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

REV	ZONE	ECN	DESCRIPTION OF CHANGE	CK APPD	ENG APPD
G		494020	PRODUCTION RELEASED		
				DATE	DATE
				03/21/07	?

# 051-7173 MLB , M42C

3/21/2007 POST RAMP

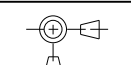
Page	(.csa)	Contents	DRI	Sync	Date
1	1	Table of Contents	RX	N/A	N/A
2	2	SYSTEM BLOCK DIAGRAM	RX	MASTER	5/23/05
3	3	Power Block Diagram	MK	POWER	06/30/2005
4	4	CONFIGURATION OPTIONS	RX	SMC	07/18/2005
5	5	FUNC TEST 1 OF 2	RX	TP	07/25/2005
6	6	SIGNAL ALIAS /RESET	RX	ENET	08/19/2005
7	7	CPU 1 OF 2-FSB	RX	MASTER	05/03/2005
8	8	CPU 2 OF 2-PWR/GND	MK	MASTER	05/03/2005
9	9	CPU DECAPS & VID<>	MK	SMC	08/19/2005
10	10	CPU MISC1-TEMP SENSOR	ES	ENET	08/19/2005
11	11	CPU ITP700FLEX DEBUG	RX	MASTER	5/23/05
12	12	NB CPU Interface	MK	NB	07/25/2005
13	13	NB PEG / Video Interfaces	DK	NB	07/25/2005
14	14	NB Misc Interfaces	RX	NB	08/15/2005
15	15	NB DDR2 Interfaces	LT	NB	07/25/2005
16	16	NB Power 1	DK	NB	07/25/2005
17	17	NB Power 2	DK	NB	07/25/2005
18	18	NB Grounds	DK	NB	07/25/2005
19	19	NB (GM) Decoupling	DK	NB	06/22/2005
20	20	NB Config Straps	DK	NB	06/28/2005
21	21		RX	SB	08/05/2005
22	22		RX	ENET	11/16/2005
23	23		RX	ENET	11/28/2005
24	24		RX	SB	08/05/2005
25	25		RX	SB	06/28/2005
26	26	SB Misc	RX	NB	07/26/2005
27	27	M42 SMBUS CONNECTIONS	ES	ENET	08/30/2005
28	28	DDR2 SO-DIMM Connector A	LT	MEMORY	06/20/2005
29	29	DDR2 SO-DIMM Connector B	LT	MEMORY	06/20/2005
30	30	Memory Active Termination	LT	MEMORY	06/20/2005
31	31	Memory Vtt Supply	LT	(MASTER)	(MASTER)
32	32	CLOCKS	DK	CLOCK	06/03/2005
33	33	CLOCK TERMINATION	DK	CLOCK	06/06/2005
34	34	PATA CONNECTOR	ES	ENET	11/01/2005
35	35	SATA CONNECTOR	ES	ENET	11/14/2005
36	36	ETHERNET CONTROLLER	ES	ENET	12/06/2005
37	37	ETHERNET CONNECTOR	ES	ENET	11/14/2005
38	38	FIREWIRE CONTROLLER	ES	ENET	08/30/2005
39	39	FIREWIRE PORT	ES	ENET	11/16/2005
40	40	CONNECTOR MISC	ES	ENET	11/16/2005
41	41	IR CONTROLLER	ES	ENET	11/09/2005
42	42		ES	ENET	11/01/2005
43	43		ES	ENET	08/19/2005
44	44	BLUETOOTH INTERFACE	MK	ENET	08/29/2005
45	45	SMC	MK	SMC	08/18/2005
46	46	SMC SUPPORT	LD	SMC	08/23/2005
47	47	LPC+ Debug Connector	MK	NB	06/30/2005
48	48	CPU Current & Voltage Sense	ES	ENET	08/30/2005

Page	(.csa)	Contents	DRI	Sync	Date
49	49	TEMPERATURE SENSE	RX	ENET	11/09/2005
50	50	SPI BOOTROM	ES	MASTER	5/23/05
51	51	Fan	MK	ENET	11/10/2005
52	52	SMS	RX	SMC	08/23/2005
53	53	TPM	DK	SMC	07/18/2005
54	54	AUDIO: CODEC	DK	M42AUDIO	08/05/2006
55	55	AUDIO: SPEAKER AMP	DK	M42AUDIO	08/05/2006
56	56	AUDIO: JACK	DK	M42AUDIO	08/05/2006
57	57	AUDIO: JACK TRANSLATORS	MK	M42AUDIO	08/05/2006
58	58	IMVP6 CPU VCore Regulator	MK	POWER	07/13/2005
59	59	5V / 3.3V Power Supply	MK	POWER	07/13/2005
60	60	2.5V/1.2V Regulator	MK	ENET	12/06/2005
61	61	1.8V Supply	MK	POWER	07/13/2005
62	62	1.5V / 1.05V Power Supply	MK	POWER	07/13/2005
63	63	S3/S0 FETS, G3H SUPPLY	MK	ENET	08/30/2005
64	64	Power Conn / Alias	MK	ENET	11/16/2005
65	65	DC-In & Battery Connectors	MK	POWER	07/13/2005
66	66	PBUS Supply/Battery Charger	ES	SMC	08/19/2005
67	67	INVERTER, LVDS, TMDS	DK	GRAPHIC	06/06/2005
68	68	EXTERNAL TMDS	DK	GRAPHIC	06/06/2005
69	69	MINI-DVI CONNECTOR		EUGENE	05/21/05
70	70	Cross Reference Page			
71	71	Cross Reference Page			
72	72	Cross Reference Page			
73	73	Cross Reference Page			
74	74	Cross Reference Page			
75	75	Cross Reference Page			
76	76	Cross Reference Page			
77	77	Cross Reference Page			
78	78	Cross Reference Page			

EE DRIS:  
 RX-RAYMOND XU  
 DK-DINESH KUMAR  
 RC-RAY CHANG  
 MK-MARC KLINGELHOFER  
 LT-LAWRENCE TAN  
 ES-ERIC SMITH  
 LD-LINDA DUNN

Schematic / PCB #'s

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
051-7173	1	SCHEM, MACBOOK, MLB	SCH	
820-1889	1	PCBF, MACBOOK, MLB	PCB	

DIMENSIONS ARE IN MILLIMETERS		METRIC		Apple Computer Inc.	
XX :	_____	DRAPTER	DESIGN CK	NOTICE OF PROPRIETARY PROPERTY THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE COMPUTER, INC. THE POSSESSOR AGREES TO THE FOLLOWING: I TO MAINTAIN THE DOCUMENT IN CONFIDENCE II NOT TO REPRODUCE OR COPY IT III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART	
X.XX :	_____	ENG APPD	MFG APPD		
X.XXX :	_____	QA APPD	DESIGNER		
ANGLES :	_____	RELEASE	SCALE		
DO NOT SCALE DRAWING		NONE		TITLE	
 THIRD ANGLE PROJECTION		MATERIAL/FINISH NOTED AS APPLICABLE		DRAWING NUMBER	
		SIZE D		051-7173	
				REV. G	
				SHT 1 OF 108	

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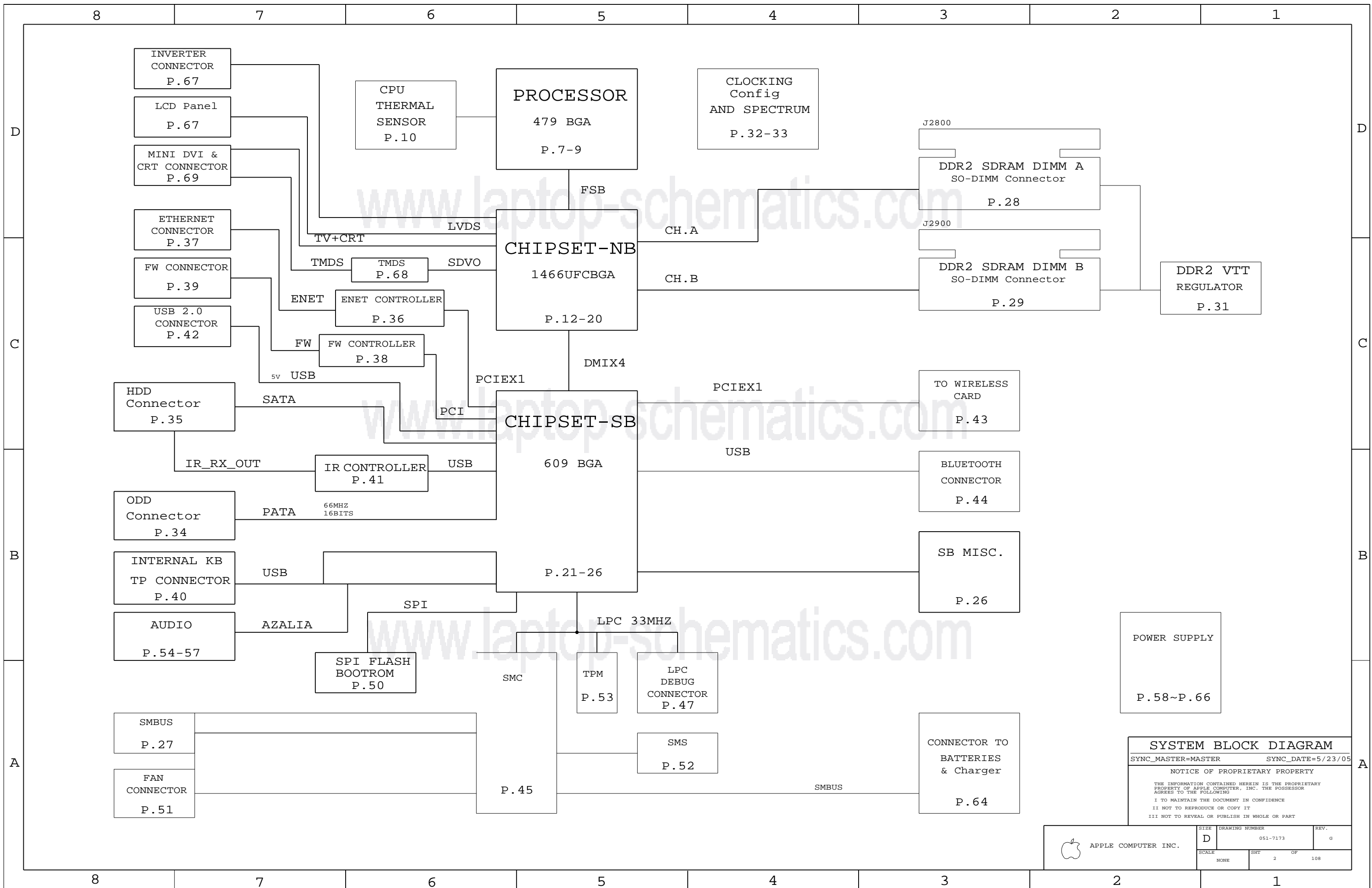
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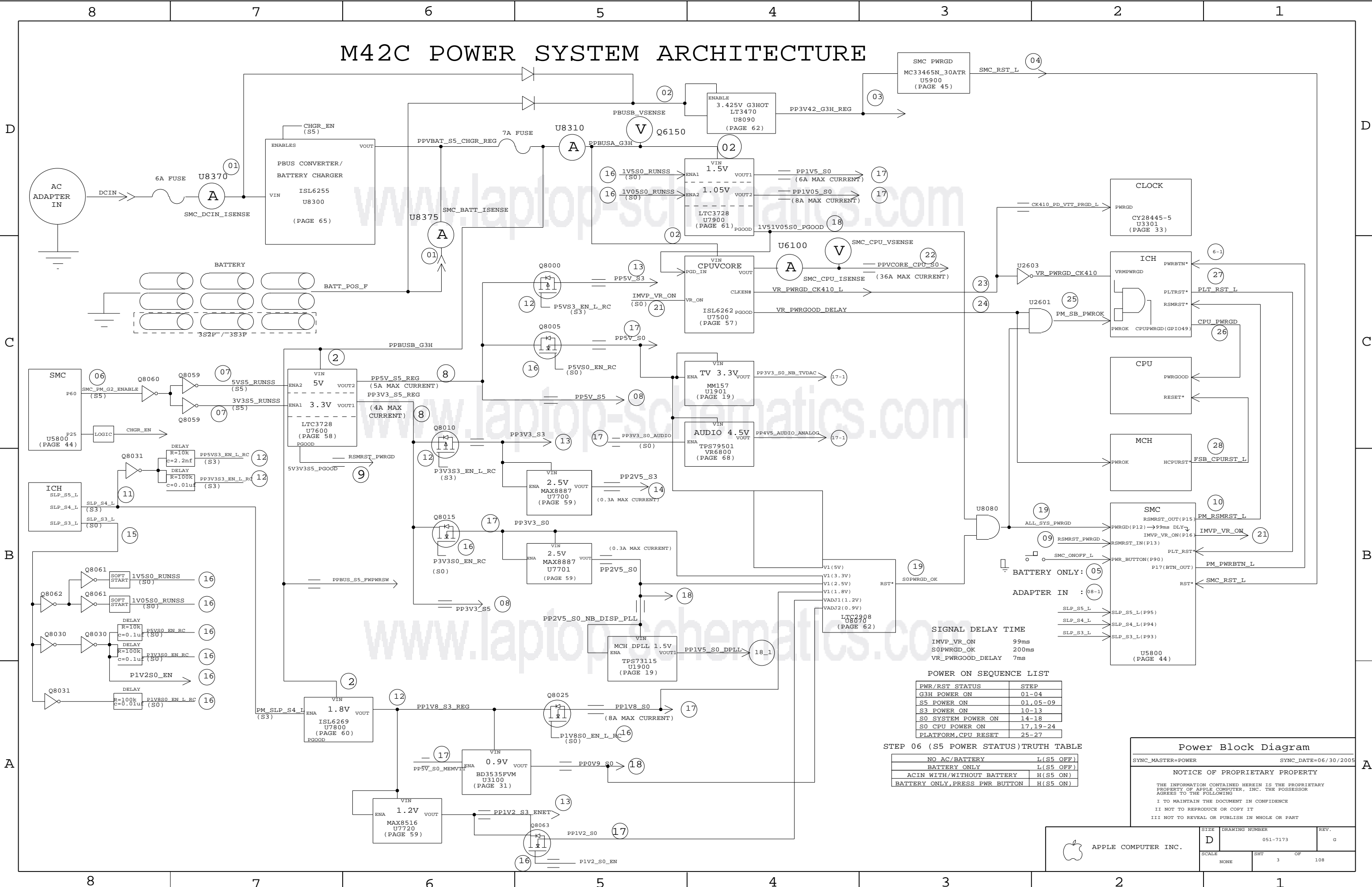


**SYSTEM BLOCK DIAGRAM**  
 SYNC\_MASTER=MASTER SYNC\_DATE=5/23/05

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	2	108	

# M42C POWER SYSTEM ARCHITECTURE



**SIGNAL DELAY TIME**

IMVP_VR_ON	99ms
SOPWRGD_OK	200ms
VR_PWRGOOD_DELAY	7ms

**POWER ON SEQUENCE LIST**

PWR/RST STATUS	STEP
G3H POWER ON	01-04
S5 POWER ON	01,05-09
S3 POWER ON	10-13
S0 SYSTEM POWER ON	14-18
S0 CPU POWER ON	17,19-24
PLATFORM,CPU RESET	25-27

**STEP 06 (S5 POWER STATUS) TRUTH TABLE**

NO AC/BATTERY	L(S5 OFF)
BATTERY ONLY	L(S5 OFF)
ACIN WITH/WITHOUT BATTERY	H(S5 ON)
BATTERY ONLY,PRESS PWR BUTTON	H(S5 ON)

**Power Block Diagram**

SYNC\_MASTER=POWER SYNC\_DATE=06/30/2005

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SIZE	D	DRAWING NUMBER	051-7173	REV.	G
SCALE	NONE	SHT	3	OF	108

# BOARD STACK-UP AND CONSTRUCTION

Top	SIGNAL
2	GROUND
3	SIGNAL(High Speed)
4	SIGNAL(High Speed)
5	GROUND
6	POWER
7	POWER
8	GROUND
9	SIGNAL(High Speed)
10	SIGNAL(High Speed)
11	GROUND
BOTTOM	SIGNAL

LAYER	THICKNESS (MM)	TRACE WIDTH (MM)
CONFORMAL_COAT		
L1	SIGNAL(TOP)	0.047
L1-L2		0.07
L2	GROUND	0.014
L2-L3		0.076
L3	SIGNAL	0.014
L3-L4		0.156
L4	SIGNAL	0.014
L4-L5		0.076
L5	GND	0.014
L5-L6		0.07
L6	POWER	0.031
L6-L7		0.076
L7	POWER	0.031
L7-L8		0.07
L8	GROUND	0.014
L8-L9		0.076
L9	SIGNAL	0.014
L9-L10		0.156
L10	SIGNAL	0.014
L10-L11		0.076
L11	GROUND	0.014
L11-L12		0.07
L12	SIGNAL(BOTTOM)	0.047
CONFORMAL_COAT		
<b>TOTAL</b>	<b>1.276</b>	<b>---</b>

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
337S3450	1	IC, MEMOM, CPU L2 DC 1.80GHZ, 479 PGA	U0700	GOOD
337S3389	1	IC, MEMOM, CPU R2 DC 2.0GHZ, 479 PGA	U0700	BETTER
337S3389	1	IC, MEMOM, CPU R2 DC 2.0GHZ, 479 PGA	U0700	BEST

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
338S0268	1	IC, FW32306, 1394A LINK, BGA, 129P	U4400	LEMENU
338S0270	1	IC, 8888053, GIGABIT ESET XCVR, 64P QFN, NO	U4101	LEMENU
359S0109	1	IC, S1G81P436, CLOCK GEN, 68PIN QFN	U3301	LEMENU

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
341S2104	1	IC, 16MBIT 8-PIN SPI SERIAL FLASH, 80P8S	U6301	M42A_PGM
341S1797	1	IC, EEPROM, SERIAL IC, 8KBIT, 808	U4102	M42A_PGM
341S1946	1	IC, BMC, 176P BGA, H58/2116	U5800	M42A_PGM
341S1890	1	IC, PSOC-W/USB, 56P, MLP, CY8C24794	U5100	M42A_PGM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
826-4393	1	LBL, P/N LABEL, PCB, 28MMX6MM	EEE:WES	CRITICAL	GOOD-ST
826-4393	1	LBL, P/N LABEL, PCB, 28MMX6MM	EEE:WET	CRITICAL	BETTER-ST
826-4393	1	LBL, P/N LABEL, PCB, 28MMX6MM	EEE:WEW	CRITICAL	BEST-KIONIX
826-4393	1	LBL, P/N LABEL, PCB, 28MMX6MM	EEE:WEV	CRITICAL	GOOD-KIONIX
826-4393	1	LBL, P/N LABEL, PCB, 28MMX6MM	EEE:W6V	CRITICAL	BETTER-KIONIX
826-4393	1	LBL, P/N LABEL, PCB, 28MMX6MM	EEE:WEU	CRITICAL	BEST-ST


## CONFIGURATION OPTIONS

SYNC\_MASTER=SMC SYNC\_DATE=07/18/2005

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	D	051-7173	G
SCALE	SHT	OF	
NONE	4	108	

# Functional Test Points

## Power Supply NO\_TESTS

NO_TEST		
1E23	IMVP6 RBIAS	58
1E24	IMVP6 COMP	58
1E25	5VS5_RUNSS	59 63
1E26	1V5S0_RUNSS	52 63
1E27	1V8S3_COMP	61
1E28	1V8S3_FSET	61
1E29	TRUE 3V3S5_COMP	
1E30	TRUE 3V3S5_FSET	
1E31	TRUE 1V05S0_COMP	
1E32	TRUE 1V05S0_FSET	
1E33	TRUE P3V42G3H_FB	63

## CLOCK NO\_TESTS

NO_TEST		
1E34	TRUE CK410_CPU0_N	32 33
1E35	TRUE CK410_CPU0_P	32 33
1E36	TRUE CK410_CPU1_N	32 33
1E37	TRUE CK410_CPU1_P	32 33
1E38	TRUE CK410_CPU2_ITP_SRC10_N	32 33
1E39	TRUE CK410_CPU2_ITP_SRC10_P	32 33
1E40	TRUE CK410_DOT96_27M_N	32 33
1E41	TRUE CK410_DOT96_27M_P	32 33
1E42	TRUE CK410_LVDS_N	32 33
1E43	TRUE CK410_LVDS_P	32 33
1E44	TRUE CK410_PCI4_CLK_SPN	
1E45	TRUE CK410_PCF1_CLK	32 33
1E46	TRUE CK410_SRC1_N_SPN	6
1E47	TRUE CK410_SRC1_P_SPN	6
1E48	TRUE CK410_SRC2_N	32 33
1E49	TRUE CK410_SRC2_P	32 33
1E50	TRUE CK410_SRC3_N_SPN	6
1E51	TRUE CK410_SRC3_P_SPN	6
1E52	TRUE CK410_SRC4_N	32 33
1E53	TRUE CK410_SRC4_P	32 33
1E54	TRUE CK410_SRC5_N	32 33
1E55	TRUE CK410_SRC5_P	32 33
1E56	TRUE CK410_SRC6_N	32 33
1E57	TRUE CK410_SRC6_P	32 33
1E58	TRUE CK410_SRC7_N_SPN	6
1E59	TRUE CK410_SRC7_P_SPN	6
1E60	TRUE CK410_SRC8_N	32 33
1E61	TRUE CK410_SRC8_P	32 33
1E62	TRUE CK410_SRC_CLKREQ01_L_SPN	6
1E63	TRUE CK410_SRC_CLKREQ03_L_SPN	6
1E64	TRUE CK410_SRC_CLKREQ08_L	32 33

## FIREWARE NO\_TESTS

NO_TEST		
1E65	TRUE FW_B_TPA_N_SPN	6
1E66	TRUE FW_B_TPA_P_SPN	6
1E67	TRUE FW_B_TPBIAS_SPN	6
1E68	TRUE FW_B_TPB_N_SPN	6
1E69	TRUE FW_B_TPB_P_SPN	6
1E70	TRUE FW_C_TPA_N_SPN	6
1E71	TRUE FW_C_TPA_P_SPN	6
1E72	TRUE FW_C_TPBIAS_SPN	6
1E73	TRUE FW_C_TPB_N_SPN	6
1E74	TRUE FW_C_TPB_P_SPN	6

## LVDS NO\_TESTS

NO_TEST		
1E75	TRUE LVDS_B_CLK_N_SPN	6
1E76	TRUE LVDS_B_CLK_P_SPN	6
1E77	TRUE LVDS_B_DATA_N0_SPN	6
1E78	TRUE LVDS_B_DATA_N1_SPN	6
1E79	TRUE LVDS_B_DATA_N2_SPN	6
1E80	TRUE LVDS_B_DATA_P1_SPN	6
1E81	TRUE LVDS_B_DATA_P2_SPN	6

## ETHERNET NO\_TESTS

NO_TEST		
1E82	TRUE ENET_MDI_TRAN_P<2>	37
1E83	TRUE ENET_MDI_TRAN_N<2>	37
1E84	TRUE ENET_MDI_TRAN_P<3>	37

NO_TEST		
1E85	TRUE SMC_FAN_3_TACH	45 46
1E86	TRUE ALS_LEFT	45 46

## Fan Connectors

FUNC_TEST		
1E87	TRUE =PP5V_S0_FAN_RT	51 64
1E88	TRUE FAN_RT_PWM	51
1E89	TRUE FAN_RT_TACH	51
1E90	TRUE =PP3V3_S0_FAN_RT	51 64
1E91	TRUE SMC_FAN_1_CTL	45 51
1E92	TRUE SMC_FAN_1_TACH	45 51

## LPC+ Debug Connector

FUNC_TEST		
1E93	TRUE =PP3V42_G3H_LPCPLUS	47 64
1E94	TRUE =PP5V_S0_LPCPLUS	47 64
1E95	TRUE LPC_AD<0>	21 45 47 53
1E96	TRUE LPC_AD<1>	21 45 47 53
1E97	TRUE LPC_FRAME_L	21 45 47 53
1E98	TRUE PM_CLKRUN_L	23 38 45 47 53
1E99	TRUE BOOT_LPC_SPI_L	32 45 47
1E100	TRUE SMC_TMS	45 46 47
1E101	TRUE DEBUG_RST_L	26 47
1E102	TRUE SMC_TRST_L	45 47
1E103	TRUE SMC_TDO	45 46 47
1E104	TRUE SMC_MD1	45 47
1E105	TRUE SMC_TX_L	45 46 47
1E106	TRUE FWH_INIT_L	5 21 47
1E107	TRUE PCI_CLK_PORT80_LPC	33 47
1E108	TRUE LPC_AD<2>	21 45 47 53
1E109	TRUE LPC_AD<3>	21 45 47 53
1E110	TRUE INT_SERIRO	23 45 47 53
1E111	TRUE PM_SUS_STAT_L	23 45 46 47 53
1E112	TRUE SMC_TDI	45 46 47
1E113	TRUE SMC_TCK	45 46 47
1E114	TRUE SMC_RST_L	45 46 47
1E115	TRUE SMC_NMI	45 47
1E116	TRUE SMC_RX_L	45 46 47
1E117	TRUE SV_SET_UP	23 47

## Other Func Test Points

FUNC_TEST		
1E118	TRUE =PP1V05_S0_REG	52 64
1E119	SMBus_FUNC_TEST	
1E120	TRUE SMBUS_SMC_MLB_SCL	27
1E121	TRUE SMBUS_SMC_MLB_SDA	27
1E122	FIREWIRE_FUNC_TEST	
1E123	TRUE PPFW_SWITCH	39
1E124	SLEEP_LED_FUNC_TEST	
1E125	TRUE SYS_LED_ANODE	35 46
1E126	SMC_FUNC_TEST	
1E127	TRUE SMC_LID	40 45 46 65
1E128	TRUE SMC_MANUAL_RST_L	46
1E129	TRUE SMC_CPU_VSENSE	45 48
1E130	Power_Supply_FUNC_TEST	
1E131	TRUE ALL_SYS_PWRGD	26 45 63
1E132	TRUE PPVCORE_CPU_S0	64
1E133	TRUE PP1V05_S0	64
1E134	TRUE PP1V5_S0	64
1E135	TRUE PP1V8_S0	64
1E136	TRUE PP2V5_S0	64
1E137	TRUE PP3V3_S0	64
1E138	TRUE PP5V_S0	64
1E139	TRUE PP1V2_S3	64
1E140	TRUE PP1V8_S3	64
1E141	TRUE PP2V5_S3	64
1E142	TRUE PP3V3_S3	64
1E143	TRUE PP5V_S3	64
1E144	TRUE PP3V3_S5	64
1E145	TRUE PP5V_S5	64
1E146	TRUE PP3V42_G3H	64
1E147	TRUE PPBUSA_G3H	64
1E148	TRUE PPBUSB_G3H	64
1E149	TRUE PP18V5_G3H	64
1E150	TRUE PPQV9_S0	64

## Battery Digital Connector

FUNC_TEST		
1E151	TRUE SMC_BS_ALRT_L	45 46 65
1E152	TRUE SMBUS_BATT_SCL_F	65
1E153	TRUE SMBUS_BATT_SDA_F	65
1E154	TRUE BATT_IN	65
1E155	TRUE BATT_POS	65
1E156	TRUE BATT_NEG	65

## Audio FUNC\_TEST

FUNC_TEST		
1E157	TRUE PP5V_S0_AUDIO_PWR	
1E158	TRUE PP5V_S0_AUDIO	
1E159	TRUE GND_AUDIO_PWR	64
1E160	TRUE GND_AUDIO_CODEC	64
1E161	TRUE ACZ_SDATAIN<0>	21 64
1E162	TRUE ACZ_SDATAOUT	21 64
1E163	TRUE ACZ_BITCLK	21 64
1E164	TRUE ACZ_RST_L	21 54 57
1E165	TRUE ACZ_SYNC	21 64

## Battery FUNC\_TEST

FUNC_TEST		
1E166	TRUE SMC_BATT_ISET	45 66
1E167	TRUE SMC_BATT_CHG_EN	45 46 66
1E168	TRUE SMC_BC_ACOK	45 46 65 66
1E169	TRUE SMC_PS_ON	39 45 46 65
1E170	TRUE SMC_BATT_TRICKLE_EN_L	45 46 66
1E171	TRUE SYS_ONEWIRE	45 46 65

## USB FUNC\_TEST

FUNC_TEST		
1E172	TRUE TP_USBP_E	6
1E173	TRUE TP_USBN_E	6
1E174	TRUE TP_USBP_F	6
1E175	TRUE TP_USBN_F	6

## DC-JACK FUNC\_TEST

FUNC_TEST		
1E176	TRUE ACIN_ENABLE_GATE	65

## Battery charger FUNC\_TEST

FUNC_TEST		
1E177	TRUE PPVBAT_G3H_CHGR_OUT	66

## INVERTER CONNECTOR FUNC\_TEST

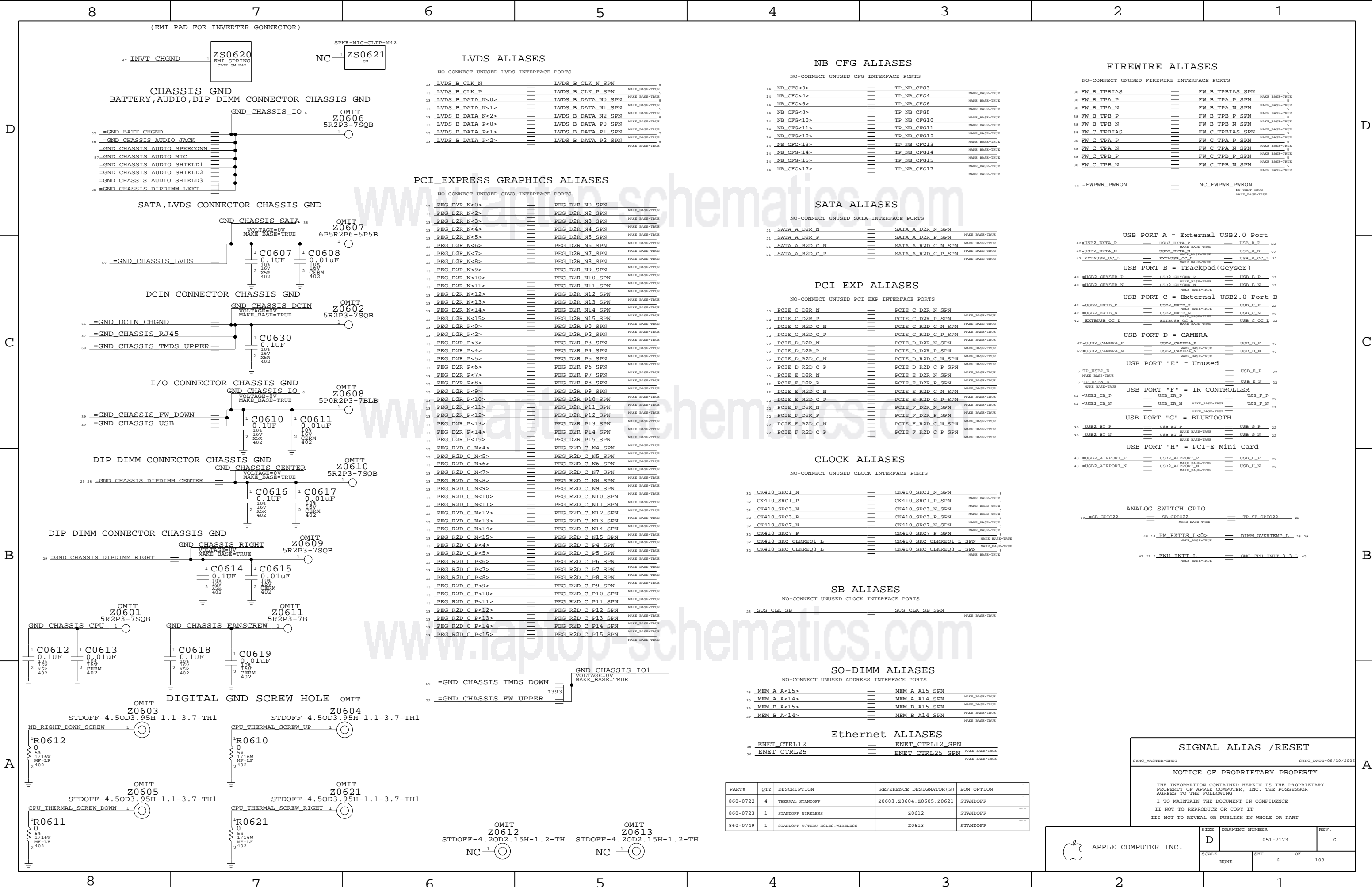
FUNC_TEST		
1E178	TRUE PPBUS_ALL_INV_CONN	67
1E179	TRUE INV_GND	67
1E180	TRUE PP5V_INV_F	67
1E181	TRUE INV_BKLIGHT_PWM_L	67

FUNC TEST 1 OF 2

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	NONE	SHT	5 OF 108



LVDS ALIASES

Table listing LVDS aliases such as LVDS B CLK N, LVDS B CLK P, LVDS B DATA N<0>, etc., with columns for signal name, connector pin, and component value.

NB CFG ALIASES

Table listing NB CFG aliases such as NB\_CFG<3>, NB\_CFG<4>, NB\_CFG<6>, etc., with columns for signal name, connector pin, and component value.

FIREWIRE ALIASES

Table listing FIREWIRE aliases such as FW\_B TPBIAS, FW\_B TPA P, FW\_B TPA N, etc., with columns for signal name, connector pin, and component value.

PCI EXPRESS GRAPHICS ALIASES

Table listing PCI EXPRESS GRAPHICS aliases such as PEG\_D2R N<0>, PEG\_D2R N<2>, PEG\_D2R N<3>, etc., with columns for signal name, connector pin, and component value.

SATA ALIASES

Table listing SATA aliases such as SATA\_A D2R N, SATA\_A D2R P, SATA\_A R2D C N, etc., with columns for signal name, connector pin, and component value.

PCI\_EXP ALIASES

Table listing PCI\_EXP aliases such as PCIE\_C D2R N, PCIE\_C D2R P, PCIE\_C R2D C N, etc., with columns for signal name, connector pin, and component value.

CLOCK ALIASES

Table listing CLOCK aliases such as CK410\_SRC1\_N, CK410\_SRC1\_P, CK410\_SRC3\_N, etc., with columns for signal name, connector pin, and component value.

SB ALIASES

Table listing SB aliases such as SUS\_CLK\_SB, with columns for signal name, connector pin, and component value.

SO-DIMM ALIASES

Table listing SO-DIMM aliases such as MEM\_A A<15>, MEM\_A A<14>, MEM\_B A<15>, etc., with columns for signal name, connector pin, and component value.

Ethernet ALIASES

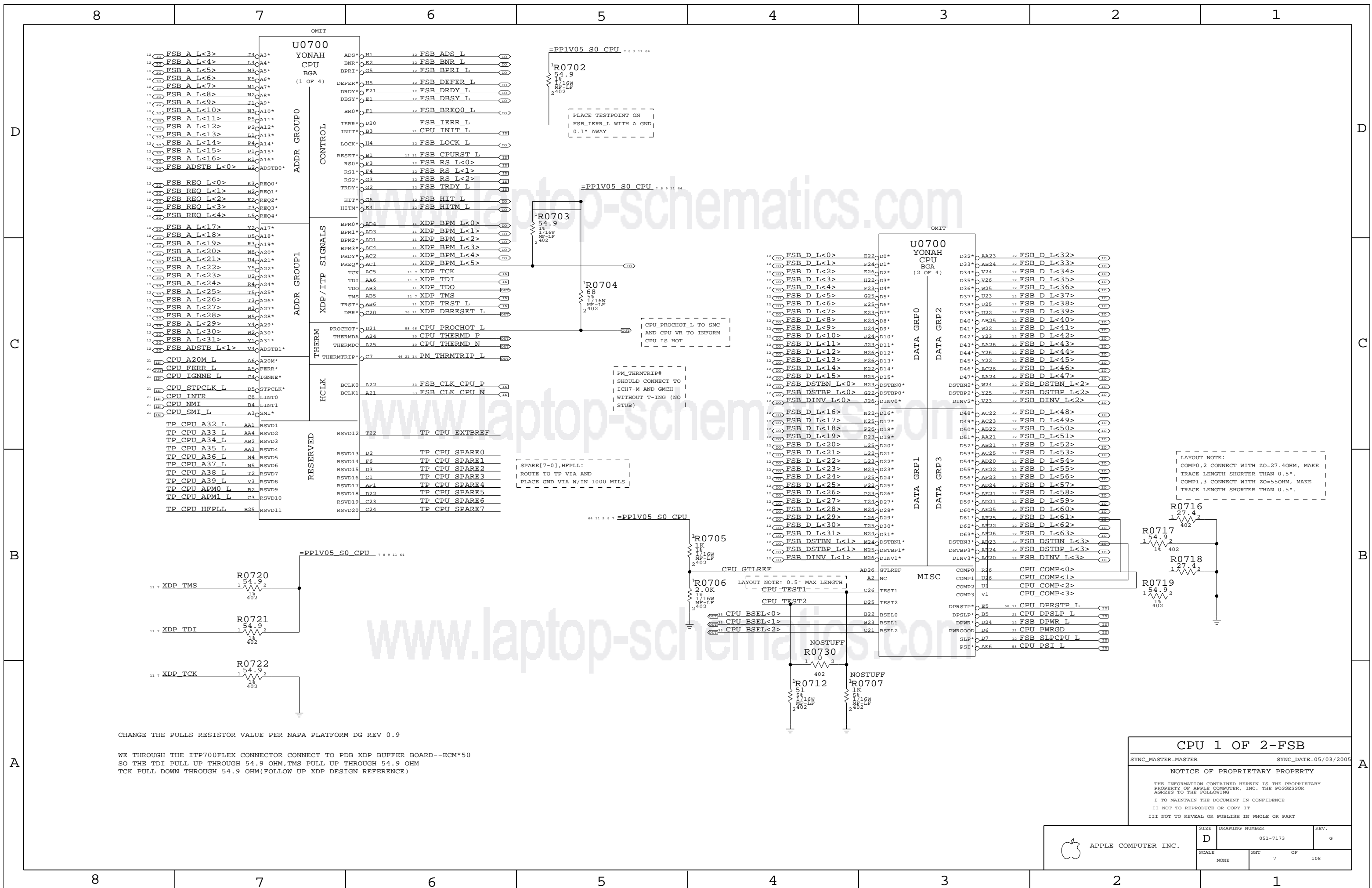
Table listing Ethernet aliases such as ENET\_CTRL12, ENET\_CTRL25, with columns for signal name, connector pin, and component value.

SIGNAL ALIAS /RESET

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Table with columns: PART#, QTY, DESCRIPTION, REFERENCE DESIGNATOR(S), BOM OPTION. Lists items like 860-0722, 860-0723, 860-0749.

