



Reference Series

610a

611a

1 CHANNEL POWER AMPLIFIER

SERVICE MANUAL



Infinity Systems, Inc.
250 Crossways Park Dr.
Woodbury, New York 11797

Rev2 10/2005

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Reference 610a/611a Specifications

| | |
|---------------------------|--|
| Output Power: | 456W RMS x 1 channels @ 4 ohms; $\leq 1\%$ THD + N |
| (14.4V supply) | 657W RMS x 1 channels @ 4 ohms; $\leq 1\%$ THD + N |
| Signal-to-noise ratio: | 70dBA (reference 1W into 4 ohms) |
| Dynamic power: | 761W @ 2 ohms |
| Effective damping factor: | 6.336 @ 4 ohms |
| Frequency response: | 17Hz – 302Hz (–3dB) |
| Maximum input signal: | 6.0V |
| Maximum sensitivity: | Reference 610a - 250mV Reference 611a - 75mV |
| DC Offset | <50mV (-50%) |
| Output regulation: | .179dB @ 4 ohms |
| Idle Current | 1.5A |
| Input Impedance | 22k Ω |
| Max Current Draw | 43A @ 4 ohms 70A @ 2 ohms |
| Dimensions: | 12 x 15 x 2 11/16" (L x W x D) (305mm x 381mm x 68mm) |
| Fuses: | 30A x 2 |

Infinity continually strives to update and improve existing products, as well as create new ones. The specifications and details in this and related JBL publications are therefore subject to change without notice.

Features

- 1-Channel Operation
- Advanced MOSFET Oversized Floating Rail Power Supply
- Floating Ground Factory – Head – Unit Speaker – Level input
- Variable Input Sensitivity (250mV – 6V)
- Fully Complementary Output Stage with Class-D Voltage Amplification
- Gold-plated Power, Input and Output Connectors
- 2-Ohm Stable

Test Conditions and Notes

- All tests to be done, unless otherwise specified, from 10Hz to 320Hz at 14.4V DC into 2 ohm loads and adjust the units gain so that with a .250 volt input signal the unit is at its maximum rated output. All measurements will be done using an Audio precision system one and the supply voltage.
- An A+ line voltage of 14.4V DC shall be applied to the unit under test for all measurements unless otherwise specified. The voltage applied to the unit shall be measured at the power connection on the Amplifier.
- Signal Source
Unless otherwise specified, all tests shall be conducted with the Audio Signal Generator output configured to be balanced, less than or equal to 50 ohm source impedance, and floating. The signal source "GND" shall be connected to the Amplifier PWR GND at the Amplifier.
- Output Load
Unless otherwise specified, all tests shall be conducted with 2 ohm resistive loads having less than 10% reactive components at any frequency below 320Hz. Each resistor shall have a value that remains within 1% while dissipating the rated output of the unit under test.
- Power Indicator LED steadily illuminates for normal operation. LED blinks when protection circuitry is engaged, and during power up.

POWER CONNECTIONS

The Reference amplifiers are capable of delivering high power levels, and require a reliable connection to the vehicle's electrical system in order to perform optimally. See Figure 1 for connection location. Please adhere to the following instructions carefully.

GROUND CONNECTION

Connect the amplifier's Ground (GND) terminal to a solid point on the vehicle's metal chassis, as close to the amplifier as possible. Refer to the chart below to determine minimum wire-gauge size. Sand away any paint from this location; use a star-type-lock washer to secure the connection.

POWER CONNECTION

Connect a wire (see chart at right for appropriate gauge) directly to the vehicle's positive battery terminal, and install an appropriate fuse holder within 18" of the battery terminal. Do not install the fuse at this time. Route the wire to the amplifier's location, and connect it to the amplifier's positive (+12V) terminal. Be sure to use appropriate grommets whenever routing wires through the firewall or other sheet metal. Failure to adequately protect the positive wire from potential damage may result in a vehicle fire. When you are done routing and connecting this wire to the battery and to the amplifier, you may install the fuse at the battery. The fuse value should be selected based on total amplifier-current draw; see chart at right.

REMOTE CONNECTION

Connect the amplifier's Remote (REMOTE) terminal to the source unit's Remote Turn-On lead using a minimum of 18-gauge wire. If your source unit does not have a remote turn-on connection, connect the amplifier's (REMOTE) terminal to the vehicle's accessory circuit.

WIRE-GAUGE CHART

| Amplifier Model | Maximum Current Draw | Minimum Wire Gauge |
|-----------------|----------------------|--------------------|
| 610a/611a | 69A | #6 AWG |

These recommendations assume 7' – 10' wire runs. If your installation differs markedly, you will need to adjust the wire gauge accordingly.

SPEAKER CONNECTIONS

Refer to the application guides on the pages that follow. Speaker connections should be made using a minimum of 16-gauge wire.

NOTE: When using the low-level or high-level inputs, the AUX outputs can be used to pass a full-range line-level signal to another amplifier.

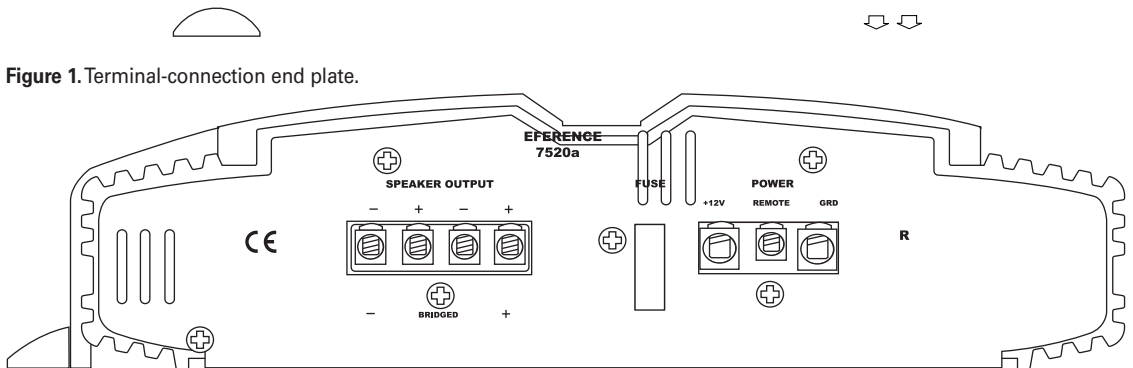


Figure 1. Terminal-connection end plate.

APPLICATIONS – 610a/611a

The Reference subwoofer amplifiers are single-channel amplifiers. There are two sets of terminals to make it easy to connect multiple woofers. Either set of (+/-) terminals may be used when connecting woofers.

To the right are two application diagrams to help plan your subwoofer system installation. Figures 3 and 4 show how to configure the Reference subwoofer amplifiers

NOTE: For simplicity, Figures 3 and 4 do not show power, remote and input connections.

NOTE: Minimum speaker load is 2 ohms.

