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,DC-IN/LT USB,PB17"
07/24/03

REV	ZONE	ECN	DESCRIPTION OF CHANGE	CK APPD / DATE	ENG APPD / DATE
B		285243	PRODUCTION RELEASED	07/25/03?	

PAGE CONTENTS

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
051-6474	1	SCHEM,DC-IN/LT USB,PB17INCH	SCH1	
820-1536	1	PCBF,DC-IN/LT USB,PB17INCH	PCB1	

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

THIRD ANGLE PROJECTION

METRIC

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

MATERIAL/FINISH NOTED AS APPLICABLE

SIZE D

Apple Computer Inc.

TITLE
SCHEM,DC-IN/LT USB,PB17INCH

DRAWING NUMBER 051-6474 REV. B

SHT 1 OF 8

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

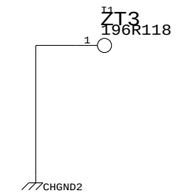
SEE PCB CAD FILES FOR MORE SPECIFIC INFO.

BOARD STACK-UP AND CONSTRUCTION

20R10 TH VIA OR VIA IN PAD

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	PREPREG (3MIL)	SIGNAL (1/3 OZ + COPPER PLATING)

BOARD HOLES



PCB BOARD STANDOFFS

BOARD INFORMATION

NOTICE OF PROPRIETARY PROPERTY

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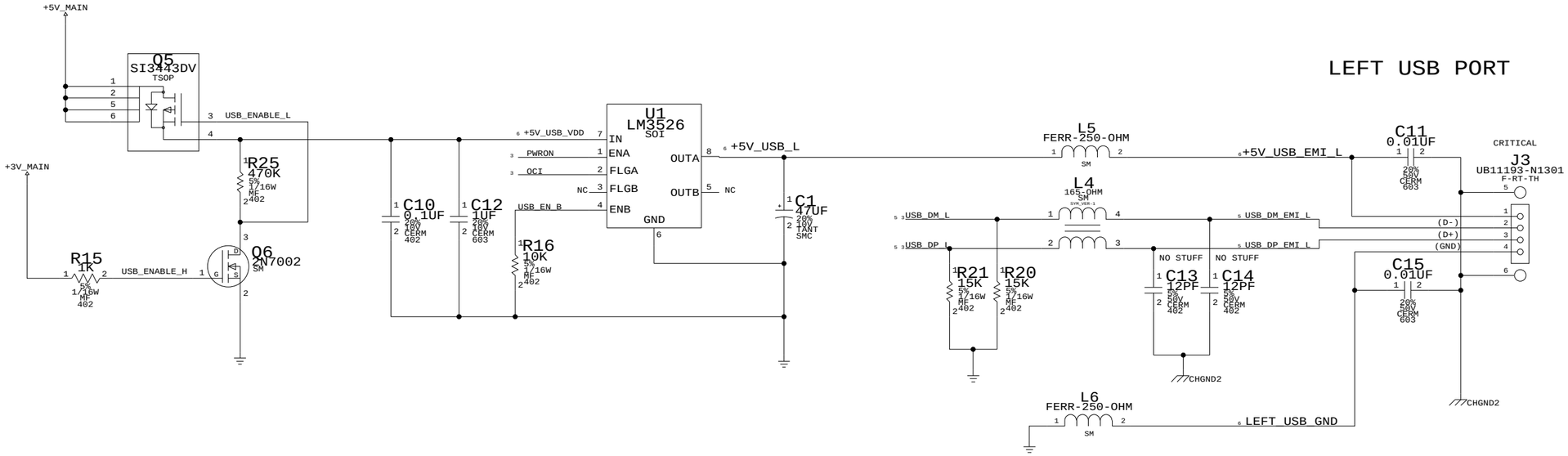
I TO MAINTAIN THE DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT

III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6474	B
SCALE: NONE	SHT 2 OF 8	



USB & ALS

NOTICE OF PROPRIETARY PROPERTY

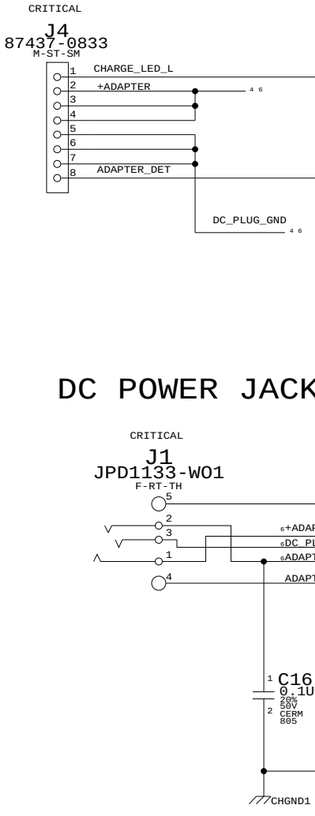
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6474	B

