M72/M78 "HOP" AUDIO

M72/M78 HOP DVT

CHANGE LIST (CHANGES FROM M51)

23OCT06
1. CHANGED CODEC TO QFN, ADDED 4 AND 5 PIN FLAT SPEAKER CONNECTORS.
2. ADDED 4 PIN MICROPHONE CONNECTOR
3. DELETED OPTIONAL STUFF PATH FOR LINE INPUT TO CDIN OF CODEC, ADDED VARIOUS I/O LABELS

24OCT06
4. DELETED C6517,C6501,C6617,C6601(TOO LARGE CAPS ON SPEAKER AMPLIFIERS)
5. CHANGED C6508/C6600 TO 220UF FROM 470UF(NO NEED FOR THAT MUCH BULK)
6. DELETED R8827/R8828 AS THEY ARE UNNEEDED IN SINGLE-ENDED MIC CKT
7. CHANGED CODEC AVDD CAPS TO 22UF (NOT INVOLVING A HIGH CURRENT LOAD)
8. ADDED TPS79501 VOLTAGE REGULATOR TO GENERATE 4.5V AVDD
9. CHANGED R6787/R6570 0 OHM RESISTORS THAT WERE EXPENSIVE AND NO LONGER NEEDED.
10. REPLACED C6582, C6602 WITH MORE APPROPRIATE CAPACITORS (335S0008) AS THE OTHERS WERE RARE

15NOV06
11. DELETED ALL FERRITE BEADS ON OUTPUT SIDE OF T FILTER
12. DELETED 4 PIN STATIC ZAP DIODES
13. REPLACED ALL OUTPUT FILTER CAPACITORS WITH VARISTERS (100PF CAP PLUS ZAP PROTECTION)
14. CHANGED Q7ECL TRANSISTORS TO SOT-23 FROM SOT-323 FOR SMALLER PACKAGE
15. CHANGED TOP AND BOTTOM RESISTORS FOR LI DETECT SO THAT IT WILL OPERATE PROPERLY

28NOV06
16. CHANGED BOARD TO BOARD CONNECTOR TO APN 516S0564 (22 PIN)
17. ADDED SYSTEM LED
18. ADDED DECOUPLING AROUND BRD TO BRD CONNECTOR
19. CHANGED BOARD TO BOARD CONNECTOR TO PADS WHICH IS APN 998-1569

29NOV06 AUDIOHW/SW/EFT DESIGN REVIEW HELD (1PM SONNY ROLLINS)
20. CHANGED L6207,L6202 TO CHEAPER 220 OHM FERRITE BEADS
21. ADDED NET NAMES TO U6200 PIN1, U6201 PINS1,5,8, ADDED AUD_ TO BEEP.JDREF,VREF ON PAGE 62
22. CHANGED R6308 TO 20K ON PAGE 63
23. CHANGED R6410 TO 0 OHMS. CHANGED NOTES FROM LINE OUTPUT TO HEADPHONES ON PAGE 64
24. CHANGED L6505,L6506,L6507,L6508,L6605,L6606,L6607,6008 TO 0402 PACKAGES PAGES 65 AND 66
25. CHANGED ALL CHASSIS NET NAMES TO THE SAME (GND_CHASSIS_AUDIO_EXTERNAL) PAGE 67
26. CHANGED NET NAME ON J6702 PIN3 TO NC_J6702. ADDED CHASSIS GNDS TO PINS 5,6 J6701, PINS 6,7 J6702
27. OBSOLETED D26702 AND D26709 AS THEY SHOULD NEVER BE NEEDED DUE TO LOCATION OF PIN DEEP INSIDE CONNECTOR
28. CHANGED REFERENCES TO LINE OUTPUT ON PAGE 68 TO BE REFERENCES TO HEADPHONES

6DEC06
29. FIXED ONE SINGLE PIN NET ON CHASSIS GND NEAR XW6700
30. ADDED MIN LINE WIDTH PROPERTY TO AUD_LO_GND
31. DELETED ALL ALIASED NETS (=) SIGNS TO ELIMINATE AMBIGUITY
32. FIXED THE MIN NECK/MIN LINE WIDTH PROPERTIES ON GND
33. COMBINED 12V POWER AND GROUND FOR BOTH SPEAKER AMPLIFIERS TO AID IN PLANE POURING AND ROUTING

7DEC06
34. FIXED A COUPLE OF LINE WIDTH MINIMUMS FOR ROUTING

8DEC06
35. ADDED M72/M78 AUDIO IN/OUT CONNECTORS
36. CHANGED R6303/08 TO 100K FROM 39K AS WE DO NOT NEED THE PULL DOWN FUNCTION FOR DETECT
37. ADDED R6720/L6781 TO L1 TYPE DETECT LINE AS WE ARE NOW GOING TO USE IT
38. CHANGED NET NAME FOR L1_DET TO END WITH
39. DELETED DETECT TRANSISTORS AS THE CONNECTORS WILL NOW TAKE THAT FUNTIONALITY

11DEC06
40. ADDED STANDOFFS, FIXED NET PROPERTIES IN HEADPHONES CIRCUIT

12DEC06
41. MODIFIED PORT CONNECTIONS TO MATCH M75/M76 WHERE POSSIBLE
42. MODIFIED SOME MIN LINE/MIN NECK WIDTHS ON GROUNDS FOR I/O

13DEC06
43. ADDED GPIO1 FUNCTIONALITY FOR M72/M78 SELECTION
44. VREF_A NOW MUTES LINE OUTPUT

14DEC06
45. CHANGED J9900 TO 998-1580 (20 PIN VERSION)

15DEC06
46. ADDED RESISTOR STUFF OPTIONS TO PLATED HOLES TO CONNECT TO RELEVANT GROUNDS
47. CHANGED MICROPHONE SHIELD SHORT TO 0 OHM RESISTOR IN CASE WE NEED TO REMOVE A GROUND LOOP
48. ADDED "PROPER" HOLES FOR AUDIO BOARD (960-8893)
49. CHANGED PINOUT OF 20 PIN CONNECTOR TO REDUCE CROSSTALK BETWEEN SIGNALS

18DEC06
50. ADDED PROPER SIZED HOLES
51. CHANGED 22UF CAPS FROM 120S0087 TO HIGHER TEMP 126S0110 (ALSO ADDS A SUPPLIER FOR GSM)
52. CHANGED C6300,C6301,C6304,C6305 TO COMPLIANT 127S0050 CAPS
53. ADDED 128S0106 AS ALTERNATE FOR C6202,C6203
54. CHANGED L6505/06/07/08, L6605/06/07/08 TO APN 155S0137 TO MATCH PARTS ON OTHER PAGES (SAME PART WITH DIFFERENT PART NUMBER)

10JAN07
55. FOUND SERIOUS ERRORS IN DETECT CIRCUITRY, REDESIGNED DETECTS

11JAN07
56. CHANGED J6701/J6704 TO VERTICAL CONNECTORS PER PD

23JAN07
57. CHANGED U6200 TO LQFP
58. ADDED 30 PIN ZIF CONNECTOR J9901, HOOKED UP
59. DELETED Z79901

24JAN07
60. PLACED QFN CODEC BACK ONTO SCHEMATIC (U6200)
61. MODIFIED PIN OUT FOR J9900 TO PLACE DGND BETWEEN TWO POWERS
62. CHANGED PULL DOWN RESISTORS ON OUTPUT OF MAX9722 TO 2.2K FROM 1K TO AID IN THD+N

29JAN07
63. CHANGED Q6500 TO MATCH Q6800,Q6802 (BOM CONSOLODATION)
64. DELETED R6203 AND MXM_SPDIF_NET (NOT REQ'D PER DEREK DICARLO AND LAURA METZ)
65. DELETED R6217 AND NO CONNECTED GPIO_1 (NOT REQ'D PER RADAR 4880571)

29JAN07
65. DELETED R6217 AND NO CONNECTED GPIO_1 (NOT REQ'D PER RADAR 4880571)

9 FEB 07
66 UPDATED PORT LABEL TABLE TO INCLUDE VREF_A AS MUTE FOR HEADPHONES AMPLIFIER
67 CHANGED L6280 TO 220 OHM FERRITE (SAME AS M70/75/76) AND CHANGED C6202/C6203 TO 150 UF FROM 33UF TO IMPROVE THD+N ON HEADPHONES OUTPUT.

13 FEB 07
68 ADDED DUAL ANALOG MIC SUPPORT

13 MAR 07
69 CHANGED VREF CAP ON CODEC (C6205) TO 3.3UF FROM 10UF TO ENSURE THAT THE VREF IS FULLY CHARGED WHEN SPKR AND HP AMPS ARE UNMUTED
70 CHANGED THE DECOUPLING CAPS (C6400,C6401) TO 3.3UF FROM 10UF TO REDUCE POP
71 ADDED NO-STUFFED R6854 TO CONNECT L AND R CHANNELS TOGETHER FOR MONO MIC IMPLEMENTATION

14 MAR 07
71 BACKED OUT CHANGES FOR MULTIPLE MICROPHONE SUPPORT ON THIS SCHEMATIC (MOVED CHANGES TO NEW 951-0619 TEST SCHEMATIC.

26 MAR 07
72 ADDED R6843 (0 OHM RESISTOR) SO THAT M72/M78 WILL FOLLOW LOW POWER MODEL IMPLEMENTED ON ALL NEW MACS.

9 APR 07
73 ADDED SILICONIX PART 376S0422 AS ALTERNATE FOR 376S0568 (DUAL PACKAGE FET)

3 MAY 07
74 ADDED CRITICAL ATTRIBUTE TO A LOT OF COMPONENTS
75 CHANGED C6406 TO 22OF PER RADAR 5063912.

7 MAY 07
75 ADDED C6219 (1UF CAP) AND CHANGED R6211 TO 2.21K FROM 1K TO FIX MLB POWER SUPPLY STARTUP ISSUE (RADAR-5183842)..
76 REMOVED PLATING FROM TWO HOLES (ZT6800, ZT6801 AND REMOVED RESISTOR R6840 WHICH WAS NO LONGER NEEDED.
77 ADDED HOLE ZT6800 BACK AS AFTER FURTHER REVIEW IT IS NEEDED FOR CHASSIS CONNECTION.
78 STUFFED R5900, R6836, R6841, R6842 FOR EMC.

