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.

Mullet

M1 MLB

DVT Build - 12/02/2005

REV	ZONE	ECN	DESCRIPTION OF CHANGE	CK APPD / DATE	ENG APPD / DATE
12		412764	ENGINEERING RELEASED		12/03/05

Schematic / PCB #'s

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
051-6941	1	SCHEM,MULLET,M1	SCH	CRITICAL	
820-1881	1	PCBF,MULLET,M1	PCB	CRITICAL	PCB_THICK
920-0342	1	PCBF,MULLET_THIN,M1	PCB	CRITICAL	PCB_THIN

DRAWING
TITLE=MULLET
ABBREV=DRAWING
LAST_MODIFIED=Fri Dec 2 23:03:42 2005

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
SCHEM,MULLET,M1

DRAWING NUMBER 051-6941 REV. 12

SHT 1 OF 104

8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

D

C

B

A

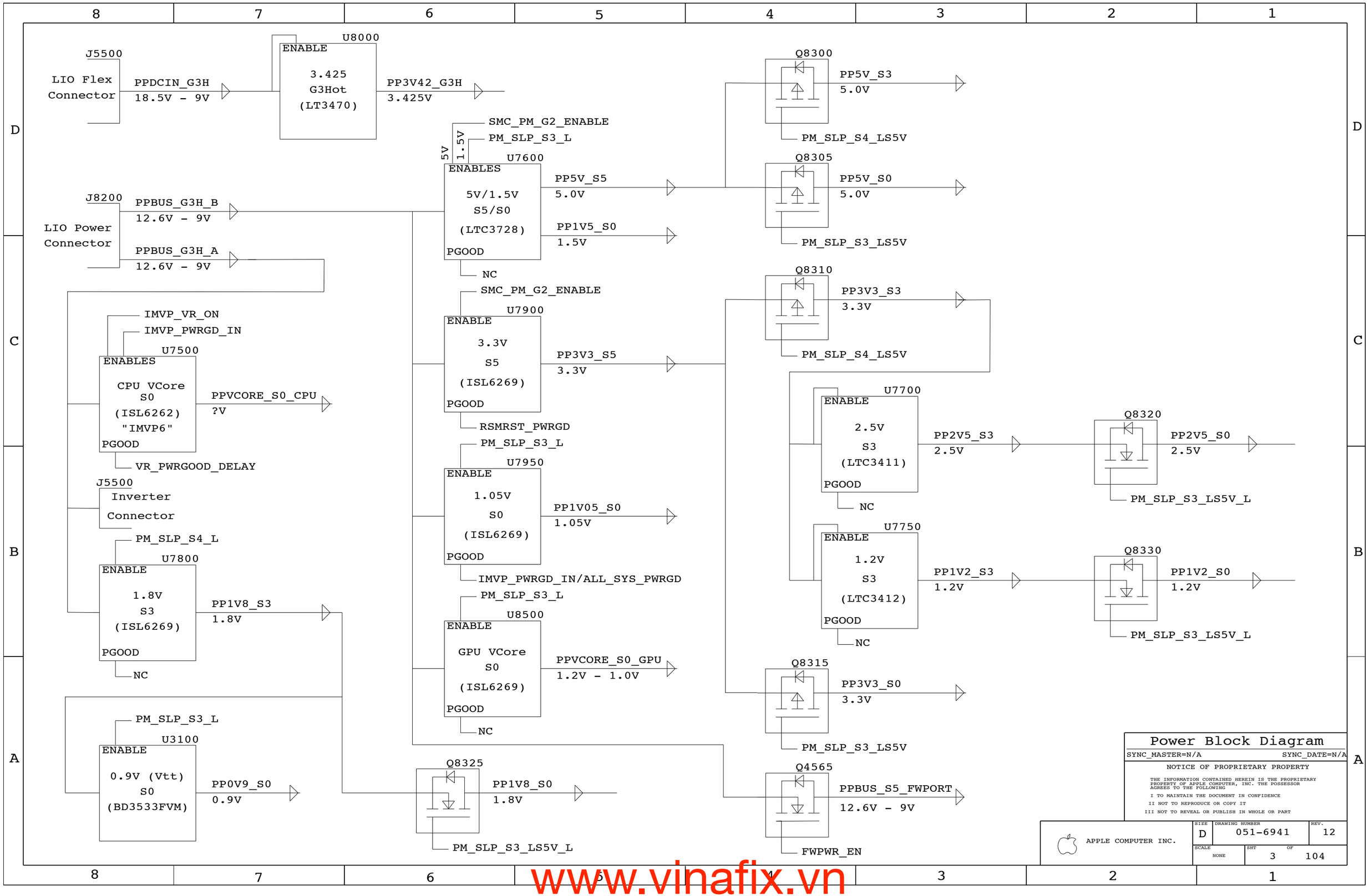
System Block Diagram

SYNC_MASTER=N/A SYNC_DATE=N/A

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	2	104



"Better" BOMs

BOM NUMBER	BOM NAME	BOM OPTIONS
630-7401	PCBA,MULLET_BTR,HY128,M1	075-0139,075-0140,075-0154,EEE_UNH
630-7403	PCBA,MULLET_BTR,SAM128,M1	075-0139,075-0140,075-0156,EEE_UNK

"Best" BOMs

BOM NUMBER	BOM NAME	BOM OPTIONS
630-7429	PCBA,MULLET_BST,SAM128,M1	075-0139,075-0171,075-0156,EEE_UR8
630-7430	PCBA,MULLET_BST,HY128,M1	075-0139,075-0171,075-0154,EEE_UR9
630-7254	PCBA,MULLET_BST,SAM256,M1	075-0139,075-0171,075-0138,EEE_TYY
630-7402	PCBA,MULLET_BST,HY256,M1	075-0139,075-0171,075-0155,EEE_UNJ

Phantom BOMs

BOM NUMBER	BOM NAME	BOM OPTIONS
075-0139	PROJ_PTS,MULLET,M1	COMMON,M1_COMMON,M1_DEBUG,PROJ_PROTOEVTDVT
075-0140	LE_MENU,MULLET_BTR,M1	CPU_BTR,LEMENU_PROTOEVTDVT
075-0171	LE_MENU,MULLET_BST,M1	CPU_BST,LEMENU_PROTOEVTDVT
075-0156	128SAM,MULLET,M1	VRAM_128_SAMSUNG
075-0154	128HY,MULLET,M1	GPU_MEM_HYNIX,VRAM_128_HYNIX
075-0138	256SAM,MULLET,M1	GPU_MEM_256M,VRAM_256_SAMSUNG
075-0155	256HY,MULLET,M1	GPU_MEM_256M,GPU_MEM_HYNIX,VRAM_256_HYNIX

BOMOPTION Groups

BOM GROUP	BOM OPTIONS
M1_COMMON	M1_COMMON1,M1_COMMON2,M1_COMMON3
M1_COMMON1	ENETPWR_S3AC,GPU_BB_CTL,GPUTHM_A_GPU,HSTHMSNS_HAS,INVERTER_BUF
M1_COMMON2	KBDLED_HAS,LVDS_PD,MEMVREF_S3,MEMVTT_EN_PU,PCB_THICK
M1_COMMON3	RTUSB_ESD,USB_C_OC_PU,USB_D_OC_PU,USB_E_OC_PU,USB_G_OC_PU
M1_DEBUG	DEVELOPMENT,ITP,LPCPLUS

Phantom BOM #'s

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
075-0138	1	256SAM,B13,MULLET,M1	BOM3	CRITICAL	075-0138
075-0139	1	PROJ PTS,MULLET,M1	BOM1	CRITICAL	075-0139
075-0140	1	LE MENU,MULLET BTR,M1	BOM2	CRITICAL	075-0140
075-0154	1	128HY,MULLET,M1	BOM3	CRITICAL	075-0154
075-0155	1	256HY,MULLET,M1	BOM3	CRITICAL	075-0155
075-0156	1	128SAM,MULLET,M1	BOM3	CRITICAL	075-0156
075-0171	1	LE MENU,MULLET BST,M1	BOM2	CRITICAL	075-0171

Bar Code Label / EEE #'s

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION	
826-4393	1	LBL,P/N LABEL,PCB,28MM X 6 MM	[EEE:TYY]	CRITICAL	EEE_TYY	M1,BST,SAM256
826-4393	1	LBL,P/N LABEL,PCB,28MM X 6 MM	[EEE:UNH]	CRITICAL	EEE_UNH	M1,BTR,HY128
826-4393	1	LBL,P/N LABEL,PCB,28MM X 6 MM	[EEE:UNJ]	CRITICAL	EEE_UNJ	M1,BST,HY256
826-4393	1	LBL,P/N LABEL,PCB,28MM X 6 MM	[EEE:UNK]	CRITICAL	EEE_UNK	M1,BTR,SAM128
826-4393	1	LBL,P/N LABEL,PCB,28MM X 6 MM	[EEE:UR8]	CRITICAL	EEE_UR8	M1,BST,SAM128
826-4393	1	LBL,P/N LABEL,PCB,28MM X 6 MM	[EEE:UR9]	CRITICAL	EEE_UR9	M1,BST,HY128

Module Parts

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
333S0354	4	IC,SGRAM,GDDR3,8MX32,700MHZ,136 FBGA	U8900,U8950,U9000,U9050	CRITICAL	VRAM_128_SAMSUNG
333S0350	4	IC,SGRAM,GDDR3,16MX32,700MHZ,136 FBGA	U8900,U8950,U9000,U9050	CRITICAL	VRAM_256_SAMSUNG
333S0358	4	IC,SGRAM,GDDR3,8MX32,700MHZ,136 FBGA	U8900,U8950,U9000,U9050	CRITICAL	VRAM_128_HYNIX
333S0351	4	IC,SGRAM,GDDR3,16MX32,700MHZ,136 FBGA	U8900,U8950,U9000,U9050	CRITICAL	VRAM_256_HYNIX

"LeMenu Stage #1" Parts

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
338S0268	1	IC,FW32306,1394A LINK,BGA,129P	U4400	CRITICAL	LEMENU_STAGE1
338S0270	1	IC,88E8053,GIGABIT ENET XCVR,64P QFN, NO	U4101	CRITICAL	LEMENU_STAGE1
338S0274	1	IC,SMC,HS8/2116	U5800	CRITICAL	LEMENU_STAGE1
338S0309	1	IC,ATI,M56P,GRPHSCTRL,880BGA,LF	U8400	CRITICAL	LEMENU_STAGE1
341S1797	1	IC,EEPROM,SERIAL IIC,8KBIT,SO8	U4102	CRITICAL	LEMENU_STAGE1
341S1812	1	IC,EFI,BOOTROM DEVELOPMENT,M1	U6301	CRITICAL	BOOTROM_DEVEL
341S1813	1	IC,EFI,BOOTROM FINAL,M1	U6301	CRITICAL	BOOTROM_FINAL
353S1235	1	IC,CPU VOLTAGE REGULATOR,IMVP,TWO PHASE	U7530	CRITICAL	LEMENU_STAGE1
359S0101	1	IC,CY28445-5,CLOCK GEN,68PIN QFN	U3301	CRITICAL	LEMENU_STAGE1

"LeMenu Stage #2" Parts

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
341S1789	1	IC, TPM, 28-PIN TSSOP	U6700	CRITICAL	LEMENU_STAGE2

"LeMenu Stage #3" Parts

PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
337S3267	1	IC,M1 BTR,479 BGA	U0700	CRITICAL	CPU_BTR
337S3268	1	IC,M1 BST,479 BGA	U0700	CRITICAL	CPU_BST
338S0269	1	IC,945GM,SOUTHBRIDGE	U1200	CRITICAL	LEMENU_STAGE3
343S0385	1	IC,SB,652BGA	U2100	CRITICAL	LEMENU_STAGE3

LeMenu Stage Mappings

BOM GROUP	BOM OPTIONS
LEMENU_LOCALPROTO	BOOTROM_DEVEL,LEMENU_STAGE1,LEMENU_STAGE2,LEMENU_STAGE3
LEMENU_PROTOEVTDVT	LEMENU_STAGE2,LEMENU_STAGE3
PROJ_PROTOEVTDVT	BOOTROM_DEVEL,LEMENU_STAGE1
LEMENU_PVTRAMP	LEMENU_STAGE3
PROJ_PVTRAMP	BOOTROM_FINAL,LEMENU_STAGE1,LEMENU_STAGE2

The number of parts managed as Le Menu decreases as a project progresses.
The above stages and build settings are per 8/25 strategy statement.

BOM Configuration

SYNC_MASTER=N/A SYNC_DATE=N/A

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE: NONE SHT 4 OF 104

Functional Test Points

Power Supply NO_TESTs

NO_TEST	EXPOSED_VIA		
TRUE		IMVP6_RBIAS	57
TRUE		IMVP6_COMP	57
TRUE		P5VS5_RUNSS	58 62
TRUE		P1V5S0_RUNSS	58 62
TRUE		P2V5S3_MODE	59
TRUE		P2V5S3_SHDNRT	59
TRUE		P1V2S3_RT	59
TRUE		P1V2S3_RUNSS	39 59
TRUE		P1V8S3_COMP	60
TRUE		P1V8S3_FSET	60
TRUE		P3V3S5_COMP	61
TRUE		P3V3S5_FSET	61
TRUE		P1V05S0_COMP	61
TRUE		P1V05S0_FSET	61
TRUE		P3V42G3H_FB	62
TRUE		GPUVCORE_COMP	66
TRUE		GPUVCORE_FSET	66
TRUE		GPUBBP_ADJ	66

CPU FSB NO_TESTs

NO_TEST	EXPOSED_VIA		
TRUE		FSB_A_L<31..3>	7 12 79
TRUE		FSB_ADS_L	7 12 79
TRUE	TRUE	FSB_ADSTB_L<1..0>	7 12 79
TRUE		FSB_BNR_L	7 12 79
TRUE		FSB_BREQ0_L	7 12 79
TRUE		FSB_D_L<63..0>	7 12 79
TRUE		FSB_DBSY_L	7 12 79
TRUE	TRUE	FSB_DINV_L<3..0>	7 12 79
TRUE		FSB_DRDY_L	7 12 79
TRUE	TRUE	FSB_DSTBN_L<3..0>	7 12 79
TRUE	TRUE	FSB_DSTBP_L<3..0>	7 12 79
TRUE		FSB_HIT_L	7 12 79
TRUE		FSB_HITM_L	7 12 79
TRUE		FSB_LOCK_L	7 12 79
TRUE		FSB_REQ_L<4..0>	7 12 79

EXPOSED_VIA property indicates that the net should have a via with 10-mil soldermask opening for use as engineering probe point.

Misc EXPOSED_VIA Nets

EXPOSED_VIA		
TRUE	DMI_N2S_P<1..0>	14 22
TRUE	DMI_N2S_N<1..0>	14 22
TRUE	SB_CLK100M_SATA_P	21 34
TRUE	SB_CLK100M_SATA_N	21 34

FUNC_TEST property removed since these test points are not on the proper side for Functional Test points.

Fan Connectors

FUNC_TEST	
=PP5V_S0_FAN_LT	54 63
FAN_LT_PWM	54
FAN_LT_TACH	54
FAN_RT_PWM	54
FAN_RT_TACH	54

LPC+ Debug Connector

FUNC_TEST	
TRUE =PP3V3_S5_LPCPLUS	49 63
TRUE =PP5V_S0_LPCPLUS	49 63
TRUE LPC_AD<0>	21 47 49 56
TRUE LPC_AD<1>	21 47 49 56
TRUE LPC_FRAME_L	21 47 49 56
TRUE PM_CLKRUN_L	23 40 47 49 56
TRUE BOOT_LPC_SPI_L	22 47 49
TRUE SMC_TMS	47 48 49
TRUE DEBUG_RST_L	26 49
TRUE SMC_TRST_L	47 49
TRUE SMC_TDO	47 48 49
TRUE SMC_MD1	47 49
TRUE SMC_TX_L	47 48 49
TRUE FWH_INIT_L	21 48 49
TRUE PCI_CLK_PORT80_LPC	34 49
TRUE LPC_AD<2>	21 47 49 56
TRUE LPC_AD<3>	21 47 49 56
TRUE INT_SERIRQ	23 47 49 56
TRUE PM_SUS_STAT_L	23 47 48 49 56
TRUE SMC_TDI	47 48 49
TRUE SMC_TCK	47 48 49
TRUE SMC_RST_L	47 48 49
TRUE SMC_NMI	47 49
TRUE SMC_RX_L	47 48 49
TRUE SV_SET_UP	23 49

Left ALS Connector

FUNC_TEST	
TRUE =PP3V3_S3_LTALS	63 76
TRUE ALS_GAIN	6 47 76
TRUE LTALS_OUT	53 76
TRUE GND\g	

Camera Connector

FUNC_TEST	
TRUE =PP5V_S3_CAMERA	43 63
TRUE =USB2_CAMERA_N	6 43
TRUE =USB2_CAMERA_P	6 43
TRUE =SMBUS_ATS_SDA	27 43
TRUE =SMBUS_ATS_SCL	27 43
TRUE GND\g	

Thermal Diode Connectors

FUNC_TEST	
TRUE HSTHMSNS_DX_P	50
TRUE HSTHMSNS_DX_N	50
TRUE RSFSTHMSNS_D_P	50
TRUE RSFSTHMSNS_D_N	50

Other Func Test Points

FUNC_TEST	
TRUE =PP1V05_S0_REG	51 61 63
TRUE PM_SYSRST_L	23 26 47
TRUE SMC_ONOFF_L	43 47 48 51

Current Sense Calibration

FUNC_TEST	
TRUE ISENSE_CAL_EN	
TRUE =PP5V_S0_ISENSECAL	
2 TPs per: TRUE PP1V8_S3_REG	63
TRUE PP1V5_S0_REG	63
TRUE PPVCORE_S0_GPU	63
TRUE PPVCORE_S0_CPU	63
TRUE GND\g	

8 TPs, 2 with each of above TP pairs

Battery Digital Connector

FUNC_TEST	
TRUE SMC_BS_ALRT_L	47 48 64
TRUE =SMBUS_BATT_SCL	27 64
TRUE =SMBUS_BATT_SDA	27 64
TRUE GND_BATT	64

Left I/O Data Connector

FUNC_TEST	
TRUE =PP1V5_S0_LIO	45 63
TRUE =PPDCIN_G3H_LIO	45 63
TRUE =PP5V_S5_LIO	45 63
TRUE =PP3V42_G3H_LIO	45 63
TRUE PP5V_S0_AUDIO_PWR	45
TRUE PP5V_S0_AUDIO	45
TRUE GND_AUDIO_PWR	45
TRUE GND_AUDIO	45
TRUE ACZ_SDATAIN<0>	21 45 79
TRUE ACZ_SDATAOUT	21 45 79
TRUE ACZ_BITCLK	21 45 79
TRUE ACZ_RST_L	21 45 79
TRUE EXCARD_OC_L	6 45 48
TRUE LTUSB_OC_L	6 45
TRUE LIO_BATT_ISENSE	45 51
TRUE SMC_SYS_ISET	45 47
TRUE SMC_BATT_ISET	45 47
TRUE SMC_BATT_CHG_EN	45 47 48
TRUE SMC_BC_ACOK	45 47 48
TRUE SMC_ADAPTER_EN	41 45 47 48
TRUE LIO_P3V3S0_EN_L	45 62
TRUE LIO_DCIN_ISENSE	45 51
TRUE LIO_P3V3S3_EN	45 62
TRUE SMC_BATT_TRICKLE_EN_L	45 47 48
TRUE SYS_ONEWIRE	45 47 48
TRUE MINI_CLKREQ_L	34 45
TRUE SMC_EXCARD_CP	45 47 48
TRUE EXCARD_CLKREQ_L	34 45
TRUE SMC_EXCARD_PWR_EN	45 47
TRUE LIO_PLT_RESET_L	26 45
TRUE ACZ_SYNC	21 45 79
TRUE =USB2_LT_N	6 45
TRUE =USB2_LT_P	6 45
TRUE =USB2_EXCARD_N	6 45
TRUE =USB2_EXCARD_P	6 45
TRUE =PCIE_EXCARD_R2D_N	45 46
TRUE =PCIE_EXCARD_R2D_P	45 46
TRUE =PCIE_EXCARD_D2R_N	45 46
TRUE =PCIE_EXCARD_D2R_P	45 46
TRUE PCIE_CLK100M_EXCARD_P	34 45
TRUE PCIE_CLK100M_EXCARD_N	34 45
TRUE =PCIE_MINI_R2D_N	45 46
TRUE =PCIE_MINI_R2D_P	45 46
TRUE =PCIE_MINI_D2R_N	45 46
TRUE =PCIE_MINI_D2R_P	45 46
TRUE PCIE_CLK100M_MINI_P	34 45
TRUE PCIE_CLK100M_MINI_N	34 45
TRUE =SMBUS_LIO_SMC_SCL	27 45
TRUE =SMBUS_LIO_SMC_SDA	27 45
TRUE =SMBUS_LIO_SB_SCL	27 45
TRUE =SMBUS_LIO_SB_SDA	27 45
TRUE PCIE_WAKE_L	23 37 45

Left I/O Power Connector

FUNC_TEST	
TRUE =PPBUS_G3H_LIO_CONN	63 64
TRUE GND\g	

Request for at least 10 GND test points

NOTE: 10 additional GND test points are called out separately in these notes.

Functional / ICT Test

SYNC_MASTER=N/A SYNC_DATE=N/A

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	5	104

NC_CPU_A32_L = TP_CPU_A32_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_A33_L = TP_CPU_A33_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_A34_L = TP_CPU_A34_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_A35_L = TP_CPU_A35_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_A36_L = TP_CPU_A36_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_A37_L = TP_CPU_A37_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_A38_L = TP_CPU_A38_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_A39_L = TP_CPU_A39_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_APM0_L = TP_CPU_APM0_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_APM1_L = TP_CPU_APM1_L (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_EXTBREF = TP_CPU_EXTBREF (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_HFPLL = TP_CPU_HFPLL (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_SPARE0 = TP_CPU_SPARE0 (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_SPARE1 = TP_CPU_SPARE1 (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_SPARE2 = TP_CPU_SPARE2 (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_CPU_SPARE4 = TP_CPU_SPARE4 (7)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_MEM_A_A<15..14> = MEM_A_A<15..14> (28)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_MEM_B_A<15..14> = MEM_B_A<15..14> (29)
MAKE_BASE=TRUE
NO_TEST=TRUE

TP_NB_CFG<4..3> = NB_CFG<4..3> (14)
MAKE_BASE=TRUE

TP_NB_CFG<6> = NB_CFG<6> (14)
MAKE_BASE=TRUE

TP_NB_CFG<8> = NB_CFG<8> (14)
MAKE_BASE=TRUE

TP_NB_CFG<11..10> = NB_CFG<11..10> (14)
MAKE_BASE=TRUE

TP_NB_CFG<15..14> = NB_CFG<15..14> (14)
MAKE_BASE=TRUE

TP_NB_CFG<17> = NB_CFG<17> (14)
MAKE_BASE=TRUE

NOTE: NB_CFG<13..12> require test access

TP_NB_CFG<13..12> = NB_CFG<13..12> (14)
MAKE_BASE=TRUE

TP_SB_SUS_CLK = SUS_CLK_SB (23)
MAKE_BASE=TRUE

NC_SB_XOR_T5 = TP_SB_XOR_T5 (21)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_SB_XOR_U5 = TP_SB_XOR_U5 (21)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_SB_XOR_V3 = TP_SB_XOR_V3 (21)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_SB_XOR_V4 = TP_SB_XOR_V4 (21)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_SB_XOR_W3 = TP_SB_XOR_W3 (21)
MAKE_BASE=TRUE
NO_TEST=TRUE

TP_SMC_RSTGATE_L = SMC_RSTGATE_L (47)
MAKE_BASE=TRUE

ALS_GAIN (76 47 5) = =RTALS_GAIN (53)
MAKE_BASE=TRUE

NC_ENET_CTRL12 = ENET_CTRL12 (37)
MAKE_BASE=TRUE
NO_TEST=TRUE

NC_ENET_CTRL25 = ENET_CTRL25 (37)
MAKE_BASE=TRUE
NO_TEST=TRUE

Ethernet Power Management Support

ENET_LOM_DISABLE
R0600
0
5%
1/16W
MF-LF
402

22 IN SB_GPIO30 — 1 — 2 — ENET_LOM_DIS_L OUT (37)

NOTE: BOM options "USB_G_OC_PU" and
"ENET_LOM_DISABLE" are mutually-exclusive.

USB Port "A" (Debug Port) = Right USB 2.0 Port

=USB2_RT_P (44) = USB2_RT_P = USB_A_P (22)
MAKE_BASE=TRUE

=USB2_RT_N (44) = USB2_RT_N = USB_A_N (22)
MAKE_BASE=TRUE

=RTUSB_OC_L (44) = RTUSB_OC_L = USB_A_OC_L (22)
MAKE_BASE=TRUE

USB Port "B" = Trackpad (Geyser)

=USB_TRACKPAD_P (43) = USB_TRACKPAD_P = USB_B_P (22)
MAKE_BASE=TRUE

=USB_TRACKPAD_N (43) = USB_TRACKPAD_N = USB_B_N (22)
MAKE_BASE=TRUE

UNUSED_USB_B_OC_L = USB_B_OC_L (22)
MAKE_BASE=TRUE

USB Port "C" = Left USB 2.0 Port

=USB2_LT_P (45 5) = USB2_LT_P = USB_C_P (22)
MAKE_BASE=TRUE

=USB2_LT_N (45 5) = USB2_LT_N = USB_C_N (22)
MAKE_BASE=TRUE

LTUSB_OC_L (45 5) = USB_C_OC_L (22)
MAKE_BASE=TRUE

USB Port "D" = Camera

=USB2_CAMERA_P (43 5) = USB2_CAMERA_P = USB_D_P (22)
MAKE_BASE=TRUE

=USB2_CAMERA_N (43 5) = USB2_CAMERA_N = USB_D_N (22)
MAKE_BASE=TRUE

UNUSED_USB_D_OC_L = USB_D_OC_L (22)
MAKE_BASE=TRUE

USB Port "E" = ExpressCard

=USB2_EXCARD_P (45 5) = USB2_EXCARD_P = USB_E_P (22)
MAKE_BASE=TRUE

=USB2_EXCARD_N (45 5) = USB2_EXCARD_N = USB_E_N (22)
MAKE_BASE=TRUE

EXCARD_OC_L (48 45 5) = USB_E_OC_L (22)
MAKE_BASE=TRUE

USB Port "F" = IR Receiver

=USB_IR_P (76) = USB_IR_P = USB_F_P (22)
MAKE_BASE=TRUE

=USB_IR_N (76) = USB_IR_N = USB_F_N (22)
MAKE_BASE=TRUE

USB Port "G" = Bluetooth (M13P)

=USB_BT_P (76) = USB_BT_P = USB_G_P (22)
MAKE_BASE=TRUE

=USB_BT_N (76) = USB_BT_N = USB_G_N (22)
MAKE_BASE=TRUE

USB Port "H" = Reserved (PCI-E Mini Card)

TP_USB2_HP = USB_H_P (22)
MAKE_BASE=TRUE

TP_USB2_HN = USB_H_N (22)
MAKE_BASE=TRUE

Trace deleted to make room for other diffpairs over RAM connector.

Chassis connection to be made at the mounting hole northwest of the DVI connector
ZT0600
HOLE-VIA-P5RP25
1
GND_CHASSIS_DVI_TOP
MIN_LINE_WIDTH=0.5 mm
MIN_NECK_WIDTH=0.25 mm
VOLTAGE=0V
MAKE_BASE=TRUE
=GND_CHASSIS_DVI2 (75)
=GND_CHASSIS_DVI4 (75)

Chassis connection to be made at the mounting hole southwest of the USB connector
ZT0601
HOLE-VIA-P5RP25
1
GND_CHASSIS_DVI_BOT
MIN_LINE_WIDTH=0.5 mm
MIN_NECK_WIDTH=0.25 mm
VOLTAGE=0V
MAKE_BASE=TRUE
=GND_CHASSIS_DVI1 (75)
=GND_CHASSIS_DVI3 (75)
=GND_CHASSIS_DVI5 (75)
=GND_CHASSIS_ENET (38)
=GND_CHASSIS_FW_EMI (42)
=GND_CHASSIS_FW_PORT1 (42)
=GND_CHASSIS_RTUSB (44)

Chassis connection to be made at the mounting hole east of the LVDS connector
ZT0602
HOLE-VIA-P5RP25
1
GND_CHASSIS_LVDS
MIN_LINE_WIDTH=0.5 mm
MIN_NECK_WIDTH=0.25 mm
VOLTAGE=0V
MAKE_BASE=TRUE
=GND_CHASSIS_LCD1 (74)
=GND_CHASSIS_LCD2 (74)
=GND_CHASSIS_LCD3 (74)
=GND_CHASSIS_LCD4 (74)

SH0600
OG-503040
SHLD-SM-LF
1
2
3
GND_CHASSIS_INVERTER
MIN_LINE_WIDTH=0.5 mm
MIN_NECK_WIDTH=0.25 mm
VOLTAGE=0V
MAKE_BASE=TRUE
=GND_CHASSIS_INVERTER (74)

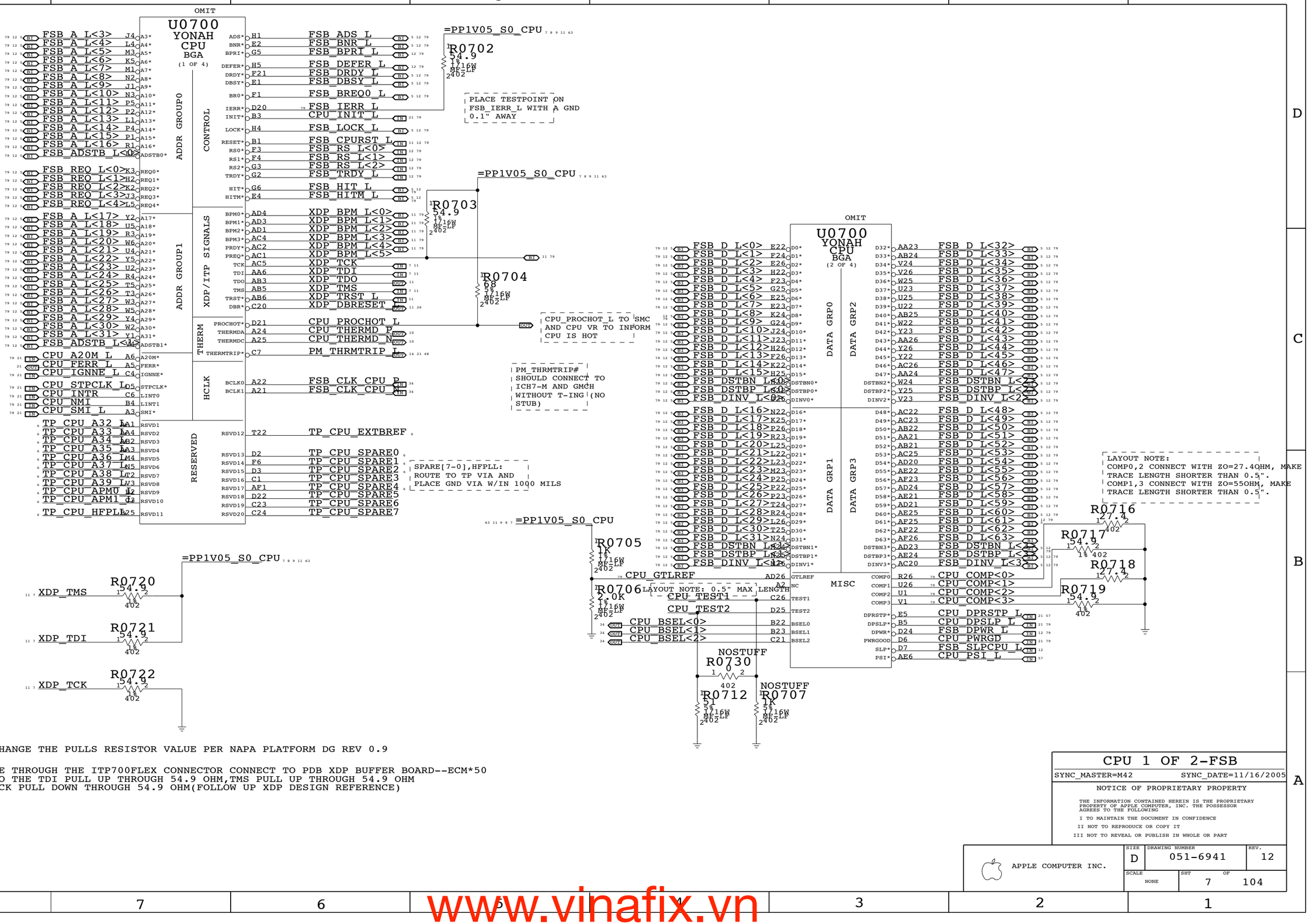
Signal Aliases

SYNC_MASTER=N/A SYNC_DATE=N/A

APPLE COMPUTER INC.

SIZE D | DRAWING NUMBER 051-6941 | REV. 12

SCALE NONE | SHT 6 OF 104



CHANGE THE PULLS RESISTOR VALUE PER NAPA PLATFORM DG REV 0.9

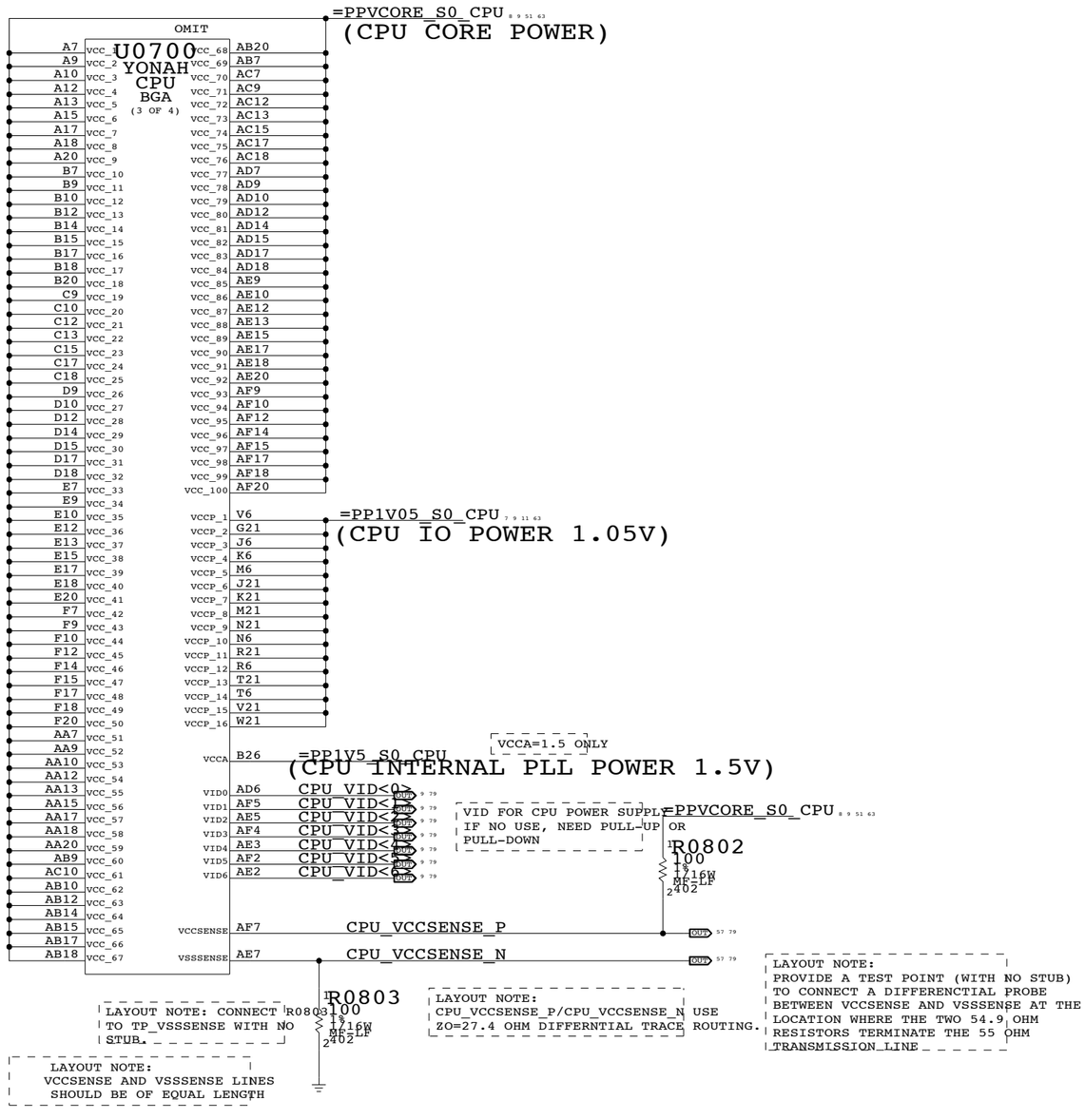
WE THROUGH THE ITP700FLEX CONNECTOR CONNECT TO PDB XDP BUFFER BOARD--ECM*50
SO THE TDI PULL UP THROUGH 54.9 OHM,TMS PULL UP THROUGH 54.9 OHM
TCK PULL DOWN THROUGH 54.9 OHM(FOLLOW UP XDP DESIGN REFERENCE)

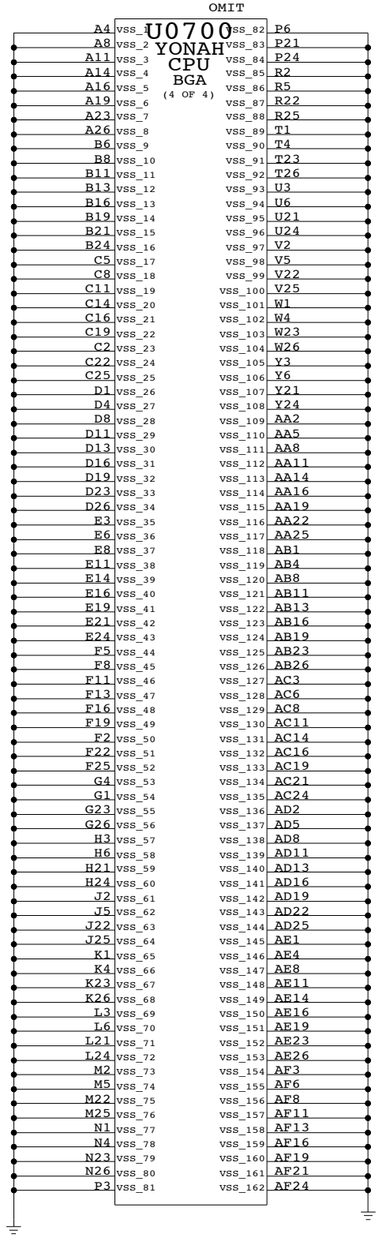
CPU 1 OF 2-FSB

SYNC_MASTER=M42 SYNC_DATE=11/16/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 7 OF 104	





CPU 2 OF 2-PWR/GND

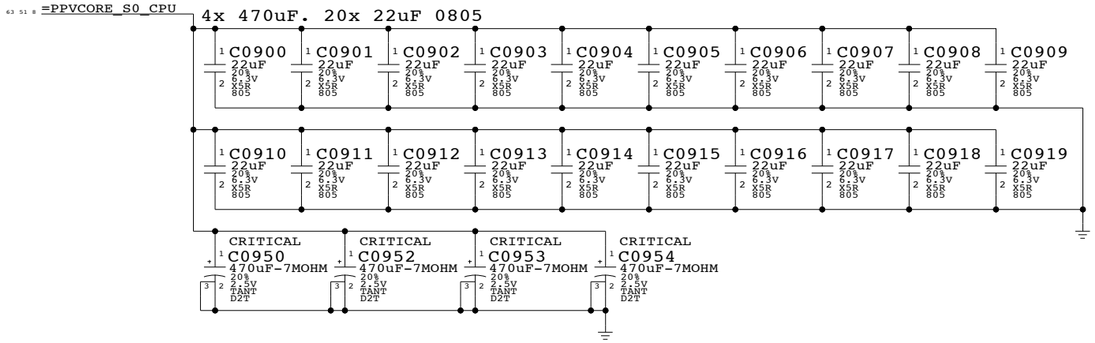
SYNC_MASTER=M42 SYNC_DATE=11/16/2005

APPLE COMPUTER INC.

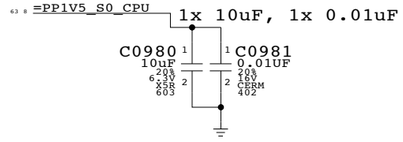
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	8	104

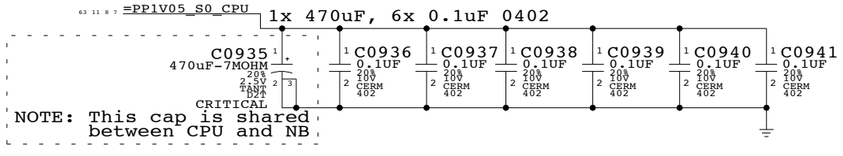
CPU VCORE HF AND BULK DECOUPLING



VCCA (CPU AVdd) Decoupling

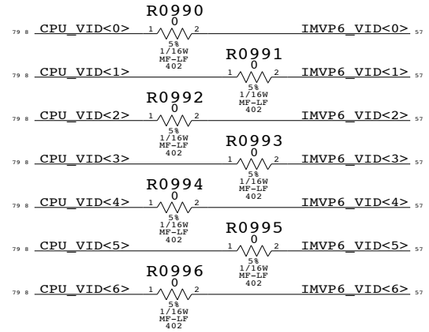


VCCP (CPU I/O) Decoupling



CPU VCORE VID Connections

Resistors to allow for override of CPU VID
Will probably be removed before production



CPU Decoupling & VID

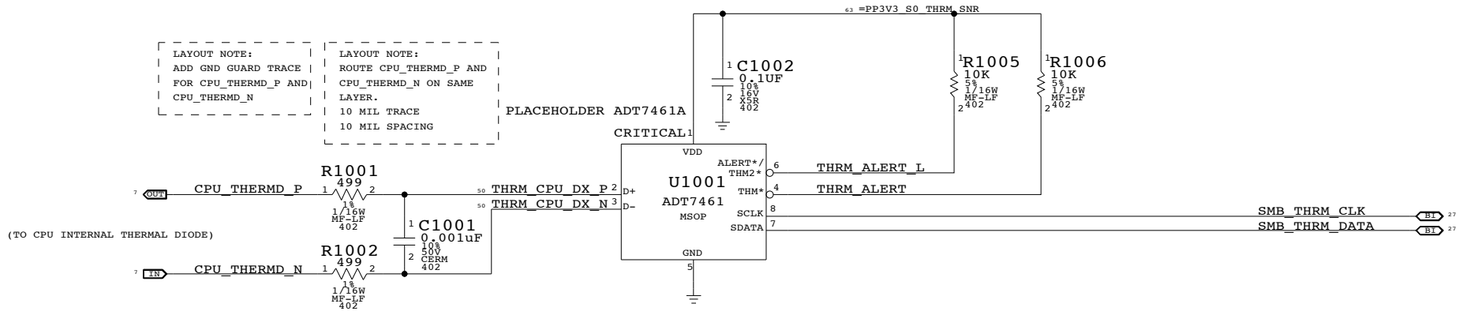
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	9	104

CPU ZONE THERMAL SENSOR



PLACE U1001 NEAR THE U1200

CPU MISC1-TEMP SENSOR

SYNC_MASTER=M42 SYNC_DATE=10/07/2005

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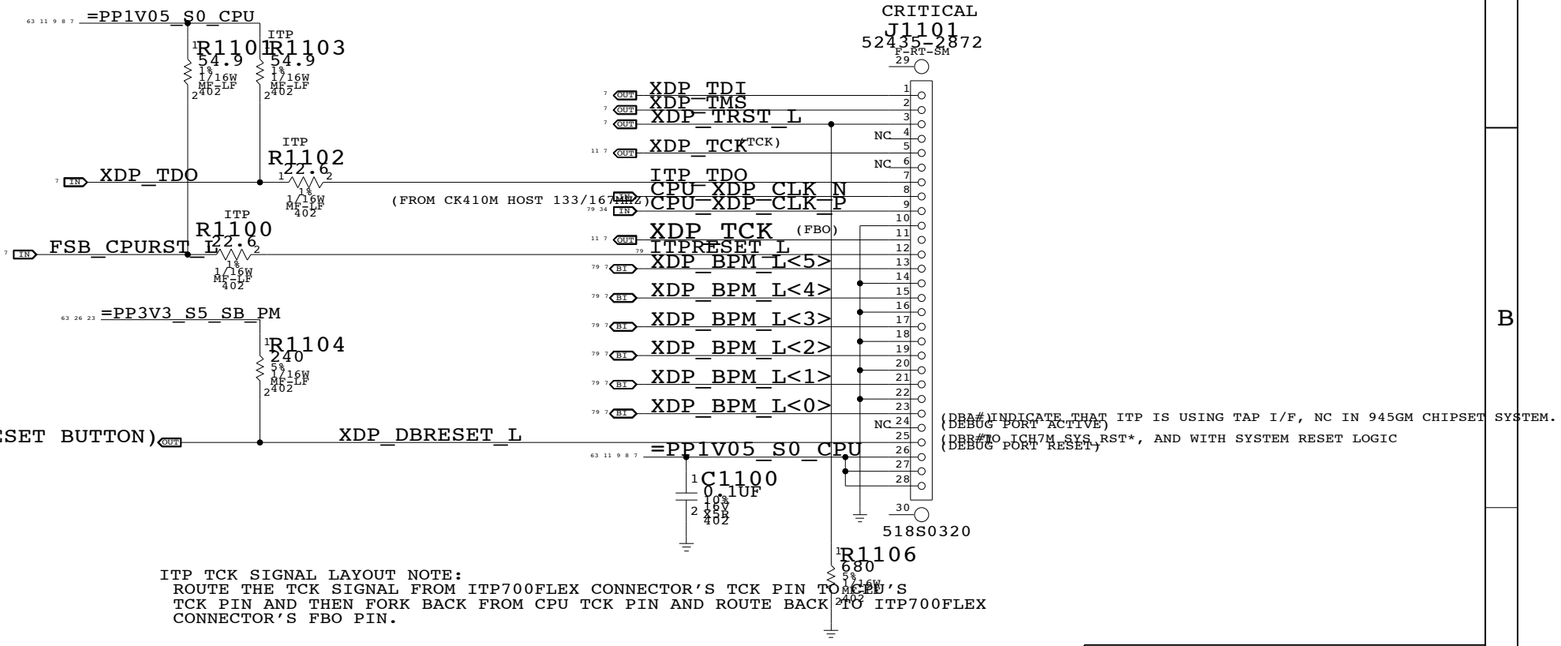
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	10	104

CPU ITP700FLEX DEBUG SUPPORT



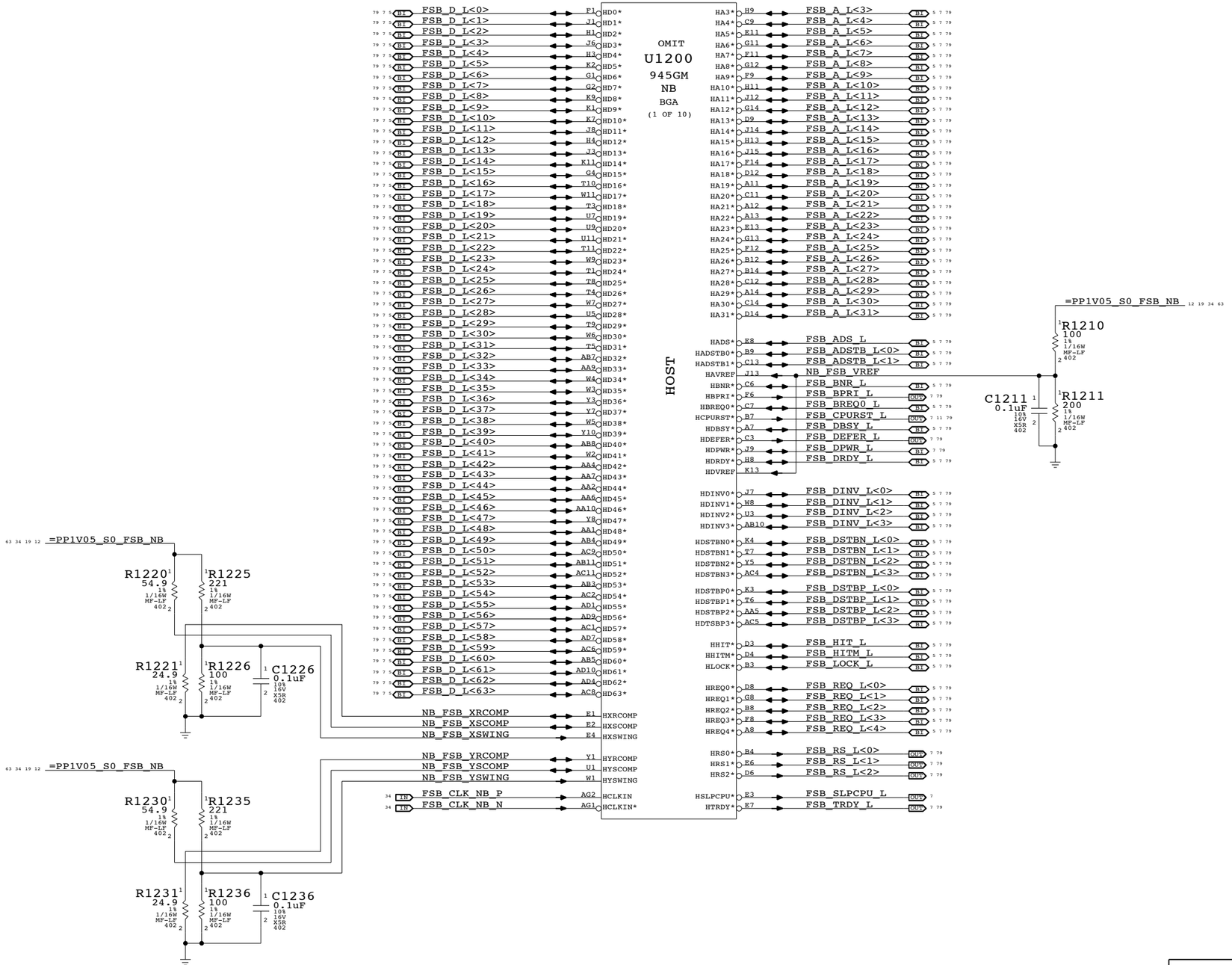
ITP TCK SIGNAL LAYOUT NOTE:
ROUTE THE TCK SIGNAL FROM ITP700FLEX CONNECTOR'S TCK PIN TO CPU'S TCK PIN AND THEN FORK BACK FROM CPU TCK PIN AND ROUTE BACK TO ITP700FLEX CONNECTOR'S FBO PIN.

