

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 DATE	ENG APPD DATE
01		229127	ENGINEERING RELEASED	07/22/02	?

PAGE CONTENTS


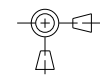
1	TITTLE PAGE AND CONTENTS
2	PCB NOTES
3	USB / SENSOR
4	POWER CONNECTOR
5	SIGNAL CONSTRAINTS
6	POWER CONSTRAINTS
7	COMPONENT LOCATIONS
8	SIGNAL LOCATIONS

SUTRO

DVT

11/27/2002

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
051-6282	1	SCHEM, SUTRO, P84	SCH1	
820-1388	1	PCBF, SUTRO, P84	PCB1	

DIMENSIONS ARE IN MILLIMETERS		METRIC		 Apple Computer Inc.	
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X.XX : _____				TITLE SCHEM, SUTRO, P84	
X.XXX : _____				DRAWING NUMBER 405595 REV. AA	
ANGLES : _____				SHT 1 OF 8	
DO NOT SCALE DRAWING				MATERIAL / FINISH NOTED AS APPLICABLE SIZE D	
 THIRD ANGLE PROJECTION					

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

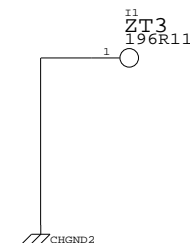
SEE PCB CAD FILES FOR MORE SPECIFIC INFO.

