



Studio L Series

L8400P

Amplifier/Subwoofer

SERVICE MANUAL



JBL Consumer Products
250 Crossways Park Dr.
Woodbury, New York 11797

Rev1 3/2006

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L8400P BASIC SPECIFICATIONS

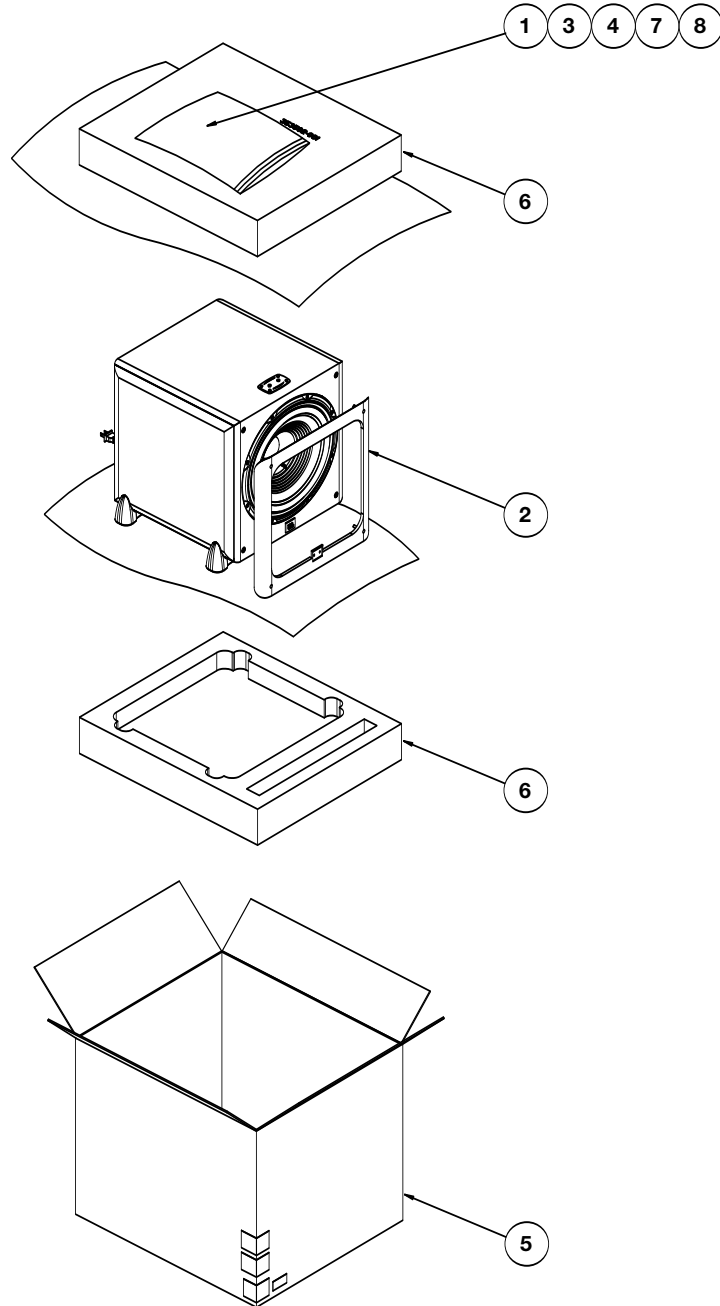
| | |
|---------------------------------------|--|
| Amplifier Power (RMS) | 600 Watts |
| Peak Dynamic Power * | 1200 Watts |
| Frequency Response (-3dB) | 22Hz – Low-pass crossover frequency |
| Low-Pass Crossover Frequencies | 50Hz – 150Hz, Continuously adjustable |
| Low-Frequency Transducer | 12" (300mm) PolyPlas™ cone |
| Baffle | Low diffraction, IsoPower™ |
| Enclosure | Sealed |
| Inputs | Gold-plated 5-way binding-post speaker-level; Left and right line-level, switchable to LFE |
| Outputs | 150Hz when using speaker-level connection Gold-plated 5-way binding-posts |
| Dimensions (H x W x D) | 16-1/2" (15-1/2" without feet) x 15-1/2" x 15-1/2" (419mm [394mm without feet] x 394mm x 394mm) |
| Weight | 58 lb (26.4kg) |

* The Peak Dynamic Power is measured by recording the highest peak-to-center voltage produced by the power amplifier with its limiters disabled, across the output of a resistive load equal to minimum impedance of the transducer, using a 50Hz sine waveburst, 3 cycles on, 17 cycles off.

Occasional refinements may be made to existing products without notice but will always meet or exceed original specifications unless otherwise stated



L8400P Packaging

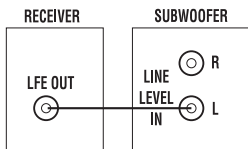


| ITEM NO. | DESCRIPTION | QTY. | PART NO. | ITEM NO. | DESCRIPTION | QTY. | PART NO. |
|----------|-----------------------------|------|------------|----------|-------------------------------|------|------------|
| 1. | Owner's Manual | 1 | 354038-001 | 6. | Pad, Foam, Top, Bottom L8400P | 2 | 353592-001 |
| 2. | Front Grille | 1 | 353234-001 | 7. | Y-Adapter Cable | 1 | 354058-001 |
| 3. | Warranty Card, JBL 5YR/1YR | 1 | 338381-001 | 8. | Foot, Bump-On 3M, SJ5744 | 4 | 330104-001 |
| 4. | Kit, Spike Foot | 4 | 354432-001 | | | | |
| 5. | L8400P Outer Carton, Black | 1 | 353588-001 | | | | |
| | L8400P Outer Carton, Beech | 1 | 353588-002 | | | | |
| | L8400P Outer Carton, Cherry | 1 | 353588-003 | | | | |

| L8400P Powered Sub/ Plate Amp | | | | | |
|--|--------|------------|----------------|--|---|
| LINE VOLTAGE | Yes/No | Hi/Lo Line | Nom. | Unit | Notes |
| US 120VAC/60Hz | Yes | 108-132 | 120 | Vrms | Normal Operation |
| EU 230VAC/50-60Hz | Yes | 207-264 | 230 | Vrms | Normal operation, MOMS required |
| Parameter | Spec. | Unit | QA Test Limits | Conditions | Notes |
| Amp Section | | | | | |
| Type (Class AB, D, other) | D | n/a | n/a | | Bridge type amplifier, None of the speaker terminals must be connected to system GND at any time. |
| Load Impedance (speaker) | 4 | Ohms | n/a | Nominal | |
| Rated Output Power | 450 | Watts | 380 | 1 input driven | Measuring 425 Watts Cold |
| THD @ Rated Power | 0.5 | % | 1 | 22K filter | |
| THD @ 1 Watt | 0.1 | % | 0.2 | 22K filter | |
| Dynamic Power | 460 | Watts | 450 | Power is the average measurement of the first four consecutive peaks of the burst signal | 3/20 Cycles @ 50 Hz, burst test into 4 Ohms, input driven 6dB above its maximum sensitivity, volume level at Maximum. |
| DC Offset | 80 | mV-DC | 100 | @ Speaker Outputs | |
| Damping factor | >20 | DF | 15 | Measured at amplifier board | Measured at the speaker cable. 200 Watts, measured at speaker output terminals located at the amp board. |
| Input Sensitivity | | | | | |
| Input Frequency | 50 | Hz | 30 | Nominal Freq. | |
| Left or Right inputs | 16.6 | mVrms | ±2dB | To 1 Watt | Single input driven, Ap Zo=600 Ohms, LP ON, Volume ctrl & crossover at max |
| Left & Right with LFE or LP filter OFF Mode selected | 16.6 | mVrms | ±2dB | To 1 Watt | Single input driven, Ap Zo=600 Ohms, LP OFF, Volume ctrl & crossover at max |
| Speaker/Hi Level Input | 165 | mVrms | ±2dB | To 1 Watt | Single input driven, Ap Zo=25 Ohms, Normal, Volume ctrl & crossover at max |
| Signal to Noise | | | | | |
| SNR-A-Weighted | 100 | dBA | 90 | Relative to rated power (400 Watts) | A-Weighting filter |
| SNR-unweighted | 95 | dBr | 85 | Relative to rated power (400 Watts) | 22K filter |
| SNR rel. 1W-unweighted | 70 | dBr | 65 | Relative to 1W Output | 22K filter |
| Residual Noise Floor | 0.5 | mVrms | 1 | Volume @max, using RMS reading DMM/VOM (or A/P) | |
| Residual Noise Floor | 0.5 | mVrms(max) | 1 | Volume @max, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics) | |
| Speaker input rejection | | | | 1.0V + RMS applied to + & - inputs | |
| CMRR Speaker in | >37 | dB | Reference | 50 Hz, Generator GND to system GND | |
| Input Impedance | | | | | |
| Line Input (L, R,LFE) | 10K | ohms | n/a | Nominal | |
| Speaker/Hi Level Input | 10K | ohms | n/a | Nominal | |
| Filters | | | | | |
| LP 4th order variable | 50-150 | Hz | ± 10 | | |
| Subsonic filter (HPF) 3rd Order | Fixed | Hz | ± 10 | | |
| Low pass filter OFF | Fixed | Hz | ± 20 | L or R input driven, LP Filter OFF | |
| HP Speaker output 4 Ohms | 200 | Hz | ± 10 | Speaker output loaded with 4 Ohms | |
| HP Speaker output 8 Ohms | 100 | Hz | ± 10 | Speaker output loaded with 8 Ohms | |
| Limiter | | | | | |
| THD at Max. Output Power | YES | n/a | functional | | |
| Features | | | | | |
| Auto - On -Off | YES | -- | functional | | No switch to select the ATO mode is provided, Refer to ATO section |

| Parameter | Spec. | Unit | QA Test Limits | Conditions | Notes |
|--|-------|---------|----------------|---|---|
| Amp Section | | | | | |
| Phase switch | 0-180 | deg | functional | | |
| Volume pot Taper (lin/log) | LOG | -- | functional | | 5K A Taper |
| Variable crossover 50-150 Hz | YES | | functional | | 4th Order LP Filter, 2nd order fix and 2nd order variable. |
| HP Speaker out | YES | | functional | | Pass through from the speaker input section |
| LP On- Off Select switch | YES | -- | functional | | Disables LP filter, intended for LFE |
| On-Off indicators | YES | | functional | | Unit is provided with 2 LED's BLU-ON, RED-OFF |
| Input Configuration | | | | | |
| Line In (L,R) & LFE | YES | -- | functional | | Dual RCA jack, L or R is used in LFE mode |
| Spkr/Hi Level In | YES | -- | functional | | Binding post connector L&R |
| Signal Sensing (ATO) | | | | | |
| Auto-Turn-On (yes/no) | YES | | functional | Auto - on selection switch in Auto | |
| ATO Input test frequency | 50 | Hz | functional | " | |
| Min ATO Level L or R Inputs | 3 | mV | functional | " | Single input driven |
| Min ATO Level Speaker in L or R inputs | 30 | mV | functional | " | Single input driven |
| ATO Turn-on time | 2 | seconds | functional | Amp connected and AC on, then input signal applied | |
| Auto Mute/ Turn-OFF Time | 5 | minutes | 17 | (T) Time before muting, after minimum ATO signal is removed (3mV) | Auto turn of time (T) must be 5 > T < 17 Minutes |
| Auto Mute/ Turn-OFF Time | 15 | Minutes | 17 | (T) Time before muting, after input signal is removed | Auto turn of time (T) must be 10 > T < 17 Minutes |
| Power on Delay time | | | | | |
| | 2 | sec. | 4 | AC Power Applied | |
| Transients/Pops | | | | | |
| ATO Transient | 5 | mV-peak | n/a | @ Speaker Outputs | |
| Turn-on Transient | 50 | mV-peak | 1V-pk-pk | @ Speaker Outputs | AC Line cycled from OFF to ON |
| Turn-off Transient | 50 | mV-peak | 1V-pk-pk | @ Speaker Outputs | AC Line cycled from ON to OFF |
| Efficiency | | | | | |
| Efficiency | 68 | % | 65 | 400W of output power | Nominal Line voltage 120 VAC |
| Stand-by Input Power | 18 | Watts | 20 | @ nominal line voltage, Amp in OFF state, RED LED activated | Maximum allowable input power LED in RED, Class D inactive |
| Stand-by Input Power | 22 | Watts | 25 | @ nom. line voltage, Amp in On state, Green LED activated | Maximum allowable input power under nominal Input voltage and frequency, in stand-by mode (HOT or COLD operation, LED GREEN). Class D active but no signal applied. |
| Power Cons. @ 400W | 584 | Watts | 615 | @ nom. line voltage | 400 Watts into 4 Ohms nominal line voltage |
| Protection | | | | | |
| Thermal Protection | YES | | functional | @ 1/8 max unclipped Power | Temperature rise in accessible metal parts should not exceed 35K rise for domestic version or 30K rise for European versions (refer to requirements sheet). Unit is protected for over-temperature conditions |
| DC Offset Protection | YES | | - | DC present at Speaker Out leads | Relay opens during a DC output condition |
| Line Fuse Rating | | | | | |
| USA-Domestic | 5 | Amps | | Type-T or Slo Blo-250 V | |
| EU | 2.5 | Amps | | Type-T , Low Breaking capacity-250 V | Internal fuse with UL/SEMKO rated holder |