CPU ITP700FLEX DEBUG

SYNC_MASTER=M52 SYNC_DATE=10/12/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE	SHT	OF
NONE	11	104



NB CPU Interface

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	12	104

LVDS Disable

Can leave all signals NC if LVDS is not implemented
Tie VCC_TXLVDS and VCCA_LVDS to GND. If SDVO is used
VCCD_LVDS must remain powered with proper decoupling.
Otherwise, tie VCCD_LVDS to GND also.

TV-Out Signal Usage:

Composite: DACA only
S-Video: DACB & DACC only
Component: DACA, DACB & DACC

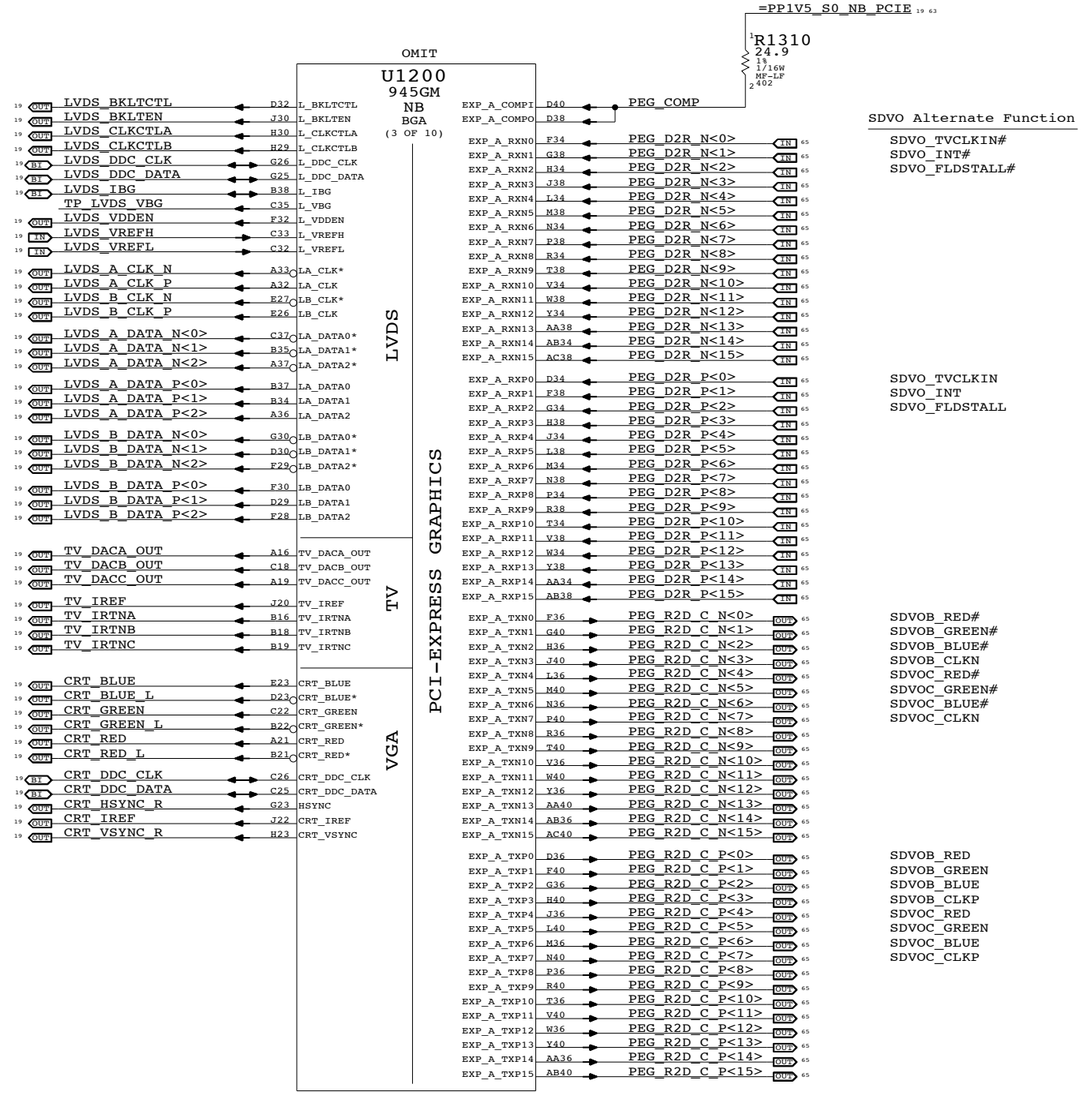
Unused DAC outputs must remain powered, but can omit filtering components. Unused DAC outputs should connect to GND through 75-ohm resistors.

TV-Out Disable

Tie DACx_OUT, IRTNx, and IREF to 1.5V power rail.
Tie VCCD_TVDAC, VCCD_QTVDAC, VCCA_TVDACx, and
VCCA_TVBG to 1.5V power rail. Tie VSSA_TVBG to GND.

CRT Disable

Tie R/R#/G/G#/B/B# and IREF to VCC Core rail, tie
HSYNC and VSYNC to GND. Tie VCCA_CRTDAC to VCC Core
rail, and tie VSSA_CRTDAC and VCC_SYNC to GND.

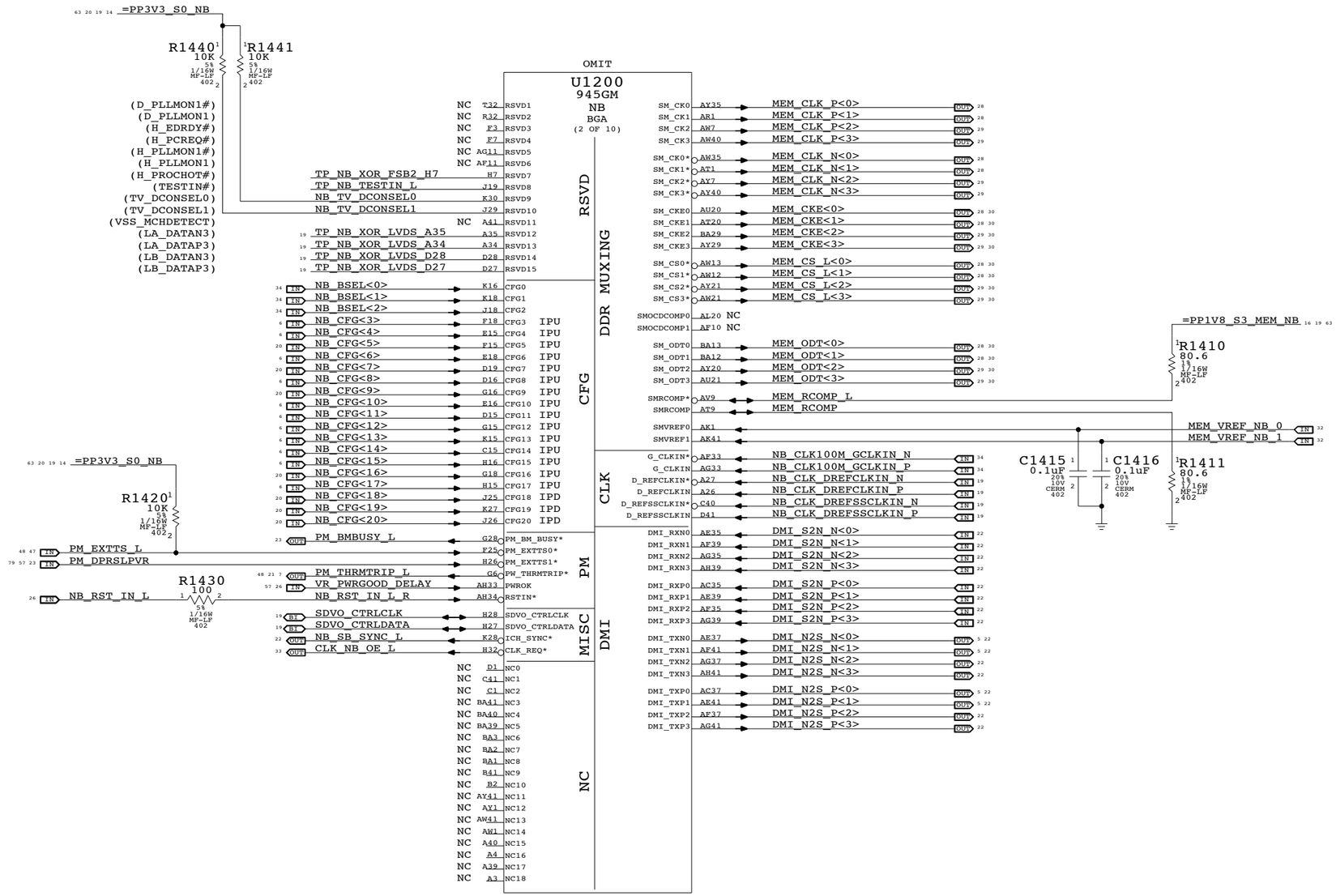


NB PEG / Video Interfaces

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 13 OF 104	



NB Misc Interfaces

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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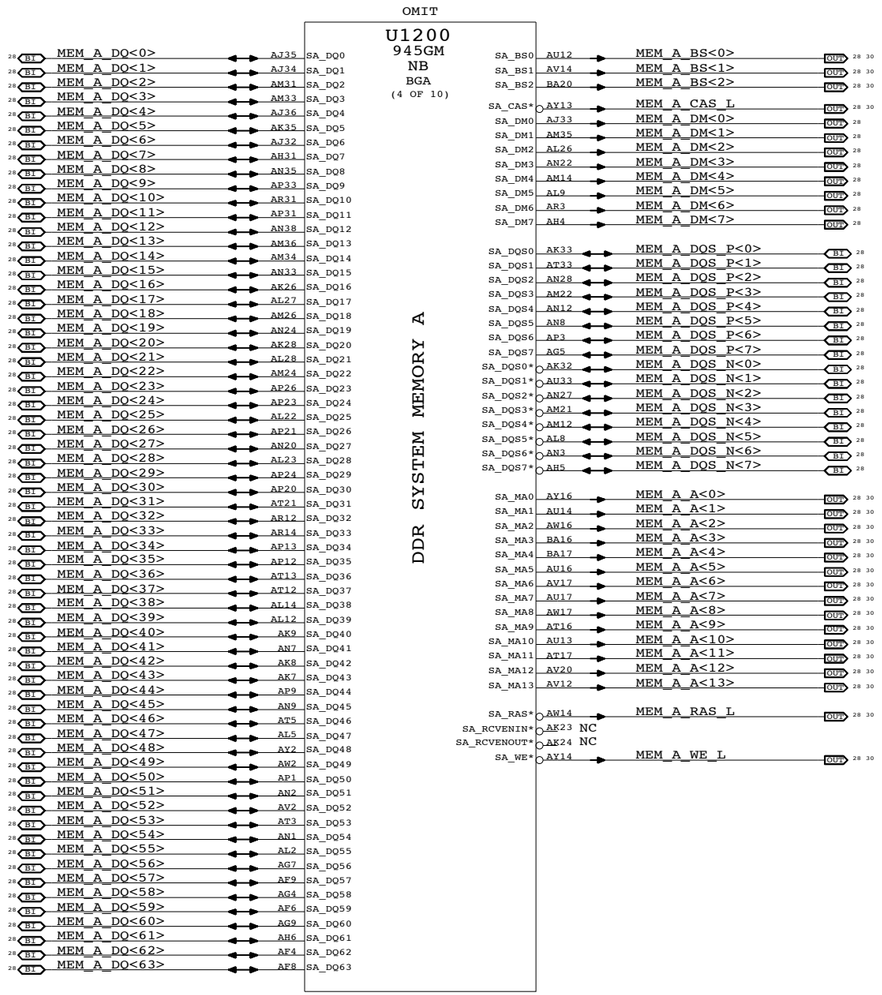
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 14 OF 104	



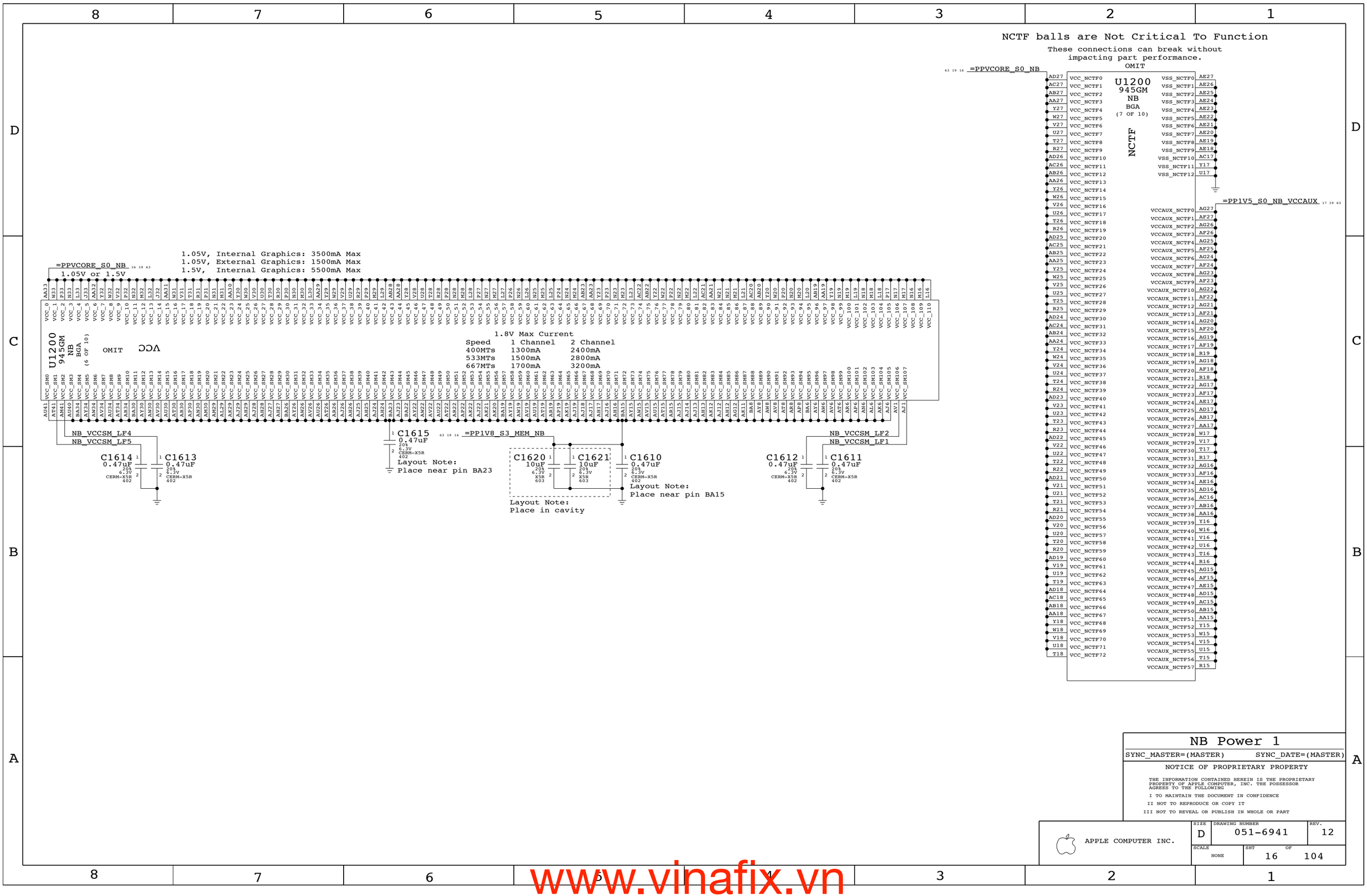
NB DDR2 Interfaces

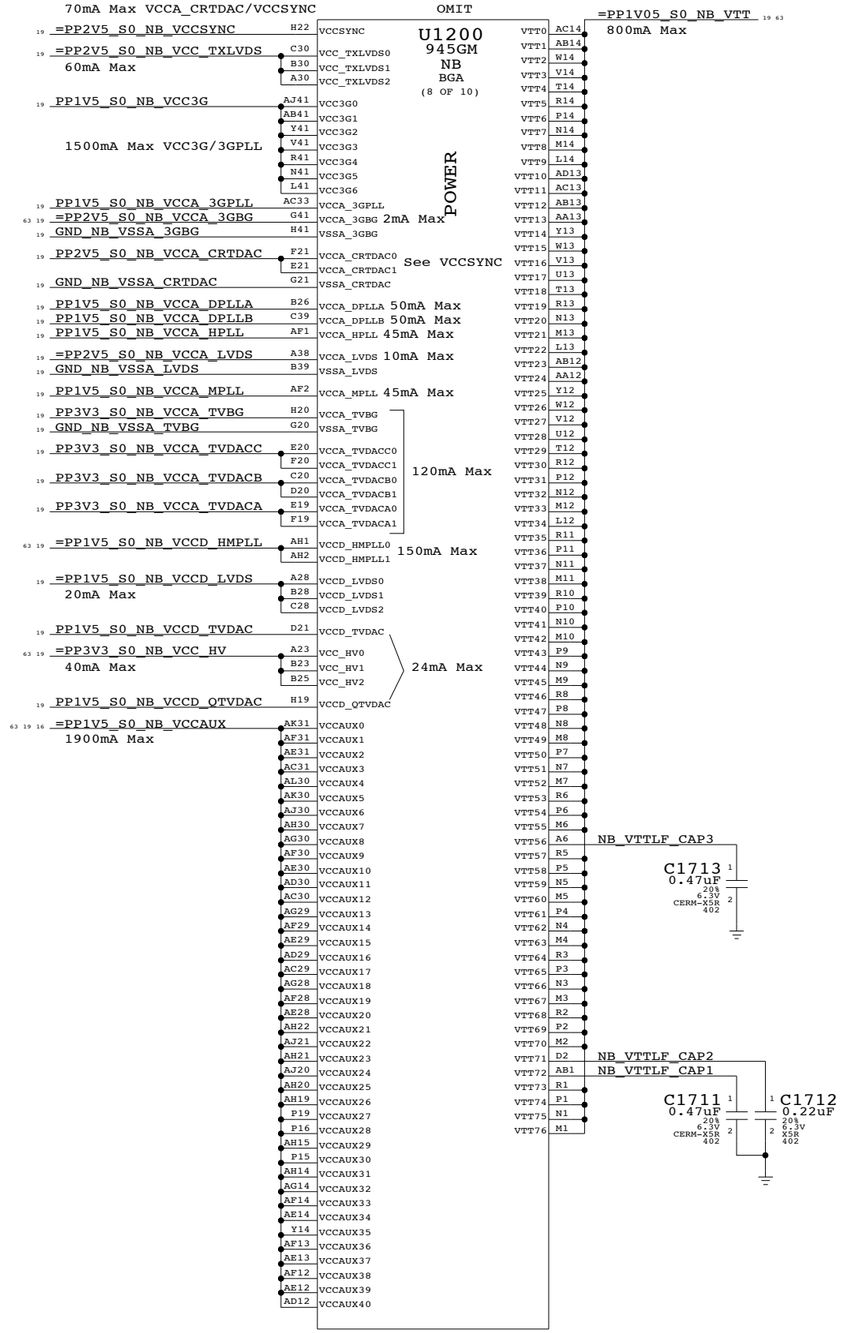
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	15	104





NB Power 2

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 17 OF 104	

OMIT

U1200
945GM
NB
BGA
(9 OF 10)

VSS

AC41	VSS_0	VSS_97	AK34
AA41	VSS_1	VSS_98	AG34
W41	VSS_2	VSS_99	AF34
T41	VSS_3	VSS_100	AE34
P41	VSS_4	VSS_101	AC34
M41	VSS_5	VSS_102	C34
J41	VSS_6	VSS_103	AW33
F41	VSS_7	VSS_104	AV33
AV40	VSS_8	VSS_105	AR33
AP40	VSS_9	VSS_106	AE33
AN40	VSS_10	VSS_107	AB33
AK40	VSS_11	VSS_108	Y33
AJ40	VSS_12	VSS_109	V33
AH40	VSS_13	VSS_110	T33
AG40	VSS_14	VSS_111	R33
AF40	VSS_15	VSS_112	M33
AE40	VSS_16	VSS_113	H33
B40	VSS_17	VSS_114	G33
AY39	VSS_18	VSS_115	F33
AW39	VSS_19	VSS_116	D33
AV39	VSS_20	VSS_117	B33
AR39	VSS_21	VSS_118	AH32
AN39	VSS_22	VSS_119	AG32
AJ39	VSS_23	VSS_120	AF32
AC39	VSS_24	VSS_121	AE32
AB39	VSS_25	VSS_122	AC32
AA39	VSS_26	VSS_123	AB32
Y39	VSS_27	VSS_124	G32
W39	VSS_28	VSS_125	B32
V39	VSS_29	VSS_126	AY31
T39	VSS_30	VSS_127	AV31
R39	VSS_31	VSS_128	AN31
P39	VSS_32	VSS_129	AJ31
N39	VSS_33	VSS_130	AG31
M39	VSS_34	VSS_131	AB31
L39	VSS_35	VSS_132	Y31
J39	VSS_36	VSS_133	AB30
H39	VSS_37	VSS_134	E30
G39	VSS_38	VSS_135	AT29
F39	VSS_39	VSS_136	AN29
D39	VSS_40	VSS_137	AB29
AT38	VSS_41	VSS_138	T29
AM38	VSS_42	VSS_139	N29
AH38	VSS_43	VSS_140	K29
AG38	VSS_44	VSS_141	G29
AF38	VSS_45	VSS_142	E29
AE38	VSS_46	VSS_143	C29
C38	VSS_47	VSS_144	B29
AK37	VSS_48	VSS_145	A29
AH37	VSS_49	VSS_146	BA28
AB37	VSS_50	VSS_147	AW28
AA37	VSS_51	VSS_148	AU28
Y37	VSS_52	VSS_149	AP28
W37	VSS_53	VSS_150	AM28
V37	VSS_54	VSS_151	AD28
T37	VSS_55	VSS_152	AC28
R37	VSS_56	VSS_153	W28
P37	VSS_57	VSS_154	J28
N37	VSS_58	VSS_155	E28
M37	VSS_59	VSS_156	AP27
L37	VSS_60	VSS_157	AM27
J37	VSS_61	VSS_158	AK27
H37	VSS_62	VSS_159	J27
G37	VSS_63	VSS_160	G27
F37	VSS_64	VSS_161	F27
D37	VSS_65	VSS_162	C27
AY36	VSS_66	VSS_163	B27
AW36	VSS_67	VSS_164	AN26
AN36	VSS_68	VSS_165	M26
AH36	VSS_69	VSS_166	K26
AG36	VSS_70	VSS_167	F26
AF36	VSS_71	VSS_168	D26
AE36	VSS_72	VSS_169	AK25
AC36	VSS_73	VSS_170	P25
C36	VSS_74	VSS_171	K25
B36	VSS_75	VSS_172	H25
BA35	VSS_76	VSS_173	E25
AV35	VSS_77	VSS_174	D25
AR35	VSS_78	VSS_175	A25
AH35	VSS_79	VSS_176	BA24
AB35	VSS_80	VSS_177	AU24
AA35	VSS_81	VSS_178	AL24
Y35	VSS_82	VSS_179	AW23
W35	VSS_83		
V35	VSS_84		
T35	VSS_85		
R35	VSS_86		
P35	VSS_87		
N35	VSS_88		
M35	VSS_89		
L35	VSS_90		
J35	VSS_91		
H35	VSS_92		
G35	VSS_93		
F35	VSS_94		
D35	VSS_95		
AN34	VSS_96		

OMIT

U1200
945GM
NB
BGA
(10 OF 10)

VSS

AT23	VSS_180	VSS_273	J11
AN23	VSS_181	VSS_274	D11
AM23	VSS_182	VSS_275	B11
AH23	VSS_183	VSS_276	AV10
AC23	VSS_184	VSS_277	AP10
W23	VSS_185	VSS_278	AL10
K23	VSS_186	VSS_279	AJ10
J23	VSS_187	VSS_280	AG10
F23	VSS_188	VSS_281	AC10
C23	VSS_189	VSS_282	W10
AA22	VSS_190	VSS_283	U10
K22	VSS_191	VSS_284	BA9
G22	VSS_192	VSS_285	AW9
F22	VSS_193	VSS_286	AR9
E22	VSS_194	VSS_287	AH9
D22	VSS_195	VSS_288	AB9
A22	VSS_196	VSS_289	Y9
BA21	VSS_197	VSS_290	R9
AV21	VSS_198	VSS_291	G9
AR21	VSS_199	VSS_292	E9
AN21	VSS_200	VSS_293	A9
AL21	VSS_201	VSS_294	AG8
AB21	VSS_202	VSS_295	AD8
Y21	VSS_203	VSS_296	AA8
P21	VSS_204	VSS_297	U8
K21	VSS_205	VSS_298	K8
J21	VSS_206	VSS_299	C8
H21	VSS_207	VSS_300	BA7
C21	VSS_208	VSS_301	AV7
AW20	VSS_209	VSS_302	AP7
AR20	VSS_210	VSS_303	AL7
AM20	VSS_211	VSS_304	AJ7
AA20	VSS_212	VSS_305	AH7
K20	VSS_213	VSS_306	AF7
B20	VSS_214	VSS_307	AC7
A20	VSS_215	VSS_308	R7
AN19	VSS_216	VSS_309	G7
AC19	VSS_217	VSS_310	D7
W19	VSS_218	VSS_311	AG6
K19	VSS_219	VSS_312	AD6
G19	VSS_220	VSS_313	AB6
C19	VSS_221	VSS_314	Y6
AH18	VSS_222	VSS_315	U6
P18	VSS_223	VSS_316	N6
H18	VSS_224	VSS_317	K6
D18	VSS_225	VSS_318	H6
A18	VSS_226	VSS_319	B6
AY17	VSS_227	VSS_320	AV5
AR17	VSS_228	VSS_321	AP5
AP17	VSS_229	VSS_322	AD5
AM17	VSS_230	VSS_323	AY4
AK17	VSS_231	VSS_324	AR4
AV16	VSS_232	VSS_325	AP4
AN16	VSS_233	VSS_326	AL4
AL16	VSS_234	VSS_327	AJ4
J16	VSS_235	VSS_328	Y4
F16	VSS_236	VSS_329	U4
C16	VSS_237	VSS_330	R4
AN15	VSS_238	VSS_331	J4
AM15	VSS_239	VSS_332	F4
AK15	VSS_240	VSS_333	C4
N15	VSS_241	VSS_334	AY3
M15	VSS_242	VSS_335	AW3
L15	VSS_243	VSS_336	AV3
B15	VSS_244	VSS_337	AL3
A15	VSS_245	VSS_338	AH3
BA14	VSS_246	VSS_339	AG3
AT14	VSS_247	VSS_340	AF3
AK14	VSS_248	VSS_341	AD3
AD14	VSS_249	VSS_342	AC3
AA14	VSS_250	VSS_343	AA3
U14	VSS_251	VSS_344	G3
K14	VSS_252	VSS_345	AT2
H14	VSS_253	VSS_346	AR2
E14	VSS_254	VSS_347	AP2
AV13	VSS_255	VSS_348	AK2
AR13	VSS_256	VSS_349	AJ2
AN13	VSS_257	VSS_350	AD2
AM13	VSS_258	VSS_351	AB2
AL13	VSS_259	VSS_352	Y2
AG13	VSS_260	VSS_353	U2
P13	VSS_261	VSS_354	T2
F13	VSS_262	VSS_355	N2
D13	VSS_263	VSS_356	J2
B13	VSS_264	VSS_357	H2
AY12	VSS_265	VSS_358	F2
AC12	VSS_266	VSS_359	C2
K12	VSS_267	VSS_360	AL1
H12	VSS_268		
E12	VSS_269		
AD11	VSS_270		
AA11	VSS_271		
Y11	VSS_272		

NB Grounds

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	18	104

Power Interface

These are the power signals that leave the NB "block"

Rail Totals:

2310mA Max?	=PPVCORE_S0_NB	1500mA Max
	=PP1V05_S0_FSB_NB	10mA Max?
	=PP1V05_S0_NB_VTT	800mA Max
	=PP1V05_S0_NB_CRT	?mA Max
3674mA Max	=PP1V5_S0_NB	?mA Max
	=PP1V5_S0_NB_3G	1500mA Max
	=PP1V5_S0_NB_3GPLL	
	=PP1V5_S0_NB_PCIE	?mA Max
	=PP1V5_S0_NB_PLL	100mA Max
	=PP1V5_S0_NB_TVDAC	24mA Max
	=PP1V5_S0_NB_VCCD_HMPLL	150mA Max
	=PP1V5_S0_NB_VCCAUX	1900mA Max
3200mA Max	=PP1V8_S3_MEM_NB	3200mA Max
	=PP2V5_S0_NB_VCCSYNC	70mA Max
132mA Max	=PP2V5_S0_NB_VCC_TXLVDS	60mA Max
	=PP2V5_S0_NB_VCCA_3GBG	2mA Max
	=PP3V3_S0_NB	?mA Max
40mA Max?	=PP3V3_S0_NB_VCC_HV	40mA Max

=PP1V05_S0_NB_CRT
- CRT_RED
- CRT_GREEN
- CRT_BLUE
- CRT_RED_L
- CRT_GREEN_L
- CRT_BLUE_L
- CRT_IREF
- CRT_HSYNC_R
- CRT_VSYNC_R

TP_CRT_DDC_CLK (MAKE_BASE=TRUE) — CRT_DDC_CLK
TP_CRT_DDC_DATA (MAKE_BASE=TRUE) — CRT_DDC_DATA

=PP1V5_S0_NB_TVDAC
- TV_DACA_OUT
- TV_DACB_OUT
- TV_DACC_OUT
- TV_IREF
- TV_IRTNA
- TV_IRTNB
- TV_IRTNC

TP_LVDS_BKLTCTL (MAKE_BASE=TRUE) — LVDS_BKLTCTL
TP_LVDS_BKLTEN (MAKE_BASE=TRUE) — LVDS_BKLTEN
TP_LVDS_CLKCTLA (MAKE_BASE=TRUE) — LVDS_CLKCTLA
TP_LVDS_CLKCTLB (MAKE_BASE=TRUE) — LVDS_CLKCTLB
TP_LVDS_DDC_CLK (MAKE_BASE=TRUE) — LVDS_DDC_CLK
TP_LVDS_DDC_DATA (MAKE_BASE=TRUE) — LVDS_DDC_DATA
NC_LVDS_IBG (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_IBG
TP_LVDS_VDDEN (MAKE_BASE=TRUE) — LVDS_VDDEN
NC_LVDS_VREFH (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_VREFH
TP_LVDS_VREFL (MAKE_BASE=TRUE) — LVDS_VREFL
NC_LVDS_A_CLKP (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_A_CLK_P
NC_LVDS_A_CLKN (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_A_CLK_N
NC_LVDS_A_DATAP<2..0> (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_A_DATA_P<2..0>
NC_LVDS_A_DATAN<2..0> (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_A_DATA_N<2..0>
NC_LVDS_B_CLKP (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_B_CLK_P
NC_LVDS_B_CLKN (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_B_CLK_N
NC_LVDS_B_DATAP<2..0> (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_B_DATA_P<2..0>
NC_LVDS_B_DATAN<2..0> (MAKE_BASE=TRUE NO_TEST=TRUE) — LVDS_B_DATA_N<2..0>
NC_NB_XOR_LVDS_A34 (MAKE_BASE=TRUE NO_TEST=TRUE) — TP_NB_XOR_LVDS_A34
NC_NB_XOR_LVDS_A35 (MAKE_BASE=TRUE NO_TEST=TRUE) — TP_NB_XOR_LVDS_A35
NC_NB_XOR_LVDS_D27 (MAKE_BASE=TRUE NO_TEST=TRUE) — TP_NB_XOR_LVDS_D27
NC_NB_XOR_LVDS_D28 (MAKE_BASE=TRUE NO_TEST=TRUE) — TP_NB_XOR_LVDS_D28
TP_SDVO_CTRLCLK (MAKE_BASE=TRUE) — SDVO_CTRLCLK
TP_SDVO_CTRLDATA (MAKE_BASE=TRUE) — SDVO_CTRLDATA

(MCH LVDS DATA/CLK TX 2.5V PWR)
=PP2V5_S0_NB_VCC_TXLVDS

(MCH LVDS DIGITAL 1.5V PWR)
=PP1V5_S0_NB_VCCD_LVDS

(MCH LVDS ANALOG 2.5V PWR)
=PP2V5_S0_NB_VCCA_LVDS

NC_GND_NB_VSSA_LVDS (MAKE_BASE=TRUE NO_TEST=TRUE) — GND_NB_VSSA_LVDS

=PPVCORE_S0_NB
(MCH CRTDAC ANALOG 2.5V PWR)
PP2V5_S0_NB_VCCA_CRTDAC
GND_NB_VSSA_CRTDAC

(MCH H/V SYNC 2.5V PWR)
=PP2V5_S0_NB_VCCSYNC

=PP1V5_S0_NB_TVDAC
(MCH TVDAC DEDICATED PWR 1.5V)
PP1V5_S0_NB_VCCD_TVDAC

(MCH TVDAC DIGITAL QUIET 1.5V PWR)
PP1V5_S0_NB_VCCD_QTVDAC

(MCH TV OUT CHANNEL A 3.3V PWR)
PP3V3_S0_NB_VCCA_TVDACA

(MCH TV OUT CHANNEL B 3.3V PWR)
PP3V3_S0_NB_VCCA_TVDACB

(MCH TV OUT CHANNEL C 3.3V PWR)
PP3V3_S0_NB_VCCA_TVDACC

(MCH TV DAC BAND GAP 3.3V PWR)
PP3V3_S0_NB_VCCA_TVBG
GND_NB_VSSA_TVBG

(MCH DISPLAY A PLL 1.5V PWR)
TP_NB_VCCA_DPLLA (MAKE_BASE=TRUE) — PP1V5_S0_NB_VCCA_DPLLA

(MCH DISPLAY B PLL 1.5V PWR)
TP_NB_VCCA_DPLLB (MAKE_BASE=TRUE) — PP1V5_S0_NB_VCCA_DPLLB

NB_CLK_DREFCLKIN_P
NB_CLK_DREFCLKIN_N
NB_CLK_DREFSSCLKIN_P
NB_CLK_DREFSSCLKIN_N

=PPVCORE_S0_NB, 1500mA Max
GMCH CORE PWR 1.05V BYPASS
CRITICAL
C1900 470uF-7MOHM 20% 2.5V TANT D2T
C1902 10uF 20% 6.3V X5R 603
C1903 10uF 20% 6.3V X5R 603
C1904 1uF 10% 6.3V CERM 402
C1905 0.22uF 20% 6.3V X5R 402
C1906 0.22uF 20% 6.3V X5R 402
C1907 0.22uF 20% 6.3V X5R 402

=PP1V05_S0_NB_VTT, 800mA Max
MCH VTT BYPASS
(MCH FSB 1.05V PWR)
C1965 4.7uF 20% 6.3V CERM 603
C1966 2.2uF 20% 6.3V CERM1 603
Layout Note: Place in cavity
(SHARE C0940 470UF)
C1967 0.22uF 20% 6.3V X5R 402
Layout Note: Place on the edge

=PP3V3_S0_NB_VCC_HV, 40mA Max
MCH VCC_HV BYPASS
(MCH HV BUFFER 3.3V PWR)
C1914 10uF 20% 6.3V X5R 603
C1915 0.1uF 20% 10V CERM 402

=PP2V5_S0_NB_VCCA_3GBG, 2mA Max
MCH VCCA_3GBG BYPASS
(MCH PCIE/DMI BAND GAP 2.5V PWR)
C1916 0.1uF 20% 10V CERM 402

=PP1V5_S0_NB_VCCAUX, 1900mA Max
GMCH VCCAUX FILTER
(MCH DDR DLL&IO, FSB HSIO&IO PWR 1.5V)
C1918 0.1uF 20% 10V CERM 402

=PP1V5_S0_NB_PLL, 100mA Max
L1934 FERR-120-OHM-0.2A 0603
C1934 22uF 20% 6.3V X5R 805
C1935 0.1uF 20% 10V CERM 402
GMCH VCCA_HPLL FILTER
(HOST PLL 1.5V PWR)
PP1V5_S0_NB_VCCA_HPLL
MIN_LINE_WIDTH=0.38 mm
MIN_NECK_WIDTH=0.25 mm
VOLTAGE=1.5V
45mA Max

L1936 FERR-120-OHM-0.2A 0603
C1936 22uF 20% 6.3V X5R 805
C1937 0.1uF 20% 10V CERM 402
GMCH VCCA_MPLL FILTER
(MCH MEMORY PLL 1.5V PWR)
PP1V5_S0_NB_VCCA_MPLL
MIN_LINE_WIDTH=0.38 mm
MIN_NECK_WIDTH=0.25 mm
VOLTAGE=1.5V
45mA Max

=PP1V5_S0_NB_3G, 1500mA Max
L1970 91nH 1210
C1970 220UF 20% 2.5V POLY SMB2
Layout Note: Place L and C close to MCH
C1971 10uF 20% 6.3V X5R 603
C1972 10uF 20% 6.3V X5R 603
Layout Note: 10uF caps should be close to MCH on opposite side.
GMCH VCC3G FILTER
(PCI-E/DMI ANALOG 1.5V PWR)
PP1V5_S0_NB_VCC3G
MIN_LINE_WIDTH=0.5 mm
MIN_NECK_WIDTH=0.25 mm
VOLTAGE=1.5V
1500mA Max

=PP1V5_S0_NB_3GPLL, 1500mA Max
L1975 1.0UH-220MA-0.12-OHM 0805
PP1V5_S0_NB_3GPLL_F
MIN_LINE_WIDTH=0.6 mm
MIN_NECK_WIDTH=0.4 mm
VOLTAGE=1.5V
R1975 0.51 1% 1/16W MF-LF 402
C1975 10uF 20% 6.3V X5R 603
C1976 0.1uF 20% 10V CERM 402
GND_NB_VSSA_3GBG
Layout Note: 3GPLL 10uF cap should be placed in cavity
Layout Note: Route to caps, then GND
GMCH VCCA_3GPLL FILTER
(3GIO PLL 1.5V PWR)
PP1V5_S0_NB_VCCA_3GPLL
MIN_LINE_WIDTH=0.5 mm
MIN_NECK_WIDTH=0.25 mm
VOLTAGE=1.5V

NB (GM) Decoupling

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 19 OF 104	

NB_CFG<3>	RESERVED

NB_CFG<4>	RESERVED

14 NB_CFG<5>
Internal pull-up

NB_CFG<5> DMI x2 Select	High = DMIx4 Low = DMIx2

NBCFG_DMI_X2
R2075 1
2.2K
5% 1/16W MF-LF
402 2

PROBABLY NOT NEEDED

NB_CFG<6>	RESERVED

14 NB_CFG<7>
Internal pull-up

NB_CFG<7> CPU Strap	High = Mobile CPU Low = RESERVED

NO STUFF
R2077 1
2.2K
5% 1/16W MF-LF
402 2

NB_CFG<8>	RESERVED

14 NB_CFG<9>
Internal pull-up

NB_CFG<9> PCIE Graphics Lane Reversal	High = Normal Low = Reversed

NBCFG_PEG_REVERSE
R2079 1
2.2K
5% 1/16W MF-LF
402 2

NB_CFG<10>	RESERVED

NB_CFG<11>	RESERVED

Internal pull-ups

NB_CFG<13:12>	00 = Partial Clock Gating Disable 01 = XOR Mode Enabled 10 = All-Z Mode Enabled 11 = Normal Operation

NB_CFG<14>	RESERVED

NB_CFG<15>	RESERVED

14 NB_CFG<16>
Internal pull-up

NB_CFG<16> FSB Dynamic ODT	High = Enabled Low = Disabled

NBCFG_DYN_ODT_DISABLE
R2085 1
2.2K
5% 1/16W MF-LF
402 2

NB_CFG<17>	RESERVED

=PP3V3_S0_NB 14 19 20 63
NBCFG_VCC_1V5
R2058 1
2.2K
5% 1/16W MF-LF
402 2

NB_CFG<18> VCC Select	High = 1.5V Low = 1.05V

14 NB_CFG<18>
Internal pull-down

=PP3V3_S0_NB 14 19 20 63
NBCFG_DMI_REVERSE
R2059 1
2.2K
5% 1/16W MF-LF
402 2

NB_CFG<19> DMI Lane Reversal	High = Reversed Low = Normal

14 NB_CFG<19>
Internal pull-down

945 External Design Spec says reserved

=PP3V3_S0_NB 14 19 20 63
NBCFG_SDVO_AND_PCIE
R2060 1
2.2K
5% 1/16W MF-LF
402 2

NB_CFG<20> PCIe Backward Interop. Mode	High = Both active Low = Only SDVO or PCIe x1

