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
02		384341	ENGINEERING RELEASED	06/03/05	?

SCHEM,FLUTE,Q41C
06/03/2005
(EVT)

PART#	QTY	DESCRIPTION	REFERENCE DESIGNATOR(S)	BOM OPTION
051-6850	1	SCHEM,FLUTE,Q41C	SCH1	
820-1823	1	PCBF,FLUTE,Q41C	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,FLUTE,Q41C

DRAWING NUMBER 051-6850 REV. 02

SHT 1 OF 109

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

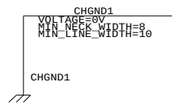
SEE PCB CAD FILES FOR MORE SPECIFIC INFO.

BOARD STACK-UP AND CONSTRUCTION

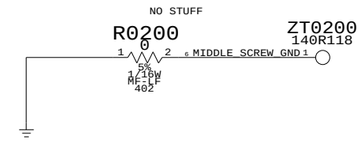
1		SIGNAL
2	PREPREG	GROUND
3	LAMINATE	SIGNAL
4	PREPREG	SIGNAL
5	LAMINATE	GROUND
6	PREPREG	CUT POWER PLANE
7	LAMINATE	CUT POWER PLANE
8	PREPREG	GROUND
9	LAMINATE	SIGNAL
10	PREPREG	SIGNAL
11	LAMINATE	GROUND
12	PREPREG	SIGNAL

BOARD HOLES

PAD ON SLOT IN BETWEEN J4 AND J5 (LAYER 1 AND LAYER 12)



PAD ON MIDDLE HOLE (LAYER 1 AND LAYER 12)



PCB BOARD STANDOFFS

BOARD INFORMATION

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02

SCALE	SHT	OF
NONE	2	109

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Block Diagram

SYNC_MASTER=N/A SYNC_DATE=N/A

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02

SCALE	SHT	OF
NONE	3	109

Revision History

02

SYNC_MASTER=N/A SYNC_DATE=N/A

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APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02

SCALE	SHT	OF
NONE	5	109

FUNCTIONAL TEST POINTS

SIG_NAME	FUNC_TEST	FUNC_QTY	
AUDIO_LO_DET_L	TRUE		7 13
AUDIO_LO_OPTICAL_PLUG_L	TRUE		7 13
AUDIO_LI_DET_L	TRUE		7 13
AUDIO_LI_OPTICAL_PLUG_L	TRUE		7 13
AUDIO_CODEC_RESET_L	TRUE		7 8
AUDIO_SPDIFRX_RESET_L	TRUE		7 10
PP3V3_RUN_AUDIO_DVDD	TRUE		6
I2C_AUDIO_SDA	TRUE		6
I2C_AUDIO_SCL	TRUE		6
SLEEP_LED	TRUE		7
GND_SLEEP_LED	TRUE		7
AUDIO_I2S_DTIB_SEL	TRUE		7 10
GND_AUDIO_STAR_GND	TRUE		
GND_AUDIO_SGND	TRUE		6
I2S_DEV_TO_SB_DTI	TRUE		6 7
I2S_SB_TO_DEV_DTO	TRUE		6 7
I2S_BITCLK	TRUE		6 7
I2S_MCLK	TRUE		6 7
AUDIO_SPKR_MUTE_L	TRUE		7 12
AUDIO_LO_MUTE_L	TRUE		7 11
AUDIO_EXT_MCLK_SEL	TRUE		7 10
AUDIO_SPDIFRX_GPO0	TRUE		6 7
PP3V3_PWRON_AUDIO_AVDD	TRUE		6
PP5V_PWRON_AUDIO_PVDD	TRUE		6
PP5V_PWRON_AUDIO_AVDD	TRUE		6
	TRUE		IN

Functional Test Signals

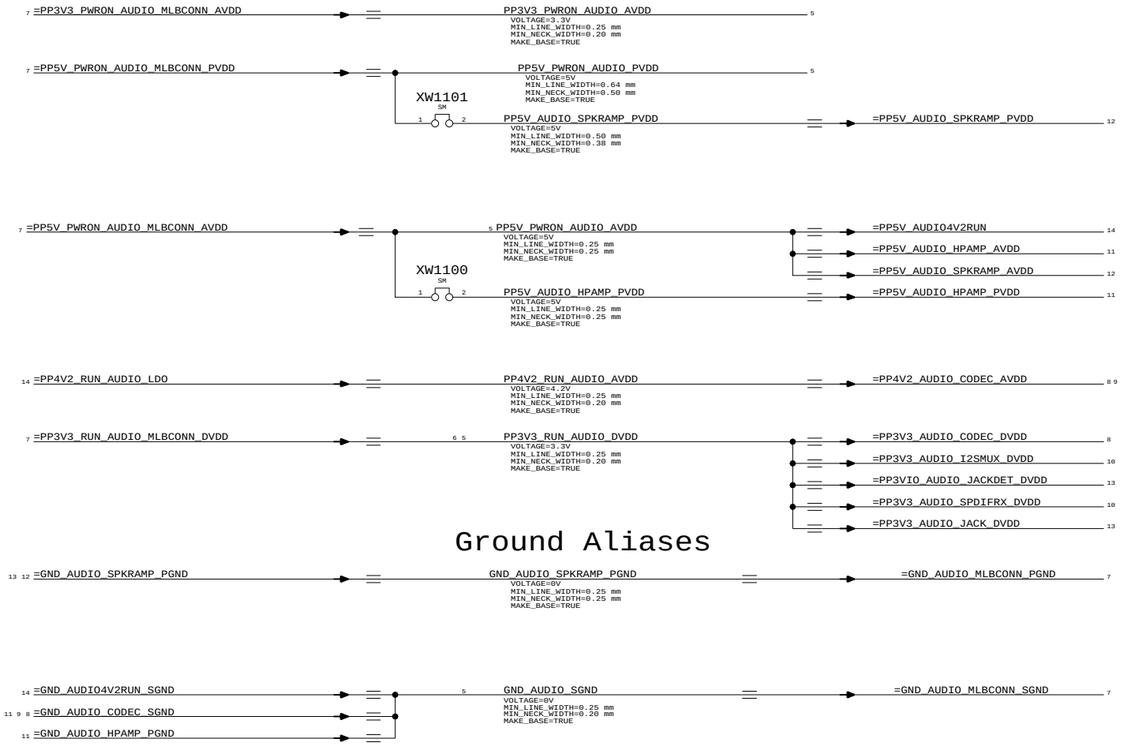
SYNC_MASTER=N/A SYNC_DATE=N/A

APPLE COMPUTER INC.

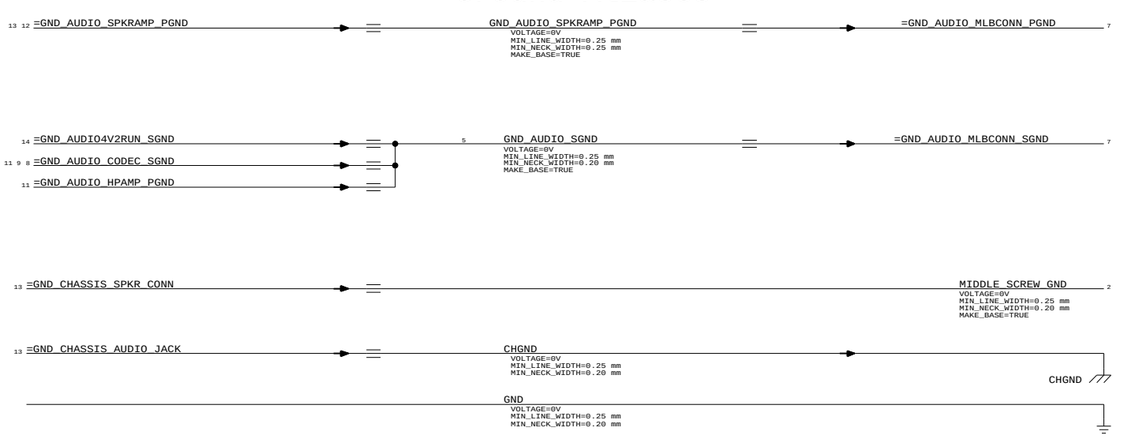
SIZE D | DRAWING NUMBER 051-6850 | REV. 02