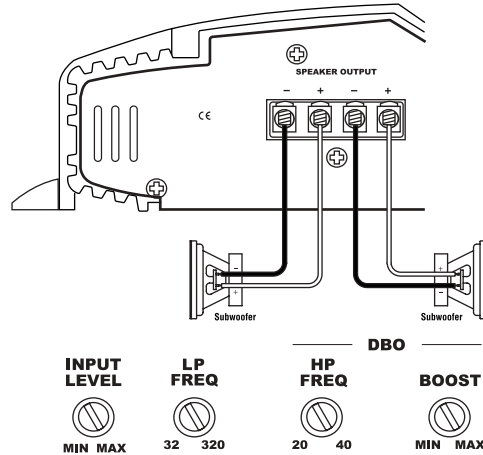


Figure 3. Reference subwoofer amplifier with two woofer connections.

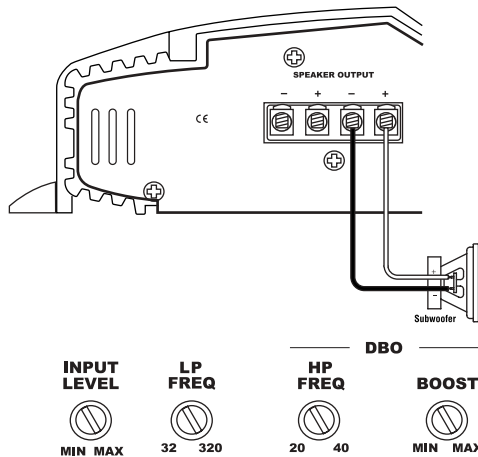


Figure 4. Reference subwoofer amplifier with one woofer connection.

INSTALLATION AND SETUP

SETTING INPUT SENSITIVITY

1. Initially turn the INPUT LEVEL control(s) to minimum (counterclockwise).
2. Reconnect the (-) negative lead to the vehicle's battery. Apply power to the audio system and play a dynamic music track.
3. On the source unit, increase the volume control to 3/4 volume. Slowly increase the INPUT LEVEL control(s) toward three o'clock until you hear slight distortion in the music. Then reduce the INPUT LEVEL slightly until distortion is no longer heard.

NOTE: After the source unit is on, blue LEDs (on the top panel) will light, indicating the amplifier is on. If not, check the wiring, especially the remote connection from the source unit. Also refer to "Troubleshooting" on the page 7.

REMOTE LEVEL CONTROL (OPTIONAL)

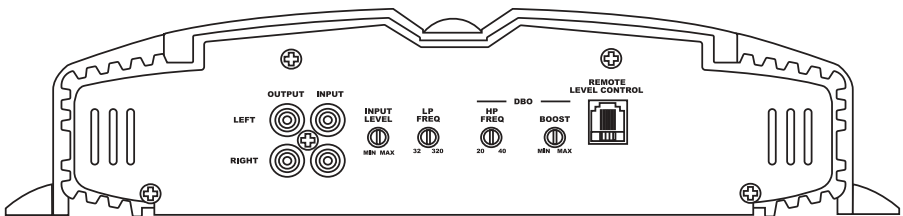
All three Reference subwoofer amplifiers and the 5760a amplifier have inputs for an optional remote level control (100rc). This will allow the subwoofer level to be adjusted from the listening position. Connect the optional remote level control using the RJ-11 jack on the side of the amplifier. Install the control module in the front of the vehicle within easy reach of the driver. Both the underside of the dash and the center console are suitable locations. Refer to the mounting instructions accompanying the 100rc.

AUX OUTPUT

Reference amplifiers are equipped with full-range outputs that can be used to connect additional amplifiers.

NOTE: When using the low- or high-level inputs, the AUX outputs can be used to pass a full-range line-level signal to another amplifier.

Figure 13. Control end panel.



INSTALLATION AND SETUP (CONT.)

SETTING DBO™

The Dynamic Bass Optimizer (DBO) is used to enhance low-frequency reproduction in a vehicle. Conventional bass-boost circuits only increase bass at a fixed frequency, and cause the amplifier to consume considerable power. The DBO allows you to adjust the frequency (20Hz – 80Hz) as well as the boost level (up to 12dB; see Figure 14), allowing you to fine-tune the bass in your system to optimize performance.

For sealed enclosures, the DBO can be used to enhance the lower bass region of sealed enclosures.

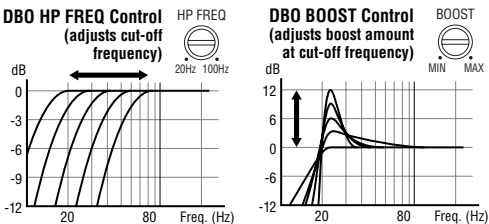
For bigger/fuller bass, adjust the HP FREQ between 35Hz and 45Hz; adjust the BOOST control according to your preference.

For tighter-sounding bass, adjust the HP FREQ between 45Hz and 55Hz; adjust the BOOST control according to your preference.

For vented enclosures, the DBO should be used as a subsonic filter to reduce overexcursion of the woofers. Set the HP FREQ control 10Hz below the tuning frequency of the enclosure (e.g., 25Hz for a box tuning of 35Hz); adjust the BOOST control to taste. This will conserve amplifier power typically wasted on frequencies below the tuned frequency of the enclosure.

For infinite-baffle applications, set the HP FREQ to the speaker's Fs value (reducing overexcursion of the woofer); adjust the Boost control to taste.

Figure 14. Frequency-response curves show typical DBO control ranges.



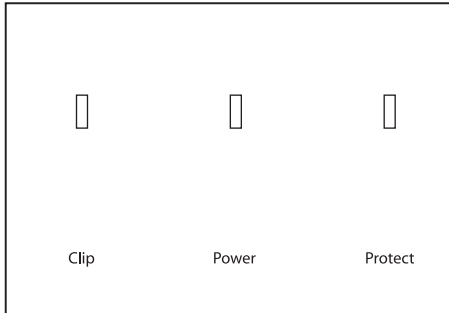
STATUS LEDs

Clip: Indicates the amplifier is being overdriven, and your speakers may be in danger. This should blink only on musical peaks, and not be on constantly.

Power: Indicates the amplifier is on.

Protection: Refer to "Troubleshooting" for specific indications.

Figure 15. LED status.



TROUBLESHOOTING

- **PROBLEM:**

No audio (POWER LED is off).

CAUSE and SOLUTION:

No voltage at BATT+ and/or REM terminals, or bad or no ground connection. Check voltages at amplifier terminals with VOM.

- **PROBLEM:**

No audio (PROTECT LED flashes every 4 seconds).

CAUSE and SOLUTION:

DC voltage on amplifier output. Amplifier may need service; see enclosed warranty card for service information.

- **PROBLEM:**

No audio (PROTECT LED is on).

CAUSE and SOLUTION:

Amplifier is overheated. Make sure amplifier cooling is not blocked at mounting location; verify that speaker-system impedance is within specified limits.

- **PROBLEM:**

No audio (PROTECT and POWER LEDs flash).

CAUSE and SOLUTION:

Voltage less than 9V on BATT+ connection. Check vehicle charging system.

- **PROBLEM:**

No audio (PROTECT LED is on).

CAUSE and SOLUTION:

Voltage greater than 16V or less than 8.5V on BATT+ connection. Check vehicle charging system.