AUDIO: CODEC

SYNC_MASTER=AUDIO SYNC_DATE=08/04/2006

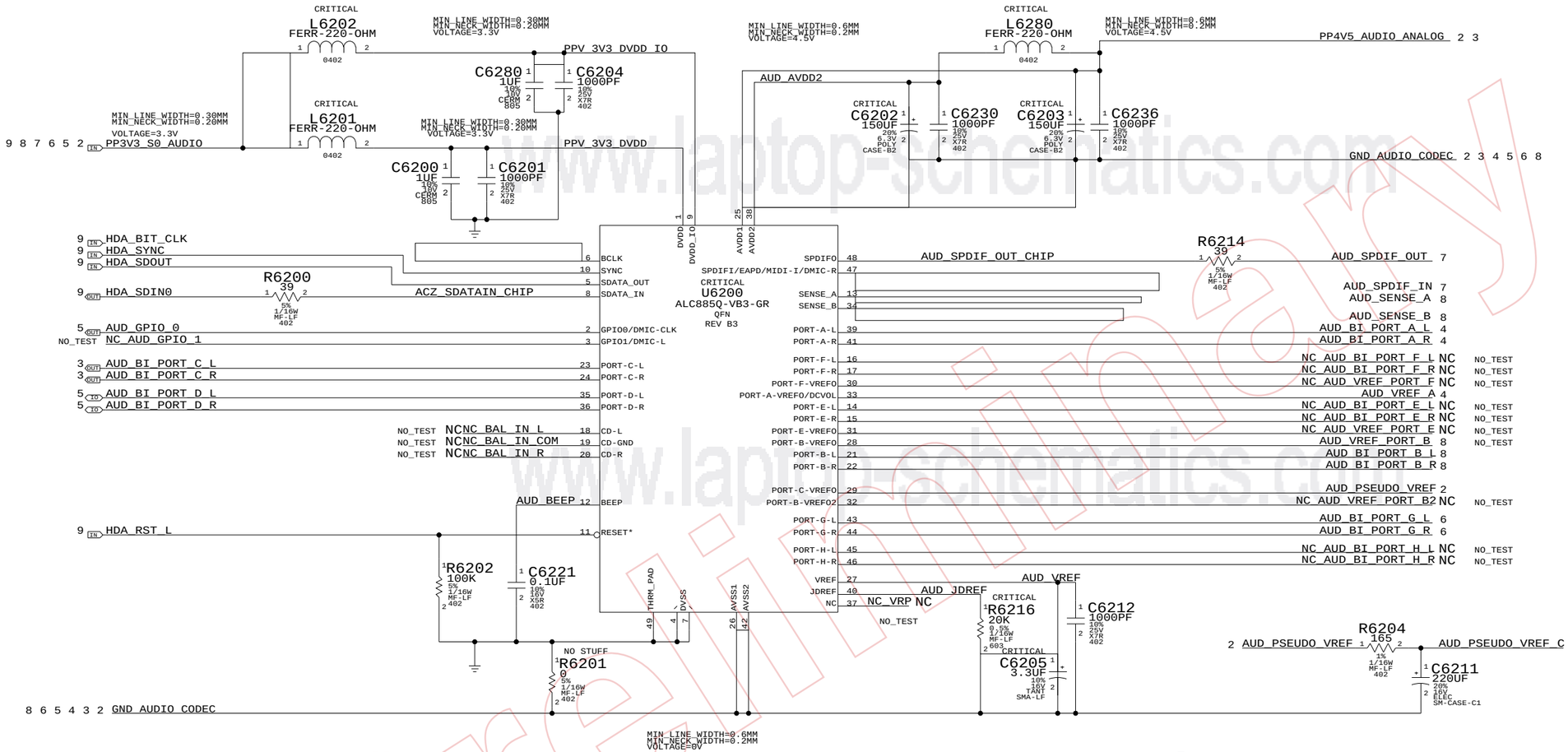
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-7265	16

SCALE NONE SHT 1 OF 101

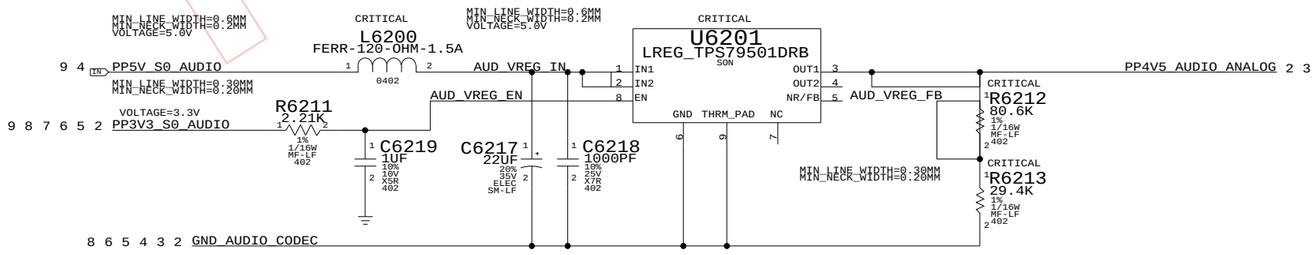
AUDIO CODEC

APPLE P/N 353S1538



4.5V POWER SUPPLY FOR CODEC AND LINE IN AMP

VOUT = 1.2246 X (1+ (80.6K/29.4K)) = 4.58V



PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
128S0106	128S0079		C6202,C6203	GSM REQUEST

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	CRITICAL	BOM OPTION
820-2136	1	PCB, FAB, AUDIO, M72/M78	MLB1		

AUDIO: CODEC

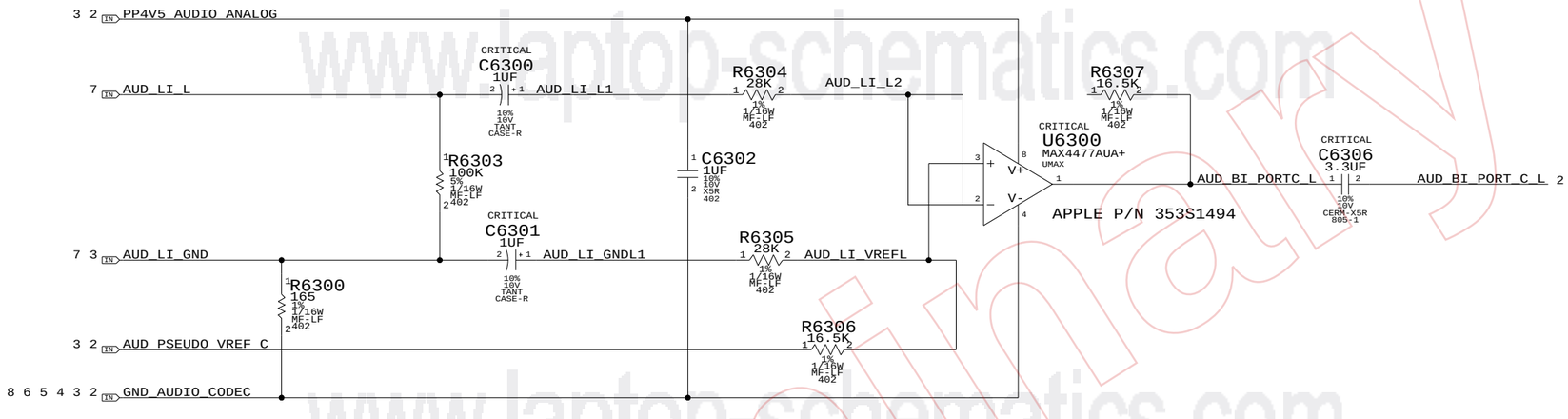
SYNC_MASTER=AUDIO SYNC_DATE=08/04/2006

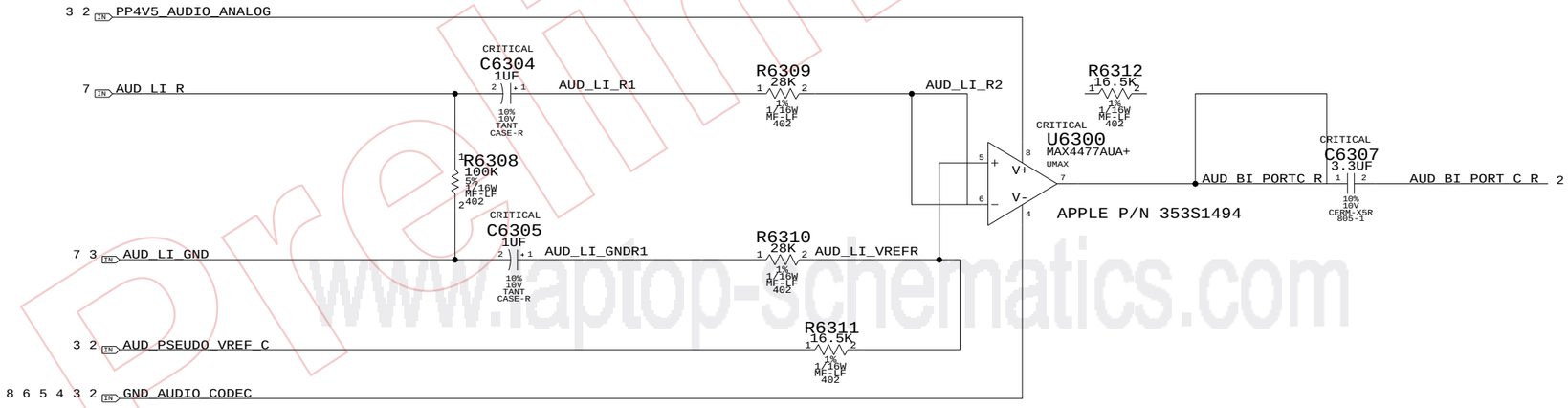
APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-7265	16
SCALE: NONE	SHT 62 OF 101	