DOLBY® DIGITAL OR DTS® (OR OTHER DIGITAL SURROUND MODE) CONNECTION



Use this installation method for Dolby Digital, DTS or other digital surround processors:

Use either the left or right line-level input jack for the Low-Frequency Effects channel; it doesn't matter which one you choose.

IMPORTANT: Make sure that the LFE/Normal toggle switch **5** is in the "LFE" position. This will bypass the subwoofer's normal low-pass filter, reducing the possibility of signal degradation and more accurately reproducing the program materials. However, if your receiver is passing a full-range signal through its subwoofer output, place the toggle switch in the "Normal" position, which will activate the low-pass filter and protect

the subwoofer from possible damage. Connect this jack to the LFE output or subwoofer output on your receiver or amplifier. Connect each speaker to the corresponding speaker terminals on your receiver or amplifier.

Make sure that you have configured your surround sound processor for "Subwoofer On." Also, remember to configure your receiver for 5.1-, 6.1- or 7.1-channel operation as appropriate.

DOLBY PRO LOGIC® (NON-DIGITAL) – LINE LEVEL

Use this installation method for Dolby Pro Logic applications (not Dolby Digital, DTS or other digital processing), where the receiver/processor is equipped with a subwoofer output, or a volume-controlled preamp (line-) level output:

Use RCA-type interconnects to connect the line-level subwoofer outputs on your receiver or amplifier to the line-level inputs on the sub-

woofer. **IMPORTANT:** Make sure that the LFE/Normal toggle switch **5** is in the "Normal" position. This will activate the subwoofer's low-pass filter, protecting the subwoofer from possible damage and enabling it to operate most efficiently by reproducing only the low-frequency materials that it is best at handling.

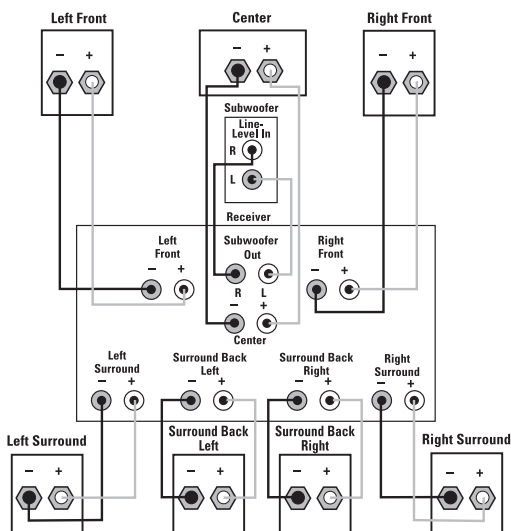
NOTE: If your receiver or amplifier only has one sub-

woofer output jack, then you will need to use a Y-connector (not included). Plug the male end of the Y-connector into your receiver or amplifier's subwoofer output jack, and connect each of the two female ends to separate RCA-type interconnects. Finally, plug the RCA-type interconnects into the line-level inputs on the subwoofer.

Connect each speaker to the corresponding speaker terminals on your receiver or amplifier.

Make sure your receiver or processor is correctly configured to indicate that the subwoofer is "On."

Note for advanced users: If your receiver/processor has a built-in low-pass crossover filter for the subwoofer output, you may switch the LFE/Normal toggle switch to the "LFE" position to bypass the subwoofer's internal crossover.

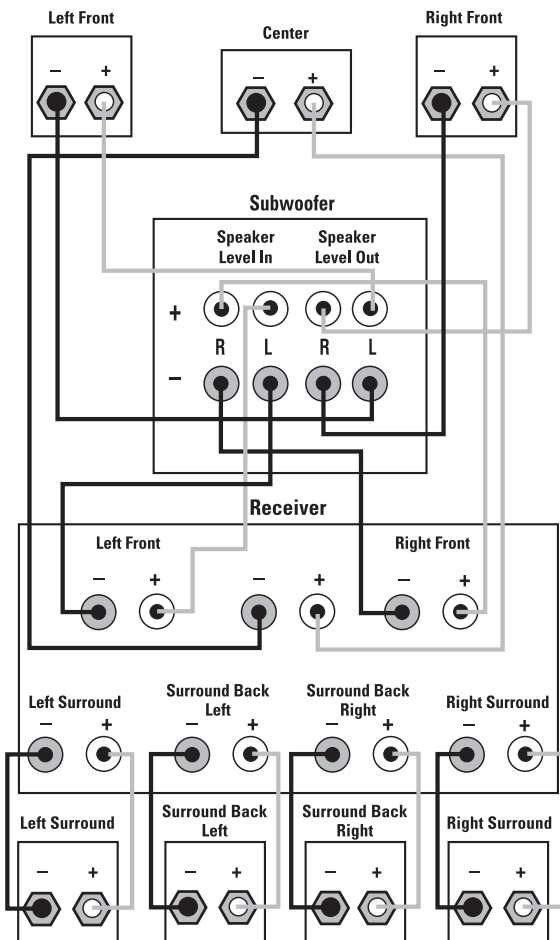


DOLBY PRO LOGIC (NON-DIGITAL) – SPEAKER LEVEL

Use this installation method for Dolby Pro Logic applications (not Dolby Digital, DTS or other digital processing), where the receiver/processor does not have a subwoofer output, or a volume-controlled preamp (line-) level output:

Connect your receiver or amplifier's front left and right speaker terminals to the left and right terminals on the subwoofer that are marked "Speaker Level In." Connect the left and right terminals on the subwoofer that are marked "Speaker Level Out" to the corresponding terminals on the back of your front left and right speakers.

Connect your receiver or amplifier's center, surround and surround back speaker terminals to the corresponding terminals on the back of your center and surround speakers.



OPERATION

Power

Move the Master Power switch **4** to the "On" position to use the L8400P subwoofer.

If you will be away from home for an extended period of time, or if the subwoofer will not be

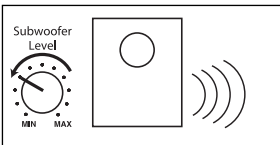
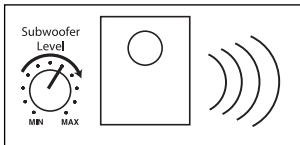
used, switch the Master Power switch **4** to the "Off" position.

Level Control

The subwoofer Level Control **3** adjusts the volume of the subwoofer relative to the rest of the system. Proper level

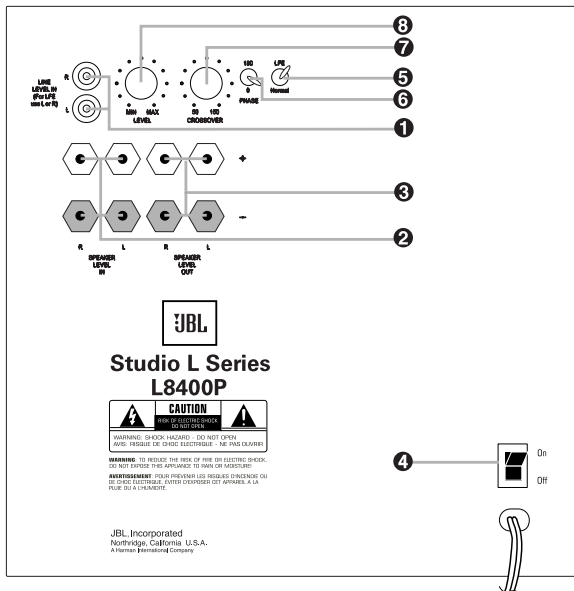
adjustment depends on several variables such as room size, subwoofer placement, type of main speakers and

position. Adjust the subwoofer level so that the volume of the bass information is pleasing to you.



Crossover Adjustments

The Crossover Frequency Control **7** determines the highest frequency at which the subwoofer reproduces sounds. If your main speakers can comfortably reproduce some low-frequency sounds, set this control to a lower frequency setting, between 50Hz and 100Hz. This will concentrate the subwoofer's efforts on the ultradeep bass sounds required by today's films and music. If you are using smaller bookshelf speakers that do not extend to the lower bass frequencies, set the low-pass crossover control to a higher setting, between 120Hz and 150Hz. This control is not used when the LFE switch **5** is in the "LFE" position.



Phase Control



The Phase Control **6** determines whether the subwoofer's pistonlike action moves in and out in phase with the main speakers or opposite the main speakers. There is no correct or incorrect setting. Proper phase adjustment depends on several variables such as subwoofer placement and listener position. Adjust the

Phase switch to maximize bass output at the listening position.

Remember, every system, room and listener is different. There are no right or wrong settings; this switch offers the added flexibility to adjust your subwoofer for optimum performance for your specific listening conditions without

having to move your speakers. If at some time in the future you happen to rearrange your listening room and move your speakers, you should experiment with the Phase switch in both positions, and leave it in the position that maximizes bass performance.

TROUBLESHOOTING

If you used the high-level (speaker) inputs and there is no sound from any of the speakers:

- Check that the receiver/amplifier is on and a source is playing.
- Check that the powered subwoofer is plugged into an active electrical outlet and is switched on.
- Check all wires and connections between the receiver/amplifier and the speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured, or touching each other.
- Review proper operation of your receiver/amplifier.

If there is low (or no) bass output:

- Make sure the connections to the left and right "Speaker Inputs" have the correct polarity (+ and -).
- Make sure that the subwoofer is plugged into an active electrical outlet and switched on.
- Adjust the crossover point.
- Flip the Phase Control switch to the opposite position.
- If you are using a Dolby Digital/DTS receiver or processor, make sure that the subwoofer and bass management adjustments on the receiver/processor are set up correctly.
- Slowly turn the Level Control clockwise until you begin to hear the desired amount of bass.