- **PROBLEM:**

Distorted audio.

CAUSE and SOLUTION:

Input sensitivity is not set properly, or amplifier or source unit is defective. Check INPUT LEVEL setting, or check speaker wires for shorts or grounds.

- **PROBLEM:**

Distorted audio (PROTECT LED flashes).

CAUSE and SOLUTION:

Short circuit in speaker or wire. Remove speaker leads one at a time to locate shorted speaker or wire, then repair.

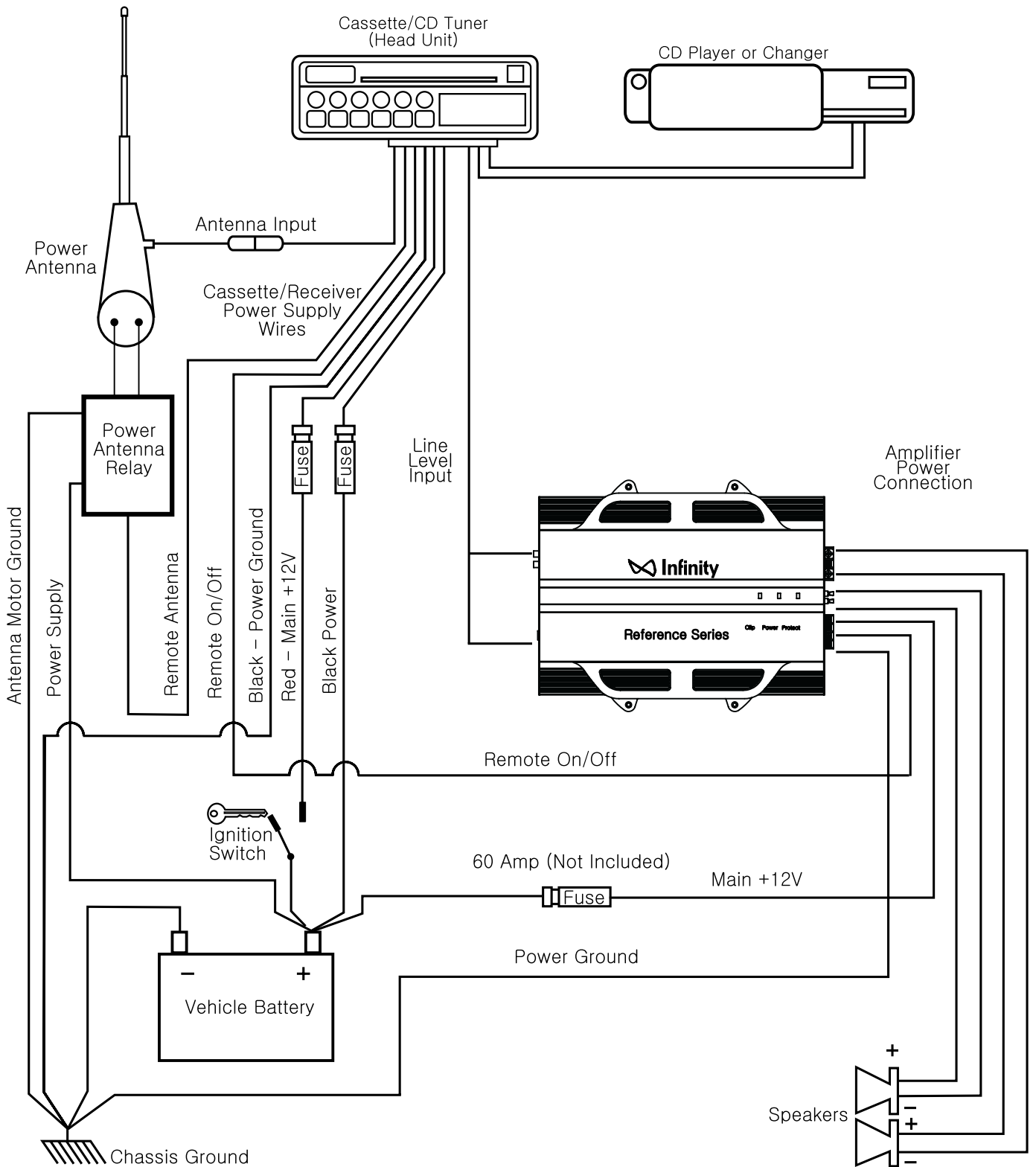
- **PROBLEM:**

Music lacks "punch"

CAUSE and SOLUTION:

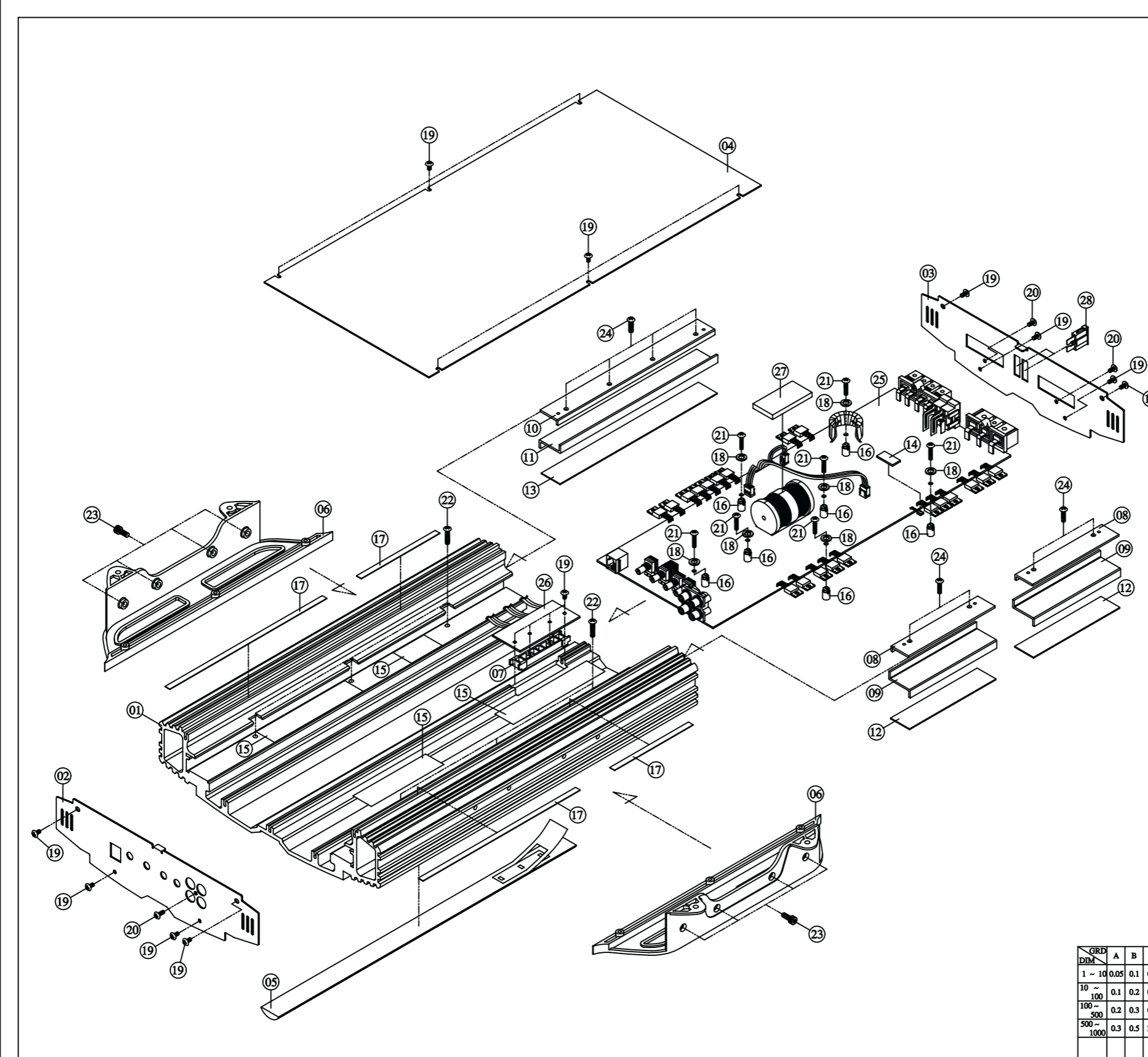
Speakers are not connected properly. Check speaker connections for proper polarity.