14 NB_CFG<20>
Internal pull-down

PROBABLY NOT NEEDED

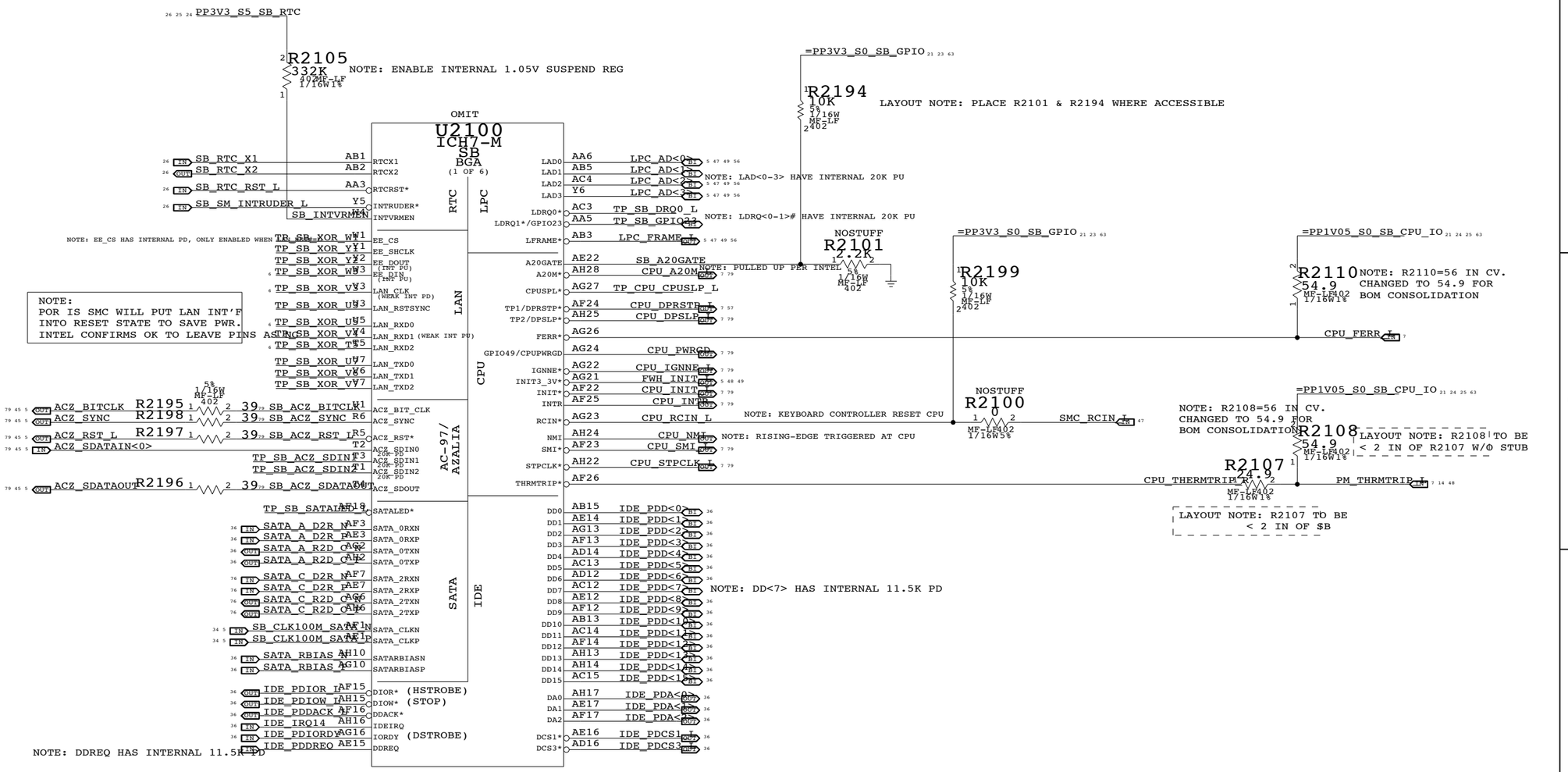
NB Config Straps

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	20	104



	AC '07	INTEL HIGH DEFINITION AUDIO
ACZ_BIT_CLK	INTERNAL 20K PD ENABLED WHEN	INTERNAL 20K PD ONLY ENABLED IN S3COLD
ACZ_RST#	- LSO BIT IN AC'97 GLOBAL CONTROL REG = 1; OR - BOTH FUNCTION 2 & 3 OF DEVICE 30 ARE DISABLED	NONE
ACZ_SDIN[0-2]	INTERNAL 20K PD	INTERNAL 20K PD
ACZ_SDOUT	INTERNAL 20K PD ENABLED DURING RESET AND WHEN - LSO BIT IN AC'97 GLOBAL CONTROL REG = 1; OR - BOTH FUNCTION 2 & 3 OF DEVICE 30 ARE DISABLED	INTERNAL 20K PD ENABLED WHEN - LSO BIT IN AC'97 GLOBAL CONTROL REG = 1; OR - BOTH FUNCTION 2 & 3 OF DEVICE 30 ARE DISABLED
ACZ_SYNC		INTERNAL 20K PD

SB: 1 OF 4

SYNC_MASTER=M38 SYNC_DATE=11/16/2005

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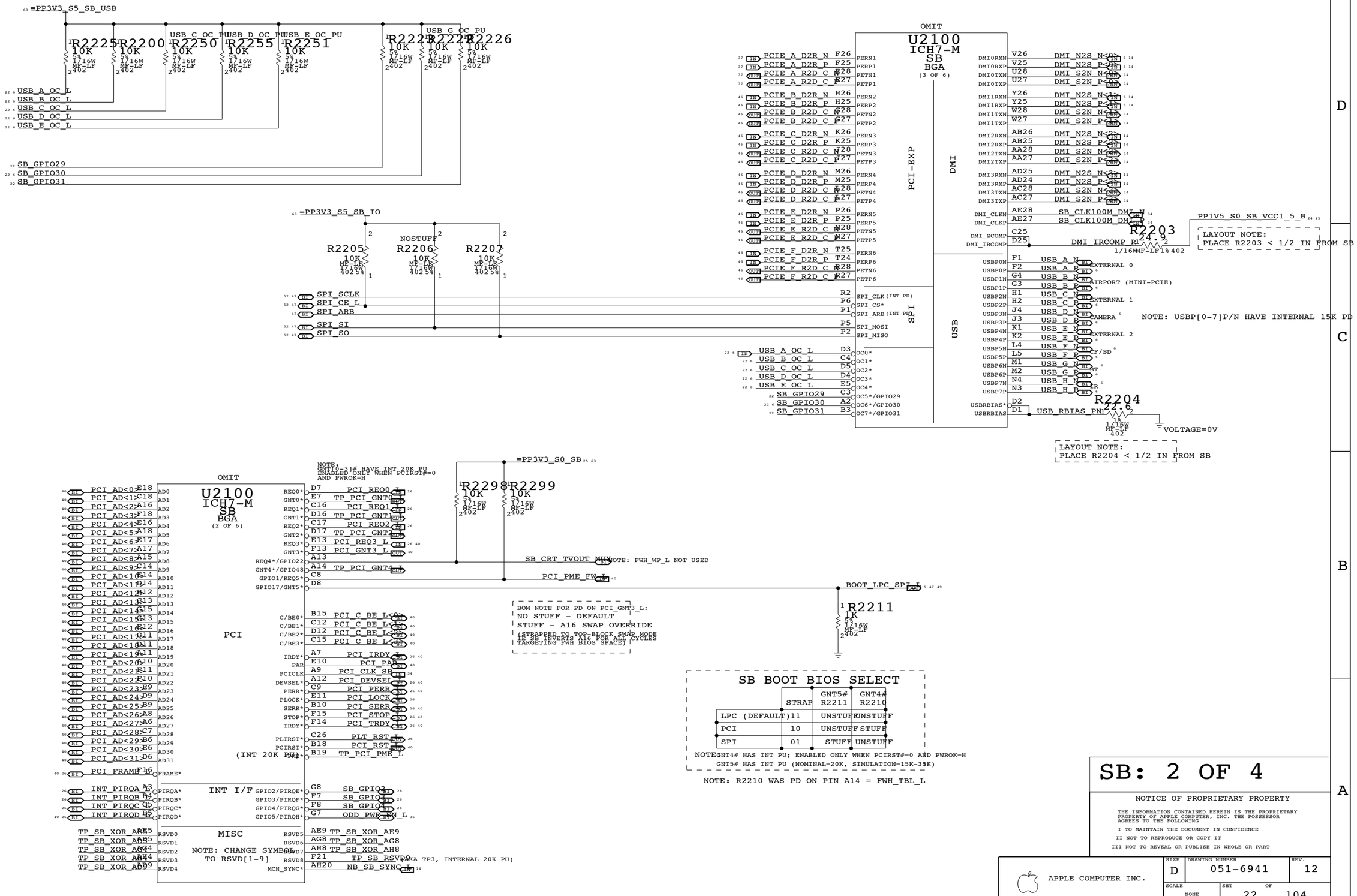
SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT: 21 OF: 104	



SB: 2 OF 4

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	22	104

NOTE FOR R2323 (DEF=NOSTUFF)
STRAPPING 8 PWROK_RISING:
SB WILL DISABLE TCO TIMER
SO SYSTEM REBOOT FEATURE

=PP3V3_S0_SB_GPIO 21 23 63

=PP3V3_S5_SB 23 25 63

63 25 23 =PP3V3_S5_SB

R2318 10K 1/16W 402 2MF-LF 5%
R2395 8.2K 1/16W 402 2MF-LF 5%
R2396 10K 1/16W 402 2MF-LF 5%
R2397 8.2K 1/16W 402 2MF-LF 5%
R2327 10K 1/16W 402 2MF-LF 5%
R2326 10K 1/16W 402 2MF-LF 5%
R2323 1K 1/16W 402 2MF-LF 5%
NOSTUFF NOSTUFF NO_REBOOT_MODE

RP2300 10K 5% 1/16W 8M-LF

R2398 1K 1/16W 402 2MF-LF 5%
R2320 10K 1/16W 402 2MF-LF 5%
R2317 10K 1/16W 402 2MF-LF 5%
R2316 10K 1/16W 402 2MF-LF 5%

OMIT

U2100
ICH7-M
SB
BGA
(4 OF 6)

SMB_CLK 27 B1 — C22 SMBCLK
SMB_DATA 27 B1 — B22 SMBDATA
SMB_LINK_ALERT_L — A26 SMLINKALERT*
SMLINK<0> — B25 SMLINK0
NOT USED — SMLINK<1> — A25 SMLINK1
PM_RI_L — A28 RI*
SB_SPKR — A19 SPKR (INT WEAK PD)
PM_SUS_STAT_L 56 49 48 47 5 OUT — A27 SUS_STAT*
PM_SYSRST_L 47 26 5 IN — A22 SYS_RST*
PM_BMBUSY_L 14 IN — AB18 GPIO0/BM_BUSY*
SMB_ALERT_L — B23 GPIO11/SMBALERT*
NOTE: RESERVED FOR FUTURE
PM_STPPCI_L 33 OUT — AC20 GPIO18/STPPCI*
PM_STPCPU_L 33 OUT — AF21 GPIO20/STPCPU*
SB_GPIO26 — A21 GPIO26
BIOS_REC 23 — B21 GPIO27
FWH_MFG_MODE 23 — E23 GPIO28
PM_CLKRUN_L 56 49 47 40 5 B1 — AG18 GPIO32/CLKRUN*
RESERVED FOR MOBILE
AZALIA DOCKING INTF
TP_AZ_DOCK_EN — AG19 GPIO33/AZ_DOCK_EN*
TP_AZ_DOCK_RST_L — AD2 GPIO34/AZ_DOCK_RST*
PCIE_WAKE_L 45 37 5 IN — F20 WAKE*
INT_SERIRQ 56 49 47 5 B1 — AH21 SERIRQ
PM_THRM_L 47 IN — AF20 THERM*
VR_PWRGD_CK410 26 IN — AD22 VRMPWRGD
TP_SB_GPIO6 B1 — AC21 GPIO6
SMC_RUNTIME_SCI_L 47 IN — AC18 GPIO7
SMC_EXTSMI_L 47 IN — E21 GPIO8

SMB

CLKS
CLK14 — AC1 — SB_CLK14P3M_TIMER 34
CLK48 — B2 — SB_CLK48M_USBCONTR 34
SUSCLK — C20 — SUS_CLK_SB 6

SYS GPIO / PWR MNGT
SLP_S3* — B24 — PM_SLP_S3_L 41 47 62
SLP_S4* — D23 — PM_SLP_S4_L 39 47 62
SLP_S5* — F22 — PM_SLP_S5_L 47 48
PWROK — AA4 — PM_SB_PWROK 26
GPIO16/DPRSLPVR — AC22 — PM_DPRSLPVR 14 57 79
TP0/BATLOW* — C21 — NOTE: DPRSLPVR HAS INT 20K PD, ENABLED AT BOOT/RESET FOR STRAPPING FCN — PM_BATLOW_L 47
(INT 20K PU) PWRBTN* — C23 — PM_PWRBTN_L 47
LAN_RST* — C19 — PM_LAN_ENABLE — NOTE: SMC WILL DRIVE 0-1-0 TO KEEP LAN INT'F IN RESET STATE TO SAVE PWR
RSMRST* — Y4 — PM_RSMRST_L 47

GPIO

GPIO9 — E20 — SMS_INT_L 47 48
GPIO10 — A20 — SMC_SB_NMI 47
DEF=GPI GPIO12 — F19 — PATA_PWR_EN_L 23
GPIO13 — E19 — SMC_WAKE_SCI_L 47
DEF=GPI GPIO14 — R4 — IDE_RESET_L 36
GPIO15 — E22 — SV_SET_UP 5 23 49
GPIO24 — R3 — CRB_SV_DET 23
GPIO25 — D20 — TP_SB_GPIO25_DO_NOT_USE
OD GPIO35 — AD21 — SB_CLK100M_SATA_OE_L 33
GPIO38 — AD20 — TP_SB_GPIO38 B1
DEF=GPI GPIO39 — AE20 — SATA_C_PWR_EN_L 23

SATA GPIO
GPIO21/SATA0GP — AF19 — SB_GPIO21 100 — R2302 — SATA_C_DET_L 36
GPIO19/SATA1GP — AH18 — SB_GPIO19 100 — R2303
GPIO36/SATA2GP — AH19
GPIO37/SATA3GP — AE19 — SB_GPIO37 100 — R2305

=PP3V3_S5_SB_PM 11 26 63
R2319 10K 1/16W 402 2MF-LF 5%
R2343 8.2K 1/16W 402 2MF-LF 5%

R2399 100K 5% 1/16W 402 2MF-LF

NOTE FOR GPIO25:
- HAS INTERNAL 20K PU, ENABLED DURING RSMRST# AND DISABLED WITHIN 100MS AFTER RSMRST# DEASSERTS
- CAN NOT BE LOW FOR 35US AFTER RSMRST# ON BOOT (DMI AC COUPLING MODE STRAP)

63 25 23 =PP3V3_S5_SB
R2306 10K 1/16W 402 2MF-LF 5% NOSTUFF
R2308 10K 1/16W 402 2MF-LF 5%
SV_SET_UP 5 23 49
CRB_SV_DET 23
R2307 10K 1/16W 402 2MF-LF 5%
R2309 0 1/16W 402 2MF-LF 5% NOSTUFF

LAYOUT NOTE:
PLACE R2306-14 WHERE PHYSICALLY ACCESSIBLE

NOTE:
SV_SET_UP IS LINDACARD DETECT
HI = PRESENT
LO = NOT PRESENT

63 25 23 =PP3V3_S5_SB
R2313 10K 1/16W 402 2MF-LF 5%
R2310 10K 1/16W 402 2MF-LF 5%
FWH_MFG_MODE 23
BIOS_REC 23
R2314 0 1/16W 402 2MF-LF 5% NOSTUFF
R2311 10K 1/16W 402 2MF-LF 5% NOSTUFF

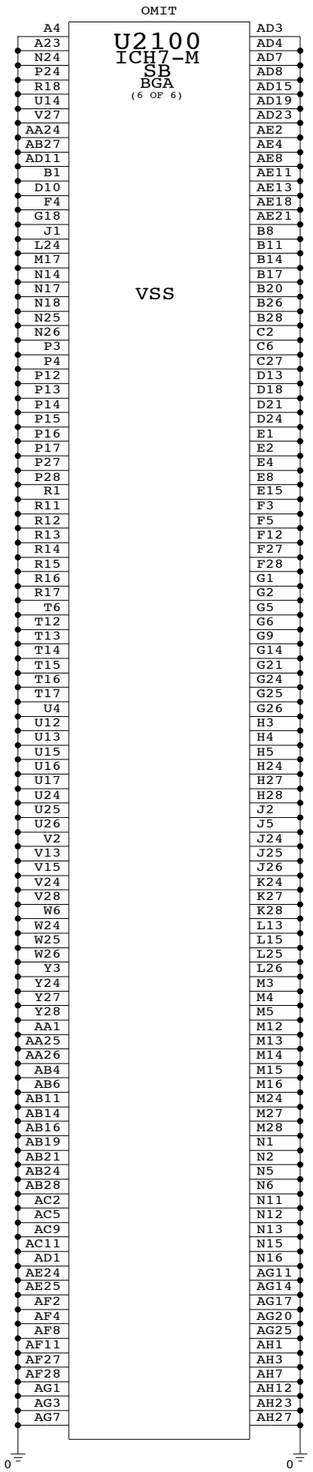
=PP3V3_S5_SB 23 25 63
R2390 10K 5% 1/16W MF-LF 2402
23 PATA_PWR_EN_L

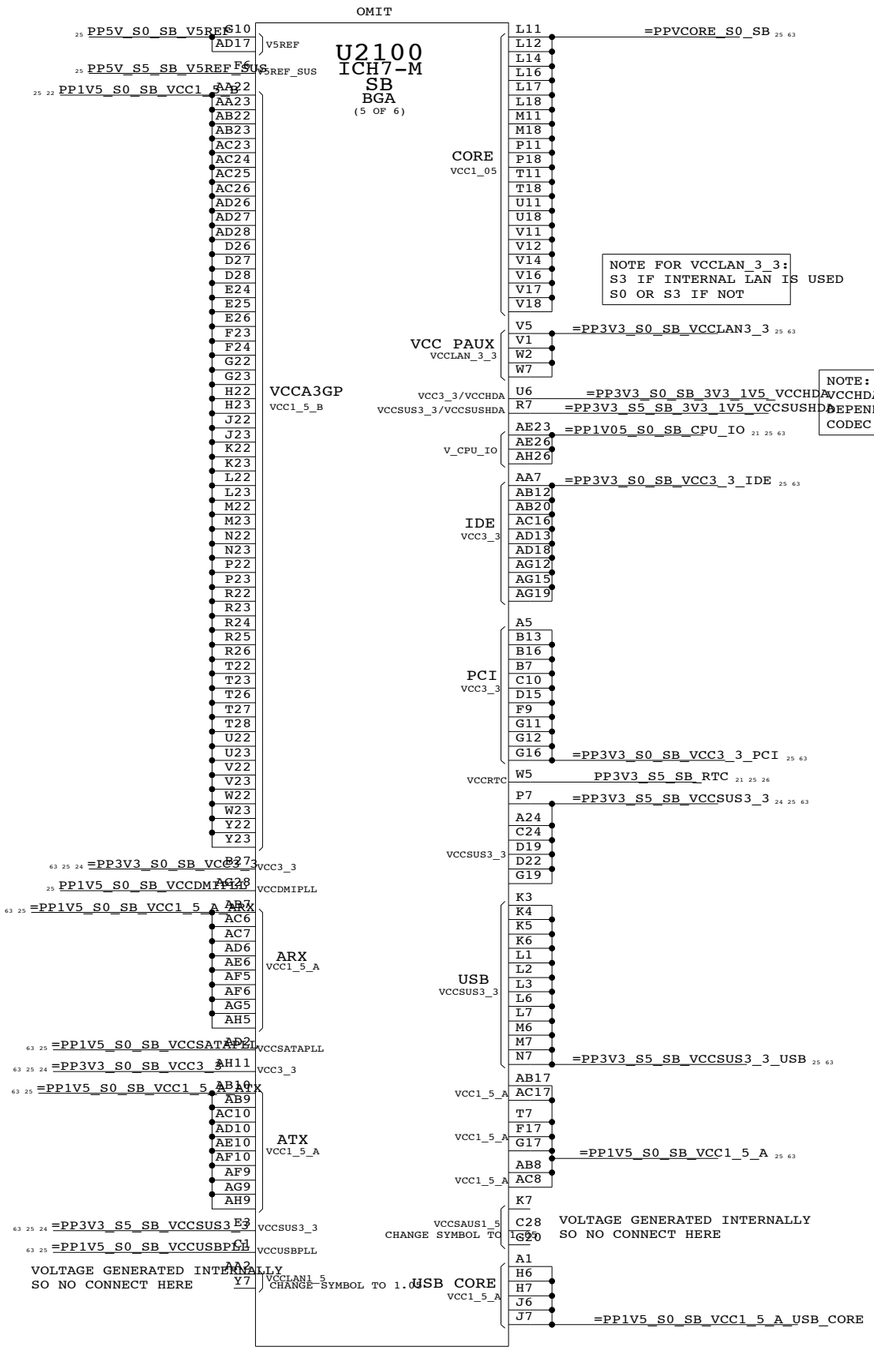
=PP3V3_S0_SB_GPIO 21 23 63
R2388 10K 5% 1/16W MF-LF 2402
23 SATA_C_PWR_EN_L

SB: 3 OF 4
SYNC_MASTER=M38 SYNC_DATE=11/16/2005

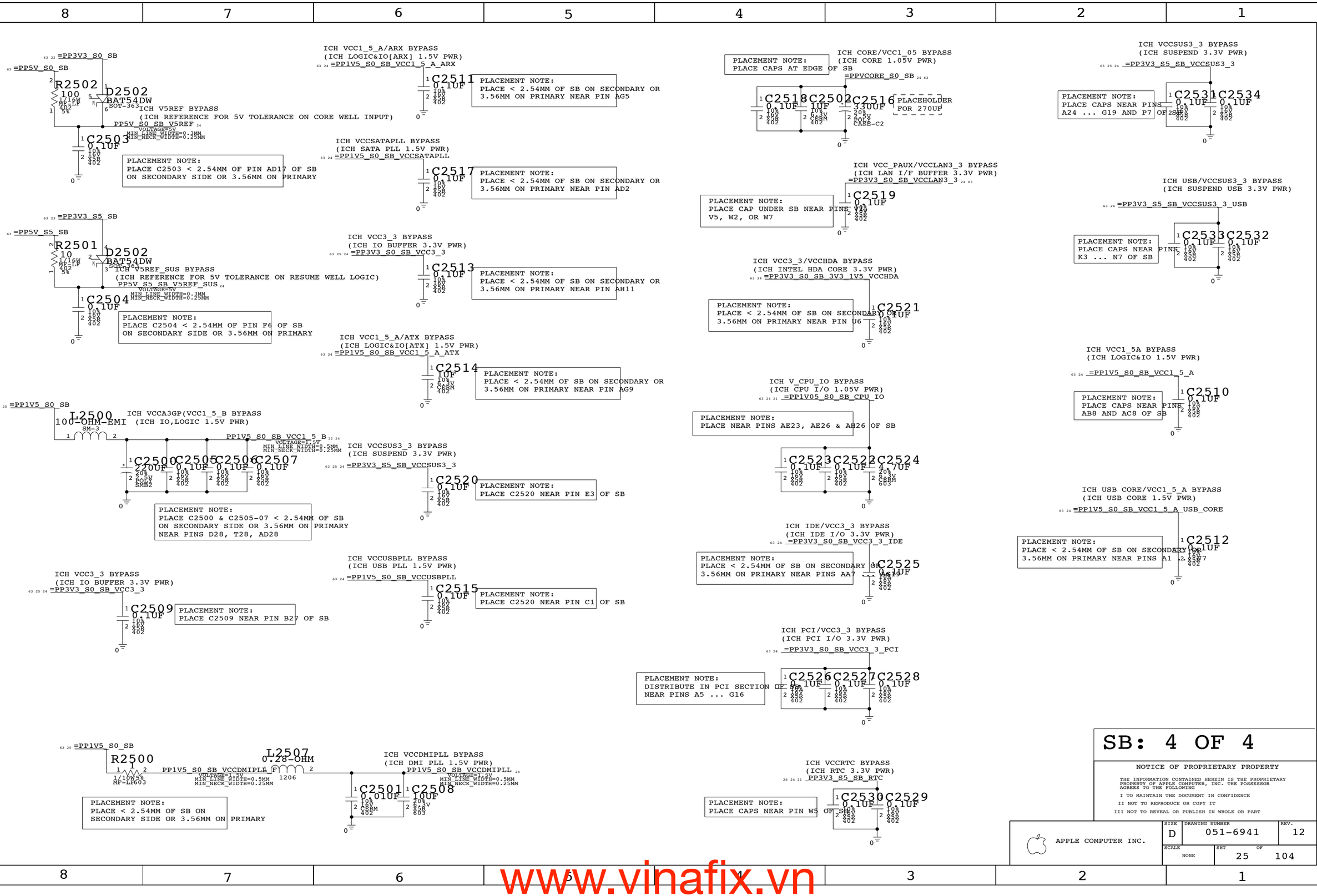
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 23 OF 104	

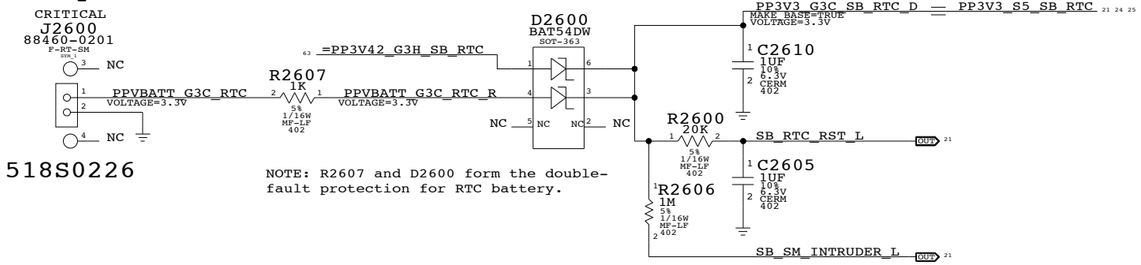




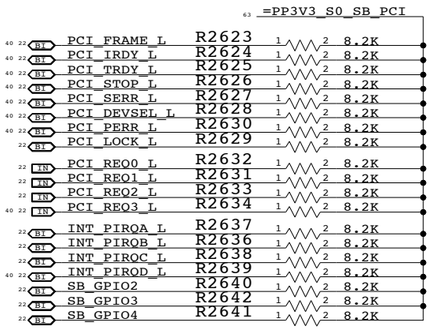
APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-6941	12
	SCALE: NONE	SHT: 24 OF 104	



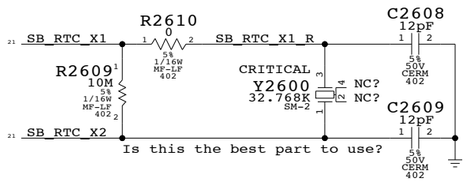
RTC Battery Connector



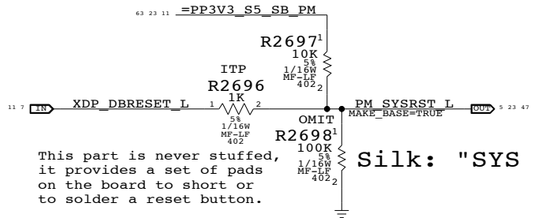
NOTE: R2607 and D2600 form the double-fault protection for RTC battery.



SB RTC Crystal Circuit



Is this the best part to use?

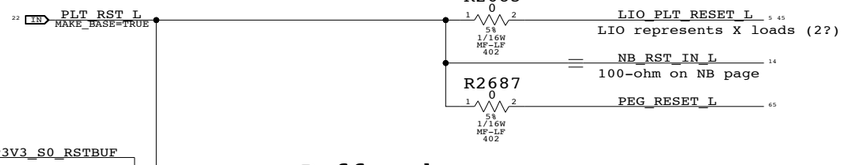


This part is never stuffed, it provides a set of pads on the board to short or to solder a reset button.

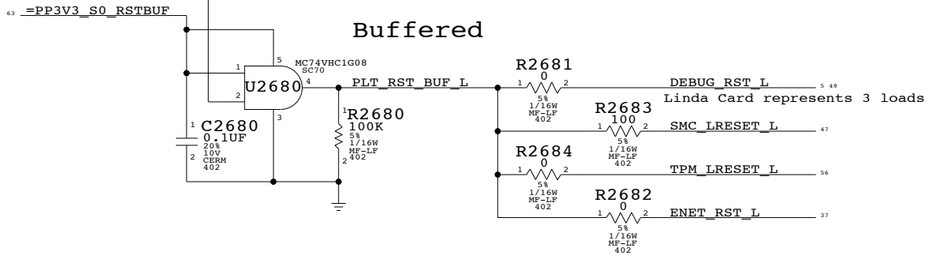
Silk: "SYS RST"

Platform Reset Connections

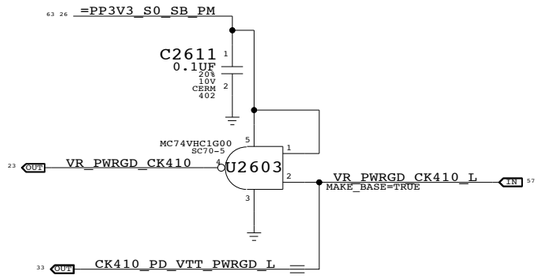
Unbuffered



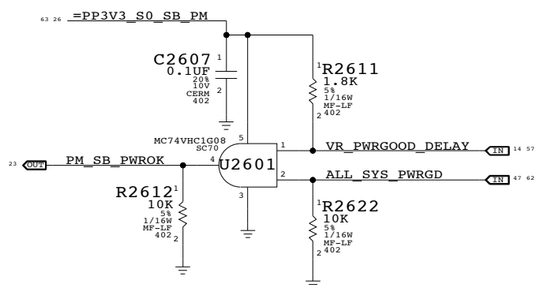
Buffered



Initial resistor values are based on CRB, but may change after characterization.



1G00 used as small & cheap inverter



SB Misc

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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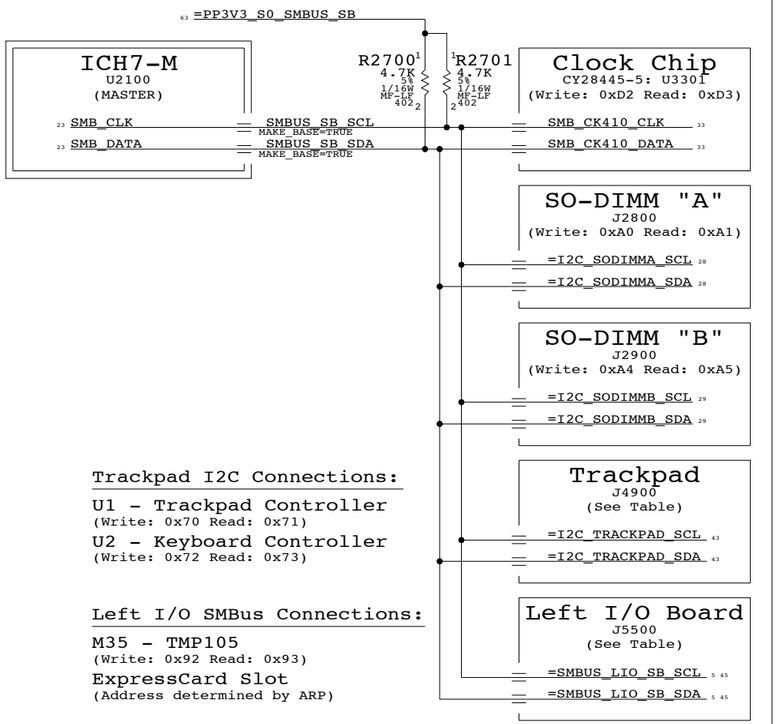
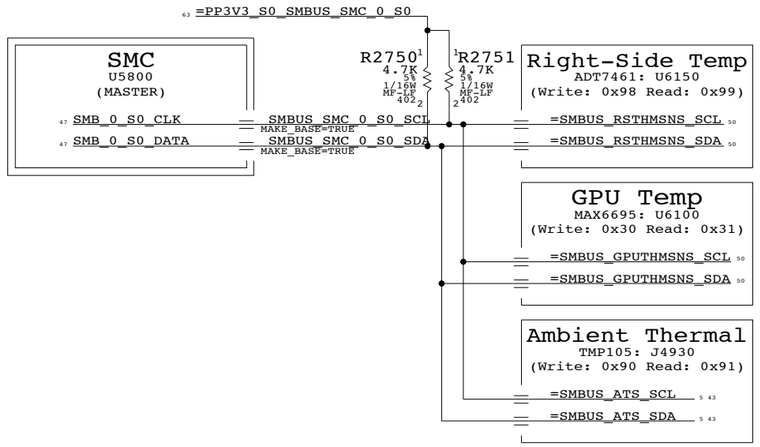
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	26	104

ICH7-M SMBus Connections

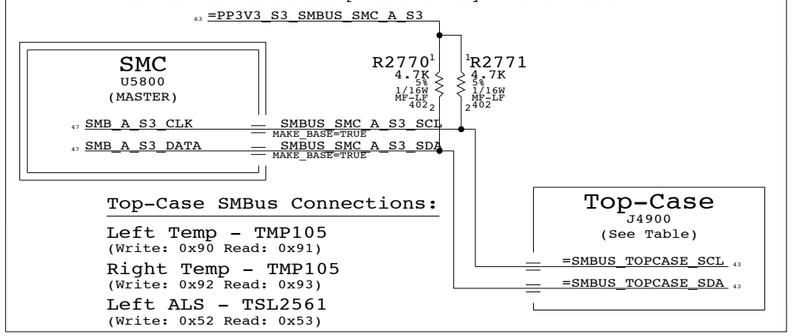


SMC "0" SMBus Connections

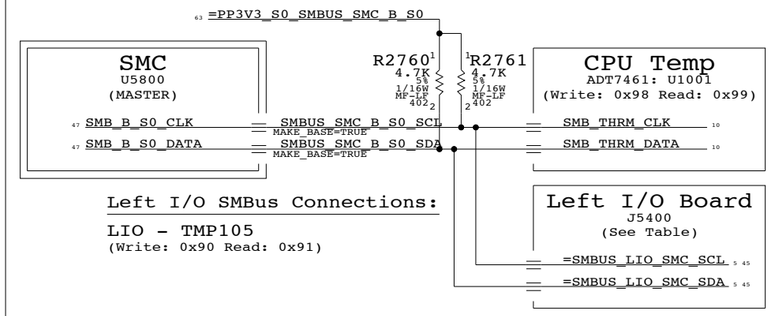


SMC "A" SMBus Connections

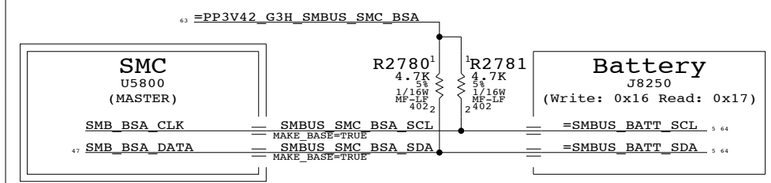
NOTE: SMC RMT bus remains powered and may be active in S3 state



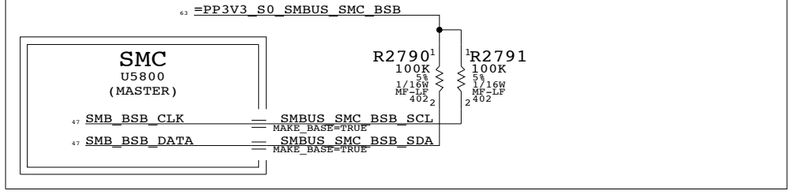
SMC "B" SMBus Connections



SMC "Battery A" SMBus Connections



SMC "Battery B" SMBus Connections



M1 SMBus Connections

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 27 OF 104	

Page Notes

Power aliases required by this page:
- =PP1V8_S3_MEM
- =PPSPD_S0_MEM (2.5V - 3.3V)

Signal aliases required by this page:
- =I2C_SODIMMA_SCL
- =I2C_SODIMMA_SDA

BOM options provided by this page:
(NONE)

NOTE: This page does not supply VREF. The reference voltage must be provided by another page.

"Lower" (surface-mount) slot

32 29 MEM_VREF

C2801 2.2uF 20% 6.3V CERM1 603

C2800 0.1uF 20% 10V CERM 402

63 29 28 =PP1V8_S3_MEM

203 201 NC

CRITICAL J2800 F-RT-SM

DDR2-SODIMM-DUAL

	1A	VREF	VSS0	2A			
	3A	VSS1	DQ4	4A	MEM_A_DQ<8>		15
15 MEM_A_DQ<14>	5A	DQ0	DQ5	6A	MEM_A_DQ<12>		15
15 MEM_A_DQ<13>	7A	DQ1	VSS2	8A			
	9A	VSS4	DM0	10A	MEM_A_DM<1>		15
15 MEM_A_DQS_N<1>	11A	DQS0*	VSS5	12A			
15 MEM_A_DQS_P<1>	13A	DQS0	DQ6	14A	MEM_A_DQ<15>		15
	15A	VSS6	DQ7	16A	MEM_A_DQ<9>		15
15 MEM_A_DQ<10>	17A	DQ2	VSS7	18A			
15 MEM_A_DQ<11>	19A	DQ3	DQ12	20A	MEM_A_DQ<2>		15
	21A	VSS8	DQ13	22A	MEM_A_DQ<3>		15
15 MEM_A_DQ<5>	23A	DQ8	VSS9	24A			
15 MEM_A_DQ<4>	25A	DQ9	DM1	26A	MEM_A_DM<0>		15
	27A	VSS10	VSS11	28A			
15 MEM_A_DQS_N<0>	29A	DQS1*	CK0	30A	MEM_CLK_P<0>		14
15 MEM_A_DQS_P<0>	31A	DQS1	CK0*	32A	MEM_CLK_N<0>		14
	33A	VSS12	VSS13	34A			
15 MEM_A_DQ<6>	35A	DQ10	DQ14	36A	MEM_A_DQ<1>		15
15 MEM_A_DQ<7>	37A	DQ11	DQ15	38A	MEM_A_DQ<0>		15
	39A	VSS14	VSS15	40A			
		KEY					
	41A	VSS16	VSS17	42A			
15 MEM_A_DQ<19>	43A	DQ16	DQ20	44A	MEM_A_DQ<23>		15
15 MEM_A_DQ<18>	45A	DQ17	DQ21	46A	MEM_A_DQ<22>		15
	47A	VSS18	VSS19	48A			
15 MEM_A_DQS_N<2>	49A	DQS2*	NC0	50A	DIMM_OVERTEMP_L	29	48
15 MEM_A_DQS_P<2>	51A	DQS2	DM2	52A	MEM_A_DM<2>		15
	53A	VSS21	VSS22	54A			
15 MEM_A_DQ<20>	55A	DQ18	DQ22	56A	MEM_A_DQ<21>		15
15 MEM_A_DQ<16>	57A	DQ19	DQ23	58A	MEM_A_DQ<17>		15
	59A	VSS23	VSS24	60A			
15 MEM_A_DQ<28>	61A	DQ24	DQ28	62A	MEM_A_DQ<29>		15
15 MEM_A_DQ<25>	63A	DQ25	DQ29	64A	MEM_A_DQ<24>		15
	65A	VSS25	VSS26	66A			
15 MEM_A_DM<3>	67A	DM3	DQS3*	68A	MEM_A_DQS_N<3>		15
NC	69A	NC1	DQS3	70A	MEM_A_DQS_P<3>		15
	71A	VSS27	VSS28	72A			
15 MEM_A_DQ<27>	73A	DQ26	DQ30	74A	MEM_A_DQ<26>		15
15 MEM_A_DQ<30>	75A	DQ27	DQ31	76A	MEM_A_DQ<31>		15
	77A	VSS29	VSS30	78A			
30 14 MEM_CKE<0>	79A	CKE0	NC/CKE1	80A	MEM_CKE<1>	14	30
	81A	VDD0	VDD1	82A			
NC	83A	NC2	NC/A15	84A	MEM_A_A<15>		6
30 15 MEM_A_BS<2>	85A	BA2	NC/A14	86A	MEM_A_A<14>		6
	87A	VDD2	VDD3	88A			
30 15 MEM_A_A<12>	89A	A12	A11	90A	MEM_A_A<11>	15	30
30 15 MEM_A_A<9>	91A	A9	A7	92A	MEM_A_A<7>	15	30
30 15 MEM_A_A<8>	93A	A8	A6	94A	MEM_A_A<6>	15	30
	95A	VDD4	VDD5	96A			
30 15 MEM_A_A<5>	97A	A5	A4	98A	MEM_A_A<4>	15	30
30 15 MEM_A_A<3>	99A	A3	A2	100A	MEM_A_A<2>	15	30
30 15 MEM_A_A<1>	101A	A1	A0	102A	MEM_A_A<0>	15	30
	103A	VDD6	VDD7	104A			
30 15 MEM_A_A<10>	105A	A10/AP	BA1	106A	MEM_A_BS<1>	15	30
30 15 MEM_A_BS<0>	107A	BA0	RAS*	108A	MEM_A_RAS_L	15	30
30 15 MEM_A_WE_L	109A	WE*	S0*	110A	MEM_CS_L<0>	14	30
	111A	VDD8	VDD9	112A			
30 15 MEM_A_CAS_L	113A	CAS*	ODT0	114A	MEM_ODT<0>	14	30
30 14 MEM_CS_L<1>	115A	NC/S1*	NC/A13	116A	MEM_A_A<13>	15	30
	117A	VDD10	VDD11	118A			
30 14 MEM_ODT<1>	119A	NC/ODT1	NC3	120A	NC		
	121A	VSS31	VSS32	122A			
15 MEM_A_DQ<35>	123A	DQ32	DQ36	124A	MEM_A_DQ<38>		15
15 MEM_A_DQ<39>	125A	DQ33	DQ37	126A	MEM_A_DQ<34>		15
	127A	VSS33	VSS34	128A			
15 MEM_A_DQS_N<4>	129A	DQS4*	DM4	130A	MEM_A_DM<4>		15
15 MEM_A_DQS_P<4>	131A	DQS4	VSS35	132A			
	133A	VSS36	DQ38	134A	MEM_A_DQ<32>		15
15 MEM_A_DQ<37>	135A	DQ34	DQ39	136A	MEM_A_DQ<36>		15
15 MEM_A_DQ<33>	137A	DQ35	VSS37	138A			
	139A	VSS38	DQ44	140A	MEM_A_DQ<57>		15
15 MEM_A_DQ<60>	141A	DQ40	DQ45	142A	MEM_A_DQ<63>		15
15 MEM_A_DQ<59>	143A	DQ41	VSS39	144A			
	145A	VSS40	DQS5*	146A	MEM_A_DQS_N<7>		15
15 MEM_A_DM<7>	147A	DM5	DQS5	148A	MEM_A_DQS_P<7>		15
	149A	VSS41	VSS42	150A			
15 MEM_A_DQ<58>	151A	DQ42	DQ46	152A	MEM_A_DQ<56>		15
15 MEM_A_DQ<61>	153A	DQ43	DQ47	154A	MEM_A_DQ<62>		15
	155A	VSS43	VSS44	156A			
15 MEM_A_DQ<43>	157A	DQ48	DQ52	158A	MEM_A_DQ<40>		15
15 MEM_A_DQ<45>	159A	DQ49	DQ53	160A	MEM_A_DQ<42>		15
	161A	VSS45	VSS46	162A			
NC	163A	NC_TEST	CK1	164A	MEM_CLK_P<1>		14
	165A	VSS47	CK1*	166A	MEM_CLK_N<1>		14
15 MEM_A_DQS_N<5>	167A	DQS6*	VSS48	168A			
15 MEM_A_DQS_P<5>	169A	DQS6	DM6	170A	MEM_A_DM<5>		15
	171A	VSS49	VSS50	172A			
15 MEM_A_DQ<41>	173A	DQ50	DQ54	174A	MEM_A_DQ<47>		15
15 MEM_A_DQ<46>	175A	DQ51	DQ55	176A	MEM_A_DQ<44>		15
	177A	VSS51	VSS52	178A			
15 MEM_A_DQ<51>	179A	DQ56	DQ60	180A	MEM_A_DQ<54>		15
15 MEM_A_DQ<50>	181A	DQ57	DQ61	182A	MEM_A_DQ<55>		15
	183A	VSS53	VSS54	184A			
15 MEM_A_DM<6>	185A	DM7	DQS7*	186A	MEM_A_DQS_N<6>		15
	187A	VSS55	DQS7	188A	MEM_A_DQS_P<6>		15
15 MEM_A_DQ<53>	189A	DQ58	VSS56	190A			
15 MEM_A_DQ<48>	191A	DQ59	DQ62	192A	MEM_A_DQ<52>		15
63 29 =PPSPD_S0_MEM	193A	VSS57	DQ63	194A	MEM_A_DQ<49>		15
27 =I2C_SODIMMA_SDA	195A	SDA	VSS58	196A			
27 =I2C_SODIMMA_SCL	197A	SCL	SA0	198A			
	199A	VDDSPD	SA1	200A	ADDR=0xA0(WR)/0xA1(RD)		

516S0382 202 204 NC

=PP1V8_S3_MEM 28 29 63

DDR2 Bypass Caps

(For return current)

63 29 28 =PP1V8_S3_MEM

C2808 10UF 20% 6.3V X5R 603

C2809 10UF 20% 6.3V X5R 603

C2810 0.1uF 20% 10V CERM 402

C2811 0.1uF 20% 10V CERM 402

C2812 0.1uF 20% 10V CERM 402

C2813 0.1uF 20% 10V CERM 402

C2814 0.1uF 20% 10V CERM 402

C2815 0.1uF 20% 10V CERM 402

C2816 0.1uF 20% 10V CERM 402

C2817 0.1uF 20% 10V CERM 402

C2818 0.1uF 20% 10V CERM 402

C2819 0.1uF 20% 10V CERM 402

C2820 0.1uF 20% 10V CERM 402

C2821 0.1uF 20% 10V CERM 402

DDR2 SO-DIMM Connector A

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	28	104

Page Notes

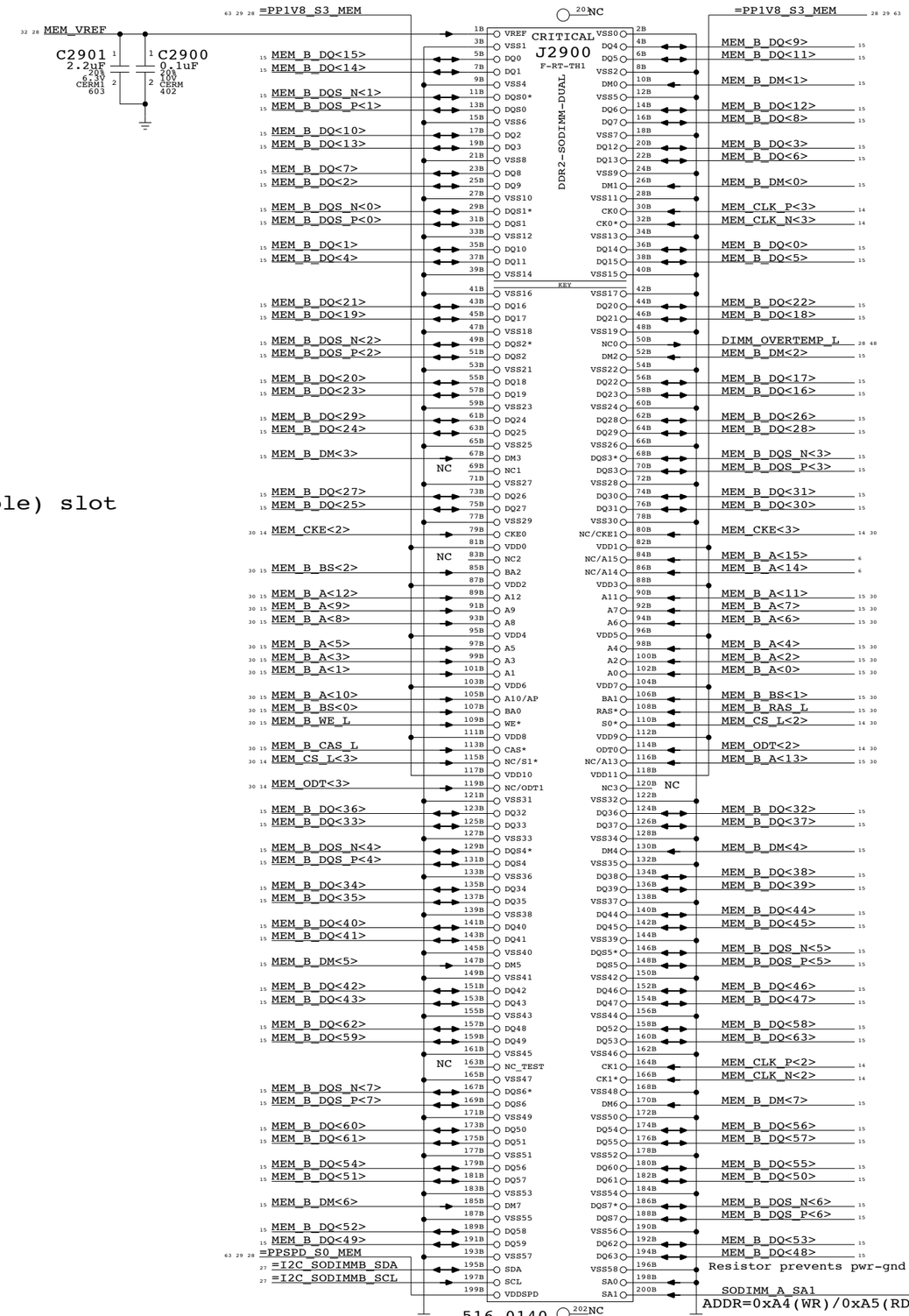
Power aliases required by this page:
- =PP1V8_S3_MEM
- =PPSPD_S0_MEM (2.5V - 3.3V)

Signal aliases required by this page:
- =I2C_SODIMMB_SCL
- =I2C_SODIMMB_SDA

BOM options provided by this page:
(NONE)

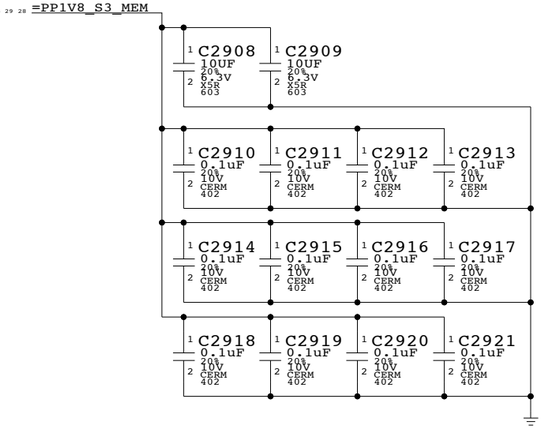
NOTE: This page does not supply VREF. The reference voltage must be provided by another page.