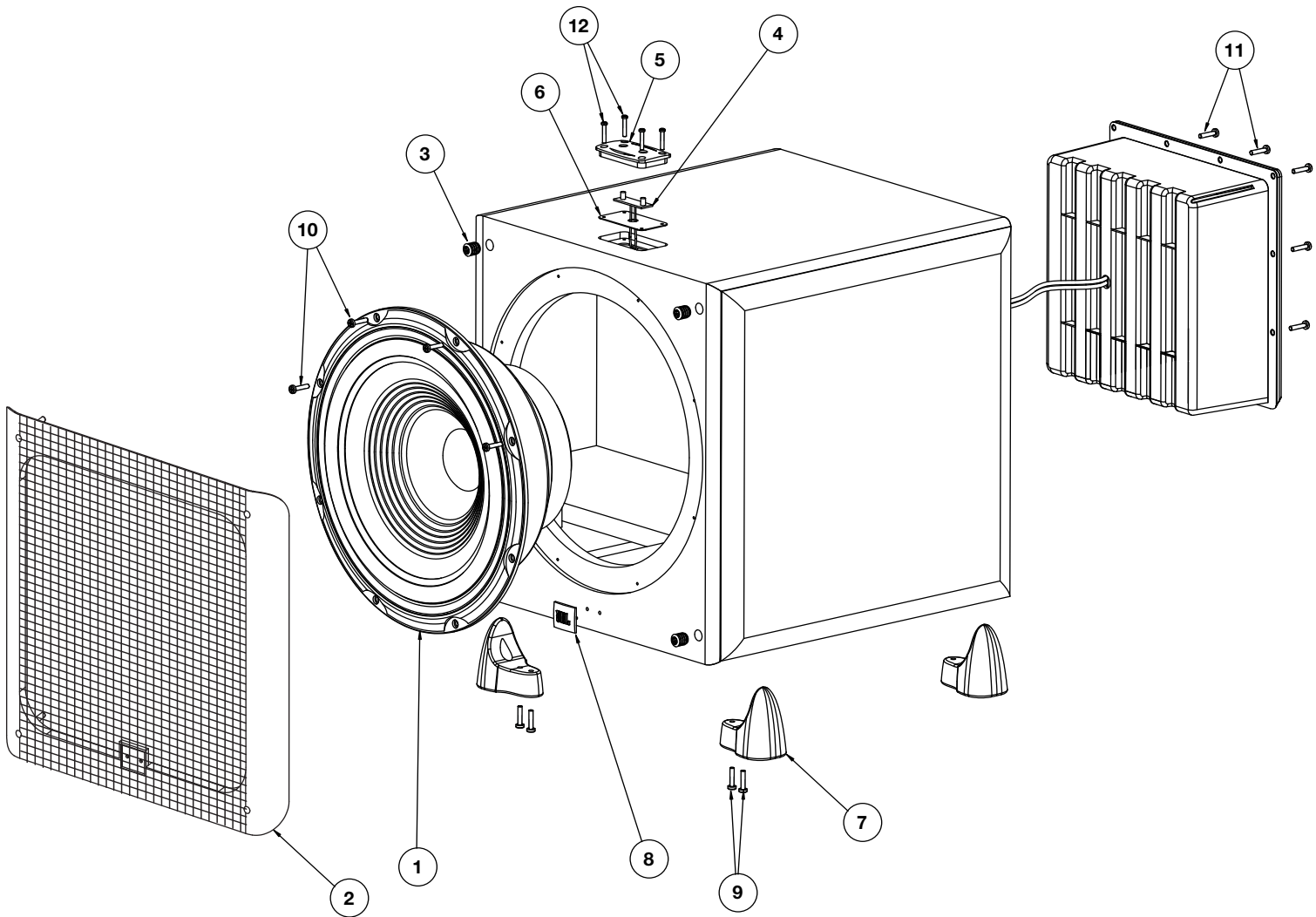
If you used the line-level inputs and there is no sound from the subwoofer:

- Check that the receiver/amplifier is on and a source is playing.
- Check that the powered subwoofer is plugged into an active electrical outlet and is switched on.
- Check all wires and connections between the receiver/amplifier and the subwoofer. Make sure all wires are connected. Make sure none of the wires are frayed, cut or punctured, or touching each other.
- Review proper operation of your receiver/amplifier.
- Slowly turn the Level Control clockwise until you begin to hear the desired amount of bass.
- Make sure that you have configured your receiver/processor so that the subwoofer/LFE output is on.



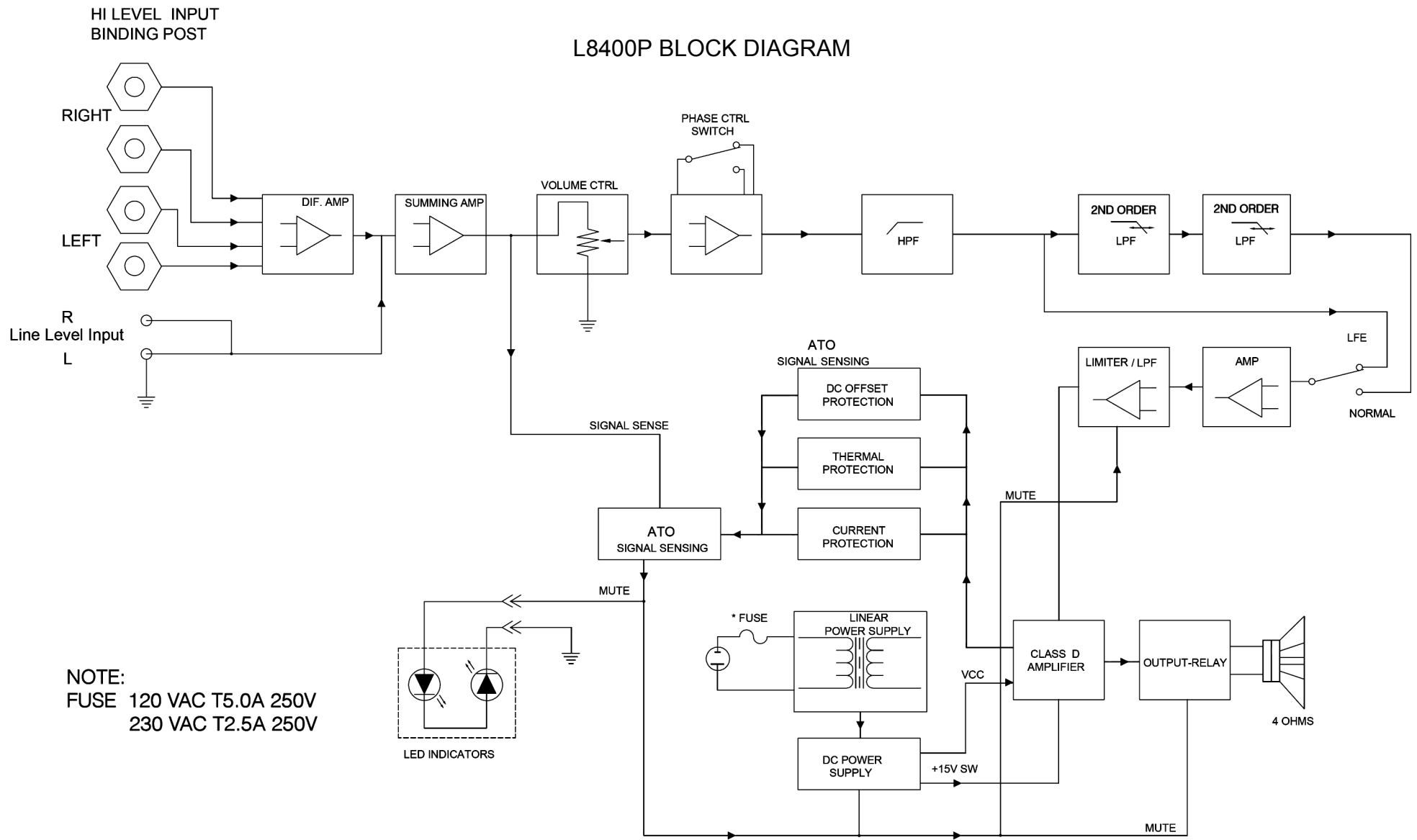
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Exploded View

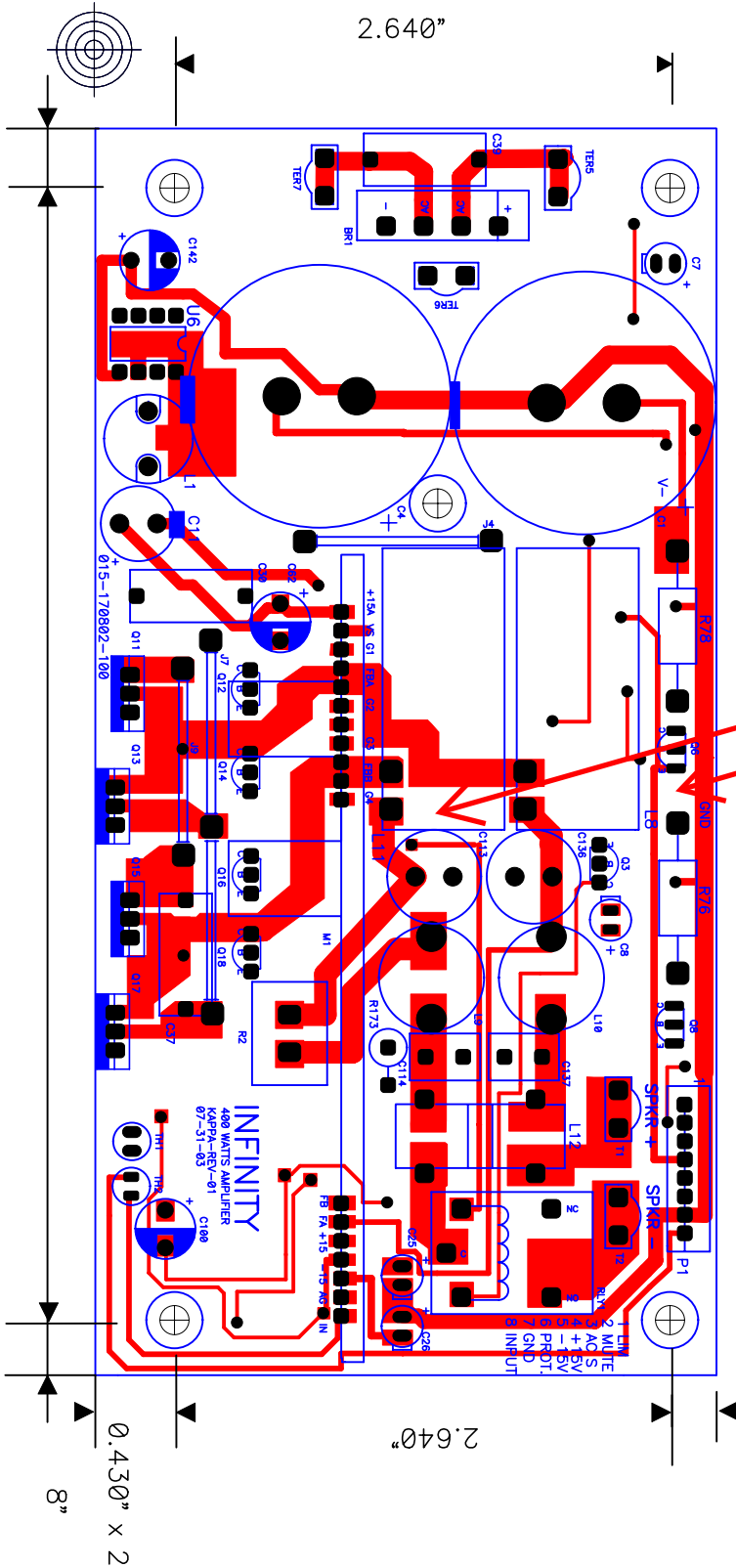


| ITEM NO. | DESCRIPTION | QTY. | PART NO. | ITEM NO. | DESCRIPTION | QTY. | PART NO. |
|----------|-----------------------------------|------|------------|----------|--|------|------------|
| 1. | Woofer Assembly 12" DCR=3.7Ω ±10% | 1 | 353112-001 | 7. | Assembly, Foot | 4 | 353354-001 |
| 2. | Front Grille | 1 | 353234-001 | 8. | Assembly, Logo | 1 | 353284-001 |
| 3. | Grille Cup, BLK | 4 | 333249-001 | 9. | Screw (Foot) #8 X 1, PB, TRPH CR BLK | 8 | 903101-016 |
| | Grille Cup, BE & CH | 4 | 333249-003 | 10. | Screw (Woofer) #8 X 3/4," PB, HXS, ZINC | 8 | 903802-012 |
| 4. | LED Wire Assembly | 1 | 354288-001 | 11. | Screw (Amplifier) #8 X 1, PPH, PB, BLK | 12 | 900101-016 |
| 5. | Plate LED | 1 | 353356-001 | 12. | Screw (LED Plate) #6 X 3/4," PB, HXS, ZINC | 4 | 908302-012 |
| 6. | Gasket, Plate LED | 1 | 353589-001 | | | | |