LINE IN PSEUDO-DIFFERENTIAL AMP

AV = 0.59
FC = 5.7 HZ





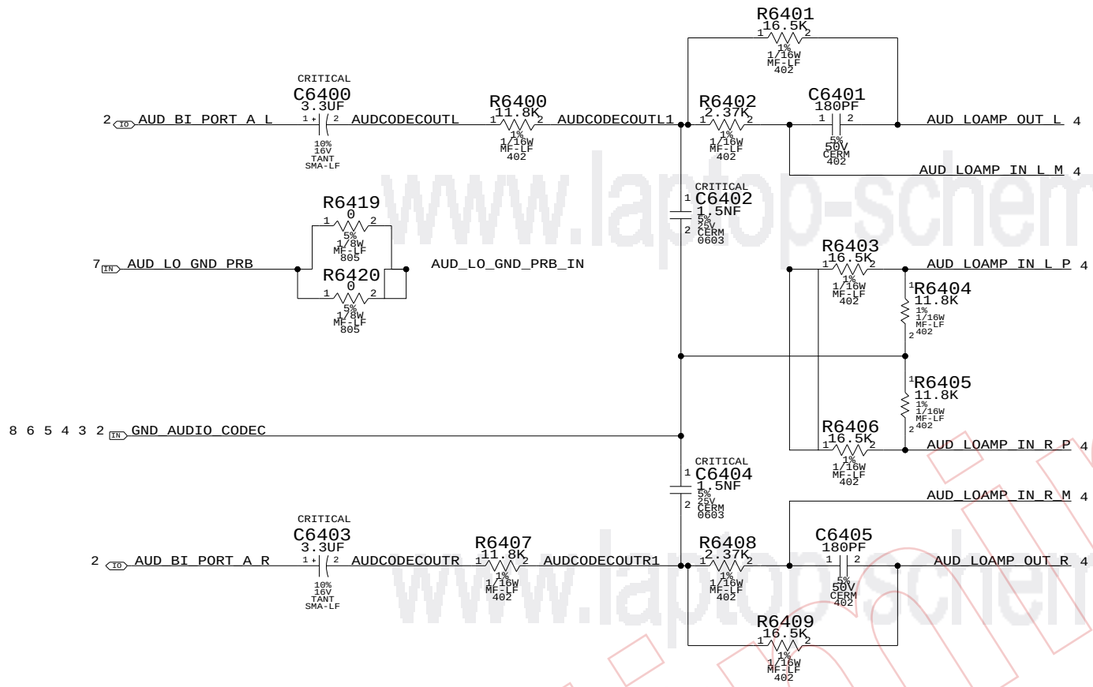
AUDIO: LINE INPUT AMP

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-7265	16
SCALE: NONE	SHT 63 OF 101	

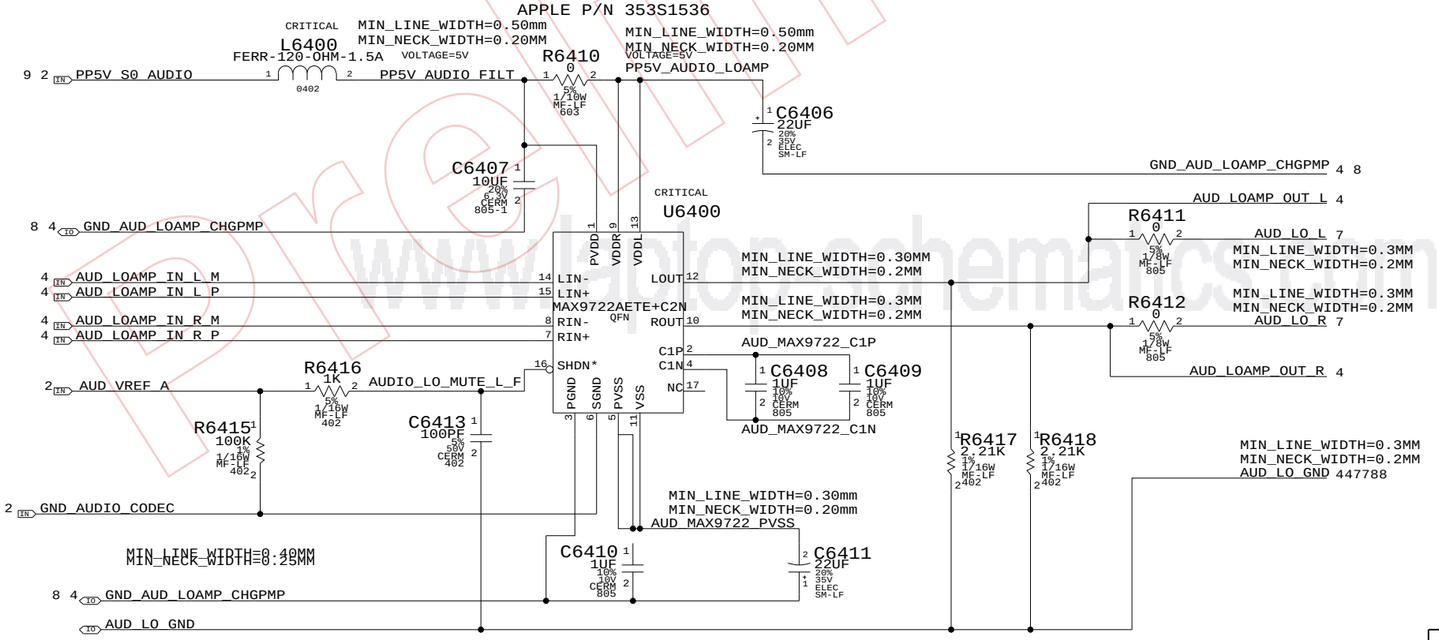
HEADPHONES LOW-PASS FILTER

Fc = 46 KHZ, Av = -1.4



HEADPHONES AMP

APPLE P/N 353S1536



AUDIO: HEADPHONES AMP

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-7265	16

SCALE	SHT	OF
NONE	64	101

SPEAKER AMP
APPLE P/N 353S1156

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.2MM
MIN_NECK_WIDTH=0.2MM
VOLTAGE=12V

8 6 PP12V_AUD_SPKRAMP_PLANE
8 6 5 GND_AUDIO_SPKRAMP_PLANE
2 AUD_BI_PORT_D_R
8 6 5 4 3 2 GND_AUDIO_CODEC
2 AUD_BI_PORT_D_L
9 8 7 6 5 2 PP3V3_S0_AUDIO
6 AUD_SPKRAMP_MUTE
9 8 7 6 5 2 PP3V3_S0_AUDIO
2 AUD_GPIO_0
8 6 5 4 3 2 GND_AUDIO_CODEC
8 6 5 GND_AUDIO_SPKRAMP_PLANE
8 6 5 4 3 2 GND_AUDIO_CODEC

C6500 220UF 20% 16V ELEC SM-CASE-C1
C6518 0.1UF 10% 16V CERM 603
C6502 1UF 10% 16V X7R 805
C6519 0.1UF 20% 16V CERM 603
C6503 10UF 10% 16V X5R-CERM 1210
GND_AUDIO_SPKRAMP_PLANE 5 6 8

L6505 FERR-1000-OHM 0402
L6506 FERR-1000-OHM 0402
L6507 FERR-1000-OHM 0402
L6508 FERR-1000-OHM 0402
C6504 0.47UF 10% 16V X7R 805
C6505 0.47UF 10% 16V X7R 805
C6506 0.47UF 10% 16V X7R 805
C6507 0.47UF 10% 16V X7R 805
C6515 100PF 5% 50V CERM 402
C6516 100PF 5% 50V CERM 402
AUDSAMPINLN
AUDSAMPINLP
AUDSAMPINRP
AUDSAMPINRN

R6514 47K 5% 1/10W MF-LF 402 AUD_SAMP_SHDN_L
R6515 47K 5% 1/10W MF-LF 402
R6513 47K 5% 1/10W MF-LF 402 AUD_SPKRAMP_MUTE_L
R6512 11.8K 1% 1/10W MF-LF 402
C6521 100PF 5% 50V CERM 402
C6590 100PF 5% 50V CERM 402
Q6500 NTZD3154N SOT-563
Q6500 NTZD3154N SOT-563
C6514 1UF 10% 25V X5R 603
C6509 0.47UF 10% 16V X7R 805

CRITICAL
U6500
MAX9714
QFN-LF

AUD_SAMP_INL_N	9	INL-
AUD_SAMP_INL_P	10	INL+
AUD_SAMP_INR_P	16	INR+
AUD_SAMP_INR_N	15	INR-
5 AUD_SAMP_G1	17	G1
5 AUD_SAMP_G2	18	G2
5 AUD_SAMP_FS1	19	FS1
5 AUD_SAMP_FS2	20	FS2
AUD_SAMP_SHDN_L	11	SHDN*
NO_TEST NC	8	NC
AUD_MAX9714_VREG	14	REG
	7	CHOLD
	31	OUTL+
	32	OUTL+
	29	OUTL-
	30	OUTL-
	6	C1+
	5	C1-
	27	OUTR+
	28	OUTR+
	25	OUTR-
	26	OUTR-
	12	SS
	3,4,21,22	VDD
	13,33,1,2,23,24	THM AGND PAD PGND

MIN_LINE_WIDTH=0.2MM MIN_NECK_WIDTH=0.2MM AUD_MAX9714_CHOLD
SPKRAMP_SS
MIN_LINE_WIDTH=0.2MM MIN_NECK_WIDTH=0.15MM

NET SPACING TYPE=AUDIO MIN_LINE_WIDTH=0.5MM MIN_NECK_WIDTH=0.2MM
AUDSAMPOUTLP
AUDSAMPOUTLN
MIN_LINE_WIDTH=0.2MM MIN_NECK_WIDTH=0.15MM
AUDSAMPCPP
AUDSAMPCPN
C6508 0.1UF 10% 50V X7R 603-1
AUDSAMPOUTRP
AUDSAMPOUTRN

CRITICAL L6501 180-OHM-1.5A 0603-LF
CRITICAL L6502 180-OHM-1.5A 0603-LF
CRITICAL L6503 180-OHM-1.5A 0603-LF
CRITICAL L6504 180-OHM-1.5A 0603-LF

AUD_SPKR_OUTDR_P 7
AUD_SPKR_OUTDR_N 7
AUD_SPKR_OUTDL_P 7
AUD_SPKR_OUTDL_N 7

C6510 1000PF 10% 25V X7R 402
C6511 1000PF 10% 25V X7R 402
C6512 1000PF 10% 25V X7R 402
C6513 1000PF 10% 25V X7R 402

NET SPACING TYPE=AUDIO MIN_LINE_WIDTH=0.6MM MIN_NECK_WIDTH=0.2MM
GND_AUDIO_SPKRAMP_PLANE 5 6 8

NOSTUFF R6519 0 5% 1/16W MF-LF 402

GAIN SETTINGS: +16DB
MODULATION SETTING: LOW EMI
GAIN AND SWITCHING FREQUENCY STUFF OPTIONS

9 8 7 6 5 2 PP3V3_S0_AUDIO
RP6500 47K 5% 1/16W SM-LF
5 AUD_SAMP_FS2
5 AUD_SAMP_FS1
5 AUD_SAMP_G2
5 AUD_SAMP_G1
NOSTUFF R6518 0 5% 1/16W MF-LF 402
NOSTUFF R6508 0 5% 1/16W MF-LF 402
8 6 5 GND_AUDIO_SPKRAMP_PLANE

AUDIO: SPEAKER AMP_1

SYNC_MASTER=AUDIO SYNC_DATE=08/04/2006

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-7265	16
SCALE: NONE	SHT 65 OF 101	

