGE 98

LINE OUT
AMP
PAGE 97

LINE OUT

SPEAKER
AMP
PAGE 97

J9801
SPEAKER
CONNECTOR
PAGE 98

LINE IN
AMP
PAGE 97

J9800
LINE IN
CONNECTOR
PAGE 98

J9802
MIC
CONNECTOR
PAGE 98

U8700
10/100 ETHERNET
BCM5221
PAGE 87

4 Diff pairs

J8700
ETHERNET
CONNECTOR
PAGE 87

U9000
FIREWIRE A
802A
PAGE 90
0 1

2 Diff pairs

J9000, J9001
FIREWIRE A
CONNECTORS
PAGE 90

SYSTEM BLOCK DIAGRAM

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I

SCALE: NONE

SHT 2 OF 103

POWER CONNECTOR

J700
PAGE 7

PP24V_RUN
FW CONN
20" LCD INVERTER

PP12V_RUN
20" PANEL POWER
20" LCD INVERTER

PP5V_RUN
HDD & OPTICAL

PP5V_ALL

PP3V3_RUN
PCI BUS
AUDIO CODEC

SYS_POWERUP_L

SMU
POWER SEQUENCE PIN

PULSAR_POWER_DOWN
MAKE_BASE=TRUE
=PULSAR_POWER_DOWN 27
TURN_ON_SHASTA_CORE_L 10
TURN_ON_PP1V2_L 10

SMU_PWRSEQ_P1_4 13
SMU_PWRSEQ_P1_0 13
SMU_PWRSEQ_P1_1 13
SMU_PWRSEQ_P9_5 13 (PWR_GOOD_SB_CORE)
SMU_PWRSEQ_P9_6 13 (PWR_GOOD_PP2V5)
SMU_PWRSEQ_P1_2 13 (TURN_ON_VTT)

5V

PP5V_RUN_AUDIO LINEAR
PAGE 99
5V — HP/LINEOUT AMP

PP4V5_RUN_AUDIO LINEAR
PAGE 99
4.5V — AUDIO CODEC

CPU CORE SWITCHER
PAGE 33 SC1211*4 SC2643VX*1
0.8~1.2V — GPUL

=PP5V_RUN_CPU 6 7 8 31
ALIAS CPU_AVDD_EN 31

PP2V5_RUN_CPU_AVDD LINEAR
PAGE 31
2.8V — CPU AVDD

PP5V_PWRON FET SWITCH
PAGE 11
5V — USB CONN, UDASH MODEM

PP3V3_ALL LINEAR
PAGE 11
3.3V — FW PHY, SMU

PP3V3_PWRON FET SWITCH
PAGE 11
3.3V — ENET PHY, USB2 HOST, MODEM & BT

GPU CORE SWITCHER
PAGE 50 IRU3037CS
1.6/1.4V — NV18B/NV34

PP1V2_SHASTA_CORE SWITCHER
PAGE 10 IRU3037ACS
1.2V — SHASTA CORE

U3LITE CORE SWITCHER
PAGE 22 IRU3037CS
1.53V — U3LITE CORE

PP2V5_PWRON SWITCHER
PAGE 9 IRU3037CS
2.62V — SHASTA HT, DDR DIMM

PP2V5_PWRON

PP1V2_PWRON FET SWITCH
PAGE 10
PWRON_SD
PWRON_DISK_SB

PP1V2_RUN FET SWITCH
PAGE 10
HT BUS
API BUS

PP2V5_RUN FET SWITCH
PAGE 9
RAM TERM
GRAPHIC FB

PP1V25_RAM_VTT LINEAR
PAGE 46
1.25V — RAM VTT

PP1V5_PWRON LINEAR
PAGE 50
1.5V — PULSAR CORE

PP1V5_RUN POWER SW
PAGE 50
AGP BUS

46 TURN_ON_VTT

PP3V3_ALL
R331 10K 5% 1/16W MF 402
PWR_GOOD_SB_CORE

11 RAIL_CTL_NEG
LM339A SOI
U1100 V+ GND
R330 100K 5% 1/16W MF 402
COMPARE_SB_CORE
C330 0.01UF 20% 16V CERM 402

10 6 PPVCORE_PWRON_SB

PP5V_ALL
R342 150K 5% 1/16W MF 402
PS_2V_REF
R343 100K 5% 1/16W MF 402

PP3V3_ALL
R341 10K 5% 1/16W MF 402
PWR_GOOD_PP2V5

R340 100K 5% 1/16W MF 402
COMPARE_PP2V5
C340 0.01UF 20% 16V CERM 402

POWER BLOCK DIAGRAM

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 3 OF 103	

DATE	DESCRIPTION
02/27/04	EVT3 RELEASE (REV 20)
03/05/04	GPU XTAL - C5700 AND C5719 -> 27PF FROM 22PF I2C A - U1800 MOVED BACK TO PWRON RAIL HEATSINK ASSEMBLY - NEW PART NUMBERS FAN 3 - STUFFING ON ALL CONFIGS FIREWIRE POWER DU JOUR EVT3 - BOM REV 21 RELEASE
03/24/04	MASTER PAGE SYNC EVT3 REWORKS NOSTUFF R807 - SMU_BOOT_SCLK IS ALSO CPU_VID<5> NOSTUFF R3691 & R828 - DIODE CAL RETURN PATH MOVED MARTY SERIAL 0 OHM RESISTORS TO COMMON BOM SMU - ADDED QREQ GPU - ADDED DECOUPLING TO GPU_VTT FOR NV36 INVERTER CONTROL - ADDED AND GATES U5850 & U5851 TO CONTROL LCD_PWM AND FPD_PWR_ON CHECKIN 21001
04/12/04	CPU - CHANGED CPU SYMBOL TO NEO-10S-REV2-76C (OLD IS OBSOLETE) SCHEMATIC REUSE - NETS THAT NEED ALIASES START WITH = (DOES NOT EFFECT NETLIST) 3PHASE CPU POWER SUPPLY - ADDED TABLE FOR R3328 INVERTER - ADDED RESISTORS R5860-1 AND CHANGED R5808-9 TO 47OHM TMDS POWER - ADDED R5960 AND D5914 DIODE CAL - ADDED OPTION TO POWER FROM PP5V_ALL AND PP3V3_ALL RAILS CHECKIN 21002
04/12/04	MASTER PAGE SYNC - IN SYNC ON ALL PAGES EXCEPT PAGE 13 EMI - REMOVED EMI700 & EMI9400 QREQ_L HACK - ADDED U2850, C2850, R2850, R2851 VOLTAGE SENSE FROM 12V - ADDED R3360, R3361 CHECKIN 21003
04/13/04	MAIN MEMORY DQS PARALLEL TERM - CHANGED TO 100 OHM (LIKE EVT3) I/O ALIGNMENT FIXTURE - ADDED 815-8008 TO MLB BOM DIMM CONNECTORS - UPDATED 30 DEGREE SYMBOL GREEN LED - ADDED KINGBRIGHT AS ALTERNATE VTT - NO LONGER POWER SEQUENCED - NO STUFFED R4610 AND R4603 HD TEMP SENSOR - STUFFED ON ALL CONFIGS SMU PULLUPS CHANGES - R1312 -> 2K; R1311 -> 10K SDF804 -> ZH804 CHECKIN 21004
04/14/04	RAM PARALLEL TERM - DQ RPAKS CHANGED TO 68 OHM STROBE RESISTORS CHANGED TO 120 OHM EVT3A RELEASE (REV 22) CHECKIN 22001 - FIXING DIMM SYMBOL CHECKIN 22002 - FIXING DIMM SYMBOL AGAIN
04/21/04	MASTER PAGE SYNC - NOW IN SYNC ON ALL SHAREABLE PAGES MAIN MEMORY - DQ SERIES TERM CHANGED TO 22 OHM MAIN MEMORY - DQ PARALLEL TERM CHANGED TO 82 OHM FIREWIRE POWER - NEW CURRENT LIMITING RESISTOR NOSTUFFING FIREWIRE PORT POWER "CHOICE A" CIRCUIT INPUT VOLTAGE SENSE - CHANGED DIVIDER VALUES INPUT CURRENT SENSE - CHANGED R3343 TO 0.025 OHM 1% RESISTOR CHECKIN 22003
04/21/04	SMU_SUSPENDREQ - STUFFED LEVEL SHIFTER CPU POWER SUPPLY - NOSTUFFED R3305 CHANGED R3304 TO 116S1000 CHANGED C3304-7 TO 132S4733 EVT3A BOM RELEASE REV 23
04/26/04	USB POWER CAPS - NOSTUFFED C9211, C9221, C9231 PULSAR_POWER_DOWN CONNECTED TO SMU_PWRSEQ_P1_4 SW703 CHANGED TO 516S0221 MASTER PAGE SYNC CHECKIN 23001
04/27/04	MASTER PAGE SYNC - AUDIO AND SMU CHANGES SUSPENDACK LEVEL SHIFTER - REPLACED Q2407 AND Q2408 WITH Q2420 SN7002DW I2C_CPU_A - ADDED Q1801 TO LEVEL SHIFTER ADDED POWER SUPPLY TEMP SENSOR Q3000 ADDED TO LEVEL SHIFT / INVERT CPU_BYPASS AND CPU_HRESET CURRENT SENSE - CHANGED R3345 FROM 121K TO 73.2K CHECKIN 23002
04/29/04	QREQ CIRCUITS MOVED TO PWRON RAIL I2C UPDATE NB_SUSPENDACK_L NOW USED U700 TO LEVEL SHIFT - OLD CIRCUIT REMOVED DIMMS - UPDATED TO 25/28 DEGREE CONNECTORS MASTER PAGE SYNC CHECKIN 23003
04/30/04	SOFT MODEM - ADDED DECOUPLING CAPS TO POWER RAIL REMOVED OLD OVERTEMP CIRCUIT ADDED DIAG LED MASTER PAGE SYNC CHECKIN 23004
05/03/04	CPU POWER SUPPLY - ON SEMI FETS ONLY ADDED 1.6GHZ CPU PART NUMBER UPDATED PLATING FOR ZH702 CHECKIN 23005
05/05/04	CPU AVDD - ADDED 2.7V BOM OPTION POWER_FAIL - RESISTOR DIVIDED TO 3.3V ADDED BOMS OPTIONS FOR ON_SEMI AND VISHAY FETS FOR 3PHASE AND 4PHASE CPU PS AVP CHANGES CPU VREG - ADDED BOM OPTION 'EXTRA_C' FOR CAPS WE WOULD LIKE TO NOSTUFF CHECKIN 23006 CPU VREG AVP - C3304, C3305, C3306, C3307 CHANGED TO 8.2NF TMDS TERM - STUFFING CHANGES CHECKIN 23007
05/06/04	DVT RELEASE (REV 24)
05/07/04	TMDS - NEW PARALLEL TERMINATION RESISTORS R5869-R5872 CHECKIN 24001
05/10/04	FRAME BUFFER CLOCKS - ADDED DIFF PAIR PROPERTIES PCI_RESET - UPDATES FOR SCHEMATIC REUSE MASTER PAGE SYNC - ADDED S/PDIF XMITTER AND BITCLK DELAY CHECKIN 24002 AUDIO UPDATES CHECKINS 24003-24005
05/11/04	DVT RELEASE (REV 25)
06/10/04	LAST MINUTE BOM CHANGES FOR DVT: SUSPENDREQ LEVEL SHIFTER - R2419, R2420 CHANGED TO 330 OHM I2C A BUS PULLUPS - R1816,R1817 CHANGED TO 200 OHM USB PULL-DOWNS - R9403,R9404 MOVED TO COMMON BOM SMU CRYSTAL CAPS - C1304,C1305 CHANGED TO 18PF FROM 12PF SMU RESET - CHANGED R1322 TO 150K FROM 100K CPU HEATSINK ASSEMBLIES - NEW PART NUMBERS TMDS POWER - CHANGED D5914 TO SURFACE MOUNT PART FROM THROUGH HOLE MOVED R714 TO R1303 FOR SCHEMATIC REUSE U1600,U1601,U1700 CHANGED TO 353S0890 FOR MORE SOURCES MOVED CPU LOGIC ANALYZER RESISTORS TO DEVELOPMENT BOM CHECKIN 25001
06/11/04 06/21/04	MASTER PAGE SYNC - NOSUFFED EXTERNAL S/PDIF TRANSMITTER ADDED TABLES FOR: NEW 1.5V FET - LOWER RDS(ON) - Q5006 PATA CONN J8301 CHANGED TO 516S0235 (ADDED VENDOR) NEW SATA CONNECTER SOURCES J8300, J8302 NEW TMDS CONNECTOR W/ BOSS J5902 REMOVED COIN CELL BATTERY AND I/O ALIGNMENT FIXTURE FROM MLB BOM (FATP ITEMS) NEW BACKUP SMU_RESET CIRCUIT (SAME AS Q78) CHECKIN 25003
06/22/04	REPLACED Q5006 (FET FOR 1.5V) WITH 376S0254 FAN OPAMPS - REPLACED U1600 W/ SECOND OPAMP IN U1700 TIED INPUTS IN UNUSED OPAMP IN U1601 NOSTUFFED CPU VREG ELECTROLYTIC CAPS C3332, C3427, C3421 NOSTUFFED R2775/6 (UNUSED CLOCKS) CHECKIN 25004
06/22/04 06/23/04	"PROPERLY" TERMINATED UNUSED OPAMP IN U1601 BOM RELEASE REV 26
06/24/04	"PROPERLY" TERMINATED UNUSED OPAMP IN U2100 R5010 REMOVED TO DECREASE DROOP ON 1.5V RAIL ADDED CONNECTOR J1701 TO SUPPORT REMOTE HD TEMP SENSOR CHECKIN 26001
06/28/04	MASTER PAGE SYNC - PICKED UP AUDIO CHANGES RELATED TO BITCLK CHECKIN 26002
06/28/04	SUPPORT FOR 2GB DIMMS - SWAPPED PINS 103 & 167 ON DIMM CONNECTOR CHECKIN 26003
07/01/04	ADDED SECOND SOURCE VTT REGULATOR (PAGE 46) NO STUFF POWER SUPPLY TEMP SENSOR CHANGED HD TEMP SENSOR CONN J1701 TO 4 PIN MASTER PAGE SYNC - AUDIO CHANGES CHECKIN 26004
07/02/04	UPDATED LINE AND NECK WIDTH CONSTRAINTS THROUGHOUT SCHEMATIC NOSTUFFED ON BOARD HD TEMP SENSOR CHANGED U3LITE CORE TO 1.53V FEEDBACK RESISTORS CHANGED TO 603 CHECKIN 26005
07/06/04	REMOVED ON BOARD HARD DRIVE TEMP SENSOR AUDIO DETECT PULLUPS - CHANGED FROM 47K TO 4.7K CHANGED AUDIO I2S_BITCLK SERIES RESISTER TO 0 OHM U3LITE FEEDBACK RESISTORS CHANGED TO 0.5% TOLERANCE CHECKIN 26006
07/08/04	REPLACED MAXIM ANALOG SWITCH U2850 WITH TI ANALOG SWITCH PERICOM ADDED AS AN ALTERNATE ALL I/O CONNECTORS CHANGED POWER CONNECTOR CHANGED POWER SWITCH CHANGED SMU DOWNLOAD CONNECTOR - PRODUCTION P/N CPU PART NUMBERS - UPDATED WITH ACTUAL PART NUMBERS CHECKIN 26007 BOM RELEASE REV 27
07/12/04	CPU VREG DROOP - R3327 CHANGED TO 1.5K; R3326 CHANGED TO 301 PULSAR_POWER_DOWN - R2750 CHANGED TO 47 OHM FOR ICT AUDIO DETECT PULLUPS - CHANGED BACK TO 47K FROM 4.7K AUDIO MUTE PULLDOWNS R9815 & RA012 - CHANGED FROM 47K TO 4.7K MIC BIAS - NOSTUFFED CA210 TO HELP NOISE FLOOR 1.5V_RUN FET - ADDED (N/S) C5060 FOR POSSIBLE SOFT-START 2.5V VREG SOFT START - CHANGED C915 TO 1UF FOR U3L POWER SEQUENCING MLB CARCODE - CHANGED TO 825-6447 I/O CONNECTOR SYMBOL UPDATES CHECKIN 27001
07/13/04	POWER_FAIL_L R DIVIDE - ADJUSTED FOR 2K PULLUP THAT WILL BE IN PVT POWER SUPPLIES ORIGIN HOLE ZH702 - CHANGED TO 4.15MM CHECKIN 27002
07/14/04	FIREWIRE CRYSTAL - ADDED R9060 & R9061 CHECKIN 27003 FIREWIRE CRYSTAL R - FIXED REF DES ANALOG SWITCH U2850 - ADDED PERICOM & AND MAXIM AS ALTERNATES TO TI STUFFED P/S TEMP SENSOR NAMED SOME UNNAMED NETS CHECKIN 27004
07/15/04	U3LITE PWR SEQ - CHANGED C915 TO 0.22UF P/S TEMP SENSOR - NOSTUFF REMOTE HD TEMP SENSOR CONNECTOR - NOSTUFF PVT / PRODUCTION RELEASE 820-1540:A (SCH 051-6482 REV A)
07/28/04	STUFFED TMDS CONNECTOR J5902 (ACCIDENTALLY OMITTED) FIREWIRE CRYSTAL - CHANGED R9061 TO 470 OHM 2.5V VREG - CHANGED SOFT START CAP TO 0.68UF NEW P/N FOR HEATSINK ASSEMBLIES NOSTUFFED OPTICAL TEMP SENSOR STUFFED REMOTE HD TEMP SENSOR CONNECTOR BOM RELEASE (REV B)
08/03/04	2.5V VREG - CHANGED SOFT START CAP TO 0.47UF I/O CONNECTOR SHIELD CHANGE P/N TO 805-5664 NEW CPU P/N AND BINCODES FOR 1.10V VMIN BOM RELEASE (REV C)
08/20/04	TMDS VCC - CHANGED C5918 TO 0.022UF TO LOWER INRUSH CURRENT POWER SWITCH SW703 - MADE FOXCONN 516S0248 AND SUYIN 516S0249 ALTERNATES PATA CONNECTOR J8301 - CHANGED TO 516S0264 TO MATCH REVERSED BOSSES ON FAB BOM RELEASE (REV D)
08/27/04	NOSTUFF SDF700 SW703 - SUYIN WAS REMOVED AS ALTERNATE BOM RELEASE (REV E)
09/14/04	CPU - WAVE5 PROCESSORS ADDED AS ALTERNATES (ARL, BPL, BRL) CPU P/S CAPS - AIR CHANNEL BY STUFFING C3427, C3332 AND NOSTUFFING C3327, C3428 SATABR RESET - STUFFED PULLDOWN R2565 CPU_INT_L - CHANGED R2578 TO 47 OHM TO CURRENT LIMIT BOM RELEASE (REV F)
09/30/04	CPU - 1.6GHZ 1.20V PROCESSORS ADDED AS ALTERNATES (APA, APL) REMOTE HD TEMP SENSOR CONN - CHANGED J1701 TO BLACK 518S0193 KEPT 518S0084 AS ALTERNATE FW SURGE RESISTORS - CHANGED R9056 & R9002 TO 1.3 OHM 107S0060 BOM RELEASE (REV G)
11/15/04	CPU - ADDED HP PROCESSORS AS ALTERNATES (ANA, BNA) AUDIO GROUND - CHANGED R9813 & R9814 TO 0 OHM HD TEMP CONN - REMOVED ALTERNATE CONNECTOR BOM RELEASE (REV H)
12/13/04	CPU DECOUPLING - NOSTUFFED EXTRA_C BOM OPTION U3LITE - ADDED NEW LAMINATE PART AS ALTERNATE BOM RELEASE (REV I)

REVISION HISTORY

APPLE COMPUTER INC.	SIZE D	DRAWING NUMBER 051-6482	REV. I
	SCALE NONE	SHT 4 OF 103	

PROCESSORS

QUALIFIED

	PART #	QTY	DEVICE	PACKAGE	DESCRIPTION	VALUE	VOLT.	WATT.	TOL.	REFERENCE DESIGNATOR(S)	BOM OPTION
WAVE3	337S2968	1	PROCESSOR	CBGA-576-1MM	IC,GPUL,10S,DD3,1.6G,85C,ARA	1.6GHZ	1.25V	42W	?	U2900	CPU_DD30_1_6GHZ
WAVE3	337S2969	1	PROCESSOR	CBGA-576-1MM	IC,GPUL,10S,DD3,1.8G,85C,BPA	1.8GHZ	1.20V	42W	?	U2900	CPU_DD30_1_8GHZ

	PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:	VOLTAGE
WAVE3	337S2994	337S2968	CPU_DD30_1_6GHZ	U2900	IC,GPUL,DD3,1.6G,APA	1.20V
WAVE5	337S2995	337S2968	CPU_DD30_1_6GHZ	U2900	IC,GPUL,DD3,1.6G,APL	1.20V
WAVE5	337S2980	337S2968	CPU_DD30_1_6GHZ	U2900	IC,GPUL,DD3,1.6G,ARL	1.25V
WAVE5 HP	337S2997	337S2968	CPU_DD30_1_6GHZ	U2900	IC,GPUL,DD3,1.6G,ANA	1.20V
WAVE3	337S2970	337S2969	CPU_DD30_1_8GHZ	U2900	IC,GPUL,DD3,1.8G,BRA	1.25V
WAVE5	337S2981	337S2969	CPU_DD30_1_8GHZ	U2900	IC,GPUL,DD3,1.8G,BPL	1.20V
WAVE5	337S2982	337S2969	CPU_DD30_1_8GHZ	U2900	IC,GPUL,DD3,1.8G,BRL	1.25V
WAVE5 HP	337S2998	337S2969	CPU_DD30_1_8GHZ	U2900	IC,GPUL,DD3,1.8G,BNA	1.20V

NOT QUALIFIED

	PART #	QTY	DEVICE	PACKAGE	DESCRIPTION	VALUE	VOLT.	WATT.	TOL.	REFERENCE DESIGNATOR(S)	BOM OPTION
	337S2865	1	PROCESSOR	CBGA-576-1MM	IC,GPUL,10S,DD2.11,1.8GHZ,85C	1.8GHZ	1.45V	45W	?	U2900	CPU_DD211_1_8GHZ
	337S2866	1	PROCESSOR	CBGA-576-1MM	IC,GPUL,10S,DD2.11,2.0GHZ,85C	2.0GHZ	1.45V	45W	?	U2900	CPU_DD211_2_0GHZ
	337S2787	1	PROCESSOR	CBGA-576-1MM	IC,GPUL,10S,REV3,2.0G,85C,CJA	2.0GHZ	1.25V	45W	?	U2900	CPU_DD30_2_0GHZ

ASICS

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
343S0284	1	IC,U3LITE,V1.1,300MM,PBGA	U3	

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
343S0282	343S0284		U3	U3L,V1.1,200MM,PBGA
343S0321	343S0284		U3	U3L,NEW LAM,200MM
343S0320	343S0284		U3	U3L,NEW LAM,300MM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
343S0283	1	IC,ASIC,SHASTA,V1.1,PBGA	U2300	

MISC PARTS

	PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
	062-2082	1	SPEC,VENDOR PACKAGING PROCEDURE	VPP1	
	820-1540	1	PCB,FAB,MLB	MLB1	
	825-6447	1	BARCODE LABEL, MLB, Q45	LBL1	
	051-6482	1	PCB,SCHEM,MLB	SCH1	
	341T1366	1	IC,FLASH,1MX8,3.3V,90NS	U7500	
	341T1395	1	PURCH ASSY, SMU BIG	U1300	
CRITICAL	603-6015	1	HEAT SINK ASSEMBLY 17 IN	MECH17	17_INCH_LCD
CRITICAL	603-6016	1	HEAT SINK ASSEMBLY 20 IN	MECH20	20_INCH_LCD

ALTERNATES

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
378S0119	378S0114	LED700,LED702,LED5900		KINGBRIGHT LED

TABLE ITEMS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I

SCALE	SHT	OF
NONE	5	103

	NO_TEST=YES	TP_BUF_RST	57
	NO_TEST=YES	TP_DFPCLK	58
L3	NO_TEST=YES	TP_DFPCLK_L	58
L4	NO_TEST=YES	TP_DFPD0	58
L5	NO_TEST=YES	TP_DFPD1	58
L6	NO_TEST=YES	TP_DFPD2	58
L7	NO_TEST=YES	TP_DFPD3	58
L8	NO_TEST=YES	TP_DFPD5	58
L9	NO_TEST=YES	TP_DFPD6	58
L10	NO_TEST=YES	TP_EXT_TMDS_CKM	58
L29	NO_TEST=YES	TP_EXT_TMDS_CKP	58
L29	NO_TEST=YES	TP_EXT_TMDS_D0M	58
L29	NO_TEST=YES	TP_EXT_TMDS_D0P	58
L29	NO_TEST=YES	TP_EXT_TMDS_D1M	58
L30	NO_TEST=YES	TP_EXT_TMDS_D1P	58
L29	NO_TEST=YES	TP_EXT_TMDS_D2M	58
L30	NO_TEST=YES	TP_EXT_TMDS_D2P	58
L30	NO_TEST=YES	TP_FBBCS1_L	52
L31	NO_TEST=YES	TP_GPU_INTB_L	49
L31	NO_TEST=YES	TP_GPU_THERMA	58
L31	NO_TEST=YES	TP_GPU_THERMC	58
L31	NO_TEST=YES	TP_IFP1VREF	58
L31	NO_TEST=YES	TP_NVAGP_TDO	49
L32	NO_TEST=YES	TP_TMDS_TXD3M	58
L31	NO_TEST=YES	TP_TMDS_TXD3P	58
L32	NO_TEST=YES	TP_TMDS_TXD7M	58
L32	NO_TEST=YES	TP_TMDS_TXD7P	58
L32	NO_TEST=YES	TP_VIPHCLK	57
L33	NO_TEST=YES	TP_FRWRLPS	58
L33	NO_TEST=YES	TP_AGP_MB_AGP8X_DET_L	48
L33	NO_TEST=YES	TP_ATTENTION	29
L34	NO_TEST=YES	TP_ENET_CLK125M_GTX	87
L33	NO_TEST=YES	TP_ENET_TXD<7>	87
L34	NO_TEST=YES	TP_ENET_TXD<4>	87
L34	NO_TEST=YES	TP_ENET_TXD<5>	87
L34	NO_TEST=YES	TP_FW_CLK98M_LCLK	90
L34	NO_TEST=YES	TP_AFN	29
L34	NO_TEST=YES	TP_PSRO1	29
L34	NO_TEST=YES	TP_PSRO2	29
L34	NO_TEST=YES	TP_PSYNCOUT	29
L34	NO_TEST=YES	TP_USB2_PWREN<2>	92
L35	NO_TEST=YES	TP_USB2_PWREN<3>	92
L34	NO_TEST=YES	TP_USB2_PWREN<4>	92
L35	NO_TEST=YES	TP_NEC_AMC	77
L35	NO_TEST=YES	TP_NEC_NANDTEST	77
L35	NO_TEST=YES	TP_NEC_NTEST1	77
L35	NO_TEST=YES	TP_NEC_SMC	77
L35	NO_TEST=YES	TP_NEC_SMI_L	77
L36	NO_TEST=YES	TP_NEC_SRCLK	77
L35	NO_TEST=YES	TP_NEC_SRDATA	77
L36	NO_TEST=YES	TP_NEC_SRMOD	77
L36	NO_TEST=YES	TP_NEC_TEB	77
L36	NO_TEST=YES	TP_NEC_TEST	77
L36	NO_TEST=YES	TP_PLS_CLK_66M_0	27
L36	NO_TEST=YES	TP_PLS_CLK_66M_1	27
L37	NO_TEST=YES	TP_PLS_REF_CML	27
L37	NO_TEST=YES	TP_PLS_TEST1	27
L37	NO_TEST=YES	TP_PLS_TEST2	27
L37	NO_TEST=YES	TP_PLS_TEST3	27
L37	NO_TEST=YES	TP_SB_FSTEST	25
L37	NO_TEST=YES	TP_SB_PLLTEST	25
L37	NO_TEST=YES	TP_VREF_CG	48
L37	NO_TEST=YES	TP_SB_NC_P7	91
L38	NO_TEST=YES	TP_SB_NC_P8	91
L37	NO_TEST=YES	TP_SB_NC_R3	91
L38	NO_TEST=YES	TP_SB_NC_R4	91
L38	NO_TEST=YES	TP_SB_NC_R5	91
L38	NO_TEST=YES	TP_SB_NC_R6	91
L38	NO_TEST=YES	TP_SB_NC_R7	91
L38	NO_TEST=YES	TP_SB_NC_R8	91
L38	NO_TEST=YES	TP_SB_NC_T1	91
L38	NO_TEST=YES	TP_SB_NC_T2	91
L38	NO_TEST=YES	TP_SB_NC_T3	91
L39	NO_TEST=YES	TP_SB_NC_T4	91
L38	NO_TEST=YES	TP_SB_NC_T5	91
L39	NO_TEST=YES	TP_SB_NC_T6	91
L39	NO_TEST=YES	TP_SB_NC_T7	91
L39	NO_TEST=YES	TP_SB_NC_T8	91
L39	NO_TEST=YES	TP_SB_NC_U1	91
L39	NO_TEST=YES	TP_SB_NC_U2	91
L39	NO_TEST=YES	TP_SB_NC_U3	91
L39	NO_TEST=YES	TP_SB_NC_U4	91
L39	NO_TEST=YES	TP_SB_NC_U5	91
L39	NO_TEST=YES	TP_SB_NC_U6	91
L40	NO_TEST=YES	TP_SB_NC_V1	91
L40	NO_TEST=YES	TP_SB_NC_V2	91
L40	NO_TEST=YES	TP_SB_NC_V3	91
L40	NO_TEST=YES	TP_SB_NC_V4	91
L40	NO_TEST=YES	TP_SB_NC_W1	91
L40	NO_TEST=YES	TP_SB_NC_W3	91
L40	NO_TEST=YES	TP_SB_NC_Y1	91
L40	NO_TEST=YES	TP_SB_NC_Y3	91
L40	NO_TEST=YES	TP_SATA_CLK25M	27
L42	NO_TEST=YES	TP_ENET_TCK	87
L42	NO_TEST=YES	TP_USB2_PWREN<0>	92
L42	NO_TEST=YES	TP_USB2_PWREN<1>	92
L43	NO_TEST=YES	TP_DUMMY_A	24
L43	NO_TEST=YES	TP_DUMMY_B	24
L43	NO_TEST=YES	TP_RAM_CKE_R<2>	8
L43	NO_TEST=YES	TP_RAM_CKE_R<3>	8
L43	NO_TEST=YES	TP_RAM_CKE_R<6>	8
L43	NO_TEST=YES	TP_RAM_CKE_R<7>	8
L43	NO_TEST=YES	TP_RAM_CS_L_R<10>	8
L43	NO_TEST=YES	TP_RAM_CS_L_R<11>	8
L43	NO_TEST=YES	TP_RAM_CS_L_R<2>	8
L43	NO_TEST=YES	TP_RAM_CS_L_R<3>	8
L44	NO_TEST=YES	TP_RAM_MUXEN0	8
L44	NO_TEST=YES	TP_RAM_MUXEN4	8
L44	NO_TEST=YES	TP_NB_PM_SLEEP0	24
L44	NO_TEST=YES	TP_J4000_SJRESET_L	40
L44	NO_TEST=YES	TP_J4001_SJRESET_L	40
L44	NO_TEST=YES	TP_CMP_SPARE	
L44	NO_TEST=YES	TP_ENET_TXD<6>	87
L781	NO_TEST=YES	U2100_UNUSED	21
L809	NO_TEST=YES	PLS_CLK_66M_0_R	27
L810	NO_TEST=YES	PLS_CLK_66M_1_R	27

GENZ SHOULD USE J1400 FOR THE FOLLOWING NETS:

L782	NO_TEST=TRUE	EI_CPU_TO_NB_AD<0..43>	14 28 29
L784	NO_TEST=YES	EI_CPU_TO_NB_CLK_N	14 28 29
L785	NO_TEST=YES	EI_CPU_TO_NB_CLK_P	14 28 29
L786	NO_TEST=TRUE	EI_CPU_TO_NB_SR_N<0..1>	14 28 29
L787	NO_TEST=TRUE	EI_CPU_TO_NB_SR_P<0..1>	14 28 29
L788	NO_TEST=TRUE	EI_NB_TO_CPU_AD<0..43>	14 28 29
L789	NO_TEST=YES	EI_NB_TO_CPU_CLK_N	14 28 29
L790	NO_TEST=YES	EI_NB_TO_CPU_CLK_P	14 28 29
L792	NO_TEST=TRUE	EI_NB_TO_CPU_SR_N<0..1>	14 28 29
L793	NO_TEST=TRUE	EI_NB_TO_CPU_SR_P<0..1>	14 28 29
L793	NO_TEST=YES	CHKSTOP_L	8 14 29
L794	NO_TEST=YES	CPU_HRESET_L	14 29 30
L795	NO_TEST=YES	CPU_INT_L	14 25 29 30
L796	NO_TEST=YES	CPU1_HTBEN	14
L797	NO_TEST=YES	EI_CPU1_CLK_N	14 27
L798	NO_TEST=YES	EI_CPU1_CLK_P	14 27
L799	NO_TEST=YES	EI_QACK_L	14 28 29
L800	NO_TEST=YES	EI_QREQ_L	14 28 29 30
L801	NO_TEST=YES	EI_SE	14 28 29 30
L802	NO_TEST=YES	I2C_SMU_A_SCL_OUT_L	13 14 18
L803	NO_TEST=YES	I2C_SMU_A_SDA_OUT_L	13 14 18
L804	NO_TEST=YES	MCP_L	14 29
L805	NO_TEST=YES	RI_L	14 29 30
L806	NO_TEST=YES	SYNCENABLE	14 29 30
L807	NO_TEST=YES	TP_PROC_TRIGGER_OUT	14 29
L808	NO_TEST=YES	EI_CPU1_SYNC	14 27

90	IN	FW_VP_PORT1	FUNC_TEST=YES
90	IN	FW_TPO1P	FUNC_TEST=YES
90	IN	FW_TPO1N	FUNC_TEST=YES
90	IN	FW_TPI1P	FUNC_TEST=YES
90	IN	FW_TPI1N	FUNC_TEST=YES
90	IN	FW_VP_PORT2	FUNC_TEST=YES
90	IN	FW_TPO2P	FUNC_TEST=YES
90	IN	FW_TPO2N	FUNC_TEST=YES
90	IN	FW_TPI2P	FUNC_TEST=YES
90	IN	FW_TPI2N	FUNC_TEST=YES
90	IN	FW_VGND	FUNC_TEST=YES
77 76 75 74 73	IN	PCI_AD<31..0>	FUNC_TEST=TRUE
77 76 74 73	IN	PCI_CBE_L<3..0>	FUNC_TEST=TRUE
8	IN	PCI_CLK33M_AIRPORT	FUNC_TEST=YES
76 74	IN	PCI_SLOTA_REQ_L	FUNC_TEST=YES
76 74	IN	PCI_SLOTA_GNT_L	FUNC_TEST=YES
76 25	IN	PCI_SLOTA_INT_L	FUNC_TEST=YES
74 58 51 8	IN	PCI_RESET_L	FUNC_TEST=YES
77 76 74 73	IN	PCI_FRAME_L	FUNC_TEST=YES
77 76 74 73	IN	PCI_TRDY_L	FUNC_TEST=YES
77 76 74 73	IN	PCI_IRDY_L	FUNC_TEST=YES
77 76 74 73	IN	PCI_STOP_L	FUNC_TEST=YES
77 76 74 73	IN	PCI_DEVSEL_L	FUNC_TEST=YES
77 76 74 73	IN	PCI_PAR	FUNC_TEST=YES
76	IN	PCI_SLOTA_IDSEL	FUNC_TEST=YES
76 75 74	IN	ROM_CS_L	FUNC_TEST=YES
76 75 74	IN	ROM_OE_L	FUNC_TEST=YES
76 75 74	IN	ROM_WE_L	FUNC_TEST=YES
76 75	IN	ROM_ONBOARD_CS_L	FUNC_TEST=YES
76	IN	AIRPORT_CLKRUN_L_PD	FUNC_TEST=YES
92	IN	USB_BT_N	FUNC_TEST=YES
92	IN	USB_BT_P	FUNC_TEST=YES
92	IN	USB2_PORT1_N_F	FUNC_TEST=YES
92	IN	USB2_PORT1_P_F	FUNC_TEST=YES
92	IN	USB2_PORT2_N_F	FUNC_TEST=YES
92	IN	USB2_PORT2_P_F	FUNC_TEST=YES
92	IN	USB2_PORT3_N_F	FUNC_TEST=YES
92	IN	USB2_PORT3_P_F	FUNC_TEST=YES
92	IN	PP5V_USB2_PORT1_F	FUNC_TEST=YES
92	IN	PP5V_USB2_PORT2_F	FUNC_TEST=YES
92	IN	PP5V_USB2_PORT3_F	FUNC_TEST=YES
94 76 25	IN	I2S1_DEV_TO_SB_DTI 2 TEST POINTS	FUNC_TEST=YES
94 25	IN	I2S1_SYNC 2 TEST POINTS	FUNC_TEST=YES
94 25	IN	I2S1_BITCLK 2 TEST POINTS	FUNC_TEST=YES
94 76 25	IN	I2S1_MCLK 2 TEST POINTS	FUNC_TEST=YES
94 76 25	IN	I2S1_SB_TO_DEV_DTO 2 TEST POINTS	FUNC_TEST=YES
94 25	IN	I2S1_RESET_L 2 TEST POINTS	FUNC_TEST=YES
94 25	IN	MODEM_RING2SYS_L 2 TEST POINTS	FUNC_TEST=YES
94 18	IN	I2C_UDASH_SDA	FUNC_TEST=YES
94 18	IN	I2C_UDASH_SCL	FUNC_TEST=YES
94	IN	USB_UDASH_N	FUNC_TEST=YES
94	IN	USB_UDASH_P	FUNC_TEST=YES
94 25	IN	UDASH_SDOWN	FUNC_TEST=YES
94 25	IN	UDASH_RESET_L	FUNC_TEST=YES
94	IN	UDASH_I2C_A1_PU	FUNC_TEST=YES
59	IN	PPVCC_TMDS	FUNC_TEST=YES
59	IN	PP3V3_DDC	FUNC_TEST=YES
59	IN	TD0M	FUNC_TEST=YES
59	IN	TD0P	FUNC_TEST=YES
59	IN	TD1M	FUNC_TEST=YES
59	IN	TD1P	FUNC_TEST=YES
59	IN	TD2M	FUNC_TEST=YES
59	IN	TD2P	FUNC_TEST=YES
59	IN	TCKM	FUNC_TEST=YES
59	IN	TCKP	FUNC_TEST=YES
59	IN	TMDS_DDC_DAT	FUNC_TEST=YES
59	IN	TMDS_DDC_CLK	FUNC_TEST=YES
59 7	IN	GND_CHASSIS_TMDS	FUNC_TEST=YES
59	IN	FILT_ANALOG_RED	FUNC_TEST=YES
59	IN	FILT_ANALOG_GRN	FUNC_TEST=YES
59	IN	FILT_ANALOG_BLU	FUNC_TEST=YES
59 57 56	IN	ANALOG_HSYNC_L	FUNC_TEST=YES
59 57 56	IN	ANALOG_VSYNC_L	FUNC_TEST=YES
59	IN	VGA_IIC_CLK	FUNC_TEST=YES
59	IN	VGA_IIC_DAT	FUNC_TEST=YES
59 58	IN	MON_DETECT	FUNC_TEST=YES
59	IN	DDC_VCC_5	FUNC_TEST=YES
59	IN	PP24V_INV	FUNC_TEST=YES
59	IN	GND_20_INV	FUNC_TEST=YES
59	IN	INV_20_LCD_PWM_	FUNC_TEST=YES
59	IN	INV_20_CUR_HI_F	FUNC_TEST=YES
59	IN	PP12V_INV	FUNC_TEST=YES
59	IN	GND_17_INV	FUNC_TEST=YES
59	IN	PP5V_AGP_RL	FUNC_TEST=YES
59	IN	INV_17_LCD_PWM_F	FUNC_TEST=YES
59	IN	LAMP_STS_F	FUNC_TEST=YES
59	IN	INV_17_CUR_HI_F	FUNC_TEST=YES
33 8	IN	CPU_VID_R<5..0>	FUNC_TEST=TRUE
36	IN	KPVDD2_FMAX	FUNC_TEST=YES
36	IN	KPGND2_FMAX	FUNC_TEST=YES
36	IN	TDIODE_POS_FMAX	FUNC_TEST=YES
36	IN	TDIODE_NEG_FMAX	FUNC_TEST=YES
36 33	IN	CORE_ISNS_M	FUNC_TEST=YES
36 33	IN	CORE_ISNS_P	FUNC_TEST=YES

PP12V_RUN PP5V_RUN PP24V_RUN PP5V_ALL PP3V3_RUN

	IN	PP12V_RUN	10 TEST POINTS	FUNC_TEST=YES
11 7	IN	PP5V_ALL	5 TEST POINTS	FUNC_TEST=YES
18 11	IN	PP5V_RUN	5 TEST POINTS	FUNC_TEST=YES
18 11	IN	PP3V3_RUN	5 TEST POINTS	FUNC_TEST=YES
	IN	PP24V_RUN	5 TEST POINTS	FUNC_TEST=YES
83 7	IN	=PP5V_DISK	5 TEST POINTS	FUNC_TEST=YES
83 7	IN	=PP12V_DISK	5 TEST POINTS	FUNC_TEST=YES
	IN	GND	12 TEST POINTS	FUNC_TEST=YES

PP2V5_RUN PP5V_PWRON PP1V2_PWRON PP1V5_RUN PP3V3_PWRON

	IN	PP2V5_RUN		FUNC_TEST=YES
	IN	PP1V5_RUN		FUNC_TEST=YES
18 13	IN	PP5V_PWRON		FUNC_TEST=YES
27 18 13	IN	PP3V3_PWRON		FUNC_TEST=YES
	IN	PP1V2_PWRON		FUNC_TEST=YES
10 7	IN	PPVCORE_PWRON_SB		FUNC_TEST=YES
13 8 7	IN	=PP3V3_ALL_SMU		FUNC_TEST=TRUE
31 8 7	IN	=PP5V_RUN_CPU		FUNC_TEST=YES
22 7	IN	PPVCORE_NB		FUNC_TEST=YES
35 34 33 7	IN	PPVCORE_CPU		FUNC_TEST=YES
34 33	IN	PP12V_CPU		FUNC_TEST=YES
33	IN	VCORE_SENSE_GND		FUNC_TEST=YES
33	IN	VCORE_SENSE_VOUT		FUNC_TEST=YES
8 7	IN	SMU_MANUAL_RESET_L	2 TEST POINTS	FUNC_TEST=YES
13 7	IN	SYS_POWER_BUTTON_L	2 TEST POINTS	FUNC_TEST=YES
7	IN	POWER_BUTTON_L		FUNC_TEST=YES
7	IN	RESET_BUTTON_L		FUNC_TEST=YES
13 8	IN	SMU_RESET_L		FUNC_TEST=YES
33 13 11 10 7	IN	SYS_POWERUP_L		FUNC_TEST=YES
50 46 11 10 9 8	IN	SYS_SLEEP		FUNC_TEST=YES
13 8	IN	SYS_POWERFAIL_L		FUNC_TEST=YES
	IN	EXT_POWER_BUTTON_L		FUNC_TEST=TRUE
9	IN	U900_FEEDBACK		FUNC_TEST=YES
22	IN	U2200_FEEDBACK		FUNC_TEST=YES
59 57	IN	ANALOG_RED		FUNC_TEST=YES
59 57	IN	ANALOG_GRN		FUNC_TEST=YES
59 57	IN	ANALOG_BLU		FUNC_TEST=YES
	IN	AUDIO_LI_DETECT_L		FUNC_TEST=TRUE
101 25	IN	AUDIO_LO_DET_L		FUNC_TEST=YES
75	IN	ROM_WP_L		FUNC_TEST=YES
83 80	IN	UATA_DD<15..0>		FUNC_TEST=TRUE
83 80	IN	UATA_DA<2..0>		FUNC_TEST=TRUE
83 80	IN	UATA_CS0_L		FUNC_TEST=YES
83 80	IN	UATA_CS1_L		FUNC_TEST=YES
83 80	IN	UATA_RESET_L		FUNC_TEST=YES
83	IN	UATA_DSTROBE_R		FUNC_TEST=YES
83 80	IN	UATA_HSTROBE		FUNC_TEST=YES
83 8046 83 80	IN	UATA_STOP		FUNC_TEST=YES
83	IN	UATA_DMARQ_R		FUNC_TEST=YES
83 80	IN	UATA_DMACK_L		FUNC_TEST=YES
83	IN	UATA_INTRQ_R		FUNC_TEST=YES
83	IN	UATA_IOCS16_PU		FUNC_TEST=YES
83	IN	UATA_CSEL_PD		FUNC_TEST=YES
36 31	IN	TDIODE_NEG		FUNC_TEST=YES
76	IN	TP_AIRPORT_PME_L		FUNC_TEST=YES
76	IN	TP_AIRPORT_RF_DISABLE		FUNC_TEST=YES

FUNC TEST

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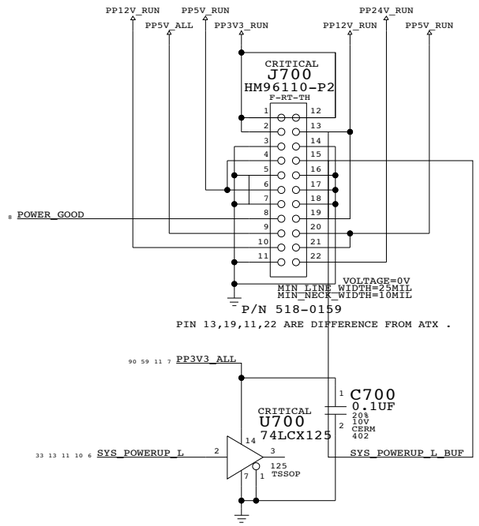
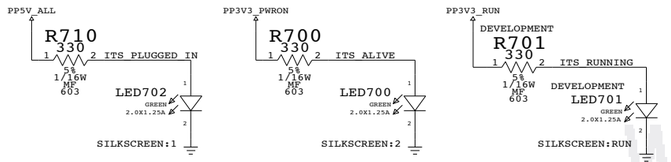
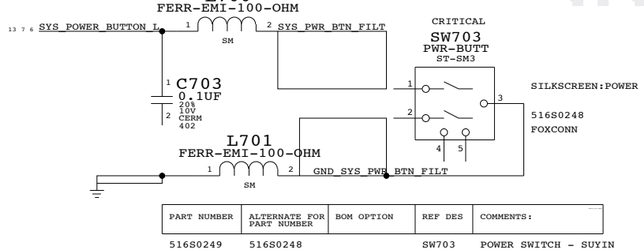
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 6 OF 103	

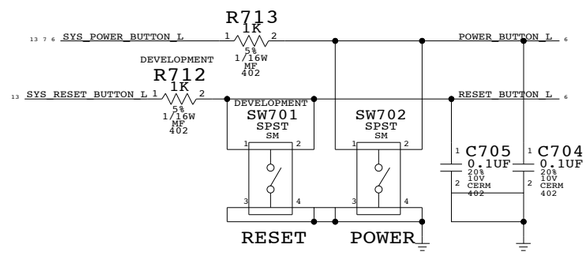


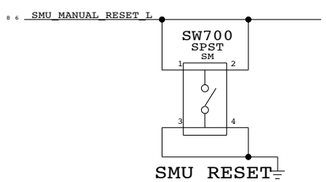




PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
516S0249	516S0248		SW703	POWER SWITCH - SUYIN

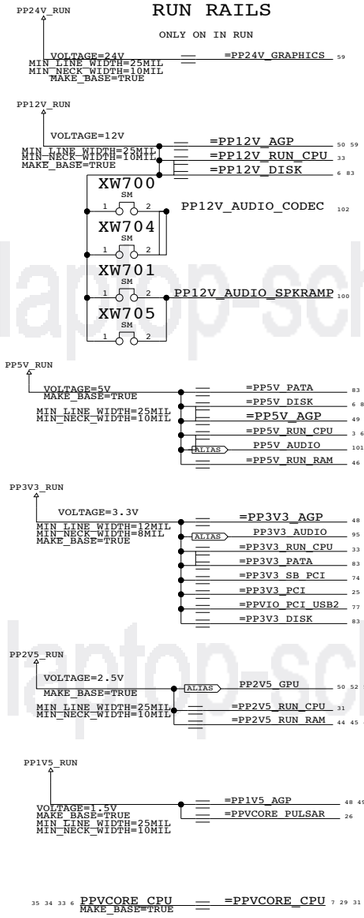
SUYIN WILL NOT BE USED FOR INITIAL RAMP





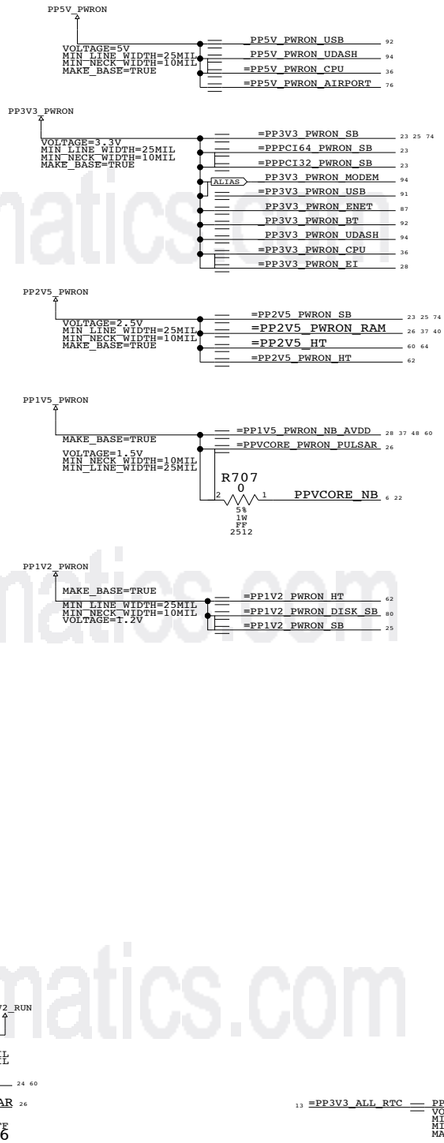
RUN RAILS

ONLY ON IN RUN



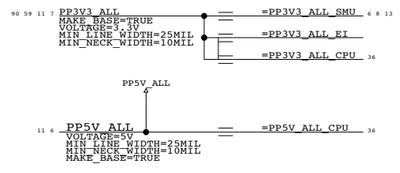
PWRON RAILS

ON IN RUN AND SLEEP

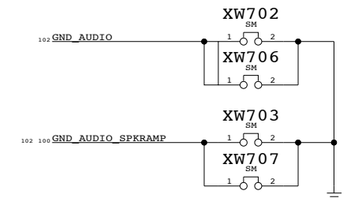


ALL RAILS

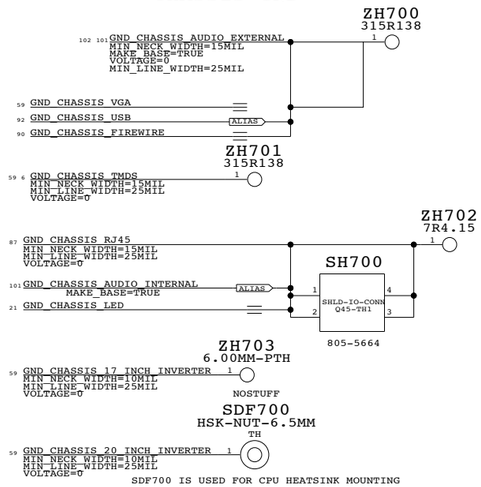
ALWAYS ON WHEN UNIT HAS AC POWER (TRICKLE)



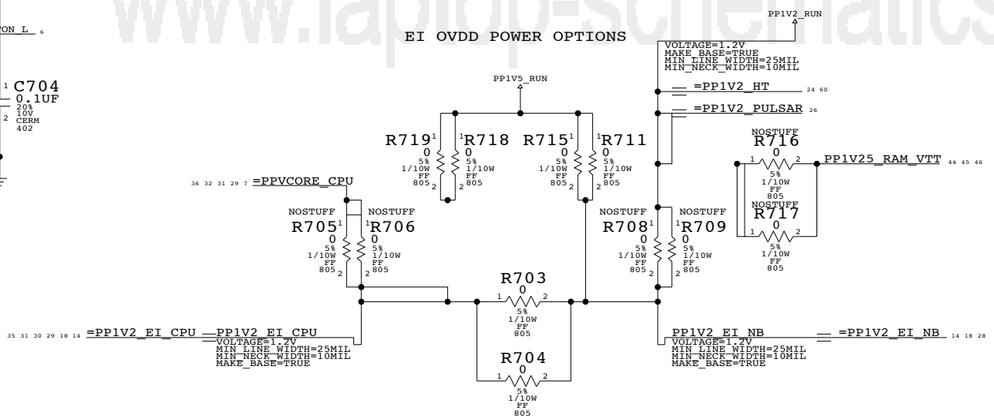
GND RAILS



CHASSIS GND

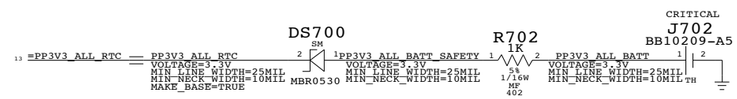


EI OVDD POWER OPTIONS



RTC BATTERY

ALWAYS ON (TRICKLE)



POWER CONN / ALIAS

APPLE COMPUTER INC.