Typical System Configuration



EXPLODED VIEW

A
B
C
D
E
F
G



| NO | PART NAME | MIFR PARTS | DESCRIPTION | QTY |
|----|------------------------|--------------|--|-------|
| 01 | HEAT SINK-MAIN | HEA-01-183AB | AL/EXTRUSION(L=380.0mm) | 1EA |
| 02 | PANEL-FRONT | PAN-06-279AA | EGI, 1.2t | 1EA |
| 03 | REF 610a PANEL-REAR | PAN-06-280AA | EGI, 1.2t | 1EA |
| | REF 611a PANEL-REAR | PAN-06-301AA | EGI, 1.2t | 1EA |
| 04 | COVER-BOTTOM | COV-06-134AA | EGI, 1.2t | 1EA |
| 05 | COVER-LENS | COV-22-552AA | ACRYLIC, L=380.0mm | 1EA |
| 06 | FOOT-MOUNTING | FOO-21-014AA | ABS(XR-401), L=290.0mm | 2EA |
| 07 | ILLUMINATOR | ILL-23-503A0 | PC/MILKY | 1EA |
| 08 | BRACKET-TR(A) | BKT-11-001A0 | SBHG, 110.0×22.5×2.0t | 2EA |
| 09 | BRACKET-TR(B) | BKT-11-002A0 | SBHG, 110.0×25.5×2.0t | 2EA |
| 10 | BRACKET-TR(C) | BKT-11-011A0 | SBHG, 200.0×22.5×2.0t | 1EA |
| 11 | BRACKET-TR(D) | BKT-11-012A0 | SBHG, 200.0×25.5×2.0t | 1EA |
| 12 | CUSHION-TR BRACKET (A) | SUB-28-001A0 | FIBER, 110.0×22.0×1.0t | 2EA |
| 13 | CUSHION-TR BRACKET (B) | SUB-28-084A0 | FIBER, 200.0×22.0×1.0t | 1EA |
| 14 | CUSHION-RUBBER | SUB-33-001A0 | RUBBER, 10.0×20.0×1.6t | 1EA |
| 15 | SILICON PAD | SIL-34-001A0 | SP1000, 22.0×0.3t | 420mm |
| 16 | SUPPORT-PCB | SS-5 | NYLON, L=7.9mm | 7EA |
| 17 | PAPER SPACER(A) | SUB-28-002A0 | FIBER, 200.0×6.0×0.5t | 3EA |
| 18 | WASHER-SPRING | WAS-00-017A0 | M5B, $\varnothing 8.9 \times \varnothing 5.2 \times 1.0$ (NATURAL) | 7EA |
| 19 | SCREW | SC5-BB-30060 | STT2 BH 3×6 BK | 18EA |
| 20 | SCREW | SC5-BB-30080 | STT2 BH 3×8 BK | 3EA |
| 21 | SCREW | SC5-NB-30150 | STT2 BH 3×15 NI-P | 7EA |
| 22 | SCREW | SC5-NP-35160 | STT2 PH 3.5×16 NI-P | 6EA |
| 23 | SCREW | SC1-NL-40100 | SML 4×10 NI-P | 8EA |
| 24 | SCREW | SC1-NP-40140 | SMP 4×14 NI-P | 8EA |
| 25 | MAIN PCB | PAM660-01 | 148.0×379.0mm | 1EA |
| 26 | LED PCB | PAS328-01 | 44.0×76.0mm, BLACK | 1EA |
| 27 | GAP PAD | GAP-00-029A0 | 25.0×50.0×5.0t | 1EA |
| 28 | AUTO FUSE | FUS-AT-00006 | 30A | 2EA |