APPLE COMPUTER INC.
DRAWING NUMBER: 051-7173
SCALE: NONE
SHT: 6 OF 108



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**

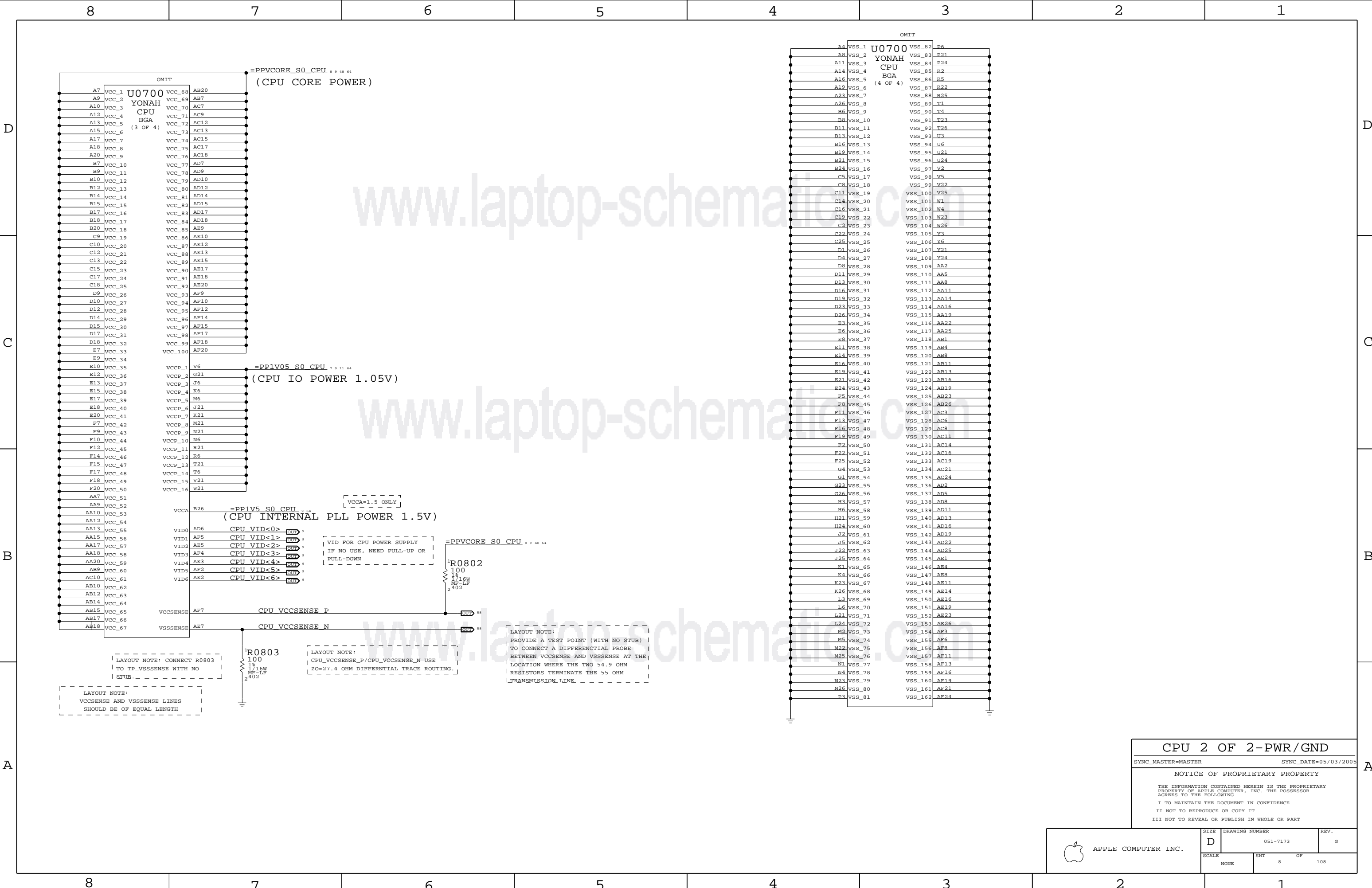
SYNC\_MASTER=MASTER      SYNC\_DATE=05/03/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	7		



**CPU 2 OF 2-PWR/GND**

SYNC\_MASTER=MASTER      SYNC\_DATE=05/03/2005

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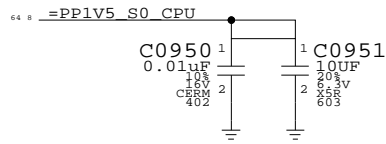
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT		OF
NONE	8		108



VCCA DECOUPLING  
(CPU INTERNAL PLL POWER 1.5V)



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CPU CORE VID<> SETTINGS

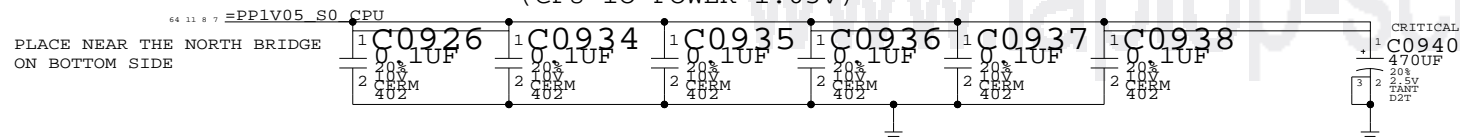
CPU VID<6>	R0921	1	0	CPU VID R<6>
CPU VID<5>	R0922	1	0	CPU VID R<5>
CPU VID<4>	R0923	1	0	CPU VID R<4>
CPU VID<3>	R0924	1	0	CPU VID R<3>
CPU VID<2>	R0925	1	0	CPU VID R<2>
CPU VID<1>	R0926	1	0	CPU VID R<1>
CPU VID<0>	R0927	1	0	CPU VID R<0>

R0921~R0927 FOR CPU VOLTAGE MANUAL SETTING

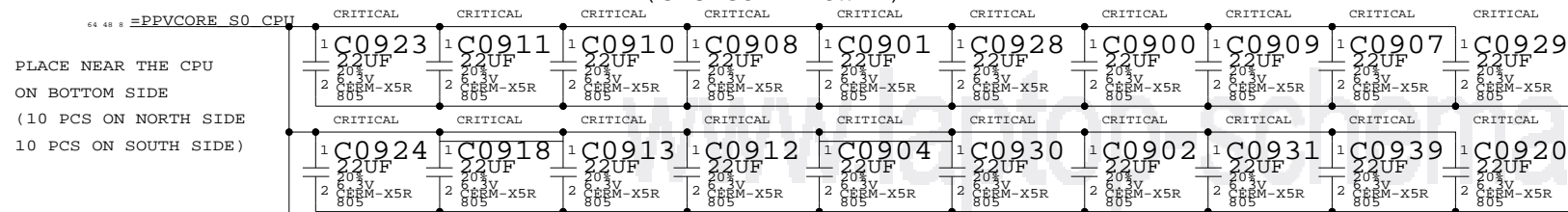
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
138S0603	138S0602	?	ALL	USE SAMSUNG AND MURATA ONLY
138S0606	138S0602	?	ALL	USE TAIYO

VCCP CORE DECOUPLING  
(CPU IO POWER 1.05V)

THIS 470UF FOR CPU, GMCH FSB BUS 1.05V



VCC CORE DECOUPLING  
(CPU CORE POWER)



IF WE USE LOW ESL CAP, THEN WE CAN USE 20 PCS 22UF CAP

	MIN	TYP	MAX
DUAL CORE SV CPU	VCCHFM 1.1625		1.30
	VCCLFM TBD		TBD
SINGLE CORE SV CPU	VCCHFM 1.1625		1.30
	VCCLFM TBD		TBD
DUAL CORE LV CPU	VCCHFM 1.0		1.1625
	VCCLFM TBD		TBD
ULV CPU	VCCHFM TBD		TBD
	VCCLFM TBD		TBD

UNIT: V

- # ALL PROCESSOR DEFAULT VCORE FOR INITIAL POWER UP IS 1.2V
- # TWO PROCESSORS AT THE SAME FREQUENCY MAY HAVE DIFFERENT SETTING WITH THE VID RANGE (VCORE VOLTAGE)!
- # REFER TO YONAH PROCESSOR EMTS REV 1.0
- # VCCHFM: VCORE AT HIGHEST FREQUENCY MODE
- # VCCLFM: VCORE AT LOWEST FREQUENCY MODE

CPU DECAPS & VID<>

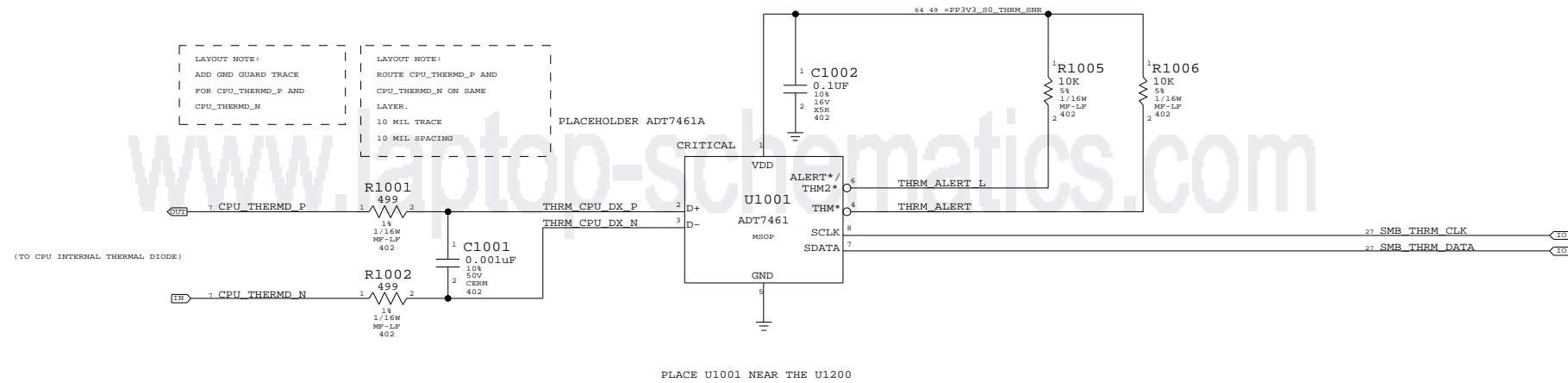
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SCALE	SHT	OF	REV.
NONE	9	108	

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### CPU ZONE THERMAL SENSOR



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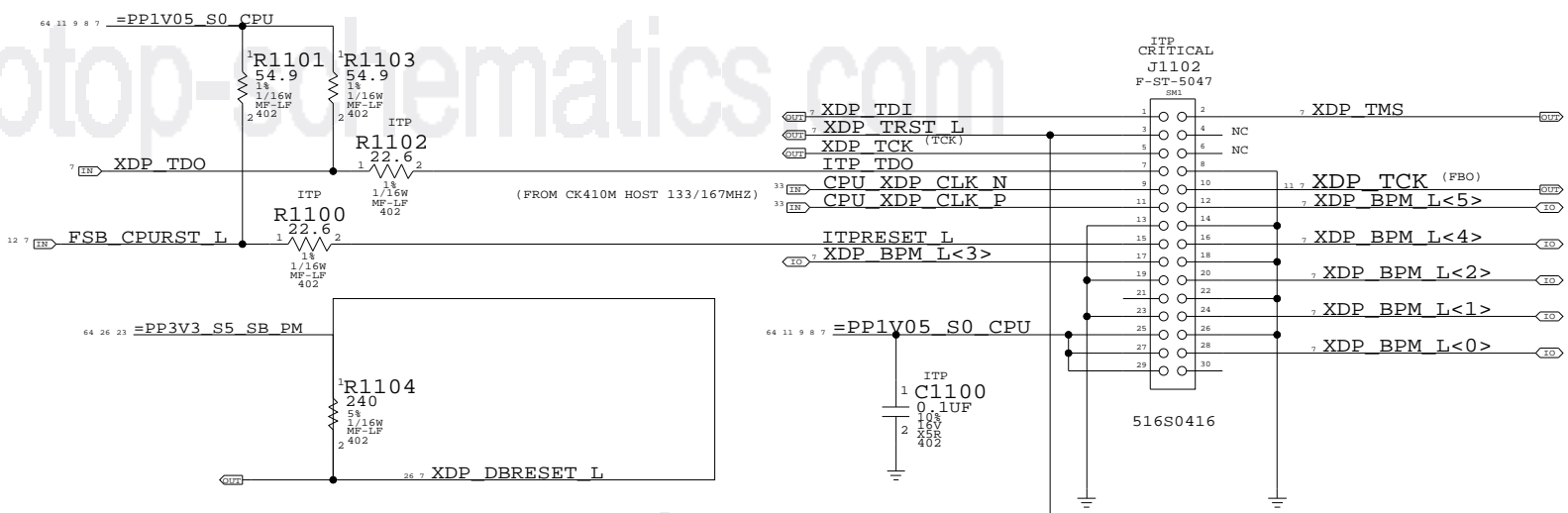
CPU MISC1-TEMP SENSOR  
SYNC\_MASTER=ENET SYNC\_DATE=08/19/2005  
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	D	051-7173	G
SCALE	SHT	OF	108
NONE	10		

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### CPU ITP700FLEX DEBUG SUPPORT

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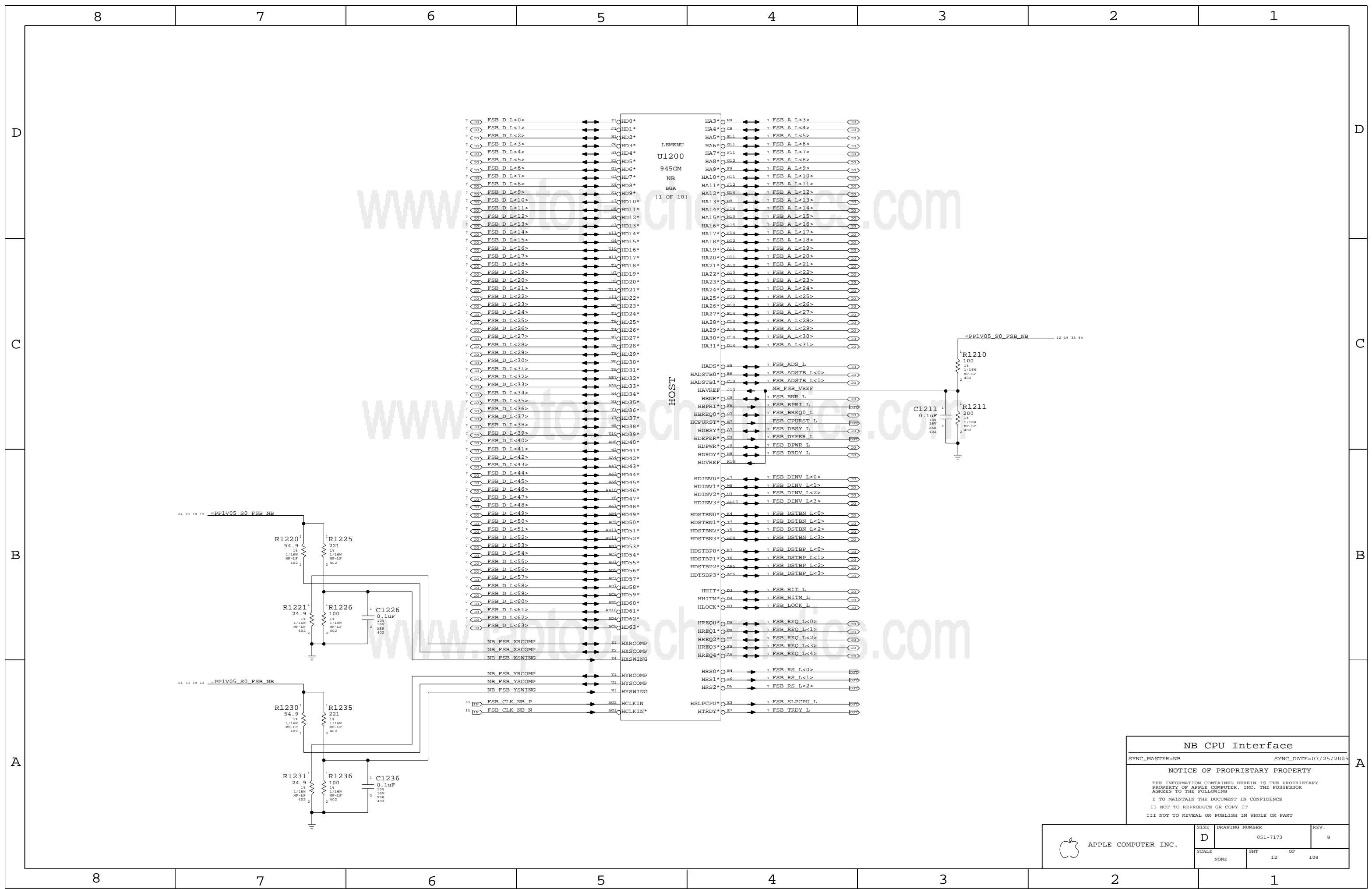
(AND WITH RESET BUTTON)

(DBA#) INDICATE THAT ITP IS USING TAP I/F, NC IN 945GM CHIPSET SYSTEM.  
(DEBUG PORT ACTIVE)  
(DBR#) TO ICH7M SYS\_RST\*, AND WITH SYSTEM RESET LOGIC  
(DEBUG PORT RESET)

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=MASTER SYNC\_DATE=5/23/05  
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	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	11	108	



**NB CPU Interface**

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APPLE COMPUTER INC.	SIZE <b>D</b>	DRAWING NUMBER 051-7173	REV. G
	SCALE NONE	SHEETS 12	OF 108

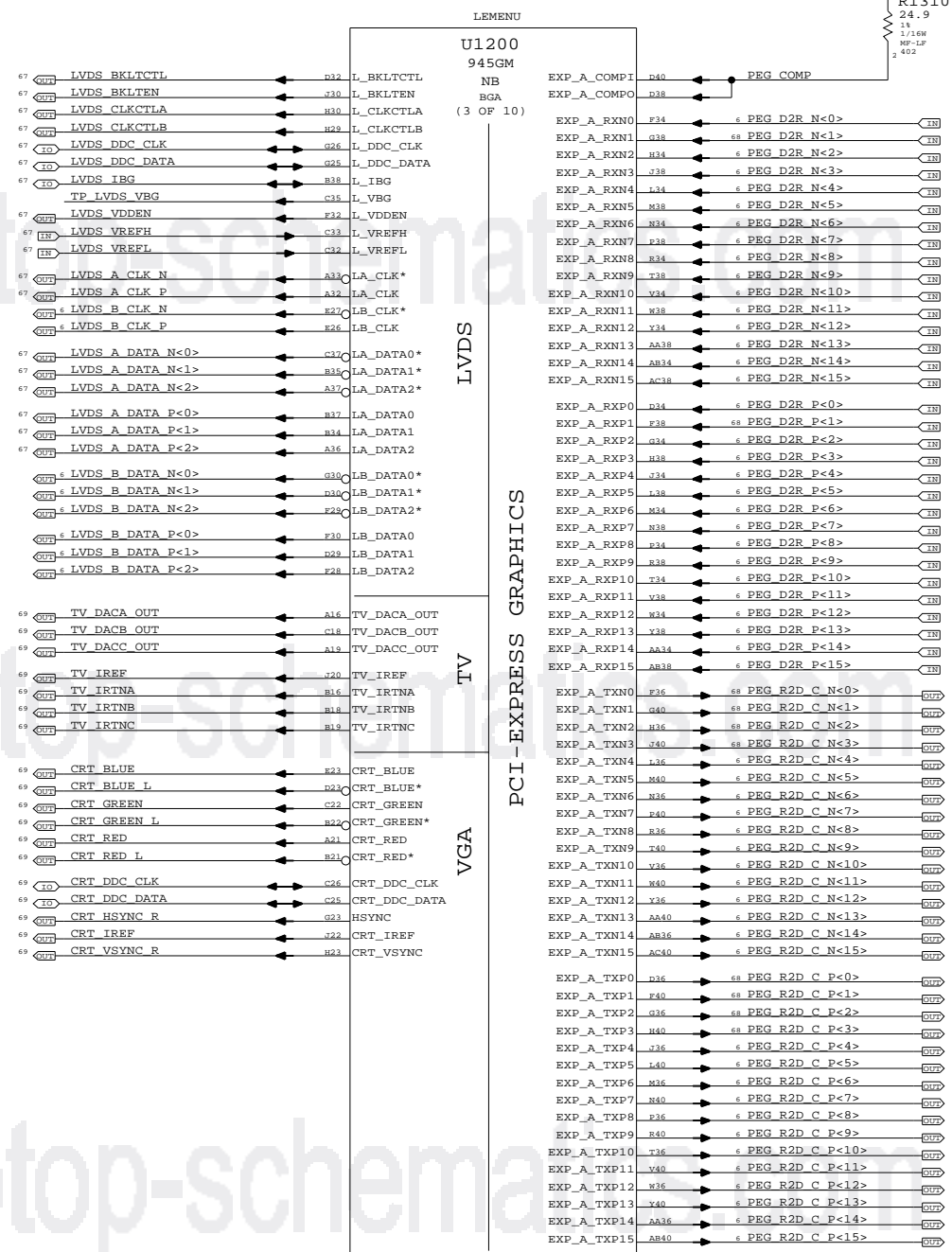
**LVDS Disable**  
 Can leave all signals NC if LVDS is not implemented  
 Tie VCC\_TXLVDS and VCCA\_LVDS to GND. If SDVO is used  
 VCCD\_LVDS must remain powered with proper decoupling.  
 Otherwise, tie VCCD\_LVDS to GND also.

**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\_TVVBG to 1.5V power rail. Tie VSSA\_TVVBG 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.



SDVO Alternate Function

SDVO\_TVCLKIN#  
 SDVO\_INT#  
 SDVO\_FLDSTALL#

SDVO\_TVCLKIN  
 SDVO\_INT  
 SDVO\_FLDSTALL

SDVOB\_RED#  
 SDVOB\_GREEN#  
 SDVOB\_BLUE#  
 SDVOB\_CLKN  
 SDVOC\_RED#  
 SDVOC\_GREEN#  
 SDVOC\_BLUE#  
 SDVOC\_CLKN

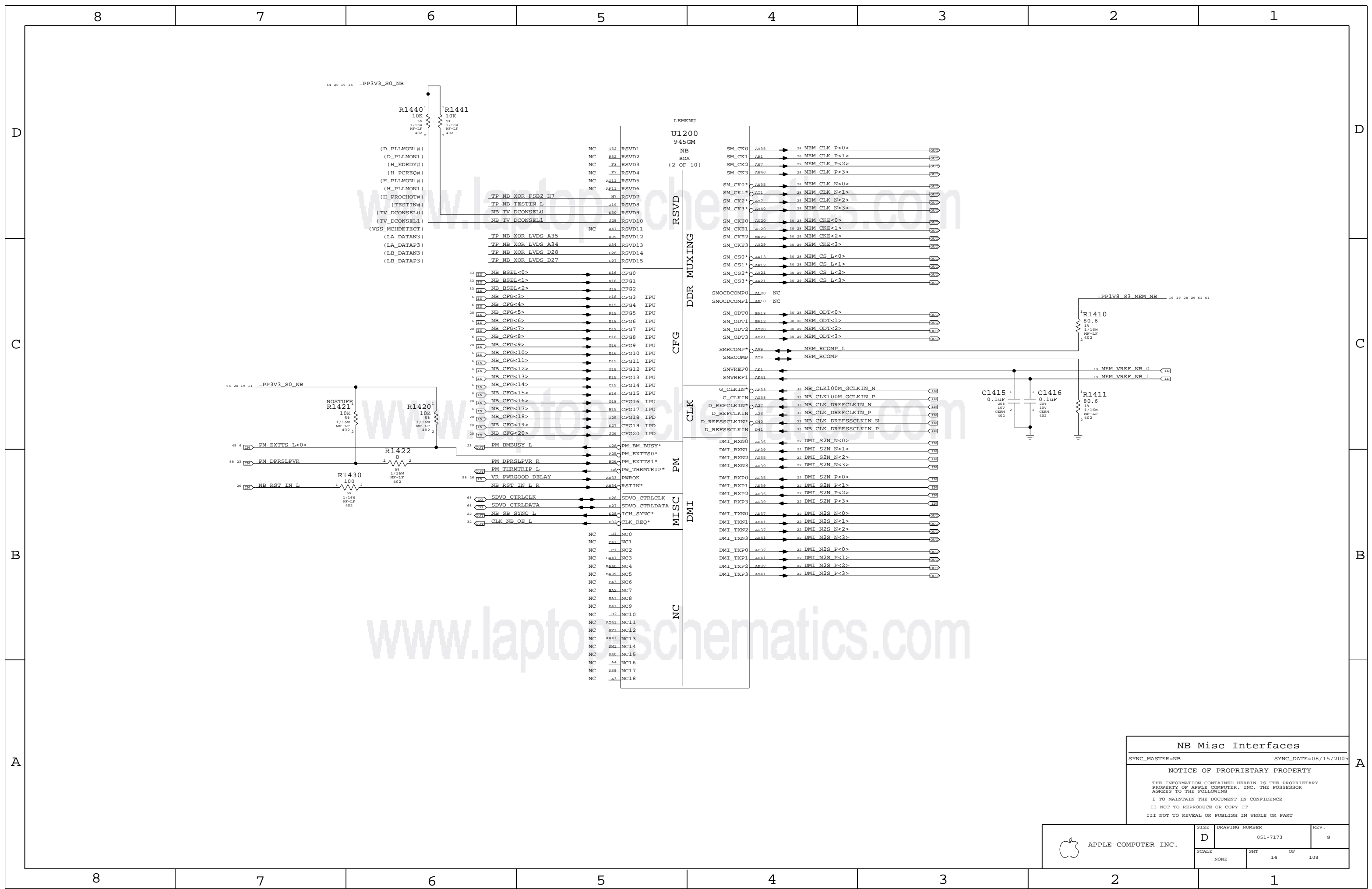
SDVOB\_RED  
 SDVOB\_GREEN  
 SDVOB\_BLUE  
 SDVOB\_CLKP  
 SDVOC\_RED  
 SDVOC\_GREEN  
 SDVOC\_BLUE  
 SDVOC\_CLKP

**NB PEG / Video Interfaces**

SYNC\_MASTER=NB SYNC\_DATE=07/25/2005

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	D	051-7173	G
SCALE	SHT		OF
NONE	13		108



**NB Misc Interfaces**

SYNC\_MASTER=NB SYNC\_DATE=08/15/2005

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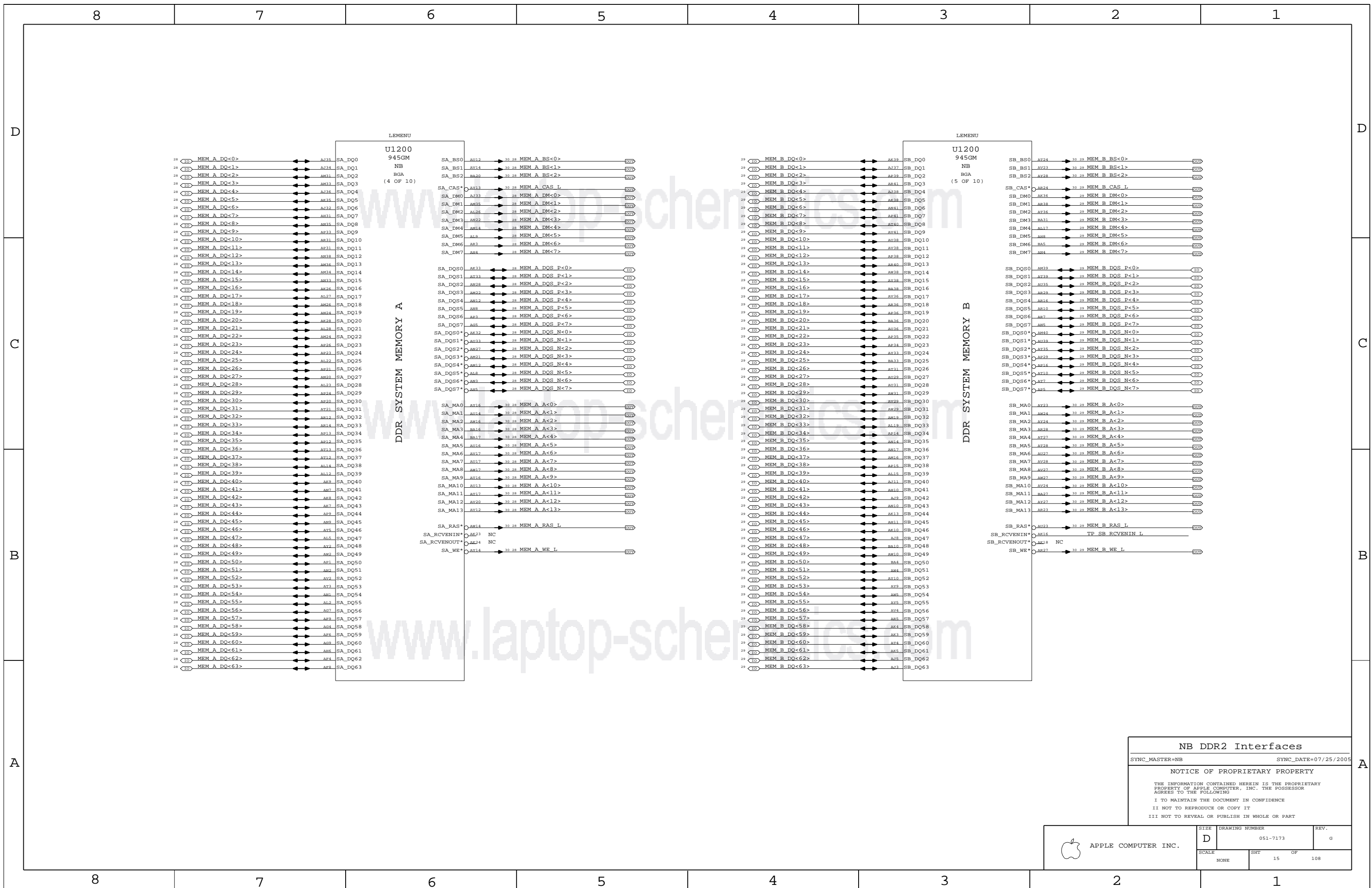
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	SCALE NONE	SHEET 14	OF 108



**NB DDR2 Interfaces**

SYNC\_MASTER=NB SYNC\_DATE=07/25/2005

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	SCALE NONE	SHEET 15	OF 108

NCTF balls are Not Critical To Function

These connections can break without impacting part performance.

LEMENU

D

D

C

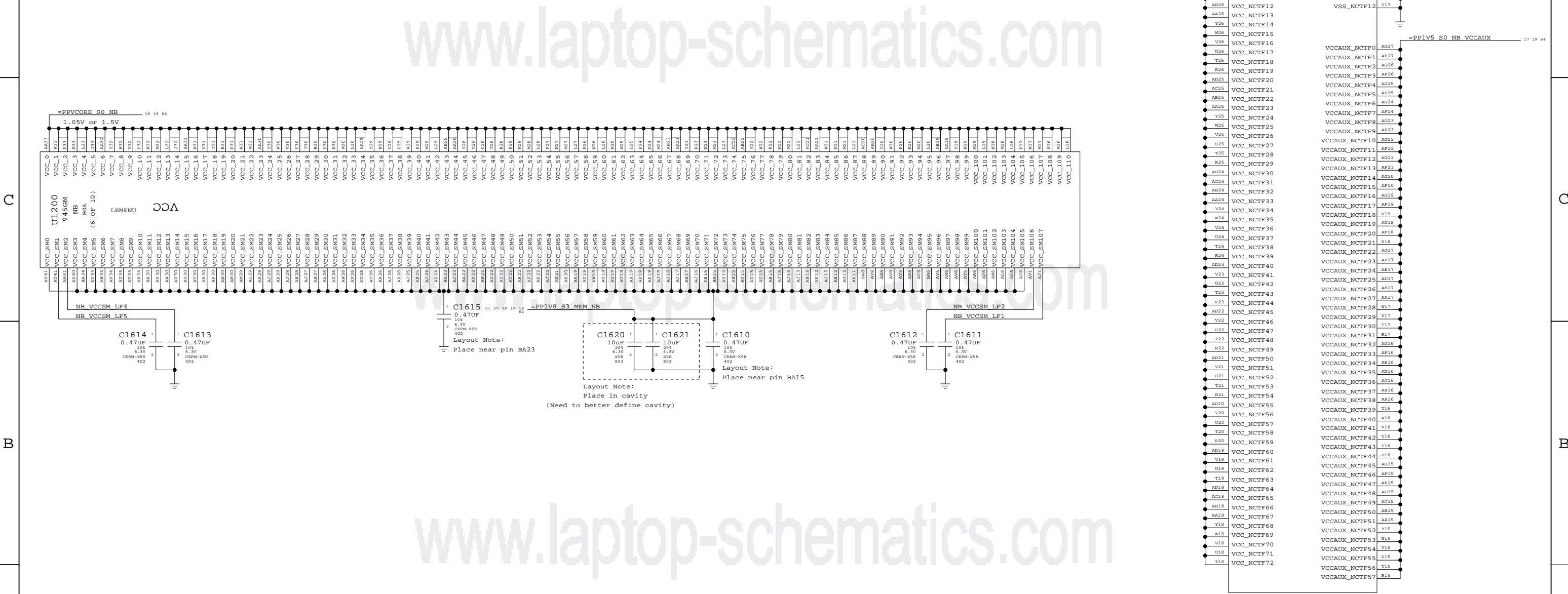
C

B

B

A

A



NB Power 1

SYNC\_MASTER=NB SYNC\_DATE=07/25/2005

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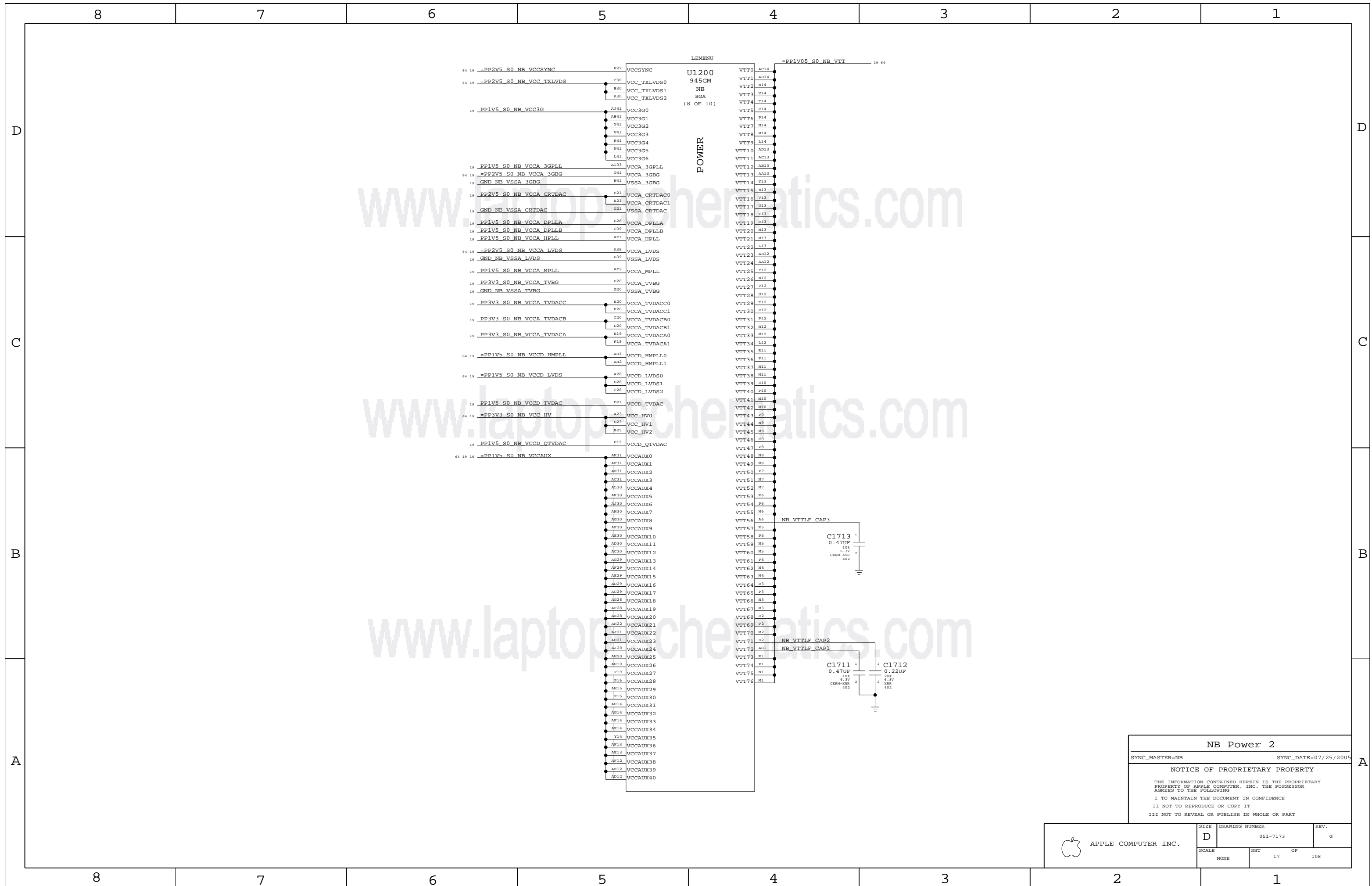
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	
NONE	16	108	





**NB Power 2**

SYNC\_MASTER=NB SYNC\_DATE=07/25/2005

**NOTICE OF PROPRIETARY PROPERTY**

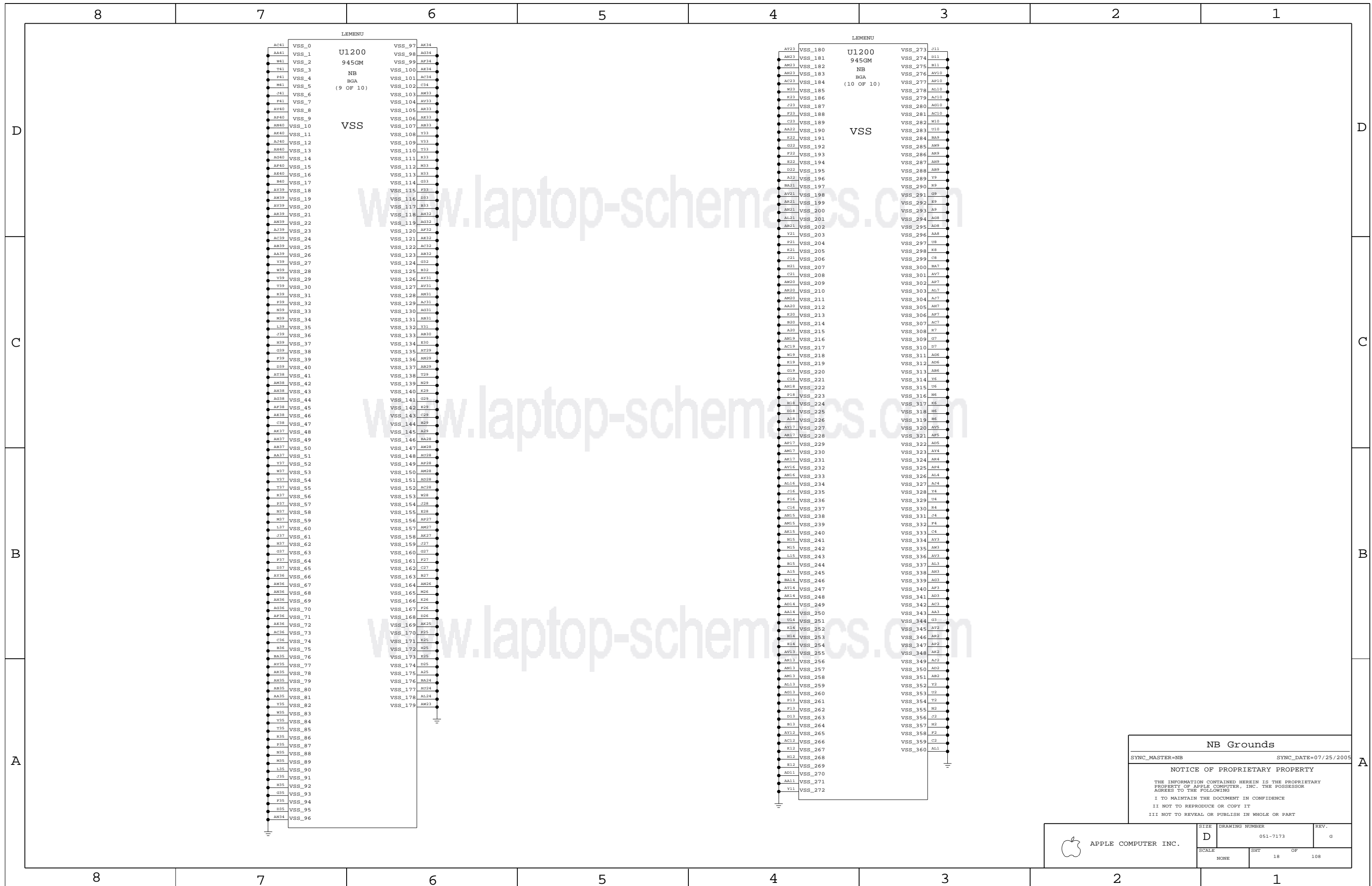
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SCALE	SHT	OF	REV.
NONE	17	108	



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**NB Grounds**

SYNC\_MASTER=NB      SYNC\_DATE=07/25/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	18		

Power Interface

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

PP1V05_S0_FSB_NB	12 33 64
PPVCORE_S0_NB	16 19 64
PP1V05_S0_NB	17 19 64
PP1V05_S0_NB_VTT	17 19 64
PP1V5_S0_NB	19 64
PP1V5_S0_NB_PCIE	19 64
PP1V5_S0_NB_PLL	19 64
PP1V5_S0_NB_TVDAC	19 64
PP1V5_S0_NB_VCCD_HMPLL	17 19 64
PP1V5_S0_NB_VCCD_LVDS	17 19 64
PP1V5_S0_NB_VCCA_3GBG	16 17 19 64
PP1V5_S0_NB_VCCA_LVDS	17 19 64
PP1V8_S3_MEM_NB	14 16 28 29 61 64
PP2V5_S0_NB_CRTDAC	19 64
PP2V5_S0_NB_VCCSYNC	17 19 64
PP2V5_S0_NB_VCC_TXLVDS	17 19 64
PP2V5_S0_NB_VCCA_3GBG	17 19 64
PP2V5_S0_NB_VCCA_LVDS	17 19 64
PP3V3_S0_NB	14 20 64
PP3V3_S0_NB_VCC_HV	17 19 64
PP5V_S0_NB_TVDAC	19 64

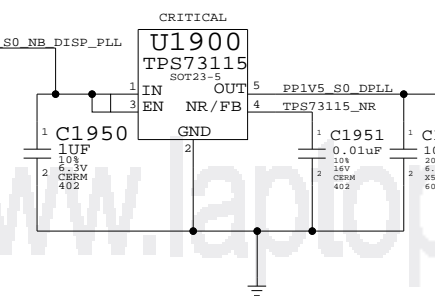
D

C

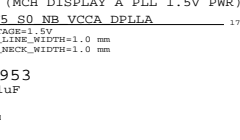
B

A

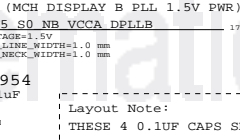
MCH DISPLAY PLL POWER LDO



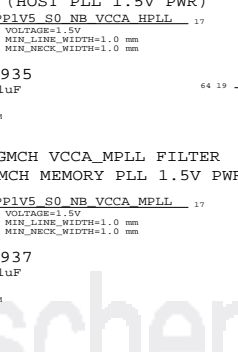
MCH VCCA\_DPLL FILTER



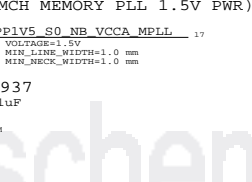
GMCH VCCA\_DPLL\_B FILTER



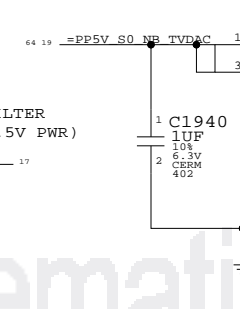
GMCH VCCA\_HPLL FILTER



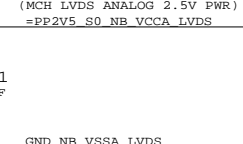
GMCH VCCA\_MPLL FILTER



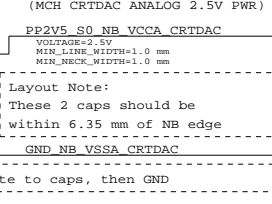
MCH VCCA\_CRTDAC BYPASS



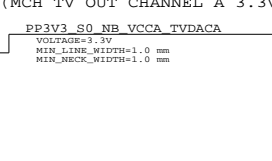
MCH LVDS\_LVDS FILTER



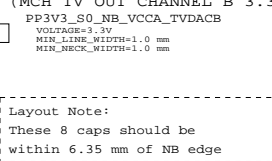
MCH VCCA\_CRTDAC BYPASS



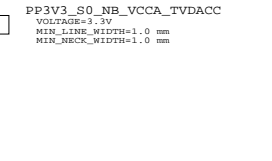
MCH VCCA\_TVDACC FILTER



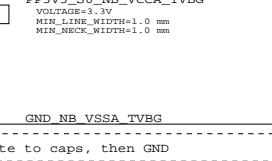
MCH VCCA\_TVDACC FILTER



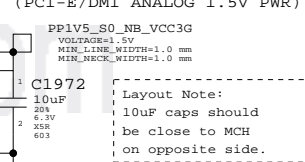
MCH VCCA\_TVDACC FILTER



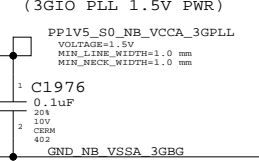
MCH VCCA\_TVBG FILTER



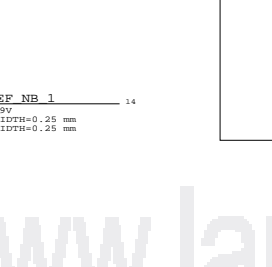
GMCH VCC3G FILTER



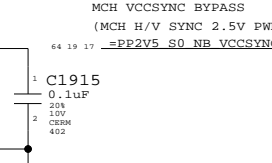
GMCH VCCA\_3GPLL FILTER



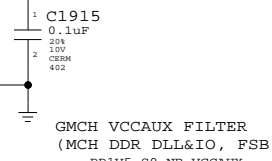
GMCH CORE PWR 1.05V BYPASS



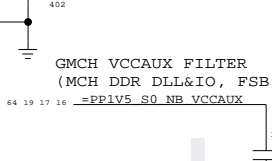
MCH VCCD\_LVDS BYPASS



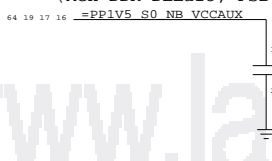
MCH VCC\_HV BYPASS



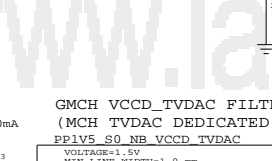
MCH VCCSYNC BYPASS



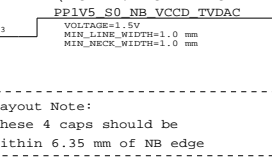
MCH VTT BYPASS



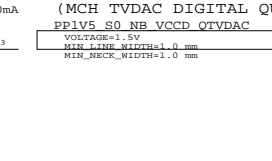
GMCH VCCAUX FILTER



GMCH VCCD\_TVDAC FILTER



GMCH VCCD\_QTVDAC FILTER



GMCH VCCAUX FILTER



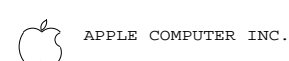
NB (GM) Decoupling

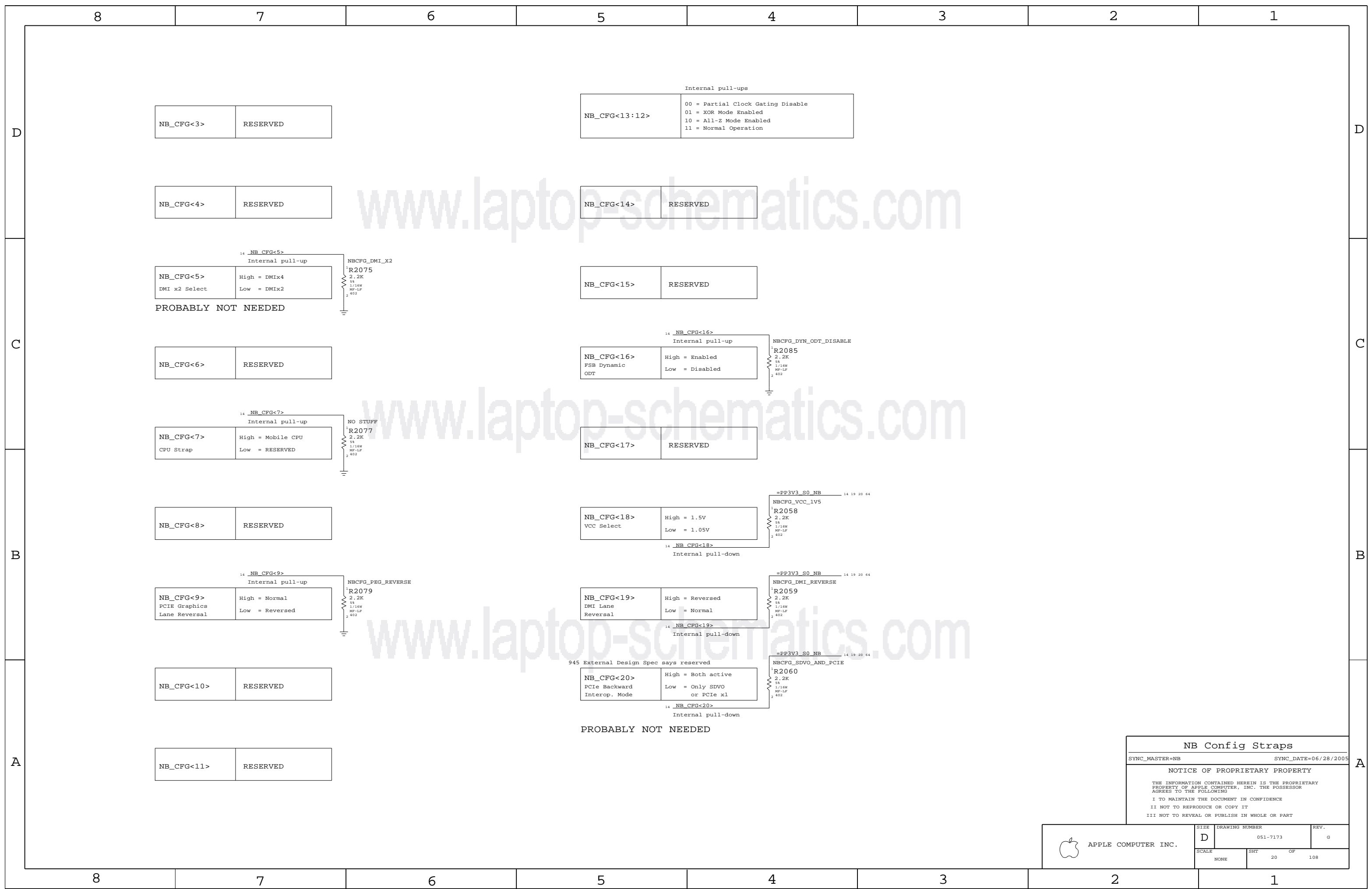
SYNC\_MASTER=NB SYNC\_DATE=06/22/2005

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SIZE	D	DRAWING NUMBER	051-7173	REV.	G
SCALE	NONE	SHT	19	OF	108





NB_CFG<3>	RESERVED
-----------	----------

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

NB_CFG<4>	RESERVED
-----------	----------

NB_CFG<14>	RESERVED
------------	----------

14 NB_CFG<5> Internal pull-up	
NB_CFG<5>	High = DMiX4 DMI x2 Select Low = DMiX2
PROBABLY NOT NEEDED	

NB_CFG<15>	RESERVED
------------	----------

NB_CFG<6>	RESERVED
-----------	----------

14 NB_CFG<16> Internal pull-up	
NB_CFG<16>	High = Enabled FSB Dynamic ODT Low = Disabled

14 NB_CFG<7> Internal pull-up	
NB_CFG<7>	High = Mobile CPU CPU Strap Low = RESERVED

NB_CFG<17>	RESERVED
------------	----------

NB_CFG<8>	RESERVED
-----------	----------

14 NB_CFG<18> Internal pull-down	
NB_CFG<18>	High = 1.5V VCC Select Low = 1.05V

14 NB_CFG<9> Internal pull-up	
NB_CFG<9>	High = Normal PCIe Graphics Lane Reversal Low = Reversed

14 NB_CFG<19> Internal pull-down	
NB_CFG<19>	High = Reversed DMI Lane Reversal Low = Normal

NB_CFG<10>	RESERVED
------------	----------

945 External Design Spec says reserved	
14 NB_CFG<20> Internal pull-down	
NB_CFG<20>	High = Both active PCIe Backward Interop. Mode Low = Only SDVO or PCIe x1
PROBABLY NOT NEEDED	