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PCI CLOCKS

TP_NB_THMI (MAKE_BASE=TRUE, ALIAS) → NB_THMI (24)
TP_THMO (MAKE_BASE=TRUE, ALIAS) → NB_THMO (24)
TP_RAM_CKE_R<2> (6, MAKE_BASE=TRUE, ALIAS) → RAM_CKE_R<2> (37)
TP_RAM_CKE_R<3> (6, MAKE_BASE=TRUE, ALIAS) → RAM_CKE_R<3> (37)
TP_RAM_CKE_R<6> (6, MAKE_BASE=TRUE, ALIAS) → RAM_CKE_R<6> (37)
TP_RAM_CKE_R<7> (6, MAKE_BASE=TRUE, ALIAS) → RAM_CKE_R<7> (37)
TP_RAM_MUXEN0 (6, MAKE_BASE=TRUE, ALIAS) → RAM_MUXEN0 (37)
TP_RAM_MUXEN4 (6, MAKE_BASE=TRUE, ALIAS) → RAM_MUXEN4 (37)
TP_RAM_CS_L_R<2> (6, MAKE_BASE=TRUE, ALIAS) → RAM_CS_L_R<2> (37)
TP_RAM_CS_L_R<3> (6, MAKE_BASE=TRUE, ALIAS) → RAM_CS_L_R<3> (37)
TP_RAM_CS_L_R<10> (6, MAKE_BASE=TRUE, ALIAS) → RAM_CS_L_R<10> (37)
TP_RAM_CS_L_R<11> (6, MAKE_BASE=TRUE, ALIAS) → RAM_CS_L_R<11> (37)

PCI_CLK33M_USB2 (MAKE_BASE=TRUE) → PCI_CLK_GP0 (27); =PCI_CLK33M_USB2 (77)
TP_PCI_CLK_GP1 (MAKE_BASE=TRUE, ALIAS) → PCI_CLK_GP1 (27)
PCI_CLK33M_AIRPORT (6, MAKE_BASE=TRUE) → PCI_CLK_P3 (27); PCI_CLK33M_AIRPORT (76)
TP_PCI_CLK_P4 (MAKE_BASE=TRUE, ALIAS) → PCI_CLK_P4 (27)
PCI_CLK33M_SB_EXT (74 27, MAKE_BASE=TRUE, ALIAS) → PCI_CLK_P1 (27)

SMU

TP_ALS0_OUT (MAKE_BASE=TRUE, ALIAS) → ALS0_OUT (13)
TP_ALS1_OUT (MAKE_BASE=TRUE, ALIAS) → ALS1_OUT (13)
TP_ALS_GAIN_BOOST (MAKE_BASE=TRUE, ALIAS) → ALS_GAIN_BOOST (13)
TP_SMU_ONEWIRE (MAKE_BASE=TRUE, ALIAS) → SMU_ONEWIRE (13)
TP_SYS_SLOT_PWR (MAKE_BASE=TRUE, ALIAS) → SYS_SLOT_PWR (13)
TP_SMU_PWRSEQ_P1_3 (MAKE_BASE=TRUE, ALIAS) → SMU_PWRSEQ_P1_3 (13)
TP_SYS_DOOR_AJAR_L (MAKE_BASE=TRUE, ALIAS) → SYS_DOOR_AJAR_L (13)
TP_FAN_PWM8 (MAKE_BASE=TRUE, ALIAS) → FAN_PWM8 (13)
TP_SYS_DRIVE_BAY_INT_L (MAKE_BASE=TRUE, ALIAS) → SYS_DRIVE_BAY_INT_L (13)
SMU_WARM_RESET_L (13 8, MAKE_BASE=TRUE, ALIAS) → NB_WARM_RESET_L (24)
PCI_RESET_L (74 58 51 6, MAKE_BASE=TRUE) → PCI_AIRPORT_RESET_L (76); GPU_RESET_L (49); =PCI_ROM_RESET_L (75); =PCI_USB2_RESET_L (77)

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
LEAD SMU_RESET	10 MIL SPACING		SYS_COLD_RESET_L (13 24)
LEAD SMU_RESET	10 MIL SPACING		SYS_WARM_RESET_L (8 25 74 77 87)

DIAG LED

PP5V_ALL → R850 180 5% 1/16W MF 402 → LED850P1 → LED850 RED SM → LED850P2 → Q850 2N3904 SM
DIAG_LED (13, MAKE_BASE=TRUE) → R851 1K 5% 1/16W MF 402 → DIAG_LED_R

CPU VID<0:5>

VID CONTROLLED BY SMU

PP3V3_RUN → R814 10K, R816 10K, R817 10K, R808 10K, R809 10K, R804 10K (5% 1/16W MF 402)

CPU_VID<0> (13) → R819 0 → CPU_VID_R<0> (6 33)
CPU_VID<1> (13) → R820 0 → CPU_VID_R<1> (6 33)
CPU_VID<2> (13) → R821 0 → CPU_VID_R<2> (6 33)
CPU_VID<3> (13) → R822 0 → CPU_VID_R<3> (6 33)
CPU_VID<4> (13) → R823 0 → CPU_VID_R<4> (6 33)
CPU_VID<5> (13) → R824 0 → CPU_VID_R<5> (6 33)
(5% 1/16W MF 402)

J803 BM12B-SRSS-TB (NOSTUFF, F-ST-SM)

NOSTUFF: R832 1K, R831 1K, R830 1K, R829 1K, R827 1K, R811 20K (5% 1/16W MF 402)

NOTE:PULL UP CPU_VID<5>TO 2.2V FOR CPU VRM10.

BACKUP SMU RESET CIRCUIT

=PP3V3_ALL_SMU (13 7 6) → NOSTUFF C800 0.1uF 10% 16V CERM 402 → U890 SM (VCC, DELAY, NOSTUFF_RESET, GND; VOLTAGE DETECTOR MC33465N_30ATR) → R890 1K 5% 1/16W MF 402
SMU_MANUAL_RESET_L (8 7 6) → NOSTUFF C890 0.01UF 10% 16V CERM 402
SMU_RESET_L (6 13) ← NOSTUFF C891 1uF 10% 6.3V CERM 402
R810 0 5% 1/16W MF 402

PULSAR ERROR_L LED

PP3V3_RUN → DEVELOPMENT R801 4.7K 5% 1/16W MF 402 → ERROR_LED → DEVELOPMENT D810 RED SM
CLOCK_ERROR_L (27)

DOWNLOAD CONNECTOR

PP3V3_ALL → J802 HCT7U51 M-ST-TH (518-0158)
SMU_BOOT_SCLK (13) → J802_2
SMU_BOOT_CE (13) → J802_4
SMU_BOOT_CNVSS (13) → J802_6
J802_2 → R826 100 5% 1/16W MF 402 → SMU_BOOT_BUSY (13)
SMU_BOOT_RXD (13)
(SMU_BOOT_EPM)
SMU_MANUAL_RESET_L (6 7 8)
SMU_BOOT_TXD (13)
R806 10K, R807 10K NOSTUFF; R805 0, R803 10K (5% 1/16W MF 402)

J802 & R826 CAN MOVE TO DEVELOPMENT BOM POST RAMP

PLL LOCK LED

=PP5V_RUN_CPU (31 8 7 6 3)
DEVELOPMENT R837 180 5% 1/16W MF 402; DEVELOPMENT Q802 2N3906 SM
Q802_B → Q802_E
DEVELOPMENT R838 1K; DEVELOPMENT R835 180 (5% 1/16W MF 402)
LED802_1 → DEVELOPMENT LED802 GREEN 2.0X1.25A
Q803_C → DEVELOPMENT Q803 2N3904 SM
PLLLOCK (29) → DEVELOPMENT R839 180 5% 1/16W MF 402 → Q803_B

CHKSTOP LED

=PP5V_RUN_CPU (31 8 7 6 3)
DEVELOPMENT R833 180 5% 1/16W MF 402 → LED801_1 → DEVELOPMENT LED801 RED SM
Q800_D
DEVELOPMENT R834 180 5% 1/16W MF 402 → Q800_G → DEVELOPMENT Q800 2N7002 SM
CHKSTOP_L (29 14 6) → DEVELOPMENT R836 180 5% 1/16W MF 402 → Q801_B → DEVELOPMENT Q801 2N3904 SM

SHASTA JTAG PULL DOWN

JTAG_SB_TRST_L (25) → R825 10K 5% 1/16W MF 402

THESE PINS HAVE INTERNAL PULLUPS

TP_JTAG_SB_TCK (MAKE_BASE=TRUE, ALIAS) → JTAG_SB_TCK (25)
TP_JTAG_SB_TDI (MAKE_BASE=TRUE, ALIAS) → JTAG_SB_TDI (25)
TP_JTAG_SB_TDO (MAKE_BASE=TRUE, ALIAS) → JTAG_SB_TDO (25)
TP_JTAG_SB_TMS (MAKE_BASE=TRUE, ALIAS) → JTAG_SB_TMS (25)

DEVELOPMENT J800 U.FL-R-SMT

NB_PMR_OBSV (24) → F-ST-SM → 518S0104

SMU ANALOG VREF

PP3V3_ALL_SMU_AVCC (13) → NOSTUFF R818 200 1% 1/16W MF 402
PPVREF_SMU (MAKE_BASE=TRUE) → =PPVREF_SMU (13)
R802 0 → PPVREF_SMU_ADC_REF (36)
NOSTUFF C801 2.2UF 20% 10V CERM 805
NOSTUFF VR801 2.5V SOT-23
NOSTUFF C802 0.47UF 20% 10V CERM 603
GND_SMU_AVSS (13 33 36)
NOSTUFF R828 0 → GND_SMU_AVSS_DAGND (36)
(5% 1/16W MF 402)

POWER_FAIL_L CONNECTION

POWER_GOOD (7) → PP3V3_ALL
NOSTUFF R813 430, NOSTUFF R812 10K (5% 1/16W MF 402)
SYS_POWERFAIL_L (6 13)
R860 4.7K (5% 1/16W MF 402)
POWER_GOOD IS A 5V DRIVEN SIGNAL FROM POWER SUPPLY
2K PULLUP INSIDE P/S

AIRPORT CARDGUIDE SMT NUTS

SDF890 STDOFF-6MMOD1MMH-TH
SDF891 STDOFF-6MMOD1MMH-TH

CPU HEATSINK SMT NUTS

NOSTUFF SDF800 HSK-NUT-6.5MM TH
NOSTUFF SDF801 HSK-NUT-6.5MM TH
NOSTUFF SDF802 HSK-NUT-6.5MM TH
HS_SDF800 (1) → C880 0.01UF 20% 16V CERM 402
HS_SDF801 (1) → C881 0.01UF 20% 16V CERM 402
HS_SDF802 (1) → C882 0.01UF 20% 16V CERM 402
NOSTUFF SDF803 HSK-NUT-6.5MM TH
QMIT ZH804 6P15R5P4
HS_SDF803 (1) → C883 0.01UF 20% 16V CERM 402
HS_SDF804 (1) → C884 0.01UF 20% 16V CERM 402
SDF700 IS ALSO USED FOR HEATSINK MOUNTING

SIGNAL ALIAS

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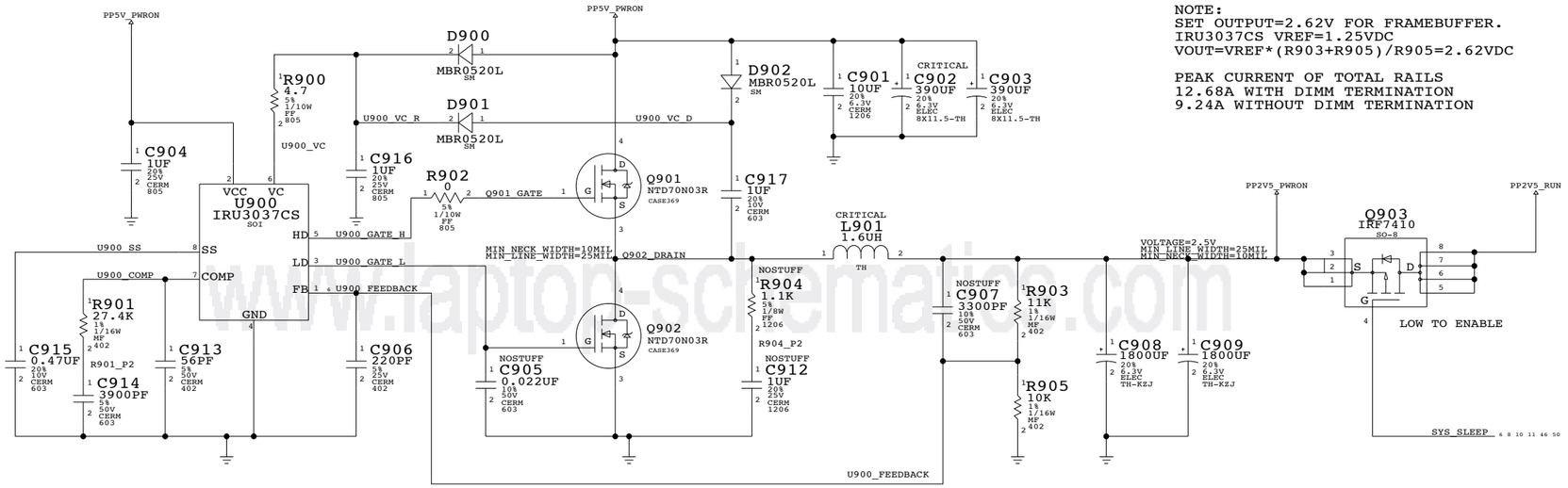
2.5V VOLTAGE REGULATOR



NOTE:
SET OUTPUT=2.62V FOR FRAMEBUFFER.
IRU3037CS VREF=1.25VDC
VOUT=VREF*(R903+R905)/R905=2.62VDC

PEAK CURRENT OF TOTAL RAILS
12.68A WITH DIMM TERMINATION
9.24A WITHOUT DIMM TERMINATION

2.5V VREG

APPLE COMPUTER INC.

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SCALE: NONE

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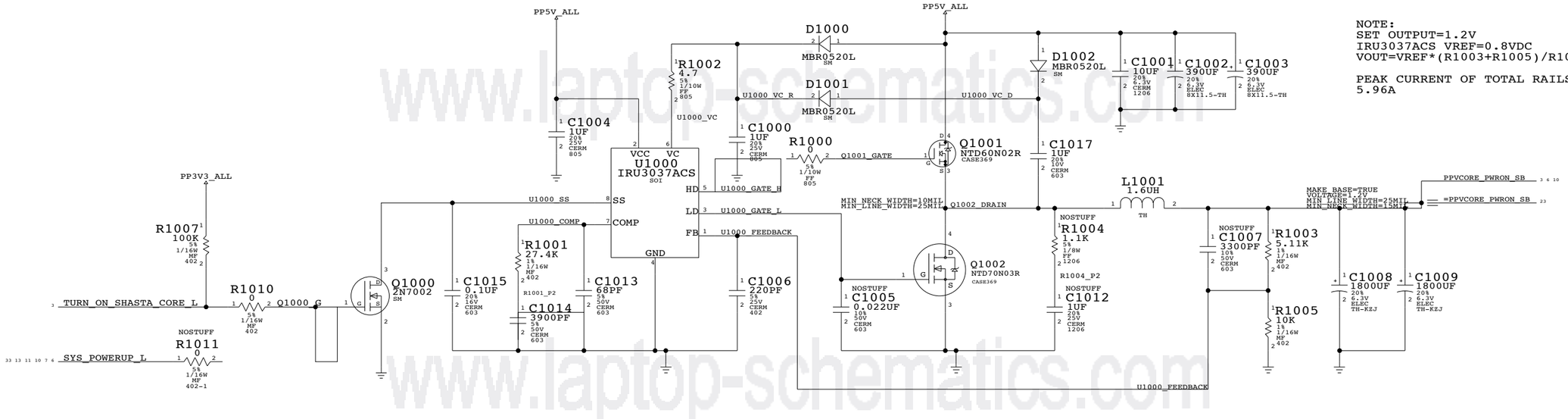
SHASTA CORE VOLTAGE REGULATOR

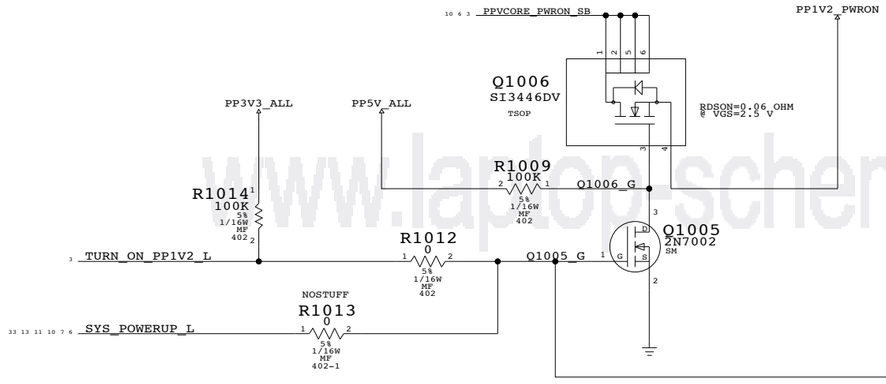


NOTE:
SET OUTPUT=1.2V
IRU3037ACS VREF=0.8VDC
VOUT=VREF*(R1003+R1005)/R1005=1.206VDC

PEAK CURRENT OF TOTAL RAILS
5.96A

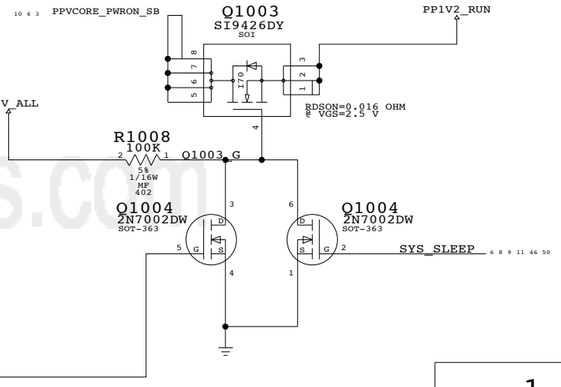
PP1V2_PWRON FET SWITCH

PEAK CURRENT 0.6A



PP1V2_RUN FET SWITCH

PEAK CURRENT 4.43A



1.2V VREG

APPLE COMPUTER INC.

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D	051-6482	I
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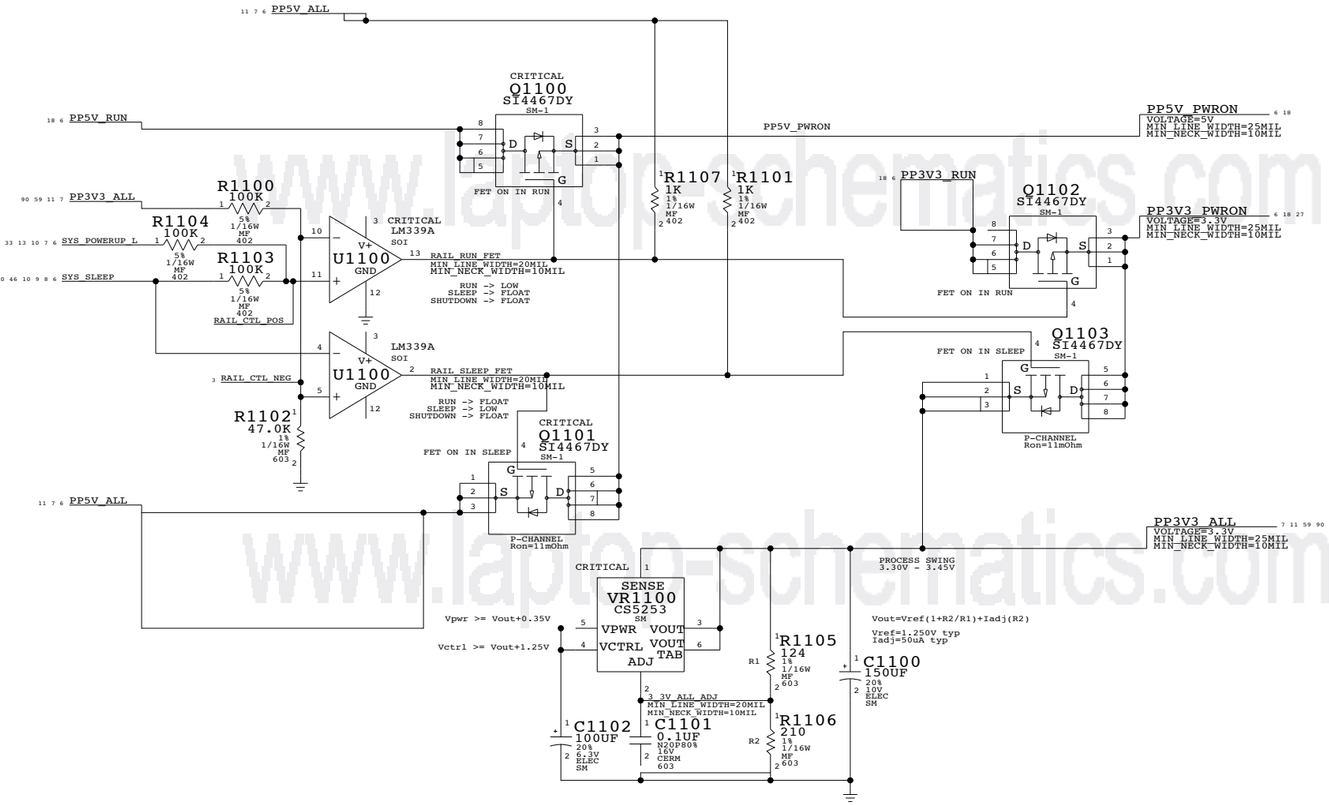

5V & 3.3V VREGS

APPLE COMPUTER INC.

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D	051-6482	I
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ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
SMU_CLK10M_XTAL	15 MIL SPACING		SMU_CLK10M_XIN
	15 MIL SPACING		SMU_CLK10M_XOUT
	15 MIL SPACING		SMU_CLK10M_XOUT_R
RTC_CLK32K_XTAL	15 MIL SPACING		RTC_CLK32K_X1
	15 MIL SPACING		RTC_CLK32K_X2

Page Notes

Power aliases required by this page:
- _PP3V3_ALL_SMU
- _PP3V3_ALL_RTC
- _PP3V3_PWRON_SMU
- _PPVREF_SMU (SMU AVCC or 2.5V reference)

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

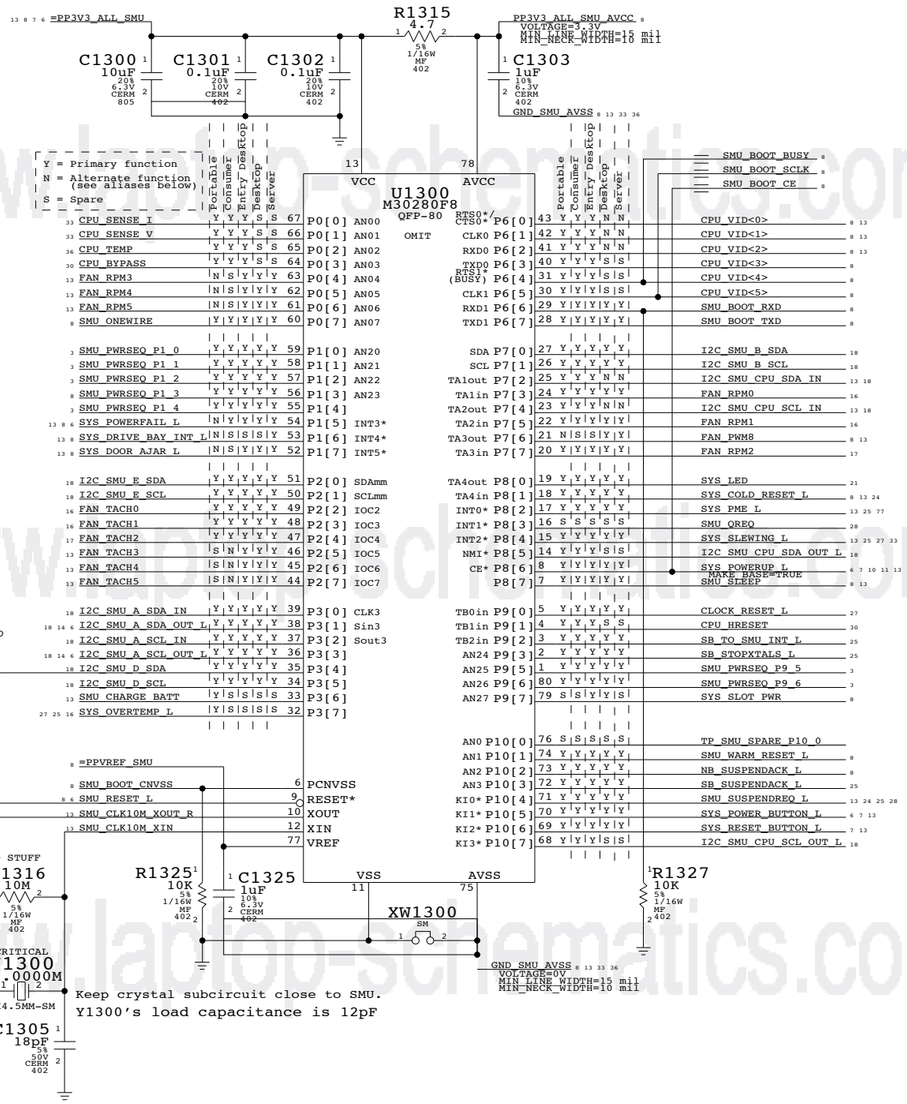
NOTE: CPU current/voltage monitoring (CPU_SENSE_I/CPU_SENSE_V) requires 100K/10uF RC filter at SMU pins. Caps should connect to GND_SMU_AVSS. SMU_VREF should be same signal or reference used by monitoring circuit, but be aware that this will affect other analog inputs such as AC adapter ID.

NOTE: All analog inputs to SMU should have a 100pF capacitor to the SMU AVSS signal (GND_SMU_AVSS). None of those capacitors are provided on this page.

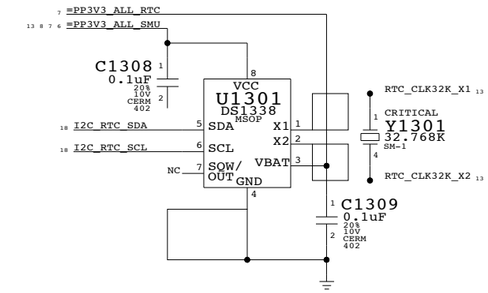
NOTE: Some primary and alternate functions reuire pull-ups that are not. provided on this page. Please. review the latest SMU specification to ensure missing pull-ups are provided on another page.

NOTE: Pinout matches SMU pinout v1.51.

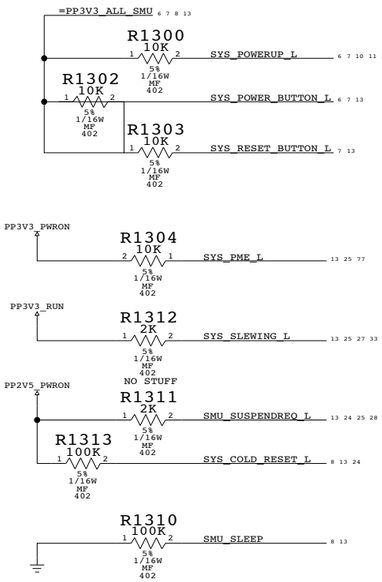
System Management Unit



Real Time Clock



SMU Pull-ups / pull-down



Alternate Functions

Portable

	Port		
FAN_RPM3	0.4	—	ALS0_OUT
FAN_RPM4	0.5	—	ALS1_OUT
FAN_RPM5	0.6	—	ALS_GAIN_BOOST
SYS_POWERFAIL_L	1.5	—	SMU_ACIN
SYS_DRIVE_BAY_INT_L	1.6	—	SMU_BATT_DET_L
SYS_DOOR_AJAR_L	1.7	—	SYS_LID_OPEN
FAN_PWM8	7.6	—	SYS_KBDLED

Consumer

	Port		
FAN_TACH3	2.5	—	SYS_LED_RED
FAN_TACH4	2.6	—	SYS_LED_GREEN
FAN_TACH5	2.7	—	SYS_LED_BLUE
SMU_CHARGE_BATT	3.6	—	DIAG_LED

Tower & Server

	Port		
CPU_VID<0>	6.0	—	FAN_TACH6
CPU_VID<1>	6.1	—	FAN_TACH7
CPU_VID<2>	6.2	—	FAN_TACH8
I2C_SMU_CPU_SDA_IN	7.2	—	FAN_PWM6
I2C_SMU_CPU_SCL_IN	7.4	—	FAN_PWM7

Master: Link

System Management Unit

APPLE COMPUTER INC.

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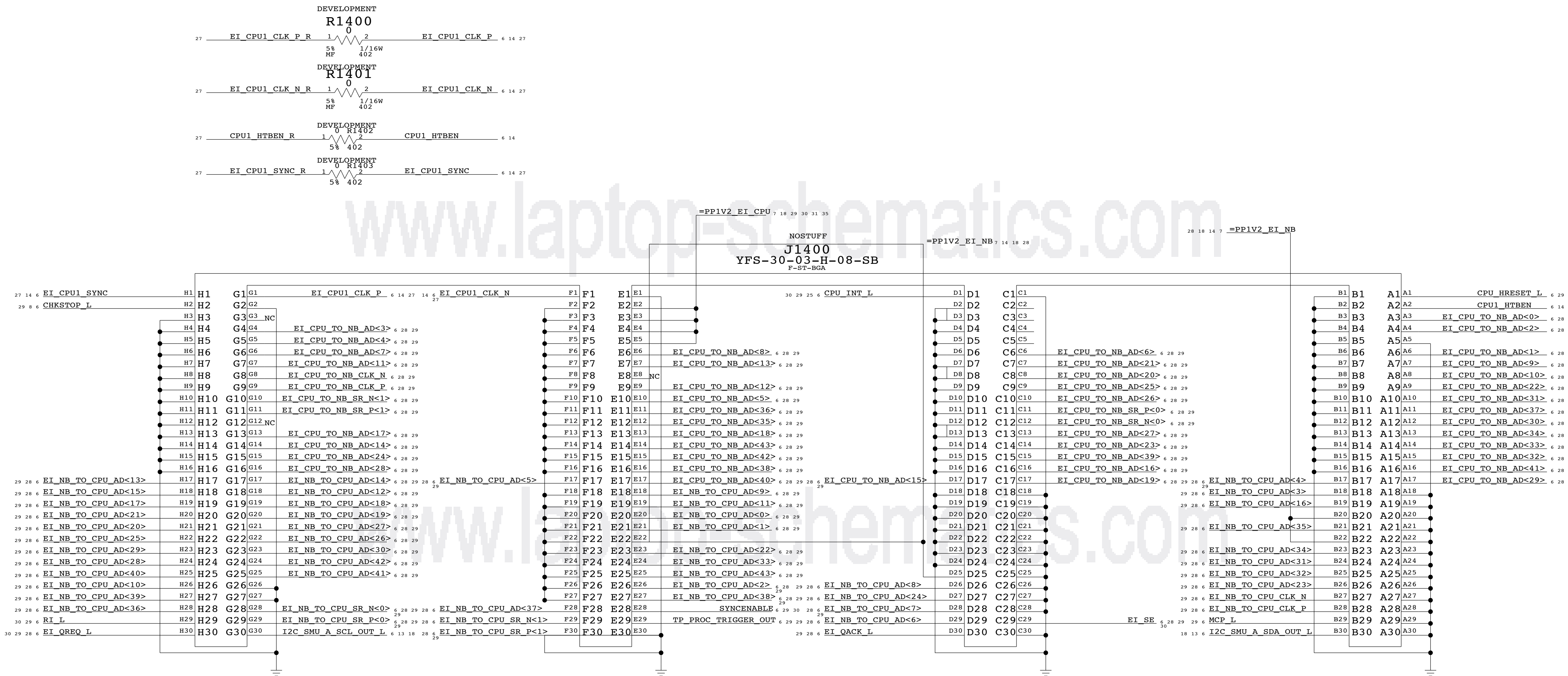

CPU LOGIC ANALYZER

APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
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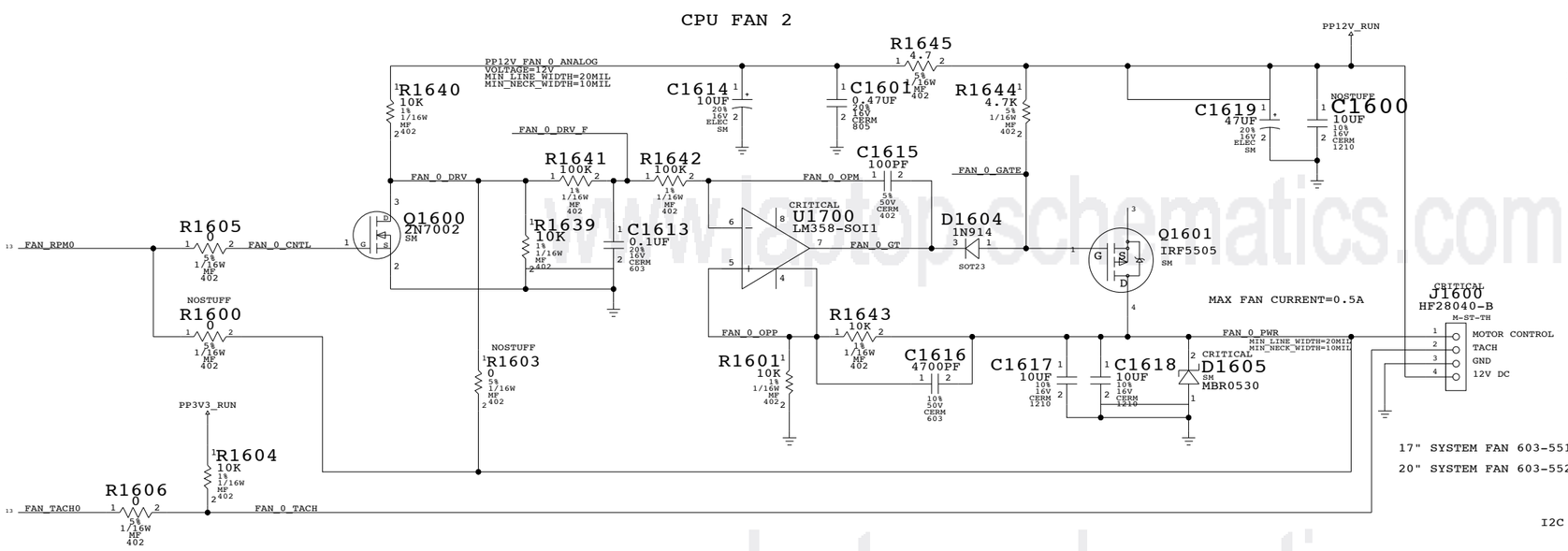
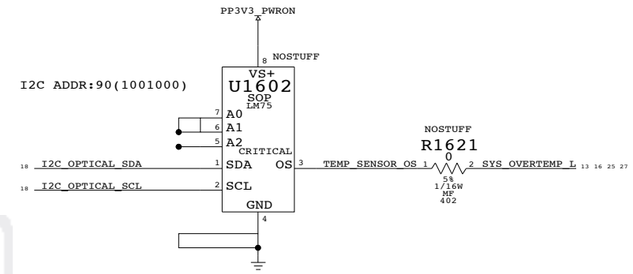
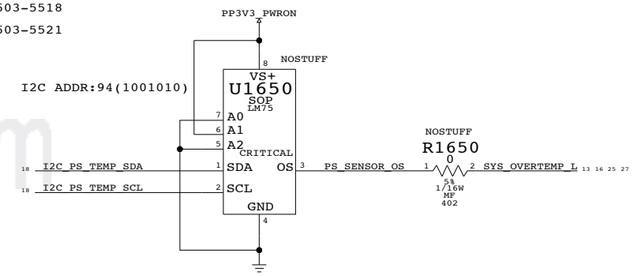
FAN 1 - Q37 STYLE CPU FAN CONTROL CIRCUIT



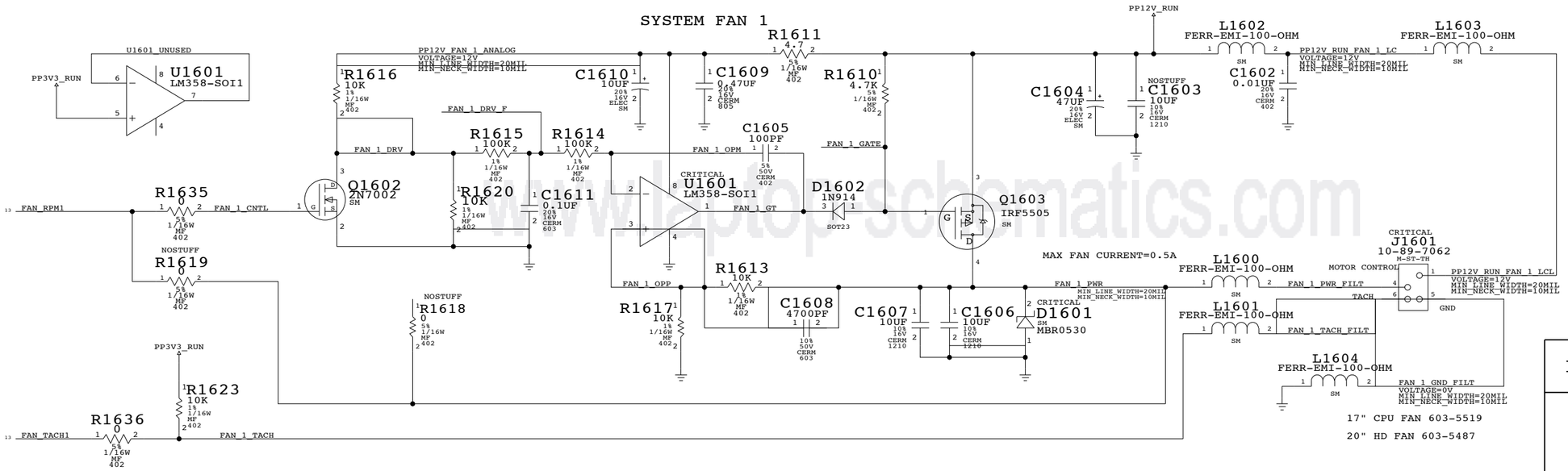
OPTICAL TEMP SENSOR



POWER SUPPLY TEMP SENSOR



FAN 2 - Q37 STYLE CPU FAN CONTROL CIRCUIT



FAN 1, 2 & SYSTEM TEMP

APPLE COMPUTER INC.

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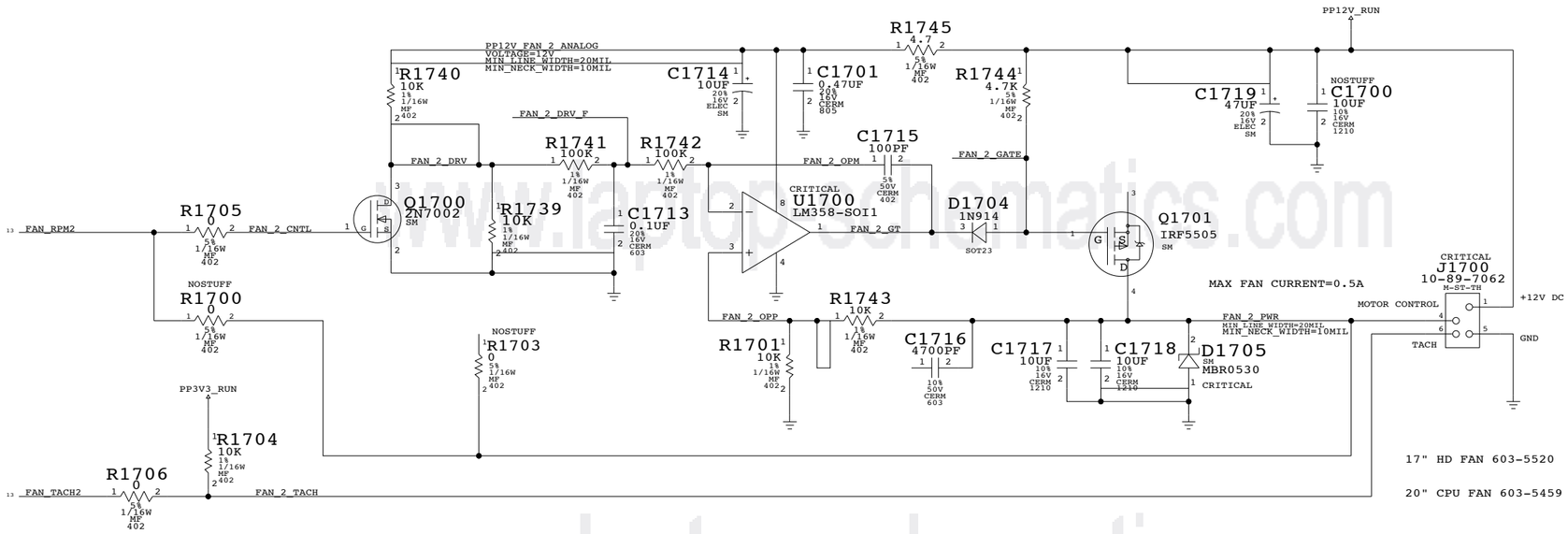
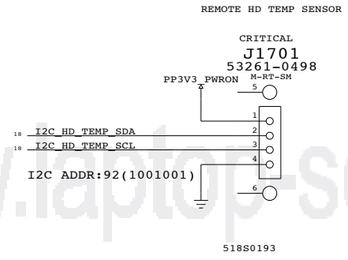
SCALE: NONE	SHT 16 OF 103	

FAN 3 - Q37 STYLE SYSTEM FAN CONTROL CIRCUIT



REMOTE HARD DRIVE TEMP SENSOR



FAN 3 & HD TEMP

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
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I2C A BUS

SMU
MASTER
U1300
I2C_SMU_A_SDA_IN — MAKE_BASE=TRUE — NET_SPACING_TYPE=I2C
I2C_SMU_A_SDA_OUT_L — MAKE_BASE=TRUE — NET_SPACING_TYPE=I2C
I2C_SMU_A_SCL_IN — MAKE_BASE=TRUE — NET_SPACING_TYPE=I2C
I2C_SMU_A_SCL_OUT_L — MAKE_BASE=TRUE — NET_SPACING_TYPE=I2C
PINS 36-39

PP5V_PWRON — R1832 0 603 NOSTUFF
PP5V_RUN — R1833 0 603
PP5V_U1800
MIN_LINE_WIDTH=12MIL
MIN_NECK_WIDTH=8MIL

PP3V3_RUN — NOSTUFF R1830 2K 1/16W MF 402 — NOSTUFF R1831 2K 1/16W MF 402
PP3V3_PWRON — R1800 2K 1/16W MF 402 — R1801 2K 1/16W MF 402

C1800 0.1UF 20% 10V CERM 402
NOSTUFF R1809 4.7K 5% 1/16W MF 402
R1828 4.7K 5% 1/16W MF 402
C1802 0.1UF 20% 10V CERM 402
R1808 200 5% 1/16W MF 402
R1810 200 5% 1/16W MF 402
=PP1V2_EI_NB

U1800 LM339A SOI — V+ GND
Q1800 2N7002DW SOT-363

U3LITE
U3
I2C_NB_A_SDA — 24
I2C_NB_A_SCL — 24
PINS A20, B20

NOSTUFF R1820 0 5% 1/16W MF 402
NOSTUFF R1821 0 5% 1/16W MF 402

PP3V3_PWRON — R1819 2K 1/16W MF 402 — R1818 2K 1/16W MF 402

SMU
MASTER
U1300
I2C_SMU_CPU_SCL_IN — MAKE_BASE=TRUE — I2C
I2C_SMU_CPU_SCL_OUT_L — MAKE_BASE=TRUE — I2C
I2C_SMU_CPU_SDA_IN — MAKE_BASE=TRUE — I2C
I2C_SMU_CPU_SDA_OUT_L — MAKE_BASE=TRUE — I2C
PINS 14,25,23,68

RP1800 0K 5% 1/16W SM1
SMU_CPU_JTAG_OR_I2C
I2C_CPU_A_SCL — NET_SPACING_TYPE=I2C
I2C_CPU_A_SDA_TO_SMU
I2C_CPU_A_SDA_TO_CPU

=PP1V2_EI_CPU
R1816 200 5% 1/16W MF 402
R1817 200 5% 1/16W MF 402

CPU
U2900
I2C_CPU_A_SCL — 29
I2C_CPU_A_SDA — 29
PINS AA20, Y21

Q1801 2N7002DW SOT-363
I2C_CPU_SCL_LS

NOSTUFF RP1801 0K 5% 1/16W SM1
CPU JTAG
JTAG_CPU_TDO — 29 30
JTAG_CPU_TDI — 29 30
JTAG_CPU_TMS — 29 30
JTAG_CPU_TCK — 29 30

C1801 0.1UF 20% 10V CERM 402
R1811 4.7K 5% 1/16W MF 402 — I2C_0V6_REF
USE 576 OHM FOR R1811 IF 5V RAIL IS USED FOR REFERENCE

I2C B BUS

PP3V3_PWRON — R1803 2K 1/16W MF 402 — R1802 2K 1/16W MF 402

SMU
MASTER
U1300
I2C_SMU_B_SDA — MAKE_BASE=TRUE — NET_SPACING_TYPE=I2C
I2C_SMU_B_SCL — MAKE_BASE=TRUE — NET_SPACING_TYPE=I2C
PINS 26, 27

PULSAR
U2600
I2C_CLOCK_SDA — ALIAS
I2C_CLOCK_SCL — ALIAS
PINS C1, B1

OPTICAL TEMP SENSOR
U1602
I2C_OPTICAL_SDA — ALIAS
I2C_OPTICAL_SCL — ALIAS
PINS 1, 2
I2C ADDR:90

PS TEMP SENSOR
U1650
I2C_PS_TEMP_SDA — ALIAS
I2C_PS_TEMP_SCL — ALIAS
PINS 1, 2
I2C ADDR:94

HD TEMP SENSOR
U1702
I2C_HD_TEMP_SDA — ALIAS
I2C_HD_TEMP_SCL — ALIAS
PINS 1, 2
I2C ADDR:92

I2C C BUS

PP2V5_PWRON — R1805 2K 1/16W MF 402 — R1804 2K 1/16W MF 402
NET_SPACING_TYPE=I2C
NET_SPACING_TYPE=I2C

U3LITE
MASTER
U3
I2C_NB_C_SDA — MAKE_BASE=TRUE — 24
I2C_NB_C_SCL — MAKE_BASE=TRUE — 24
PINS C21, E21

DIMMS
J4000 = A0
J4001 = A2
ALIAS — I2C_DIMM_SDA — 40
ALIAS — I2C_DIMM_SCL — 40
PINS 91, 92
OF EACH DIMM

I2C D & E BUS

PP2V5_PWRON — R1812 2K 1/16W MF 402 — R1813 2K 1/16W MF 402
PP3V3_ALL — R1807 2K 1/16W MF 402 — R1806 2K 1/16W MF 402

U3LITE 'B'
U3
I2C_NB_B_SDA — I2C
I2C_NB_B_SCL — I2C
PINS C20, B21

RTC
U1301
I2C_RTC_SDA — I2C
I2C_RTC_SCL — I2C
PINS 5, 6

NOSTUFF R1822 0 5% 1/16W MF 402
NOSTUFF R1823 0 5% 1/16W MF 402

R1824 0 5% 1/16W MF 402
NOSTUFF R1826 0 5% 1/16W MF 402
R1825 0 5% 1/16W MF 402
NOSTUFF R1827 0 5% 1/16W MF 402

SMU 'E'
MASTER
U1300
I2C_SMU_E_SDA — I2C
I2C_SMU_E_SCL — I2C
PINS 50, 51

SMU 'D'
MASTER
U1300
I2C_SMU_D_SDA — I2C — 13
I2C_SMU_D_SCL — I2C — 13
PINS 34, 35

I2C SB BUS

PP3V3_RUN — R1815 1K 1/16W MF 402 — R1814 1K 1/16W MF 402

SHASTA
MASTER
U2300
I2C_SB_SDA — MAKE_BASE=TRUE — NET_SPACING_TYPE=I2C
I2C_SB_SCL — MAKE_BASE=TRUE — NET_SPACING_TYPE=I2C
PINS Y9, AB7

MICRODASH
J9400
I2C_UDASH_SDA — ALIAS
I2C_UDASH_SCL — ALIAS
PINS 21, 24

AUDIO
U9500 / AU300
I2C_AUDIO_SDA — ALIAS
I2C_AUDIO_SCL — ALIAS
PINS 18, 19

STANDARD CONFIGURATION: SMU IS MASTER OF BUS E WITH RTC AS SLAVE; U3LITE 'B' AND SMU 'D' ARE NOT USED
TO IMPROVE LATENCY WITH RGB LED - U3LITE 'B' AND SMU 'E' CAN MAKE AN I2C 'E' BUS
SMU 'D' AND RTC CAN MAKE AN I2C 'D' BUS

I2C CONNECTIONS

APPLE COMPUTER INC.
SIZE D | DRAWING NUMBER 051-6482 | REV. I
SCALE NONE | SHT 18 OF 103

TOTAL CURRENT EXCLUDING LEDS CURRENT < 170 MICRO AMPS

PLACE THESE PARTS CLOSE TO SMU IC

SYS_LED_GREEN
MAKE_BASE=TRUE
PWM INPUT FROM SMU

R2101 0 5% 1/16W MF 402
G_PWM_IN_H
R2109 953K 1% 1/16W MF 402
PP5V_PWRON
U2100 LP324 TSSOP
G_BASE_DRV
G_PWM_DC
R2104 953K 1% 1/16W MF 402
C2104 0.022UF 20% 16V CERM 402
C2106 0.47UF 20% 10V CERM 603
R2105 200K 1% 1/16W MF 402
R2112 1K 1% 1/16W MF 402
G_IN_OFFSET
5MV INPUT OFFSET

100% DUTY CYCLE OF 3V-PP PWM = 0.5V

C2105 220PF 5% 25V CERM 402
GND_CHASSIS_LED
G_DRV_K MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
L2100 400-OHM-EMI SM-1
G_DRV MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
Q2102 2N3904 SM
G_DRV_FB MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
R2100 25.5 1% 1/16W MF 402 <-- 17 INCH

CHANGE R2100 VALUE TO SET LED CURRENT
MAX LED CURRENT = 0.5 / R

LED2100 LATBG66B AMB-GRN-BLUE PLCC
AMB
GRN
BLUE
RGB_LED_A MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
L2104 400-OHM-EMI SM-1
PP5V_PWRON
C2107 220PF 5% 25V CERM 402
C2108 220PF 5% 25V CERM 402
GND_CHASSIS_LED
C2109 220PF 5% 25V CERM 402

PP3V3_PWRON
PP5V_PWRON
C2103 0.1UF 20% 10V CERM 402
U2100 LP324 TSSOP
U2100_UNUSED

PLACE THESE PARTS CLOSE TO SMU IC

SYS_LED_RED
MAKE_BASE=TRUE
PWM INPUT FROM SMU

R2115 0 5% 1/16W MF 402
R_PWM_IN_H
R2102 953K 1% 1/16W MF 402
PP5V_PWRON
U2100 LP324 TSSOP
R_BASE_DRV
R_PWM_DC
R2110 953K 1% 1/16W MF 402
C2101 0.022UF 20% 16V CERM 402
C2112 0.47UF 20% 10V CERM 603
R2111 200K 1% 1/16W MF 402
R2114 1K 1% 1/16W MF 402
R_IN_OFFSET

R_DRV_K MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
L2101 400-OHM-EMI SM-1
R_DRV MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
Q2108 2N3904 SM
R_DRV_FB MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
R2113 25.5 1% 1/16W MF 402 <-- 17 INCH

PLACE THESE PARTS CLOSE TO SMU IC

SYS_LED_BLUE
MAKE_BASE=TRUE
PWM INPUT FROM SMU

R2130 0 5% 1/16W MF 402
B_PWM_IN_H
R2118 953K 1% 1/16W MF 402
PP5V_PWRON
U2100 LP324 TSSOP
B_BASE_DRV
B_PWM_DC
R2116 953K 1% 1/16W MF 402
C2102 0.022UF 20% 16V CERM 402
C2118 0.47UF 20% 10V CERM 603
R2117 200K 1% 1/16W MF 402
R2127 1K 1% 1/16W MF 402
B_IN_OFFSET

B_DRV_K MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
L2102 400-OHM-EMI SM-1
B_DRV MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
Q2114 2N3904 SM
B_DRV_FB MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
R2126 25.5 1% 1/16W MF 402 <-- 17 INCH

PLACE THESE PARTS CLOSE TO SMU IC

NOSTUFF
Q2100 FDV302P SOT-23
PP3V3_PWRON
SYS_LED_H
WHITE_LED
R2106 1K 5% 1/16W MF 402
SYS_GATE
NOSTUFF
R2119 953K 1% 1/16W MF 402
R2129 4.7K 5% 1/16W MF 402
NOSTUFF
R2132 1K 5% 1/16W MF 402
SYS_LED
PWM INPUT FROM SMU
SYS_LED_IN
R2107 0 5% 1/16W MF 402

(STUFF WHEN SYS_LED_L = ACTIVE HIGH)
(AND NO STUFF R2132, R2119 & Q2100)

LED2101
WHITE SM6
SYS_DRV_A MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
PP5V_PWRON
WHITE_LED L2105 400-OHM-EMI SM-1
WHITE_LED C2111 220PF 5% 25V CERM 402
WHITE_LED C2110 220PF 5% 25V CERM 402
GND_CHASSIS_LED
WHITE_LED L2103 400-OHM-EMI SM-1
SYS_LED_DRV_K MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
17_INCH_LCD
R2103 56.2 1% 1/16W MF 402
SYS_LED_DRV_C MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
WHITE_LED Q2101 FDV301N SM

20 INCH -->

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
114S3921	1	RES, 39.2 OHM, 1%, 402	R2103	20_INCH_LCD
114S1821	3	RES, 18.2 OHM, 1%, 402	R2100,R2113,R2126	NOSTUFF

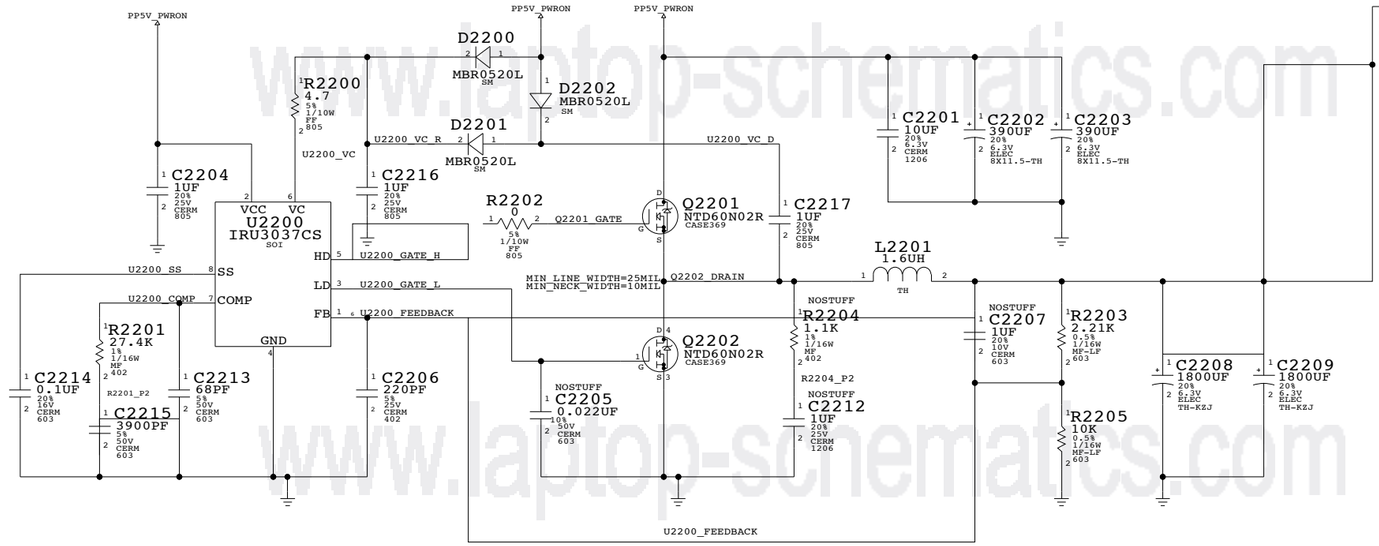
INDICATOR LED

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 21 OF 103	

NOTE:
SET OUTPUT=1.5VDC FOR U3LITE CORE
IRU3037CS VREF=1.25VDC
VOUT=VREF*(R2203+R2205)/R2205=1.53VDC

7.73A OF PEAK CURRENT DRAW ON PCORE_NB



CHECK FETS

=PPVCORE_NB

C2222 0.1UF 20% 10V CERM 402
C2223 0.1UF 20% 10V CERM 402
C2225 0.1UF 20% 10V CERM 402
C2227 0.1UF 20% 10V CERM 402
C2228 0.1UF 20% 10V CERM 402
C2229 0.1UF 20% 10V CERM 402
C2230 0.1UF 20% 10V CERM 402
C2231 0.1UF 20% 10V CERM 402
C2232 0.1UF 20% 10V CERM 402
C2233 0.1UF 20% 10V CERM 402
C2234 0.1UF 20% 10V CERM 402
C2235 0.1UF 20% 10V CERM 402
C2236 0.1UF 20% 10V CERM 402
C2237 0.1UF 20% 10V CERM 402
C2238 0.1UF 20% 10V CERM 402
C2239 0.1UF 20% 10V CERM 402
C2240 0.1UF 20% 10V CERM 402
C2242 0.1UF 20% 10V CERM 402
C2243 0.1UF 20% 10V CERM 402
C2244 0.1UF 20% 10V CERM 402
C2245 0.1UF 20% 10V CERM 402
C2246 0.1UF 20% 10V CERM 402
C2247 0.1UF 20% 10V CERM 402

U3LITE CORE POWER

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 22 OF 103	

Page Notes

Power aliases required by this page:
- _PPPCI64_PWRON_SB (to 5V or 3.3V)
- _PPPCI32_PWRON_SB (to 5V or 3.3V)
- _PP3V3_PWRON_SB
- _PP2V5_PWRON_SB
- _PPVCORE_PWRON_SB (1.2V)

NOTE: PCI pads use the VIO supply to meet different drive timing characteristics required by the PCI spec for 5V vs. 3.3V operation. Connect _PPPCI32_PWRON_SB to appropriate PCI bus voltage and _PPPCI64_PWRON_SB to same if 64-bit PCI, otherwise 3.3V.

