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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

ENG APPD

DATE

DATE

A

356279

PRODUCTION RELEASED

12/17/04

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COMPONENT LOCATIONS

SCHEM, LEFT I/O BRD, PB15"

12/17/2004

PART#

QTY

DESCRIPTION

REFERENCE DESIGNATOR(S)

BOM OPTION

051-6686

1

SCHEM, LEFT I/O BRD, PB15

SCH1

820-1685

1

PCBF, LEFT I/O BRD, PB15

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

MATERIAL/FINISH NOTED AS APPLICABLE

SIZE D

Apple Computer Inc.

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TITLE

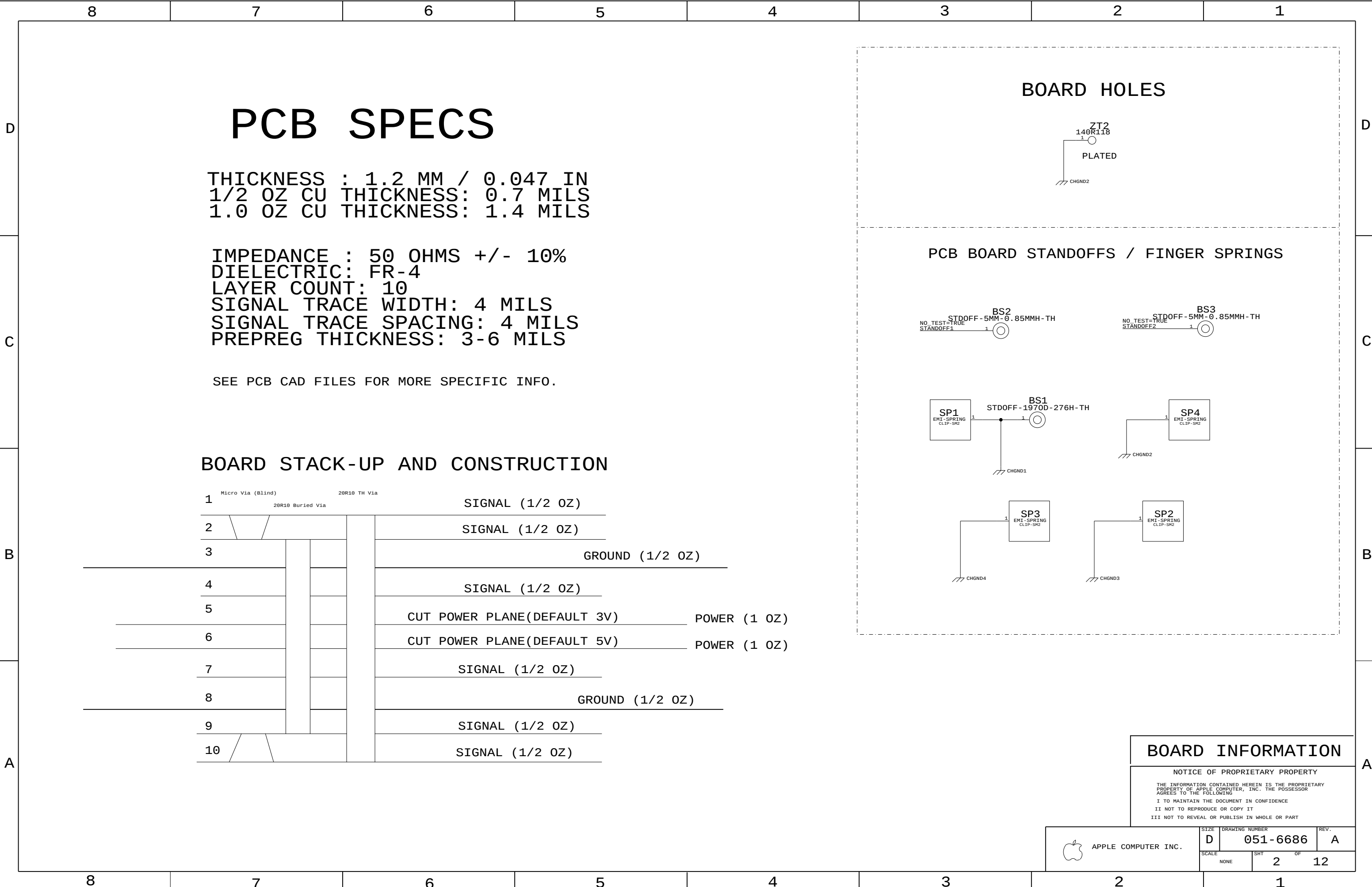
SCHEM, LEFT I/O BRD, PB15