NB_CFG<11>	RESERVED
------------	----------

**NB Config Straps**

SYNC\_MASTER=NB SYNC\_DATE=06/28/2005

**NOTICE OF PROPRIETARY PROPERTY**

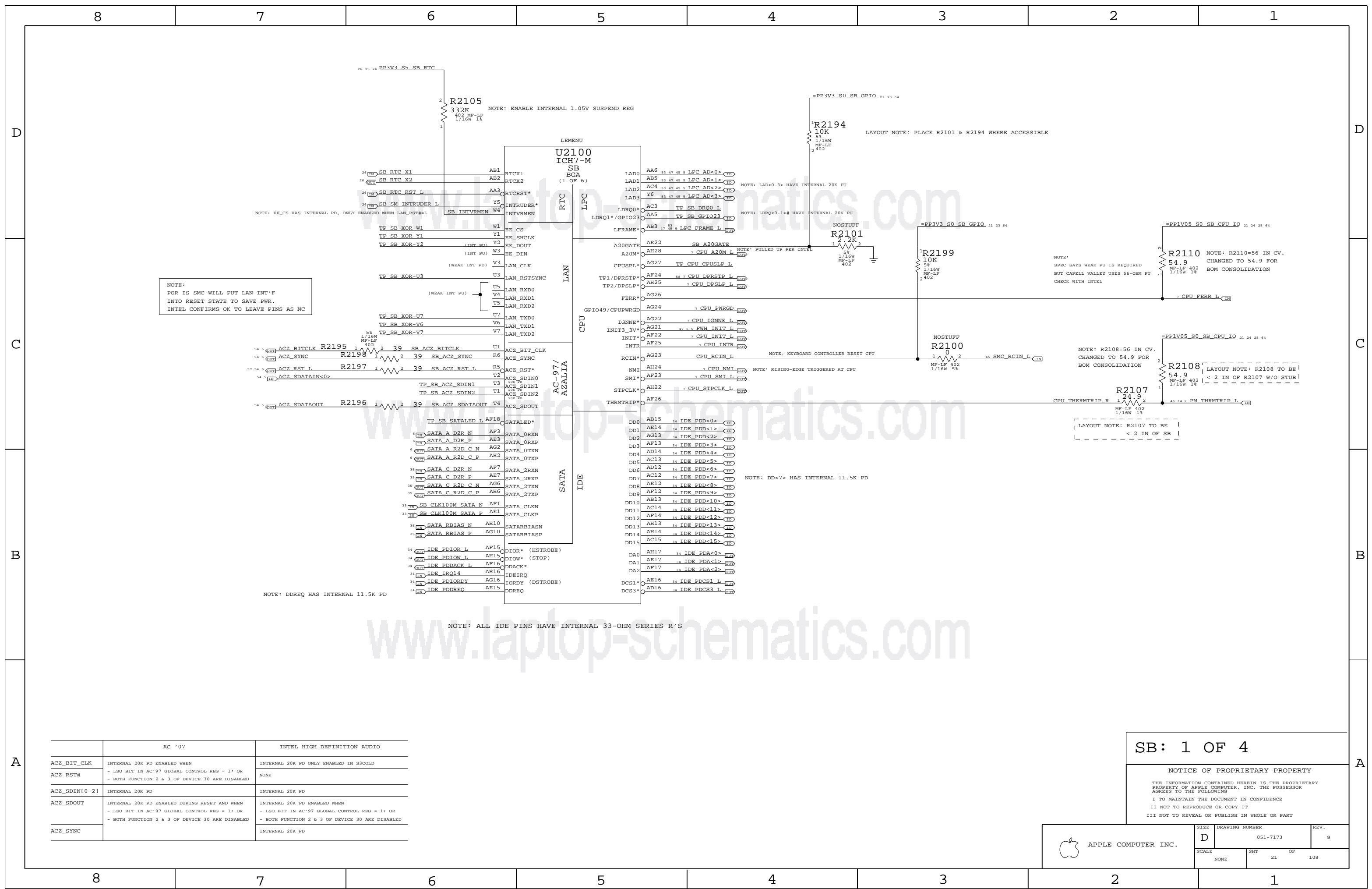
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	20	108	



NOTE:  
POR IS SMC WILL PUT LAN INT'F  
INTO RESET STATE TO SAVE PWR.  
INTEL CONFIRMS OK TO LEAVE PINS AS NC

NOTE: ER\_CS HAS INTERNAL PD, ONLY ENABLED WHEN LAN\_RST# = L

NOTE: LAD<0-3> HAVE INTERNAL 20K PU

NOTE: LDRQ<0-1># HAVE INTERNAL 20K PU

NOTE: PULLED UP PER INTEL

NOTE: KEYBOARD CONTROLLER RESET CPU

NOTE: RISING-EDGE TRIGGERED AT CPU

NOTE: DD<7> HAS INTERNAL 11.5K PD

LAYOUT NOTE: PLACE R2101 & R2194 WHERE ACCESSIBLE

NOTE:  
SPEC SAYS WEAK PU IS REQUIRED  
BUT CAPELL VALLEY USES 56-OHM PU  
CHECK WITH INTEL

NOTE: R2108=56 IN CV.  
CHANGED TO 54.9 FOR  
BOM CONSOLIDATION

LAYOUT NOTE: R2107 TO BE  
< 2 IN OF SB

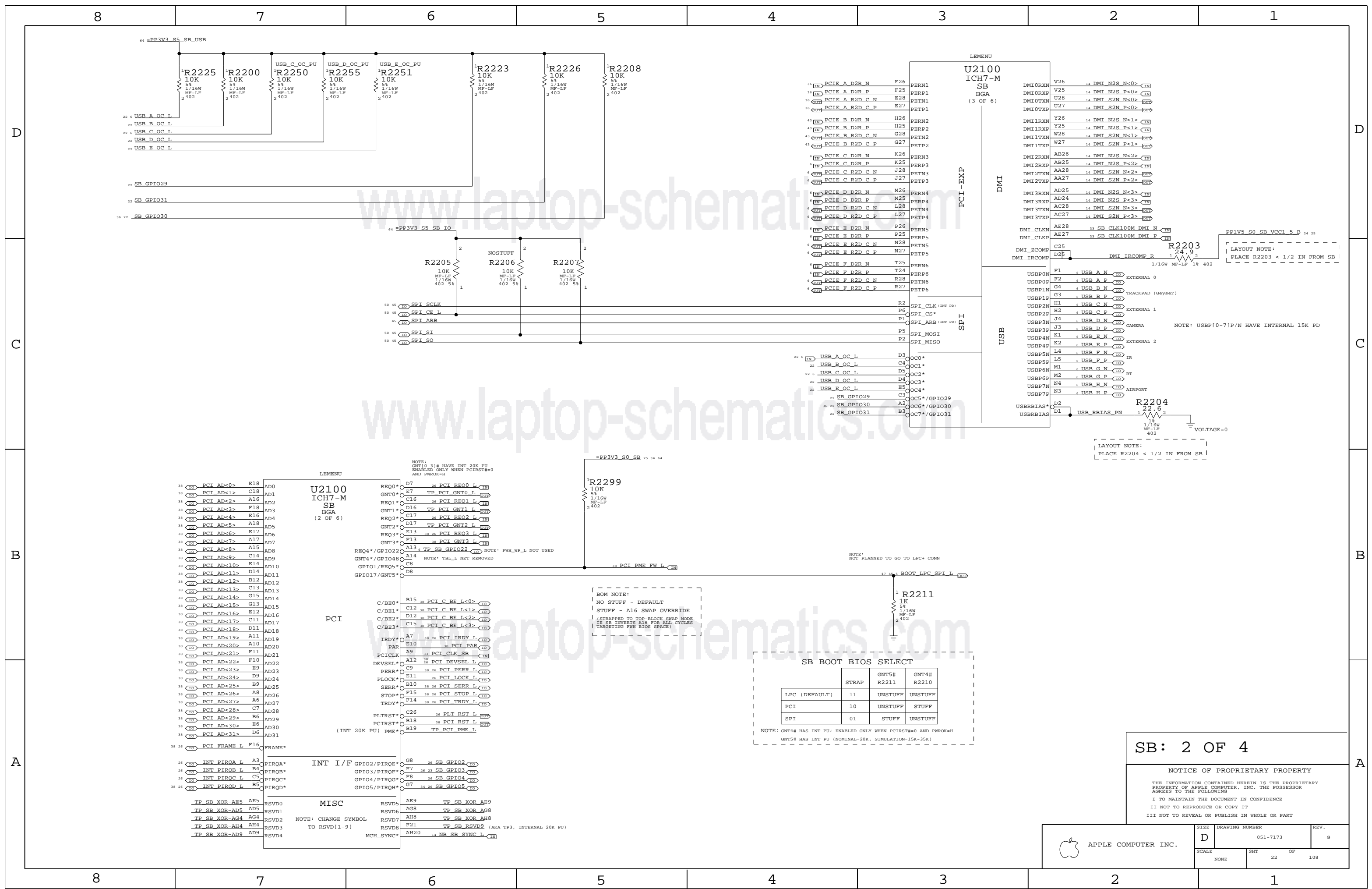
NOTE: ALL IDE PINS HAVE INTERNAL 33-OHM SERIES R'S

AC '07	INTEL HIGH DEFINITION AUDIO
ACZ_BIT_CLK	INTERNAL 20K PD ONLY ENABLED IN S3COLD
ACZ_RST#	NONE
ACZ_SDIN[0-2]	INTERNAL 20K PD
ACZ_SDOUT	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

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	D	051-7173	G
SCALE	SHT	OF	108
NONE	21		



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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	NONE	SHT	22 OF 108

D

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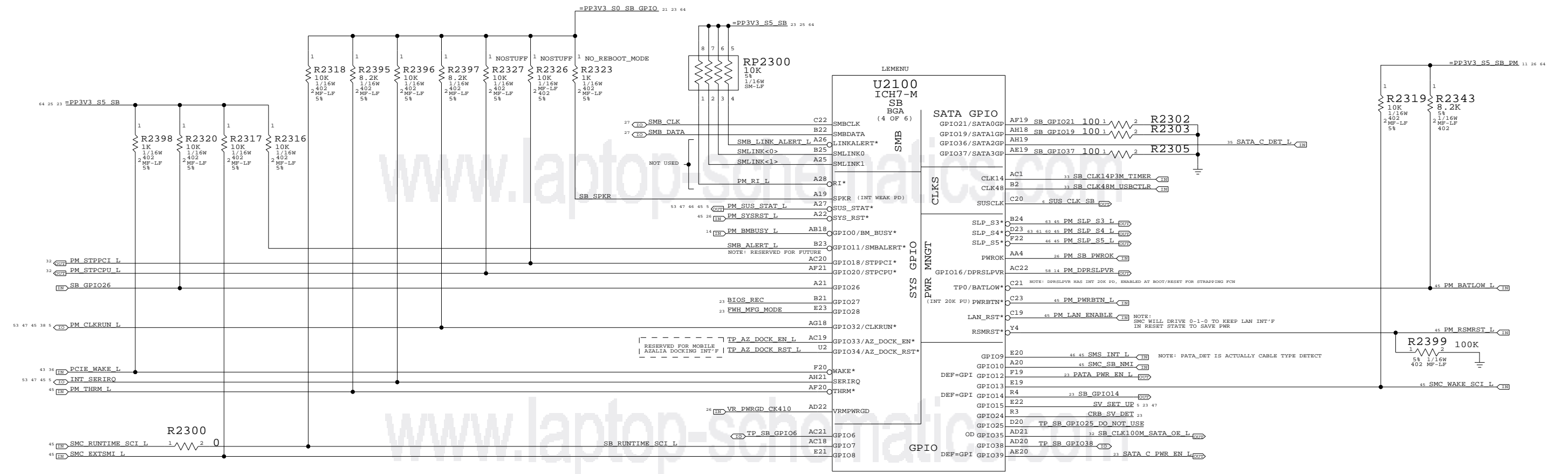
D

C

B

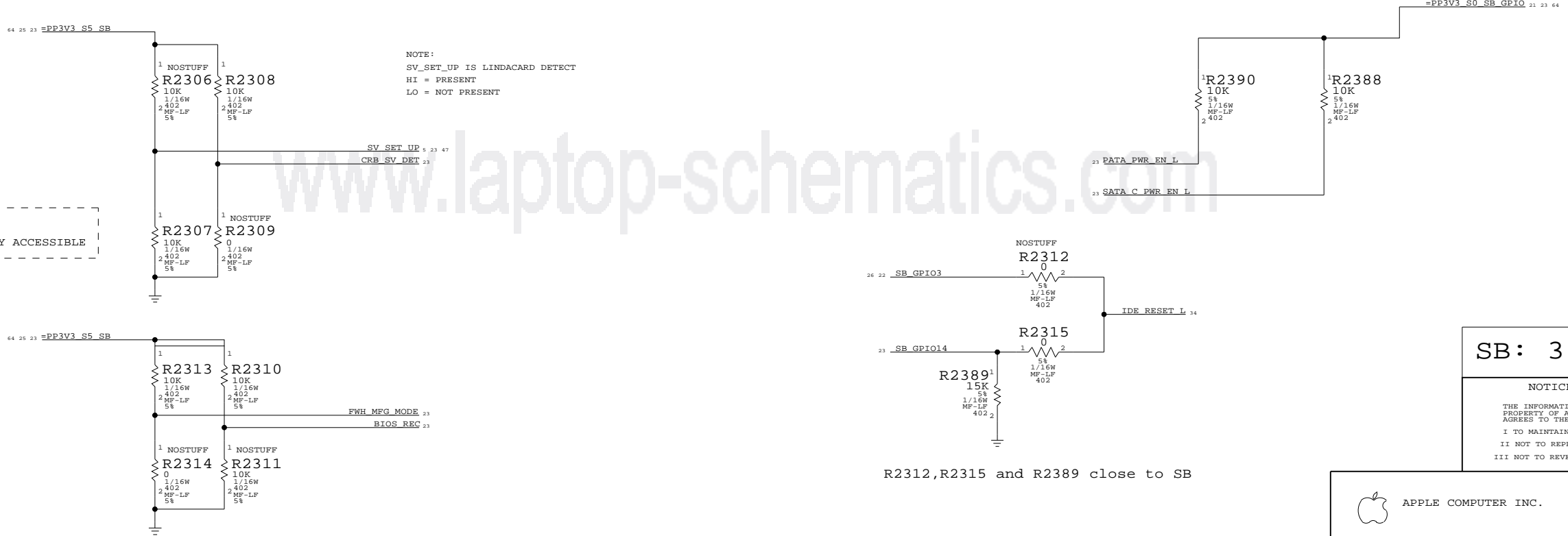
A

NOTE FOR R2323 (DEF-NOSTUFF) | STRAPPING & PWROK RISING: SB WILL DISABLE TOO TIMER SYSTEM REBOOT FEATURE



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 (EMI AC COUPLING MODE STRAP)

LAYOUT NOTE:  
PLACE R2306-14 WHERE PHYSICALLY ACCESSIBLE

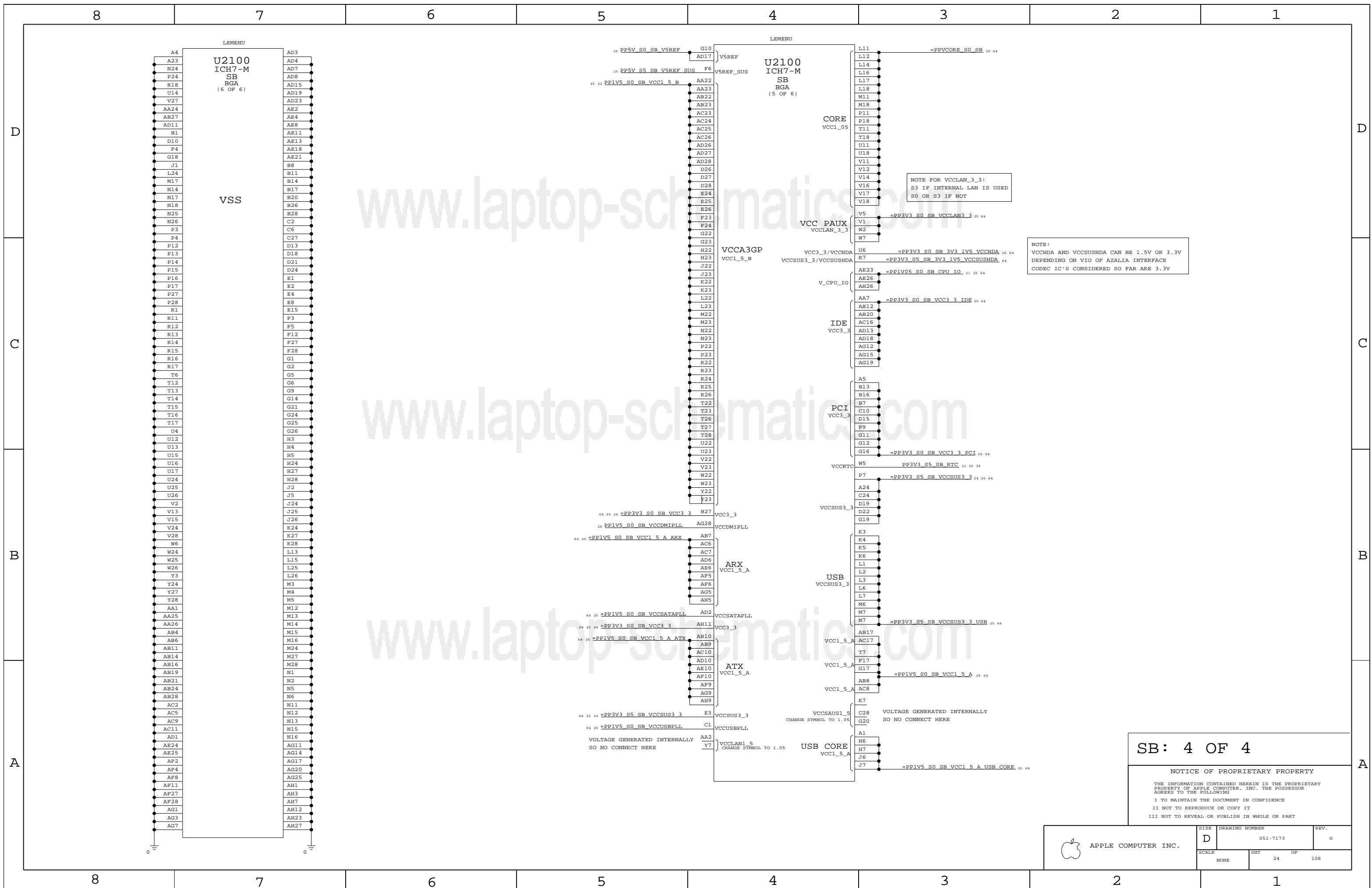


R2312, R2315 and R2389 close to SB

SB: 3 OF 4

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	D	051-7173	G
SCALE	SHT	OF	108
NONE	23		



NOTE FOR VCCLAN\_3\_3:  
S3 IF INTERNAL LAN IS USED  
S0 OR S3 IF NOT

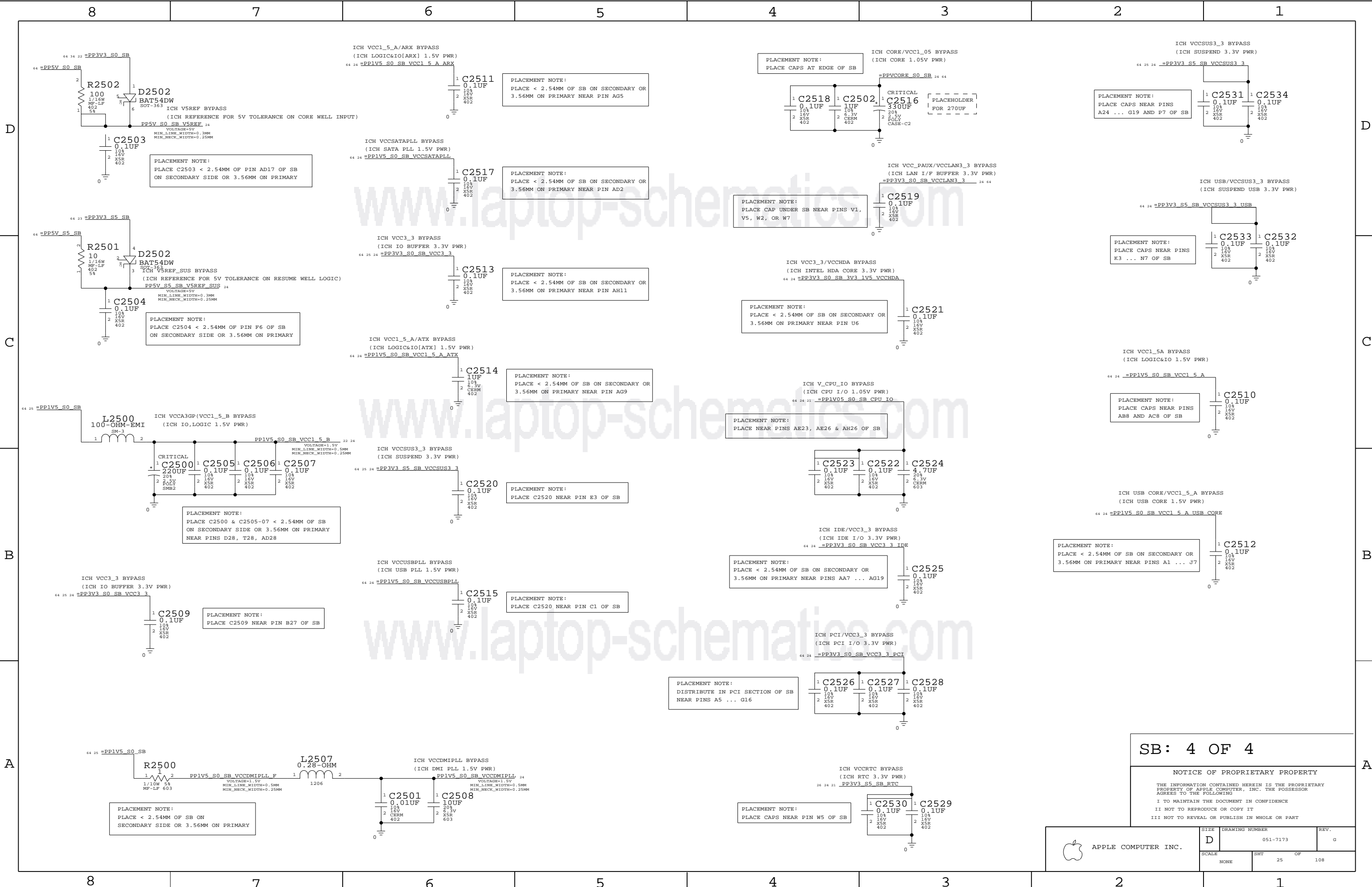
NOTE:  
VCCCHDA AND VCCSUSHDA CAN BE 1.5V OR 3.3V  
DEPENDING ON VIO OF AZALIA INTERFACE  
CODEC IC'S CONSIDERED SO FAR ARE 3.3V

SB: 4 OF 4

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	D	051-7173	G
SCALE	SHT	OF	108
NONE	24		





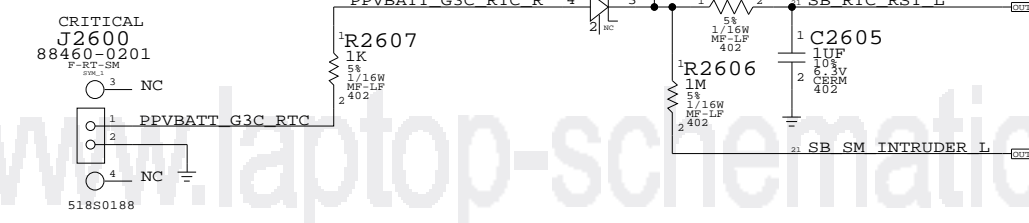
SB: 4 OF 4

NOTICE OF PROPRIETARY PROPERTY

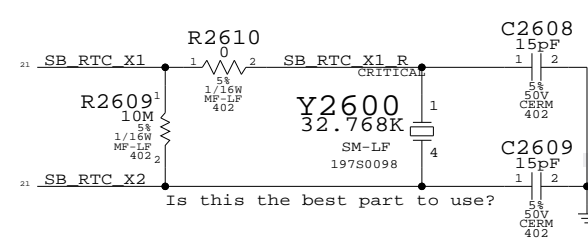
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	25		

RTC Battery Connector

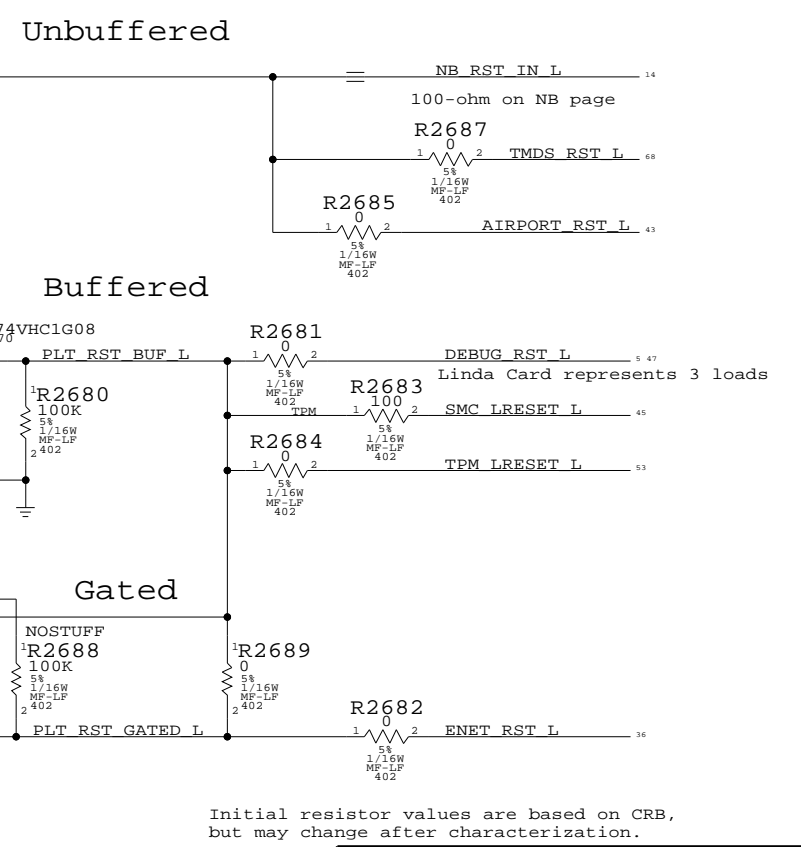


SB RTC Crystal Circuit



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



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

SB Misc		
SYNC_MASTER=NB	SYNC_DATE=07/26/2005	
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	26		

8

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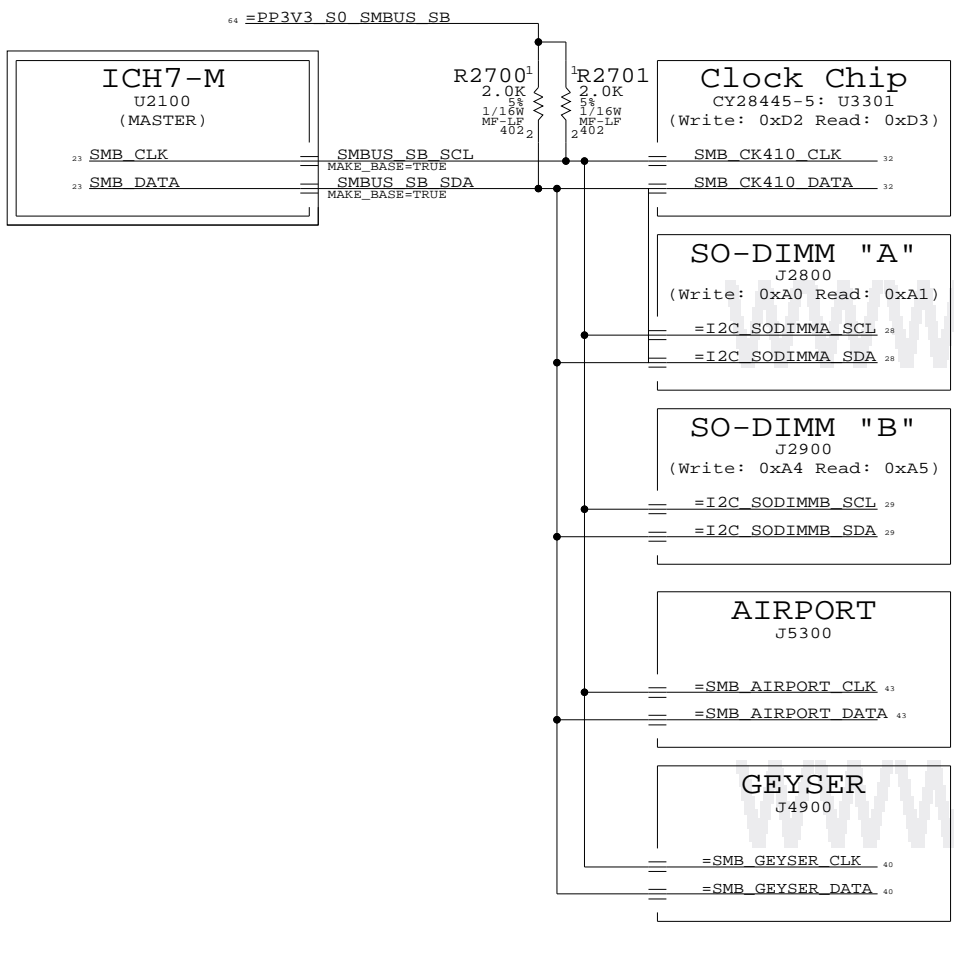
4

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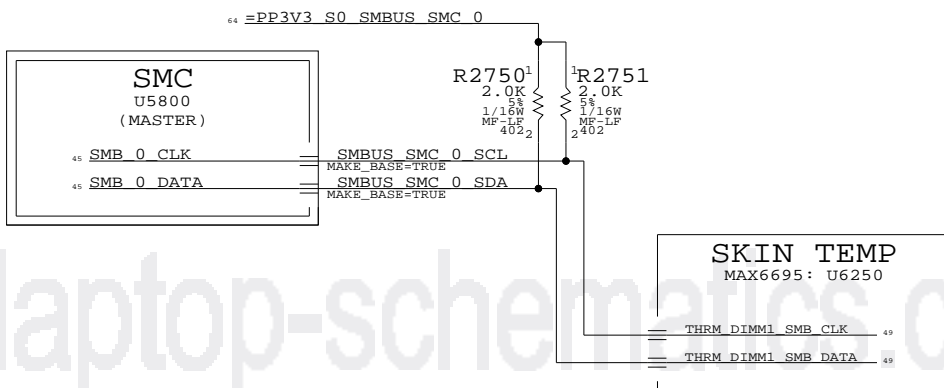
2

1

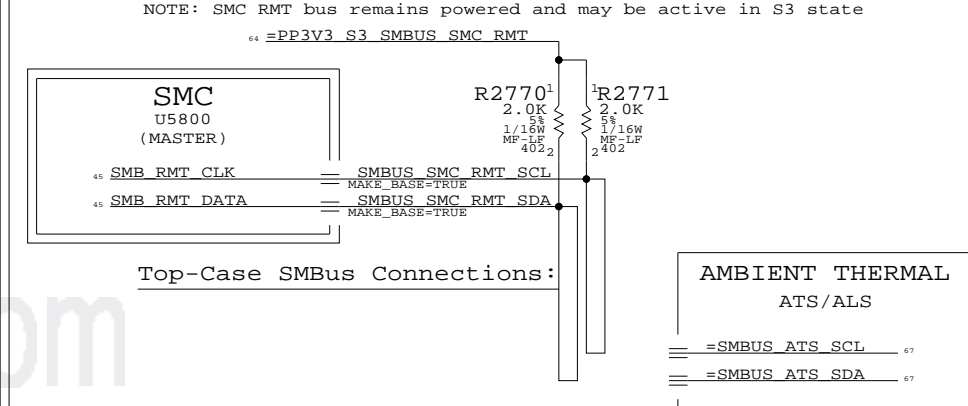
### ICH7-M SMBus Connections



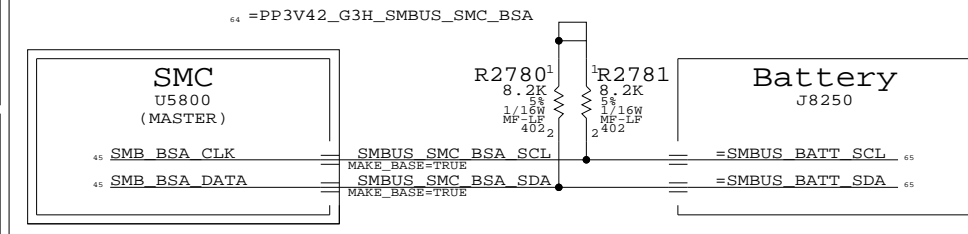
### SMC "0" SMBus Connections



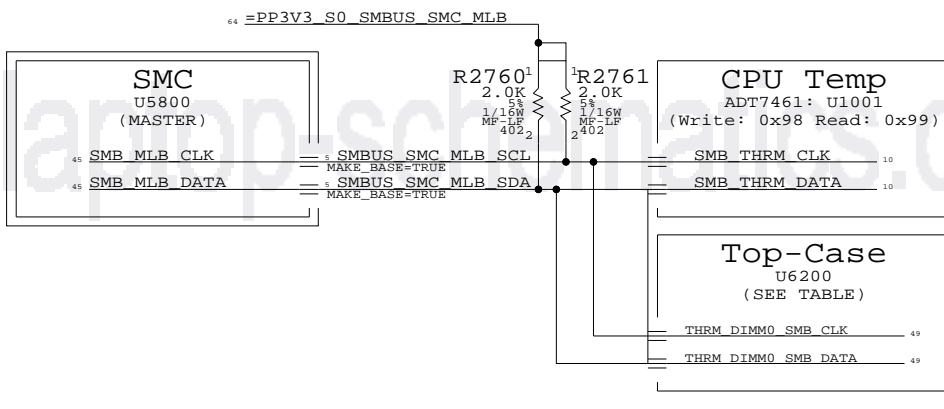
### SMC "RMT" SMBus Connections



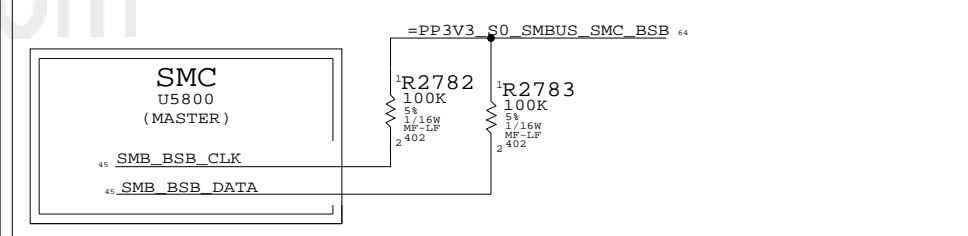
### SMC "Battery A" SMBus Connections



### SMC "MLB" SMBus Connections



### SMC "Battery B" SMBus Connections



www.laptop-schematics.com

### M42 SMBUS CONNECTIONS

SYNC\_MASTER=ENET SYNC\_DATE=08/30/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	27		

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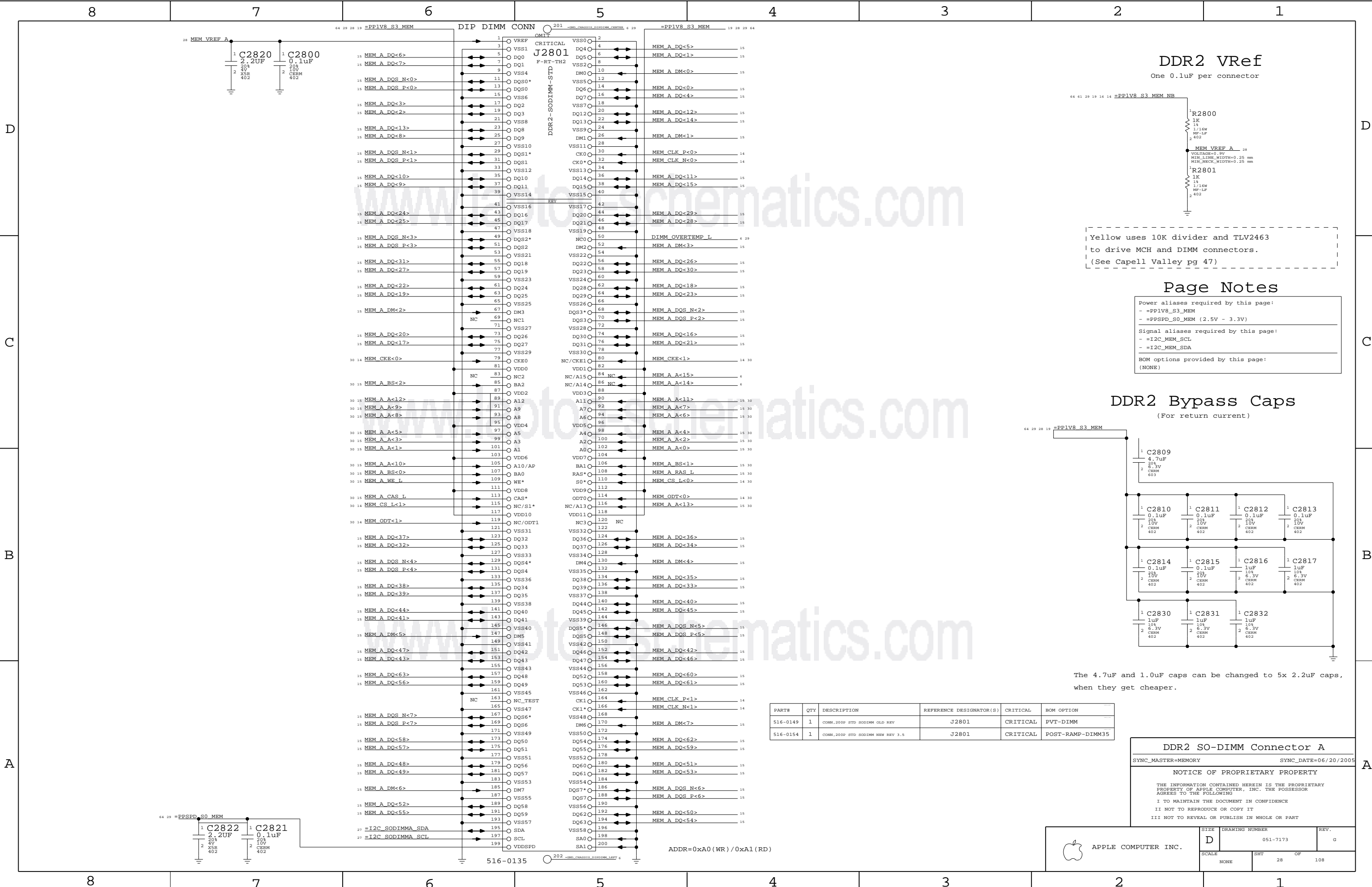
A

D

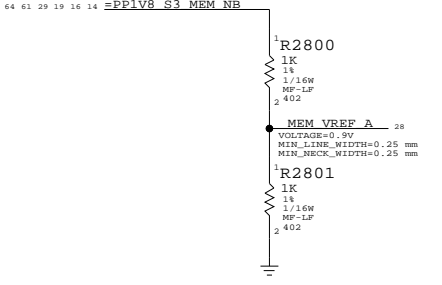
C

B

A



DDR2 VRef  
One 0.1uF per connector

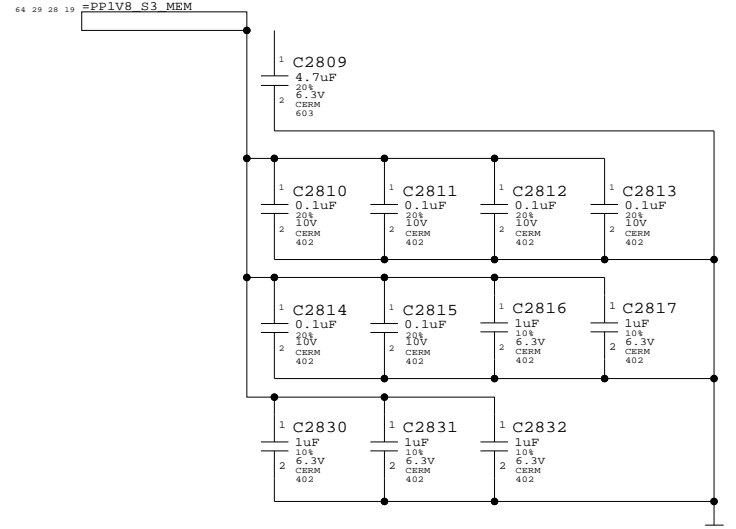


Yellow uses 10K divider and TLV2463 to drive MCH and DIMM connectors. (See Capell Valley pg 47)

Page Notes

- Power aliases required by this page:
  - =P1V8\_S3\_MEM
  - =PPSPD\_S0\_MEM (2.5V - 3.3V)
- Signal aliases required by this page:
  - =I2C\_MEM\_SCL
  - =I2C\_MEM\_SDA
- BOM options provided by this page:
  - (NONE)

DDR2 Bypass Caps  
(For return current)



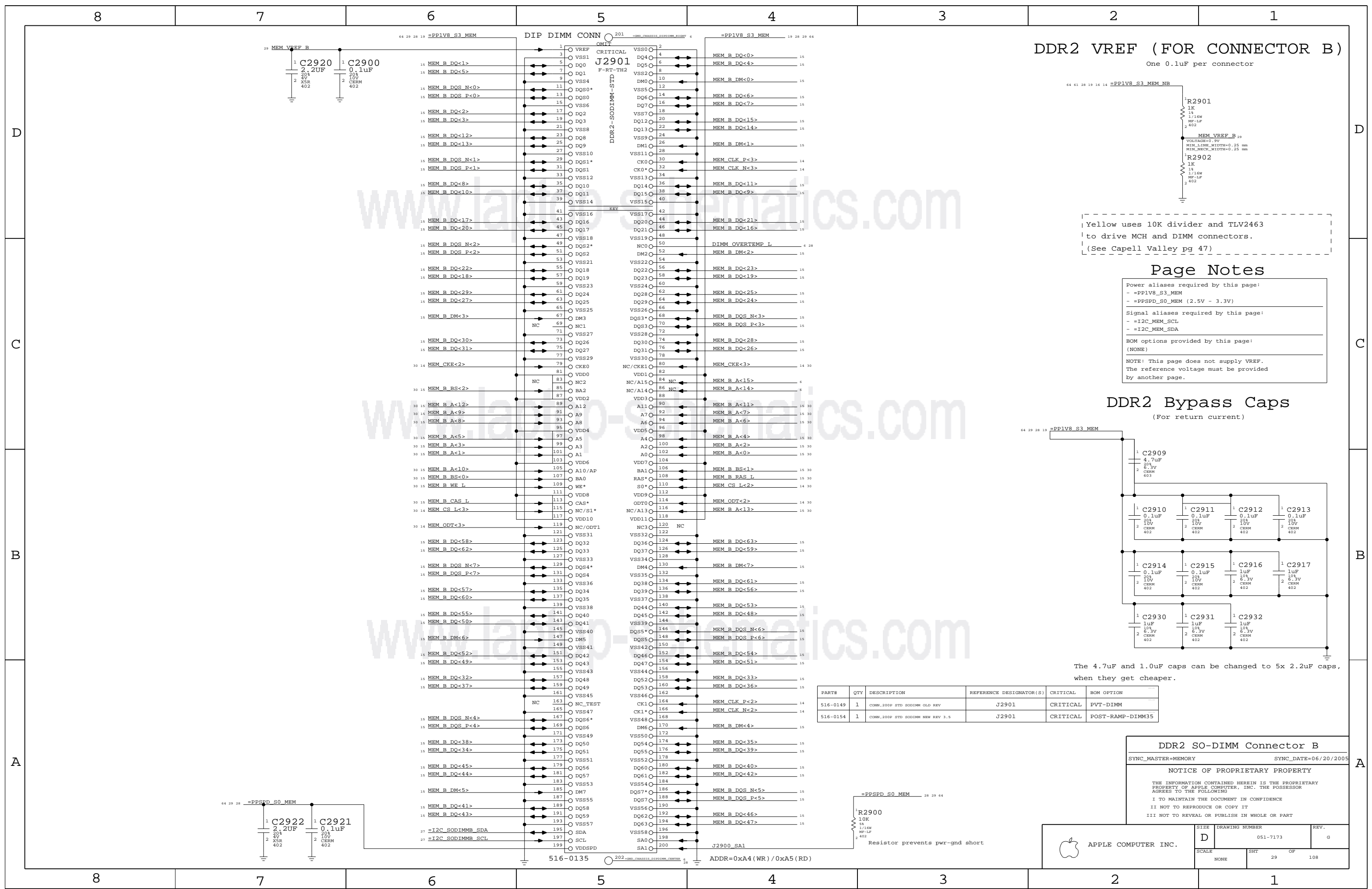
The 4.7uF and 1.0uF caps can be changed to 5x 2.2uF caps, when they get cheaper.