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

Power Sequencing:
Must power Shasta VCore rail before any other Shasta supplies.

10 =PPVCORE_PWRON_SB

C2300 C2301 C2302 C2303 C2304
C2305 C2306 C2307 C2308 C2309
C2310 C2311 C2312 C2313 C2314
0.1uF 20% 10V CERM 402

74 25 7 =PP3V3_PWRON_SB

C2320 C2321 C2322 C2323 C2324
C2325 C2326 C2327 C2328 C2329
C2330 C2331 C2332 C2333 C2334
C2335 C2336 C2337 C2338 C2339
0.1uF 20% 10V CERM 402

U2300
SHASTA
V1.0
BGA
(1 OF 8)

POWER

OMIT

VDDC: H15 H8 J12 J15 K8 L15 L8 M15 N8 P15 R10 R12 R9 T10 T15

VDDO33: AA1 AA2 AA3 AB10 AB2 AB6 B1 B2 B5 D1 F4 F8 H1 L7 M1 R2 U12 U9 V7 W4

A1 A2 A22 A5 AA10 AA6 AB1 AB22 C19 D2 E22 F3 F7 H2 H9 J10 J11 J13 J14 J16

GND: J22 K10 K11 K12 K13 K7 K9 L10 L11 L12 L13 L14 L16 L9 M10 M11 M12 M13 M14

W5 W19 U22 U13 U10 T12 R19 P9 P4 P14 P13 P12 P10 N9 N22 N13 N12 N11 N10 M2

VDDO25: D19 G15

VIO1: H18 H17 K21

VIO2: L21 W22 Y19

VDDP_KL: V8

Shasta max (est 06/30/03) current:

DIGITAL	1.2V	950 mA (1175 mW)
ANALOG12	1.2V	600 mA (760 mW)
VDDPs	2.5V	100 mA (250 mW)
I/O 2.5	2.5V	20 mA (60 mW)
I/O 3.3	3.3V	220 mA (770 mW)
Total:		3015 mW

=PP2V5_PWRON_SB 7 23 25 74 88

C2350 C2351 C2365
0.1uF 20% 10V CERM 402

=PPPCI64_PWRON_SB 7

C2355 C2356 C2357
0.1uF 20% 10V CERM 402

For PCI_AD<63..32>

=PPPCI32_PWRON_SB 7

C2360 C2361 C2362
0.1uF 20% 10V CERM 402

For PCI_AD<31..0>

Master: Link

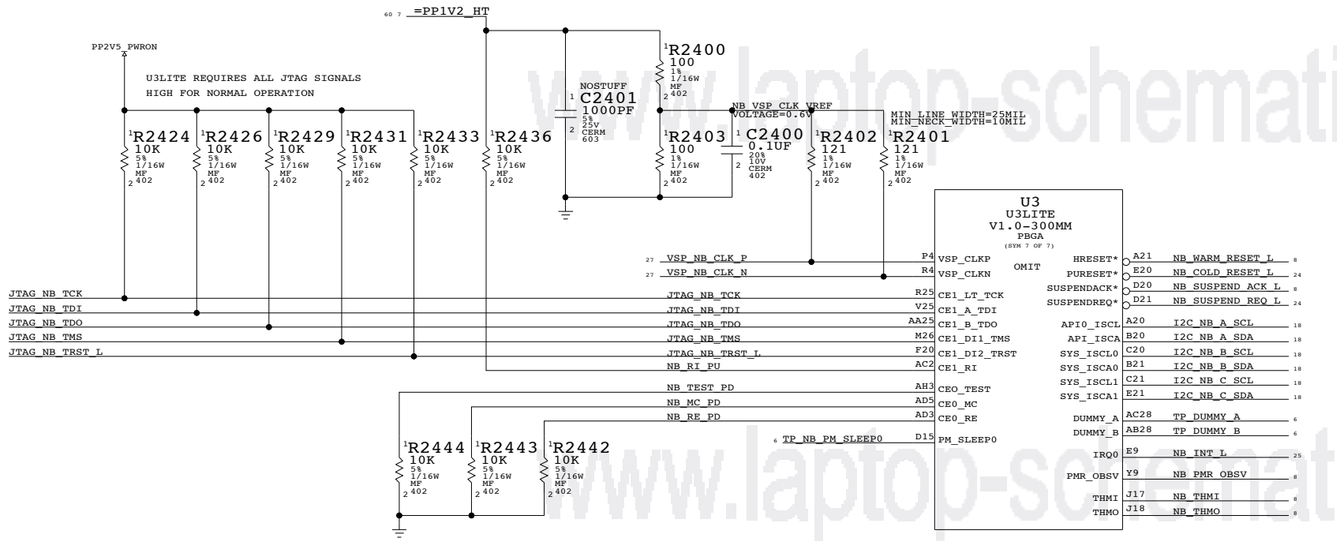
Shasta Core Power

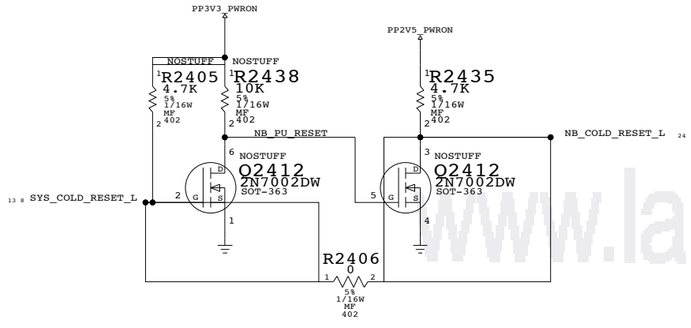
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 23 OF 103	

DRAWING

LAST_MODIFIED=Mon Dec 13 20:01:04 2004





MASTER: GILA
LAST MODIFIED: JUNE 10, 04

U3LITE MISC

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 24 OF 103	

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR		
I2S0_TO_SB			I2S0_DEV_TO_SB_DTI	25 95
I2S0_TO_DEV			I2S0_SB_TO_DEV_DTO	25 95 103
I2S0_TO_DEV	AUDIO		I2S0_MCLK	25 102
I2S0_BIDIR			I2S0_BITCLK	25 102 103
I2S0_BIDIR			I2S0_SYNC	25 95 103
I2S1_TO_SB			I2S1_DEV_TO_SB_DTI	6 25 76 94
I2S1_TO_DEV			I2S1_SB_TO_DEV_DTO	6 25 76 94
I2S1_TO_DEV	10 MIL SPACING		I2S1_MCLK	6 25 76 94
I2S1_BIDIR			I2S1_BITCLK	6 25 94
I2S1_BIDIR			I2S1_SYNC	6 25 94
I2S2_TO_SB			I2S2_DEV_TO_SB_DTI	25 102
I2S2_TO_DEV			I2S2_SB_TO_DEV_DTO	25 102
I2S2_TO_DEV	10 MIL SPACING		I2S2_MCLK	25 102
I2S2_BIDIR			I2S2_BITCLK	25 102
I2S2_BIDIR			I2S2_SYNC	25 102
SB_CLK18M_XTAL	15 MIL SPACING		SB_CLK18M_XTALI	25
	15 MIL SPACING		SB_CLK18M_XTALO	25
	15 MIL SPACING		SB_CLK18M_XTALO_R	25
SB_CLK25M_ATA	15 MIL SPACING		SB_CLK25M_ATA	25 27

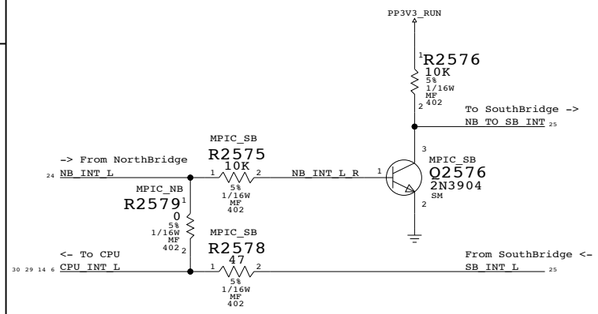
Page Notes

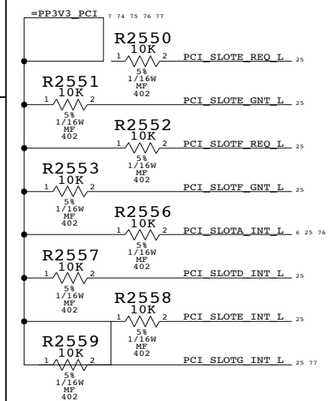
Power aliases required by this page:
- _PP3V3_PCI
- _PP3V3_PWRON_SB
- _PP2V5_PWRON_SB
- _PP1V2_PWRON_SB

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
- PCI_64BIT
  Configures Shasta for 64-bit PCI
  NOTE: XGC required for Shasta GPIOs
- MPIC_NB/MPIC_SB
  Selects whether NorthBridge or SouthBridge MPIC will be used for interrupt controller.

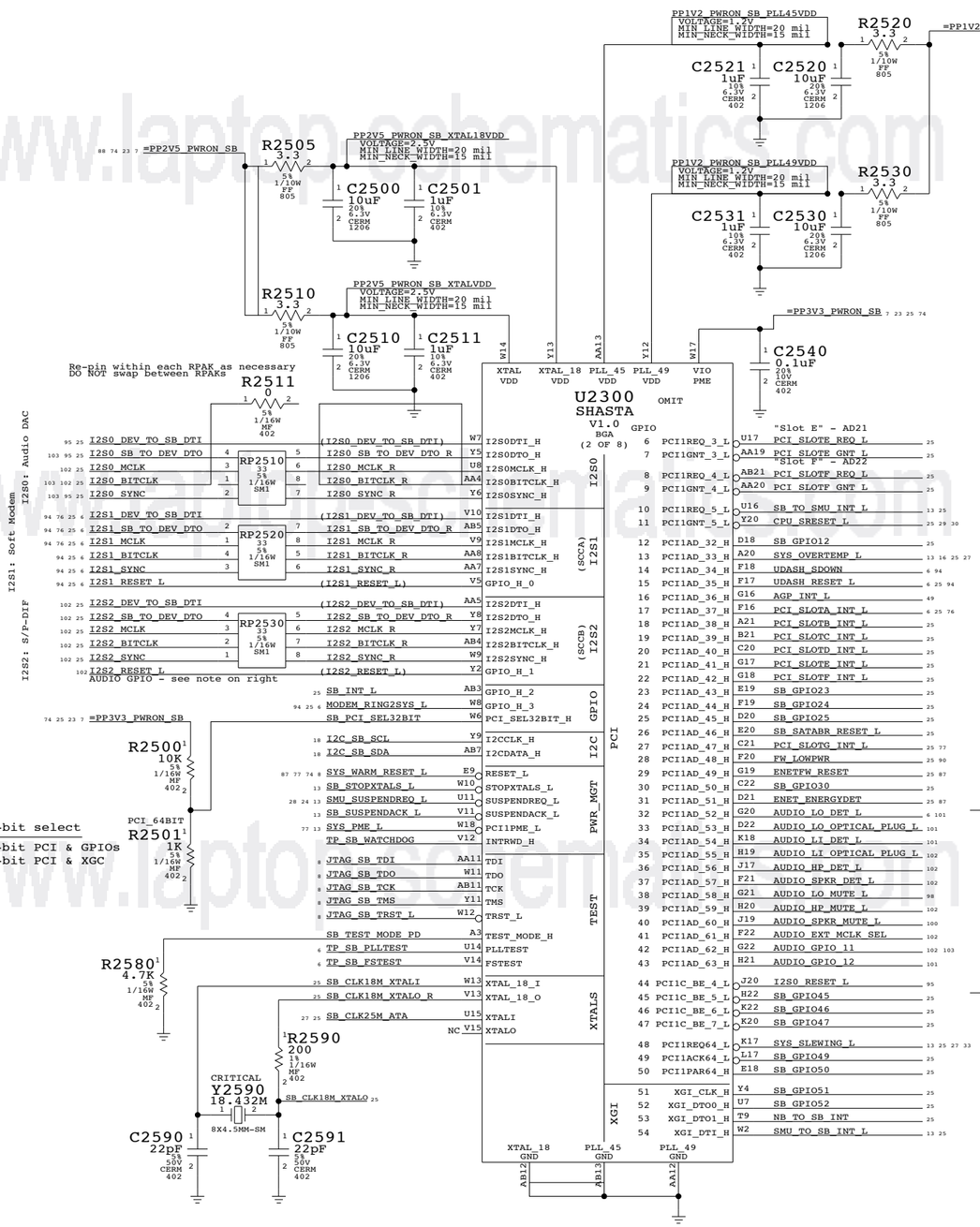
NorthBridge / SouthBridge MPIC Routing





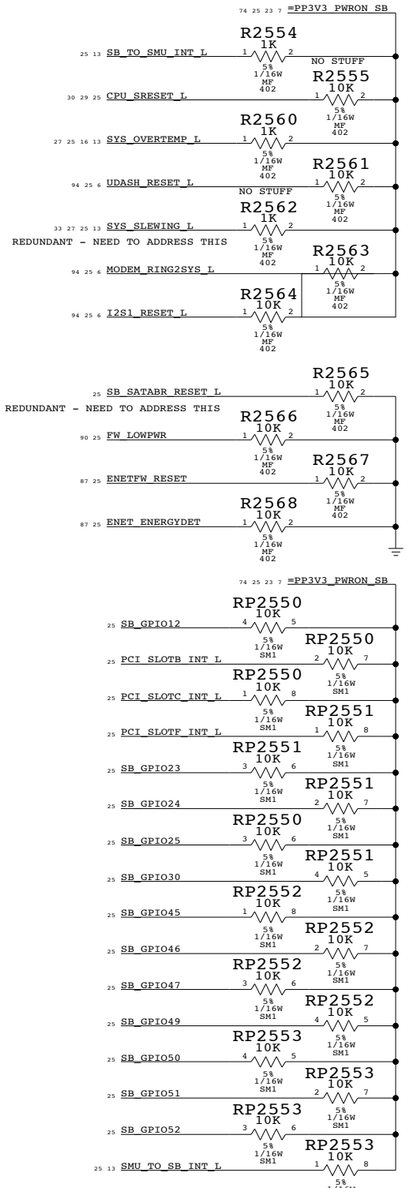
DRAWING

LAST_MODIFIED=Mon Dec 13 20:01:12 2004



PCI 32-bit select

1 = 32-bit PCI & GPIOs
0 = 64-bit PCI & XGC

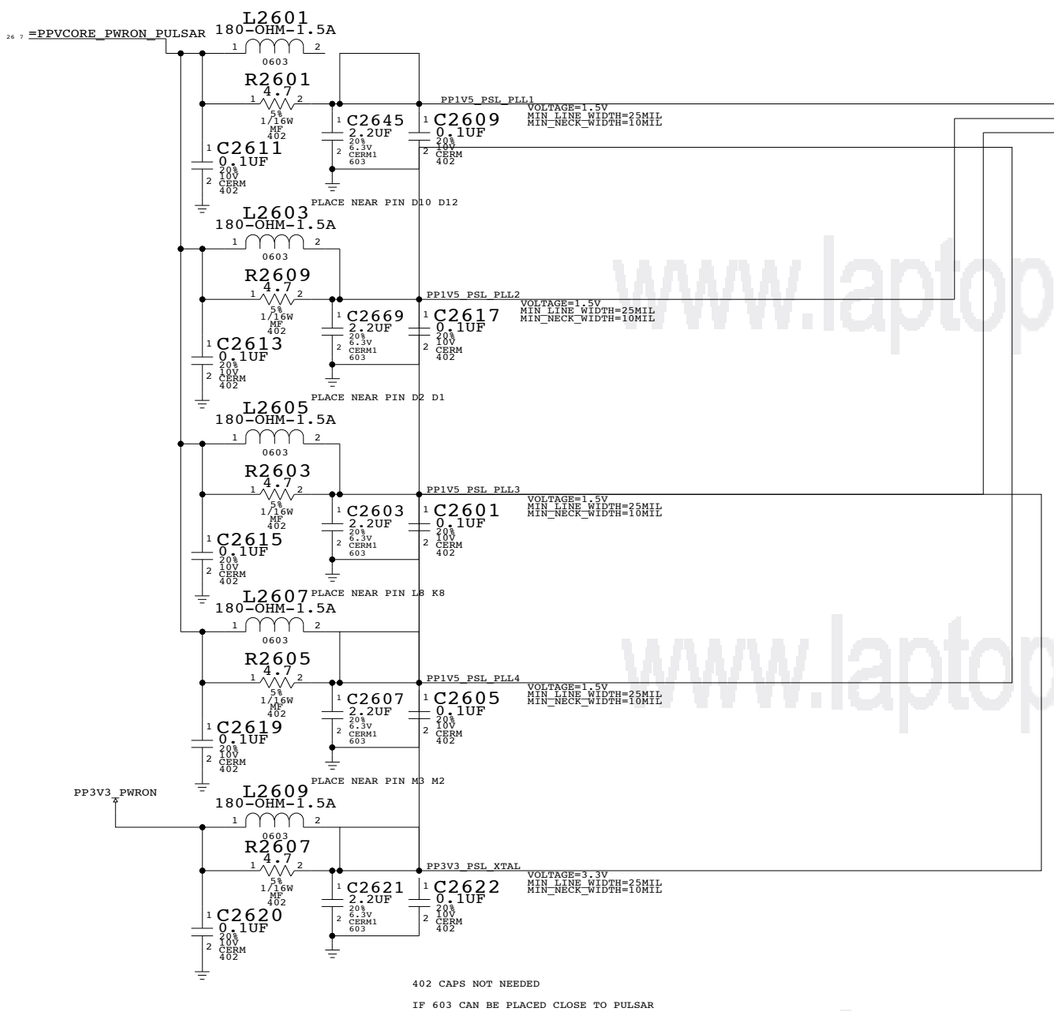


Master: Link

Shasta Serial / Misc

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 25 OF 103	



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
35980076	1	PULSAR, PBGA	U2600	

MASTER: GILA
LAST MODIFIED: APR 09, 04

PULSAR POWER

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 26 OF 103	

ELECTRICAL_CONSTRAINT_SET	NET_PHYSICAL_TYPE	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
EI_CPU_CLK_P	EI_CPU_CLK	CLOCKS	EI_CPU_CLK	116
EI_CPU_CLK_N	EI_CPU_CLK	CLOCKS	EI_CPU_CLK	117
EI_CPU1_CLK_P	EI_CPU1_CLK	CLOCKS	EI_CPU1_CLK	114
EI_CPU1_CLK_N	EI_CPU1_CLK	CLOCKS	EI_CPU1_CLK	115
EI_NB_CLK_P	EI_NB_CLK	CLOCKS	EI_NB_CLK	126
EI_NB_CLK_N	EI_NB_CLK	CLOCKS	EI_NB_CLK	127
EI_CPU_SYNC	EI_SYNC	CLOCKS		128
EI_NB_SYNC		CLOCKS		129
EI_CPU1_SYNC	EI_CPU1_SYNC	CLOCKS		118
VSP_NB_CLK_P	VSP_NB_CLK	CLOCKS	VSP_NB_CLK	124
VSP_NB_CLK_N	VSP_NB_CLK	CLOCKS	VSP_NB_CLK	125
AGP_CLK66M_NB	AGP_NB_CLK	CLOCKS		100
AGP_CLK66M_GPU	AGP_GPU_CLK	CLOCKS		101
HT_CLK66M_NB	HT_NB_CLK	CLOCKS		102
HT_CLK66M_SB	HT_SB_CLK	CLOCKS		103
PCI_CLK66M_SB_INT	CLOCKS_PCI	CLOCKS		130
PCI_CLK33M_SB_EXT	CLOCKS_PCI	CLOCKS		131
PLS_EXTCLK	PLS_XTAL	CLOCKS		119

DIFFERENTIAL SIGNALS SHOULD HAVE 5 MIL SPACING TO EACH OTHER
ALL SPACING GROUPS SHOULD HAVE 15 MIL SPACING TO SIGNALS NOT IN THEIR GROUP

EI_NB_SYNC IS PART OF EI_CPU_SYNC TOPOLOGY

NET SPACING TYPE

SYM 1 OF 2

OMIT
U2600
PULSAR
FSBGA

GPCLK33_0	L4	PCI_CLK_GP0_R	CLOCKS	
GPCLK33_1	K4	PCI_CLK_GP1_R	CLOCKS	
VCLKN	A2	VSP_NB_CLK_N_C	CLOCKS	
VCLKP	B3	VSP_NB_CLK_P_C	CLOCKS	
HCLKN_0	B10	EI_CPU_CLK_N_C	CLOCKS	
HCLKN_1	C8	EI_CPU1_CLK_N_R	CLOCKS	14
HCLKN_2	C4	EI_NB_CLK_N_C	CLOCKS	
HCLKP_0	A10	EI_CPU_CLK_P_C	CLOCKS	
HCLKP_1	B8	EI_CPU1_CLK_P_R	CLOCKS	14
HCLKP_2	B5	EI_NB_CLK_P_C	CLOCKS	
GPCLK25_0	J3	6 PLS_CLK_66M_0_R	CLOCKS	
GPCLK25_1	J1	6 PLS_CLK_66M_1_R	CLOCKS	
PCLK25_0	K2	HT_CLK66M_NB_R	CLOCKS	
PCLK25_1	L1	RAM_CLK66M_NB_R	CLOCKS	
PCLK33_0	K5	PCI_CLK66M_SB_INT_R	CLOCKS	
PCLK33_1	L6	PCI_CLK_P1_R	CLOCKS	
PCLK33_2	M7	AGP_CLK66M_GPU_R	CLOCKS	
PCLK33_3	L9	PCI_CLK_P3_R	CLOCKS	
PCLK33_4	M10	PCI_CLK_P4_R	CLOCKS	
HTBEN_0	K11	CPU_HTBEN_R	CLOCKS	
HTBEN_1	J12	CPU1_HTBEN_R	CLOCKS	14
NBSYNC	F12	EI_NB_SYNC_R	CLOCKS	
HSYNC_0	J10	EI_CPU_SYNC_R	CLOCKS	
HSYNC_1	H11	EI_CPU1_SYNC_R	CLOCKS	14
REFCLK_0	G2	SB_CLK25M_ATA_R	CLOCKS	
REFCLK_1	H1	SATA_CLK25M_R	CLOCKS	
SLEWING*	K9	SLEWING_L_R	CLOCKS	
ERROR*	M8	CLOCK_ERROR_L 8		
PCLK12	L11	HT_CLK66M_SB_R	CLOCKS	
PCLK15	L10	AGP_CLK66M_NB_R	CLOCKS	

SCLK	C1	18 I2C_CLOCK_SCL		
SDATA	B1	18 I2C_CLOCK_SDA		
RESET*	D3	PLS_RESET_L	13 CLOCK_RESET_L	R2704 0 5% 402
XIN	C11	PLS_X_IN		
XOUT	B12	PLS_X_OUT		
ADDRSEL	E3	PLS_X_ADDRSEL		R2738 1K 5% 402 NOSTUFF
TEST1	K3	6 TP_PLS_TEST1		
TEST2	E11	6 TP_PLS_TEST2		
TEST3	D11	6 TP_PLS_TEST3		
SCAN_MODE	M1	PLS_SCAN_MODE	R2706 249 1%	
REF15	G11	PLS_REF15	R2744 681 1%	
REF25	J2	PLS_REF25	R2740 1K 1%	
REF33	M6	PLS_REF33	R2746 1K 1%	
REF_CML	A5	6 TP_PLS_REF_CML		
PRES_CML	B6	PLS_PRES_CML	R2742 806 1%	
FORCESPO*	F2	PLS_FORCE_P0_L_R		
PD	C3			

0=IIC ADDR D2/D3
1=IIC ADDR D4/D5

18 11 6 PP3V3_PWRON — R2722 1K 5% 1/16W MF 402

25 16 13 SYS_OVERTEMP_L — R2748 0 5% 1/16W MF 402 NOSTUFF

3 =PULSAR_POWER_DOWN — R2750 47 5% 402 — PULSAR_POWER_DOWN_R

R2724 1K 5% 402 NOSTUFF

17 PLS_EXTCLK — J2700 U.FL-R SMT F-ST-SM

PLS_INTERM — R2762 24 5% 1/16W MF 402 NOSTUFF; R2764 24 5% 1/16W MF 402 NOSTUFF

R2752 0 5% 1/16W MF 402 NO STUFF
R2754 0 5% 1/16W MF 402
R2758 330K 5% 1/16W MF 402 NO STUFF
R2756 0 5% 1/16W MF 402

CRITICAL
Y2701 25.0000M 8X4.5MM-SM
PLS_X_IN_B — PLS_X_OUT_B

C2707 33PF 5% 50V CERM 402
C2705 33PF 5% 50V CERM 402

R2701 0 5% 3.3V 33MHZ — PCI_CLK_GP0 8
R2761 0 5% 402 3.3V 33MHZ — PCI_CLK_GP1 8

C2708 0.001UF 50V 10% 2CERM 402 — VSP_NB_CLK_P 24 27
C2710 0.001UF 50V 10% 2CERM 402 — VSP_NB_CLK_N 24 27
C2713 0.001UF 50V 10% 2CERM 402 — EI_CPU_CLK_P 27 29
C2715 0.001UF 50V 10% 2CERM 402 — EI_CPU_CLK_N 27 29

C2700 0.001UF 50V 10% 2CERM 402 — EI_NB_CLK_P 27 28
C2702 0.001UF 50V 10% 2CERM 402 — EI_NB_CLK_N 27 28

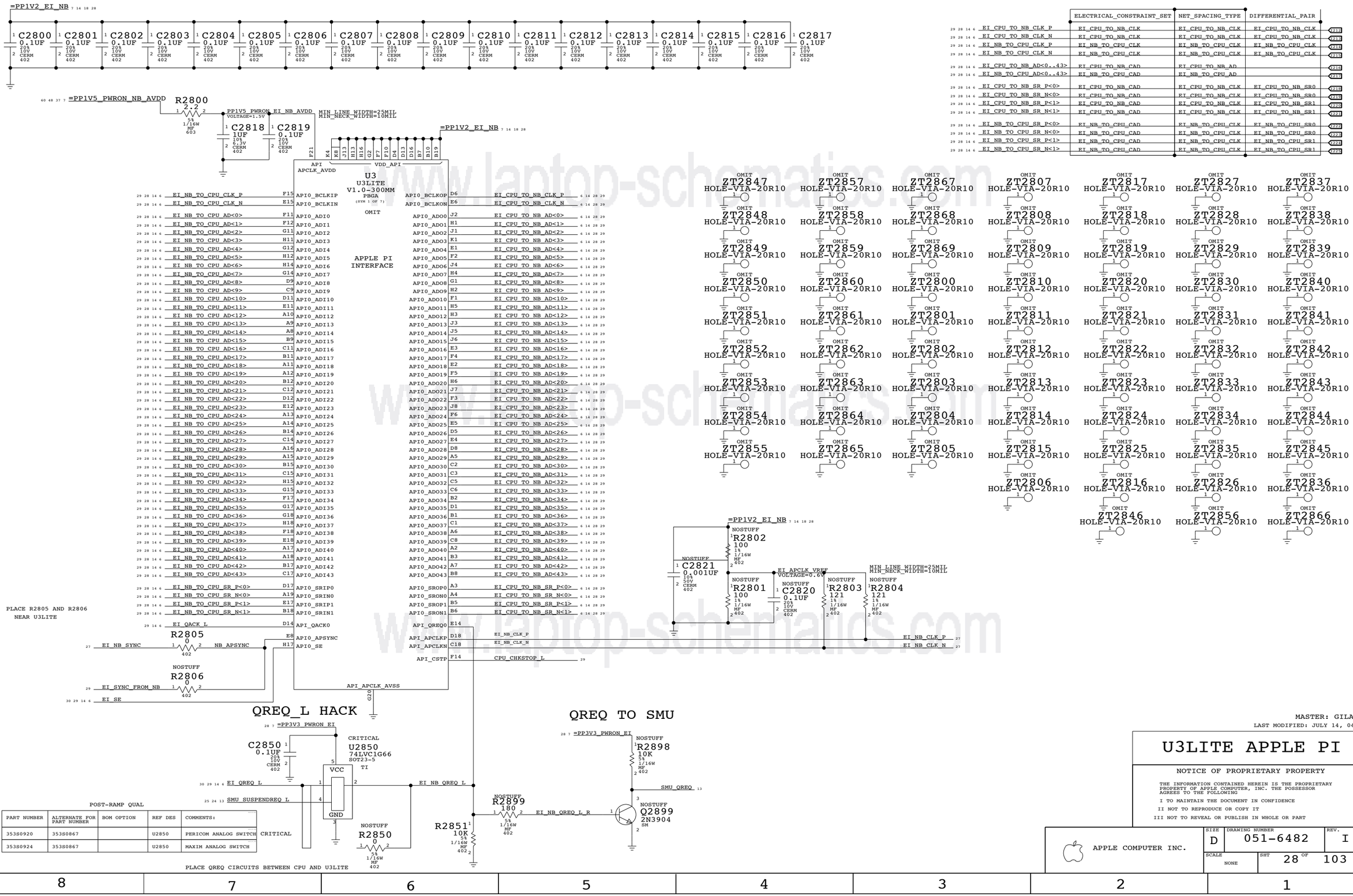
R2775 0 5% 402 NOSTUFF	2.5V	66MHZ	TP_PLS_CLK_66M_0 6
R2776 0 5% 402	2.5V	66MHZ	TP_PLS_CLK_66M_1 6
R2703 20 5% 402	2.5V	66MHZ	HT_CLK66M_NB 27 40
R2709 20 5% 402	2.5V	66MHZ	RAM_CLK66M_NB 37
R2705 0 5% 402	3.3V	66MHZ	PCI_CLK66M_SB_INT 27 74
R2711 0 5% 402	3.3V	33MHZ	PCI_CLK_P1 8
R2707 0 5% 402	3.3V	66MHZ	AGP_CLK66M_GPU 27 49
R2702 0 5% 402	3.3V	33MHZ	PCI_CLK_P3 8
R2779 0 5% 402			PCI_CLK_P4 8
R2715 0 5% 402	1.2V	33MHZ	CPU_HTBEN 29 30
R2768 0 5% 402	1.2V		EI_NB_SYNC 27 28
R2772 0 5% 402	1.2V		EI_CPU_SYNC 27 29
R2770 20 5% 402 NOSTUFF	2.5V	25MHZ	SB_CLK25M_ATA 25
R2700 22 5% 402	2.5V	25MHZ	TP_SATA_CLK25M 6
R2720 0 5% 402 — SYS_SLEWING_L 13 25 33			
R2717 0 5% 402	1.2V	66MHZ	HT_CLK66M_SB 27 62
R2719 0 5% 402	1.5V	66MHZ	AGP_CLK66M_NB 27 48

MASTER: GILA
LAST MODIFIED: JULY 12, 04

PULSAR CLOCKS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 27 OF 103	


=PP1V2_EI_NB
C2800 0.1UF
C2801 0.1UF
C2802 0.1UF
C2803 0.1UF
C2804 0.1UF
C2805 0.1UF
C2806 0.1UF
C2807 0.1UF
C2808 0.1UF
C2809 0.1UF
C2810 0.1UF
C2811 0.1UF
C2812 0.1UF
C2813 0.1UF
C2814 0.1UF
C2815 0.1UF
C2816 0.1UF
C2817 0.1UF
=PP1V5_PWRON_NB_AVDD
R2800 2.2
PP1V5_PWRON_EI_NB_AVDD
VOLTAGE=1.5V
MIN_LINE_WIDTH=25MIL
MIN_NECK_WIDTH=10MIL
C2818 1UF
C2819 0.1UF
=PP1V2_EI_NB
U3
U3LITE
V1.0-300MM
PBGA
(SYM 1 OF 7)
OMIT
API
APCLK_AVDD
VDD_API
APPLE PI
INTERFACE
EI_NB_TO_CPU_CLK_P
EI_NB_TO_CPU_CLK_N
EI_NB_TO_CPU_AD<0>
EI_NB_TO_CPU_AD<1>
EI_NB_TO_CPU_AD<2>
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EI_NB_TO_CPU_SR_P<0>
EI_NB_TO_CPU_SR_N<0>
EI_NB_TO_CPU_SR_P<1>
EI_NB_TO_CPU_SR_N<1>
EI_QACK_L
API_BCLKIP
API_BCLKIN
API_ADI0
API_ADI1
API_ADI2
API_ADI3
API_ADI4
API_ADI5
API_ADI6
API_ADI7
API_ADI8
API_ADI9
API_ADI10
API_ADI11
API_ADI12
API_ADI13
API_ADI14
API_ADI15
API_ADI16
API_ADI17
API_ADI18
API_ADI19
API_ADI20
API_ADI21
API_ADI22
API_ADI23
API_ADI24
API_ADI25
API_ADI26
API_ADI27
API_ADI28
API_ADI29
API_ADI30
API_ADI31
API_ADI32
API_ADI33
API_ADI34
API_ADI35
API_ADI36
API_ADI37
API_ADI38
API_ADI39
API_ADI40
API_ADI41
API_ADI42
API_ADI43
API_SRIP0
API_SRIN0
API_SRIP1
API_SRIN1
API_QACK0
API_APSYNC
API_SE
API_BCLKOP
API_BCLKON
API_ADO0
API_ADO1
API_ADO2
API_ADO3
API_ADO4
API_ADO5
API_ADO6
API_ADO7
API_ADO8
API_ADO9
API_ADO10
API_ADO11
API_ADO12
API_ADO13
API_ADO14
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API_ADO36
API_ADO37
API_ADO38
API_ADO39
API_ADO40
API_ADO41
API_ADO42
API_ADO43
API_SROP0
API_SRON0
API_SROP1
API_SRON1
API_QREQ0
API_APCLKP
API_APCLKN
API_CSTP
EI_CPU_TO_NB_CLK_P
EI_CPU_TO_NB_CLK_N
EI_CPU_TO_NB_AD<0>
EI_CPU_TO_NB_AD<1>
EI_CPU_TO_NB_AD<2>
EI_CPU_TO_NB_AD<3>
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EI_CPU_TO_NB_AD<41>
EI_CPU_TO_NB_AD<42>
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EI_CPU_TO_NB_SR_P<1>
EI_CPU_TO_NB_SR_N<1>
CPU_CHKSTOP_L
ELECTRICAL_CONSTRAINT_SET
NET_SPACING_TYPE
DIFFERENTIAL_PAIR
EI_CPU_TO_NB_CLK
EI_CPU_TO_NB_CAD
EI_NB_TO_CPU_CLK
EI_NB_TO_CPU_CAD
EI_CPU_TO_NB_AD
EI_NB_TO_CPU_AD
ZT2847 HOLE-VIA-20R10
ZT2857 HOLE-VIA-20R10
ZT2867 HOLE-VIA-20R10
ZT2807 HOLE-VIA-20R10
ZT2817 HOLE-VIA-20R10
ZT2827 HOLE-VIA-20R10
ZT2837 HOLE-VIA-20R10
ZT2848 HOLE-VIA-20R10
ZT2858 HOLE-VIA-20R10
ZT2868 HOLE-VIA-20R10
ZT2808 HOLE-VIA-20R10
ZT2818 HOLE-VIA-20R10
ZT2828 HOLE-VIA-20R10
ZT2838 HOLE-VIA-20R10
ZT2849 HOLE-VIA-20R10
ZT2859 HOLE-VIA-20R10
ZT2869 HOLE-VIA-20R10
ZT2809 HOLE-VIA-20R10
ZT2819 HOLE-VIA-20R10
ZT2829 HOLE-VIA-20R10
ZT2839 HOLE-VIA-20R10
ZT2850 HOLE-VIA-20R10
ZT2860 HOLE-VIA-20R10
ZT2800 HOLE-VIA-20R10
ZT2810 HOLE-VIA-20R10
ZT2820 HOLE-VIA-20R10
ZT2830 HOLE-VIA-20R10
ZT2840 HOLE-VIA-20R10
ZT2851 HOLE-VIA-20R10
ZT2861 HOLE-VIA-20R10
ZT2801 HOLE-VIA-20R10
ZT2811 HOLE-VIA-20R10
ZT2821 HOLE-VIA-20R10
ZT2831 HOLE-VIA-20R10
ZT2841 HOLE-VIA-20R10
ZT2852 HOLE-VIA-20R10
ZT2862 HOLE-VIA-20R10
ZT2802 HOLE-VIA-20R10
ZT2812 HOLE-VIA-20R10
ZT2822 HOLE-VIA-20R10
ZT2832 HOLE-VIA-20R10
ZT2842 HOLE-VIA-20R10
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ZT2803 HOLE-VIA-20R10
ZT2813 HOLE-VIA-20R10
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ZT2833 HOLE-VIA-20R10
ZT2843 HOLE-VIA-20R10
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ZT2804 HOLE-VIA-20R10
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ZT2824 HOLE-VIA-20R10
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ZT2805 HOLE-VIA-20R10
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ZT2836 HOLE-VIA-20R10
ZT2846 HOLE-VIA-20R10
ZT2856 HOLE-VIA-20R10
ZT2866 HOLE-VIA-20R10
=PP1V2_EI_NB
R2802 100
C2821 0.001UF
EI_APCLK_VREF
VOLTAGE=0.6V
MIN_LINE_WIDTH=25MIL
MIN_NECK_WIDTH=10MIL
R2801 100
C2820 0.1UF
R2803 121
R2804 121
EI_NB_CLK_P
EI_NB_CLK_N
PLACE R2805 AND R2806
NEAR U3LITE
R2805 0
EI_NB_SYNC
NB_APSYNC
R2806 0
EI_SYNC_FROM_NB
EI_SE
API_APCLK_AVSS
QREQ_L HACK
=PP3V3_PWRON_EI
C2850 0.1UF
CRITICAL
U2850
74LVC1G66
SOT23-5
TI
VCC
GND
EI_QREQ_L
SMU_SUSPENDREQ_L
EI_NB_QREQ_L
R2850 0
R2851 10K
R2899 180
EI_NB_QREQ_L_R
QREQ TO SMU
R2898 10K
SMU_QREQ
Q2899
2N3904
SM
POST-RAMP QUAL
PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS:
353S0920 | 353S0867 | | U2850 | PERICOM ANALOG SWITCH | CRITICAL
353S0924 | 353S0867 | | U2850 | MAXIM ANALOG SWITCH
PLACE QREQ CIRCUITS BETWEEN CPU AND U3LITE
MASTER: GILA
LAST MODIFIED: JULY 14, 04
U3LITE APPLE PI
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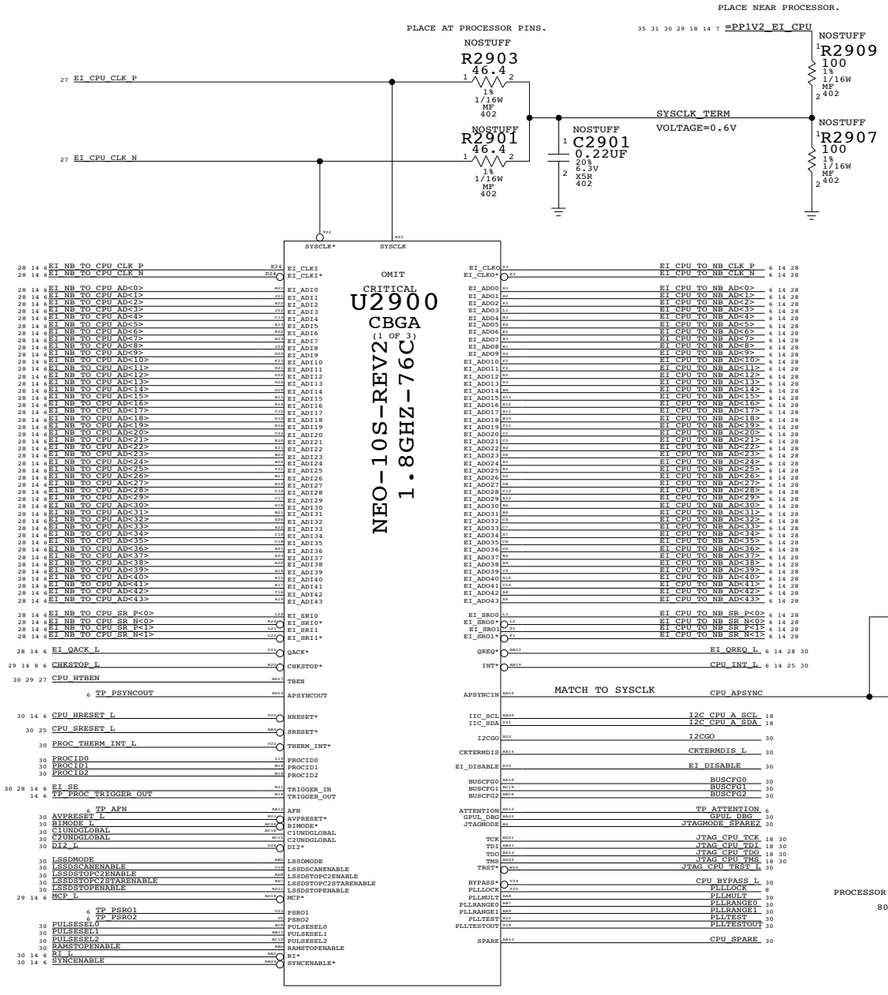
APPLE COMPUTER INC.
SIZE D
DRAWING NUMBER 051-6482
REV. I
SCALE NONE
SHT 28 OF 103


PLACE AT PROCESSOR PINS.
PLACE NEAR PROCESSOR.
35 31 30 29 18 14 7 =PP1V2_EI_CPU
27 EI_CPU_CLK_P
27 EI_CPU_CLK_N
NOSTUFF
R2903
46.4
1% 1/16W MF 402
NOSTUFF
R2901
46.4
1% 1/16W MF 402
NOSTUFF
C2901
0.22UF
20% 6.3V X5R 402
SYSCLK_TERM
VOLTAGE=0.6V
NOSTUFF
R2909
100
1% 1/16W MF 402
NOSTUFF
R2907
100
1% 1/16W MF 402
SYSCLK*
SYSCLK
OMIT
CRITICAL
U2900
CBGA
(1 OF 3)
NEO-10S-REV2
1.8GHZ-76C
28 14 6 EI_NB_TO_CPU_CLK_P
28 14 6 EI_NB_TO_CPU_CLK_N
EI_CLKI
EI_CLKI*
EI_CLKO
EI_CLKO*
EI_CPU_TO_NB_CLK_P 6 14 28
EI_CPU_TO_NB_CLK_N 6 14 28
28 14 6 EI_NB_TO_CPU_AD<0>
28 14 6 EI_NB_TO_CPU_AD<1>
28 14 6 EI_NB_TO_CPU_AD<2>
28 14 6 EI_NB_TO_CPU_AD<3>
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28 14 6 EI_NB_TO_CPU_AD<42>
28 14 6 EI_NB_TO_CPU_AD<43>
EI_AD10
EI_AD11
EI_AD12
EI_AD13
EI_AD14
EI_AD15
EI_AD16
EI_AD17
EI_AD18
EI_AD19
EI_AD110
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EI_AD112
EI_AD113
EI_AD114
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EI_AD116
EI_AD117
EI_AD118
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EI_AD124
EI_AD125
EI_AD126
EI_AD127
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28 14 6 EI_NB_TO_CPU_SR_N<0>
28 14 6 EI_NB_TO_CPU_SR_P<1>
28 14 6 EI_NB_TO_CPU_SR_N<1>
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EI_SR00*
EI_SR01
EI_SR01*
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EI_CPU_TO_NB_SR_N<0> 6 14 28
EI_CPU_TO_NB_SR_P<1> 6 14 28
EI_CPU_TO_NB_SR_N<1> 6 14 28
28 14 6 EI_QACK_L
QACK*
EI_QREQ_L 6 14 28 30
QREQ*
29 14 8 6 CHKSTOP_L
CHKSTOP*
30 29 27 CPU_HTBEN
TBEN
6 TP_PSYNCOUT
APSYNCOUT
MATCH TO SYSCLK
CPU_APSYNC
R2910
0
5% 1/16W MF 402
NOSTUFF
R2911
0
5% 1/16W MF 402
EI_SYNC_FROM_NB 28
30 14 6 CPU_HRESET_L
HRESET*
30 25 CPU_SRESET_L
SRESET*
30 PROC_THERM_INT_L
THERM_INT*
30 PROCID0
30 PROCID1
30 PROCID2
PROCID0
PROCID1
PROCID2
30 28 14 6 EI_SE
14 6 TP_PROC_TRIGGER_OUT
TRIGGER_IN
TRIGGER_OUT
6 TP_AFN
AFN
30 AVPRESET_L
30 BIMODE_L
30 C1UNDGLOBAL
30 C2UNDGLOBAL
30 DI2_L
AVPRESET*
BIMODE*
C1UNDGLOBAL
C2UNDGLOBAL
DI2*
30 LSSDMODE
30 LSSDSCANENABLE
30 LSSDSTOPC2ENABLE
30 LSSDSTOPC2SPARENABLE
30 LSSDSTOPENABLE
29 14 6 MCP_L
LSSDMODE
LSSDSCANENABLE
LSSDSTOPC2ENABLE
LSSDSTOPC2SPARENABLE
LSSDSTOPENABLE
MCP*
6 TP_PSRO1
6 TP_PSRO2
30 PULSESEL0
30 PULSESEL1
30 PULSESEL2
30 RAMSTOPENABLE
30 14 6 RI_L
30 14 6 SYNCENABLE
PSRO1
PSRO2
PULSESEL0
PULSESEL1
PULSESEL2
RAMSTOPENABLE
RI*
SYNCENABLE*
30 14 6 I2C_CPU_A_SCL
30 14 6 I2C_CPU_A_SDA
I2C_SCL
I2C_SDA
I2C_CPU_A_SCL 18
I2C_CPU_A_SDA 18
I2CGO
I2CGO 30
CKTERMDIS
CKTERMDIS_L 30
EI_DISABLE
EI_DISABLE 30
BUSCFG0
BUSCFG1
BUSCFG2
BUSCFG0 30
BUSCFG1 30
BUSCFG2 30
ATTENTION
GPUL_DBG
JTAGMODE
TP_ATTENTION 6
GPUL_DBG 30
JTAGMODE_SPARE2 30
TCK
TDI
TDO
TMS
TRST*
JTAG_CPU_TCK 18 30
JTAG_CPU_TDI 18 30
JTAG_CPU_TDO 18 30
JTAG_CPU_TMS 18 30
JTAG_CPU_TRST_L 30
BYPASS*
PLLLOCK
PLLMULT
PLLRANGE0
PLLRANGE1
PLLTEST
PLLTESTOUT
CPU_BYPASS_L 30
PLLLOCK 8
PLLMULT 30
PLLRANGE0 30
PLLRANGE1 30
PLLTEST 30
PLLTESTOUT 30
SPARE
CPU_SPARE 30
PROCESSOR IIC ADDRESS:
80,84
MORE PROCESSOR DECOUPLING ON PAGES 31 & 32
36 32 31 7 =PPVCORE_CPU
C2953 C2947 C2945 C2939 C2937 C2928 C2924 C2920 C2914 C2912
C2954 C2948 C2946 C2940 C2938 C2929 C2925 C2921 C2915 C2913
C2955 C2951 C2949 C2943 C2941 C2930 C2926 C2922 C2918 C2916
C2956 C2952 C2950 C2944 C2942 C2931 C2927 C2923 C2919 C2917
C2900 C2960 C2959 C2958 C2957 C2936 C2935 C2934 C2933 C2932
C2911 C2910 C2909 C2908 C2907 C2906 C2905 C2904 C2903 C2902
1UF 10% 6.3V CERM 402
NOSTUFF
R2905
49.9
1% 1/16W MF 402
30 29 27 CPU_HTBEN
PLACE BY PROCESSOR PIN.
35 31 30 29 18 14 7 =PP1V2_EI_CPU
R2906
1K
5% 1/16W MF 402
R2908
1K
5% 1/16W MF 402
R2902
0
5% 1/16W MF 402
CHKSTOP_L 6 8 14 29
28 CPU_CHKSTOP_L
NOSTUFF
R2904
0
5% 1/16W MF 402
MCP_L 6 14 29
PROCESSOR LOGIC I/O
MASTER: GILA
LAST MODIFIED: APR 09, 04
NEO APPLE PI
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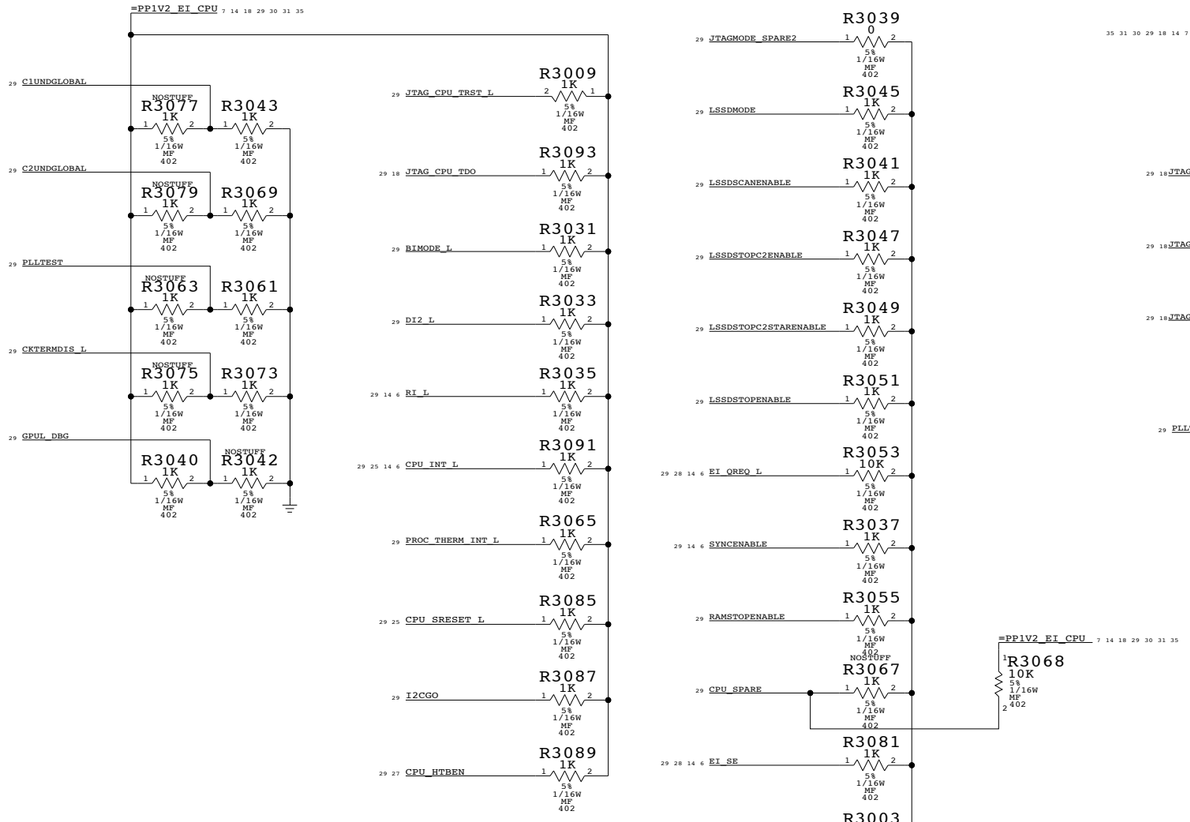
APPLE COMPUTER INC.
SIZE D
DRAWING NUMBER 051-6482
REV. I
SCALE NONE
SHT 29 OF 103



SELECT PROCESSOR CLOCK MULTIPLIER. PROCESSOR CLOCK(MHZ)= SYSTCLOCK * PLLMULT.

	PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION	
*	114S1103	1	RES,1K OHM,1/16W,5%,0402	R3034	EI_3TO1	SYSCLK * 12
	114S1103	1	RES,1K OHM,1/16W,5%,0402	R3018	EI_2TO1	SYSCLK * 8

SELECT EI BUS DIVIDER. BUS DATA RATE(BPS)= (PROCESSOR CLOCK) / BUSCFG.

	PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION	
	114S1103	3	RES,1K OHM,1/16W,5%,0402	R3024,R3026,R3028	EI_2TO1	PROC / 2
*	114S1103	3	RES,1K OHM,1/16W,5%,0402	R3024,R3026,R3012	EI_3TO1	PROC / 3
	114S1103	3	RES,1K OHM,1/16W,5%,0402	R3024,R3010,R3028	NOSTUFF	PROC / 4
	114S1103	3	RES,1K OHM,1/16W,5%,0402	R3024,R3010,R3012	NOSTUFF	PROC / 6
	114S1103	3	RES,1K OHM,1/16W,5%,0402	R3008,R3026,R3028	NOSTUFF	PROC / 8
	114S1103	3	RES,1K OHM,1/16W,5%,0402	R3008,R3026,R3012	NOSTUFF	PROC / 12
	114S1103	3	RES,1K OHM,1/16W,5%,0402	R3008,R3010,R3028	NOSTUFF	PROC / 16
	114S1103	3	RES,1K OHM,1/16W,5%,0402	R3008,R3010,R3012	NOSTUFF	

SELECT ELASTIC MODE OR BYPASS.

	PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION	
*	114S1103	1	RES,1K OHM,1/16W,5%,0402	R3036		
	114S1103	1	RES,1K OHM,1/16W,5%,0402	R3020	NOSTUFF	BYPASS MODE

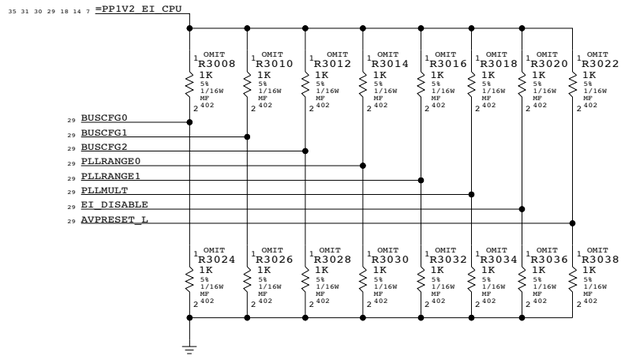
SELECT PLL FREQUENCY RANGE.

	PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION	
>= 1.8 GHZ *	114S1103	2	RES,1K OHM,1/16W,5%,0402	R3030,R3032	CPU_PLL_LOW	
	114S1103	2	RES,1K OHM,1/16W,5%,0402	R3030,R3016	CPU_PLL_HIGH	
<= 1.6 GHZ *	114S1103	2	RES,1K OHM,1/16W,5%,0402	R3014,R3032	CPU_PLL_MEDIUM	
	114S1103	2	RES,1K OHM,1/16W,5%,0402	R3014,R3016	NOSTUFF	RESERVED

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION	
114S1103	1	RES,1K OHM,1/16W,5%,0402	R3022		AVPRESET OFF
114S1103	1	RES,1K OHM,1/16W,5%,0402	R3038	NOSTUFF	AVPRESET ON

* STUFF THESE ON Q45.