SCALE NONE | SHT 7 OF 109

Power Aliases

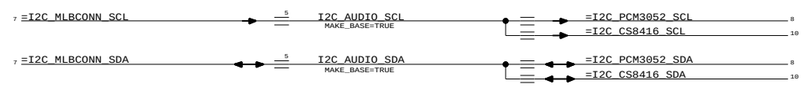


Ground Aliases

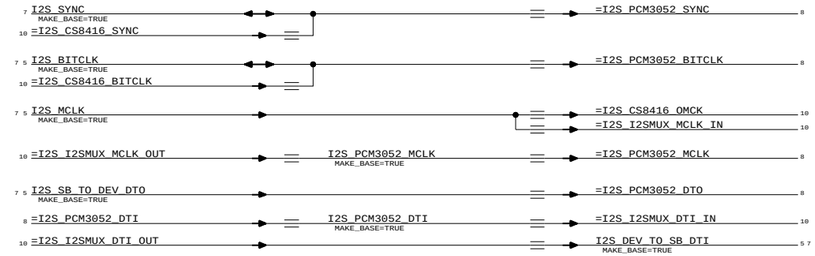


Signal Aliases

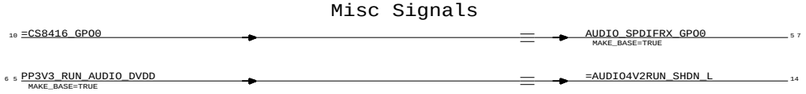
I2C Connections



I2S Connections



Misc Signals



Signal & Power Aliases

SYNC_MASTER=SPDIF-AUDIO-Q41C SYNC_DATE=06/03/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02
SCALE: NONE	SHT 11 OF 109	

NET_TYPE			
ELECTRICAL_CONSTRAINT_SET	SPACING	PHYSICAL	DIFFERENTIAL_PAIR
	I2S	I2S	
	I2S	I2S	
	I2S	I2S	
	I2S	I2S	

I2S_SB_TO_DEV_DTO 5 6 7
I2S_DEV_TO_SB_DTI 5 6 7
I2S_MCLK 5 6 7
I2S_BITCLK 5 6 7

Page Notes

Power aliases required by this page:
- =PP5V_PWRON_AUDIO_MLBCONN_PVDD
- =PP5V_PWRON_AUDIO_MLBCONN_AVDD
- =PP3V3_PWRON_AUDIO_MLBCONN_AVDD
- =PP3V3_RUN_AUDIO_MLBCONN_DVDD
- =GND_AUDIO_MLBCONN_SGND (GND for AVDD)
- =GND_AUDIO_MLBCONN_PGND (GND for PVDD)

Signal aliases required by this page:
- =I2C_MLBCONN_SCL
- =I2C_MLBCONN_SDA

BOM options provided by this page:
(NONE)

AUDIO CONNECTOR (TO MLB)

CRITICAL
J2500
24-5047-040-400-856
F-ST-SM-LF

6 =GND_AUDIO_MLBCONN_PGND	1	2	=PP5V_PWRON_AUDIO_MLBCONN_PVDD 6
	3	4	=PP5V_PWRON_AUDIO_MLBCONN_AVDD 6
	5	6	
6 =GND_AUDIO_MLBCONN_SGND	7	8	=PP3V3_PWRON_AUDIO_MLBCONN_AVDD 6
	9	10	
	11	12	
	13	14	
	15	16	AUDIO_SPDIFRX_GPO0 IN 5 6
13 5 IN AUDIO_LO_DET_L	17	18	AUDIO_EXT_MCLK_SEL OUT 5 10
13 5 IN AUDIO_LO_OPTICAL_PLUG_L	19	20	AUDIO_LO_MUTE_L OUT 5 11
	21	22	AUDIO_SPKR_MUTE_L OUT 5 12
	23	24	AUDIO_I2S_DTIB_SEL OUT 5 10
13 5 IN AUDIO_LI_DET_L	25	26	I2S_SB_TO_DEV_DTO OUT 5 6 7
13 5 IN AUDIO_LI_OPTICAL_PLUG_L	27	28	I2S_DEV_TO_SB_DTI IN 5 6 7
8 5 OUT AUDIO_CODEC_RESET_L	29	30	I2S_BITCLK BI 5 6 7
10 5 OUT AUDIO_SPDIFRX_RESET_L	31	32	
6 BI =I2C_MLBCONN_SDA	33	34	=PP3V3_RUN_AUDIO_MLBCONN_DVDD 6
6 OUT =I2C_MLBCONN_SCL	35	36	I2S_SYNC BI 5
	37	38	I2S_MCLK OUT 5 6 7
	39	40	

SLEEP LED CONNECTOR

CRITICAL
J2501
53398-0271
SM

MIN_LINE_WIDTH=0.38 mm
MIN_NECK_WIDTH=0.25 mm
5 SLEEP_LED
5 GND_SLEEP_LED
VOLTAGE=0V
MIN_LINE_WIDTH=0.38 mm
MIN_NECK_WIDTH=0.25 mm

Non-Audio Connectors

SYNC_MASTER=N/A SYNC_DATE=N/A

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02
SCALE: NONE	SHT 25 OF 109	

NET_TYPE			
ELECTRICAL_CONSTRAINT_SET	SPACING	PHYSICAL	DIFFERENTIAL_PAIR
	I2S	I2S	

I2S_PCM3052_DTI_R 8

Page Notes

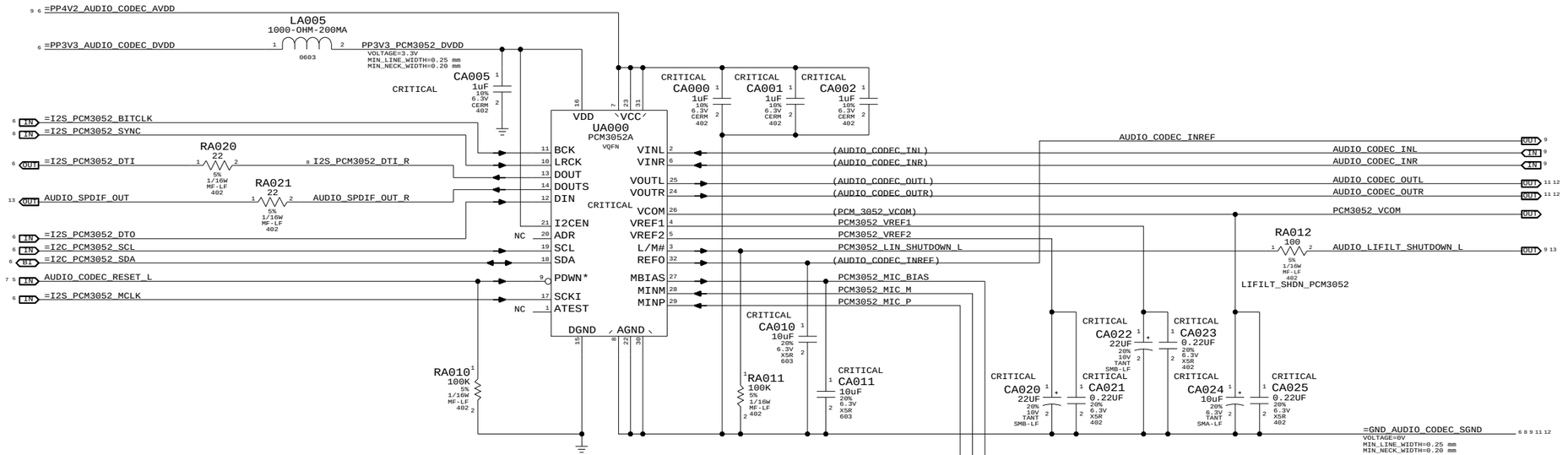
Power aliases required by this page:
- =PP4V2_AUDIO_CODEC_AVDD
- =PP3V3_AUDIO_CODEC_DVDD
- =GND_AUDIO_CODEC_SGND