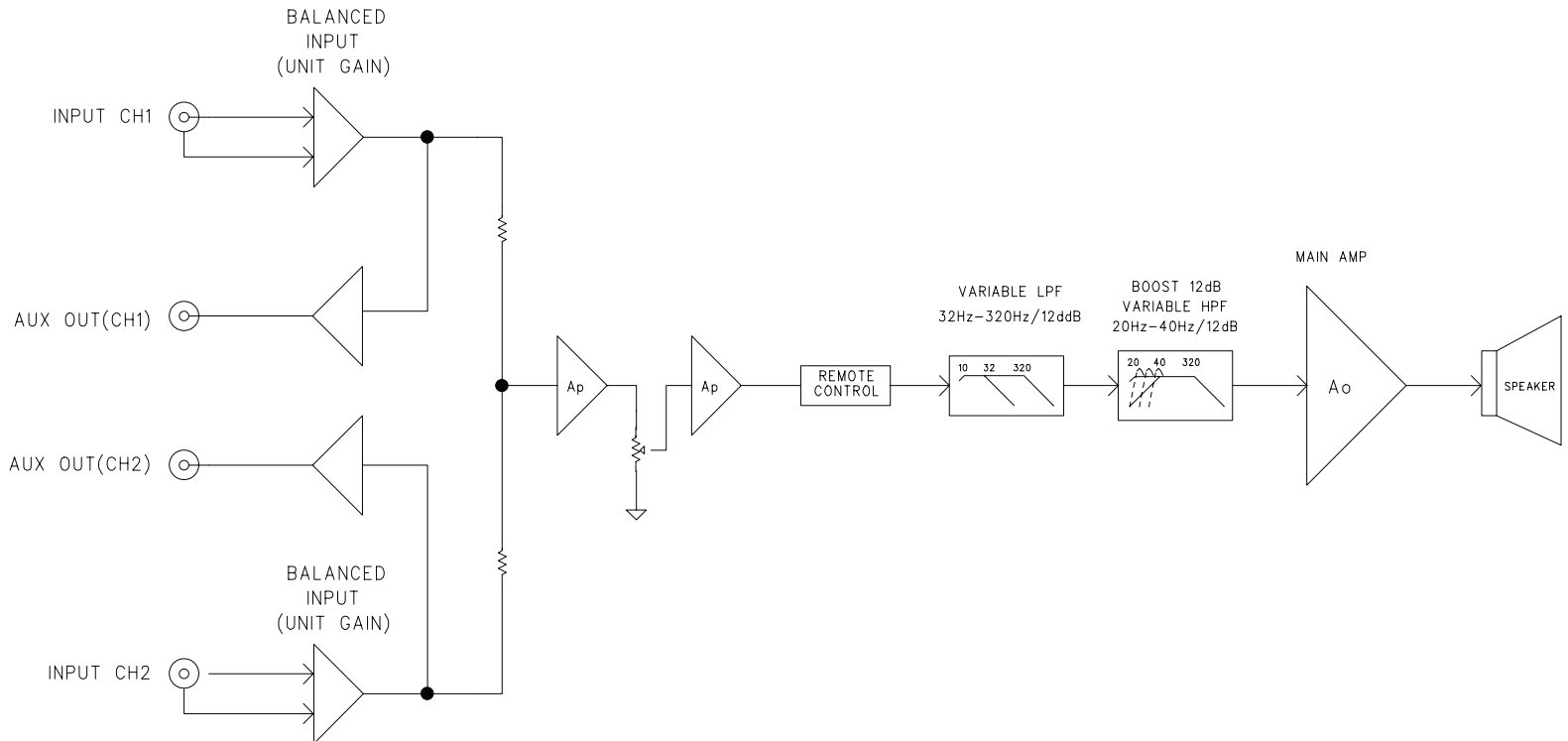
| GRD DIM | A | B | C | THIRD ANGLE | UNIT | SCALE | DATE | MODEL | REF610a |
|------------|------|-----|-----|-------------|------|-------|------------|----------|----------------------|
| 1 ~ 10 | 0.05 | 0.1 | 0.2 | | MM | 1:1 | 2004.04.10 | DRAW NO | |
| 10 ~ 100 | 0.1 | 0.2 | 0.3 | | DRAW | CHECK | APPRO | NAME | EXPLODED VIEW |
| 100 ~ 500 | 0.2 | 0.3 | 0.5 | H.Y.AN | | | D.W.SEO | CODE NO. | |
| 500 ~ 1000 | 0.3 | 0.5 | 1.5 | | | | | ISSUE | |
| | | | | | | | | | Φ |

1 2 3 4 5 6 7 8 9

Mechanical Parts List

| PART NO. | NOMENCATURE | DESCRIPTION | MFR PARTS | Q'TY |
|---------------------|----------------------------|--------------------------------|---|-------|
| HEA-01-183AB | HEAT SINK-MAIN | AL/EXTRUSION(L=380.0mm) | side:P432C sandton spray,top:silver spray/1 silk screen | 1 |
| PAN-06-279AA | PANEL-FRONT | EGL, 1.2t | P432C Painting & silk screen | 1 |
| PAN-06-280AA | REF 610a PANEL-REAR | EGL, 1.2t | P432C Painting & silk screen | 1 |
| PAN-06-301AA | REF 611a PANEL-REAR | EGL, 1.2t | P432C Painting & silk screen | 1 |
| COV-01-134AA | COVER-BOTTOM | AL, 1.2t | P432C Painting | 1 |
| COV-22-552AA | COVER-LENS | ACRYLIC,(L=380mm) | SILKSCREEN,DUAL TAPE | 1 |
| FOO-21-014AA | FOOT-MOUNTING | ABS(XR-401),L=290mm | SILVER SPRAY | 2 |
| ILL-23-503A0 | ILLUMINATOR | PC/MILKY | | 1 |
| BKT-11-001A0 | BRACKET-TR(A) | SBHG, 110.0x22.5x2.0t | | 2 |
| BKT-11-002A0 | BRACKET-TR(B) | SBHG, 110.0x25.5x2.0t | | 2 |
| BKT-11-011A0 | BRACKET-TR(C) | SBHG, 200.0x22.5x2.0t | | 1 |
| BKT-11-012A0 | BRACKET-TR(D) | SBHG, 200.0x25.5x2.0t | | 1 |
| SUB-28-001A0 | CUSHION-TR BRACKET(A) | FIBER, 110.0x22.0x1.0t | | 2 |
| SUB-28-084A0 | CUSHION-TR BRACKET(B) | FIBER, 200.0x22.0x1.0t | | 1 |
| SUB-33-001A0 | CUSHION-RUBBER | RUBBER, 10.0x20.0x1.6t | | 1 |
| SIL-34-001A0 | SILICON PAD | SP1000, 22.0x0.3t | | 420mn |
| SS-5 | SUPPORT-PCB | NYLON, L=7.9mm | | 7 |
| SUB-28-002A0 | PAPER SPACER(A) | FIBER, 200.0x6.0x0.5t | COVER-BOTTOM | 3 |
| SUB-28-503A0 | PAPER SPACER(B) | FIBER, 200.0x10.0x0.5t | FET | 1 |
| WAS-00-017A0 | WASHER-SPRING | M5,\$ 8.9x\$ 5.2x1.0t(NATURAL) | SUPPORT+GROUND WIRE | 7 |
| SC5-BB-30060 | SCREW | STT2 BH 3x6 BK | PANEL/S+H/S(8),SUB/P+ILLUMINATOR(2),SUB/P+H/S(2),C/B+H/S(6) | 18 |
| SC5-BB-30080 | SCREW | STT2 BH 3x8 BK | RCA(1), TERMINAL(2) | 3 |
| SC5-NB-30150 | SCREW | STT2 BH 3x15 NI-P | PCB + HEAT SINK | 7 |
| SC5-NP-35140 | SCREW | STT2 PH 3.5x16 NI-P | FOOT/M+ H/SINK | 6 |
| SC1-NL-40100 | SCREW | SML 4x10 NI-P | FOOT/M + H/SINK | 8 |
| SC1-NP-40140 | SCREW | SMP 4x14 NI-P | BRACKET TR | 8 |
| SC4-NO-40250 | SCREW | STT1 OH 4x25 NI-P | ACCESSORY | 4 |