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

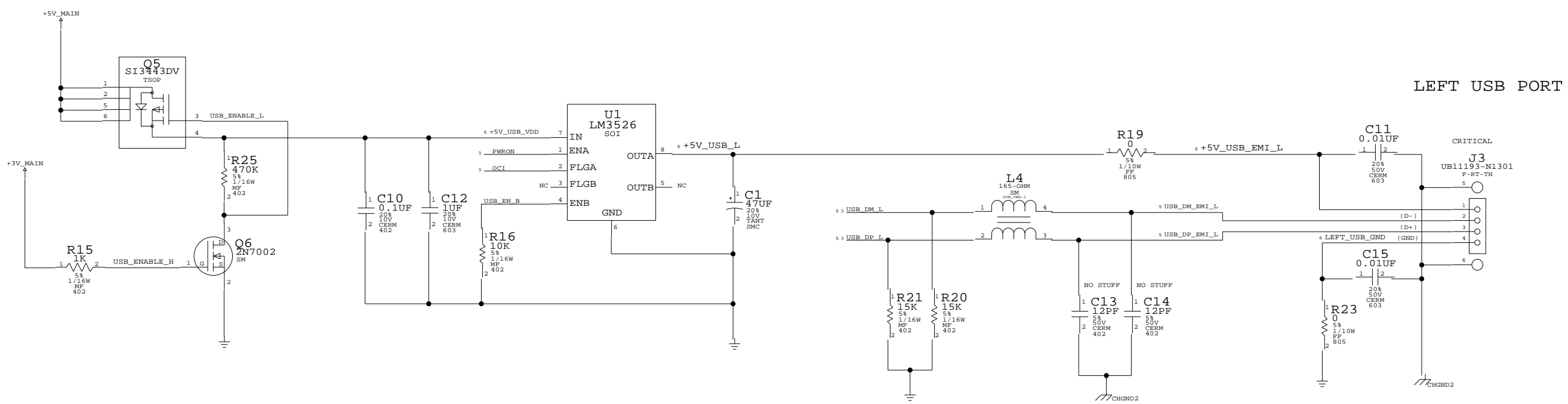
BOARD INFORMATION

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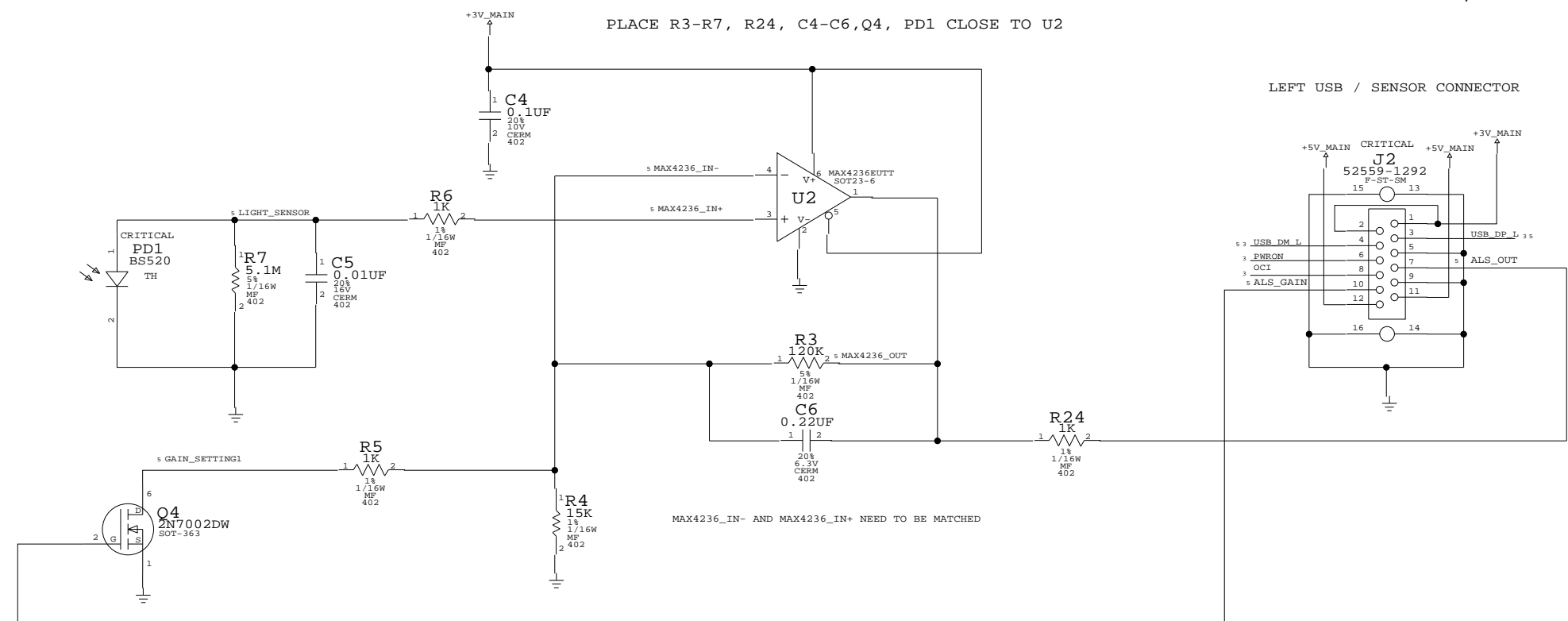
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SIZE	D	DRAWING NUMBER	405595	REV.	AA
SCALE	NONE	SHT	2	OF	8



LEFT USB PORT

PUT R19, R23 AND L4 ACROSS THE MOAT



PLACE R3-R7, R24, C4-C6, Q4, PD1 CLOSE TO U2

LEFT USB / SENSOR CONNECTOR

USB & ALS

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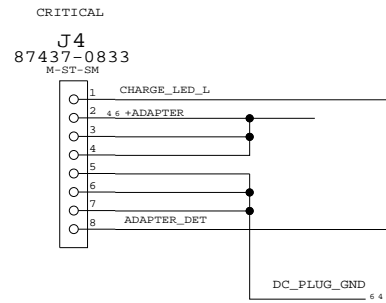
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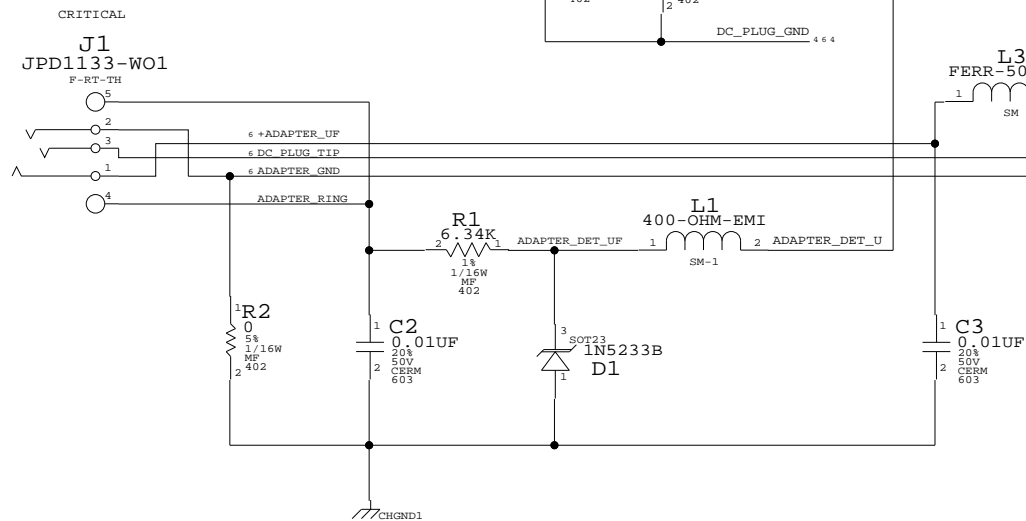
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SCALE	SHT	OF	
NONE	3	8	