Signal aliases required by this page:
- =I2C_PCM3052_SCL
- =I2C_PCM3052_SDA
- =I2S_PCM3052_DTO
- =I2S_PCM3052_DTI
- =I2S_PCM3052_MCLK
- =I2S_PCM3052_BITCLK
- =I2S_PCM3052_SYNC

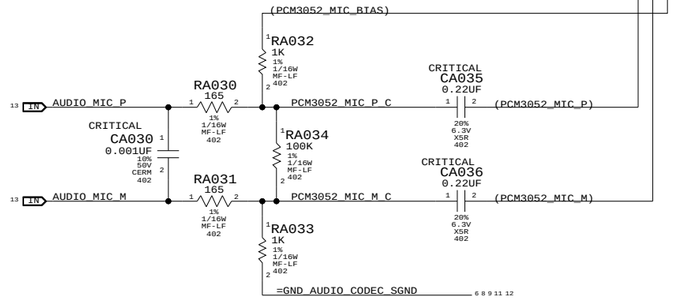
BOM options provided by this page:
(NONE)

BrownOdio CODEC (TI PCM3052A)

If 3052 uses I2S-a, ADR = NC or low, I2C Addr=8C
If 3052 uses I2S-b, ADR = high, I2C Addr=8E



Microphone Interface



BrownOdio Codec			
SYNC_MASTER=SPDIF-AUDIO-Q16C		SYNC_DATE=06/03/2005	
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APPLE COMPUTER INC.	SIZE D	DRAWING NUMBER 051-6850	REV. 02
	SCALE NONE	SHT 100 OF 109	

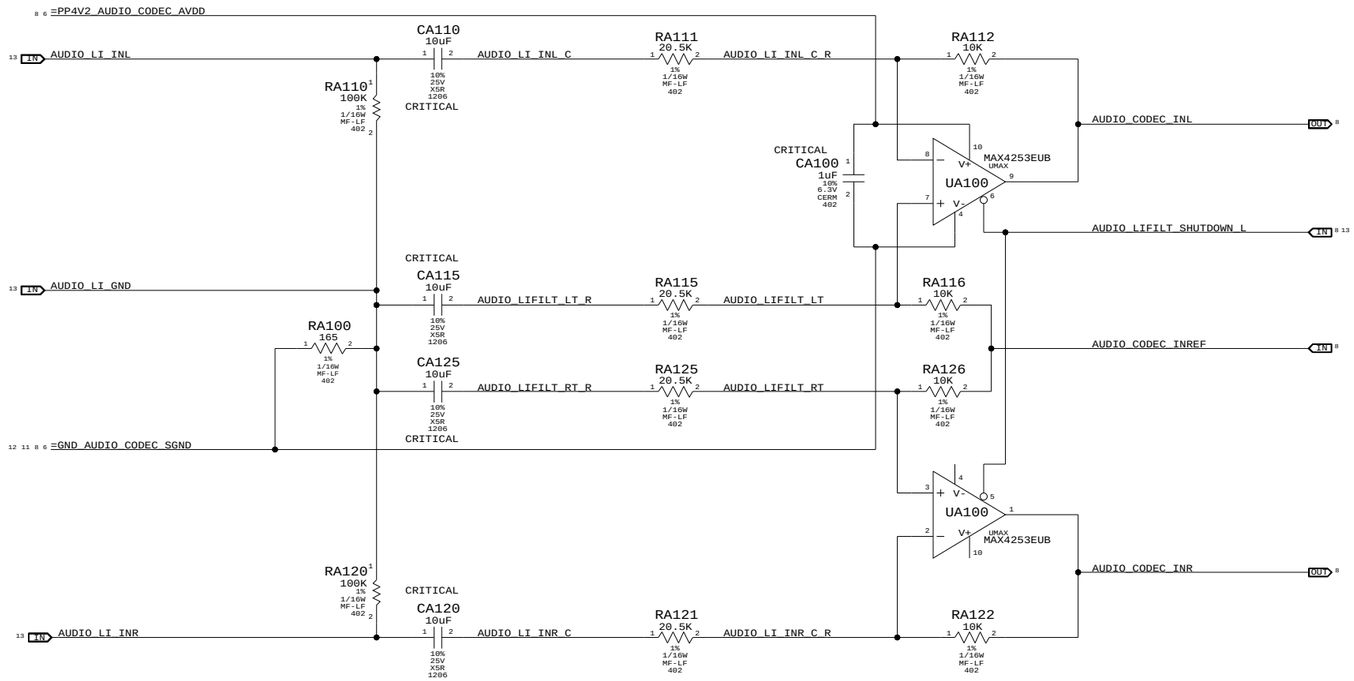
Page Notes

Power aliases required by this page:
- =PP4V2_AUDIO_LIFILT_AVDD
- =GND_AUDIO_CODEC_SGND

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

Pseudo-Diff Line-In Filter
Gain = -6.24dB Av = 0.49
Fc = 0.78 Hz



Line In Filter

SYNC_MASTER=SPDIF-AUDIO-Q16C SYNC_DATE=06/03/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02
SCALE: NONE	SHT 101 OF 109	

ELECTRICAL_CONSTRAINT_SET	NET_TYPE SPACING	PHYSICAL	DIFFERENTIAL_PAIR
I2S_I2SMUX_MCLK_OUT_R	I2S	I2S	
I2S_I2SMUX_DTI_OUT_R	I2S	I2S	
I2S_CS8416_DTI_R	I2S	I2S	
I2S_CS8416_RMCK_R	I2S	I2S	
I2S_CS8416_BITCLK_R	I2S	I2S	
I2S_CS8416_SYNC_R	I2S	I2S	
I2S_CS8416_DTI	I2S	I2S	
I2S_CS8416_RMCK	I2S	I2S	

Page Notes

Power aliases required by this page:
- =PP3V3_AUDIO_SPDIFRX_DVDD
- =PP3V3_AUDIO_I2SMUX_DVDD

Signal aliases required by this page:
- =I2C_CS8416_SCL
- =I2C_CS8416_SDA
- =I2S_CS8416_BITCLK
- =I2S_CS8416_OMCK
- =I2S_CS8416_RMCK
- =I2S_CS8416_SYNC
- =I2S_I2SMUX_MCLK_IN
- =I2S_I2SMUX_MCLK_OUT
- =I2S_I2SMUX_DTI_IN
- =I2S_I2SMUX_DTI_OUT
- =CS8416_GPO0

BOM options provided by this page:
- CS8416_I2CADDR_0X22 / CS8416_I2CADDR_0X2A
  Selects between two I2C addresses for CS8416.
- CS8416_RESET_ISOL / CS8416_RESET_NOISOL
  Stuffs or bypasses isolation circuit for CS8416 RESET input. This circuit protects the CS8416 from leakage on the RESET GPIO from I/O ASIC.
- I2S_MCLKMUX_ENABLE / I2S_MCLKMUX_BYPASS
  Connects or bypasses I2S MCLK mux circuit. When enabled, I/O ASIC GPIO AUDIO_EXT_MCLK_SEL selects CS8416 MCLK output instead of I/O ASIC MCLK output to be used as input to CODEC circuit.
- I2S_CLKSW_ENABLE / I2S_CLKSW_BYPASS
  Enable or disable UA270 tristate functionallity for SYNC and BITCLK
  Allows for alternate method of removing CS4216 from the hostbus when SB I2S a is in Master mode.