REF 610a/611a BLOCK DIAGRAM



A

B

C

D

E

1

2

3

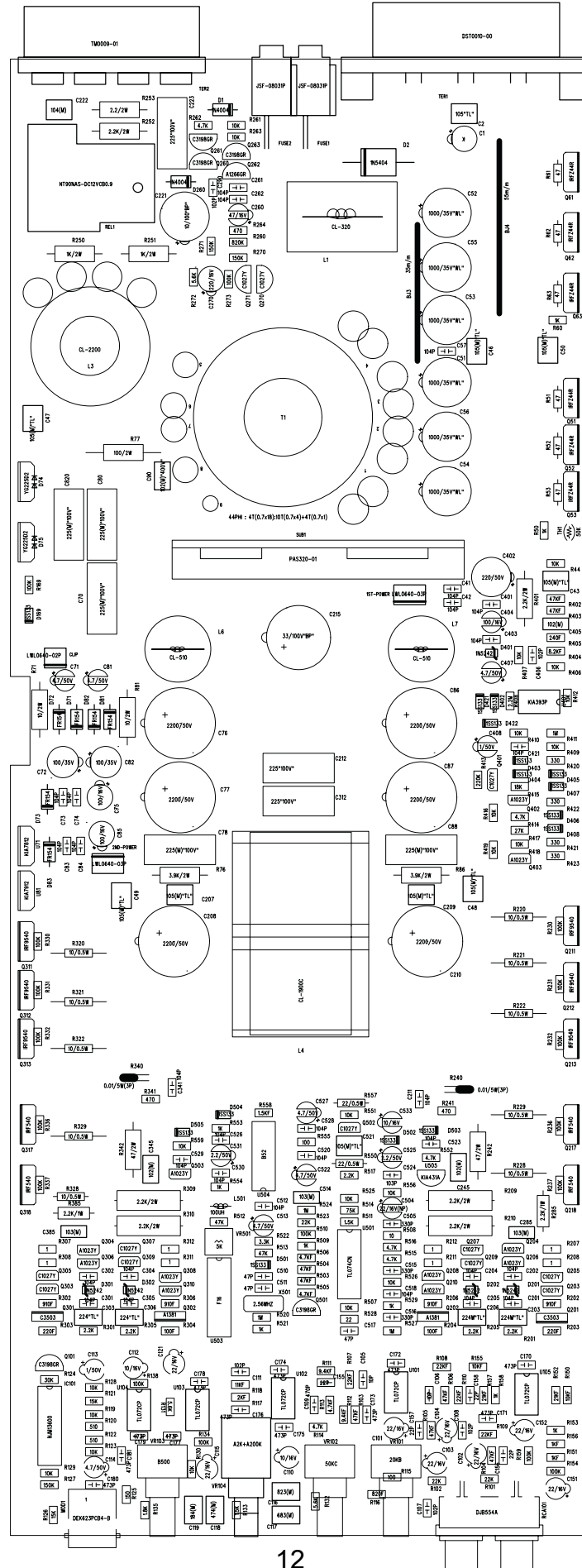
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5

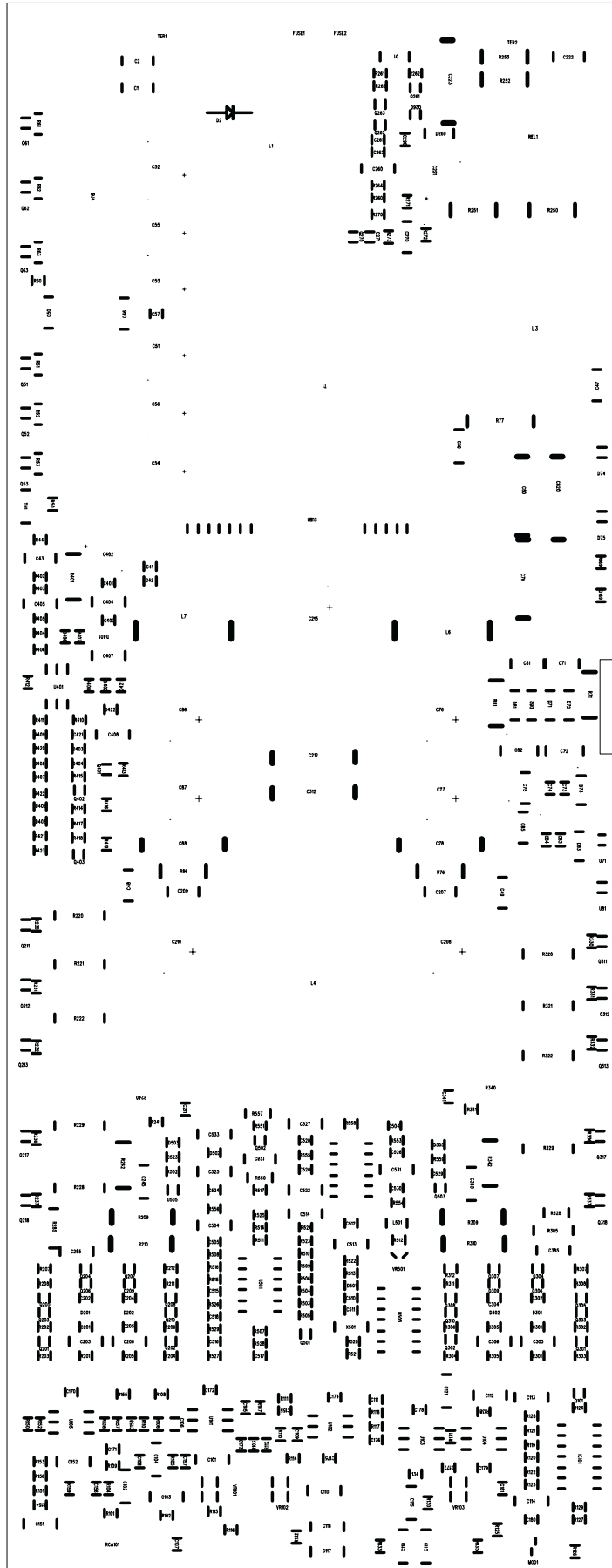
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7

Printed Circuit Board (Top View)

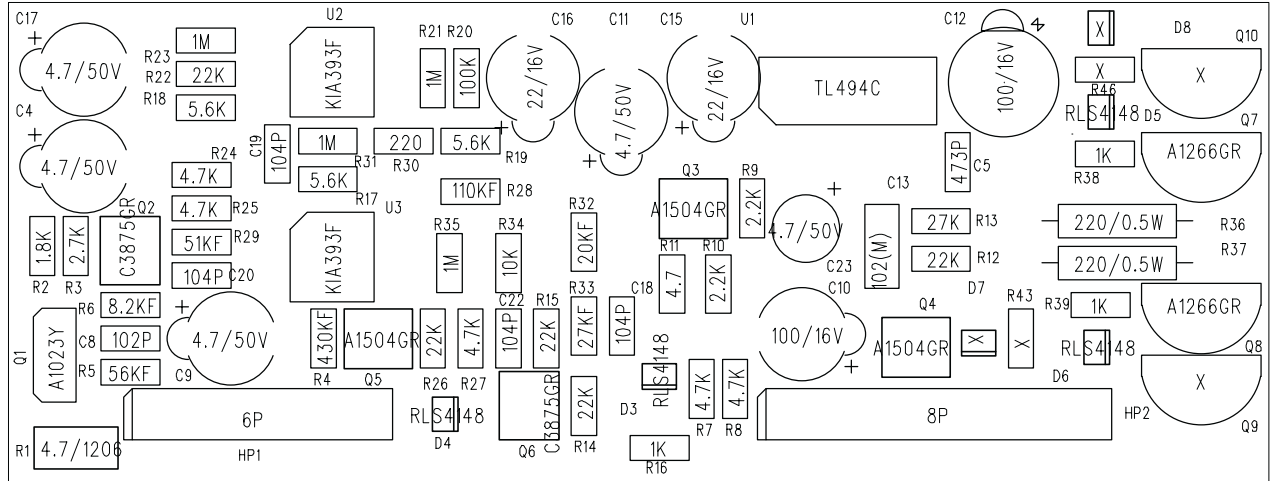


Printed Circuit Board (BOTTOM View)