L8400P BLOCK DIAGRAM

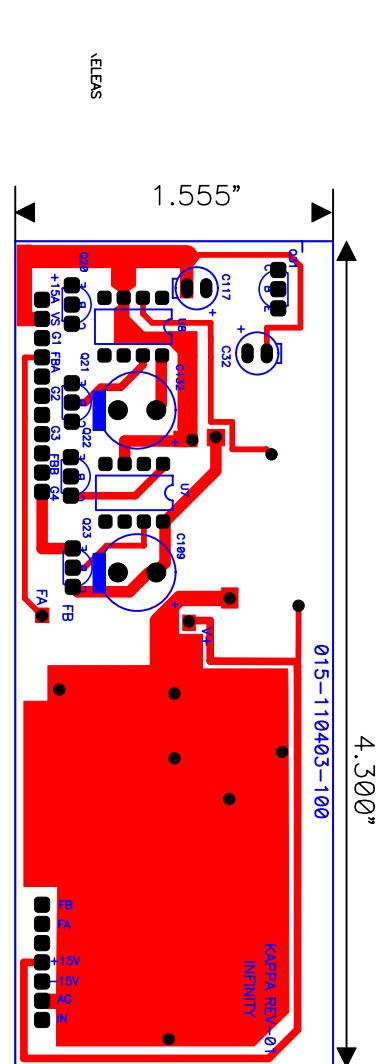


NOTE:
 FUSE 120 VAC T5.0A 250V
 230 VAC T2.5A 250V

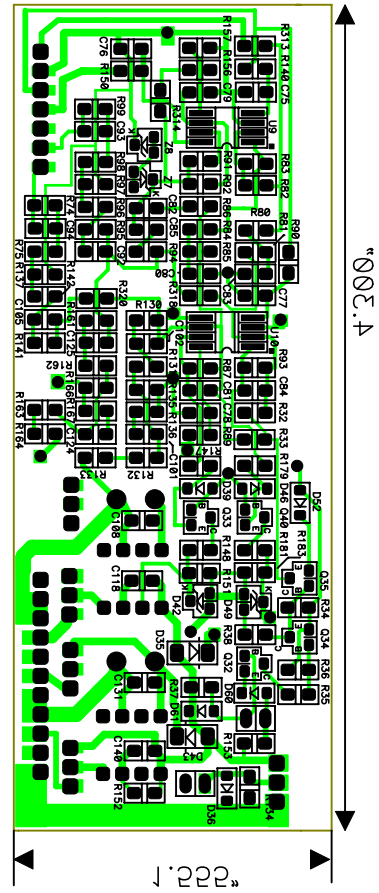
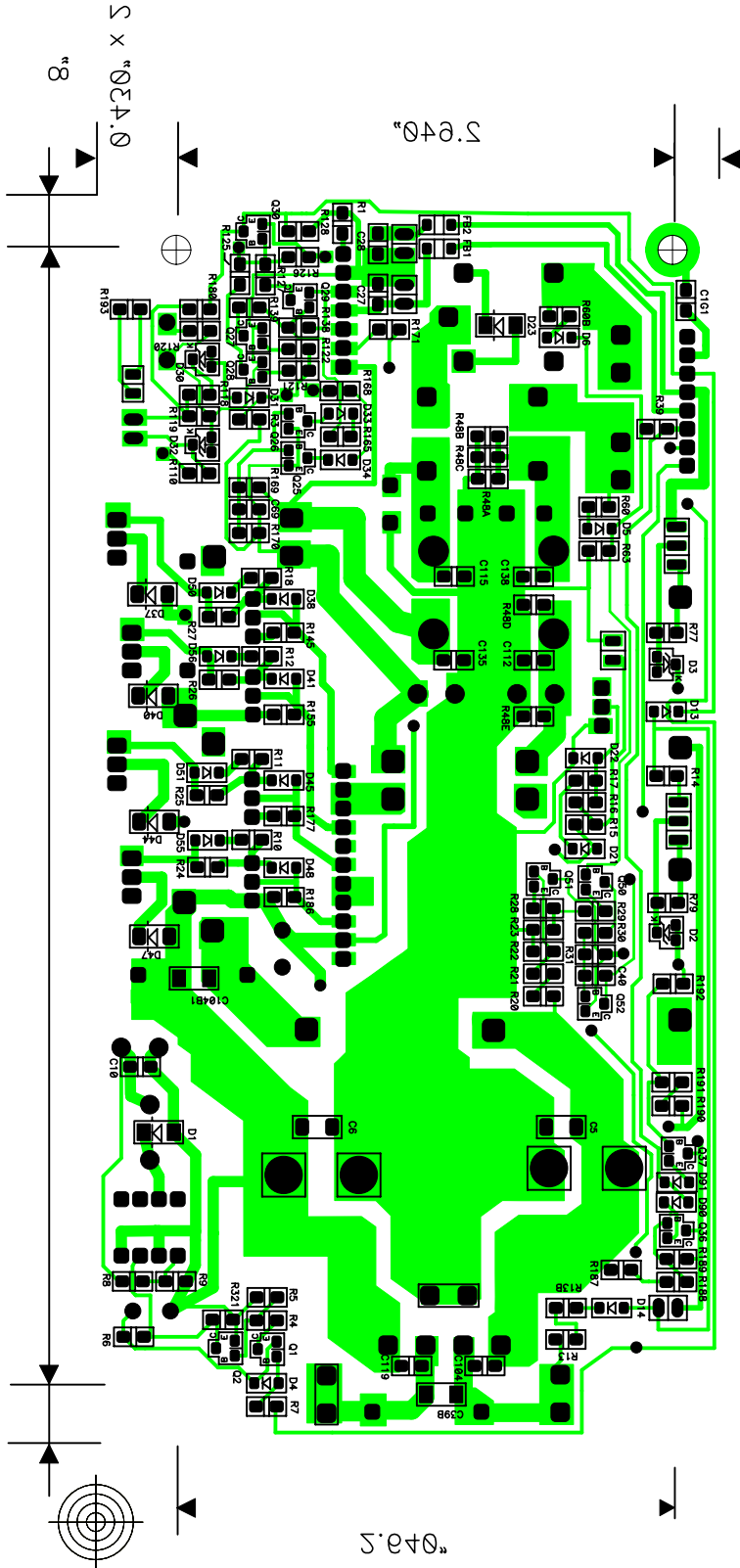


NOTE: HOLE DIAMETERS ARE IN INCHES.

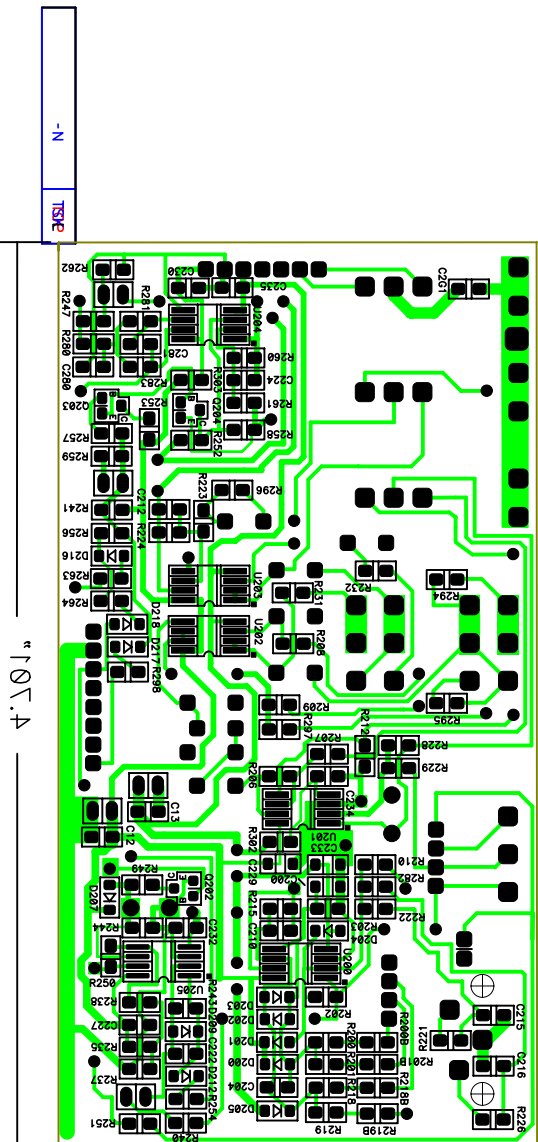
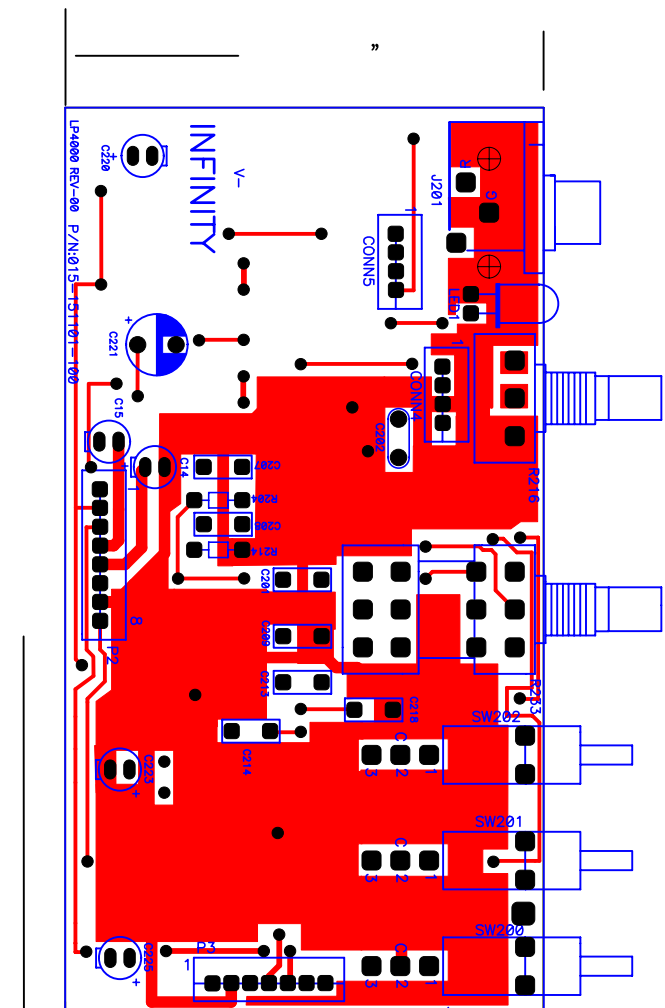
NOTE: DESIGNATORS ARE WRONG (SWAPPED) FOR L8 AND L11. BOTH DRAWING AND ACTUAL PCB ON MODEL FIFTEEN

