

8

7

6

5

4

3

2

1

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.

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POWER BLOCK DIAGRAM

PCB NOTES AND HOLES

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MPC7450 DATA

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INTREPID MEMORY INTERFACE / BOOT ROM

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INTREPID ENET/FW/UATA/EIDE INTERFACES

INTREPID GPIOS/SERIAL/USB INTERFACES/SSCG

INTREPID POWER RAILS

INTREPID DECOUPLING

CARDBUS CONTROLLER (PCI1510)

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M11 LVDS/TMDS/VGA/GPIO & GPU VCORE

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MMM, BATTERY CURRENT SENSE

INTERNAL CONNECTORS - DVD,
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PMU (POWER MANAGEMENT UNIT)

BATTERY CHARGER AND CONNECTOR

12.8V SYSTEM POWER SUPPLY / PMU POWER SUPPLY

3.3V / 5V SYSTEM POWER SUPPLIES

CPU CORE VOLTAGE POWER SUPPLY

1.5V/ 1.8V / 2.5V SYSTEM POWER SUPPLIES

SIGNAL CONSTRAINTS (1 OF 3) - DIGITAL/CLK

SIGNAL CONSTRAINTS (2 OF 3) - DIGITAL/DIFF

SIGNAL CONSTRAINTS (3 OF 3) - POWER NETS

FUNCTIONAL TEST POINTS

REVISION HISTORY (1 OF 1)

SCHEMATIC CREF AND NETLIST REPORTS

REV

ZONE

ECN

DESCRIPTION OF CHANGE

CK APPD
DATE

ENG APPD
DATE

B

35714

2PRODUCTION RELEASED

12/21/04

?

SCHEM,MLB,PB17"

12/21/2004

BOM OPTIONS

STUFF

NO STUFF

D3_HOT

✓

D3_COLD

✓

GPU_SS

✓

GPU_SWITCH

✓

SERIAL_DEBUG

✓

VCORE_OFFSET

✓

1_8V_MAXBUS

✓

1_5V_MAXBUS

✓

NEC_USB

✓

INTREPID_USB

✓

BBANG

✓

NO_BBANG

✓

ATI_MEMIO_HI

✓

ATI_MEMIO_LO

✓

SSCG

✓

NO_SSCG

✓

5V_HD_LOGIC

✓

3V_HD_LOGIC

✓

EXT_TMDS

✓

INT_TMDS

✓

MMM

✓

INT_CLK

✓

EXT_CLK

✓

PART#

QTY

DESCRIPTION

REFERENCE DESIGNATOR(S)

BOM OPTION

051-6694

1

SCHEM,MLB,PB17

SCH1

820-1688

1

PCBF,MLB,PB17

PCB1

DIMENSIONS ARE IN MILLIMETERS

XX : _____

X.XX : _____

X.XXX : _____

ANGLES : _____

DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

METRIC

DRAFTER

ENG APPD

QA APPD

RELEASE

DESIGN CK

MFG APPD

DESIGNER

SCALE

SIZE

D

MATERIAL/FINISH
NOTED AS
APPLICABLE

Apple Computer Inc.

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TITLE

SCHEM,MLB,PB17"

DRAWING NUMBER

051-6694

REV.

B

SHT

1

OF

45

8

7

6

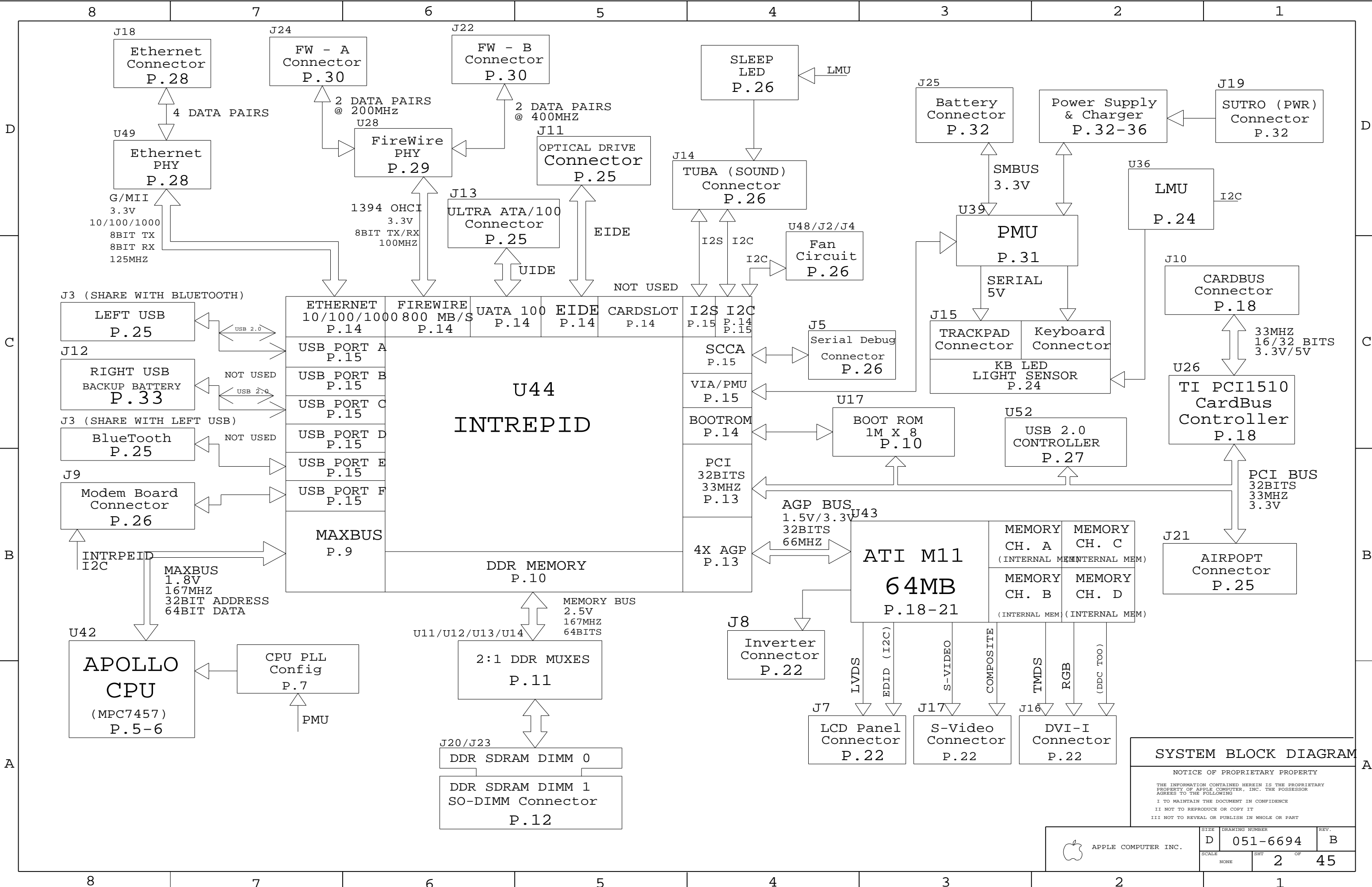
5

4

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2

1



SYSTEM BLOCK DIAGRAM

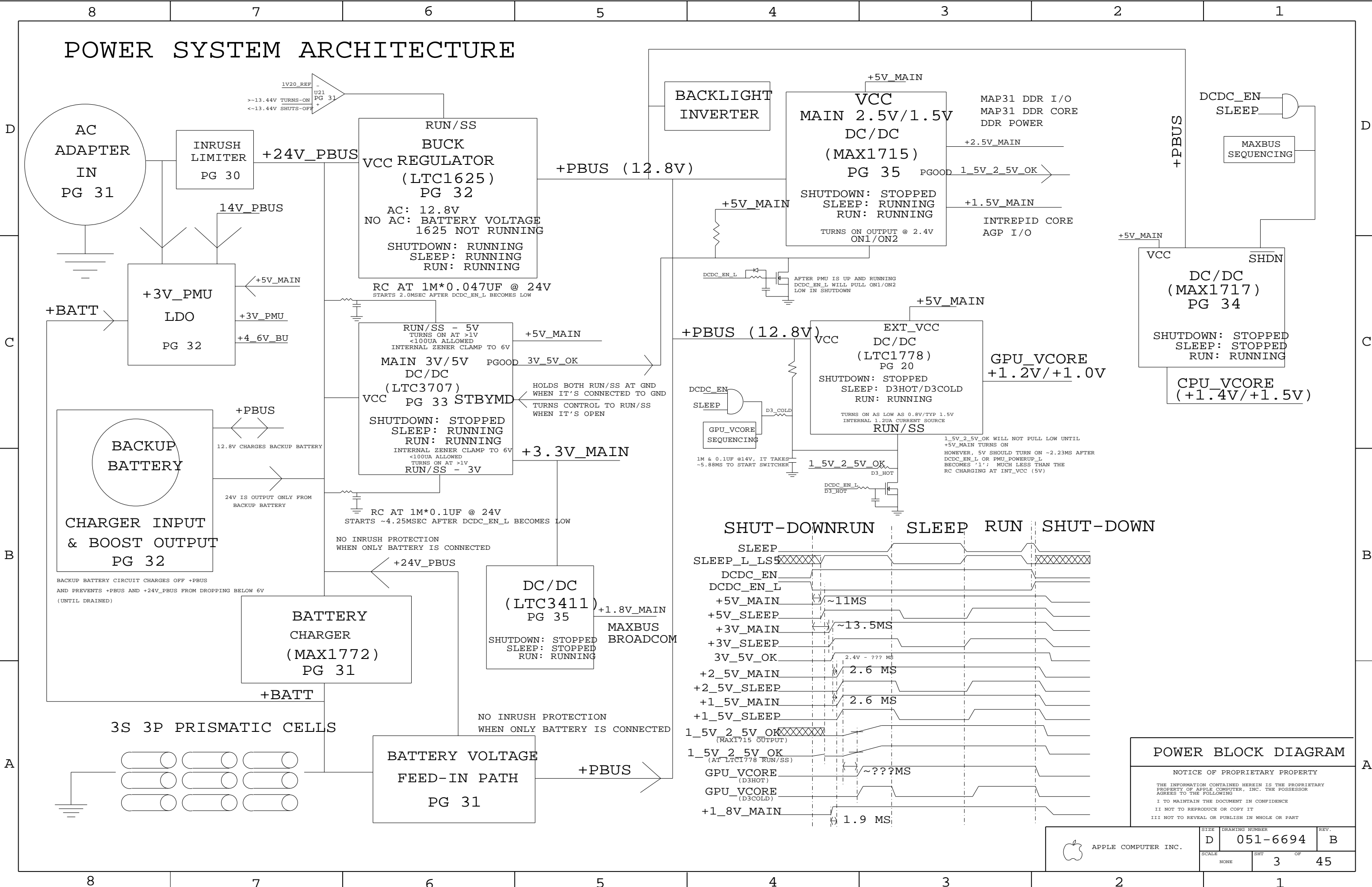
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PCB SPECS

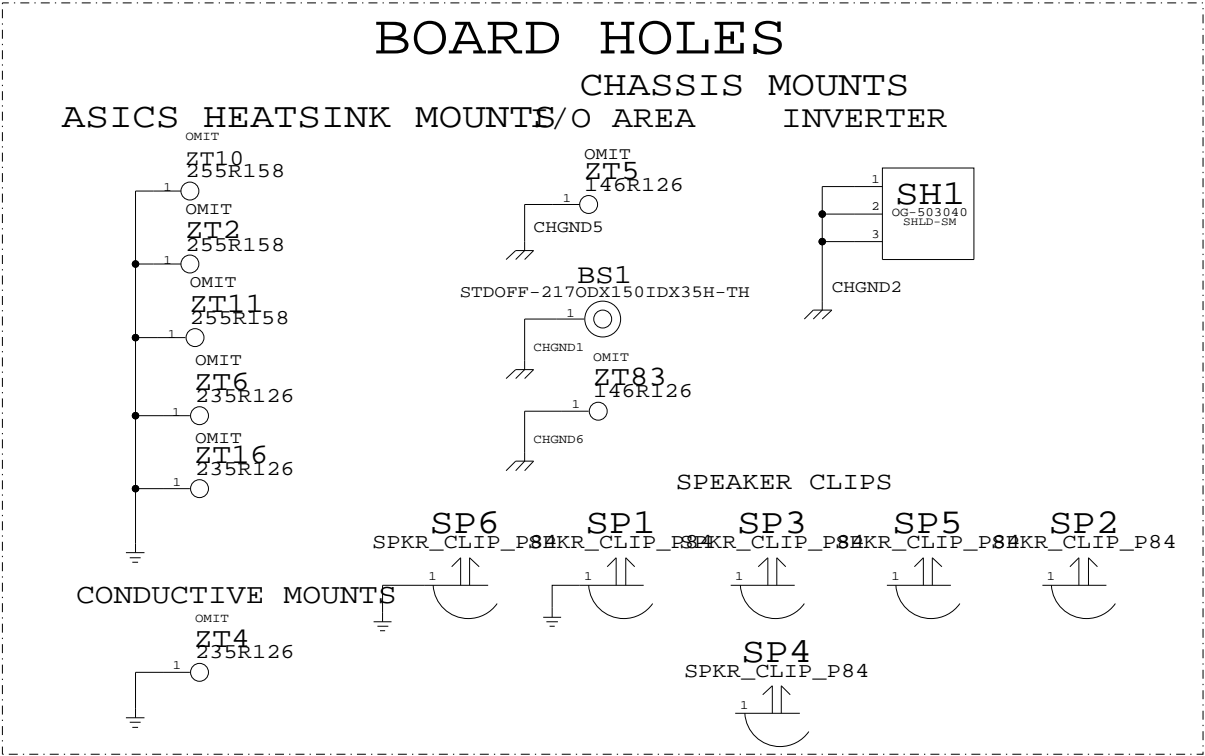
THICKNESS : 1.2 MM / 0.047 IN
1/2 OZ CU THICKNESS: 0.7 MILS
1.0 OZ CU THICKNESS: 1.4 MILS

IMPEDANCE : 50 OHMS +/- 10%
DIELECTRIC: FR-4
LAYER COUNT: 12
SIGNAL TRACE WIDTH: 4 MILS
SIGNAL TRACE SPACING: 4 MILS
PREPREG THICKNESS: 2-3 MILS

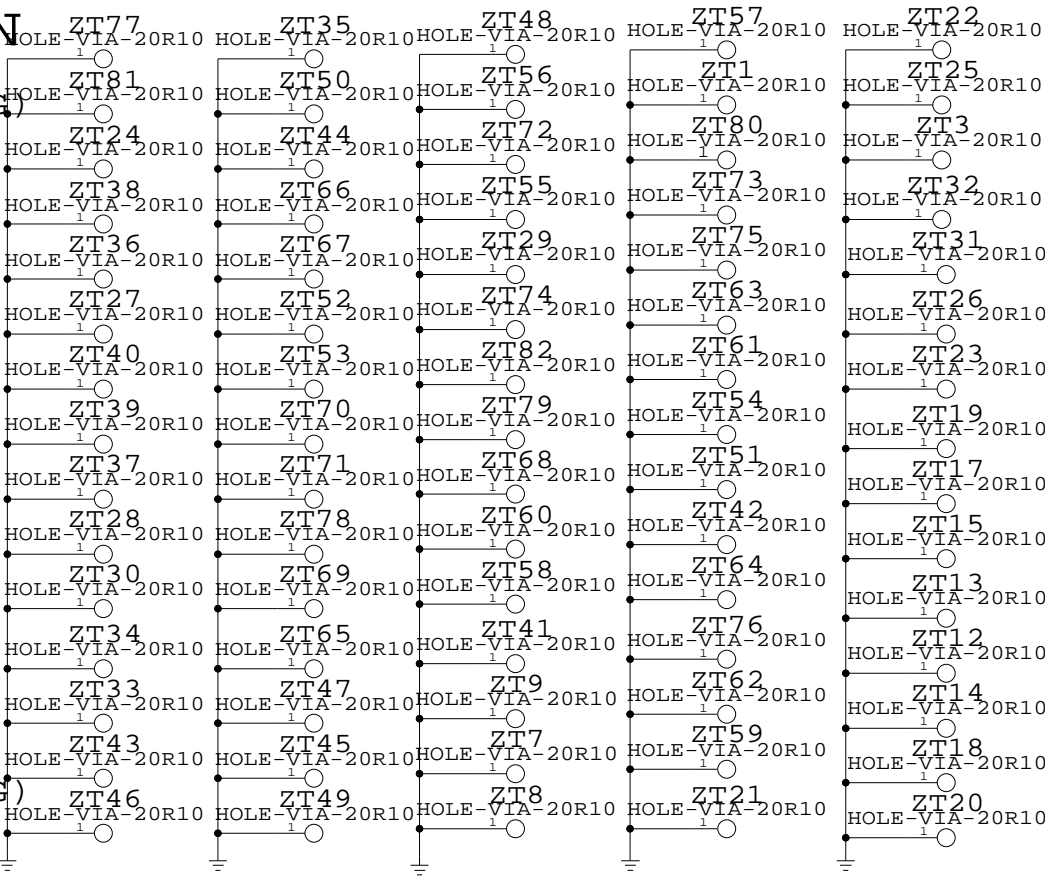
SEE PCB CAD FILES FOR MORE SPECIFIC INFO.