"Upper" (thru-hole) slot



DDR2 Bypass Caps

(For return current)



DDR2 SO-DIMM Connector B

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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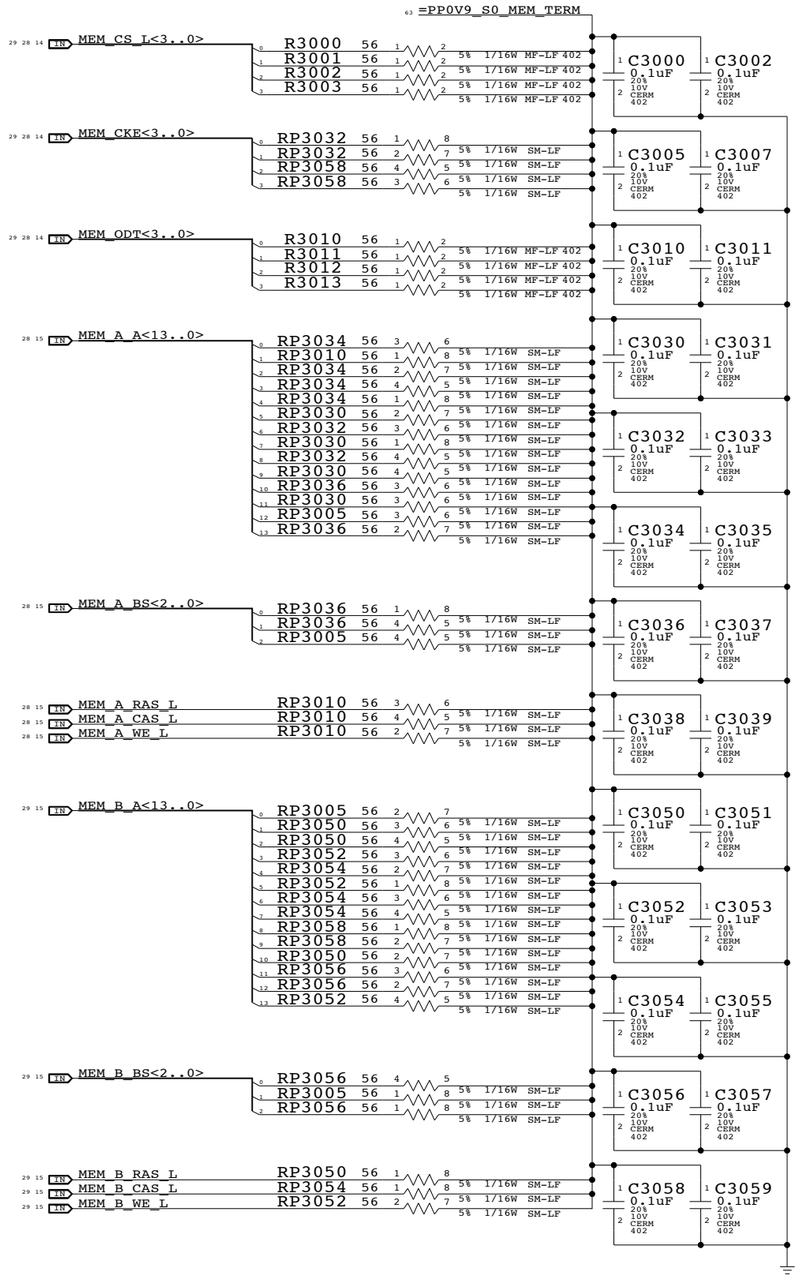
SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 29 OF 104	

One cap for each side of every RPAK, one cap for every two discrete resistors

Ensure CS_L and ODT resistors are close to SO-DIMM connector



Memory Active Termination

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	30	104

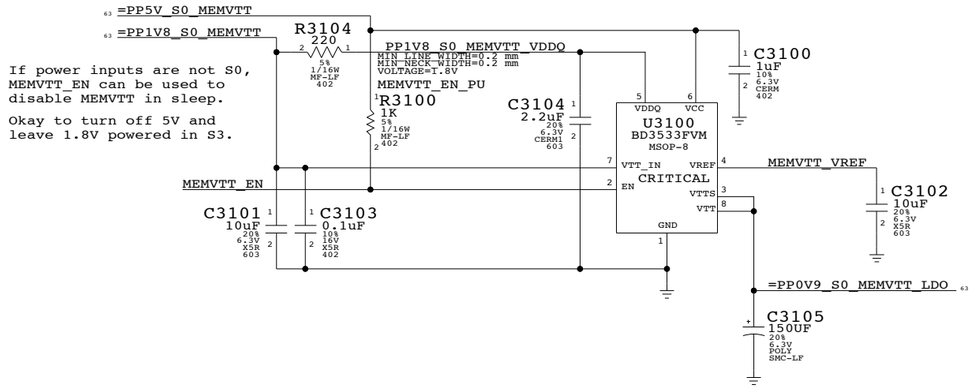
Page Notes

Power aliases required by this page:
- =PP5V_S0_MEMVTT
- =PP1V8_S0_MEMVTT
- =PP0V9_S0_MEMVTT_LDO

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

DDR2 Vtt Regulator



If power inputs are not S0, MEMVTT_EN can be used to disable MEMVTT in sleep.

Okay to turn off 5V and leave 1.8V powered in S3.

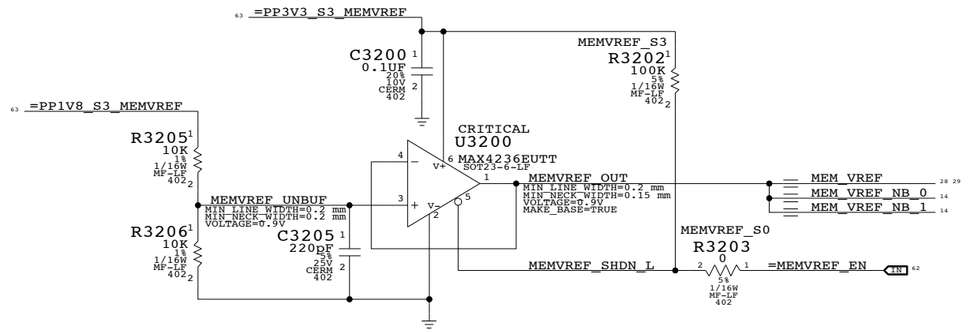
Memory Vtt Supply

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	31	104



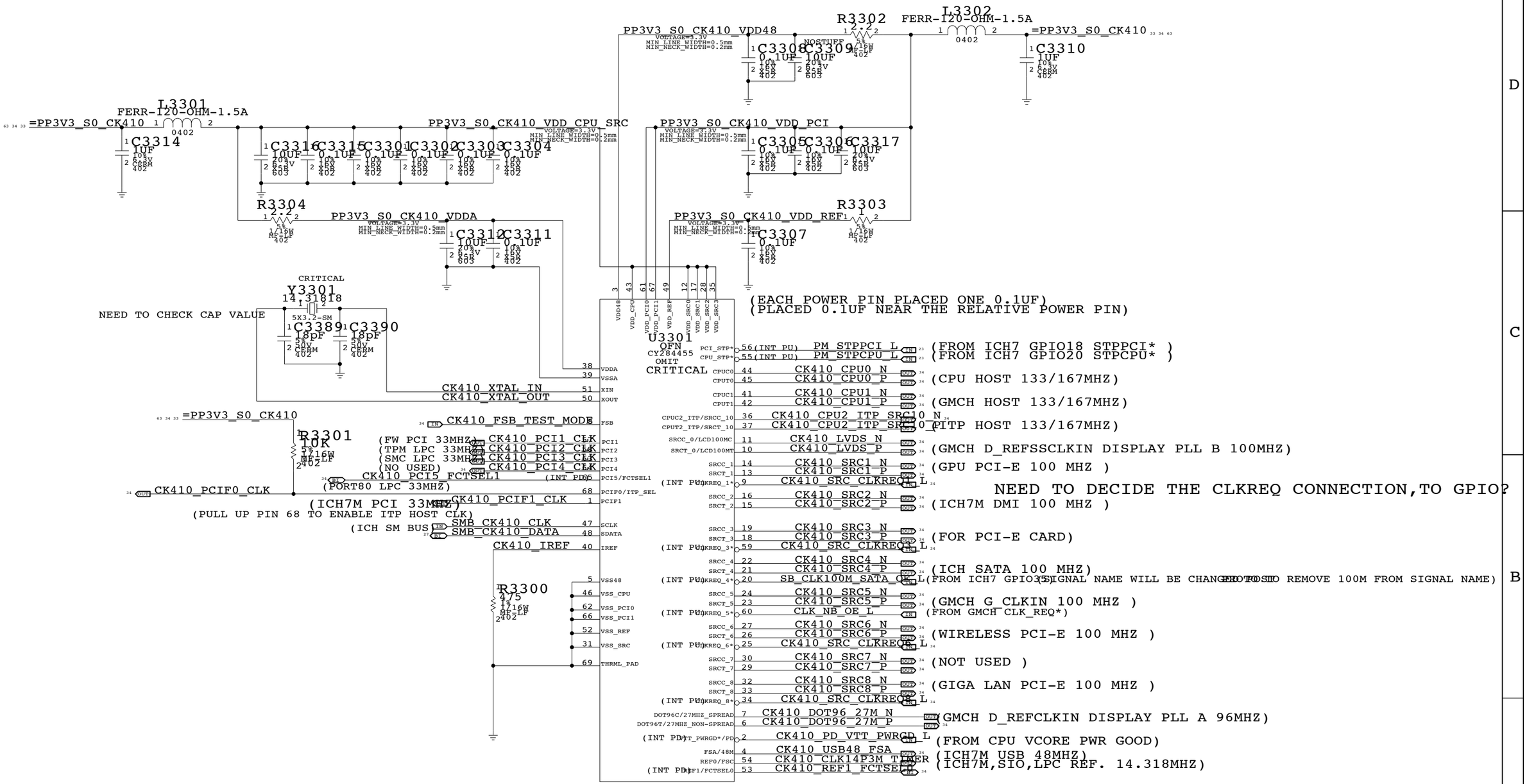
DDR2 VRef

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	32	104



FCTSEL1	FCTSEL0	PIN 6	PIN 7	PIN 10	PIN 11	
0	0	DOT96T	DOT96C	100MT_SS	T100MC_SST	* FOR INT. GRAPHIC SYSTEM
0	1	DOT96T	DOT96C	SRCT0	SRCC0	
1	0	27M_NON_SPREAD	27M_SPREAD	SRCT0	SRCC0	* FOR EXT. GRAPHIC SYSTEM
1	1	OFF LOW	TBD	SRCT0	SRCC0	

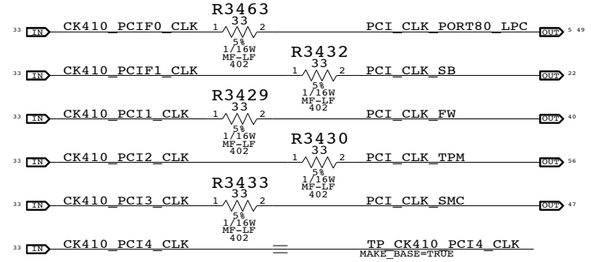
CLOCKS

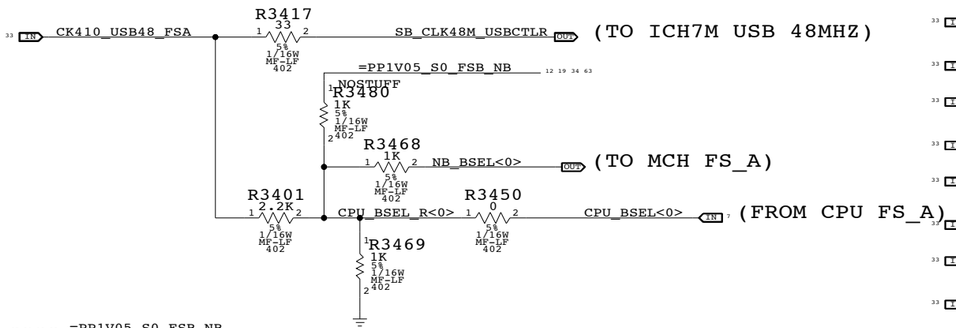
SYNC_MASTER=M87 SYNC_DATE=10/12/2005

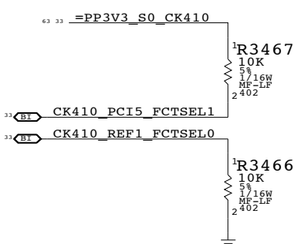
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	33	104



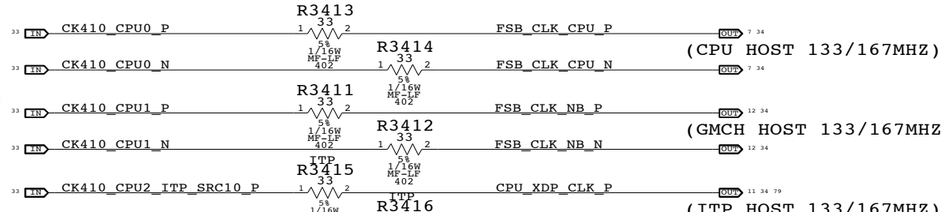


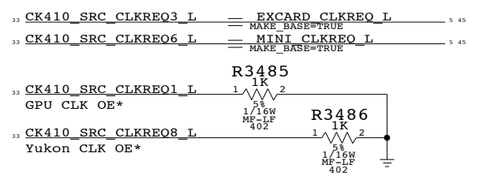


NOSTUFF R3450,R3451,R3453 FOR MANUAL CPU FREQUENCY

FS_C	FS_B	FS_A	CPU
0	0	0	266M
# 0	0	1	133M
# 0	1	0	166M
0	1	1	200M
1	0	0	100M
1	0	1	333M
1	1	0	400M
1	1	1	RESERVED

NAPA PLATFORM ONLY SUPPORT 133M/166M CPU SPEED





Clock Termination

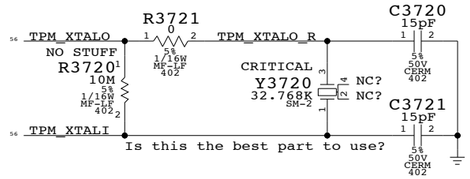
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

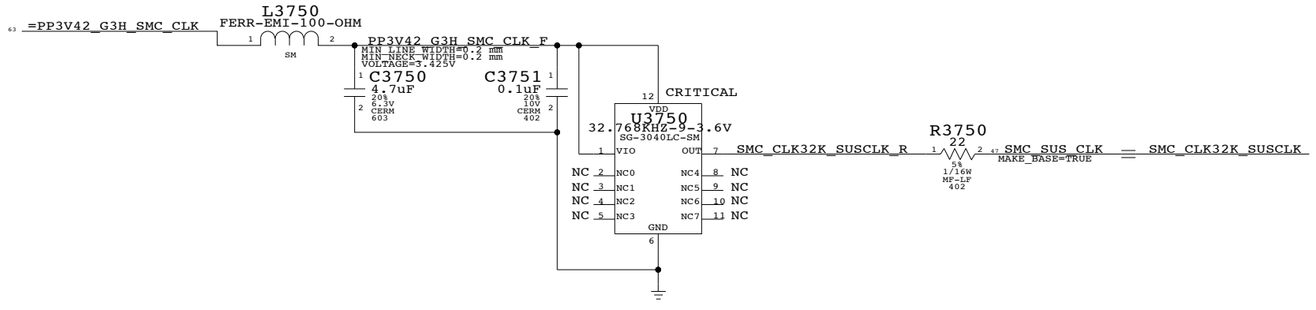
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	34	104

TPM Crystal Circuit



SMC G3Hot Oscillator



Mobile Clocking

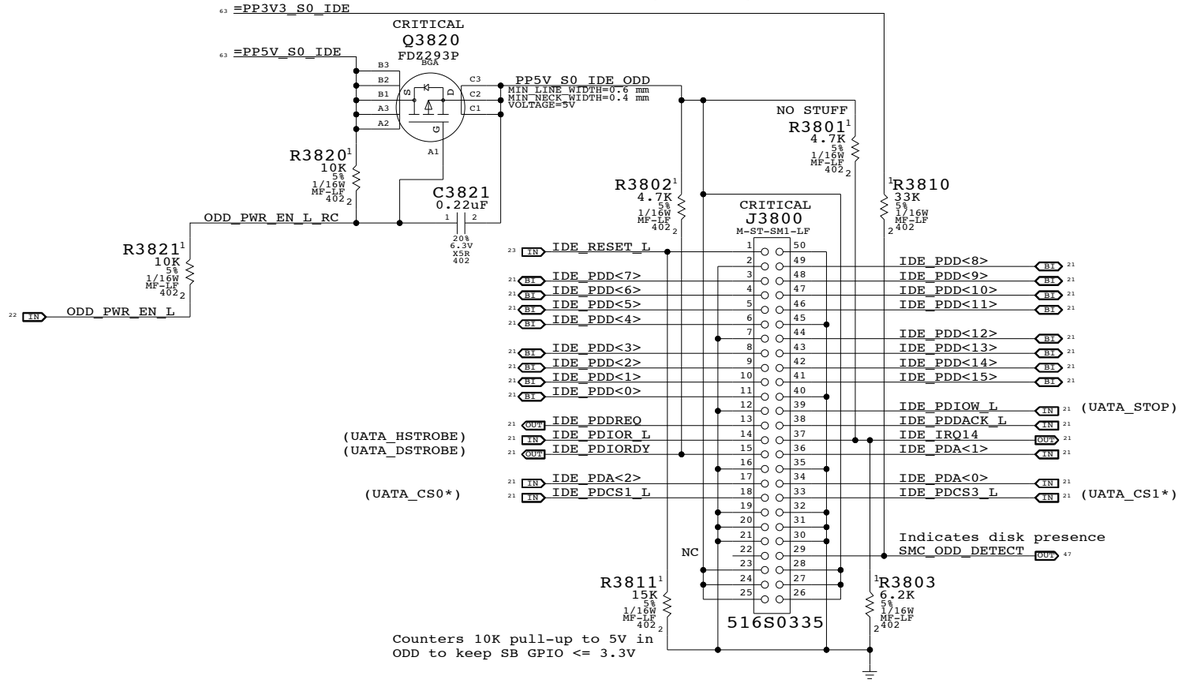
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

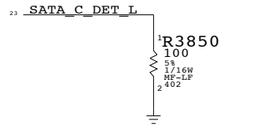
APPLE COMPUTER INC.

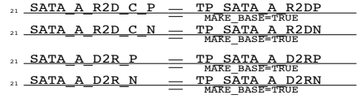
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

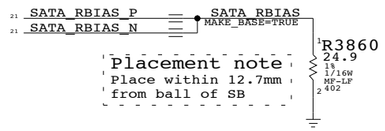
SCALE	SHT	OF
NONE	37	104

IDE (ODD) Connector









PATA Connector

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 38 OF 104	

PLACE C4100-C4106 NEAR PINS AVDLL0-AVDLL6.
SCHEME MATCHES DOC MVL100258-01 MIN_LINE_WIDTH=0.4MM
MIN_NECK_WIDTH=0.22MM
VOLTAGE=2.5V

PP2V5_S3_ENET_AVDD

C4100 1UF 10% 6.3V CERM 402
C4101 0.1UF 10% 16V X5R 402
C4102 0.1UF 10% 16V X5R 402
C4103 0.1UF 10% 16V X5R 402
C4104 0.1UF 10% 16V X5R 402
C4105 0.001UF 10% 50V CERM 402
C4106 0.001UF 10% 50V CERM 402
C4107 0.1UF 10% 16V X5R 402

L4100 FERR-120-OHM-1.5A 0402 =PP2V5_S3_ENET

PLACE C4107 NEAR U4101 AVDD

=PP3V3_S3_ENET
=PP1V2_S3_ENET
=PP3V3_S3_ENET

R4101 4.7K 5% 1/16W MF-LF 402

PLACE C4110 AND C4111 WITHIN
12 MIL OF U4101 PIN 49 AND 50

C4110 0.1UF 10% 16V X5R 402
C4111 0.1UF 10% 16V X5R 402
C4112 0.1UF 10% 16V X5R 402

PCIE_A_D2R_C_P
PCIE_A_D2R_C_N
PCIE_A_D2R_P
PCIE_A_D2R_N
PCIE_A_R2D_P
PCIE_A_R2D_N
PCIE_A_R2D_C_P
PCIE_A_R2D_C_N

PLACE C4113 AND C4112 WITHIN
12 MIL OF U21UU E27 AND E28

C4113 0.1UF 10% 16V X5R 402

ENET_CLK100M_PCIE_P
ENET_CLK100M_PCIE_N
PCIE_WAKE_L
ENET_RST_L

OMIT
CRITICAL
U4101
88E8053
QFN

OPTIONAL EXTERNAL LDO

ENET_LOM_DISABLE_L
ENET_VMAIN_AVLBL
ENET_CTRL25
ENET_CTRL12
ENET_RSET

R4102 4.87K 1% 1/16W MF-LF 402
NO PULL-UP NEEDED

ANALOG
PCI EXPRESS
MEDIA
LED
TEST
TWSI
SPI
MAIN CLK

ENET_VPD_CLK
ENET_VPD_DATA
ENET_PU_VDD_TTL0
ENET_PU_VDD_TTL1

ASF IS UNAVAILABLE ON 8053

INTERNAL PULL-UP

CRITICAL
ENET_XTALI
ENET_XTALO

1. KEEP ENET_XTALI AND ENET_XTALO TRACE LENGTH <12MIL
2. DO NOT ROUTE UNDER CRYSTAL

Y4101 SM-3.2X2.5MM 25.0000M
C4150 27pF 5% 50V CERM 402
C4151 27pF 5% 50V CERM 402

THRML_PAD

ENET_MDI_P<0>
ENET_MDI_N<0>
ENET_MDI_P<1>
ENET_MDI_N<1>
ENET_MDI_P<2>
ENET_MDI_N<2>
ENET_MDI_P<3>
ENET_MDI_N<3>

R4106 49.9 1% 1/16W MF-LF 402
R4105 49.9 1% 1/16W MF-LF 402
R4104 49.9 1% 1/16W MF-LF 402
R4103 49.9 1% 1/16W MF-LF 402
R4120 49.9 1% 1/16W MF-LF 402
R4119 49.9 1% 1/16W MF-LF 402
R4118 49.9 1% 1/16W MF-LF 402
R4117 49.9 1% 1/16W MF-LF 402

ENET_MDI0
ENET_MDI1
ENET_MDI2
ENET_MDI3

C4116 0.001UF 10% 50V CERM 402
C4115 0.001UF 10% 50V CERM 402
C4117 0.001UF 10% 50V CERM 402
C4118 0.001UF 10% 50V CERM 402

PLACE RESISTORS CLOSE TO U4101

=PP3V3_S3_ENET

R4130 4.7K 5% 1/16W MF-LF 402
R4131 4.7K 5% 1/16W MF-LF 402

ENET_PU_VDD_TTL0
ENET_PU_VDD_TTL1

=PP3V3_S3_ENET

PLACE C4140 NEAR U4102 VCC

C4140 0.1UF 10% 16V X5R 402

R4122 4.7K 5% 1/16W MF-LF 402
R4123 4.7K 5% 1/16W MF-LF 402

OMIT
CRITICAL
U4102
M24C08
SO8

ENET_VPD_DATA
ENET_VPD_CLK

PLACE C4127-C4134 NEAR PINS VDD0-VDD7 ON U4101
SCHEME MATCHES DOC MVL100258-01

=PP1V2_S3_ENET

C4126 0.1UF 10% 16V X5R 402
C4127 0.1UF 10% 16V X5R 402
C4128 0.1UF 10% 16V X5R 402
C4129 0.1UF 10% 16V X5R 402
C4130 0.1UF 10% 16V X5R 402
C4131 0.001UF 10% 50V CERM 402
C4132 0.001UF 10% 50V CERM 402
C4133 0.001UF 10% 50V CERM 402
C4134 0.001UF 10% 50V CERM 402

PLACE C4135-C4139 NEAR VDDO_TTL0-VDD_TTL4 ON U4101
SCHEME MATCHES DOC MVL100258-01

=PP3V3_S3_ENET

C4135 0.1UF 10% 16V X5R 402
C4136 0.1UF 10% 16V X5R 402
C4137 0.1UF 10% 16V X5R 402
C4138 0.001UF 10% 50V CERM 402
C4139 0.001UF 10% 50V CERM 402

ETHERNET CONTROLLER

SYNC_MASTER=M42 SYNC_DATE=10/12/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	41	104

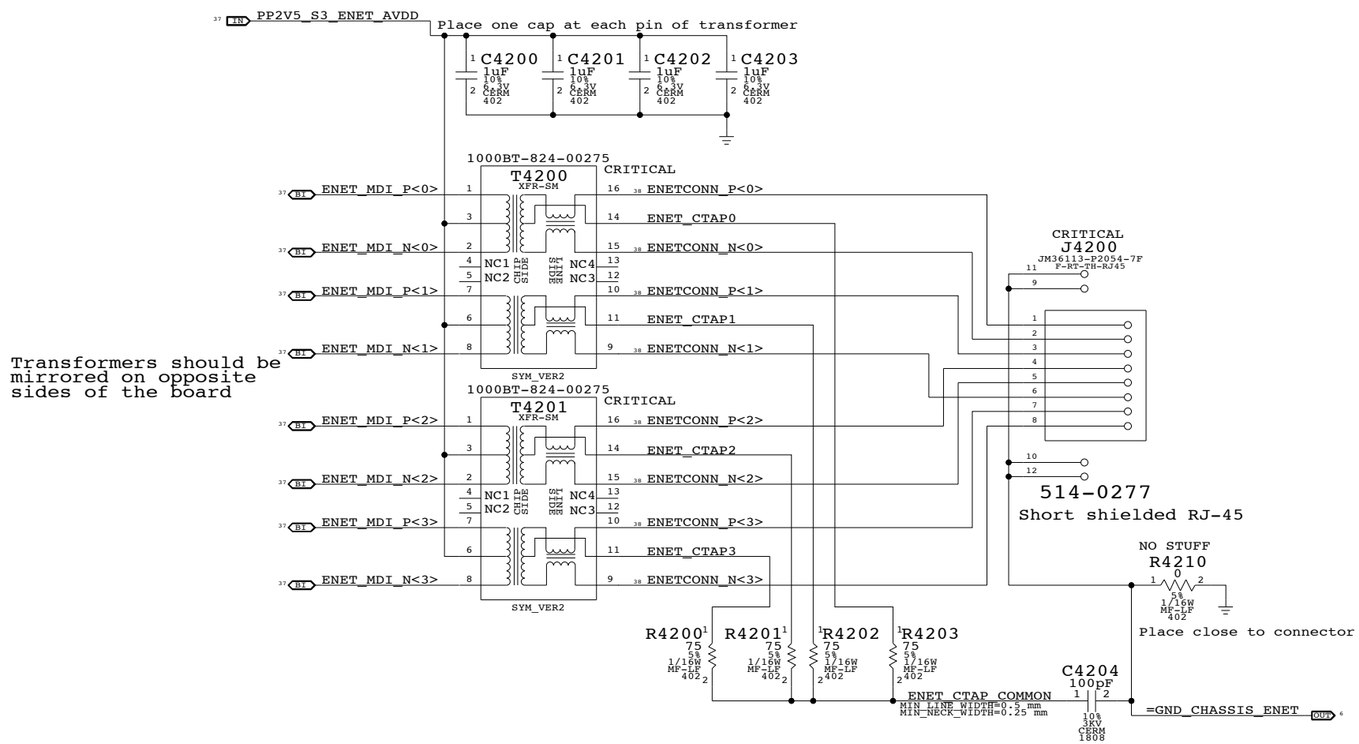
ELECTRICAL_CONSTRAINT_SET	NET_TYPE SPACING	NET_TYPE PHYSICAL	
PROVIDED BY ETHERNET PHY	ENETCONN	ENET_100D	ENETCONN_P<0> 38
	ENETCONN	ENET_100D	ENETCONN_N<0> 38
	ENETCONN	ENET_100D	ENETCONN_P<1> 38
	ENETCONN	ENET_100D	ENETCONN_N<1> 38
	ENETCONN	ENET_100D	ENETCONN_P<2> 38
	ENETCONN	ENET_100D	ENETCONN_N<2> 38
	ENETCONN	ENET_100D	ENETCONN_P<3> 38
	ENETCONN	ENET_100D	ENETCONN_N<3> 38

Page Notes

Power aliases required by this page:
- =PP2V5_ENET
- =GND_CHASSIS_ENET

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)



Transformers should be mirrored on opposite sides of the board

Ethernet Connector

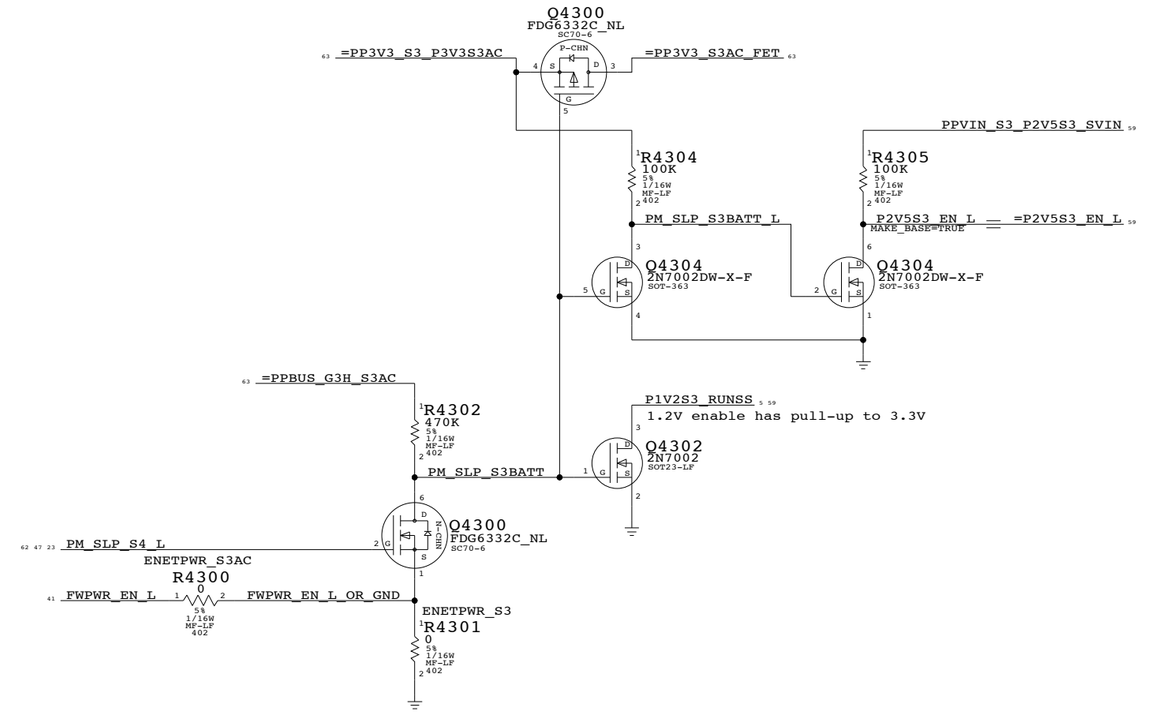
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 42 OF 104	

Yukon Power Control

Allows powering Yukon down during battery sleep to save power



When ENETPWR_S3AC BOMOPTION is active:

State	FWPWR_EN_L	PM_SLP_S4_L	PM_SLP_S3BATT	PM_SLP_S3BATT_L	P2V5S3_EN_L	P1V2S3_RUNSS
S0 AC	0V	3.3V	0V (3.3V ON)	3.3V	0V (2.5V ON)	3.3V (1.2V ON)
S0 Batt	0V	3.3V	0V (3.3V ON)	3.3V	0V (2.5V ON)	3.3V (1.2V ON)
S3 AC	0V	3.3V	0V (3.3V ON)	3.3V	0V (2.5V ON)	3.3V (1.2V ON)
S3 Batt	PBUS	3.3V	PBUS (3.3V OFF)	0V	3.3V (2.5V OFF)	0V (1.2V OFF)
S5 AC	0V	0V	PBUS (3.3V OFF)	0V	Hi-Z (2.5V OFF)	0V (1.2V OFF)
S5 Batt	PBUS	0V	PBUS (3.3V OFF)	0V	Hi-Z (2.5V OFF)	0V (1.2V OFF)
G3H Batt	PBUS	0V	PBUS (3.3V OFF)	0V	Hi-Z (2.5V OFF)	0V (1.2V OFF)

When ENETPWR_S3 BOMOPTION is active:

State	PM_SLP_S4_L	PM_SLP_S3BATT	PM_SLP_S3BATT_L	P2V5S3_EN_L	P1V2S3_RUNSS
S0	3.3V	0V (3.3V ON)	3.3V	0V (2.5V ON)	3.3V (1.2V ON)
S3	3.3V	0V (3.3V ON)	3.3V	0V (2.5V ON)	3.3V (1.2V ON)
S5	0V	PBUS (3.3V OFF)	0V	Hi-Z (2.5V OFF)	0V (1.2V OFF)
G3H	0V	PBUS (3.3V OFF)	0V	Hi-Z (2.5V OFF)	0V (1.2V OFF)

Yukon Power Control

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	43	104

PAGE NOTES

INPUT
=PP3V3_S0_FW - 3.3V POWER FOR FIREWIRE (MOBILE: OFF DURING SLEEP)
=PP3V3_S0_PCI - 3.3V POWER FOR PCI FIREWIRE (MOBILE: OFF DURING SLEEP)
PCI_GNT3_L - PCI GRANT FROM SB
PCI_CLK_FW - NEED TO REFERENCE TO ALIAS PAGE
PCI_RST_L - PCI RESET FROM SB
FW_PC0 - FIREWIRE POWER CLASS IDENTIFIER

INPUT/OUTPUT
PCI_AD<0..31>,PCI_C_BE_L<0..3>,PCI_FRAME_L,PCI_IRDY_L,PCI_TRDY_L,
PCI_DEVSEL_L, PCI_STOP_L, PCI_PAR, PCI_PERR_L, PCI_SERR_L
FW_A_TPA_P/N, FW_A_TPB_P/N, FW_A_TPBIAS - PORT 0 FIREWIRE DIFF PAIRS
FW_B_TPA_P/N, FW_B_TPB_P/N, FW_B_TPBIAS - PORT 1 FIREWIRE DIFF PAIRS
FW_C_TPA_P/N, FW_C_TPB_P/N, FW_C_TPBIAS - PORT 2 FIREWIRE DIFF PAIRS

OUTPUT
PCI_REQ3_L - PCI REQUEST TO SB
PM_CLKRUN_L - CLOCK-RUN PCI PROTOCOL
INT_PIRQD_L - INTERRUPT TO SB
PCI_PME_FW_L - DEDICATED PME FOR FIREWIRE (SB GPIO1)

PAGE HISTORY

5/19/2005 - FIRST REVISION OF PAGE
6/20/2005 - BGA VERSION OF FW323-06 ADDED
6/21/2005 - CHANGED INT* TO INT_PIRQD_L (PER ARCHITECTURAL DEFINITION)
6/21/2005 - CHANGED PCI_ID TO AD19 (PER ARCHITECTURAL DEFINITION)
6/21/2005 - CHANGED REQ/GNT TO REQ3/GNT3 (PER ARCHITECTURAL DEFINITION)
6/22/2005 - ADDED 51OK PULL-DOWN ON RS3* AND REMOVED CONNECTION TO PLT_RST_L
6/22/2005 - CHANGED CLK_PME_R1FE_PAIR NAMES TO BE RE-USE COMPLIANT
6/22/2005 - REMOVED CONSTRAINT SETS AS THEY WILL BE MANAGED ON BOARD SIDE
6/22/2005 - REMOVED C4421 - REDUNDANT
6/22/2005 - BRING OUT PCI CONNECTION TO BE CONNECTED ON PORT PAGE
7/26/2005 - CONNECTED PIN E10 TO GND

0.001A DURING SLEEP

=PP3V3_S3_FW

PLACE ONE CAP PER TWO PINS STARTING WITH C4424 ON VDD0

C4424 10UF 20% 6.3V X5R 603
C4418 0.1UF 20% 10V CERM 402
C4422 0.1UF 20% 10V CERM 402
C4426 0.1UF 20% 10V CERM 402
C4428 0.1UF 20% 10V CERM 402
C4430 0.1UF 20% 10V CERM 402
C4432 0.1UF 20% 10V CERM 402

L4400
600-OHM-300MA
0402

PLACE ONE CAP PER TWO PINS STARTING WITH C4416 ON VDDA0

C4416 10UF 20% 6.3V X5R 603
C4417 0.1UF 10% 16V X5R 402
C4429 0.1UF 10% 16V X5R 402
C4425 0.1UF 10% 16V X5R 402

PP3V3_S3_FW_AVDD
VOLTAGE=3.3V
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM

GND_FW_VSSA
VOLTAGE=0V
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM

=PP3V3_S3_PCI

CONNECT TO VDD FOR 3.3V OPERATION

VDD0 G4, VDD1 N1, VDD2 N2, VDD3 K5, VDD4 K6, VDD5 K7, VDD6 L13, VDD7 H13, VDD9 A2
VDDA0 D10, VDDA1 A14, VDDA2 B13, VDDA3 A7, VDDA4 B8, VDDA5 D9

PCI_VIOS

PCI_AD<0>	F10	PCI_AD0
PCI_AD<1>	G10	PCI_AD1
PCI_AD<2>	H10	PCI_AD2
PCI_AD<3>	H12	PCI_AD3
PCI_AD<4>	J13	PCI_AD4
PCI_AD<5>	J12	PCI_AD5
PCI_AD<6>	K13	PCI_AD6
PCI_AD<7>	K10	PCI_AD7
PCI_AD<8>	L12	PCI_AD8
PCI_AD<9>	M13	PCI_AD9
PCI_AD<10>	L11	PCI_AD10
PCI_AD<11>	M12	PCI_AD11
PCI_AD<12>	M11	PCI_AD12
PCI_AD<13>	N12	PCI_AD13
PCI_AD<14>	M10	PCI_AD14
PCI_AD<15>	N11	PCI_AD15
PCI_AD<16>	M4	PCI_AD16
PCI_AD<17>	N5	PCI_AD17
PCI_AD<18>	N4	PCI_AD18
PCI_AD<19>	M3	PCI_AD19
PCI_AD<20>	M2	PCI_AD20
PCI_AD<21>	N3	PCI_AD21
PCI_AD<22>	K4	PCI_AD22
PCI_AD<23>	M1	PCI_AD23
PCI_AD<24>	K2	PCI_AD24
PCI_AD<25>	J4	PCI_AD25
PCI_AD<26>	K1	PCI_AD26
PCI_AD<27>	J2	PCI_AD27
PCI_AD<28>	J1	PCI_AD28
PCI_AD<29>	H2	PCI_AD29
PCI_AD<30>	H4	PCI_AD30
PCI_AD<31>	H1	PCI_AD31
PCI_C_BE_L<0>	K12	PCI_CBE0*
PCI_C_BE_L<1>	M9	PCI_CBE1*
PCI_C_BE_L<2>	L3	PCI_CBE2*
PCI_C_BE_L<3>	L4	PCI_CBE3*
PCI_PAR	N10	PCI_PAR
PCI_FRAME_L	N6	PCI_FRAME*
PCI_IRDY_L	M6	PCI_IRDY*
PCI_TRDY_L	N7	PCI_TRDY*
PCI_DEVSEL_L	N8	PCI_DEVSEL*
PCI_STOP_L	M7	PCI_STOP*
FW_PCI_IDSEL	L2	PCI_IDSEL
PCI_REQ3_L	E2	PCI_REQ*
PCI_GNT3_L	E1	PCI_GNT*
PCI_PERR_L	M8	PCI_PERR*
PCI_SERR_L	N9	PCI_SERR*
PCI_CLK_FW	G2	PCI_CLK
PM_CLKRUN_L	D1	CLKRUN*
FW_PCI_RST_L	F1	PCI_RST*
INT_PIRQD_L	D2	PCI_INTA*
PCI_PME_FW_L	F2	PCI_PME*

R4431 22 5% 1/16W MF-LF 402
R4432 100 5% 1/16W MF-LF 402

THIS IS FROM ~~ICH-7M~~

CRITICAL
U4400
FW32306
BGA
OMIT

197S0178 3.2MMX2.5MM
CRITICAL

Y4403 SM-3.2X2.5MM 24.576MHZ
R4400 390 5% 1/16W MF-LF 402
C4411 22PF 5% 50V CERM 402
C4412 22PF 5% 50V CERM 402
NEED TO CHECK CRYSTAL LOAD CAPACITANCE

XI	A5	FW_XI
XO	B5	FW_XO
RESET*	B4	FW_PWRON_RST_L
R1	A6	FW_R1
R0	B7	FW_R0
TPBIAS0	B8	FW_A_TPBIAS
TPA0_P	A9	FW_A_TPA_P
TPA0_N	B9	FW_A_TPA_N
TPB0_P	B10	FW_A_TPB_P
TPB0_N	A10	FW_A_TPB_N
TPBIAS1	D8	FW_B_TPBIAS
TPA1_P	A11	FW_B_TPA_P
TPA1_N	B11	FW_B_TPA_N
TPB1_P	B12	FW_B_TPB_P
TPB1_N	A12	FW_B_TPB_N
TPBIAS2	C13	FW_C_TPBIAS
TPA2_P	C11	FW_C_TPA_P
TPA2_N	C12	FW_C_TPA_N
TPB2_P	D13	FW_C_TPB_P
TPB2_N	D12	FW_C_TPB_N

SPEC RECOMMENDS 2.49K
R4452 2.49K 1% 1/16W MF-LF 402
C4420 0.1UF 10% 16V X5R 402
R4420 510K 5% 1/16W MF-LF 402

MODE_420	M5	MODE FOR EXTERNAL LINK
MODE_A	B6	
PC0	E12	FW_PC0
PC1	F13	
PC2	F12	
CONTENDER	G12	LOW = NOT BUS MANAGER
CARDBUSN	B1	LOW = PCI OPERATION
MPCI_ACTN_323	E10	

DUAL PORT DEVICES ARE POWER CLASS 4 ('100')
SINGLE PORT DEVICES ARE POWER CLASS 0 ('000')

MANUFACTURING TEST PINS

TEST0	C2
TEST1	C1
ATEST	A4
SE	A3
SM	B3

VSS0 A1, VSS1 B2, VSS2 C3, VSS3 D4, VSS4 E4, VSS5 E5, VSS6 F4, VSS7 F6, VSS8 F7, VSS9 F8, VSS10 G1, VSS11 G6, VSS12 G7, VSS13 G8, VSS14 H6, VSS15 H7, VSS16 H8, VSS17 J5, VSS18 J9, VSS19 J10, VSS20 K8, VSS21 K9, VSS22 N13
VSSA0 E13, VSSA1 E9, VSSA2 D9, VSSA3 D7, VSSA4 D5

XW4400 SM

GND_FW_VSSA

FIREWIRE CONTROLLER

SYNC_MASTER=(M42) SYNC_DATE=08/29/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 44 OF 104	

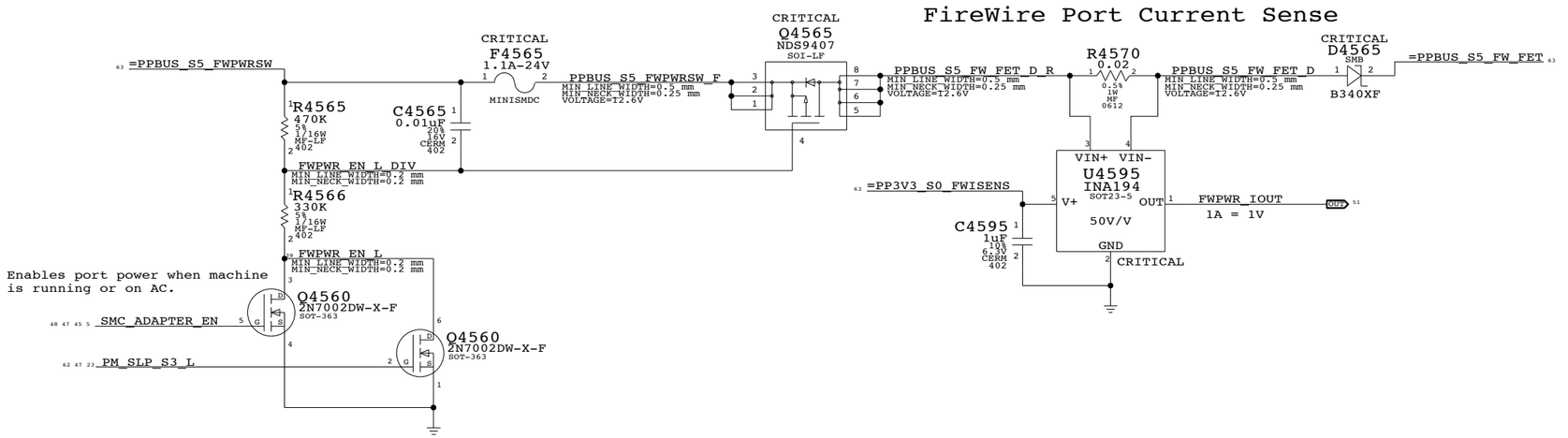
Page Notes

Power aliases required by this page:
- =PPBUS_S0_FWPWRSW (system supply for bus power)
- =PP3V3_S0_FWPORTPWRSW

Signal aliases required by this page:
- =FWPWR_PWRON (see related text note below)

BOM options provided by this page:
(NONE)

Port Power Switch



FireWire Port Current Sense

FireWire Port Power

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	45	104

ELECTRICAL_CONSTRAINT_SET	NET_TYPE SPACING	NET_TYPE PHYSICAL	
PROVIDED BY PHY PAGE	FW	FW_110D	FW_PORT1_TPA_FL_P 42
	FW	FW_110D	FW_PORT1_TPA_FL_N 42
	FW	FW_110D	FW_PORT1_TPB_FL_P 42
	FW	FW_110D	FW_PORT1_TPB_FL_N 42

Page Notes

Power aliases required by this page:
- =PPFW_PORT1
- =PP3V3_S5_FWLATEVG
- =GND_CHASSIS_FW_PORT1

Signal aliases required by this page:
(NONE)

NOTE: This page is expected to contain the necessary aliases to map the FireWire TPA/TPB pairs to their appropriate connectors and/or to properly terminate unused signals.