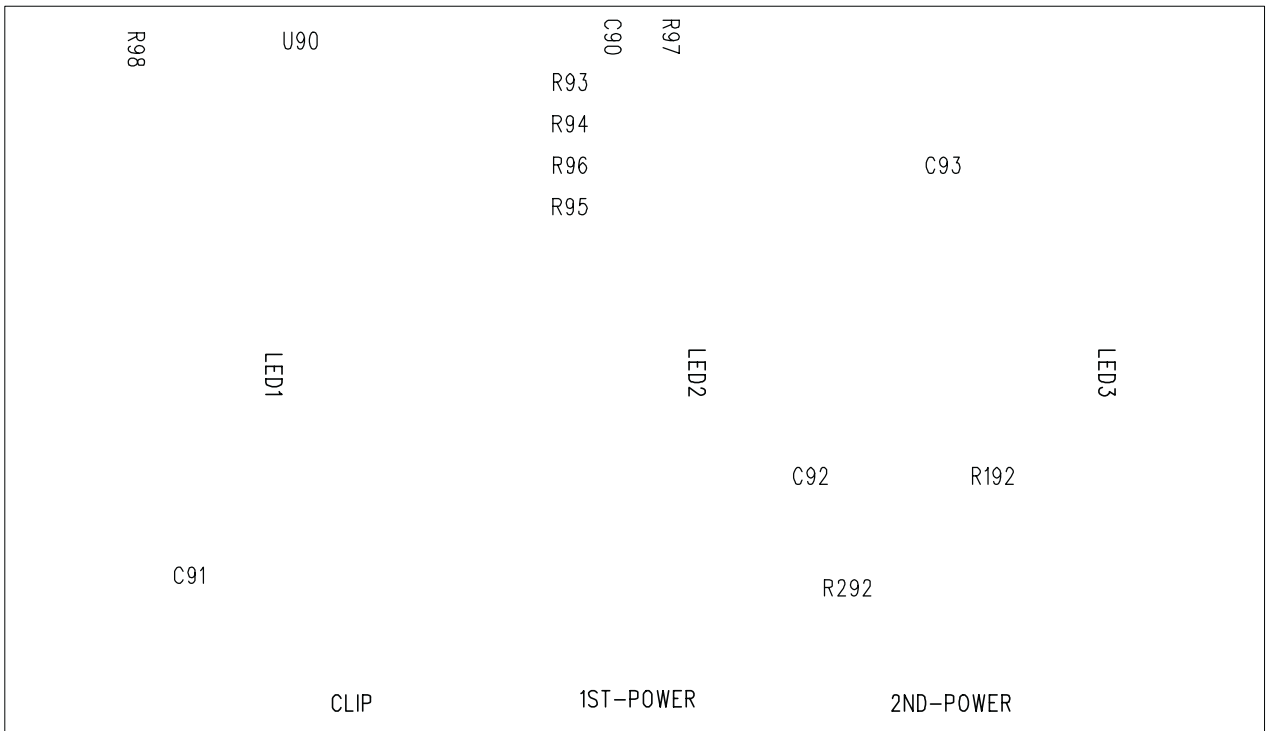
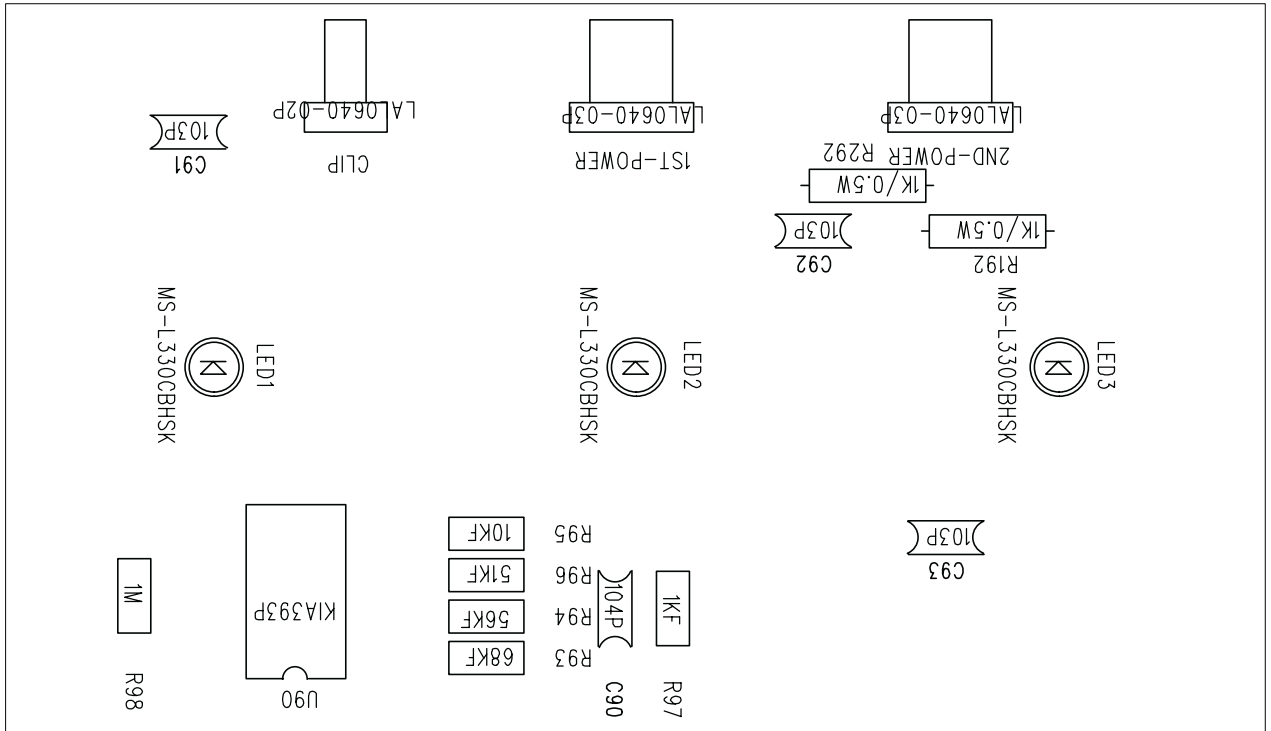
Printed Circuit Board (SUB TOP View)

PAS329-01



Printed Circuit Board (SUB TOP/BOTTOM View)