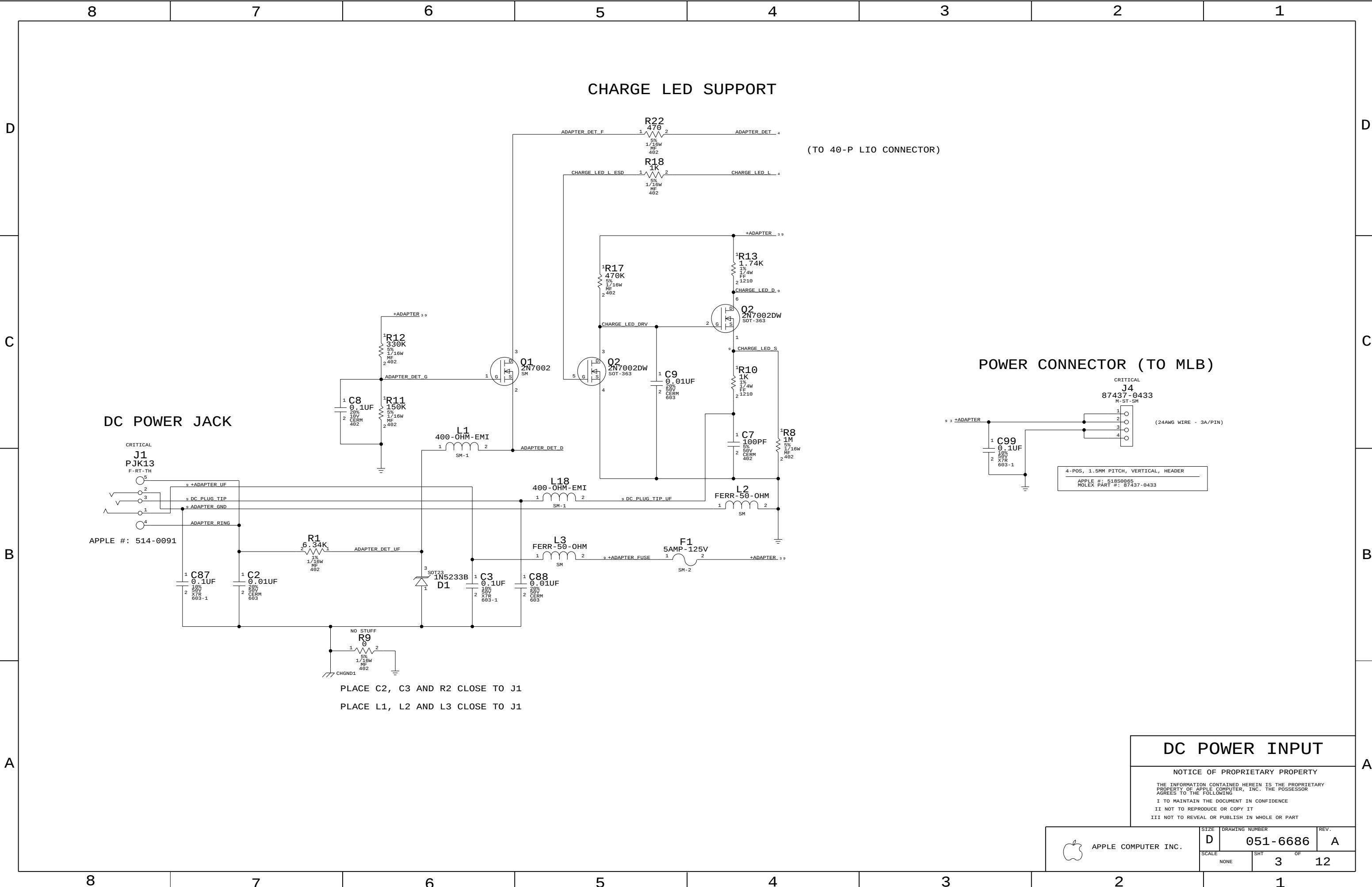
DRAWING NUMBER

051-6686

REV. A

SHT 1 OF 12





**DC POWER INPUT**

NOTICE OF PROPRIETARY PROPERTY

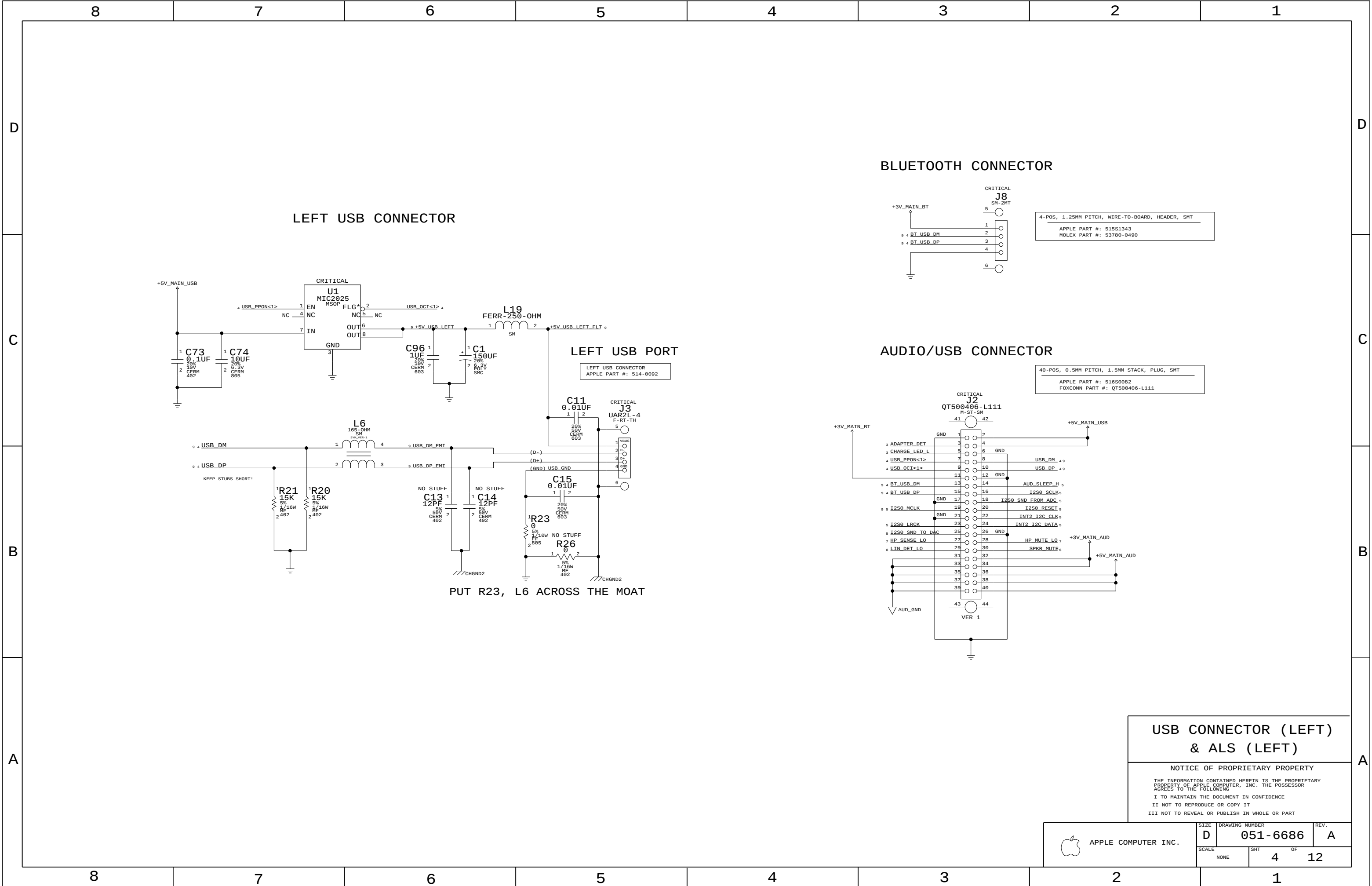
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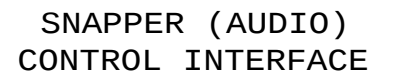
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|                     |               |                            |           |
|---------------------|---------------|----------------------------|-----------|
| APPLE COMPUTER INC. | SIZE<br>D     | DRAWING NUMBER<br>051-6686 | REV.<br>A |
|                     | SCALE<br>NONE | SHT<br>3                   | OF<br>12  |