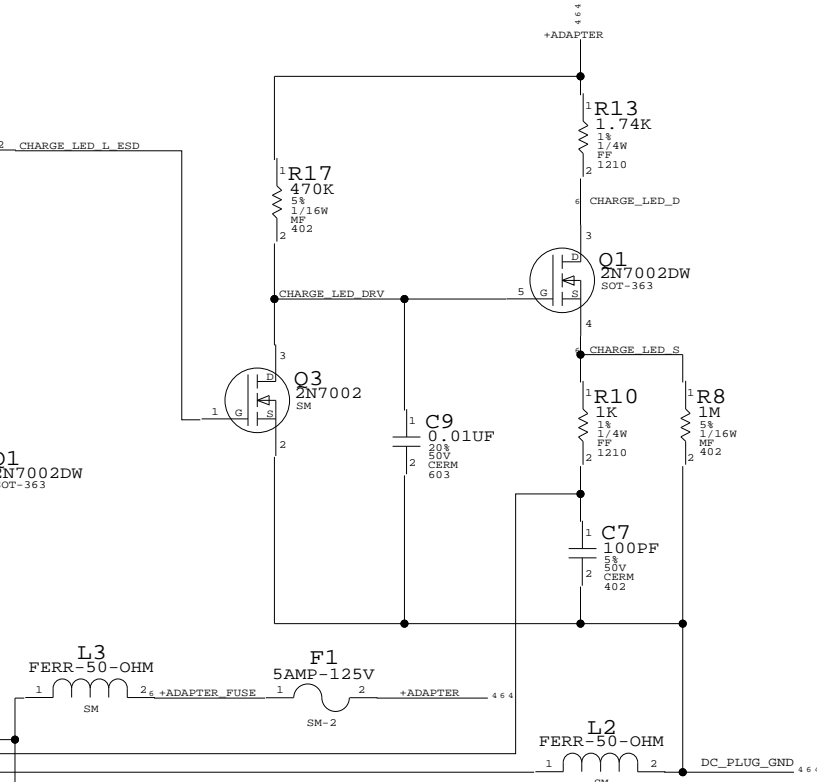
POWER CONNECTOR



DC POWER JACK



CHARGE LED SUPPORT



PLACE C2, C3 AND R2 CLOSE TO J1
PLACE L1, L2 AND L3 CLOSE TO J1

DC POWER INTERFACE

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	D	405595	AA
SCALE	SHT	OF	
NONE	4	8	

8

7

6

5

4

3

2

1

RIVISION HISTORY

11/04/02 - CHANGED FROM BS120 TO BS520
 CHANGED FROM GND TO DC_PLUG_GND FOR THE DC ADAPTER CIRCUIT
 CHANGED FROM +3V_SLEEP TO +3V_MAIN FOR THE ALS CIRCUIT

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

ALS SIGNALS

GROUP	SIG_NAME	DELAY_RULE	MATCHED_DELAY	STUB_LENGTH	MIN_LINE_WIDTH	NET_SPACING_TYPE	MAX_VIAS
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		