I2S Bus DTI Mux

Host bus receives either CODEC DTI or CS8416 DTI

I2S Bus MCLK Mux

CODEC receives either host I2S bus MCLK or CS8416 RMCK

I2S Bus SYNC/BCLK Switch

Host bus SYNC/BITCLK direction switch

S/PDIF Receiver (CS8416)

I2C Address selection

i2s-a	AD2=0, AD1=0, AD0=0
i2s-b	AD2=0, AD1=0, AD0=1
i2s-c	AD2=0, AD1=1, AD0=0
i2s-d	AD2=0, AD1=1, AD0=1

CS8416 Pin To Supply Leakage Isolator

S/PDIF Receiver

SYNC_MASTER=SPDIF-AUDIO-Q16C SYNC_DATE=06/03/2005

APPLE COMPUTER INC.

SIZE D | DRAWING NUMBER 051-6850 | REV. 02

SCALE NONE | SHT 102 OF 109

NET_TYPE			
ELECTRICAL_CONSTRAINT_SET	SPACING	PHYSICAL	DIFFERENTIAL_PAIR
	AUDIO	AUDIO	
	AUDIO	AUDIO	
	AUDIO	AUDIO	
	AUDIO	AUDIO	

AUDIO_HPAMP_OUTL_R 11
AUDIO_HPAMP_OUTR_R 11
AUDIO_HPAMP_OUTL 11 13
AUDIO_HPAMP_OUTR 11 13

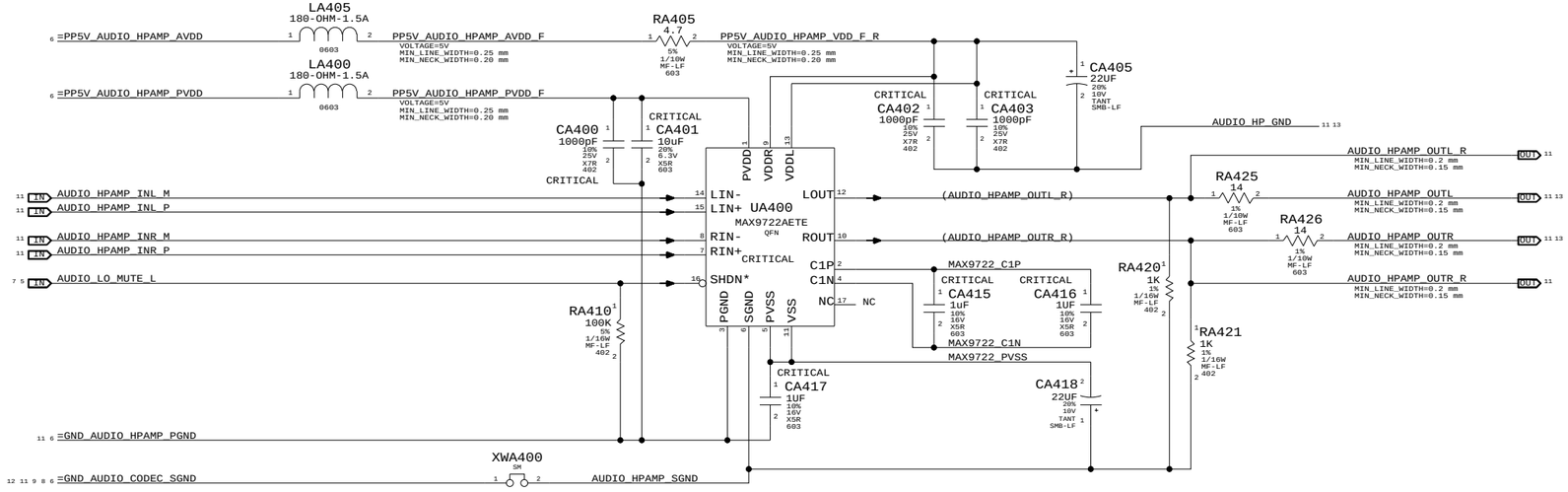
Page Notes

Power aliases required by this page:
- =PP5V_AUDIO_HPAMP_AVDD
- =PP5V_AUDIO_HPAMP_PVDD
- =GND_AUDIO_HPAMP_PGND (GND for power)
- =GND_AUDIO_HPAMP_SGND (GND for signal)
- =GND_AUDIO_CODEC_SGND
- =GND_AUDIO_HP_STAR_GND

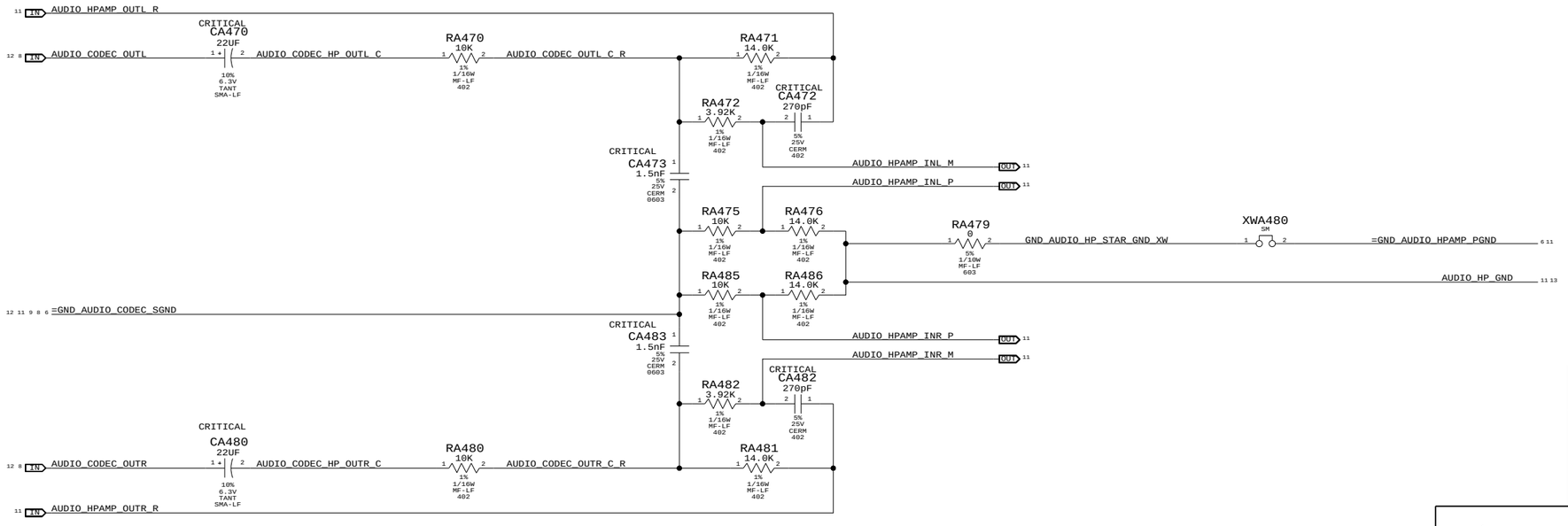
Signal aliases required by this page:
(NONE)

BOM options provided by this page:
(NONE)

Headphone Amplifier (MAX9722)



2nd Order DAC Filter



Headphone Amp

SYNC_MASTER=SPDIF-AUDIO-Q41C SYNC_DATE=06/03/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02
SCALE: NONE	SHT 104 OF 109	

Page Notes

Power aliases required by this page:
- =PP5V_AUDIO_SPKRAMP_PVDD
- =PP5V_AUDIO_SPKRAMP_AVDD
- =GND_AUDIO_SPKRAMP_PGND (GND for power)
- =GND_AUDIO_SPKRAMP_SGND (GND for signal)