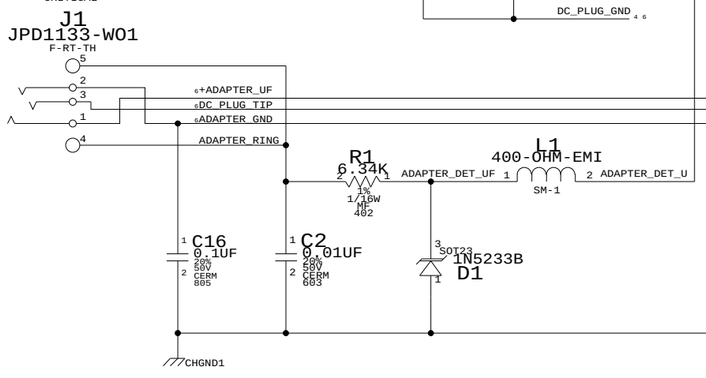
SCALE NONE

SHT 3 OF 8

POWER CONNECTOR



DC POWER JACK



CHARGE LED SUPPORT

PLACE C2, C3 AND C16 CLOSE TO J1

PLACE L1, L2 AND L3 CLOSE TO J1

DC POWER INTERFACE

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6474	B
SCALE: NONE	SHT 4 OF 8	

REVISION HISTORY

04/22/03 - DESIGN ORIGINATED FROM 051-6282
04/28/03 - PG 3 - REPLACED R19 & R23 WITH 250-OHM 2A FERRITES (TABLE ITEM)
PG 4 - CHANGED C3 TO 0.1UF 0805 (WAS 0.01UF 0603)
REPLACED R2 WITH C16 0.1UF 0805 (WAS 0-OHM 0402)
EVT 04/29/03 - PG 4 - REPLACED R19 & R23 WITH L5 & L6 (PAD CHANGE FOR FERRITES)
CHANGED L2 & L3 FROM 50-OHM FERRITES TO 160-OHM
07/24/03 - PRODUCTION RELEASE

Differential Signals

GROUP	SIG_NAME	DIFFERENTIAL_PAIR	MATCHED_DELAY	MIN_LINE_WIDTH	NET_SPACING_TYPE		MAX_VIAS
USB							
	USB_DM_L	USB_D1	USB_DM:J1.4:L4.1:20	MIN_LINE_WIDTH=5	10 MIL SPACING		3
	USB_DP_L	USB_D1	USB_DP:J1.3:L4.2:20	MIN_LINE_WIDTH=5	10 MIL SPACING		3
	USB_DM_EMI_L	USB_D1_EMI	USB_D1_EMI:L4.4:J3.2:20	MIN_LINE_WIDTH=5	10 MIL SPACING		3
	USB_DP_EMI_L	USB_D1_EMI	USB_D1_EMI:L4.3:J3.3:20	MIN_LINE_WIDTH=5	10 MIL SPACING		3

FOR USB DIFFERENTIAL TRACES (ZSINGLE=45 OHM +- 10%,ZDIFF=90 OHM +- 15%)		
	MICROSTRIP (OUTER LAYERS)	STRIPLINE (INTERNAL LAYERS)
TRACE WIDTH	4 MIL	5 MIL
SEPARATION OF TRACES	8 MIL	10 MIL

ALS SIGNALS

GROUP	SIG_NAME	DELAY_RULE	MATCHED DELAY	STUB_LENGTH	MIN_LINE_WIDTH	NET_SPACING_TYPE
ALS						
	3 LIGHT_SENSOR				MIN_LINE_WIDTH=20	
	3 GAIN_SETTING1				MIN_LINE_WIDTH=20	
	3 MAX4236_IN+				MIN_LINE_WIDTH=20	
	3 MAX4236_IN-				MIN_LINE_WIDTH=20	
	3 MAX4236_OUT				MIN_LINE_WIDTH=20	
	3 ALS_GAIN				MIN_LINE_WIDTH=5	
	3 ALS_OUT				MIN_LINE_WIDTH=10	