BOARD STACK-UP AND CONSTRUCTION

| | | |
|----|----------------------------------|-----------------------|
| 1 | SIGNAL (1/3 OZ + COPPER PLATING) | |
| 2 | PREPREG (3MIL) | GROUND (1/2 OZ) |
| 3 | LAMINATE (4MIL) | SIGNAL (1/2 OZ) |
| 4 | PREPREG (3MIL) | SIGNAL (1/2 OZ) |
| 5 | LAMINATE (4MIL) | GROUND (1/2 OZ) |
| 6 | PREPREG (2MIL) | CUT POWER PLANE(1 OZ) |
| 7 | LAMINATE (3MIL) | CUT POWER PLANE(1 OZ) |
| 8 | PREPREG (2MIL) | GROUND (1/2 OZ) |
| 9 | LAMINATE (4MIL) | SIGNAL (1/2 OZ) |
| 10 | PREPREG (3MIL) | SIGNAL (1/2 OZ) |
| 11 | LAMINATE (4MIL) | GROUND (1/2 OZ) |
| 12 | SIGNAL (1/3 OZ + COPPER PLATING) | |



GROUND VIAS



BOARD INFORMATION

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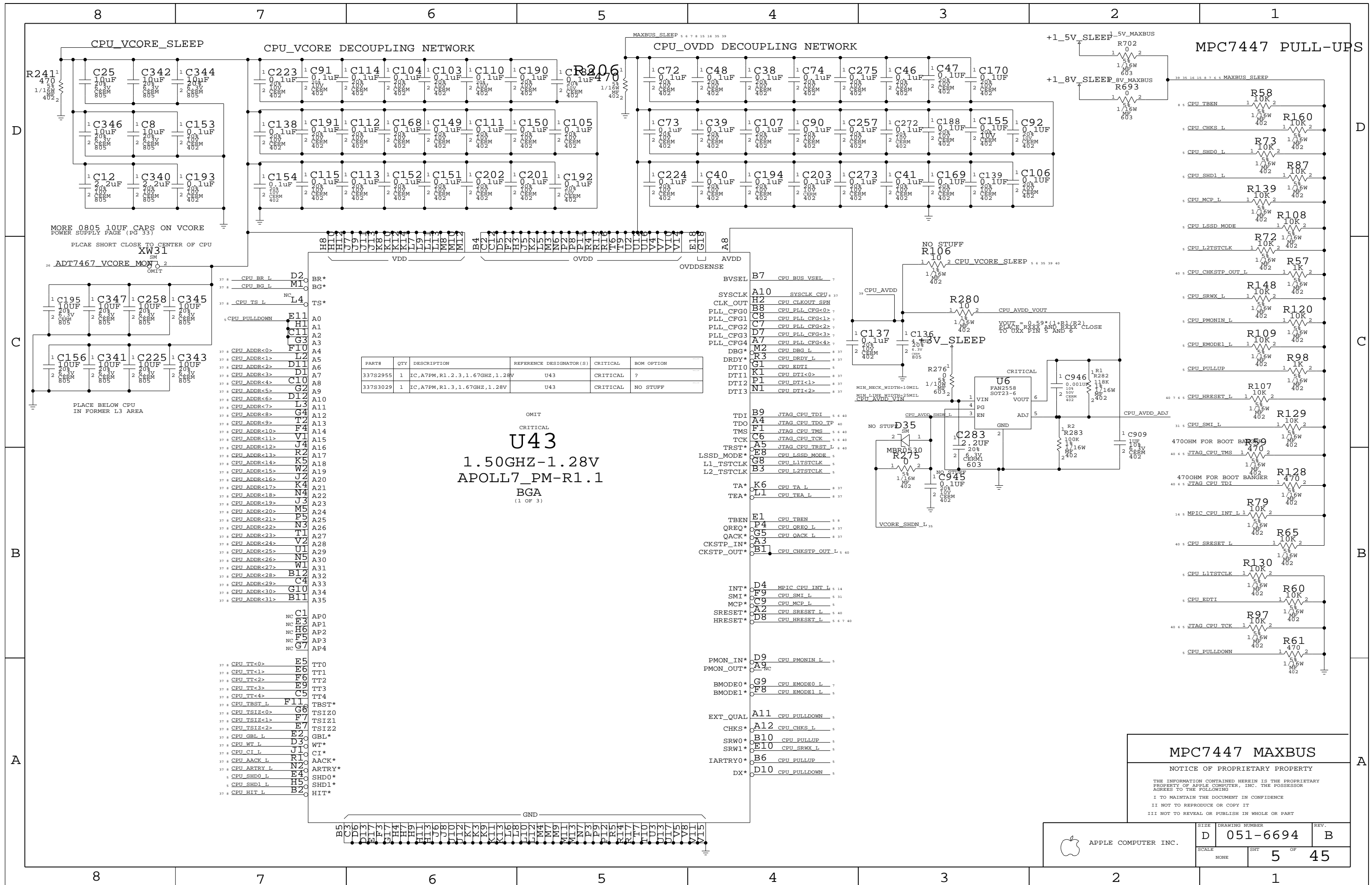
II NOT TO REPRODUCE OR COPY IT

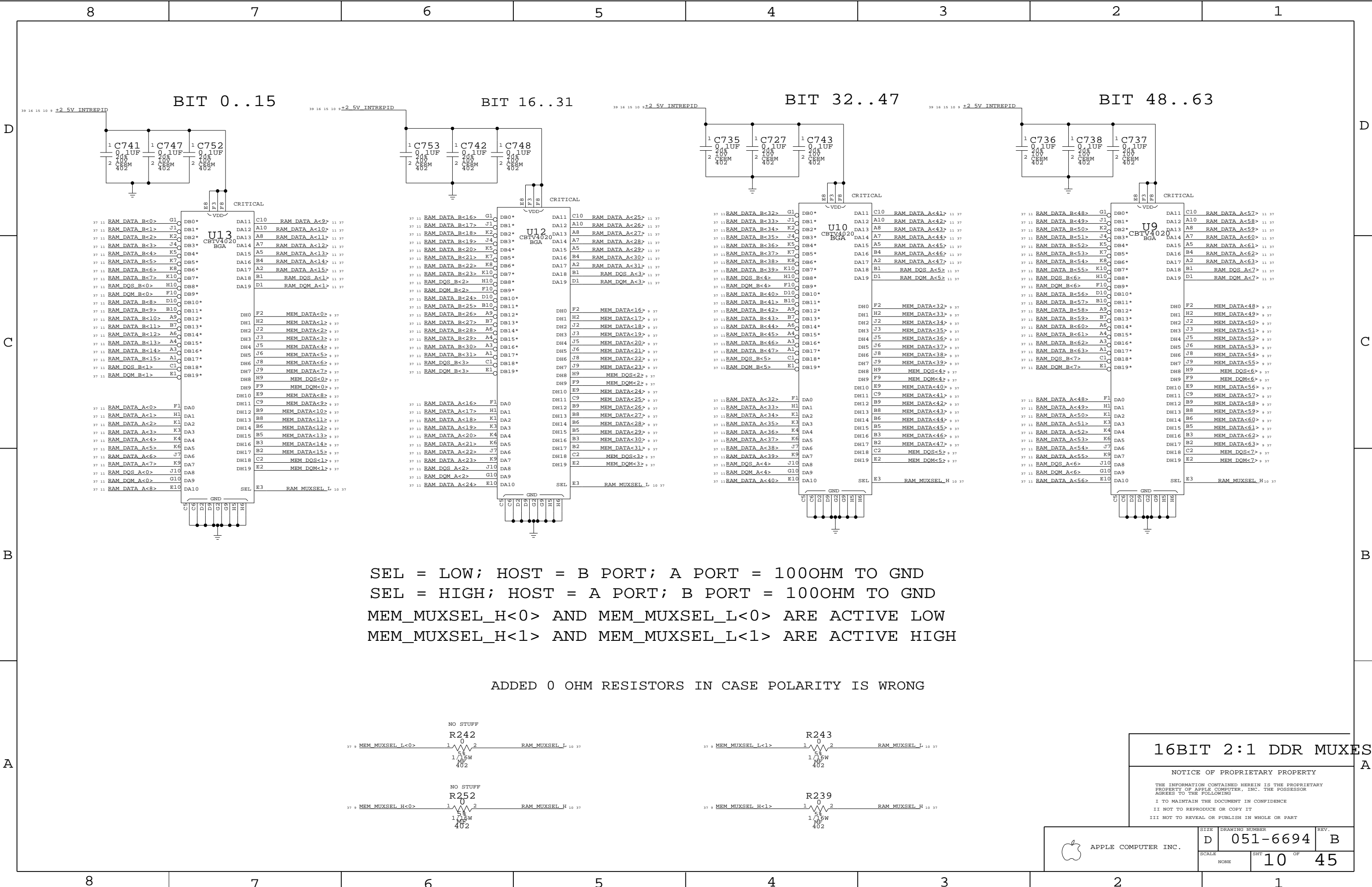
III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART



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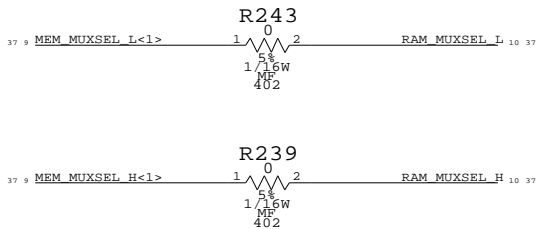
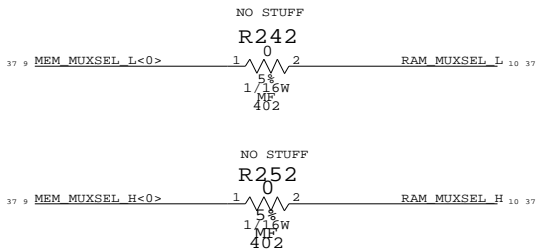
| SIZE | DRAWING NUMBER | REV. |
|-------|----------------|------|
| D | 051-6694 | B |
| SCALE | SHT | OF |
| NONE | 4 | 45 |





SEL = LOW; HOST = B PORT; A PORT = 100OHM TO GND
SEL = HIGH; HOST = A PORT; B PORT = 100OHM TO GND
MEM_MUXSEL_H<0> AND MEM_MUXSEL_L<0> ARE ACTIVE LOW
MEM_MUXSEL_H<1> AND MEM_MUXSEL_L<1> ARE ACTIVE HIGH

ADDED 0 OHM RESISTORS IN CASE POLARITY IS WRONG



16BIT 2:1 DDR MUXES

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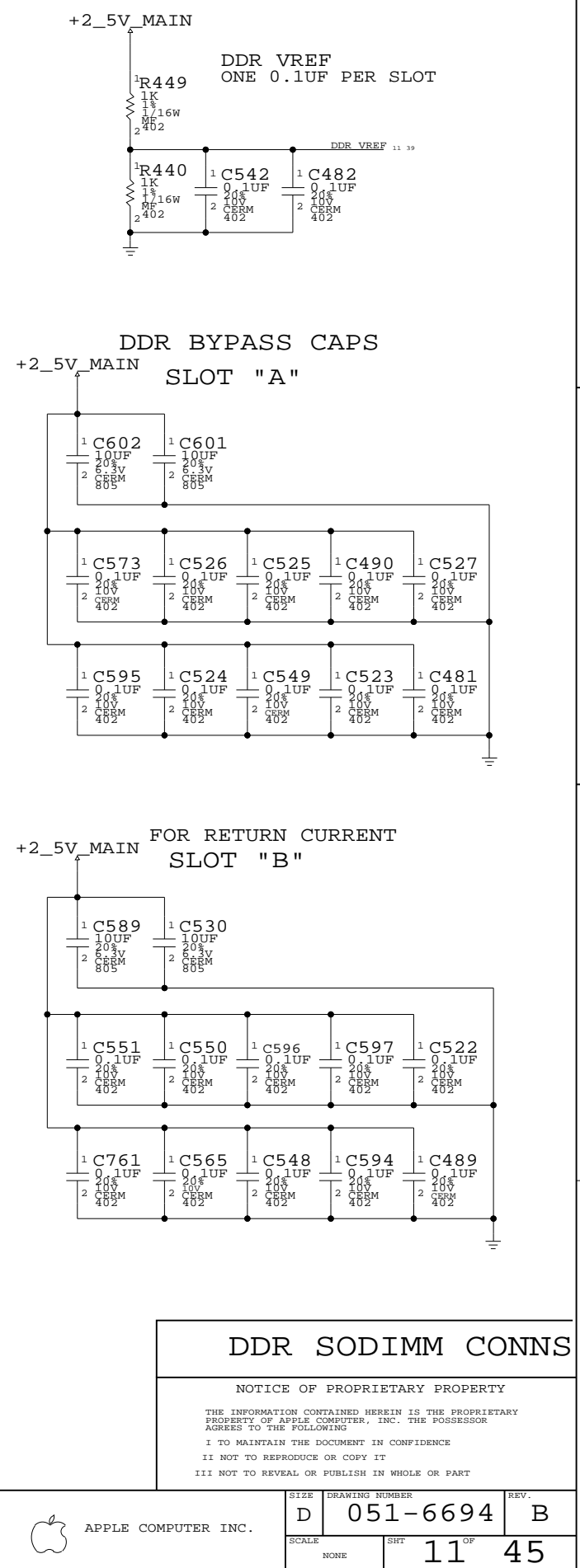
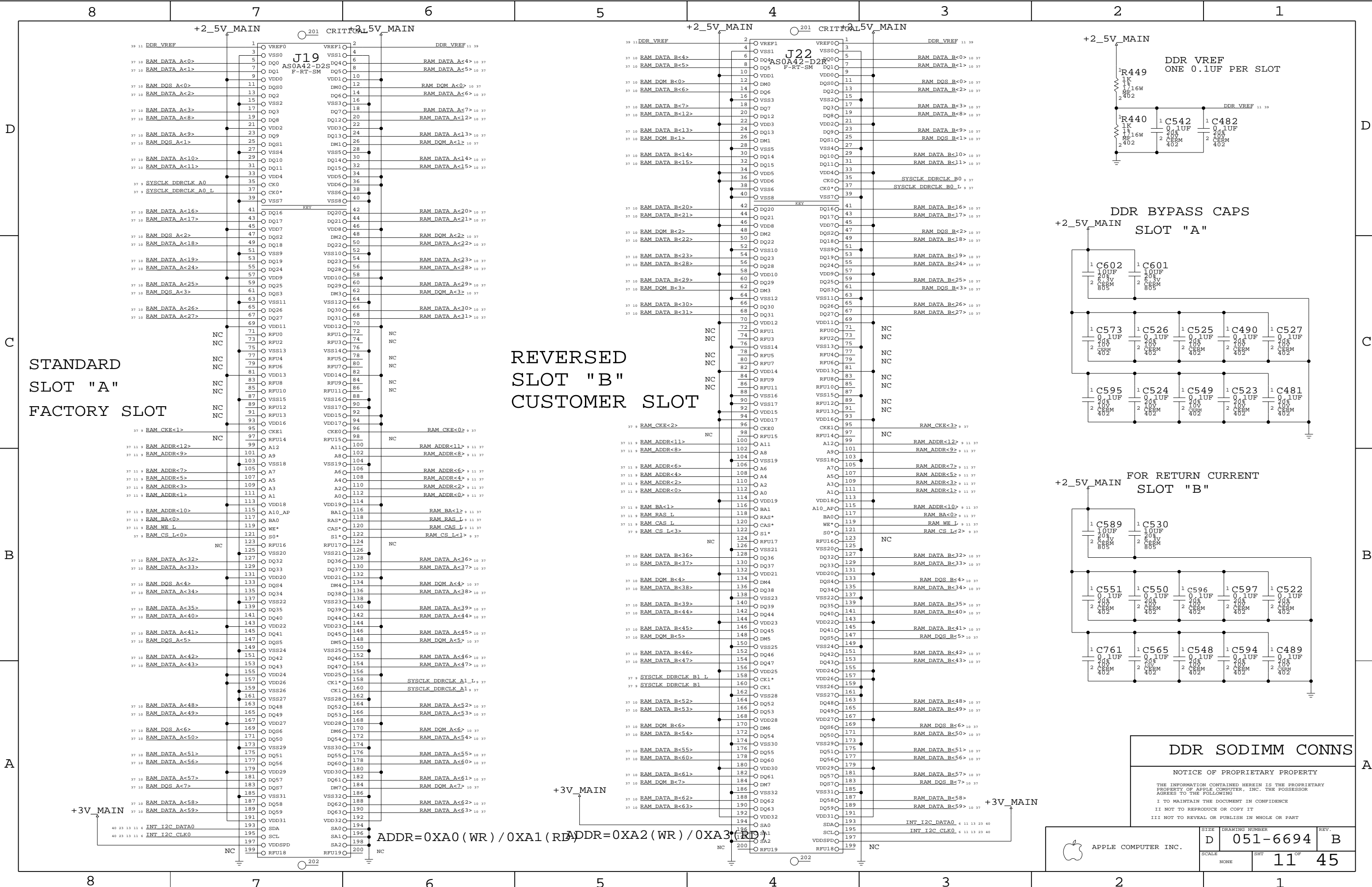
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SIZE D DRAWING NUMBER 051-6694 REV. B