SYSTEM CONFIGURATION

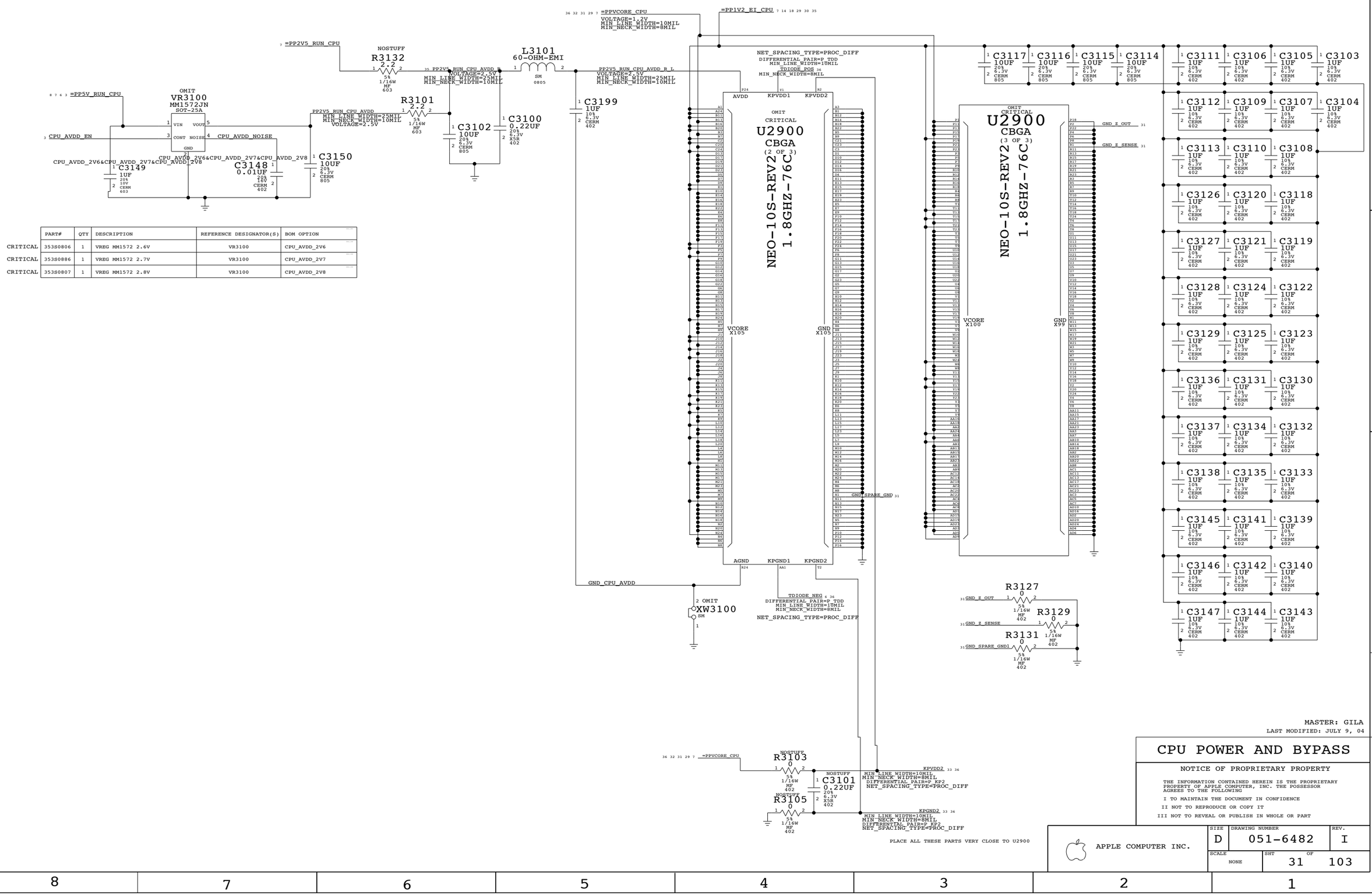


MASTER: GILA
LAST MODIFIED: APR 27, 04

CPU STRAPS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 30 OF 103	



	PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
CRITICAL	353S0806	1	VREG MM1572 2.6V	VR3100	CPU_AVDD_2V6
CRITICAL	353S0886	1	VREG MM1572 2.7V	VR3100	CPU_AVDD_2V7
CRITICAL	353S0807	1	VREG MM1572 2.8V	VR3100	CPU_AVDD_2V8

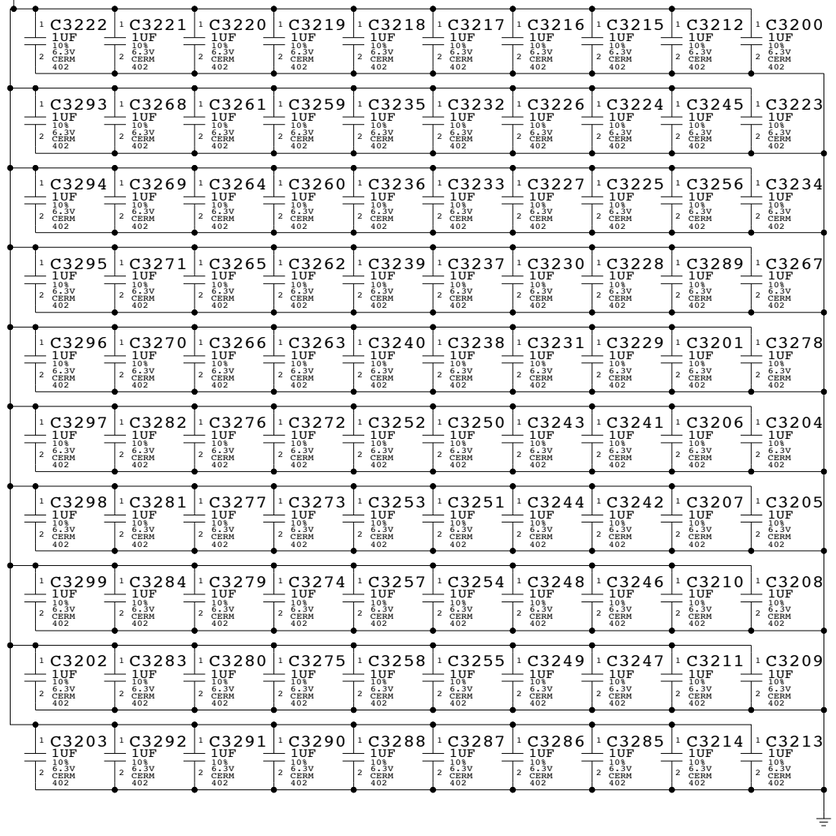
MASTER: GILA
LAST MODIFIED: JULY 9, 04

CPU POWER AND BYPASS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 31 OF 103	

36 31 29 7 =PPVCORE_CPU



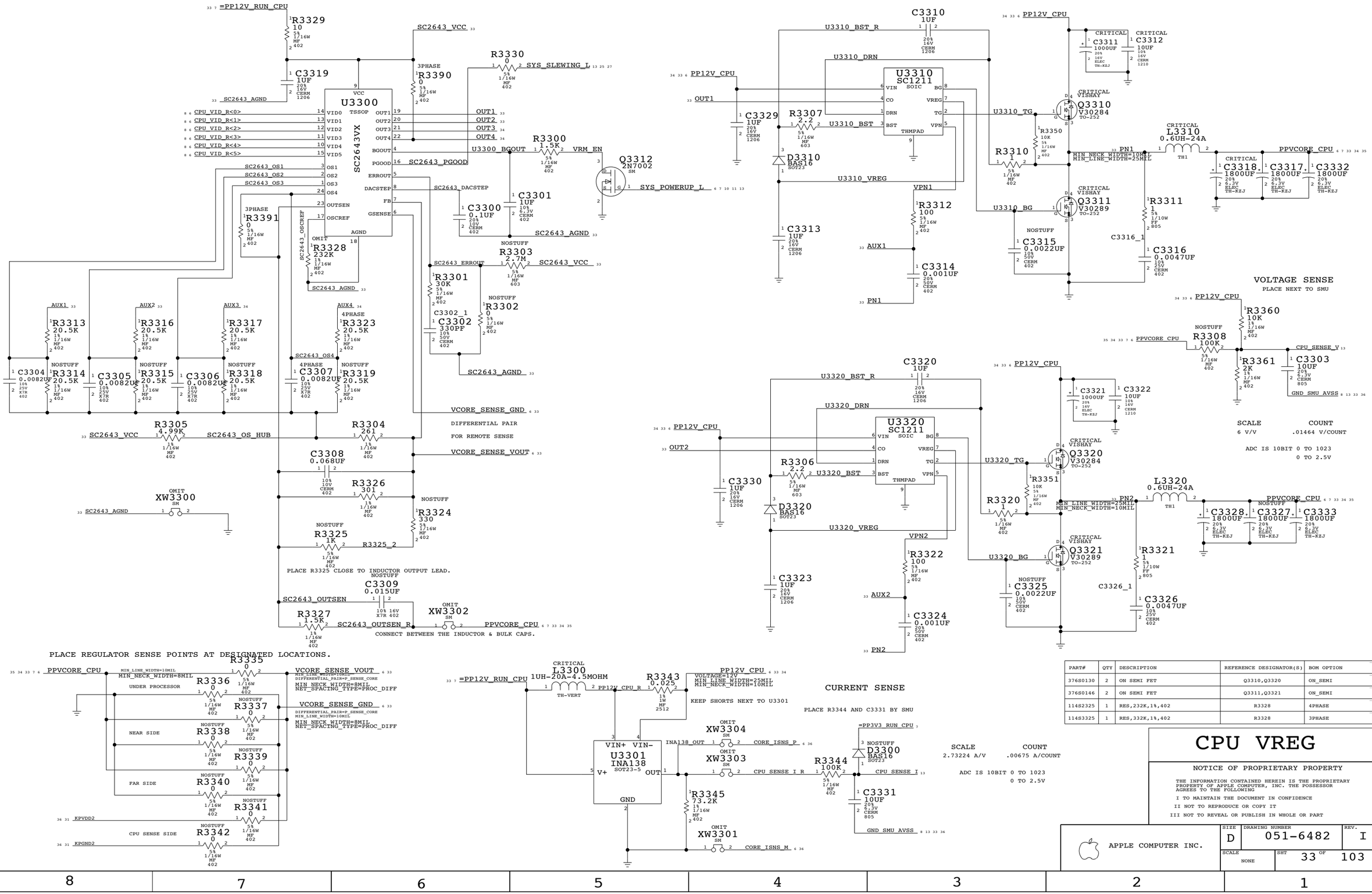
MASTER: GILA

LAST MODIFIED: APR 09, 04

PROC DECOUPLING

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 32 OF 103	

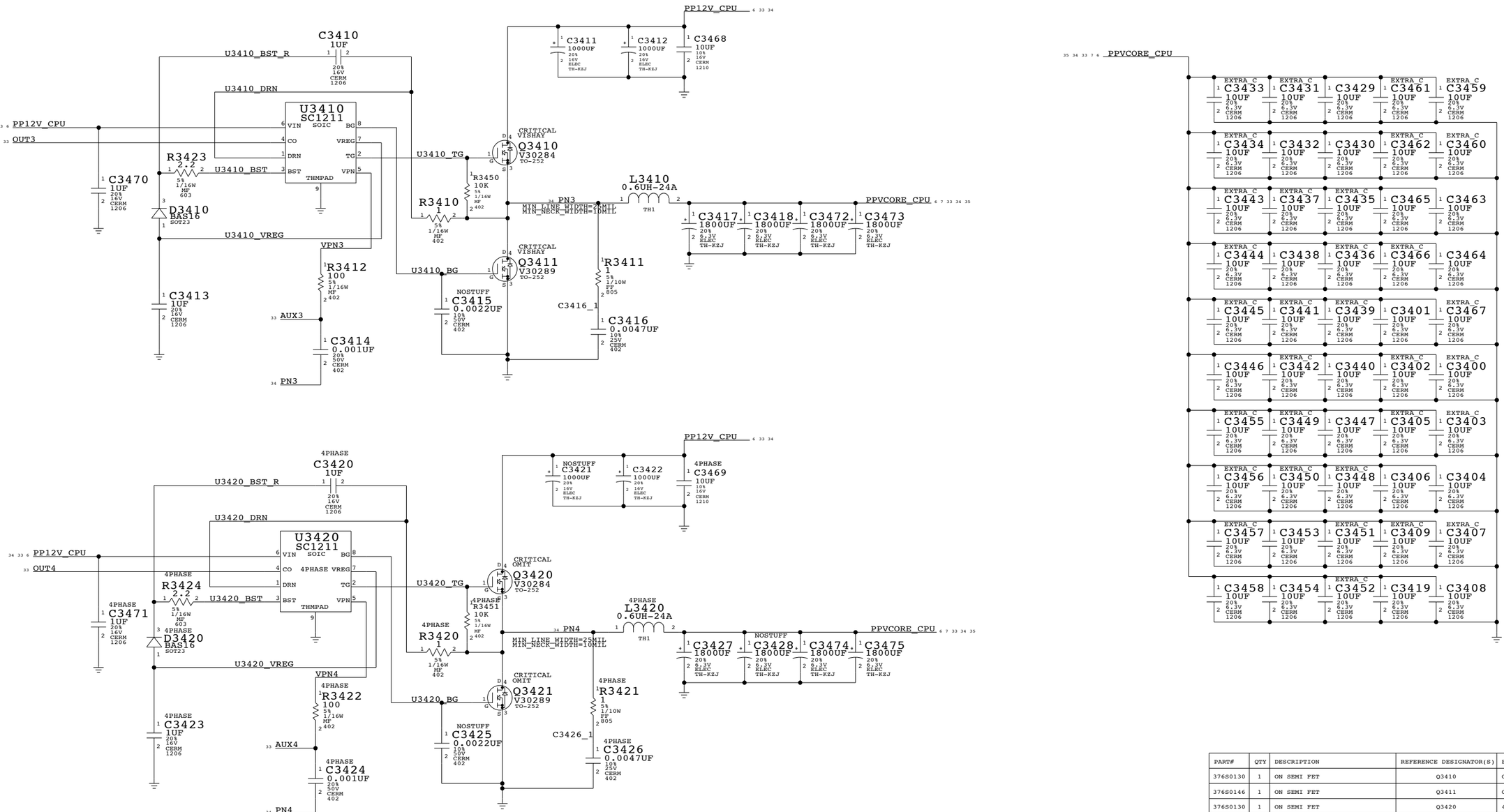


PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
376S0130	2	ON SEMI FET	Q3310,Q3320	ON_SEMI
376S0146	2	ON SEMI FET	Q3311,Q3321	ON_SEMI
114S2325	1	RES,232K,1%,402	R3328	4PHASE
114S3325	1	RES,332K,1%,402	R3328	3PHASE

CPU VREG

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE NONE	SHT 33 OF 103	



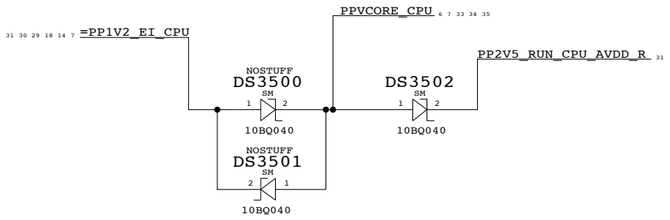
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
376S0130	1	ON SEMI FET	Q3410	ON_SEMI
376S0146	1	ON SEMI FET	Q3411	ON_SEMI
376S0130	1	ON SEMI FET	Q3420	4PHASE_ON
376S0146	1	ON SEMI FET	Q3421	4PHASE_ON
376S0204	1	VISHAY FET	Q3420	4PHASE_VISH
376S0207	1	VISHAY FET	Q3421	4PHASE_VISH

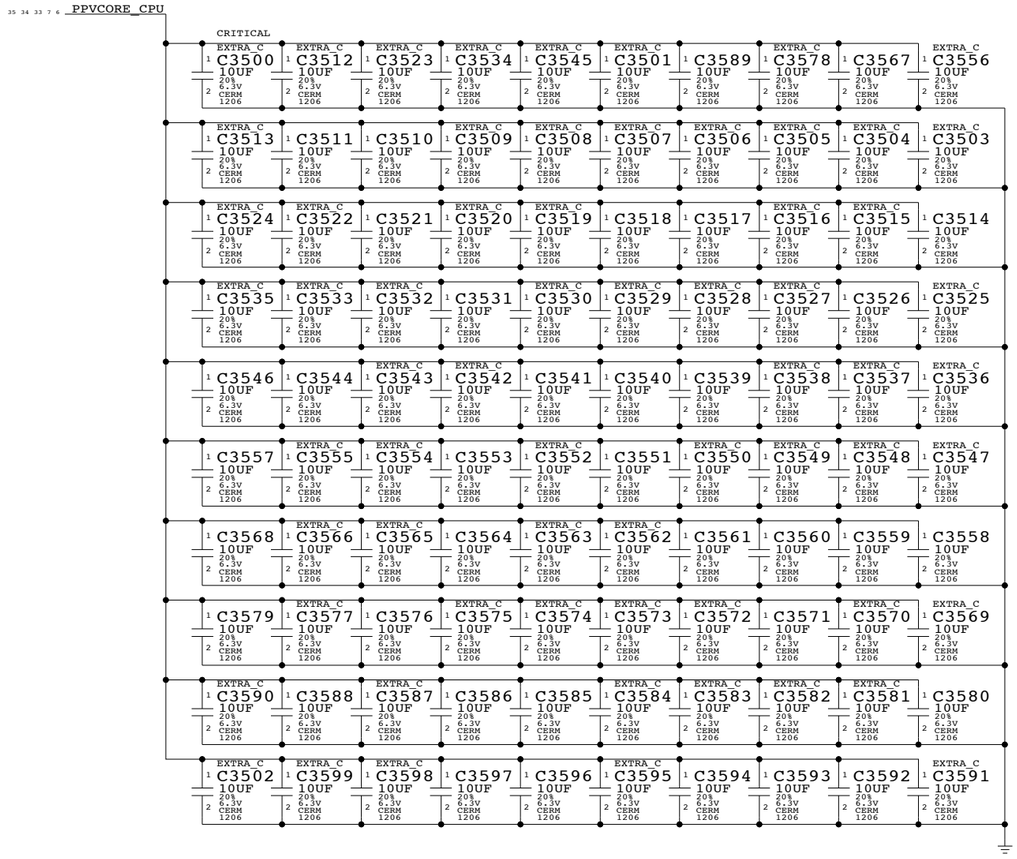
CPU VREG

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I

SCALE	SHT
NONE	34 OF 103

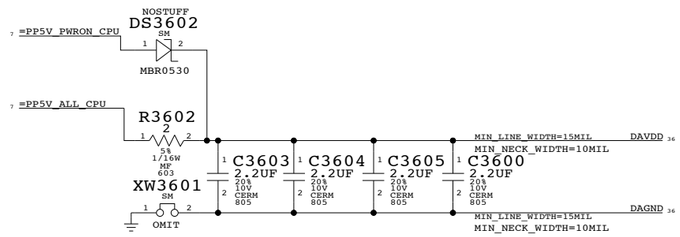




CPU VREG OUTPUT CAPS

APPLE COMPUTER INC.

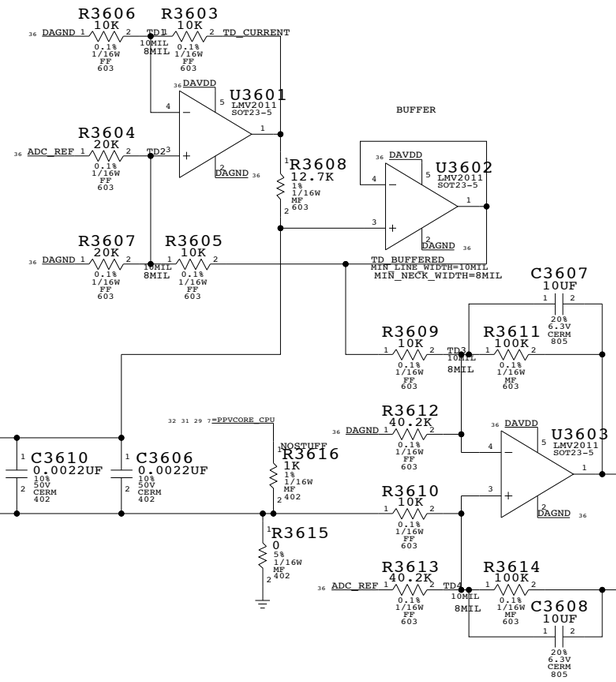
SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 35 OF 103	



XW3600, R3602, AND DS3602 MUST BE PLACED CLOSE TO SMU

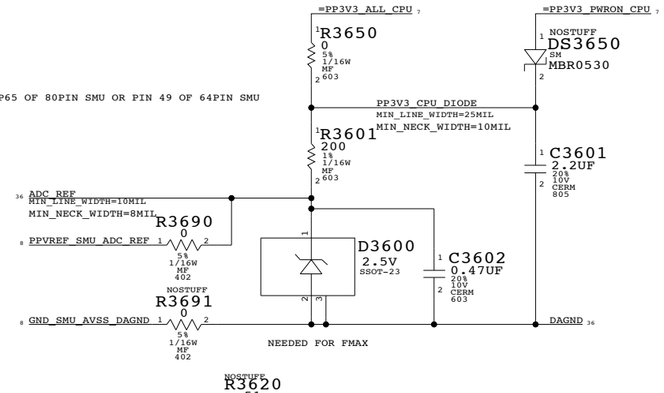
100UA CURRENT SOURCE

THESE SIGNALS HAVE A MIN_LINE_WIDTH=10MIL
AND MIN_NECK_WIDTH=8MIL

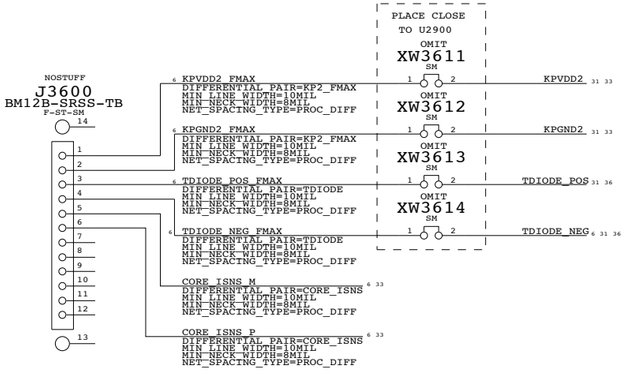


NEED TO CONNECT TO P65 OF 80PIN SMU OR PIN 49 OF 64PIN SMU

POWER MONITOR



PLACE AT BOARD EDGE



CPU DIODE CONDITIONER

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 36 OF 103	

U3TWINS DO NOT HAVE MASKS

=PP2V5_PWRON_RAM

U3 U3LITE V1.0-300MM PBGA (SYM 2 OF 7) OMIT

MEMORY DATA INTERFACE

RAM_DQ_R<0>	AF20	DDR_DQ0	DDR_DQ64 / AG27 / RAM_DQ_R<64>
RAM_DQ_R<1>	AH22	DDR_DQ1	DDR_DQ65 / AF24 / RAM_DQ_R<65>
RAM_DQ_R<2>	AH21	DDR_DQ2	DDR_DQ66 / AE24 / RAM_DQ_R<66>
RAM_DQ_R<3>	AG21	DDR_DQ3	DDR_DQ67 / AG26 / RAM_DQ_R<67>
RAM_DQ_R<4>	AB20	DDR_DQ4	DDR_DQ68 / AF26 / RAM_DQ_R<68>
RAM_DQ_R<5>	AC21	DDR_DQ5	DDR_DQ69 / AD24 / RAM_DQ_R<69>
RAM_DQ_R<6>	AD23	DDR_DQ6	DDR_DQ70 / AD25 / RAM_DQ_R<70>
RAM_DQ_R<7>	AD21	DDR_DQ7	DDR_DQ71 / AG28 / RAM_DQ_R<71>
RAM_DQ_R<8>	AH26	DDR_DQ8	DDR_DQ72 / AF28 / RAM_DQ_R<72>
RAM_DQ_R<9>	AH25	DDR_DQ9	DDR_DQ73 / AE28 / RAM_DQ_R<73>
RAM_DQ_R<10>	AH24	DDR_DQ10	DDR_DQ74 / AD26 / RAM_DQ_R<74>
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RAM_DQ_R<13>	AG24	DDR_DQ13	DDR_DQ77 / AC25 / RAM_DQ_R<77>
RAM_DQ_R<14>	AF23	DDR_DQ14	DDR_DQ78 / AC27 / RAM_DQ_R<78>
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RAM_DQ_R<20>	U24	DDR_DQ20	DDR_DQ84 / Y26 / RAM_DQ_R<84>
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RAM_DQ_R<25>	R22	DDR_DQ25	DDR_DQ89 / V27 / RAM_DQ_R<89>
RAM_DQ_R<26>	R21	DDR_DQ26	DDR_DQ90 / V24 / RAM_DQ_R<90>
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RAM_DQ_R<31>	P23	DDR_DQ31	DDR_DQ95 / U26 / RAM_DQ_R<95>
RAM_DQ_R<32>	M25	DDR_DQ32	DDR_DQ96 / R27 / RAM_DQ_R<96>
RAM_DQ_R<33>	M23	DDR_DQ33	DDR_DQ97 / R26 / RAM_DQ_R<97>
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RAM_DQ_R<35>	P22	DDR_DQ35	DDR_DQ99 / P27 / RAM_DQ_R<99>
RAM_DQ_R<36>	M24	DDR_DQ36	DDR_DQ100 / M28 / RAM_DQ_R<100>
RAM_DQ_R<37>	L22	DDR_DQ37	DDR_DQ101 / N28 / RAM_DQ_R<101>
RAM_DQ_R<38>	L23	DDR_DQ38	DDR_DQ102 / L28 / RAM_DQ_R<102>
RAM_DQ_R<39>	J23	DDR_DQ39	DDR_DQ103 / P28 / RAM_DQ_R<103>
RAM_DQ_R<40>	D23	DDR_DQ40	DDR_DQ104 / L25 / RAM_DQ_R<104>
RAM_DQ_R<41>	D24	DDR_DQ41	DDR_DQ105 / L26 / RAM_DQ_R<105>
RAM_DQ_R<42>	C26	DDR_DQ42	DDR_DQ106 / L27 / RAM_DQ_R<106>
RAM_DQ_R<43>	C27	DDR_DQ43	DDR_DQ107 / K28 / RAM_DQ_R<107>
RAM_DQ_R<44>	A22	DDR_DQ44	DDR_DQ108 / H27 / RAM_DQ_R<108>
RAM_DQ_R<45>	A25	DDR_DQ45	DDR_DQ109 / H28 / RAM_DQ_R<109>
RAM_DQ_R<46>	C24	DDR_DQ46	DDR_DQ110 / J27 / RAM_DQ_R<110>
RAM_DQ_R<47>	C23	DDR_DQ47	DDR_DQ111 / L24 / RAM_DQ_R<111>
RAM_DQ_R<48>	B24	DDR_DQ48	DDR_DQ112 / J25 / RAM_DQ_R<112>
RAM_DQ_R<49>	B23	DDR_DQ49	DDR_DQ113 / J24 / RAM_DQ_R<113>
RAM_DQ_R<50>	A23	DDR_DQ50	DDR_DQ114 / J26 / RAM_DQ_R<114>
RAM_DQ_R<51>	A24	DDR_DQ51	DDR_DQ115 / G28 / RAM_DQ_R<115>
RAM_DQ_R<52>	A27	DDR_DQ52	DDR_DQ116 / H25 / RAM_DQ_R<116>
RAM_DQ_R<53>	A28	DDR_DQ53	DDR_DQ117 / H24 / RAM_DQ_R<117>
RAM_DQ_R<54>	B28	DDR_DQ54	DDR_DQ118 / F27 / RAM_DQ_R<118>
RAM_DQ_R<55>	A26	DDR_DQ55	DDR_DQ119 / H26 / RAM_DQ_R<119>
RAM_DQ_R<56>	F24	DDR_DQ56	DDR_DQ120 / E28 / RAM_DQ_R<120>
RAM_DQ_R<57>	J22	DDR_DQ57	DDR_DQ121 / E27 / RAM_DQ_R<121>
RAM_DQ_R<58>	E23	DDR_DQ58	DDR_DQ122 / F26 / RAM_DQ_R<122>
RAM_DQ_R<59>	H23	DDR_DQ59	DDR_DQ123 / E26 / RAM_DQ_R<123>
RAM_DQ_R<60>	J21	DDR_DQ60	DDR_DQ124 / D28 / RAM_DQ_R<124>
RAM_DQ_R<61>	H21	DDR_DQ61	DDR_DQ125 / C28 / RAM_DQ_R<125>
RAM_DQ_R<62>	G21	DDR_DQ62	DDR_DQ126 / E25 / RAM_DQ_R<126>
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=PP1V5_PWRON_NB_AVDD

R3702 2.2 5% 1/16W MF 603

PP1V5_PWRON_RAM_NB_AVDD VOLTAGE=1.5V

C3745 1UF 10% 6.3V CERM 402

C3744 0.1UF 20% 10V CERM 402

MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL

=PP2V5_PWRON_RAM

U3 U3LITE V1.0-300MM PBGA (SYM 3 OF 7) OMIT

MEMORY CONTROL INTERFACE

RAM_CLK66M_NB	AC20	DDR_CLKP	
RAM_CLK_A_P_R	AA12	DDR_CK_A	
RAM_CLK_A_N_R	AB12	DDR_CK_AN	
RAM_CLK_B_P_R	AB14	DDR_CK_B	
RAM_CLK_B_N_R	AA14	DDR_CK_BN	
RAM_CLK_C_P_R	AE15	DDR_CK_C	
RAM_CLK_C_N_R	AE14	DDR_CK_CN	
RAM_CLK_D_P_R	AC14	DDR_CK_D	
RAM_CLK_D_N_R	AD14	DDR_CK_DN	
RAM_CLK_E_P_R	AD15	DDR_CK_E	
RAM_CLK_E_N_R	AC15	DDR_CK_EN	
RAM_CLK_F_P_R	AA15	DDR_CK_F	
RAM_CLK_F_N_R	AB15	DDR_CK_FN	
RAM_CKE_R<0>	AC17	DDR_CKE0	
RAM_CKE_R<1>	AD17	DDR_CKE1	
RAM_CKE_R<2>	AE17	DDR_CKE2	
RAM_CKE_R<3>	AF17	DDR_CKE3	
RAM_CKE_R<4>	AB17	DDR_CKE4	
RAM_CKE_R<5>	AA17	DDR_CKE5	
RAM_CKE_R<6>	AB18	DDR_CKE6	
RAM_CKE_R<7>	AA18	DDR_CKE7	
	Y21	DDR_VREF0	
	U21	DDR_VREF1	
	L21	DDR_VREF2	
	H20	DDR_VREF3	
	AA21	DDR_VREF4	
	M21	DDR_VREF5	
	V21	DDR_VREF6	
	J20	DDR_VREF7	
	AB21	DDR_CLK_AVDD	
	AA20	DDR_CLK_AVSS	
	AE21	DDR_RAS	RAM_RAS_L_R
	AD20	DDR_CAS	RAM_CAS_L_R
	AC23	DDR_WE	RAM_WE_L_R
	AF21	DDR_BA0	RAM_BA_R<0>
	AE20	DDR_BA1	RAM_BA_R<1>
	AH16	DDR_MUXEN0	RAM_MUXEN0
	AH18	DDR_MUXEN4	RAM_MUXEN4
	AG12	DDR_MAD0	RAM_A_R<0>
	AH13	DDR_MAD1	RAM_A_R<1>
	AH14	DDR_MAD2	RAM_A_R<2>
	AH15	DDR_MAD3	RAM_A_R<3>
	AF12	DDR_MAD4	RAM_A_R<4>
	AE12	DDR_MAD5	RAM_A_R<5>
	AD12	DDR_MAD6	RAM_A_R<6>
	AC12	DDR_MAD7	RAM_A_R<7>
	AG15	DDR_MAD8	RAM_A_R<8>
	AF15	DDR_MAD9	RAM_A_R<9>
	AF14	DDR_MAD10	RAM_A_R<10>
	AG14	DDR_MAD11	RAM_A_R<11>
	AH17	DDR_MAD12	RAM_A_R<12>
	AG17	DDR_MAD13	RAM_A_R<13>
	AF18	DDR_CS0	RAM_CS_L_R<0>
	AE18	DDR_CS1	RAM_CS_L_R<1>
	AG20	DDR_CS2	RAM_CS_L_R<2>
	AH20	DDR_CS3	RAM_CS_L_R<3>
	AC18	DDR_CS8	RAM_CS_L_R<8>
	AD18	DDR_CS9	RAM_CS_L_R<9>
	AG18	DDR_CS10	RAM_CS_L_R<10>
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	AC24	DDR_DQSP0	RAM_DQS_R<0>
	AG23	DDR_DQSP1	RAM_DQS_R<1>
	Y23	DDR_DQSP2	RAM_DQS_R<2>
	R23	DDR_DQSP3	RAM_DQS_R<3>
	M22	DDR_DQSP4	RAM_DQS_R<4>
	B26	DDR_DQSP5	RAM_DQS_R<5>
	B27	DDR_DQSP6	RAM_DQS_R<6>
	F23	DDR_DQSP7	RAM_DQS_R<7>
	AE23	DDR_DQSP8	RAM_DQS_R<8>
	AD28	DDR_DQSP9	RAM_DQS_R<9>
	Y27	DDR_DQSP10	RAM_DQS_R<10>
	U28	DDR_DQSP11	RAM_DQS_R<11>
	M27	DDR_DQSP12	RAM_DQS_R<12>
	J28	DDR_DQSP13	RAM_DQS_R<13>
	F28	DDR_DQSP14	RAM_DQS_R<14>
	F25	DDR_DQSP15	RAM_DQS_R<15>

=PP2V5_PWRON_RAM

R3700 1K 1% 1/16W MF 402

R3701 1K 1% 1/16W MF 402

PP1V25_PWRON_RAM_VREF_NB VOLTAGE=1.25V

MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL

C3730 0.1UF 20% 10V CERM 402

C3746 0.1UF 20% 10V CERM 402

C3747 0.1UF 20% 10V CERM 402

C3748 0.1UF 20% 10V CERM 402

=PP2V5_PWRON_RAM

C3700 C3701 C3702 C3703 C3704 C3705 C3706 C3707 C3708 C3709 C3710 C3711 C3712 C3713 C3714 C3731 C3732 C3733 C3734 C3735 C3736 C3737 0.1UF 20% 10V CERM 402

C3715 C3716 C3717 C3718 C3719 C3720 C3721 C3722 C3724 C3725 C3726 C3727 C3728 C3729 C3743 C3742 C3740 C3739 C3738 0.1UF 20% 10V CERM 402

MASTER: GILA

LAST MODIFIED: APR 12, 04

U3LITE MEMORY

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 37 OF 103	

ALL R PACKS ARE 1/16W 5%

38 37	RAM_DQ_R<7>	RP3836	4	5	22	RAM_DQ<7>	38 40 44
38 37	RAM_DQ_R<2>	RP3836	1	8	22	RAM_DQ<2>	38 40 44
38 37	RAM_DQ_R<0>	RP3836	3	6	22	RAM_DQ<0>	38 40 44
38 37	RAM_DQ_R<3>	RP3836	2	7	22	RAM_DQ<3>	38 40 44
38 37	RAM_DQ_R<1>	RP3816	1	8	22	RAM_DQ<1>	38 40 44
38 37	RAM_DQ_R<4>	RP3816	2	7	22	RAM_DQ<4>	38 40 44
38 37	RAM_DQ_R<6>	RP3816	4	5	22	RAM_DQ<6>	38 40 44
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38 37	RAM_DQ_R<9>	RP3835	4	5	22	RAM_DQ<9>	38 40 44
38 37	RAM_DQ_R<10>	RP3801	1	8	22	RAM_DQ<10>	38 40 44
38 37	RAM_DQ_R<11>	RP3801	3	6	22	RAM_DQ<11>	38 40 44
38 37	RAM_DQ_R<14>	RP3801	4	5	22	RAM_DQ<14>	38 40 44
38 37	RAM_DQ_R<12>	RP3835	2	7	22	RAM_DQ<12>	38 40 44
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38 37	RAM_DQ_R<15>	RP3835	1	8	22	RAM_DQ<15>	38 40 44
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38 37	RAM_DQ_R<24>	RP3808	1	8	22	RAM_DQ<24>	38 40 44
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THE FOLLOWING IS A SWAPPABLE GROUP

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38 37	RAM_CS_L_R<8>	RP3842	1	8	15	RAM_CS_L<8>	38 40 45
38 37	RAM_CS_L_R<9>	RP3842	2	7	15	RAM_CS_L<9>	38 40 45
38 37	RAM_CS_L_R<1>	RP3842	3	6	15	RAM_CS_L<1>	38 40 44
38 37	RAM_CS_L_R<0>	RP3842	4	5	15	RAM_CS_L<0>	38 40 44

THE FOLLOWING IS A SWAPPABLE GROUP

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38 37	RAM_A_R<1>	RP3832	4	5	15	RAM_A<1>	38 40 44
38 37	RAM_A_R<10>	RP3832	2	7	15	RAM_A<10>	38 40 45
38 37	RAM_WE_L_R	RP3800	4	5	15	RAM_WE_L	38 40 45
38 37	RAM_A_R<4>	RP3833	3	6	15	RAM_A<4>	38 40 44
38 37	RAM_A_R<6>	RP3833	2	7	15	RAM_A<6>	38 40 44
38 37	RAM_A_R<7>	RP3833	1	8	15	RAM_A<7>	38 40 44
		RP3834	1	8	15		
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38 37	RAM_A_R<2>	RP3834	2	7	15	RAM_A<2>	38 40 44
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38 37	RAM_RAS_L_R	RP3804	3	6	15	RAM_RAS_L	38 40 45
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38 37	RAM_DQ_R<114>	RP3815	4	5	22	RAM_DQ<114>	38 40 45
38 37	RAM_DQ_R<121>	RP3827	3	6	22	RAM_DQ<121>	38 40 45
38 37	RAM_DQ_R<124>	RP3827	2	7	22	RAM_DQ<124>	38 40 45
38 37	RAM_DQ_R<120>	RP3827	4	5	22	RAM_DQ<120>	38 40 45
38 37	RAM_DQ_R<123>	RP3810	2	7	22	RAM_DQ<123>	38 40 45
38 37	RAM_DQ_R<125>	RP3827	1	8	22	RAM_DQ<125>	38 40 45
38 37	RAM_DQ_R<122>	RP3810	4	5	22	RAM_DQ<122>	38 40 45
38 37	RAM_DQ_R<126>	RP3810	1	8	22	RAM_DQ<126>	38 40 45
38 37	RAM_DQ_R<127>	RP3810	3	6	22	RAM_DQ<127>	38 40 45

THE FOLLOWING ARE 0402 5% RESISTORS

38 37	RAM_CLK_A_P_R	R3816	1	2	15	RAM_CLK_A_P	38 40
38 37	RAM_CLK_A_N_R	R3817	1	2	15	RAM_CLK_A_N	38 40
38 37	RAM_CLK_B_P_R	R3818	1	2	15	RAM_CLK_B_P	38 40
38 37	RAM_CLK_B_N_R	R3819	1	2	15	RAM_CLK_B_N	38 40
38 37	RAM_CLK_C_P_R	R3820	1	2	15	RAM_CLK_C_P	38 40
38 37	RAM_CLK_C_N_R	R3821	1	2	15	RAM_CLK_C_N	38 40
38 37	RAM_CLK_D_P_R	R3822	1	2	15	RAM_CLK_D_P	38 40
38 37	RAM_CLK_D_N_R	R3823	1	2	15	RAM_CLK_D_N	38 40
38 37	RAM_CLK_E_P_R	R3824	1	2	15	RAM_CLK_E_P	38 40
38 37	RAM_CLK_E_N_R	R3825	1	2	15	RAM_CLK_E_N	38 40
38 37	RAM_CLK_F_P_R	R3826	1	2	15	RAM_CLK_F_P	38 40
38 37	RAM_CLK_F_N_R	R3827	1	2	15	RAM_CLK_F_N	38 40

38 37	RAM_DQS_R<0>	R3800	1	2	15	RAM_DQS<0>	38 40 44
38 37	RAM_DQS_R<1>	R3801	1	2	15	RAM_DQS<1>	38 40 44
38 37	RAM_DQS_R<2>	R3802	1	2	15	RAM_DQS<2>	38 40 44
38 37	RAM_DQS_R<3>	R3803	1	2	15	RAM_DQS<3>	38 40 44
38 37	RAM_DQS_R<4>	R3804	1	2	15	RAM_DQS<4>	38 40 44
38 37	RAM_DQS_R<5>	R3805	1	2	15	RAM_DQS<5>	38 40 44
38 37	RAM_DQS_R<6>	R3806	1	2	15	RAM_DQS<6>	38 40 44
38 37	RAM_DQS_R<7>	R3807	1	2	15	RAM_DQS<7>	38 40 44
38 37	RAM_DQS_R<8>	R3808	1	2	15	RAM_DQS<8>	38 40 45
38 37	RAM_DQS_R<9>	R3809	1	2	15	RAM_DQS<9>	38 40 45
38 37	RAM_DQS_R<10>	R3810	1	2	15	RAM_DQS<10>	38 40 45
38 37	RAM_DQS_R<11>	R3811	1	2	15	RAM_DQS<11>	38 40 45
38 37	RAM_DQS_R<12>	R3812	1	2	15	RAM_DQS<12>	38 40 45
38 37	RAM_DQS_R<13>	R3813	1	2	15	RAM_DQS<13>	38 40 45
38 37	RAM_DQS_R<14>	R3814	1	2	15	RAM_DQS<14>	38 40 45
38 37	RAM_DQS_R<15>	R3815	1	2	15	RAM_DQS<15>	38 40 45

	ELECTRICAL_CONSTRAINT_SET	NET_PHYSICAL_TYPE	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
38 37 RAM_CLK_A_P_R			RAM_CLK	RAM_CLK_A_R	2006
38 37 RAM_CLK_A_N_R			RAM_CLK	RAM_CLK_A_R	2007
38 37 RAM_CLK_B_P_R			RAM_CLK	RAM_CLK_B_R	2008
38 37 RAM_CLK_B_N_R			RAM_CLK	RAM_CLK_B_R	2009
38 37 RAM_CLK_C_P_R			RAM_CLK	RAM_CLK_C_R	2010
38 37 RAM_CLK_C_N_R			RAM_CLK	RAM_CLK_C_R	2011
38 37 RAM_CLK_D_P_R			RAM_CLK	RAM_CLK_D_R	2012
38 37 RAM_CLK_D_N_R			RAM_CLK	RAM_CLK_D_R	2013
38 37 RAM_CLK_E_P_R			RAM_CLK	RAM_CLK_E_R	2014
38 37 RAM_CLK_E_N_R			RAM_CLK	RAM_CLK_E_R	2015
38 37 RAM_CLK_F_P_R			RAM_CLK	RAM_CLK_F_R	2016
38 37 RAM_CLK_F_N_R			RAM_CLK	RAM_CLK_F_R	2017
40 38 RAM_CLK_A_P	RAM_CLK0		RAM_CLK	RAM_CLK_A	2018
40 38 RAM_CLK_A_N	RAM_CLK0		RAM_CLK	RAM_CLK_A	2019
40 38 RAM_CLK_B_P	RAM_CLK0		RAM_CLK	RAM_CLK_B	2020
40 38 RAM_CLK_B_N	RAM_CLK0		RAM_CLK	RAM_CLK_B	2021
40 38 RAM_CLK_C_P	RAM_CLK0		RAM_CLK	RAM_CLK_C	2022
40 38 RAM_CLK_C_N	RAM_CLK0		RAM_CLK	RAM_CLK_C	2023
40 38 RAM_CLK_D_P	RAM_CLK1		RAM_CLK	RAM_CLK_D	2024
40 38 RAM_CLK_D_N	RAM_CLK1		RAM_CLK	RAM_CLK_D	2025
40 38 RAM_CLK_E_P	RAM_CLK1		RAM_CLK	RAM_CLK_E	2026
40 38 RAM_CLK_E_N	RAM_CLK1		RAM_CLK	RAM_CLK_E	2027
40 38 RAM_CLK_F_P	RAM_CLK1		RAM_CLK	RAM_CLK_F	2028
40 38 RAM_CLK_F_N	RAM_CLK1		RAM_CLK	RAM_CLK_F	2029
38 37 RAM_CKE_R<1..0>			RAM_CAD		2030
38 37 RAM_CKE_R<5..4>			RAM_CAD		2031
44 40 38 RAM_CKE<0>	RAM_CKECS0		RAM_CAD		2032
44 40 38 RAM_CKE<1>	RAM_CKECS0		RAM_CAD		2033
45 40 38 RAM_CKE<4>	RAM_CKECS1		RAM_CAD		2034
45 40 38 RAM_CKE<5>	RAM_CKECS1		RAM_CAD		2035
38 37 RAM_CS_L_R<1..0>			RAM_CAD		2036
38 37 RAM_CS_L_R<9..8>			RAM_CAD		2041
44 40 38 RAM_CS_L<0>	RAM_CKECS0		RAM_CAD		2042
44 40 38 RAM_CS_L<1>	RAM_CKECS0		RAM_CAD		2043
45 40 38 RAM_CS_L<8>	RAM_CKECS1		RAM_CAD		2044
45 40 38 RAM_CS_L<9>	RAM_CKECS1		RAM_CAD		2045
38 37 RAM_DQS_R<15..0>			RAM_CAD		2046
38 37 RAM_DQ_R<127..0>			RAM_CAD		2047
45 44 40 38 RAM_DQ<127..0>			RAM_CAD		2048
44 40 38 RAM_DQS<0>	RAM_DQS0		RAM_CAD		2049
44 40 38 RAM_DQ<7..0>	RAM_DQS0		RAM_CAD		2050
44 40 38 RAM_DQS<1>	RAM_DQS1		RAM_CAD		2051
44 40 38 RAM_DQ<15..8>	RAM_DQS1		RAM_CAD		2052
44 40 38 RAM_DQS<2>	RAM_DQS2		RAM_CAD		2053
44 40 38 RAM_DQ<23..16>	RAM_DQS2		RAM_CAD		2054
44 40 38 RAM_DQS<3>	RAM_DQS3		RAM_CAD		2055
44 40 38 RAM_DQ<31..24>	RAM_DQS3		RAM_CAD		2056
44 40 38 RAM_DQS<4>	RAM_DQS4		RAM_CAD		2057
44 40 38 RAM_DQ<39..32>	RAM_DQS4		RAM_CAD		2058
44 40 38 RAM_DQS<5>	RAM_DQS5		RAM_CAD		2059
44 40 38 RAM_DQ<47..40>	RAM_DQS5		RAM_CAD		2060
44 40 38 RAM_DQS<6>	RAM_DQS6		RAM_CAD		2061
44 40 38 RAM_DQ<55..48>	RAM_DQS6		RAM_CAD		2062
44 40 38 RAM_DQS<7>	RAM_DQS7		RAM_CAD		2063
44 40 38 RAM_DQ<63..56>	RAM_DQS7		RAM_CAD		2064
45 40 38 RAM_DQS<8>	RAM_DQS8		RAM_CAD		2065
45 40 38 RAM_DQ<71..64>	RAM_DQS8		RAM_CAD		2067
45 40 38 RAM_DQS<9>	RAM_DQS9		RAM_CAD		2066
45 40 38 RAM_DQ<79..72>	RAM_DQS9		RAM_CAD		2068
45 40 38 RAM_DQS<10>	RAM_DQS10		RAM_CAD		2070
45 40 38 RAM_DQ<87..80>	RAM_DQS10		RAM_CAD		2069
45 40 38 RAM_DQS<11>	RAM_DQS11		RAM_CAD		2072
45 40 38 RAM_DQ<95..88>	RAM_DQS11		RAM_CAD		2071
45 40 38 RAM_DQS<12>	RAM_DQS12		RAM_CAD		2073
45 40 38 RAM_DQ<103..96>	RAM_DQS12		RAM_CAD		2074
45 40 38 RAM_DQS<13>	RAM_DQS13		RAM_CAD		2075
45 40 38 RAM_DQ<111..104>	RAM_DQS13		RAM_CAD		2077
45 40 38 RAM_DQS<14>	RAM_DQS14		RAM_CAD		2076
45 40 38 RAM_DQ<119..112>	RAM_DQS14		RAM_CAD		2078
45 40 38 RAM_DQS<15>	RAM_DQS15		RAM_CAD		2080
45 40 38 RAM_DQ<127..120>	RAM_DQS15		RAM_CAD		2079
38 37 RAM_A_R<13..0>			RAM_CAD		2033
38 37 RAM_BA_R<1..0>			RAM_CAD		2046
38 37 RAM_RAS_L_R			RAM_CAD		2047
38 37 RAM_CAS_L_R			RAM_CAD		2048
38 37 RAM_WE_L_R			RAM_CAD		2049
45 44 40 38 RAM_A<13..0>	RAM_A_CTL		RAM_CAD		2000
45 40 38 RAM_BA<1..0>	RAM_A_CTL		RAM_CAD		2004
45 40 38 RAM_RAS_L	RAM_A_CTL		RAM_CAD		2001
45 40 38 RAM_CAS_L	RAM_A_CTL		RAM_CAD		2002
45 40 38 RAM_WE_L	RAM_A_CTL		RAM_CAD		2003

RAM_CLK PRIMARY SPACING SET BASED ON DIFF IMPEDANCE
RAM_CLK LINE-LINE SPACING SET TO 15MIL
TOTAL LENGTH TOLERENCE = 20PS = 2.82MM

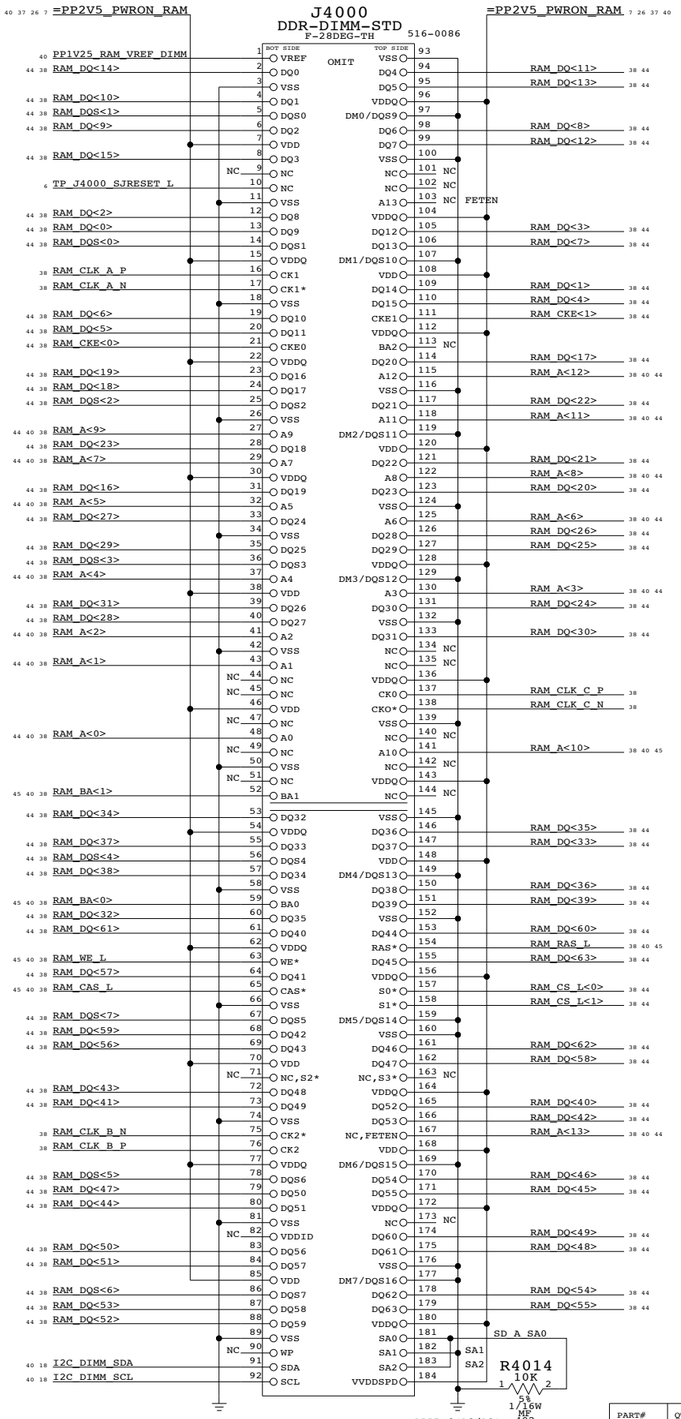
RAM_CAD SPACING IS 10MIL

SERIES TERM

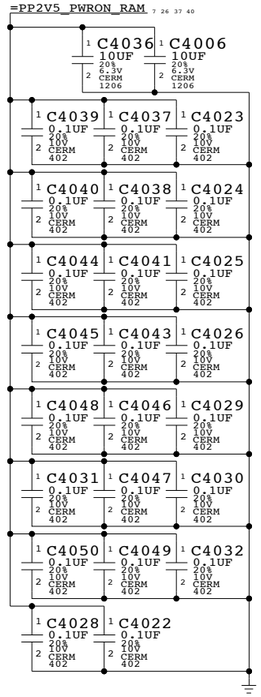
APPLE COMPUTER INC.

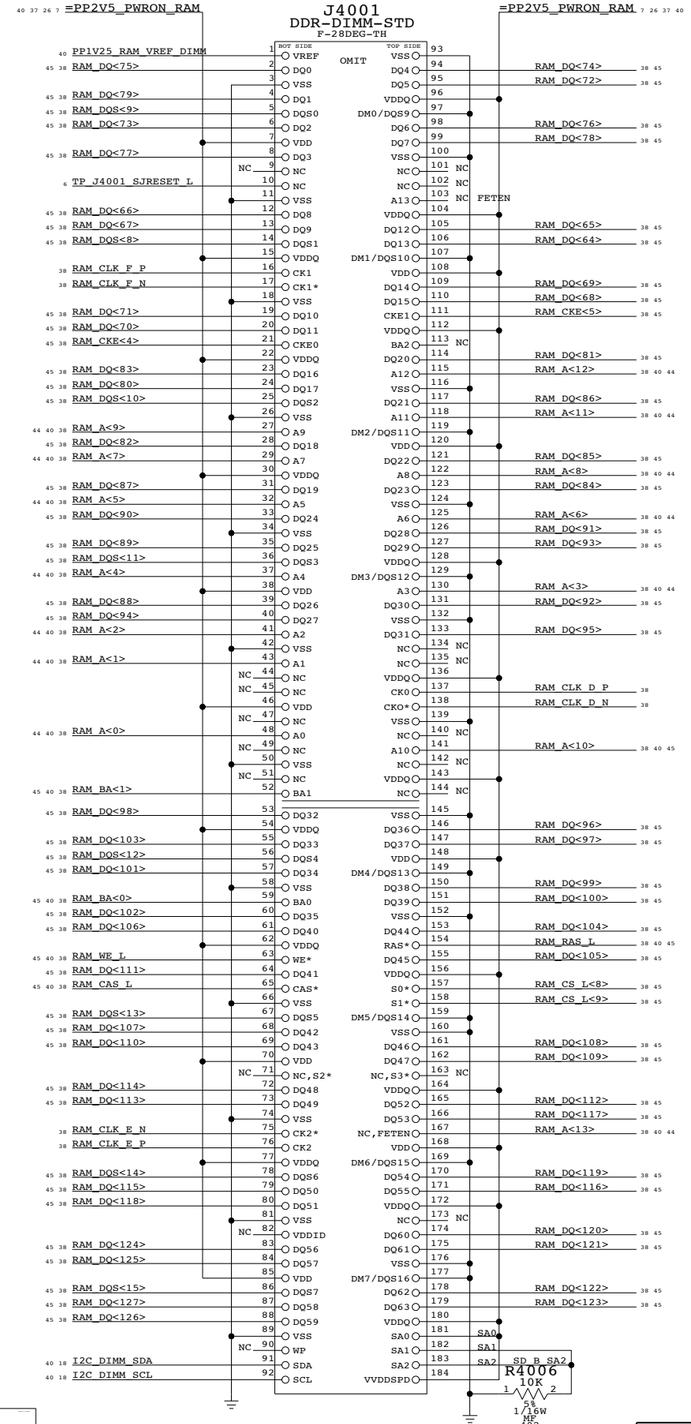
SIZE D | DRAWING NUMBER 051-6482 | REV. I

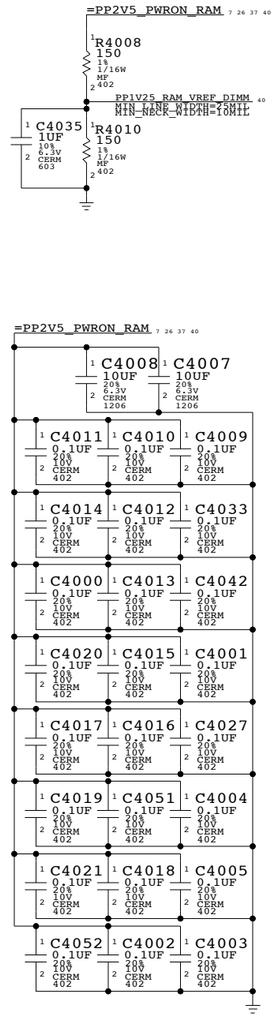
SCALE NONE | SHT 38 OF 103



PIN 82:
NC: VDD & VDDQ ARE THE SAME
GND: VDD & VDDQ ARE DIFFERENT







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516-0086	2	CONN,DDR DIMM 30 DEG	J4000,J4001	17_INCH_LCD	CRITICAL
516-0087	2	CONN,DDR DIMM REVERSE 30 DEG	J4000,J4001	20_INCH_LCD	CRITICAL

V V R R V R'S ADJACENT TO V'S OR G'S
V V R R V V'S ADJACENT TO G'S FORBIDDEN

DIMMS

APPLE COMPUTER INC.