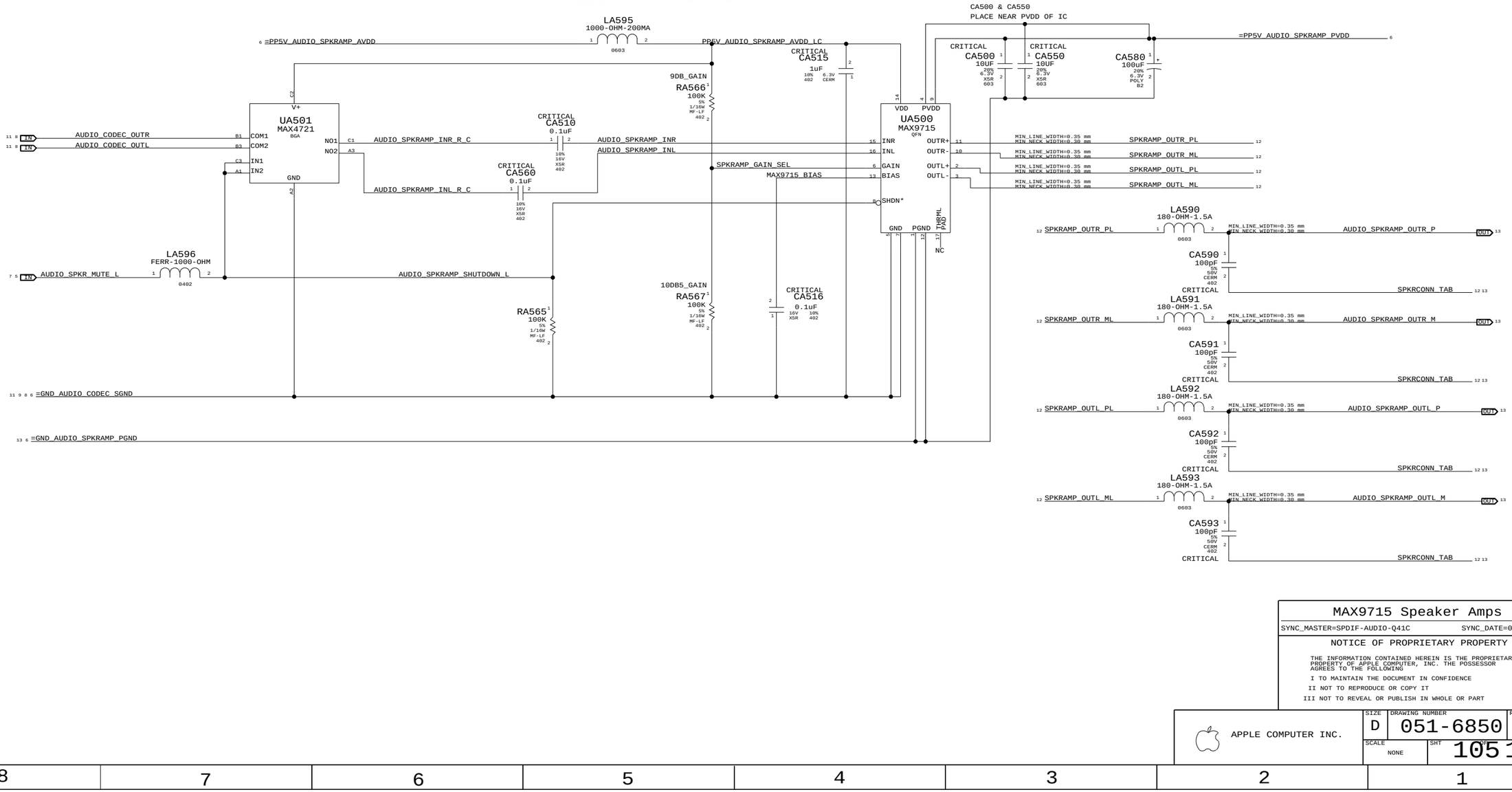
Signal aliases required by this page:
(NONE)

BOM options provided by this page:
- 10DB5_GAIN
  MAX9715 GAIN is set through this pin
  HIGH = 9dB
  LOW = 10.5dB

STEREO SPEAKER AMPLIFIERS

Gain = 10.5dB

118 < FC < 245Hz



MAX9715 Speaker Amps

SYNC_MASTER=SPDIF-AUDIO-Q41C SYNC_DATE=06/03/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02
SCALE: NONE	SHT 105 OF 109	

ELECTRICAL_CONSTRAINT_SET	NET_TYPE SPACING	PHYSICAL	DIFFERENTIAL_PAIR
	AUDIO	AUDIO	
	AUDIO	AUDIO	
	AUDIO	AUDIO	
	AUDIO	AUDIO	
	AUDIO	AUDIO	
	AUDIO	AUDIO	
	AUDIO	AUDIO	

AUDIO_LOCONN_OUTL_F 13
AUDIO_LOCONN_OUTR_F 13
AUDIO_LOCONN_GND_F 13
AUDIO_LOCONN_OUTL 13
AUDIO_LOCONN_OUTR 13
AUDIO_LOCONN_GND 13
AUDIO_HP_GND 11 13

Page Notes

Power aliases required by this page:
- =PP3V3_AUDIO_JACK_DVDD
- =PPVIO_AUDIO_JACKDET_DVDD
- =GND_AUDIO_SPKRAMP_PGND
- =GND_CHASSIS_AUDIO_JACK

Signal aliases required by this page:
(NONE)

BOM options provided by this page:
- LIFILT_SHDN_LICONN
  Uses line-in connector optical plug detect to control line-in filter shutdown signal. When no cable or an optical cable is inserted, this signal will be low, so it can be used as an active-low shutdown for the line-in filter circuit.

BOM option to be confirmed and made permanent in EVT

Line-In Connector

13 6 =PP3V3_AUDIO_JACK_DVDD

JA600
UCNT2051E007-0
F-RT-TH-RCVR

AUDIO_LICONN_GND — LA610 FERR-1000-OHM 0402 — AUDIO_LICONN_GND_F
AUDIO_LICONN_DET — LA615 FERR-1000-OHM 0402 — AUDIO_LICONN_DET_F
AUDIO_LICONN_INR — LA611 FERR-1000-OHM 0402 — AUDIO_LICONN_INR_F
AUDIO_LICONN_INL — LA612 FERR-1000-OHM 0402 — AUDIO_LICONN_INL_F
AUDIO_LICONN_FIBER — LA616 FERR-1000-OHM 0402 — AUDIO_LICONN_FIBER_F

13 6 =GND_CHASSIS_AUDIO_JACK

CA600 1UF 10% 6.3V CERM 402
CA601 22UF 10% 6.3V TANT SMA-LF
DZA610 14V-15A 0405
DZA650 14V-15A 0405

QA630 used to pull contact to ground
Deactivated when jack inserted

13 7 5 AUDIO_LI_DET_L
13 AUDIO_LI_FIBER_RC
13 AUDIO_LO_FIBER_RC
13 7 5 AUDIO_LO_DET_L

QA630 2N7002DW-X-F SOT-363
QA630 2N7002DW-X-F SOT-363

CA611 100PF 5% 50V CERM 402
CA612 100PF 5% 50V CERM 402
CA616 100PF 5% 50V CERM 402
CA610 100PF 5% 50V CERM 402
CA615 100PF 5% 50V CERM 402

13 6 =PP3VIO_AUDIO_JACKDET_DVDD
Buffers & level-shifts to desired voltage.