SCALE NONE SHT 10 OF 45



DDR SODIMM CONNS

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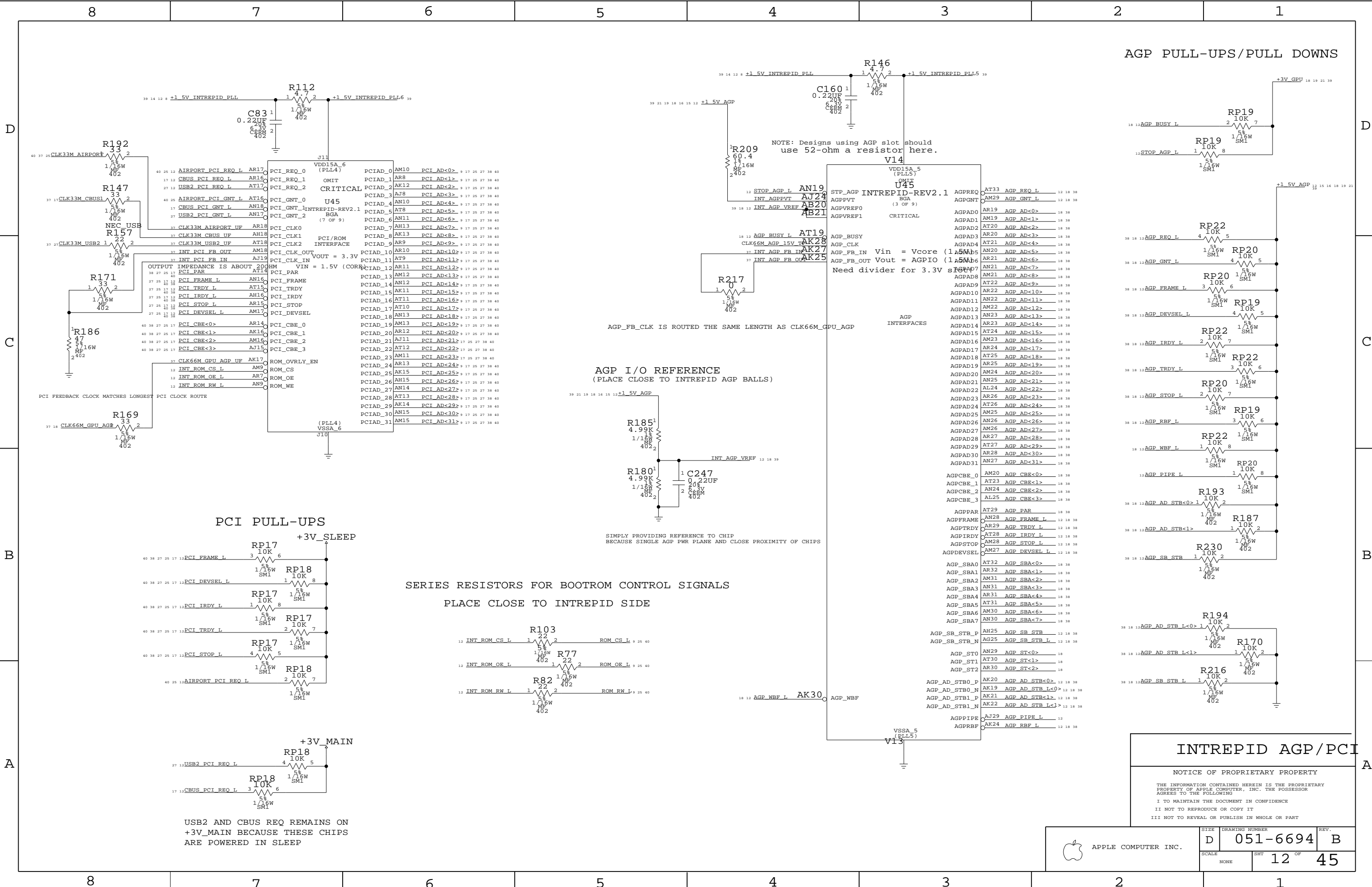
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| | | | | | |
|--|---------------------|-----|------|----------------|------|
| | APPLE COMPUTER INC. | | SIZE | DRAWING NUMBER | REV. |
| | SCALE | SHT | 11 | OF 45 | B |



AGP PULL-UPS/PULL DOWNS

AGP I/O REFERENCE
(PLACE CLOSE TO INTREPID AGP BALLS)

SERIES RESISTORS FOR BOOTROM CONTROL SIGNALS
PLACE CLOSE TO INTREPID SIDE

INTREPID AGP/PCI

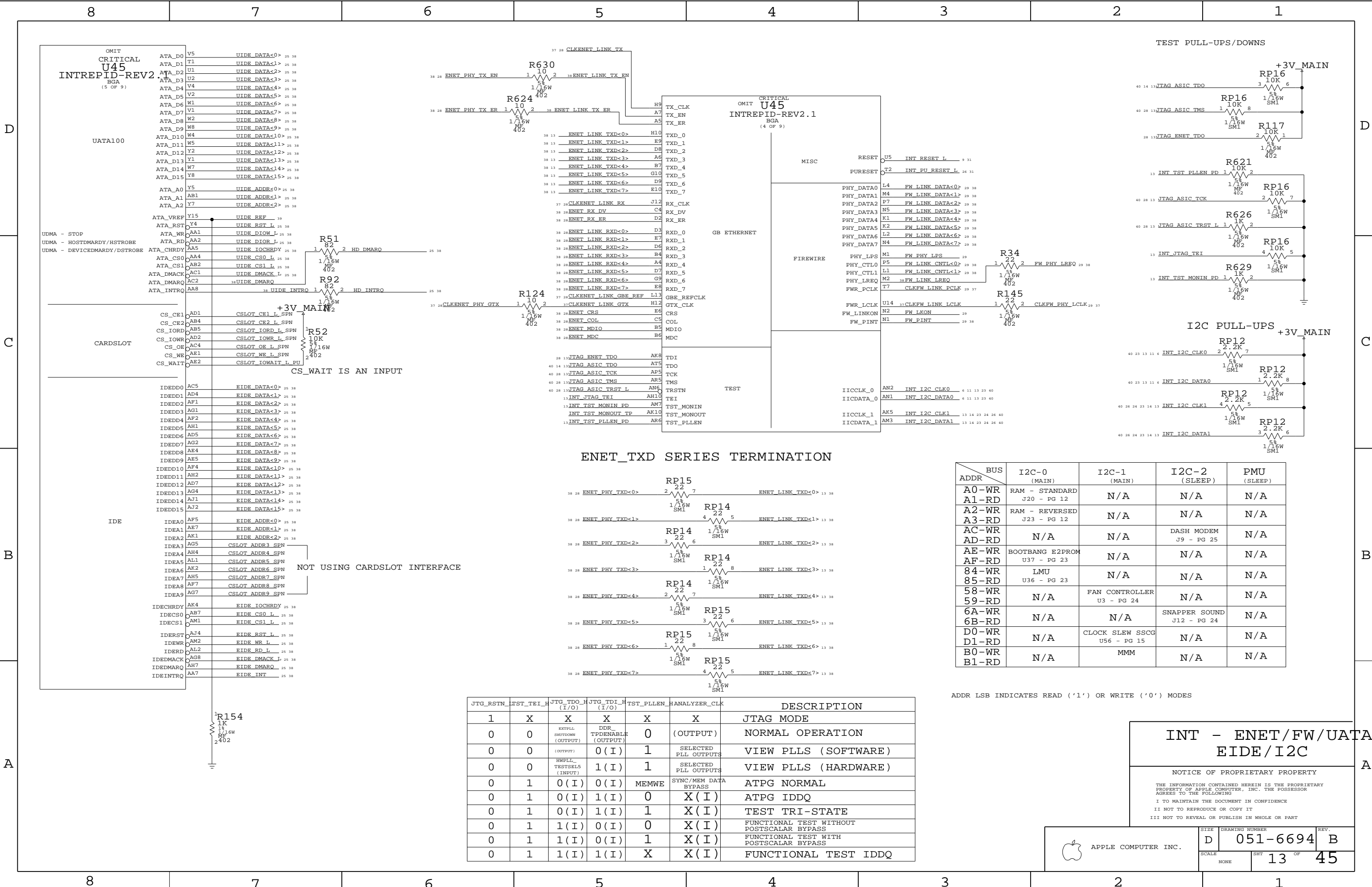
NOTICE OF PROPRIETARY PROPERTY

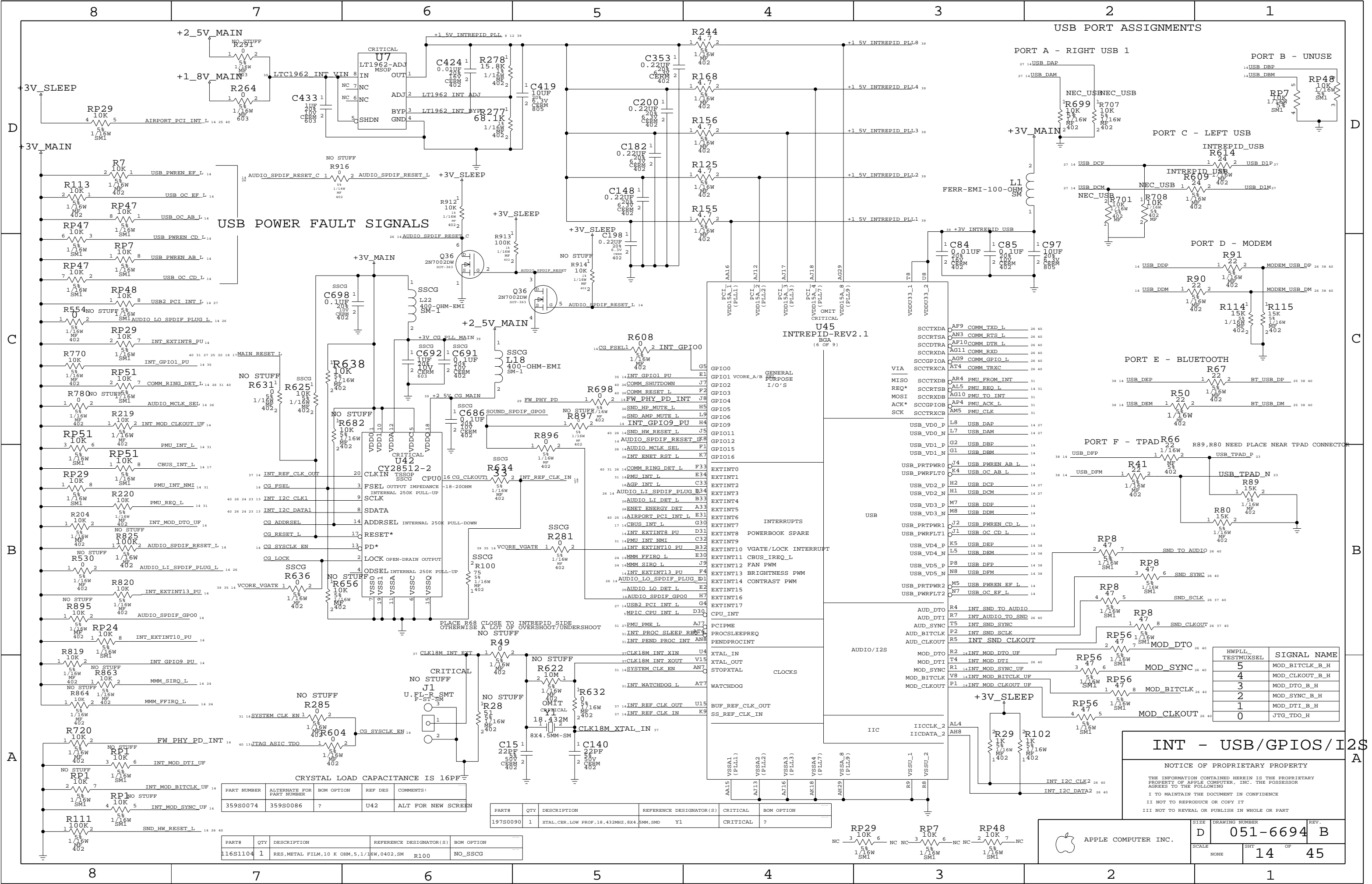
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USB POWER FAULT SIGNALS

USB PORT ASSIGNMENTS

PORT A - RIGHT USB 1

PORT B - UNUSE

PORT C - LEFT USB

PORT D - MODEM

PORT E - BLUETOOTH

PORT F - TPAD

INT - USB/GPIOS/I2S

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| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS |
|-------------|---------------------------|------------|---------|--------------------|
| 359S0074 | 359S0086 | ? | U42 | ALT FOR NEW SCREEN |

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|----------|-----|---|-------------------------|------------|
| 116S1104 | 1 | RES,METAL FILM,10 K OHM,5,1/16W,0402,SM | R100 | NO_SSCG |

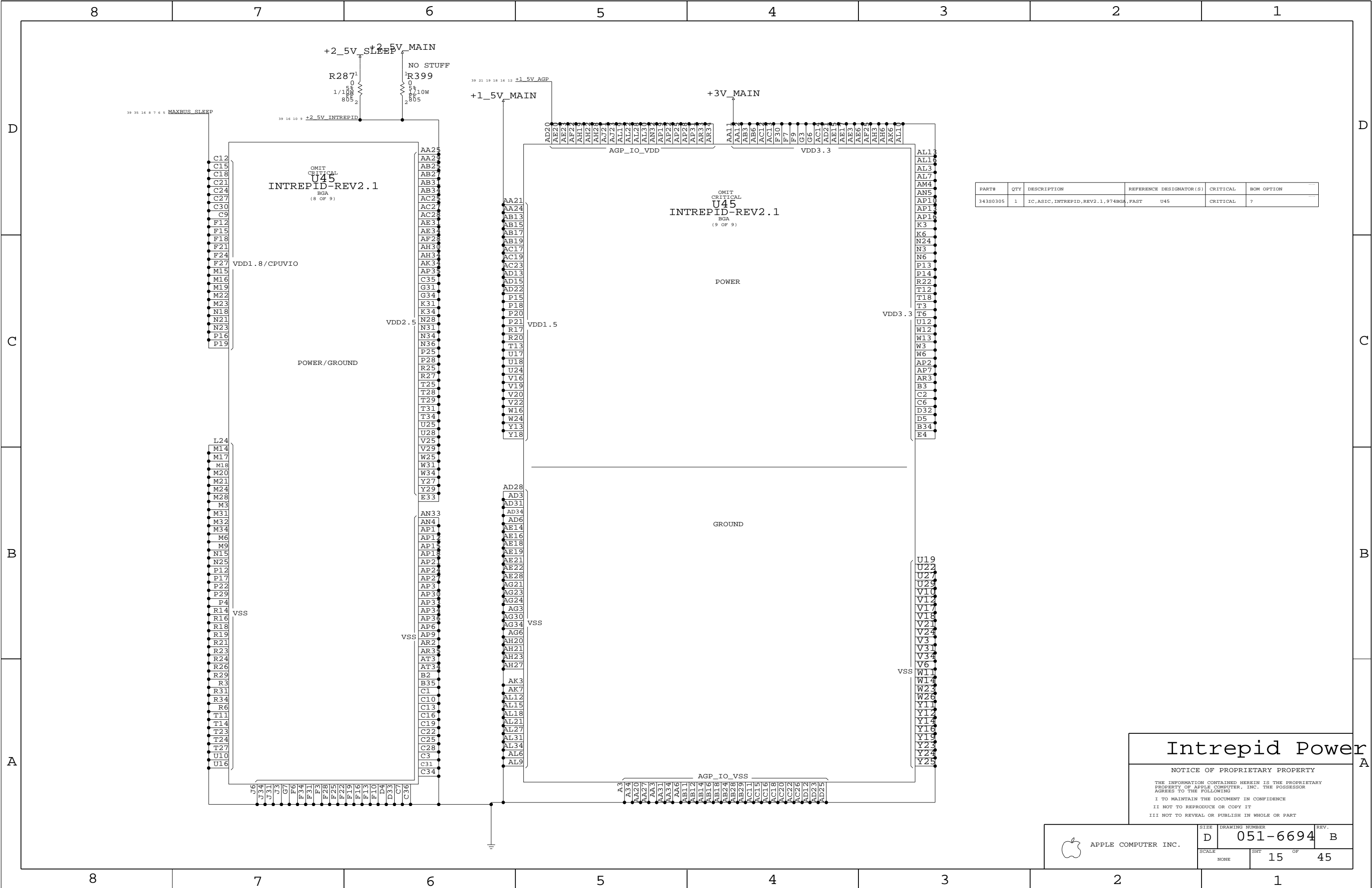
| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|----------|-----|---|-------------------------|----------|------------|
| 197S0090 | 1 | XTAL,CER,LOW PROF,18,432MHz,8X4.5MM,SMD | Y1 | CRITICAL | ? |