### 3V AUDIO POWER SUPPLY



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|      |                |      |
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| SIZE | DRAWING NUMBER | REV. |
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| D | 051-6686 | A |
|---|----------|---|

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|-------|-----|----|
| SCALE | SHT | OF |
| NONE  | 5   | 12 |

## D



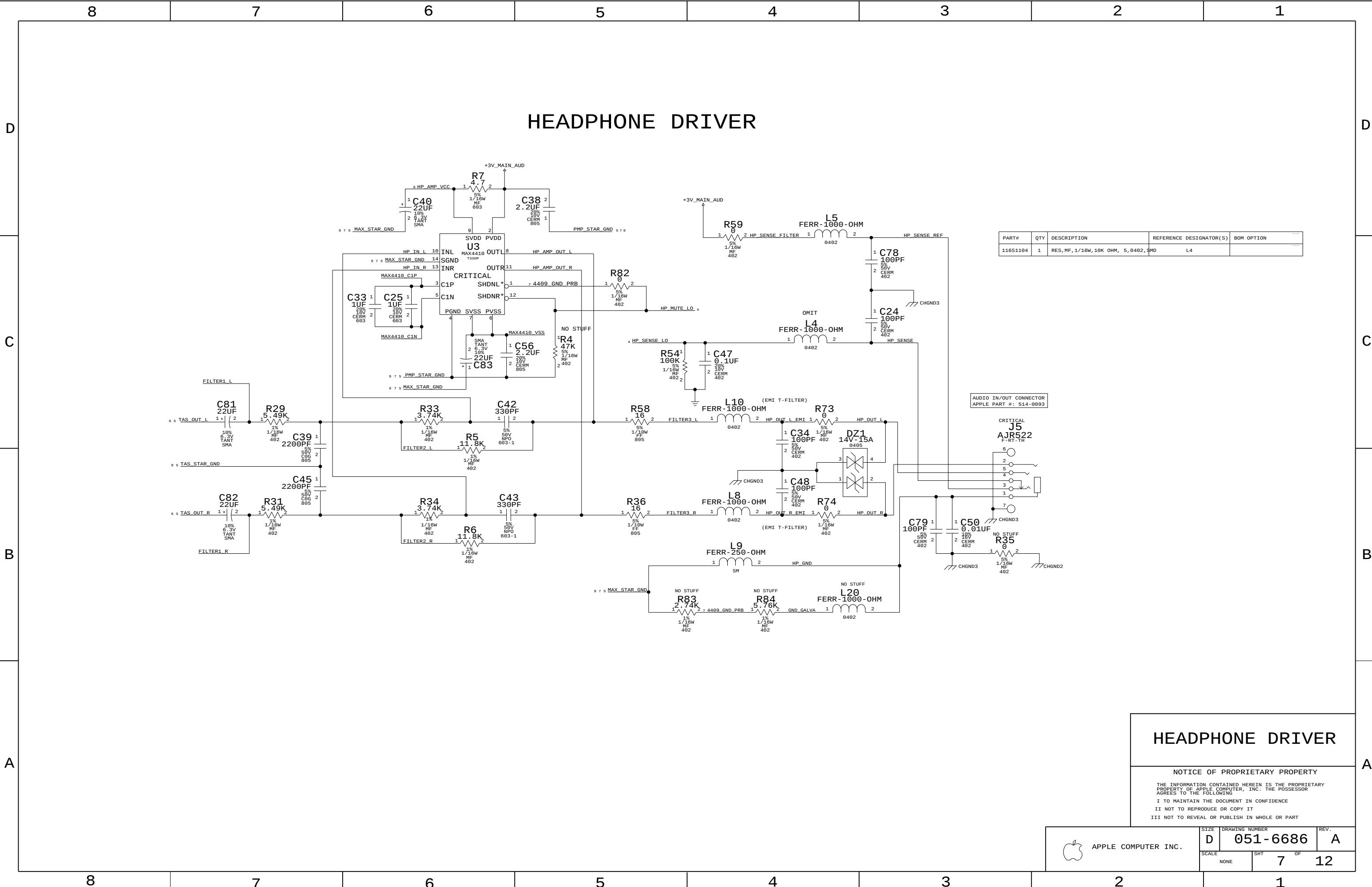
## D

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| PART#    | QTY | DESCRIPTION                        | REFERENCE DESIGNATOR(S) | BOM OPTION |
|----------|-----|------------------------------------|-------------------------|------------|
| 116S1104 | 1   | RES,MF,1/16W,10K OHM, 5, 0402, SMD | L4                      |            |