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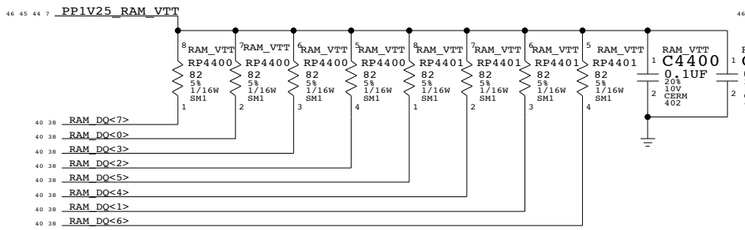
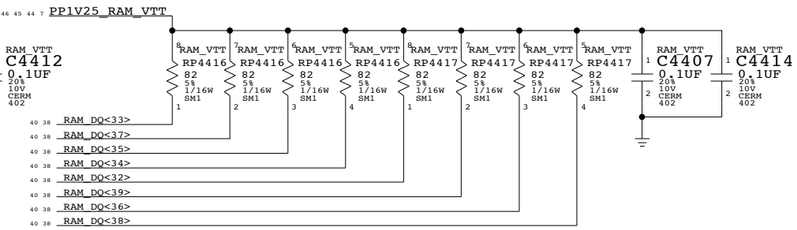
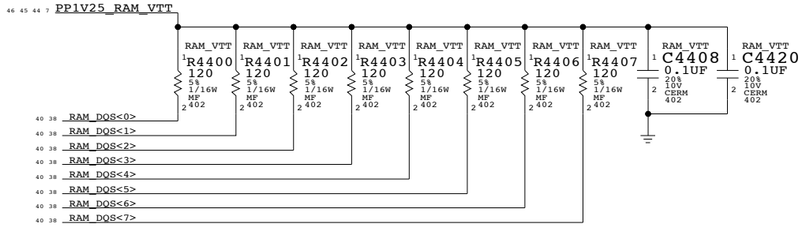
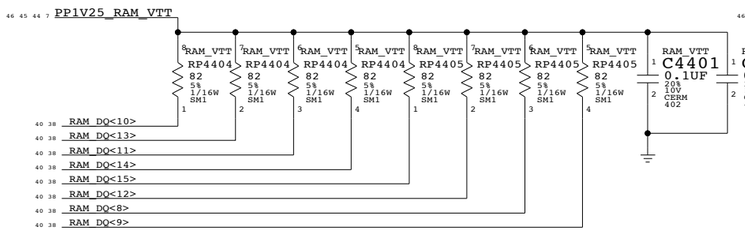
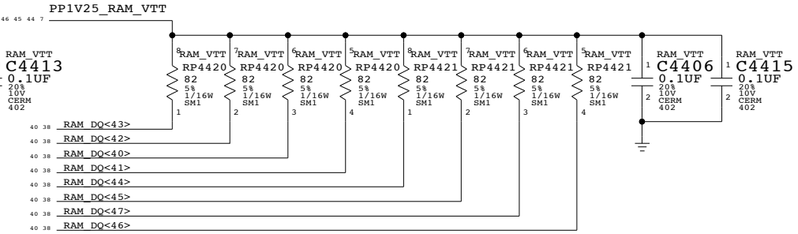
D	051-6482	I
SCALE: NONE	SHT 40 OF 103	

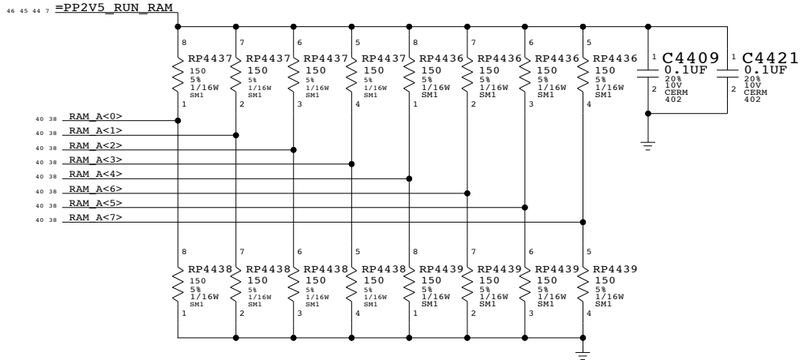


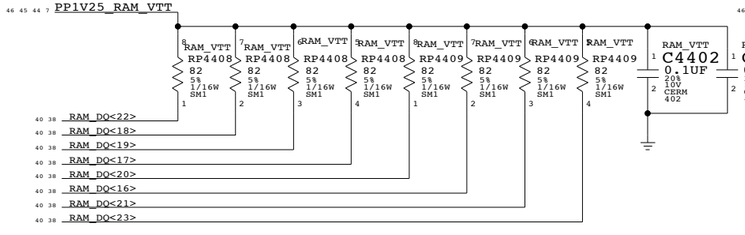


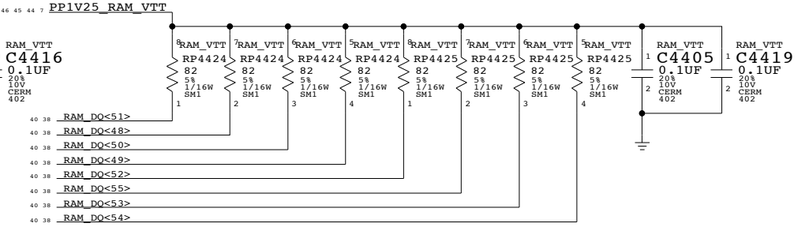


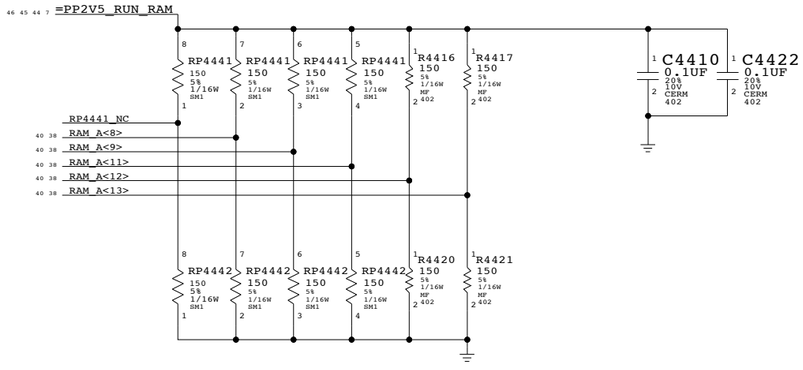


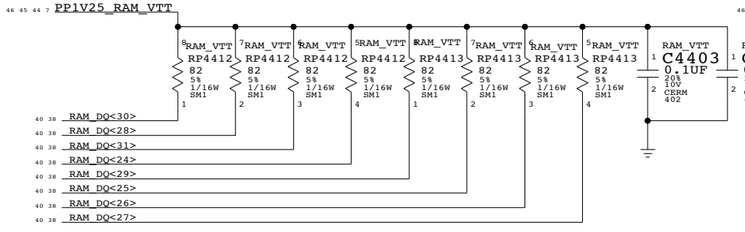


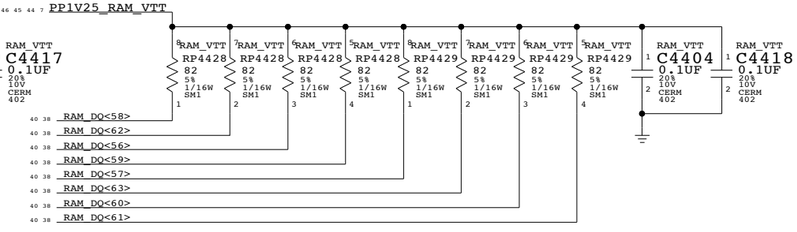


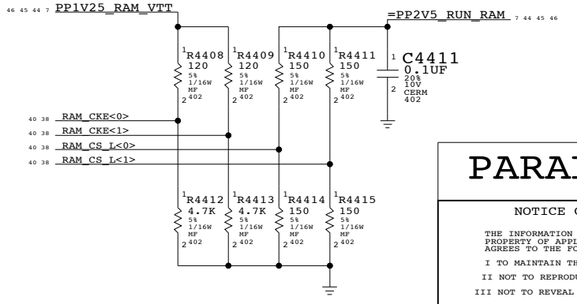












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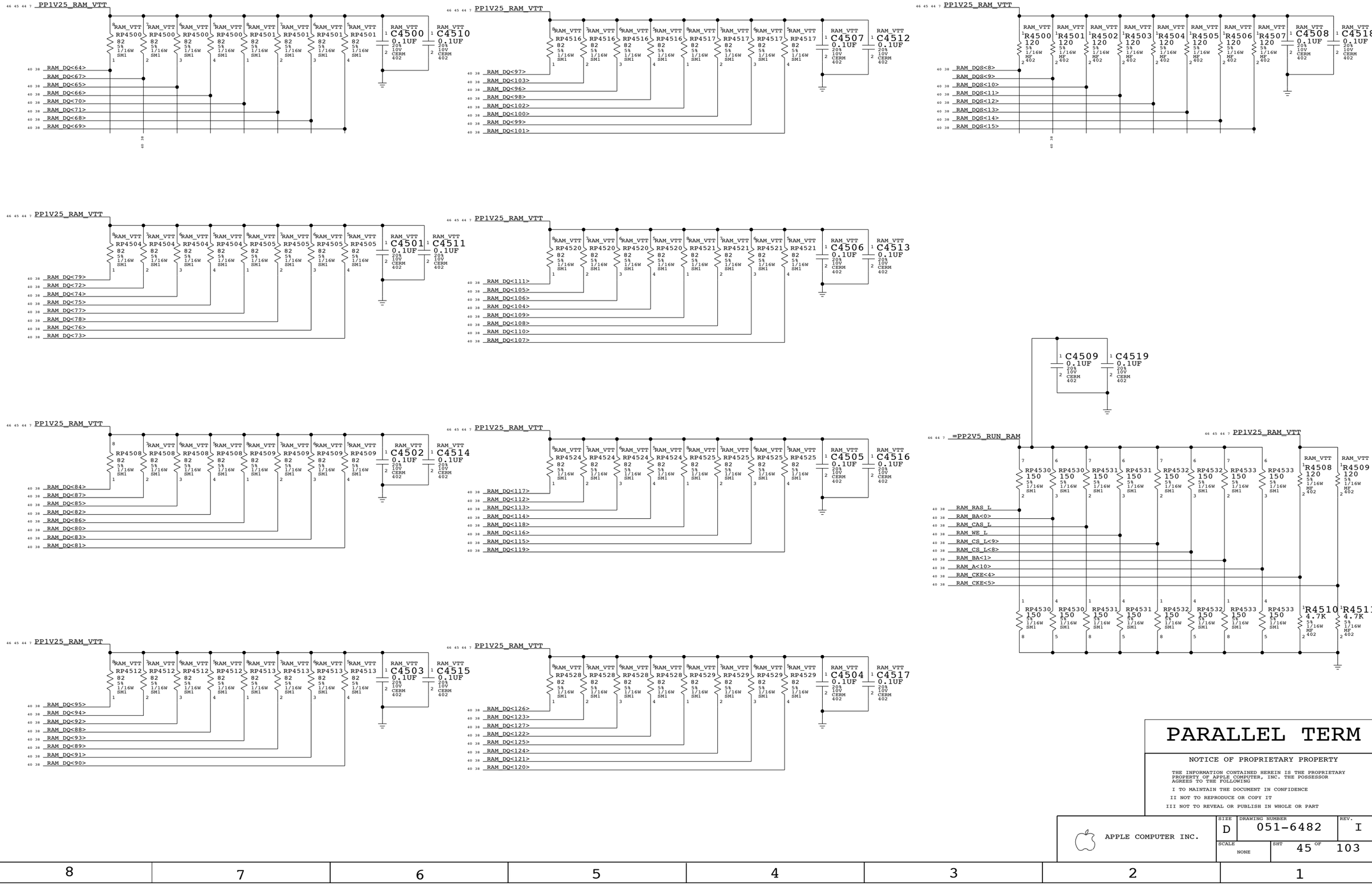
SCALE: NONE	SHT 44 OF 103	


PP1V25_RAM_VTT
RAM_VTT
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82 120 150
5% 1/16W SM1 MF 402
C4500 C4501 C4502 C4503 C4504 C4505 C4506 C4507 C4508 C4509 C4510 C4511 C4512 C4513 C4514 C4515 C4516 C4517 C4518 C4519
0.1UF 20% 10V CERM 402
RAM_DQ<64> RAM_DQ<67> RAM_DQ<65> RAM_DQ<66> RAM_DQ<70> RAM_DQ<71> RAM_DQ<68> RAM_DQ<69>
RAM_DQ<97> RAM_DQ<103> RAM_DQ<96> RAM_DQ<98> RAM_DQ<102> RAM_DQ<100> RAM_DQ<99> RAM_DQ<101>
RAM_DQS<8> RAM_DQS<9> RAM_DQS<10> RAM_DQS<11> RAM_DQS<12> RAM_DQS<13> RAM_DQS<14> RAM_DQS<15>
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=PP2V5_RUN_RAM
RAM_RAS_L RAM_BA<0> RAM_CAS_L RAM_WE_L RAM_CS_L<9> RAM_CS_L<8> RAM_BA<1> RAM_A<10> RAM_CKE<4> RAM_CKE<5>
R4508 R4509 R4510 4.7K R4511 4.7K
RAM_DQ<84> RAM_DQ<87> RAM_DQ<85> RAM_DQ<86> RAM_DQ<82> RAM_DQ<80> RAM_DQ<83> RAM_DQ<81>
RAM_DQ<117> RAM_DQ<112> RAM_DQ<113> RAM_DQ<114> RAM_DQ<118> RAM_DQ<116> RAM_DQ<115> RAM_DQ<119>
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RAM_DQ<126> RAM_DQ<123> RAM_DQ<127> RAM_DQ<122> RAM_DQ<125> RAM_DQ<124> RAM_DQ<121> RAM_DQ<120>
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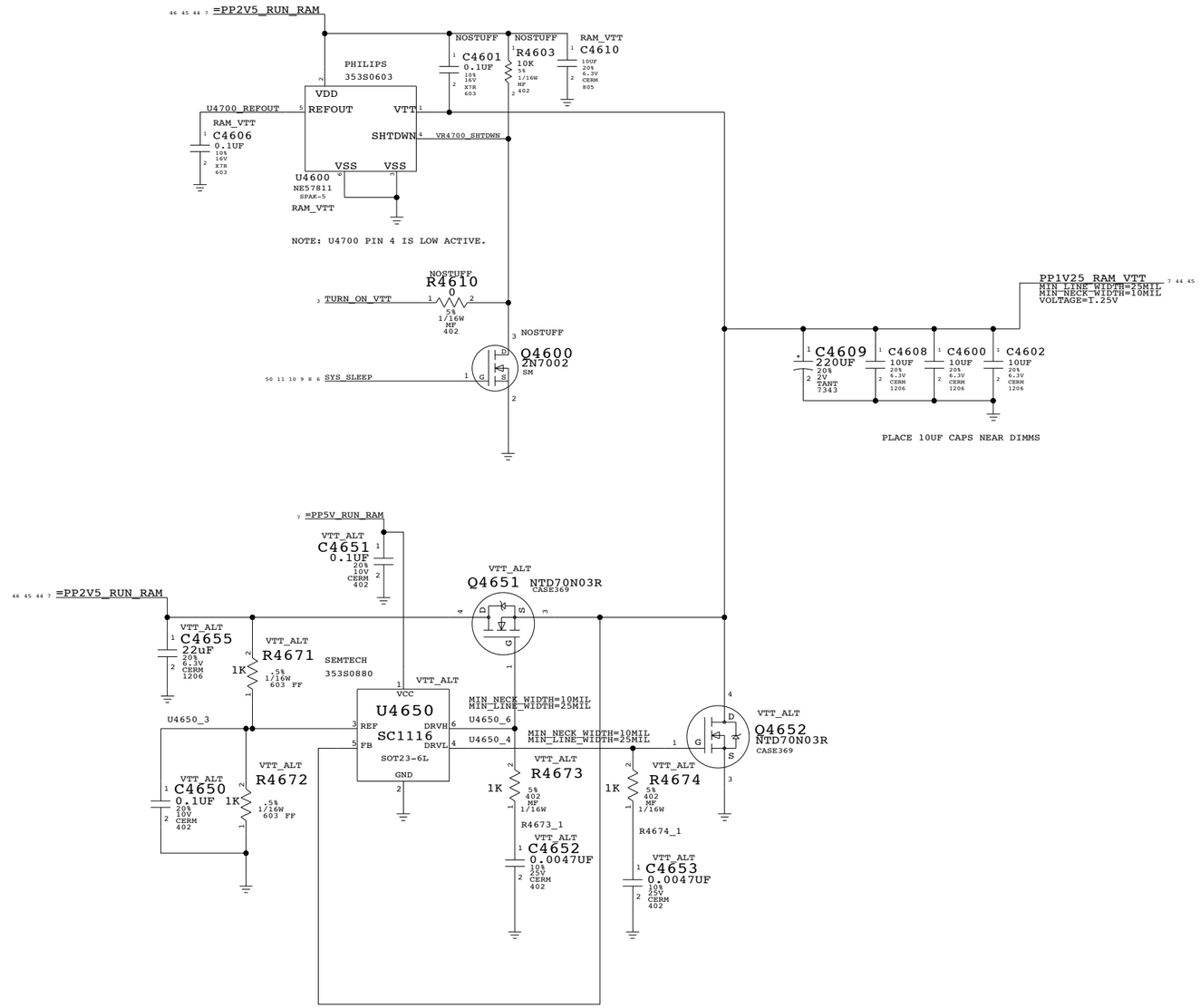

MEM TERM VREGS

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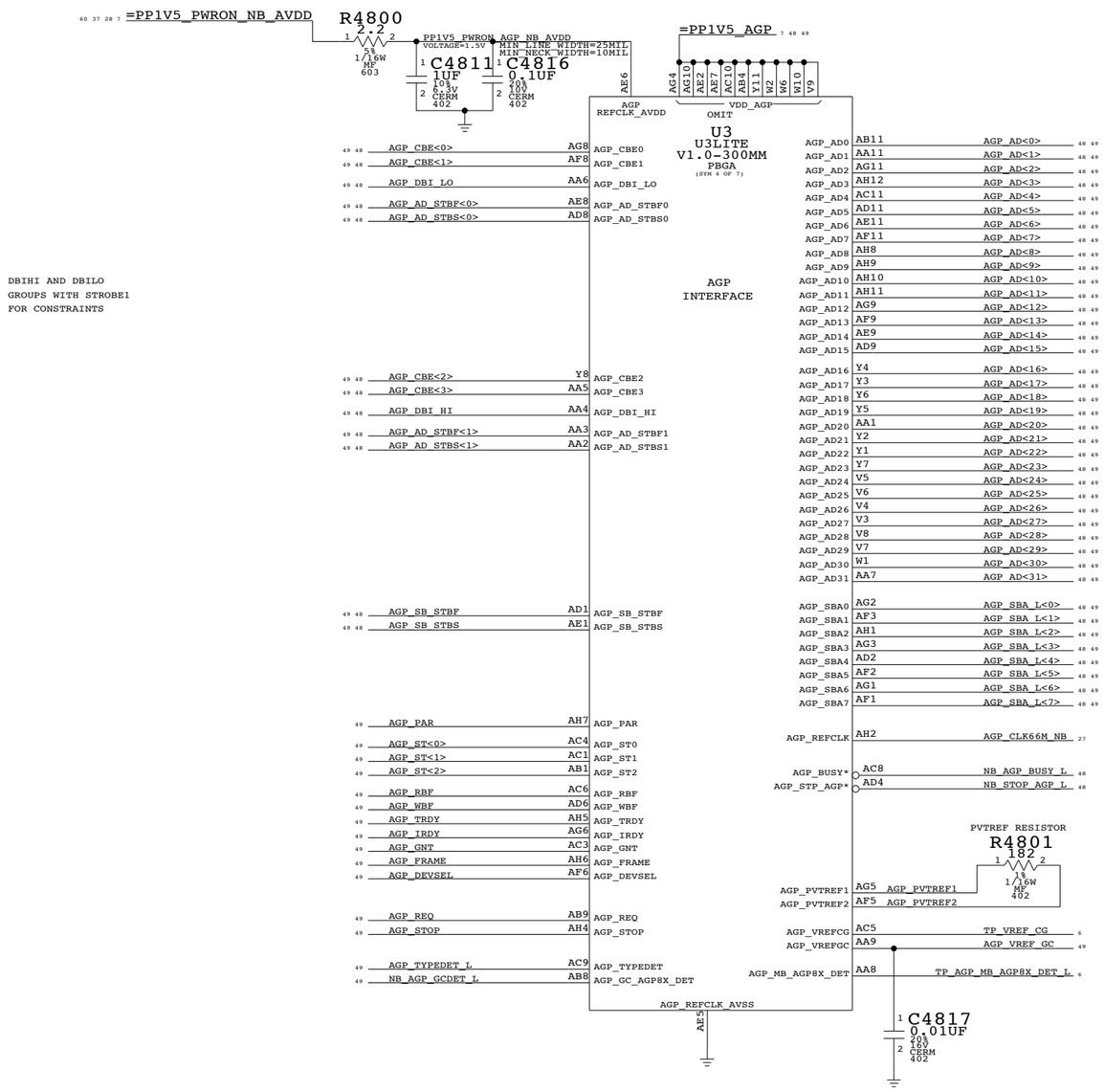
D	051-6482	I

SCALE	SHT
NONE	46 OF 103

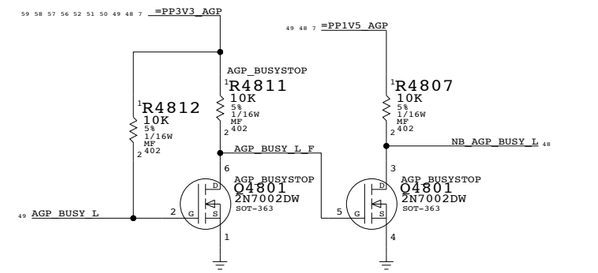


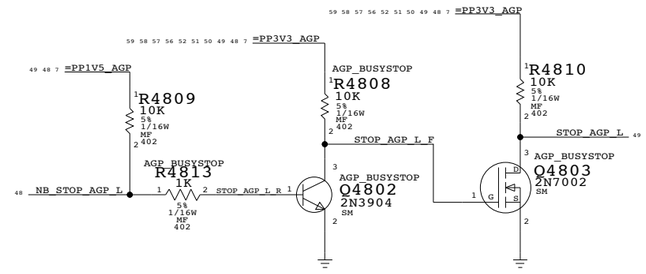
ELECTRICAL_CONSTRAINT_SET	NET_PHYSICAL_TYPE	NET_SPACING_TYPE	DIFFERENTIAL_PAIR
AGP_AD_0		AGP_DATA	
AGP_AD_1		AGP_DATA	
AGP_SB_STBS		AGP_STROBE	AGP_SB_STB
AGP_AD_STB_0		AGP_STROBE	AGP_AD_STB0
AGP_AD_STB_1		AGP_STROBE	AGP_AD_STB1

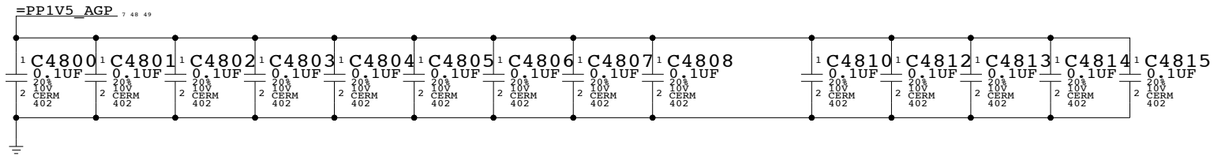
DBI_HI IS NOT A STROBE BUT SHARES THE SAME TOPOLOGY AS A STROBE

LEVEL SHIFTER FOR U3LITE

AGP BUSY AND STOP ARE NOT USED IN ALL DESIGNS







MASTER: GILA
LAST MODIFIED: APR 12, 04

U3LITE AGP

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SCALE: NONE	SHT 48 OF 103	

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
338S0176	1	IC,NV18B,GRAPHIC CTRL,C1	U4900	NV18B
338S0175	1	IC,NV34,GRAPHIC CTRL,B1	U4900	NV34

U3LITE AGP I/O REFERENCE
(PLACE CLOSE TO GPU AGP BALL)

49 48 7 =PP1V5_AGP

R4914 3.32K 1% 1/16W MF 402

AGP_VREF_GC 48

R4940 1.02K 1% 1/16W MF 402

C4940 0.01UF 20% 16V CERM 402

U4900
NV18B
BGA
(1 OF 5)
OMIT

48 AGP_AD<0>	AJ28	PCIAD0	
48 AGP_AD<1>	AK28	PCIAD1	
48 AGP_AD<2>	AH27	PCIAD2	
48 AGP_AD<3>	AK27	PCIAD3	
48 AGP_AD<4>	AJ27	PCIAD4	
48 AGP_AD<5>	AH26	PCIAD5	
48 AGP_AD<6>	AJ26	PCIAD6	
48 AGP_AD<7>	AH25	PCIAD7	
48 AGP_AD<8>	AH23	PCIAD8	
48 AGP_AD<9>	AJ23	PCIAD9	
48 AGP_AD<10>	AH22	PCIAD10	
48 AGP_AD<11>	AJ22	PCIAD11	
48 AGP_AD<12>	AJ21	PCIAD12	
48 AGP_AD<13>	AK21	PCIAD13	
48 AGP_AD<14>	AH20	PCIAD14	
48 AGP_AD<15>	AJ20	PCIAD15	
48 AGP_AD<16>	AG26	PCIAD16	
48 AGP_AD<17>	AE24	PCIAD17	
48 AGP_AD<18>	AG25	PCIAD18	
48 AGP_AD<19>	AG24	PCIAD19	
48 AGP_AD<20>	AF24	PCIAD20	
48 AGP_AD<21>	AG23	PCIAD21	
48 AGP_AD<22>	AE22	PCIAD22	
48 AGP_AD<23>	AF22	PCIAD23	
48 AGP_AD<24>	AE21	PCIAD24	
48 AGP_AD<25>	AG20	PCIAD25	
48 AGP_AD<26>	AG19	PCIAD26	
48 AGP_AD<27>	AF19	PCIAD27	
48 AGP_AD<28>	AE19	PCIAD28	
48 AGP_AD<29>	AF18	PCIAD29	
48 AGP_AD<30>	AG18	PCIAD30	
48 AGP_AD<31>	AE18	PCIAD31	
		AGP 2X,4X	: AGP 8X
48 AGP_CBE<0>	AJ24	PCIC0/BE0*	: C0*/BE0
48 AGP_CBE<1>	AH19	PCIC1/BE1*	: C1*/BE1
48 AGP_CBE<2>	AF25	PCIC2/BE2*	: C2*/BE2
48 AGP_CBE<3>	AG22	PCIC3/BE3*	: C3*/BE3
27 AGP_CLK66M_GPU	AG12	PCICLK	: CLK
8 GPU_RESET_L / NV_PCIRST_L	AF15	PCIRST*	: RST*
48 AGP_GNT	AE15	PCIGNT*	: GNT
48 AGP_REQ	AF13	PCIREQ*	: REQ
48 AGP_FRAME	AK16	PCIFRAME*	: FRAME
48 AGP_IRDY	AG16	PCIIRDY*	: IRDY
48 AGP_TRDY	AJ17	PCITRDY*	: TRDY
48 AGP_DEVSEL	AJ16	PCIDEVSEL*	: DEVSEL
48 AGP_STOP	AH17	PCISTOP*	: STOP
48 AGP_PAR	AK18	PCIPAR	: PAR
49 25 AGP_INT_L	AG15	PCIINTA*	: INTA
6 TP_GPU_INTB_L	AE10	NC_PCIINTB*	: INTB
48 AGP_RBF	AG14	AGPRBF*	: RBF
48 AGP_WBF	AG17	AGPWBF*	: WBF
48 AGP_DBI_HI	AJ18	AGPPIPE*	: DBI_HI
48 AGP_DBI_LO	AJ19	<RESRVD>	: DBI_LO
48 AGP_ST<0>	AG13	AGPST0	: ST0
48 AGP_ST<1>	AE16	AGPST1	: ST1
48 AGP_ST<2>	AE13	AGPST2	: ST2
48 AGP_AD_STBF<0>	AK24	AGPADSTBF0	: ADSTBF0
48 AGP_AD_STBS<0>	AJ25	AGPADSTBS0*	: ADSTBS0
48 AGP_AD_STBF<1>	AG21	AGPADSTBF1	: ADSTBF1
48 AGP_AD_STBS<1>	AF21	AGPADSTBS1*	: ADSTBS1
48 AGP_SB_STBF	AK13	AGPSBSTBF	: SBSTBF
48 AGP_SB_STBS	AJ13	AGPSBSTBS*	: SBSTBS
48 AGP_SBA_L<0>	AJ11	AGPSBA0	: SBA0*
48 AGP_SBA_L<1>	AH11	AGPSBA1	: SBA1*
48 AGP_SBA_L<2>	AJ12	AGPSBA2	: SBA2*
48 AGP_SBA_L<3>	AH12	AGPSBA3	: SBA3*
48 AGP_SBA_L<4>	AJ14	AGPSBA4	: SBA4*
48 AGP_SBA_L<5>	AH14	AGPSBA5	: SBA5*
48 AGP_SBA_L<6>	AJ15	AGPSBA6	: SBA6*
48 AGP_SBA_L<7>	AH15	AGPSBA7	: SBA7*
GPU_MBDET_L	AF16	<RESRVD>	: MBDET*
48 AGP_BUSY_L	AF12	AGPBUSY*	: BUSY*
48 STOP_AGP_L	AG11	AGPSTOP*	: STOP*
49 GPU_AGP_VREF	AK29	AGPVREF	: AGPVREF

R4912 0 1% 1/16W MF 402

=PP3V3_AGP 7 48 49 50 51 52 56 57 58 59

R4908 4.99K 1% 1/16W MF 402 — AGP_INT_L 25 49

NB_AGP_GCDET_L

AGP_TYPEDET_L

R4913 0 5% 1/16W MF 402

R4909 10K 5% 1/16W MF 402

DOES HOOP UP AGP_BUSY_L &
STOP_AGP_L TO 3.3V OR 1.5V?

AGP VERSION SELECT
(LOW = AGP V3.X)
(HIGH = AGP V2.X)

R4903 0 5% 1/16W MF 402 — =PP3V3_AGP 56 52 51 50 49 48 7 59 58 57

NOSTUFF R4950 10K 5% 1/16W MF 402

R4951 10K 5% 1/16W MF 402

GPU_BALLR7

GPU_BALLT7

NC — A1, AK30, G6, R7, T7

NO_TEST TP_GPUC<0>
NO_TEST TP_GPUC<1>
NO_TEST TP_GPUC<2>

	AE14	
	AE11	
	AE17	
	AE20	
AGPVDDQ	AE23	
	AD11	
	AD14	
	AD23	
	AD20	
	AD17	
	AA17	
	AA18	
	L20	
	Y20	
	L13	
	Y13	
	N20	
	P20	
	U20	
	V20	
VDD	L11	
	N11	
	P11	
	U11	
	V11	
	Y11	
	L14	
	Y14	
	L17	
	Y17	
	L18	
	Y18	
	H6	
	AC6	
	U7	
	G14	
	U6	
	AD15	
VDD33	H7	
	AD16	
	AD19	
	AD22	
	AC7	
	AD12	
	P24	

VD50CLAMP0 N4
VD50CLAMP1 AE9
AGP_PLLVDD AE12

50 OHM TO VDDQ — AGPCALPD AA13

50 OHM TO GND — AGPCALPU AA14

GPU_50PULLUP

GPU_50PULLDWN

10K OHM TO GND — TESTMODE AE5

GPU_TMODE

R4901 10K 5% 1/16W MF 402

R4900 49.9 1% 1/16W MF 402

=PP5V_AGP 7 50 59

C4953 0.1UF 20% 10V CERM 402

C4954 0.1UF 20% 10V CERM 402

=PP1V5_AGP 7 48 49

R4902 49.9 1% 1/16W MF 402

C2 TCLK
C1 TMS
D1 TDI
E2 TDO
D2 TRST*

NVAGP_TRST_L — R4905 1K

TP_NVAGP_TDO 6

TP_NVAGP_TDI

TP_NVAGP_TMS

NVAGP_TCLK — R4904 1K

NV34 R4910 10K 5% 1/16W MF 402

NV34 R4911 10K 5% 1/16W MF 402

=PP3V3_AGP 7 48 49 50 51 52 56 57 58 59

BOUNDRY SCAN AVAILABLE ONLY ON NV3X SERIES

NVIDIA RECOMMENDS A WIDER RANGE OF CAP VALUES, EMC LIKES ONE VALUE

OUTPUT DRIVER BYPASS

49 48 7 =PP1V5_AGP

C4912 0.01UF 10% 16V CERM 402
C4911 0.01UF 10% 16V CERM 402
C4904 0.1UF 20% 10V CERM 402
C4905 0.1UF 20% 10V CERM 402
C4906 0.1UF 20% 10V CERM 402
C4913 0.1UF 20% 10V CERM 402
C4907 0.1UF 20% 10V CERM 402
C4908 0.1UF 20% 10V CERM 402
C4909 0.1UF 20% 10V CERM 402
C4910 0.1UF 20% 10V CERM 402

CORE BYPASS

58 50 PPVCORE_GPU

C4914 0.01UF 10% 16V CERM 402
C4915 0.01UF 10% 16V CERM 402
C4916 0.1UF 20% 10V CERM 402
C4917 0.1UF 20% 10V CERM 402
C4918 0.1UF 20% 10V CERM 402
C4919 0.1UF 20% 10V CERM 402
C4920 0.1UF 20% 10V CERM 402
C4921 0.1UF 20% 10V CERM 402
C4922 0.1UF 20% 10V CERM 402
C4923 0.1UF 20% 10V CERM 402
C4924 0.1UF 20% 10V CERM 402

C4925 0.01UF 10% 16V CERM 402
C4926 0.01UF 10% 16V CERM 402
C4927 0.1UF 20% 10V CERM 402
C4928 0.1UF 20% 10V CERM 402
C4929 0.1UF 20% 10V CERM 402
C4930 0.1UF 20% 10V CERM 402
C4931 0.1UF 20% 10V CERM 402
C4932 0.1UF 20% 10V CERM 402

C4961 10UF 20% 6.3V CERM 805
C4960 10UF 20% 6.3V CERM 805
C4902 10UF 20% 6.3V CERM 805
C4900 10UF 20% 6.3V CERM 805
C4903 10UF 20% 6.3V CERM 805
C4901 10UF 20% 6.3V CERM 805
C4933 0.1UF 20% 10V CERM 402
C4934 0.1UF 20% 10V CERM 402
C4935 0.1UF 20% 10V CERM 402

59 58 57 56 52 51 50 49 48 7 =PP3V3_AGP

NV34 L4901 1000-OHM-EMI SM

AGP_PLLVDD — VOLTAGE=1.3V MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL

NV34 C4959 4.7UF 20% 6.3V CERM 805

NV34 C4956 0.1UF 20% 10V CERM 402

NV34 C4955 0.001UF 10% 50V CERM 402

I/O BYPASS

C4936 0.01UF 10% 16V CERM 402
C4942 0.01UF 10% 16V CERM 402
C4938 0.1UF 20% 10V CERM 402
C4939 0.1UF 20% 10V CERM 402
C4941 0.1UF 20% 10V CERM 402
C4937 0.1UF 20% 10V CERM 402

C4943 10UF 20% 6.3V CERM 805
C4944 0.01UF 10% 16V CERM 402
C4945 0.01UF 10% 16V CERM 402
C4946 0.1UF 20% 10V CERM 402
C4947 0.1UF 20% 10V CERM 402
C4949 0.1UF 20% 10V CERM 402
C4950 0.1UF 20% 10V CERM 402
C4951 0.1UF 20% 10V CERM 402
C4952 0.1UF 20% 10V CERM 402

49 48 7 =PP1V5_AGP

R4906 3.32K 1% 1/16W MF 402

GPU_AGP_VREF 49 — VOLTAGE=0.75V MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL

R4907 1.02K 1% 1/16W MF 402

C4957 0.01UF 20% 16V CERM 402

GPU AGP I/O REFERENCE
(PLACE CLOSE TO U3LITE AGP BALLS)

FROM Q27 PAGE 24

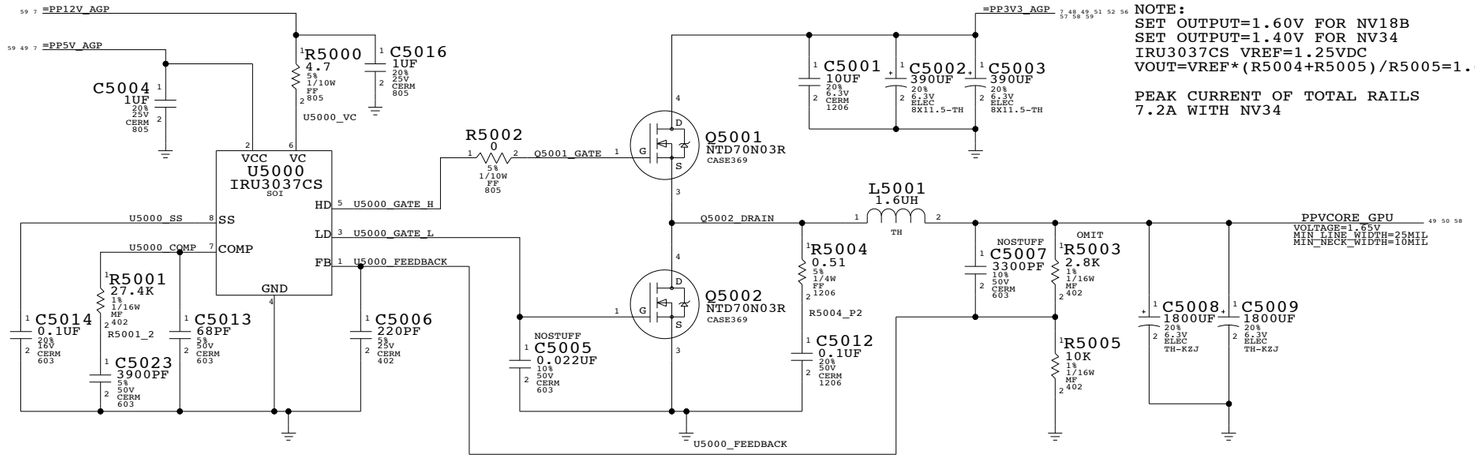
NVIDIA AGP

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 49 OF 103	

GPU VCORE VREG

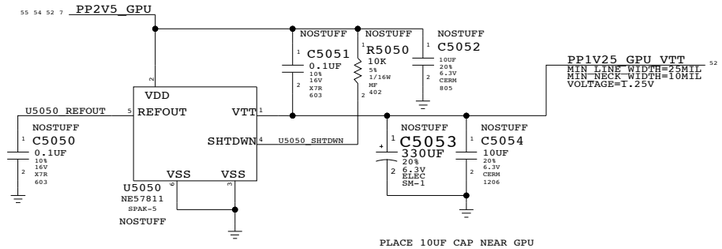
PPVCORE_GPU	PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
1.60VDC	114S2803	1	RES,2.8K OHM,1/16W,1%,0402	R5003	NV18B
1.40VDC	114S1213	1	RES,1.21K OHM,1/16W,1%,0402	R5003	NV34



NOTE:
SET OUTPUT=1.60V FOR NV18B
SET OUTPUT=1.40V FOR NV34
IRU3037CS VREF=1.25VDC
VOUT=VREF*(R5004+R5005)/R5005=1.60(OR 1.40) VDC

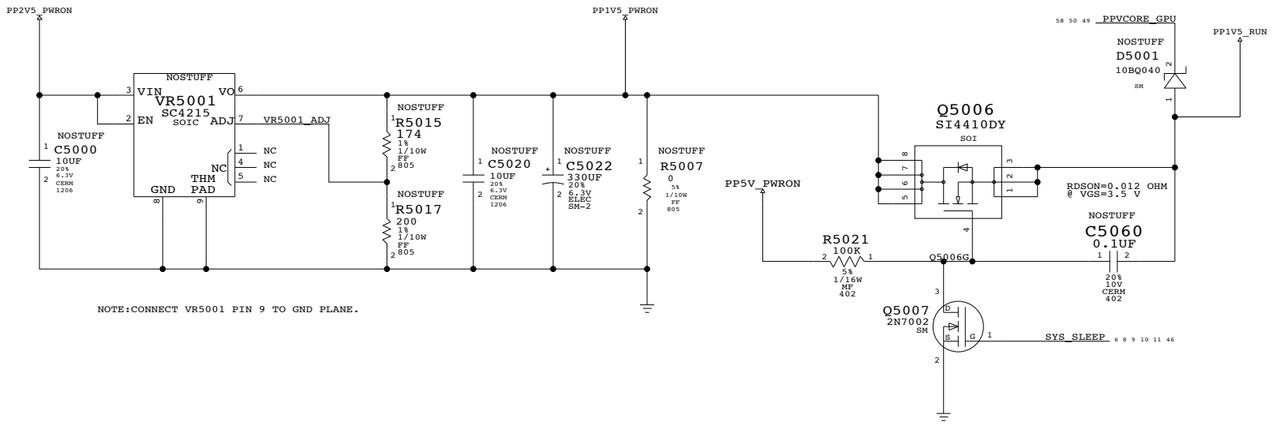
PEAK CURRENT OF TOTAL RAILS
7.2A WITH NV34

GPU VTT VREG



PLACE 10UF CAP NEAR GPU

AGP 1.5V VREG



NOTE:CONNECT VR5001 PIN 9 TO GND PLANE.

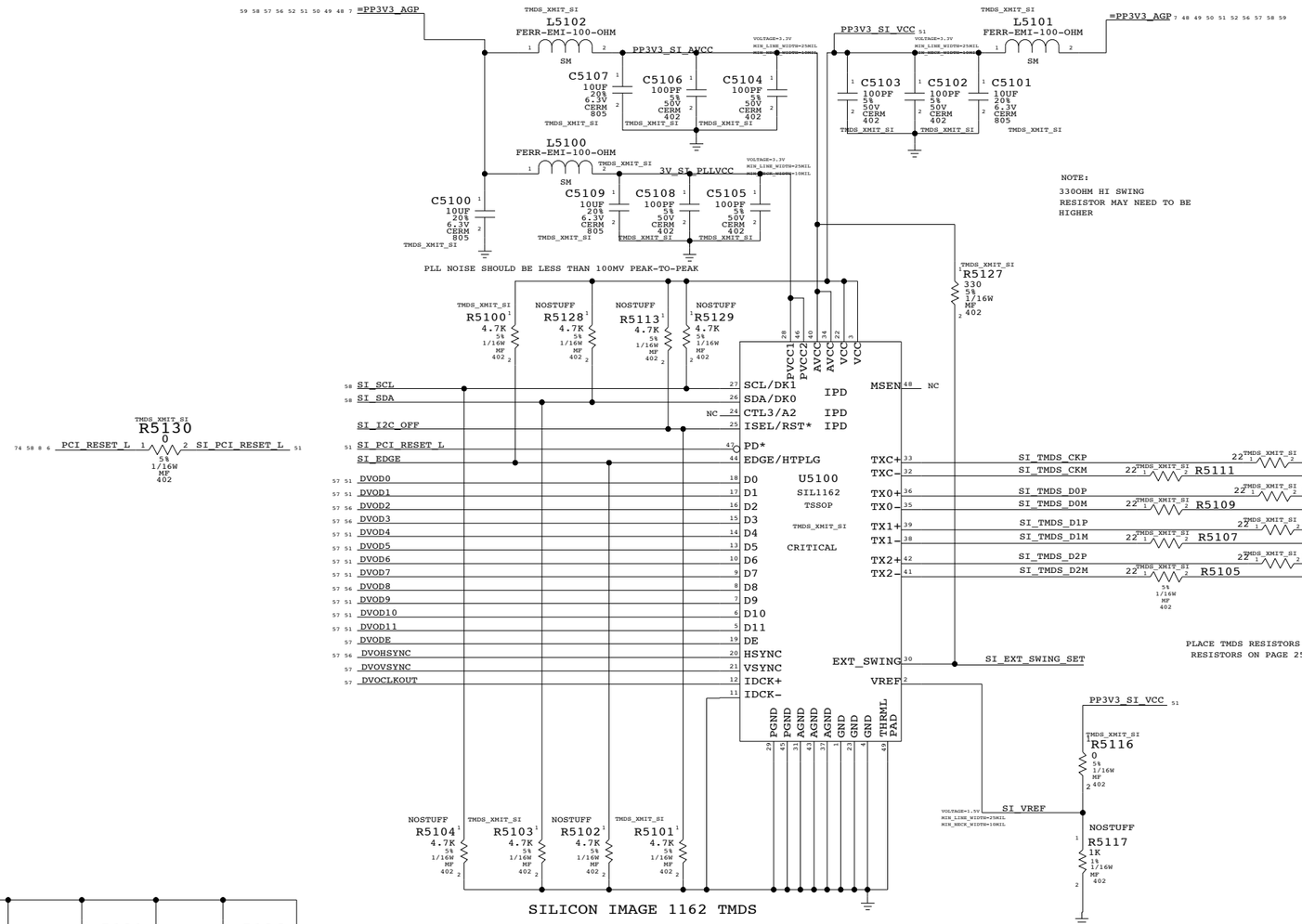
NOTE:
SET OUTPUT=1.5V
SC4215 VREF=0.8VDC
VOUT=VREF*(R5015+R5017)/R5017=1.5 VDC

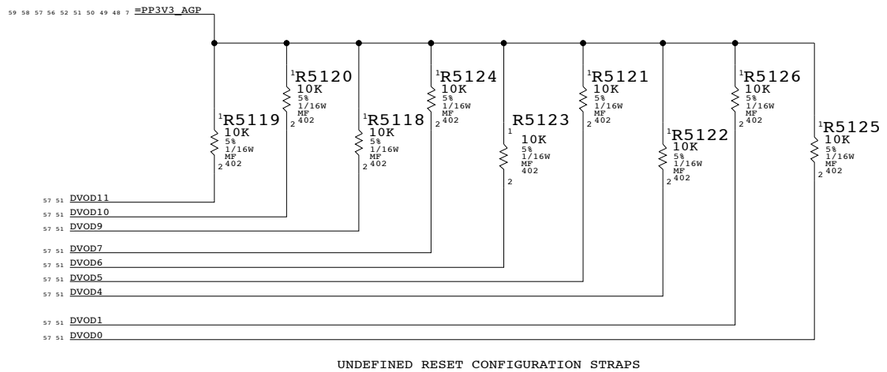
PEAK CURRENT OF TOTAL RAILS
0.95A

GRAPHICS VREGS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 50 OF 103	





EXTERNAL TMDS TRANSMITTER

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 51 OF 103	

DRAWING

NVIDIA RECOMMENDS WIDER RANGE OF CAP VALUES, EMC LIKE ONE VALUE

EVENLY DISTRIBUTE 0.01UF & 0.1 UF CAPS

AMONGST FBVDDQ PINS ON NV ASIC

PP2V5_GPU

C5208 0.01UF 10% 16V CERM 402
C5215 0.01UF 10% 16V CERM 402
C5216 0.1UF 10% 10V CERM 402
C5217 0.1UF 10% 10V CERM 402
C5218 0.1UF 10% 10V CERM 402
C5221 0.01UF 10% 16V CERM 402
C5219 0.1UF 10% 10V CERM 402
C5220 0.01UF 10% 16V CERM 402
C5213 0.1UF 10% 10V CERM 402
C5212 0.1UF 10% 10V CERM 402
C5211 0.1UF 10% 10V CERM 402
C5210 0.1UF 10% 10V CERM 402
C5201 1.0UF 20% 6.3V X5R 805
C5222 0.1UF 10% 10V CERM 402
C5224 0.1UF 10% 10V CERM 402
C5225 0.1UF 10% 10V CERM 402
C5226 0.01UF 10% 16V CERM 402
C5227 0.1UF 10% 10V CERM 402
C5228 0.1UF 10% 10V CERM 402
C5229 0.01UF 10% 16V CERM 402
C5200 0.1UF 10% 10V CERM 402
C5223 0.01UF 10% 16V CERM 402
C5214 0.1UF 10% 10V CERM 402
C5209 0.1UF 10% 10V CERM 402
C5202 1.0UF 20% 6.3V X5R 805

U4900
NV18B
BGA
(3 OF 5)

FBVDDQ
NC_VTT
GND

FBAD0 FBAD1 FBAD2 FBAD3 FBAD4 FBAD5 FBAD6 FBAD7 FBAD8 FBAD9 FBAD10 FBAD11 FBAD12 FBAD13 FBAD14 FBAD15 FBAD16 FBAD17 FBAD18 FBAD19 FBAD20 FBAD21 FBAD22 FBAD23 FBAD24 FBAD25 FBAD26 FBAD27 FBAD28 FBAD29 FBAD30 FBAD31 FBAD32 FBAD33 FBAD34 FBAD35 FBAD36 FBAD37 FBAD38 FBAD39 FBAD40 FBAD41 FBAD42 FBAD43 FBAD44 FBAD45 FBAD46 FBAD47 FBAD48 FBAD49 FBAD50 FBAD51 FBAD52 FBAD53 FBAD54 FBAD55 FBAD56 FBAD57 FBAD58 FBAD59 FBAD60 FBAD61 FBAD62 FBAD63

FBADQM0 FBADQM1 FBADQM2 FBADQM3 FBADQM4 FBADQM5 FBADQM6 FBADQM7

FBAA0 FBAA1 FBAA2 FBAA3 FBAA4 FBAA5 FBAA6 FBAA7 FBAA8 FBAA9 FBAA10 FBAA11 FBAA12

FBABA0 FBABA1

FBARAS* FBACAS* FBAWE* FBACS0* FBACS1*

FBVREF

ROMA14 ROMA15 ROMCS*

PP1V25_GPU_VTT

C5250 C5251 C5252 C5253 C5254 C5255 C5256 C5257 C5258 C5259 C5260 C5261 0.1UF 10% 10V CERM 402

DIFFERENTIAL_PAIR	NET_SPACING_TYPE
FBACLK0	FBCLK
FBACLK0_L	FBCLK
FBACLK1	FBCLK
FBACLK1_L	FBCLK
FBMCLK0	FBCLK
FBMCLK0_L	FBCLK
FBMCLK1	FBCLK
FBMCLK1_L	FBCLK

FBACLK0 FBACLK0_L FBACLK1 FBACLK1_L FBMCLK0 FBMCLK0_L FBMCLK1 FBMCLK1_L

PP2V5_GPU

R5202 49.9 1% 1/16W MF 402

FBCAL_PD_VDDQ
FBCAL_PU_GND
FBCAL_TERM_GND
FBCAL_CLK_GND
FB_DLLVDD
FBACKE

FBACLK0 FBACLK0* FBACLK1 FBACLK1*

R5201 10K 1% 1/16W MF 402

WEAK PULL-DOWN RECOMMENDED BY NVIDIA.

R5207 549 1% 1/16W MF 402 NOSTUFF
R5208 0 1% 1/16W MF 402 NOSTUFF

R5203 49.9 1% 1/16W MF 402

FBDQS0 FBDQS1 FBDQS2 FBDQS3 FBDQS4 FBDQS5 FBDQS6 FBDQS7

FBDQS0* FBDQS1* FBDQS2* FBDQS3* FBDQS4* FBDQS5* FBDQS6* FBDQS7*

NC_FBADQS0* NC_FBADQS1* NC_FBADQS2* NC_FBADQS3* NC_FBADQS4* NC_FBADQS5* NC_FBADQS6* NC_FBADQS7*

FB_DLLVDD

C5205 0.22UF 10% 16V CERM 805
C5206 0.33UF 10% 16V CERM 402
C5207 0.0010UF 10% 50V CERM 402

R5206 10 1% 1/16W MF 402

+PP2V3_AGP

ALTERNATE STUFFING FOR 10 OHM R IS FILTER APH 15580052 PER NVIDIA SPEC

U4900
NV18B
BGA
(4 OF 5)

THERMAL GND

FBCD0 FBCD1 FBCD2 FBCD3 FBCD4 FBCD5 FBCD6 FBCD7 FBCD8 FBCD9 FBCD10 FBCD11 FBCD12 FBCD13 FBCD14 FBCD15 FBCD16 FBCD17 FBCD18 FBCD19 FBCD20 FBCD21 FBCD22 FBCD23 FBCD24 FBCD25 FBCD26 FBCD27 FBCD28 FBCD29 FBCD30 FBCD31 FBCD32 FBCD33 FBCD34 FBCD35 FBCD36 FBCD37 FBCD38 FBCD39 FBCD40 FBCD41 FBCD42 FBCD43 FBCD44 FBCD45 FBCD46 FBCD47 FBCD48 FBCD49 FBCD50 FBCD51 FBCD52 FBCD53 FBCD54 FBCD55 FBCD56 FBCD57 FBCD58 FBCD59 FBCD60 FBCD61 FBCD62 FBCD63

FBCDQM0 FBCDQM1 FBCDQM2 FBCDQM3 FBCDQM4 FBCDQM5 FBCDQM6 FBCDQM7

FBCA0 FBCA1 FBCA2 FBCA3 FBCA4 FBCA5 FBCA6 FBCA7 FBCA8 FBCA9 FBCA10 FBCA11 FBCA12

FBCBA0 FBCBA1

FBBCLK0 FBBCLK0* FBBCLK1 FBBCLK1*

FBCLK1 FBCLK1 I. FBCLK0 FBCLK0 I.