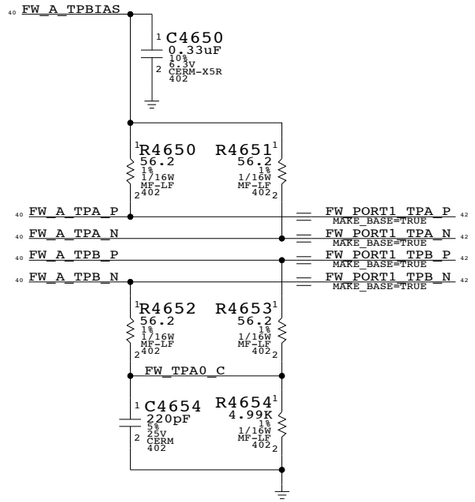
BOM options provided by this page:
(NONE)

NOTE: FireWire TPA/TPB pairs are NOT constrained on this page. It is assumed that FireWire PHY page will provide the appropriate constraints to apply to entire TPA/TPB XNets.

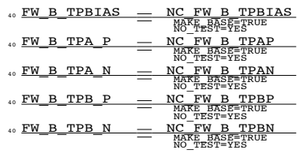
1394b implementation based on Apple FireWire Design Guide (FWDG 0.6, 5/14/03)

Termination

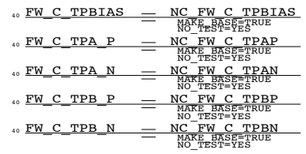
Place close to FireWire PHY



2nd TPA/TPB pair unused

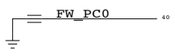


3rd TPA/TPB pair unused

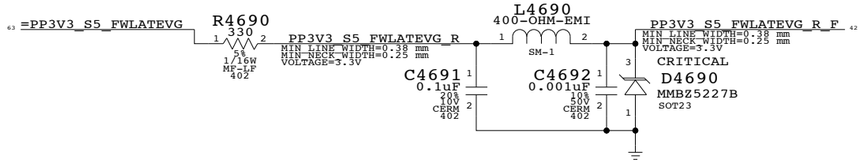


FW Power Class Strap

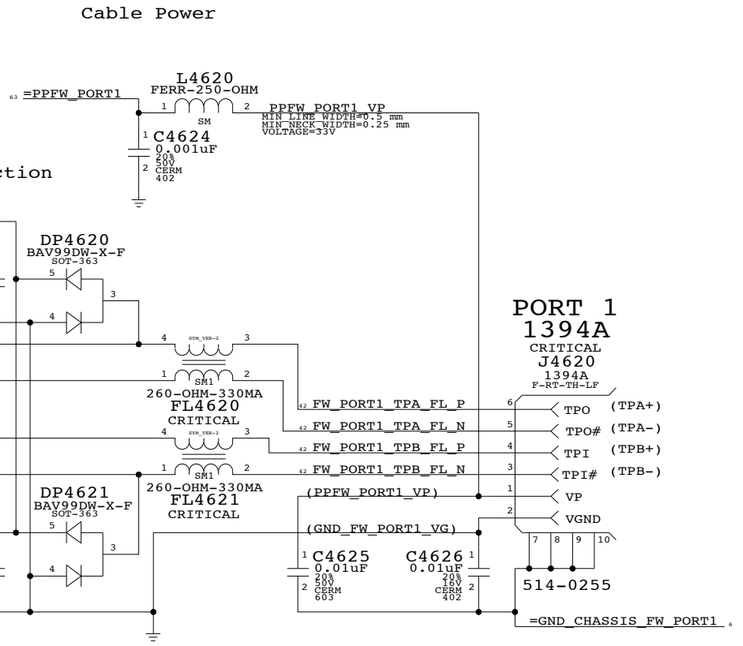
Single-port system sets PC=0



Late-VG Protection Power



Cable Power



"Snapback" & "Late VG" Protection

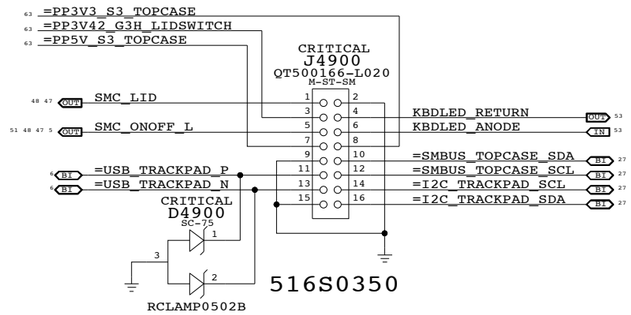
FireWire Ports

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

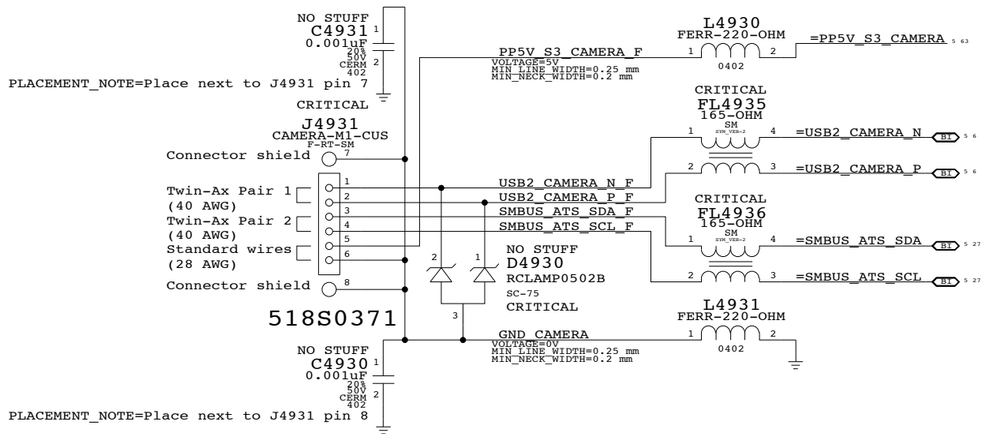
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 46 OF 104	

Top-Case Connector



Camera Connector



Internal USB Connections

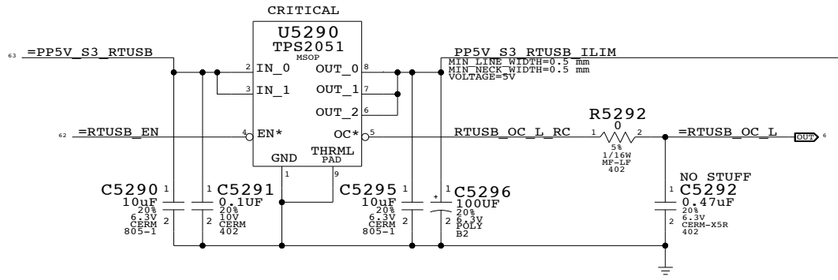
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

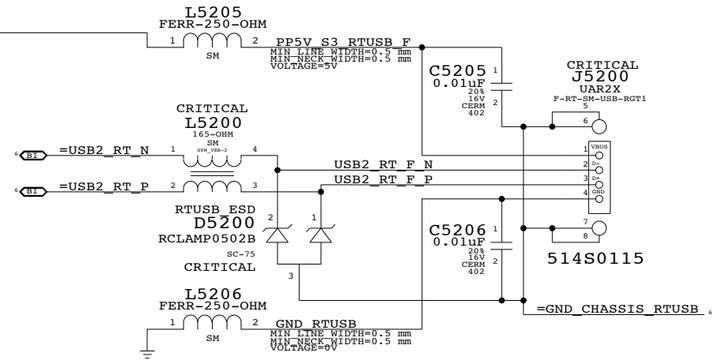
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	49	104

Port Power Switch



Right USB Port



Place L5200, L5205 and L5206 across moat

External USB Connector

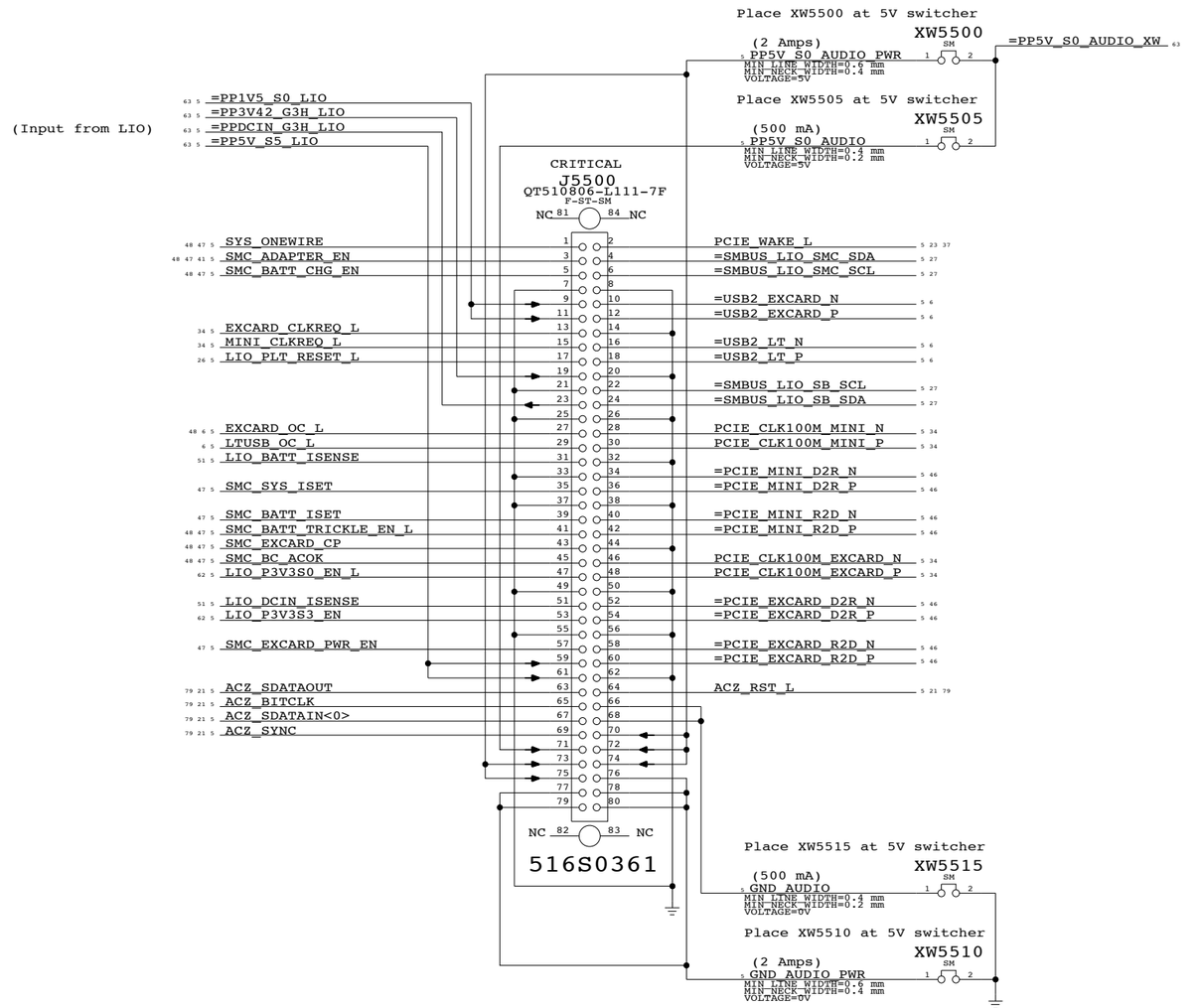
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	52	104

Left I/O Board Connector



Left I/O Board Connector

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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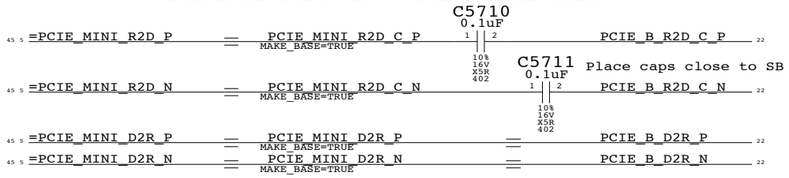
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

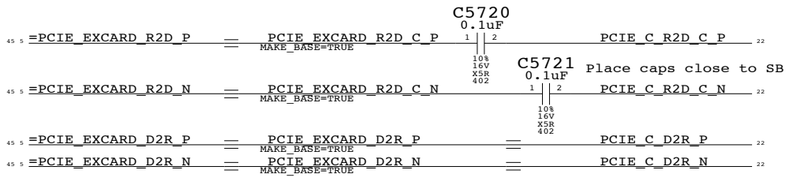
SCALE	SHT	OF
NONE	55	104

PCI-E x1 Port "A" = Ethernet (Yukon)

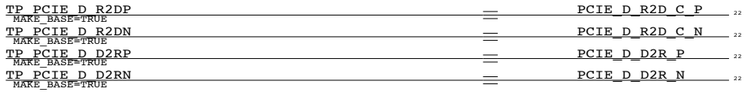
PCI-E x1 Port "B" = PCI-E Mini Card



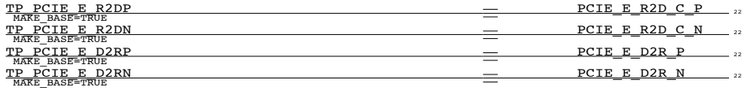
PCI-E x1 Port "C" = ExpressCard



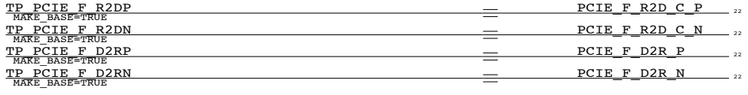
PCI-E x1 Port "D" = Unused



PCI-E x1 Port "E" = Unused



PCI-E x1 Port "F" = Unused



PCI-E Connections

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	57	104

UNUSED PINS HAVE THE FORMAT
SMC_Pxx_ WHERE Pxx IS THE PORT NUMBER.
THEY ARE SET BY SOFTWARE TO BE
DRIVEN OUTPUTS ALWAYS SO THEY
CAN BE LEFT NO-CONNECTED.

OMIT
U5800
SMC_H8S2116
BGA
(1 OF 4)

PM_LAN_ENABLE	B12	P10	P60/KIN0*	L13	SMC_PM_G2_EN	OUT	62
SMC_RSTGATE_L	C13	P11	P61/KIN1*	L14	SMC_ADAPTER_EN	OUT	5 41 45 48
ALL_SYS_PWRGD	A15	P12	P62/KIN2*	L15	SPI_ARB	IN	22
RSMRST_PWRGD	B14	P13	P63/KIN3*	K12	SPI_SCLK	IN	22 52
SMC_SB_NMI	B15	P14	P64/KIN4*	K13	SPI_SI	OUT	22 52
PM_RSMRST_L	C14	P15	P65/KIN5*	K14	SPI_SO	IN	22 52
IMVP_VR_ON	D12	P16	P66/IRQ6*/KIN6*	J12	SMC_PROCHOT_3_3_L	OUT	48
PM_PWRBTN_L	C15	P17	P67/IRQ7*/KIN7*	J13	SMC_CPU_INIT_3_3_L	IN	48
SMC_P20	D13	P20	P70/AN0	N12	SMC_CPU_ISENSE	IN	51
SMC_P21	D14	P21	P71/AN1	R13	SMC_CPU_VSENSE	IN	51
SMC_P22	D15	P22	P72/AN2	P13	SMC_GPU_ISENSE	IN	51
SMC_P23	E12	P23	P73/AN3	R14	SMC_GPU_VSENSE	IN	51
SMC_BATT_TRICKLE_EN_L	L4	P24	P74/AN4	P14	SMC_DCIN_ISENSE	IN	51
SMC_BATT_CHG_EN	E15	P25	P75/AN5	R15	SMC_PBUS_VSENSE	IN	51
SMC_P26	E13	P26	P76/AN6	N13	SMC_BATT_ISENSE	IN	51
SMC_P27	F14	P27	P77/AN7	P15	SMC_FWIRE_ISENSE	IN	51
LPC_AD<0>	D9	P30/LAD0	P80/PME*	C7	SMC_WAKE_SCI_L	IN	23
LPC_AD<1>	C9	P31/LAD1	P81/GA20	A7	SMC_TPM_GPIO	OUT	48
LPC_AD<2>	A9	P32/LAD2	P82/CLKRUN*	B7	PM_CLKRUN_L	BI	5 23 40 49 56
LPC_AD<3>	B9	P33/LAD3	P83/LPCPD*	D6	PM_SUS_STAT_L	IN	5 23 48 49 56
LPC_FRAME_L	D8	P34/LFRAME*	P84/IRQ3*/TXD1	C6	SC_TX_L	OUT	48
SMC_LRESET_L	C8	P35/LRESET*	P85/IRQ4*/RXD1	A6	SC_RX_L	IN	48
PCI_CLK_SMC	A8	P36/LCLK	P86/IRQ5*/SCK1/SCL1	B6	SMB_BSB_CLK	BI	27
INT_SERIRQ	D7	P37/SERIRQ	P90/IRQ2*	K4	SMC_ONOFF_L	IN	5 43 48 51
SMC_XDP_TMS	A5	P40/TMIO	P91/IRQ1*	J2	SMC_BC_ACOK	IN	5 45 48
SMC_SYS_LED_16B	B5	P41/TMO0	P92/IRQ0*	J1	SMC_BS_ALRT_L	IN	5 48 64
SMB_BSB_DATA	D5	P42/SDA1	P93/IRQ12*	J3	PM_SLP_S3_L	IN	23 41 62
SMC_TPM_PP	C3	P43/TMI1/EXSCK1	P94/IRQ13*	J4	PM_SLP_S4_L	IN	23 39 62
SMC_XDP_TRST_L	B1	P44/TMO1	P95/IRQ14*	H2	PM_SLP_S5_L	IN	23 48
SMC_XDP_TCK	C2	P45	P96/EXCL	H1	SMC_SUS_CLK	IN	35
SMC_SYS_LED	D3	P46/PWX0/PWM0	P97/IRQ15*/SDA0	G2	SMB_0_S0_DATA	BI	27
SMC_SYS_KBDLED	C1	P47/PWX1/PWM1					
SMC_TX_L	G1	P50					
SMC_RX_L	G4	P51					
SMB_0_S0_CLK	F2	P52/SCL0					

OMIT
U5800
SMC_H8S2116
BGA
(2 OF 4)

SMC_RCIN_L	R3	PA0/KIN8*/PA2DC	PE0	M3	SMC_CASE_OPEN	IN	48
BOOT_LPC_SPI_L	P3	PA1/KIN9*/PA2DD	PE1*/ETCK	M2	SMC_TCK	IN	5 48 49
PM_SYSRST_L	R2	PA2/KIN10*/PS2AC	PE2*/ETDI	M1	SMC_TDI	IN	5 48 49
SMC_TPM_RESET_L	N3	PA3/KIN11*/PS2AD	PE3*/ETDO	L4	SMC_TDO	OUT	5 48 49
PM_EXTTS_L	R1	PA4/KIN12*/PS2BC	PE4*/ETMS	L2	SMC_TMS	IN	5 48 49
PM_THRM_L	N2	PA5/KIN13*/PS2BD	PF0/IRQ8*/PWM2	M7	SMC_PF0		48
SYS_ONEWIRE	M4	PA6/KIN14*/PS2CC	PF1/IRQ9*/PWM3	P6	SMC_PF1		48
PM_BATLOW_L	N1	PA7/KIN15*/PS2CD	PF2/IRQ10*/TMOY	R6	SMC_LID	IN	43 48
SMC_EXTSMI_L	B10	PB0/LSMI*	PF3/IRQ11*/TMOX	N6	SMC_CPU_RESET_3_3_L	IN	48
SMC_RUNTIME_SCI_L	A10	PB1/LSCI	PF4/PWM4	M6	SMC_BATT_ISET	OUT	5 45
SMC_ODD_DETECT	D10	PB2	PF5/PWM5	R5	SMC_BATT_VSET	OUT	48
ISENSE_CAL_EN	A11	PB3	PF6/PWM6	P5	SMC_SYS_ISET	OUT	5 45
SMC_EXCARD_CP	B11	PB4	PF7/PWM7	N5	SMC_SYS_VSET	OUT	48
SMC_EXCARD_PWR_EN	C11	PB5	PG0/EXIRQ8*/TMIX	P9	SPI_CE_L	BI	22 52
SMC_EXCARD_OC_L	A12	PB6	PG1/EXIRQ9*/TMIY	R9	SMC_XDP_TCK_3_3	IN	48
SMC_XDP_TDO_3_3	D11	PB7	PG2/EXIRQ10*/SDA2	N9	SMB_BSA_DATA	BI	27
SMC_FAN_0_CTL	G14	PC0/TIOCA0/WUE8*	PG3/EXIRQ11*/SCL2	P8	SMB_BSA_CLK	BI	27
SMC_FAN_1_CTL	G15	PC1/TIOCB0/WUE9*	PG4/EXIRQ12*/EXSDAA	R8	SMB_A_S3_DATA	BI	27
SMC_FAN_2_CTL	G13	PC2/TIOCC0/TCLKA/WUE10*	PG5/EXIRQ13*/EXSCLA	M8	SMB_A_S3_CLK	BI	27
SMC_FAN_3_CTL	G12	PC3/TIOCD0/TCLKB/WUE11*	PG6/EXIRQ14*/EXSDAB	P7	SMB_B_S0_DATA	BI	27
SMC_FAN_0_TACH	H14	PC4/TIOCA1/WUE12*	PG7/EXIRQ15*/EXSCLB	R7	SMB_B_S0_CLK	BI	27
SMC_FAN_1_TACH	H15	PC5/TIOCB1/TCLKC/WUE13*	PH0/EXIRQ6*	E1	SMC_PROCHOT	OUT	48
SMC_FAN_2_TACH	H13	PC6/TIOCA2/WUE14*	PH1/EXIRQ7*	F3	SMC_THRMTRIP	OUT	48
SMC_FAN_3_TACH	H12	PC7/TIOCB2/TCLKD/WUE15*	PH2/FWE	K2	SMC_FWE	IN	48
SMS_X_AXIS	M11	PD0/AN8	PH3/EXEXCL	C4	ALS_GAIN	OUT	5 6 76
SMS_Y_AXIS	P11	PD1/AN9	PH4	D4	SMS_INT_L	OUT	23 48
SMS_Z_AXIS	R11	PD2/AN10	PH5	B3	SMS_ONOFF_L	OUT	55
SMC_ANALOG_ID	N11	PD3/AN11					
SMC_NB_ISENSE	P10	PD4/AN12					
SMC_MEM_ISENSE	R10	PD5/AN13					
ALS_LEFT	N10	PD6/AN14					
ALS_RIGHT	M10	PD7/AN15					

OMIT
U5800
SMC_H8S2116
BGA
(4 OF 4)

G3	NC0	NC12	F15
H3	NC1	NC13	A14
K3	NC2	NC14	C12
L3	NC3	NC15	C10
N4	NC4	NC16	C5
M5	NC5	NC17	A3
N7	NC6	NC18	B8
M12	NC7	NC19	E4
M13	NC8	NC20	H4
L12	NC9	NC21	M9
K15	NC10	NC22	N8
J14	NC11		

63 48 47 =PP3V3_S5_SMC

C5802 22UF 20% 6.3V X5R 805
C5803 0.1UF 20% 10V CERM 402
C5804 0.1UF 20% 10V CERM 402
C5805 0.1UF 20% 10V CERM 402
C5806 0.1UF 20% 10V CERM 402

LAYOUT NOTE:
PLACE C5807 NEAR PIN F1

SMC_VCL
C5807 0.47UF 20% 6.3V CERM-X5R 402

VCL IS INTERNAL RAIL

LAYOUT NOTE:
PLACE R5899 AND C5820 NEAR SMC PIN N14,N15

63 48 47 =PP3V3_S5_SMC
R5899 4.7 1/16W MF-LF 402
PP3V3_AVCC_SMC
C5820 0.1UF 10% CERM 402
PP3V3_AVREF_SMC 48
53 51 48 47 GND_SMC_AVSS

OMIT
U5800
SMC_H8S2116
BGA
(3 OF 4)

SMC_RST_L	E3	RES*	MD1	E2	SMC_MD1
SMC_XTAL	A2	XTAL	MD2	K1	KBC_MDE
SMC_EXTAL	B2	EXTAL	NMI	F4	SMC_NMI
			ETRST*	L1	SMC_TRST_L
			AVSS	P12, R12	
			VSS	D1, P4, R4, F12, F13, B13, A13, A4, B4, D2	

63 48 47 =PP3V3_S5_SMC
R5809 10K 5% 1/16W MF-LF 402
R5801 10K 5% 1/16W MF-LF 402
R5898 10K 5% 1/16W MF-LF 402
R5802 0 5% 1/16W MF-LF 402
NOSTUFF
R5803 10K 5% 1/16W MF-LF 402

XW5800
SM
GND_SMC_AVSS 47 48 51 53

SMC

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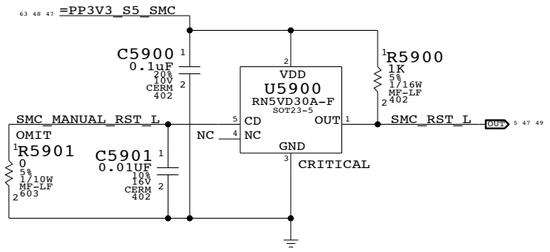
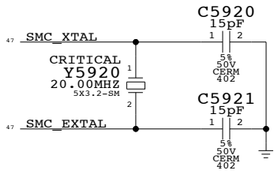
SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 58 OF 104	

SMC Reset Button / Brownout Detect

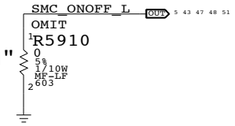


Silk: "SMC RST"

SMC Crystal Circuit



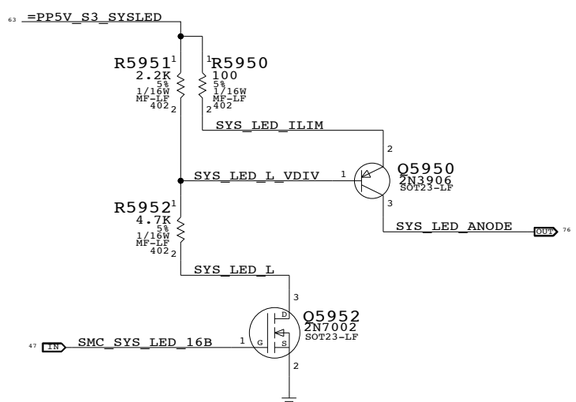
Debug Power Button



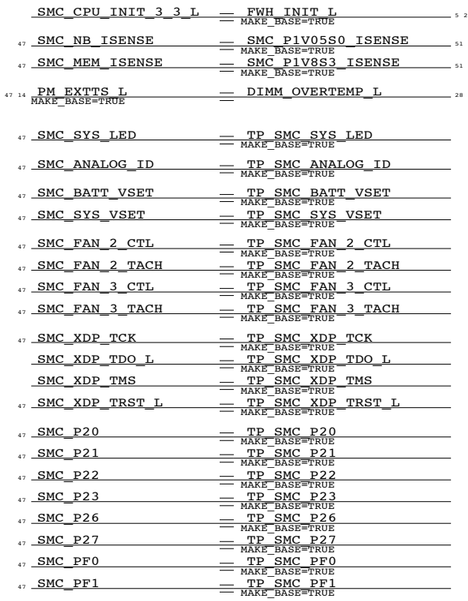
Silk: "PWR BTN"

SMC AVREF Supply

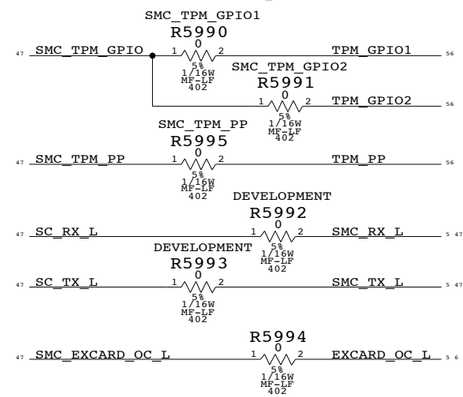
System (Sleep) LED Circuit



SMC_CPU_INIT_3_3_L

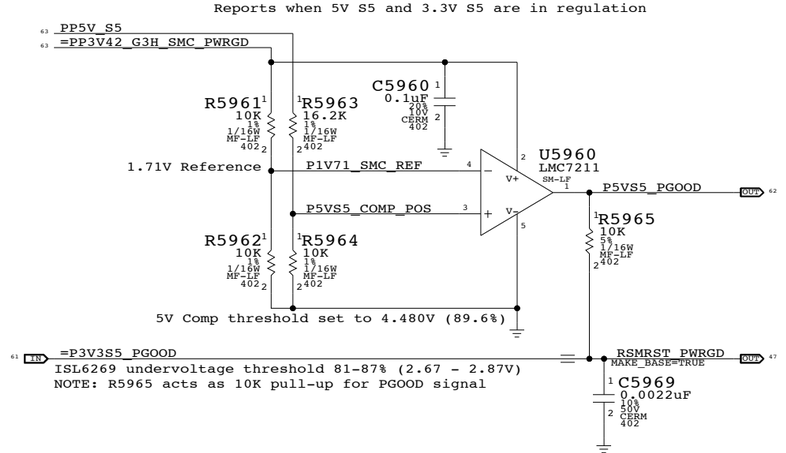


SMC_TPM_GPIO1

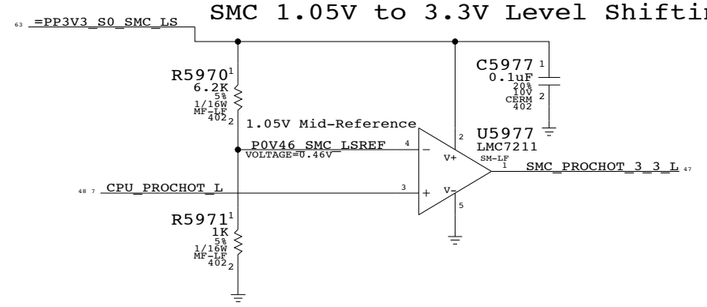


SMC PWRGD Circuit

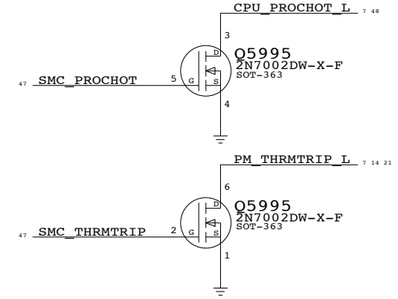
Reports when 5V S5 and 3.3V S5 are in regulation

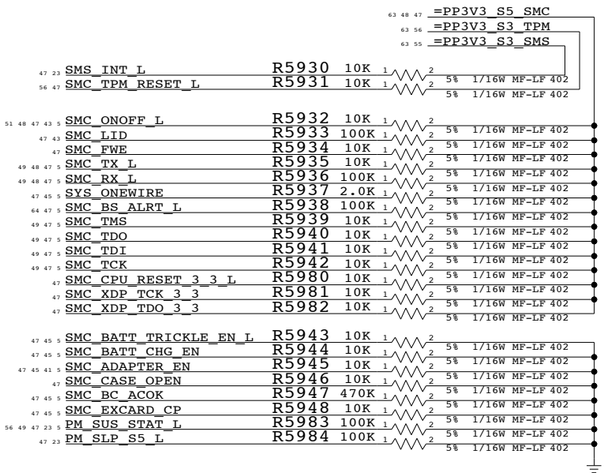


SMC 1.05V to 3.3V Level Shifting



SMC 3.3V to 1.05V Level Shifting





SMC Support

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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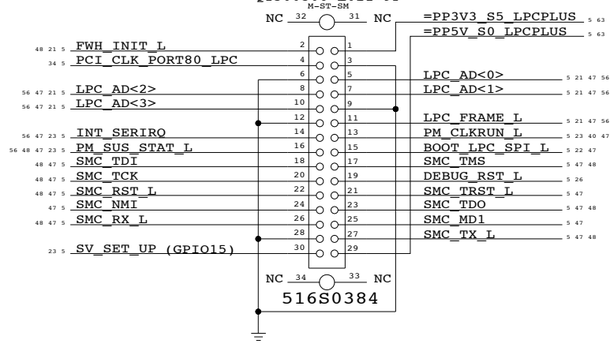
APPLE COMPUTER INC.	SIZE D	DRAWING NUMBER 051-6941	REV. 12
	SCALE NONE	SHT 59 OF 104	

CRITICAL
LPCPLUS
J6000
QT500306-L021-9F
M-ST-SM



LPC+ Debug Connector

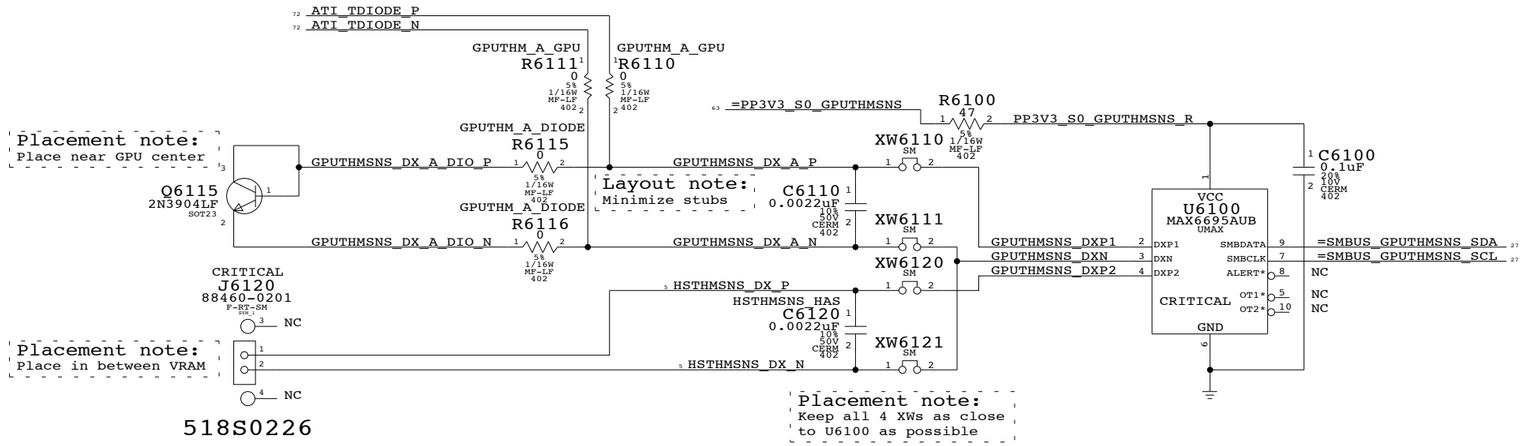
SYNC_MASTER=M42 SYNC_DATE=07/20/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

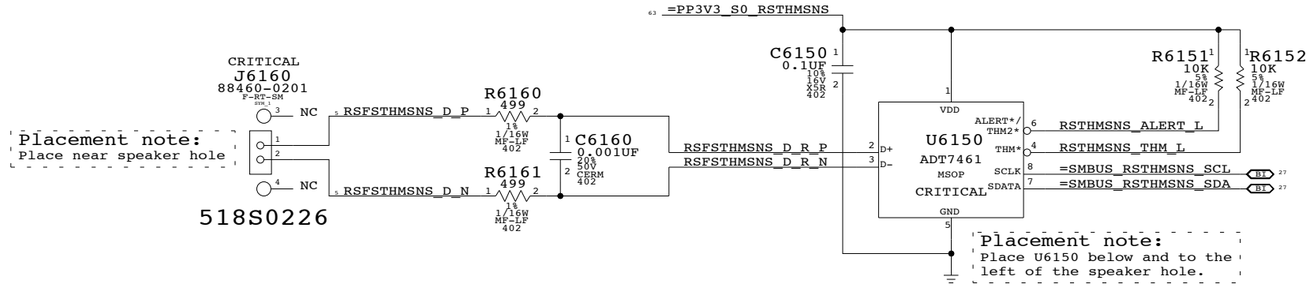
SCALE	SHT	OF
NONE	60	104

GPU / Heat Pipe Thermal Sensor

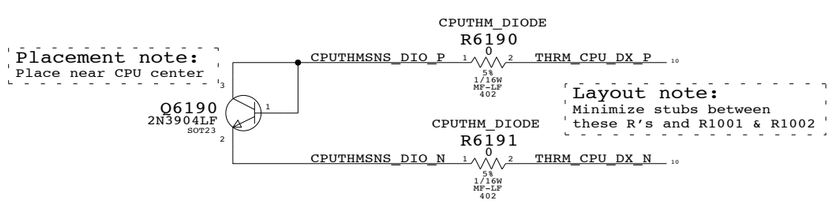


PART NUMBER	QTY	DESCRIPTION	REFERENCE DES	CRITICAL	BOM OPTION
116S0004	1	RES,0,1/16W,0402	C6120		HSTHMSNS_NOT

Right-Side/Fin Stack Thermal Sensor



CPU Back-Up Thermal Diode



R1001 / R1002 are not currently BOMOPTIONed. Can not programatically unstuff those parts to stuff these.

Thermal Sensors

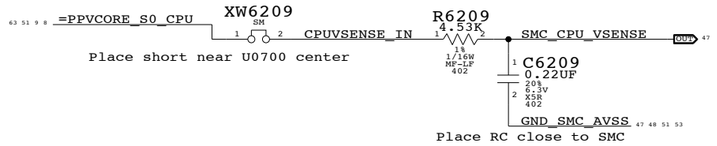
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

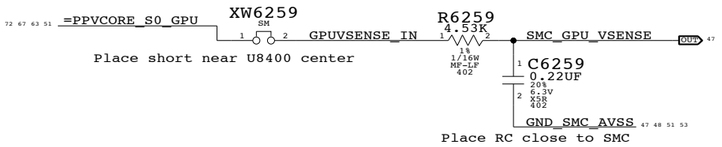
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	61	104

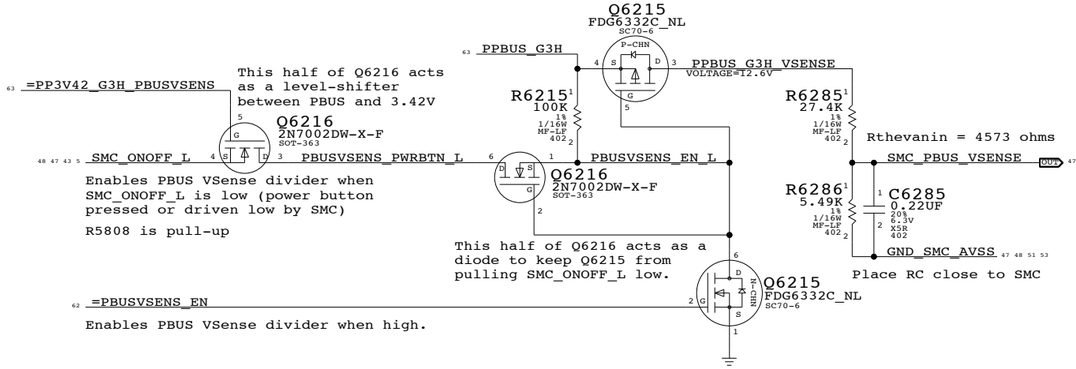
CPU Voltage Sense / Filter



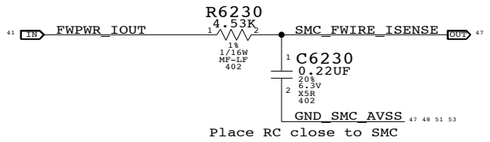
GPU Voltage Sense / Filter



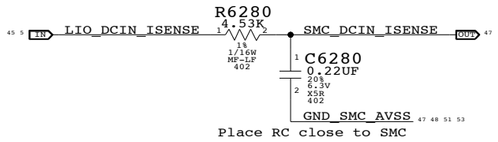
PBUS Voltage Sense Enable & Filter



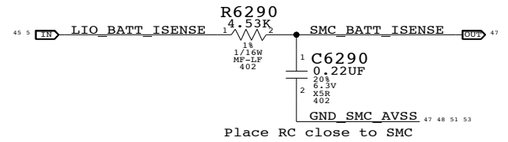
FireWire Current Sense Filter



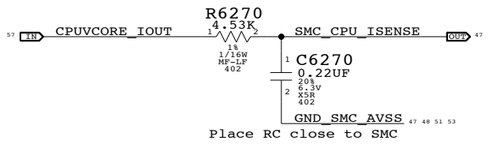
DCIN Current Sense Filter



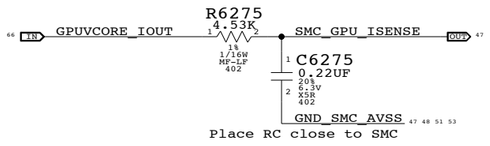
Battery Current Sense Filter



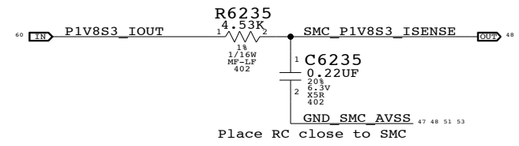
CPU Current Sense Filter



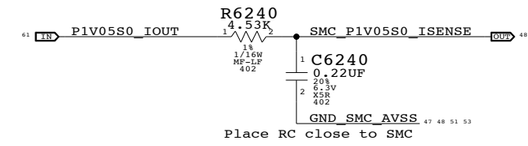
GPU Current Sense Filter



1.8V S3 (Memory) Current Sense Filter

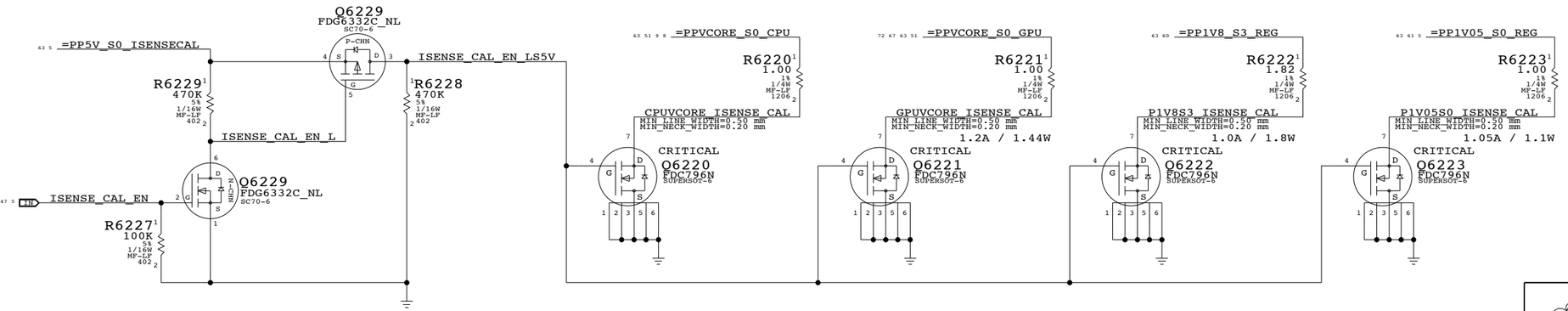


1.05V S0 (NB) Current Sense Filter



Current Sense Calibration Circuit

Switches in fixed load on power supplies to calibrate current sense circuits



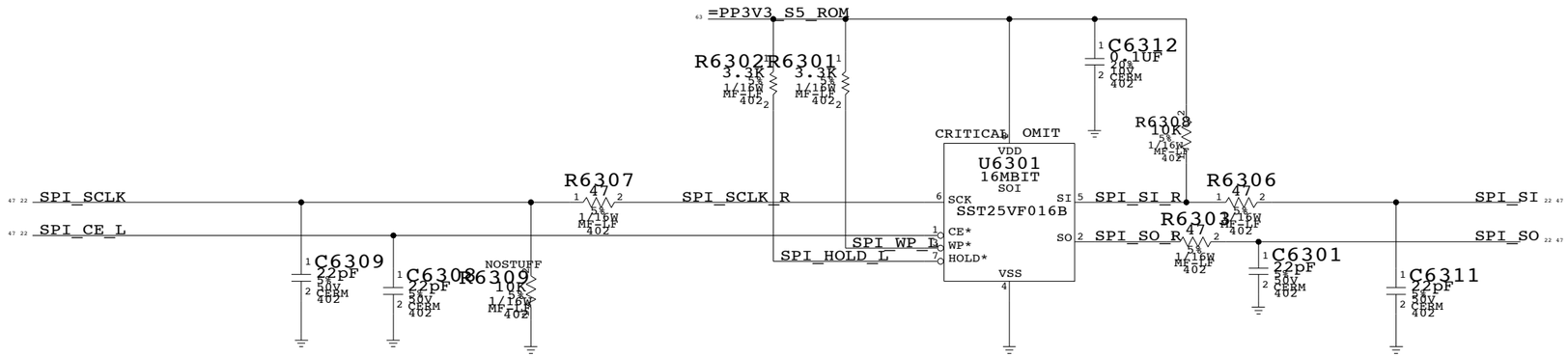
Current & Voltage Sensing

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	62	104



R6309 IS NOT NEEDED WHEN SHARING SPI FLASH WITH ICH7M AND TEKOA(LAN CHIP)