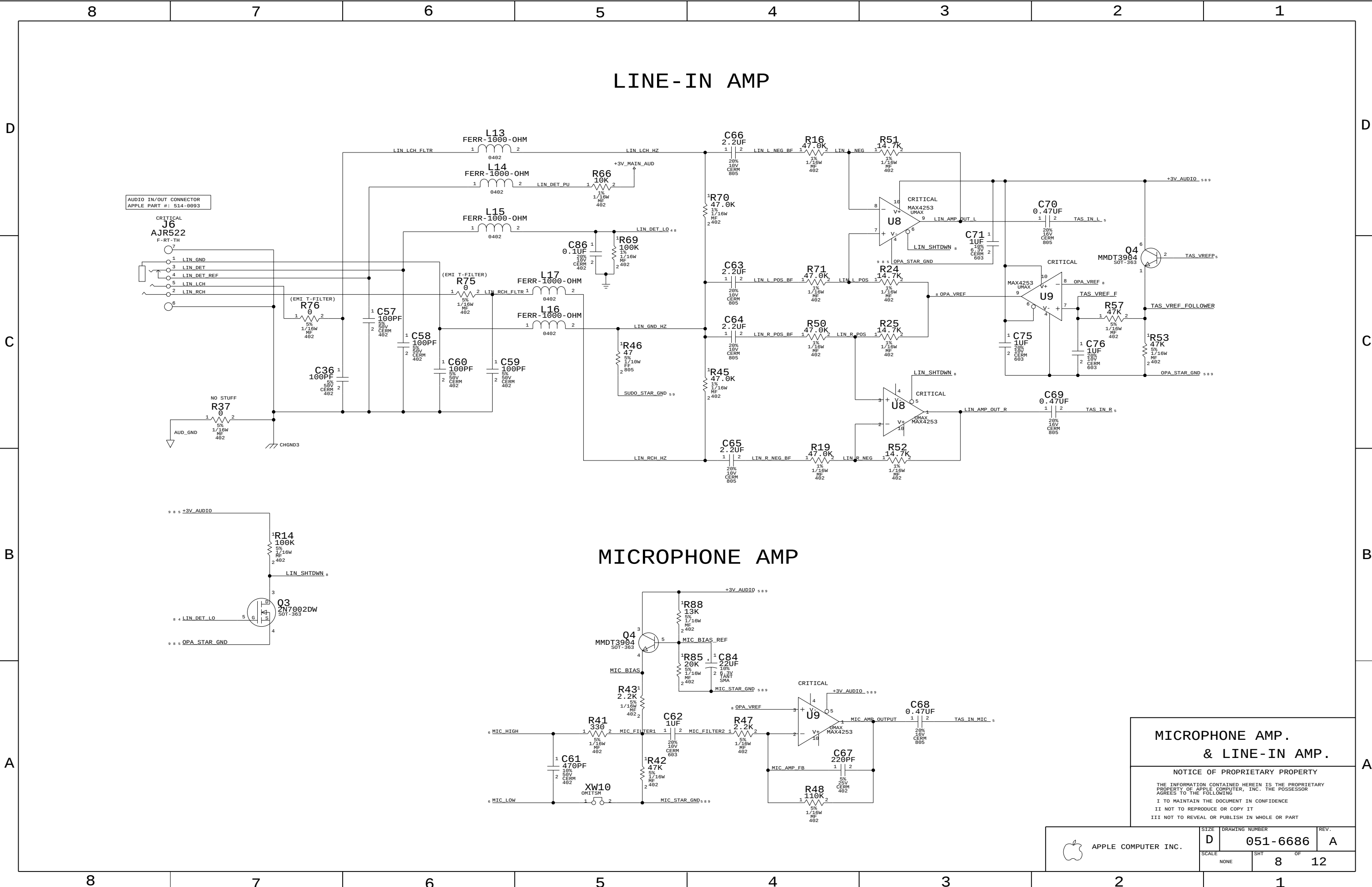
AUDIO IN/OUT CONNECTOR  
APPLE PART #: 514-0093

# HEADPHONE DRIVER

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|---------------------|------|----------------|-----|---------|
| APPLE COMPUTER INC. | SIZE | DRAWING NUMBER |     | REV.    |
|                     | D    | 051-6686       |     | A       |
| SCALE               |      | NONE           | SHT | 7 OF 12 |



LINE-IN AMP

MICROPHONE AMP

MICROPHONE AMP.  
& LINE-IN AMP.

