

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.

REV

ZONE

ECN

DESCRIPTION OF CHANGE

CK APPD

DATE

ENG APPD

DATE

C

292875

PRODUCTION RELEASED

09/09/03

?

PAGE

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PCB NOTES AND HOLES

3

SNAPPER (AUDIO) CONTROL INTERFACE

4

SPEAKER DRIVER

5

HEADPHONE DRIVER

6

LINE-IN AND MICROPHONE AMP

7

SIGNAL AND POWER CONSTRAINTS

8

SIGNAL LOCATIONS

9

PART LOCATIONS

SCHEM, SOUND, PB17"

9/9/03

8

7

6

5

4

3

2

1

PART#

QTY

DESCRIPTION

REFERENCE DESIGNATOR(S)

BOM OPTION

051-6456

1

SCHEM, SOUND, PB17 INCH

SCH1

820-1523

1

PCBF, SOUND, PB17 INCH

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

NONE

MATERIAL/FINISH NOTED AS APPLICABLE

SIZE D

Apple Computer Inc.

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TITLE

SCHEM, SOUND, PB17 INCH

DRAWING NUMBER 051-6456

REV. C

SHT 1 OF 9

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

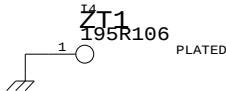
IMPEDANCE : 50 OHMS +/- 10%
DIELECTRIC: FR-4
LAYER COUNT: 12
SIGNAL TRACE WIDTH: 4 MILS
SIGNAL TRACE SPACING: 4 MILS
PREPREG THICKNESS: 2-3 MILS