RA635 100K 5% 1/10W MF-LF 402
RA645 100K 5% 1/10W MF-LF 402
RA636 100K 5% 1/10W MF-LF 402
RA646 100K 5% 1/10W MF-LF 402

LA620 FERR-1000-OHM 0402 — (AUDIO_LI_GND) — AUDIO_LI_GND
LA621 FERR-1000-OHM 0402 — (AUDIO_LI_INR) — AUDIO_LI_INR
LA622 FERR-1000-OHM 0402 — (AUDIO_LI_INL) — AUDIO_LI_INL

AUDIO_SPDIF_IN
AUDIO_LI_DET_L 5 7 13
Low = Jack inserted
AUDIO_LI_OPTICAL_PLUG_L 5 7
High for metal
Low for plastic (optical)

RA626 10K 5% 1/10W MF-LF 402
13 AUDIO_LI_FIBER_RC

RA625 0 5% 1/10W MF-LF 402
AUDIO_LI_DET_R

LIFILT_SHDN_LICONN
RA647 1K 5% 1/10W MF-LF 402
AUDIO_LIFILT_SHUTDOWN_L 8 9

RA637 100K 5% 1/10W MF-LF 402
AUDIO_LI_DET_RC

QA640 2N7002DW-X-F SOT-363
QA640 2N7002DW-X-F SOT-363

CA625 0.1UF 20% 10V CERM 402
CA626 0.1UF 20% 10V CERM 402

RA637 = 100K for tip detect jack
Circuit threshold changes when
using tip detection with signal present
TO BE CONFIRMED IN EVT

Line-Out / Headphone Connector

13 6 =PP3VIO_AUDIO_JACKDET_DVDD
Buffers & level-shifts to desired voltage.

RA656 100K 5% 1/10W MF-LF 402
RA666 100K 5% 1/10W MF-LF 402
RA655 100K 5% 1/10W MF-LF 402
RA665 100K 5% 1/10W MF-LF 402

8 IN AUDIO_SPDIF_OUT
13 11 AUDIO_HP_GND
MIN_LINE_WIDTH=0.2 mm
MIN_NECK_WIDTH=0.15 mm
11 IN AUDIO_HPAMP_OUTR
11 IN AUDIO_HPAMP_OUTL
13 7 5 OUT AUDIO_LO_DET_L
Low = Jack inserted
7 5 OUT AUDIO_LO_OPTICAL_PLUG_L
High for metal
Low for plastic (optical)

(AUDIO_HP_GND) — LA670 180-OHM-1.5A 0603 — 13 AUDIO_LOCONN_GND_F
(AUDIO_HPAMP_OUTR) — LA671 1000-OHM-200MA 0603 — 13 AUDIO_LOCONN_OUTR_F
(AUDIO_HPAMP_OUTL) — LA672 1000-OHM-200MA 0603 — 13 AUDIO_LOCONN_OUTL_F
13 AUDIO_LO_FIBER_RC — RA676 10K 5% 1/10W MF-LF 402 — AUDIO_LOCONN_FIBER_F

AUDIO_LO_DET_RC
RA667 100K 5% 1/10W MF-LF 402
AUDIO_LO_DET_R
RA675 0 5% 1/10W MF-LF 402

QA650 2N7002DW-X-F SOT-363
QA650 2N7002DW-X-F SOT-363

CA676 0.1UF 20% 10V CERM 402
CA675 0.1UF 20% 10V CERM 402

RA667 = 100K for tip detect jack
Circuit threshold changes when
using tip detection with signal present
TO BE CONFIRMED IN EVT

13 6 =PP3V3_AUDIO_JACK_DVDD

LA680 180-OHM-1.5A 0603 — 13 AUDIO_LOCONN_GND
LA685 FERR-1000-OHM 0402 — AUDIO_LOCONN_DET
LA681 1000-OHM-200MA 0603 — 13 AUDIO_LOCONN_OUTR
LA682 1000-OHM-200MA 0603 — 13 AUDIO_LOCONN_OUTL
LA686 FERR-1000-OHM 0402 — AUDIO_LOCONN_FIBER

AUDIO_LOCONN_DET_F

JA690
UCNT2050E007-0
F-RT-TH-TRANS
VIN
VCC
GND

CA690 1UF 10% 6.3V CERM 402

CA686 100PF 5% 50V CERM 402
CA681 100PF 5% 50V CERM 402
CA685 100PF 5% 50V CERM 402
CA682 100PF 5% 50V CERM 402
CA680 100PF 5% 50V CERM 402

13 6 =GND_CHASSIS_AUDIO_JACK

Speaker/Mic Connector

CRITICAL
JA699
SM-2MT-LF

12 SPKRCONN_TAB
12 IN AUDIO_SPKRAMP_OUTL_P
12 IN AUDIO_SPKRAMP_OUTL_M
8 OUT AUDIO_MIC_P
8 OUT AUDIO_MIC_M
12 IN AUDIO_SPKRAMP_OUTR_P
12 IN AUDIO_SPKRAMP_OUTR_M

12 6 =GND_AUDIO_SPKRAMP_PGND — RA671 0 5% 1/10W MF-LF 402
6 =GND_CHASSIS_SPKR_CONN — NO STUFF RA670 0 5% 1/10W MF-LF 402

Audio Connectors

SYNC_MASTER=SPDIF-AUDIO-Q41C SYNC_DATE=06/03/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02
SCALE: NONE	SHT 106 OF 109	

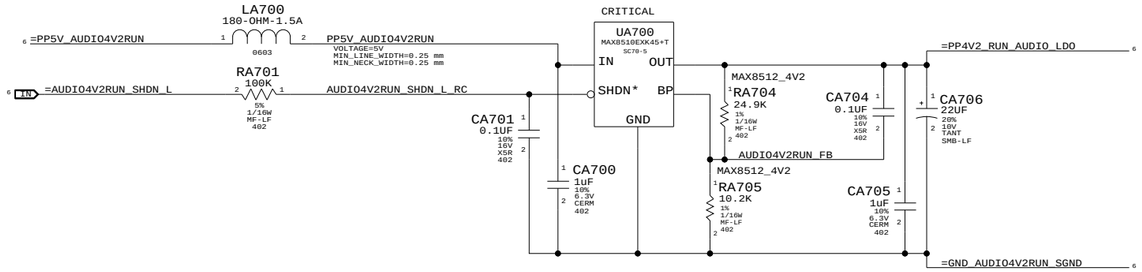
Page Notes

Power aliases required by this page:
- =PP5V_AUDIO4V2RUN
- =PP4V2_RUN_AUDIO_LDO
- =GND_AUDIO4V2RUN_SGND

Signal aliases required by this page:
- =AUDIO4V2RUN_SHDN_L

BOM options provided by this page:
- MAX8512_4V2
  Used when MAX8512 is stuff at UA700
  MAX8512 is an adjustable regulator that
  needs RA704/705 to program Vout

Audio 4.5V LDO (CODEC)



UA700 to be verified and confirmed in proto

Component option in order of preference
-MAX8510EXK45-T(353S0960) 4.5V Fixed regulator
-MAX8510EXK42-T (New part) 4.2V Fixed regulator
-MAX8512EXK-T(353S1110) Adjustable regulator

Audio Power Supply

SYNC_MASTER=SPDIF-AUDIO-Q16C SYNC_DATE=06/03/2005

APPLE COMPUTER INC.