FBCLK1 and I SWAPPED FOR ROUTING REASONS

FBCDQS0 FBCDQS1 FBCDQS2 FBCDQS3 FBCDQS4 FBCDQS5 FBCDQS6 FBCDQS7

NC_FBCDQS0* NC_FBCDQS1* NC_FBCDQS2* NC_FBCDQS3* NC_FBCDQS4* NC_FBCDQS5* NC_FBCDQS6* NC_FBCDQS7*

FBCAS* FBCCAS* FBCWE* FBCCS0* FBCCS1* FBCCKE

FBBRAS_L FBBCAS_L FBBWE_L FBBCS0_L TP_FBBCS1_L FBBCKE

R5200 10K 1% 1/16W MF 402

WEAK PULL-DOWN RECOMMENDED BY NVIDIA

PP2V5_GPU

R5204 1K 1% 1/16W MF 402
R5205 1K 1% 1/16W MF 402

VOLTAGE=1.25V
MIN_LINE_WIDTH=25MIL
MIN_NECK_WIDTH=10MIL

C5203 0.10F 10% 10V CERM 402
C5204 0.10F 10% 10V CERM 402

NVIDIA FRAME BUFFER

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APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
E	051-6482	??
SCALE: NONE	SHT 52 OF 103	

PLACE R'S CLOSE TO MEMORY

FBD<31>	15	1	8	RP5320	RFBD<31>	
FBD<30>	15	2	7	RP5320	RFBD<30>	
FBD<29>	15	3	6	RP5320	RFBD<29>	
FBD<28>	15	4	5	RP5320	RFBD<28>	
FBD<27>	15	1	8	RP5321	RFBD<27>	
FBD<26>	15	2	7	RP5321	RFBD<26>	
FBD<25>	15	3	6	RP5321	RFBD<25>	
FBD<24>	15	4	5	RP5321	RFBD<24>	
FBD<0>	15	1	8	RP5322	RFBD<0>	
FBD<1>	15	2	7	RP5322	RFBD<1>	
FBD<2>	15	3	6	RP5322	RFBD<2>	
FBD<3>	15	4	5	RP5322	RFBD<3>	
FBD<17>	15	1	8	RP5323	RFBD<17>	
FBD<16>	15	2	7	RP5323	RFBD<16>	
FBD<18>	15	3	6	RP5323	RFBD<18>	
FBD<19>	15	4	5	RP5323	RFBD<19>	
FBD<15>	15	1	8	RP5324	RFBD<15>	
FBD<14>	15	2	7	RP5324	RFBD<14>	
FBD<13>	15	3	6	RP5324	RFBD<13>	
FBD<12>	15	4	5	RP5324	RFBD<12>	
FBD<10>	15	1	8	RP5325	RFBD<10>	
FBD<11>	15	2	7	RP5325	RFBD<11>	
FBD<9>	15	3	6	RP5325	RFBD<9>	
FBD<8>	15	4	5	RP5325	RFBD<8>	
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PLACE R'S CLOSE TO GPU

FBACLK1 — R5316 100 1% 1/16W MF 402 — PLACE 100OHM TERM AT RAM — FBACLK1_L

FBACLK0 — R5317 100 1% 1/16W MF 402 — PLACE 100OHM TERM AT RAM — FBACLK0_L

FBBCLK1 — R5318 100 1% 1/16W MF 402 — PLACE 100OHM TERM AT RAM — FBBCLK1_L

FBBCLK0 — R5319 100 1% 1/16W MF 402 — PLACE 100OHM TERM AT RAM — FBBCLK0_L

PLACE THESE R CLOSE TO SGRAM

FBDQS<0>	R5301 15 1% 1/16W MF 402	RFBDQS<0>
FBDQS<1>	R5302 15 1% 1/16W MF 402	RFBDQS<1>
FBDQS<2>	R5300 15 1% 1/16W MF 402	RFBDQS<2>
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FBDQS<6>	R5306 15 1% 1/16W MF 402	RFBDQS<6>
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PLACE THESE R CLOSE TO SGRAM

FBDQS<8>	R5308 15 1% 1/16W MF 402	RFBDQS<8>
FBDQS<9>	R5314 15 1% 1/16W MF 402	RFBDQS<9>
FBDQS<10>	R5309 15 1% 1/16W MF 402	RFBDQS<10>
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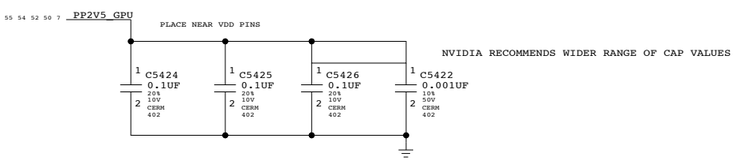
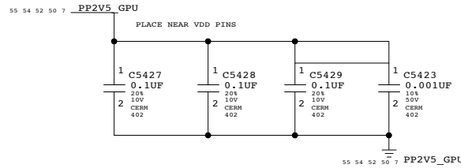
FB TERMINATION

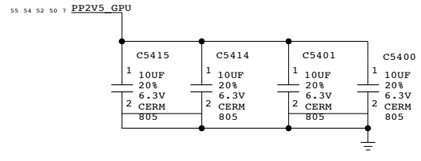
APPLE COMPUTER INC.

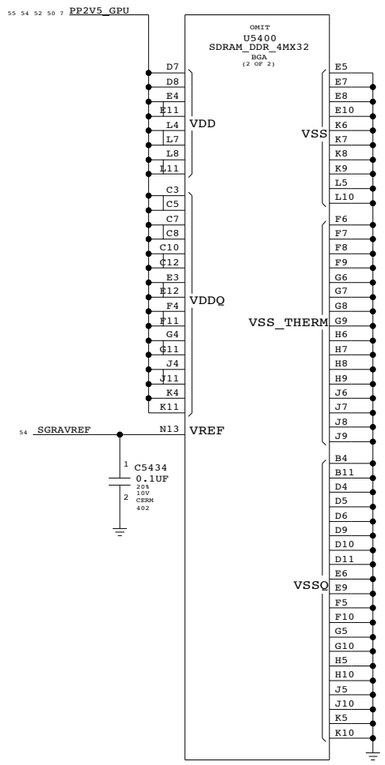
SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 53 OF 103	

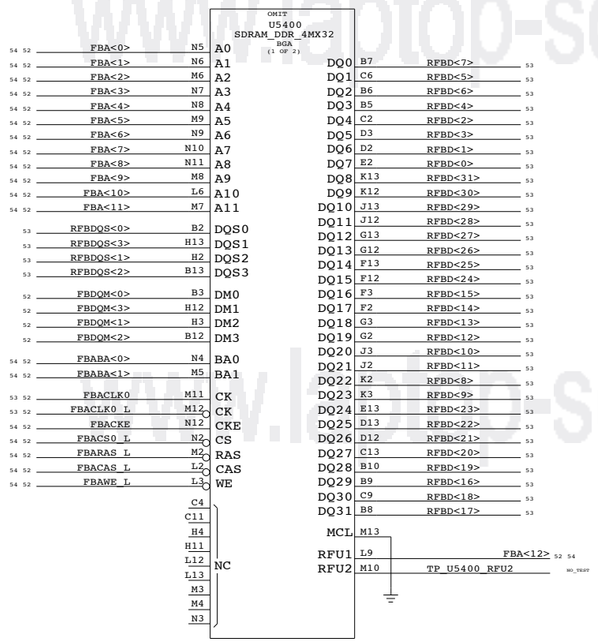


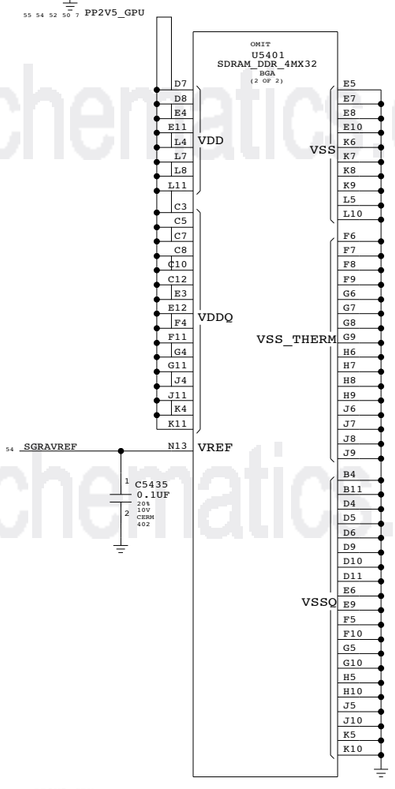
NVIDIA RECOMMENDS WIDER RANGE OF CAP VALUES

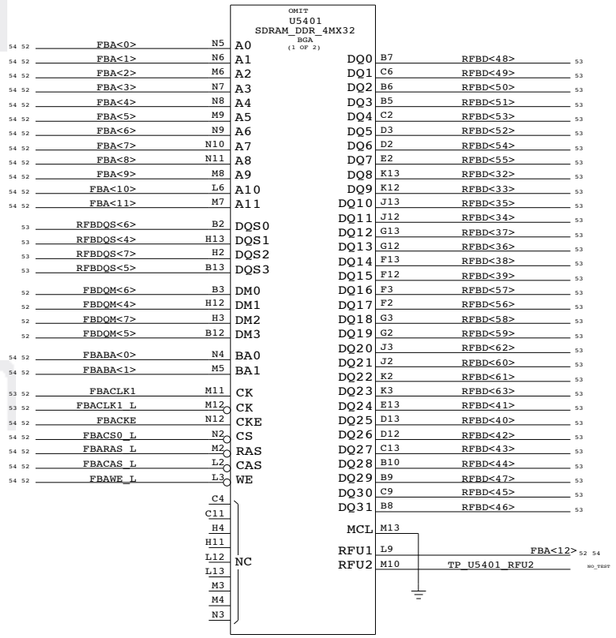


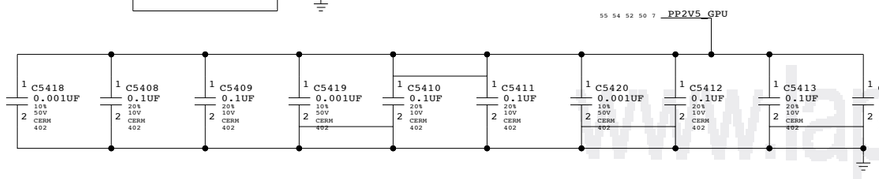


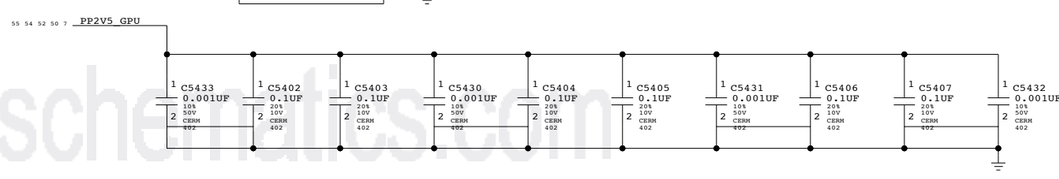






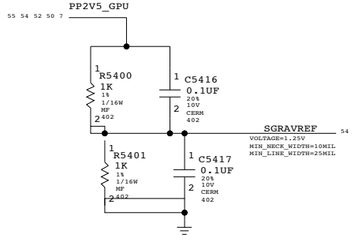






EVENLY PLACE 0.1UF CAP & 0.01UF CAPS

DDR SDRAM A VREF



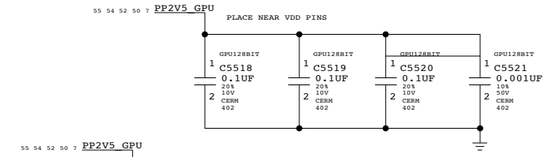
SGRAM0 & SGRAM1 MEMORY SUPPORT

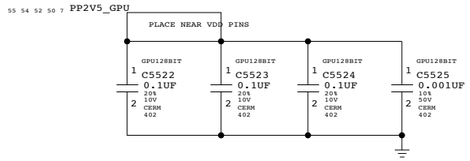
PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
333S0251	2	SDRAM,4MX32,DDR,300MHZ	U5400,U5401	CRITICAL	SAMSUNG
333S0252	2	SDRAM,4MX32,DDR,300MHZ	U5400,U5401	CRITICAL	HYNIX

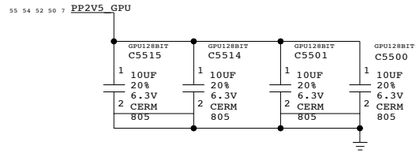
GPU DDR SDRAM A

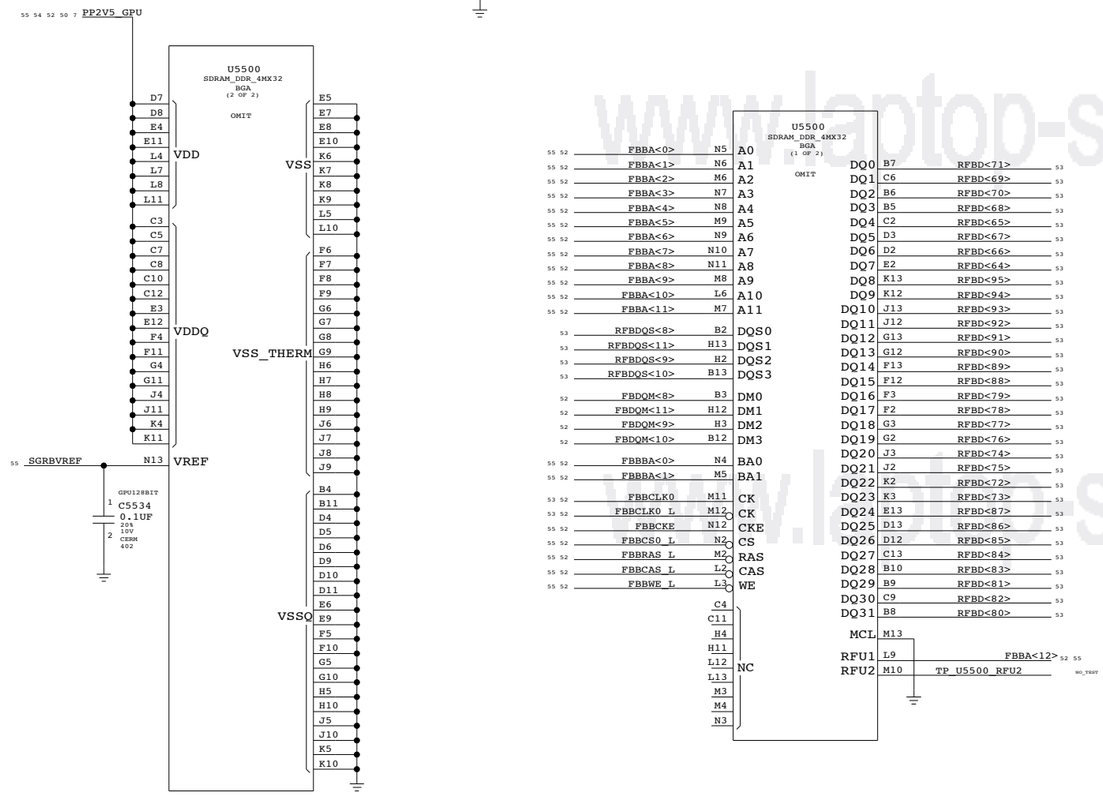
APPLE COMPUTER INC.

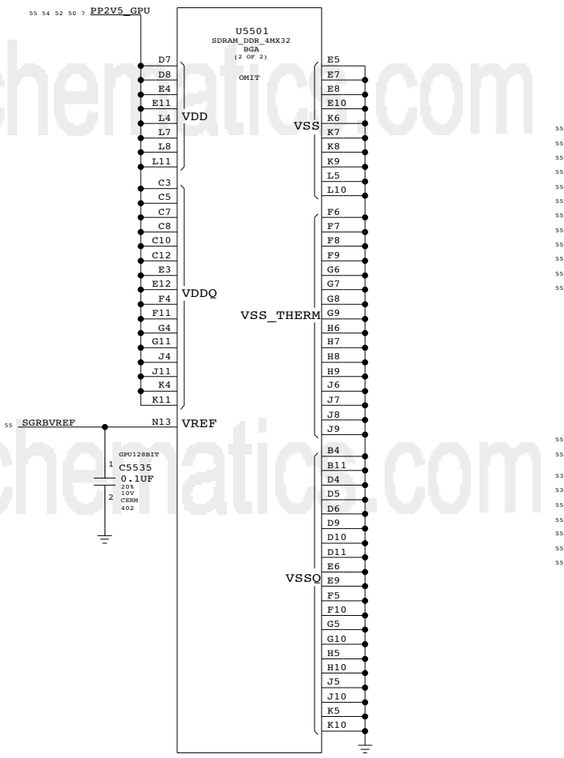
SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 54 OF 103	

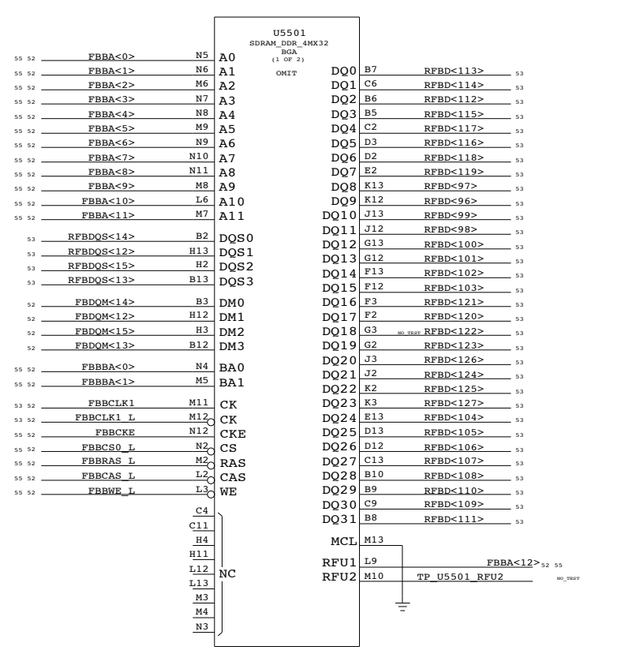


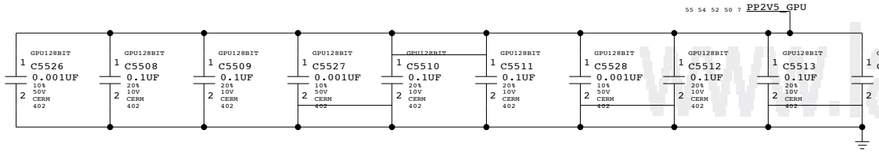




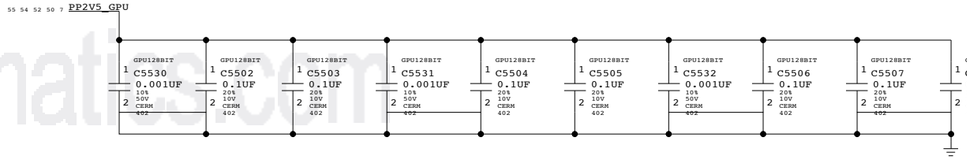




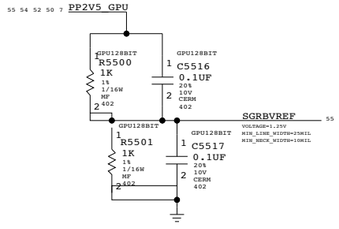




DDR SDRAM B VREF



EVENLY PLACE 0.1UF CAP & 0.01 UF CAPS



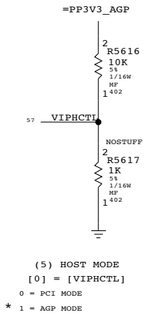
SGRAM0 & SGRAM1 MEMORY SUPPORT

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
333S0251	2	SDRAM,4MX32,DDR,300MHZ	U5500,U5501	CRITICAL	GPU128BIT_SAMSUNG
333S0252	2	SDRAM,4MX32,DDR,300MHZ	U5500,U5501	CRITICAL	GPU128BIT_HYNIX

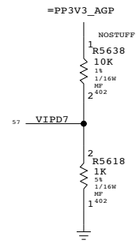
GPU DDR SDRAM B

APPLE COMPUTER INC.

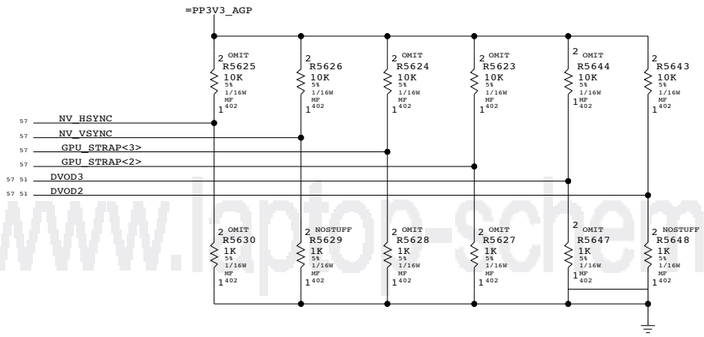
SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 55 OF 103	



(5) HOST MODE
[0] = [VIPHCTL]
0 = PCI MODE
* 1 = AGP MODE

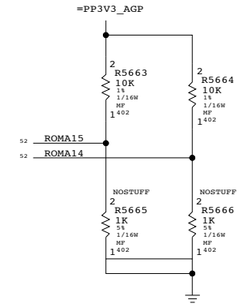


(6) AGP SIDEBAND
[0] = [VIPD7]
* 0 = ENABLE AGP SIDEBAND
1 = DISABLE AGP SIDEBAND

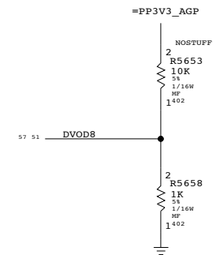


(8) FRAME BUFFER MEMORY SPEED
[5..0] = [NV11_HSYNC,NV11_VSYNC,GPU_STRAP<3>,GPU_STRAP<2>,DVOD3,DVOD2]

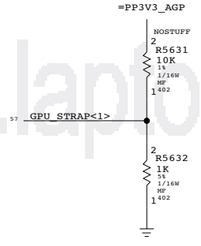
PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
110111 = 270MHZ SAMSUNG (NV18B)					
116S1104	2	RES,10K-OHM,1/16W,5%	R5625,R5623		270MHZ_SAM_18
116S1104	1	RES,10K-OHM,1/16W,5%	R5644		270MHZ_SAM_18
116S1103	1	RES,1K-OHM,1/16W,5%	R5628		270MHZ_SAM_18
110011 = 270MHZ HYNIX (NV18B)					
116S1104	2	RES,10K-OHM,1/16W,5%	R5625,R5644		270MHZ_HYN_18
116S1103	2	RES,1K-OHM,1/16W,5%	R5628,R5627		270MHZ_HYN_18
111101 = 270MHZ SAMSUNG (NV34)					
116S1104	2	RES,10K-OHM,1/16W,5%	R5625,R5624		270MHZ_SAM_34
116S1104	1	RES,10K-OHM,1/16W,5%	R5623		270MHZ_SAM_34
116S1103	1	RES,1K-OHM,1/16W,5%	R5647		270MHZ_SAM_34
111100 = 270MHZ HYNIX (NV34)					
116S1104	2	RES,10K-OHM,1/16W,5%	R5624,R5623		270MHZ_HYN_34
116S1103	2	RES,1K-OHM,1/16W,5%	R5630,R5647		270MHZ_HYN_34



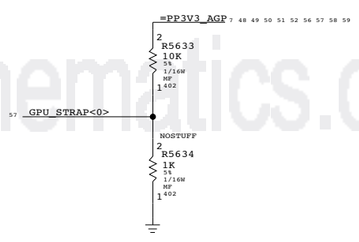
(1) ROM TYPE (OVERRIDDEN IF STRAP1 = 0)
[1..0] = [ROMA15,ROMA14]
00 = PARALLEL
01 = SERIAL AT25F
10 = SERIAL SST45VF
* 11 = SERIAL FUTURE



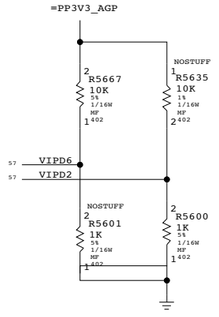
FAST WRITE SUPPORT
0=ENABLE
1=DISABLE



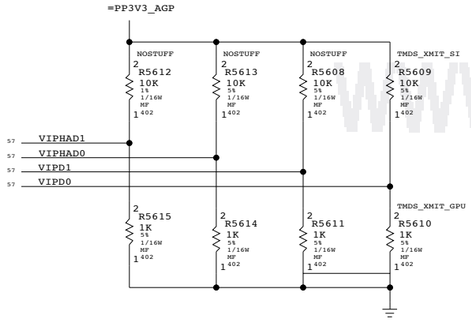
(9) SUB-VENDOR
[0] = [GPU_STRAP<1>]
* 0 = SYSTEM BIOS (VENDOR & SUBSYSTEM ID=0X0000)
1 = ADAPTER CARD VGA BIOS (VENDOR & SUBSYSTEM ID=0X54-0X57)



(10) PCI ADDRESS BUS
[0] = [GPU_STRAP<0>]
0 = REVERSED
* 1 = NORMAL

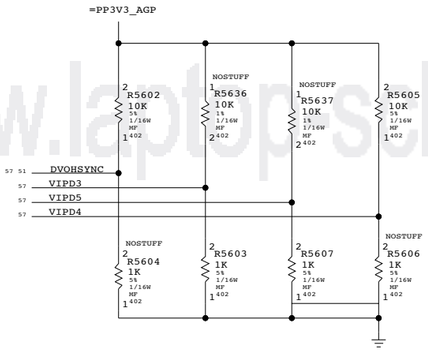


(2) CRYSTAL FREQUENCY SELECT
[1..0] = [VIPD6,VIPD2]
00 = 13.5MHZ
01 = 14.38MHZ
* 10 = 27MHZ
11 = (UNDEFINED)

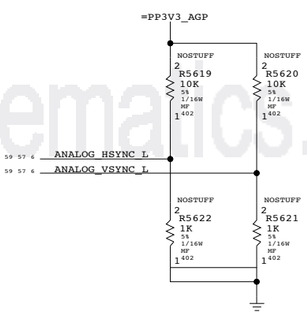


(4) USER DEFINED STRAPS
[3..0] = [VIPHAD1,VIPHAD0,VIPD1,VIPD0]

THESE BITS ARE UNDEFINED BUT THEY
MUST BE KEPT LOW DURING RESET



(3) PCI DEVICE ID
[3..0] = [DVOHSYNC,VIPD3,VIPD5,VIPD4]
0010 = 0X112 GEFORCE2 GO
0011 = 0X113 QUADRO2 GO
0100 = 0X114 NV17M
0000 = 0X110 GEFORCE2GO MX (NV11B)
* 1001 = 0X111 NV18B,NV31,NV34



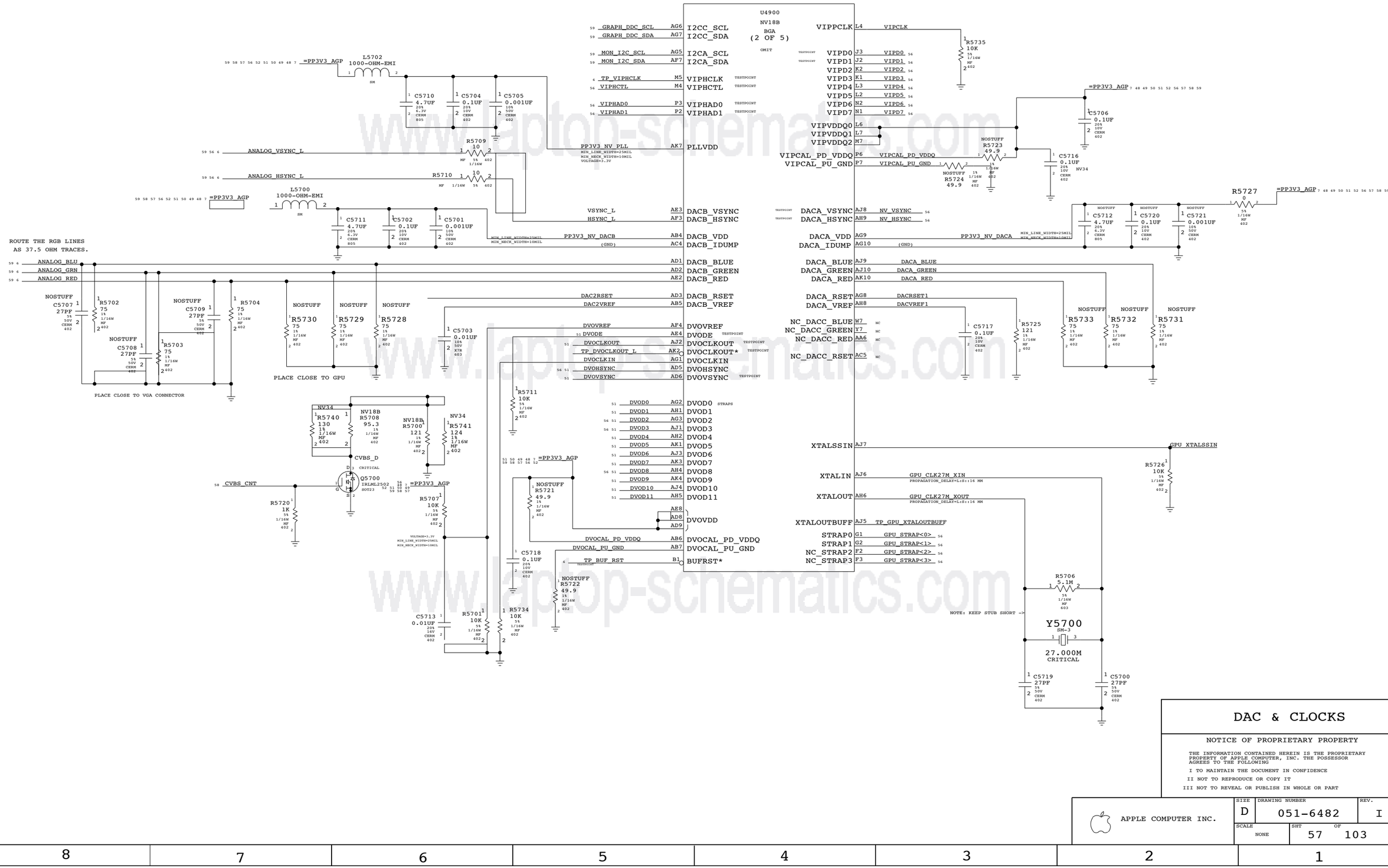
(7) TV MODE
[1..0] = [ANALOG_HSYNC*,ANALOG_VSYNC*]
00 = SECAM
01 = NTSC
10 = PAL
11 = DISABLED

(THESE RESISTORS ARE ALL NOSTUFF)

NVIDIA STRAPS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 56 OF 103	


U4900
NV18B
BGA
(2 OF 5)
I2CC_SCL
I2CC_SDA
I2CA_SCL
I2CA_SDA
VIPHCLK
VIPHCTL
VIPHAD0
VIPHAD1
PLLVDD
DACB_VSYNC
DACB_HSYNC
DACB_VDD
DACB_IDUMP
DACB_BLUE
DACB_GREEN
DACB_RED
DACB_RSET
DACB_VREF
DVOVREF
DVODE
DVOCLKOUT
DVOCLKOUT*
DVOCLKIN
DVOHSYNC
DVOVSYNC
DVOD0
DVOD1
DVOD2
DVOD3
DVOD4
DVOD5
DVOD6
DVOD7
DVOD8
DVOD9
DVOD10
DVOD11
DVOVDD
DVOCAL_PD_VDDQ
DVOCAL_PU_GND
BUFRST*
VIPPCLK
VIPD0
VIPD1
VIPD2
VIPD3
VIPD4
VIPD5
VIPD6
VIPD7
VIPVDDQ0
VIPVDDQ1
VIPVDDQ2
VIPCAL_PD_VDDQ
VIPCAL_PU_GND
DACA_VSYNC
DACA_HSYNC
DACA_VDD
DACA_IDUMP
DACA_BLUE
DACA_GREEN
DACA_RED
DACA_RSET
DACA_VREF
NC_DACC_BLUE
NC_DACC_GREEN
NC_DACC_RED
NC_DACC_RSET
XTALSSIN
XTALIN
XTALOUT
XTALOUTBUFF
STRAP0
STRAP1
NC_STRAP2
NC_STRAP3
GRAPH_DDC_SCL
GRAPH_DDC_SDA
MON_I2C_SCL
MON_I2C_SDA
TP_VIPHCLK
VIPHCTL
VIPHAD0
VIPHAD1
ANALOG_VSYNC_L
ANALOG_HSYNC_L
VSYNC_L
HSYNC_L
ANALOG_BLU
ANALOG_GRN
ANALOG_RED
DAC2RSET
DAC2VREF
TP_DVOCLKOUT_L
DVOD0 STRAPS
TP_BUF_RST
NV_VSYNC
NV_HSYNC
DACRSET1
DACVREF1
GPU_CLK27M_XIN
GPU_CLK27M_XOUT
TP_GPU_XTALOUTBUFF
GPU_XTALSSIN
GPU_STRAP<0>
GPU_STRAP<1>
GPU_STRAP<2>
GPU_STRAP<3>
PP3V3_NV_PLL
PP3V3_NV_DACB
PP3V3_NV_DACA
=PP3V3_AGP
CVBS_CNT
CVBS_D
Q5700
IRLML2502
SOT23
Y5700
27.000M
CRITICAL
ROUTE THE RGB LINES
AS 37.5 OHM TRACES.
PLACE CLOSE TO VGA CONNECTOR
PLACE CLOSE TO GPU
NOTE: KEEP STUB SHORT ->
DAC & CLOCKS
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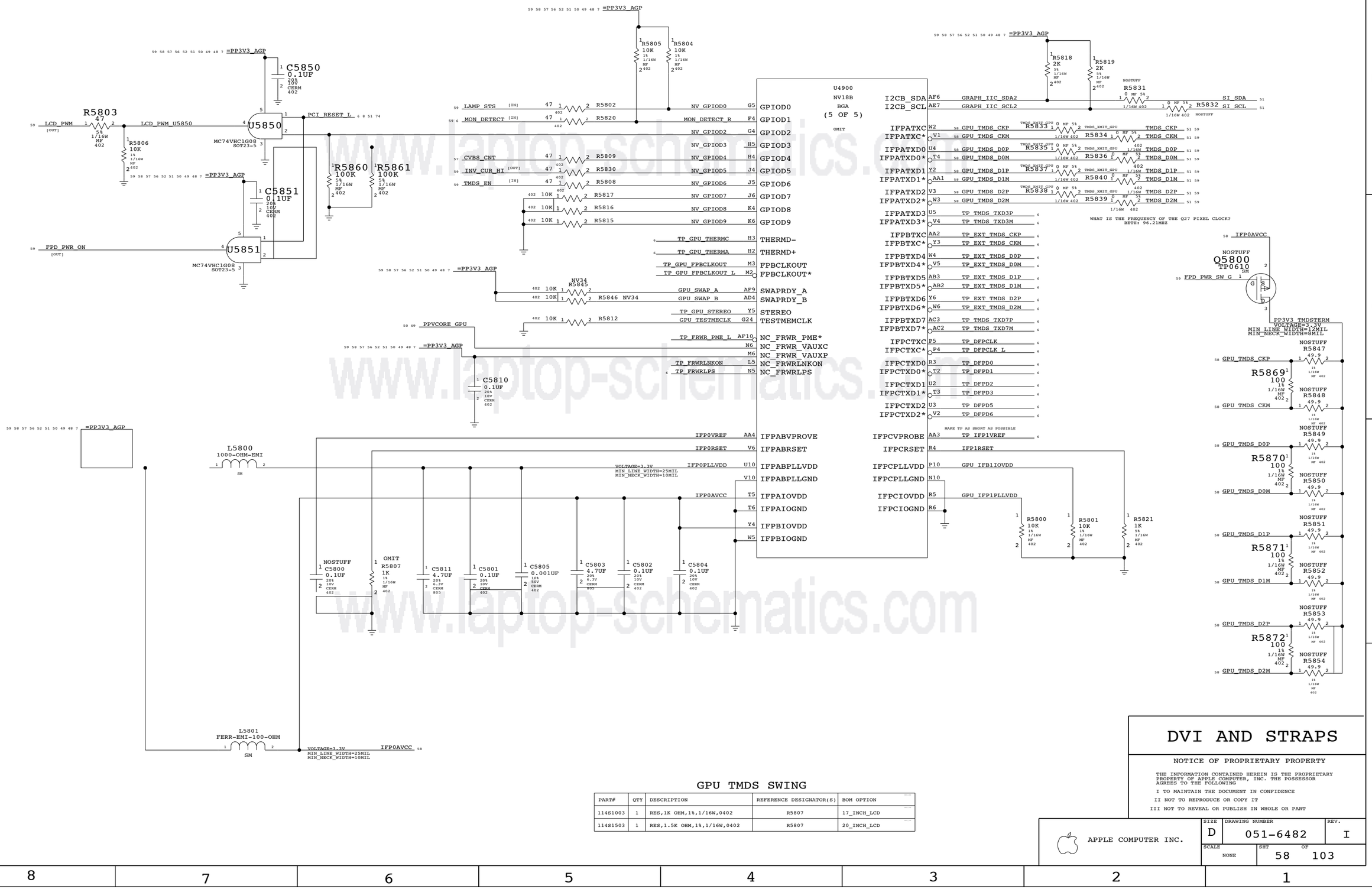
APPLE COMPUTER INC.
SIZE D
DRAWING NUMBER 051-6482
REV. I
SCALE NONE
SHT 57 OF 103



GPU TMDS SWING

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
114S1003	1	RES,1K OHM,1%,1/16W,0402	R5807	17_INCH_LCD
114S1503	1	RES,1.5K OHM,1%,1/16W,0402	R5807	20_INCH_LCD

DVI AND STRAPS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 58 OF 103	

EXTERNAL VGA CONNECTOR

ANALOG_HSYNC_L
ANALOG_VSYNC_L
C5907 22PF 5% 50V CERM 402
C5908 22PF 5% 50V CERM 402
D5900 BAV99DW SOT-363 NOSTUFF
=PP5V_AGP
GND_CHASSIS_VGA
CRITICAL (514-0201)
J5903 DV01793 F-ST-TH
CHECK RGB RETURN PINS
FL1702 LCFILTER SM-100MHZ
FL1701 LCFILTER SM-100MHZ
FL1700 LCFILTER SM-100MHZ
ANALOG_RED
ANALOG_GRN
ANALOG_BLU
MON_DETECT
FILT_ANALOG_RED
FILT_ANALOG_GRN
FILT_ANALOG_BLU
(RED_RTN)
(GRN_RTN)
(BLU_RTN)
DDC_VCC_5
VGA_IIC_DAT
VGA_IIC_CLK
VOLTAGE=5V MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
L5903 FERR-220-OHM 0805
PP5V_USB2
C5902 0.01UF 10% 16V CERM 402
C5905 0.01UF 10% 16V CERM 402
C5904 0.01UF 10% 16V CERM 402
C5903 0.01UF 10% 16V CERM 402
ROUTE THE ANALOG RGB TRACES AT 37.5 OHMS.
R5911 2K 5% 1/16W MF 402
R5910 2K 5% 1/16W MF 402
D5902 BAV99DW SOT-363 NOSTUFF
R5908 33 5% 1/16W MF 402
R5909 33 5% 1/16W MF 402
MON_I2C_SDA
MON_I2C_SCL
C5909 47PF 5% 50V CERM 402
C5906 47PF 5% 50V CERM 402

INTERNAL TMDS CONNECTOR

SDF5900 STDOFF-118OD-181H-TH (516S0241)
J5902 53307-3072 F-ST-SM
TD0M TD0P TD2M TD2P TD1M TD1P TCKM TCKP
PPVCC_TMDS VOLTAGE=3.3V MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
PP3V3_DDC VOLTAGE=3.3V MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
TMDS_DDC_DAT TMDS_DDC_CLK
GND_CHASSIS_TMDS
SDF5901 STDOFF-118OD-181H-TH
C5916 10UF 10% 16V CERM 1210
C5900 0.01UF 10% 16V CERM 402
GRAPH_DDC_SDA GRAPH_DDC_SCL
R5906 33 5% 1/16W MF 402
R5907 2K 5% 1/16W MF 402
R5905 2K 5% 1/16W MF 402
R5900 33 5% 1/16W MF 402
L5901 FERR-220-OHM 0805
C5901 0.01UF 10% 16V CERM 402
=PP3V3_AGP

R5926 0 5% 1/16W MF 402 NOSTUFF
L5902 90-OHM SM SYM_VER-1
R5904 301 1% 1/16W MF 402
R5927 0 5% 1/16W MF 402 NOSTUFF
TMDS_D2M TMDS_D2P TD2M TD2P
R5928 0 5% 1/16W MF 402 NOSTUFF
L5908 90-OHM SM SYM_VER-1
R5903 301 1% 1/16W MF 402
R5929 0 5% 1/16W MF 402 NOSTUFF
TMDS_D1M TMDS_D1P TD1M TD1P
R5930 0 5% 1/16W MF 402 NOSTUFF
L5909 90-OHM SM SYM_VER-1
R5902 301 1% 1/16W MF 402
R5931 0 5% 1/16W MF 402 NOSTUFF
TMDS_D0M TMDS_D0P TD0M TD0P
R5932 0 5% 1/16W MF 402 NOSTUFF
L5910 90-OHM SM SYM_VER-1
R5901 301 1% 1/16W MF 402
R5933 0 5% 1/16W MF 402 NOSTUFF
TMDS_CKM TMDS_CKP TCKM TCKP

INVERTER INTERFACE

20" LCD INVERTER NEED +24V.
17" LCD INVERTER NEED +12V.

Q5903 SI3433DV TSOP 17_INCH_LCD
=PP5V_AGP Q5903_GATE
R5920 100K 5% 1/16W MF 402
R5921 10K 5% 1/16W MF 402
Q5902_DRAIN
R5919 200K 5% 1/16W MF 402
D5901 1N914 SOT23 NOSTUFF
Q5902_GATE
R5916 100K 5% 1/16W MF 402
Q5902 2N7002 SM
C5920 0.1UF 20% 10V CERM 402
=PP12V_AGP
PP5V_AGP_P_SEQ
LCD_PWM
LAMP_STS
INV_CUR_HI
L5904 L5905 L5906 L5907 L5911 L5912 FERR-220-OHM 0805
C5921 10UF 20% 16V ELEC SM
C5922 10UF 20% 16V ELEC SM
C5910 C5913 C5911 C5912 C5914 C5915
J5900 42375 M-ST-TH 17_INCH_LCD CRITICAL
PP12V_INV GND_17_INV PP5V_AGP_RL INV_17_LCD_PWM_F LAMP_STS_F INV_17_CUR_HI_F
518-0135
GND_CHASSIS_17_INCH_INVERTER

=PP24V_GRAPHICS
L5913 L5914 L5915 L5916 FERR-220-OHM 0805 20_INCH_LCD
VOLTAGE=24V MIN_LINE_WIDTH=100MIL MIN_NECK_WIDTH=10MIL
PP24V_INV
VOLTAGE=0V MIN_LINE_WIDTH=100MIL MIN_NECK_WIDTH=10MIL
GND_20_INV
INV_20_LCD_PWM
INV_20_CUR_HI_F
NOTE:REMOVED 2 PINS:LAMP_STATUS & ON/OFF FOR 20" LCD INVETER.
C5947 1UF 20% 50V CERM 1210 NOSTUFF
C5942 1UF 20% 50V CERM 1210
C5943 C5944 C5945 C5946 0.01UF 220PF
GND_CHASSIS_20_INCH_INVERTER
J5901 53048 RT-S-TH 20_INCH_LCD CRITICAL
518-0141

PP3V3_ALL / PP3V3_RUN / PP12V_RUN

R5950 0 5% 1/8W FF 1206 17_INCH_LCD
R5923 0 5% 1/8W FF 1206 NOSTUFF
R5922 0 5% 1/8W FF 1206 20_INCH_LCD
PPVCC_FPD
Q5900 IRF7410 SO-8 17_INCH_LCD
376S0082
FPD_PWR_SW_G
FPD_PWR_SW_S
VOLTAGE=3.3V MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
R5934 0 5% 1/8W FF 1206 NOSTUFF
R5935 0 5% 1/8W FF 1206 NOSTUFF
L5900 FERR-220-OHM 0805 20_INCH_LCD
VOLTAGE=3.3V MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL
PPVCC_TMDS
C5919 0.01UF 20% 16V CERM 402
C5918 0.022UF 20% 16V CERM 402
R5925 100K 5% 1/16W MF 402
OMIT R5913 10K 5% 1/16W MF 402
D5914 1N914 SOT23
C5917 10UF 10% 16V CERM 1210
R5960 10K 5% 1/16W MF 402
OMIT R5912 330 5% 1/16W MF 603
LED5900_P1
LED5900 GREEN 2.0X1.25A
SILKSCREEN: 3
FPD_PWR_ON_D
TMDS_EN_R
TMDS_EN
Q5901 2N7002 SM
FPD_PWR_ON
R5915 100K 5% 1/16W MF 402
R5914 10K 5% 1/16W MF 402
DZ5900 1N5227B SOT23 20_INCH_LCD

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
116S1104	1	RES,10K OHM,1/16W,5%,0402	R5913	17_INCH_LCD
116S1105	1	RES,100K OHM,1/16W,5%,0402	R5913	20_INCH_LCD
113S1332	1	RES,330 OHM,1/16W,5%,0603	R5912	17_INCH_LCD
113S1123	1	RES,1.2K OHM,1/16W,5%,0603	R5912	20_INCH_LCD
376S0225	1	XSTR,MOSFET,P-CH,0.02OHM	Q5900	20_INCH_LCD
101S1000	1	RES,0 OHM,1/10W,5%,0805	L5900	17_INCH_LCD

EXT VGA / TMDS AND INVERTER

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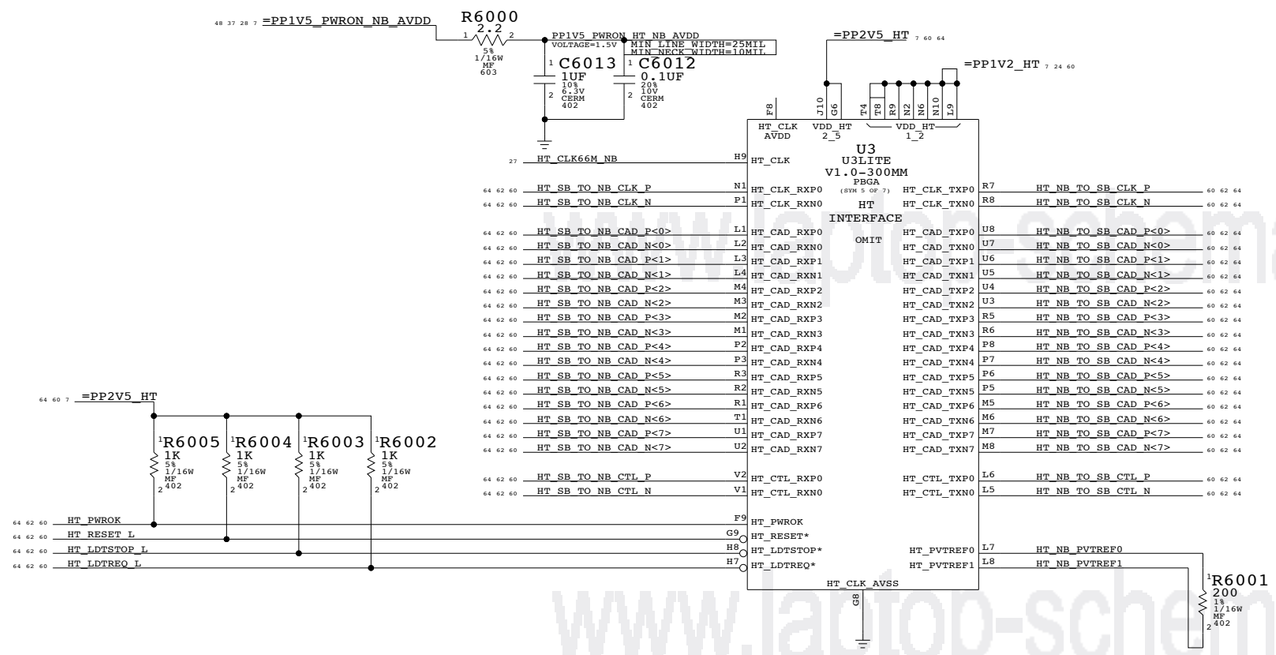
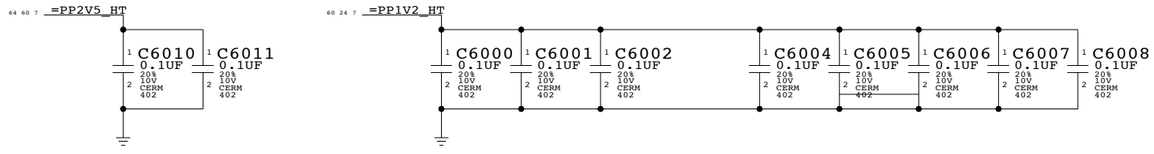
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 59 OF 103	





	ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
HT_NB_TO_SB_CLK_P	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CLK	146
HT_NB_TO_SB_CLK_N	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CLK	147
HT_NB_TO_SB_CTL_P	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CTL	183
HT_NB_TO_SB_CTL_N	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CTL	182
HT_NB_TO_SB_CAD_P<0>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD0	151
HT_NB_TO_SB_CAD_N<0>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD0	150
HT_NB_TO_SB_CAD_P<1>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD1	152
HT_NB_TO_SB_CAD_N<1>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD1	153
HT_NB_TO_SB_CAD_P<2>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD2	154
HT_NB_TO_SB_CAD_N<2>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD2	155
HT_NB_TO_SB_CAD_P<3>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD3	156
HT_NB_TO_SB_CAD_N<3>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD3	157
HT_NB_TO_SB_CAD_P<4>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD4	158
HT_NB_TO_SB_CAD_N<4>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD4	159
HT_NB_TO_SB_CAD_P<5>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD5	160
HT_NB_TO_SB_CAD_N<5>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD5	161
HT_NB_TO_SB_CAD_P<6>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD6	162
HT_NB_TO_SB_CAD_N<6>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD6	163
HT_NB_TO_SB_CAD_P<7>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD7	164
HT_NB_TO_SB_CAD_N<7>	HT_NB_TO_SB	HT_NB_TO_SB	HT_NB_TO_SB_CAD7	165
HT_SB_TO_NB_CLK_P	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CLK	148
HT_SB_TO_NB_CLK_N	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CLK	149
HT_SB_TO_NB_CTL_P	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CTL	184
HT_SB_TO_NB_CTL_N	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CTL	185
HT_SB_TO_NB_CAD_P<0>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD0	166
HT_SB_TO_NB_CAD_N<0>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD0	167
HT_SB_TO_NB_CAD_P<1>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD1	168
HT_SB_TO_NB_CAD_N<1>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD1	169
HT_SB_TO_NB_CAD_P<2>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD2	170
HT_SB_TO_NB_CAD_N<2>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD2	171
HT_SB_TO_NB_CAD_P<3>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD3	172
HT_SB_TO_NB_CAD_N<3>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD3	173
HT_SB_TO_NB_CAD_P<4>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD4	174
HT_SB_TO_NB_CAD_N<4>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD4	175
HT_SB_TO_NB_CAD_P<5>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD5	176
HT_SB_TO_NB_CAD_N<5>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD5	177
HT_SB_TO_NB_CAD_P<6>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD6	178
HT_SB_TO_NB_CAD_N<6>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD6	179
HT_SB_TO_NB_CAD_P<7>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD7	180
HT_SB_TO_NB_CAD_N<7>	HT_SB_TO_NB	HT_SB_TO_NB	HT_SB_TO_NB_CAD7	181
HT_PWROK	HT_PWROK	HT_2V5		186
HT_RESET_L	HT_CTL	HT_2V5		187
HT_LDTSTOP_L	HT_CTL	HT_2V5		188
HT_LDTREQ_L	HT_CTL	HT_2V5		189

HT_NB_TO_SB HT_SB_TO_NB
5 MIL SPACING FOR DIFF PAIR
10 MIL SPACING TO ANYTHING ELSE

HT_2V5
4 MIL SPACING IN GROUP
8 MIL SPACING TO ANYTHING ELSE

LENGTH TOLERENCE CAN BE LOOSE
MATCHED GROUP CONSTRAINT IS TIGHT ENOUGH

MASTER: GILA
LAST MODIFIED: APR 12, 04

U3LITE HT

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 60 OF 103	

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR
	15_MIL_SPACING	

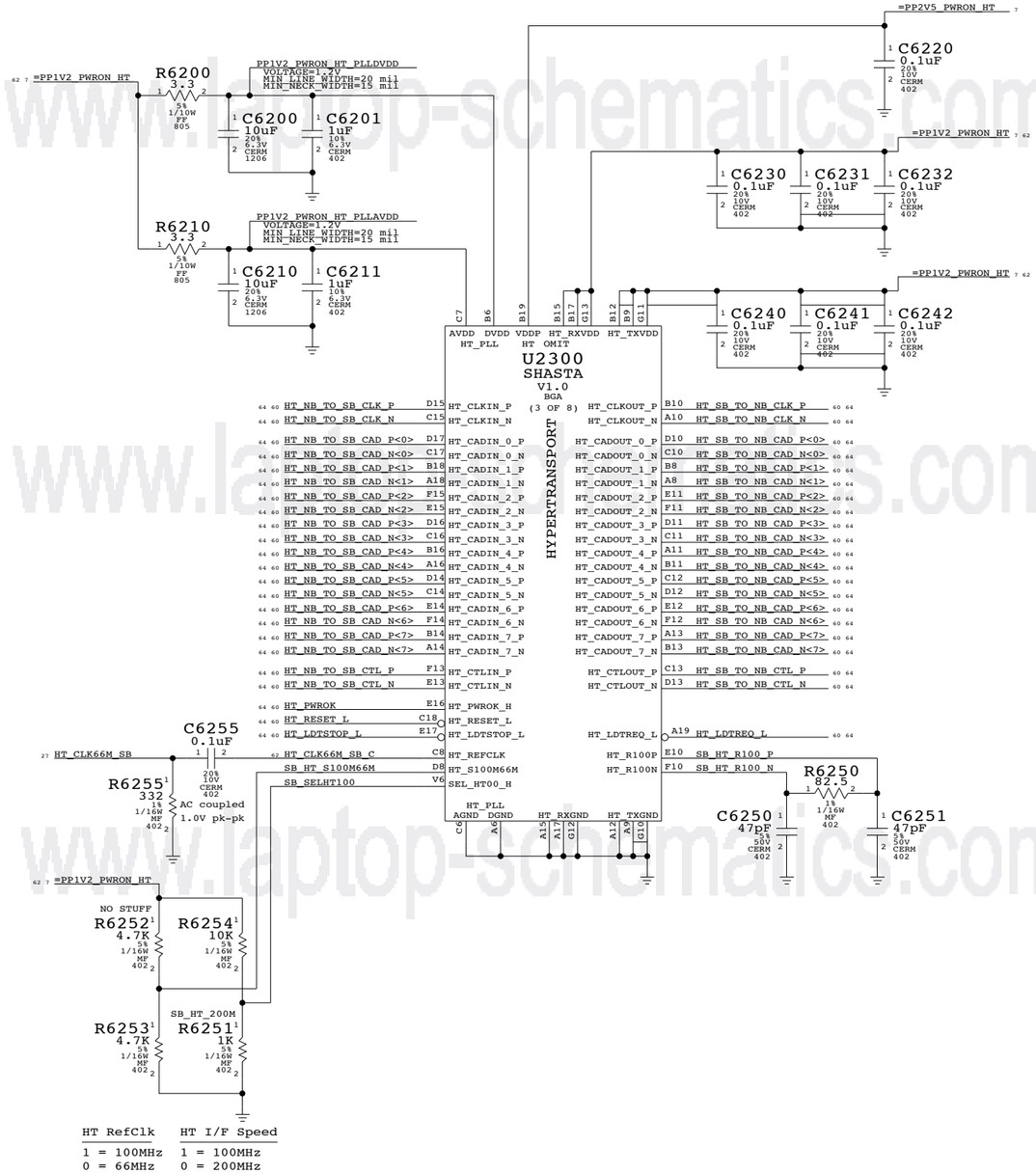
HT_CLK66M_SB_C 62

Page Notes

Power aliases required by this page:
- _PP2V5_PWRON_HT
- _PP1V2_PWRON_HT

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
- SB_HT_200M
  Stuffs resistor to select 200MHz HT I/F.



Master: Link

Shasta HyperTransport

APPLE COMPUTER INC.