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

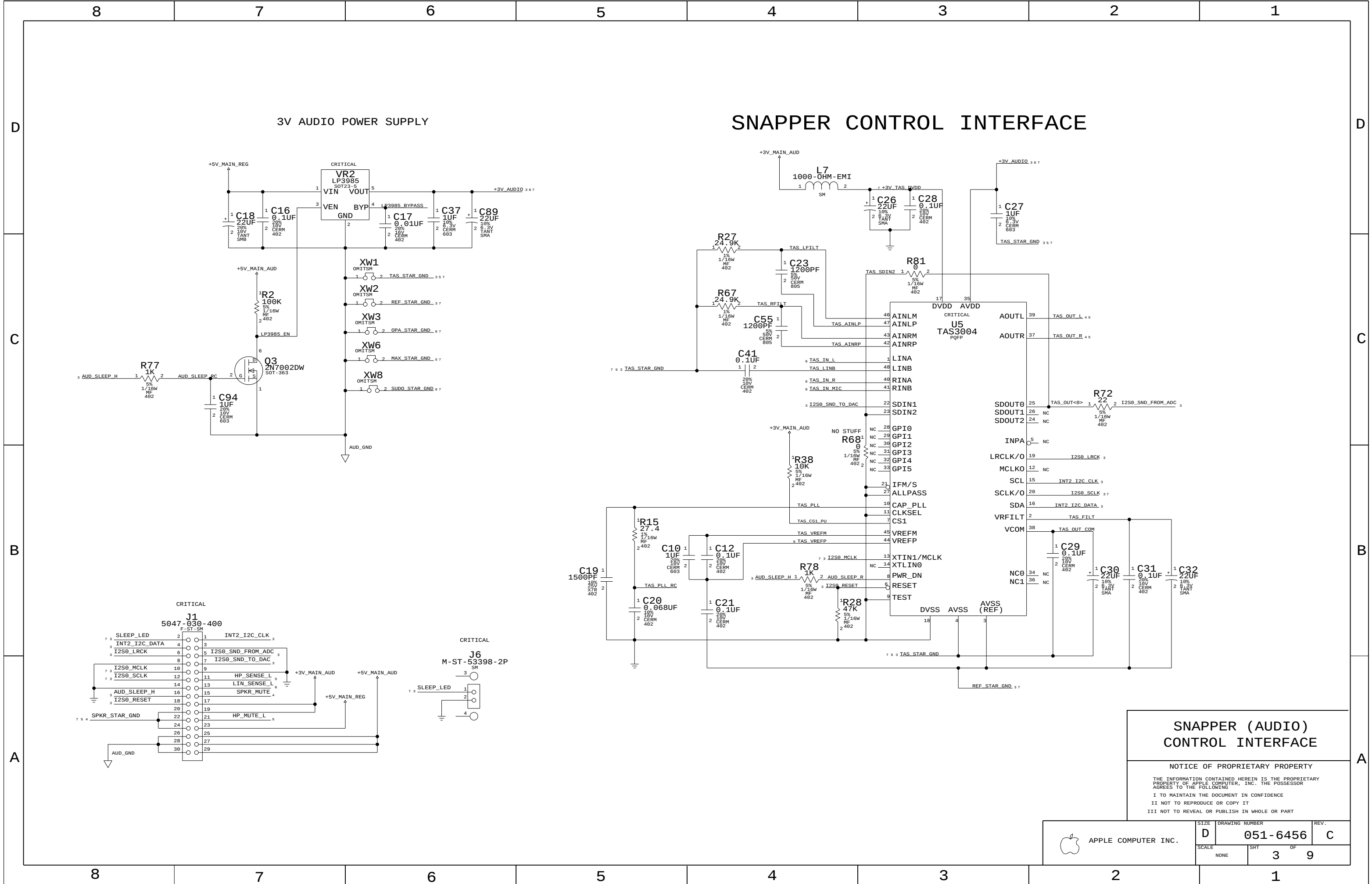


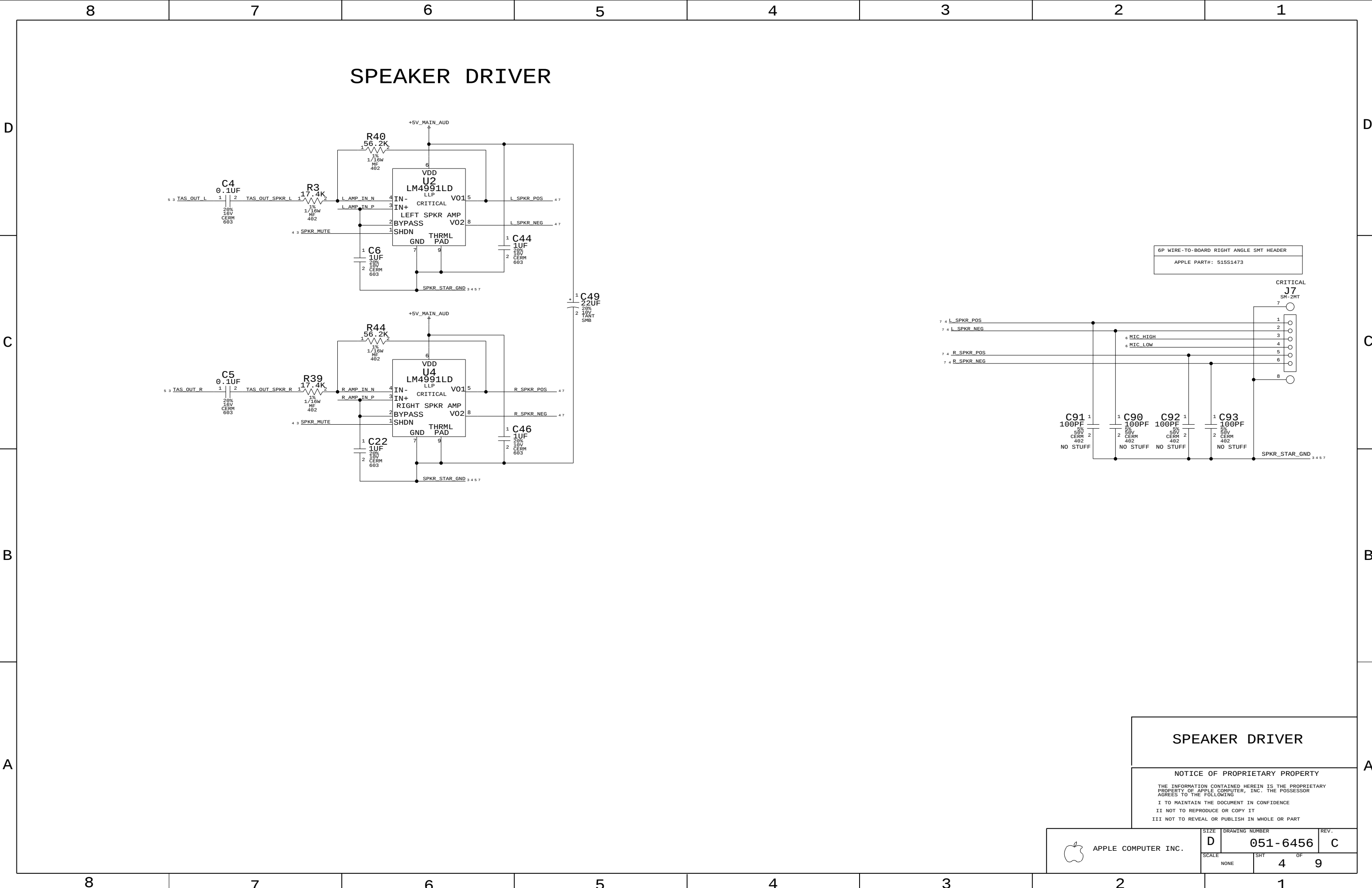
PCB BOARD STANDOFFS

BOARD INFORMATION

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 APPLE COMPUTER INC.	SIZE D	DRAWING NUMBER 051-6456	REV. C