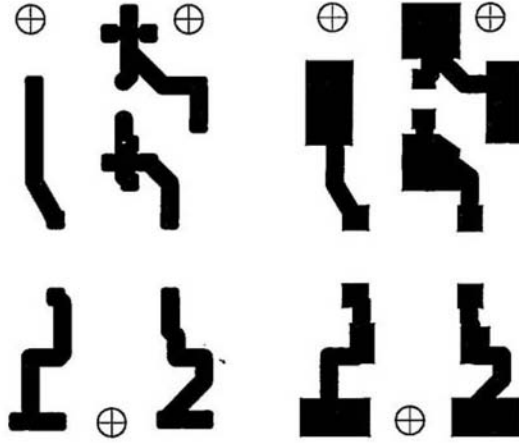
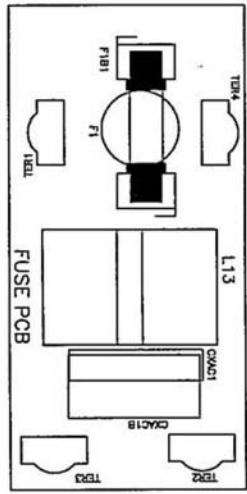


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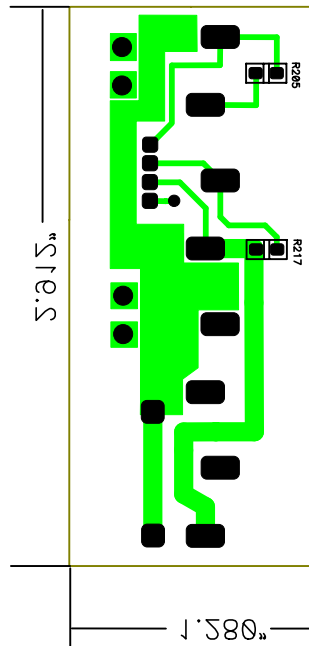
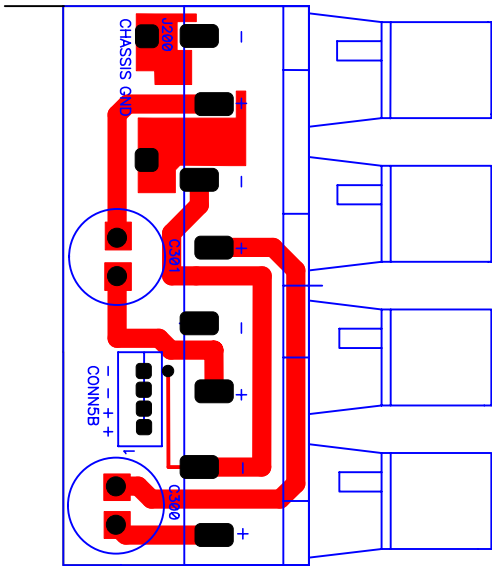


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1.280"



| L8400P (120v) ELECTRICAL PARTS LIST | | | |
|--|--|---|-----|
| Part Number | Description | Reference Designator | Qty |
| Main Amp/Supply PCB | | | |
| <i>Resistors</i> | | | |
| 024-00098-120 | GS SMD resistor 0R 1/8W J 0805 (R8) | R8 | 1 |
| 024-100498-120 | SMD resistor 1K 1/8W J 0805 (R110) | R110 | 1 |
| 024-100598-120 | GS SMD resistor 10K 1/8W J 0805 () | R5,7,16,118,121,122,125,1,126,128,138,165,170,168,139 | 15 |
| 024-100698-120 | GS SMD resistor 100K 1/8W J 0805 (R15,120) | R15,120 | 2 |
| 024-110598-120 | SMD resistor 11K 1/8W J 0805 | R187,188,190,191 | 4 |
| 024-130498-100 | SMD resistor 1K3 1/8W F 0805 | R189,192 | 2 |
| 024-150598-120 | SMD resistor 15K 1/8W J 0805 (R20,21) | R20,21 | 2 |
| 024-160598-100 | SMD resistor 16K 1/8W F 0805 (R13,13B) | R13,13B | 2 |
| 024-220298-120 | SMD resistor 22R 1/8W J 0805 (R28,29) | R28,29 | 2 |
| 024-220498-120 | SMD resistor 2K2 1/4W J 1206 (R119) | R119 | 1 |
| 024-220498-121 | SMD resistor 2K2 1/8W J 0805 (R17,31) | R17,31 | 2 |
| 024-220598-120 | SMD resistor 22K 1/8W J 0805 (R127) | R127 | 1 |
| 024-330498-120 | SMD resistor 3K3 1/8W J 0805 (R77,79,22,) | R77,79,22 | 3 |
| 024-330598-120 | SMD resistor 33K 1/8W J 0805 (R4,6,14,60,60B) | R4,6,14,60,60B | 5 |
| 024-412498-100 | SMD resistor 4K12 1/8W F 0805 (R63) | R63 | 1 |
| 024-470298-120 | GS SMD 47R 1/8W J 0805 (R24-27) | R24-27 | 4 |
| 024-470398-120 | GS SMD resistor 470R 1/8W J 0805 | R145,155,177,186 | 4 |
| 024-470598-120 | GS SMD resistor 47K 1/8W J 0805 (R3,171) | R3,171 | 2 |
| 024-510498-120 | SMD resistor 5K1 1/8W J 0805 | R48A,48B,48C,48D,48E | 5 |
| 024-560498-120 | GS SMD resistor 5K6 1/8W J 0805 | R30,169 | 2 |
| 024-680498-120 | GS SMD resistor 6K8 1/8W J 0805 (R23) | R23 | 1 |
| 021-100401-020 | MOF Resistor 1K 1W J FK TYPE | R173 | 1 |
| 021-560305-020 | MOF resistor 560R 5WS J 8x25 KINK | R76 | 1 |
| 022-005105-020 | GS Resistor PN:SQM 0R05 5W J 25x13 | R2 | 1 |
| 022-470307-020 | Resistor KNP 470R 7W J (KNP-700S) | R78 | 1 |
| <i>Capacitors</i> | | | |
| 034-100614-300 | Electrolytic cap. 100uF/16V M (R)0611 P:2.5 | C8 | 1 |
| 034-100625-300 | Electrolytic cap. 100uF/25V M (R)6.3x11 P:5 | C62 | 1 |
| 034-100695-300 | electrolytic 100uF/63V M (R)1012 P:5 () | C142 | 1 |
| 034-220525-300 | GR Electrolytic 22uF/25V M (R)5x11 P:2.5 TAPIN() | C25,26 | 2 |
| 034-330625-300 | GS Electrolytic 330uF/25V M (R)1013 P:5 () | C11,100 | 2 |
| 034-470415-300 | Electrolytic cap. 4u7/50V M (R)0511 P:2.0 () | C7 | 1 |
| 031-100184-100A | SMD Cap. 0u01/250V K 0805 X7R | C104,119 | 2 |
| 031-100244-100A | SMD Ceramic Cap. 0u01/50V K 0805 X7R (C27,28) | C27,28 | 2 |
| 031-100344-100A | SMD Cap. 0u1/50V K 0805 X7R | C115,135,138C,10,69,112 | 6 |
| 031-100384-100A | SMD Cap. 0u1/250V K 1206 X7R (C5,6) | C5,6 | 2 |
| 031-220344-300A | SMD Cap. 220pF/50V K 0805 NPO (C40) | C40 | 1 |
| 031-470144-101A | SMD Cap. 0u0047/50V K 0805 X7R (C1G1) | C1G1 | 1 |
| 033-330444-270 | NPE cap. 卍ELYTONE 3u3/50V K10 (R)8x13 SBE | C114,137 | 2 |
| 033-680464-270 | NPE cap. 卍ELYTONE 6u8/100V K10 (R)1020 GNE | C113,136 | 2 |
| 034-150895-201 | Electrolytic cap. 105°C 15000uF/63V M (R)3557 P:10mm | C1,4 | 2 |
| 032-100484-200 | GS END mylar cap. 1uF/250V K P:15 (C37,39,30) | C37,39,30 | 3 |
| <i>Semiconductors</i> | | | |
| 051-000600-100 | Transistor NPN PN:MPSW06RLRA TO-92 (ON)(Q6) | Q6 | 1 |
| 051-005600-100 | Transistor PNP PN:MPSW56RLRA TO-92 (ON)(Q8) | Q8 | 1 |
| 051-290700-100 | Transistor PNP (ON) PN:MPS2907A RLRA TO-92 | Q12,14,16,18 | 4 |
| 051-540101-000 | GR Transistor PNP(FAIRCHILD PN:2N5401 TO-92 (Q3) | Q3 | 1 |
| 054-000100-100 | GS SMD DIODE: PN:ES1D 200V 1A | D1,23,37,40,44,47 | 6 |
| 054-001002-100 | SMD ZENER DIODE PN:BZX84C10 10V SOT-23 (D32) | D32 | 1 |
| 054-001501-100 | SMD ZENER DIODE PN:BZX84C15 15V SOT-23 (D2,3) | D2,3 | 2 |
| 054-033904-100 | SMD Transistor PN:MMBT3904LT1 SOT23 | Q25,28,29,37,50,51 | 6 |
| 054-033906-100 | SMD Transistor PN:MMBT3906LT1 SOT23 | Q26,27,30,36 | 4 |
| 054-050601-100 | SMD ZENER DIODE PN:BZX84C5V6 5.6V SOT-23 | D30 | 1 |
| 054-290701-100 | SMD Transistor (ON) PN:MMBT2907ALT1 SOT-23 (Q52) | Q52 | 1 |