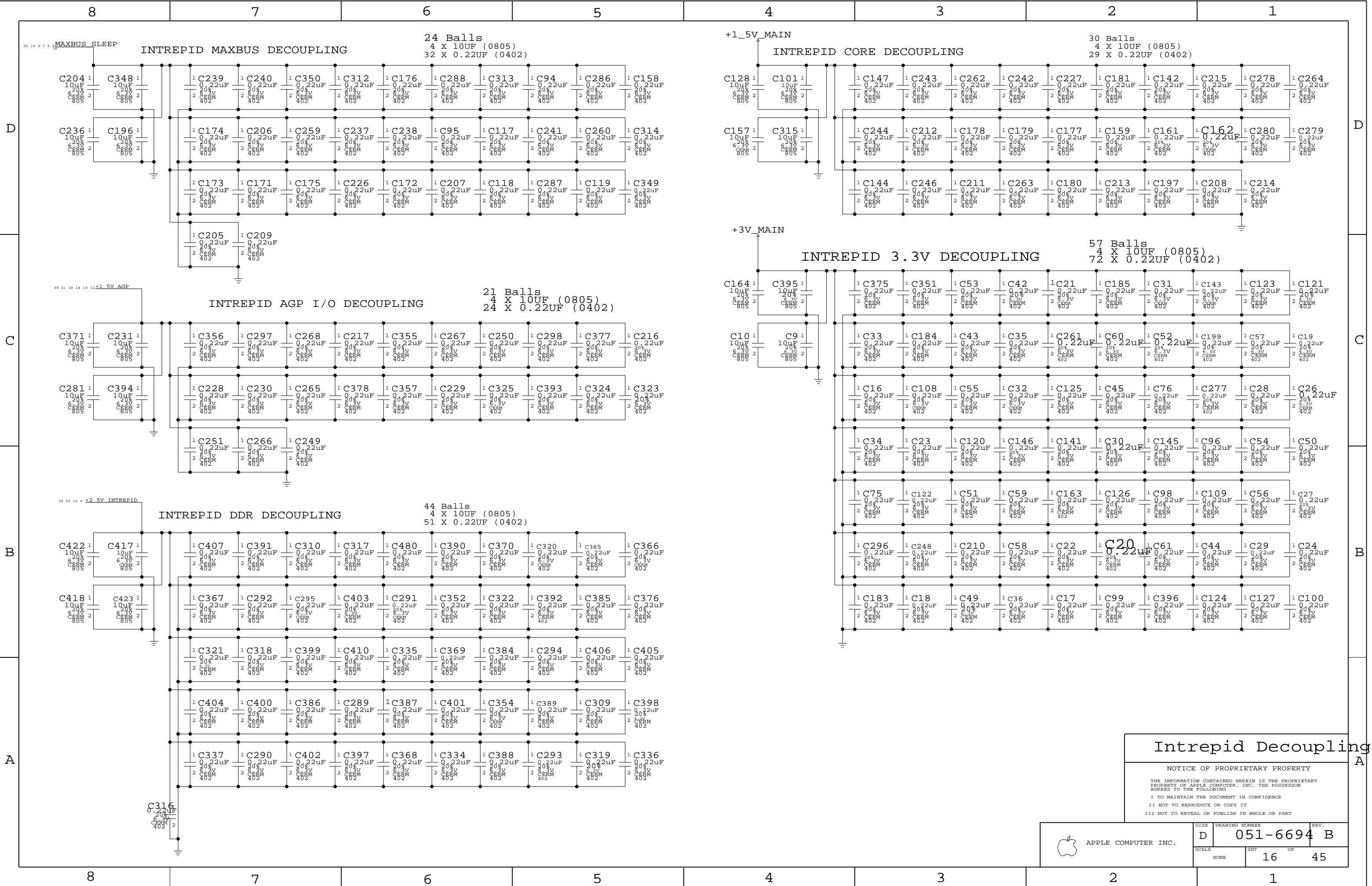
| HWPLL TESTMUXSEL | SIGNAL NAME |
|------------------|----------------|
| 5 | MOD_BITCLK_B_H |
| 4 | MOD_CLKOUT_B_H |
| 3 | MOD_DTO_B_H |
| 2 | MOD_SYNC_B_H |
| 1 | MOD_DTI_B_H |
| 0 | JTG_TDO_H |

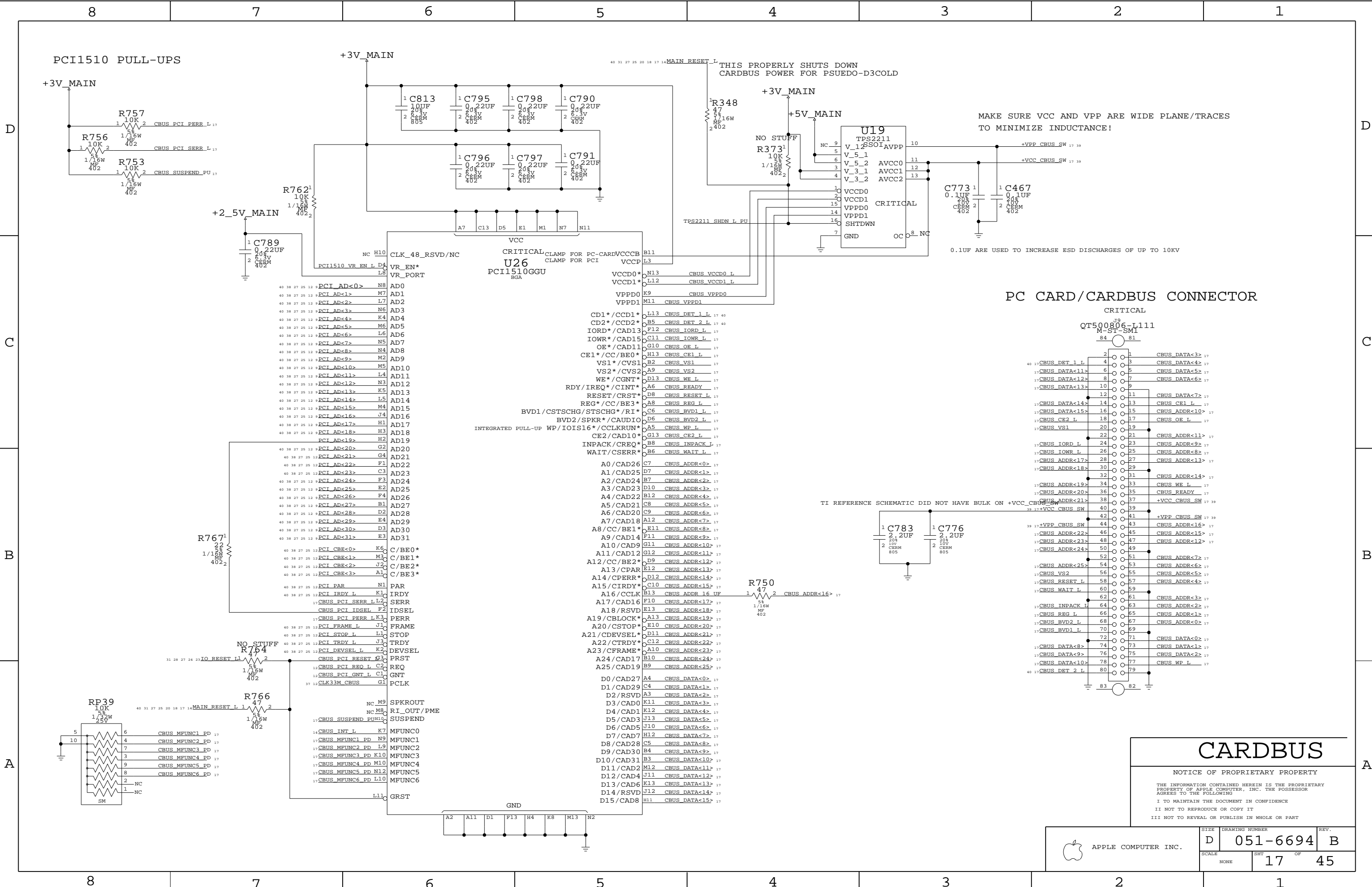


APPLE COMPUTER INC.

| SIZE | DRAWING NUMBER | REV. |
|-------|----------------|------|
| D | 051-6694 | B |
| SCALE | SHT | OF |
| NONE | 14 | 45 |



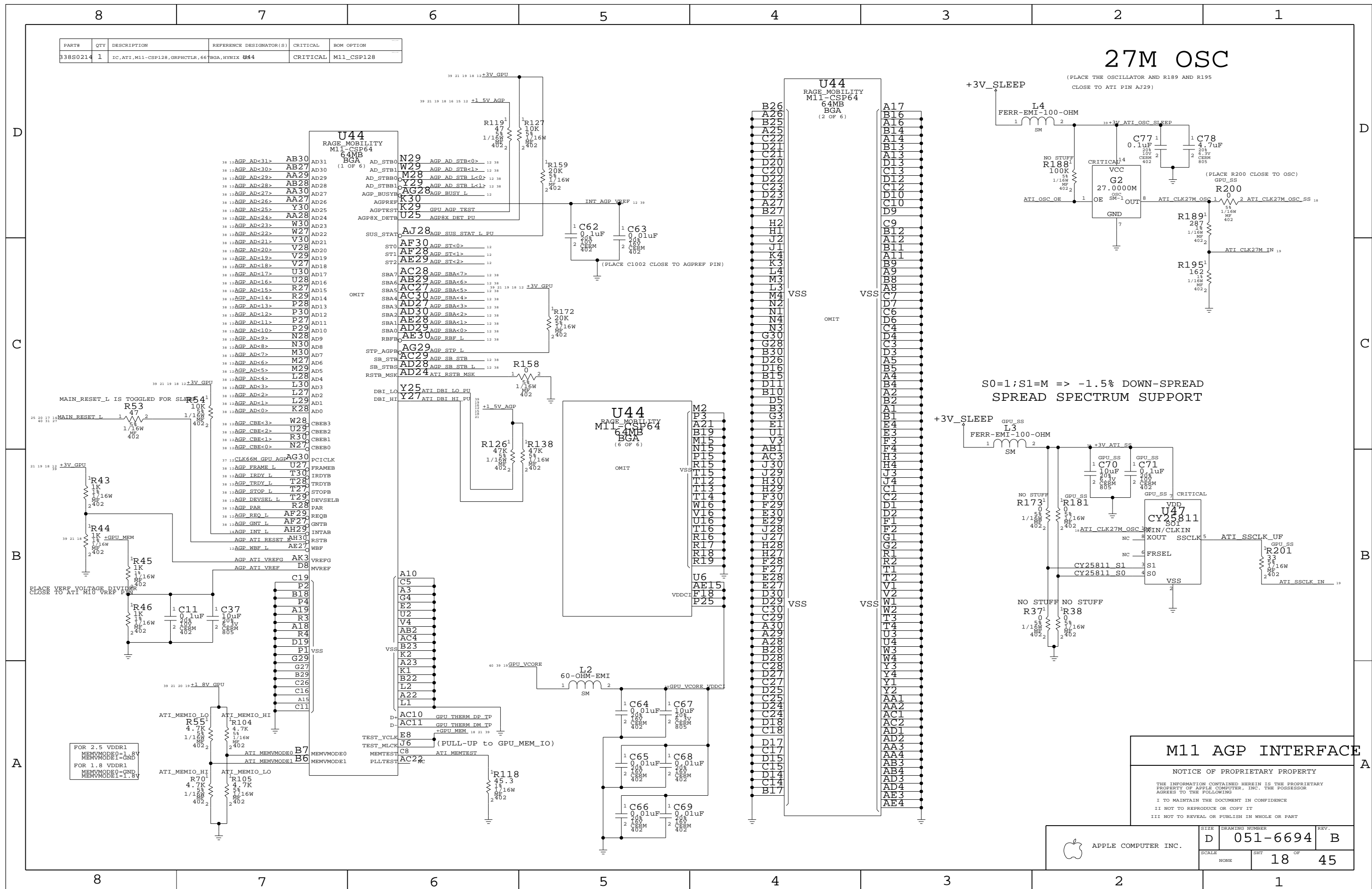


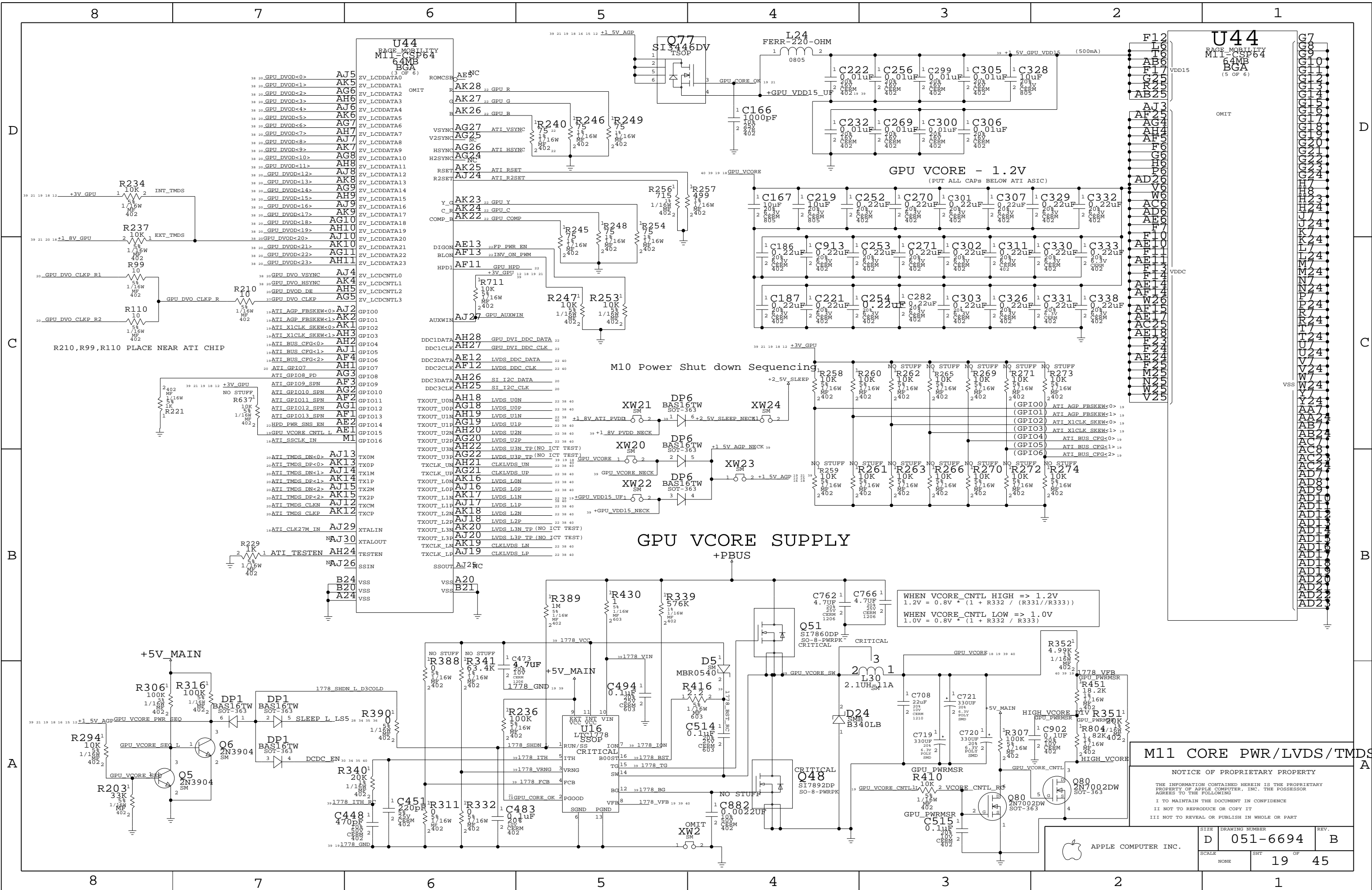


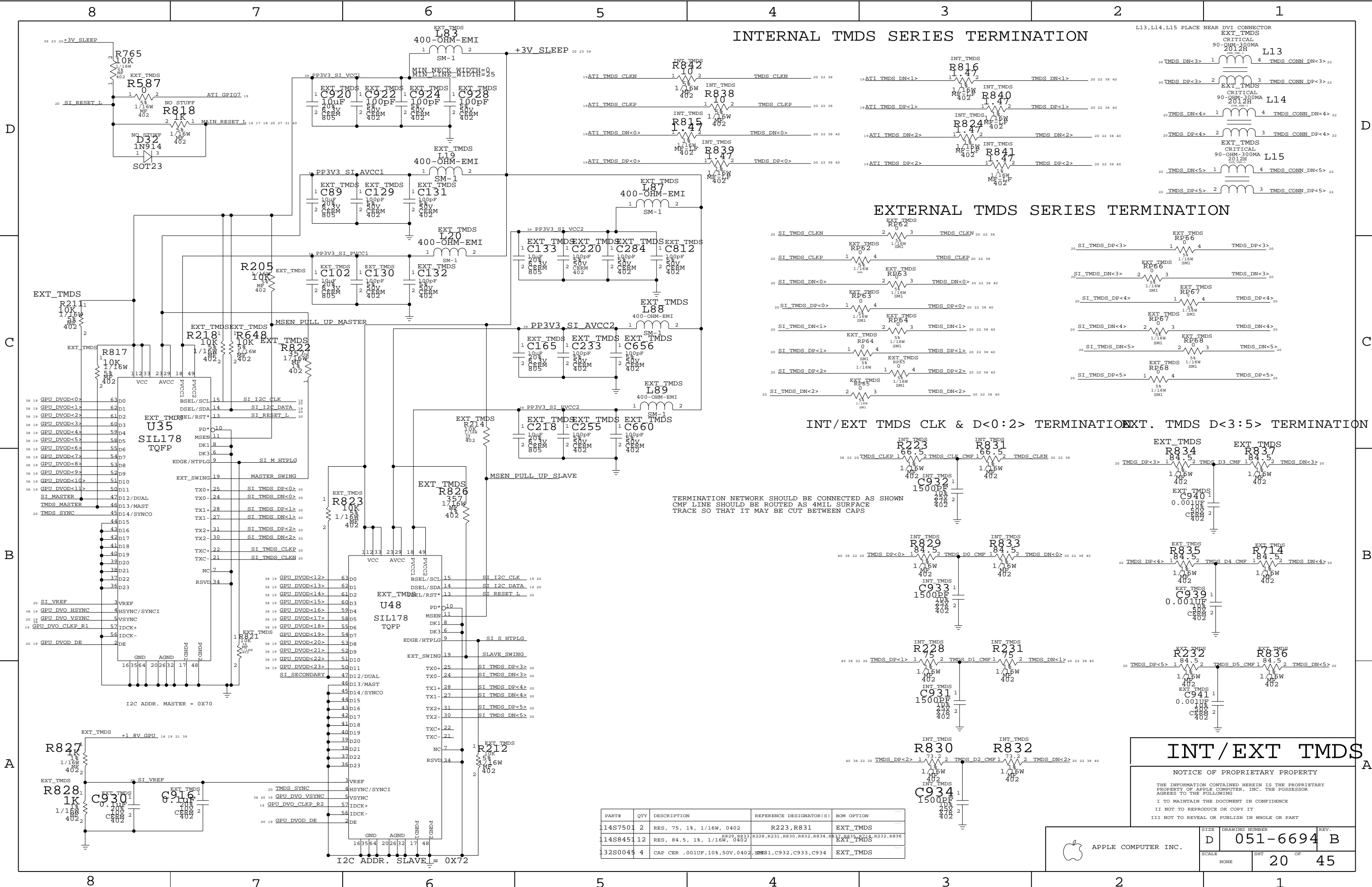
CARDBUS

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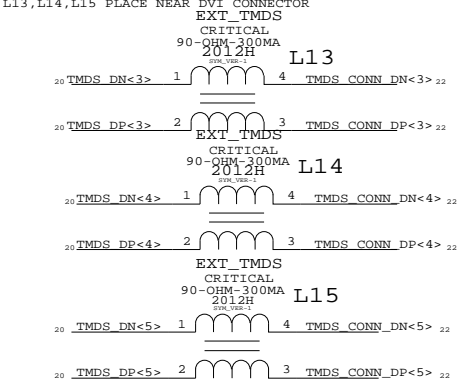
| | | | | |
|---------------------|------|----------------|-----|------|
| APPLE COMPUTER INC. | SIZE | DRAWING NUMBER | | REV. |
| | D | 051-6694 | | B |
| SCALE | NONE | | SHT | OF |
| | 17 | | 45 | |