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

SIGNAL CONSTRAINTS - PAGE 3

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SIZE	DRAWING NUMBER	REV.
D	405595	AA
SCALE	SHT	OF
NONE	5	8

8

7

6

5

4

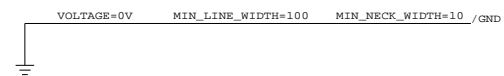
3

2

1

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
	+ADAPTER_FUSE	VOLTAGE=24V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10
	+ADAPTER	VOLTAGE=24V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10
	ADAPTER_GND	VOLTAGE=0V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10
	CHARGE_LED_D	VOLTAGE=	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10
	CHARGE_LED_S	VOLTAGE=	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10
	DC_PLUG_TIP	VOLTAGE=	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10
	DC_PLUG_GND	VOLTAGE=0V	MIN_LINE_WIDTH=100	MIN_NECK_WIDTH=10
USB	+5V_USB_VDD	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10
	+5V_USB_L	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10
	+5V_USB_EMI_L	VOLTAGE=5V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10
	LEFT_USB_GND	VOLTAGE=0V	MIN_LINE_WIDTH=20	MIN_NECK_WIDTH=10



SIGNAL CONSTRAINTS - PAGE 4

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	D	405595	AA
SCALE	SHT	OF	
NONE	6	8	

8 7 6 5 4 3 2 1

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

+3V_MAIN	6D6
+5V_MAIN	6D6
+5V_USB_EMI_L	3D3 6C6
+5V_USB_L	3D5 6C6
+5V_USB_VDD	3D6 6C6
+ADAPTER	4B3 4C3 4C5 4C7 6D6
+ADAPTER_FUSE	4B4 6D6
+ADAPTER_IF	4B6 6D6
/GND	6C6
ADAPTER_DET	4C7
ADAPTER_DET_F	4C6
ADAPTER_DET_G	4C6
ADAPTER_DET_U	4B5
ADAPTER_DET_IF	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_KSD	4C3
CHARGE_LED_S	4C3 6C6
DC_PLUG_GND	4B3 4B5 4C6 6C6
DC_PLUG_TIP	4B6 6C6
GAIN_SETTING1	3A7 5C8
LEFT_USB_GND	3C2 6C6
LIGHT_SENSOR	3B7 5C8
MAX4236_IN+	3B5 5C8
MAX4236_IN-	3B5 5C8
MAX4236_OUT	3B5 5C8
OCI	3B4 3C6
PRISON	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_M	3C8
USB_ENABLE_L	3D7
USB_EN_B	3C6

D

D

C

C

B

B

A

A


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	SCALE NONE	SHT 7 OF 8	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

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

C1	CAP	P	3C5
C2	CAP		4B6
C3	CAP		4B6
C4	CAP		3B6
C5	CAP		3B6
C6	CAP		3A5
C7	CAP		4B3
C8	CAP		4B6
C9	CAP		4C4
C10	CAP		3C6
C11	CAP		3D2
C12	CAP		3C6
C13	CAP		3C3
C14	CAP		3C3
C15	CAP		3C2
D1	ZENER		4B6
F1	FUSE		4B4
J1	CONN_FHRT_SMT_TH3		4B7
J2	CONN_F12ST_D4MT_SM1		3B3
J3	CONN_F4MT_SMT_TH		3C2
J4	CONN_REST_S_SH		4C7
L1	IND		4B5
L2	IND		4B3
L3	IND		4B5
L4	FILTER_4P		3C4
PD1	PHOTOVOLTAIC		2P 3B7
Q1	TRN_2N7002W		4C5
Q3	TRN_2N7002		4C4
Q4	TRN_2N7002W		3A7
Q5	TRN_2N4403V		3D7
Q6	TRN_2N7002		3C7
R1	RES		4B6
R2	RES		4B6
R3	RES		3B5
R4	RES		3A6
R5	RES		3A6
R6	RES		3B6
R7	RES		3B7
R8	RES		4C3
R10	RES		4C3
R11	RES		4B5
R12	RES		4C5
R13	RES		4C3
R15	RES		3C8
R16	RES		3C6
R17	RES		4C4
R18	RES		4C5
R19	RES		3D3
R20	RES		3C4
R21	RES		3C4
R22	RES		4C6
R23	RES		3C2
R24	RES		3A4
R25	RES		3C7
U1	LM3526		3D5
U2	OPAMP_MAX9813BUTT		3B5
Z1	MSHOLE		2D2

D
C
B
A

D
C
B
A


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