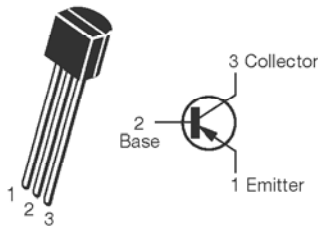
| Part Number | Description | Reference Designator | Qty |
|----------------------------|--|--|-----|
| Main Amp/Supply PCB | | | |
| 054-414803-100ZR | GR SMD DIODE PN:LL4148GSO8 (Vishay)() | D4-5,13,14,21,22,31,33,38,41,45,48,34,6,90,91, | 16 |
| 054-540100-100 | SMD Transistor (PNP) PN:MMBT5401 LT1 SOT-23 (Q1) | Q1 | 1 |
| 054-555100-100 | SMD Transistor (NPN) PN:MMBT5551 LT1 (ON)(Q2) | Q2 | 1 |
| 051-002301-000 | MOSFET N CHANNEL PN:FB23N20D | Q11,13,15,17 | 4 |
| 052-400080-000 | Bridge Rectifier PN:RS804 400V,8A (BR1) | BR1 | 1 |
| 053-257400-100 | IC:DIP,Regulator PN:LM2574 HVN-15V 8PIN (NS)(U6) | U6 | 1 |
| Miscellaneous | | | |
| 044-100100-000 | SMD FERRITE BEAD PN:321611 600R/100MHz 120€ | FB1,FB2 | 2 |
| 025-010300-000 | Thermister TSE-103 K L:50mm | TH1 | 1 |
| 025-210100-000 | Thermister (PTC) PN:PTMS2101RP516B (TH2) | TH2 | 1 |
| 043-300101-000 | INDUCTOR PN:YT-10033 30uH (L9,10) | L9,10 | 2 |
| 043-560200-000 | INDUCTOR 56uH YT-10779 (L12) | L12 | 1 |
| 043-700100-000 | INDUCTOR 70uHx2 YT-10024 (L8) | L8 | 1 |
| 043-820300-000 | INDUCTOR 820uH YT-10034 (L1) | L1 | 1 |
| 072-040008-110 | 8P Terminal base JS-1001-08 (P1) | P1 | 1 |
| 072-040039-000 | Terminal (PCB TYPE) PC205 (t=0.8m/m) T205MA | | 1 |
| 072-040064-000 | Terminal (PCB TYPE) PC250(t=0.8),T250MA | T2,TER6 | 2 |
| 072-040096-000 | Terminal T187MA(PCB TYPE) (t=0.8mm) PC187(0.8) | TER5,7 | 2 |
| 073-111003-000 | Shorting Strap 54.9x13.6x1mm (J7) | J7 | 1 |
| 073-111004-000 | Shorting Strap 29.5x12.4x0.8m/m (J4,9) | J4,9 | 2 |
| 074-300018-000 | RELAY PN:943-1C-48D (RLY1) | RLY1 | 1 |
| 061-700044-000 | Mica 13x18mm TO-220 (Q13,17) | for Q13,17 | 2 |
| 061-700090-900 | Ceramic washer 16x21mm t=2mm 化 白色 | for Q11,15 | 2 |
| 063-010010-000 | Bracket for Transistor P/N:TRK-2 | for Q11,13,15,17,TH1 | 5 |
| Drive board | | | |
| Resistors | | | |
| 024-000098-120 | GS SMD resistor 0R 1/8W J 0805 | R313,314,318,320 | 4 |
| 024-100298-120 | SMD resistor 10R 1/8W J 0805 | R89,90,140,150 | 4 |
| 024-100498-120 | SMD resistor 1K 1/8W J 0805 | R81,85,96,97,131,137,142,147,162,179 | 10 |
| 024-100598-120 | GS SMD resistor 10K 1/8W J 0805 | R75,82,83,92,98,132,133,148,163,164,181,15€ | 12 |
| 024-100798-120 | GS SMD resistor 1M 1/8W J 0805 | R32,33 | 2 |
| 024-110598-120 | SMD resistor 11K 1/8W J 0805 | R74,99 | 2 |
| 024-200598-120 | GS SMD resistor 20K 1/8W J 0805 | R95,141 | 2 |
| 024-220398-120 | GS SMD resistor 220R 1/8W J 0805 | R136,167 | 2 |
| 024-220498-121 | SMD resistor 2K2 1/8W J 0805 (R134) | R134 | 1 |
| 024-220598-120 | SMD resistor 22K 1/8W J 0805 (R37) | R37 | 1 |
| 024-220798-120 | GS SMD resistor 2M2 1/8W J 0805 (R87,93) | R87,93 | 2 |
| 024-270498-120 | GS SMD resistor 2K7 1/8W J 0805 (R80,84,157) | R80,84,157 | 3 |
| 024-390498-120 | GS SMD resistor 3K9 1/8W J 0805 (R130,161) | R130,161 | 2 |
| 024-390598-120 | GS SMD resistor 39K 1/8W J 0805 (R86,94) | R86,94 | 2 |
| 024-470398-120 | GS SMD resistor 470R 1/8W J 0805 (R91) | R91 | 1 |
| 024-470498-120 | GS SMD resistor 4K7 1/8W J 0805 | R151-153,183,34,36 | 6 |
| 024-470598-120 | GS SMD resistor 47K 1/8W J 0805 (R35) | R35 | 1 |
| 024-560598-120 | GS SMD resistor 56K 1/8W J 0805 (R38) | R38 | 1 |
| 024-680498-120 | GS SMD resistor 6K8 1/8W J 0805 (R135,166) | R135,166 | 2 |
| Capacitors | | | |
| 031-100244-100A | SMD ceramic cap. 0u01/50V K 0805 X7R | C31,140, 108,118,1 | 4 |
| 031-100343-100A | SMD cap. 100pF/50V J 0805 NPO (C81,84) | C81,84 | 2 |
| 031-100344-100A | SMD cap. 0u1/50V K 0805 X7R (85C75-78,82,) | C85,75-78,82 | 6 |
| 031-180314-100A | SMD cap. 0u18/16V K 0805 X7R (C80,83) | C80,83 | 2 |
| 031-470244-102A | SMD cap. 0u047/50V K 0805 X7R (,124C93,94,101) | C124,93,94,101 | 4 |
| 031-560243-100A | SMD cap. 56pF/50V J 0805 NPO (5,125C92,102,10) | C5,125,92,102,10 | 4 |
| 031-560343-101A | SMD cap. 560pF/50V J 1206 X7R (C79) | C79 | 1 |
| 034-100625-303 | Electrolytic cap. 100uF/25V M (R) P:2.5 (C117) | C117 | 1 |
| 034-100715-202 | Electrolytic cap. 85 °C 1000uF/16V M (R)1017 P:5 | C109,132 | 2 |
| 034-330615-301 | electrolytic cap. 330uF/16V M (R)0812 P:3.5 散裝 (C32) | C32 | 1 |

| Part Number | Description | Reference Designator | Qty |
|-----------------------|---|--|-----|
| Drive board | | | |
| <i>Semiconductors</i> | | | |
| 054-000100-100 | GS SMD DIODE PN:ES1D 200V 1A (D35,43) | D35,43 | 2 |
| 054-001002-100 | SMD ZENER DIODE PN:BZX84C10 10V SOT-23 (D42,49) | D42,49 | 2 |
| 054-005501-100 | SMD ZENER DIODE PN:BZV55C3V6 (PHILIPS)(D60) | D60 | 1 |
| 054-007200-100L | SMD IC: PN:M072M-TE1 DMP8 (JRC) DUAL OP-AMP | U9,10 | 2 |
| 054-033906-100 | SMD transistor PN:MMBT3906LT1 SOT23 (ON)(Q34,35) | Q34,35 | 2 |
| 054-050601-100 | SMD ZENER DIODE PN:BZX84C5V6 5.6V SOT-23 TAPIN | Z7,8 | 2 |
| 054-414803-100ZR | GR SMD DIODE PN:LL4148GSO8 (Vishay) | D36,39,46,52,61 | 5 |
| 054-540100-100 | SMD transistor (PNP) PN:MMBT5401 LT1 SOT-23 | Q33,40 | 2 |
| 054-555100-100 | SMD transistor (NPN) PN:MMBT5551 LT1 (ON)(Q32) | Q32 | 1 |
| 051-000600-100 | Transistor NPN PN:MPSW06RLRA TO-92 (ON)(Q31) | Q31 | 1 |
| 051-222200-100 | Transistor NPN (ON SEM) PN:MPS2222ARLRA TO-92 | Q20,22 | 2 |
| 051-555100-000 | Transistor NPN 2N5551 | Q21,23 | 2 |
| 053-211100-000 | IC:DIP, IR2111 8PIN (IR) HALF-BRIDGE DRIVER | U7,8 | 2 |
| <i>Miscellaneous</i> | | | |
| 072-040229-000 | HEADER Right Angle PN:211-107-000-400 7PIN(PIN2) | PIN2 | 1 |
| 072-040230-000 | HEADER Right Angle PN:211-111-000-400 11PIN(PIN1) | PIN1 | 1 |
| Pre-amp. Board | | | |
| <i>Resistors</i> | | | |
| 024-000097-120 | GS SMD resistor PN:1206J000 0R 1/4W J 1206 | R302,303,297 | 3 |
| 024-100498-121 | SMD resistor 1K 1/4W J 1206 | R238,264 | 2 |
| 024-100598-101 | SMD resistor PN:1206F103 10K 1/4W F 1206 | R200B,201B,218B,219B | 4 |
| 024-100598-121 | SMD resistor 10K 1/4W J 1206 | R202,206,207,212,222,229,235,252-254,257,262,282,228,217,205,251 | 17 |
| 024-100698-101 | SMD resistor 100K 1/8W F 1206 | R200,201,218,219 | 4 |
| 024-150597-120ZS | GS SMD resistor 15K 1/4W J 1206 (R223) | R223 | 1 |
| 024-200598-121 | SMD resistor 20K 1/4W J 1206 (R256,298) | R256,298 | 2 |
| 024-220298-121 | SMD resistor 22R 1/4W J 1206 (R249) | R249 | 1 |
| 024-226598-100 | SMD resistor 22K6 1/4W F 1206 | R208,209,231,232 | 4 |
| 024-237597-100 | SMD resistor 23K7 1/4W F 1206 (R281) | R281 | 1 |
| 024-270498-121 | SMD resistor 2K7 1/4W J 1206 (R237) | R237 | 1 |
| 024-300398-121 | SMD resistor 300R 1/4W J 1206 (R258) | R258 | 1 |
| 024-300598-121 | SMD resistor 30K 1/4W J 1206 (R260) | R260 | 1 |
| 024-330498-101 | SMD resistor 3K3 1/4W F 1206 (R203,215) | R203,215 | 2 |
| 024-330498-121 | SMD resistor 3K3 1/4W J 1206 (R240,210) | R240,210 | 2 |
| 024-470598-120 | GS SMD resistor 47K 1/8W J 0805 (R280,283) | R280,283 | 2 |
| 024-470698-121 | SMD resistor 470K 1/4W J 1206 (R259) | R259 | 1 |
| 024-470798-120 | SMD resistor 4M7 1/8W J 0805 (R244) | R244 | 1 |
| 024-470798-121 | SMD resistor 4M7 1/4W J 1206 (R243) | R243 | 1 |
| 024-510398-121 | SMD resistor 510R 1/4W J 1206 (R261) | R261 | 1 |
| 024-560598-121 | SMD resistor 56K 1/4W J 1206 (R224) | R224 | 1 |
| 024-620398-121 | SMD resistor 620R 1/4W J 1206 (R221,226) | R221,226 | 2 |
| 024-680498-121 | SMD resistor 6K8 1/4W J 1206 (R247) | R247 | 1 |
| 024-680598-121 | SMD resistor 68K 1/4W J 1206 (R250) | R250 | 1 |
| 024-820598-121 | SMD resistor 82K 1/4W J 1206 (R263) | R263 | 1 |
| 021-330498-100 | MF resistor 3K3 1/8W F (R204) | R204 | 1 |
| 021-820598-100 | MOF resistor 82K 1/8W F (R214) | R214 | 1 |
| 026-500495-252 | GS VR 5KA PN:RK163111R52B-5KA (EJ) LEVEL | R216 | 1 |
| 026-500595-267 | GS VR 50KBx4 PN:RD1631411001D-50KBx4 (EJ) XOVER | R233 | 1 |
| <i>Capacitors</i> | | | |
| 031-100244-101A | SMD cap. 0u01/50V K 1206 X7R | C12,13,224,280 | 4 |
| 031-100344-102A | SMD cap. 0u1/50V K 1206 X7R | C227,229,220,232-235 | 7 |
| 031-100344-104A | SMD cap. 100pF/50V K NPO 1206 | C222,204 | 2 |
| 031-220344-106A | SMD cap. 220pF/50V K X7R 1206 | C215,216,200,210 | 4 |
| 031-330445-100A | SMD cap. 3300pF/50V M 1206 X7R | C281 | 1 |