	SCALE NONE	SHT 2	OF 9





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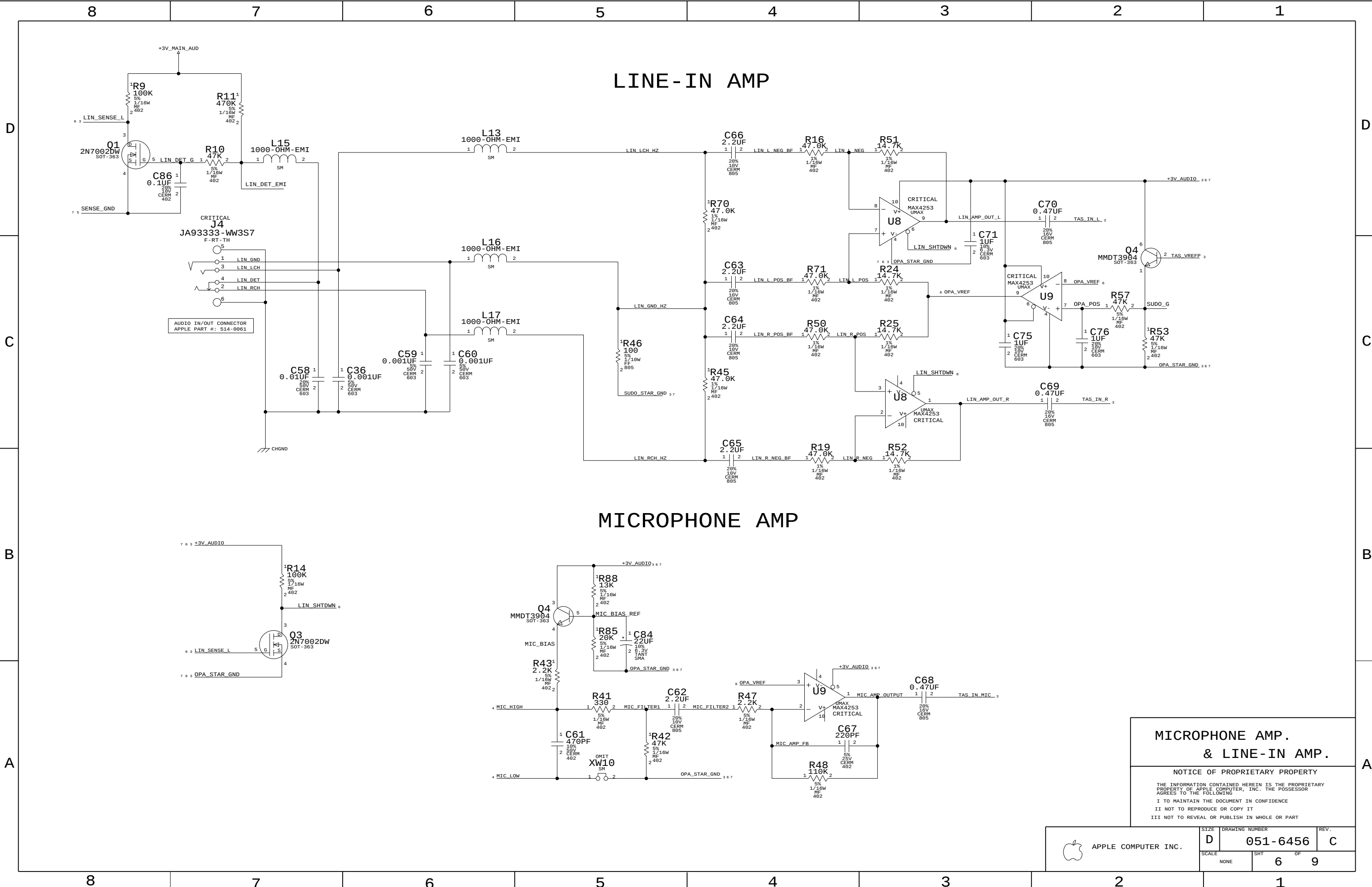
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SIZE D	DRAWING NUMBER 051-6456	REV. C
SCALE NONE	SHT 5	OF 9