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|                     | D    | 051-6686       | A    |
| SCALE               |      | SHT            | OF   |
| NONE                |      | 8              | 12   |

SIGNAL CONSTRAINTS

| SIGNAL NAME | DIFF_PAIR           | MATCHED_DELAY       | MIN_LINE_WIDTH<br>NET_PHYSICAL_TYPE | NET_SPACING_TYPE |
|-------------|---------------------|---------------------|-------------------------------------|------------------|
| USB_DM      | USB_DIFF_PAIR_STRIP | LENGTH_TOLERANCE=20 | NEC_USB_PAIR                        | 7 MIL SPACING    |
| USB_DP      | USB_DIFF_PAIR_STRIP | LENGTH_TOLERANCE=20 | NEC_USB_PAIR                        | 7 MIL SPACING    |
| USB_DM_EMI  | USB_DIFF_PAIR       | LENGTH_TOLERANCE=20 | NEC_USB_PAIR                        | 7 MIL SPACING    |
| USB_DP_EMI  | USB_DIFF_PAIR       | LENGTH_TOLERANCE=20 | NEC_USB_PAIR                        | 7 MIL SPACING    |
| BT_USB_DM   | BT_USB_DIFF         | LENGTH_TOLERANCE=20 | MIN_LINE_WIDTH=4.7                  | 12.3 MIL SPACING |
| BT_USB_DP   | BT_USB_DIFF         | LENGTH_TOLERANCE=20 | MIN_LINE_WIDTH=4.7                  | 12.3 MIL SPACING |
| I2S0_MCLK   | N/A                 | N/A                 | MIN_LINE_WIDTH=5                    | 9 MIL SPACING    |

LAYER 4 (STRIP LINES)  
E=3.8, W=3.9, B=8.7, T=0.7, S=5.6(IN MIL)  
ZSINGLE = 47.5 OHM  
ZDIFF = 88.0 OHM

LAYER 2 (STRIP LINES)  
E=3.8, W=4.7, H=3, T=0.7, S=12.3(IN MIL)  
ZSINGLE = 45.0 OHM  
ZDIFF = 89.1 OHM

POWER NET CONSTRAINTS

| GROUP        | SIG_NAME           | VOLTAGE          | MIN_LINE_WIDTH    | MIN_NECK_WIDTH    |                   |
|--------------|--------------------|------------------|-------------------|-------------------|-------------------|
| MAIN/SLEEP   | +5V_MAIN_USB       | VOLTAGE=5V       | MIN_LINE_WIDTH=35 | MIN_NECK_WIDTH=10 |                   |
|              | +3V_MAIN_BT        | VOLTAGE=3.3V     | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | +5V_MAIN_AUD       | VOLTAGE=5V       | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 |                   |
|              | +3V_MAIN_AUD       | VOLTAGE=3.3V     | MIN_LINE_WIDTH=20 | MIN_NECK_WIDTH=10 |                   |
| DC ADAPTER   | +ADAPTER           | VOLTAGE=24V      | MIN_LINE_WIDTH=50 | MIN_NECK_WIDTH=10 |                   |
|              | +ADAPTER_UF        | VOLTAGE=24V      | MIN_LINE_WIDTH=50 | MIN_NECK_WIDTH=10 |                   |
|              | +ADAPTER_FUSE      | VOLTAGE=24V      | MIN_LINE_WIDTH=50 | MIN_NECK_WIDTH=10 |                   |
|              | ADAPTER_GND        | VOLTAGE=0V       | MIN_LINE_WIDTH=50 | MIN_NECK_WIDTH=10 |                   |
|              | CHARGE_LED_D       |                  | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | CHARGE_LED_S       |                  | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | DC_PLUG_TIP        |                  | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | DC_PLUG_TIP_UF     |                  | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | USB 2.0            | +5V_USB_LEFT_FLT | VOLTAGE=5V        | MIN_LINE_WIDTH=35 | MIN_NECK_WIDTH=10 |
| +5V_USB_LEFT |                    | VOLTAGE=5V       | MIN_LINE_WIDTH=35 | MIN_NECK_WIDTH=10 |                   |
| AUDIO        | +3V_AUDIO          | VOLTAGE=3V       | MIN_LINE_WIDTH=20 | MIN_NECK_WIDTH=10 |                   |
|              | +3V_TAS_DVDD       | VOLTAGE=3V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | +3V_AUDIO_FILTERED | VOLTAGE=3V       | MIN_LINE_WIDTH=10 | MIN_NECK_WIDTH=5  |                   |
|              | TAS_STAR_GND       | VOLTAGE=0V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | REF_STAR_GND       | VOLTAGE=0V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | OPA_STAR_GND       | VOLTAGE=0V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | PMP_STAR_GND       | VOLTAGE=0V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | MAX_STAR_GND       | VOLTAGE=0V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | MIC_STAR_GND       | VOLTAGE=0V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | SUDO_STAR_GND      | VOLTAGE=0V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | SPKR_STAR_GND      | VOLTAGE=0V       | MIN_LINE_WIDTH=15 | MIN_NECK_WIDTH=10 |                   |
|              | L_SPKR_POS         |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | L_SPKR_POS_UF      |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | L_SPKR_NEG         |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | L_SPKR_NEG_UF      |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | R_SPKR_POS         |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | R_SPKR_POS_UF      |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | R_SPKR_NEG         |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | R_SPKR_NEG_UF      |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | SUB_POS            |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | SUB_POS_UF         |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | SUB_NEG            |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | SUB_NEG_UF         |                  | MIN_LINE_WIDTH=20 |                   |                   |
|              | HP_AMP_VCC         | VOLTAGE=3V       | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=10 |                   |
|              | DC-IN              | AUD_GND          | VOLTAGE=0V        | MIN_LINE_WIDTH=35 | MIN_NECK_WIDTH=10 |
|              |                    |                  | VOLTAGE=0V        | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=6  |
|              |                    | CHGND1           | VOLTAGE=0V        | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=12 |
|              |                    | CHGND2           | VOLTAGE=0V        | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=12 |
|              | USB 2.0            | CHGND3           | VOLTAGE=0V        | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=12 |
|              | AUDIO-OUT          | CHGND4           | VOLTAGE=0V        | MIN_LINE_WIDTH=25 | MIN_NECK_WIDTH=12 |
|              | AUDIO-IN           |                  |                   |                   |                   |

DC-IN

USB 2.0

AUDIO-OUT

AUDIO-IN

SIGNAL & POWER CONSTRAINTS

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APPLE COMPUTER INC.