SPEAKER AMP

APPLE P/N 353S1156

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.6MM
MIN_NECK_WIDTH=0.2MM
VOLTAGE=12V

8 5 PP12V_AUD_SPKRAMP_PLANE

8 6 5 GND_AUDIO_SPKRAMP_PLANE

2 AUD_BI_PORT_G_R

8 6 5 4 3 2 GND_AUDIO_CODEC

2 AUD_BI_PORT_G_L

9 8 7 6 5 2 PP3V3_S0_AUDIO

8 6 5 GND_AUDIO_SPKRAMP_PLANE

SPKRAMP1_SS

5 AUD_SPKRAMP_MUTE

8 6 5 GND_AUDIO_SPKRAMP_PLANE

8 6 5 4 3 2 GND_AUDIO_CODEC

L6605 FERR-1000-OHM 0402
L6606 FERR-1000-OHM 0402
L6607 FERR-1000-OHM 0402
L6608 FERR-1000-OHM 0402

C6604 0.47UF 10% 16V X7R 805
C6605 0.47UF 10% 16V X7R 805
C6606 0.47UF 10% 16V X7R 805
C6607 0.47UF 10% 16V X7R 805

C6615 100PF 5% 50V CERM 402
C6616 100PF 5% 50V CERM 402

AUDSAMPINLN1
AUDSAMPINLP1
AUDSAMPINRP1
AUDSAMPINRN1

R6614 47K 5% 1/10W MF-LF 402

C6690 100PF 5% 50V CERM 402

Q6600 2N7002 SOT23-LF

C6600 220UF 20% 16V ELEC SM-CASE-C1
C6618 0.1UF 20% 16V CERM 603
C6602 1UF 10% 16V X7R 805
C6619 0.1UF 20% 16V CERM 603
C6603 10UF 10% 16V X5R-CERM 1210

GND_AUDIO_SPKRAMP_PLANE 5 6 8

MIN_LINE_WIDTH=0.2MM
MIN_NECK_WIDTH=0.2MM
AUD_MAX9714_CHOLD1

CRITICAL
U6600
MAX9714
QFN-LF

VDD
THM
AGND PAD
PGND

AUD_SAMP1_INL_N 9 INL-
AUD_SAMP1_INL_P 10 INL+
AUD_SAMP1_INR_P 16 INR+
AUD_SAMP1_INR_N 15 INR-
6 AUD_SAMP1_G1 17 G1
6 AUD_SAMP1_G2 18 G2
6 AUD_SAMP1_FS1 19 FS1
6 AUD_SAMP1_FS2 20 FS2
AUD_SAMP1_SHDN_L 11 SHDN*
NO_TEST
NC NC_U6600_PIN8 8 NC
AUD_MAX9714_VREG1 14 REG

CHOLD 7
OUTL+ 31
OUTL+ 32
OUTL- 29
OUTL- 30
C1+ 6
C1- 5
OUTR+ 27
OUTR+ 28
OUTR- 25
OUTR- 26
SS 12

MIN_LINE_WIDTH=0.2MM
MIN_NECK_WIDTH=0.15MM

C6614 1UF 10% 25V X5R 603

C6609 0.47UF 10% 16V X7R 805

NOSTUFF
R6619 0 5% 1/16W MF-LF 402

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM
AUDSAMPOUTLP1

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM
AUDSAMPOUTLN1

MIN_LINE_WIDTH=0.2MM
MIN_NECK_WIDTH=0.15MM
AUDSAMPCPP1

C6608 0.1UF 10% 50V X7R 603-1

MIN_LINE_WIDTH=0.2MM
MIN_NECK_WIDTH=0.15MM
AUDSAMPCPN1

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM
AUDSAMPOUTRP1

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM
AUDSAMPOUTRN1

CRITICAL
L6601 180-OHM-1.5A 0603-LF
L6602 180-OHM-1.5A 0603-LF
L6603 180-OHM-1.5A 0603-LF
L6604 180-OHM-1.5A 0603-LF

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM
AUD_SPKR_OUTGR_P 7

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM
AUD_SPKR_OUTGR_N 7

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM
AUD_SPKR_OUTGL_P 7

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM
AUD_SPKR_OUTGL_N 7

C6610 1000PF 10% 25V X7R 402
C6611 1000PF 10% 25V X7R 402
C6612 1000PF 10% 25V X7R 402
C6613 1000PF 10% 25V X7R 402

NET SPACING TYPE=AUDIO
MIN_LINE_WIDTH=0.5MM
MIN_NECK_WIDTH=0.2MM

GND_AUDIO_SPKRAMP_PLANE 5 6 8

GAIN SETTINGS: +16DB
MODULATION SETTING: LOW EMI
GAIN AND SWITCHING FREQUENCY STUFF OPTIONS

9 8 7 6 5 2 PP3V3_S0_AUDIO

RP6600 47K 5% 1/16W SM-LF

6 AUD_SAMP1_FS2
6 AUD_SAMP1_FS1
6 AUD_SAMP1_G2
6 AUD_SAMP1_G1

NOSTUFF
R6618 0 5% 1/16W MF-LF 402

NOSTUFF
R6608 0 5% 1/16W MF-LF 402

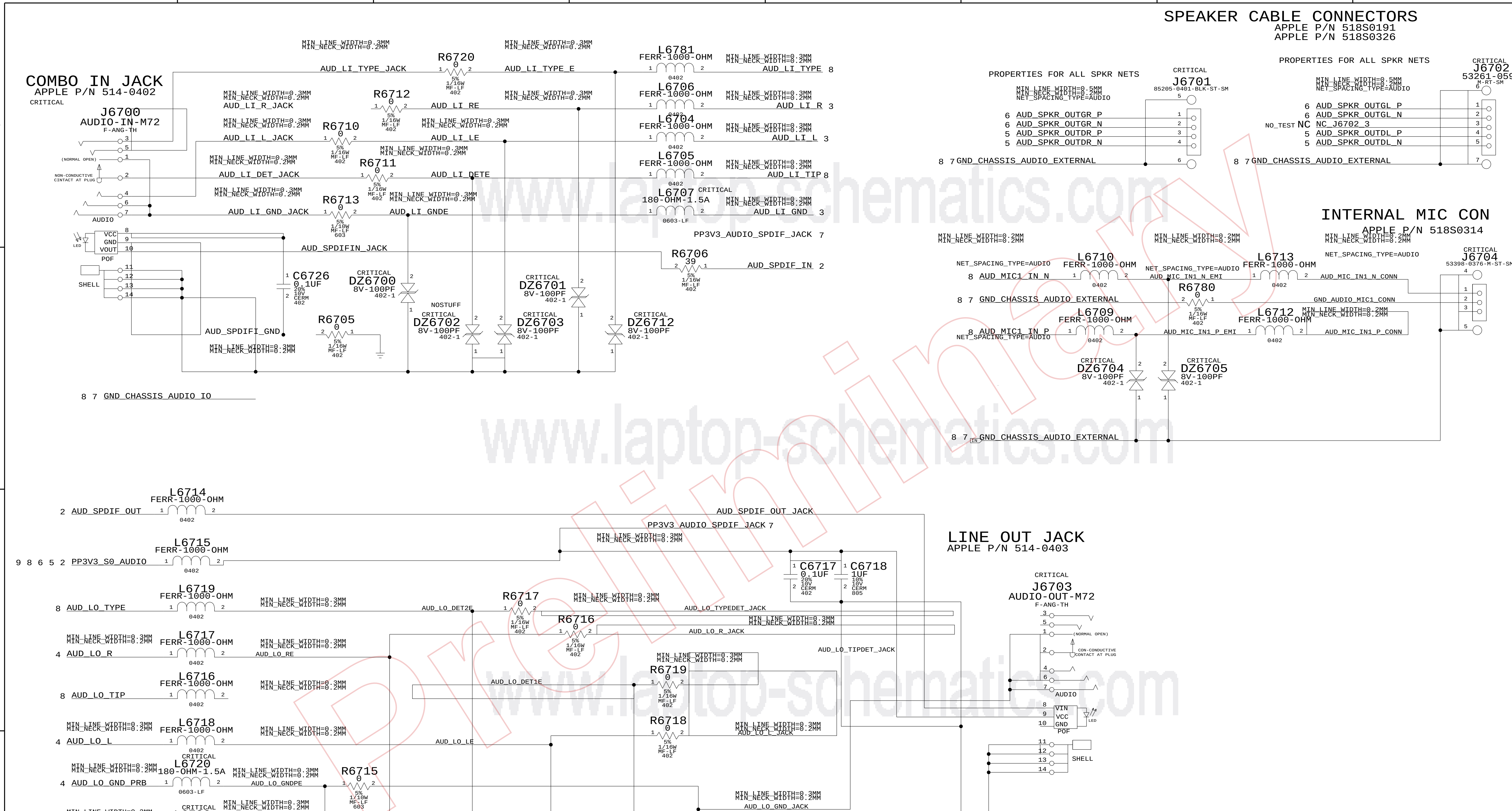
8 6 5 GND_AUDIO_SPKRAMP_PLANE

AUDIO: SPEAKER AMP

SYNC_MASTER=AUDIO SYNC_DATE=08/04/2006

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-7265	16
SCALE: NONE	SHT 66 OF 101	



AUDIO: CONNECTORS

SYNC_MASTER=AUDIO SYNC_DATE=08/04/2006

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III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-7265	16
SCALE NONE	SHT 67 OF 101	

CODEC OUTPUT SIGNAL PATHS

FUNCTION	VOLUME	DAC	PIN COMPLEX	MUTE CONTROL
HEADPHONES	0X0D	0X03	0X15(A)	VREF A
SPKR AMP(M72/M78)	0X0C	0X02	0X14(D)	GPIO 0
SPKR AMP(M72/M78)	0X0E	0X04	0X16(G)	GPIO 0
SPDIFOUT		CONVERTER=0X06	PIN=0X1E	
		DETECT DELEGATE PIN 0X1BH (E)		

CODEC INPUT SIGNAL PATHS

FUNCTION	ADC	MIXER	PORT	VREF
MIC INPUT	0X07	0X24	0X18(B)	80%
LINE INPUT	0X08	0X23	0X1A(C)	50%
SPDIFIN	CONVERTER=0X0A		PIN=0X1F	