R6307 AND R6306 SHOULD BE PLACED LESS THAN 100 MILS FORM ICH7M

R6303 SHOULD BE PLACED LESS THAN 100 MILS FORM FLASH ROM

SPI BOOTROM

SYNC_MASTER=M87 SYNC_DATE=11/16/2005

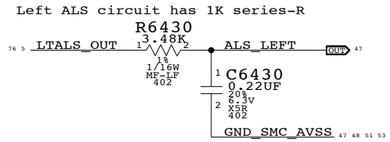
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

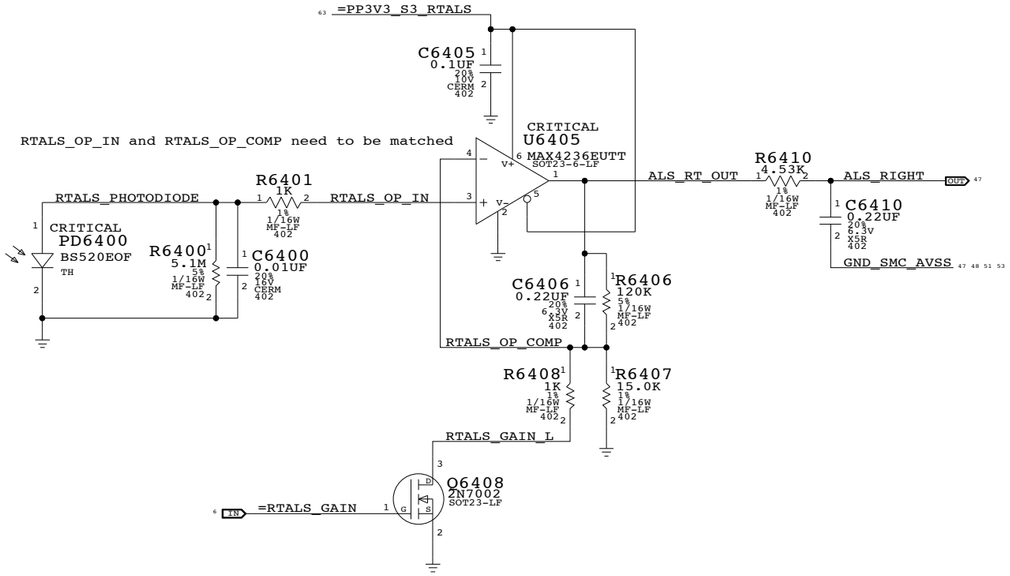
SCALE	SHT	OF
NONE	63	104

Left ALS Filter

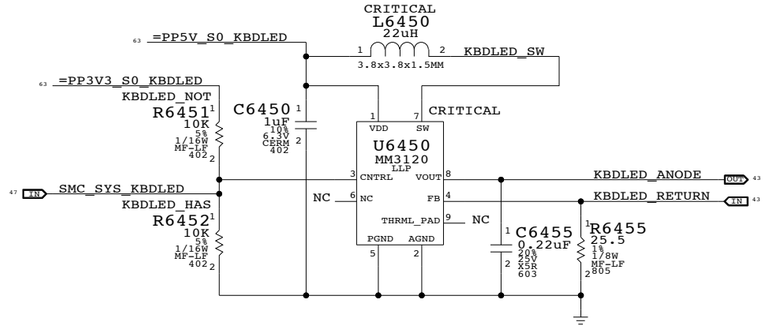
Left ALS circuit has 1K series-R



Right ALS Circuit



Keyboard LED Driver



ALS Support

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

NOTICE OF PROPRIETARY PROPERTY

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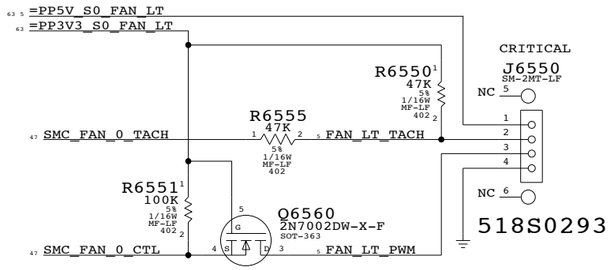
II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

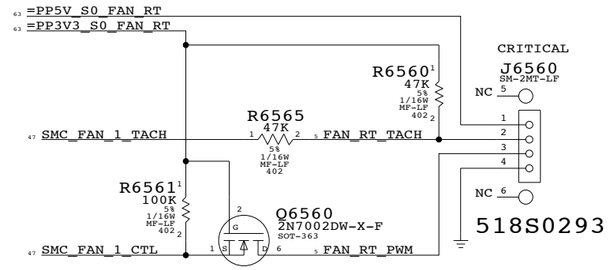
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 64 OF 104	

Left Fan



Right Fan



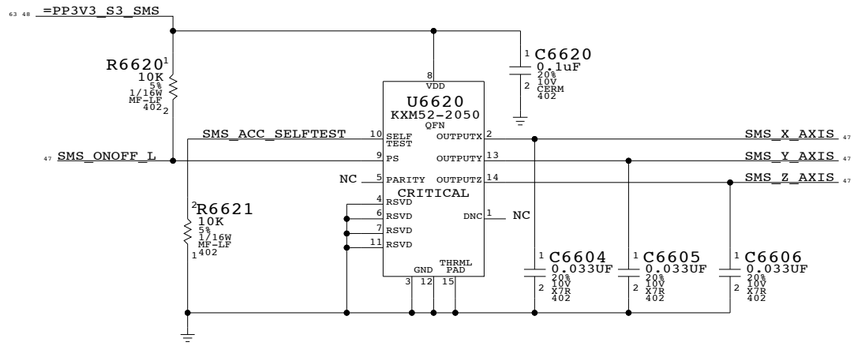
Fan Connectors

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

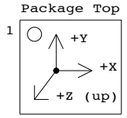
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	65	104



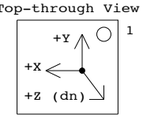
Desired orientation when placed on board top-side:

Package Top



Desired orientation when placed on board bottom-side:

Top-through View



M1 placement: Bottom-side

Sudden Motion Sensor (SMS)

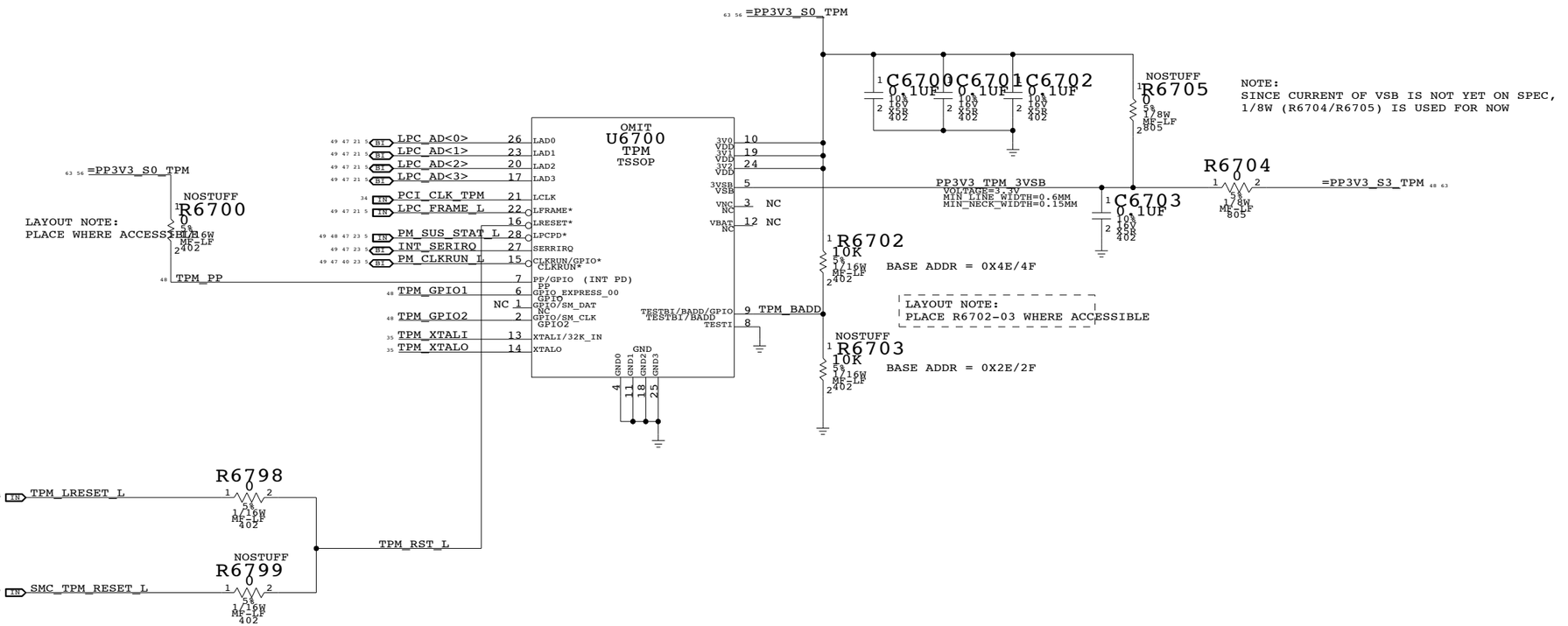
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE: NONE

SHT 66 OF 104



TPM

SYNC_MASTER=M38 SYNC_DATE=11/16/2005

NOTICE OF PROPRIETARY PROPERTY

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 67 OF 104	

DPRSLPVR	DPRSTP*	PSI*	Operation	Mode
0	1	1	2-Phase	CCM
0	1	0	1-Phase	CCM
1	0	1	1-Phase	DCM
1	1	0	1-Phase	DCM

CPU VCore Current Sense

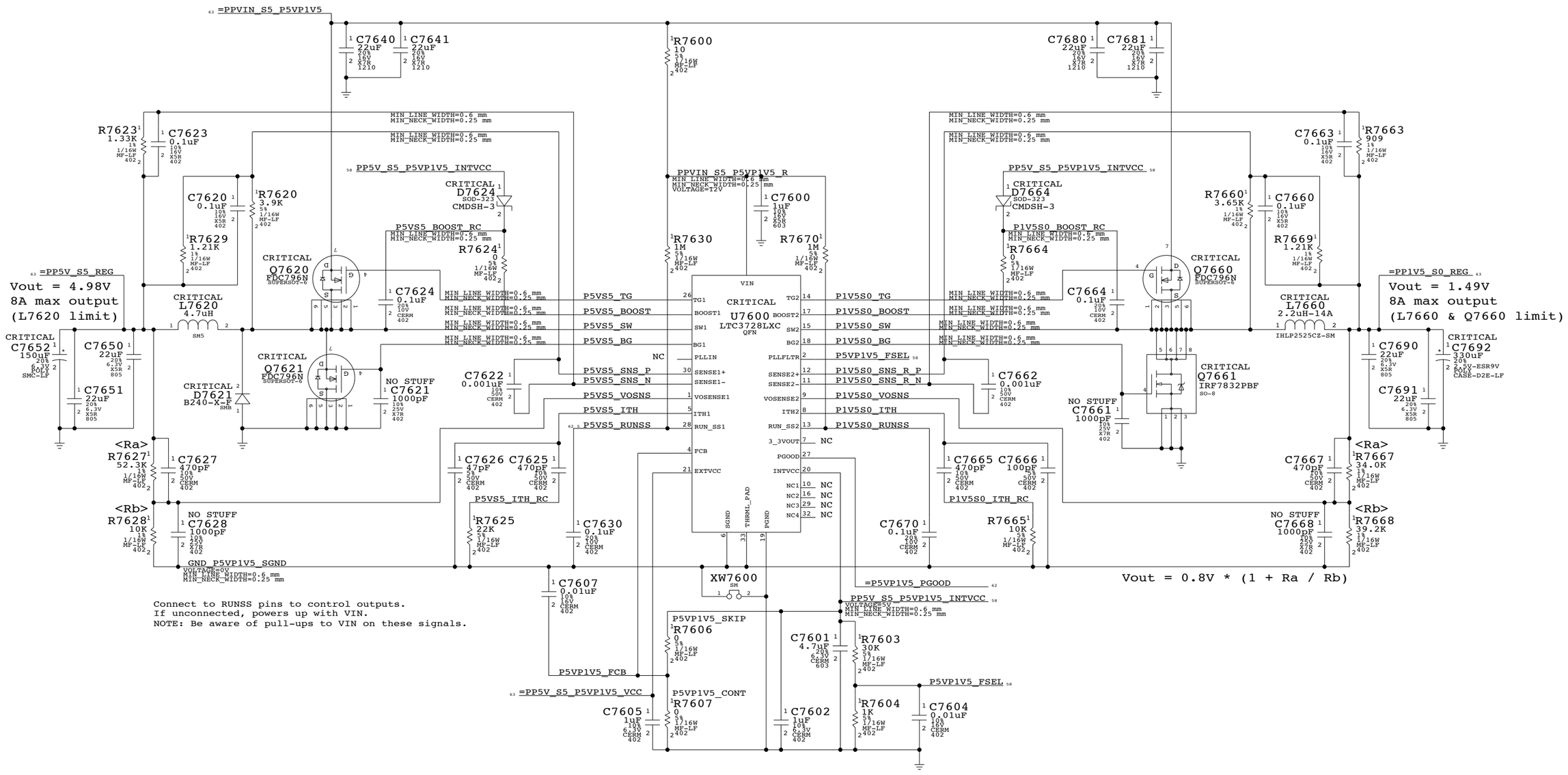
Vout = Gain * ((2.1 mV/A * Iload) + Voffset)
Voffset = (Vdrp_offset * Kdroop) + Vamp_offset
Gain = Rc / (Ra + Rb)
Voffset worst-case ~2.3mV (+/- ~1A offset)
Vout @ 36A = 2.44V-2.60V

IMVP6 CPU VCore Regulator

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 75 OF 104	



5V / 1.5V Power Supply

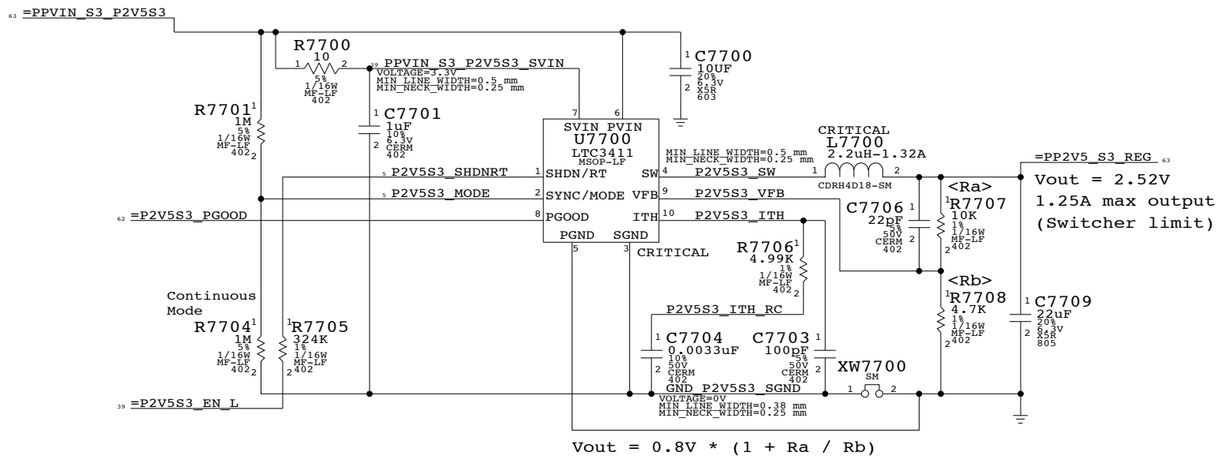
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

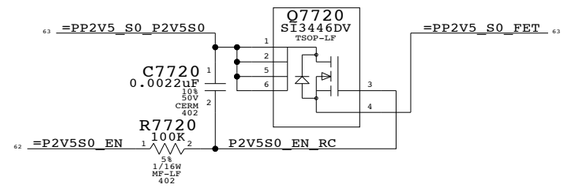
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	76	104

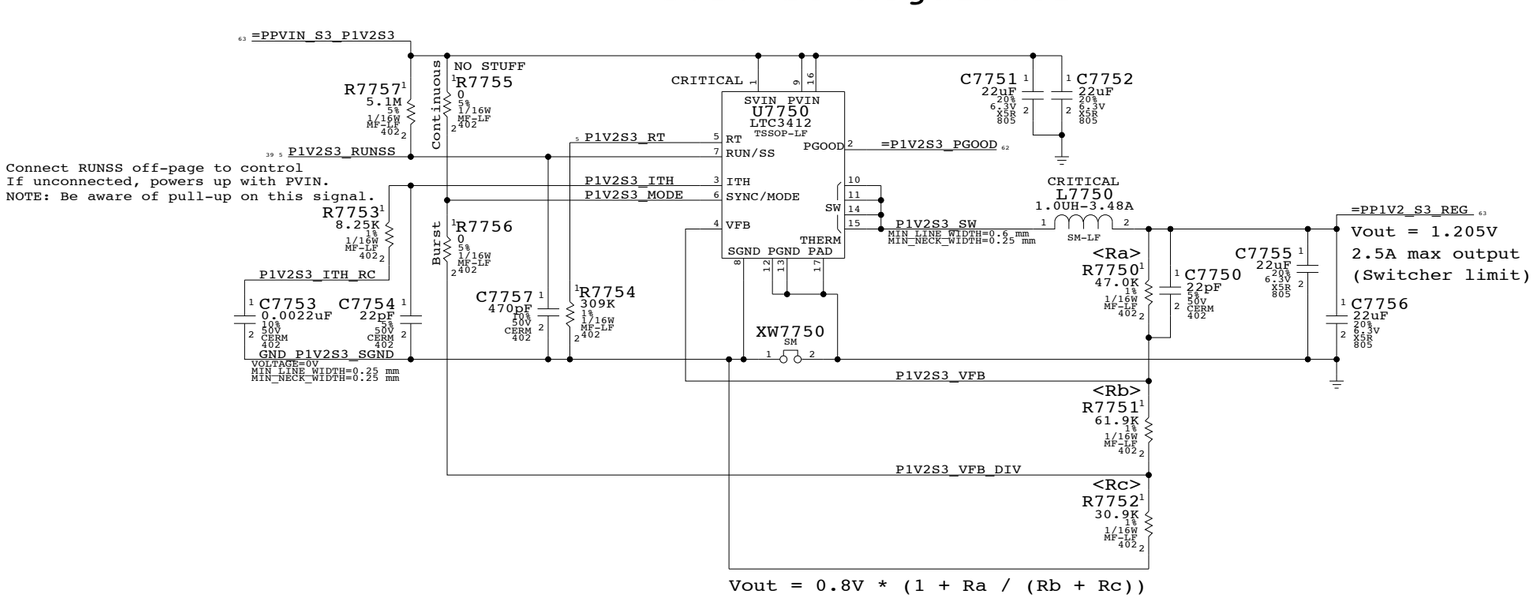
2.5V S3 Regulator



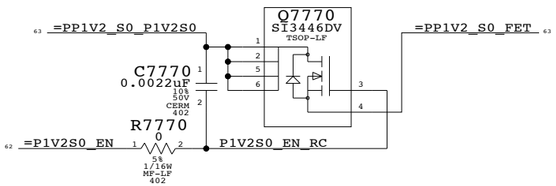
2.5V S0 FET



1.2V S3 Regulator



1.2V S0 FET



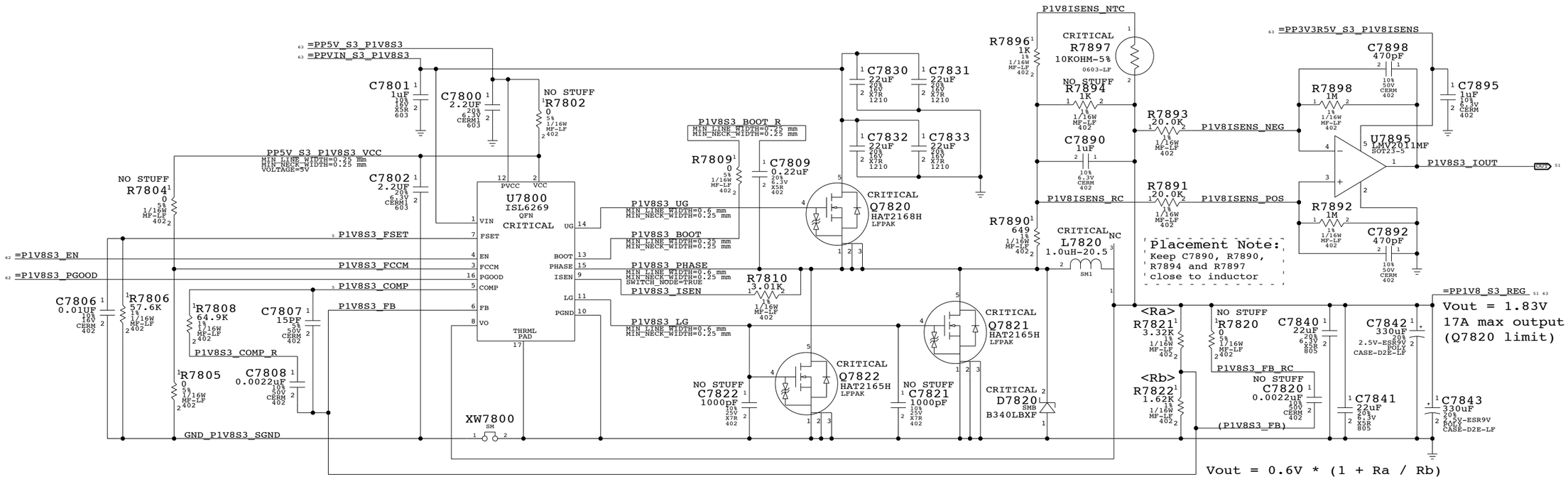
2.5V & 1.2V Regulators

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

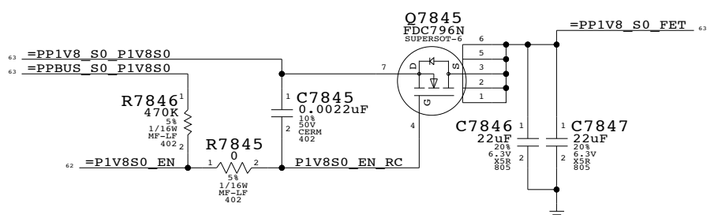
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 77 OF 104	

1.8V S3 Current Sense



1.8V S0 FET



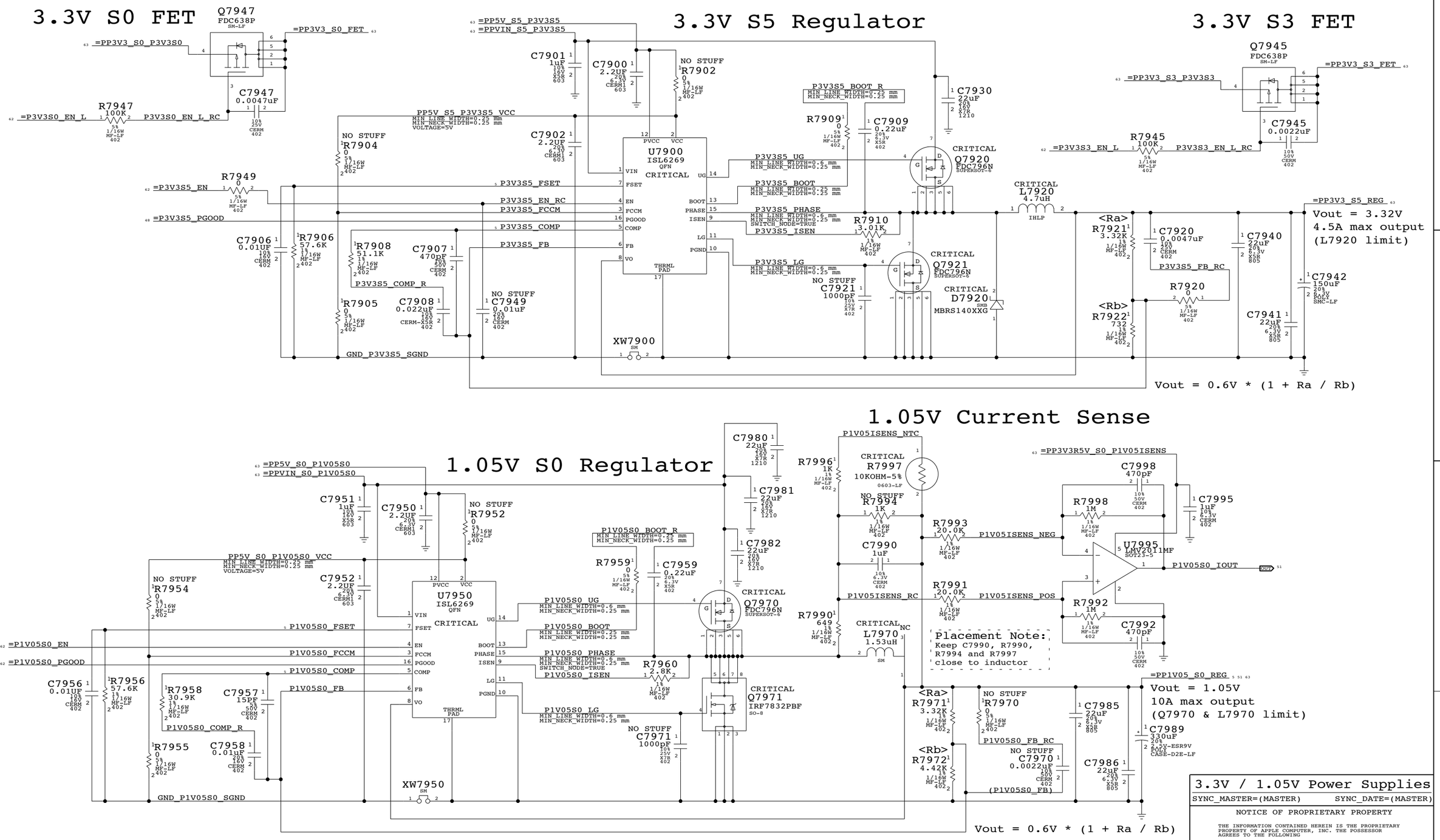
1.8V Supply

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	78	104



Power Control Signals

=PP5V_S5_PWRCTL

R8050 10K 5% 1/16W MF-LF 402

R8051 10K 5% 1/16W MF-LF 402

R8052 10K 5% 1/16W MF-LF 402

GPU requires 1.2V, 1.8V, 2.5V and 3.3V rise after VCore is up.

=GPUVCORE_PGOOD

Need to ensure that ISL6269 PGOOD does not deassert while GPU PowerPlay is changing GPU core voltage.

PM_SLP_S3_LS5V_L → =P2V5S0_EN, =P1V2S0_EN

P3V3S0_EN_L → =P3V3S0_EN_L

P1V8S0_EN → =P1V8S0_EN

1.8V Enable has pull-up to PBUS

Q8055 2N7002DW-X-F SOT-363

Q8056 2N7002DW-X-F SOT-363

Q8050 2N7002DW-X-F SOT-363

=PP3V42_G3H_PWRCTL

PM_SLP_S3_LS5V → =P5VS0_EN_L, LIO_P3V3S0_EN_L

P1V5S0_RUNSS

1.5V Enable has pull-up to PBUS

Q8050 2N7002DW-X-F SOT-363

R8054 100K 5% 1/16W MF-LF 402

Q8057 2N7002DW-X-F SOT-363

PM_SLP_S3

Q8057 2N7002DW-X-F SOT-363

PM_SLP_S3_L

R8056 100K 5% 1/16W MF-LF 402

=P1V05S0_EN, =ENET_VMAIN_AVLBL, =MEMVREF_EN, =PBUSVSENS_EN

(PM_SLP_S3_L) MAKE_BASE=TRUE

R8053 10K 5% 1/16W MF-LF 402

=P2V5S3_PGOOD

=P1V2S3_PGOOD

NO STUFF

R8060 0 5% 1/16W MF-LF 402

P2V5S3_P1V2S3_PGOOD MAKE_BASE=TRUE

GPUVCORE_EN MAKE_BASE=TRUE → =GPUVCORE_EN

Ensure 1.2V and 2.5V S3 supplies are up before enabling GPU VCore to support removing ethernet power in battery sleep.

=PP5V_S5_PWRCTL

R8055 10K 5% 1/16W MF-LF 402

PM_SLP_S4_LS5V → =P3V3S3_EN_L, =P5VS3_EN_L

Q8055 2N7002DW-X-F SOT-363

PM_SLP_S4_L

R8057 100K 5% 1/16W MF-LF 402

2.5V S3 and 1.2V S3 supplies are controlled by ethernet power control circuit.

(PM_SLP_S4_L) MAKE_BASE=TRUE → =P1V8S3_EN, =RTUSB_EN, LIO_P3V3S3_EN

=PP3V42_G3H_PWRCTL

P5VS5_PGOOD

(P5VS5_PGOOD) MAKE_BASE=TRUE → =P3V3S5_EN

R8059 470K 5% 1/16W MF-LF 402

P5VS5_RUNSS

5V Enable has pull-up to PBUS

Q8059 2N7002DW-X-F SOT-363

SMC_PM_G2_EN_L

Q8059 2N7002DW-X-F SOT-363

SMC_PM_G2_EN

R8058 100K 5% 1/16W MF-LF 402

3.425V "G3Hot" Supply

Supply needs to guarantee 3.31V delivered to SMC VRef generator

State	SMC_PM_G2_ENABLE	PM_SLP_S4_L	PM_SLP_S3_L
Run (S0)	1	1	1
Sleep (S3)	1	1	0
Soft-Off (S5)	1	0	0
Battery Off (G3Hot)	0	0	0

=PPVIN_G3H_P3V42G3H

C8000 10uF 20% 25V X5R 1206

P3V42G3H5_BOOST

C8005 0.22uF 20% 25V X5R 402

U8000 LT3470 TSOT23-8

VIN, BOOST, SHDN*, SW, BIAS, NC, NC CRITICAL, FB, GND

CRITICAL L8010 33uH CDPH4D19F-SM

P3V42G3H_SW MIN_LINE_WIDTH=0.5 mm MIN_NECK_WIDTH=0.25 mm SWITCH_NODE=TRUE

=PP3V42_G3H_REG

Vout = 3.425

200mA max output (Switcher limit)

<Ra> R8010 348K 1% 1/16W MF-LF 402

C8010 22pF 5% 50V CERM 402

<Rb> R8011 200K 1% 1/16W MF-LF 402

C8015 22uF 20% 6.3V X5R 805

P3V42G3H_FB

Vout = 1.25V * (1 + Ra / Rb)

1.5V / 1.05V PWRGD Circuit

Reports when 1.5V S0 and 1.05V S0 are in regulation

=PP3V3_S5_P1V5PG

PP1V5_S0

R8061 27.4K 1% 1/16W MF-LF 402

R8063 4.99K 1% 1/16W MF-LF 402

C8060 0.1uF 20% 10V CERM 402

U8060 LMC7211 SM-LF

0.89V Reference

P1V0_P1V5PG_REF

P1V5S0_COMP_POS

P1V5S0_PGOOD

R8062 10K 1% 1/16W MF-LF 402

R8064 10K 1% 1/16W MF-LF 402

R8065 10K 5% 1/16W MF-LF 402

1.5V Comp threshold set to 1.32V (88%)

IMVP_PWRGD_IN

=P1V05S0_PGOOD

P1V5P1V05S0_PGOOD MAKE_BASE=TRUE

ISL6269 undervoltage threshold 81-87% (0.85 - 0.91V)

NOTE: R8065 acts as 10K pull-up for PGOOD signal

Unused PGOOD Signals

=P5VP1V5_PGOOD — TP_P5V_P1V5_PGOOD MAKE_BASE=TRUE

=P1V8S3_PGOOD — TP_P1V8S3_PGOOD MAKE_BASE=TRUE

Other S0 Rails PWRGD Circuit

Reports when 5V S0, 3.3V S0, 2.5V S0, 1.8V S0, 1.2V S0 and 0.9V S0 are in regulation

PP5V_S0

PP3V3_S0

PP2V5_S0

PP1V8_S0

PP1V2_S0

PP0V9_S0

R8074 68.1K 1% 1/16W MF-LF 402

R8072 124K 1% 1/16W MF-LF 402

C8070 0.1uF 20% 10V CERM 402

C8071 0.1uF 20% 10V CERM 402

U8070 LTC2908 LLP

V1, V2, V3, V4 CRITICAL, VADJ1, VADJ2, RST*, GND, THRML PAD

S0PGOOD_1V2_DIV

S0PGOOD_0V9_DIV

S0PGOOD_PWROK

R8075 100K 1% 1/16W MF-LF 402

R8073 100K 1% 1/16W MF-LF 402

R8076 549K 1% 1/16W MF-LF 402

LTC2908 sources 6uA at 5.0V
R8075 serves as pull-down
and 3.3V level-shifter.

LTC2908 threshold is 95% (4.75V, 3.135V, 2.375V, 1.71V, 1.14V, 0.86V)

=PP3V3_S0_ALLSYSPG

U8080 MC74VHC1G08 SC70

ALL_SYS_PWRGD

C8080 0.1UF 20% 10V CERM 402

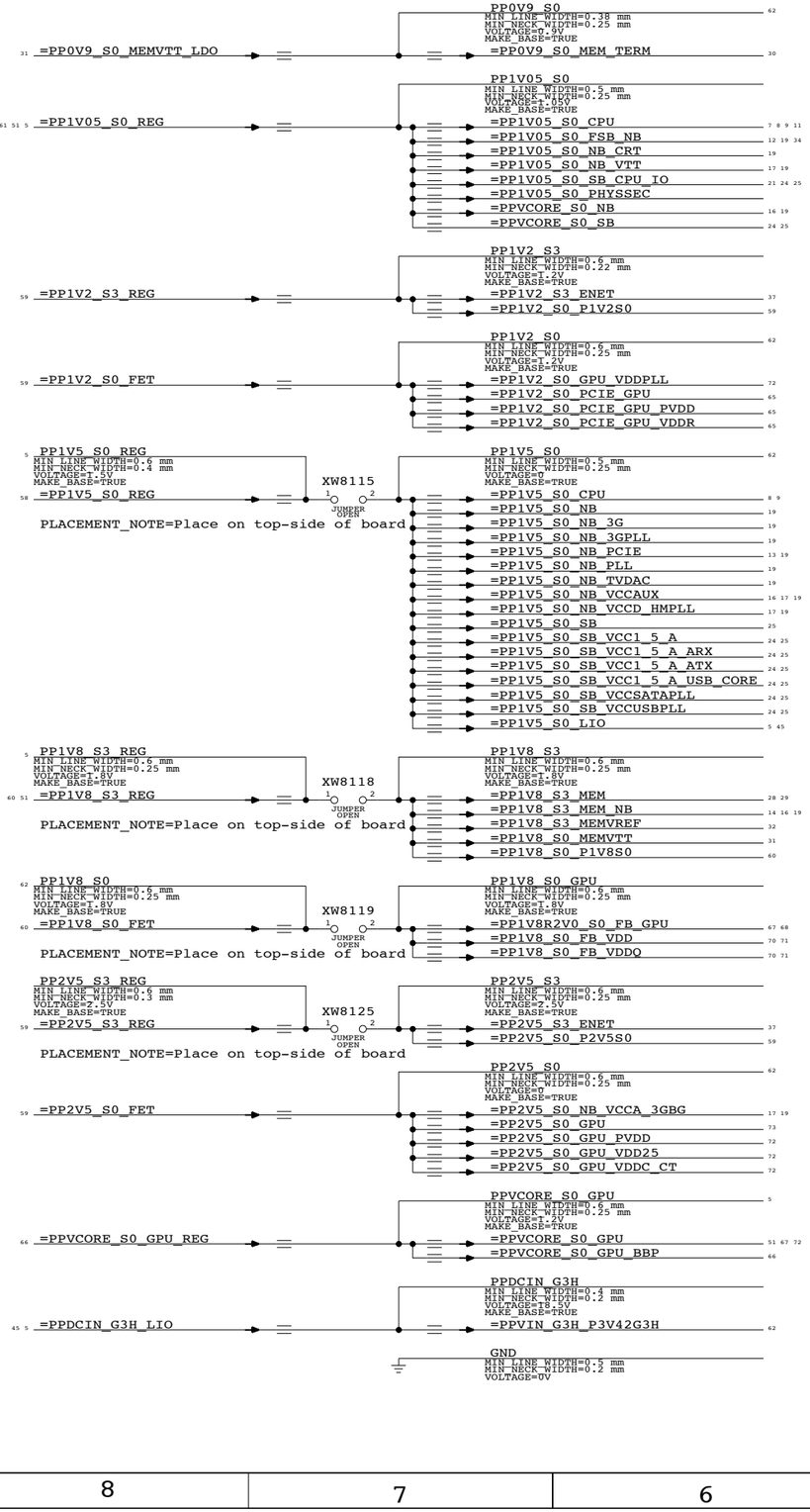
3.3V G3Hot Supply & Power Control

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

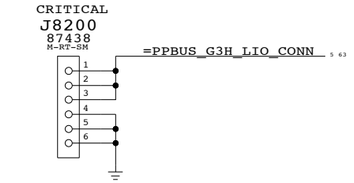
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE: NONE SHT 80 OF 104

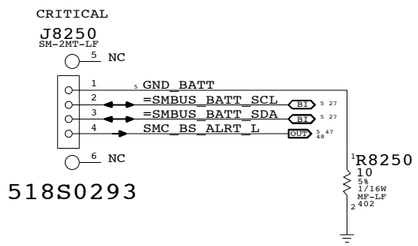


Left I/O Power Connector



518S0368

Battery Connector (Digital Signals)



518S0293

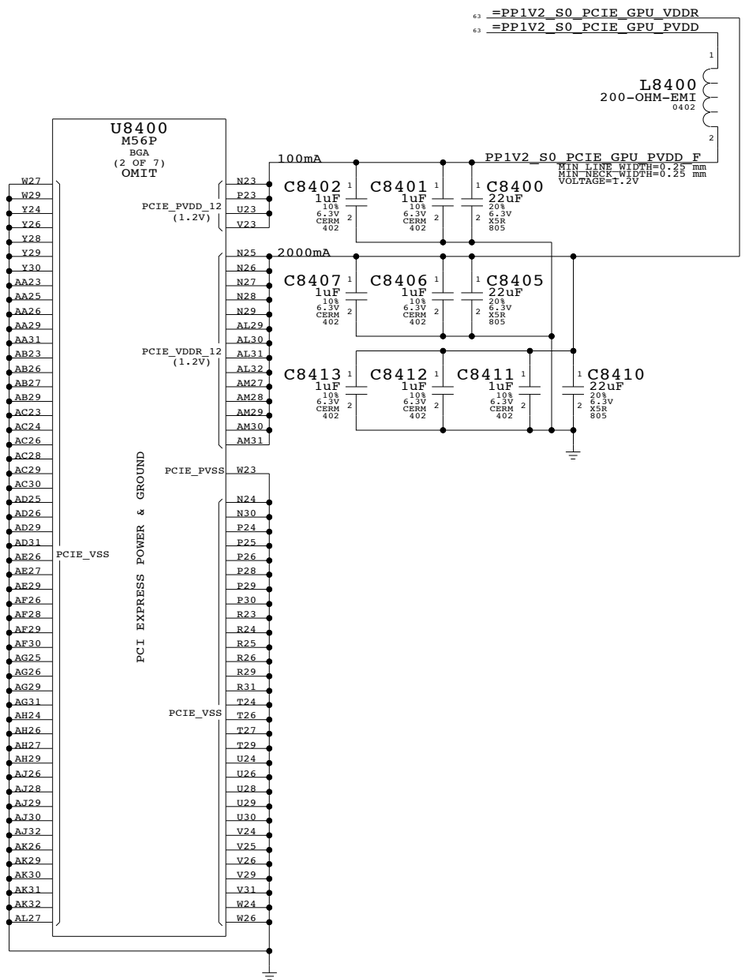
PBus-In & Battery Connectors

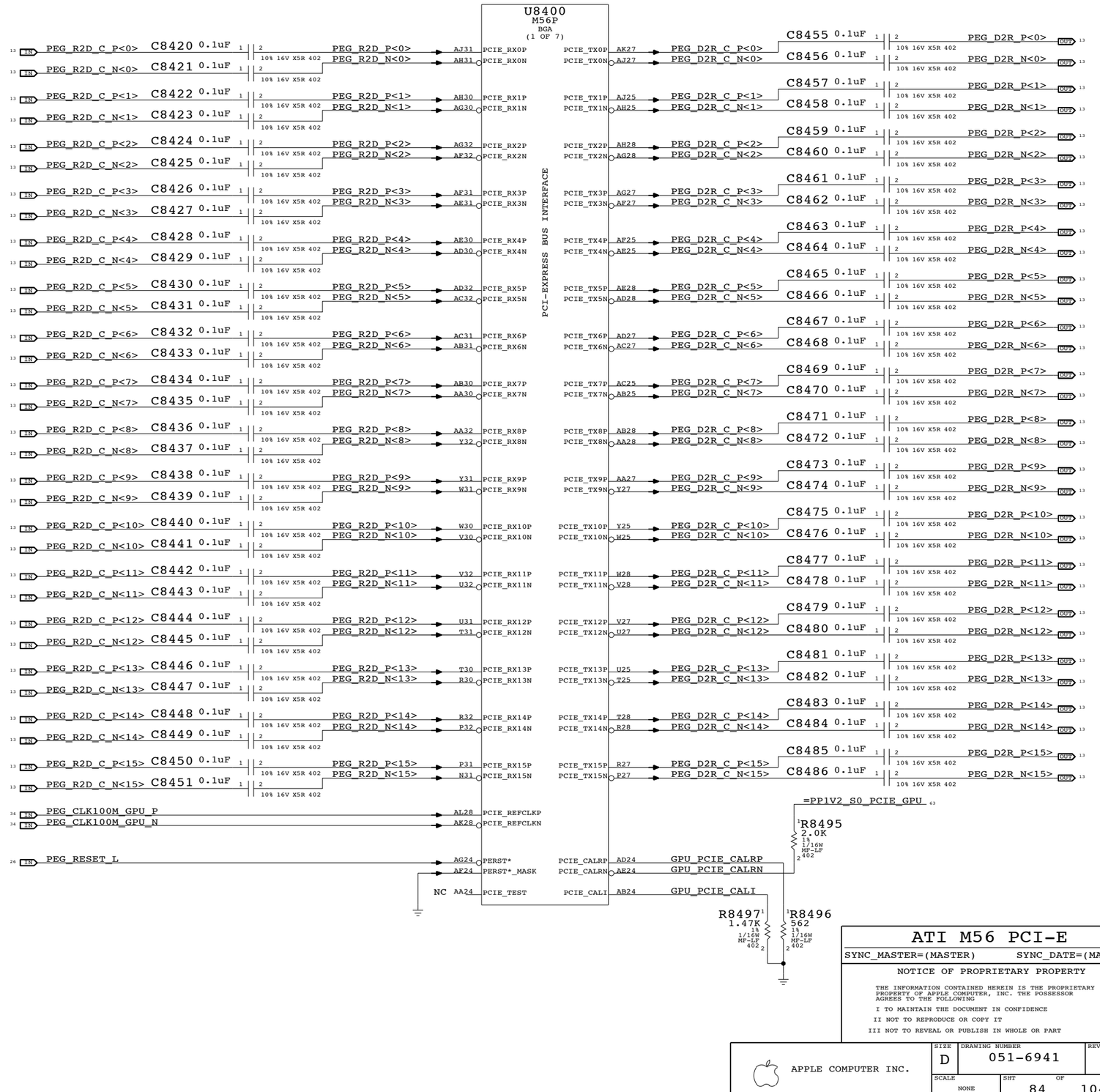
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	82	104





ATI M56 PCI-E

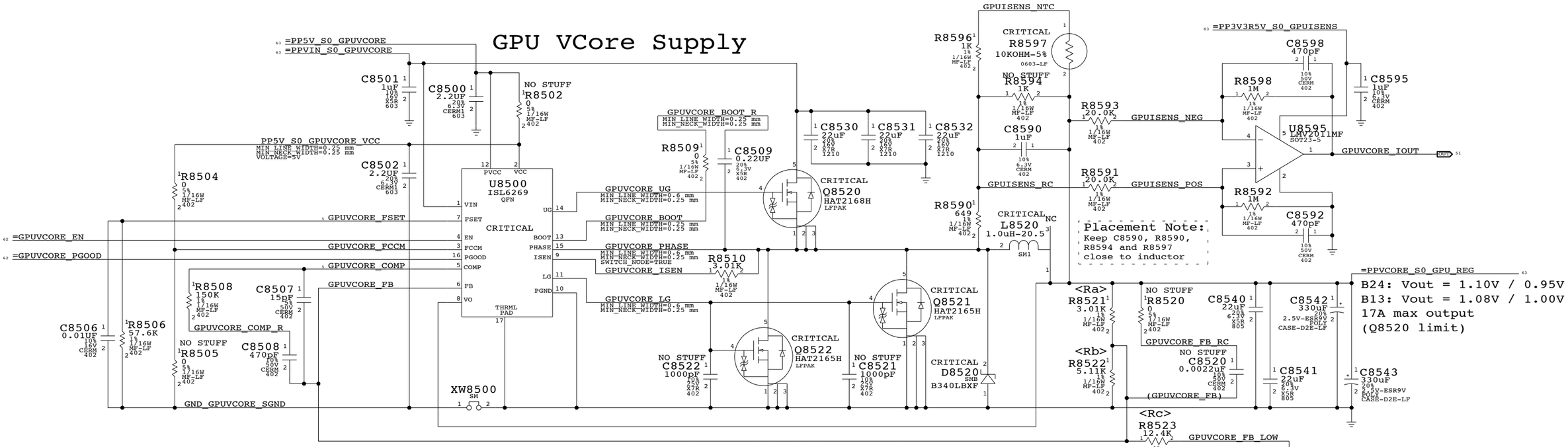
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

NOTICE OF PROPRIETARY PROPERTY

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 84 OF 104	

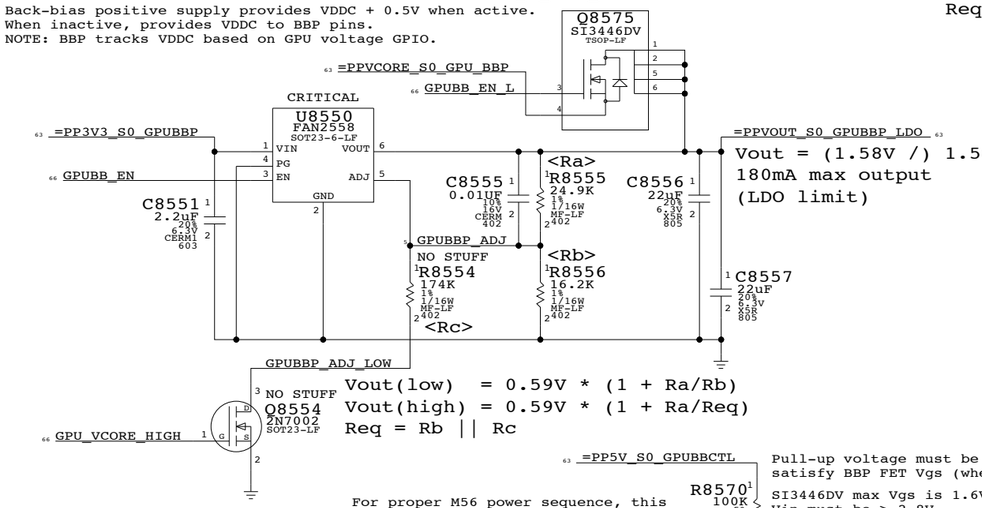
GPU VCore Supply



Vout(low) = 0.6V * (1 + Ra / Rb)
Vout(high) = 0.6V * (1 + Ra / Req)
Req = Rb || Rc

Back-Bias Positive Supply

Back-bias positive supply provides VDDC + 0.5V when active.
When inactive, provides VDDC to BBP pins.
NOTE: BBP tracks VDDC based on GPU voltage GPIO.