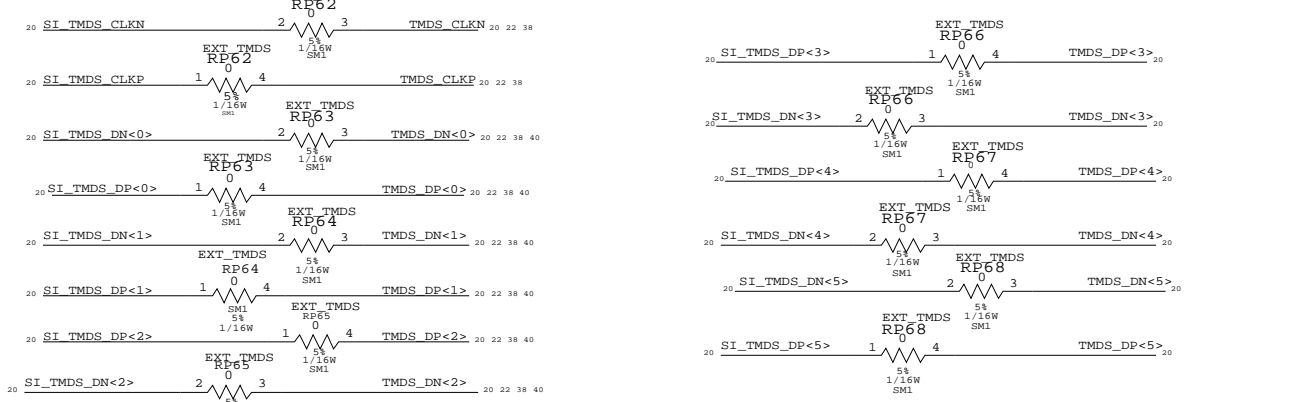




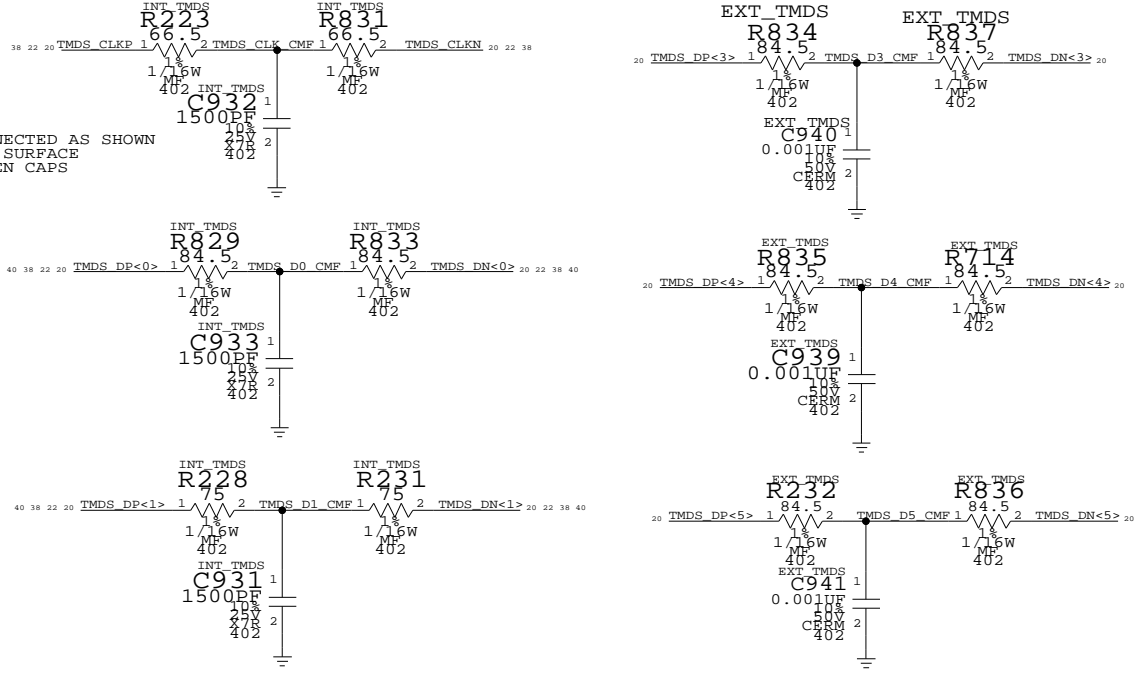
INTERNAL TMSD SERIES TERMINATION



EXTERNAL TMSD SERIES TERMINATION



INT/EXT TMSD CLK & D<0:2> TERMINATION



INT/EXT TMSD

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| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|----------|-----|-----------------------------|---|------------|
| 114S7501 | 2 | RES, 75, 1%, 1/16W, 0402 | R223,R831 | EXT_TMSD |
| 114S8451 | 12 | RES, 84.5, 1%, 1/16W, 0402 | R228,R231,R830,R832,R834,R837,R839,R214,R232,R836 | EXT_TMSD |
| 132S0045 | 4 | CAP CER .001UF,10%,50V,0402 | C931,C932,C933,C934 | EXT_TMSD |

APPLE COMPUTER INC.

D

051-6694

B

SCALE

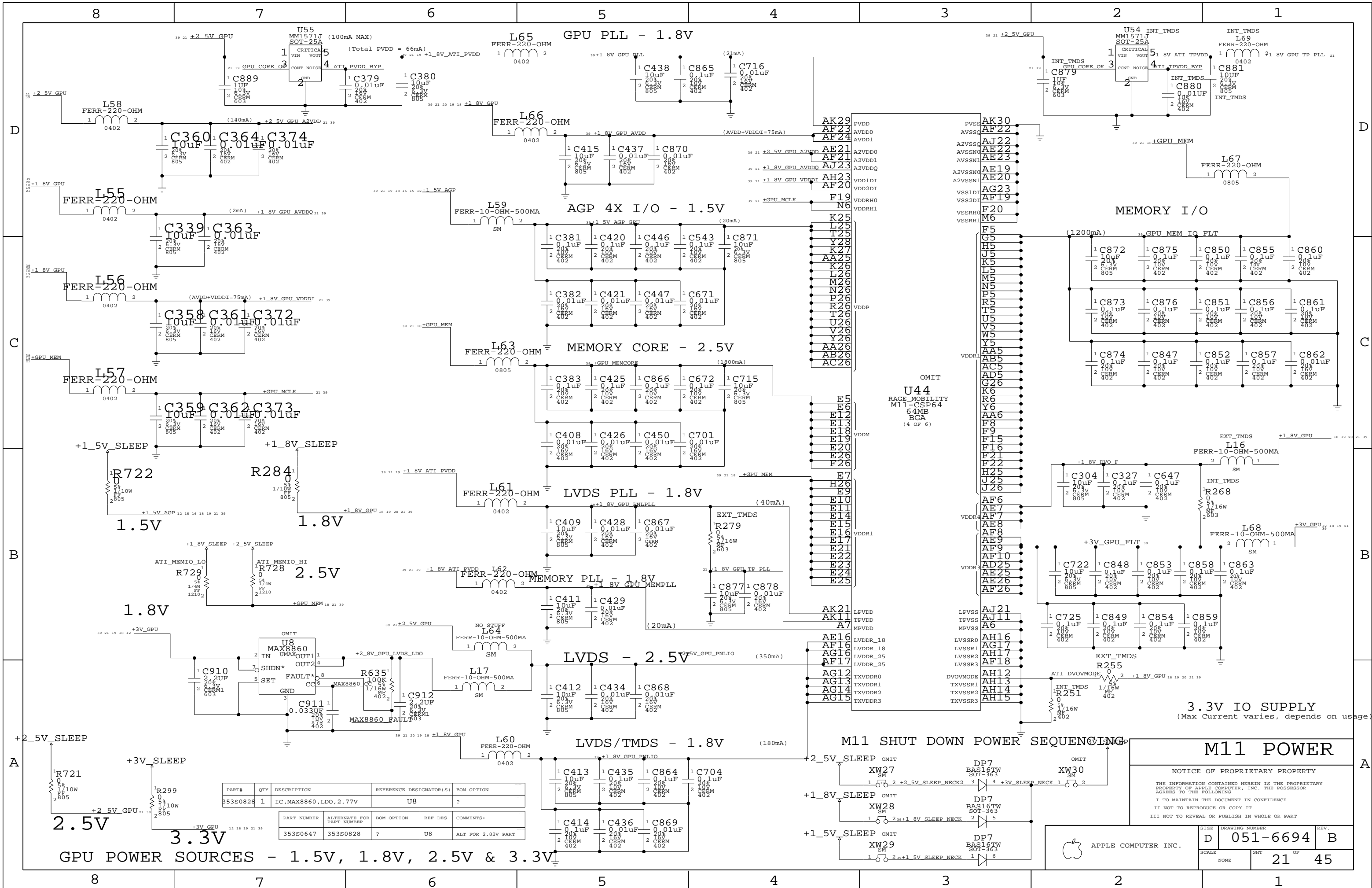
NONE

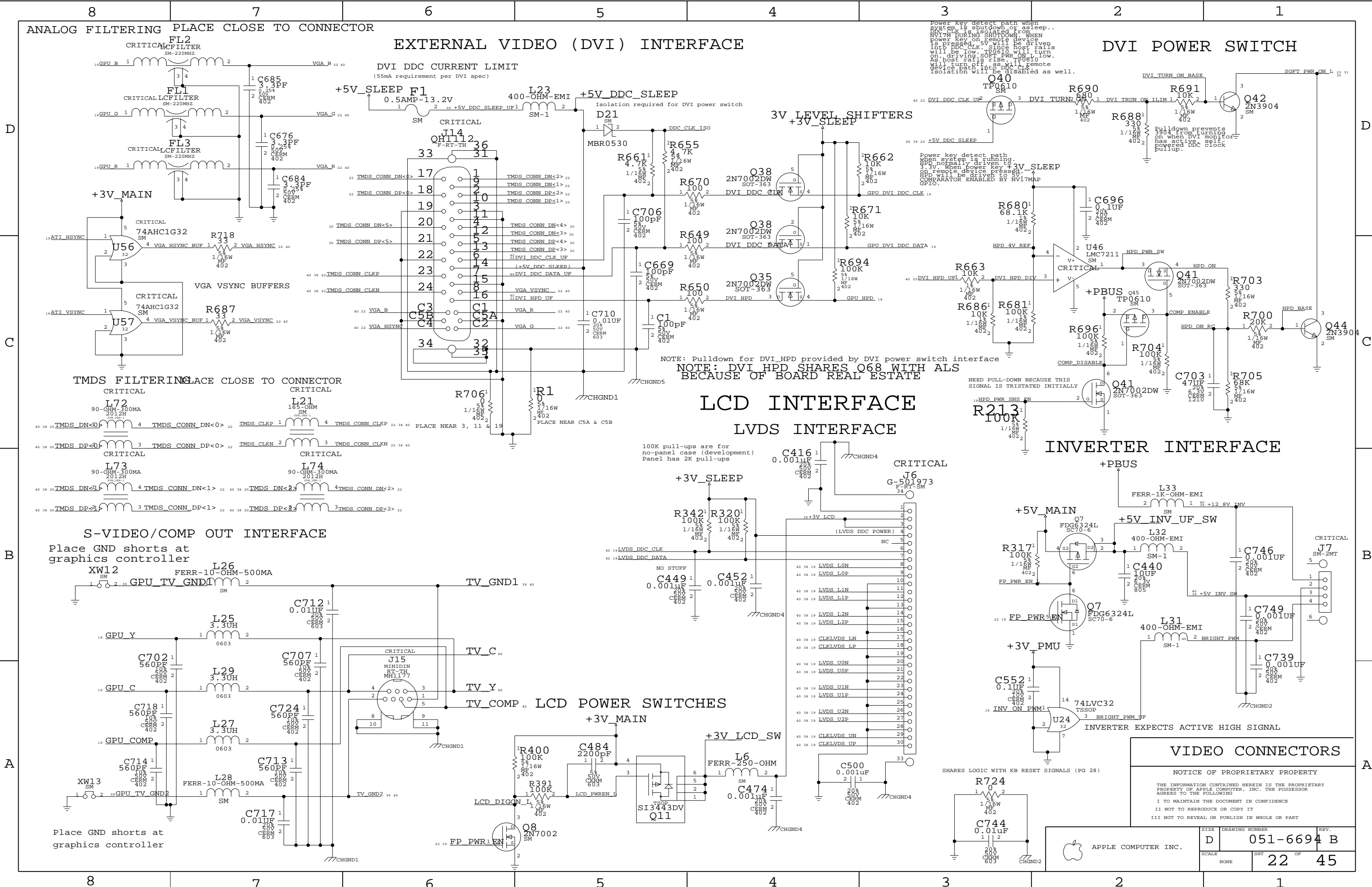
SHT

20

OF

45





D

C

B

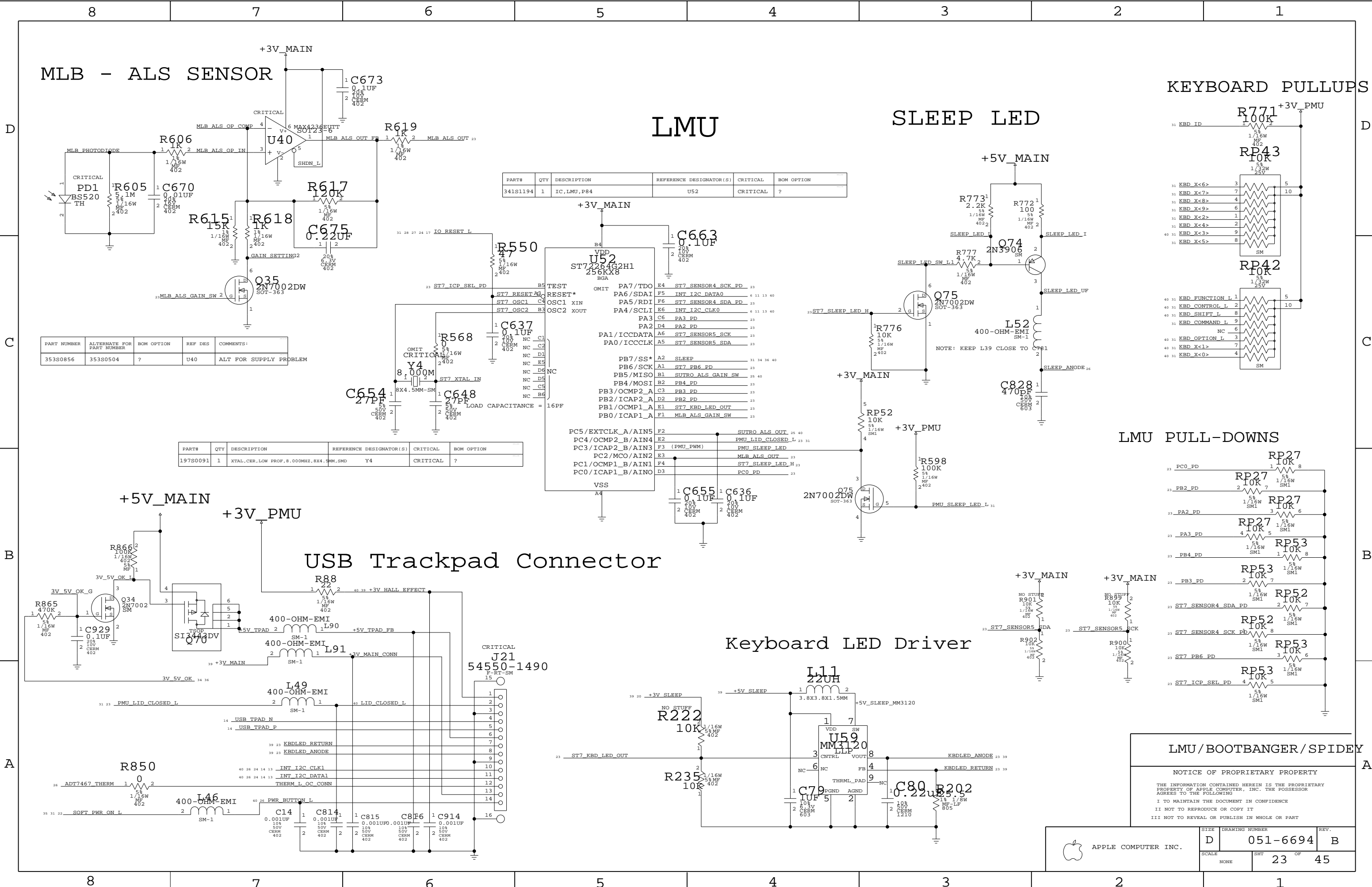
A

D

C

B

A



| PART NUMBER | ALTERNATE FOR PART NUMBER | BOM OPTION | REF DES | COMMENTS: |
|-------------|---------------------------|------------|---------|------------------------|
| 353S0856 | 353S0504 | ? | U40 | ALT FOR SUPPLY PROBLEM |