OPTIONAL RESISTOR TO COMBINE L/R SIGNALS FOR MONO MIC

8 2 AUD_BI_PORT_B_L — R6854 0 5% 1/16W MF-LF 402 (NO_TEST=TRUE) — AUD_BI_PORT_B_R 2

MICROPHONE IMPEDANCE MATCHING CIRCUIT

NET_SPACING_TYPE=AUDIO
7 AUD_MIC1_IN_P — C6818 1000PF 10% 25V X7R 402 — NET_SPACING_TYPE=AUDIO — 7 AUD_MIC1_IN_N

AUD_VREF_PORT_B_RC — R6835 2.2K 5% 1/10W MF-LF 402 — AUD_VREF_PORT_B 2

R6827 2.2K 5% 1/16W MF-LF 402 — C6835 220UF 20% 10V ELEC SM-CASE-C1 — GND_AUDIO_CODEC 2 3 4 5 6 8

C6819 0.1UF 10% 10V X5R 402 — AUD_BI_PORT_B_L 2 8

XW6803 SM — GND_AUDIO_CODEC 2 3 4 5 6 8

PORT A DIGITAL OUT DETECT DELEGATE

8 2 AUD_SENSE_B — 9 8 7 6 5 2 PP3V3_S0_AUDIO — R6850 100K 5% 1/16W MF-LF 402 — CRITICAL R6830 39.2K 1% 1/16W MF-LF 402 — AUD_Q6800_D3 — NC

8 2 AUD_SENSE_A — 9 8 7 6 5 2 PP3V3_S0_AUDIO — R6851 100K 5% 1/16W MF-LF 402 — CRITICAL R6831 39.2K 1% 1/16W MF-LF 402 — AUD_Q6800_D6 — NC

7 AUD_LO_TYPE — Q6800 NTZD3154N SOT-563 — AUD_LO_TYPE_INV

7 AUD_LO_TIP

PORT A (HP) PLUG DETECT

Q6801 NTZD3154N SOT-563

8 6 5 4 3 2 GND_AUDIO_CODEC

AUDIO GROUND RETURNS

NET_SPACING_TYPE=AUDIO
MIN_LINE_WIDTH=0.6MM
MIN_NECK_WIDTH=0.2MM
VOLTAGE=0V

PLACE NEAR HEADPHONE PORT

8 6 5 4 3 2 GND_AUDIO_CODEC — NOSTUFF R6829 0 5% 1/8W MF-LF 805 — MIN_LINE_WIDTH=0.6MM MIN_NECK_WIDTH=0.2MM — GND_CHASSIS_AUDIO_IO 7

R6836 0 5% 1/16W MF-LF 402

XW6800 SM OMIT — AUD_LO_GND 4 7

XW6801 SM OMIT — PLACE NEXT TO L6800 — GND_AUDIO_CODEC 2 3 4 5 6 8

XW6802 SM OMIT — GND_AUD_LOAMP_CHGPMP 4

AUDIO MTG HOLES

7 GND_CHASSIS_AUDIO_EXTERNAL — NOSTUFF R6812 0 5% 1/16W MF-LF 402 — MIN_LINE_WIDTH=0.6MM MIN_NECK_WIDTH=0.2MM

NOSTUFF R6837 0 5% 1/16W MF-LF 402 — GND_AUDIO_CODEC 2 3 4 5 6 8

R6841 0 5% 1/16W MF-LF 402 — OMIT ZT6800 4P2R2P5-NTH

MIN_NECK_WIDTH=0.2MM MIN_LINE_WIDTH=0.6MM — OMIT ZT6802 4P2R2P5-NTH

8 6 5 GND_AUDIO_SPKRAMP_PLANE — R6842 0 5% 1/16W MF-LF 402 — HOL6802

PLACE ACROSS GROUND SPLIT

L6800 FERR-250-OHM SM-1

NET_SPACING_TYPE=AUDIO
MIN_LINE_WIDTH=0.6MM
MIN_NECK_WIDTH=0.2MM
VOLTAGE=12V

9 PP12V_S0_AUDIO_SPKRAMP — L6801 FERR-250-OHM SM-1 — PP12V_AUD_SPKRAMP_PLANE 5 6

NET_SPACING_TYPE=AUDIO
MIN_LINE_WIDTH=0.6MM
MIN_NECK_WIDTH=0.2MM

XW6804 SM OMIT

9 GND_AUDIO_SPKRAMP — XW6805 SM OMIT — GND_AUDIO_SPKRAMP_PLANE 5 6 8

PORT G (DI) DIG DET DELEGATE

8 2 AUD_SENSE_B — 9 8 7 6 5 2 PP3V3_S0_AUDIO — R6852 100K 5% 1/16W MF-LF 402 — NOSTUFF CRITICAL R6821 10K 1% 1/16W MF-LF 402 — AUD_Q6802_D3 — NC

7 AUD_LI_TYPE — Q6802 NTZD3154N SOT-563 — NOSTUFF

7 AUD_LI_TIP

Q6801 NTZD3154N SOT-563

8 6 5 4 3 2 GND_AUDIO_CODEC

PORT C (LI) INSERT DETECT

8 2 AUD_SENSE_A — 9 8 7 6 5 2 PP3V3_S0_AUDIO — NOSTUFF R6853 100K 5% 1/16W MF-LF 402 — CRITICAL R6820 10K 1% 1/16W MF-LF 402 — AUD_Q6802_D6 — NC

AUD_LI_TYPE_INV — Q6802 NTZD3154N SOT-563 — NOSTUFF — R6843 0 5% 1/16W MF-LF 402

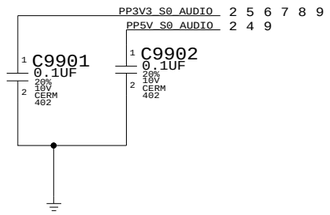
AUDIO: POWER SUPPLIES

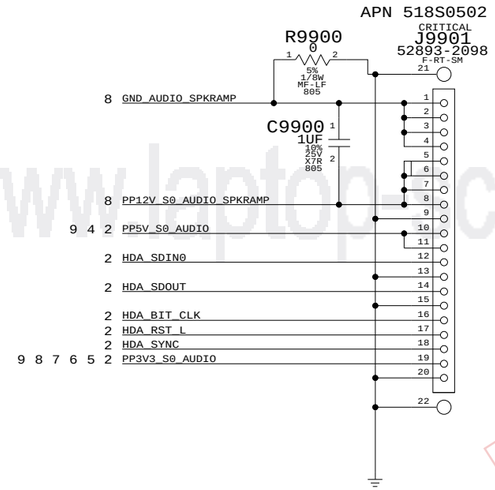
SYNC_MASTER=AUDIO — SYNC_DATE=08/04/2006

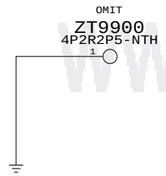
APPLE COMPUTER INC.

SIZE D | DRAWING NUMBER 051-7265 | REV. 16

SCALE NONE | SHT 68 OF 101







PART NUMBER	ALTERNATE FOR PART NUMBER	BOM OPTION	REF DES	COMMENTS:
376S0568	376S0422	ALTERNATE	Q6500,Q6800	SILICONIX DUAL FET
376S0568	376S0422	ALTERNATE	Q6801,Q6802	SILICONIX DUAL FET

AUDIO: MLB CONNECTOR

SYNC_MASTER=DEREK SYNC_DATE=10/10/2006

APPLE COMPUTER INC.

SIZE D | DRAWING NUMBER 051-7265 | REV. 16

SCALE NONE | SHT 99 OF 101

Title: Basenet Report
Design: hop
Date: Oct 23 12:30:13 2006

Base nets and synonyms for hop_lib.HOP(@hop_lib.hop(sch_1))