LINE-IN AMP

MICROPHONE AMP

MICROPHONE AMP.
& LINE-IN AMP.

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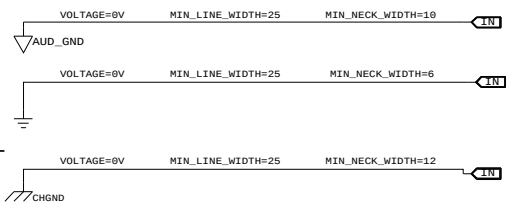
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	D	051-6456	C
SCALE		SHT	OF
NONE		6	9

8	7	6	5	4	3	2	1																																																																																																																																															
D	SIGNAL CONSTRAINTS				POWER NET CONSTRAINTS																																																																																																																																																	
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C	CHANGES FROM EVT TO EVT2																																																																																																																																																					
	1. TIED C90 TO L_SPKR_NEG																																																																																																																																																					
	2. TIED HP_OUT_L TO PIN3 AND HP_SENSE TO PIN4 AT J8.																																																																																																																																																					
	3. NO STUFF R4																																																																																																																																																					
	4. CHANGED C20 FROM 0.01 UF TO 0.068UF																																																																																																																																																					
	5. CHANGED C39 AND C45 TO 2200PF, 50V, NPO, 0805																																																																																																																																																					
	CHANGED R5 AND R6 TO 11.8K, 1%, 0402																																																																																																																																																					
	CHANGED C81 AND C82 TO 22 UF, 6.3V, 10%, SMA																																																																																																																																																					
	6. EMI CHANGES --																																																																																																																																																					
	ADDED L4, L5 AND L6																																																																																																																																																					
B	CHANGED TO 0.01 UF AT C34, C48 AND C50																																																																																																																																																					
	CHANGED TO 0.01 UF AT C36, C58, C59 AND C60																																																																																																																																																					
	NO STUFF L20																																																																																																																																																					
	CHANGES FROM EVT2/DVT TO PVT/ RAMP																																																																																																																																																					
	1. CHANGED R40 AND R44 FROM 86.6K TO 56.2K																																																																																																																																																					
	CHANGED R3 AND R39 FROM 26.7K TO 17.4K																																																																																																																																																					
	2. SWAPPED R39 AND C5																																																																																																																																																					
	SWAPPED R3 AND C4																																																																																																																																																					
	3. ADDED CONSTRAINTS FOR HEADPHONE OUTPUT SIGNALS																																																																																																																																																					
	4. CHANGED C17 TO 402 16V 0.01UF TO REMOVE OEM NPO PART																																																																																																																																																					
A	5. CHANGED L4 TO 0402																																																																																																																																																					
	6. CHANGED CONSTRAINTS																																																																																																																																																					
	7. CHANGED C36, C59 AND C60 FROM 0.01UF TO 0.001UF TO IMPROVE LINE-IN SNR																																																																																																																																																					
	8. CHANGED C34 AND C48 FROM 0.01UF TO 0.001UF TO IMPROVE HEADPHONE SNR																																																																																																																																																					
	9. CHANGED R7 FROM 113S0016 (OEM) TO 113S1470 (APPLE, 1/10W)																																																																																																																																																					
	10. CHANGED C42 AND C43 FROM 131S0012 (OEM) TO 131S0095 (APPLE)																																																																																																																																																					
	AUDIO-IN/LINE-OUT																																																																																																																																																					
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SIGNAL & POWER CONSTRAINTS