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|----------|-----|--|-------------------------|----------|------------|
| 197S0091 | 1 | XTAL,CER,LOW PROF,8.000MHZ,8X4.5MM,SMD | Y4 | CRITICAL | ? |

| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|----------|-----|-------------|-------------------------|----------|------------|
| 341S1194 | 1 | IC,LMU,P84 | U52 | CRITICAL | ? |

| PIN | FUNCTION | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|-----|----------|-------------------|-------------------------|----------|------------|
| 1 | VDD | POWER SUPPLY | U52 | CRITICAL | ? |
| 2 | RESET* | RESET SIGNAL | U52 | CRITICAL | ? |
| 3 | OSC1 | OSCILLATOR 1 | U52 | CRITICAL | ? |
| 4 | OSC2 | OSCILLATOR 2 | U52 | CRITICAL | ? |
| 5 | PA0 | PARALLEL PORT 0 | U52 | CRITICAL | ? |
| 6 | PA1 | PARALLEL PORT 1 | U52 | CRITICAL | ? |
| 7 | PA2 | PARALLEL PORT 2 | U52 | CRITICAL | ? |
| 8 | PA3 | PARALLEL PORT 3 | U52 | CRITICAL | ? |
| 9 | PA4 | PARALLEL PORT 4 | U52 | CRITICAL | ? |
| 10 | PA5 | PARALLEL PORT 5 | U52 | CRITICAL | ? |
| 11 | PA6 | PARALLEL PORT 6 | U52 | CRITICAL | ? |
| 12 | PA7 | PARALLEL PORT 7 | U52 | CRITICAL | ? |
| 13 | PA8 | PARALLEL PORT 8 | U52 | CRITICAL | ? |
| 14 | PA9 | PARALLEL PORT 9 | U52 | CRITICAL | ? |
| 15 | PA10 | PARALLEL PORT 10 | U52 | CRITICAL | ? |
| 16 | PA11 | PARALLEL PORT 11 | U52 | CRITICAL | ? |
| 17 | PA12 | PARALLEL PORT 12 | U52 | CRITICAL | ? |
| 18 | PA13 | PARALLEL PORT 13 | U52 | CRITICAL | ? |
| 19 | PA14 | PARALLEL PORT 14 | U52 | CRITICAL | ? |
| 20 | PA15 | PARALLEL PORT 15 | U52 | CRITICAL | ? |
| 21 | PA16 | PARALLEL PORT 16 | U52 | CRITICAL | ? |
| 22 | PA17 | PARALLEL PORT 17 | U52 | CRITICAL | ? |
| 23 | PA18 | PARALLEL PORT 18 | U52 | CRITICAL | ? |
| 24 | PA19 | PARALLEL PORT 19 | U52 | CRITICAL | ? |
| 25 | PA20 | PARALLEL PORT 20 | U52 | CRITICAL | ? |
| 26 | PA21 | PARALLEL PORT 21 | U52 | CRITICAL | ? |
| 27 | PA22 | PARALLEL PORT 22 | U52 | CRITICAL | ? |
| 28 | PA23 | PARALLEL PORT 23 | U52 | CRITICAL | ? |
| 29 | PA24 | PARALLEL PORT 24 | U52 | CRITICAL | ? |
| 30 | PA25 | PARALLEL PORT 25 | U52 | CRITICAL | ? |
| 31 | PA26 | PARALLEL PORT 26 | U52 | CRITICAL | ? |
| 32 | PA27 | PARALLEL PORT 27 | U52 | CRITICAL | ? |
| 33 | PA28 | PARALLEL PORT 28 | U52 | CRITICAL | ? |
| 34 | PA29 | PARALLEL PORT 29 | U52 | CRITICAL | ? |
| 35 | PA30 | PARALLEL PORT 30 | U52 | CRITICAL | ? |
| 36 | PA31 | PARALLEL PORT 31 | U52 | CRITICAL | ? |
| 37 | PA32 | PARALLEL PORT 32 | U52 | CRITICAL | ? |
| 38 | PA33 | PARALLEL PORT 33 | U52 | CRITICAL | ? |
| 39 | PA34 | PARALLEL PORT 34 | U52 | CRITICAL | ? |
| 40 | PA35 | PARALLEL PORT 35 | U52 | CRITICAL | ? |
| 41 | PA36 | PARALLEL PORT 36 | U52 | CRITICAL | ? |
| 42 | PA37 | PARALLEL PORT 37 | U52 | CRITICAL | ? |
| 43 | PA38 | PARALLEL PORT 38 | U52 | CRITICAL | ? |
| 44 | PA39 | PARALLEL PORT 39 | U52 | CRITICAL | ? |
| 45 | PA40 | PARALLEL PORT 40 | U52 | CRITICAL | ? |
| 46 | PA41 | PARALLEL PORT 41 | U52 | CRITICAL | ? |
| 47 | PA42 | PARALLEL PORT 42 | U52 | CRITICAL | ? |
| 48 | PA43 | PARALLEL PORT 43 | U52 | CRITICAL | ? |
| 49 | PA44 | PARALLEL PORT 44 | U52 | CRITICAL | ? |
| 50 | PA45 | PARALLEL PORT 45 | U52 | CRITICAL | ? |
| 51 | PA46 | PARALLEL PORT 46 | U52 | CRITICAL | ? |
| 52 | PA47 | PARALLEL PORT 47 | U52 | CRITICAL | ? |
| 53 | PA48 | PARALLEL PORT 48 | U52 | CRITICAL | ? |
| 54 | PA49 | PARALLEL PORT 49 | U52 | CRITICAL | ? |
| 55 | PA50 | PARALLEL PORT 50 | U52 | CRITICAL | ? |
| 56 | PA51 | PARALLEL PORT 51 | U52 | CRITICAL | ? |
| 57 | PA52 | PARALLEL PORT 52 | U52 | CRITICAL | ? |
| 58 | PA53 | PARALLEL PORT 53 | U52 | CRITICAL | ? |
| 59 | PA54 | PARALLEL PORT 54 | U52 | CRITICAL | ? |
| 60 | PA55 | PARALLEL PORT 55 | U52 | CRITICAL | ? |
| 61 | PA56 | PARALLEL PORT 56 | U52 | CRITICAL | ? |
| 62 | PA57 | PARALLEL PORT 57 | U52 | CRITICAL | ? |
| 63 | PA58 | PARALLEL PORT 58 | U52 | CRITICAL | ? |
| 64 | PA59 | PARALLEL PORT 59 | U52 | CRITICAL | ? |
| 65 | PA60 | PARALLEL PORT 60 | U52 | CRITICAL | ? |
| 66 | PA61 | PARALLEL PORT 61 | U52 | CRITICAL | ? |
| 67 | PA62 | PARALLEL PORT 62 | U52 | CRITICAL | ? |
| 68 | PA63 | PARALLEL PORT 63 | U52 | CRITICAL | ? |
| 69 | PA64 | PARALLEL PORT 64 | U52 | CRITICAL | ? |
| 70 | PA65 | PARALLEL PORT 65 | U52 | CRITICAL | ? |
| 71 | PA66 | PARALLEL PORT 66 | U52 | CRITICAL | ? |
| 72 | PA67 | PARALLEL PORT 67 | U52 | CRITICAL | ? |
| 73 | PA68 | PARALLEL PORT 68 | U52 | CRITICAL | ? |
| 74 | PA69 | PARALLEL PORT 69 | U52 | CRITICAL | ? |
| 75 | PA70 | PARALLEL PORT 70 | U52 | CRITICAL | ? |
| 76 | PA71 | PARALLEL PORT 71 | U52 | CRITICAL | ? |
| 77 | PA72 | PARALLEL PORT 72 | U52 | CRITICAL | ? |
| 78 | PA73 | PARALLEL PORT 73 | U52 | CRITICAL | ? |
| 79 | PA74 | PARALLEL PORT 74 | U52 | CRITICAL | ? |
| 80 | PA75 | PARALLEL PORT 75 | U52 | CRITICAL | ? |
| 81 | PA76 | PARALLEL PORT 76 | U52 | CRITICAL | ? |
| 82 | PA77 | PARALLEL PORT 77 | U52 | CRITICAL | ? |
| 83 | PA78 | PARALLEL PORT 78 | U52 | CRITICAL | ? |
| 84 | PA79 | PARALLEL PORT 79 | U52 | CRITICAL | ? |
| 85 | PA80 | PARALLEL PORT 80 | U52 | CRITICAL | ? |
| 86 | PA81 | PARALLEL PORT 81 | U52 | CRITICAL | ? |
| 87 | PA82 | PARALLEL PORT 82 | U52 | CRITICAL | ? |
| 88 | PA83 | PARALLEL PORT 83 | U52 | CRITICAL | ? |
| 89 | PA84 | PARALLEL PORT 84 | U52 | CRITICAL | ? |
| 90 | PA85 | PARALLEL PORT 85 | U52 | CRITICAL | ? |
| 91 | PA86 | PARALLEL PORT 86 | U52 | CRITICAL | ? |
| 92 | PA87 | PARALLEL PORT 87 | U52 | CRITICAL | ? |
| 93 | PA88 | PARALLEL PORT 88 | U52 | CRITICAL | ? |
| 94 | PA89 | PARALLEL PORT 89 | U52 | CRITICAL | ? |
| 95 | PA90 | PARALLEL PORT 90 | U52 | CRITICAL | ? |
| 96 | PA91 | PARALLEL PORT 91 | U52 | CRITICAL | ? |
| 97 | PA92 | PARALLEL PORT 92 | U52 | CRITICAL | ? |
| 98 | PA93 | PARALLEL PORT 93 | U52 | CRITICAL | ? |
| 99 | PA94 | PARALLEL PORT 94 | U52 | CRITICAL | ? |
| 100 | PA95 | PARALLEL PORT 95 | U52 | CRITICAL | ? |
| 101 | PA96 | PARALLEL PORT 96 | U52 | CRITICAL | ? |
| 102 | PA97 | PARALLEL PORT 97 | U52 | CRITICAL | ? |
| 103 | PA98 | PARALLEL PORT 98 | U52 | CRITICAL | ? |
| 104 | PA99 | PARALLEL PORT 99 | U52 | CRITICAL | ? |
| 105 | PA100 | PARALLEL PORT 100 | U52 | CRITICAL | ? |

LMU/BOOTBANGER/SPIDEY

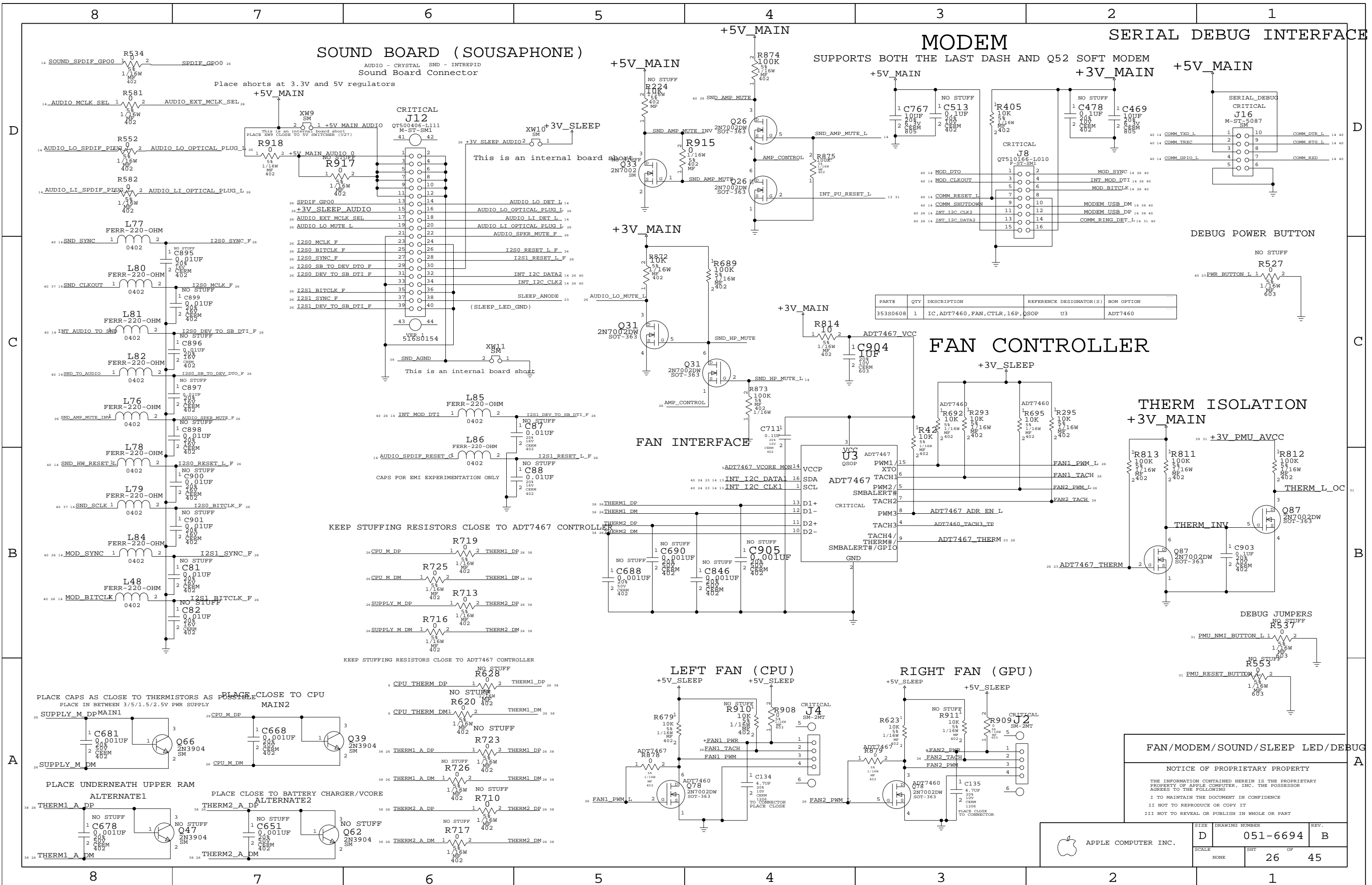
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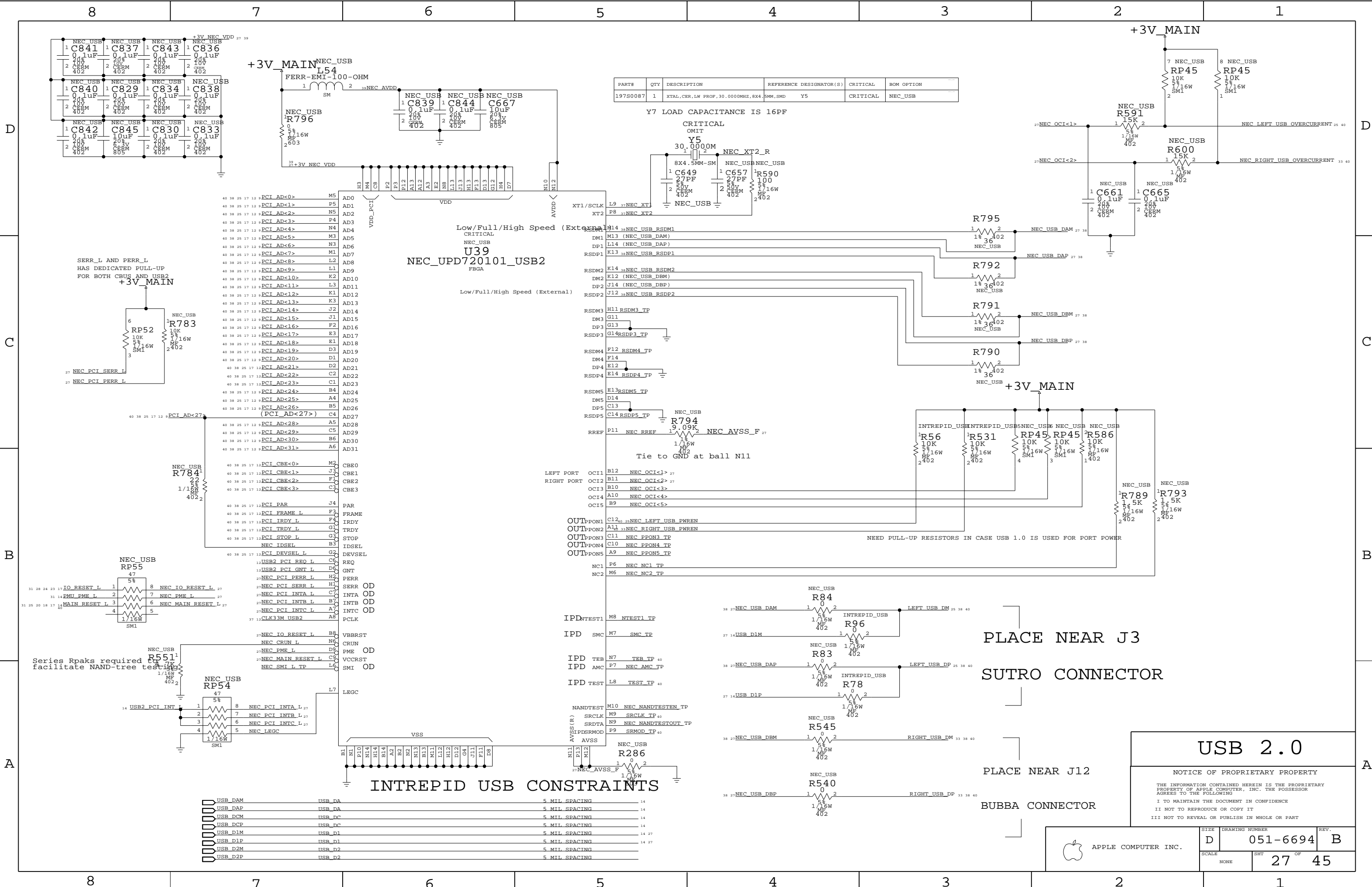
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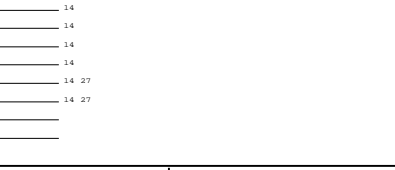
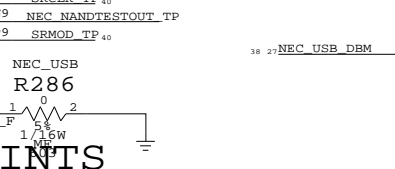
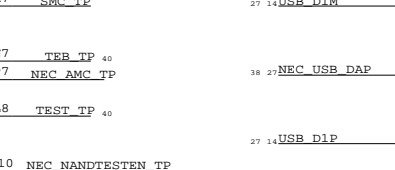
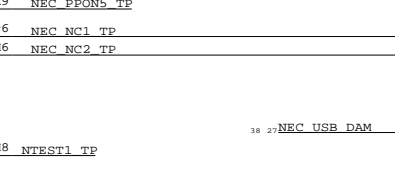
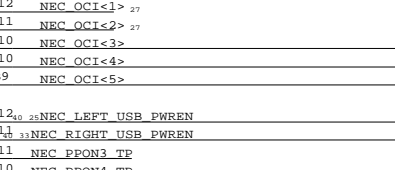
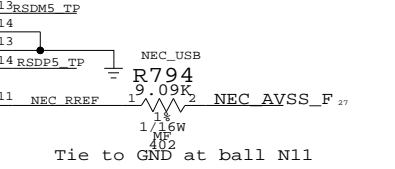
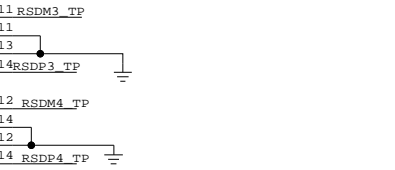
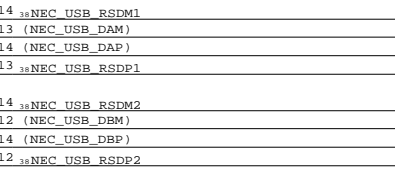
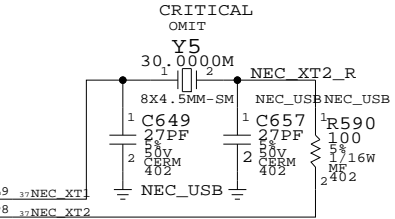
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| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|----------|-----|---|-------------------------|----------|------------|
| 197S0087 | 1 | XTAL,CER,LW PROF,30.0000MHZ,8X4,SMM,SMD | Y5 | CRITICAL | NEC_USB |