Base Signal	Synonyms	Location([Zone][dir])
12V_S5_SPKRAMP	12V_S5_SPKRAMP - @hop_lib.HOP	5D7
12V_S5_SPKRAMP1	12V_S5_SPKRAMP1 - @hop_lib.HOP	6D7
=PP3V3_S0_AUDIO	=PP3V3_S0_AUDIO - @hop_lib.HOP	2D7 5A6 5C8 5C8 6A6 6C8 7B8 8A4 8B4 8B7 9C4
=PP5V_S0_AUDIO	=PP5V_S0_AUDIO - @hop_lib.HOP	2B7 4B7 9C4
=PP12V_S5_AUDIO_SPKR AMP	=PP12V_S5_AUDIO_SPKRAMP - @hop_lib.HOP	5D8 6D8 9D4
ACZ_BITCLK	ACZ_BITCLK - @hop_lib.HOP	2D7 9D6
ACZ_RST_L	ACZ_RST_L - @hop_lib.HOP	2C7 9C6
ACZ_SDATAIN<0>	ACZ_SDATAIN<0> - @hop_lib.HOP	2C7 9C6
ACZ_SDATAIN_CHIP	ACZ_SDATAIN_CHIP - @hop_lib.HOP	2C6
ACZ_SDATAOUT	ACZ_SDATAOUT - @hop_lib.HOP	2D7 9C6
ACZ_SYNC	ACZ_SYNC - @hop_lib.HOP	2D7 9C6
AUDCODECOUTL	AUDCODECOUTL - @hop_lib.HOP	4D6
AUDCODECOUTL1	AUDCODECOUTL1 - @hop_lib.HOP	4D5
AUDCODECOUTR	AUDCODECOUTR - @hop_lib.HOP	4C6
AUDCODECOUTR1	AUDCODECOUTR1 - @hop_lib.HOP	4C5
AUDIO_LO_MUTE_L_F	AUDIO_LO_MUTE_L_F - @hop_lib.HOP	4A6
AUDLINDETH	AUDLINDETH - @hop_lib.HOP	8B7
AUDSAMPCPN	AUDSAMPCPN - @hop_lib.HOP	5C4
AUDSAMPCPN1	AUDSAMPCPN1 - @hop_lib.HOP	6C4
AUDSAMPCPP	AUDSAMPCPP - @hop_lib.HOP	5C4
AUDSAMPCPP1	AUDSAMPCPP1 - @hop_lib.HOP	6C4
AUDSAMPINLN	AUDSAMPINLN - @hop_lib.HOP	5D6
AUDSAMPINLN1	AUDSAMPINLN1 - @hop_lib.HOP	6D6
AUDSAMPINLP	AUDSAMPINLP - @hop_lib.HOP	5C6
AUDSAMPINLP1	AUDSAMPINLP1 - @hop_lib.HOP	6C6
AUDSAMPINRN	AUDSAMPINRN - @hop_lib.HOP	5C6
AUDSAMPINRN1	AUDSAMPINRN1 - @hop_lib.HOP	6C6
AUDSAMPINRP	AUDSAMPINRP - @hop_lib.HOP	5C6
AUDSAMPINRP1	AUDSAMPINRP1 - @hop_lib.HOP	6C6
AUDSAMPOURTP	AUDSAMPOURTP - @hop_lib.HOP	5C4
AUDSAMPOURTP1	AUDSAMPOURTP1 - @hop_lib.HOP	6C4
AUDSAMPOUTLN	AUDSAMPOUTLN - @hop_lib.HOP	5C4
AUDSAMPOUTLN1	AUDSAMPOUTLN1 - @hop_lib.HOP	6C4
AUDSAMPOUTLP	AUDSAMPOUTLP - @hop_lib.HOP	5C4
AUDSAMPOUTLP1	AUDSAMPOUTLP1 - @hop_lib.HOP	6C4
AUDSAMPOUTRN	AUDSAMPOUTRN - @hop_lib.HOP	5C4
AUDSAMPOUTRN1	AUDSAMPOUTRN1 - @hop_lib.HOP	6C4
AUD_BI_PORTA_L	AUD_BI_PORTA_L - @hop_lib.HOP	3C3
AUD_BI_PORTA_R	AUD_BI_PORTA_R - @hop_lib.HOP	3B3
AUD_BI_PORT_A_L	AUD_BI_PORT_A_L - @hop_lib.HOP	2C2 3C2
AUD_BI_PORT_A_R	AUD_BI_PORT_A_R - @hop_lib.HOP	2C2 3B2
AUD_BI_PORT_B_L	AUD_BI_PORT_B_L - @hop_lib.HOP	2C2 6C8
AUD_BI_PORT_B_R	AUD_BI_PORT_B_R - @hop_lib.HOP	2C2 5C8
AUD_BI_PORT_C_L	AUD_BI_PORT_C_L - @hop_lib.HOP	2C7 6D8
AUD_BI_PORT_C_R	AUD_BI_PORT_C_R - @hop_lib.HOP	2C7 5D8
AUD_BI_PORT_D_L	AUD_BI_PORT_D_L - @hop_lib.HOP	2C7 4D7
AUD_BI_PORT_D_R	AUD_BI_PORT_D_R - @hop_lib.HOP	2C7 4C7
AUD_BI_PORT_F_L	AUD_BI_PORT_F_L - @hop_lib.HOP	2B3 2C2 8C5
	AUD_BI_PORT_F_R - @hop_lib.HOP	2B2 2C2
AUD_GPIO_0	AUD_GPIO_0 - @hop_lib.HOP	2C7 5B8
AUD_GPIO_1	AUD_GPIO_1 - @hop_lib.HOP	2C7 4A7
AUD_LI_DET_EMI	AUD_LI_DET_EMI - @hop_lib.HOP	7D6
AUD_LI_DET_H	AUD_LI_DET_H - @hop_lib.HOP	7D4 8B7
AUD_LI_DET_JACK	AUD_LI_DET_JACK - @hop_lib.HOP	7D7
AUD_LI_GND	AUD_LI_GND - @hop_lib.HOP	3B7 3C7 7D4
AUD_LI_GNDL1	AUD_LI_GNDL1 - @hop_lib.HOP	3C5
AUD_LI_GNDR1	AUD_LI_GNDR1 - @hop_lib.HOP	3B5
AUD_LI_GND_EMI	AUD_LI_GND_EMI - @hop_lib.HOP	7D6
AUD_LI_GND_JACK	AUD_LI_GND_JACK - @hop_lib.HOP	7D8
AUD_LI_L	AUD_LI_L - @hop_lib.HOP	3D7 7D4
AUD_LI_L1	AUD_LI_L1 - @hop_lib.HOP	3D5
AUD_LI_L2	AUD_LI_L2 - @hop_lib.HOP	3D4
AUD_LI_L_EMI	AUD_LI_L_EMI - @hop_lib.HOP	7D5
AUD_LI_L_JACK	AUD_LI_L_JACK - @hop_lib.HOP	7D7
AUD_LI_R	AUD_LI_R - @hop_lib.HOP	3B7 7D4
AUD_LI_R1	AUD_LI_R1 - @hop_lib.HOP	3B5
AUD_LI_R2	AUD_LI_R2 - @hop_lib.HOP	3B4
AUD_LI_R_EMI	AUD_LI_R_EMI - @hop_lib.HOP	7D6
AUD_LI_R_JACK	AUD_LI_R_JACK - @hop_lib.HOP	7D7
AUD_LI_VREFL	AUD_LI_VREFL - @hop_lib.HOP	3C4
AUD_LI_VREFR	AUD_LI_VREFR - @hop_lib.HOP	3B4
AUD_LOAMP_IN_L_M	AUD_LOAMP_IN_L_M - @hop_lib.HOP	4B7 4D4
AUD_LOAMP_IN_L_P	AUD_LOAMP_IN_L_P - @hop_lib.HOP	4A7 4C4
AUD_LOAMP_IN_R_M	AUD_LOAMP_IN_R_M - @hop_lib.HOP	4A7 4C4
AUD_LOAMP_IN_R_P	AUD_LOAMP_IN_R_P - @hop_lib.HOP	4A7 4C4
AUD_LOAMP_OUT_L	AUD_LOAMP_OUT_L - @hop_lib.HOP	4B3 4D4
AUD_LOAMP_OUT_R	AUD_LOAMP_OUT_R - @hop_lib.HOP	4A3 4C4
AUD_LO_DET1	AUD_LO_DET1 - @hop_lib.HOP	7B8 8A4
AUD_LO_DET1_1	AUD_LO_DET1_1 - @hop_lib.HOP	8A2 8A4
AUD_LO_DET1_EMI	AUD_LO_DET1_EMI - @hop_lib.HOP	7B7
AUD_LO_DET1_INV	AUD_LO_DET1_INV - @hop_lib.HOP	8A3
AUD_LO_DET1_JACK	AUD_LO_DET1_JACK - @hop_lib.HOP	7B4
AUD_LO_DET2	AUD_LO_DET2 - @hop_lib.HOP	7B8 8B4
AUD_LO_DET2_1	AUD_LO_DET2_1 - @hop_lib.HOP	8B4
AUD_LO_DET2_EMI	AUD_LO_DET2_EMI - @hop_lib.HOP	7B7
AUD_LO_DET2_JACK	AUD_LO_DET2_JACK - @hop_lib.HOP	7B4
AUD_LO_GND	AUD_LO_GND - @hop_lib.HOP	4A3 4A7 7A8 8D2
AUD_LO_GND_EMI	AUD_LO_GND_EMI - @hop_lib.HOP	7A7
AUD_LO_GND_JACK	AUD_LO_GND_JACK - @hop_lib.HOP	7B4
AUD_LO_GND_PRB	AUD_LO_GND_PRB - @hop_lib.HOP	4C7 7A8
AUD_LO_GND_PRB_IN	AUD_LO_GND_PRB_IN - @hop_lib.HOP	4C6
AUD_LO_L	AUD_LO_L - @hop_lib.HOP	4B3 7B8
AUD_LO_L_EMI	AUD_LO_L_EMI - @hop_lib.HOP	7B7
AUD_LO_L_JACK	AUD_LO_L_JACK - @hop_lib.HOP	7B4
AUD_LO_R	AUD_LO_R - @hop_lib.HOP	4A3 7A8
AUD_LO_R_EMI	AUD_LO_R_EMI - @hop_lib.HOP	7A7
AUD_LO_R_JACK	AUD_LO_R_JACK - @hop_lib.HOP	7B4
AUD_MAX9714_CHOLD	AUD_MAX9714_CHOLD - @hop_lib.HOP	5C4
AUD_MAX9714_CHOLD1	AUD_MAX9714_CHOLD1 - @hop_lib.HOP	6C4
AUD_MAX9714_VREG	AUD_MAX9714_VREG - @hop_lib.HOP	5C5
AUD_MAX9714_VREG1	AUD_MAX9714_VREG1 - @hop_lib.HOP	6C5
AUD_MAX9722_C1N	AUD_MAX9722_C1N - @hop_lib.HOP	4A5
AUD_MAX9722_C1P	AUD_MAX9722_C1P - @hop_lib.HOP	4A5
AUD_MAX9722_PVSS	AUD_MAX9722_PVSS - @hop_lib.HOP	4A5
AUD_MIC_IN_N	AUD_MIC_IN_N - @hop_lib.HOP	7C6 8C8
AUD_MIC_IN_N_CONN	AUD_MIC_IN_N_CONN - @hop_lib.HOP	7C4
AUD_MIC_IN_N_EMI	AUD_MIC_IN_N_EMI - @hop_lib.HOP	7C5
AUD_MIC_IN_P	AUD_MIC_IN_P - @hop_lib.HOP	7C6 8C8
AUD_MIC_IN_P_CONN	AUD_MIC_IN_P_CONN - @hop_lib.HOP	7C4
AUD_MIC_IN_P_EMI	AUD_MIC_IN_P_EMI - @hop_lib.HOP	7C5
AUD_MIC_P1	AUD_MIC_P1 - @hop_lib.HOP	8C7
AUD_PORT_A_DET_L	AUD_PORT_A_DET_L - @hop_lib.HOP	8B6
AUD_PORT_D_DET_L	AUD_PORT_D_DET_L - @hop_lib.HOP	8B2
AUD_PORT_G_DET_L	AUD_PORT_G_DET_L - @hop_lib.HOP	8B1
AUD_PSEUDO_VREF	AUD_PSEUDO_VREF - @hop_lib.HOP	2B3 2C2
AUD_PSEUDO_VREF_F	AUD_PSEUDO_VREF_F - @hop_lib.HOP	2B2 3A7 3C7
AUD_SAMP1_FS1	AUD_SAMP1_FS1 - @hop_lib.HOP	6A6 6C5
AUD_SAMP1_FS2	AUD_SAMP1_FS2 - @hop_lib.HOP	6A6 6C5
AUD_SAMP1_G1	AUD_SAMP1_G1 - @hop_lib.HOP	6A6 6C5
AUD_SAMP1_G2	AUD_SAMP1_G2 - @hop_lib.HOP	6A6 6C5
AUD_SAMP1_INL_N	AUD_SAMP1_INL_N - @hop_lib.HOP	6C5
AUD_SAMP1_INL_P	AUD_SAMP1_INL_P - @hop_lib.HOP	6C5
AUD_SAMP1_INR_N	AUD_SAMP1_INR_N - @hop_lib.HOP	6C5
AUD_SAMP1_INR_P	AUD_SAMP1_INR_P - @hop_lib.HOP	6C5
AUD_SAMP1_SHDN_L	AUD_SAMP1_SHDN_L - @hop_lib.HOP	6C5
AUD_SAMP_FS1	AUD_SAMP_FS1 - @hop_lib.HOP	5A6 5C5
AUD_SAMP_FS2	AUD_SAMP_FS2 - @hop_lib.HOP	5A6 5C5
AUD_SAMP_G1	AUD_SAMP_G1 - @hop_lib.HOP	5A6 5C5
AUD_SAMP_G2	AUD_SAMP_G2 - @hop_lib.HOP	5A6 5C5
AUD_SAMP_INL_N	AUD_SAMP_INL_N - @hop_lib.HOP	5C5
AUD_SAMP_INL_P	AUD_SAMP_INL_P - @hop_lib.HOP	5C5
AUD_SAMP_INR_N	AUD_SAMP_INR_N - @hop_lib.HOP	5C5
AUD_SAMP_INR_P	AUD_SAMP_INR_P - @hop_lib.HOP	5C5
AUD_SAMP_SHDN_L	AUD_SAMP_SHDN_L - @hop_lib.HOP	5C6
AUD_SENSE_A	AUD_SENSE_A - @hop_lib.HOP	2C2 8B4 8B7
AUD_SENSE_B	AUD_SENSE_B - @hop_lib.HOP	2C2 8B4
AUD_SPDIFIN_JACK	AUD_SPDIFIN_JACK - @hop_lib.HOP	7D7
AUD_SPDIF_GND	AUD_SPDIF_GND - @hop_lib.HOP	7A3 7D8
AUD_SPDIF_IN	AUD_SPDIF_IN - @hop_lib.HOP	2C2 7D4
AUD_SPDIF_OUT	AUD_SPDIF_OUT - @hop_lib.HOP	2D2 7B8
AUD_SPDIF_OUT_CHIP	AUD_SPDIF_OUT_CHIP - @hop_lib.HOP	2D4
AUD_SPDIF_OUT_JACK	AUD_SPDIF_OUT_JACK - @hop_lib.HOP	7B5
AUD_SPKRAMP_MUTE	AUD_SPKRAMP_MUTE - @hop_lib.HOP	5C8 6B8
AUD_SPKRAMP_MUTE_L	AUD_SPKRAMP_MUTE_L - @hop_lib.HOP	5B7
AUD_SPKR_OUTBL_N	AUD_SPKR_OUTBL_N - @hop_lib.HOP	6C1 7D2
AUD_SPKR_OUTBL_P	AUD_SPKR_OUTBL_P - @hop_lib.HOP	6C1 7D2
AUD_SPKR_OUTBR_N	AUD_SPKR_OUTBR_N - @hop_lib.HOP	5C1 7C2
AUD_SPKR_OUTBR_P	AUD_SPKR_OUTBR_P - @hop_lib.HOP	5C1 7C2
AUD_SPKR_OUTCL_N	AUD_SPKR_OUTCL_N - @hop_lib.HOP	6C1 7D2
AUD_SPKR_OUTCL_P	AUD_SPKR_OUTCL_P - @hop_lib.HOP	6C1 7D2
AUD_SPKR_OUTCR_N	AUD_SPKR_OUTCR_N - @hop_lib.HOP	5C1 7C2
AUD_SPKR_OUTCR_P	AUD_SPKR_OUTCR_P - @hop_lib.HOP	5C1 7C2
AUD_TYPE_DET_EN	AUD_TYPE_DET_EN - @hop_lib.HOP	8B3
AUD_VREF_PORT_F	AUD_VREF_PORT_F - @hop_lib.HOP	2C2 8C5
AUD_VREF_PORT_F_RC	AUD_VREF_PORT_F_RC - @hop_lib.HOP	8C6
BAL_IN_COM	BAL_IN_COM - @hop_lib.HOP	2C7 3B3
BAL_IN_L	BAL_IN_L - @hop_lib.HOP	2C7 3D3
BAL_IN_R	BAL_IN_R - @hop_lib.HOP	2C7 3C3
BEEP	BEEP - @hop_lib.HOP	2C6
GND_AUDIO	GND_AUDIO - @hop_lib.HOP	8D4
GND_AUDIO_CODEC	GND_AUDIO_CODEC - @hop_lib.HOP	2B7 2D2 3A7 3C7 4A7 4C7 5B8 5B8 5C8 6B8 6C8 8A4 8A4 8A7 8C4 8C5 8D2 8D4
GND_AUDIO_CODEC_EMI1	GND_AUDIO_CODEC_EMI1 - @hop_lib.HOP	7A7
GND_AUDIO_MIC_CONN	GND_AUDIO_MIC_CONN - @hop_lib.HOP	7C4
GND_AUDIO_SPKRAMP	GND_AUDIO_SPKRAMP - @hop_lib.HOP	5B1 6B1 9C4
GND_AUDIO_SPKRAMP1_P LANE	GND_AUDIO_SPKRAMP1_PLANE - @hop_lib.HOP	6A6 6B2 6B8 6B8 6D2 6D8
GND_AUDIO_SPKRAMP_PL ANE	GND_AUDIO_SPKRAMP_PLANE - @hop_lib.HOP	5A6 5B2 5B8 5D2 5D8
GND_AUD_LOAMP_CHGPMP	GND_AUD_LOAMP_CHGPMP - @hop_lib.HOP	4A7 4B3 4B7 8D2
GND_CHASSIS_AUDIO_EX TERNAL	GND_CHASSIS_AUDIO_EXTERNAL - @hop_lib.HOP	7A8 7C8 8C4 8D2
GND_CHASSIS_AUDIO_IN TERNAL	GND_CHASSIS_AUDIO_INTERNAL - @hop_lib.HOP	7C6
JDREF	JDREF - @hop_lib.HOP	2B4
NC_AUD_BI_PORT_E_L	NC_AUD_BI_PORT_E_L - @hop_lib.HOP	2C2
NC_AUD_BI_PORT_E_R	NC_AUD_BI_PORT_E_R - @hop_lib.HOP	2C2
NC_AUD_BI_PORT_G_L	NC_AUD_BI_PORT_G_L - @hop_lib.HOP	2C2
NC_AUD_BI_PORT_G_R	NC_AUD_BI_PORT_G_R - @hop_lib.HOP	2C2
NC_AUD_BI_PORT_H_L	NC_AUD_BI_PORT_H_L - @hop_lib.HOP	2C2
NC_AUD_BI_PORT_H_R	NC_AUD_BI_PORT_H_R - @hop_lib.HOP	2C2
NC_AUD_LI_TYPE_JACK	NC_AUD_LI_TYPE_JACK - @hop_lib.HOP	7D7
NC_AUD_VREF_PORT_B	NC_AUD_VREF_PORT_B - @hop_lib.HOP	2C2
NC_AUD_VREF_PORT_C	NC_AUD_VREF_PORT_C - @hop_lib.HOP	2C2
NC_AUD_VREF_PORT_D	NC_AUD_VREF_PORT_D - @hop_lib.HOP	2C2
NC_AUD_VREF_PORT_E	NC_AUD_VREF_PORT_E - @hop_lib.HOP	2C2
NC_J7302_3	NC_J7302_3 - @hop_lib.HOP	7C2
NC_VRP	NC_VRP - @hop_lib.HOP	2B4
PP3V3_AUDIO_SPDIF_EM I	PP3V3_AUDIO_SPDIF_EMI - @hop_lib.HOP	7B7
PP3V3_AUDIO_SPDIF_JA CK	PP3V3_AUDIO_SPDIF_JACK - @hop_lib.HOP	7B5 7D8
PP4V5_AUDIO_ANALOG	PP4V5_AUDIO_ANALOG - @hop_lib.HOP	2B3 2D2 3B7 3D7
PP5V_AUDIO_FILT	PP5V_AUDIO_FILT - @hop_lib.HOP	4B6
PP5V_AUDIO_LOAMP	PP5V_AUDIO_LOAMP - @hop_lib.HOP	4B5
PP12V_AUD_SPKRAMP1_P LANE	PP12V_AUD_SPKRAMP1_PLANE - @hop_lib.HOP	6D5
PP12V_AUD_SPKRAMP_PL ANE	PP12V_AUD_SPKRAMP_PLANE - @hop_lib.HOP	5D5
PPV_3V3_DVDD	PPV_3V3_DVDD - @hop_lib.HOP	2D6
PPV_3V3_DVDD_IO	PPV_3V3_DVDD_IO - @hop_lib.HOP	2D6
SPKRAMP1_SS	SPKRAMP1_SS - @hop_lib.HOP	6B6
SPKRAMP_SS	SPKRAMP_SS - @hop_lib.HOP	5B6
VREF	VREF - @hop_lib.HOP	2C4