SIZE	DRAWING NUMBER	REV.
D	051-6850	02
SCALE: NONE	SHT 107 OF 109	

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

=AUDIO4V2RUN_SHDN_L 6A5> 14D6<
=CS8416_GPO0 6A8< 10A1>
=GND_AUDIO4V2RUN_SGND 6B4< 14C3<
=GND_AUDIO_CODEC_SGND 6B4< 8A4< 8B1< 9B7< 11A8< 11B6<> 12B8<
=GND_AUDIO_HPAMP_PGND 6B4< 11A2<> 11C6<
=GND_AUDIO_MLBCONN_PGND 6B1> 7C5<>
=GND_AUDIO_MLBCONN_SGND 6B1> 7C5<>
=GND_AUDIO_SPKRAMP_PGND 6B4< 12B8< 13A2<
=GND_CHASSIS_AUDIO_JACK 6A4< 13A4<> 13C7<>
=GND_CHASSIS_SPKR_CONN 6B4< 13A2<
=I2C_CS8416_SCL 6B5> 10A8<
=I2C_CS8416_SDA 6B5> 10A8<
=I2C_MLBCONN_SCL 6B8< 7B5>
=I2C_MLBCONN_SDA 6B8< 7B5>
=I2C_PCM3052_SCL 6B5> 8C7<
=I2C_PCM3052_SDA 6B5> 8C7<>
=I2S_CS8416_BITCLK 6B8< 10C1>
=I2S_CS8416_OMCK 6B5> 10B1<
=I2S_CS8416_SYNC 6B8< 10C1>
=I2S_I2SMUX_DTI_IN 6A5> 10D5<
=I2S_I2SMUX_DTI_OUT 6A8< 10D2>
=I2S_I2SMUX_MCLK_IN 6B5> 10C7<
=I2S_I2SMUX_MCLK_OUT 6A8< 10C4>
=I2S_PCM3052_BITCLK 6B5> 8C7<
=I2S_PCM3052_DTI 6A8< 8C7>
=I2S_PCM3052_DTO 6A5> 8C7<
=I2S_PCM3052_MCLK 6A5> 8C7<
=I2S_PCM3052_SYNC 6B5> 8C7<
=PP3V3_AUDIO_CODEC_DVDD 6C1> 8D7<
=PP3V3_AUDIO_I2SMUX_DVDD 6C1> 10C4< 10D5< 10D7<
=PP3V3_AUDIO_JACK_DVDD 6B1> 13B4< 13D7<
=PP3V3_AUDIO_SPDIFRX_DVDD 6C1> 10C6<
=PP3V3_PWRON_AUDIO_MLBCONN_AVDD 6D4< 7C3<>
=PP3V3_RUN_AUDIO_MLBCONN_DVDD 6C4< 7B3<>
=PP3V3IO_AUDIO_JACKDET_DVDD 6C1> 13B8< 13D3<
=PP4V2_AUDIO_CODEC_AVDD 6C1> 8D7< 9C7<
=PP4V2_RUN_AUDIO_LDO 6C4< 14D3<>
=PP5V_AUDIO4V2RUN 6C1> 14D6<
=PP5V_AUDIO_HPAMP_AVDD 6C1> 11D6<
=PP5V_AUDIO_HPAMP_PVDD 6C1> 11D6<
=PP5V_AUDIO_SPKRAMP_AVDD 6C1> 12C7<
=PP5V_AUDIO_SPKRAMP_PVDD 6D1> 12C1<
=PP5V_PWRON_AUDIO_MLBCONN_AVDD 6C4< 7C3<>
=PP5V_PWRON_AUDIO_MLBCONN_PVDD 6D4< 7C3<>
AUDIO4V2RUN_FB 14C4<>
AUDIO4V2RUN_SHDN_L_RC 14D5<>
AUDIO_CODEC_HP_OUTL_C 11B7<
AUDIO_CODEC_HP_OUTR_C 11A7<
AUDIO_CODEC_INL 8C1< 9C2>
AUDIO_CODEC_INR 8C1< 9B2>
AUDIO_CODEC_INREF 8C1> 9B2<
AUDIO_CODEC_OUTL 8C1> 11B8< 12C8<
AUDIO_CODEC_OUTL_C_R 11B6<
AUDIO_CODEC_OUTR 8C1> 11A8< 12C8<
AUDIO_CODEC_OUTR_C_R 11A6<
AUDIO_CODEC_RESET_L 5C6> 7B5> 8C7<
AUDIO_EXT_MCLK_SEL 5C6> 7C3> 10C4<> 10C7<
AUDIO_HPAMP_INL_M 11B4> 11C6<
AUDIO_HPAMP_INL_P 11B4> 11C6<
AUDIO_HPAMP_INR_M 11A4> 11C6<
AUDIO_HPAMP_INR_P 11A4> 11C6<
AUDIO_HPAMP_OUTL 11C1> 11D6> 13A8<
AUDIO_HPAMP_OUTL_R 11B8< 11C1> 11D6>
AUDIO_HPAMP_OUTR 11C1> 11D6> 13A8<
AUDIO_HPAMP_OUTR_R 11A8< 11C1> 11D6>
AUDIO_HPAMP_SGND 11B5<>
AUDIO_HP_GND 11A2< 11C2< 13B8< 13D6>
AUDIO_I2S_DTIB_SEL 5C6> 7C3> 10D5<
AUDIO_LICONN_DET 13D6<>
AUDIO_LICONN_DET_F 13D5<
AUDIO_LICONN_FIBER 13C6<>
AUDIO_LICONN_FIBER_F 13C5<
AUDIO_LICONN_GND 13D6<>
AUDIO_LICONN_GND_F 13D5<
AUDIO_LICONN_INL 13C6<>
AUDIO_LICONN_INL_F 13C5<
AUDIO_LICONN_INR 13C6<>
AUDIO_LICONN_INR_F 13C5<
AUDIO_LIFILT_LT 9C4<>
AUDIO_LIFILT_LT_R 9C5<
AUDIO_LIFILT_RT 9B4<>
AUDIO_LIFILT_RT_R 9B5<
AUDIO_LIFILT_SHUTDOWN_L 8C1> 9C2< 13C1>
AUDIO_LI_DET_L 5D6> 7B5< 13C1> 13C8<>
AUDIO_LI_DET_R 13C3<
AUDIO_LI_DET_RC 13C3<>
AUDIO_LI_FIBER_RC 13C3<> 13C8<>
AUDIO_LI_GND 9C7< 13D1>
AUDIO_LI_INL 9C7< 13C1>
AUDIO_LI_INL_C 9C5<
AUDIO_LI_INL_C_R 9C4<>
AUDIO_LI_INR 9B7< 13C1>
AUDIO_LI_INR_C 9B5<
AUDIO_LI_INR_C_R 9B4<>
AUDIO_LI_OPTICAL_PLUG_L 5D6> 7B5< 13C1>
AUDIO_LOCONN_DET 13B4<>
AUDIO_LOCONN_DET_F 13B5<
AUDIO_LOCONN_FIBER 13A4<>
AUDIO_LOCONN_FIBER_F 13A5<
AUDIO_LOCONN_GND 13B4<> 13D6>
AUDIO_LOCONN_GND_F 13B5< 13D6>
AUDIO_LOCONN_OUTL 13A4<> 13D6>
AUDIO_LOCONN_OUTL_F 13A5< 13D6>
AUDIO_LOCONN_OUTR 13A4<> 13D6>
AUDIO_LOCONN_OUTR_F 13A5< 13D6>
AUDIO_LO_DET_L 5D6> 7C5< 13A8> 13C8<>
AUDIO_LO_DET_R 13A6<
AUDIO_LO_DET_RC 13A6<>
AUDIO_LO_FIBER_RC 13A6<> 13C8<>
AUDIO_LO_MUTE_L 5C6> 7C3> 11C6<
AUDIO_LO_OPTICAL_PLUG_L 5D6> 7C5< 13A8>
AUDIO_MIC_M 8A5< 13B2>
AUDIO_MIC_P 8A5< 13B2>
AUDIO_SPDIFRX_GPO0 5B6> 6A5> 7C3<
AUDIO_SPDIFRX_RESET_L 5C6> 7B5> 10A8<
AUDIO_SPDIFRX_RESET_L_F 10A7<>
AUDIO_SPDIF_IN 10B8< 13D1>
AUDIO_SPDIF_OUT 8C7> 13B8<
AUDIO_SPDIF_OUT_R 8C6<>
AUDIO_SPKRAMP_INL 12C5<
AUDIO_SPKRAMP_INL_R_C 12C6<>
AUDIO_SPKRAMP_INR 12C5<
AUDIO_SPKRAMP_INR_R_C 12C6<>
AUDIO_SPKRAMP_OUTL_M 12A1> 13B2<
AUDIO_SPKRAMP_OUTL_P 12B1> 13B2<
AUDIO_SPKRAMP_OUTR_M 12B1> 13B2<
AUDIO_SPKRAMP_OUTR_P 12B1> 13B2<
AUDIO_SPKRAMP_SHUTDOWN_L 12B6<>
AUDIO_SPKR_MUTE_L 5C6> 7C3> 12B8<
CHGND 6A3
CHGND1 2D2>
CS8416_AD2 10A3<>
CS8416_FILT 10A4<>
CS8416_FILT_RC 10A5<
CS8416_RESET 10A6<>
CS8416_RESET_L 10A5<>
CS8416_RXN 10B4<
CS8416_RXP0 10B4<
GND_AUDIO_HP_STAR_GND_XW 11A4<>
GND_AUDIO_SGND 5C6> 6B3
GND_AUDIO_SPKRAMP_PGND 6B3
GND_AUDIO_STAR_GND 5C6>
GND_SLEEP_LED 5C6> 7B6<>
I2C_AUDIO_SCL 5C6> 6B7
I2C_AUDIO_SDA 5C6> 6B7
I2S_BITCLK 5C6> 6B8< 7B3<> 7D6>
I2S_CS8416_BITCLK_M 10B1<> 10C4<>
I2S_CS8416_BITCLK_R 10C2<> 10D6>
I2S_CS8416_DTI 10B1> 10D5< 10D6>
I2S_CS8416_DTI_R 10B2<> 10D6>
I2S_CS8416_RMCK 10B1> 10C7< 10D6>
I2S_CS8416_RMCK_R 10B3<> 10D6>
I2S_CS8416_SYNC_M 10B1<> 10C4<>
I2S_CS8416_SYNC_R 10C2<> 10D6>
I2S_DEV_TO_SB_DTI 5C6> 6A5> 7B3< 7D6>
I2S_I2SMUX_DTI_OUT_R 10D3<> 10D6>
I2S_I2SMUX_MCLK_OUT_R 10C6<> 10D6>
I2S_MCLK 5C6> 6B8< 7B3> 7D6>
I2S_PCM3052_DTI 6A7
I2S_PCM3052_DTI_R 8C6<> 8D6>
I2S_PCM3052_MCLK 6A7
I2S_SB_TO_DEV_DTO 5C6> 6A8< 7B3> 7D6>
I2S_SYNC 6B8< 7B3<>
MAX9715_BIAS 12C4<>
MAX9722_CiN 11C3<>
MAX9722_CiP 11C3<>
MAX9722_PVSS 11C3<
MIDDLE_SCREW_GND 2C2<> 6B1>
PCM3052_LIN_SHUTDOWN_L 8C4<>
PCM3052_MIC_BIAS 8C4<>
PCM3052_MIC_M 8C4<
PCM3052_MIC_M_C 8A4<
PCM3052_MIC_P 8C4<
PCM3052_MIC_P_C 8A4<
PCM3052_VCOM 8C1>
PCM3052_VREF1 8C4<>
PCM3052_VREF2 8C4<>
PP3V3_AUDIO_CS8416_VA 10B4<
PP3V3_CS8416_VD 10C4<
PP3V3_PCM3052_DVDD 8D6<
PP3V3_PWRON_AUDIO_AVDD 5B6> 6D2>
PP3V3_RUN_AUDIO_DVDD 5C6> 6A8< 6C3
PP4V2_RUN_AUDIO_AVDD 6C3
PP5V_AUDIO4V2RUN 14D5<
PP5V_AUDIO_HPAMP_AVDD_F 11D5<
PP5V_AUDIO_HPAMP_PVDD 6C3<>
PP5V_AUDIO_HPAMP_PVDD_F 11D5<
PP5V_AUDIO_HPAMP_VDD_F_R 11D4<
PP5V_AUDIO_SPKRAMP_AVDD_LC 12C5<
PP5V_AUDIO_SPKRAMP_PVDD 6D3<>
PP5V_PWRON_AUDIO_AVDD 5B6> 6C3<>
PP5V_PWRON_AUDIO_PVDD 5B6> 6D2<>
SLEEP_LED 5C6> 7B6<>
SPKRAMP_GAIN_SEL 12C5<>
SPKRAMP_OUTL_ML 12A3< 12C2>
SPKRAMP_OUTL_PL 12B3< 12C2>
SPKRAMP_OUTR_ML 12B3< 12C2>
SPKRAMP_OUTR_PL 12B3< 12C2>
SPKRCONN_TAB 12A1< 12B1< 12B1< 12B1< 13B2<>