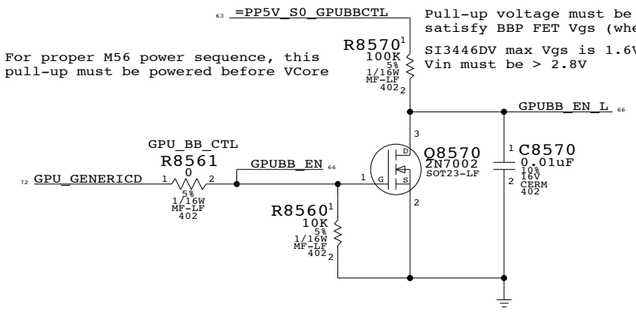
Vout(low) = 0.59V * (1 + Ra/Rb)
Vout(high) = 0.59V * (1 + Ra/Req)
Req = Rb || Rc

=PP5V_S0_GPUBBCTL

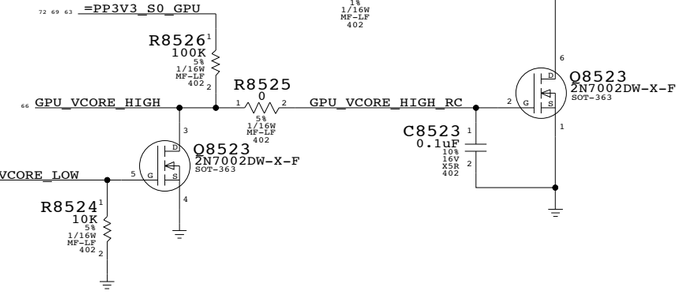
Pull-up voltage must be high enough to satisfy BBP FET Vgs (where Vs = 1.2V)

SI3446DV max Vgs is 1.6V
Vin must be > 2.8V

For proper M56 power sequence, this pull-up must be powered before VCore

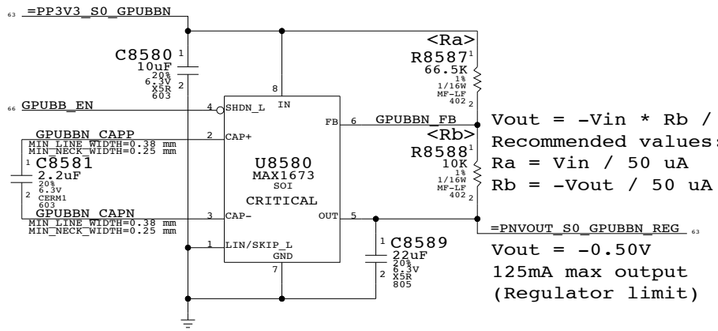


GPU VCore Current Sense



Back-Bias Negative Supply

Back-bias negative supply provides VSS - 0.5V when active.
When inactive, provides VSS to BBN pins.



Vout = -Vin * Rb / Ra
Recommended values:
Ra = Vin / 50 uA
Rb = -Vout / 50 uA
Vout = -0.50V
125mA max output
(Regulator limit)

GPU (M56) Core Supplies

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

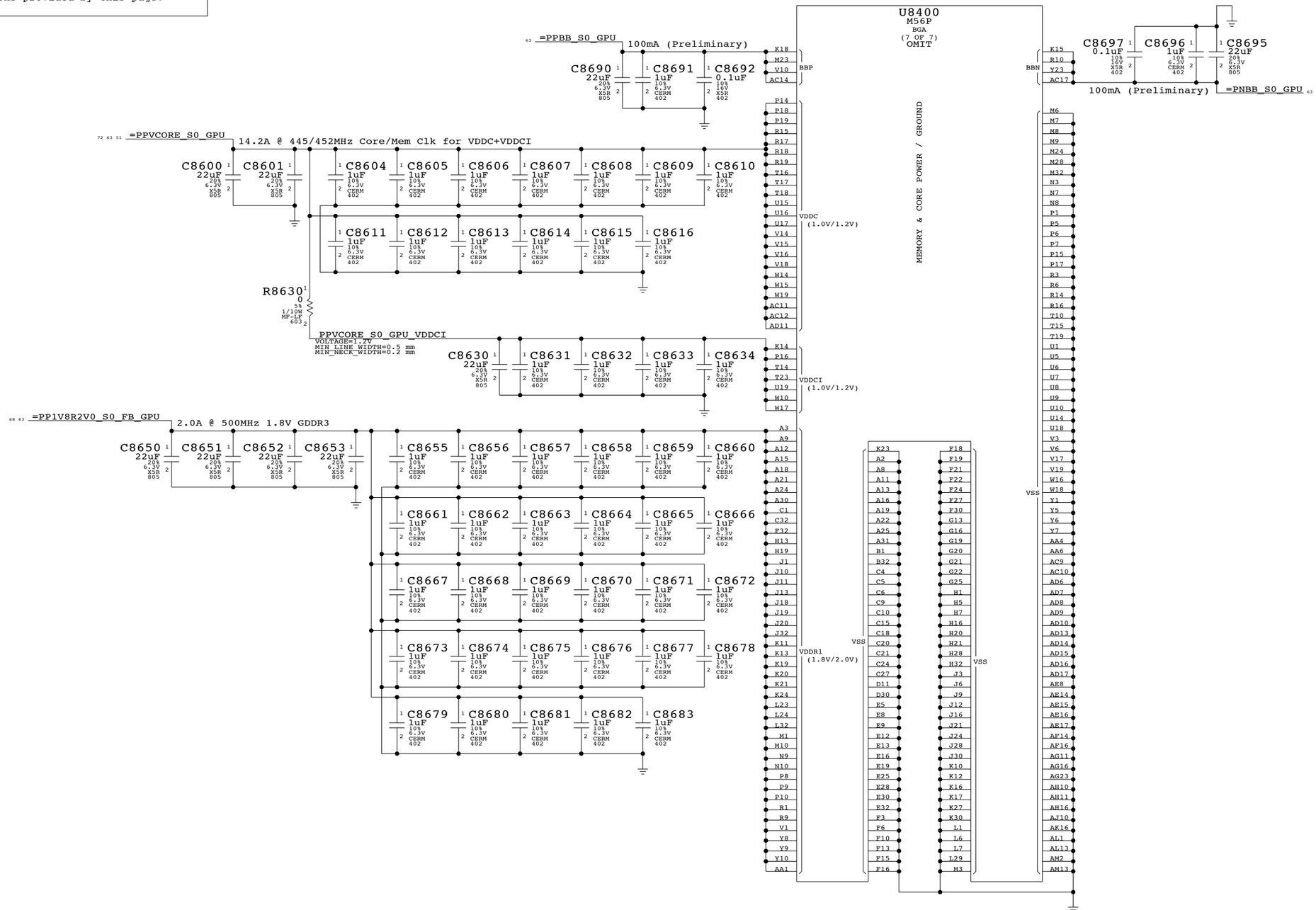
SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 85 OF 104	

Page Notes

Power aliases required by this page:
- =PP1V5_GPU_VDD15
- =PP1VR1V3_GPU_VCORE

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)



ATI M56 Core Power

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

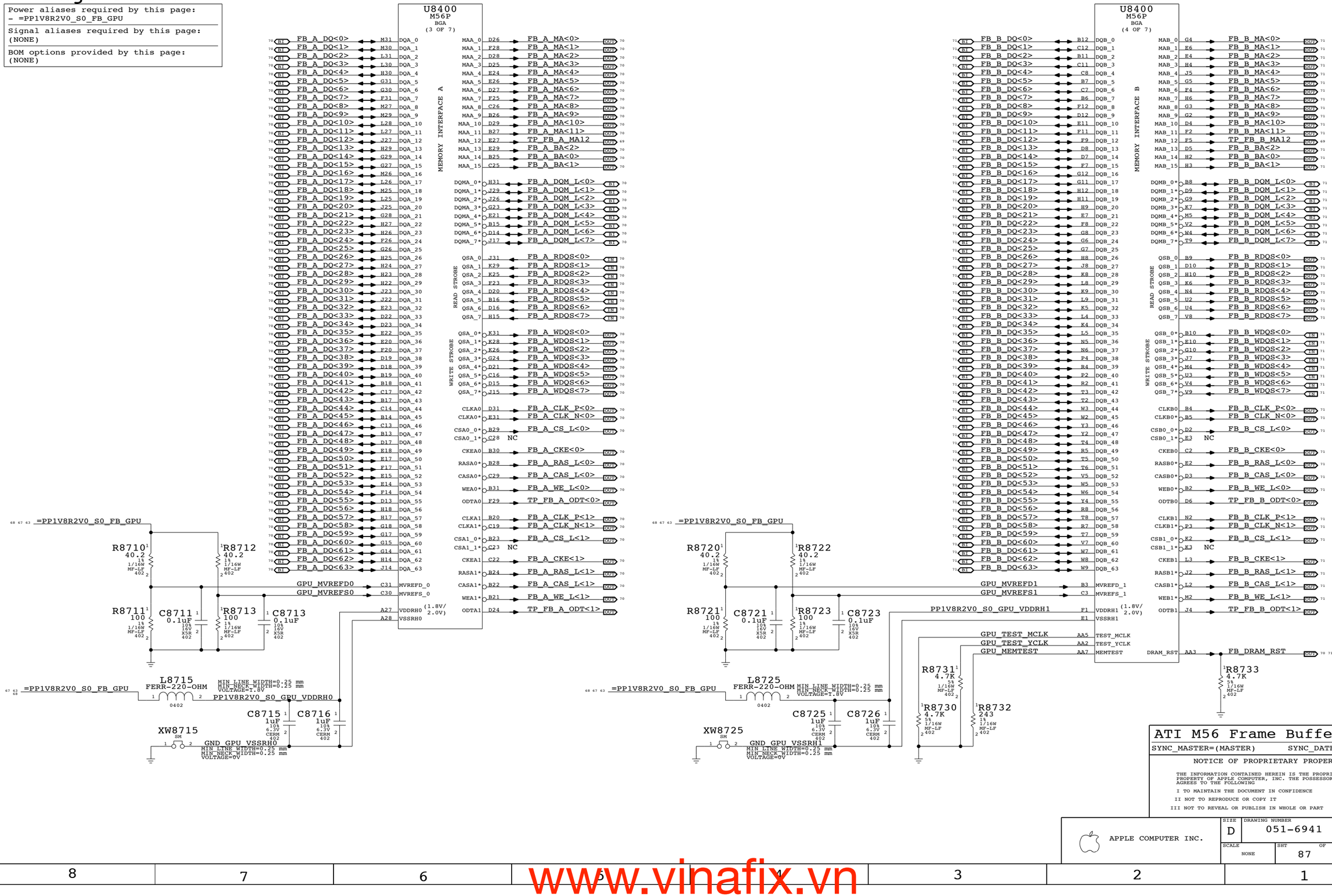
SCALE	SHT	OF
NONE	86	104

Page Notes

Power aliases required by this page:
- =PP1V8R2V0_S0_FB_GPU

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)



ATI M56 Frame Buffer I/F

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 87 OF 104	

	Serial ROM	TestBus	Misc	Straps
GPU_GPIO_0	IPD	TESTIN[0]		TX_PWRS_ENb
GPU_GPIO_1	IPD	TESTIN[1]		TX_DEEMPH_EN
GPU_GPIO_2	VDD_VCL	TESTIN[2]		Reserved
GPU_GPIO_3		TESTIN[3]		Reserved
GPU_GPIO_4	IPD	TESTIN[4]		DEBUG_ACCESS
GPU_GPIO_5		TESTIN[5]		Reserved
GPU_GPIO_6		TESTIN[6]		Reserved
GPU_GPIO_7	ENA_BL	TESTIN[7]		
GPU_GPIO_8	ROMSO	TESTWR		Reserved
GPU_GPIO_9	IPD ROMSI			ROMIDCFG[3]
GPU_GPIO_10	ROMSCK	TESTOUT[8]		
GPU_GPIO_11	IPD	TESTOUT[9]		ROMIDCFG[0]
GPU_GPIO_12	IPD	TESTOUT[10]		ROMIDCFG[1]
GPU_GPIO_13	IPD	TESTOUT[11]		ROMIDCFG[2]
GPU_GPIO_14		TESTIN[8]		
GPU_GPIO_15		TESTIN[9]	PWRCNTL	
GPU_GPIO_16			SS_IN	
GPU_GPIO_17			Thm Mon Int	

=PP3V3_S0_GPU_GPIOS

R8800 10K 5% 1/16W MF-LF 402

NO STUFF R8802 10K 5% 1/16W MF-LF 402

NO STUFF R8804 10K 5% 1/16W MF-LF 402

NO STUFF R8806 10K 5% 1/16W MF-LF 402

NO STUFF R8809 10K 5% 1/16W MF-LF 402

GPU_MEM_256M R8812 10K 5% 1/16W MF-LF 402

GPU_MEM_256M R8824 10K 5% 1/16W MF-LF 402

GPU_DEEPMH_EN R8801 10K 5% 1/16W MF-LF 402

NO STUFF R8803 10K 5% 1/16W MF-LF 402

R8805 10K 5% 1/16W MF-LF 402

NO STUFF R8808 10K 5% 1/16W MF-LF 402

GPU_MEM_64M R8813 10K 5% 1/16W MF-LF 402

NO STUFF R8811 10K 5% 1/16W MF-LF 402

GPU_MEM_HYNIX R8827 10K 5% 1/16W MF-LF 402

ROMCFGID[3..0]

0000 = 128MB
0010 = 256MB
0100 = 64MB
0110 = Reserved

GPU_BLON — MAKE_BASE=TRUE

TP_GPU_GPIO_10 — MAKE_BASE=TRUE

Required for debug access
Required for debug access
Required for debug access
Required for debug access

NC_GPU_GPIO_14 — MAKE_BASE=TRUE NO_TEST=TRUE
GPU_VCORE_LOW — MAKE_BASE=TRUE
GPU_CLK27MSS_IN — MAKE_BASE=TRUE
NC_GPU_GPIO_17 — MAKE_BASE=TRUE NO_TEST=TRUE

GPU_GPIO_18 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_18
GPU_GPIO_19 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_19
GPU_GPIO_20 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_20
GPU_GPIO_21 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_21
GPU_GPIO_22 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_22
GPU_GPIO_23 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_23
GPU_GPIO_24 — MAKE_BASE=TRUE — GPU_MEM_256M
GPU_GPIO_25 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_25
GPU_GPIO_26 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_26
GPU_GPIO_27 — MAKE_BASE=TRUE — GPU_MEMID
GPU_GPIO_28 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_28
GPU_GPIO_29 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_29
GPU_GPIO_30 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_30
GPU_GPIO_31 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_31
GPU_GPIO_32 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_32
GPU_GPIO_33 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_33
GPU_GPIO_34 — MAKE_BASE=TRUE NO_TEST=TRUE — NC_GPU_GPIO_34

Renamed signals

GPU_CLK27M — MAKE_BASE=TRUE — GPU_XTALIN

Unused signals

NC_GPU_XTALOUT	NO_TEST=TRUE	GPU_XTALOUT
NC_ATI_ROMCS_L	NO_TEST=TRUE	TP_ATI_ROMCS_L
NC_FB_A_MA12	NO_TEST=TRUE	TP_FB_A_MA12
NC_FB_B_MA12	NO_TEST=TRUE	TP_FB_B_MA12
NC_GPU_GENERICA	NO_TEST=TRUE	GPU_GENERICA
NC_GPU_GENERICB	NO_TEST=TRUE	GPU_GENERICB
NC_GPU_GENERICC	NO_TEST=TRUE	GPU_GENERICC
NC_GPU_VGA_R	NO_TEST=TRUE	GPU_VGA_R
NC_GPU_VGA_G	NO_TEST=TRUE	GPU_VGA_G
NC_GPU_VGA_B	NO_TEST=TRUE	GPU_VGA_B
TP_GPU_VGA_HSYNC		GPU_VGA_HSYNC
TP_GPU_VGA_VSYNC		GPU_VGA_VSYNC
NC_GPU_TV_Y	NO_TEST=TRUE	GPU_TV_Y
NC_GPU_TV_C	NO_TEST=TRUE	GPU_TV_C
NC_GPU_TV_COMP	NO_TEST=TRUE	GPU_TV_COMP
NC_LVDS_U_DATAP<3>	NO_TEST=TRUE	LVDS_U_DATA_P<3>
NC_LVDS_U_DATAN<3>	NO_TEST=TRUE	LVDS_U_DATA_N<3>
NC_LVDS_L_DATAP<3>	NO_TEST=TRUE	LVDS_L_DATA_P<3>
NC_LVDS_L_DATAN<3>	NO_TEST=TRUE	LVDS_L_DATA_N<3>
NC_ATI_DVPCLK	NO_TEST=TRUE	ATI_DVPCLK
NC_ATI_DVPCNTL<2..0>	NO_TEST=TRUE	ATI_DVPCNTL<2..0>
NC_ATI_DVPDATA<15..0>	NO_TEST=TRUE	ATI_DVPDATA<15..0>

Required for debug access

TP_ATI_DVPDATA<23..16> — MAKE_BASE=TRUE — ATI_DVPDATA<23..16>

Also required: GPIO10 - GPIO13

=PP3V3_S0_GPU

R9390 4.7K 5% 1/16W MF-LF 402

R9391 4.7K 5% 1/16W MF-LF 402

GPU_DDC_B_CLK
GPU_DDC_B_DATA

GPU Straps

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 88 OF 104	

Page Notes

Power aliases required by this page:
- =PP1V8_S0_FB_VDD
- =PP1V8_S0_FB_VDDQ

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

=PP1V8_S0_FB_VDD

=PP1V8_S0_FB_VDDQ

C8900 C8901 C8902 C8903 C8904 — 22uF 20% 6.3V X5R 805; 0.1uF 10% 16V X5R 402

L8910 FERR-220-OHM 0402 — PP1V8_S0_FB_A0_VDDA0 — MIN_LINE_WIDTH=0.25 mm MIN_NECK_WIDTH=0.25 mm VOLTAGE=1.8V

L8915 FERR-220-OHM 0402 — PP1V8_S0_FB_A0_VDDA1 — MIN_LINE_WIDTH=0.25 mm MIN_NECK_WIDTH=0.25 mm VOLTAGE=1.8V

Connect to designated pin, then GND

C8910 C8915 — 0.1uF 10% 16V X5R 402 — U8900.J1 U8900.J12

C8920 — 22uF 20% 6.3V X5R 805

C8921 C8922 C8923 C8924 C8925 C8926 — 0.1uF 10% 16V X5R 402

R8930 R8932 — 2.37K 1% 1/16W MF-LF 402

R8931 R8933 — 5.49K 1% 1/16W MF-LF 402

FB_A0_VREF0 — MIN_LINE_WIDTH=0.25 mm MIN_NECK_WIDTH=0.25 mm

FB_A0_VREF1 — MIN_LINE_WIDTH=0.25 mm MIN_NECK_WIDTH=0.25 mm

C8931 C8933 — 0.1uF 10% 16V X5R 402

R8940 R8942 R8944 R8946 — 121 1% 1/16W MF-LF 402; 60.4 1% 1/16W MF-LF 402

R8941 — 0 5% 1/16W MF-LF 402

R8943 — 121 1% 1/16W MF-LF 402

R8945 — 60.4 1% 1/16W MF-LF 402

R8947 — 121 1% 1/16W MF-LF 402

R8948 — 243 1% 1/16W MF-LF 402

R8949 — 0 5% 1/16W MF-LF 402

NOTE: U8900 DQ0-7 MUST connect to GPU DQA0-7 or DQA8-15. Bits can be swapped within byte-lane, but software must know how these bits are mapped for GPU to support GDDR3 vendor/device identification scheme.

U8900 — FBGA (2 OF 2) — CRITICAL OMIT — 16MX32-GDDR3-500MHZ K4J52324QC-BC20

U8900 pin map:

A2	VDD0	VSS0	A3
A11	VDD1	VSS1	A10
F1	VDD2	VSS2	G1
F12	VDD3	VSS3	G12
M1	VDD4	VSS4	L1
M12	VDD5	VSS5	L12
V2	VDD6	VSS6	V3
V11	VDD7	VSS7	V10
K1	VDDA0	VSSA0	J1
K12	VDDA1	VSSA1	J12
A1	VDDQ0	VSSQ0	B1
A12	VDDQ1	VSSQ1	B4
C1	VDDQ2	VSSQ2	B9
C4	VDDQ3	VSSQ3	B12
C9	VDDQ4	VSSQ4	D1
C12	VDDQ5	VSSQ5	D4
E1	VDDQ6	VSSQ6	D9
E4	VDDQ7	VSSQ7	D12
E9	VDDQ8	VSSQ8	G2
E12	VDDQ9	VSSQ9	G11
J4	VDDQ10	VSSQ10	L2
J9	VDDQ11	VSSQ11	L11
N1	VDDQ12	VSSQ12	P1
N4	VDDQ13	VSSQ13	P4
N9	VDDQ14	VSSQ14	P9
N12	VDDQ15	VSSQ15	P12
R1	VDDQ16	VSSQ16	T1
R4	VDDQ17	VSSQ17	T4
R9	VDDQ18	VSSQ18	T9
R12	VDDQ19	VSSQ19	T12
V1	VDDQ20		
V12	VDDQ21		
H1	VREF0		
H12	VREF1		

FB_A_MA<0> FB_A_MA<1> FB_A_MA<2> FB_A_MA<3> FB_A_MA<4> FB_A_MA<5> FB_A_MA<6> FB_A_MA<7> FB_A_MA<8> FB_A_MA<9> FB_A_MA<10> FB_A_MA<11>

FB_A_CKE<0> FB_A_CLK_P<0> FB_A_CLK_N<0> FB_A_CS_L<0> FB_A_WE_L<0> FB_A_CAS_L<0> FB_A_RAS_L<0>

FB_A_DOM_L<0> FB_A_DOM_L<1> FB_A_DOM_L<2> FB_A_DOM_L<3>

FB_A_DQ<0> FB_A_DQ<1> FB_A_DQ<2> FB_A_DQ<3> FB_A_DQ<4> FB_A_DQ<5> FB_A_DQ<6> FB_A_DQ<7> FB_A_DQ<8> FB_A_DQ<9> FB_A_DQ<10> FB_A_DQ<11> FB_A_DQ<15> FB_A_DQ<14> FB_A_DQ<12> FB_A_DQ<13> FB_A_DQ<19> FB_A_DQ<16> FB_A_DQ<18> FB_A_DQ<17> FB_A_DQ<23> FB_A_DQ<21> FB_A_DQ<20> FB_A_DQ<22> FB_A_DQ<24> FB_A_DQ<25> FB_A_DQ<26> FB_A_DQ<27> FB_A_DQ<29> FB_A_DQ<30> FB_A_DQ<28> FB_A_DQ<31>

FB_A0_ZQ FB_A0_MF FB_A0_SEN

FB_DRAM_RST

FB_A_RDQS<0> FB_A_RDQS<1> FB_A_RDQS<2> FB_A_RDQS<3>

FB_A_WDQS<0> FB_A_WDQS<1> FB_A_WDQS<2> FB_A_WDQS<3>

FB_A_BA<0> FB_A_BA<1> FB_A_BA<2>

NC NC

C8950 C8951 C8952 C8953 C8954 — 22uF 20% 6.3V X5R 805; 0.1uF 10% 16V X5R 402

L8960 FERR-220-OHM 0402 — PP1V8_S0_FB_A1_VDDA0 — MIN_LINE_WIDTH=0.25 mm MIN_NECK_WIDTH=0.25 mm VOLTAGE=1.8V

L8965 FERR-220-OHM 0402 — PP1V8_S0_FB_A1_VDDA1 — MIN_LINE_WIDTH=0.25 mm MIN_NECK_WIDTH=0.25 mm VOLTAGE=1.8V

Connect to designated pin, then GND

C8960 C8965 — 0.1uF 10% 16V X5R 402 — U8900.J1 U8900.J12

C8970 — 22uF 20% 6.3V X5R 805

C8971 C8972 C8973 C8974 C8975 C8976 — 0.1uF 10% 16V X5R 402

R8980 R8982 — 2.37K 1% 1/16W MF-LF 402

R8981 R8983 — 5.49K 1% 1/16W MF-LF 402

FB_A1_VREF0 — MIN_LINE_WIDTH=0.25 mm MIN_NECK_WIDTH=0.25 mm

FB_A1_VREF1 — MIN_LINE_WIDTH=0.25 mm MIN_NECK_WIDTH=0.25 mm

C8981 C8983 — 0.1uF 10% 16V X5R 402

R8990 R8992 R8994 R8996 — 121 1% 1/16W MF-LF 402; 60.4 1% 1/16W MF-LF 402

R8991 — 0 5% 1/16W MF-LF 402

R8993 — 121 1% 1/16W MF-LF 402

R8995 — 60.4 1% 1/16W MF-LF 402

R8997 — 121 1% 1/16W MF-LF 402

R8998 — 243 1% 1/16W MF-LF 402

R8999 — 0 5% 1/16W MF-LF 402

U8950 — FBGA (1 OF 2) — CRITICAL OMIT — 16MX32-GDDR3-500MHZ K4J52324QC-BC20

U8950 pin map:

K9	A0	DM0	E3
H11	A1	DM1	E10
K10	A2	DM2	N10
M9	A3	DM3	N3
K4	A4	DQ0	B2
H2	A5	DQ1	B3
K3	A6	DQ2	C2
L4	A7	DQ3	C3
K2	A8/AP	DQ4	E2
M4	A9	DQ5	F3
K11	A10	DQ6	F2
L9	A11	DQ7	G3
H9	CKE	DQ8	B11
J11	CK	DQ9	B10
J10	CK*	DQ10	C11
F4	CS*	DQ11	C10
H4	WE*	DQ12	E11
F9	CAS*	DQ13	F10
H10	RAS*	DQ14	F11
A4	ZQ	DQ15	G10
A9	MF	DQ16	M11
V4	SEN	DQ17	L10
V9	RESET	DQ18	N11
D3	RDQS0	DQ19	M10
D10	RDQS1	DQ20	R11
P10	RDQS2	DQ21	R10
P3	RDQS3	DQ22	T11
D2	WDQS0	DQ23	T10
D11	WDQS1	DQ24	M2
P11	WDQS2	DQ25	L3
P2	WDQS3	DQ26	N2
G9	BA0	DQ27	M3
G4	BA1	DQ28	R2
H3	BA2	DQ29	R3
J2	RFU1	DQ30	T2
J3	RFU2	DQ31	T3

FB_A_MA<0> FB_A_MA<1> FB_A_MA<2> FB_A_MA<3> FB_A_MA<4> FB_A_MA<5> FB_A_MA<6> FB_A_MA<7> FB_A_MA<8> FB_A_MA<9> FB_A_MA<10> FB_A_MA<11>

FB_A_CKE<1> FB_A_CLK_P<1> FB_A_CLK_N<1> FB_A_CS_L<1> FB_A_WE_L<1> FB_A_CAS_L<1> FB_A_RAS_L<1>

FB_A_DOM_L<4> FB_A_DOM_L<5> FB_A_DOM_L<6> FB_A_DOM_L<7>

FB_A_DQ<32> FB_A_DQ<34> FB_A_DQ<33> FB_A_DQ<35> FB_A_DQ<36> FB_A_DQ<37> FB_A_DQ<38> FB_A_DQ<39> FB_A_DQ<40> FB_A_DQ<41> FB_A_DQ<42> FB_A_DQ<43> FB_A_DQ<46> FB_A_DQ<44> FB_A_DQ<47> FB_A_DQ<45> FB_A_DQ<48> FB_A_DQ<49> FB_A_DQ<50> FB_A_DQ<51> FB_A_DQ<52> FB_A_DQ<55> FB_A_DQ<54> FB_A_DQ<53> FB_A_DQ<60> FB_A_DQ<59> FB_A_DQ<61> FB_A_DQ<57> FB_A_DQ<62> FB_A_DQ<56> FB_A_DQ<63> FB_A_DQ<58>

FB_A1_ZQ FB_A1_MF FB_A1_SEN

FB_DRAM_RST

FB_A_RDQS<4> FB_A_RDQS<5> FB_A_RDQS<6> FB_A_RDQS<7>

FB_A_WDQS<4> FB_A_WDQS<5> FB_A_WDQS<6> FB_A_WDQS<7>

FB_A_BA<0> FB_A_BA<1> FB_A_BA<2>

NC NC

GDDR3 Frame Buffer A

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

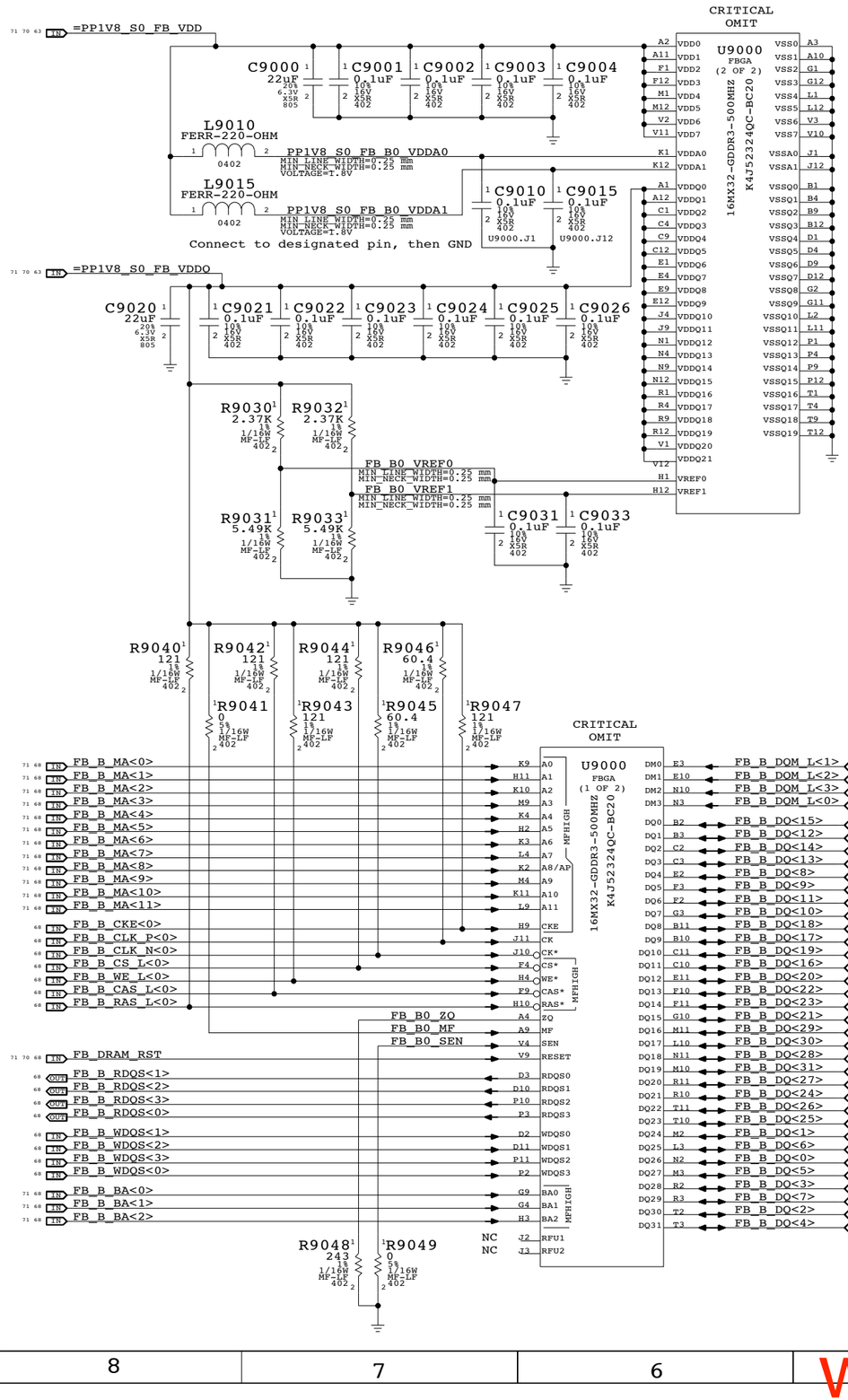
SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 89 OF 104	

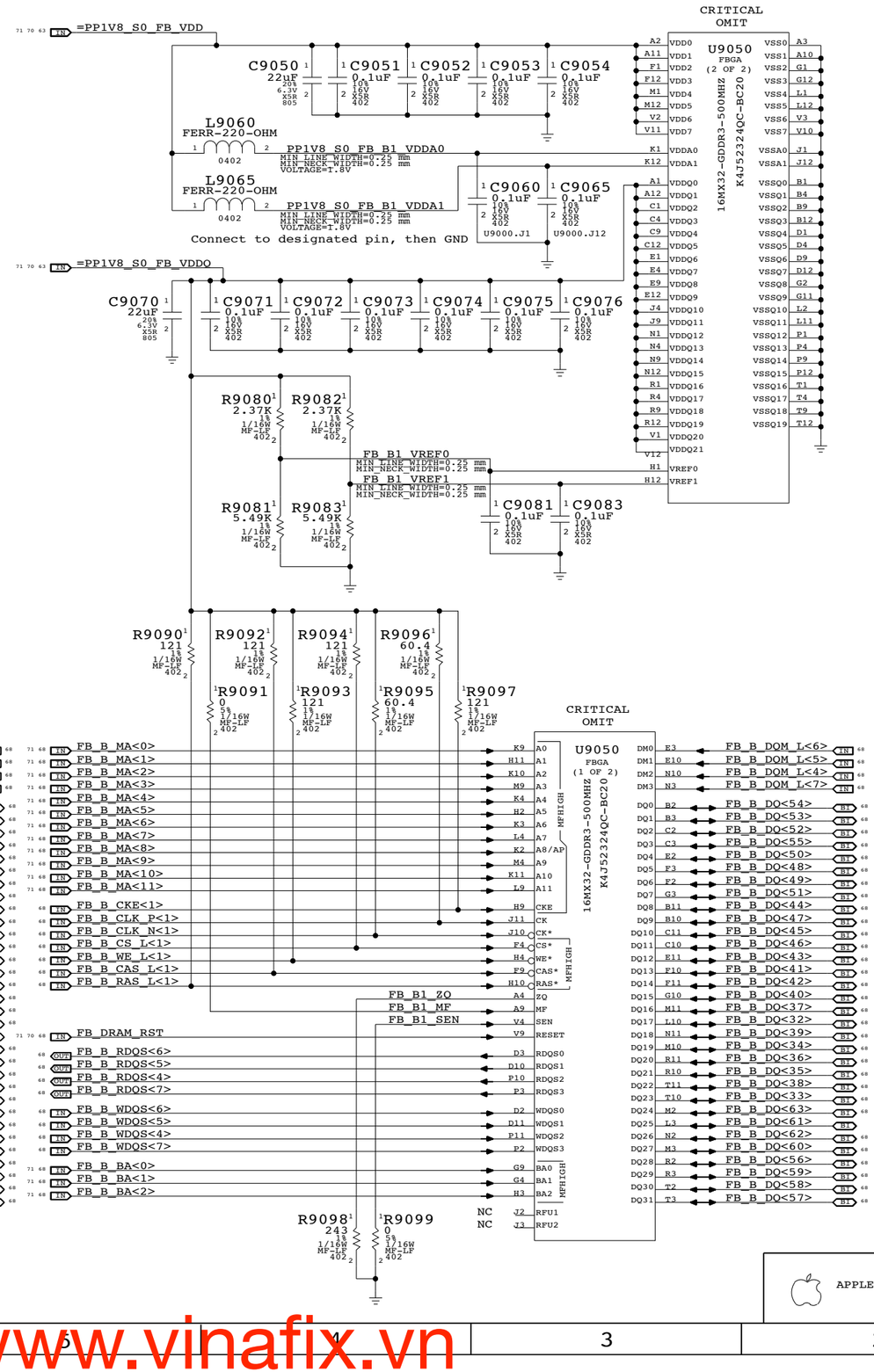
Page Notes

Power aliases required by this page:
- =PP1V8_S0_FB_VDD
- =PP1V8_S0_FB_VDDQ

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)





GDDR3 Frame Buffer B

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

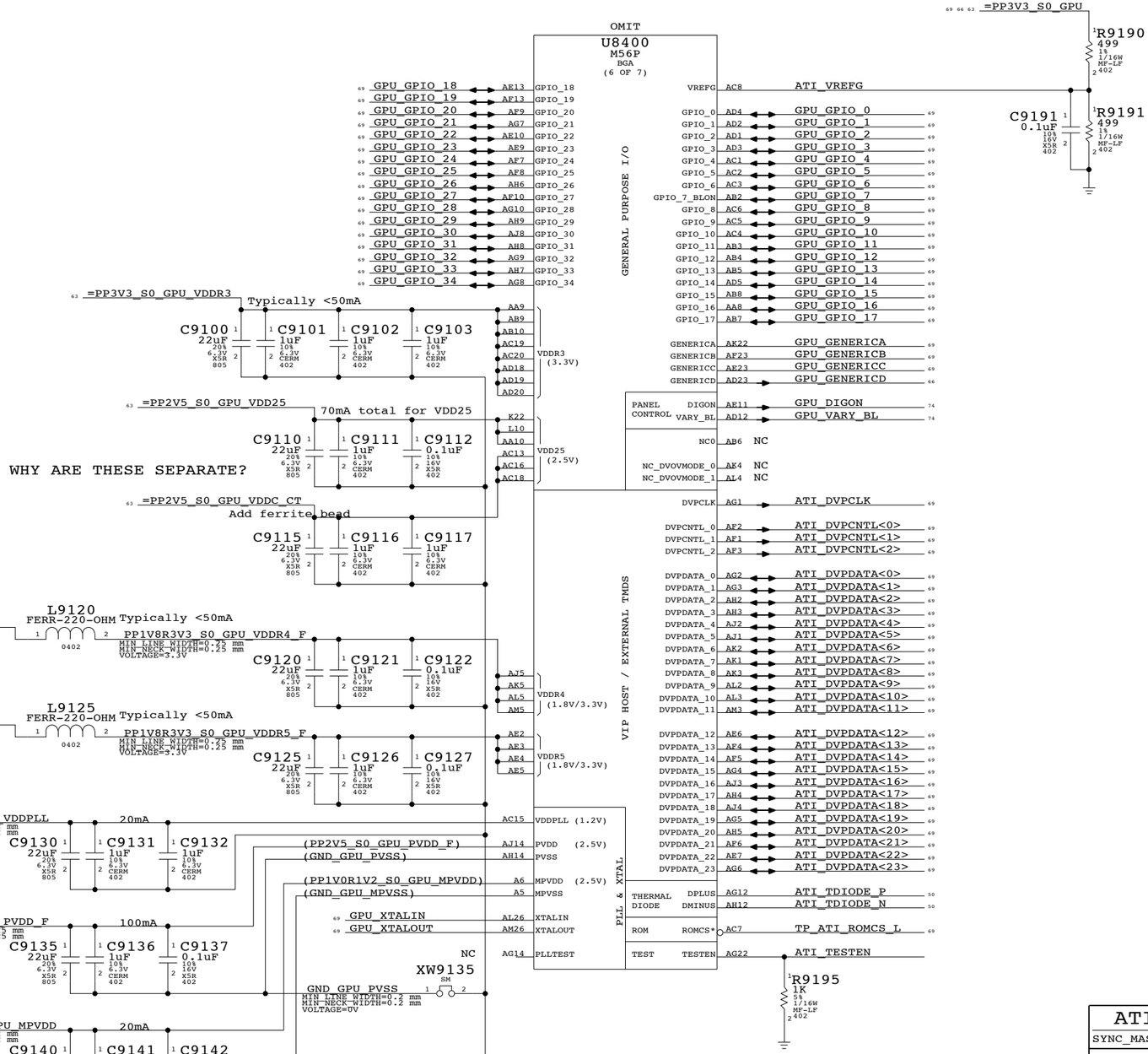
SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE	SHT	OF
NONE	90	104

Page Notes

Power aliases required by this page:
- =PP3V3_GPU_GPIOS
- =PP2V5_PVDD
- =PP1V8_GPU_LVDS_PLL

Signal aliases required by this page:
- =I2C_GPU_TMDS_SDA - I2C data line for external TMDS transmitters
- =I2C_GPU_TMDS_SCL - I2C clock line for external TMDS transmitters

BOM options provided by this page:
(NONE)



ATI M56 GPIO/DVO/Misc

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 91 OF 104	

Page Notes

Power aliases required by this page:
- =PP2V5_S0_GPU
- =PP1V8R2V5_S0_GPU_LVDDR

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

63 =PP2V5_S0_GPU

Sum of peak currents on this page: 605mA

L9300 FERR-220-OHM 0402 — PP2V5_S0_GPU_TPVDD — MIN_LINE_WIDTH=0.2 mm, MIN_NECK_WIDTH=0.2 mm, VOLTAGE=2.5V — 20mA peak
XW9300 SM — GND_GPU_TPVSS — MIN_LINE_WIDTH=0.2 mm, MIN_NECK_WIDTH=0.2 mm, VOLTAGE=0V
C9300 22uF 20% 6.3V X5R 805; C9301 1uF 10% 6.3V CERM 402; C9302 1uF 10% 6.3V CERM 402

L9305 FERR-220-OHM 0402 — PP2V5_S0_GPU_TXVDDR — MIN_LINE_WIDTH=0.3 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=2.5V — 150mA peak
XW9305 SM — GND_GPU_TXVSSR — MIN_LINE_WIDTH=0.3 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=0V
C9305 22uF 20% 6.3V X5R 805; C9306 1uF 10% 6.3V CERM 402; C9307 0.1uF 10% 16V X5R 402

L9310 FERR-220-OHM 0402 — PP2V5_S0_GPU_AVDD — MIN_LINE_WIDTH=0.25 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=2.5V — 65mA peak
XW9310 SM — GND_GPU_AVSSN — MIN_LINE_WIDTH=0.25 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=0V
C9310 22uF 20% 6.3V X5R 805; C9311 1uF 10% 6.3V CERM 402; C9312 0.1uF 10% 16V X5R 402

L9315 FERR-220-OHM 0402 — PP2V5_S0_GPU_VDD1DI — MIN_LINE_WIDTH=0.2 mm, MIN_NECK_WIDTH=0.2 mm, VOLTAGE=2.5V
XW9314 SM — GND_GPU_AVSSQ — MIN_LINE_WIDTH=0.25 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=0V
C9315 22uF 20% 6.3V X5R 805; C9316 1uF 10% 6.3V CERM 402; C9317 0.1uF 10% 16V X5R 402

20mA peak

L9320 FERR-220-OHM 0402 — PP2V5_S0_GPU_A2VDD — MIN_LINE_WIDTH=0.3 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=2.5V — 130mA peak
XW9320 SM — GND_GPU_A2VSSN — MIN_LINE_WIDTH=0.3 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=0V
C9320 22uF 20% 6.3V X5R 805; C9321 1uF 10% 6.3V CERM 402; C9322 0.1uF 10% 16V X5R 402

L9325 FERR-220-OHM 0402 — PP2V5_S0_GPU_VDD1DI — MIN_LINE_WIDTH=0.2 mm, MIN_NECK_WIDTH=0.2 mm, VOLTAGE=2.5V
XW9324 SM — GND_GPU_A2VSSQ — MIN_LINE_WIDTH=0.3 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=0V
C9325 22uF 20% 6.3V X5R 805; C9326 1uF 10% 6.3V CERM 402; C9327 0.1uF 10% 16V X5R 402

20mA peak

L9330 FERR-220-OHM 0402 — PP2V5_S0_GPU_LPVDD — MIN_LINE_WIDTH=0.2 mm, MIN_NECK_WIDTH=0.2 mm, VOLTAGE=2.5V — 20mA peak
XW9330 SM — GND_GPU_LPVSS — MIN_LINE_WIDTH=0.2 mm, MIN_NECK_WIDTH=0.2 mm, VOLTAGE=0V
C9330 22uF 20% 6.3V X5R 805; C9331 1uF 10% 6.3V CERM 402; C9332 1uF 10% 6.3V CERM 402

L9345 FERR-220-OHM 0402 — PP2V5_S0_GPU_LVDDR — MIN_LINE_WIDTH=0.25 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=2.5V — 200mA peak
XW9345 SM — GND_GPU_LVSSR — MIN_LINE_WIDTH=0.35 mm, MIN_NECK_WIDTH=0.25 mm, VOLTAGE=0V
C9340 22uF 20% 6.3V X5R 805; C9345 22uF 20% 6.3V X5R 805; C9341 1uF 10% 6.3V CERM 402; C9342 0.1uF 10% 16V X5R 402; C9346 0.1uF 10% 16V X5R 402; C9347 0.1uF 10% 16V X5R 402

ATI_RSET 73
ATI_R2SET 73
R9350 499 1% 1/16W MF-LF 402
R9351 715 1% 1/16W MF-LF 402

OMIT
U8400 M56P BGA (5 OF 7)