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C6200	CAP_805	hop[2D6]
C6201	CAP_402	hop[2D6]
C6202	CAP_P_SM-CASE-C1	hop[2D4]
C6203	CAP_P_SM-CASE-C1	hop[2D3]
C6204	CAP_402	hop[2D6]
C6205	CAP_P_SMA-LF	hop[2B4]
C6210	CAP_P_SMA-LF	hop[2B3]
C6211	CAP_P_SM-CASE-C1	hop[2B2]
C6212	CAP_402	hop[2B4]
C6221	CAP_402	hop[2C6]
C6230	CAP_402	hop[2D4]
C6236	CAP_402	hop[2D3]
C6280	CAP_805	hop[2D6]
C6300	CAP_805-1	hop[3D5]
C6301	CAP_805-1	hop[3C5]
C6302	CAP_402	hop[3C5]
C6304	CAP_805-1	hop[3B5]
C6305	CAP_805-1	hop[3B5]
C6306	CAP_805-1	hop[3C2]
C6307	CAP_805-1	hop[3B2]
C6400	CAP_P_4X5.5-SM	hop[4D6]
C6401	CAP_402	hop[4D4]
C6402	CAP_0603	hop[4D5]
C6403	CAP_P_4X5.5-SM	hop[4C6]
C6404	CAP_0603	hop[4C5]
C6405	CAP_402	hop[4C4]
C6406	CAP_P_6.3X5.5-SM	hop[4B5]
C6407	CAP_805-1	hop[4B5]
C6408	CAP_805	hop[4A5]
C6409	CAP_805	hop[4A4]
C6410	CAP_805	hop[4A5]
C6411	CAP_P_SM-LF	hop[4A4]
C6412	CAP_402	hop[4A6]
C6413	CAP_402	hop[4A5]
C6500	CAP_P_10X10-SM	hop[5D5]
C6501	CAP_1210	hop[5D5]
C6502	CAP_805	hop[5D4]
C6503	CAP_1210	hop[5D3]
C6504	CAP_805	hop[5D6]
C6505	CAP_805	hop[5C6]
C6506	CAP_805	hop[5C6]
C6507	CAP_805	hop[5C6]
C6508	CAP_603-1	hop[5C4]
C6509	CAP_805	hop[5B4]
C6510	CAP_402	hop[5B3]
C6511	CAP_402	hop[5B2]
C6512	CAP_402	hop[5B2]
C6513	CAP_402	hop[5B2]
C6514	CAP_603	hop[5B5]
C6515	CAP_402	hop[5D6]
C6516	CAP_402	hop[5C6]
C6517	CAP_P_10X10-SM	hop[5D6]
C6518	CAP_603	hop[5D5]
C6519	CAP_603	hop[5D4]
C6520	CAP_402	hop[5B7]
C6521	CAP_402	hop[5B7]
C6590	CAP_402	hop[5B6]
C6600	CAP_P_10X10-SM	hop[6D5]
C6601	CAP_1210	hop[6D5]
C6602	CAP_805	hop[6D4]
C6603	CAP_1210	hop[6D3]
C6604	CAP_805	hop[6D6]
C6605	CAP_805	hop[6C6]
C6606	CAP_805	hop[6C6]
C6607	CAP_805	hop[6C6]
C6608	CAP_603-1	hop[6C4]
C6609	CAP_805	hop[6B4]
C6610	CAP_402	hop[6B3]
C6611	CAP_402	hop[6B2]
C6612	CAP_402	hop[6B2]
C6613	CAP_402	hop[6B2]
C6614	CAP_603	hop[6B5]
C6615	CAP_402	hop[6C6]
C6616	CAP_402	hop[6C6]
C6617	CAP_P_10X10-SM	hop[6D6]
C6618	CAP_603	hop[6D5]
C6619	CAP_603	hop[6D4]
C6690	CAP_402	hop[6C6]
C6700	CAP_402	hop[7D6]
C6701	CAP_402	hop[7C5]
C6702	CAP_402	hop[7D5]
C6703	CAP_402	hop[7C5]
C6711	CAP_402	hop[7A7]
C6712	CAP_402	hop[7A6]
C6713	CAP_402	hop[7A6]
C6714	CAP_402	hop[7A7]
C6715	CAP_402	hop[7A6]
C6717	CAP_402	hop[7B4]
C6718	CAP_805	hop[7B4]
C6721	CAP_402	hop[7C5]
C6722	CAP_402	hop[7C5]
C6723	CAP_402	hop[7A6]
C6726	CAP_402	hop[7C7]
C6780	CAP_402	hop[7A7]
C6800	CAP_402	hop[8B4]
C6801	CAP_402	hop[8B7]
C6802	CAP_402	hop[8A4]
C6818	CAP_402	hop[8C7]
C6819	CAP_402	hop[8C6]
C6835	CAP_P_SM-CASE-C1	hop[8C6]
DZ6700	SUPPR_TRANSIENT_4P1_0405	hop[7C7]
DZ6701	SUPPR_TRANSIENT_4P1_0405	hop[7A5]
DZ6702	SUPPR_TRANSIENT_4P1_0405	hop[7A4]
DZ6703	SUPPR_TRANSIENT_4P1_0405	hop[7C7]
DZ6704	SUPPR_TRANSIENT_4P1_0405	hop[7C4]
J6700	CON_F9ANG_S4MT_TH3_F-ANG-TH	hop[7D8]
J6701	CON_M4RT_S2MT_SM_M-RT-SM	hop[7D1]
J6702	CON_M5RT_S2MT_SMA_M-RT-SM	hop[7C1]
J6703	CON_F9ANG_S4MT_TH2_F-ANG-TH	hop[7B3]
J9900	CON_F14ST_D_SM_F-ST-	hop[9D5]