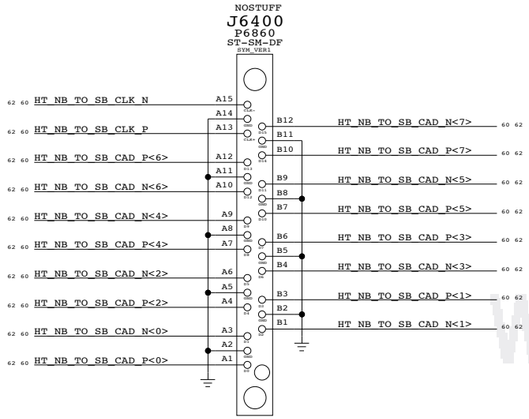
SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 62 OF 103	

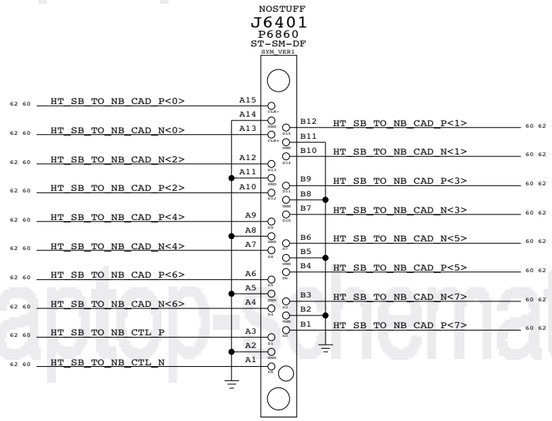
DRAWING

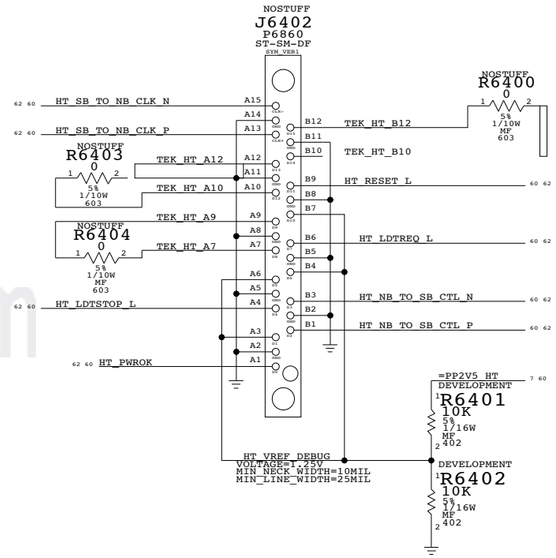
LAST_MODIFIED=Mon Dec 13 20:02:27 2004

SAME CONNECTORS & PINOUT AS

Q37 HYPERTRANSPORT BETWEEN GOLEM AND K2







MASTER: GILA
LAST MODIFIED: APR 12, 04

HT DEBUG CONN

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 64 OF 103	

ALL RESISTOR PACKS ARE 47 OHM 1/16W 5%

R PAKS ARE PIN SWAPPABLE ACROSS ALL SIGNALS (EXCEPT IDSELS)

74	PCI_SB_AD<0>	RP7300	2	7	47	PCI_AD<0>	6 74 75 76 77
74	PCI_SB_AD<1>	RP7303	1	8	47	PCI_AD<1>	6 74 75 76 77
74	PCI_SB_AD<2>	RP7303	2	7	47	PCI_AD<2>	6 74 75 76 77
74	PCI_SB_AD<3>	RP7303	4	5	47	PCI_AD<3>	6 74 75 76 77
74	PCI_SB_AD<4>	RP7309	2	7	47	PCI_AD<4>	6 74 75 76 77
74	PCI_SB_AD<5>	RP7300	1	8	47	PCI_AD<5>	6 74 75 76 77
74	PCI_SB_AD<6>	RP7300	3	6	47	PCI_AD<6>	6 74 75 76 77
74	PCI_SB_AD<7>	RP7309	4	5	47	PCI_AD<7>	6 74 75 76 77
74	PCI_SB_AD<8>	RP7300	4	5	47	PCI_AD<8>	6 74 75 76 77
74	PCI_SB_AD<9>	RP7301	2	7	47	PCI_AD<9>	6 74 75 76 77
74	PCI_SB_AD<10>	RP7301	1	8	47	PCI_AD<10>	6 74 75 76 77
74	PCI_SB_AD<11>	RP7301	4	5	47	PCI_AD<11>	6 74 75 76 77
74	PCI_SB_AD<12>	RP7309	1	8	47	PCI_AD<12>	6 74 75 76 77
74	PCI_SB_AD<13>	RP7309	3	6	47	PCI_AD<13>	6 74 75 76 77
74	PCI_SB_AD<14>	RP7301	3	6	47	PCI_AD<14>	6 74 75 76 77
74	PCI_SB_AD<15>	RP7307	1	8	47	PCI_AD<15>	6 74 75 76 77
74	PCI_SB_AD<16>	RP7308	1	8	47	PCI_AD<16>	6 74 75 76 77

R7300
47
5%
1/16W
MF
402

76 74	PCI_SB_AD<17>		1	2		PCI_AD<17>	6 74 75 76 77

74	PCI_SB_AD<18>	RP7307	2	7	47	PCI_AD<18>	6 74 75 76 77
74	PCI_SB_AD<19>	RP7306	3	6	47	PCI_AD<19>	6 74 75 76 77
74	PCI_SB_AD<20>	RP7305	1	8	47	PCI_AD<20>	6 74 75 76 77
74	PCI_SB_AD<21>	RP7305	2	7	47	PCI_AD<21>	6 74 76 77
74	PCI_SB_AD<22>	RP7302	1	8	47	PCI_AD<22>	6 74 76 77
74	PCI_SB_AD<23>	RP7302	3	6	47	PCI_AD<23>	6 74 76 77
74	PCI_SB_AD<24>	RP7304	1	8	47	PCI_AD<24>	6 74 75 76 77
74	PCI_SB_AD<25>	RP7306	4	5	47	PCI_AD<25>	6 74 75 76 77
74	PCI_SB_AD<26>	RP7305	3	6	47	PCI_AD<26>	6 74 75 76 77

R7301
47
5%
1/16W
MF
402

77 74	PCI_SB_AD<27>		1	2		PCI_AD<27>	6 74 75 76 77

74	PCI_SB_AD<28>	RP7302	2	7	47	PCI_AD<28>	6 74 75 76 77
74	PCI_SB_AD<29>	RP7304	4	5	47	PCI_AD<29>	6 74 75 76 77
74	PCI_SB_AD<30>	RP7302	4	5	47	PCI_AD<30>	6 74 75 76 77
74	PCI_SB_AD<31>	RP7304	2	7	47	PCI_AD<31>	6 74 75 76 77
74	PCI_SB_CBE_L<0>	RP7303	3	6	47	PCI_CBE_L<0>	6 74 76 77
74	PCI_SB_CBE_L<1>	RP7306	2	7	47	PCI_CBE_L<1>	6 74 76 77
74	PCI_SB_CBE_L<2>	RP7305	4	5	47	PCI_CBE_L<2>	6 74 76 77
74	PCI_SB_CBE_L<3>	RP7304	3	6	47	PCI_CBE_L<3>	6 74 76 77
74	PCI_SB_DEVSEL_L	RP7306	1	8	47	PCI_DEVSEL_L	6 74 76 77
74	PCI_SB_FRAME_L	RP7307	4	5	47	PCI_FRAME_L	6 74 76 77
74	PCI_SB_IRDY_L	RP7307	3	6	47	PCI_IRDY_L	6 74 76 77
74	PCI_SB_TRDY_L	RP7308	3	6	47	PCI_TRDY_L	6 74 76 77
74	PCI_SB_STOP_L	RP7308	4	5	47	PCI_STOP_L	6 74 76 77
74	PCI_SB_PAR	RP7308	2	7	47	PCI_PAR	6 74 76 77

PLACE CLOSE TO SHASTA

AD<17> IS IDSEL FOR AIRPORT
AD<27> IS IDSEL FOR USB

PCI SERIES TERMINATION

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 73 OF 103	

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
PCI_AD			PCI_AD<31..28> 6 73 75 76 77
PCI_AD27			PCI_AD<27> 6 73 75 76 77
PCI_AD			PCI_AD<26..24> 6 73 75 76 77
PCI_AD23			PCI_AD<23> 6 73 76 77
PCI_AD22			PCI_AD<22> 6 73 76 77
PCI_AD21			PCI_AD<21> 6 73 76 77
PCI_AD20			PCI_AD<20> 6 73 75 76 77
PCI_AD			PCI_AD<19..18> 6 73 75 76 77
PCI_AD17			PCI_AD<17> 6 73 75 76 77
PCI_AD			PCI_AD<16..0> 6 73 75 76 77
PCI			PCI_CBE_L<3..0> 6 73 76 77
PCI			PCI_PAR 6 73 76 77
PCI_CTL			PCI_DEVSEL_L 6 73 74 76 77
PCI_CTL			PCI_FRAME_L 6 73 74 76 77
PCI_CTL			PCI_IRDY_L 6 73 74 76 77
PCI_CTL			PCI_TRDY_L 6 73 74 76 77
PCI_CTL			PCI_STOP_L 6 73 74 76 77

Page Notes

Power aliases required by this page:
- _PP3V3_PCI
- _PP3V3_SB_PCI (can be _PP3V3_PCI)
- _PP3V3_PWRON_SB
- _PP2V5_PWRON_SB

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

PCI Devices implemented on this page:
AD11 - PCI0 (0x106B/0x0053)
AD11 - PCI1 (0x106B/0x0054)
AD11 - PCI2 (0x106B/0x0055)

AD23 - KeyLargo (0x106B/0x004F, PCI1)
AD28 - SATA 150 (0x1166/0x0240, PCI0 or 2)
AD29 - UATA 133 (0x106B/0x0050, PCI0 or 2)
AD30 - FireWire (0x106B/0x0052, PCI0 or 2)
AD31 - Ethernet (0x106B/0x0051, PCI0)

7 =PP3V3_SB_PCI

NO STUFF C7410 10uF 20% 6.3V CERM 805
C7400 0.1uF 20% 10V CERM 402
C7401 0.1uF 20% 10V CERM 402
C7402 0.1uF 20% 10V CERM 402
C7403 0.1uF 20% 10V CERM 402
C7404 0.1uF 20% 10V CERM 402

NO STUFF C7411 10uF 20% 6.3V CERM 805
C7405 0.1uF 20% 10V CERM 402
C7406 0.1uF 20% 10V CERM 402
C7407 0.1uF 20% 10V CERM 402
C7408 0.1uF 20% 10V CERM 402
C7409 0.1uF 20% 10V CERM 402

=PP2V5_PWRON_SB 7 23 25 88

C7420 0.1uF 20% 10V CERM 402
C7421 0.1uF 20% 10V CERM 402
C7422 0.1uF 20% 10V CERM 402
C7423 0.1uF 20% 10V CERM 402

AA22 AB22 E21 H16 J21 M16 N21 R20 U21 V19 — VDDOPC
E20 J14 N20 U20 — PCIVDDP

U2300 SHASTA V1.0 BGA (4 OF 8) — OMIT

PCI

27 PCI_CLK66M_SB_INT	AB9	PCIBR_CLK_H	
27 8 PCI_CLK33M_SB_EXT	U19	PCI1CLK_H	
PCI1AD_0_H	L18	PCI_SB_AD<0>	73
PCI1AD_1_H	K19	PCI_SB_AD<1>	73
PCI1AD_2_H	L22	PCI_SB_AD<2>	73
PCI1AD_3_H	M22	PCI_SB_AD<3>	73
PCI1AD_4_H	M18	PCI_SB_AD<4>	73
PCI1AD_5_H	L20	PCI_SB_AD<5>	73
PCI1AD_6_H	M21	PCI_SB_AD<6>	73
PCI1AD_7_H	N16	PCI_SB_AD<7>	73
PCI1AD_8_H	M20	PCI_SB_AD<8>	73
PCI1AD_9_H	P22	PCI_SB_AD<9>	73
PCI1AD_10_H	M17	PCI_SB_AD<10>	73
PCI1AD_11_H	N18	PCI_SB_AD<11>	73
PCI1AD_12_H	M19	PCI_SB_AD<12>	73
PCI1AD_13_H	N19	PCI_SB_AD<13>	73
PCI1AD_14_H	P21	PCI_SB_AD<14>	73
PCI1AD_15_H	R22	PCI_SB_AD<15>	73
PCI1AD_16_H	P20	PCI_SB_AD<16>	73
PCI1AD_17_H	V21	PCI_SB_AD<17>	73 76
PCI1AD_18_H	P18	PCI_SB_AD<18>	73
PCI1AD_19_H	T20	PCI_SB_AD<19>	73
PCI1AD_20_H	R16	PCI_SB_AD<20>	73
PCI1AD_21_H	R17	PCI_SB_AD<21>	73
PCI1AD_22_H	W21	PCI_SB_AD<22>	73
PCI1AD_23_H	Y22	PCI_SB_AD<23>	73
PCI1AD_24_H	R18	PCI_SB_AD<24>	73
PCI1AD_25_H	T19	PCI_SB_AD<25>	73
PCI1AD_26_H	T18	PCI_SB_AD<26>	73
PCI1AD_27_H	Y21	PCI_SB_AD<27>	73 77
PCI1AD_28_H	W20	PCI_SB_AD<28>	73
PCI1AD_29_H	T16	PCI_SB_AD<29>	73
PCI1AD_30_H	AA21	PCI_SB_AD<30>	73
PCI1AD_31_H	T17	PCI_SB_AD<31>	73
PCI1C_BE_0_L	L19	PCI_SB_CBE_L<0>	73
PCI1C_BE_1_L	P16	PCI_SB_CBE_L<1>	73
PCI1C_BE_2_L	V22	PCI_SB_CBE_L<2>	73
PCI1C_BE_3_L	V20	PCI_SB_CBE_L<3>	73
PCI1DEVSEL_L	T22	PCI_SB_DEVSEL_L	73
PCI1FRAME_L	T21	PCI_SB_FRAME_L	73
PCI1IRDY_L	R21	PCI_SB_IRDY_L	73
PCI1TRDY_L	P19	PCI_SB_TRDY_L	73
PCI1STOP_L	P17	PCI_SB_STOP_L	73
PCI1PAR_H	N17	PCI_SB_PAR	73
PCI1RST_L	U18	SB_PCI_RESET_L	

"Slot A" - AD17
76 74 6 PCI_SLOTA_REQ_L AB18 PCI1REQ_0_L
76 74 6 PCI_SLOTA_GNT_L AA18 PCI1GNT_0_L

"Slot G" - AD27
77 74 PCI_SLOTG_REQ_L AB20 PCI1REQ_1_L
77 74 PCI_SLOTG_GNT_L AB19 PCI1GNT_1_L

"Slot D" - AD20
74 PCI_SLOTD_REQ_L V17 PCI1REQ_2_L
74 PCI_SLOTD_GNT_L V18 PCI1GNT_2_L

76 75 6 ROM_CS_L AB8 ROMCS_L
76 75 6 ROM_OE_L AA9 ROMOE_L
76 75 6 ROM_WE_L Y10 ROMRW_L

=PP3V3_PCI 7 25 74 75 76 77

RP7400 4.7K 5% 1/16W SM1 — 2 7 — PCI_SLOTA_REQ_L 6 74 76
RP7400 4.7K 5% 1/16W SM1 — 1 8 — PCI_SLOTA_GNT_L 6 74 76
RP7400 4.7K 5% 1/16W SM1 — 4 5 — PCI_SLOTG_REQ_L 74 77
RP7400 4.7K 5% 1/16W SM1 — 3 6 — PCI_SLOTG_GNT_L 74 77
RP7401 4.7K 5% 1/16W SM1 — 3 6 — PCI_SLOTD_REQ_L 74
RP7401 4.7K 5% 1/16W SM1 — 4 5 — PCI_SLOTD_GNT_L 74

=PP3V3_PWRON_SB 7 23 25

R7455 4.7K 5% 1/16W MF 402
C7450 0.1uF 20% 10V CERM 402
R7450 4.7K 5% 1/16W MF 402

U7450 MC74VHC1G08 SOT23-5

87 77 25 8 SYS_WARM_RESET_L
PCI_RESET_L 6 8 51 58

Shasta drives PCI RESET, but its output may not be valid during power-up, so it is ANDed with a reset from the SMU.

77 76 75 74 25 7 =PP3V3_PCI

RP7402 4.7K 5% 1/16W SM1 — 3 6 — PCI_DEVSEL_L 77 76 74 73 6
RP7402 4.7K 5% 1/16W SM1 — 4 5 — PCI_FRAME_L 77 76 74 73 6
RP7402 4.7K 5% 1/16W SM1 — 2 7 — PCI_IRDY_L 77 76 74 73 6
RP7402 4.7K 5% 1/16W SM1 — 1 8 — PCI_TRDY_L 77 76 74 73 6
RP7401 4.7K 5% 1/16W SM1 — 7 2 — PCI_STOP_L 77 76 74 73 6

Master: Link

Shasta PCI Interface

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 74 OF 103	

DRAWING

LAST_MODIFIED=Mon Dec 13 20:02:33 2004

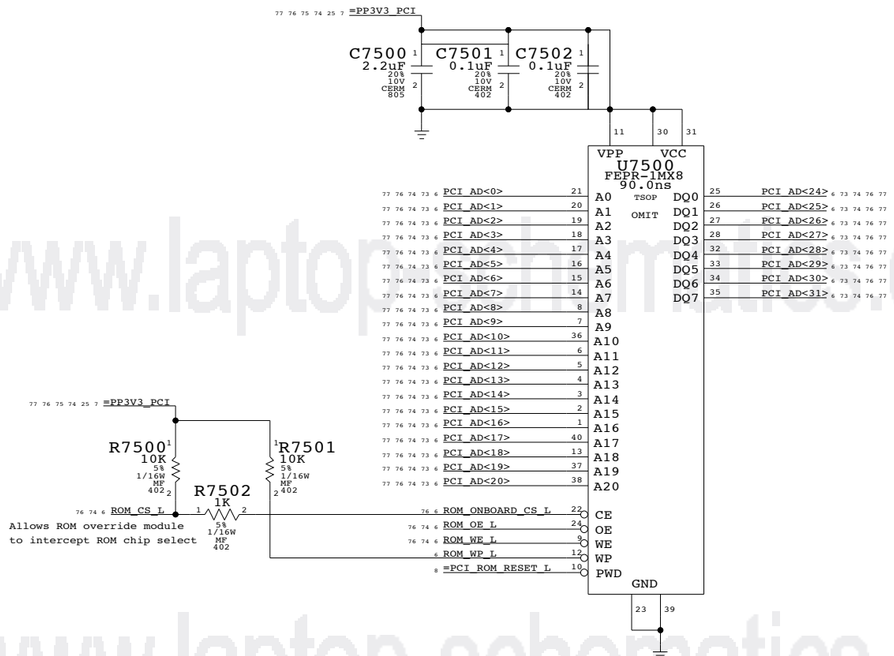
Page Notes

Power aliases required by this page:
- _PP3V3_PCI

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

NOTE: This page does not specify a BootROM part number. Must use a TABLE_x_ITEM symbol to declare U7500 part number.



Master: Link

BootROM

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I

SCALE	SHT	OF
NONE	75	103

DRAWING

LAST_MODIFIED=Mon Dec 13 20:02:34 2004

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR
PCI_CLK_AIRPORT	CLOCKS	

PCI_CLK33M_AIRPORT 8 76

Page Notes

Power aliases required by this page:
- _PP3V3_PCI

Signal aliases required by this page:
- _PCI_CLK33M_AIRPORT (33MHz PCI clock)

BOM options provided by this page:
(NONE)

PCI Devices implemented on this page:
AD17 (Slot "A") - AirPort (0x????/0x????)

NOTE: This AirPort implementation does not support PME#.

77 75 74 25 7 =PP3V3_PCI

C7600 10UF 20% 6.3V CERM 1206 — NO STUFF
C7601 10UF 20% 6.3V CERM 1206 — NO STUFF
C7602 0.1UF 20% 10V CERM 402
C7603 0.1UF 20% 10V CERM 402

CRITICAL
J7600
RCPT-CARD-EDGE
P-ST-TH1

SIDE-A		SIDE-B	
8 PCI_AIRPORT_RESET_L	1	2	
6 TP_AIRPORT_RF_DISABLE	3	4	PCI_CLK33M_AIRPORT 8 76
74 6 PCI_SLOTA_REQ_L	5	6	
	7	8	PCI_SLOTA_GNT_L 6 74
77 75 74 73 6 PCI_AD<31>	9	10	TP_AIRPORT_PME_L 6
	11	12	PCI_SLOTA_INT_L 6 25
77 75 74 73 6 PCI_AD<29>	13	14	PCI_AD<30> 6 73 74 75 77
77 75 74 73 6 PCI_AD<27>	15	16	
77 75 74 73 6 PCI_AD<25>	17	18	PCI_AD<28> 6 73 74 75 77
	19	20	PCI_AD<26> 6 73 74 75 77
77 74 73 6 PCI_CBE_L<3>	21	22	PCI_AD<24> 6 73 74 75 77
	23	24	6 PCI_SLOTA_IDSEL
77 74 73 6 PCI_AD<23>	25	26	
77 74 73 6 PCI_AD<21>	27	28	PCI_AD<22> 6 73 74 77
77 75 74 73 6 PCI_AD<19>	29	30	PCI_AD<20> 6 73 74 75 77
	31	32	PCI_PAR 6 73 74 77
77 75 74 73 6 PCI_AD<17>	33	34	PCI_AD<18> 6 73 74 75 77
	35	36	PCI_AD<16> 6 73 74 75 77
77 74 73 6 PCI_CBE_L<2>	37	38	
77 74 73 6 PCI_IRDY_L	39	40	PCI_FRAME_L 6 73 74 77
	41	42	PCI_TRDY_L 6 73 74 77
6 AIRPORT_CLKRUN_L_PD	43	44	PCI_STOP_L 6 73 74 77
	45	46	PCI_DEVSEL_L 6 73 74 77
77 74 73 6 PCI_CBE_L<1>	47	48	
77 75 74 73 6 PCI_AD<14>	49	50	PCI_AD<15> 6 73 74 75 77
KEY	51	52	PCI_AD<13> 6 73 74 75 77
77 75 74 73 6 PCI_AD<12>	53	54	PCI_AD<11> 6 73 74 75 77
77 75 74 73 6 PCI_AD<10>	55	56	
75 74 6 ROM_WE_L	57	58	PCI_AD<9> 6 73 74 75 77
77 75 74 73 6 PCI_AD<8>	59	60	PCI_CBE_L<0> 6 73 74 77
77 75 74 73 6 PCI_AD<7>	61	62	ROM_OE_L 6 74 75
	63	64	PCI_AD<6> 6 73 74 75 77
77 75 74 73 6 PCI_AD<5>	65	66	
75 6 ROM_ONBOARD_CS_L	67	68	PCI_AD<4> 6 73 74 75 77
77 75 74 73 6 PCI_AD<3>	69	70	PCI_AD<2> 6 73 74 75 77
	71	72	PCI_AD<0> 6 73 74 75 77
77 75 74 73 6 PCI_AD<1>	73	74	
75 74 6 ROM_CS_L	75	76	NC
	NC 77	78	NC RESERVED FOR USB_DP AND USB_DN
	NC 79	80	
	NC 81	82	NC
	83	84	NC I2S1_MCLK_MARTY
	85	86	NC I2S1_DEV_TO_SB_DTI_MARTY
	NC 87	88	NC
	89	90	NC I2S1_SB_TO_DEV_DTO_MARTY
	NC 91	92	NC RESERVED FOR RADIO_IO
	NC 93	94	NC
	NC 95	96	NC
	97	98	NC PP5V_PWRON_AIRPORT_MARTY
	NC 99	100	NC MIN_LINE_WIDTH=25MIL MIN_NECK_WIDTH=10MIL

516-0069

R7600 22 5% 1/16W MF 402
1 — 2 PCI_SB_AD<17> 73 74

R7612 0 5% 1/16W MF 402
94 25 6 I2S1_MCLK SCC_RTS_L — I2S1_MCLK_MARTY

R7610 0 5% 1/16W MF 402
94 25 6 I2S1_DEV_TO_SB_DTI SCC_RXDA — I2S1_DEV_TO_SB_DTI_MARTY

R7611 0 5% 1/16W MF 402
94 25 6 I2S1_SB_TO_DEV_DTO SCC_TXDA — I2S1_SB_TO_DEV_DTO_MARTY

R7613 0 5% 1/16W MF 402
7 =PP5V_PWRON_AIRPORT — PP5V_PWRON_AIRPORT_MARTY

R7601 10K 5% 1/16W MF 402
1 — 2

AirPort Extreme

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 76 OF 103	

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR
PCI_CLK_USB2	CLOCKS	

=PCI_CLK33M_USB2 8 77

Page Notes

Power aliases required by this page:
- _PPVIO_PCI (to 3.3V or 5V)

Signal aliases required by this page:
- _PCI_CLK33M_USB2 (33MHz PCI clock)

BOM options provided by this page:
(NONE)

PCI Devices implemented on this page:
AD27 (Slot "G") - USB2 (0x1033/0x0035)

NOTE: This USB2 implementation supports D3cold.

7 =PPVIO_PCI_USB2

C7703 0.1uF 20% 10V CERM 402

VDD_PCI

CRITICAL
U7700
NEC_uPD720101_USB2
FBGA

76 75 74 73 6 PCI_AD<0>	M5	AD0	
76 75 74 73 6 PCI_AD<1>	P5	AD1	
76 75 74 73 6 PCI_AD<2>	N5	AD2	
76 75 74 73 6 PCI_AD<3>	P4	AD3	
76 75 74 73 6 PCI_AD<4>	N4	AD4	
76 75 74 73 6 PCI_AD<5>	M3	AD5	
76 75 74 73 6 PCI_AD<6>	N3	AD6	
76 75 74 73 6 PCI_AD<7>	M1	AD7	
76 75 74 73 6 PCI_AD<8>	L2	AD8	
76 75 74 73 6 PCI_AD<9>	L1	AD9	
76 75 74 73 6 PCI_AD<10>	K2	AD10	
76 75 74 73 6 PCI_AD<11>	L3	AD11	
76 75 74 73 6 PCI_AD<12>	K1	AD12	
76 75 74 73 6 PCI_AD<13>	K3	AD13	
76 75 74 73 6 PCI_AD<14>	J2	AD14	
76 75 74 73 6 PCI_AD<15>	J1	AD15	
76 75 74 73 6 PCI_AD<16>	F2	AD16	
76 75 74 73 6 PCI_AD<17>	E3	AD17	
76 75 74 73 6 PCI_AD<18>	E1	AD18	
76 75 74 73 6 PCI_AD<19>	D3	AD19	
76 75 74 73 6 PCI_AD<20>	D1	AD20	
76 74 73 6 PCI_AD<21>	D2	AD21	
76 74 73 6 PCI_AD<22>	C2	AD22	
76 74 73 6 PCI_AD<23>	C1	AD23	
76 75 74 73 6 PCI_AD<24>	B6	AD24	
76 75 74 73 6 PCI_AD<25>	A4	AD25	
76 75 74 73 6 PCI_AD<26>	B5	AD26	
76 75 74 73 6 PCI_AD<27> (PCI_AD<27>)	C4	AD27	
76 75 74 73 6 PCI_AD<28>	A3	AD28	
76 75 74 73 6 PCI_AD<29>	C5	AD29	
76 75 74 73 6 PCI_AD<30>	B6	AD30	
76 75 74 73 6 PCI_AD<31>	A6	AD31	
76 74 73 6 PCI_CBE_L<0>	M2	CBE0	
76 74 73 6 PCI_CBE_L<1>	J3	CBE1	
76 74 73 6 PCI_CBE_L<2>	F1	CBE2	
76 74 73 6 PCI_CBE_L<3>	C3	CBE3	
76 74 73 6 PCI_PAR	J4	PAR	
76 74 73 6 PCI_FRAME_L	F3	FRAME	
76 74 73 6 PCI_IRDY_L	F4	IRDY	
76 74 73 6 PCI_TRDY_L	G1	TRDY	
76 74 73 6 PCI_STOP_L	G3	STOP	
PCI_SLOTG_IDSEL	B3	IDSEL	
76 74 73 6 PCI_DEVSEL_L	G2	DEVSEL	
74 PCI_SLOTG_REQ_L	C6	REQ	
74 PCI_SLOTG_GNT_L	D6	GNT	
NEC_PERR_L_PU	H2	PERR	
NEC_SERR_L_PU	H1	SERR OD	
NEC_INTA_L	C7	INTA OD	
NEC_INTB_L	B7	INTB OD	
NEC_INTC_L	A7	INTC OD	
77 8 =PCI_CLK33M_USB2	A8	PCLK	
NEC_VBBRST_L	B8	VBBRST(CHIP RESET)	
NEC_CRUN_L_PD	N6	CRUN	
NEC_PME_L	D9	PME OD	
NEC_VCCRST_L	C9	VCCRST(PCI RESET)	
6 TP_NEC_SMI_L	L6	SMI OD	
NEC_LEGC_PD	L7	LEGC	

IPD NTEST1	M8	TP_NEC_NTEST1	6
IPD SMC	M7	TP_NEC_SMC	6
IPD TEB	N7	TP_NEC_TEB	6
IPD AMC	P7	TP_NEC_AMC	6
IPD TEST	L8	TP_NEC_TEST	6
NANDTEST	M10	TP_NEC_NANDTEST	6
SRCLK	M9	TP_NEC_SRCLK	6
SRDTA	N9	TP_NEC_SRDATA	6
IPD SRMOD	P9	TP_NEC_SRMOD	6

74 73 PCI_SB_AD<27>

R7714 22 5% 1/16W MF 402

76 75 74 25 7 =PP3V3_PCI

R7716 10K 5% 1/16W MF 402

R7713 10K 5% 1/16W MF 402

RP7703 47 5% 1/16W SM1

25 PCI_SLOTG_INT_L

87 74 25 8 SYS_WARM_RESET_L

25 13 SYS_PME_L

8 =PCI_USB2_RESET_L

RP7702 47 5% 1/16W SM1

RP7702 & RP7703 required to facilitate NAND-tree testing

R7715 4.7K 5% 1/16W MF 402

RP7703 47 5% 1/16W SM1

Master: Link

USB 2.0 PCI Interface

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 77 OF 103	

DRAWING

LAST_MODIFIED=Mon Dec 13 20:02:35 2004

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
SATA_RXD1	SATA	SATA_RXD1_C	SATA_RXD_P1_C
SATA_RXD1	SATA	SATA_RXD1_C	SATA_RXD_N1_C
SATA_TXD1	SATA	SATA_TXD1	SATA_TXD_P1
SATA_TXD1	SATA	SATA_TXD1	SATA_TXD_N1
SATA_RXD2	SATA	SATA_RXD2_C	SATA_RXD_P2_C
SATA_RXD2	SATA	SATA_RXD2_C	SATA_RXD_N2_C
SATA_TXD2	SATA	SATA_TXD2	SATA_TXD_P2
SATA_TXD2	SATA	SATA_TXD2	SATA_TXD_N2
UATA_DD			UATA_DD<15..8>
UATA_DD7			UATA_DD<7>
UATA_DD			UATA_DD<6..0>
UATA_HOST			UATA_DA<2..0>
UATA_HOST			UATA_CS0_L
UATA_HOST			UATA_CS1_L
UATA_HOST			UATA_HSTROBE
UATA_HOST			UATA_STOP
UATA_HOST_R			UATA_DMACK_L
UATA_HOST_R			UATA_RESET_L
UATA_DEV_R_C			UATA_DSTROBE
UATA_DEV_R			UATA_DMARQ
UATA_DEV_R			UATA_INTRQ

Page Notes

Power aliases required by this page:
- _PP1V2_PWRON_DISK

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

Net Spacing Type: SATA

Line To Line:	15 mils
Length Tolerance:	50 mils
Primary Max Sep:	10 mils outer
Primary Max Sep:	9 mils inner
Secondary Max Sep:	100 mils
Secondary Length:	500 mils

NOTE: Target differential impedance for SATA data pairs is 100 ohms.

=PP1V2_PWRON_DISK_SB

SATA_VDD x 5

C8000 0.1uF 20% 10V CERM 402
C8001 0.1uF 20% 10V CERM 402
C8002 0.1uF 20% 10V CERM 402
C8003 0.1uF 20% 10V CERM 402
C8004 0.1uF 20% 10V CERM 402

AB14 AB17 T14 W15 Y18 SATA_VDD

U2300 OMIT
SHASTA
V1.0
BGA
(5 OF 8)

UATA

UD_IDEDD_0_H	J6	UATA_DD_R<0>
UD_IDEDD_1_H	H7	UATA_DD_R<1>
UD_IDEDD_2_H	H6	UATA_DD_R<2>
UD_IDEDD_3_H	E2	UATA_DD_R<3>
UD_IDEDD_4_H	C1	UATA_DD_R<4>
UD_IDEDD_5_H	C2	UATA_DD_R<5>
UD_IDEDD_6_H	E3	UATA_DD_R<6>
UD_IDEDD_7_H	G6	UATA_DD_R<7>
UD_IDEDD_8_H	G5	UATA_DD_R<8>
UD_IDEDD_9_H	D4	UATA_DD_R<9>
UD_IDEDD_10_H	G7	UATA_DD_R<10>
UD_IDEDD_11_H	F6	UATA_DD_R<11>
UD_IDEDD_12_H	C3	UATA_DD_R<12>
UD_IDEDD_13_H	F5	UATA_DD_R<13>
UD_IDEDD_14_H	E5	UATA_DD_R<14>
UD_IDEDD_15_H	D5	UATA_DD_R<15>
UD_IDEDA0_H	E6	UATA_DA_R<0>
UD_IDEDA1_H	C4	UATA_DA_R<1>
UD_IDEDA2_H	D6	UATA_DA_R<2>
UD_IDECS1FX_L	B3	UATA_CS0_L_R
UD_IDECS3FX_L	B4	UATA_CS1_L_R
UD_IDEDMACK_L	E8	UATA_DMACK_L_R
UD_IDERD_L	E4	UATA_HSTROBE_R
UD_IDEWR_L	D3	UATA_STOP_R
UD_IDERST_L	E7	UATA_RESET_L_R

DSTROBE aka:
IORDY/HDMARDY*

HSTROBE aka:
DIOR*

STOP aka:
DIOW*

UATA_DSTROBE	F9	UD_IDECHRDY_H
UATA_DMARQ	D7	UD_IDEDMARQ_H
UATA_INTRQ	C5	UD_IDEINTRQ_H

SATA 0

SATA_RXD_P1_C	Y17	RXDP1
SATA_RXD_N1_C	Y16	RXDN1
		TXDP1 AA16 SATA_TXD_P1
		TXDN1 AB16 SATA_TXD_N1

SATA 1

SATA_RXD_P2_C	AB15	RXDP2
SATA_RXD_N2_C	AA15	RXDN2
		TXDP2 Y15 SATA_TXD_P2
		TXDN2 Y14 SATA_TXD_N2

SATA_GND

AA14 AA17 T13 W16

AC coupling required for any SATA pair used.
Recommend 0.1uF cap placed close to Shasta.
(Caps provided by device page)

UATA Termination

R8005 10K 5% 1/16W MF 402

RP8000 33 5% 1/16W SM1
RP8000 33 5% 1/16W SM1
RP8000 33 5% 1/16W SM1
RP8001 33 5% 1/16W SM1
RP8001 33 5% 1/16W SM1
RP8002 33 5% 1/16W SM1
RP8002 33 5% 1/16W SM1
RP8002 33 5% 1/16W SM1
RP8003 33 5% 1/16W SM1
RP8003 33 5% 1/16W SM1
RP8003 33 5% 1/16W SM1
RP8004 33 5% 1/16W SM1
RP8004 33 5% 1/16W SM1
RP8004 33 5% 1/16W SM1
R8000 33 5% 1/16W MF 402
R8001 33 5% 1/16W MF 402
R8002 22 5% 1/16W MF 402
R8003 22 5% 1/16W MF 402
R8004 22 5% 1/16W MF 402

Master: Link

Shasta Disk

APPLE COMPUTER INC.

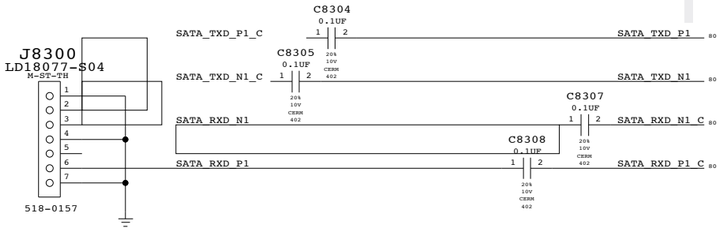
SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 80 OF 103	

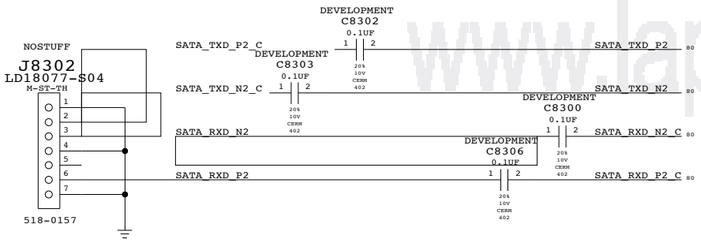
DRAWING

LAST_MODIFIED=Mon Dec 13 20:02:37 2004

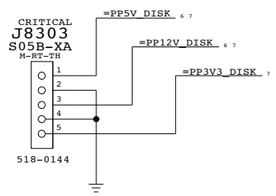
ELECTRICAL_CONSTRAINT_SET	NET_PHYSICAL_TYPE	NET_SPACING_TYPE	DIFFERENTIAL_PAIR
UATA_DD<15..8>	UATA_DD		
UATA_DD<7>	UATA_DD7		
UATA_DD<6..0>	UATA_DD		
UATA_DA<2..0>	UATA_HOST		
UATA_CS0_L	UATA_HOST		
UATA_CS1_L	UATA_HOST		
UATA_HSTROBE	UATA_HOST		
UATA_STOP	UATA_HOST		
UATA_DMACK_L	UATA_HOST_R		
UATA_RESET_L	UATA_HOST_R		
UATA_DSTROBE	UATA_DEV_R_C		
UATA_DMARQ	UATA_DEV_R		
UATA_INTRQ	UATA_DEV_R		

SATA CONNECTORS

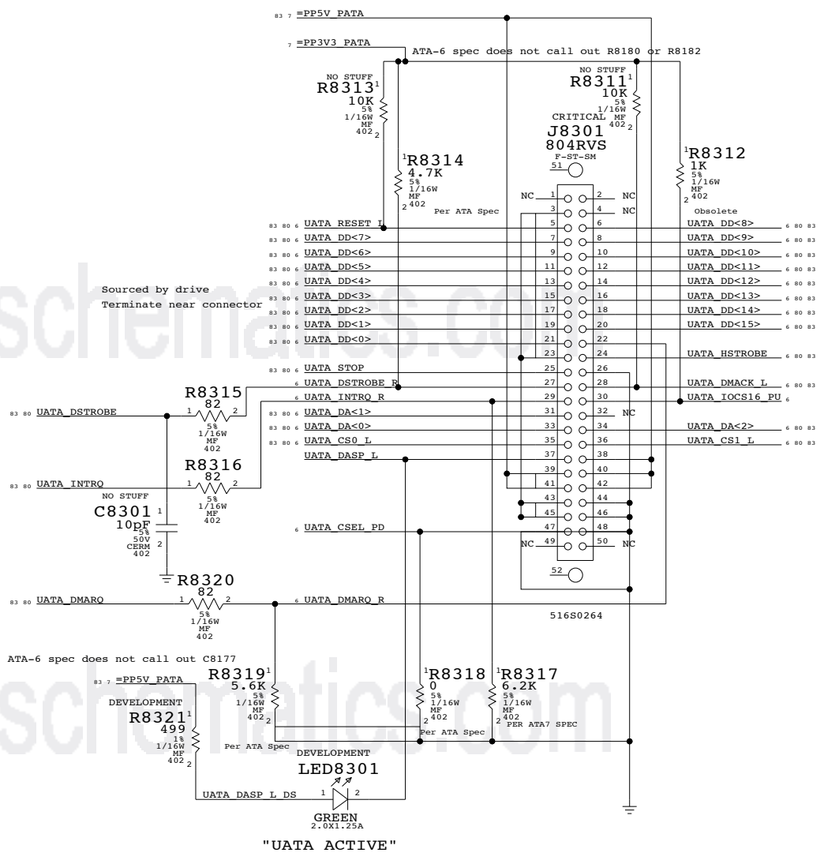




HD POWER



PATA CONNECTOR



"UATA ACTIVE"

DISK CONNECTORS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 83 OF 103	

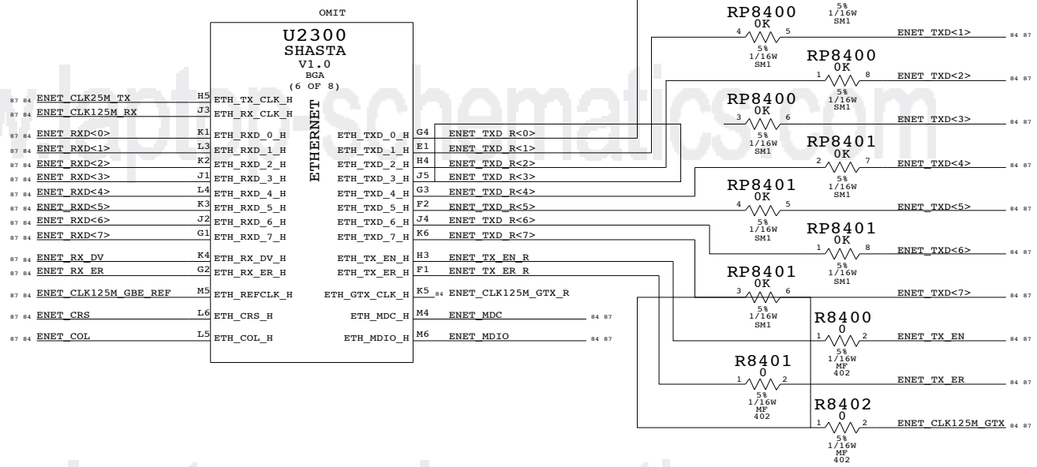
ELECTRICAL_CONSTRAINT_SET	NET_PHYSICAL_TYPE	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
ENET_RX_CLK	ENET	10_MIL		ENET_CLK25M_TX
ENET_RX_CLK	ENET	10_MIL		ENET_CLK125M_RX
ENET_GBE_REF	ENET	15_MIL_SPACING		ENET_CLK125M_GBE_REF
ENET_TX_CLK	ENET	15_MIL_SPACING		ENET_CLK125M_GTX
	ENET	15_MIL_SPACING		ENET_CLK125M_GTX_R
ENET_RX	ENET			ENET_RXD<7..0>
ENET_RX_CTL	ENET			ENET_RX_DV
ENET_RX_CTL	ENET			ENET_RX_ER
ENET_TX	ENET			ENET_TXD<7..0>
ENET_TX_CTL	ENET			ENET_TX_EN
ENET_TX_CTL	ENET			ENET_TX_ER
ENET_RX_CTL	ENET			ENET_CRS
ENET_RX_CTL	ENET			ENET_COL
ENET_MDC	ENET			ENET_MDC
ENET_MDIO	ENET			ENET_MDIO

Page Notes

Power aliases required by this page:
(NONE)

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)



Master: Link

Shasta Ethernet

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 84 OF 103	

DRAWING

LAST_MODIFIED=Mon Dec 13 18:49:50 2004

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
ENET_MDI_TX	ENET	ENET_MDI_TD	ENET_TDP 87
ENET_MDI_TX	ENET	ENET_MDI_TD	ENET_TDN 87
ENET_MDI_RX	ENET	ENET_MDI_RD	ENET_RDP 87
ENET_MDI_RX	ENET	ENET_MDI_RD	ENET_RDN 87
ENET_XTAL	15 MIL SPACING		ENET_CLK25M_XIN 87
	15 MIL SPACING		ENET_CLK25M_XOUT 87

ETHERNET ROUTING PRIORITY:
1. DECOUPLING CAPS
2. TX TERMINATION - LOCATE NEAR PHY
3. RX TERMINATION - LOCATE NEAR PHY

ROUTE TD OVER 2.5V PLANE (BOTTOM LAYER) ONLY
ROUTE RD OVER GROUND PLANE (TOP LAYER) ONLY

ALL DIFFERENTIAL SIGNALS SHOULD BE CLOSE, PARALLEL, MATCHED LENGTHS, WITH MINIMUM VIA COUNT, AND SHORT IF POSSIBLE

CLEAR OUT ALL PLANES BETWEEN MIDDLE OF TRANSFORMER AND CONNECTOR

87 7 PP3V3_PWRON_ENET

PP2V5_ENET — VOLTAGE=2.5V, MIN_LINE_WIDTH=25MIL, MIN_NECK_WIDTH=10MIL

C8703 0.1UF 20% 10V CERM 402
C8704 0.01UF 20% 16V CERM 402
C8702 0.1UF 20% 10V CERM 402
C8705 0.01UF 20% 16V CERM 402
C8712 10UF 20% 6.3V CERM 805

ENET_DVDD — VOLTAGE=2.5V, MIN_LINE_WIDTH=25MIL, MIN_NECK_WIDTH=10MIL

C8711 10UF 20% 6.3V CERM 805
C8716 0.1UF 20% 10V CERM 402
C8708 0.01UF 20% 16V CERM 402
C8715 0.1UF 20% 10V CERM 402
C8709 0.01UF 20% 16V CERM 402

NOTE: PLACE R3128, R3100, RP 3101 CLOSE TO PHY

U8700
BCM5231
TQFP
(SYM_VER2)
CRITICAL

REGDVDD	3		
REGAVDD	20		
DVDD1	2		
DVDD2	55		
AVDD1	27		
AVDD2	28		
OVDD1	1		
OVDD2	46		
REFCLK	4		
BIASVDD	22		
OVDD/NC	8		
TD+	31		
TD-	30		
RD+	26		
RD-	25		
NC	21		
NC	19	NC	
FDX	39	ENET_5221_FDX 87	
F100/JTAG_TCK	37	TP_ENET_TCK 6	
ANEN/JTAG_TRST	38	ANEN	
TESTEN	15	ENET_5221_TESTEN 87	
OVDD/NC	18	MII_EN	
LOW_PWR	16	ENET_5221_LOW_PWR 87	
ENERGY_DET	17	ENET_ENERGYDET 25	
RDAC	23		
LNKLED/JTAG_TDI*	35	ENET_TDI 87	
SPDLED/JTAG_TMS*	36	ENET_TMS 87	
XMTLED*	34	XMIT_LED 87	
RCVLED/JTAG_TDO*	33	TP_ENET_TDO	
TXC	53		
TXD0	57		
TXD1	58		
TXD2	59		
TXD3	60		
TXEN	56		
TXER	52		
RXC	50		
RXD0	48		
RXD1	47		
RXD2	44		
RXD3	43		
RXDV	49		
RXER	51		
CRS	62		
COL	61		
RESET*	9		
MDC	42		
MDIO	41		
XTALI	6		
XTALO	5		
PHYAD0	10	NC	
PHYAD1	11	NC	
PHYAD2	12	NC	
PHYAD3	13	NC	
PHYAD4	14	NC	
OGND1	40		
OGND2	45		
OGND3/JTAG_EN	64		
DGND1	54		
DGND2	63		
AGND1	29		
AGND2	32		
XTALGND	7		
BIASGND	24		

PHY ADDRESS 00000

(PLACE R3126, R3127 R3117, R3118 CLOSE TO PHY)

C8710 0.1UF 20% 10V CERM 402
R8701 49.9 1% 1/16W MF 402
R8700 49.9 1% 1/16W MF 402
C8722 0.1UF 20% 10V CERM 402

PP3V3_PWRON_ENET
R8712 10K 5% 1/16W MF 402
R8713 10K 5% 1/16W MF 402
R8703 49.9 1% 1/16W MF 402
R8702 49.9 1% 1/16W MF 402

C8706 0.1UF 20% 10V CERM 402
C8707 0.1UF 20% 10V CERM 402
C8714 0.1UF 20% 10V CERM 402
C8721 0.1UF 20% 10V CERM 402

TWO OF THESE CAPS SHOULD BE NEAR J8700 PINS 2&5

R8704 10K 5% 1/16W MF 402
ENET_RDAC_PD

R8704 PULLDOWN ENABLES AUTO-MDI/MDIX

R8705 1.27K 1% 1/16W MF 402

RP8702 10K 5% 8M1
87 ENET_5221_FDX
87 ENET_5221_TESTEN
87 ENET_5221_LOW_PWR
87 OGND3_JTAG_EN

I237 MAKE_BASE=TRUE
84 ENET_CLK25M_TX
R8706 33 5% 1/16W MF 402
CLK_ENET_LINK_TX (NET_SPACING_TYPE=10 MIL) — CLKENET_PHY_TX (NET_SPACING_TYPE=10 MIL)

I238 MAKE_BASE=TRUE
84 ENET_CLK125M_RX
CLK_ENET_LINK_RX (NET_SPACING_TYPE=10 MIL)

R8707 33 5% 1/16W MF 402
CLKENET_PHY_RX (NET_SPACING_TYPE=10 MIL)

RP8700 33 5% 8M1

84 ENET_RXD<0>	1	8	ENET_PHY_RXD<0> 48
84 ENET_RXD<1>	2	7	ENET_PHY_RXD<1> 47
84 ENET_RXD<2>	3	6	ENET_PHY_RXD<2> 44
84 ENET_RXD<3>	4	5	ENET_PHY_RXD<3> 43

84 ENET_TXD<0> 57
84 ENET_TXD<1> 58
84 ENET_TXD<2> 59
84 ENET_TXD<3> 60
84 ENET_TX_EN 56
84 ENET_TX_ER 52

R8709 33 5% 1/16W MF 402
84 ENET_RX_DV
ENET_PHY_RX_DV 49
ENET_PHY_RX_ER 51

RP8701 33 5% 1/16W
84 ENET_RX_ER
84 ENET_CRS
84 ENET_COL
ENET_PHY_CRS 62
ENET_PHY_COL 61

ETHPHYRESET_L (NET_SPACING_TYPE=10 MIL) 9
84 ENET_MDC 42
MDIO 41

87 7 PP3V3_PWRON_ENET
C8750 0.1uF 10V CERM 402
77 74 25 8 SYS_WARM_RESET_L
U8750 MC74VHC1G08 SOT23-5
ETHPHYRESET_L_R
R8711 0 5% 1/16W MF 402

R8719 1K 5% 1/16W MF 402
Q8700 2N7002 SM
25 ENETFW_RESET
ENETFW_RESET_L 90
C8723 NOSTUFF 10UF 20% 10V CERM 603
SHASTA SIGNAL IS ACTIVE HIGH

87 7 PP3V3_PWRON_ENET
R8708 1.5K 1% 1/16W MF 603
84 ENET_MDIO

(PLACE Y8700 CRYSTAL CLOSE TO PHY)
87 ENET_CLK25M_XIN
87 ENET_CLK25M_XOUT
Y8700 25.0000M 8X4.5MM-SM
CRITICAL
C8701 27PF 5% 50V CERM 603
C8700 27PF 5% 50V CERM 603

87 OGND3_JTAG_EN

PRIMARY
SYM_VER-3
ENET_TDP 1
ENET_TDN 3
ENET_RDP 4
ENET_RDN 6
RJ45 CHIP SIDE
GND_CHASSIS_RJ45

(514-0200)
CRITICAL
J8700
RJ45
JFM24V10
F-ST-TH

1CT:1CT TX-SIDE
1CT:1CT RX-SIDE
SECONDARY
J1 J2 J3 J4 J5 J6 J7 J8
RJ45 CABLE SIDE
75 OHM 75 OHM 75 OHM 75 OHM
SHIELD 1000PF, 2000V

87 7 PP3V3_PWRON_ENET

DEVELOPMENT
R8718 4.7K 5% 1/16W MF 603
R8717 330 5% 1/16W MF 603
DS3P1 DEVELOPMENT LED8702 GREEN 2.0X1.25A 10/100

R8716 330 5% 1/16W MF 603
DS1P1 DEVELOPMENT LED8701 GREEN 2.0X1.25A XMIT

R8715 330 5% 1/16W MF 603
R8714 4.7K 5% 1/16W MF 603
DS2P1 DEVELOPMENT LED8700 GREEN 2.0X1.25A LINK

87 ENET_TMS
87 XMIT_LED
87 ENET_TDI

NOTE: LINK SUPPORT FOR GIGABIT ETHERNET PULLED DOWN OR ALIASED TO TEST POINTS HERE.