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

CA000 CAP 8
CA001 CAP 8
CA002 CAP 8
CA005 CAP 8
CA010 CAP 8
CA011 CAP 8
CA020 CAP_P 8
CA021 CAP 8
CA022 CAP_P 8
CA023 CAP 8
CA024 CAP_P 8
CA025 CAP 8
CA030 CAP 8
CA035 CAP 8
CA036 CAP 8
CA100 CAP 9
CA110 CAP 9
CA115 CAP 9
CA120 CAP 9
CA125 CAP 9
CA200 CAP 10
CA201 CAP 10
CA210 CAP_P 10
CA211 CAP 10
CA212 CAP 10
CA220 CAP 10
CA221 CAP 10
CA228 CAP 10
CA229 CAP 10
CA270 CAP 10
CA280 CAP 10
CA290 CAP 10
CA400 CAP 11
CA401 CAP 11
CA402 CAP 11
CA403 CAP 11
CA405 CAP_P 11
CA415 CAP 11
CA416 CAP 11
CA417 CAP 11
CA418 CAP_P 11
CA470 CAP_P 11
CA472 CAP 11
CA473 CAP 11
CA480 CAP_P 11
CA482 CAP 11
CA483 CAP 11
CA500 CAP 12
CA510 CAP 12
CA515 CAP 12
CA516 CAP 12
CA550 CAP 12
CA560 CAP 12
CA580 CAP_P 12
CA590 CAP 12
CA591 CAP 12
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CA601 CAP_P 13
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CA682 CAP 13
CA685 CAP 13
CA686 CAP 13
CA690 CAP 13
CA700 CAP 14
CA701 CAP 14
CA704 CAP 14
CA705 CAP 14
CA706 CAP_P 14
DZA610 SUPPR_TRANSIENT_4P1 13
DZA650 SUPPR_TRANSIENT_4P1 13
JJ500 CON_F40ST_D_SM 7
JJ501 CON_M2ST_S2MT_SM 7
JA600 CON_F8RT_SPDIFRCVR_TH2 13
JA690 CON_F8RT_SPDIFTRAN_TH2 13
JA699 CON_MGRT_WR1B 13
LA005 IND 8
LA200 IND 10
LA250 IND 10
LA400 IND 11
LA405 IND 11
LA590 IND 12
LA591 IND 12
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LA700 IND 14
QA255 TRA_2N7002ZDW 10
QA630 TRA_2N7002ZDW 13
QA640 TRA_2N7002ZDW 13
QA650 TRA_2N7002ZDW 13
R0200 RES 2
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RA012 RES 8
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RA021 RES 8
RA030 RES 8
RA031 RES 8
RA032 RES 8
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RA675 RES 13
RA676 RES 13
RA701 RES 14
RA704 RES 14
RA705 RES 14
UA000 AUDIO_PCM3052A 8
UA100 OPAMP_MAX4253 9
UA200 CS8416_SOFT 10
UA270 SN74LVC2G126YZA 10
UA280 SN74LVC2G157YZA 10
UA290 SN74LVC2G157YZA 10
UA400 MAX9722 11
UA500 MAX9715 12
UA501 MAX4721 12
UA700 MAX8510 14
XW1100 SHORT 6
XW1101 SHORT 6
XWA400 SHORT 11
XWA480 SHORT 11
ZT0200 MTGHOLE 2