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SCALE	NONE	SHT	7	OF	9

8		7		6		5		4		3		2		1		
D	*** Part Cross-Reference for the entire design ***															D
	C1	CAP	5													
	C4	CAP	4													
	C5	CAP	4													
	C6	CAP	4													
	C10	CAP	3													
	C12	CAP	3													
	C16	CAP	3													
	C17	CAP	3													
	C18	CAP_P	3													
C	C19	CAP	3													C
	C20	CAP	3													
	C21	CAP	3													
	C22	CAP	4													
	C23	CAP	3													
	C24	CAP	5													
	C26	CAP_P	3													
	C27	CAP	3													
	C28	CAP	3													
	C29	CAP	3													
B	C30	CAP_P	3													B
	C31	CAP	3													
	C32	CAP_P	3													
	C34	CAP	5													
	C36	CAP	6													
	C37	CAP	3													
	C38	CAP	5													
	C39	CAP	5													
	C40	CAP_P	5													
	C41	CAP	3													
A	C42	CAP	5													A
	C43	CAP	5													
	C44	CAP	4													
	C45	CAP	5													
	C46	CAP	4													
	C47	CAP	5													
	C48	CAP	5													
	C49	CAP_P	4													
	C50	CAP	5													
	C55	CAP	3													
	C56	CAP	5													
	C58	CAP	6													
	C59	CAP	6													
	C60	CAP	6													
	C61	CAP	6													
	C62	CAP	6													
	C63	CAP	6													
	C64	CAP	6													
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	C66	CAP	6													
	C67	CAP	6													
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	C69	CAP	6													
	C70	CAP	6													
	C71	CAP	6													
	C75	CAP	6													
	C76	CAP	6													
	C79	CAP	5													
	C81	CAP_P	5													
	C82	CAP_P	5													
	C83	CAP_P	5													
	C84	CAP_P	6													
	C86	CAP	6													
	C89	CAP_P	3													
	C90	CAP	4													
	C91	CAP	4													
	C92	CAP	4													
	C93	CAP	4													
	C94	CAP	3													
	D21	SUPPR_TRANSIENT_AP1	5													
	D22	SUPPR_TRANSIENT_AP1	5													
	J1	CON_F3RST_D_SM	3													
	J4	CON_F4RT_S2WT_TH3	6													
	J6	CON_M2ST_S2MT_SM	3													
	J7	CON_M6RT_WRIIB	4													
	J8	CON_F4RT_S2WT_TH3	5													
	L4	IND	5													
	L5	IND	5													
	L6	IND	5													
	L7	IND	3													
	L8	IND	5													
	L9	IND	5													
	L10	IND	5													
	L13	IND	6													
	L15	IND	6													
	L16	IND	6													
	L17	IND	6													
	L20	IND	5													
	Q1	TRA_2N70B2DW	5 6													
	Q3	TRA_2N70B2DW	3 6													
Q4	TRA_DUAL_MPOT3984	6														
	R1	RES	5													
	R2	RES	3													
	R3	RES	4													
	R4	RES	5													
	R5	RES	5													
	R6	RES	5													
	R7	RES	5													
	R8	RES	5													
	R9	RES	6													
	R10	RES	6													
	R11	RES	6													
	R14	RES	6													
	R15	RES	3													
	R16	RES	6													
	R19	RES	6													
	R24	RES	6													
	R25	RES	6													
	R27	RES	3													
	R28	RES	3													
	R29	RES	5													
	R31	RES	5													
	R33	RES	5													
	R34	RES	5													
	R36	RES	5													
	R38	RES	3													
	R39	RES	4													
	R40	RES	4													
	R41	RES	6													
	R42	RES	6													
	R43	RES	6													
	R44	RES	4													
	R45	RES	6													
	R46	RES	6													
	R47	RES	6													
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	R54	RES	5													
	R57	RES	6													
	R58	RES	5													
	R67	RES	3													
	R68	RES	3													
	R70	RES	6													
	R71	RES	6													
	R72	RES	3													
	R77	RES	3													
	R78	RES	3													
	R81	RES	3													
	R82	RES	5													
	R83	RES	5													
	R84	RES	5													
	R85	RES	6													
	R88	RES	6													
	U2	AUDIO_LM4991LD	4													
	U3	MAX4410	5													
	U4	AUDIO_LM4991LD	4													
	U5	TAS3904	3													
	U8	OPAMP_MAX4253	6													
U9	OPAMP_MAX4253	6														
VH2	VREG_LF3985	3														
	XW1	SHORT	3													
	XW2	SHORT	3													
	XW3	SHORT	3													
	XW6	SHORT	3													
	XW8	SHORT	3													
	XW10	SHORT	6													
	ZT1	HTGHOLE	2													
	9															
	1															