SM

L6200	IND_0402	hop[2B5]
L6201	IND_0402	hop[2D6]
L6202	IND_0402	hop[2D6]
L6400	IND_0402	hop[4B6]
L6500	IND_SM-1	hop[5D6]
L6501	IND_0603-LF	hop[5C2]
L6502	IND_0603-LF	hop[5C2]
L6503	IND_0603-LF	hop[5C3]
L6504	IND_0603-LF	hop[5C3]
L6505	IND_0603	hop[5D6]
L6506	IND_0603	hop[5C6]
L6507	IND_0603	hop[5C6]
L6508	IND_0603	hop[5C6]
L6522	IND_SM-1	hop[5D6]
L6600	IND_SM-1	hop[6D6]
L6601	IND_0603-LF	hop[6C2]
L6602	IND_0603-LF	hop[6C2]
L6603	IND_0603-LF	hop[6C3]
L6604	IND_0603-LF	hop[6C3]
L6605	IND_0603	hop[6D6]
L6606	IND_0603	hop[6C6]
L6607	IND_0603	hop[6C6]
L6608	IND_0603	hop[6C6]
L6622	IND_SM-1	hop[6D6]
L6700	IND_0603-LF	hop[7D6]
L6701	IND_0603-LF	hop[7D6]
L6702	IND_0603-LF	hop[7D6]
L6703	IND_0603-LF	hop[7D6]
L6704	IND_0603-LF	hop[7D5]
L6705	IND_0603-LF	hop[7D5]
L6706	IND_0603-LF	hop[7D5]
L6707	IND_0603-LF	hop[7D5]
L6709	IND_0603-LF	hop[7C6]
L6710	IND_0603-LF	hop[7C6]
L6712	IND_0603-LF	hop[7C4]
L6713	IND_0603-LF	hop[7C4]
L6714	IND_0603-LF	hop[7B7]
L6715	IND_0603-LF	hop[7B7]
L6716	IND_0603	hop[7B7]
L6717	IND_0603-LF	hop[7A7]
L6718	IND_0603-LF	hop[7B7]
L6719	IND_0603-LF	hop[7B7]
L6720	IND_0603-LF	hop[7A7]
L6723	IND_0603-LF	hop[7B5]
L6724	IND_0603-LF	hop[7B5]
L6725	IND_0603-LF	hop[7A5]
L6726	IND_0603-LF	hop[7B5]
L6727	IND_0603-LF	hop[7B5]
L6728	IND_0603-LF	hop[7A5]
L6780	IND_0603-LF	hop[7A7]
L6781	IND_0603-LF	hop[7A5]
Q6500	TRA_2N7002DW_SOT-363	hop[5B6 5B6]
Q6600	TRA_2N7002_SOT23-LF	hop[6B7]
Q6800	TRA_2N7002DW_SOT-363	hop[8B3 8A3]
Q6801	TRA_2N7002_SOT23-LF	hop[8B6]
Q6802	TRA_2N7002DW_SOT-363	hop[8B1 8B2]
R6200	RES_402	hop[2C7]
R6201	RES_402	hop[2B6]
R6202	RES_402	hop[2C6]
R6203	RES_402	hop[2D3]
R6204	RES_402	hop[2B2]
R6210	RES_402	hop[2B5]
R6216	RES_603	hop[2B4]
R6300	RES_402	hop[3C6]
R6303	RES_402	hop[3C5]
R6304	RES_402	hop[3D4]
R6305	RES_402	hop[3C4]
R6306	RES_402	hop[3C4]
R6307	RES_402	hop[3D3]
R6308	RES_402	hop[3B5]
R6309	RES_402	hop[3B4]
R6310	RES_402	hop[3B4]
R6311	RES_402	hop[3A4]
R6312	RES_402	hop[3B3]
R6313	RES_402	hop[3D5]
R6314	RES_402	hop[3C5]
R6315	RES_402	hop[3B4]
R6400	RES_402	hop[4D6]
R6401	RES_402	hop[4D5]
R6402	RES_402	hop[4D5]
R6403	RES_402	hop[4C4]
R6404	RES_402	hop[4C4]
R6405	RES_402	hop[4C4]
R6406	RES_402	hop[4C4]
R6407	RES_402	hop[4C6]
R6408	RES_402	hop[4C5]
R6409	RES_402	hop[4B5]
R6410	RES_603	hop[4B5]
R6411	RES_805	hop[4B3]
R6412	RES_805	hop[4A3]
R6415	RES_402	hop[4A6]
R6416	RES_402	hop[4A6]
R6417	RES_402	hop[4A4]
R6418	RES_402	hop[4A4]
R6419	RES_805	hop[4D6]
R6420	RES_805	hop[4C6]
R6508	RES_402	hop[5A4]
R6512	RES_402	hop[5B7]
R6513	RES_402	hop[5B7]
R6514	RES_402	hop[5C6]
R6515	RES_402	hop[5C7]
R6518	RES_402	hop[5A5]
R6519	RES_402	hop[5B4]
R6570	RES_1206	hop[5D7]
R6608	RES_402	hop[6A4]
R6614	RES_402	hop[6C6]
R6618	RES_402	hop[6A5]
R6619	RES_402	hop[6B4]
R6670	RES_1206	hop[6D7]
R6702	RES_402	hop[7A3]
R6705	RES_402	hop[7C8]
R6706	RES_402	hop[7D5]
R6800	RES_402	hop[8B4]
R6804	RES_402	hop[8B7]
R6805	RES_402	hop[8B6]
R6807	RES_402	hop[8A3]
R6808	RES_402	hop[8A4]
R6809	RES_402	hop[8A4]
R6812	RES_402	hop[8C3]
R6813	RES_402	hop[8B4]
R6820	RES_402	hop[8B7]
R6825	RES_402	hop[8C7]
R6826	RES_402	hop[8C7]

R6827	RES_402	hop[8C6]
R6829	RES_805	hop[8D3]
R6830	RES_402	hop[8B1]
R6831	RES_402	hop[8B2]
R6835	RES_402	hop[8C5]
RP6500	RPAK4P_SM-LF	hop[5A4]
RP6600	RPAK4P_SM-LF	hop[6A4]
U6200	AUDIO_ALC885B2_QFN_QFN	hop[2D5]
U6300	OPAMP_MAX4477_UMAX	hop[3B4 3C4]
U6400	MAX9722_QFN	hop[4B5]
U6500	MAX9714_QFN-LF	hop[5C5]
U6600	MAX9714_QFN-LF	hop[6C5]
XW6501	SHORT_SM	hop[5B2]
XW6502	SHORT_SM	hop[5B2]
XW6601	SHORT_SM	hop[6B2]
XW6602	SHORT_SM	hop[6B2]
XW6700	SHORT_SM	hop[7C5]
XW6800	SHORT_SM	hop[8D3]
XW6801	SHORT_SM	hop[8D3]
XW6802	SHORT_SM	hop[8D3]
XW6803	SHORT_SM	hop[8C6]