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
516-0149	1	CONN,200P STD SODIMM OLD REV	J2801	CRITICAL	PVT-DIMM
516-0154	1	CONN,200P STD SODIMM NEW REV 3.5	J2801	CRITICAL	POST-RAMP-DIMM35

DDR2 SO-DIMM Connector A  
SYNC\_MASTER=MEMORY SYNC\_DATE=06/20/2005  
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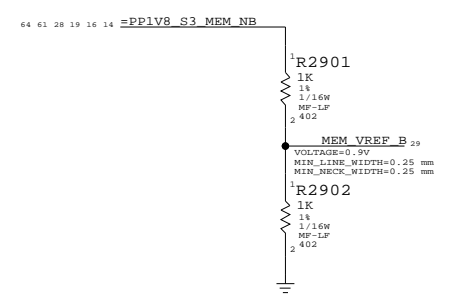
APPLE COMPUTER INC.	SCALE	DRAWING NUMBER	REV.
	NONE	D 051-7173	G
	SHT	OF	
	28	108	

ADDR=0xA0 (WR) / 0xA1 (RD)



### DDR2 VREF (FOR CONNECTOR B)

One 0.1uF per connector

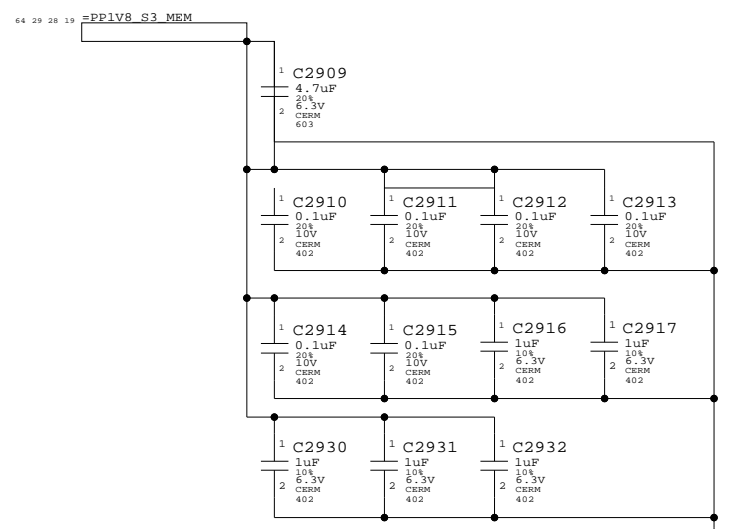


Yellow uses 10K divider and TLV2463 to drive MCH and DIMM connectors.  
(See Capell Valley pg 47)

### Page Notes

- Power aliases required by this page:
    - =PPIV8\_S3\_MEM
    - =PPSPD\_S0\_MEM (2.5V - 3.3V)
  - Signal aliases required by this page:
    - =I2C\_MEM\_SCL
    - =I2C\_MEM\_SDA
  - BOM options provided by this page:
    - (NONE)
- NOTE: This page does not supply VREF. The reference voltage must be provided by another page.

### DDR2 Bypass Caps (For return current)



The 4.7uF and 1.0uF caps can be changed to 5x 2.2uF caps, when they get cheaper.

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
516-0149	1	CONN,200P STD SODIMM OLD REV	J2901	CRITICAL	PVT-DIMM
516-0154	1	CONN,200P STD SODIMM NEW REV 1.5	J2901	CRITICAL	POST-RAMP-DIMM35

### DDR2 SO-DIMM Connector B

SYNC\_MASTER=MEMORY SYNC\_DATE=06/20/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	
NONE	29	108	

8

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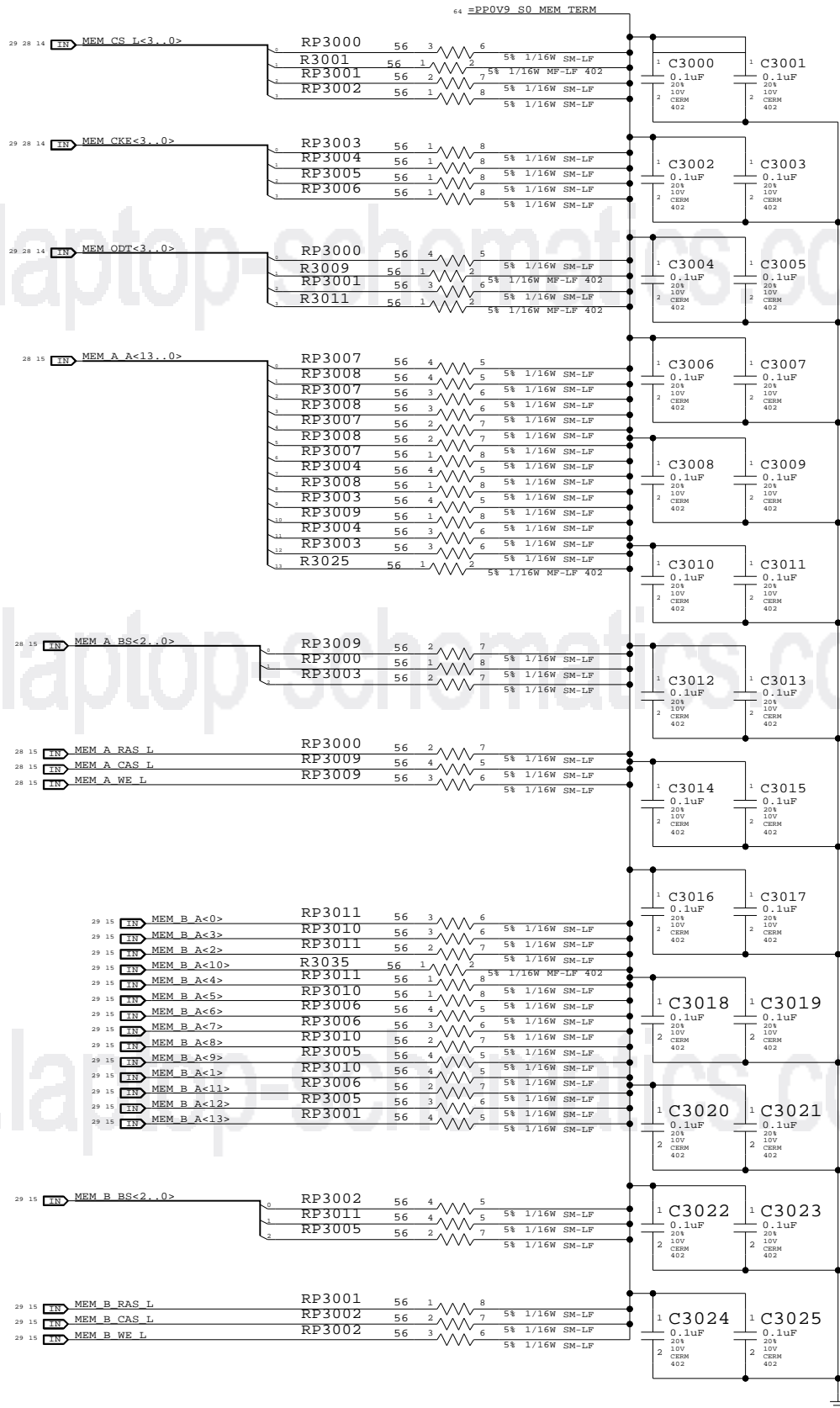
4

3

2

1

One cap for each side of every RPAK, one cap for every two discrete resistors  
BOMOPTION shown at the top of each group applies to every part below it



LAYOUT NOTE: PLACE ONE CAP CLOSE TO EVERY TWO PULLUP RESISTORS TERMINATED TO PP0V9\_S0\_MEM\_TERM

Memory Active Termination

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APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-7173	G
SCALE	SHT	OF
NONE	30	108

8

7

6

5

4

3

2

1

Page Notes

Power aliases required by this page:  
 - =PP5V\_S0\_MEMVTT  
 - =PP1V8\_S0\_MEMVTT  
 - =PP0V9\_S0\_MEMVTT\_LDO

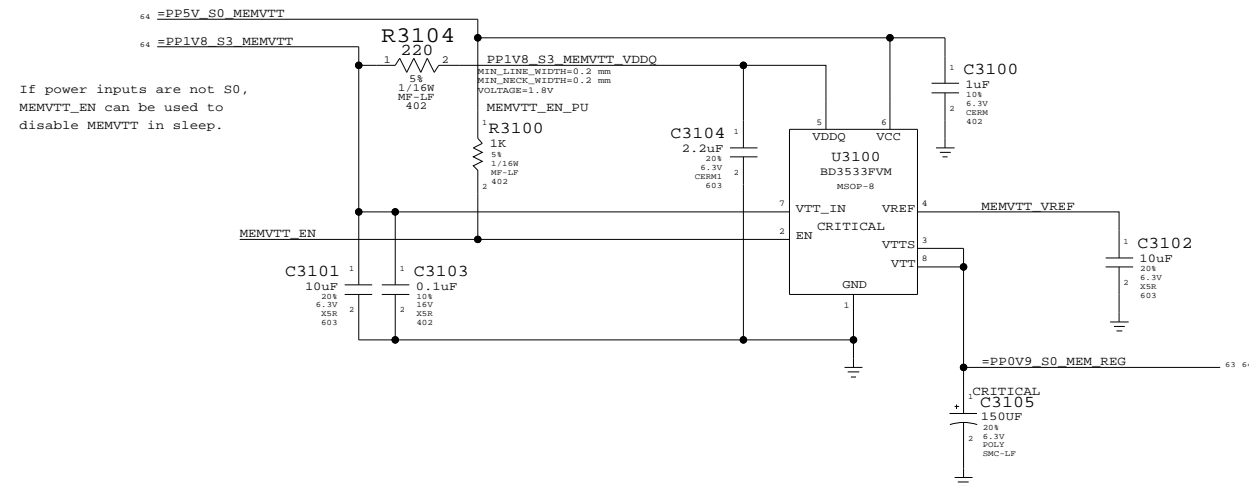
---

Signal aliases required by this page:  
 (NONE)

---

BOM options provided by this page:  
 (NONE)

DDR2 Vtt Regulator



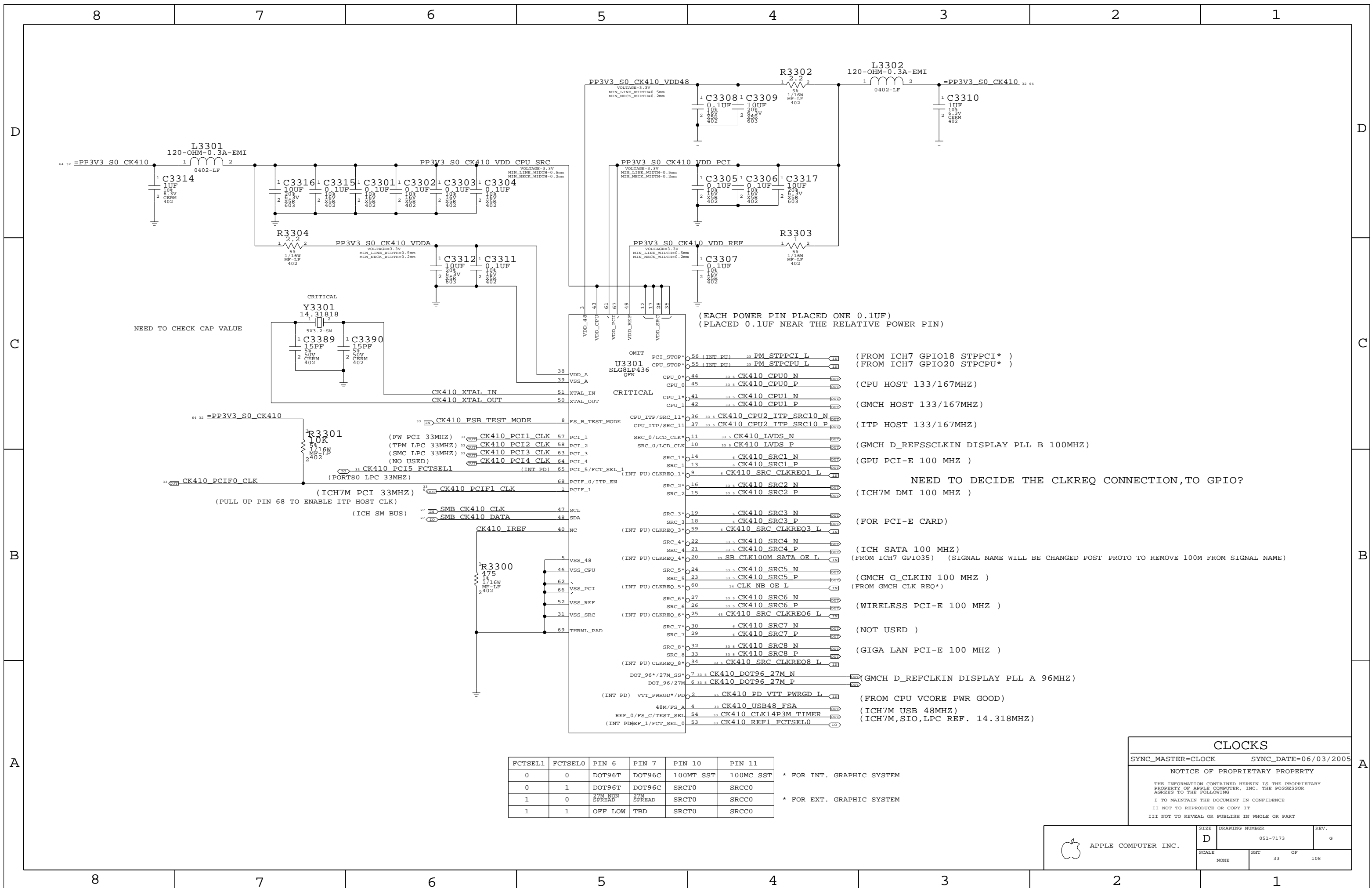
Memory Vtt Supply

SYNC\_MASTER=(MASTER) SYNC\_DATE=(MASTER)

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	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	31	108	



NEED TO CHECK CAP VALUE

(EACH POWER PIN PLACED ONE 0.1UF)  
(PLACED 0.1UF NEAR THE RELATIVE POWER PIN)

(FROM ICH7 GPIO18 STPPCI\* )  
(FROM ICH7 GPIO20 STPCPU\* )

(CPU HOST 133/167MHZ)

(GMCH HOST 133/167MHZ)

(ITP HOST 133/167MHZ)

(GMCH D\_REFSSCLKIN DISPLAY PLL B 100MHZ)

(GPU PCI-E 100 MHZ )

NEED TO DECIDE THE CLKREQ CONNECTION, TO GPIO?

(ICH7M DMI 100 MHZ )

(FOR PCI-E CARD)

(ICH SATA 100 MHZ)  
(FROM ICH7 GPIO35) (SIGNAL NAME WILL BE CHANGED POST PROTO TO REMOVE 100M FROM SIGNAL NAME)

(GMCH G\_CLKIN 100 MHZ )  
(FROM GMCH CLK\_REQ\*)

(WIRELESS PCI-E 100 MHZ )

(NOT USED )

(GIGA LAN PCI-E 100 MHZ )

(GMCH D\_REFCLKIN DISPLAY PLL A 96MHZ)

(FROM CPU VCORE PWR GOOD)

(ICH7M USB 48MHZ)  
(ICH7M,SIO,LPC REF. 14.318MHZ)

FCTSEL1	FCTSELO	PIN 6	PIN 7	PIN 10	PIN 11
0	0	DOT96T	DOT96C	100MT_SST	100MC_SST
0	1	DOT96T	DOT96C	SRCT0	SRCC0
1	0	27M NON SPREAD	27M SPREAD	SRCT0	SRCC0
1	1	OFF LOW	TBD	SRCT0	SRCC0

\* FOR INT. GRAPHIC SYSTEM

\* FOR EXT. GRAPHIC SYSTEM

**CLOCKS**

SYNC\_MASTER=CLOCK      SYNC\_DATE=06/03/2005

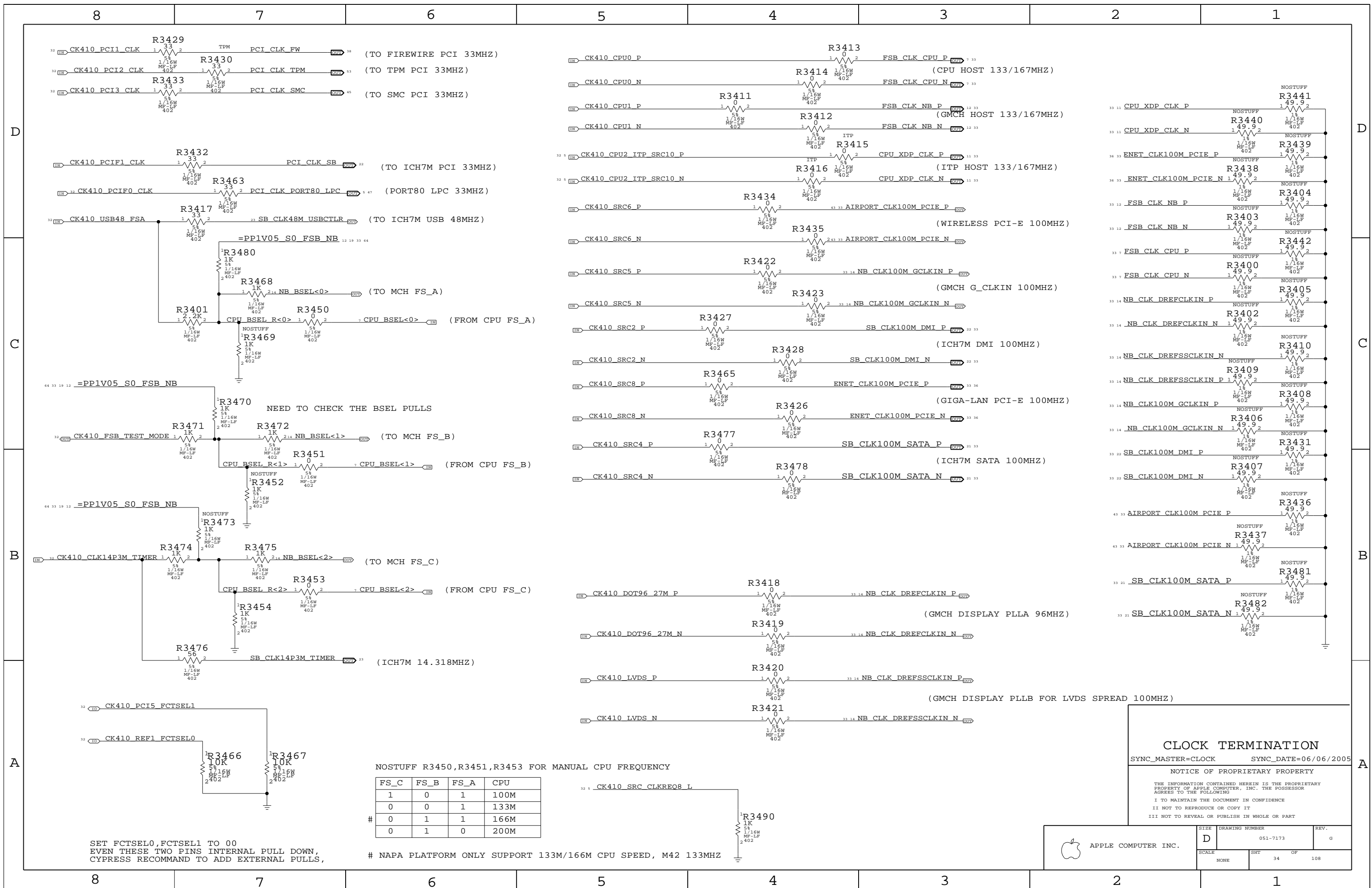
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	DRAWING NUMBER		REV.
	D	051-7173	G
SCALE		SHT	OF
NONE		33	108





NOSTUFF R3450, R3451, R3453 FOR MANUAL CPU FREQUENCY

FS_C	FS_B	FS_A	CPU
1	0	1	100M
0	0	1	133M
0	1	1	166M
0	1	0	200M

# NAPA PLATFORM ONLY SUPPORT 133M/166M CPU SPEED, M42 133MHZ

SET FCTSEL0, FCTSEL1 TO 00  
EVEN THESE TWO PINS INTERNAL PULL DOWN,  
CYPRESS RECOMMAND TO ADD EXTERNAL PULLS,

### CLOCK TERMINATION

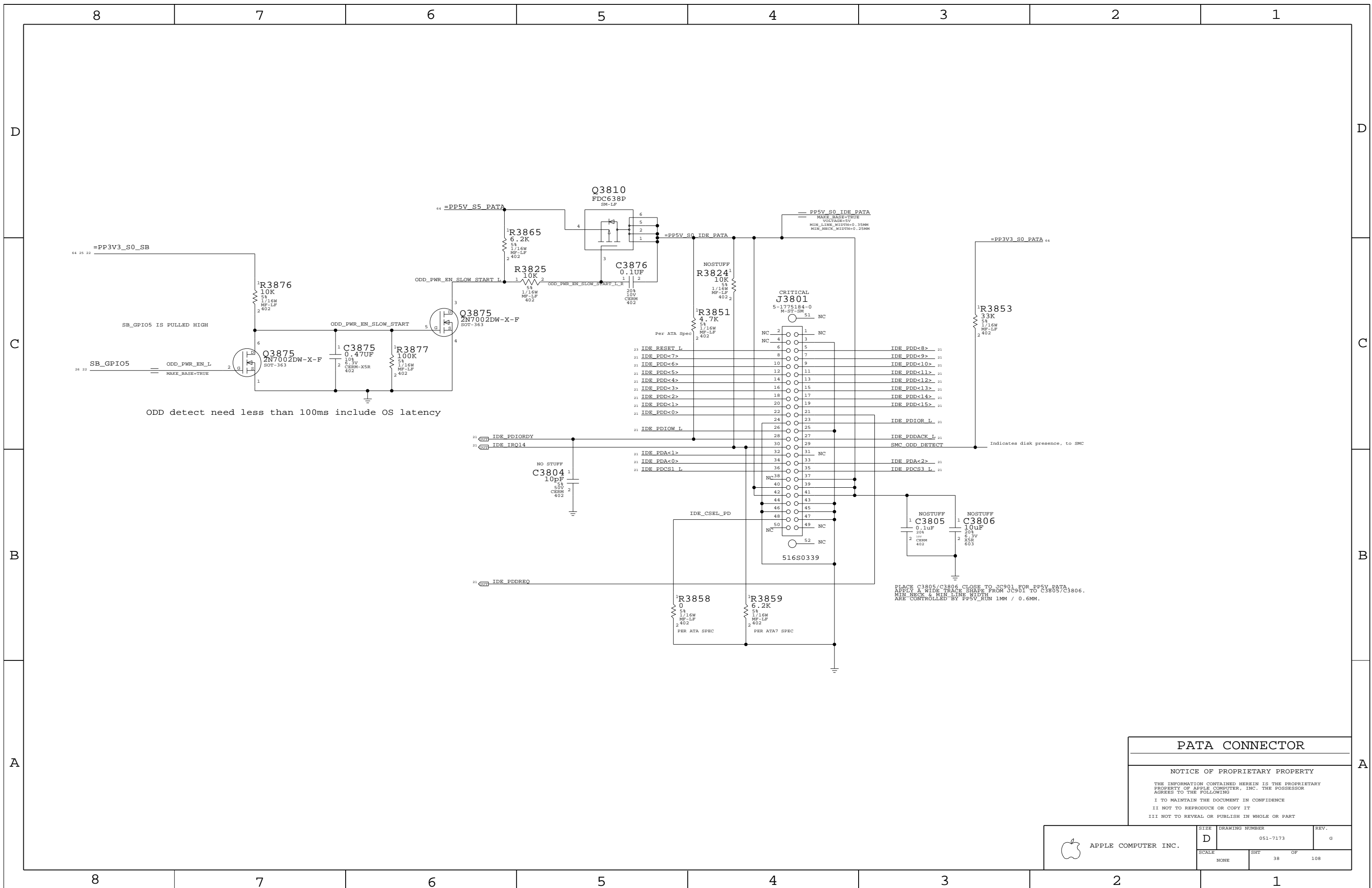
SYNC\_MASTER=CLOCK SYNC\_DATE=06/06/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	34		



**PATA CONNECTOR**

---

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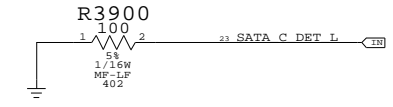
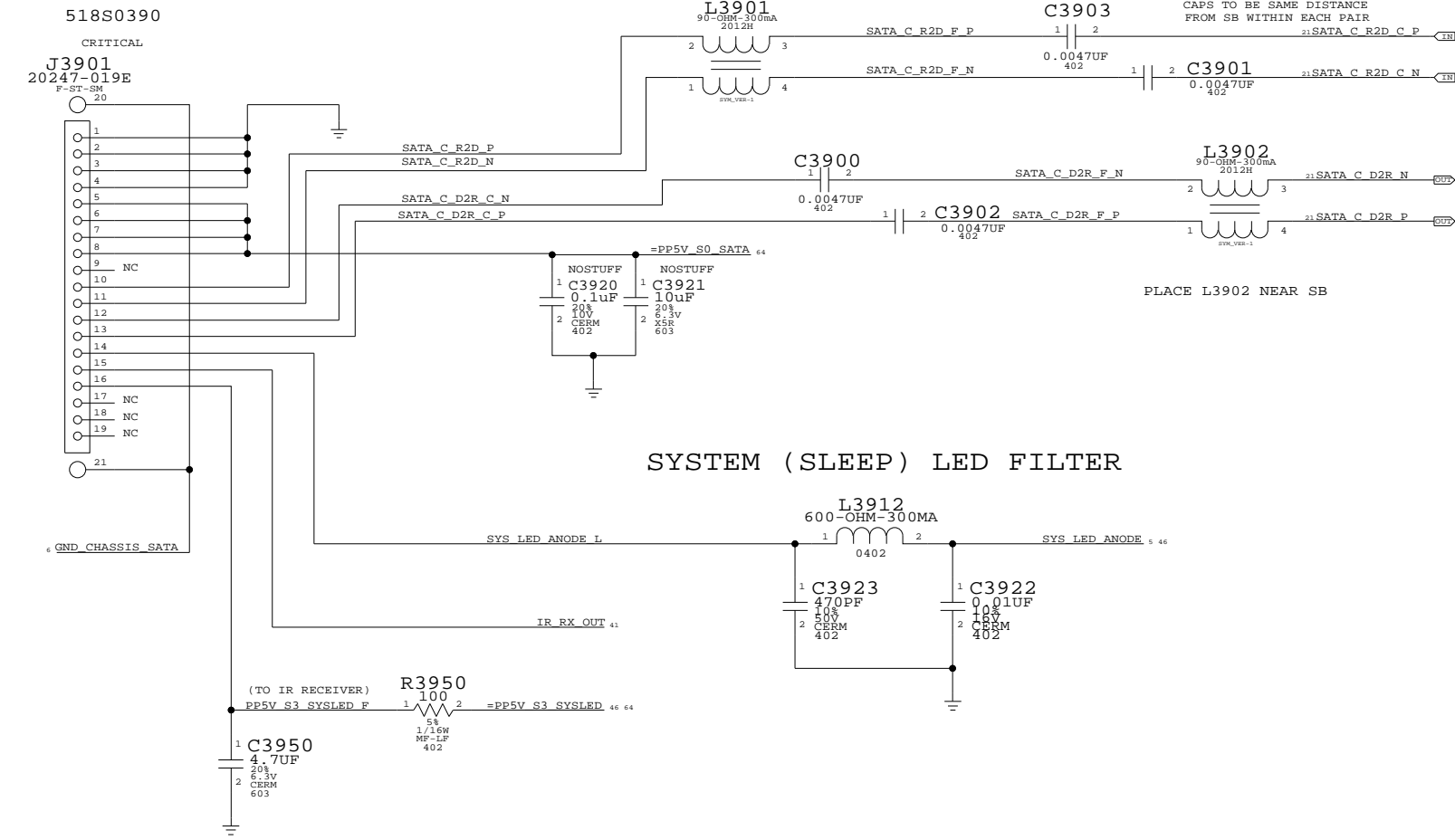
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II NOT TO REPRODUCE OR COPY IT

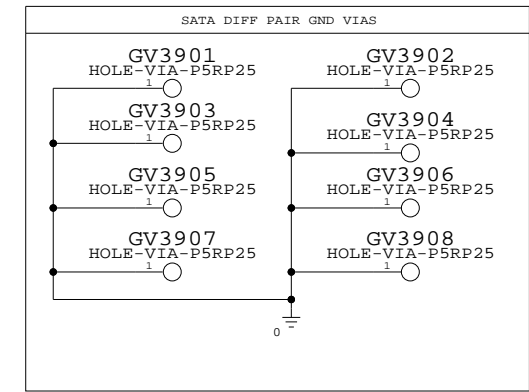
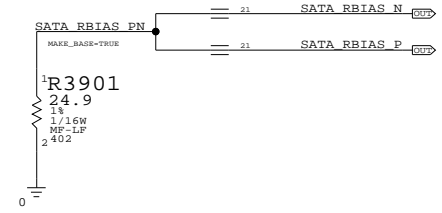
III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

APPLE COMPUTER INC.	SIZE <b>D</b>	DRAWING NUMBER 051-7173	REV. G
	SCALE NONE	SHEET 38	OF 108

SATA CONNECTOR



PLACE NEAR ICH7 PIN



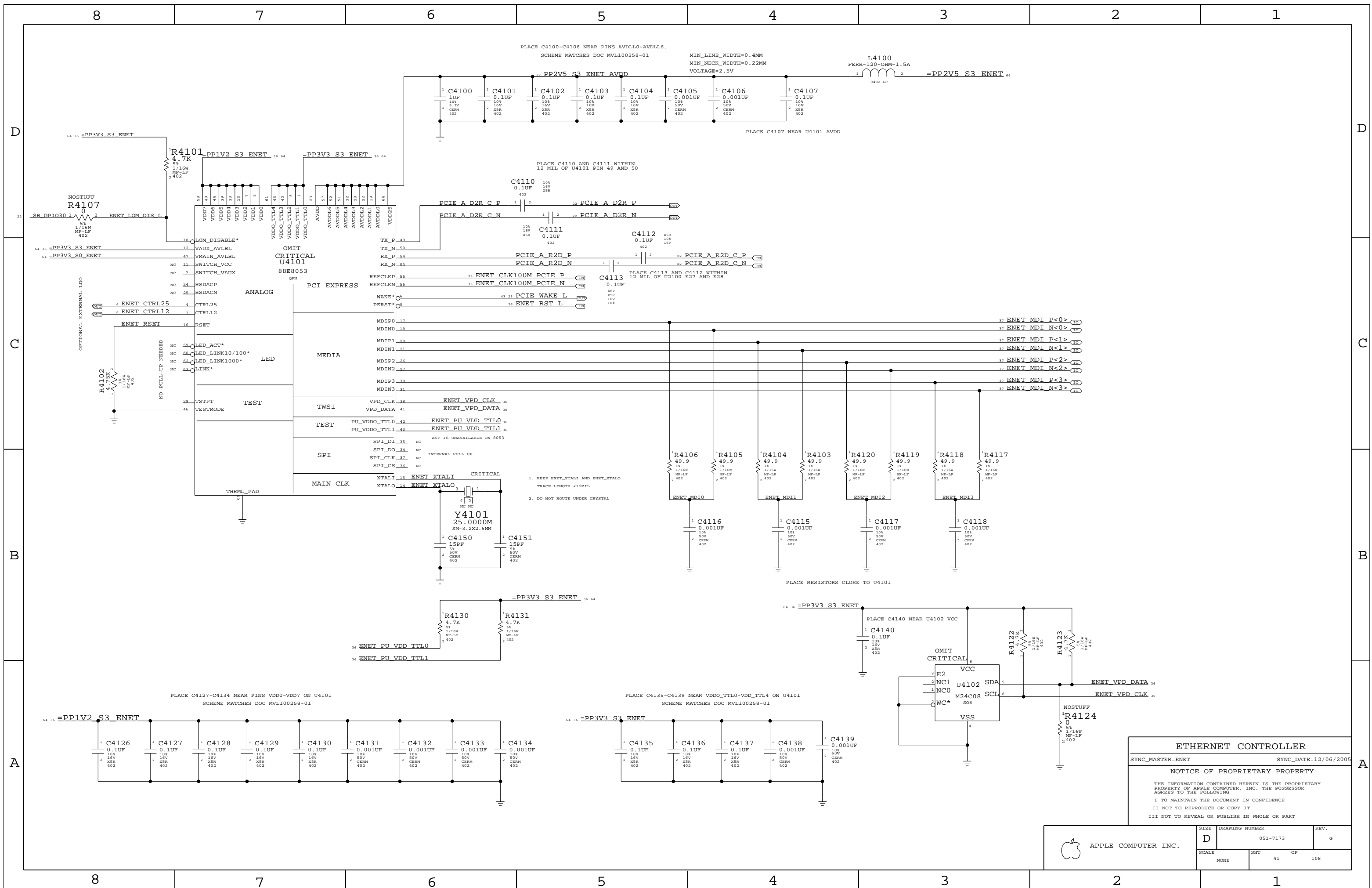
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
155S0227	155S0164	?	L3901, L3902	KEEP MAG. LAYER IN BOM

SATA CONNECTOR

NOTICE OF PROPRIETARY PROPERTY

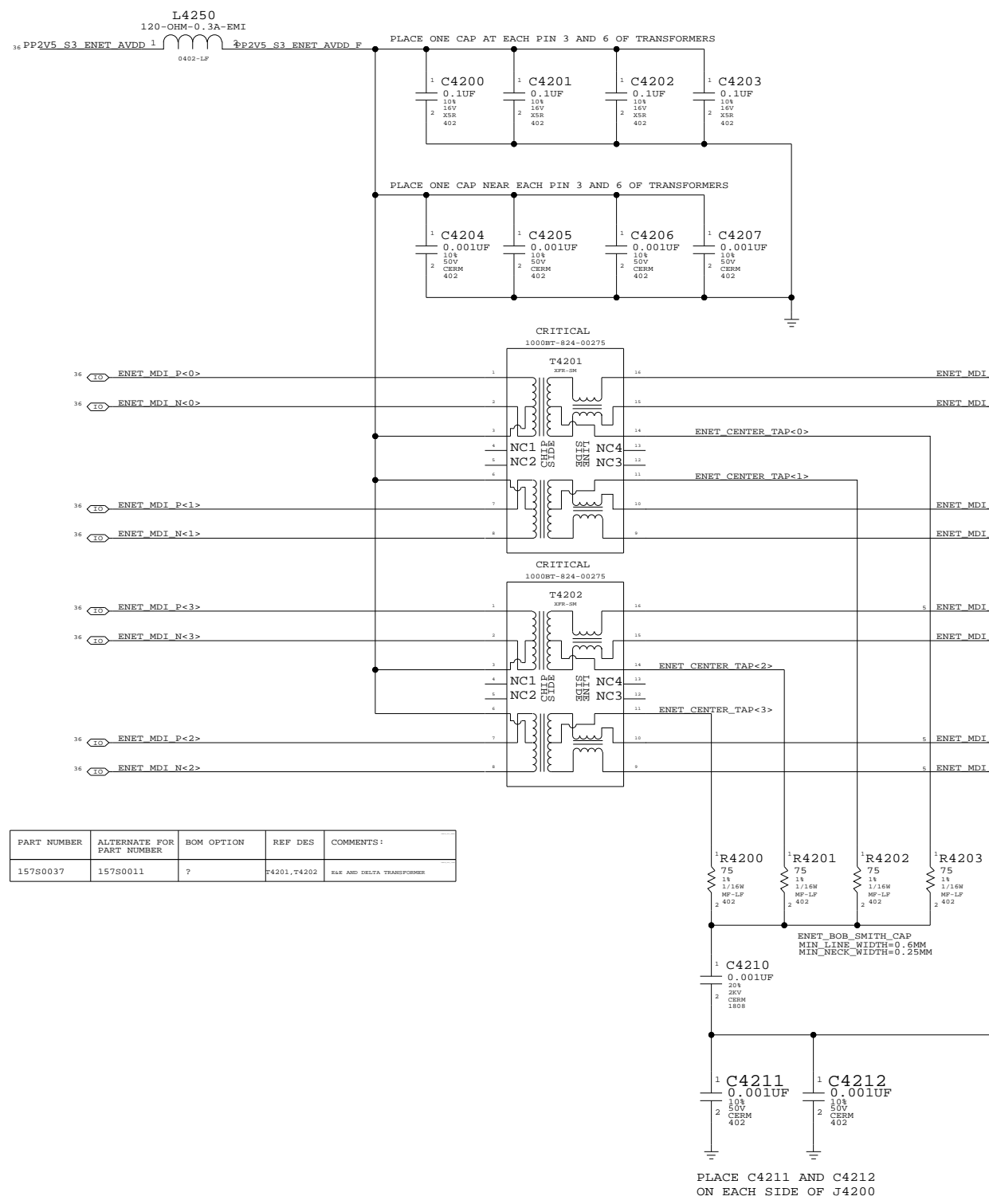
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT OF		
NONE	39 OF		108

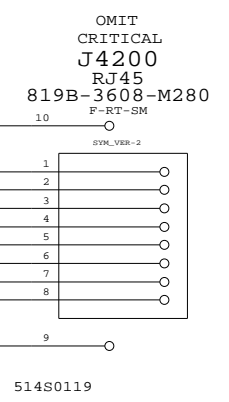


8 7 6 5 4 3 2 1

D  
C  
B  
A



CROSS-OVERS ARE IN SCHEMATIC TO EASE ROUTING



PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
157S0037	157S0011	?	R4201, T4202	SEE AND DELTA TRANSFORMER

PLACE C4211 AND C4212 ON EACH SIDE OF J4200

ETHERNET CONNECTOR  
 SYNC\_MASTER=ENET SYNC\_DATE=11/14/2005  
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PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
514S0143	1	CONN, SP RJ-45 JACK, MIDPLANE, M3, LF	J4200	CRITICAL	NORMAL
514S0144	1	CONN, SP RJ-45 JACK, MIDPLANE, BLACK, LF	J4200	CRITICAL	FANCY

APPLE COMPUTER INC.