INTEGRATED TMDS
AM8 TPVDD (2.5V)
AL8 TPVSS
AJ6 AK6 AL6 AM6 TXVDDR (2.5V)
AJ7 AK7 AK8 AL7 AM7 TXVSSR
AL25 AM25 AVDD (2.5V)
AJ24 AK25 AVSS
AK23 AVSSQ
AM23 VDD1DI (2.5V)
AL23 VSS1DI
AL22 RSET

DAC (CRT)
AL16 AM16 A2VDD (2.5V)
AL17 AM17 A2VSS
NC AL14 NC_A2VDDQ
AK13 A2VSSQ
AJ16 VDD2DI (2.5V)
AJ17 VSS2DI
AK14 R2SET

DAC2 (TV/CRT2)
AE19 LPVDD (2.5V)
AE18 LPVSS
AC21 AC22 AD21 AD22 AE20 AE21 AE22 AF19 AF20 LVDDR (2.5V)
AF17 AF18 AF21 AF22 AG17 AG19 AH17 AH19 AJ19 AK17 LVSSR

LVDS
AF11 HPD1

MONITOR IDENTIFICATION

TXCP AM9 TMDS_CLK_P — OUT 74 75 79
TXCM AL9 TMDS_CLK_N — OUT 74 75 79
TX0P AL10 TMDS_DATA_P<0> — OUT 74 75 79
TX0M AK10 TMDS_DATA_N<0> — OUT 74 75 79
TX1P AM11 TMDS_DATA_P<1> — OUT 74 75 79
TX1M AL11 TMDS_DATA_N<1> — OUT 74 75 79
TX2P AM12 TMDS_DATA_P<2> — OUT 74 75 79
TX2M AL12 TMDS_DATA_N<2> — OUT 74 75 79
TX3P AJ9 TMDS_DATA_P<3> — OUT 74 75 79
TX3M AK9 TMDS_DATA_N<3> — OUT 74 75 79
TX4P AJ11 TMDS_DATA_P<4> — OUT 74 75 79
TX4M AK11 TMDS_DATA_N<4> — OUT 74 75 79
TX5P AJ12 TMDS_DATA_P<5> — OUT 74 75 79
TX5M AK12 TMDS_DATA_N<5> — OUT 74 75 79

R AK24 GPU_VGA_R — OUT 69
G AM24 GPU_VGA_G — OUT 69
B AL24 GPU_VGA_B — OUT 69
HSYNC AJ23 GPU_VGA_HSYNC — OUT 69
VSYNC AJ22 GPU_VGA_VSYNC — OUT 69

R2 AK15 GPU_R2 — OUT 74 75
G2 AM15 GPU_G2 — OUT 74 75
B2 AL15 GPU_B2 — OUT 74 75
H2SYNC AF15 GPU_H2SYNC — OUT 75
V2SYNC AG15 GPU_V2SYNC — OUT 75
Y AJ15 GPU_TV_Y — OUT 69
C AJ13 GPU_TV_C — OUT 69
COMP AH15 GPU_TV_COMP — OUT 69

TXCLK_UP AJ21 LVDS_U_CLK_P — OUT 74 77
TXCLK_UN AK21 LVDS_U_CLK_N — OUT 74 77
TXOUT_U0P AG18 LVDS_U_DATA_P<0> — OUT 74 77
TXOUT_U0N AH18 LVDS_U_DATA_N<0> — OUT 74 77
TXOUT_U1P AK20 LVDS_U_DATA_P<1> — OUT 74 77
TXOUT_U1N AJ20 LVDS_U_DATA_N<1> — OUT 74 77
TXOUT_U2P AG20 LVDS_U_DATA_P<2> — OUT 74 77
TXOUT_U2N AH20 LVDS_U_DATA_N<2> — OUT 74 77
TXOUT_U3P AH21 LVDS_U_DATA_P<3> — OUT 69
TXOUT_U3N AG21 LVDS_U_DATA_N<3> — OUT 69
TXCLK_LP AM18 LVDS_L_CLK_P — OUT 74 77
TXCLK_LN AL18 LVDS_L_CLK_N — OUT 74 77
TXOUT_L0P AL19 LVDS_L_DATA_P<0> — OUT 74 77
TXOUT_L0N AK19 LVDS_L_DATA_N<0> — OUT 74 77
TXOUT_L1P AM20 LVDS_L_DATA_P<1> — OUT 74 77
TXOUT_L1N AL20 LVDS_L_DATA_N<1> — OUT 74 77
TXOUT_L2P AM21 LVDS_L_DATA_P<2> — OUT 74 77
TXOUT_L2N AL21 LVDS_L_DATA_N<2> — OUT 74 77
TXOUT_L3P AJ18 LVDS_L_DATA_P<3> — OUT 69
TXOUT_L3N AK18 LVDS_L_DATA_N<3> — OUT 69

DDC1CLK AH23 GPU_DDC_A_CLK — BI 75
DDC1DATA AH22 GPU_DDC_A_DATA — BI 75
DDC2CLK AG13 GPU_DDC_B_CLK — BI 69
DDC2DATA AH13 GPU_DDC_B_DATA — BI 69
DDC3CLK AF12 GPU_DDC_C_CLK — BI 74
DDC3DATA AE12 GPU_DDC_C_DATA — BI 74

ATI_RSET 73
ATI_R2SET 73
NC GPU_HPD — IN 75

Composite/S-Video	VGA	Component
Y	G	Y
C	R	Pr
Comp	B	Pb

ATI M56 Video Interfaces

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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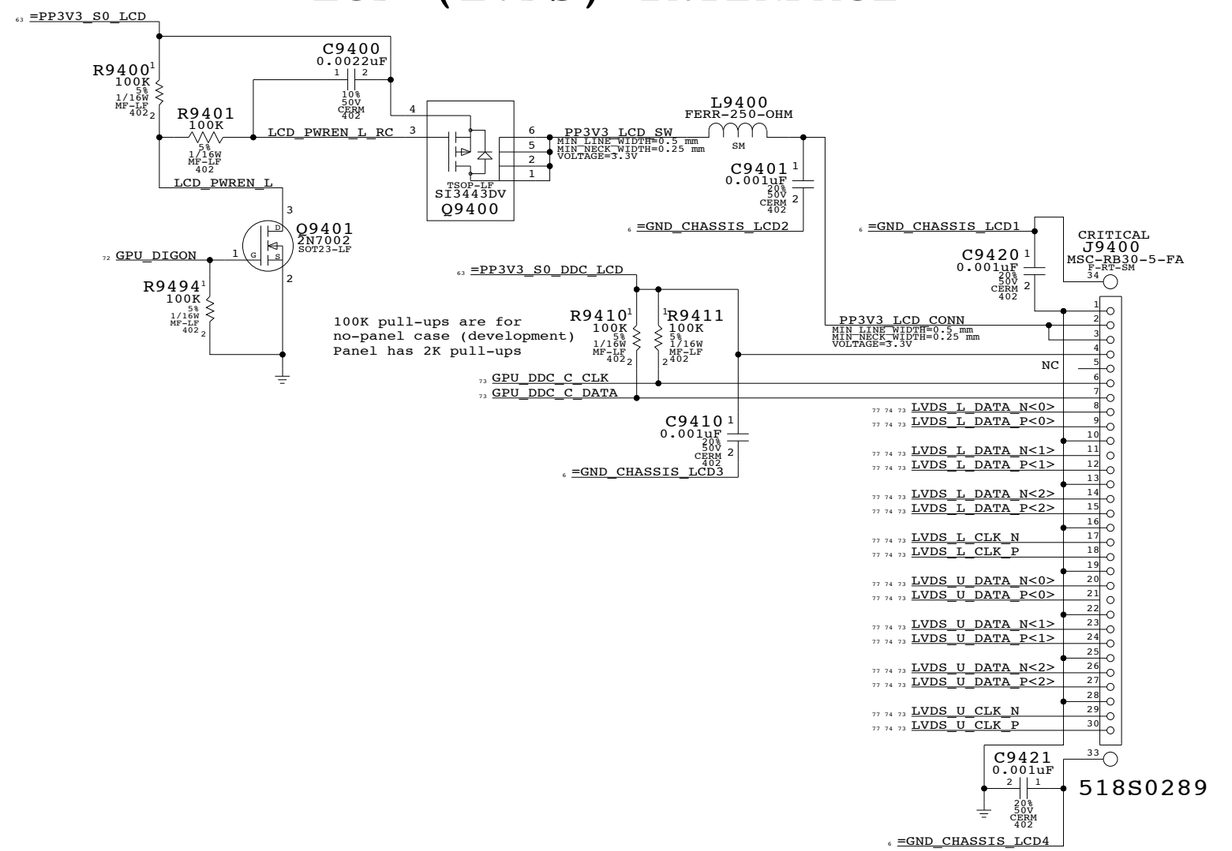
SIZE	DRAWING NUMBER	REV.
D	051-6941	12

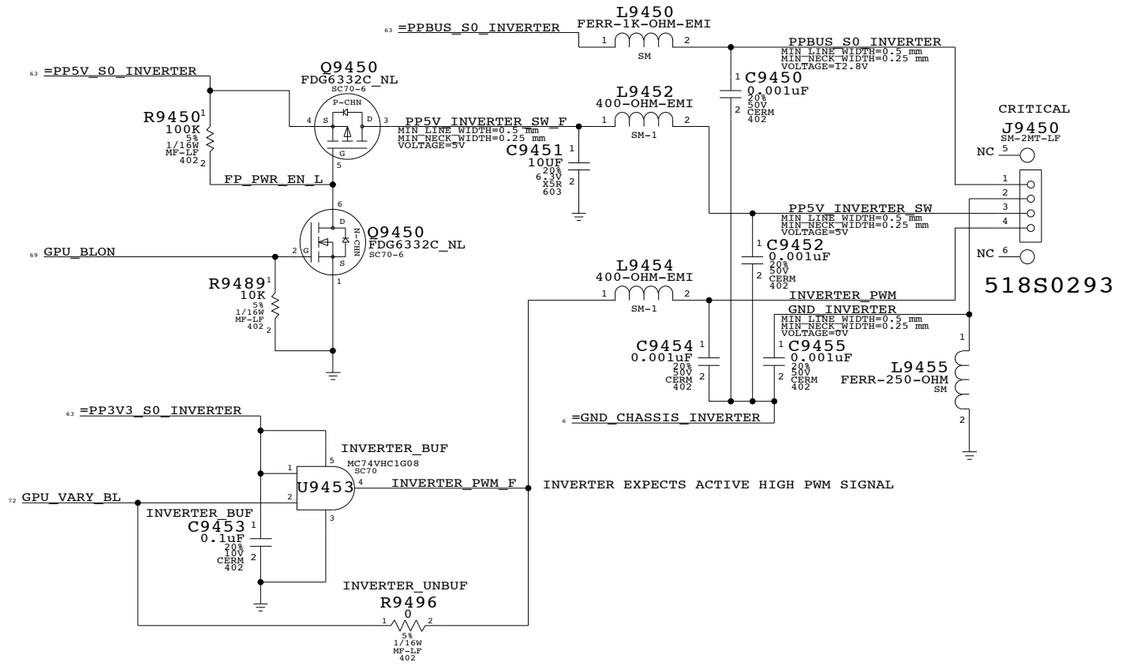
SCALE: NONE SHT 93 OF 104

LCD (LVDS) INTERFACE

ELECTRICAL_CONSTRAINT_SET	NET_TYPE SPACING	NET_TYPE PHYSICAL	
	VGA	VGA	GPU_R2
	VGA	VGA	GPU_G2
	VGA	VGA	GPU_B2
	LVDS	LVDS	LVDS_U_CLK_P
	LVDS	LVDS	LVDS_U_CLK_N
	LVDS	LVDS	LVDS_U_DATA_P<2..0>
	LVDS	LVDS	LVDS_U_DATA_N<2..0>
	LVDS	LVDS	LVDS_L_CLK_P
	LVDS	LVDS	LVDS_L_CLK_N
	LVDS	LVDS	LVDS_L_DATA_P<2..0>
	LVDS	LVDS	LVDS_L_DATA_N<2..0>
	TMDS	TMDS	TMDS_CLK_P
	TMDS	TMDS	TMDS_CLK_N
	TMDS	TMDS	TMDS_DATA_P<5..3>
	TMDS	TMDS	TMDS_DATA_N<5..3>
	TMDS	TMDS	TMDS_DATA_P<2..0>
	TMDS	TMDS	TMDS_DATA_N<2..0>



INVERTER INTERFACE



Internal Display Connectors

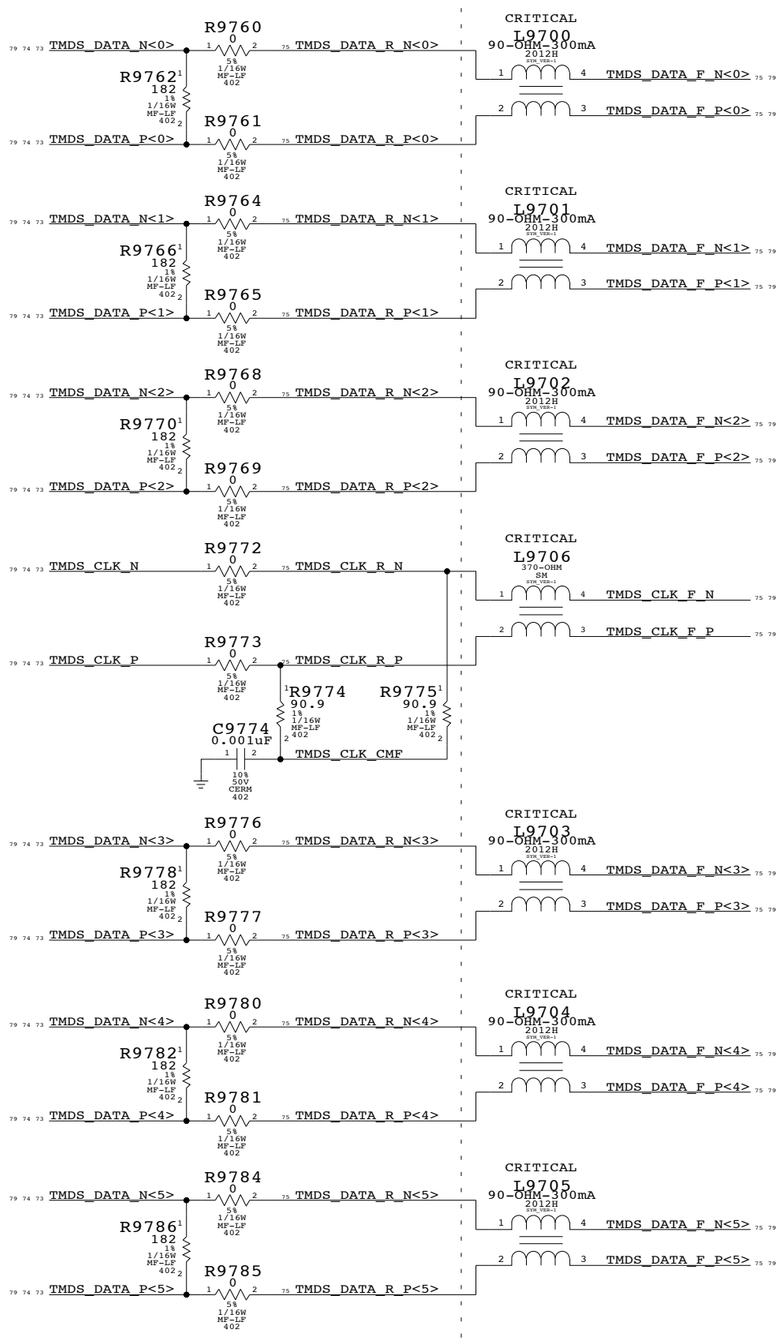
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

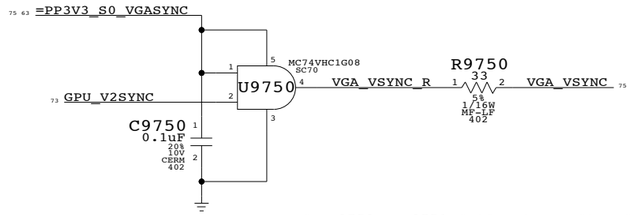
SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 94 OF 104	

TMDS Filtering

Place series R's and common-mode filtering close to GPU, common mode chokes near connector.



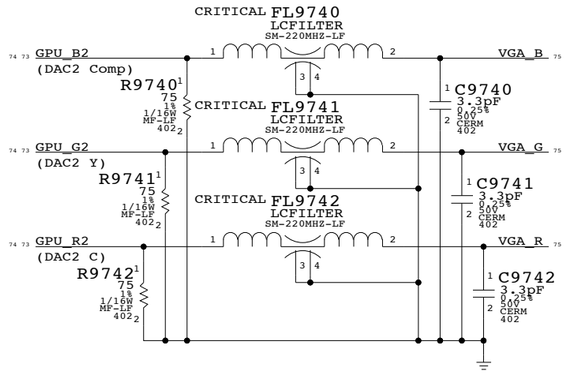
VGA SYNC BUFFERS



PLACE U9750 & U9751 CLOSE TO DVI CONNECTOR

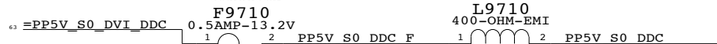
NET_TYPE		
ELECTRICAL_CONSTRAINT_SET	SPACING	PHYSICAL
	TMDS	TMDS_CLK_R_P
	TMDS	TMDS_CLK_R_N
	TMDS	TMDS_DATA_R_P<5..0>
	TMDS	TMDS_DATA_R_N<5..0>
	TMDSCONN	TMDSCONN TMDS_CLK_F_P
	TMDSCONN	TMDSCONN TMDS_CLK_F_N
	TMDSCONN	TMDSCONN TMDS_DATA_F_P<5..0>
	TMDSCONN	TMDSCONN TMDS_DATA_F_N<5..0>

ANALOG FILTERING
PLACE CLOSE TO CONNECTOR

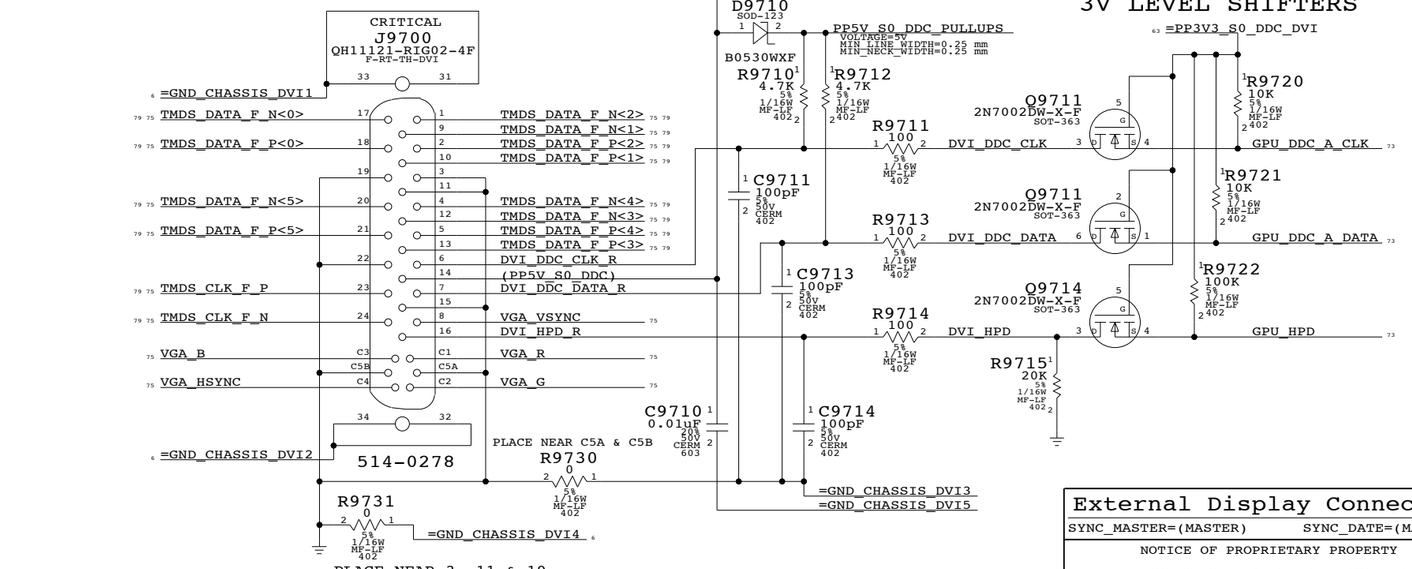


DVI INTERFACE

DVI DDC CURRENT LIMIT
(55mA requirement per DVI spec)



Isolation required for DVI power switch



3V LEVEL SHIFTERS

External Display Connector

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

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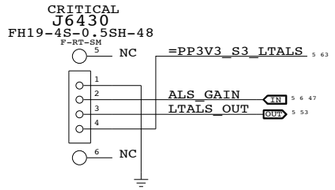
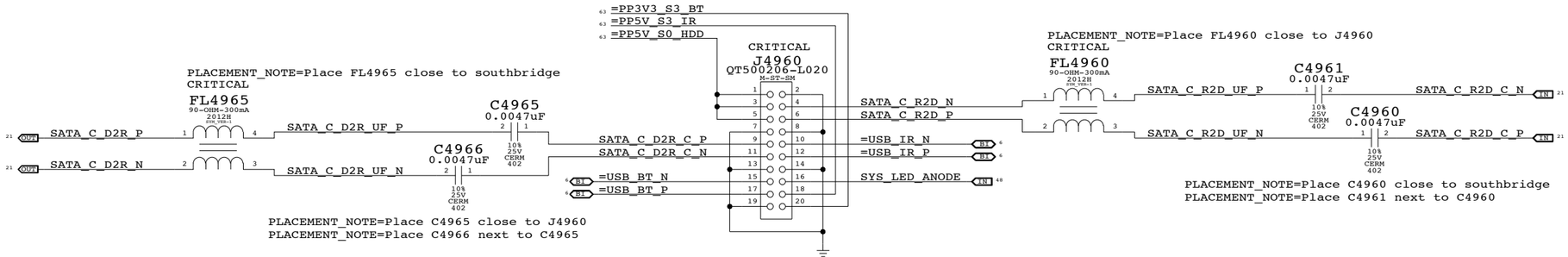
SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 97 OF 104	

Left ALS Connector



518S0395

Bluetooth (M13P) & SATA HDD Flex Connector



516S0412

NOTE: _UF_ nets cross DDR2 signals and pick up significant noise. Common-mode chokes are to remove this noise from SATA signals.

M1 Specific Connectors

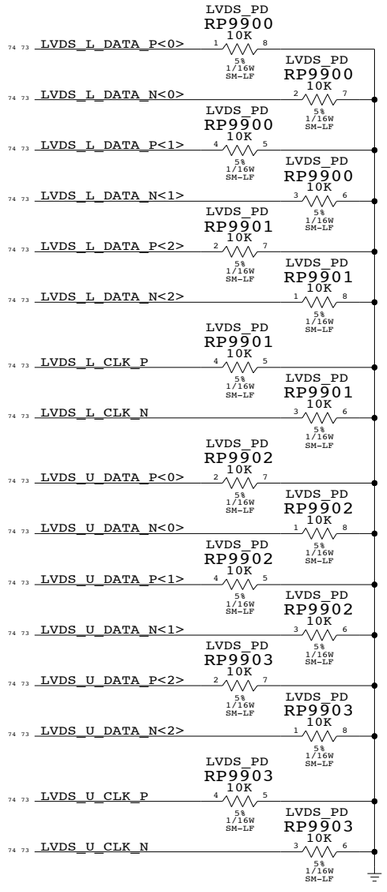
SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT 98 OF 104	

LVDS Interface Pull-downs

NOTE: These parts are to counter an invalid state caused by the M56 part. Bias voltage is present on LVDS interface pins even when they should be tri-stated to meet panel power sequence requirements. Resulting pump-up in LCD panel can cause startup and long-term reliability issues. Pull-down resistors reduce the pump-up in the panel, though some voltage will still be seen on LVDS signals when they should be 0V.



LVDS Interface Pull-downs

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE	SHT	OF
NONE	99	104

Date - Radar # - Description

DMS Release #03000 (RFA #394758)

2005/08/11 - 4214109 - Changed J4931 to proper 518S0342 part.
2005/08/12 - 4231030 - Changed pinout of J4960, added placement notes.

Changes from Proto Branch (DMS Release #04000):

2005/08/27 - 4230219 - Changed Y3301 to non-obsoleted part.
2005/08/27 - 4235208 - Changed value of R7707 to fix 2.5V S3 supply.
2005/08/27 - 4235213 - Changed R8305, R8310, R8315 to slow down FET RCs.
2005/08/27 - 4235401 - Moved a few pins at LIO BTB connector.
2005/08/27 - 4227325 - Removed S0 option for camera, now S3-only.
2005/08/27 - 4227369 - Removed SMC options for display/backlight, now GPU-only.
2005/08/27 - 4225433 - Changed PBUS voltage sense circuit.
2005/08/28 - 4217535 - Added Left ALS FFC connector.
2005/08/28 - 4232563 - Changed analog video from Y/C/Comp to G2/R2/B2.
2005/08/28 - 4235203 - Changed BOM settings to stuff R2251.
2005/08/28 - 4217524 - Added LEFT ALS connector (J6430).
2005/08/28 - 4217535 - OMITs and tables to change 4-pin WTB connector parts.
2005/08/28 - 4221973 - Added pull-up for SB GPIO22 (REQ4#).
2005/08/28 - 4225369 - Changed ISL6269 PVCC aliases, added RC for 3.3V S5.
2005/08/28 - 4225433 - Changed PBUS Voltage Sense circuit.
2005/08/28 - 4227322 - Changed FW323 PCI_VIOS pin from 3.3V S0 to 3.3V S3.
2005/08/28 - 4235179 - OMIT and table to change 8-pin DC-In connector to 6-pin.
2005/08/28 - 4235179 - Changed PBUS net names to merge PBUS A & PBUS B.
2005/08/28 - 4232715 - Added FireWire ISense resistor, changed INA193 to INA194.
2005/08/28 - 4235217 - Added RC on Q3820 gate to slow down ODD FET turn-on.
2005/08/28 - 4225369 - OMITs and tables for staged LeMenu BOM approach.
2005/08/28 - 4227323 - Repinned Top-Case Flex connector.

DMS Checkin #04001

2005/08/29 - 4235179 - Changed J8200 to proper 6-pin part.
2005/08/29 - 4232826 - Changed MEM_ODT* from RPAKs to discrete Rs.
2005/08/29 - 4217524 - Changed R6430 from 4.5K to 3.5K.
2005/08/29 - 4237119 - Changed LIO 5V S3 to 5V S5.
2005/08/29 - 4225369 - Changed 3.3V S5 sequence to follow 5V S5 PGOOD.
2005/08/29 - 4227336 - Changed Y5920 to 197S0169.
2005/08/29 - 4227309 - Resolved sync issues with M38 (SB page 21).
2005/08/29 - 4227310 - Resolved sync issues with M38 (SB page 22).
2005/08/29 - 4227312 - Resolved sync issues with M38 (SB page 23).
2005/08/29 - 4227322 - Sync page 44 with M42 to fix FW power net S-states.
2005/08/29 - 4227332 - Resolved sync issues with M38 (SMC page 58).
2005/08/29 - 4227335 - Changed U5900 to resolve ROHS issue.

DMS Checkin #04002

2005/08/30 - 4225433 - Fixed voltage divider values in PBUS VSense circuit.
2005/08/30 - 4217535 - Removed BOM tables and OMITs for new 4-pin WTB connector.
2005/08/31 - 4214109 - Reversed pinout of J4931 to match updated PCB footprint.
2005/08/31 - 4227328 - Added ESD protection diode on right USB port.
2005/08/31 - 4223808 - Various power supply R/C updates, plus some R/C adds.
2005/08/31 - 4227315 - Changed BSA bus pull-ups from 2K to 10K.
2005/08/31 - 4237025 - Added R8824 and R8827 for GPU memory configuration straps.

DMS Checkin #04003

2005/08/31 - 4240157 - Corrected pinout at SATA/BT conn (J4960) to match flex.
2005/08/31 - 4240150 - Swapped PCIE Mini Card R2D/D2R connections at J5500.
2005/08/31 - 4232563 - Corrected net properties on R2/G2/B2 nets.
2005/08/31 - 4227306 - Swapped primary & alt part numbers for CPU VCore caps.
2005/08/31 - 4240300 - Changed C6455 to a smaller part for cost & MCO.
2005/08/31 - 4240486 - Power line width & neck reductions at PCB request.
2005/08/31 - 4240257 - Swapped some top & bottom EMC connections at DVI connector.

DMS Checkin #04004

2005/08/31 - 4227328 - Changed EMI caps from 50V to 16V to fid in ESD protection.

DMS Checkin #04005

2005/09/02 - 4241087 - Fixed pinout of USB D+/D- at camera connector to match FHB.
2005/09/02 - 4243269 - Inverted GPU VCore control, adjusted supply R values.
2005/09/02 - 4244019 - Moved GPU-related power alias from PP3V3_S0 to PP3V3_S0_GPU.
2005/09/02 - 4240486 - Adjusted line/neck widths, changed J4931 to 518S0371.

DMS Checkin #04006

2005/09/03 - 4232534 - Fixed documentation of battery address on I2C page.
2005/09/03 - 4244484 - Changed P1V5S0_RUNSS circuit to work properly in G3Hot.
2005/09/03 - 4244539 - Added GPUVCORE_PGOOD to 1.2V, 1.8V, & 2.5V S0 sequence.
2005/09/03 - 4227315 - Changed SMBus pull-ups to 4.7K.
2005/09/03 - 4232534 - Added notes for power supplies and connectors.

DMS Checkin #04007

2005/09/06 - 4240486 - Removed NO_TEST property from GPU HSYNC and VSYNC.
2005/09/06 - 4246683 - Removed NO STUFF option from R8805 per ATI request.
2005/09/06 - 4232534 - Fixed label BOM tables to call out proper EEE #'s.

DMS Release #05000-07000 (Proto 2 releases)

2005/09/08 - 4247941 - Net property & name changes to support PCB/ICT requests.
2005/09/08 - 4248911 - Sync with M38 & M42.
2005/09/08 - 4214493 - Combined RTC coin cell diodes into dual-diode package.
2005/09/08 - 4229560 - First implementation of Physical Security Guidelines.
2005/09/16 - 4256660 - Updated FUNC_TEST property for merged PBUS.
2005/09/16 - 4229560 - Changed FW PCI REQ/GNT pair for Physical Security.
2005/09/19 - 4247941 - GND line/neck/voltage properties updated per PCB request.
2005/09/19 - 4235898 - Moved signal alias to improve schematic reuse.
2005/09/20 - 4214847 - Updated L1970 (old part no longer exists in library).
2005/09/21 - 4227306 - Changed CPU VCore caps to proper production part number.
2005/09/21 - 4234952 - Replaced FDG6324L parts with FDG6332C for cost & supply.
2005/09/26 - 4239505 - Updated J4200 (old part no longer exists in library).
2005/09/26 - 4274915 - Thermal sensor BOM updates from Proto 2 MLB branch.
2005/09/26 - 4274915 - U6301 part number updated to M1 development BootROM.

Date - Radar # - Description

DMS Checkin #07001

2005/09/28 - 4221965 - Added 2.2uF caps on SO-DIMM VREF pins.
2005/09/28 - 4278828 - Adjusted P5VS5_PGOOD R's, added cap on PM_RSMRST_L.
2005/09/29 - 4232826 - Swapped Vtt RPAK functions to free up unnecessary part.
2005/09/30 - 4261313 - Added placeholder connector for IR FFC connector.
2005/09/30 - 4282162 - Changed GPU BBN supply to MAX1673.
2005/09/30 - 4248911 - Sync with M38 & M42.
2005/09/30 - 4282349 - Added CRITICAL flags to parts identified in scrub.
2005/09/30 - 4274915 - C1001 stuffing change from Proto 2 MLB branch.

DMS Checkin #07002

2005/10/04 - 4256409 - Changed fan CTL series R's to 2N7002 level-shifter.
2005/10/04 - 4261313 - Deleted placeholder connector, grew HDD connector for IR.
2005/10/04 - 4281394 - BOM option change to stuff right USB ESD protection part.
2005/10/06 - 4227330 - Added ESD protection on top-case USB port.
2005/10/07 - 4286888 - BOM restructuring per EVT build plan.
2005/10/07 - 4292633 - Changed IMVP6 10K NTC from 10% to 5% part.
2005/10/07 - 4248911 - Sync with M38 & M42.

DMS Checkin #07003

2005/10/08 - 4214493 - Simplified FireWire port power circuit for BOM consolidation.
2005/10/08 - 4293072 - Various BOM / connection changes at IMVP6 (CPU VCore).
2005/10/08 - 4286729 - Changed value of TPM Xtal caps.
2005/10/08 - 4290735 - Swapped trackpad & PCIe Mini Card USB connections.
2005/10/09 - 4235898 - Part moves & refdes changes to support sync with M9.
2005/10/09 - 4214494 - Changed GPU VCore supply enable to use 1.2V/2.5V S3 PGOODs.
2005/10/09 - 4272237 - Changed 2.5V S0 FET RC to 100K to slow down turn-on.

DMS Checkin #07004

2005/10/10 - 4232826 - Swapped Vtt RPAK functions to optimize layout.
2005/10/10 - 4247941 - Net property updates found via back-annotation.

DMS Checkin #07005

2005/10/10 - 4229560 - Removed Physical Security circuitry.
2005/10/10 - 4214493 - Cost reductions to GPU power supply circuitry.
2005/10/10 - 4214847 - Changed 0-ohm resistor to solder jumper.
2005/10/10 - 4248911 - Sync with M38 & M42.
2005/10/10 - 4295280 - Changed sleep LED connection per new SMC ERS.

DMS Checkin #07006

2005/10/11 - 4261313 - Updated SATA connector pinout to match latest flex.
2005/10/11 - 4227308 - Deleted unnecessary MCH TVDAC filtering.
2005/10/11 - 4229560 - Changed SB GNT3#/GNT4# back to test points.
2005/10/12 - 4248911 - Sync with M38 & M42.
2005/10/12 - 4298899 - Changed stuffing option to disable PLT_RST gating.
2005/10/12 - 4297684 - Split FW323 VSSA from VSS to reduce noise.
2005/10/12 - 4223808 - Power supply changes per vendor feedback.
2005/10/12 - 4227320 - Updated SB pin name for GPIO 5 (ODD_PWR_EN_L).
2005/10/12 - 4244539 - Retasked FET to control 3.3V S0 FET from GPU VCore PGOOD.
2005/10/12 - 4247941 - Added properties to resolve a PCB constraint issue.
2005/10/12 - 4214493 - Consolidated 0.22uF caps in design.
2005/10/12 - 4298905 - Changed ethernet VMAIN_AVLBL connection.
2005/10/12 - 4298943 - Replaced last remaining non-RoHS compliant connector.
2005/10/12 - 4214494 - Implemented circuit to power down ethernet in S3 on battery.

DMS Checkin #07007

2005/10/13 - 4247941 - Swapped pins at trackpad ESD protection diode.

DMS Checkin #07008

2005/10/13 - 4247941 - Unswapped pins at trackpad ESD protection diode.

DMS Checkin #07009

2005/10/13 - 4247941 - Removed NO_TEST properties from CPU FSB strobe signals.
2005/10/13 - 4247941 - Spacing/Physical rule updates to match latest board database.
2005/10/14 - 4247941 - Restored NO_TEST properties, added EXPOSED_VIA properties.
2005/10/17 - 4292633 - Changed remaining 10K NTCs to new 5% part.
2005/10/17 - 4304248 - Updated GPU VCore / BBP voltages for B13/B24 support.

DMS Release #08000-11000 (EVT releases)

2005/10/20 - 4310267 - Synced 4 pages from mlb_evt branch back to trunk.
2005/10/21 - 4310267 - Synced 3 pages from mlb_evt branch back to trunk.
2005/10/21 - 4235898 - Synced 2 pages from m9/mlb.
2005/10/26 - 4310267 - Synced 4 pages from mlb_evt branch back to trunk.
2005/11/03 - 4310267 - Synced 6 pages from mlb_evt branch back to trunk.
2005/11/15 - 4310267 - Synced 5 pages from mlb_evt branch back to trunk.
2005/11/15 - 4298899 - Removed unused platform reset gate.
2005/11/15 - 4322537 - Updated thru-hole SO-DIMM connector part number.
2005/11/16 - 4345498 - Updated Ethernet & FireWire crystal part numbers.
2005/11/16 - 4235898 - Aliased connection to ALS_GAIN to support M9 request.
2005/11/16 - 4235898 - Changed Yukon power rail neck widths per M9 request.
2005/11/16 - 4227333 - Updated SMC net names per ERS v1.2.1.
2005/11/16 - 4345921 - FUNC_TEST updates per test team request.
2005/11/16 - 4346006 - Updated J5500 pinout to match updated LIO board pinout.
2005/11/16 - 4343202 - Changed USB overcurrent switch to TPS2051B, added OC* RC.
2005/11/16 - 4346184 - Inserted common-mode chokes on SATA R2D/D2R pairs.

DMS Checkin #11001

2005/11/16 - 4235898 - Sync with M38 & M42.
(11.1.0) 2005/11/16 - 4298899 - Fixed ethernet reset net name on page 26.
(11.2.0) 2005/11/16 - 4227333 - Fixed single-pin nets caused by SMC net name updates.
2005/11/18 - 4235898 - Changed R4210 package size per M9 request.
(11.3.0) 2005/11/18 - 4235898 - Changed C9710 GND connection per M9 request.
2005/11/19 - 4346184 - Fixed location of SATA R2D common-mode choke.
2005/11/19 - 4347717 - Changed SMS self-test pull-up to pull-down.
2005/11/19 - 4350840 - Simplified TMDS filtering to allow movement of filter.
2005/11/19 - 4229560 - Changed FW chip back to REQ/GNT3.
2005/11/19 - 4350849 - Added option to connect SB_GPIO30 to ENET_LOM_DIS_L.
2005/11/19 - 4340256 - Changed topcase flex trackpad power from 3.3V to 5V.
(11.4.0) 2005/11/19 - 4292165 - Refreshed schematic symbol for U3750 (library update).

Date - Radar # - Description

DMS Checkin #11002

2005/11/21 - 4351196 - Added 1K pull-down on IDE_RESET_L.
2005/11/21 - 4343202 - Changed RC value and net name for USB OC.
2005/11/22 - 4350840 - Swapped TMDS termination components for placement.
2005/11/22 - 4352020 - Changed 2.5V S3 supply inductor & compensation values.
2005/11/28 - 4347845 - Added pull-down resistors on LVDS interface.
2005/11/30 - 4227340 - Removed CPU VCore current sense input RC.
2005/11/30 - 4331670 - Added CRITICAL flags to some more parts.
2005/11/30 - 4343864 - Added EMI/ESD parts at camera connector.
2005/11/30 - 4351181 - Changed ITP connector BOM option.
2005/11/30 - 4351196 - Changed IDE_RESET_L pull-down from 1K to 15K.
2005/11/30 - 4358831 - Added pull-downs on two SB-to-SMC signals.
2005/12/01 - 4362404 - Changed TMDS diff term from 100-ohm to 180-ohm.
2005/12/01 - 4352020 - Changed 2.5V supply inductor to RoHS-compliant part.
2005/12/01 - 4227340 - Changed supply for 1.8V S3 current sense amp.
2005/12/01 - 4362566 - Restructured BOM for thick/thin PCB versions.
2005/12/01 - 4347845 - RPAK pinswaps to LVDS pull-downs for PCB layout.

DMS Checkin #11003

2005/12/02 - 4256256 - Added BOMOPTION to R8801 to allow per-project control.
2005/12/02 - 4363848 - Removed M56 GPU die rev B13 support from BOM.
2005/12/02 - 4363870 - Removed M1a support from BOM.
2005/12/02 - 4217524 - Updated part number for J6430.

DMS Release #12000

12

SYNC_MASTER=N/A SYNC_DATE=N/A

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12

SCALE: NONE SHT 100 OF 104

ELECTRICAL_CONSTRAINT_SET	NET_TYPE PHYSICAL	NET_TYPE SPACING		
	FSB_55S	FSB_COMMON	FSB_ADS_L	5 7 12
	FSB_55S	FSB_COMMON	FSB_BNR_L	5 7 12
	FSB_55S	FSB_COMMON	FSB_BPRI_L	7 12
	FSB_55S	FSB_COMMON	FSB_BREQ0_L	5 7 12
	FSB_55S	FSB_COMMON	FSB_DBSY_L	5 7 12
	FSB_55S	FSB_COMMON	FSB_DEFER_L	7 12
	FSB_55S	FSB_COMMON	FSB_DPWR_L	7 12
	FSB_55S	FSB_COMMON	FSB_DRDY_L	5 7 12
	FSB_55S	FSB_COMMON	FSB_HIT_L	5 7 12
	FSB_55S	FSB_COMMON	FSB_HITM_L	5 7 12
	FSB_55S	FSB_COMMON	FSB_LOCK_L	5 7 12
	FSB_55S	FSB_COMMON	FSB_RS_L<2..0>	7 12
	FSB_55S	FSB_COMMON	FSB_TRDY_L	7 12
	FSB_55S	FSB_COMMON	FSB_CPURST_L	7 11 12
	FSB_55S	FSB_DATA	FSB_D_L<63..0>	5 7 12
	FSB_55S	FSB_DATA	FSB_DINV_L<3..0>	5 7 12
	FSB_55S	FSB_DSTB	FSB_DSTBP_L<3..0>	5 7 12
	FSB_55S	FSB_DSTB	FSB_DSTBN_L<3..0>	5 7 12
	FSB_55S	FSB_ADDR	FSB_A_L<31..3>	5 7 12
	FSB_55S	FSB_ADDR	FSB_REQ_L<4..0>	5 7 12
	FSB_55S	FSB_ADSTB	FSB_ADSTB_L<3..0>	5 7 12
	CPU_55S		FSB_IERR_L	7
	CPU_55S		FSB_FERR_L	
	CPU_55S		CPU_PWRGD	7 21
	CPU_55S		CPU_INTR	7 21
	CPU_55S		CPU_NMI	7 21
	CPU_55S		CPU_A20M_L	7 21
	CPU_55S		CPU_DPSLP_L	7 21
	CPU_55S		CPU_IGNNE_L	7 21
	CPU_55S		CPU_INIT_L	7 21
	CPU_55S		CPU_SMI_L	7 21
	CPU_55S		CPU_STPCLK_L	7 21
	CPU_55S	CPU_2TO1	CPU_THERMTRIP_L	
	CPU_55S	CPU_2TO1	PM_DPRSLPVR	14 23 57
	CPU_55S	CPU_2TO1	IMVP_DPRSLPVR	57
	CPU_55S	CPU_GTLREF	CPU_GTLREF	7
	CPU_55S	CPU_COMP	CPU_COMP<3>	7
	CPU_27P4S	CPU_COMP	CPU_COMP<2>	7
	CPU_55S	CPU_COMP	CPU_COMP<1>	7
	CPU_27P4S	CPU_COMP	CPU_COMP<0>	7
	CPU_55S	CPU_ITP	XDP_BPM_L<5..0>	7 11
	CLK_FSB_100D	CPU_ITP	CPU_XDP_CLK_P	11 34
	CLK_FSB_100D	CPU_ITP	CPU_XDP_CLK_N	11 34
	CPU_55S	CPU_ITP	ITPRESET_L	11
	CPU_55S	CPU_2TO1	CPU_VID<6..0>	8 9 79
	CPU_55S	CPU_2TO1	CPU_VID<6..0>	8 9 79
THERM	CPU_27P4S	CPU_VCCSENSE	CPU_VCCSENSE_P	8 57
THERM	CPU_27P4S	CPU_VCCSENSE	CPU_VCCSENSE_N	8 57
	CPU_27P4S	CPU_VCCSENSE	IMVP6_VSEN_P	57
	CPU_27P4S	CPU_VCCSENSE	IMVP6_VSEN_N	57

MEM_CLK	MEM_70D
MEM_CTRL	MEM_45S
MEM_CMD	MEM_55S
MEM_DATA	MEM_55S
MEM_DQS	MEM_85D
FB_CLK	FB_75D
FB_ADCTRL	FB_35S_TO_55S
FB_ADCTRL	FB_55S
FB_DATA	FB_40S
LVDS	LVDS_100D
TMDS	TMDS_100D
VGA	VGA_75S
PCIE	PCIE_100D
DMI	DMI_100D
SATA	SATA_100D
IDE	IDE_55S
USB2	USB2_90D
ENET	ENET_100D
FW	FW_110D
SMB	SMB_55S
SPI	SPI_55S
CLK_FSB	CLK_FSB_100D
CLK_PCIE	CLK_PCIE_100D
CLK_MED	CLK_MED_55S
CLK_SLOW	CLK_SLOW_55S

AUDIO_55S	AUDIO	SB_ACZ_BITCLK	21
AUDIO_55S	AUDIO	ACZ_BITCLK	5 21 45
AUDIO_55S	AUDIO	SB_ACZ_SYNC	21
AUDIO_55S	AUDIO	ACZ_SYNC	5 21 45
AUDIO_55S	AUDIO	SB_ACZ_RST_L	21
AUDIO_55S	AUDIO	ACZ_RST_L	5 21 45
AUDIO_55S	AUDIO	ACZ_SDATAIN<0>	5 21 45
AUDIO_55S	AUDIO	SB_ACZ_SDATAOUT	21
AUDIO_55S	AUDIO	ACZ_SDATAOUT	5 21 45

	TMDS	TMDS	TMDS_CLK_P	73 74 75
	TMDS	TMDS	TMDS_CLK_N	73 74 75
	TMDS	TMDS	TMDS_DATA_P<5..3>	73 74 75
	TMDS	TMDS	TMDS_DATA_N<5..3>	73 74 75
D0	TMDS	TMDS	TMDS_DATA_P<2..0>	73 74 75
D1	TMDS	TMDS	TMDS_DATA_N<2..0>	73 74 75
	TMDSCONN	TMDSCONN	TMDS_CLK_F_P	75
	TMDSCONN	TMDSCONN	TMDS_CLK_F_N	75
	TMDSCONN	TMDSCONN	TMDS_DATA_F_P<5..3>	75
	TMDSCONN	TMDSCONN	TMDS_DATA_F_N<5..3>	75
D2	TMDSCONN	TMDSCONN	TMDS_DATA_F_P<2..0>	75
D3	TMDSCONN	TMDSCONN	TMDS_DATA_F_N<2..0>	75

M1 Net Properties

SYNC_MASTER=(MASTER) SYNC_DATE=(MASTER)

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6941	12
SCALE: NONE	SHT: 104 OF 104	