SIZE D DRAWING NUMBER 051-6686 REV. A

SCALE NONE SHT 9 OF 12

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## REVISION HISTORY

(REV. 01) 07/07/2004 - SCHEMATIC ORIGINATED FROM Q16B LIO

(REV. A) 12/17/2004 - SCHEMATIC RELEASE FOR PRODUCTION

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APPLE COMPUTER INC.

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

+3V\_AUDIO 5C5< 5D2<< 8A3<> 8B4<> 8B7< 8D1<>  
9C2>  
+3V\_AUDIO\_FILTERED 9C2>  
+3V\_MAIN\_AUD 9D2>  
+3V\_MAIN\_BT 9D2>  
+3V\_TAS\_DVDD 5D3< 9C2>  
+5V\_MAIN\_AUD 9D2>  
+5V\_MAIN\_USB 9D2>  
+5V\_USB\_LEFT 4C5<> 9C2>  
+5V\_USB\_LEFT\_FLT 4C5<> 9C2>  
+ADAPTER 3B4< 3C3<> 3C4< 3C6< 9D2>  
+ADAPTER\_FUSE 3B5< 9D2>  
+ADAPTER\_UF 3B7<> 9D2>  
4A89\_SND\_PWB 7B4< 7C5<  
ADAPTER\_DET 3D4< 4B3<>  
ADAPTER\_DET\_D 3B5<  
ADAPTER\_DET\_F 3D5<  
ADAPTER\_DET\_G 3C6<  
ADAPTER\_DET\_UF 3B6<  
ADAPTER\_GND 3B7<> 9D2>  
ADAPTER\_RING 3B7<>  
AUD\_SLEEP\_H 4B2<> 5B4< 5B8<  
AUD\_SLEEP\_R 5B4<  
AUD\_SLEEP\_RC 5B7<>  
BT\_USB\_DM 4B3<> 4C3<> 9C6>  
BT\_USB\_DP 4B3<> 4C3<> 9C6>  
CHARGE\_LED\_D 3C4<> 9D2>  
CHARGE\_LED\_DRV 3C5<>  
CHARGE\_LED\_L 3D4< 4B3<>  
CHARGE\_LED\_L\_ESD 3D5<>  
CHARGE\_LED\_S 3C4<> 9D2>  
DC\_PLUG\_TIP 3B7<> 9D2>  
DC\_PLUG\_TIP\_UF 3B5< 9C2>  
FILTER1\_L 7C7<  
FILTER1\_R 7B7<  
FILTER2\_L 7B6<  
FILTER2\_R 7B6<  
FILTER3\_L 7C5<  
FILTER3\_R 7B5<  
GND\_GALVA 7B4<  
HP\_AMP\_OUT\_L 7C5<>  
HP\_AMP\_OUT\_R 7C5<>  
HP\_AMP\_VCC 7D5<> 9B2>  
HP\_GND 7B4<>  
HP\_IN\_L 7C6<>  
HP\_IN\_R 7C6<  
HP\_MUTE\_LO 4B2<> 7C4<  
HP\_OUT\_L 7C4<>  
HP\_OUT\_L\_EMI 7C4<  
HP\_OUT\_R 7B4<>  
HP\_OUT\_R\_EMI 7B4<  
HP\_SENSE 7C3<>  
HP\_SENSE\_FILTER 7C4<  
HP\_SENSE\_LO 4B3<> 7C5<  
HP\_SENSE\_REF 7C3<>  
I2S0\_LRCK 4B3<> 5B2<>  
I2S0\_MCLK 4B3<> 5B4< 9C6>  
I2S0\_RESET 4B2<> 5B4<  
I2S0\_SCLK 4B2<> 5B2<>  
I2S0\_SND\_FROM\_ADC 4B2<> 5C2<  
I2S0\_SND\_TO\_DAC 4B3<> 5C4<  
INT2\_I2C\_CLK 4B2<> 5B2<>  
LIN\_AMP\_OUT\_L 8C3<>  
LIN\_AMP\_OUT\_R 8C3<>  
LIN\_DET 8C7<>  
LIN\_DET\_LO 4B3<> 8B7<> 8C5<  
LIN\_DET\_PU 8D5<  
LIN\_DET\_REF 8C7<>  
LIN\_GND 8C7<>  
LIN\_GND\_HZ 8C5<  
LIN\_LCH 8C7<>  