SIZE D	DRAWING NUMBER 051-7173	REV. G
SCALE NONE	SHT 42	OF 108

8 7 6 5 4 3 2 1

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\_PCO - 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 (PER ARCHITECTURAL DEFINITION)
6/21/2005 - CHANGED PCI\_ID TO AD19 (PER ARCHITECTURAL DEFINITION)
6/21/2005 - CHANGED REQ3/GNT TO REQ3/GNT1 (PER ARCHITECTURAL DEFINITION)
6/22/2005 - ADDED 510K PULL-DOWN ON RST\* AND REMOVED CONNECTION TO PLT\_RST\_L
6/22/2005 - CHANGED CLK\_PME DIFF PAIR NAMES TO BE RE-USE COMPLIANT
6/22/2005 - REMOVED CONSTRAINT SETS AS THEY WILL BE MANAGED ON BOARD SIDE
6/22/2005 - CHANGED CLK\_PME DIFF PAIR NAMES TO BE RE-USE COMPLIANT
6/22/2005 - REMOVED C4421 - REDUNDANT
6/22/2005 - BRING OUT PCO CONNECTION TO BE CONNECTED ON PORT PAGE
7/26/2005 - CONNECTED PIN E10 TO GND

MOBILE TURNS OFF CONTROLLER POWER DURING SLEEP
0.001A DURING SLEEP

D

D

C

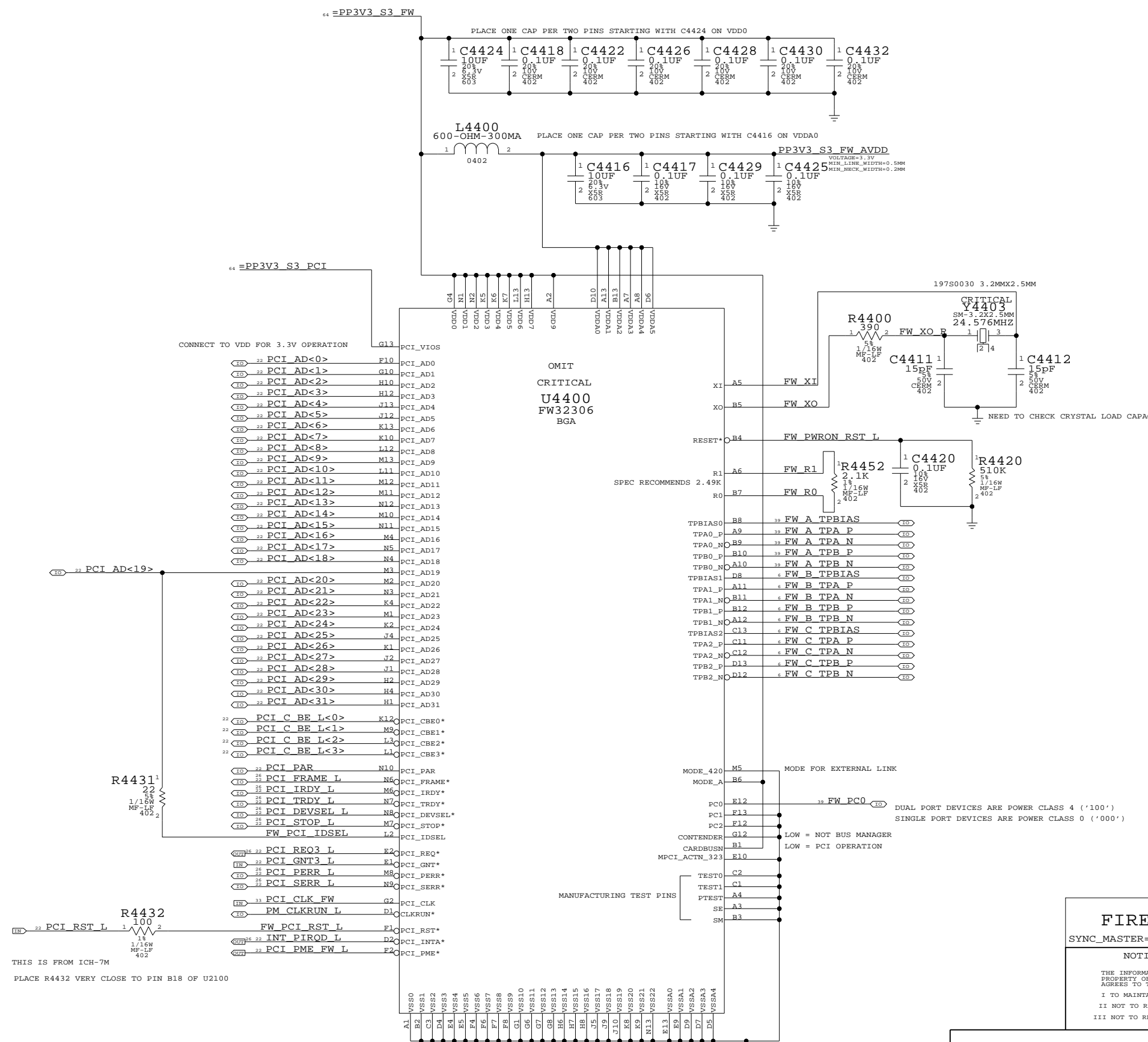
C

B

B

A

A



THIS IS FROM ICH-7M
PLACE R4432 VERY CLOSE TO PIN B18 OF U2100

FIREWIRE CONTROLLER
SYNC\_MASTER=ENET SYNC\_DATE=08/30/2005

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Table with columns for Apple Computer Inc., Drawing Number (D 051-7173), Scale (NONE), Sheet (44), and Revision (G).

**Page Notes**

INPUT:  
 =PPBUS\_S5\_FWPWRSM - PORT POWER  
 =PP3V3\_S5\_FW - DIGITAL POWER  
 =GND\_CHASSIS\_FW\_PORT0 - CHASSIS GROUND  
 =FWPWR\_PWRON - ADDITIONAL POWER CONTROL

INPUT/OUTPUT:  
 FW\_TP0\_P/N, FW\_TP0\_P/N, FW\_TPBAS0 - FIREWIRE DIFF PAIRS

OUTPUT:  
 FW\_PCO - POWER CLASS IDENTIFIER (SINGLE PORT - TIE LOW)

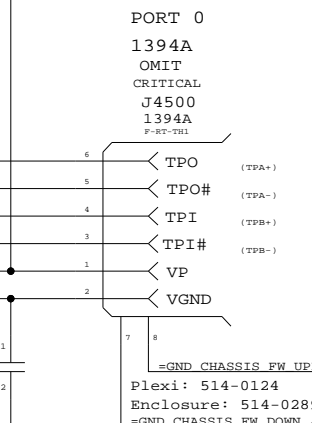
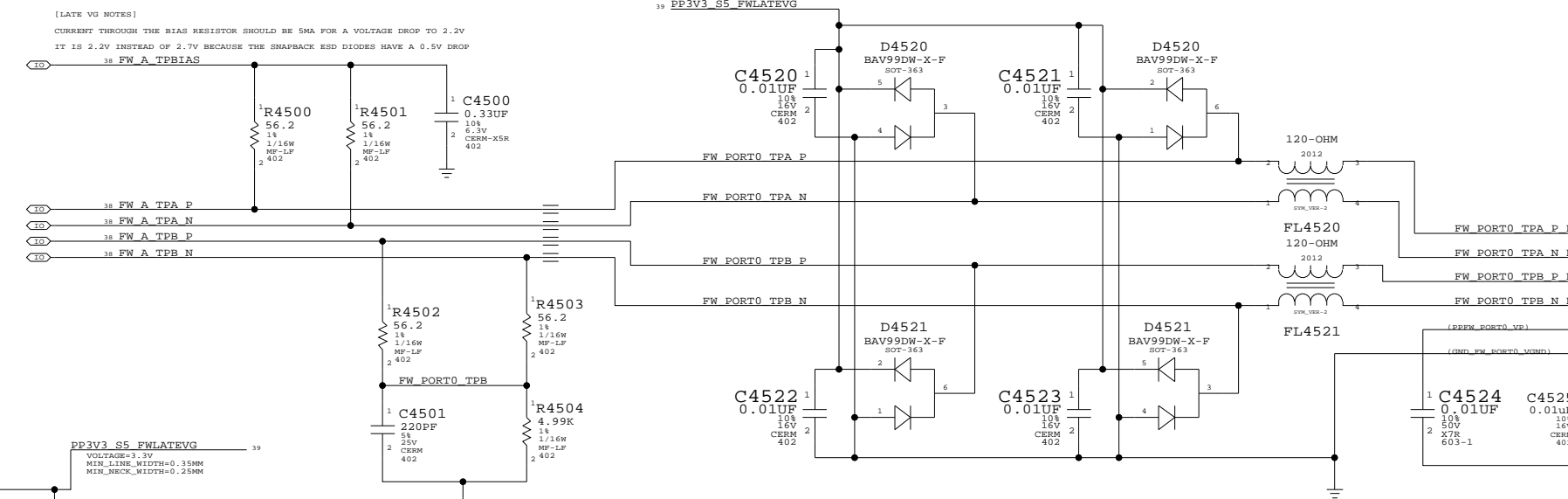
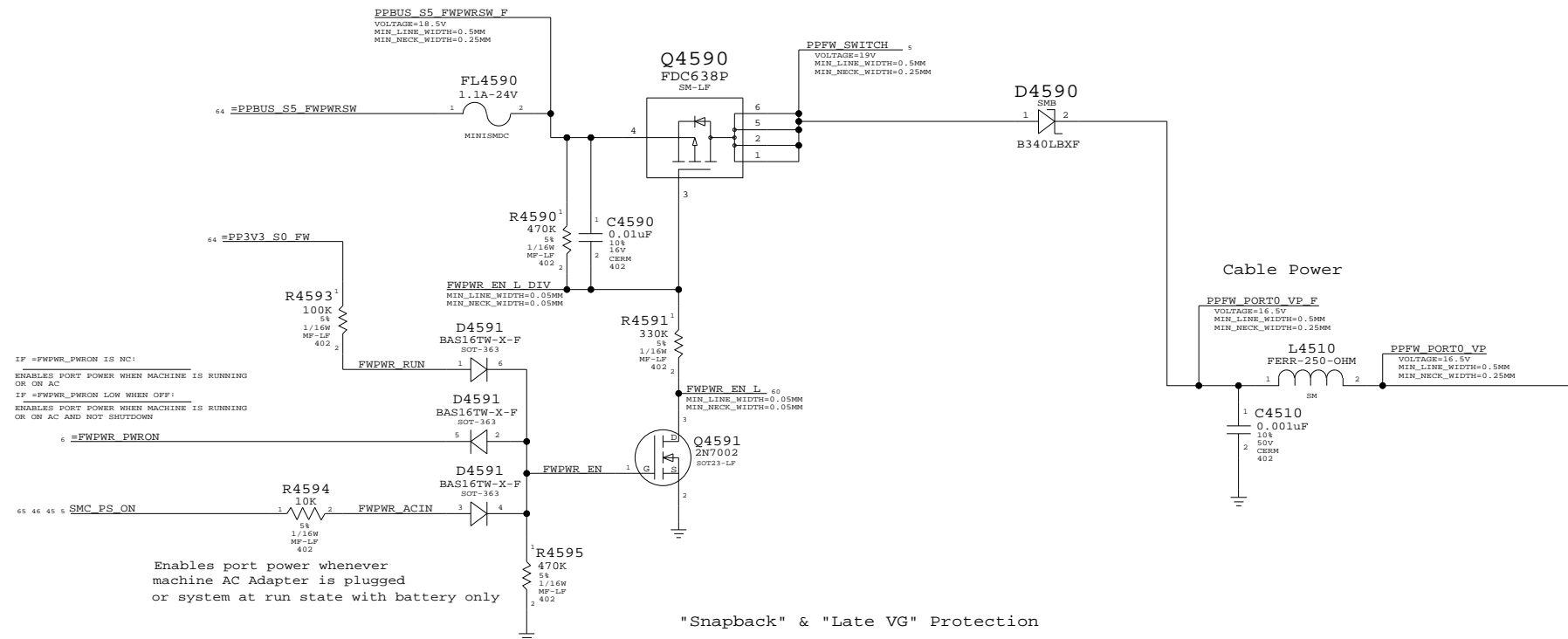
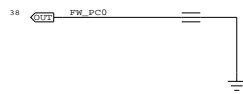
**PAGE HISTORY**

5/19/05 - INITIAL REVISION  
 6/22/05 - CHANGED DIFF PAIR NAMES TO MATCH REUSE  
 6/22/05 - REMOVED CONSTRAINTS BECAUSE USING ALLEGRO CONST MANAGER  
 6/22/05 - CONNECTED FW\_PCO FOR SINGLE PORT  
 7/26/05 - UPDATED LATE-VG POWER FAIL CIRCUIT FROM M1  
 7/26/05 - CHANGED CONNECTOR PORT NAMING TO PORT0  
 7/26/05 - SWITCHED TO 514-0124 FOR FIRE-PROTD CONNECTOR  
 7/26/05 - REMOVED R4520 - IT HASN'T BEEN STUFFED FOR MANY PRODUCTS  
 7/26/05 - CHANGED FL4590 TO 1.1A VERSION  
 7/26/05 - REMOVED ETHERNET LOW-POWER MODE CIRCUIT  
 7/26/05 - UPDATED SIGNAL NAMES FOR FW PORT POWER ENABLE

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

**PORT POWER CLASS**

0 FOR SINGLE PORT  
 1 FOR DUAL PORT



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
514-0359	1	CONN, 6P 1394A RCPT, MIDLANE, M3, LF	J4500	CRITICAL	NORMAL
514-0316	1	CONN, 6P 1394A RCPT, MIDLANE, BLACK, LF	J4500	CRITICAL	FANCY

**FIREWIRE PORT**

SYNC\_MASTER=ENET SYNC\_DATE=11/16/2005

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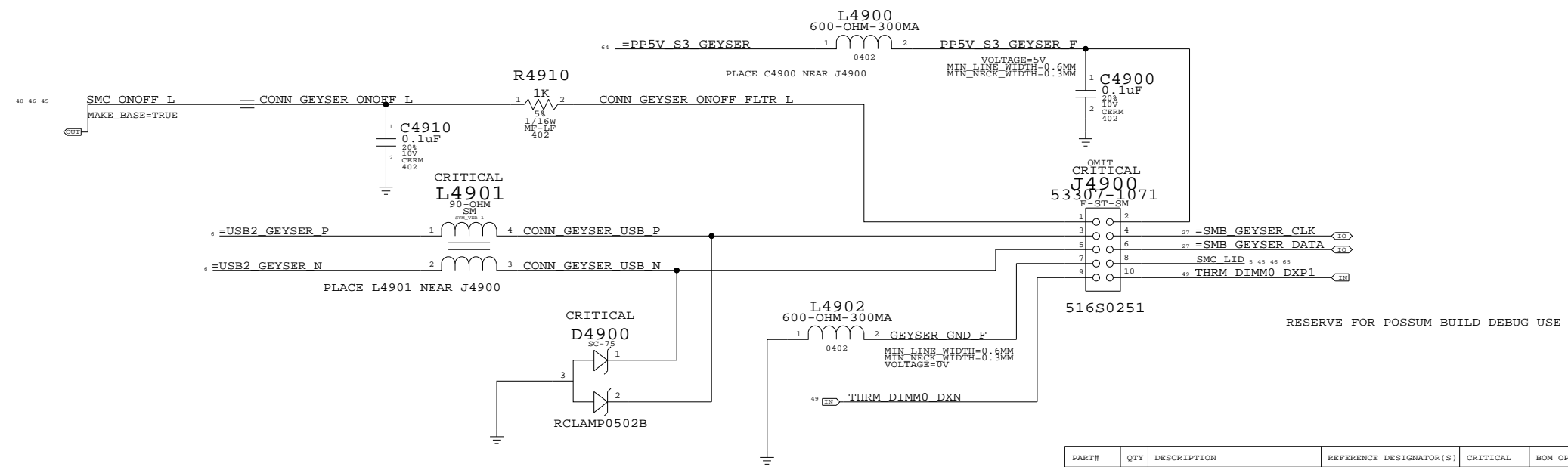
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APPLE COMPUTER INC.

SIZE: **D** DRAWING NUMBER: 051-7173 REV. G

SCALE: NONE SHEET: 45 OF 108

# GEYSER AND DIMMO REMOTE TEMP SENSORS



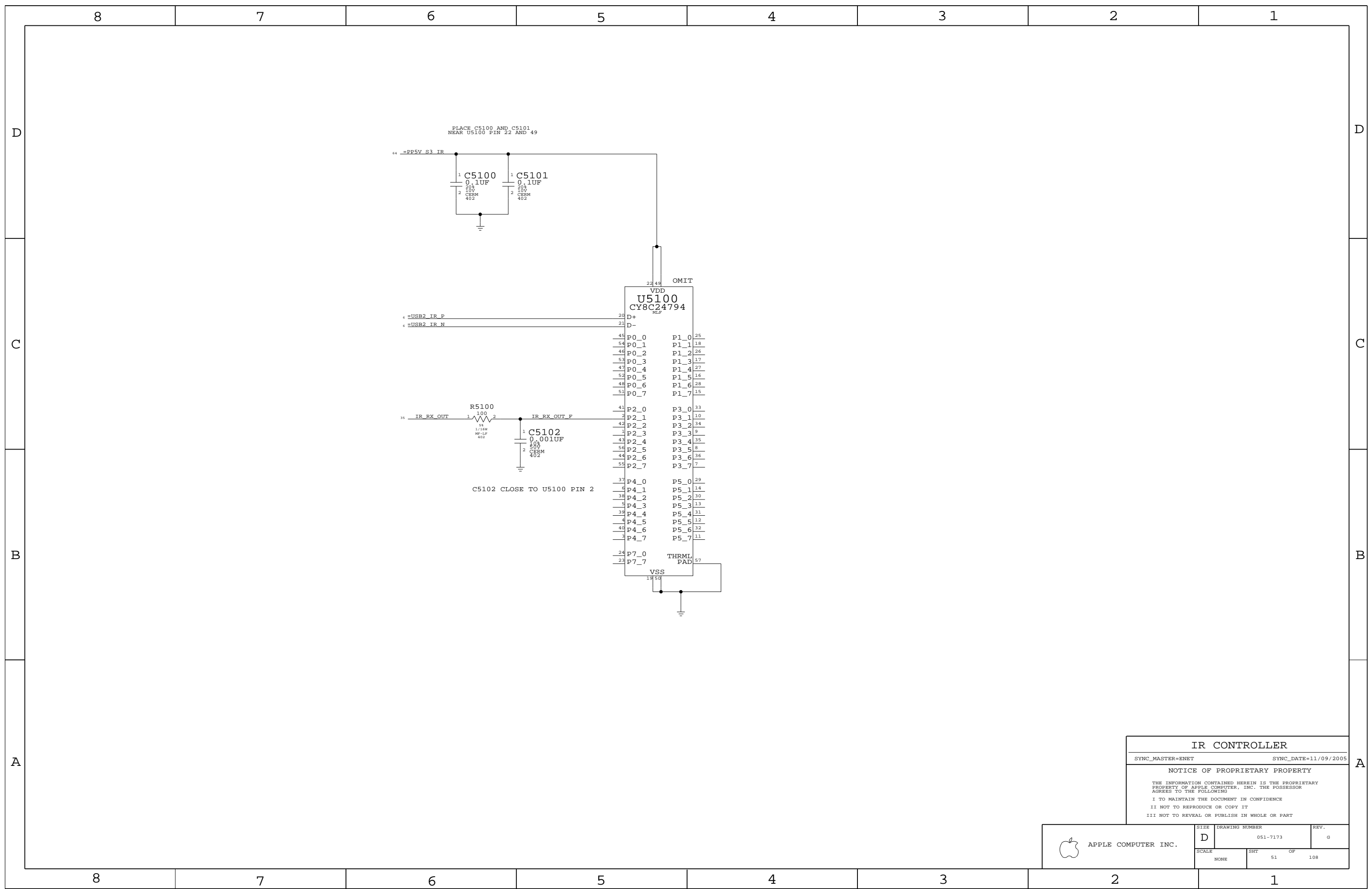
PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
516S0482	1	ACES 88646-1071-NS	J4900	CRITICAL	NORMAL
516S0482	1	ACES 88646-1071-NS	J4900	CRITICAL	FANCY

**CONNECTOR MISC**  
 SYNC\_MASTER=ENET      SYNC\_DATE=11/16/2005

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	SCALE NONE	SHEET 49	OF 108





**IR CONTROLLER**

SYNC\_MASTER=ENET SYNC\_DATE=11/09/2005

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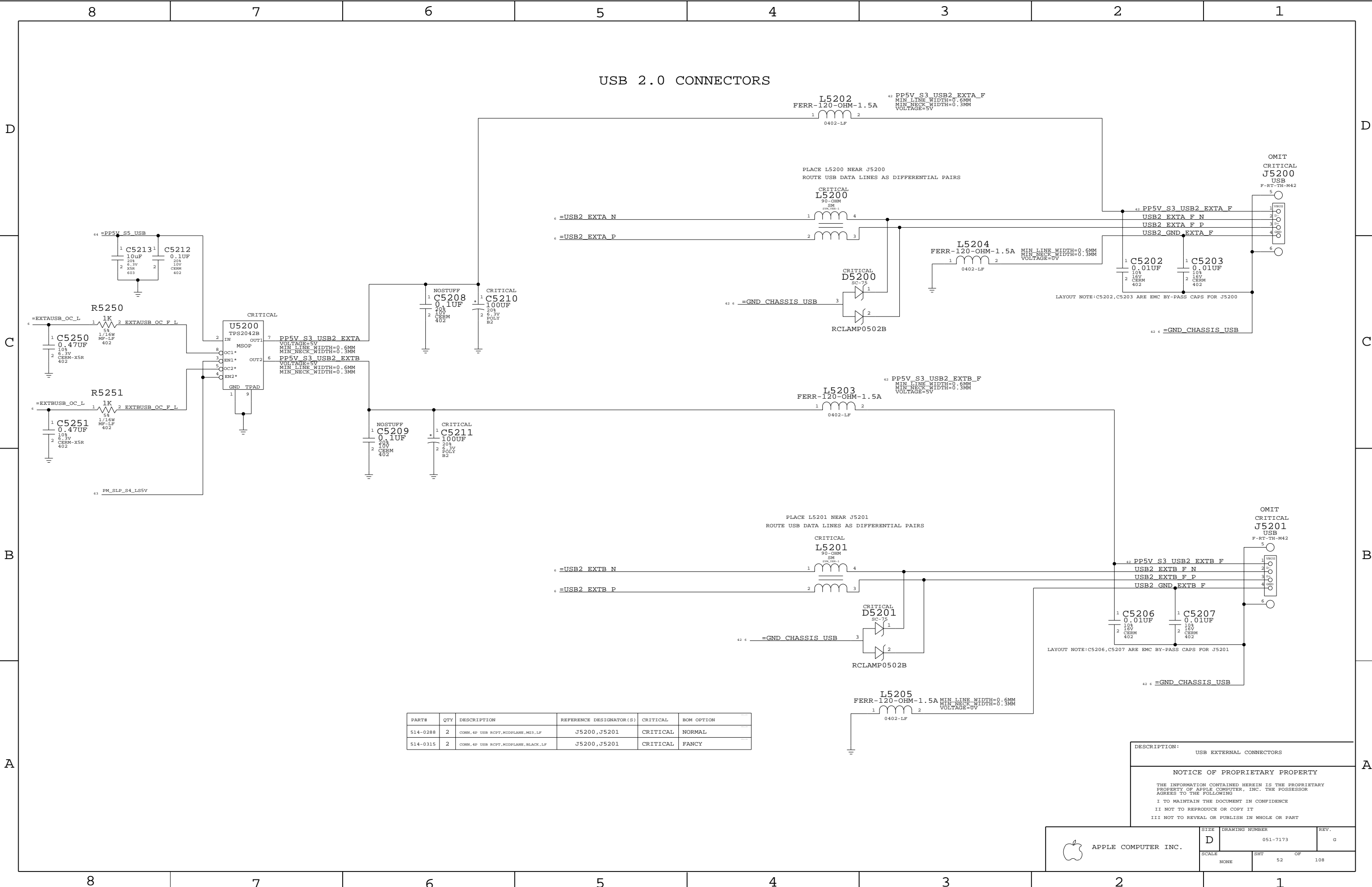
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APPLE COMPUTER INC.	SIZE <b>D</b>	DRAWING NUMBER 051-7173	REV. G
	SCALE NONE	SHEET 51	OF 108

# USB 2.0 CONNECTORS



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
514-0288	2	CONN, 4P USB RCPT, MIDPLANE, W3, LF	J5200, J5201	CRITICAL	NORMAL
514-0315	2	CONN, 4P USB RCPT, MIDPLANE, BLACK, LF	J5200, J5201	CRITICAL	FANCY

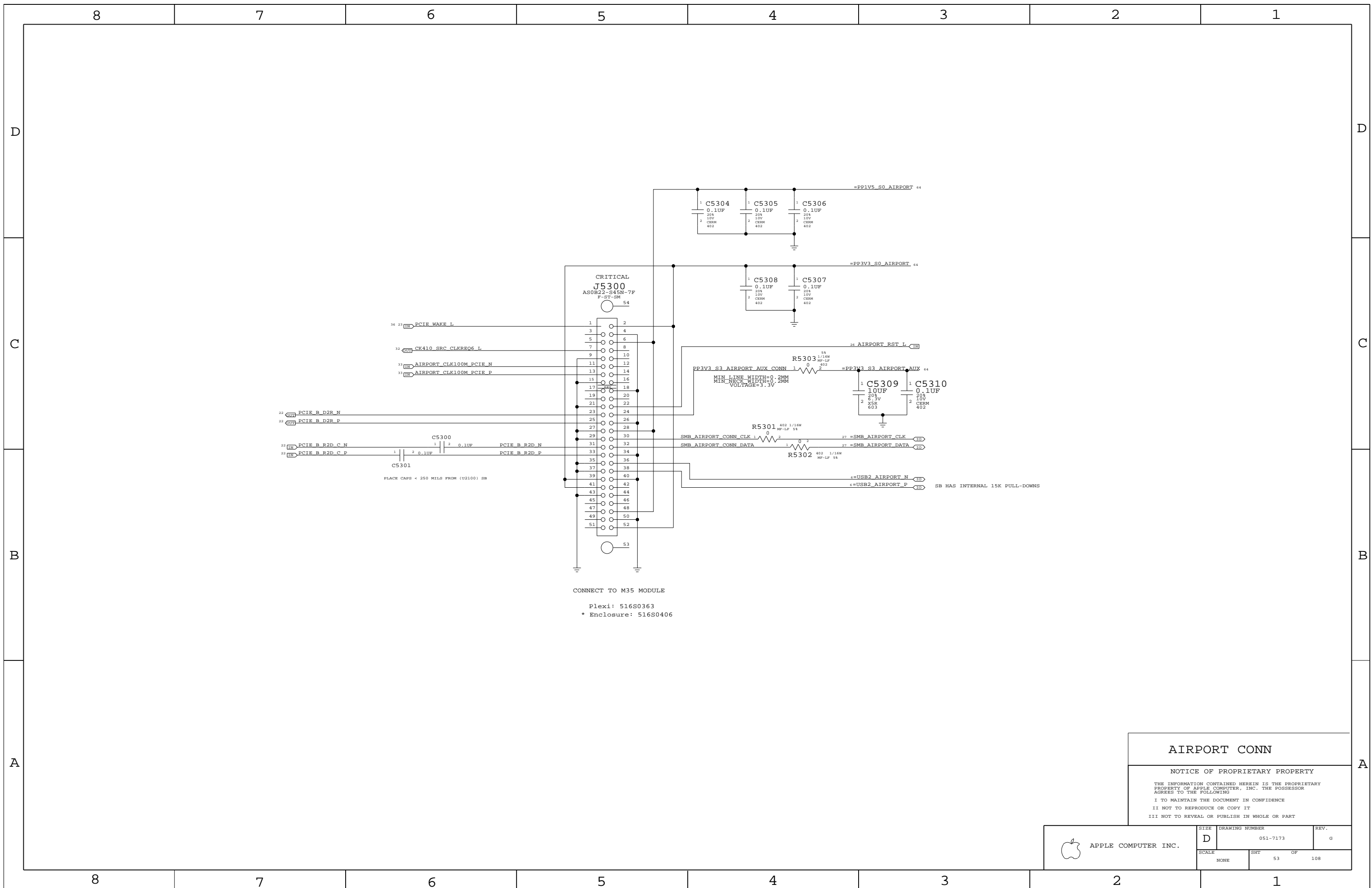
DESCRIPTION:  
USB EXTERNAL CONNECTORS

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	52	108	

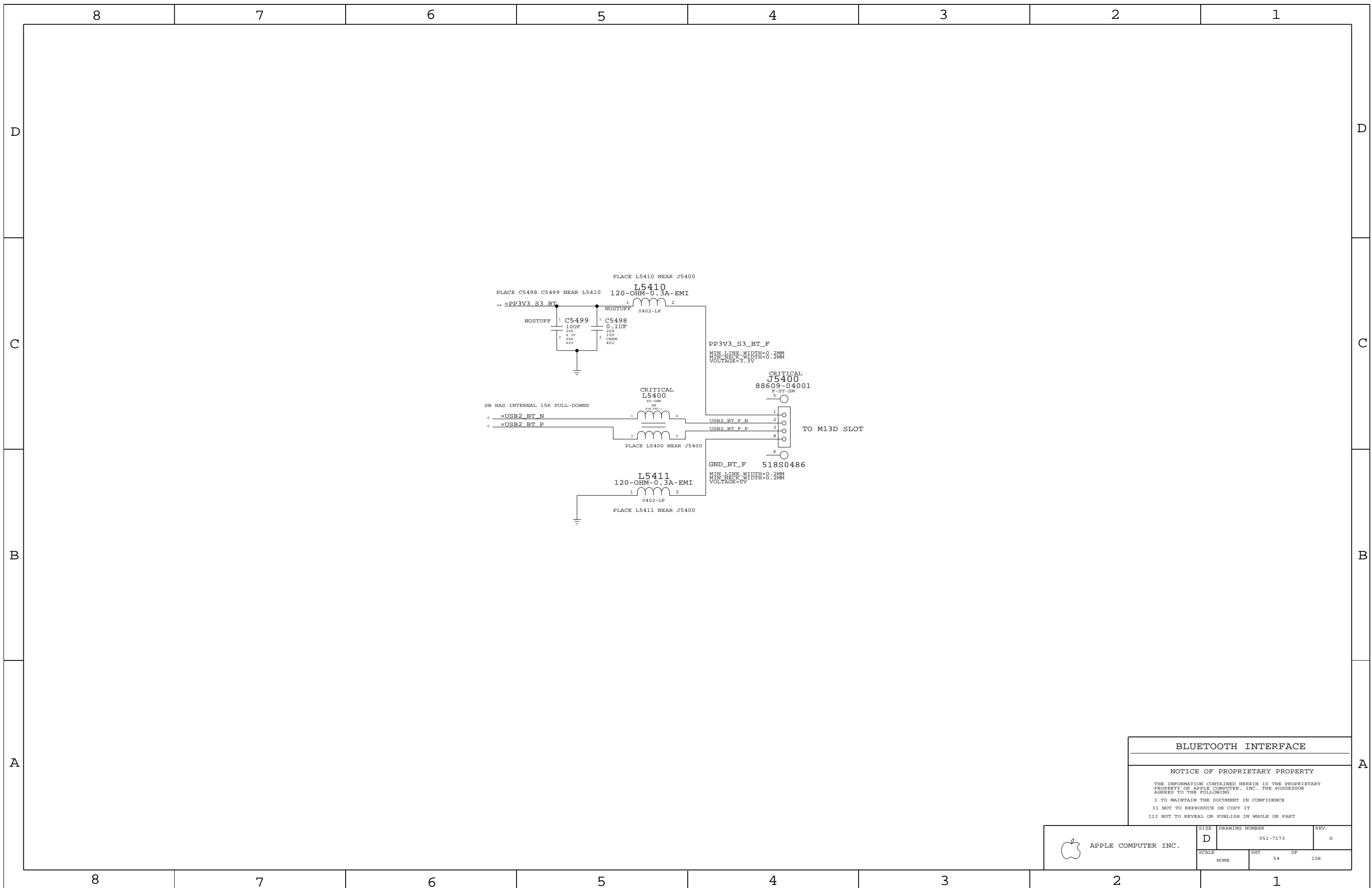


AIRPORT CONN

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	53	108	



BLUETOOTH INTERFACE

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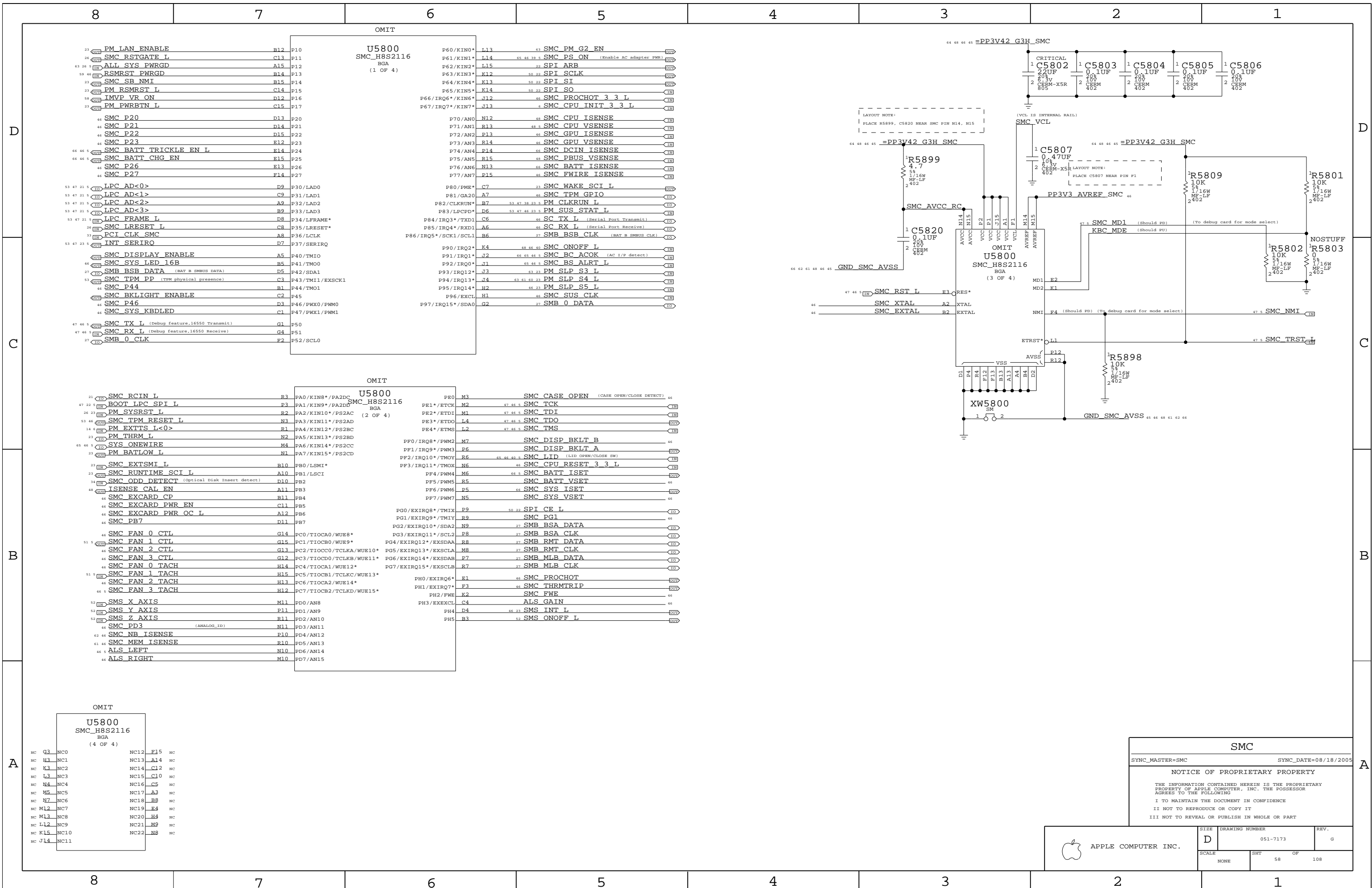
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	
NONE	54	108	



SMC

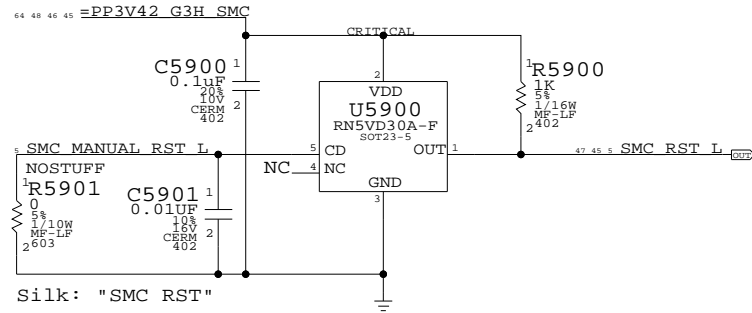
SYNC\_MASTER=SMC SYNC\_DATE=08/18/2005

NOTICE OF PROPRIETARY PROPERTY

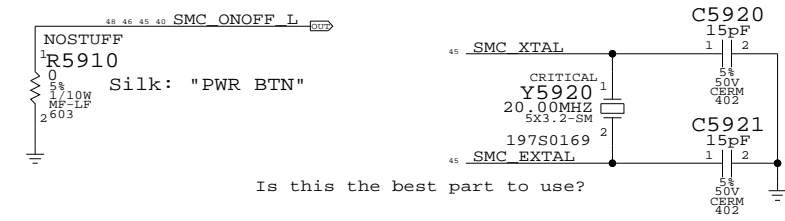
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	58		

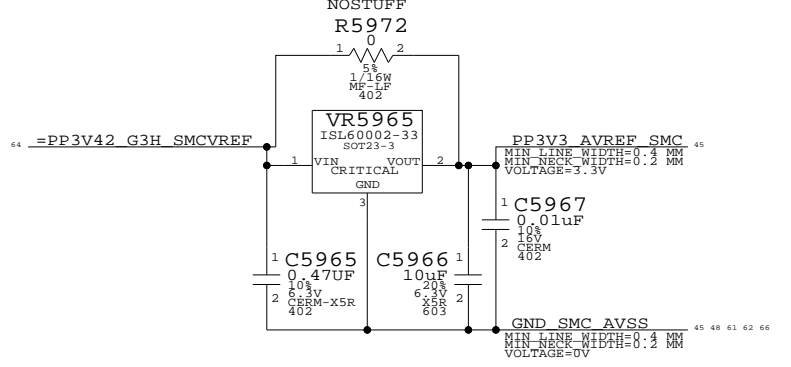
SMC Reset Button / Brownout Detect



Debug Power Button SMC Crystal Circuit

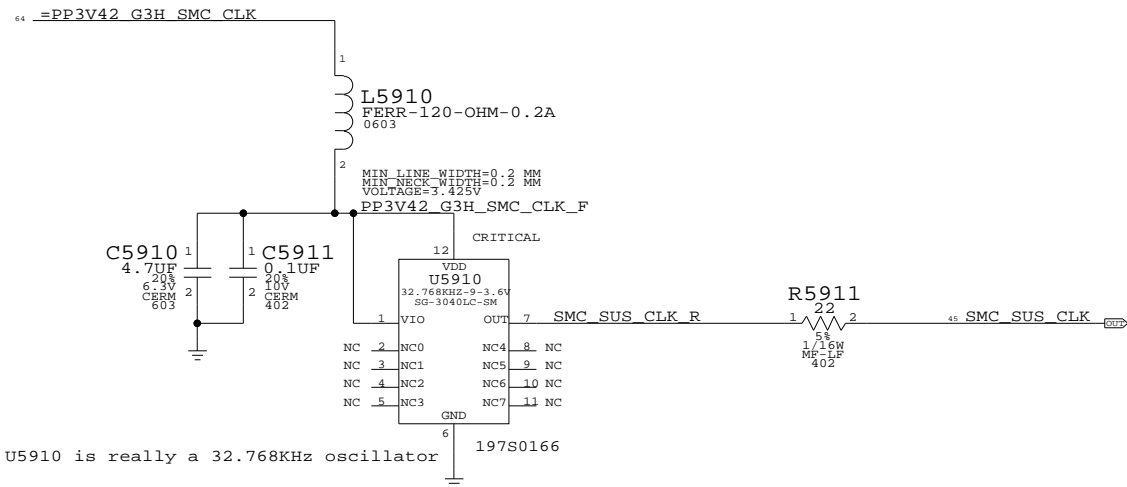


SMC AVREF Supply



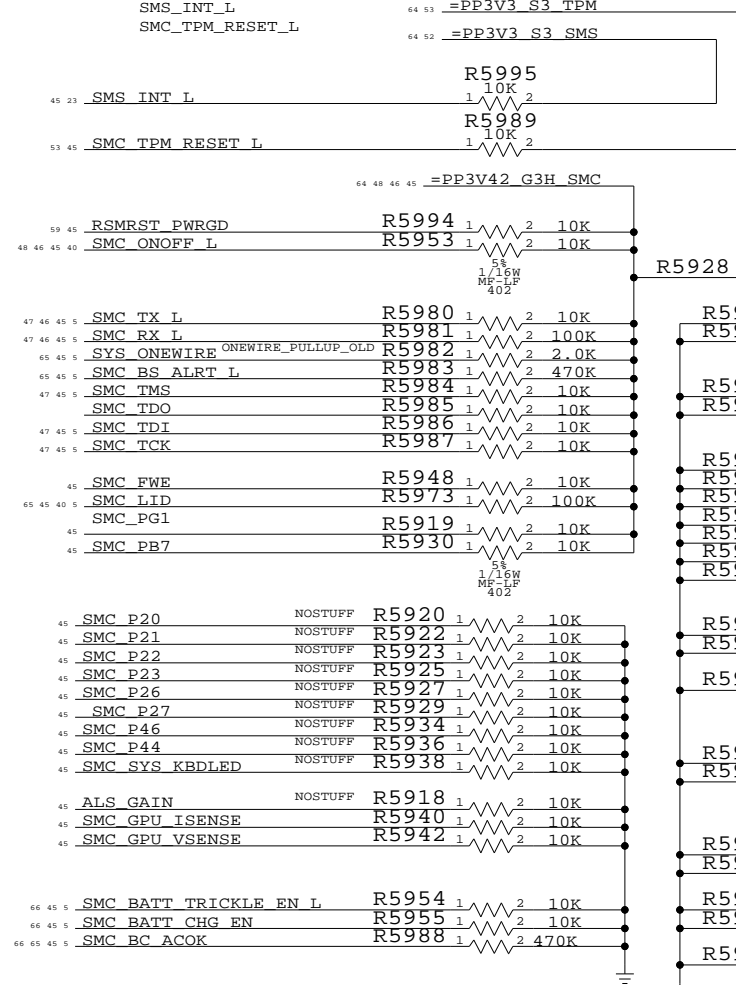
PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
353S1278	353S1381	?	VR5965	TI REF3133

SMC G3HOT OSCILLATOR

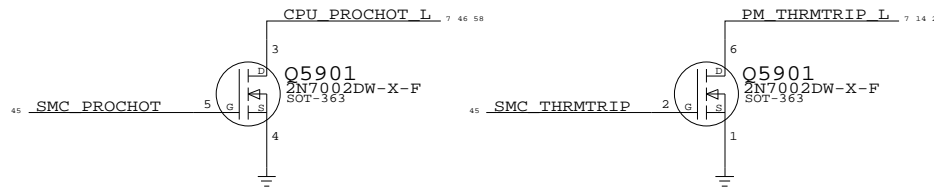


U5910 is really a 32.768KHz oscillator 197S0166

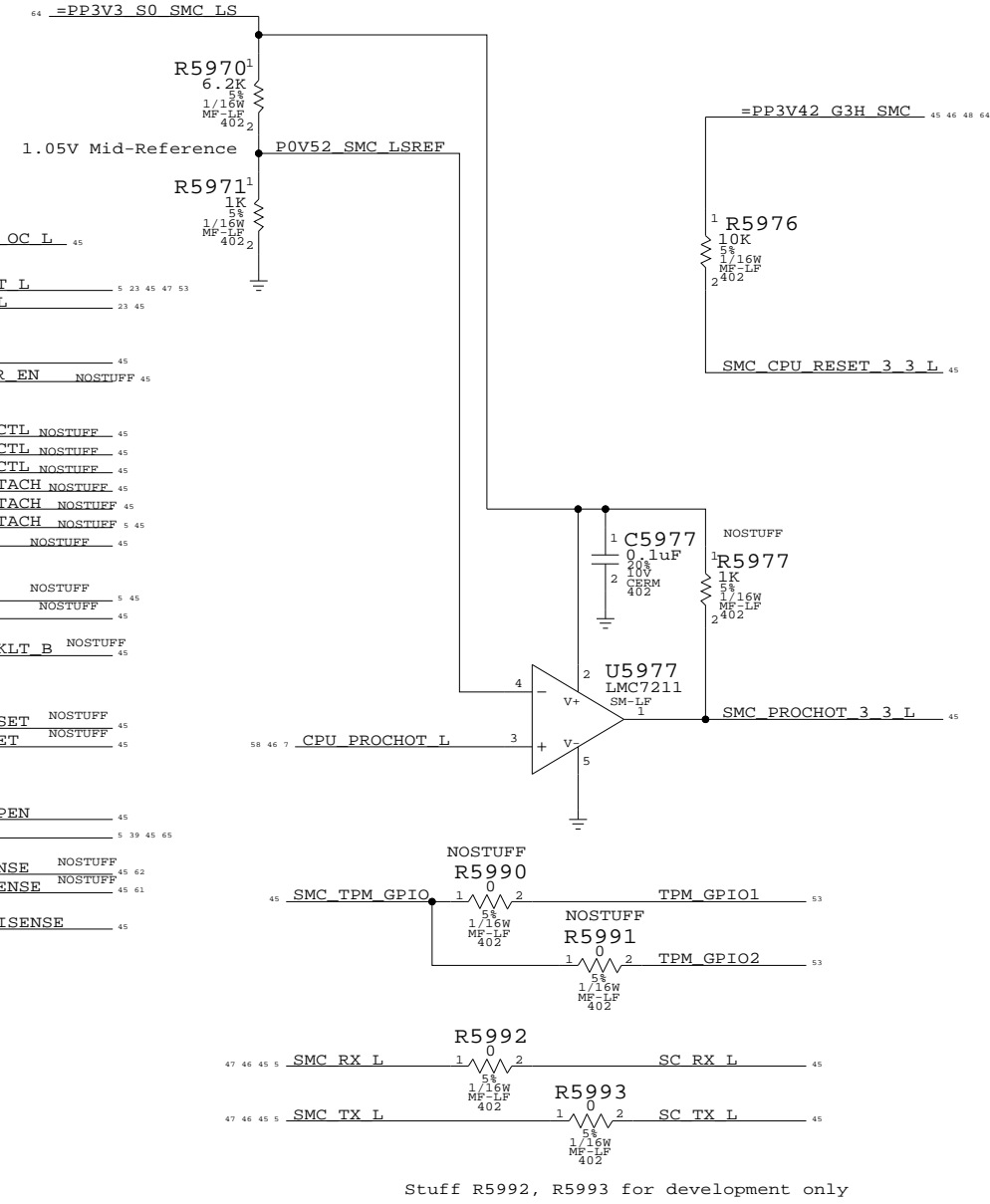
THESE NEED TO BE PULLED TO THE PROPER RAIL:



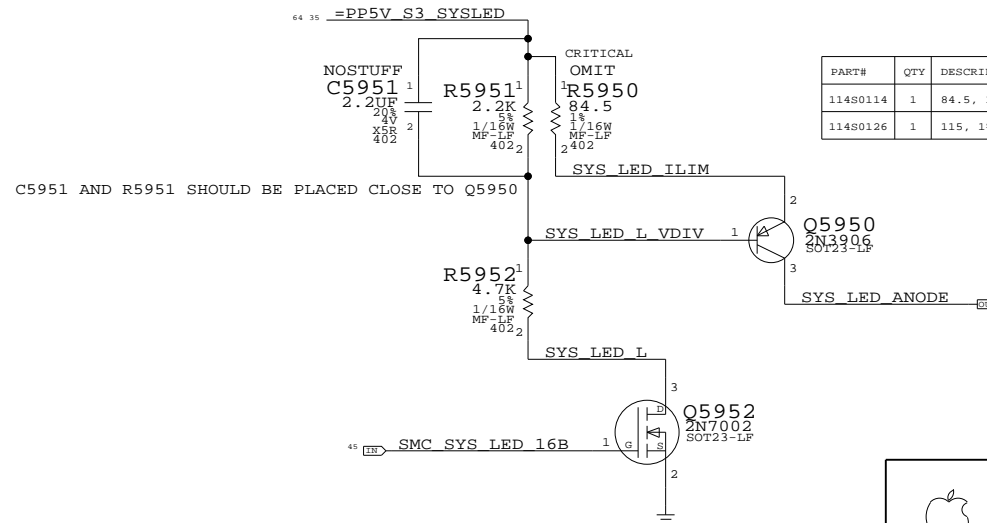
SMC 3.3V to 1.05V Level Shifting



SMC 1.05V to 3.3V Level Shifting



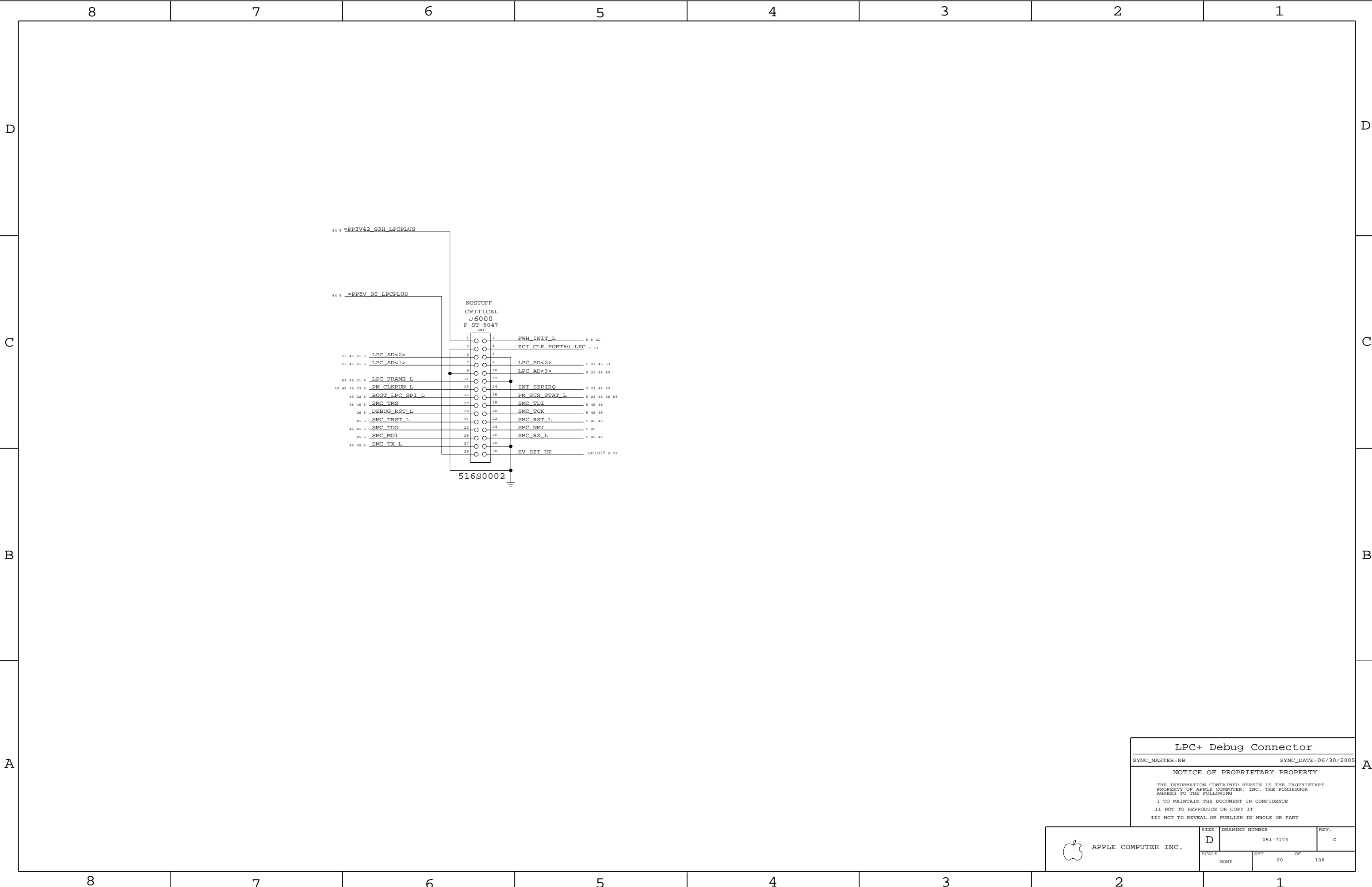
System (Sleep) LED Circuit



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
11480114	1	84.5, 1%, 1/16W, MF-LF, 402	R5950	NORMAL
11480126	1	115, 1%, 1/16W, MF-LF, 402	R5950	FANCY

**SMC SUPPORT**  
 SYNC\_MASTER=SMC SYNC\_DATE=08/23/2005  
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SCALE	SHT	OF	108
NONE	59		



**LPC+ Debug Connector**

SYNC\_MASTER=NB SYNC\_DATE=06/30/2005

**NOTICE OF PROPRIETARY PROPERTY**

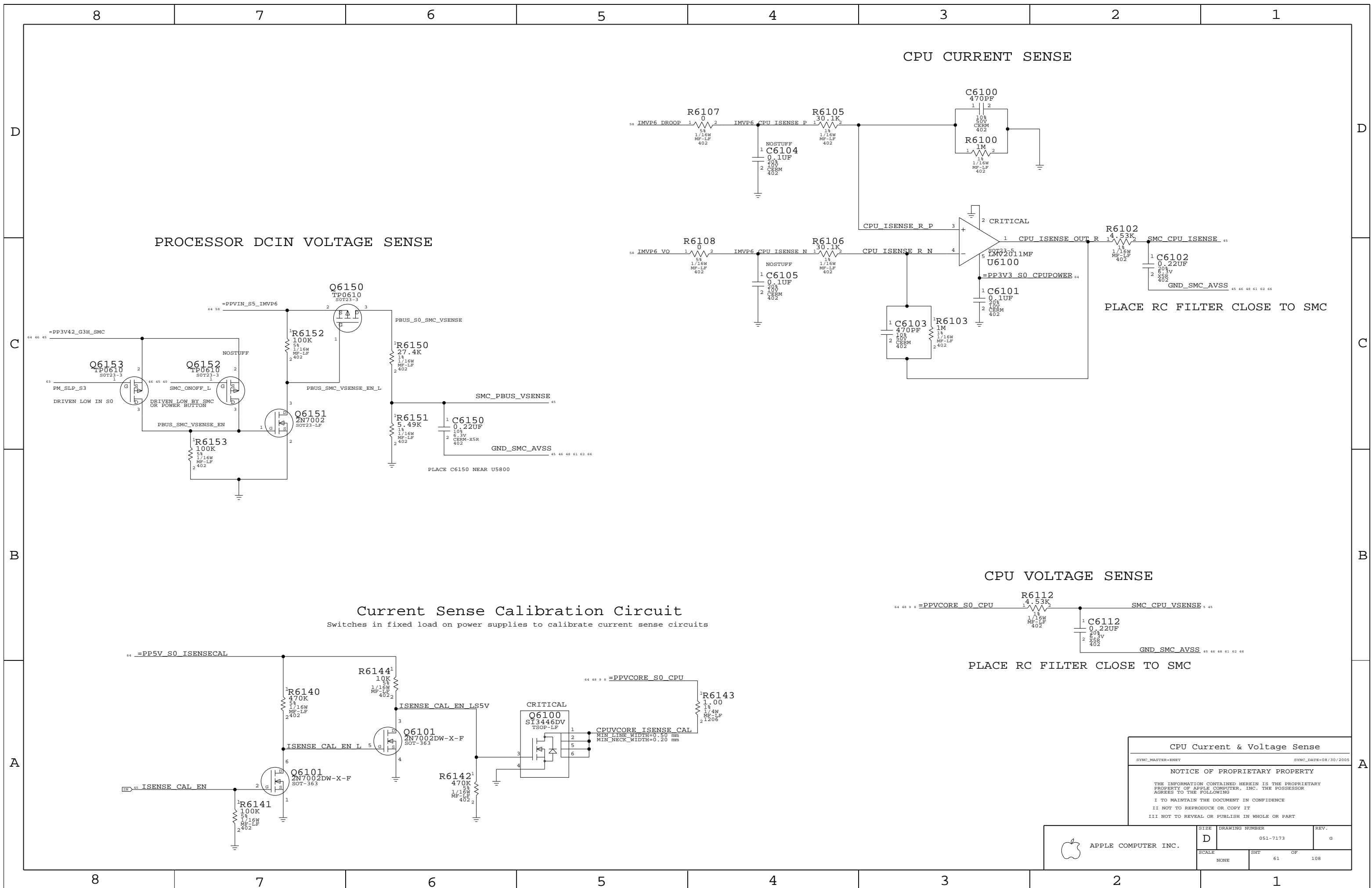
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	SCALE NONE	SHT 60	OF 108



PROCESSOR DCIN VOLTAGE SENSE

CPU CURRENT SENSE

CPU VOLTAGE SENSE

Current Sense Calibration Circuit

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

PLACE RC FILTER CLOSE TO SMC

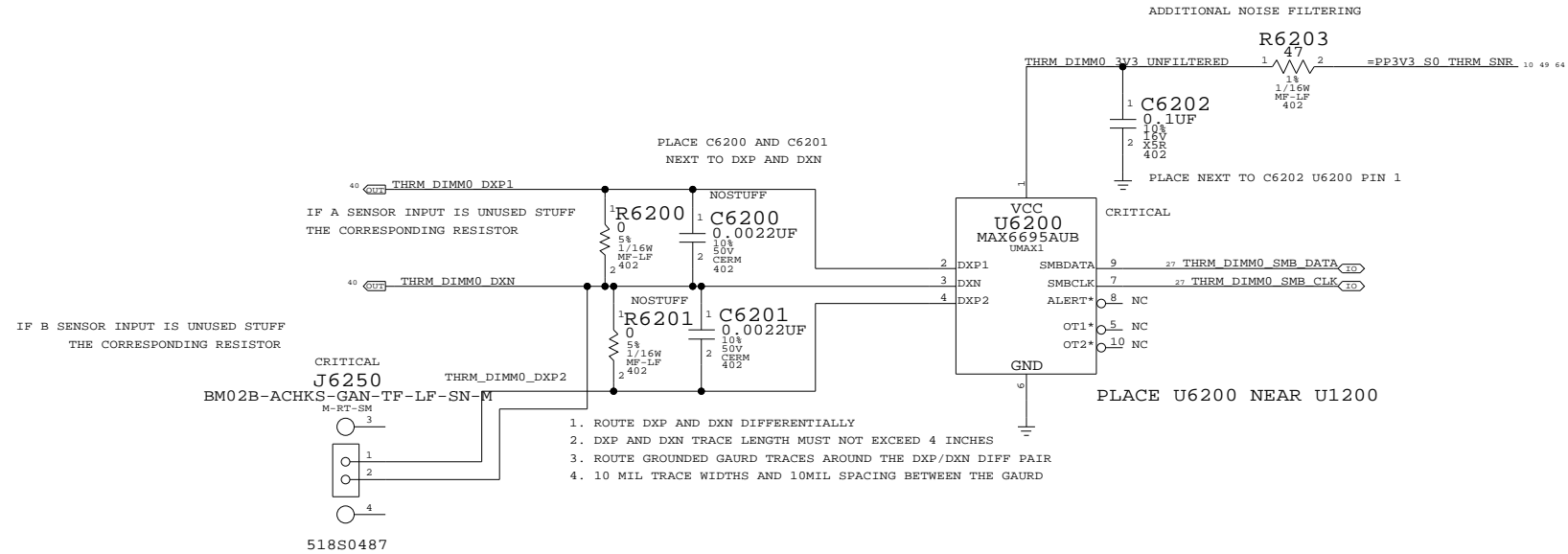
PLACE RC FILTER CLOSE TO SMC

CPU Current & Voltage Sense		
SYNC_MASTER=EMBT	SYNC_DATE=08/30/2005	
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APPLE COMPUTER INC.	SIZE <b>D</b>	DRAWING NUMBER 051-7173	REV. G
	SCALE NONE	SHT 61	OF 108

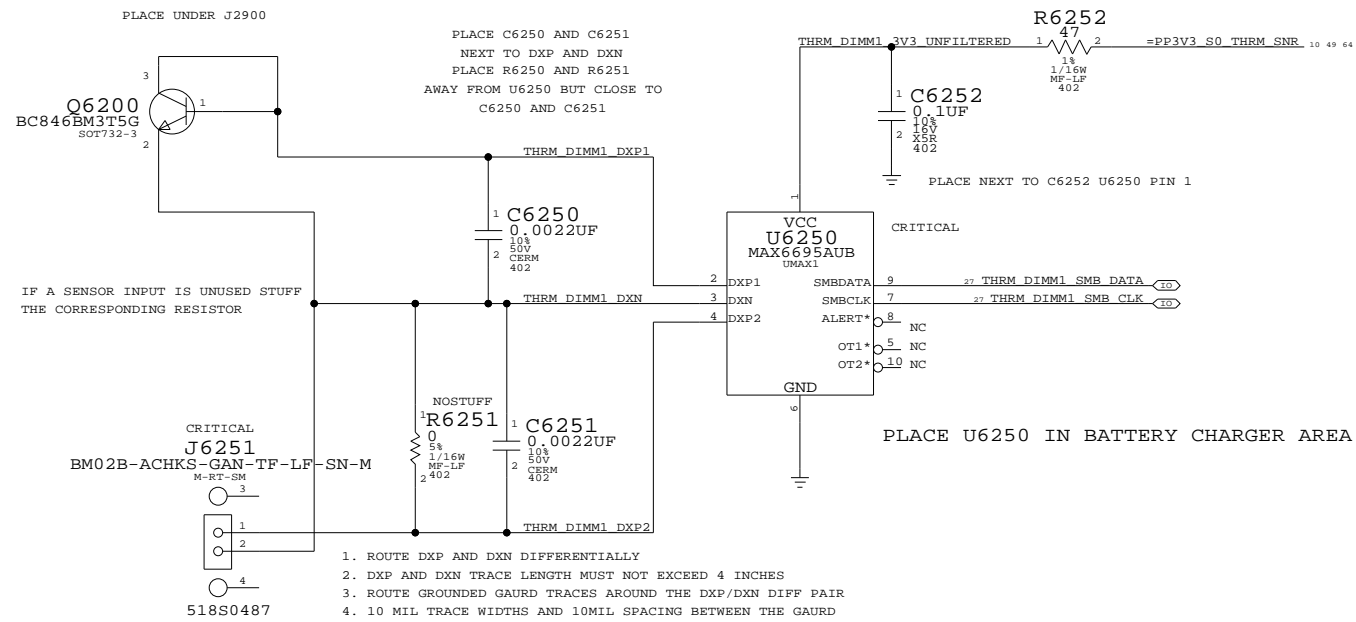


### DIMM0 TEMPERATURE ZONE



NOTE: REPLACE J6250 AND J6251 FROM 518S0332 TO 518S0452 AND THEN 518S0487  
 AFTER THIS CHANGE, THE SCHEAMTIC DOES NOT MATCH THE PCB ON THESE TWO LOCATIONS.

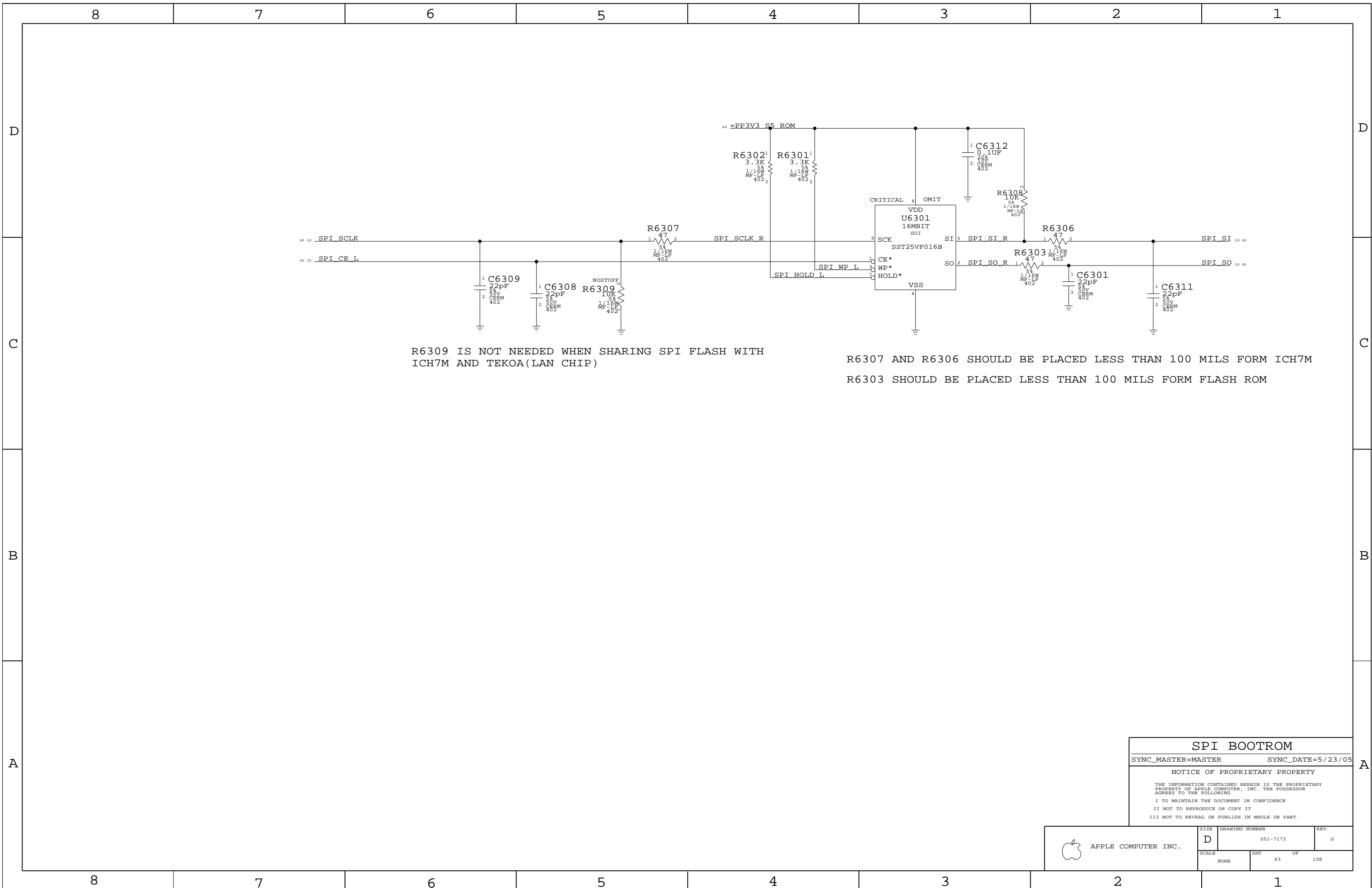
### DIMM1 TEMPERATURE ZONE



NOTE: REPLACE J6250 AND J6251 FROM 518S0332 TO 518S0452 AND 518S0487  
 AFTER THIS CHANGE, THE SCHEAMTIC DOES NOT MATCH THE PCB ON THESE TWO LOCATIONS.

<b>TEMPERATURE SENSE</b>	
SYNC_MASTER=ENET	SYNC_DATE=11/09/2005
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	62	108	




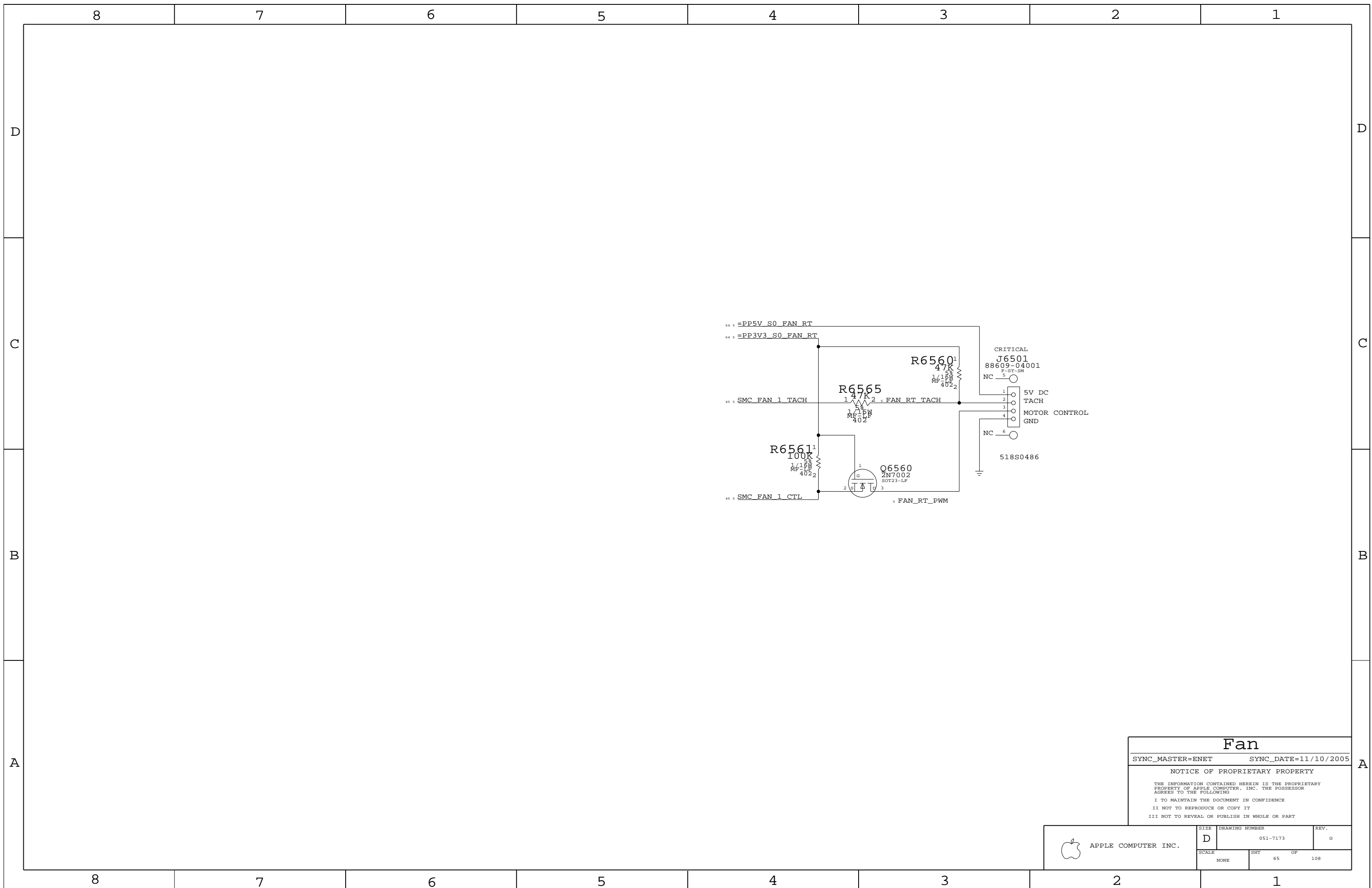
R6309 IS NOT NEEDED WHEN SHARING SPI FLASH WITH ICH7M AND TEKOA(LAN CHIP)

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=MASTER SYNC\_DATE=5/23/05

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	D	051-7173	G
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NONE	63		




**Fan**

SYNC\_MASTER=ENET      SYNC\_DATE=11/10/2005

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SCALE	SHT	OF	
NONE	65	108	

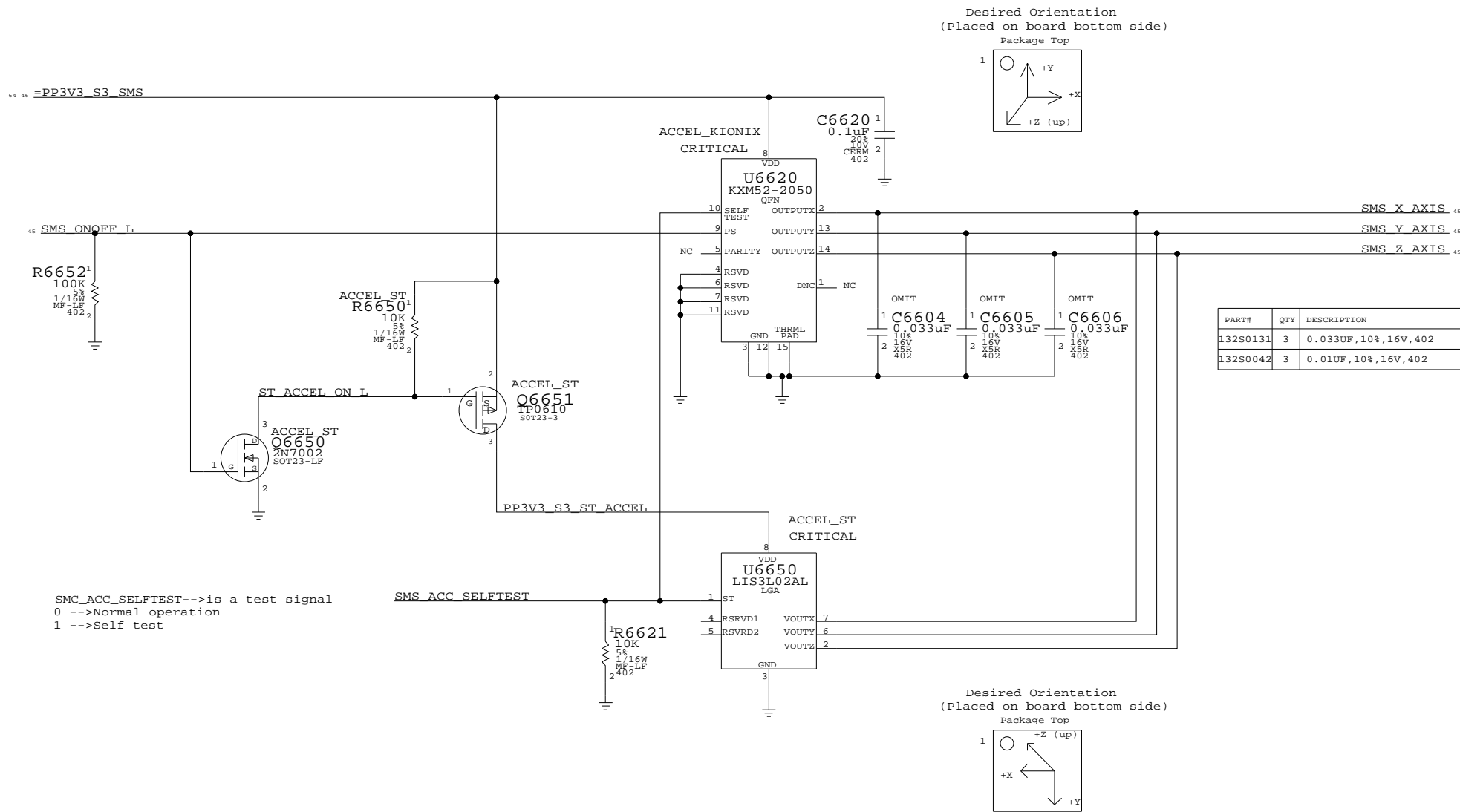
PAGE NOTES

INPUT  
 =PP3V3\_S3\_SMS - 3.3V POWER FOR SMS (STAYS ALIVE IN SLEEP)  
 SMS\_ONOFF\_L - CONNECT TO SMC TO BE ABLE TO PUT SMS INTO LOW-POWER MODE

OUTPUT  
 SMS\_ACC\_\*\_AXIS - ACCELEROMETER OUTPUT TO SCU

PAGE HISTORY

5/19/2005 - FIRST REVISION OF PAGE  
 7/26/2005 - REMOVED BOM TABLE AND UPDATED SYMBOL TO KXM52-2050  
 7/28/2005 - CONNECTED PD PIN TO SMC'S SMS\_ONOFF\_L  
 7/28/2005 -



SMC\_ACC\_SELFTEST-->is a test signal  
 0 -->Normal operation  
 1 -->Self test

**SMS**

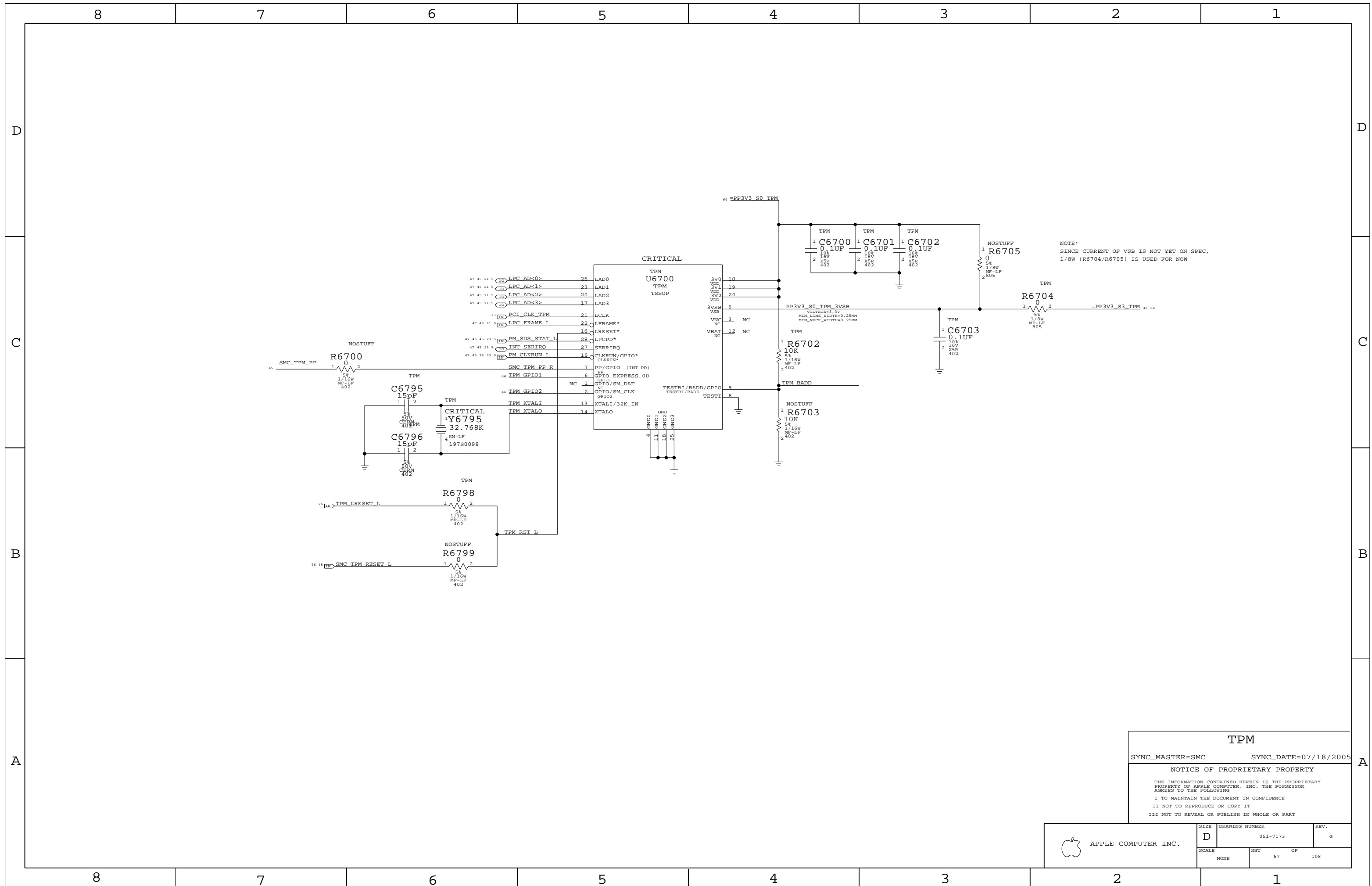
SYNC\_MASTER=SMC      SYNC\_DATE=08/23/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	66	108	



**TPM**

SYNC\_MASTER=SMC                      SYNC\_DATE=07/18/2005

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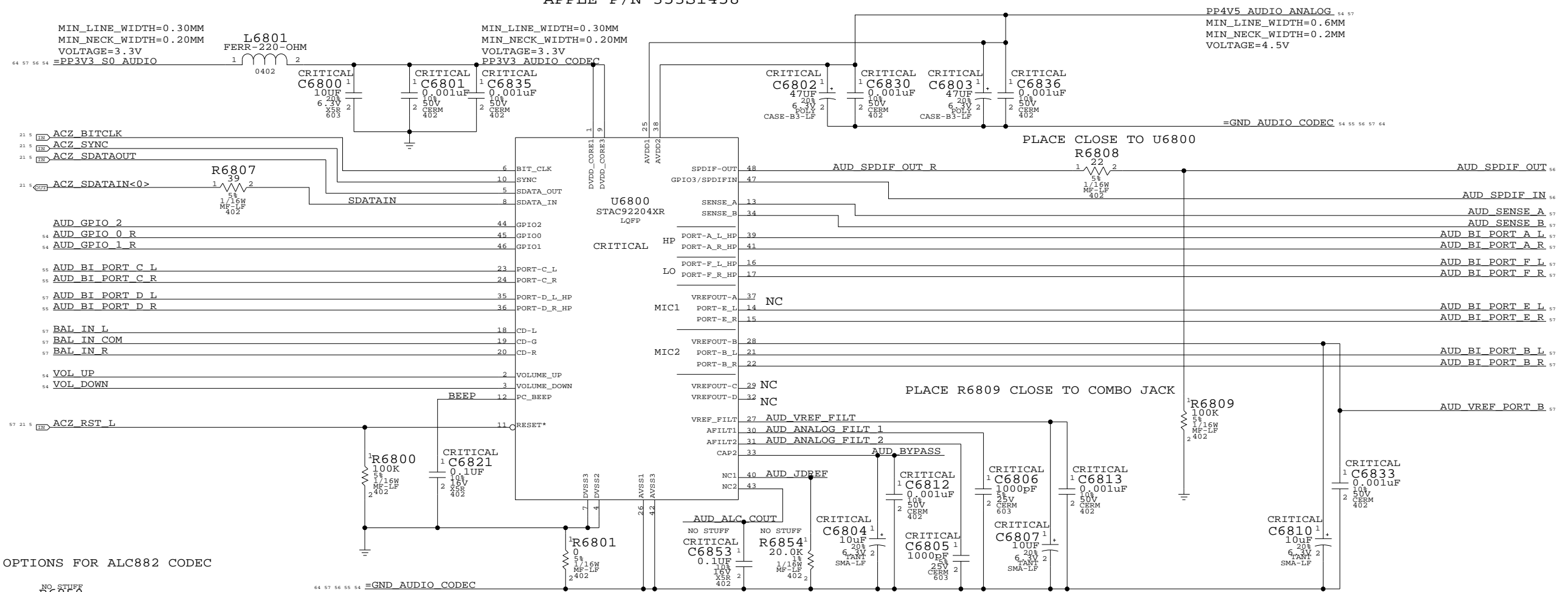
II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

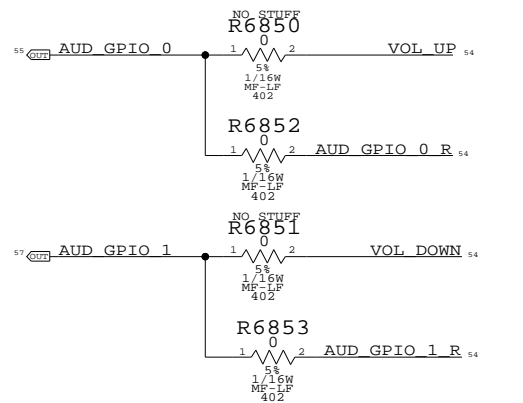
APPLE COMPUTER INC.	SIZE <b>D</b>	DRAWING NUMBER 051-7173	REV. G
	SCALE NONE	SHEET 67	OF 108

# AUDIO CODEC

APPLE P/N 353S1458

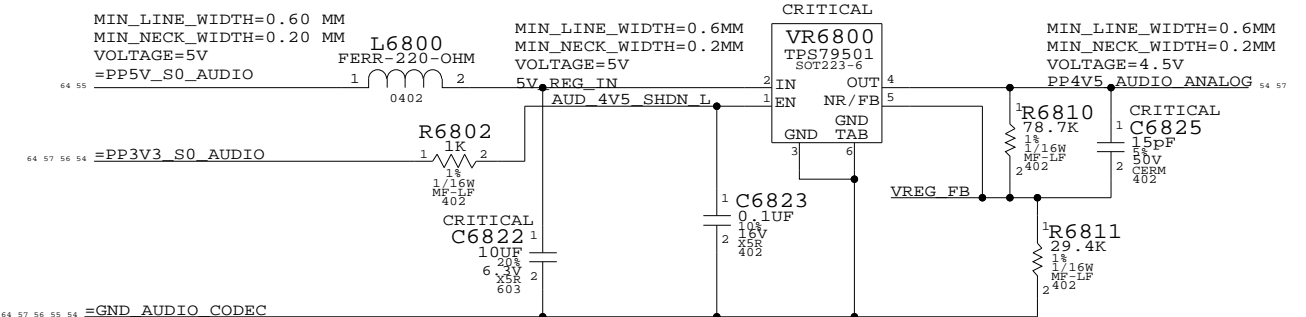


## STUFFING OPTIONS FOR ALC882 CODEC



## USING DC OFFSET SCREENED PART AS PRIMARY OPTION

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
353S1345	353S1458	?	U6800	DC OFFSET SCREEN PRTS



## 4.5V POWER SUPPLY FOR CODEC

**AUDIO: CODEC**

SYNC\_MASTER=M42AUDIO    SYNC\_DATE=08/05/2006

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	68	OF	108

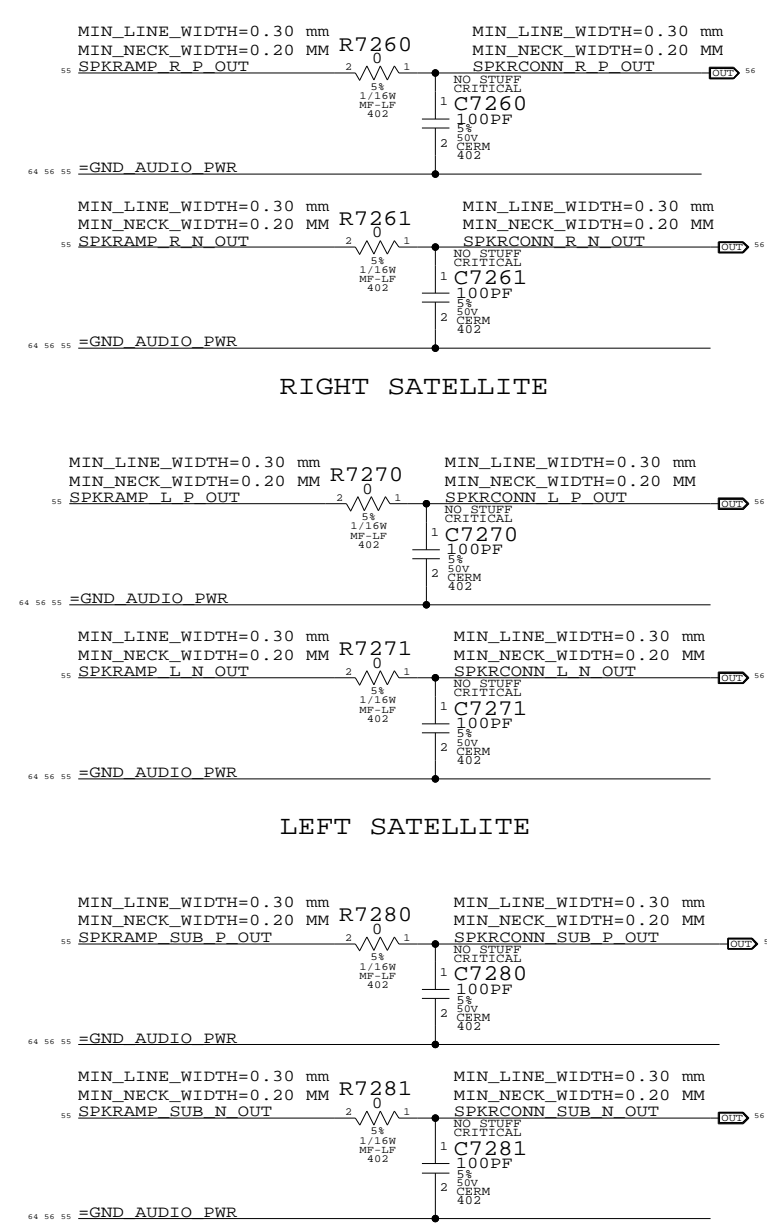
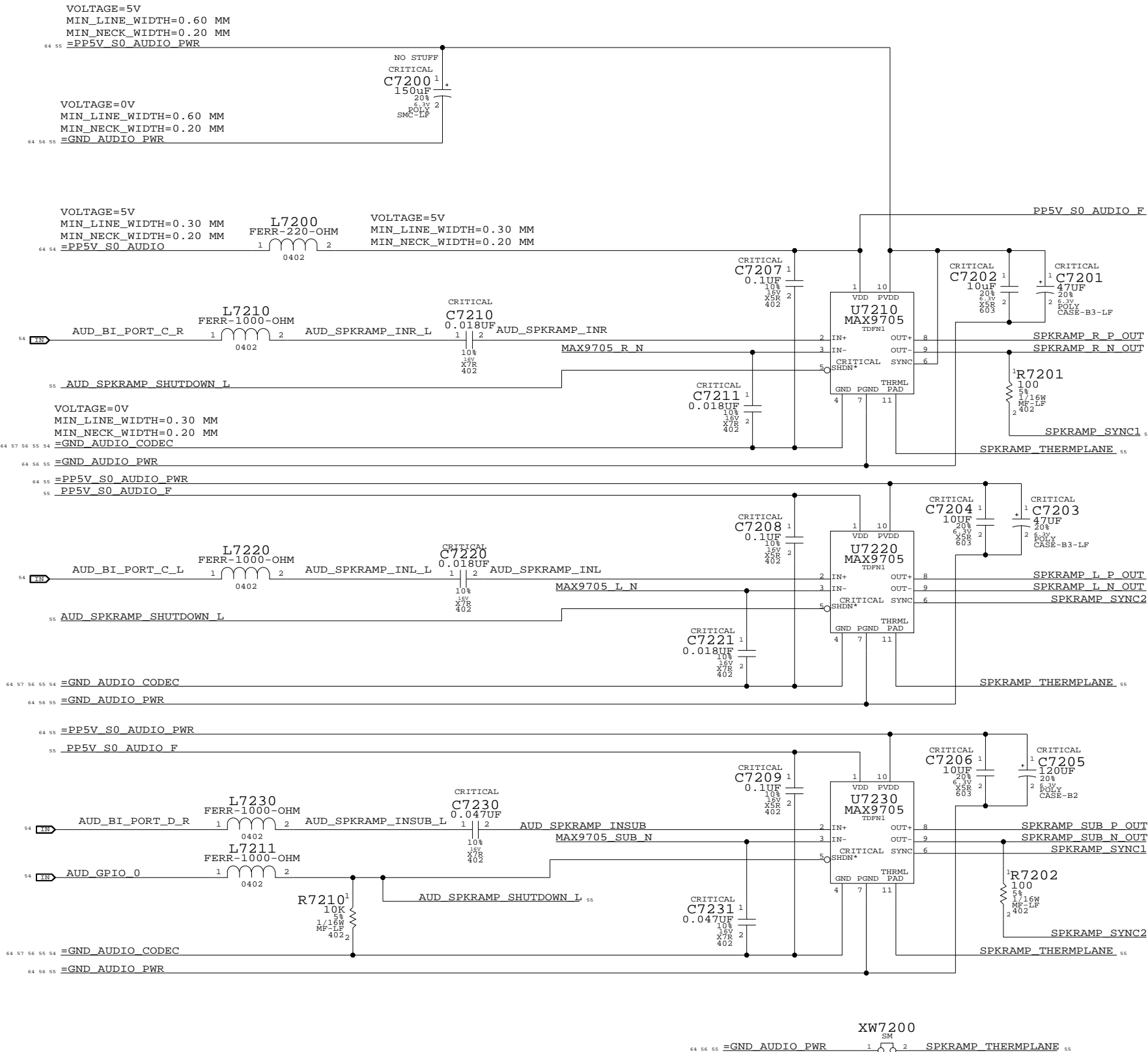
SATELLITE & SUB TWEETER AMPLIFIER APN:353S1595