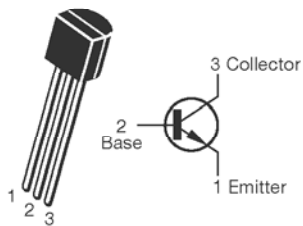
| Part Number | Description | Reference Designator | Qty |
|---------------------------------------|--|----------------------------------|-----|
| Pre-amp. Board | | | |
| 031-470444-101A | SMD cap. 4700pF/50V K X7R 1206 | C2G1 | 1 |
| 031-680444-100A | SMD cap. 6800pF/50V K X7R 1206 | C212 | 1 |
| 033-200645-300 | GR NP cap. 200u/50V M (R)1321 P:5 | C300,301 | 2 |
| 034-100515-300G | electrolytic cap. 10uF/16V M (R)0511 P:2 | C220 | 1 |
| 034-100615-301 | Electrolytic cap. 100uF/16V M (R)0611 P:5 | C221 | 1 |
| 034-220516-301 | Electrolytic cap. 22uF/16V M (R)0511 P:2 | C223,225 | 2 |
| 034-220525-300 | GR Electrolytic cap. 22uF/25V M (R)5x11 P:2.5 TAPIN | C14,15 | 2 |
| 035-220243-100 | PE cap. FE-M 0u022/63V J P:5m/m | C202 | 1 |
| 035-330293-300 | PE cap. PN:ESK063S33JT 0u033/63V J P:5 | C209,218 | 2 |
| 035-330354-301 | PE cap. FE-M 0u33/63V K P:5m/m | C207,208 | 2 |
| 035-680253-300 | PE cap. FE-M PN:ESK063S68JT 0u068/63V J P:5mm | C201,213 | 2 |
| 035-680353-300 | GS ESK cap. 0u68/63V J P:5 PN:ESK063P68JA(C214) | C214 | 1 |
| Semiconductors | | | |
| 054-007200-100L | SMD IC: PN:M072M-TE1 DMP8 (JRC) DUAL OP-AMP | U200-205 | 6 |
| 054-011400-100 | SMD Transistor PN:DTC114TKA SMT3) | Q202 | 1 |
| 054-033904-100 | SMD Transistor PN:MMBT3904LT1 SOT23 | Q203,204 | 2 |
| 054-414803-100ZR | GR SMD DIODE PN:LL4148GSO8 (Vishay) | D200-205,207,209,212,216,217,218 | 12 |
| Miscellaneous | | | |
| 072-010058-000ZR | GR RCA JACK 2P PN:0502000W1G (Red,White)(J201) | J201 | 1 |
| 072-040008-110 | 8P Terminal base JS-1001-08 (P2) | P2 | 1 |
| 072-040169-000 | CONNECTOR 2 PIN JS-1001-2 P:2.5mm | CONN4-Pin3,4 | 1 |
| 072-060219-000 | BINDING POST (gold plated) PN:A807A-RB 8PIN | J200 | 1 |
| 074-030002-000 | TOGGLE SW PN:L101-T2B4QE LFE/PHASE | SW201,202 | 2 |
| 077-100104-100 | GR conjunction base PN:JS-1001-04 P=2.5 4P | CONN5,CONN5B | 2 |
| Fuse PCB | | | |
| 093-205205-300 | FUSE:VBS UTE FUSE:5A,250V,5*20mm | F1 | 1 |
| 073-050001-000 | FUSE CLIP P/N:CFFH1206 (F1,B1) | F1,B1 | 2 |
| 039-220384-100 | GR X2 Safety Capacitor 0u22/250V x16.5x8.5 | CXAC1 | 1 |
| 043-324300-000 | INDUCTOR 324uH YT-10778 (L13) | L13 | 1 |
| 072-040064-000 | Terminal (PCB TYPE) PC250(t=0.8),T250MA (TER2) | TER2 | 1 |
| 072-040096-000 | Terminal T187MA(PCB TYPE) (t=0.8mm) PC187(0.8) | TER1,3,4 | 3 |
| Miscellaneous/Mechanical parts | | | |
| 042-010139-000 | Power Transformer PN:YT-13438 CSW-10 120V/60Hz | PT1 | 1 |
| 063-252623-900 | Front Panel (L8400P 120V) 10"x10"x0.0984" SPCC black | | 1 |
| 073-014084-500 | Bracket 6.64"x3.5"x3.2" SPCC | | 1 |
| 074-020018-000 | ROCKER SW (POWER) PN:RF1003-BB4-0 | SW4 | 1 |
| 086-021836-000 | Power Cord SPT-2 #18 12 ft. +T187膠套 | CORD 01 | 1 |
| 062-252506-000 | Bucket 10"x10"x4.89" HIPS UL94 V0 黑 | Plastic air-tight cover | 1 |

Integrated Circuit/Transistor Diagrams

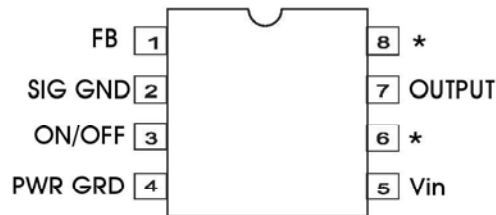
**MPSW56, 2N2709A,
2N5401**
Q3,8,12,14,16,18,52



**MPS2N222
MPSW06, 2N5551**
Q6, 20-23,31

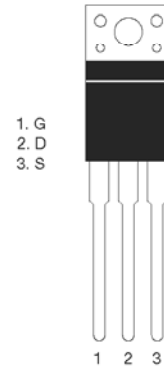


LM2574
0.5A Buck Regulator
U6



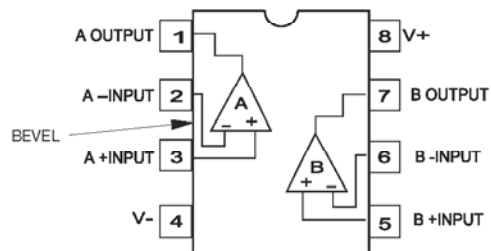
* No internal connection, but should be soldered to PC board for best heat transfer.

MOSFET IRFB23N20D
Q11,13,15,17

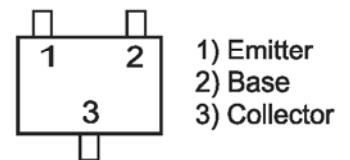


- * MMBT3904LTI SOT23,
- * MMBT3906LTI SOT23,
- * DTC114TK SMT3,
- * MMBT5401 LTI,
- * MMBT5551 LTI

**OPAMP, DUAL
TL072CDR SO-8,
U9,10,200-205**



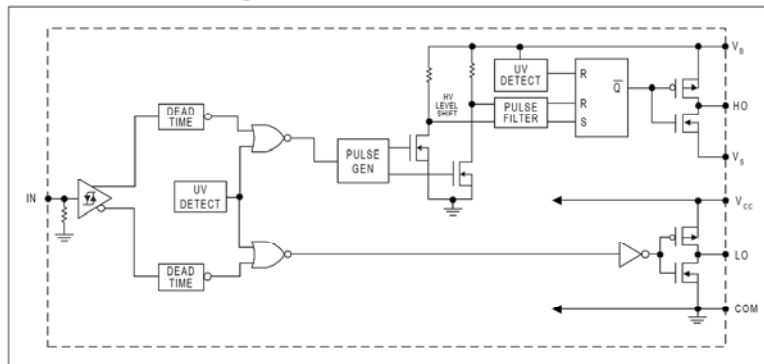
**Q1,2,25-30, 32,
33-37,40,50, 51,40,202-204**



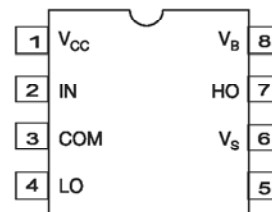
- 1) Emitter
- 2) Base
- 3) Collector

* PREFIX MAY BE "FMMT"