LIN\_LCH\_FLTR 8D6<  
LIN\_LCH\_HZ 8D5<  
LIN\_L\_NEG 8D4<>  
LIN\_L\_NEG\_BP 8D4<  
LIN\_L\_POS 8C4<>  
LIN\_L\_POS\_BP 8C4<  
LIN\_RCH 8C7<>  
LIN\_RCH\_FLTR 8C6<  
LIN\_RCH\_HZ 8B5<  
LIN\_R\_NEG 8B4<>  
LIN\_R\_NEG\_BP 8B4<  
LIN\_R\_POS 8C4<>  
LIN\_R\_POS\_BP 8C4<  
LIN\_SHUTDOWN 8B7<> 8C3<> 8C3<>  
LP3985\_BYPASS 5C5<>  
LP3985\_EN 5B7<>  
L\_AMP\_IN\_N 6D6<  
L\_AMP\_IN\_P 6D7<>  
L\_SPKR\_NEG 6C2<> 9B2>  
L\_SPKR\_NEG\_UF 6C3< 6C5< 9B2>  
L\_SPKR\_POS 6C2<> 9B2>  
L\_SPKR\_POS\_UF 6C3< 6D5<> 9B2>  
MAX4418\_CIN 7C6<  
MAX4418\_CLIP 7C6<>  
MAX4418\_VSS 7C5<  
MAX\_STAR\_GND 5B5<> 7B5< 7C6< 7C6< 9C2>  
MIC\_AMP\_FB 8A4<>  
MIC\_AMP\_OUTPUT 8A4<>  
MIC\_BIAS 8A5<>  
MIC\_BIAS\_REF 8A5<>  
MIC\_FILTER1 8A5<  
MIC\_FILTER2 8A4<  
MIC\_HIGH 6C2<> 8A6<  
MIC\_LOW 6C2<> 8A6<  
MIC\_STAR\_GND 5B5<> 8A4<> 8A4< 9C2>  
OPA\_VREF 8A4<> 8C2<> 8C3<>  
PMP\_STAR\_GND 5B5<> 7C3< 7C6<> 9C2>  
REF\_STAR\_GND 5A3< 5C6<> 9C2>  
R\_AMP\_IN\_N 6C6<  
R\_AMP\_IN\_P 6C7<>  
R\_SPKR\_NEG 6C2<> 9B2>  
R\_SPKR\_NEG\_UF 6C3< 6C5< 9B2>  
R\_SPKR\_POS 6C2<> 9B2>  
R\_SPKR\_POS\_UF 6C3< 6C5<> 9B2>  
SPKR\_STAB\_GND 5B5<> 6A7<> 6C7<> 8C7<>  
SUB\_AMP\_IN\_N 6A6<  
SUB\_AMP\_IN\_P 6A7<>  
SUB\_NEG 6B2<> 9B2>  
SUB\_NEG\_UF 6A5< 6B3< 9B2>  
SUB\_POS 6C2<> 9B2>  
SUB\_POS\_UF 6A5<> 6C3< 9B2>  
SUDO\_STAR\_GND 5B5<> 8C5< 9B2>  
TAS\_AINLP 5C4<  
TAS\_AINRP 5C4<  
TAS\_CS1\_PU 5B4<  
TAS\_FILT 9B2<>  
TAS\_IN\_L 5C4< 8C2<  
TAS\_IN\_MIC 5C4< 8A3<  
TAS\_IN\_R 5C4< 8C2<  
TAS\_LPFLT 5C4<  
TAS\_LINB 5C4<  
TAS\_OUT+@ 5C2<>  
TAS\_OUT\_COM 5B2<>  
TAS\_OUT\_L 5C2> 6B7< 6D7< 7C7<  
TAS\_OUT\_R 5C2> 6A7< 6C7< 7B7<  
TAS\_OUT\_SPKR\_L 6D7<  
TAS\_OUT\_SPKR\_R 6C7<  
TAS\_OUT\_Sub\_L 6B7<  
TAS\_OUT\_Sub\_R 6A7<  
TAS\_PLL 5B4<  
TAS\_PLL\_RC 5B5<  
TAS\_RPFLT 5C4<  
TAS\_SOINZ 5C3<  
TAS\_STAR\_GND 5A3< 5C2< 5C5< 5C6<> 7B7< 9C2>  
TAS\_VREFN 5B4<  
TAS\_VREFP 5B4< 8C1<>  
TAS\_VREF\_F 8C2<>  
TAS\_VREF\_FOLLOWER 8C1<>  
USB\_DM 4B2<> 4B7<> 9D6>  
USB\_DM\_EMI 4B6<> 9D6>  
USB\_DP 4B2<> 4B7<> 9D6>  
USB\_DP\_EMI 4B6<> 9D6>  
USB\_GND 4B5<>  
USB\_OC1<1> 4B3<> 4C6>  
USB\_PPON<1> 4B3<> 4C7<