I228 ENET_RXD_PD MAKE_BASE=TRUE
84 ENET_RXD<4>
84 ENET_RXD<5>
I229
84 ENET_RXD<6>
I230
84 ENET_RXD<7>
I231
R8799 10K 1% 1/16W MF 402

84 ENET_CLK125M_GBE_REF
R8798 10K 1% 1/16W MF 402

84 ENET_TXD<4>	I232	TP_ENET_TXD<4> 6 MAKE_BASE=TRUE
84 ENET_TXD<5>	I233	TP_ENET_TXD<5> 6 MAKE_BASE=TRUE
84 ENET_TXD<6>	I234	TP_ENET_TXD<6> 6 MAKE_BASE=TRUE
84 ENET_TXD<7>	I235	TP_ENET_TXD<7> 6 MAKE_BASE=TRUE
84 ENET_CLK125M_GTX	I236	TP_ENET_CLK125M_GTX 6 MAKE_BASE=TRUE

87 PP3V3_PWRON_ENET
C8720 4.7UF 20% 10V CERM 1206
C8719 0.1UF 20% 10V CERM 402
C8718 0.1UF 20% 10V CERM 402
C8717 0.1UF 20% 10V CERM 402
C8713 10UF 20% 6.3V CERM 1206
KEEP ALL CAPS CLOSE TO TRANSCEIVER ON THIS PAGE

ETHERNET PHY

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APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 87 OF 103	

DRAWING

ELECTRICAL_CONSTRAINT_SET	NET_PHYSICAL_TYPE	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
FW	FW			FW_DATA<7..0> 88 90
FW	FW			FW_CTL<1..0> 88 90
FW_LPS	FW			FW_LPS 88 90
FW_LREQ	FW			FW_LREQ 88 90
FW_PINT	FW			FW_PINT 88 90
FW_LCLK	FW	15_MIL_SPACING		FW_CLK98M_LCLK 88 90
FW_PCLK	FW	15_MIL_SPACING		FW_CLK98M_PCLK 88 90
		15_MIL_SPACING		FW_CLK98M_LCLK_R 88

Page Notes

Power aliases required by this page:
- _PP2V5_PWRON_SB

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

74 25 23 7 =PP2V5_PWRON_SB

C8800 0.1uF 20% 10V CERM 402
C8801 0.1uF 20% 10V CERM 402
C8802 0.1uF 20% 10V CERM 402

N5 J7 A4 FWVDDP

U2300 OMIT
SHASTA
V1.0
BGA
(7 OF 8)

FIREWIRE

PHY_DATA_0_H	N4	FW_DATA<0>	88 90
PHY_DATA_1_H	P5	FW_DATA<1>	88 90
PHY_DATA_2_H	N1	FW_DATA<2>	88 90
PHY_DATA_3_H	M7	FW_DATA<3>	88 90
PHY_DATA_4_H	N6	FW_DATA<4>	88 90
PHY_DATA_5_H	L1	FW_DATA<5>	88 90
PHY_DATA_6_H	M3	FW_DATA<6>	88 90
PHY_DATA_7_H	L2	FW_DATA<7>	88 90
PHY_CTL_0_H	N2	FW_CTL<0>	88 90
PHY_CTL_1_H	N3	FW_CTL<1>	88 90
PHY_LPS_H	P6	FW_LPS	88 90
PHY_LREQ_H	P1	FW_LREQ	88 90
PHY_LCLK_H	R1	FW_CLK98M_LCLK_R	88
PHY_LINKON_L	N7	FW_LINKON	90

90 88 FW_CLK98M_PCLK P2 PHY_SCLK_H
90 88 FW_PINT P3 PHY_PINT_L

R8800 22 5% 1/16W MF 402
1 2 FW_CLK98M_LCLK 88 90

Master: Link

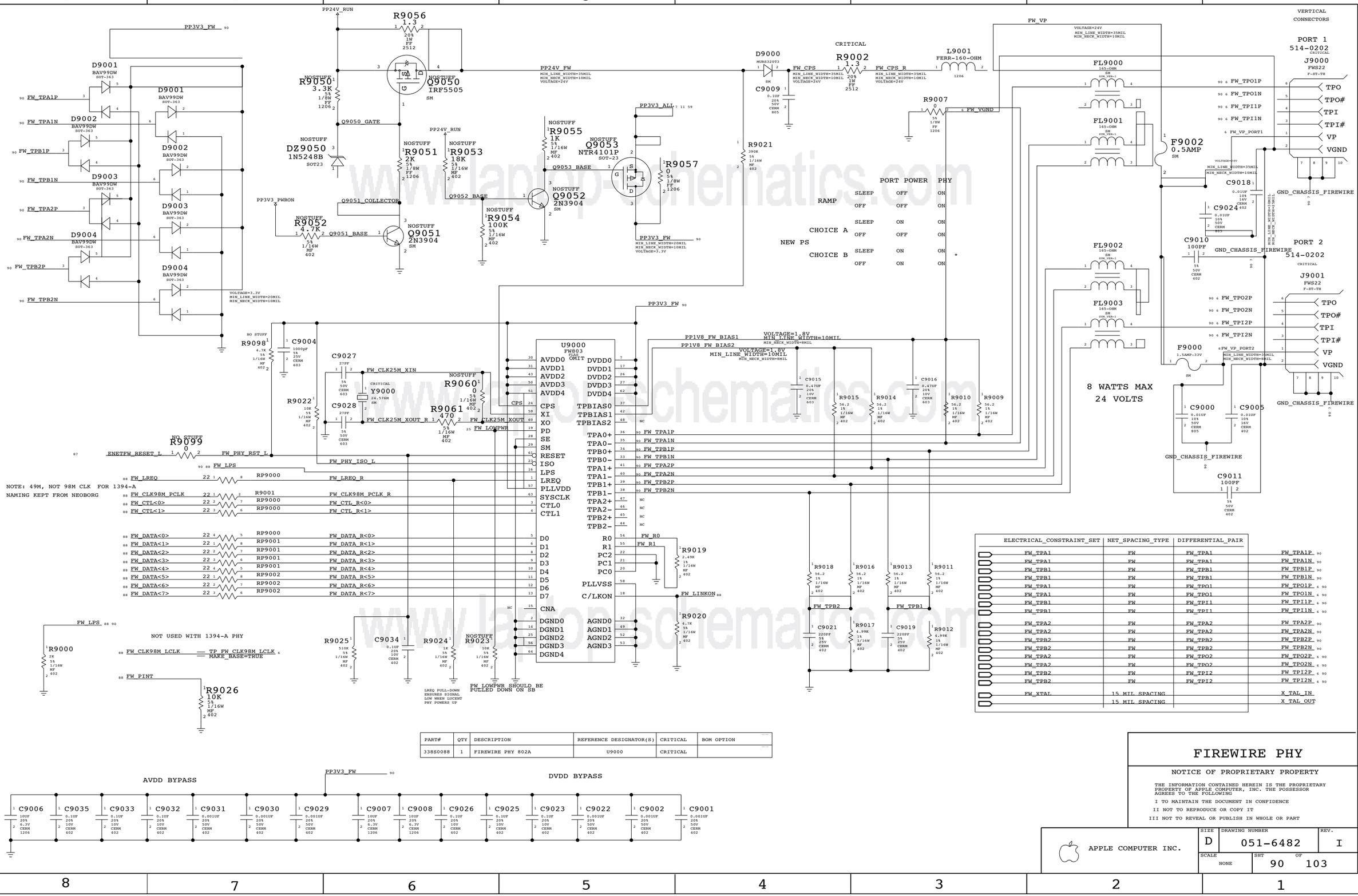
Shasta FireWire

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 88 OF 103	

DRAWING

LAST_MODIFIED=Mon Dec 13 20:02:42 2004



ELECTRICAL_CONSTRAINT_SET	NET_PHYSICAL_TYPE	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
USB2_0	USB2	USB2	USB2_0	USB2_P<0>
USB2_0	USB2	USB2	USB2_0	USB2_N<0>
USB2_1	USB2	USB2	USB2_1	USB2_P<1>
USB2_1	USB2	USB2	USB2_1	USB2_N<1>
USB2_2	USB2	USB2	USB2_2	USB2_P<2>
USB2_2	USB2	USB2	USB2_2	USB2_N<2>
USB2_3	USB2	USB2	USB2_3	USB2_P<3>
USB2_3	USB2	USB2	USB2_3	USB2_N<3>
USB2_4	USB2	USB2	USB2_4	USB2_P<4>
USB2_4	USB2	USB2	USB2_4	USB2_N<4>
USB2_NEC_XTAL		15_MIL_SPACING		NEC_CLK30M_XT1
		15_MIL_SPACING		NEC_CLK30M_XT2
		15_MIL_SPACING		NEC_CLK30M_XT2_R

Page Notes

Power aliases required by this page:
- _PP3V3_PWRON_USB

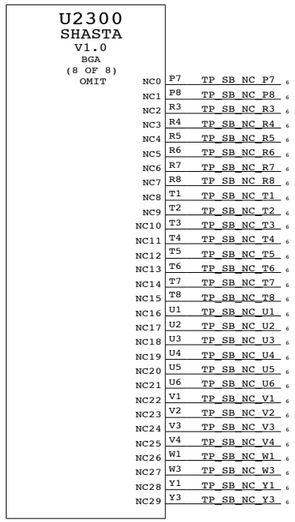
Signal aliases required by this page:
(NONE)

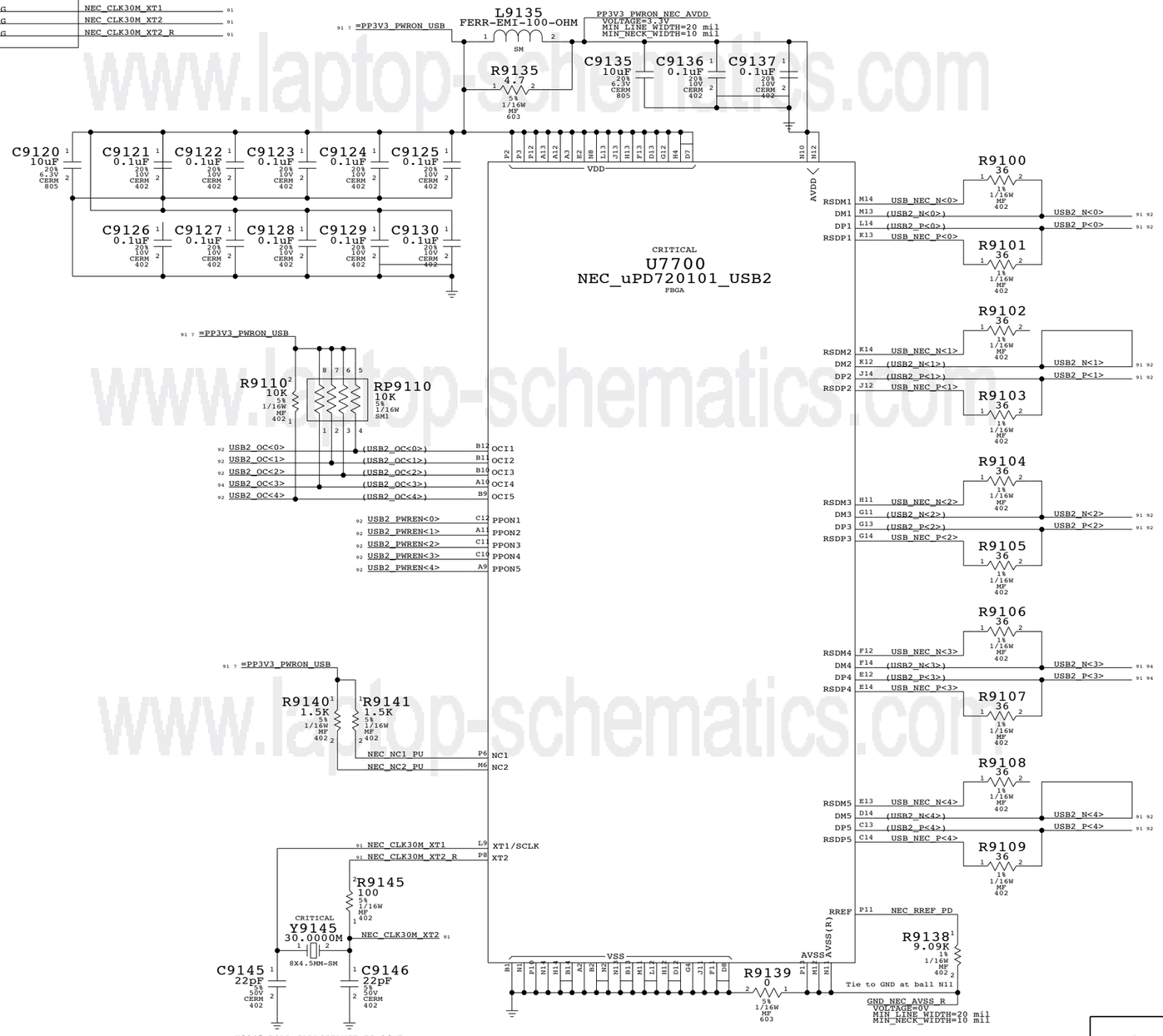
BOM options provided by this page:
(NONE)

Net Spacing Type: USB2

Line To Line: 19.5 mils
Length Tolerance: 50 mils
Primary Max Sep: 7.5 mils
Secondary Max Sep: 100 mils
Secondary Length: 500 mils

NOTE: Target differential impedance for USB2 data pairs is 90 ohms.





DRAWING

LAST_MODIFIED=Mon Dec 13 20:02:45 2004

Master: Fizzy

USB Host Interfaces

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 91 OF 103	

ELECTRICAL_CONSTRAINT_SET	NET_SPACING_TYPE	DIFFERENTIAL_PAIR	
PROVIDED BY USB CONTROLLER	USB2	USB2_PORT1_F	USB2_PORT1_P_F
	USB2	USB2_PORT1_F	USB2_PORT1_N_F
	USB2	USB2_PORT2_F	USB2_PORT2_P_F
	USB2	USB2_PORT2_F	USB2_PORT2_N_F
	USB2	USB2_PORT3_F	USB2_PORT3_P_F
	USB2	USB2_PORT3_F	USB2_PORT3_N_F

External USB Ports

Page Notes

Power aliases required by this page:
- _PP5V_PWRON_USB
- _PP5V_PWRON_UDASH
- _PP3V3_PWRON_UDASH
- _PP3V3_PWRON_BT

Signal aliases required by this page:
(NONE)

NOTE: This page is expected to contain the necessary aliases to map the USB pairs to their appropriate destinations and/or to properly terminate unused signals.

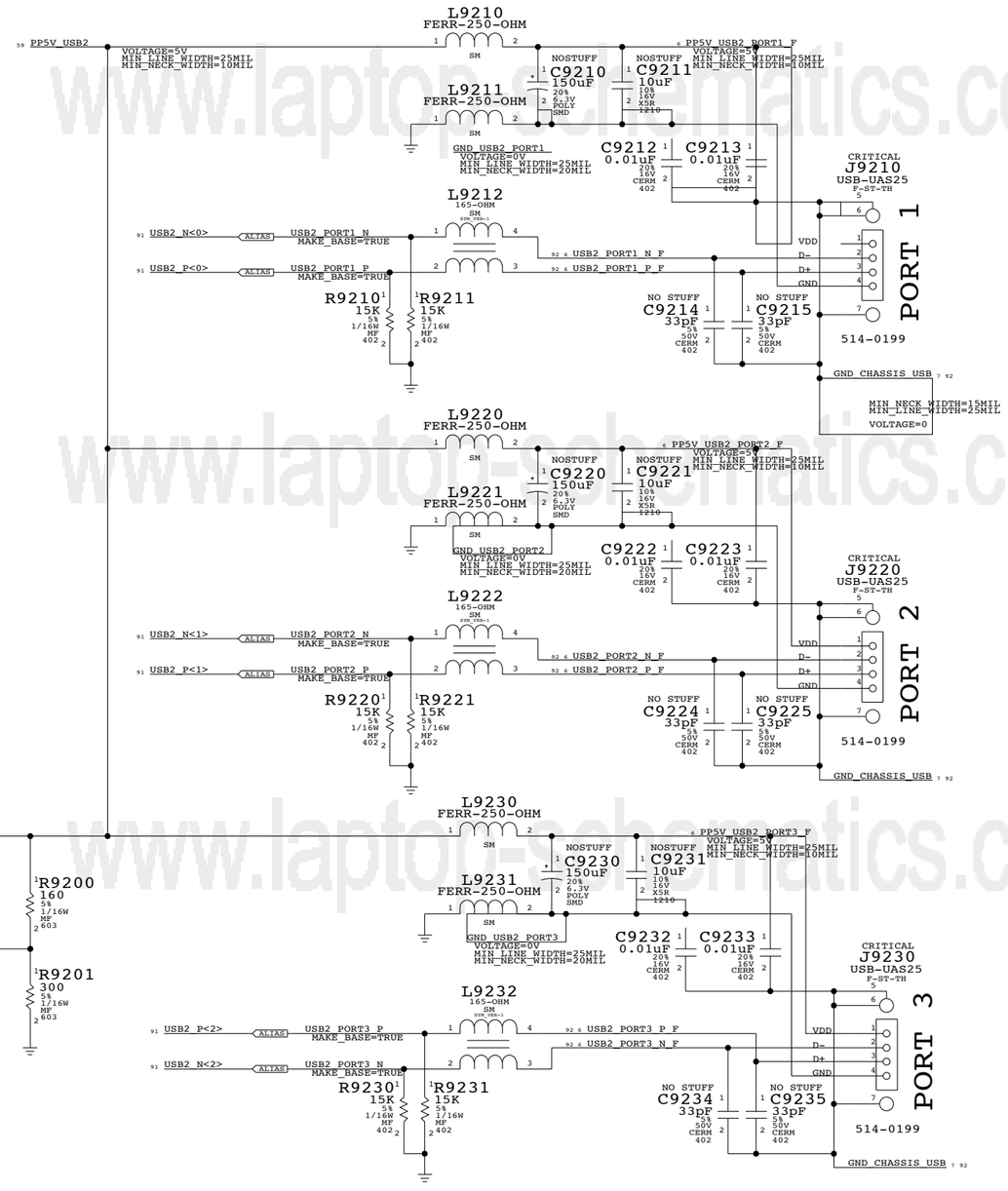
BOM options provided by this page:
(NONE)

NOTE: USB pairs are NOT constrained on this page. It is assumed that the USB Host Controller page will provide the appropriate constraints to apply to entire USB D+/D- XNets.

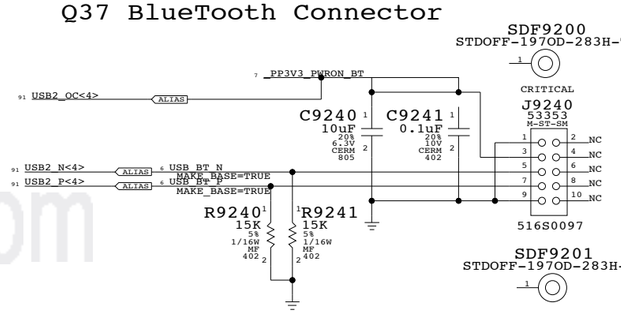
neoBorg Implementation

NOTE: This design does not provide power control on USB ports 2-4. Rename USB controller outputs to indicate single-pin connections.

- USB2_PWREN<0> (ALIAS) → TP_USB2_PWREN<0> MAKE_BASE=TRUE
- USB2_PWREN<1> (ALIAS) → TP_USB2_PWREN<1> MAKE_BASE=TRUE
- USB2_PWREN<2> (ALIAS) → TP_USB2_PWREN<2> MAKE_BASE=TRUE
- USB2_PWREN<3> (ALIAS) → TP_USB2_PWREN<3> MAKE_BASE=TRUE
- USB2_PWREN<4> (ALIAS) → TP_USB2_PWREN<4> MAKE_BASE=TRUE



Q37 BlueTooth Connector



USB Device Interfaces

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APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 92 OF 103	

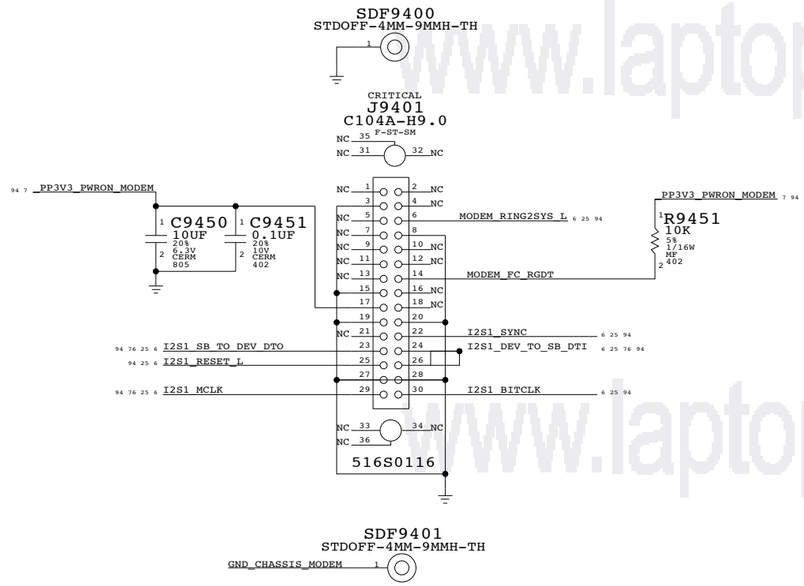
Page Notes

Power aliases required by this page:
- _PP3V3_PWRON_MODEM
  Spec Load: 0.5 A active, 3 mA auxiliary

Signal aliases required by this page:
(NONE)

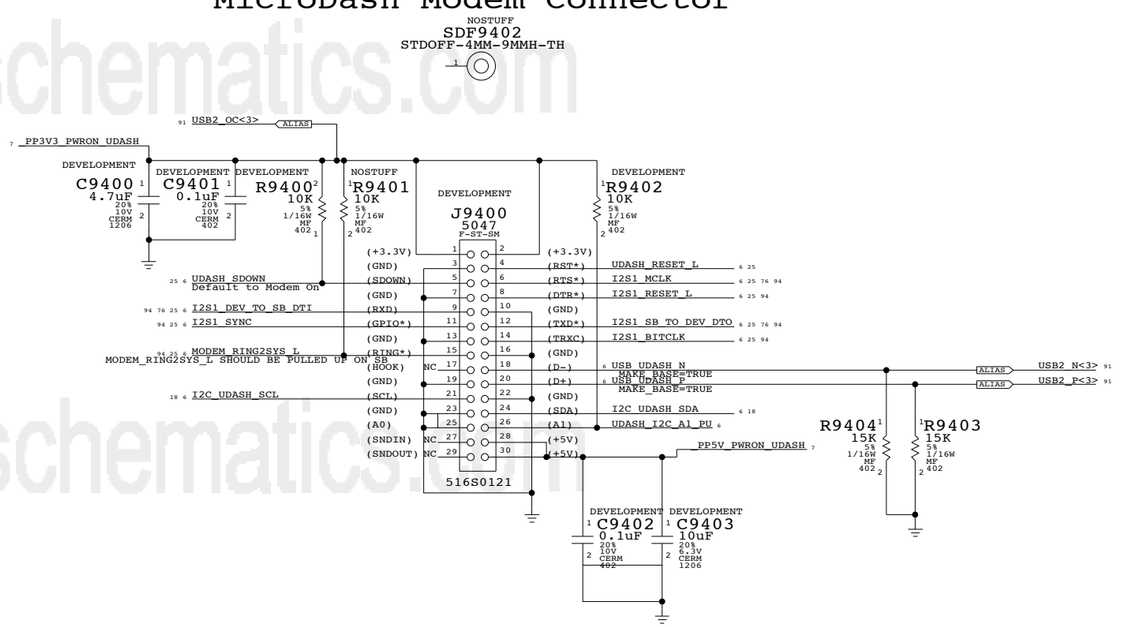
BOM options provided by this page:
(NONE)

Q52 Modem Connector



SOFT MODEM IS PLAN OF RECORD
MICRODASH MODEM CONNECTOR LEFT ON FOR DEVELOPMENT PURPOSES ONLY

MicroDash Modem Connector



RJ11 CONNECTOR

STUFFED AT FATP
SYMBOL USED FOR PLACEMENT

OMIT

J9402
RJ11-HGT27.5
ST-TH

514-0205

From Intel Mobile Audio/Modem
Daughter Card Specification
Rev 1.0, February 22, 1999

1 - MONO_OUT/PC_BEEP	2 - AUDIO_PWRON
3 - GND	4 - MONO_PHONE
5 - AUXA_RIGHT	6 - RESERVED
7 - AUXA_LEFT	8 - GND
9 - CD_GND	10 - 5Vmain
11 - CD_RIGHT	12 - RESERVED
13 - CD_LEFT	14 - RESERVED
15 - GND	16 - PRIMARY_DN
17 - 3.3Vaux	18 - 5Vd
19 - GND	20 - GND
21 - 3.3Vmain	22 - AC97_SYNC
23 - AC97_SDATA_OUT	24 - AC97_SDATA_INB
25 - AC97_RESET#	26 - AC97_SDATA_INA
27 - GND	28 - GND
29 - AC97_MSTRCLK	30 - AC97_BITCLK

Modem Interface

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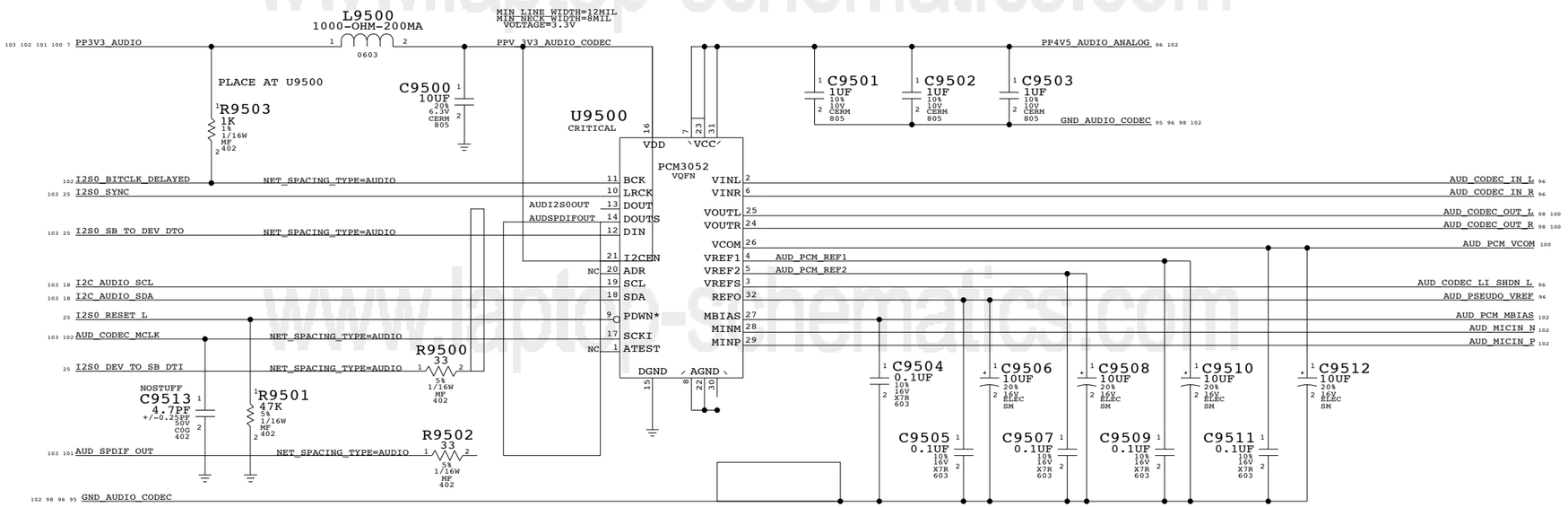
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 94 OF 103	

AUDIO CODEC
APPLE P/N 353S0655



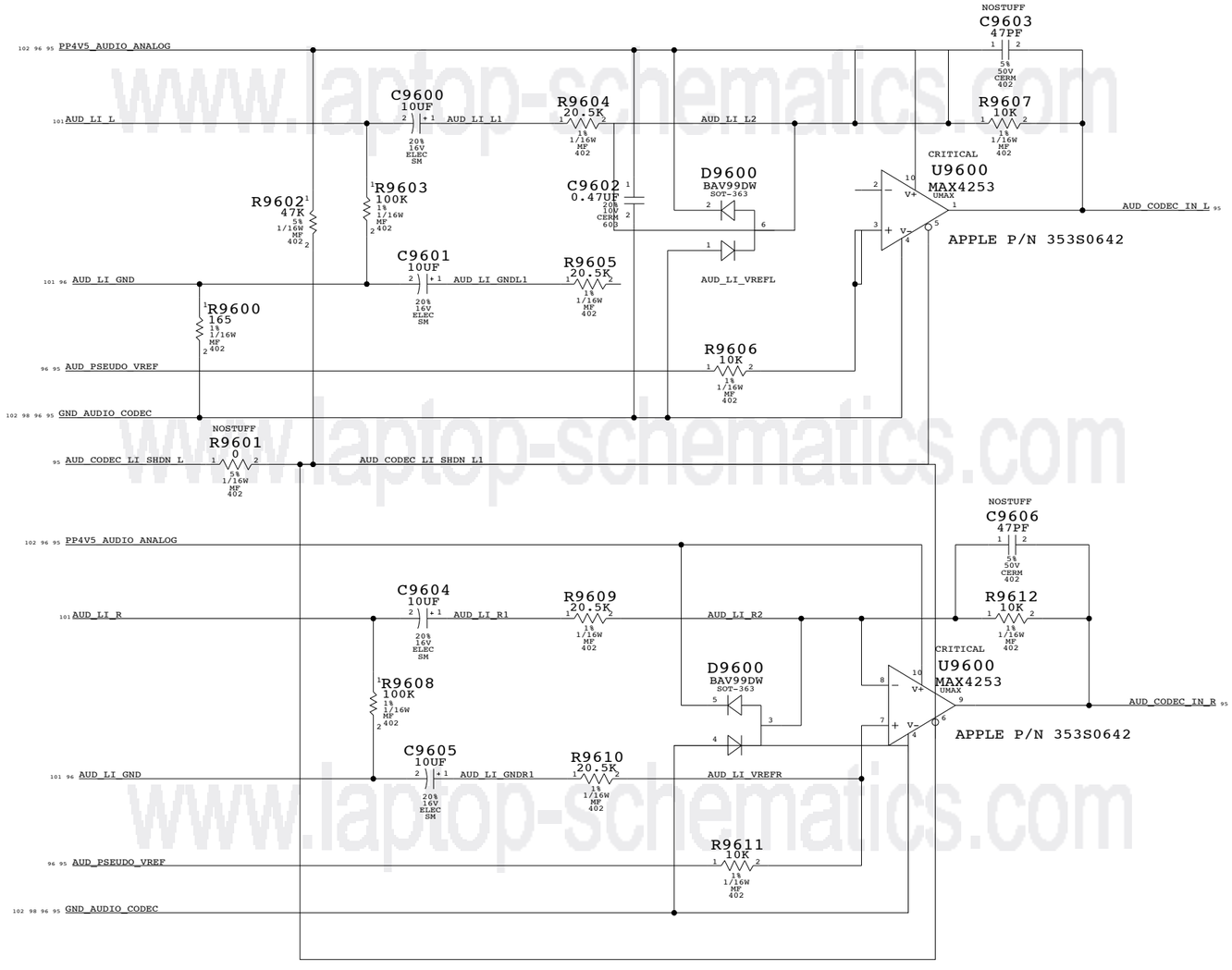
AUDIO: CODEC

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 95 OF 103	

LINE IN PSEUDO-DIFFERENTIAL AMP

AV= 0.49

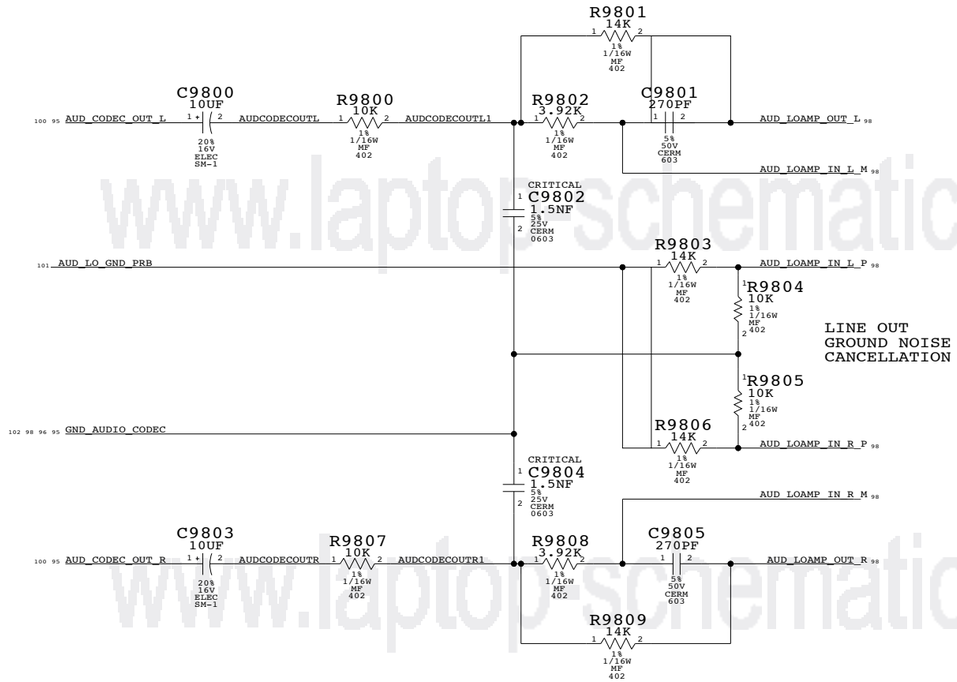


AUDIO: LINE INPUT AMP

APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-6482	I
	SCALE	SHT	OF
	NONE	96	103

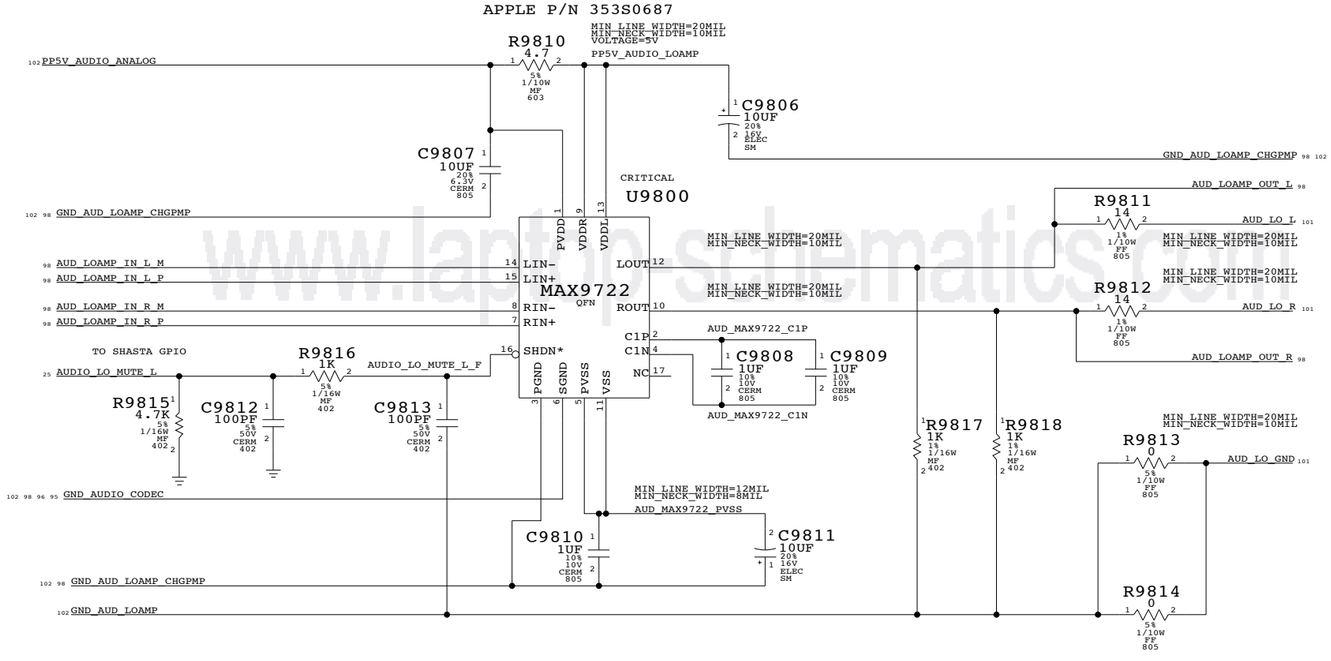
LINE OUT LOW-PASS FILTER

FC = 37 KHZ, HO = -1.4



LINE OUT AMP

APPLE P/N 353S0687



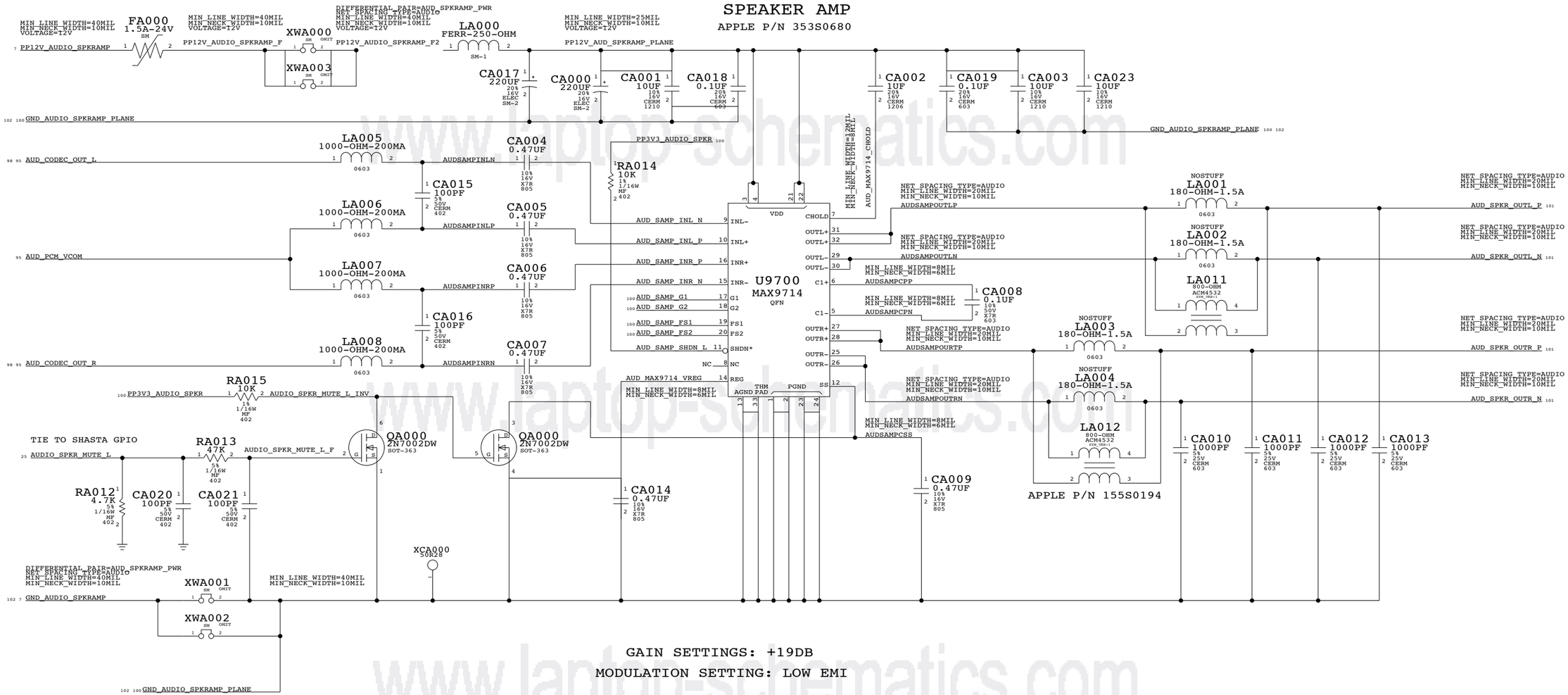
AUDIO: LINE OUT AMP

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 98 OF 103	

SPEAKER AMP

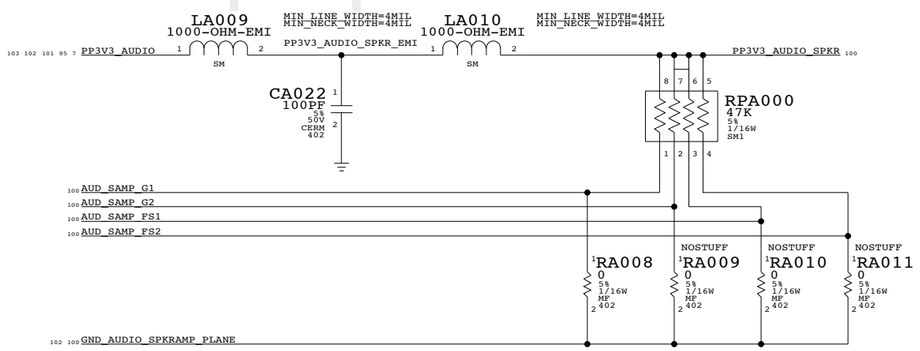
APPLE P/N 353S0680



GAIN SETTINGS: +19DB

MODULATION SETTING: LOW EMI

GAIN AND SWITCHING FREQUENCY STUFF OPTIONS



AUDIO: SPEAKER AMP

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT: 100	OF: 103

LINE IN JACK

APPLE P/N 514-0203

JA100 AJR23 F-ST-TH

LA100 FERR-EMI-100-OHM SM — MIN_LINE_WIDTH=8MIL MIN_NECK_WIDTH=6MIL — AUD_LI_L_JACK — AUD_LI_L_EMI
LA101 FERR-EMI-100-OHM SM — AUD_LI_DET_JACK — AUD_LI_DET_EMI
LA102 FERR-EMI-100-OHM SM — AUD_LI_R_JACK — AUD_LI_R_EMI
LA103 FERR-EMI-100-OHM SM — AUD_LI_GND_JACK — AUD_LI_GND_EMI
LA104 FERR-EMI-100-OHM SM — AUD_LI_L_EMI — AUD_LI_L 96
LA105 FERR-EMI-100-OHM SM — AUD_LI_DET_EMI — AUD_LI_DET_H 101
LA106 FERR-EMI-100-OHM SM — AUD_LI_R_EMI — AUD_LI_R 96
LA107 FERR-EMI-100-OHM SM — AUD_LI_GND_EMI — AUD_LI_GND 96

GND_CHASSIS_AUDIO_EXTERNAL (102 101 7)

CA100 100PF 5% 50V CERM 402
CA101 100PF 5% 50V CERM 402
CA102 100PF 5% 50V CERM 402
CA103 100PF 5% 50V CERM 402

NOSTUFF DZA100 14V-15A 0405

AUD_LI_GND_EMI (101)

GND_CHASSIS_AUDIO_EXTERNAL (102 101 7)

SPEAKER CABLE CONNECTOR

APPLE P/N 518-0138

AUD_SPKR_OUTR_P (100) — LA130 180-OHM-1.5A 0603 — AUD_SPKR_OUTR_P_CONN — JA101 10-89-7082 M-ST-TH — AUD_SPKR_OUTR_N_CONN — LA133 180-OHM-1.5A 0603 — AUD_SPKR_OUTR_N (100)
AUD_SPKR_OUTL_N (100) — LA131 180-OHM-1.5A 0603 — AUD_SPKR_OUTL_N_CONN — AUD_SPKR_OUTL_P_CONN — LA134 180-OHM-1.5A 0603 — AUD_SPKR_OUTL_P (100)

NET_SPACING_TYPE=AUDIO MIN_LINE_WIDTH=20MIL MIN_NECK_WIDTH=12MIL

AUDIO_GPIO_12_CONN

PP3V3_AUDIO (103 102 101 100 95 7) — RA113 47K 5% 1/16W MF 402 — AUDIO_GPIO_12 (25)

SPEAKER TYPE DETECT TO SHASTA GPIO

LA132 1000-OHM-200MA 0603

CA119 1000PF 5% 25V CERM 603
CA125 1000PF 5% 25V CERM 603
CA126 1000PF 5% 25V CERM 603
CA127 1000PF 5% 25V CERM 603
NOSTUFF CA104 1000PF 5% 25V CERM 603
NOSTUFF CA105 1000PF 5% 25V CERM 603
NOSTUFF CA106 1000PF 5% 25V CERM 603
NOSTUFF CA107 1000PF 5% 25V CERM 603

GND_CHASSIS_AUDIO_INTERNAL (101 7)

LINE IN PLUG DETECT

AUDIO_IN_DET0_L = LOW: PLUG INSERTED
AUDIO_IN_DET0_L = HIGH: PLUG NOT INSERTED

PP3V3_AUDIO (103 102 101 100 95 7)

RA100 100K 5% 1/16W MF 402
RA101 47K 5% 1/16W MF 402 — TO SHASTA GPIO — AUDIO_LI_DET_L (25)
RA102 47K 5% 1/16W MF 402 — AUD_LI_DET_H (101) — AUDLINDETH

QA100 2N7002 SM

CA108 0.1UF 20% 10V CERM 402

MIC CABLE CONNECTOR

APPLE P/N 518-0034

JA102 HF28 M-ST-TH — GND_AUDIO_MIC_CONN — AUD_MIC_IN_P_CONN — AUD_MIC_IN_N_CONN

LA108 FERR-EMI-100-OHM SM — GND_AUDIO_MIC (102) — GND_AUDIO_MIC_EMI
LA109 FERR-EMI-100-OHM SM — AUD_MIC_IN_P (102) — AUD_MIC_IN_P_EMI
LA110 FERR-EMI-100-OHM SM — AUD_MIC_IN_N (102) — AUD_MIC_IN_N_EMI
LA111 FERR-EMI-100-OHM SM
LA112 FERR-EMI-100-OHM SM
LA113 FERR-EMI-100-OHM SM

CA120 1000PF 10% 25V X7R 402
CA121 1000PF 10% 25V X7R 402
CA122 1000PF 10% 25V X7R 402

GND_CHASSIS_AUDIO_INTERNAL (101 7)

LINE OUT PLUG DETECTS

AUDIO_LO_DET_L = LOW: PLUG INSERTED
AUDIO_LO_DET_L = HIGH: PLUG NOT INSERTED

AUDIO_LO_OPTICAL_PLUG_L = LOW: OPTICAL DIGITAL AUDIO PLUG INSERTED
AUDIO_LO_OPTICAL_PLUG_L = HIGH: ANALOG AUDIO PLUG INSERTED

PP3V3_AUDIO (103 102 101 100 95 7)

RA103 100K 5% 1/16W MF 402
RA104 47K 5% 1/16W MF 402 — TO SHASTA GPIO — AUDIO_LO_DET_L (6 25)
QA101 2N7002DW SOT-363
RA105 47K 5% 1/16W MF 402 — AUD_LO_DET1 (101) — AUD_LO_DET1_1
CA109 0.1UF 20% 10V CERM 402

PP3V3_AUDIO (103 102 101 100 95 7)

RA106 100K 5% 1/16W MF 402
RA107 47K 5% 1/16W MF 402 — TO SHASTA GPIO — AUDIO_LO_OPTICAL_PLUG_L (25)
QA101 2N7002DW SOT-363
RA108 47K 5% 1/16W MF 402 — AUD_LO_DET2 (101) — AUD_LO_DET2_1
CA110 0.1UF 20% 10V CERM 402
NOSTUFF RA109 100K 5% 1/16W MF 402

LINE OUT JACK

APPLE P/N 514-0204

JA103 JFJ8210 F-ST-TH

AUD_LO_GND_JACK
AUD_LO_DET1_JACK
AUD_LO_R_JACK — MIN_LINE_WIDTH=12MIL MIN_NECK_WIDTH=8MIL
AUD_LO_L_JACK — MIN_LINE_WIDTH=12MIL MIN_NECK_WIDTH=8MIL
AUD_LO_DET2_JACK

LED VIN VDD GND

MIN_LINE_WIDTH=12MIL MIN_NECK_WIDTH=8MIL AUD_SPDIF_GND

RA112 0 5% 1/16W MF 402

PLACE NEAR J9801 XCA100 50R28
PLACE NEAR J700 XCA101 50R28

GND_CHASSIS_AUDIO_INTERNAL (101 7)

LA114 FERR-EMI-100-OHM SM — AUD_SPDIF_OUT (103 95) — AUD_SPDIF_OUT_EMI
LA115 FERR-EMI-100-OHM SM — PP5V_AUDIO (7) — PP5V_AUDIO_SPDIF_EMI
LA116 FERR-EMI-100-OHM SM — AUD_LO_DET1 (101) — AUD_LO_DET1_EMI
LA117 FERR-EMI-100-OHM SM — AUD_LO_R (98) — AUD_LO_R_EMI
LA118 FERR-EMI-100-OHM SM — AUD_LO_L (98) — AUD_LO_L_EMI
LA119 FERR-EMI-100-OHM SM — AUD_LO_DET2 (101) — AUD_LO_DET2_EMI
LA120 FERR-EMI-100-OHM SM — AUD_LO_GND (98) — AUD_LO_GND_EMI
LA121 FERR-EMI-100-OHM SM — AUD_LO_GND_PRB (98) — AUD_LO_GND_PRB_EMI
LA122 FERR-EMI-100-OHM SM — AUD_SPDIF_OUT_JACK
LA123 FERR-EMI-100-OHM SM — PP5V_AUDIO_SPDIF_JACK
LA124 FERR-EMI-100-OHM SM
LA125 FERR-EMI-100-OHM SM
LA126 FERR-EMI-100-OHM SM
LA127 FERR-EMI-100-OHM SM
LA128 FERR-EMI-100-OHM SM
LA129 FERR-EMI-100-OHM SM

MIN_LINE_WIDTH=12MIL MIN_NECK_WIDTH=8MIL

CA117 0.1UF 20% 10V CERM 402
CA118 1UF 10% 10V CERM 805

CA123 100PF 5% 50V CERM 402
CA124 100PF 5% 50V CERM 402
CA111 100PF 5% 50V CERM 402
CA112 100PF 5% 50V CERM 402
CA113 100PF 5% 50V CERM 402
CA114 100PF 5% 50V CERM 402
CA115 100PF 5% 50V CERM 402
CA116 0.01UF 10% 16V CERM 402

AUD_LI_GND_EMI (101)
DZA101 MMBZ15DLT1 15V SOT23

GND_CHASSIS_AUDIO_EXTERNAL (102 101 7)

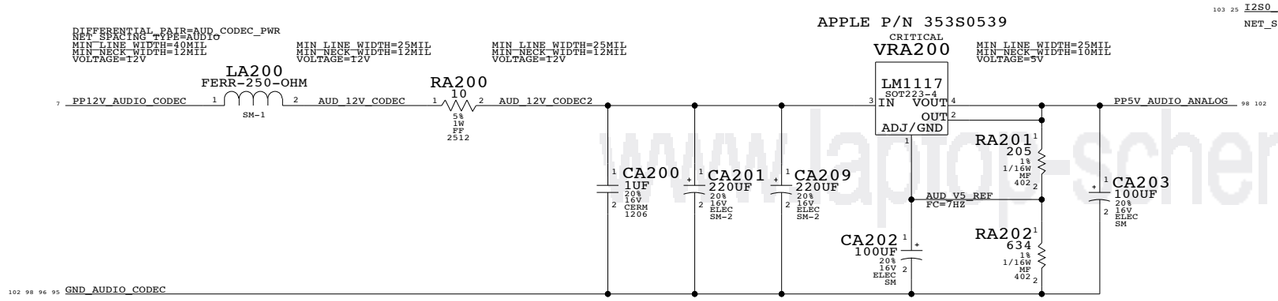
AUDIO: Q45 CONNECTORS

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 101 OF 103	

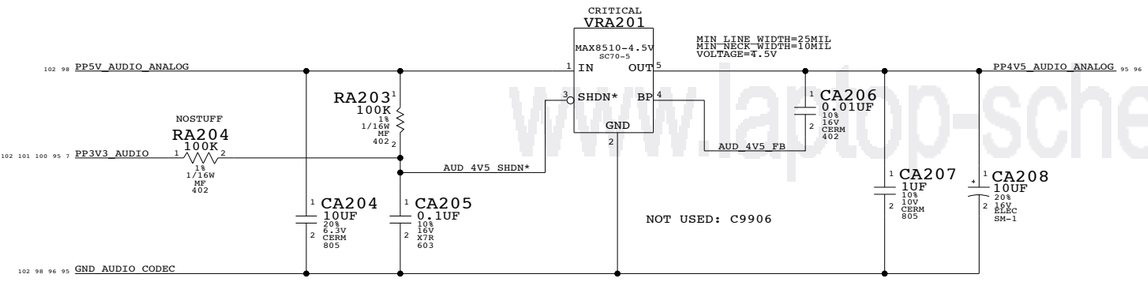
5V POWER SUPPLY FOR THE HEADPHONES/LINE OUT AMP

APPLE P/N 353S0539

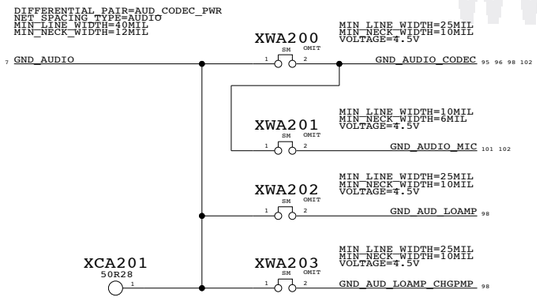


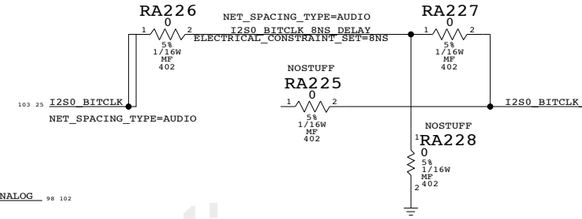
4.5V POWER SUPPLY FOR CODEC AND LINE IN AMP

APPLE P/N 353S0733

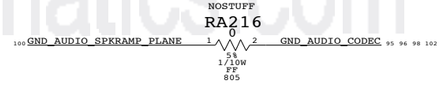


AUDIO GROUND RETURNS

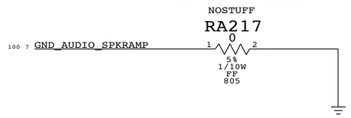




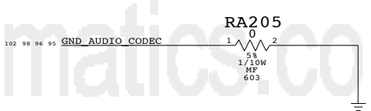
PLACE ACROSS GROUND SPLIT
AT RIGHT SIDE OF CA007



PLACE NEAR ENTRY TO SPEAKER
AMP GROUND PLANE

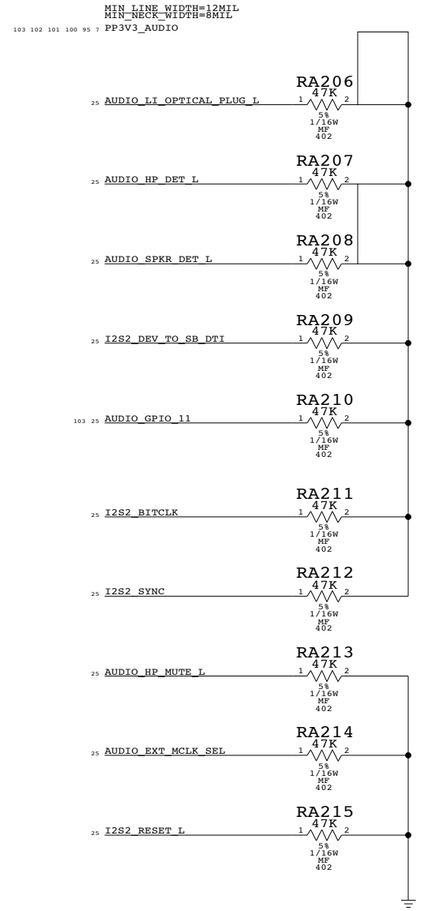


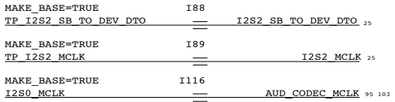
PLACE ACROSS GROUND SPLIT
AT CODEC U9500



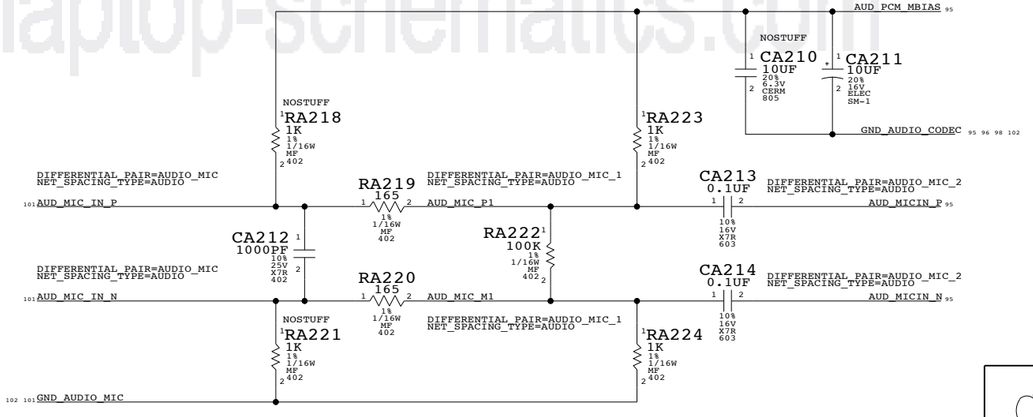
PLACE AT J5903

UNUSED GPIO TERMINATIONS





MICROPHONE IMPEDANCE MATCHING CIRCUIT



AUDIO: Q45 POWER SUPPLIES

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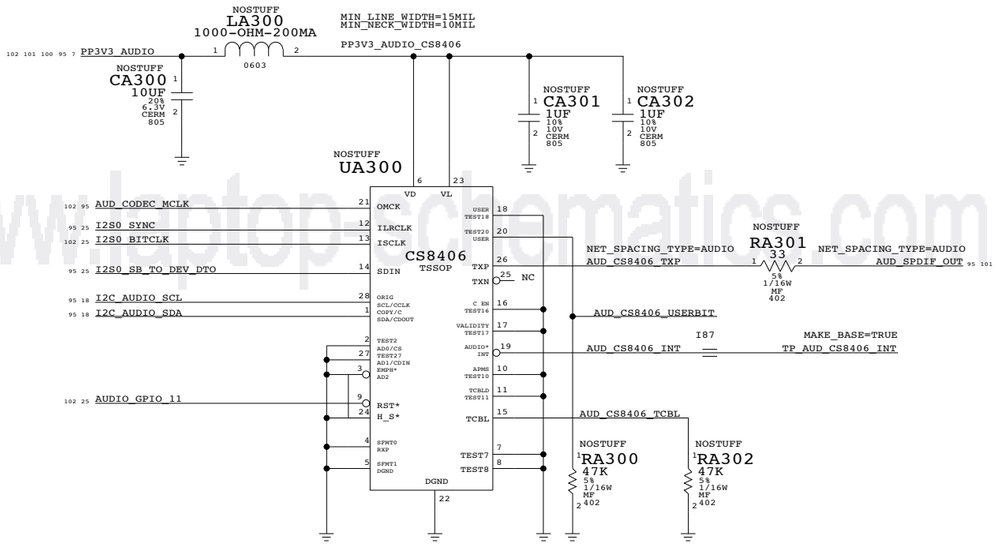
D	051-6482	I
SCALE: NONE	SHT 102 OF 103	

S/PDIF TRANSMITTER
I2C ADDRESS = 0010 000X

APPLE P/N 353S0597



AUDIO: S/PDIF XMITTER

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6482	I
SCALE: NONE	SHT 103 OF 103	