SATELLITE 442 Hz < FC < 736 Hz  
 SUB 169 Hz < FC < 282 Hz

SPEAKER OUTPUT EMI FILTERS

D  
C  
B  
A

D  
C  
B  
A



RIGHT SATELLITE

LEFT SATELLITE

SUB-TWEETER

**AUDIO: SPEAKER AMP**  
 SYNC\_MASTER=M42AUDIO SYNC\_DATE=08/05/2006  
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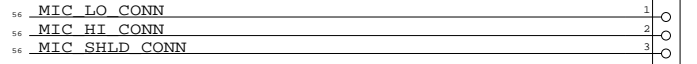
APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	72		

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
518S0491	518S0332	?	J7302	IMPROVED TWO PIN CONNECTOR

**MIC CONNECTOR**  
APN:514S0392

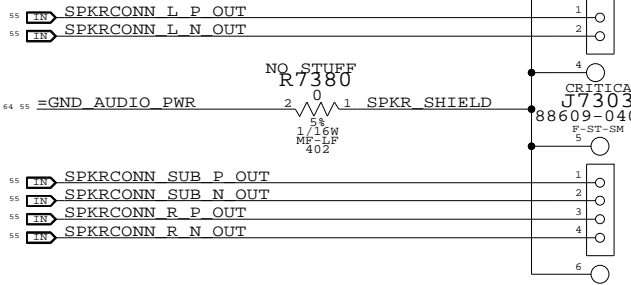
CRITICAL  
J7301  
48227-0301  
M-RT-SM1  
4

**AUDIO JACK 1: LO/HP CONNECTOR, SPDIF TX**



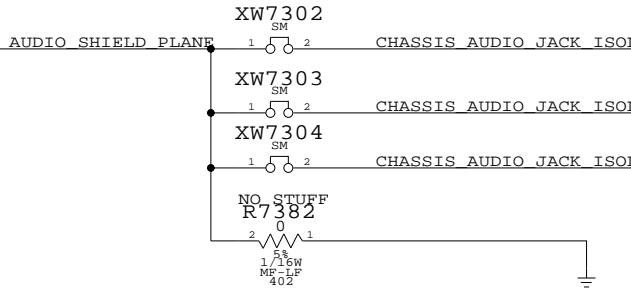
**SPEAKER CONNECTOR**  
APN:518S0332

CRITICAL  
J7302  
88611-02001  
F-ST-SM  
3

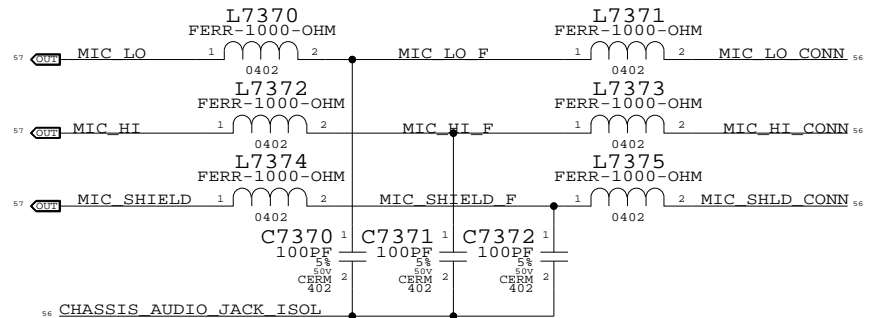


REPLACE 518S0334 WITH 518S0486

**AUDIO SHIELD FILL**



**MIC EMI FILTER**



**AUDIO JACK 2: LINE IN CONNECTOR, SPDIF RX**

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
514-0290	1	CONN, 3.5MM COMBO AUDIO OUT, RA, MG3, LF	J7300	CRITICAL	NORMAL
514-0291	1	CONN, 3.5MM COMBO AUDIO IN, RA, MG3, LF	J7350	CRITICAL	NORMAL
514-0317	1	CONN, 3.5MM COMBO AUDIO OUT, RA, BLACK, LF	J7300	CRITICAL	FANCY
514-0318	1	CONN, 3.5MM COMBO AUDIO IN, RA, BLACK, LF	J7350	CRITICAL	FANCY

**AUDIO: JACK**  
SYNC\_MASTER=M42AUDIO SYNC\_DATE=08/05/2006

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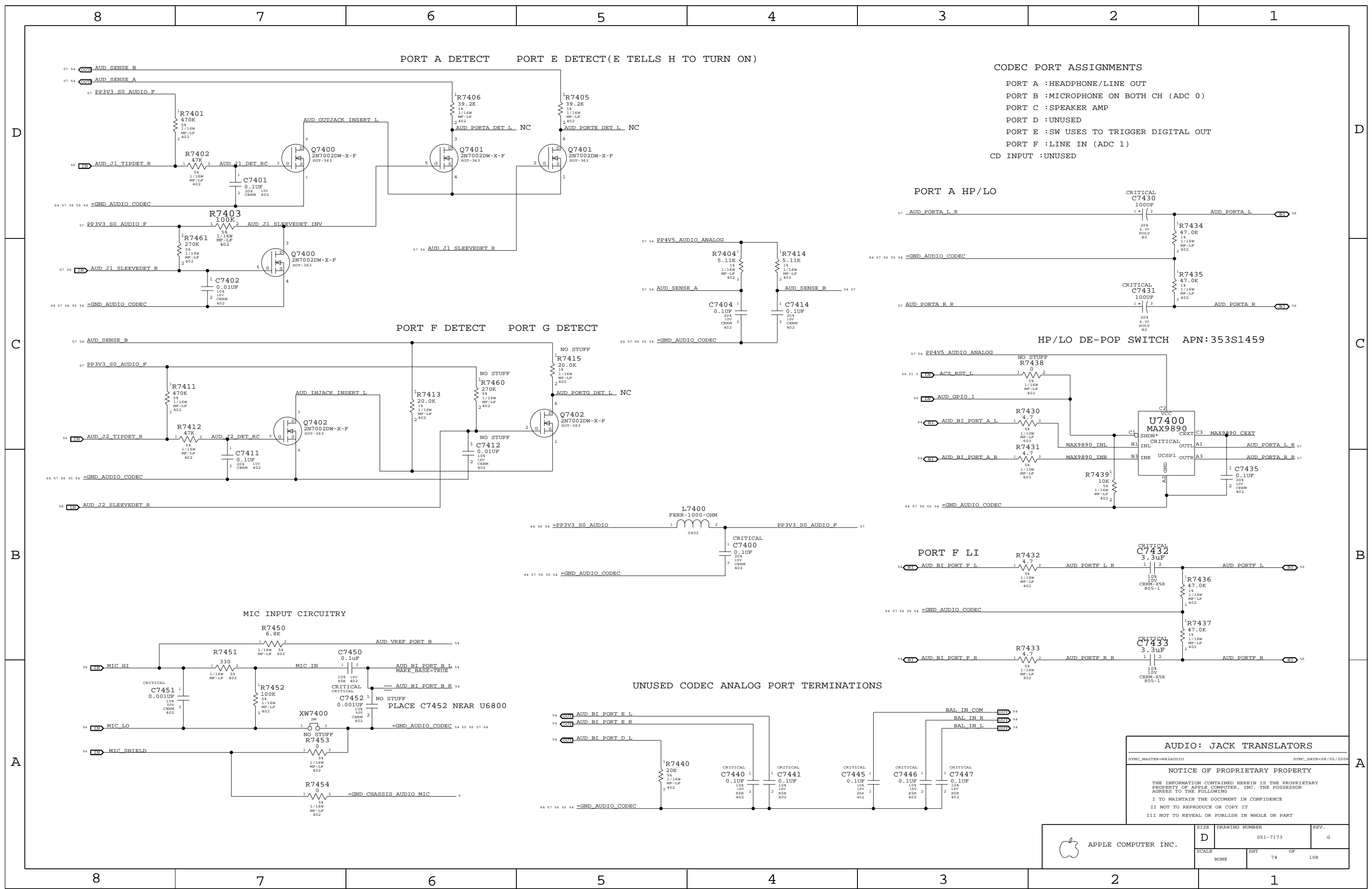
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APPLE COMPUTER INC.

SCALE: NONE SHEET: 73 OF 108

SIZE: D DRAWING NUMBER: 051-7173 REV: G

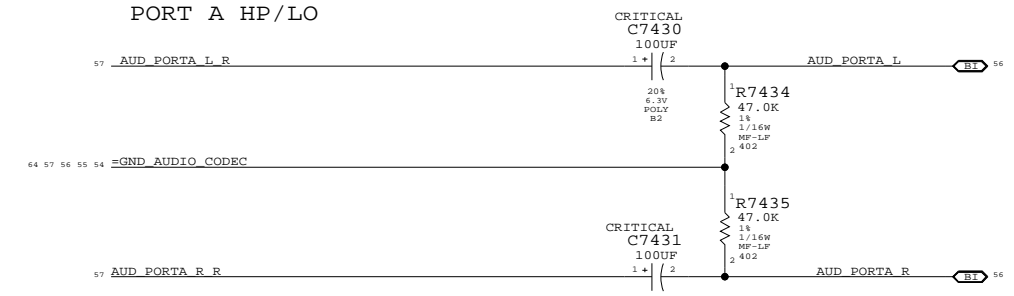




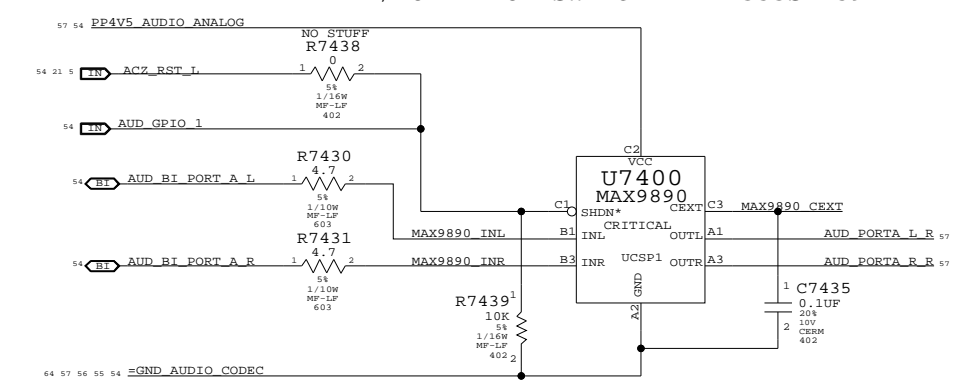
CODEC PORT ASSIGNMENTS

- PORT A : HEADPHONE/LINE OUT
- PORT B : MICROPHONE ON BOTH CH (ADC 0)
- PORT C : SPEAKER AMP
- PORT D : UNUSED
- PORT E : SW USES TO TRIGGER DIGITAL OUT
- PORT F : LINE IN (ADC 1)
- CD INPUT : UNUSED

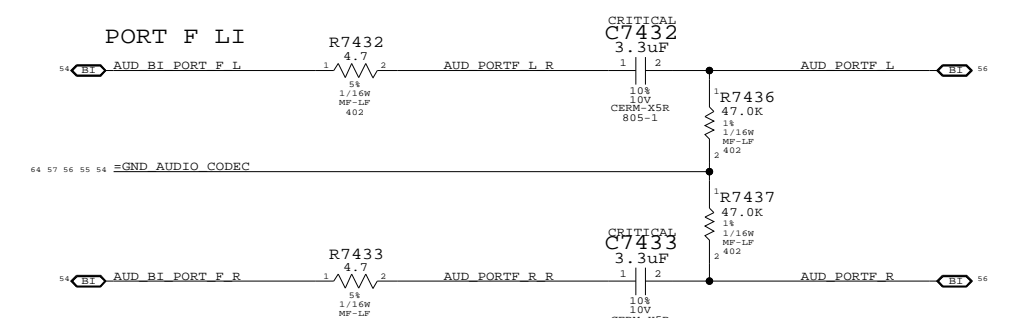
PORT A HP/LO



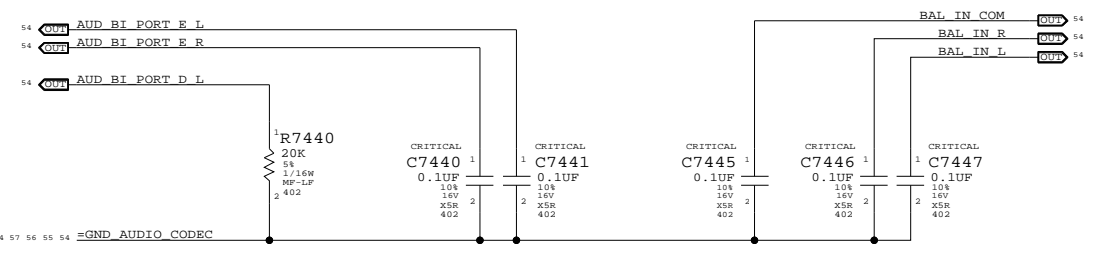
HP/LO DE-POP SWITCH APN:353S1459



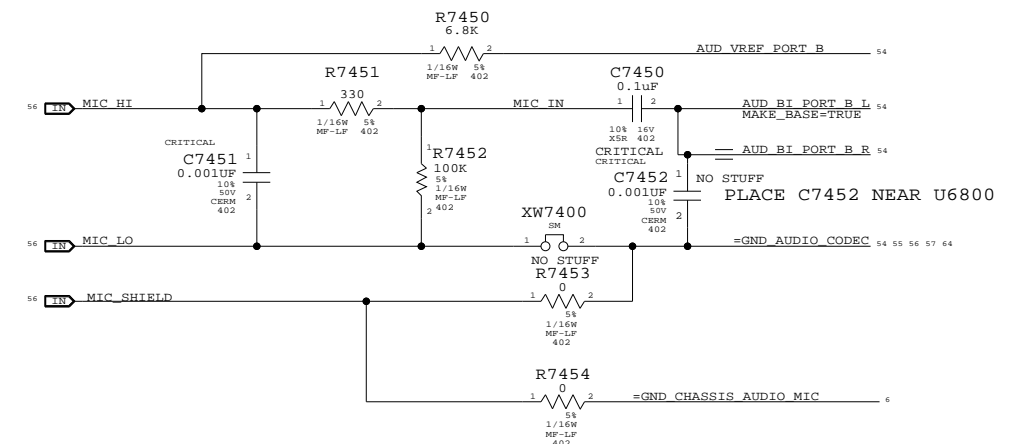
PORT F LI



UNUSED CODEC ANALOG PORT TERMINATIONS



MIC INPUT CIRCUITRY



AUDIO: JACK TRANSLATORS

SYNC\_MASTER=M42AUDIO SYNC\_DATE=08/05/2006

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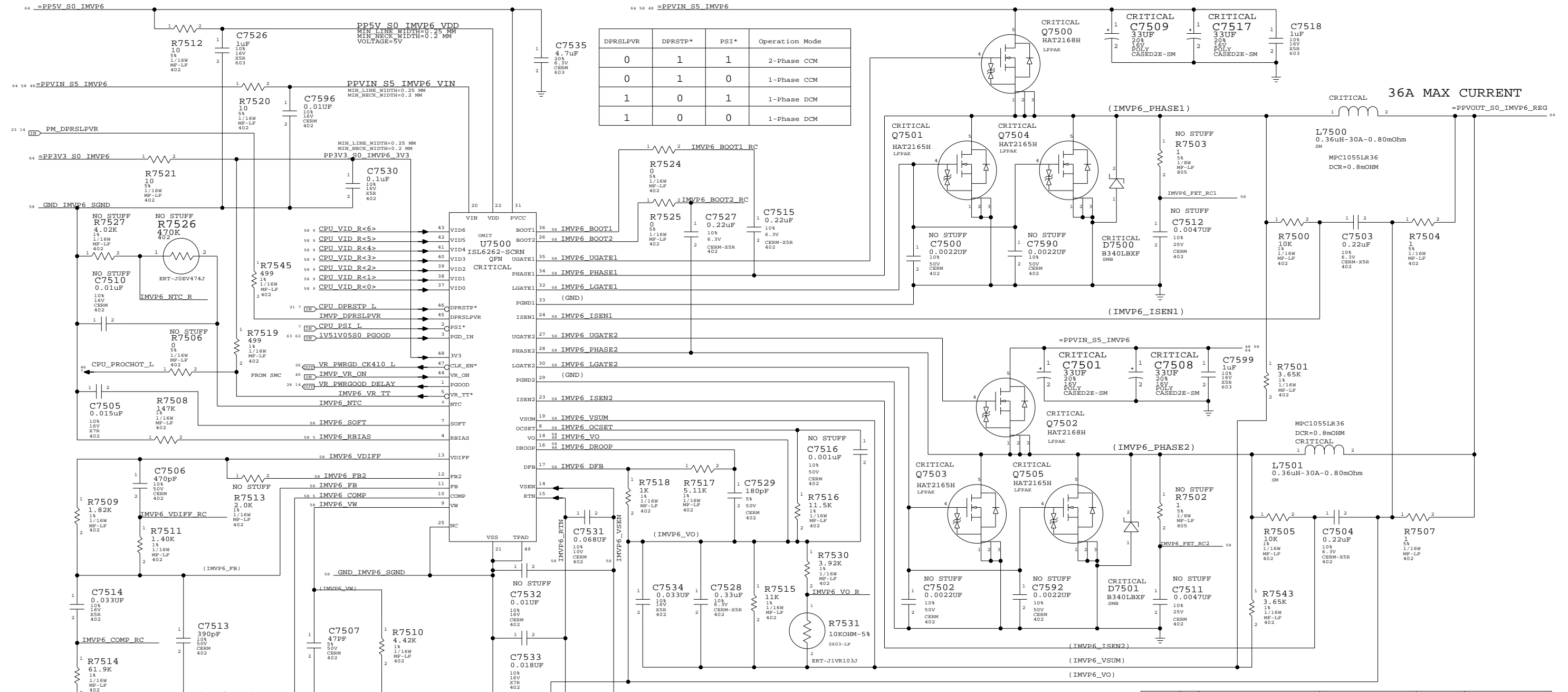
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	74	108	

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
128S0093	128S0092	?	C7501_C7508	RENET T520V3300016AT0457650
128S0093	128S0092	?	C7509_C7517	RENET T520V3300016AT0457650



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

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
353S1465	1	ISL6262	U7500		M42
353S1461	1	ISL9504	U7500		M42A

# IMVP6 CPU VCore Regulator

	MIN_LINE_WIDTH	MIN_NECK_WIDTH
IMVP6_PHASE1	1.5 MM	0.25 MM
IMVP6_BOOT1	0.25 MM	0.25 MM
IMVP6_UGATE1	1.5 MM	0.25 MM
IMVP6_LGATE1	1.5 MM	0.25 MM
IMVP6_ISEN1	0.25 MM	0.25 MM
IMVP6_FET_RC1	0.25 MM	0.25 MM
IMVP6_VSUM_R1	0.25 MM	0.25 MM
IMVP6_VO_R1	0.25 MM	0.25 MM

	MIN_LINE_WIDTH	MIN_NECK_WIDTH
IMVP6_PHASE2	0.25 MM	0.25 MM
IMVP6_BOOT2	0.25 MM	0.25 MM
IMVP6_UGATE2	0.25 MM	0.25 MM
IMVP6_LGATE2	0.25 MM	0.25 MM
IMVP6_ISEN2	0.25 MM	0.25 MM
IMVP6_FET_RC2	0.25 MM	0.25 MM
IMVP6_VSUM_R2	0.25 MM	0.25 MM
IMVP6_VO_R2	0.25 MM	0.25 MM

	MIN_LINE_WIDTH	MIN_NECK_WIDTH
IMVP6_OCSET	0.25 MM	0.20 MM
CPU_VID_R<0..6>	0.25 MM	0.20 MM
IMVP6_VSUM	0.25 MM	0.20 MM
GND_IMVP6_SGND	0.50 MM	0.20 MM
IMVP6_VO	0.25 MM	0.20 MM
IMVP6_DROOP	0.25 MM	0.20 MM
IMVP6_DFB	0.25 MM	0.20 MM
IMVP6_SOFT	0.25 MM	0.20 MM
IMVP6_RBIAS	0.25 MM	0.20 MM
IMVP6_VDIFF	0.25 MM	0.20 MM
IMVP6_FB2	0.25 MM	0.20 MM
IMVP6_FB	0.25 MM	0.20 MM
IMVP6_COMP	0.25 MM	0.20 MM
IMVP6_VW	0.25 MM	0.25 MM
CPU_VCCSENSE_P	0.25 MM	0.25 MM
CPU_VCCSENSE_N	0.25 MM	0.25 MM
IMVP6_RTIN	0.25 MM	0.25 MM
IMVP6_VSEN	0.25 MM	0.25 MM

## IMVP6 CPU VCore Regulator

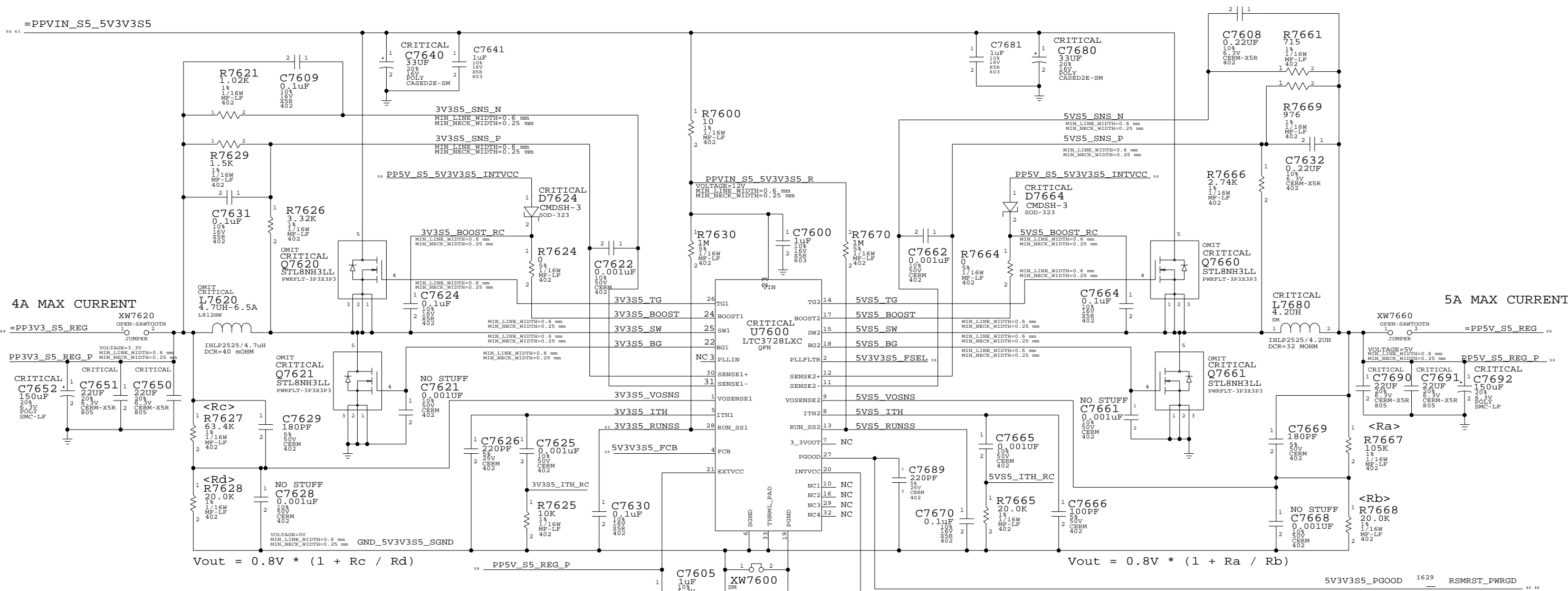
SYNC\_MASTER=POWER SYNC\_DATE=07/13/2005

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APPLE COMPUTER INC.	SCALE	SHEET	OF	REV.
	NONE	75	108	G

# 5V / 3.3V POWER SUPPLY



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
15280133	1	4.7UH, +/-20%, 40mOHM, 3mm	L7620	3V3_IND_3MM
15280365	1	4.7UH, +/-20%, 40mOHM, 2.8mm	L7620	3V3_IND_2MM8
37680445	4	FAIRCHILD FDM6296	Q7620, Q7621, Q7660, Q7661	FET_FDM6296

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
12880093	12880092	?	C7680, C7640	RENET VS20V33M016ATE0487650
37680448	37680445	?	Q7620, Q7621	VISHAY SI7806ADN
37680448	37680445	?	Q7660, Q7661	VISHAY SI7806ADN

## 5V / 3.3V Power Supply

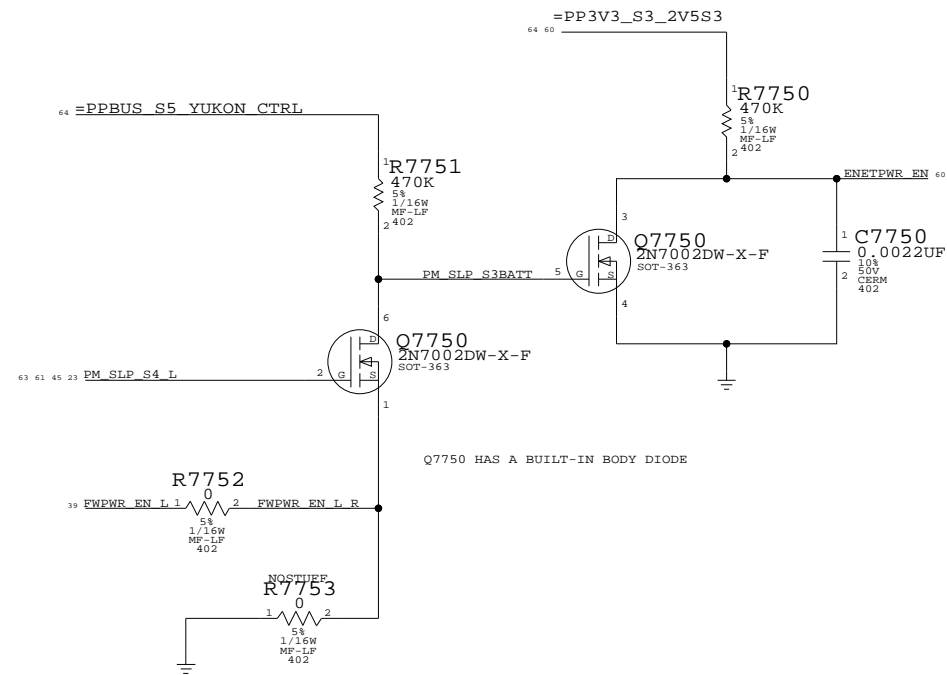
SYNC\_MASTER=POWER SYNC\_DATE=07/13/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	76		

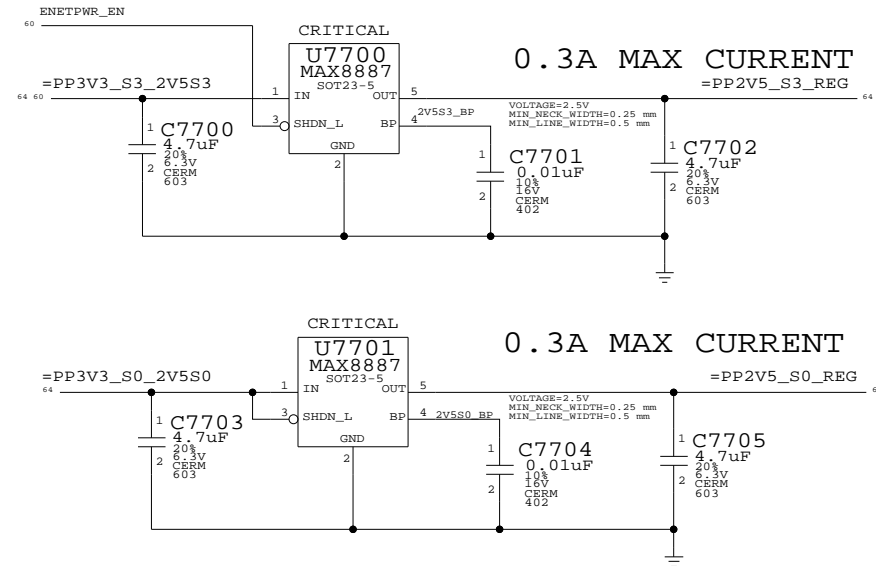
# YUKON POWER CONTROL



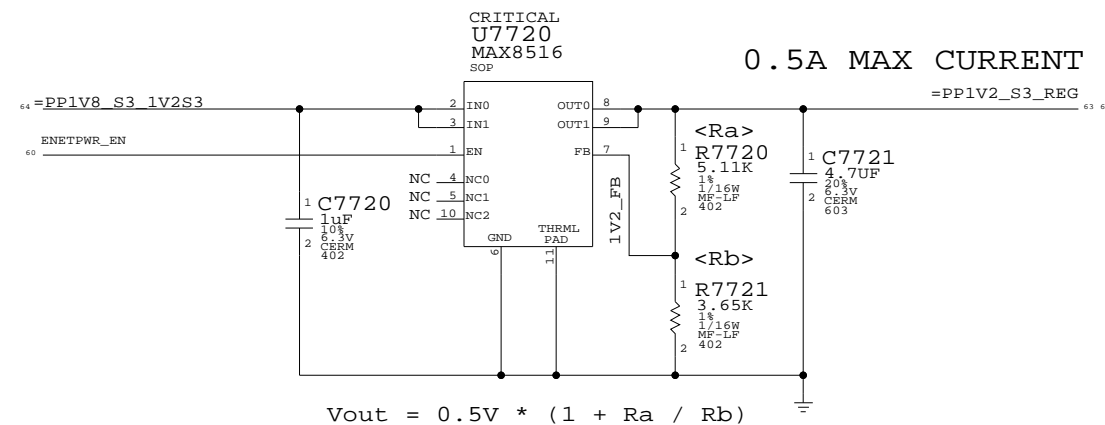
NAME	PM_SLP_S4_L	FWPWR_EN_L	PM_SLP_S3BATT	ENETPWR_EN
LOGIC	S3   S0	~S0   ~SMC_PS_ON		POWER YUKON
S3 ON BATTERY	TRUE (3.3V)	TRUE (PBUS 12.6V)	TRUE (PBUS 12.6V)	FALSE (0V)
S0 OR S3 ON AC	TRUE (3.3V)	FALSE (0V)	FALSE (0V)	TRUE (3.3V)
S5 ON AC	FALSE (0V)	TRUE (PBUS 12.6V)	TRUE (PBUS 12.6V)	FALSE (0V)
S5 ON BATT	FALSE (0V)	FALSE (0V)	TRUE (PBUS 12.6V)	FALSE (0V)

NOTE: IF CHANGE TO STUFFING R7753 THEN ENETPWR\_EN IS BUFFERED PM\_SLP\_S4\_L

# 2.5V REGULATORS



# 1.2V REGULATOR

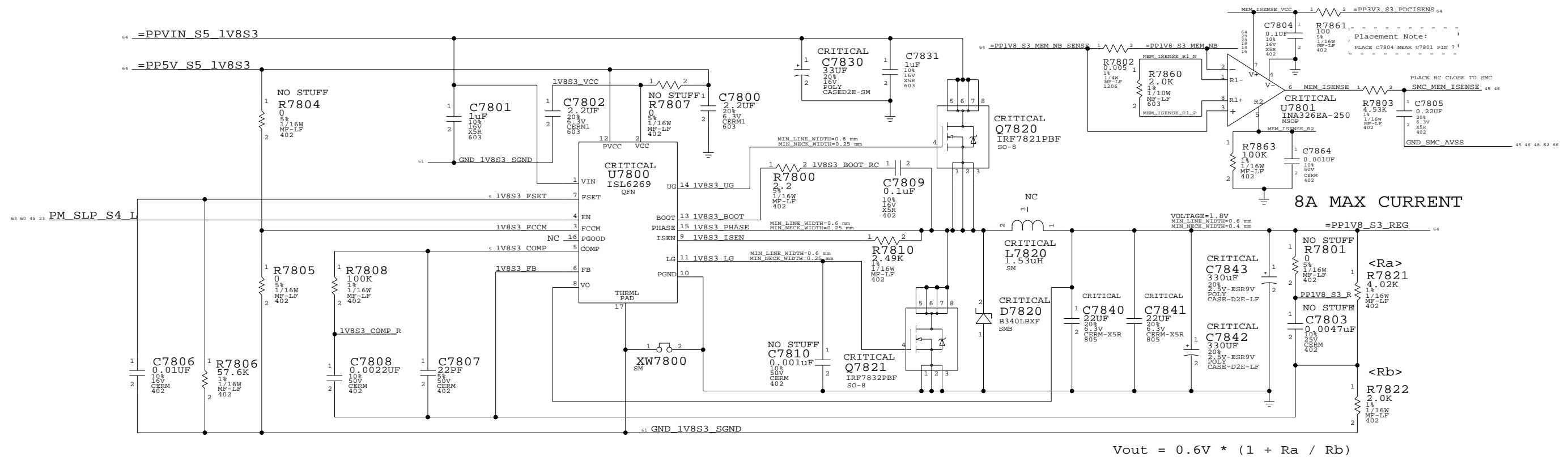


2.5V/1.2V Regulator  
 SYNC\_MASTER=ENET SYNC\_DATE=12/06/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	77	108	

# 1.8V POWER SUPPLY



PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
128S0093	128S0092	?	C7830	ERRY 7520V330M16AT00457450

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
128S0094	128S0060	?	C7842, C7843	PANASONIC KEPSX0D331ER
128S0095	128S0060	?	C7842, C7843	PANASONIC KEPSX0D331EK

**1.8V Supply**

SYNC\_MASTER=POWER      SYNC\_DATE=07/13/2005

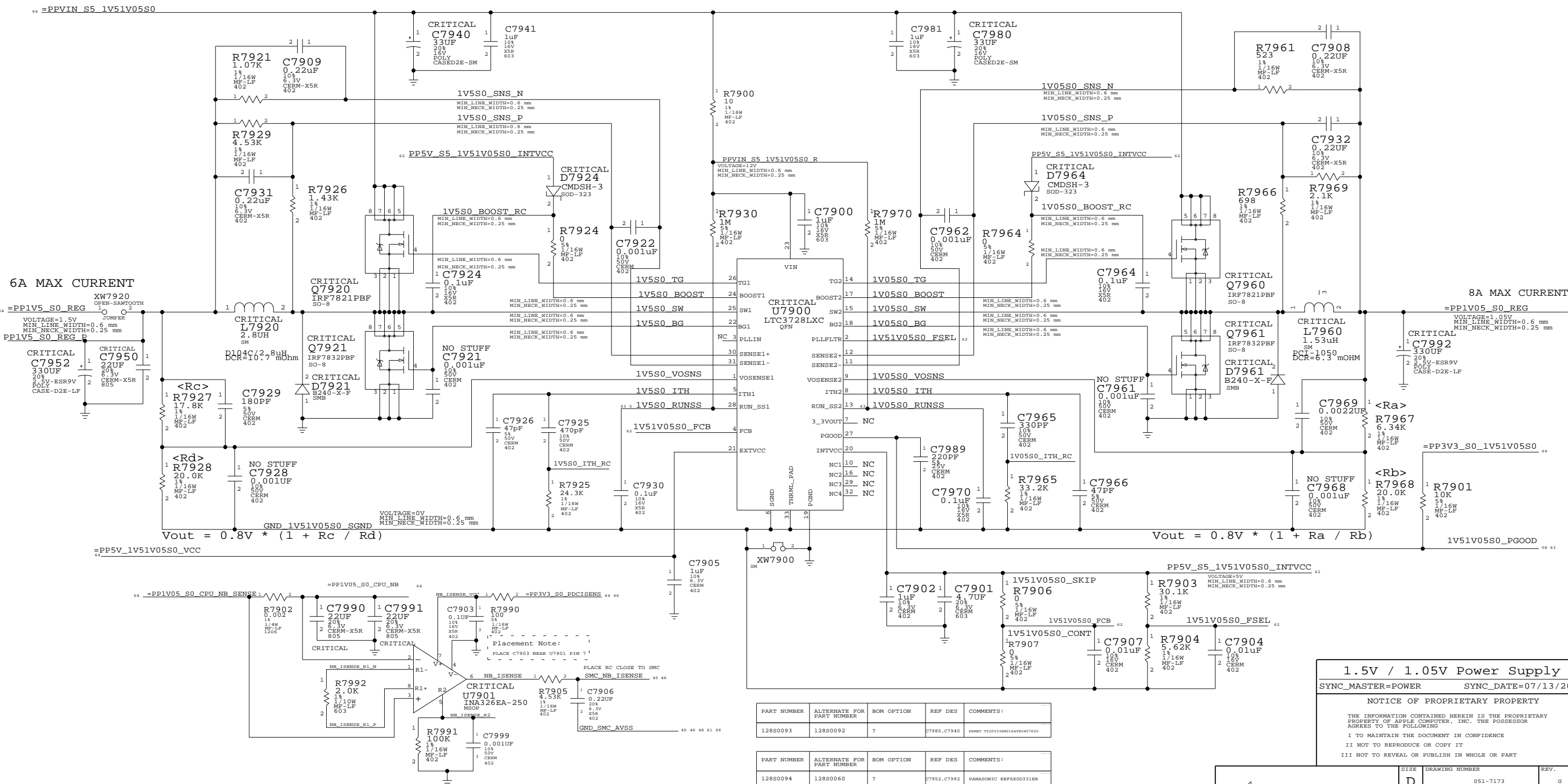
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	78		

# 1.5V/1.05V POWER SUPPLY

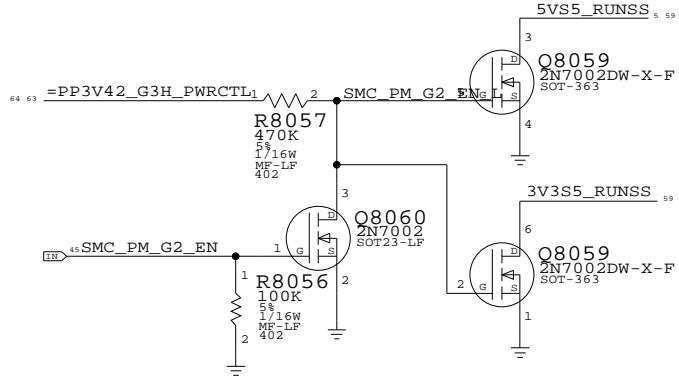


# POWER CONTROL SIGNALS

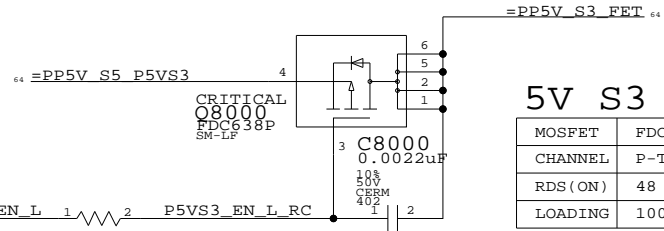
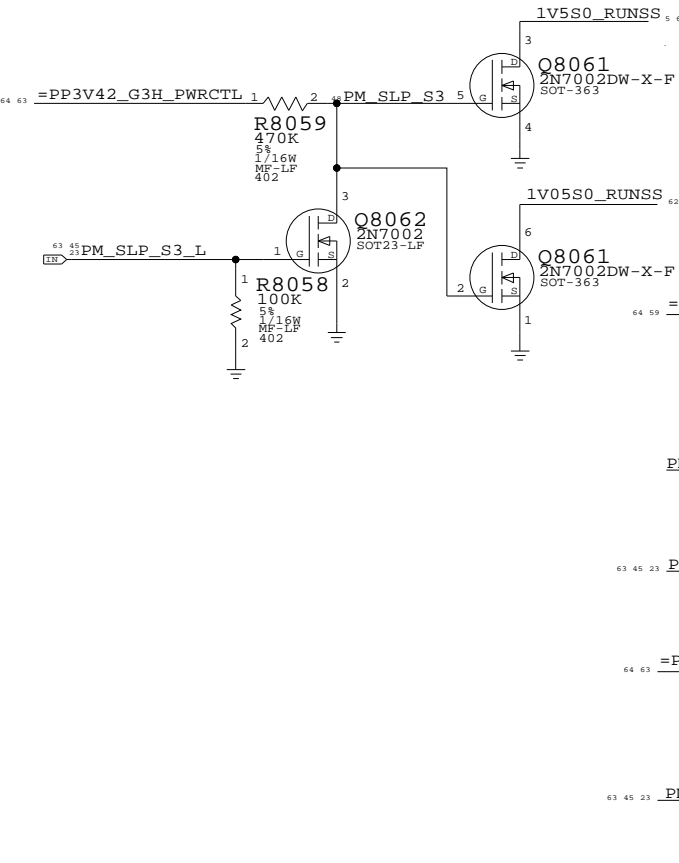
These rails are monitored by LTC2908

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

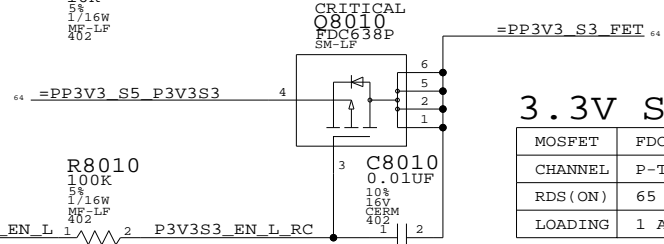
## 5V/3.3V S5 RUN/SS CONTROL



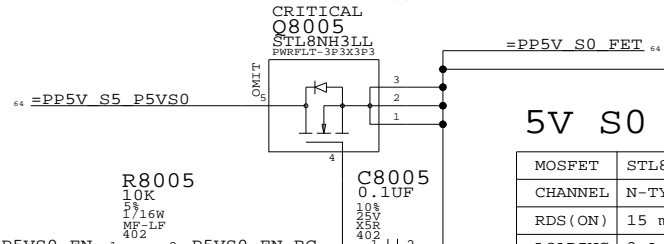
## 1.5V/1.05V S0 RUN/SS CONTROL



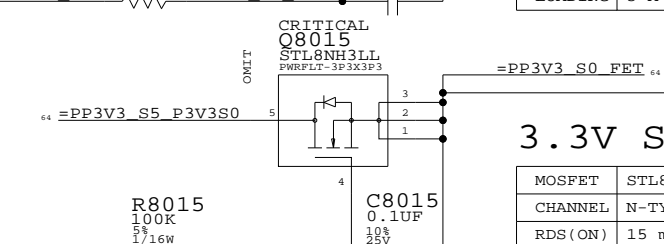
MOSFET	FDC638P
CHANNEL	P-TYPE
RDS(ON)	48 mOhm @4.5V
LOADING	100 mA