SIGNAL CONSTRAINTS - PAGE 3

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6474	B

SCALE NONE SHT 5 OF 8

POWER NET CONSTRAINTS

GROUP	SIG_NAME	VOLTAGE	MIN_LINE_WIDTH	MIN_NECK_WIDTH
ADAPTER	+5V_MAIN	VOLTAGE=5V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10
	+3V_MAIN	VOLTAGE=3.3V	MIN_LINE_WIDTH=25	MIN_NECK_WIDTH=10
	+ADAPTER_UF	VOLTAGE=24V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10 4
	+ADAPTER_FUSE	VOLTAGE=24V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10 4
	+ADAPTER	VOLTAGE=24V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10 4
	ADAPTER_GND	VOLTAGE=0V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10 4
	CHARGE_LED_D	VOLTAGE=	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10 4
	CHARGE_LED_S	VOLTAGE=	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10 4
	DC_PLUG_TIP	VOLTAGE=	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10 4
	DC_PLUG_GND	VOLTAGE=0V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10 4
USB	+5V_USB_VDD	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10 3
	+5V_USB_L	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10 3
	+5V_USB_EMI_L	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10 3
	LEFT_USB_GND	VOLTAGE=0V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10 3

VOLTAGE=0V MIN_LINE_WIDTH=100 MIN_NECK_WIDTH=10 GND

SIGNAL CONSTRAINTS - PAGE 4

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6474	B
SCALE: NONE	SHT 6 OF 8	

*** Signal Cross-Reference for the entire design ***

+3V_MAIN	6D6>
+5V_MAIN	6D6>
+5V_USB_EMI_L	3C3<> 6C6>
+5V_USB_L	3D5<> 6C6>
+5V_USB_VDD	3D6<> 6C6>
+ADAPTER	4B3< 4C3< 4C5< 4C7<> 6D6>
+ADAPTER_FUSE	4B4< 6D6>
+ADAPTER_UF	4B6<> 6D6>
ADAPTER_DET	4C7<>
ADAPTER_DET_F	4C6<>
ADAPTER_DET_G	4C6<>
ADAPTER_DET_U	4B5<>
ADAPTER_DET_UF	4B6<>
ADAPTER_GND	4B6<> 6C6>
ADAPTER_RING	4B6<>
ALS_GAIN	3B4<> 5C8<
ALS_OUT	3B3<> 5C8<
CHARGE_LED_D	4C3<> 6C6>
CHARGE_LED_DRV	4C4<>
CHARGE_LED_L	4C7<>
CHARGE_LED_L_ESD	4C5<
CHARGE_LED_S	4C3<> 6C6>
DC_PLUG_GND	4B3< 4B5< 4C6<> 6C6>
DC_PLUG_TIP	4B6<> 6C6>
GAIN_SETTING1	3A7<> 5C8<
LEFT_USB_GND	3C3<> 6C6>
LIGHT_SENSOR	3B7<> 5C8<
MAX4236_IN+	3B5< 5C8<
MAX4236_IN-	3B5< 5C8<
MAX4236_OUT	3B5<> 5C8<
OCI	3B4<> 3C6>
PWRON	3B4<> 3C6<
USB_DM_EMI_L	3C3<> 5D2>
USB_DM_L	3B4<> 3C4<> 5D2>
USB_DP_EMI_L	3C3<> 5D2>
USB_DP_L	3B3<> 3C4<> 5D2>
USB_ENABLE_H	3C8<
USB_ENABLE_L	3D7<>
USB_EN_B	3C6<

*** Part Cross-Reference for the entire design ***

C1 CAP_P 3
C2 CAP 4
C3 CAP 4
C4 CAP 3
C5 CAP 3
C6 CAP 3
C7 CAP 4
C8 CAP 4
C9 CAP 4
C10 CAP 3
C11 CAP 3
C12 CAP 3
C13 CAP 3
C14 CAP 3
C15 CAP 3
C16 CAP 4
D1 ZENER 4
F1 FUSE 4
J1 CON_F3RT_S2MT_TH3 4
J2 CON_F12ST_D4MT_SM1 3
J3 CON_F4RT_S2MT_TH 3
J4 CON_MOST_S_SM 4
L1 IND 4
L2 IND 4
L3 IND 4
L4 FILTER_4P 3
L5 IND 3
L6 IND 3
PD1 PHOTODIODE_2P 3
Q1 TRA_2N7002ZDW 4
Q3 TRA_2N7002 4
Q4 TRA_2N7002DW 3
Q5 TRA_SI3443DV 3
Q6 TRA_2N7002 3
R1 RES 4
R3 RES 3
R4 RES 3
R5 RES 3
R6 RES 3
R7 RES 3
R8 RES 4
R10 RES 4
R11 RES 4
R12 RES 4
R13 RES 4
R15 RES 3
R16 RES 3
R17 RES 4
R18 RES 4
R20 RES 3
R21 RES 3
R22 RES 4
R24 RES 3
R25 RES 3
U1 LM3526 3
U2 OPAMP_MAX423GEUTT 3
ZT3 MTGHOLE 2