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| 8 |                                                    | 7                    |   | 6   |                    | 5 |     | 4                  |   | 3   |                    | 2 |     | 1                  |   |   |
|---|----------------------------------------------------|----------------------|---|-----|--------------------|---|-----|--------------------|---|-----|--------------------|---|-----|--------------------|---|---|
| D | *** Part Cross-Reference for the entire design *** |                      |   |     |                    |   |     |                    |   |     |                    |   |     |                    | D |   |
|   | B51                                                | PCB_STANDOFF         | 2 | R39 | RES                | 6 | R40 | RES                | 6 | R41 | RES                | 8 | R42 | RES                |   | 8 |
|   | C1                                                 | CAP_P                | 4 | R43 | RES                | 8 | R44 | RES                | 6 | R45 | RES                | 8 | R46 | RES                |   | 8 |
|   | C2                                                 | CAP                  | 3 | R47 | RES                | 8 | R48 | RES                | 8 | R49 | RES                | 6 | R50 | RES                |   | 8 |
|   | C3                                                 | CAP                  | 3 | R51 | RES                | 8 | R52 | RES                | 8 | R53 | RES                | 8 | R54 | RES                |   | 7 |
|   | C4                                                 | CAP                  | 6 | R55 | RES                | 6 | R56 | RES                | 6 | R57 | RES                | 8 | R58 | RES                |   | 7 |
|   | C5                                                 | CAP                  | 6 | R59 | RES                | 7 | R60 | RES                | 6 | R61 | RES                | 6 | R62 | RES                |   | 6 |
|   | C6                                                 | CAP                  | 6 | R63 | RES                | 6 | R64 | RES                | 6 | R65 | RES                | 6 | R66 | RES                |   | 8 |
|   | C7                                                 | CAP                  | 3 | R67 | RES                | 5 | R68 | RES                | 5 | R69 | RES                | 8 | R70 | RES                |   | 8 |
|   | C8                                                 | CAP                  | 3 | R71 | RES                | 8 | R72 | RES                | 5 | R73 | RES                | 7 | R74 | RES                |   | 7 |
| C | C9                                                 | CAP                  | 3 | R75 | RES                | 8 | R76 | RES                | 8 | R77 | RES                | 5 | R78 | RES                | 5 |   |
|   | C10                                                | CAP                  | 5 | R81 | RES                | 5 | R82 | RES                | 7 | R83 | RES                | 7 | R84 | RES                | 7 |   |
|   | C11                                                | CAP                  | 4 | R85 | RES                | 8 | R88 | RES                | 8 | SP1 | SPRING_CLIP_IP_EMI | 2 | SP2 | SPRING_CLIP_IP_EMI | 2 |   |
|   | C12                                                | CAP                  | 5 | SP3 | SPRING_CLIP_IP_EMI | 2 | SP4 | SPRING_CLIP_IP_EMI | 2 | U1  | SMT_MTC2825        | 4 | U2  | AUDIO_LM4991LD     | 6 |   |
|   | C13                                                | CAP                  | 4 | U3  | MAX4418            | 7 | U4  | AUDIO_LM4991LD     | 6 | U5  | TAS3884            | 5 | U6  | AUDIO_LM4991LD     | 6 |   |
|   | C14                                                | CAP                  | 4 | U8  | OPAMP_MAX4253      | 8 | U9  | OPAMP_MAX4253      | 8 | V82 | VREG_LP3985        | 5 | X81 | SHORT              | 5 |   |
|   | C15                                                | CAP                  | 4 | X82 | SHORT              | 5 | X83 | SHORT              | 5 | X84 | SHORT              | 5 | X86 | SHORT              | 5 |   |
|   | C16                                                | CAP                  | 5 | X87 | SHORT              | 5 | X88 | SHORT              | 5 | X89 | SHORT              | 5 | X90 | SHORT              | 8 |   |
|   | C17                                                | CAP                  | 5 | ZT2 | MTGHOLE            | 2 |     |                    |   |     |                    |   |     |                    |   |   |
|   | C18                                                | CAP_P                | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
| B | C19                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C20                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C21                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C22                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C23                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C24                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C25                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C26                                                | CAP_P                | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C27                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C28                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
| A | C29                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C30                                                | CAP_P                | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C31                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C32                                                | CAP_P                | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C33                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C34                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C36                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C37                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C38                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C39                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C40                                                | CAP_P                | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C41                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C42                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C43                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C44                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C45                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C46                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C47                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C48                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C49                                                | CAP_P                | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C50                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C52                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C53                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C54                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C55                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C56                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C57                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C58                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C59                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C60                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C61                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C62                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C63                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C64                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C65                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C66                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C67                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C68                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C69                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C70                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C71                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C72                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C73                                                | CAP                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C74                                                | CAP                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C75                                                | CAP                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C76                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C77                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C78                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C79                                                | CAP                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C80                                                | CAP_P                | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C81                                                | CAP_P                | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C82                                                | CAP_P                | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C83                                                | CAP_P                | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C84                                                | CAP_P                | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C86                                                | CAP                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C87                                                | CAP                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C88                                                | CAP                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C89                                                | CAP_P                | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C90                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C91                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C92                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C93                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C94                                                | CAP                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C96                                                | CAP                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C97                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C98                                                | CAP                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | C99                                                | CAP                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | D1                                                 | ZENER                | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | D21                                                | SUPPL_TRANSIENT_4P1  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | F1                                                 | FUSE                 | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | J1                                                 | CON_FSR1_S2MT_TH3    | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | J2                                                 | CON_M48ST_D4MT_SM    | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | J3                                                 | CON_F4RT_USB_S2MT_TH | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | J4                                                 | CON_M4ST_S_DP        | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | J5                                                 | CON_FSR1_S2MT_TH2    | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | J6                                                 | CON_FSR1_S2MT_TH2    | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | J7                                                 | CON_FSR1_S2MT_OR     | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | J8                                                 | CON_4RT_MR1B         | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L1                                                 | IND                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L2                                                 | IND                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L3                                                 | IND                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L4                                                 | IND                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L5                                                 | IND                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L6                                                 | FILTER_4P            | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L7                                                 | IND                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L8                                                 | IND                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L9                                                 | IND                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L10                                                | IND                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L13                                                | IND                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L14                                                | IND                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L15                                                | IND                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L16                                                | IND                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L17                                                | IND                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L18                                                | IND                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L19                                                | IND                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | L20                                                | IND                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | Q1                                                 | TRA_2N7002           | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | Q2                                                 | TRA_2N7002DM         | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | Q3                                                 | TRA_2N7002DM         | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | Q4                                                 | TRA_DUAL_MMOT3984    | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R1                                                 | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R2                                                 | RES                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R3                                                 | RES                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R4                                                 | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R5                                                 | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R6                                                 | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R7                                                 | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R8                                                 | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R9                                                 | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R10                                                | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R11                                                | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R12                                                | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R13                                                | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R14                                                | RES                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R15                                                | RES                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R16                                                | RES                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R17                                                | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R18                                                | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R19                                                | RES                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R20                                                | RES                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R21                                                | RES                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R22                                                | RES                  | 3 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R23                                                | RES                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R24                                                | RES                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R25                                                | RES                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R26                                                | RES                  | 4 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R27                                                | RES                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R28                                                | RES                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R29                                                | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R31                                                | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R32                                                | RES                  | 6 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R33                                                | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R34                                                | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R35                                                | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R36                                                | RES                  | 7 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R37                                                | RES                  | 8 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | R38                                                | RES                  | 5 |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | 12                                                 |                      |   |     |                    |   |     |                    |   |     |                    |   |     |                    |   |   |
|   | 8                                                  |                      | 7 |     | 6                  |   | 5   |                    | 4 |     | 3                  |   | 2   |                    | 1 |   |