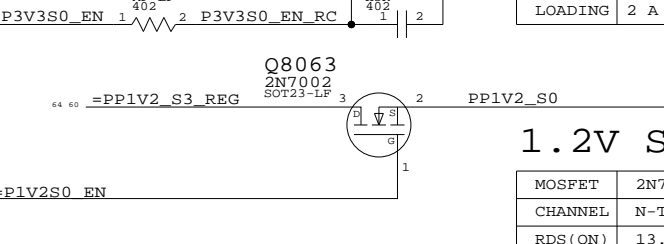
MOSFET	FDC638P
CHANNEL	P-TYPE
RDS(ON)	65 mOhm @2.5V
LOADING	1 A



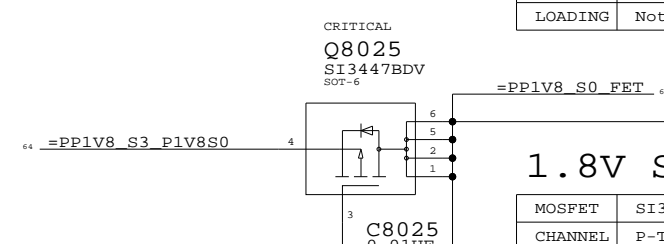
MOSFET	STL8NH3LL
CHANNEL	N-TYPE
RDS(ON)	15 mOhm @10V
LOADING	3 A



MOSFET	STL8NH3LL
CHANNEL	N-TYPE
RDS(ON)	15 mOhm @10V
LOADING	2 A



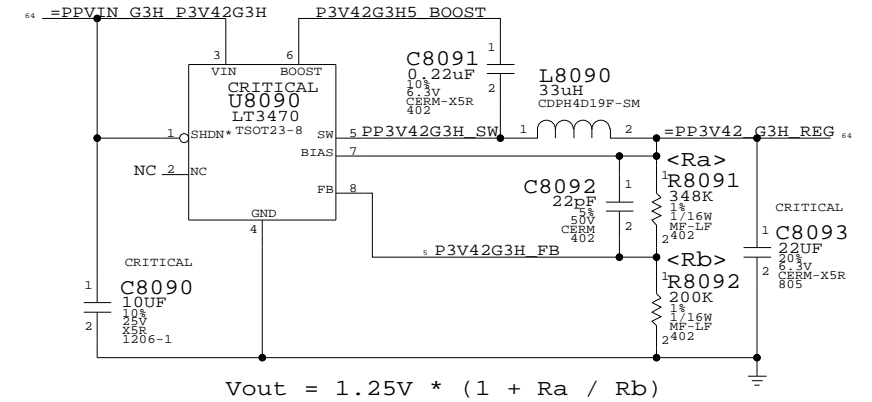
MOSFET	2N7002
CHANNEL	N-TYPE
RDS(ON)	13.5 Ohm
LOADING	Nothing



MOSFET	SI3447BDV
CHANNEL	P-TYPE
RDS(ON)	72 mOhm @1.8V
LOADING	320 mA

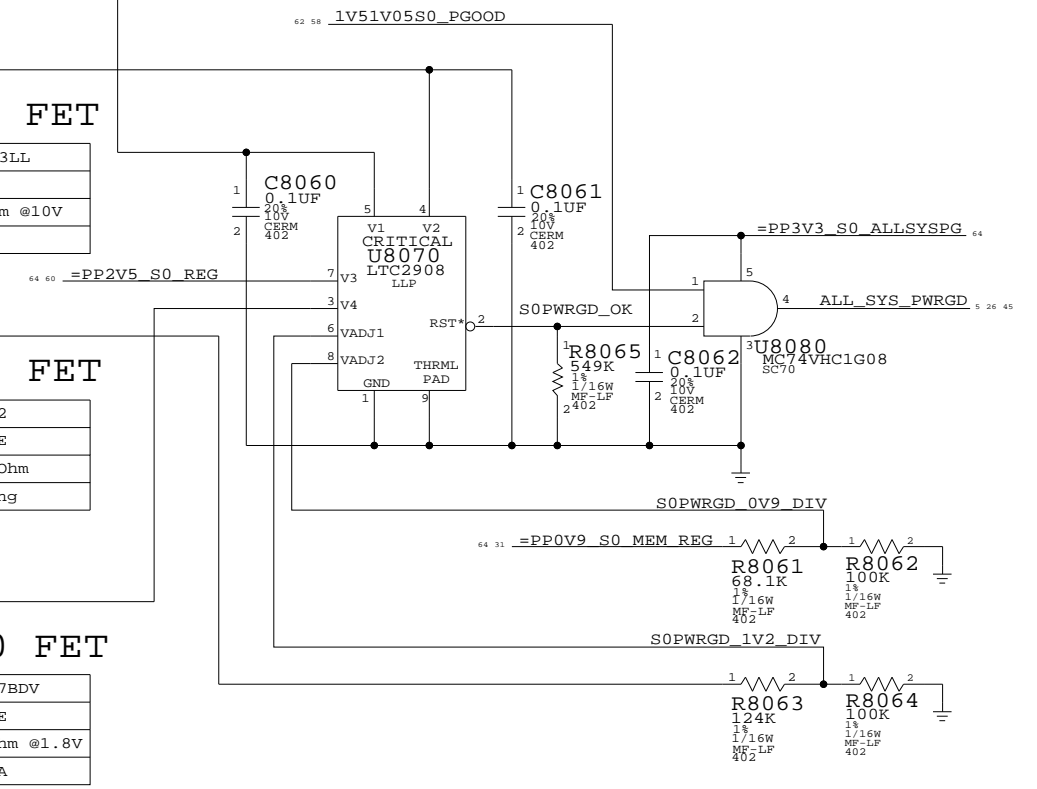
## 3.425V "G3Hot" SUPPLY

Supply needs to guarantee 3.31V delivered to SMC VRef generator



$$V_{out} = 1.25V * (1 + R_a / R_b)$$

## ALL SYSTEM PWRGD CIRCUIT



PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
376S0445	2	FAIRCHILD FDM6296	Q8005,Q8015	FET_FDM6296

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
376S0448	376S0445	?	D8005,Q8015	VISHAY SI7806ADN

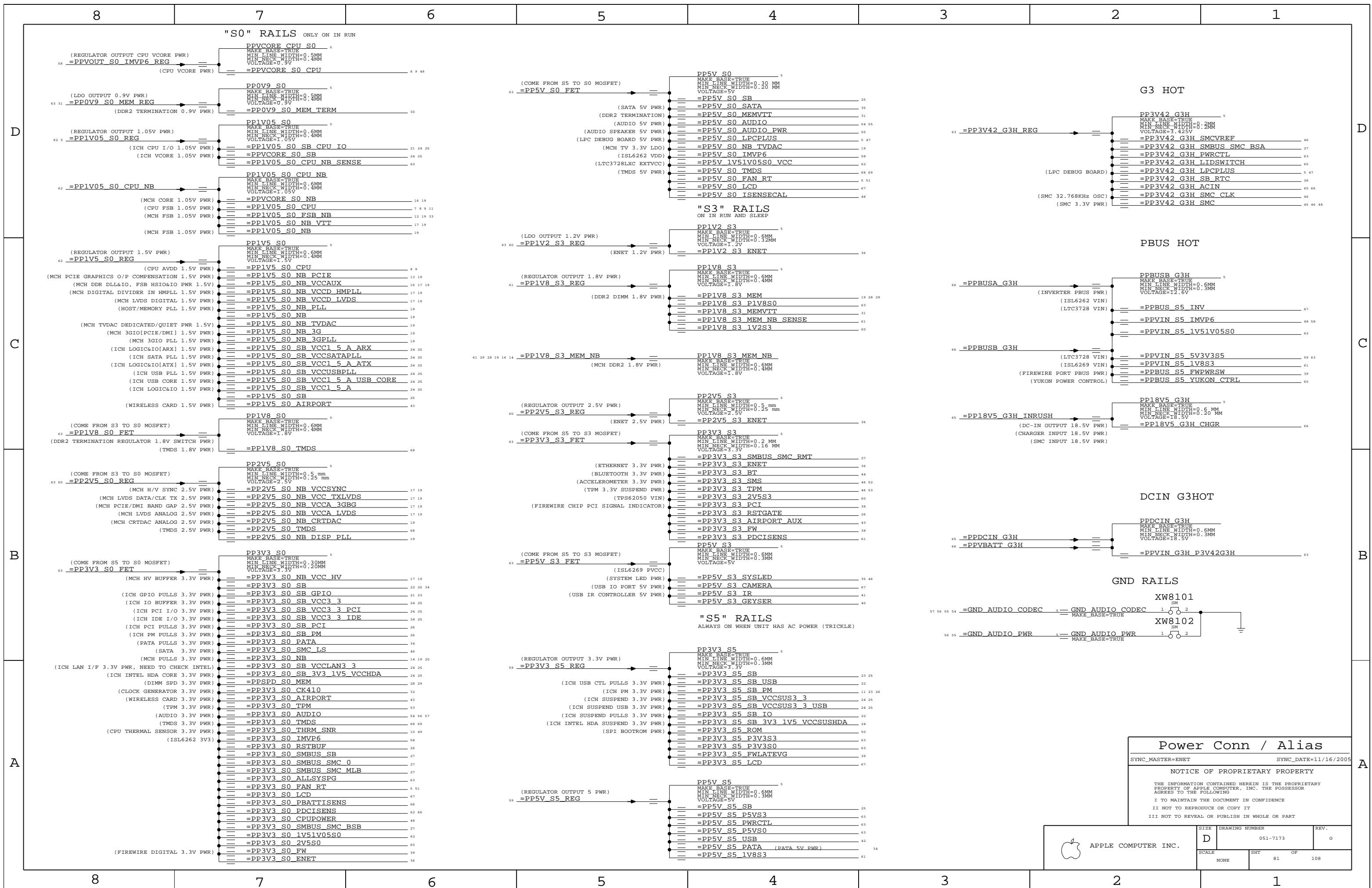
## S3/S0 FETS, G3H SUPPLY

SYNC\_MASTER=ENET SYNC\_DATE=08/30/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	80		



**Power Conn / Alias**

SYNC\_MASTER=ENET SYNC\_DATE=11/16/2005

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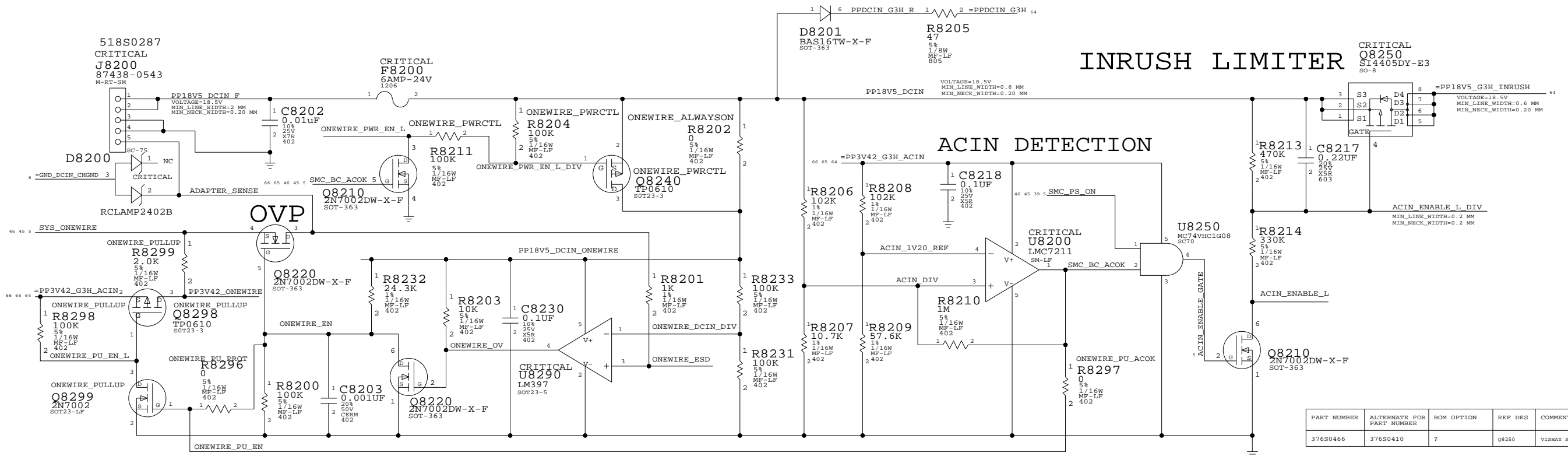
III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

	DRAWING NUMBER		REV.
	D 051-7173		G
SCALE		SHT	OF
NONE		81	108



# DC-JACK INTERFACE

8 7 6 5 4 3 2 1



## INRUSH LIMITER

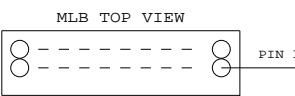
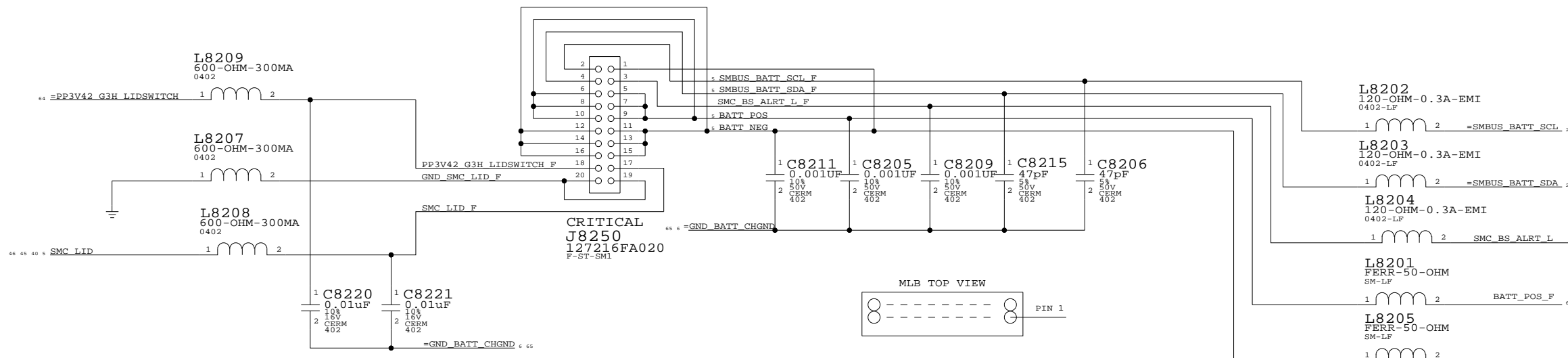
## ACIN DETECTION

## OVP

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
376S0466	376S0410	?	Q8250	VISHAY S14413ADY

# BATTERY INTERFACE

B B



## LID HALL EFFECT SENSOR

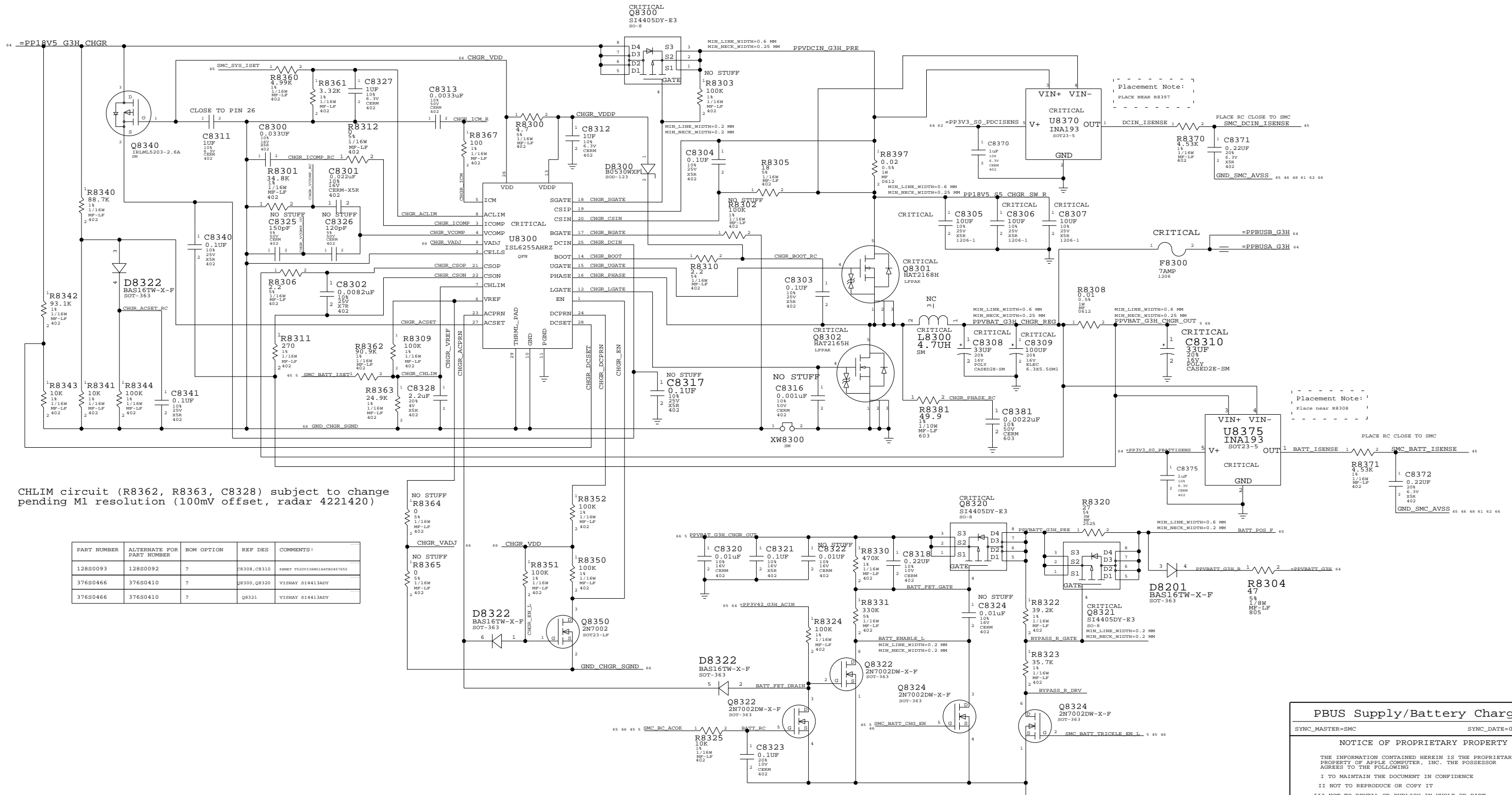
DC-In & Battery Connectors  
 SYNC\_MASTER=POWER SYNC\_DATE=07/13/2005

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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	REV.
NONE	82	108	

8 7 6 5 4 3 2 1

# PBUS SUPPLY / BATTERY CHARGER

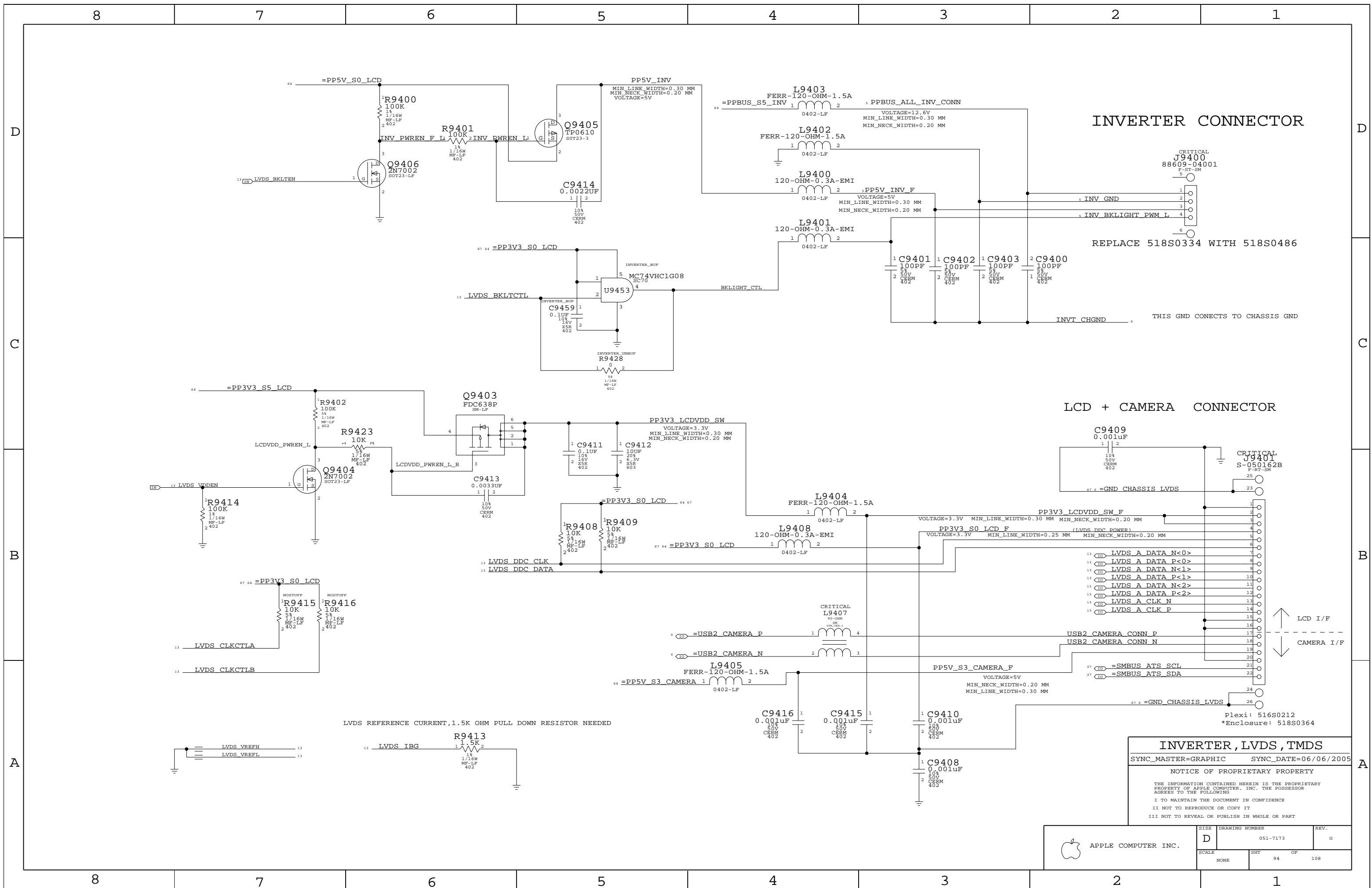


CHLIM circuit (R8362, R8363, C8328) subject to change pending M1 resolution (100mV offset, radar 4221420)

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
128S0093	128S0092	?	C8308, C8310	KEMET T520V33M018AT040457650
376S0466	376S0410	?	Q8300, Q8320	VISHAY S14413ADY
376S0466	376S0410	?	Q8321	VISHAY S14413ADY

**PBUS Supply/Battery Charger**  
 SYNC\_MASTER=SMC SYNC\_DATE=08/19/2005  
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APPLE COMPUTER INC.	SIZE	DRAWING NUMBER	REV.
	D	051-7173	G
SCALE	SHT	OF	108
NONE	83		



**INVERTER CONNECTOR**

CRITICAL  
**J9400**  
 88609-04001  
 F-ST-SM

REPLACE 518S0334 WITH 518S0486

THIS GND CONNECTS TO CHASSIS GND

**LCD + CAMERA CONNECTOR**

**C9409**  
 0.001uF

CRITICAL  
**J9401**  
 S-050162B  
 F-RT-SM

**INVERTER, LVDS, TMDs**

SYNC\_MASTER=GRAPHIC SYNC\_DATE=06/06/2005

**NOTICE OF PROPRIETARY PROPERTY**

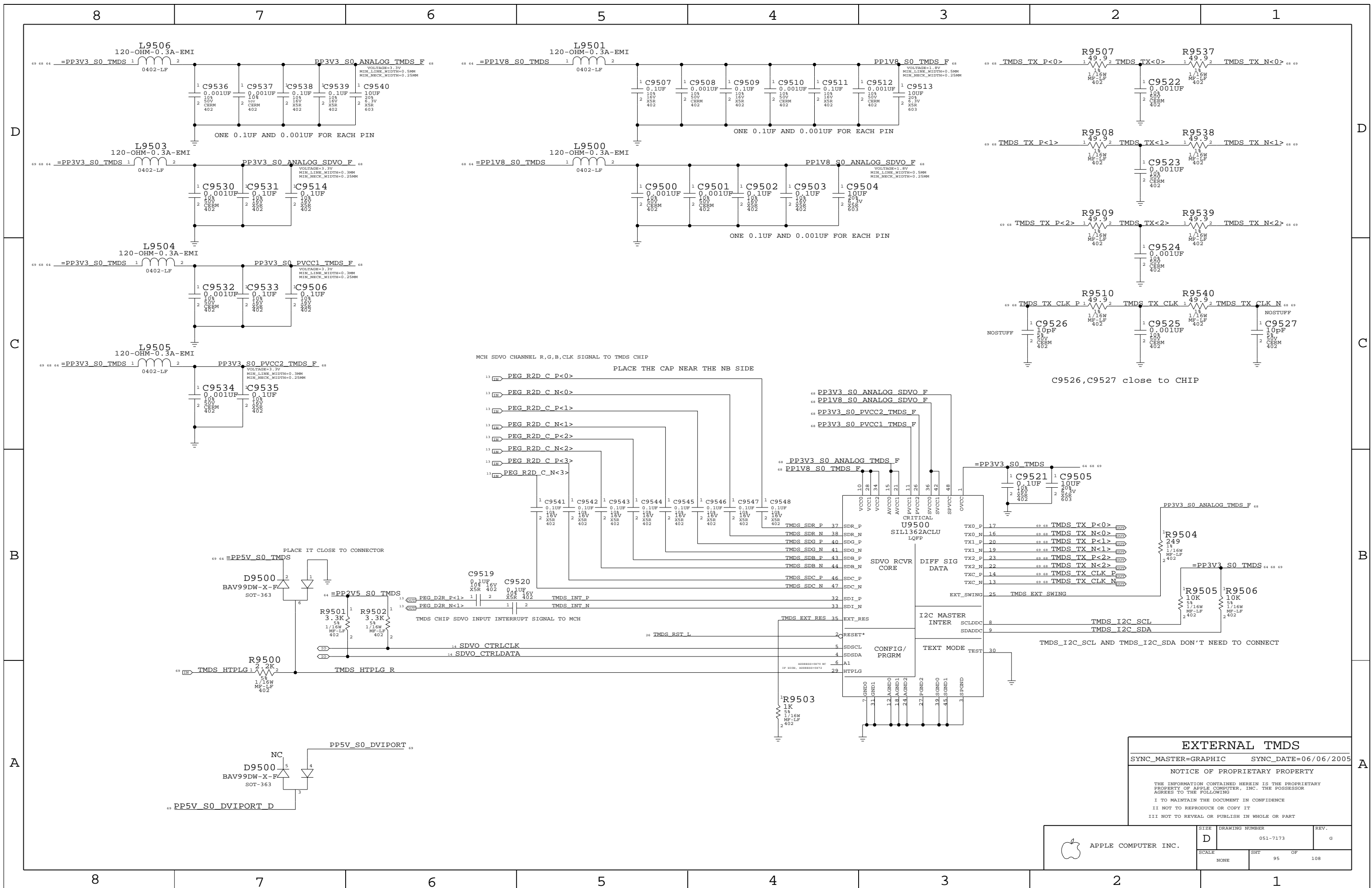
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APPLE COMPUTER INC.	SIZE <b>D</b>	DRAWING NUMBER 051-7173	REV. G
	SCALE NONE	SHEET 94	OF 108



**EXTERNAL TMDs**

SYNC\_MASTER=GRAPHIC    SYNC\_DATE=06/06/2005

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APPLE COMPUTER INC.	SIZE <b>D</b>	DRAWING NUMBER 051-7173	REV. G
	SCALE NONE	SHEET 95	OF 108

PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS
15580227	15580164	?	REF: 15580164	KEEP MAG LAYER IN BOX

## Video Connectors

EXTERNAL VIDEO (VGA) INTERFACE

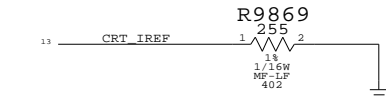
TMDS(MINI DVI) INTERFACE

Isolation required for DVI power switch

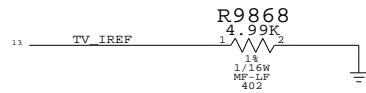
PLACE THE RESISTOR CLOSE TO GMCH AND THE CAP NEAR CONNECTOR

PLACE THE RESISTOR CLOSE TO GMCH AND THE CAP NEAR THE CONNECTOR

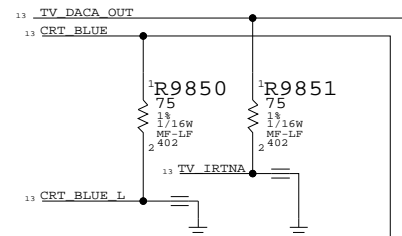
A 255 OHM 1% RESISTOR IS REQUIRED BETWEEN CRT\_IREF AND GROUND



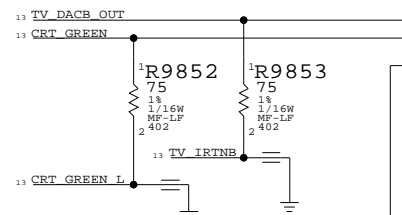
TV REFERENCE CURRENT, USES AN EXTERNAL RESISTOR OF 5K OHM 1% TO SET INTERNAL VOLTAGE LEVELS



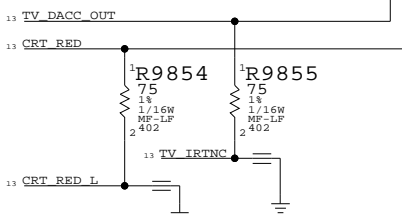
PLACE THE RESISTOR CLOSE TO GMCH



PLACE THE RESISTOR CLOSE TO GMCH



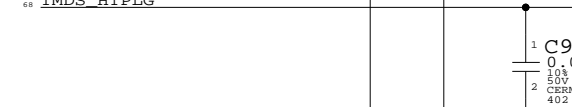
PLACE THE RESISTOR CLOSE TO GMCH



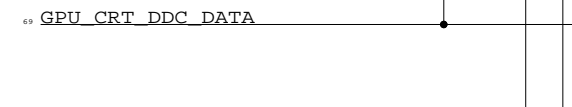
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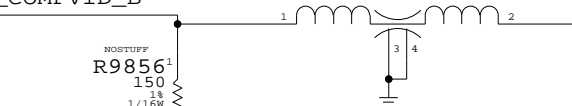
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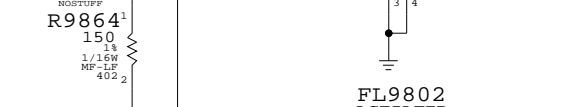
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VOLTAGE=5V  
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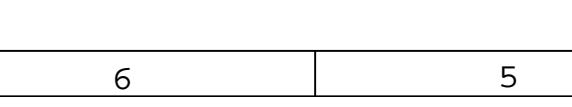
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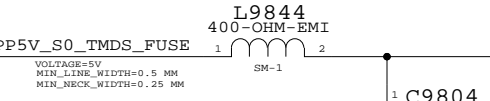
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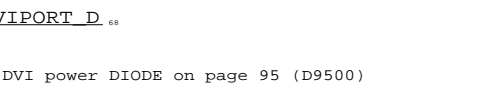
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VOLTAGE=5V  
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VOLTAGE=5V  
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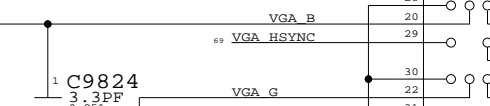
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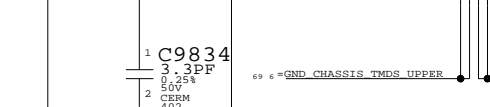
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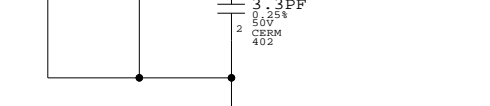
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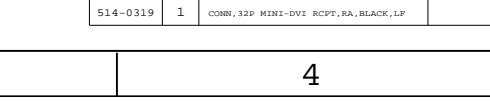
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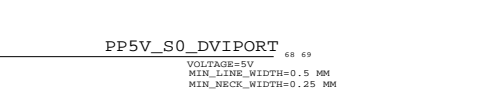
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VOLTAGE=5V  
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MIN\_NECK\_WIDTH=0.25 MM



VOLTAGE=5V  
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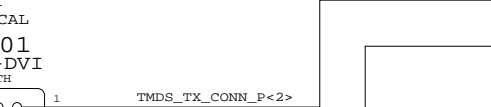
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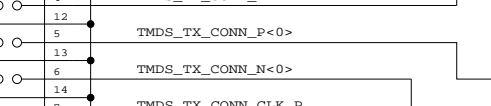
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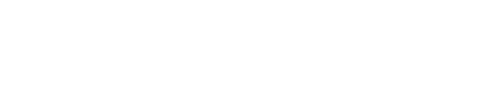
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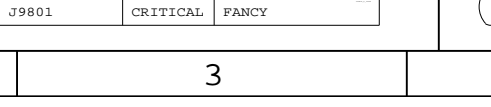
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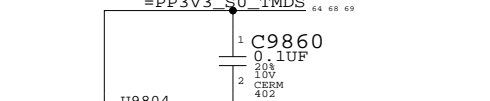
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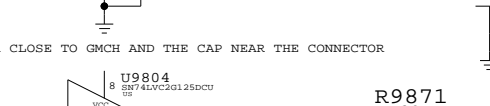
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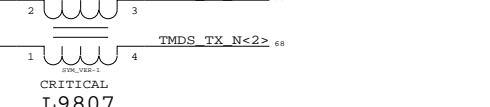
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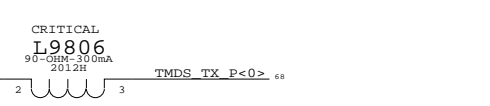
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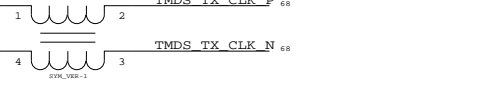
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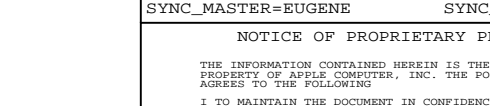
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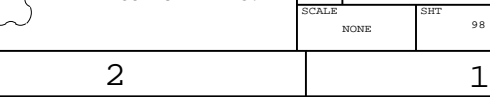
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VOLTAGE=5V  
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VOLTAGE=5V  
MIN\_LINE\_WIDTH=0.5 MM  
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VOLTAGE=5V  
MIN\_LINE\_WIDTH=0.5 MM  
MIN\_NECK\_WIDTH=0.25 MM

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
514-0292	1	CONN, 32P MINI-DVI RCP7, RA, M3, LF	J9801	CRITICAL	NORMAL
514-0319	1	CONN, 32P MINI-DVI RCP7, RA, BLACK, LF	J9801	CRITICAL	FANCY

### MINI-DVI CONNECTOR

SYNC\_MASTER=EUGENE SYNC\_DATE=05/21/05

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SCALE	SHT	OF	108
NONE	98		





















	8	7	6	5	4	3	2	1				
D	R7210	RES_402	m42a[55A7]	R7903	RES_402	m42a[62A3]	R9509	RES_402	m42a[68C2]	XW7300	SHORT_SM	m42a[56C4]
	R7260	RES_402	m42a[55D2]	R7904	RES_402	m42a[62A3]	R9510	RES_402	m42a[68C2]	XW7301	SHORT_SM	m42a[56B4]
	R7261	RES_402	m42a[55C2]	R7905	RES_402	m42a[62A6]	R9537	RES_402	m42a[68D1]	XW7302	SHORT_SM	m42a[56C2]
	R7270	RES_402	m42a[55C2]	R7906	RES_402	m42a[62A3]	R9538	RES_402	m42a[68D1]	XW7303	SHORT_SM	m42a[56C2]
	R7271	RES_402	m42a[55C2]	R7907	RES_402	m42a[62A3]	R9539	RES_402	m42a[68C1]	XW7304	SHORT_SM	m42a[56B2]
	R7280	RES_402	m42a[55B2]	R7921	RES_402	m42a[62C7]	R9540	RES_402	m42a[68C1]	XW7305	SHORT_SM	m42a[56B7]
	R7281	RES_402	m42a[55B2]	R7924	RES_402	m42a[62C6]	R9821	RES_402	m42a[69D7]	XW7400	SHORT_SM	m42a[57A7]
	R7300	RES_402	m42a[56C4]	R7925	RES_402	m42a[62B6]	R9822	RES_402	m42a[69D6]	XW7500	SHORT_SM	m42a[58A6]
	R7301	RES_402	m42a[56C4]	R7926	RES_402	m42a[62C7]	R9850	RES_402	m42a[69B8]	XW7600	SHORT_SM	m42a[59A5]
	R7320	RES_402	m42a[56B5]	R7927	RES_402	m42a[62B8]	R9851	RES_402	m42a[69B8]	XW7620	JUMPER_OPEN-SAWTOOTH	m42a[59B8]
C	R7321	RES_402	m42a[56D7]	R7928	RES_402	m42a[62B8]	R9852	RES_402	m42a[69A8]	XW7660	JUMPER_OPEN-SAWTOOTH	m42a[59B1]
	R7322	RES_402	m42a[56B7]	R7929	RES_402	m42a[62C7]	R9853	RES_402	m42a[69A8]	XW7800	SHORT_SM	m42a[61B5]
	R7349	RES_402	m42a[56B7]	R7930	RES_402	m42a[62C5]	R9854	RES_402	m42a[69A8]	XW7900	SHORT_SM	m42a[62A5]
	R7350	RES_402	m42a[56A4]	R7961	RES_402	m42a[62C2]	R9855	RES_402	m42a[69A8]	XW7920	JUMPER_OPEN-SAWTOOTH	m42a[62B8]
	R7351	RES_402	m42a[56A4]	R7964	RES_402	m42a[62C3]	R9856	RES_402	m42a[69B6]	XW8101	SHORT_SM	m42a[64B2]
	R7380	RES_402	m42a[56C2]	R7965	RES_402	m42a[62B3]	R9859	RES_402	m42a[69A6]	XW8102	SHORT_SM	m42a[64B2]
	R7382	RES_402	m42a[56B2]	R7966	RES_402	m42a[62C2]	R9860	RES_402	m42a[69C3]	XW8300	SHORT_SM	m42a[66B4]
	R7391	RES_402	m42a[56C7]	R7967	RES_402	m42a[62B2]	R9861	RES_402	m42a[69C3]	Y2600	CRYSTAL_4PIN_SM-LF	m42a[26C7]
	R7401	RES_402	m42a[57D8]	R7968	RES_402	m42a[62D2]	R9862	RES_402	m42a[69C5]	Y3301	CRYSTAL_5X3.2-SM	m42a[32C7]
	R7402	RES_402	m42a[57D7]	R7969	RES_402	m42a[62C2]	R9863	RES_402	m42a[69C5]	Y4101	CRYSTAL_4PIN_SM-3.2X	m42a[36B6]
B	R7403	RES_402	m42a[57C7]	R7970	RES_402	m42a[62C4]	R9864	RES_402	m42a[69A6]	2.5MM		
	R7404	RES_402	m42a[57C4]	R7970	RES_402	m42a[62C4]	R9868	RES_402	m42a[69C8]	Y4403	CRYSTAL_4PIN_SM-3.2X	m42a[38C2]
	R7405	RES_402	m42a[57D5]	R7991	RES_402	m42a[62A6]	R9869	RES_402	m42a[69C8]	2.5MM		
	R7406	RES_402	m42a[57D6]	R7992	RES_603	m42a[62A7]	R9870	RES_402	m42a[69C1]	Y5920	CRYSTAL_5X3.2-SM	m42a[46C7]
	R7411	RES_402	m42a[57C8]	R8000	RES_402	m42a[63D5]	R9871	RES_402	m42a[69C1]	Y6795	CRYSTAL_4PIN_SM-LF	m42a[53B6]
	R7412	RES_402	m42a[57B7]	R8005	RES_402	m42a[63C5]	RP2300	RPAK4P_SM-LF	m42a[23D5]	Z0601	MTGHOLE	m42a[68B]
	R7413	RES_402	m42a[57C6]	R8010	RES_402	m42a[63C5]	RP2600	RPAK4P_SM-LF	m42a[26D2]	Z0602	MTGHOLE	m42a[68C]
	R7414	RES_402	m42a[57C4]	R8015	RES_402	m42a[63A5]	RP2601	RPAK4P_SM-LF	m42a[26D2]	Z0603	PCB_STANDOFF	m42a[68B]
	R7415	RES_402	m42a[57C5]	R8025	RES_402	m42a[63A5]	RP2602	RPAK4P_SM-LF	m42a[26C2]	Z0604	PCB_STANDOFF	m42a[68C]
	R7430	RES_603	m42a[57C3]	R8030	RES_402	m42a[63B6]	RP3000	RPAK4P_SM-LF	m42a[30B4 30C4 30D4 30D4]	Z0605	PCB_STANDOFF	m42a[68B]
A	R7431	RES_603	m42a[57B3]	R8031	RES_402	m42a[63B6]	RP3001	RPAK4P_SM-LF	m42a[30C4 30A4 30A4 30D4]	Z0606	MTGHOLE	m42a[68C]
	R7432	RES_402	m42a[57B3]	R8032	RES_402	m42a[63D6]	RP3002	RPAK4P_SM-LF	m42a[30A4 30A4 30A4 30D4]	Z0607	MTGHOLE	m42a[68C]
	R7433	RES_402	m42a[57A3]	R8033	RES_402	m42a[63D6]	RP3003	RPAK4P_SM-LF	m42a[30C4 30C4 30C4 30D4]	Z0608	MTGHOLE	m42a[68C]
	R7434	RES_402	m42a[57C2]	R8050	RES_402	m42a[63A6]	RP3004	RPAK4P_SM-LF	m42a[30C4 30C4 30D4]	Z0609	MTGHOLE	m42a[68B]
	R7435	RES_402	m42a[57C2]	R8056	RES_402	m42a[63C8]	RP3005	RPAK4P_SM-LF	m42a[30B4 30A4 30A4 30D4]	Z0610	MTGHOLE	m42a[68B]
	R7436	RES_402	m42a[57B2]	R8057	RES_402	m42a[63C8]	RP3006	RPAK4P_SM-LF	m42a[30B4 30B4 30A4 30D4]	Z0611	MTGHOLE	m42a[68B]
	R7437	RES_402	m42a[57B2]	R8058	RES_402	m42a[63B8]	RP3007	RPAK4P_SM-LF	m42a[30C4 30C4 30C4 30C4]	Z0612	PCB_STANDOFF	m42a[68C]
	R7438	RES_402	m42a[57C2]	R8059	RES_402	m42a[63B8]	RP3008	RPAK4P_SM-LF	m42a[30C4 30C4 30C4 30C4]	Z0613	PCB_STANDOFF	m42a[68C]
	R7439	RES_402	m42a[57B2]	R8061	RES_402	m42a[63B1]	RP3009	RPAK4P_SM-LF	m42a[30B4 30B4 30C4 30C4]	Z0621	PCB_STANDOFF	m42a[68C]
	R7440	RES_402	m42a[57A5]	R8062	RES_402	m42a[63B1]	RP3010	RPAK4P_SM-LF	m42a[30B4 30B4 30B4 30B4]	ZS0620	SPRING_CLIP_LP_RMI_C	m42a[6D7]