Y7 LOAD CAPACITANCE IS 16PF



NEED PULL-UP RESISTORS IN CASE USB 1.0 IS USED FOR PORT POWER

PLACE NEAR J3

SUTRO CONNECTOR

PLACE NEAR J12

BUBBA CONNECTOR

USB 2.0

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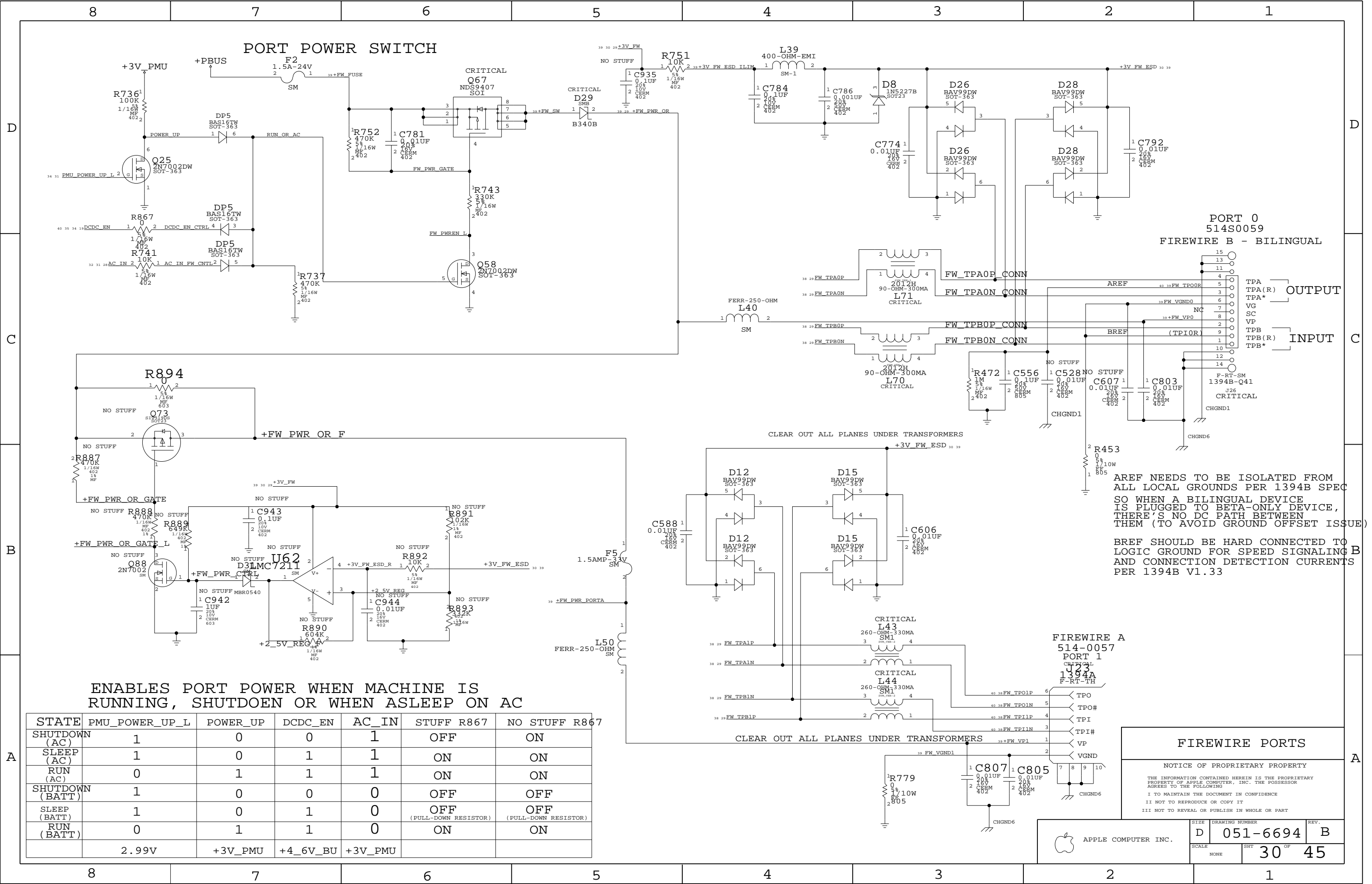
NONE

SHT

27

OF

45



PORT POWER SWITCH

ENABLES PORT POWER WHEN MACHINE IS RUNNING, SHUTDOWN OR WHEN ASLEEP ON AC

| STATE | PMU_POWER_UP_L | POWER_UP | DCDC_EN | AC_IN | STUFF R867 | NO STUFF R867 |
|-----------------|----------------|----------|----------|---------|------------|---------------|
| SHUTDOWN (AC) | 1 | 0 | 0 | 1 | OFF | ON |
| SLEEP (AC) | 1 | 0 | 1 | 1 | ON | ON |
| RUN (AC) | 0 | 1 | 1 | 1 | ON | ON |
| SHUTDOWN (BATT) | 1 | 0 | 0 | 0 | OFF | OFF |
| SLEEP (BATT) | 1 | 0 | 1 | 0 | OFF | OFF |
| RUN (BATT) | 0 | 1 | 1 | 0 | ON | ON |
| | 2.99V | +3V_PMU | +4_6V_BU | +3V_PMU | | |

PORT 0
514S0059
FIREWIRE B - BILINGUAL

AREF NEEDS TO BE ISOLATED FROM ALL LOCAL GROUNDS PER 1394B SPEC SO WHEN A BILINGUAL DEVICE IS PLUGGED TO BETA-ONLY DEVICE, THERE'S NO DC PATH BETWEEN THEM (TO AVOID GROUND OFFSET ISSUE)

BREF SHOULD BE HARD CONNECTED TO LOGIC GROUND FOR SPEED SIGNALING B AND CONNECTION DETECTION CURRENTS PER 1394B V1.33

FIREWIRE PORTS

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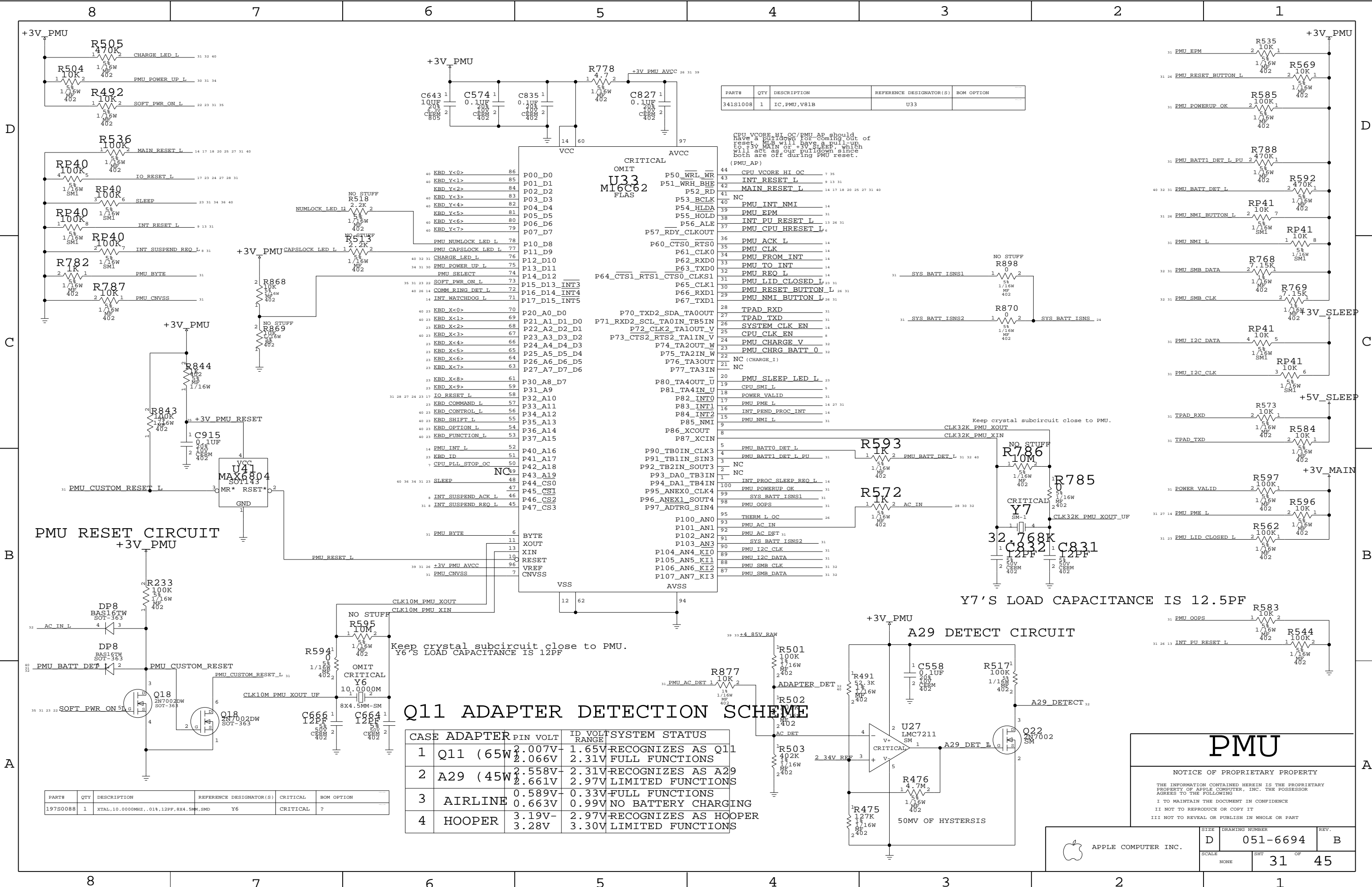
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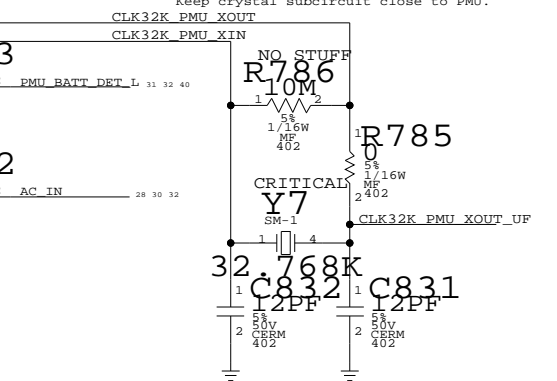
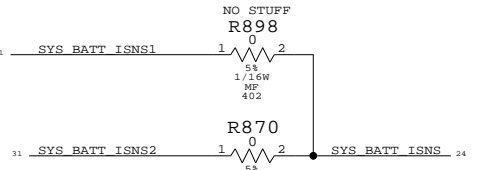
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|-------|----------------|------|
| D | 051-6694 | B |
| SCALE | SHT | OF |
| NONE | 30 | 45 |

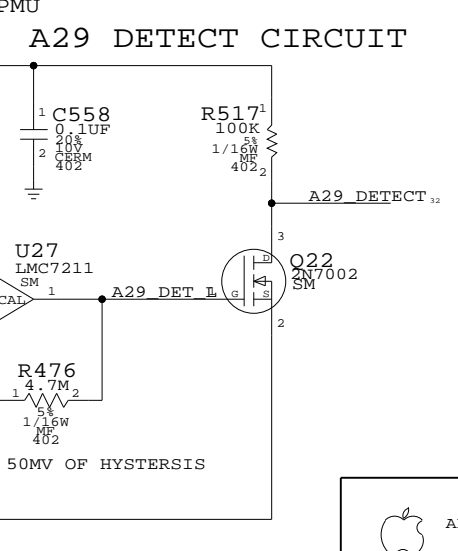


| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | BOM OPTION |
|----------|-----|-------------|-------------------------|------------|
| 341S1008 | 1 | IC,PMU,V81B | U33 | |

CPU VCORE HI OC/PMU AP should have a pull-down resistor coming out of reset. MIB will have a pull-up to +3V MAIN or +3V SLEEP, which will act as our pull-down since both are off during PMU reset. (PMU_AP)



Y7'S LOAD CAPACITANCE IS 12.5PF



Q11 ADAPTER DETECTION SCHEME

| CASE | ADAPTER | PIN | VOLT | ID VOLT RANGE | SYSTEM STATUS |
|------|---------|-------|---------------|---------------|--|
| 1 | Q11 | (65W) | 2.007V-2.066V | 1.65V-2.31V | RECOGNIZES AS Q11 FULL FUNCTIONS |
| 2 | A29 | (45W) | 2.558V-2.661V | 2.31V-2.97V | RECOGNIZES AS A29 LIMITED FUNCTIONS |
| 3 | AIRLINE | | 0.589V-0.663V | 0.33V-0.99V | FULL FUNCTIONS NO BATTERY CHARGING |
| 4 | HOOPER | | 3.19V-3.28V | 2.97V-3.30V | RECOGNIZES AS HOOPER LIMITED FUNCTIONS |

PMU

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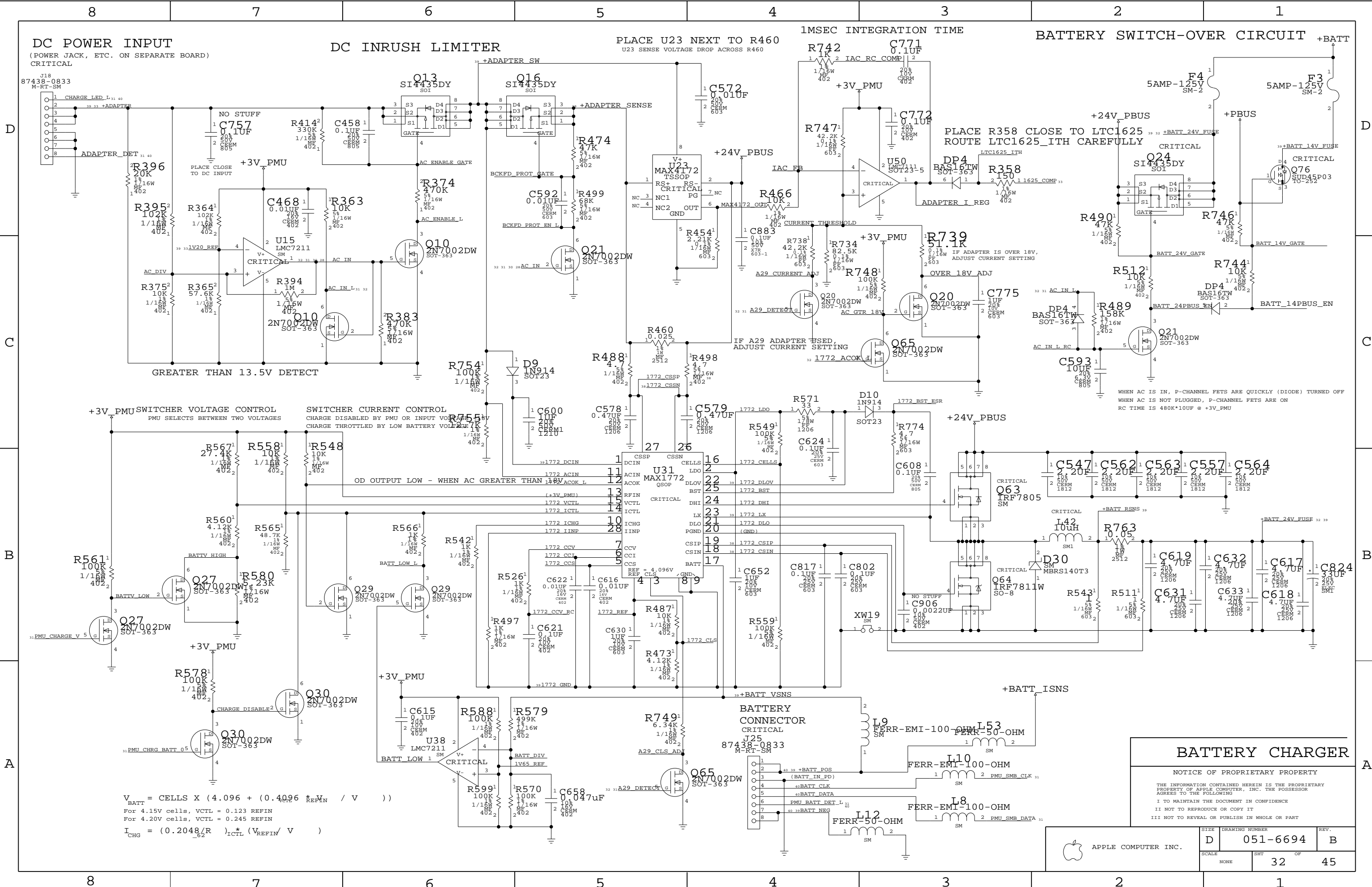
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| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|----------|-----|---------------------------------------|-------------------------|----------|------------|
| 197S0088 | 1 | XTAL,10.0000MHZ,.018,12PF,8X4.5MM,SMD | Y6 | CRITICAL | ? |



