### TABLE 5

<table>
<thead>
<tr>
<th>QTY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PART#</td>
</tr>
</tbody>
</table>

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.

---

**SCHEM, MLB, PB17"**

01/07/05

---

**BOM OPTIONS**

- **STUFF**
  - DJ_HOT
  - DJ_COLD
  - GPU_SS
  - GPU_SWITCH
  - SERIAL_DEBUG
  - VCORE_OFFSET
  - 1_5V_MAXBUS
  - 1_8V_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

---

**SCH1**

- 820-1688
- 051-6694
- www.vinafix.vn
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

IMPEDEANCE: 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

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness ($)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PREPREG (3MIL)</td>
<td>SIGNAL (1/3 OZ + COPPER PLATING)</td>
</tr>
<tr>
<td>2</td>
<td>LAMINATE (4MIL)</td>
<td>GROUND (1/2 OZ)</td>
</tr>
<tr>
<td>3</td>
<td>LAMINATE (4MIL)</td>
<td>SIGNAL (1/2 OZ)</td>
</tr>
<tr>
<td>4</td>
<td>LAMINATE (4MIL)</td>
<td>SIGNAL (1/2 OZ)</td>
</tr>
<tr>
<td>5</td>
<td>PREPREG (2MIL)</td>
<td>GROUND (1/2 OZ)</td>
</tr>
<tr>
<td>6</td>
<td>LAMINATE (3MIL)</td>
<td>CUT POWER PLANE (1 OZ)</td>
</tr>
<tr>
<td>7</td>
<td>PREPREG (2MIL)</td>
<td>GROUND (1/2 OZ)</td>
</tr>
<tr>
<td>8</td>
<td>LAMINATE (4MIL)</td>
<td>SIGNAL (1/2 OZ)</td>
</tr>
<tr>
<td>9</td>
<td>PREPREG (3MIL)</td>
<td>SIGNAL (1/2 OZ)</td>
</tr>
<tr>
<td>10</td>
<td>LAMINATE (4MIL)</td>
<td>GROUND (1/2 OZ)</td>
</tr>
<tr>
<td>11</td>
<td>PREPREG (3MIL)</td>
<td>SIGNAL (1/3 OZ + COPPER PLATING)</td>
</tr>
<tr>
<td>12</td>
<td>LAMINATE (4MIL)</td>
<td>SIGNAL (1/2 OZ)</td>
</tr>
</tbody>
</table>
SEL = LOW; HOST = B PORT; A PORT = 1000OHM TO GND
SEL = HIGH; HOST = A PORT; B PORT = 1000OHM 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
MLB - ALS SENSOR

LMU

SLEEP LED

KEYBOARD PULLUPS

USB Trackpad Connector

Keyboard LED Driver

LMU PULL-DOWNS

LMU/BOOTBANGER/SPIDER

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or copy other circuits or schematics, unless authorized by Apple Computer, Inc.
ENABLES PORT POWER WHEN MACHINE IS RUNNING, SHUTDOEN OR WHEN ASLEEP ON AC

<table>
<thead>
<tr>
<th>STATE</th>
<th>PMU_POWER_UP_L</th>
<th>POWER_UP</th>
<th>DCC_EN</th>
<th>AC IN</th>
<th>STUFF R867</th>
<th>NO STUFF R847</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHUTDOWN</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>SLEEP</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>ON</td>
<td>ON</td>
<td>ON</td>
</tr>
<tr>
<td>STOP</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>(STANDBY)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>(STANDBY)</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOW V</th>
<th>2.99V</th>
<th>+3V_PMU</th>
<th>+4.6V_BU</th>
<th>+3V_PMU</th>
</tr>
</thead>
</table>

AREF NEEDS TO BE ISOLATED FROM ALL LOCAL GROUNDS PER 1394B SPEC TO PREVENT BILINGUAL ISSUE, THERE'S NO AC 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

APPLE COMPUTER INC.
www.vinafix.vn
3.3V/5V MAIN SUPPLY

+24V_MAIN

+5V_MAIN

+3V_MAIN

5V START TO TURN ON 12.1ms AFTER SLEEP_NET
2V START TO TURN ON 2.25ms AFTER DCDC_EN_L

POWERDOWN DELAY IS AROUND 4MS-15.6MS
DIODE WILL ENSURE DCDC_EN_L IS QUICKLY DISCHARGED DURING SHUT-DOWN
3V START TO TURN ON ~25MS AFTER DCDC_EN_L
5V START TO TURN ON ~12.5MS AFTER DCDC_EN_L

THERE'S NO 10UF INPUT CAP BECAUSE Q21 IS PLACED AT OUTPUT OF +3V_MAIN SWITCHER

-3V SLEEP LOADS

1) PCI Pull-Up Resistors
2) Graphics
3) Modem
4) Owner Switch
5) FDC
6) CPU
7) Halt
8) Modem
9) SLEEP
10) Hibernate
11) Halt
12) PowerOFF
13) Panel
14) System
15) SLEEP
16) SLEEP
17) Halt
18) Halt
19) SLEEP
20) SLEEP
21) SLEEP
22) SLEEP
23) SLEEP
24) SLEEP
25) SLEEP
26) SLEEP
27) SLEEP
28) SLEEP
29) SLEEP
30) SLEEP
31) SLEEP
32) SLEEP
33) SLEEP
34) SLEEP
35) SLEEP
36) SLEEP
37) SLEEP
38) SLEEP
39) SLEEP
40) SLEEP
41) SLEEP
42) SLEEP
43) SLEEP
44) SLEEP
45) SLEEP