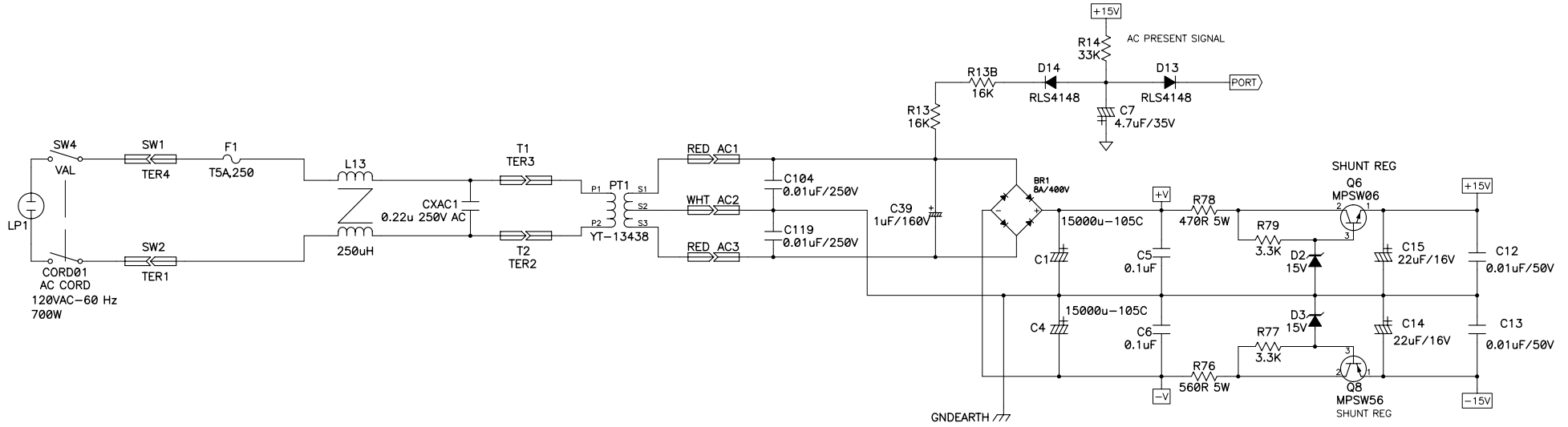
IR2111
Functional Block Diagram



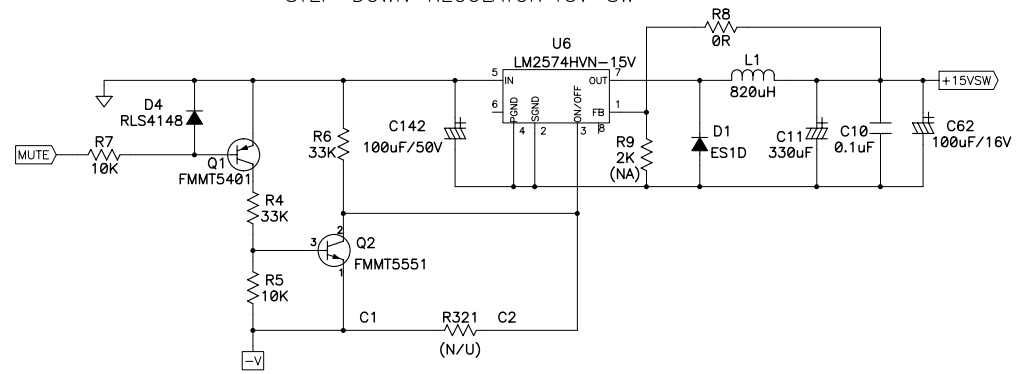
**IR2111 HALF-BRIDGE
DRIVER
U7,8**



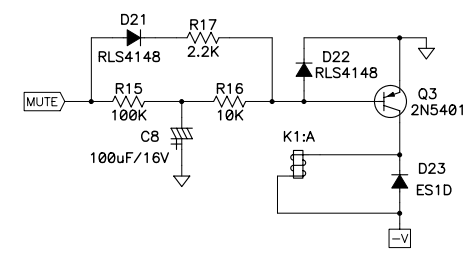
L8400P L series



STEP-DOWN-REGULATOR 15V-SW

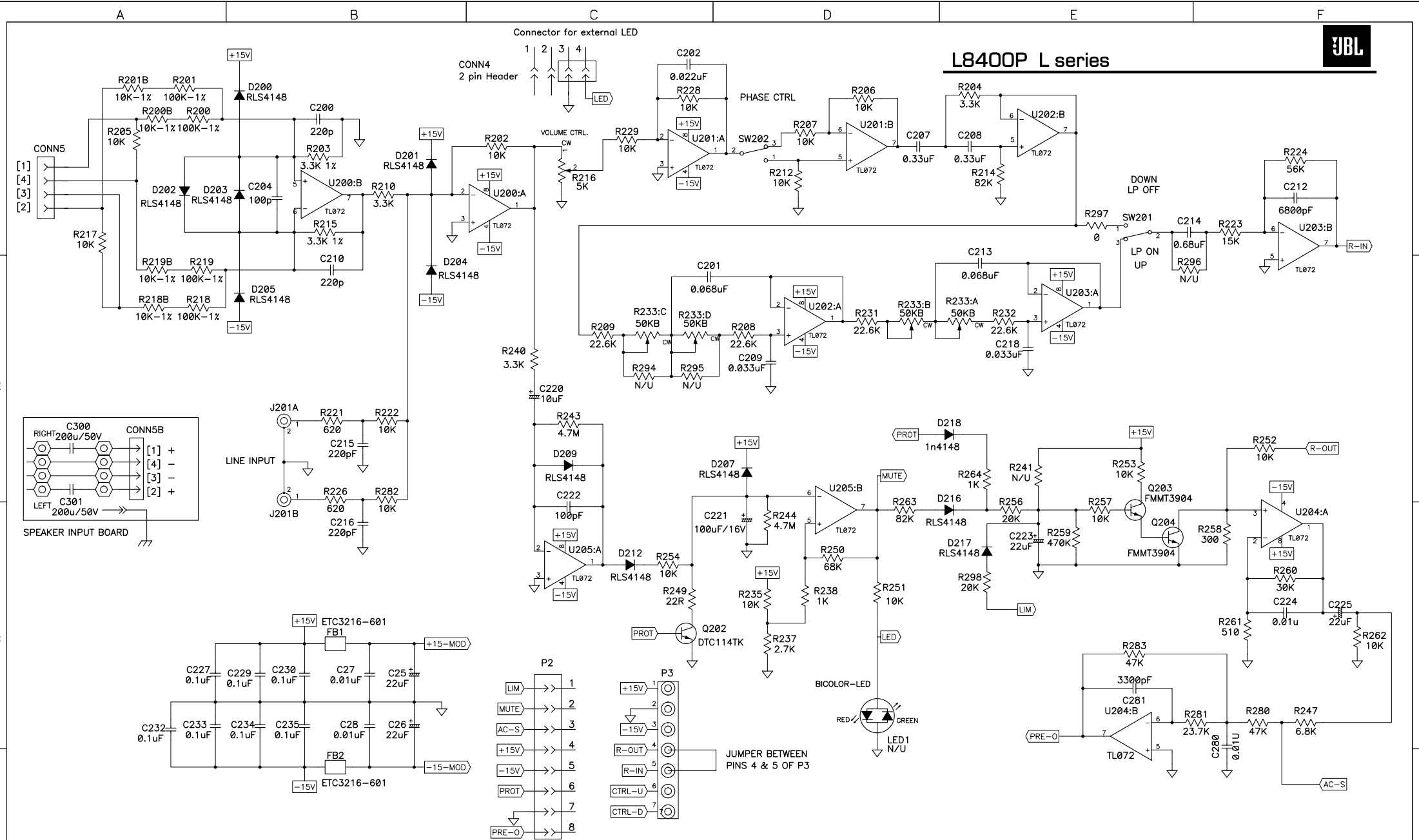


RELAY CIRCUIT



| | | | | | | | | | | |
|---------|--------|----------------|---------|--------|----------|---------|-------------|------------|-------------|----------------------------------|
| Rev: 00 | Notes: | Date: 09/16/04 | Rev: 01 | Notes: | 12/09/04 | Draw by | Designed by | Checked by | Approved By | Harman Consumer Group |
| 01 | | 12/09/04 | | | | | | | | 353590-002 |
| | | | | | | | | | | Model no: Studio L8400P |
| | | | | | | | | | | Sch name: L8400P-120V-120904.sch |
| | | | | | | | | | | Issue no: |
| | | | | | | | | | | Date: 12/09/2004 |
| | | | | | | | | | | Sheet: 1 of 4 Rev: 01 |
| | | | | | | | | | | Size: A2 Author: AMM |

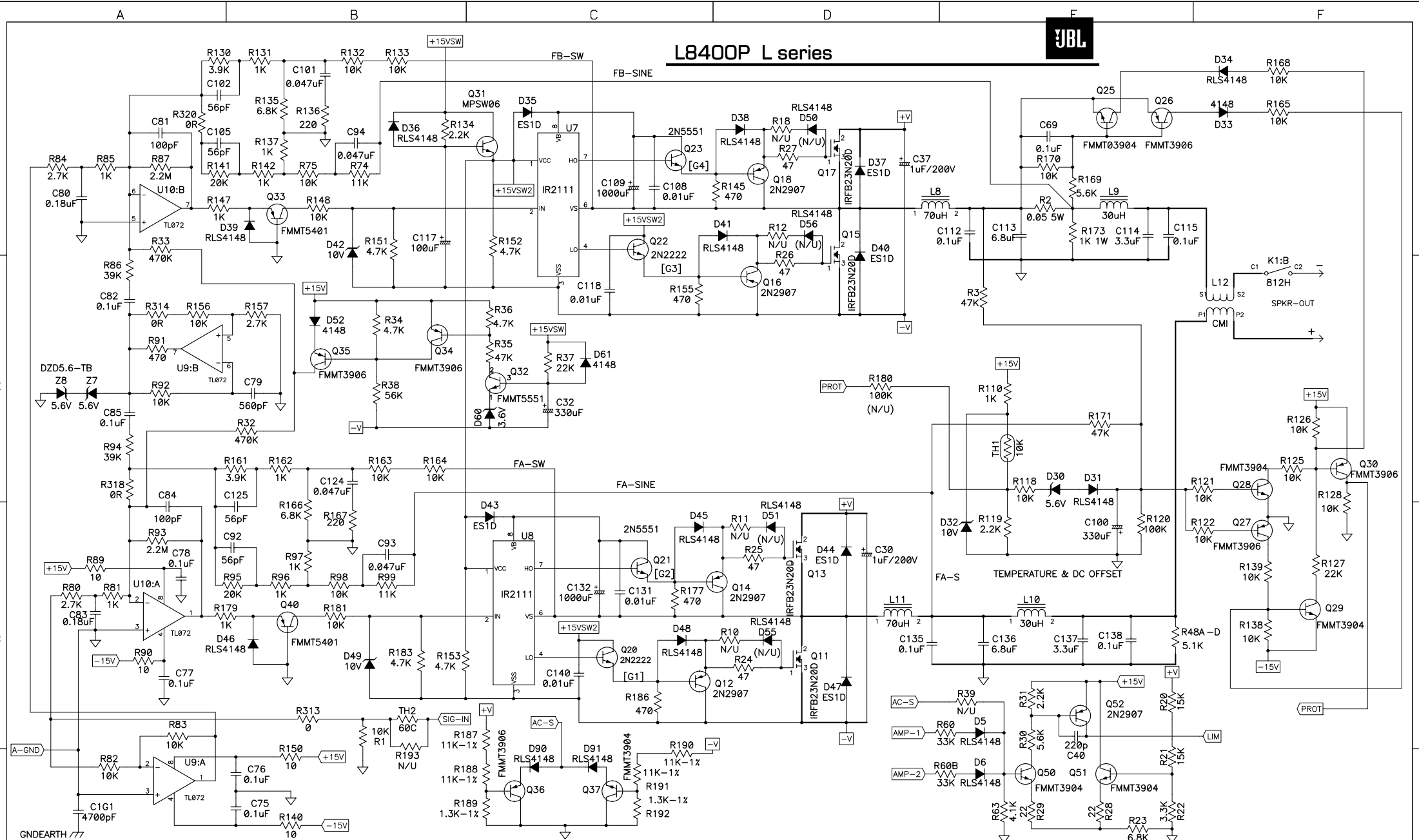
L8400P L series



| | | | | | | | | | | |
|---------|--------|----------------|---------|--------|----------------|----------|--------------|-------------|--------------|----------------------------------|
| Rev: 00 | Notes: | Date: 09/16/04 | Rev: 01 | Notes: | Date: 12/09/04 | Draw by: | Designed by: | Checked by: | Approved By: | Harman Consumer Group |
| 00 | | 09/16/04 | | | | | | | | : 353590-002 |
| 01 | | 12/09/04 | | | | | | | | Model no: Studio L8400P |
| | | | | | | | | | | Sch name: L8400P-120V-120904.sch |
| | | | | | | | | | | Issue no: |
| | | | | | | | | | | Date: 12/09/2004 |
| | | | | | | | | | | Sheet: 2 OF 4 Rev: 01 |
| | | | | | | | | | | Size: A2 Author: AMM |



L8400P L series



| | | | | | | | | | | |
|---------|--------|----------------|---------|--------|----------------|---------|-------------|------------|-------------|----------------------------------|
| Rev: 00 | Notes: | Date: 09/16/04 | Rev: 01 | Notes: | Date: 12/09/04 | Draw by | Designed by | Checked by | Approved By | Harman Consumer Group |
| 00 | | 09/16/04 | 01 | | 12/09/04 | | | | | 353590-002 |
| 01 | | 12/09/04 | | | | | | | | Model no: Studio L8400P |
| | | | | | | | | | | Sch name: L8400P-120V-120904.sch |
| | | | | | | | | | | Issue no: |
| | | | | | | | | | | Date: 12/09/2004 |
| | | | | | | | | | | Sheet: 3 OF 4 Rev: 01 |
| | | | | | | | | | | Size: A2 Author: AMM |

A

B

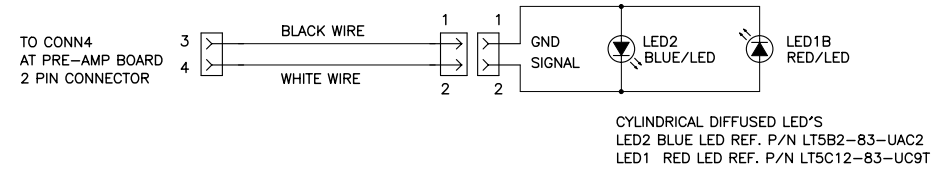
C

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L8400P L series



| Rev: | Notes: | Date: | Rev: | Notes: | Draw by | Designed by | Checked by | Approved By | Harman Consumer Group |
|------|--------|----------|------|--------|---------|-------------|------------|-------------|----------------------------------|
| 00 | | 09/16/04 | | | | | | | : 353590-002 |
| 01 | | 12/09/04 | | | | | | | Model no: Studio L8400P |
| | | | | | | | | | Sch name: L8400P-120V-120904.sch |
| | | | | | | | | | Issue no: |
| | | | | | | | | | Date: 12/09/2004 |
| | | | | | | | | | Sheet: 4 OF 4 Rev: 01 |
| | | | | | | | | | Size: A2 Author: AMM |

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