DC POWER INPUT

(POWER JACK, ETC. ON SEPARATE BOARD)
CRITICAL

DC INRUSH LIMITER

PLACE U23 NEXT TO R460
U23 SENSE VOLTAGE DROP ACROSS R460

1MSEC INTEGRATION TIME

BATTERY SWITCH-OVER CIRCUIT

+3V_PMU SWITCHER VOLTAGE CONTROL

PMU SELECTS BETWEEN TWO VOLTAGES

SWITCHER CURRENT CONTROL

CHARGE DISABLED BY PMU OR INPUT VOLTAGE
CHARGE THROTTLED BY LOW BATTERY VOLTAGE

BATTERY CONNECTOR

CRITICAL

BATTERY CHARGER

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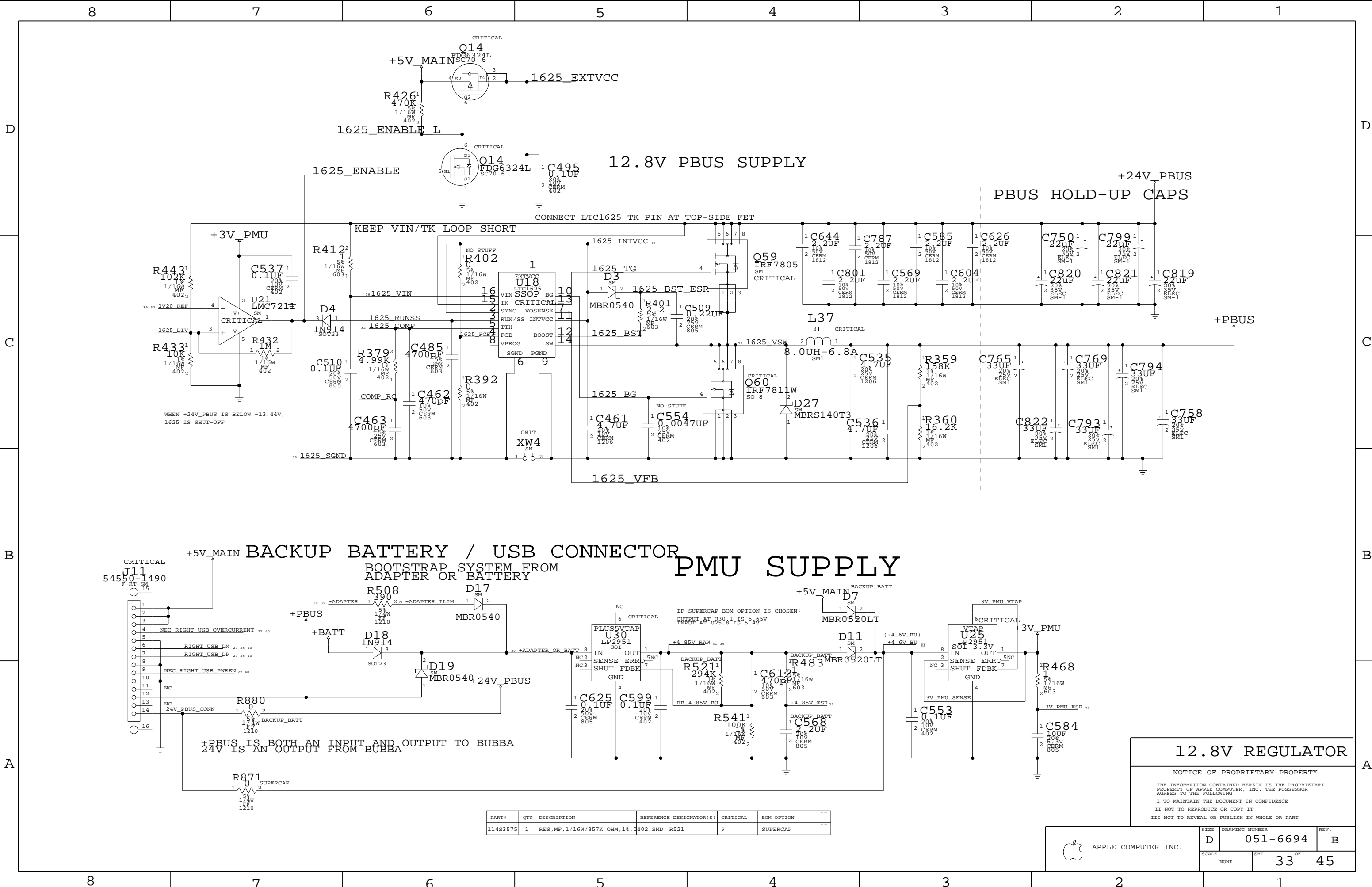
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| | D | 051-6694 | B |
| SCALE | | SHT | OF |
| NONE | | 32 | 45 |

$$V_{BATT} = CELLS \times (4.096 + (0.4096 \times \frac{V_{REFIN}}{V}))$$

For 4.15V cells, VCTL = 0.123 REFIN
For 4.20V cells, VCTL = 0.245 REFIN

$$I_{CHG} = (0.2048/R_{ICTL}) \times (V_{REFIN}/V)$$



| PART# | QTY | DESCRIPTION | REFERENCE DESIGNATOR(S) | CRITICAL | BOM OPTION |
|----------|-----|----------------------------------|-------------------------|----------|------------|
| 114S3575 | 1 | RES,MF,1/16W/357K OHM,1%,402,SMD | R521 | ? | SUPERCAP |

12.8V REGULATOR

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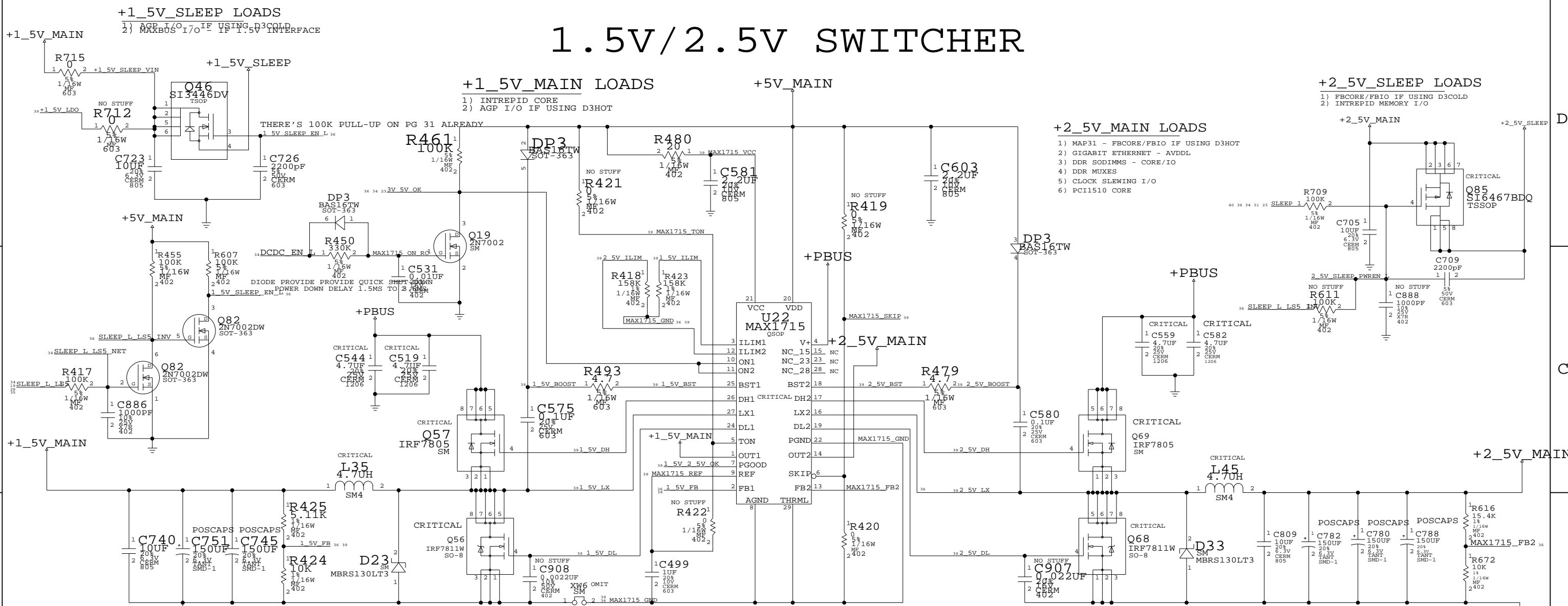
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D

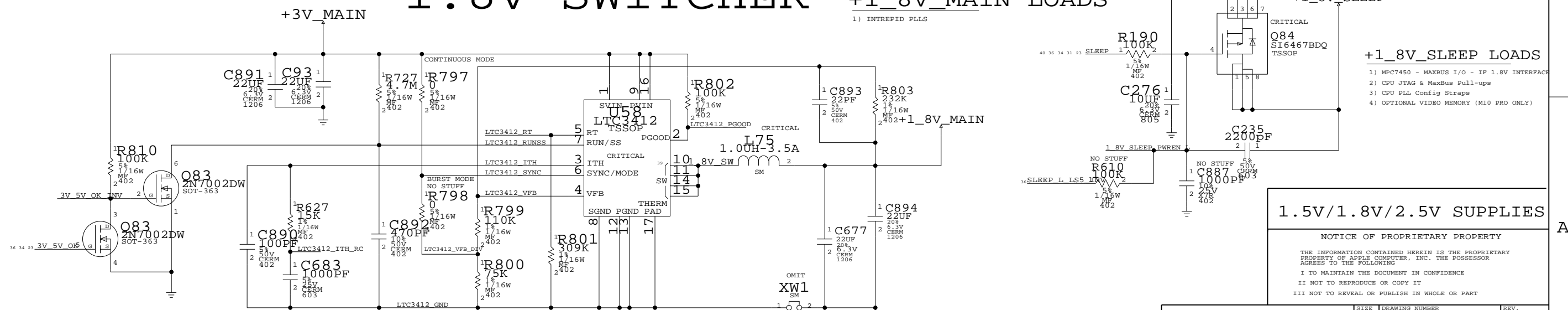
SHT 33 OF 45

REV. B

1.5V/2.5V SWITCHER



1.8V SWITCHER



APPLE COMPUTER INC.

SIZE

D

DRAWING NUMBER

051-6694

REV.

B

SCALE

NONE

SHT

36

OF

45

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|---|-----------------------|------------------|---------------|-------------------|-------------------|--------------------------|--------------|------------------|------------------|-------------------|
| | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | | |
| | POWER NET CONSTRAINTS | | | | | | | | | |
| | GROUP | SIG_NAME | VOLTAGE | MIN_LINE_WIDTH | MIN_NECK_WIDTH | GROUP | SIG_NAME | VOLTAGE | MIN_LINE_WIDTH | MIN_NECK_WIDTH |
| D | MAIN/SLEEP | +24V PBUS | VOLTAGE=24V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | LTC1625 14V SWITCHER | 1625 VIN | VOLTAGE=24V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=6 |
| | | +BATT | VOLTAGE=12.6V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1625 VSW | VOLTAGE=12.8V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +PBUS | VOLTAGE=12.8V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1625 EXTVCC | VOLTAGE=5V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=6 |
| | | +5V MAIN | VOLTAGE=5V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1625 INTVCC | VOLTAGE=5V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=6 |
| | | +5V SLEEP | VOLTAGE=5V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1625 SGND | VOLTAGE=0V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=6 |
| | | +3V MAIN | VOLTAGE=3.3V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1V20 REF | VOLTAGE=1.2V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=10 |
| | | +3V SLEEP | VOLTAGE=3.3V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=6 | LTC3707 5V SWITCHER | 3707 INTVCC | VOLTAGE=5V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=10 |
| | | +3V PMU | VOLTAGE=3.3V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 5V SW | VOLTAGE=5V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=10 |
| | | +2.5V MAIN | VOLTAGE=2.5V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 5V RSNS | VOLTAGE=5V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +2.5V SLEEP | VOLTAGE=2.5V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 3V SW | VOLTAGE=3.3V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +1.8V MAIN | VOLTAGE=1.8V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=6 | | 3V RSNS | VOLTAGE=3.3V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +1.8V SLEEP | VOLTAGE=1.8V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=6 | | 3707 SGND | VOLTAGE=0V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=10 |
| | | +1.5V MAIN | VOLTAGE=1.5V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | MAX1715 2.5V SWITCHER | 2.5V LX | VOLTAGE=2.5V | MIN_LINE_WIDTH=5 | MIN_NECK_WIDTH=10 |
| | | +1.5V SLEEP | VOLTAGE=1.5V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 2.5V BST | VOLTAGE=5V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=10 |
| | | +1.5V LDO | VOLTAGE=1.5V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 2.5V BOOST | VOLTAGE=5V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=10 |
| | | +1.5V SLEEP VIN | VOLTAGE=1.5V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 2.5V DH | VOLTAGE=2.5V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +ADAPTER | VOLTAGE=24V | MIN_LINE_WIDTH=50 | MIN_NECK_WIDTH=10 | | 2.5V DL | VOLTAGE=2.5V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +ADAPTER_SW | VOLTAGE=24V | MIN_LINE_WIDTH=50 | MIN_NECK_WIDTH=10 | 1.5V SWITCHER | 1.5V FB | VOLTAGE=1.5V | MIN_LINE_WIDTH=8 | MIN_NECK_WIDTH=6 |
| | | +ADAPTER_SENSE | VOLTAGE=24V | MIN_LINE_WIDTH=50 | MIN_NECK_WIDTH=10 | | 1.5V LX | VOLTAGE=1.5V | MIN_LINE_WIDTH=5 | MIN_NECK_WIDTH=10 |
| | | +BATT_POS | VOLTAGE=16.8V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1.5V BST | VOLTAGE=5V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=10 |
| | | BATT_NEG | VOLTAGE=0V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1.5V BOOST | VOLTAGE=5V | MIN_LINE_WIDTH=1 | MIN_NECK_WIDTH=10 |
| | | 1772 DCIN | VOLTAGE=24V | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=10 | | 1.5V DH | VOLTAGE=1.5V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | 1772 LX | VOLTAGE=12.6V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1.5V DL | VOLTAGE=1.5V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +BATT_14V_FUSE | VOLTAGE=12.6V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 1.5V ILIM | MIN_LINE_WIDTH=8 | MIN_NECK_WIDTH=6 | |
| | | +BATT_24V_FUSE | VOLTAGE=12.6V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | 2.5V ILIM | MIN_LINE_WIDTH=8 | MIN_NECK_WIDTH=6 | |
| | | +BATT_RSNS | VOLTAGE=12.6V | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 | | MAX1715_TON | MIN_LINE_WIDTH=8 | MIN_NECK_WIDTH=6 | |
| | | +BATT_VSNS | VOLTAGE=12.6V | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=10 | | MAX1715_SKIP | MIN_LINE_WIDTH=8 | MIN_NECK_WIDTH=6 | |
| | | 1772 LDO | VOLTAGE=5.4V | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=6 | | MAX1715_REF | VOLTAGE=2.0V | MIN_LINE_WIDTH=8 | MIN_NECK_WIDTH=6 |
| | | 1772 DLOV | VOLTAGE=5.4V | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=6 | | MAX1715_VCC | VOLTAGE=5V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | 1772 GND | VOLTAGE=0V | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=6 | | MAX1715_GND | VOLTAGE=0V | MIN_LINE_WIDTH=3 | MIN_NECK_WIDTH=10 |
| C | PMU | +ADAPTER_ILIM | VOLTAGE=24V | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=6 | MAX1717 | VCORE_VCC | VOLTAGE=5V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +ADAPTER_OR_BATT | VOLTAGE=24V | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=6 | | VCORE_LX | VOLTAGE=1.4V | MIN_LINE_WIDTH=2 | MIN_NECK_WIDTH=10 |
| | | +4.85V_RAW | VOLTAGE=4.85V | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=6 | | VCORE | | | |

FUNCTIONAL TEST POINTS

D

C

B

A

D

C

B

A

FUNCTIONAL TEST POINTS

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| SCALE | SHT | OF |
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