-3V SLEEP LOADS

1) USB Hub
2) Audio
3) Video
4) Modem
5) Network
6) Printer
7) FDC
8) CPU
9) Halt
10) Hibernate
11) SLEEP
12) PowerOFF
13) Panel
14) System
15) SLEEP
16) SLEEP
17) SLEEP
18) SLEEP
19) SLEEP
20) SLEEP
21) SLEEP
22) SLEEP
23) SLEEP
24) SLEEP
25) SLEEP
26) SLEEP
27) SLEEP
28) SLEEP
29) SLEEP
30) SLEEP
31) SLEEP
32) SLEEP
33) SLEEP
34) SLEEP
35) SLEEP
36) SLEEP
37) SLEEP
38) SLEEP
39) SLEEP
40) SLEEP
41) SLEEP
42) SLEEP
43) SLEEP
44) SLEEP
45) SLEEP

3.3V/5V REGULATOR

NOTICE OF PROPRIETARY PROPERTY

APPLE COMPUTER INC.

www.vinafix.vn
### Differential Signals

<table>
<thead>
<tr>
<th>SIGNAL</th>
<th>SIG_NAME</th>
<th>DIFFERENTIAL</th>
<th>NUM_GENERATED</th>
<th>W ave</th>
<th>THickness</th>
<th>TYPE</th>
<th>LAYER</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW_LP1</td>
<td>FW_PKT1</td>
<td>1</td>
<td>1</td>
<td>33</td>
<td></td>
<td>50</td>
<td>D</td>
</tr>
<tr>
<td>FW_LP1</td>
<td>FW_PKT1</td>
<td>1</td>
<td>1</td>
<td>33</td>
<td></td>
<td>50</td>
<td>C</td>
</tr>
<tr>
<td>FW_LP1</td>
<td>FW_PKT1</td>
<td>1</td>
<td>1</td>
<td>33</td>
<td></td>
<td>50</td>
<td>B</td>
</tr>
<tr>
<td>FW_LP1</td>
<td>FW_PKT1</td>
<td>1</td>
<td>1</td>
<td>33</td>
<td></td>
<td>50</td>
<td>A</td>
</tr>
</tbody>
</table>

### Internal Layer

- **ER = 4.3** (Dielectric Constant)
- **W = 3.4MIL** (Trace Width)
- **B = 12.2MIL** (Dist Between 2 Gnd Planes)
- **T = 0.7MIL** (Trace Thickness)
- **ZSINGLE = 53.37OHM**
- **ZDIFF = 99.80OHM**

### For FireWire

- **ER = 4.3** (Dielectric Constant)
- **W = 3.4MIL** (Trace Width)
- **B = 12.2MIL** (Dist Between 2 Gnd Planes)
- **T = 0.7MIL** (Trace Thickness)
- **ZSINGLE = 53.37OHM**
- **ZDIFF = 99.80OHM**

### Internal Layer (USB 1.1/USB 2.0)

- **ER = 4.3** (Dielectric Constant)
- **W = 3.4MIL** (Trace Width)
- **B = 12.2MIL** (Dist Between 2 Gnd Planes)
- **T = 0.7MIL** (Trace Thickness)
- **ZSINGLE = 53.50OHM (USB 1.1) / 66.20OHM (USB 2.0)**
- **ZDIFF = 99.20OHM (USB 1.1) / 99.40OHM (USB 2.0)**

---

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**SCALE**

**SIZE**

**SHT**

**D**

**A**

**B**

**C**

**D**

*www.vinafix.vn*
## POWER NET CONSTRAINTS

<table>
<thead>
<tr>
<th>Net Name</th>
<th>Scale</th>
<th>Size</th>
<th>Min Line Width</th>
<th>Min Neck Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DDR RAM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTREP1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I/O AREA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INVERTER</td>
<td></td>
<td></td>
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<tr>
<td>TRACKPAD</td>
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<tr>
<td>LVDS</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I/O AREA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USB 2.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTREP2</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### LTC162
- 1V Switch
- 1.5V Switch
- 2.5V Switch

### LTC3701
- 5V Switch
- 3V Switch

### MAX1715
- 2.5V Switch

### BATTERY CHARGER
- PP3V3_SI_AVCC1
- PP3V3_SI_AVCC2

### PMU
- 1.8V VFB
- LTC3411_GND
- 1.5V_2.5V_OK
- GPU_VCORE_SW
- VCORE_GNDSNS
- VCORE_TIME
- VCORE_FB
- VCORE_CC
- VCORE_TON
- VCORE_ILIM
- VCORE_DL

### MAX1715_GND
- 2.5V_DH
- 5V_SW
- 1625_EXTVCC

### LTC1962
- L3_VOUT
- L3_VIN
- 1.8V_VFB

### LTC1963
- LTC1771
- LTC3411
- LTC1961

### SCALE
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

### SIZE
- A
- B
- C
- D

---

**VOLTAGE = 0V**

**VOLTAGE = 1.4V**

**VOLTAGE = 1.5V**

**VOLTAGE = 2.5V**

**VOLTAGE = 3.3V**

**VOLTAGE = 5V**

**VOLTAGE = 12.6V**

**VOLTAGE = 24V**

**MIN LINE WIDTH = 6**

**MIN LINE WIDTH = 8**

**MIN LINE WIDTH = 10**

**MIN LINE WIDTH = 15**

**MIN LINE WIDTH = 20**

**MIN LINE WIDTH = 25**

**MIN NECK WIDTH = 6**

**MIN NECK WIDTH = 10**

**MIN NECK WIDTH = 15**

**MIN NECK WIDTH = 20**

**MIN NECK WIDTH = 25**

---

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