PAS328-01



Electrical Parts List

| PART NO. | NOMENCATURE | DESCRIPTION | MFR PARTS | REF. NO | Q'TY |
|--------------|-------------|---------------------------|-----------------|---|------|
| IC0-00-00098 | IC | SHUNT REGULATOR | KIA431/KIA431A | U505 | 1 |
| DIO-00-00108 | DIODE | FAST RECOVERY | FR154 | D71,72,73,81,82,83 | 6 |
| DIO-00-00003 | DIODE | RECTIFIER | 1N4004 | D1,260 | 2 |
| DIO-00-00041 | DIODE | ZENER 0.5W,12V | 1N5242 | D201,202,301,302,401 | 5 |
| DIO-00-00006 | DIODE | SWITCHING SIGNAL | 1SS133 / 1N4148 | D169,402,403,404,405,406,407,408,421,422 D501,502,503,504,505 | 15 |
| TRS-00-00087 | TRANSISTOR | SMALL SIGNAL PNP "TO-92L" | KTA1023Y | Q204,206,208,210,304,306,308,310,402,403 Q503 | 11 |
| TRS-00-00088 | TRANSISTOR | SMALL SIGNAL NPN "TO-92L" | KTC1027Y | Q203,205,207,209,270,271,303,305,307,309 Q401,502 | 12 |
| TRS-00-00090 | TRANSISTOR | SMALL SIGNAL PNP "TO-92" | KTA1266GR | Q262 | 1 |
| TRS-00-00110 | TRANSISTOR | SMALL SIGNAL NPN "TO-92" | KTC3198GR | Q101,260,261,263,501 | 5 |
| RES-00-00401 | RESISTOR | METAL FILM 1/5WF | 100 OHM | R204,304 | 2 |
| RES-00-00463 | RESISTOR | METAL FILM 1/5WF | 220 OHM | R203,303 | 2 |
| RES-00-00474 | RESISTOR | METAL FILM 1/5WF | 240 OHM | R405 | 1 |
| RES-00-00586 | RESISTOR | METAL FILM 1/5WF | 820 OHM | R116 | 1 |
| RES-00-00590 | RESISTOR | METAL FILM 1/5WF | 910 OHM | R202,206,302,306 | 4 |
| RES-00-00437 | RESISTOR | METAL FILM 1/5WF | 1K OHM | R151,156 | 2 |
| RES-00-00393 | RESISTOR | METAL FILM 1/5WF | 1.5K OHM | R558 | 1 |
| RES-00-00482 | RESISTOR | METAL FILM 1/5WF | 2K OHM | R117 | 1 |
| RES-00-00523 | RESISTOR | METAL FILM 1/5WF | 4.7K OHM | R113,505,506 | 3 |
| RES-00-00581 | RESISTOR | METAL FILM 1/5WF | 8.2K OHM | R404 | 1 |
| RES-00-00589 | RESISTOR | METAL FILM 1/5WF | 9.4K OHM | R111,112 | 2 |
| RES-00-00402 | RESISTOR | METAL FILM 1/5WF | 10K OHM | R150,155 | 2 |
| RES-00-00409 | RESISTOR | METAL FILM 1/5WF | 11K OHM | R118 | 1 |
| RES-00-00459 | RESISTOR | METAL FILM 1/5WF | 21K OHM | R152,157 | 2 |
| RES-00-00467 | RESISTOR | METAL FILM 1/5WF | 22K OHM | R107,108,109,110 | 4 |
| RES-00-00537 | RESISTOR | METAL FILM 1/5WF | 47K OHM | R103,104,105,106,402,403,503,504 | 8 |
| RES-00-00636 | RESISTOR | CARBON FILM 1/5WJ | 1 OHM | R207,208,211,212,307,308,311,312 | 8 |
| RES-00-00610 | RESISTOR | CARBON FILM 1/5WJ | 10 OHM | R508 | 1 |
| RES-00-00660 | RESISTOR | CARBON FILM 1/5WJ | 22 OHM | R528 | 1 |
| RES-00-00716 | RESISTOR | CARBON FILM 1/5WJ | 47 OHM | R51,52,53,61,62,63 | 6 |
| RES-00-00606 | RESISTOR | CARBON FILM 1/5WJ | 100 OHM | R115,555 | 2 |
| RES-00-00622 | RESISTOR | CARBON FILM 1/5WJ | 150 OHM | R125 | 1 |
| RES-00-00685 | RESISTOR | CARBON FILM 1/5WJ | 330 OHM | R420,421,422,423 | 4 |
| RES-00-00712 | RESISTOR | CARBON FILM 1/5WJ | 470 OHM | R241,264,341 | 3 |
| RES-00-00723 | RESISTOR | CARBON FILM 1/5WJ | 510 OHM | R120,122 | 2 |
| RES-00-00633 | RESISTOR | CARBON FILM 1/5WJ | 1K OHM | R50,60,153,158,509,521,529,553,554 | 9 |
| RES-00-00598 | RESISTOR | CARBON FILM 1/5WJ | 1.5K OHM | R133,511 | 2 |
| RES-00-00602 | RESISTOR | CARBON FILM 1/5WJ | 1.8K OHM | R135 | 1 |
| RES-00-00637 | RESISTOR | CARBON FILM 1/5WJ | 2.2K OHM | R201,205,301,305,517 | 5 |
| RES-00-00672 | RESISTOR | CARBON FILM 1/5WJ | 3.3K OHM | R522 | 1 |
| RES-00-00702 | RESISTOR | CARBON FILM 1/5WJ | 4.7K OHM | R114,262,414,515,516,552 | 6 |
| RES-00-00720 | RESISTOR | CARBON FILM 1/5WJ | 5.6K OHM | R131,132,272 | 3 |
| RES-00-00608 | RESISTOR | CARBON FILM 1/5WJ | 10K OHM | R44,119,123,128,129,130,261,263,406,407 R409,410,412,416,418,419,507,525,526,551 R556,559 | 22 |
| RES-00-00623 | RESISTOR | CARBON FILM 1/5WJ | 15K OHM | R121,126 | 2 |
| RES-00-00630 | RESISTOR | CARBON FILM 1/5WJ | 18K OHM | R415 | 1 |
| RES-00-00658 | RESISTOR | CARBON FILM 1/5WJ | 22K OHM | R101,102,523 | 3 |
| RES-00-00666 | RESISTOR | CARBON FILM 1/5WJ | 27K OHM | R417 | 1 |
| RES-00-00680 | RESISTOR | CARBON FILM 1/5WJ | 30K OHM | R124 | 1 |
| RES-00-00714 | RESISTOR | CARBON FILM 1/5WJ | 47K OHM | R512,513 | 2 |
| RES-00-00748 | RESISTOR | CARBON FILM 1/5WJ | 75K OHM | R514 | 1 |
| RES-00-00604 | RESISTOR | CARBON FILM 1/5WJ | 100K OHM | R134,138,154,159,169,230,231,232,236,237 R273,330,331,332,336,337,510 | 17 |
| RES-00-00620 | RESISTOR | CARBON FILM 1/5WJ | 150K OHM | R127,270,271 | 3 |
| RES-00-00654 | RESISTOR | CARBON FILM 1/5WJ | 220K OHM | R413 | 1 |
| RES-00-00755 | RESISTOR | CARBON FILM 1/5WJ | 820K OHM | R260 | 1 |
| RES-00-00635 | RESISTOR | CARBON FILM 1/5WJ | 1M OHM | R411,520,524,527 | 4 |
| RES-00-00639 | RESISTOR | CARBON FILM 1/5WJ | 2.2M OHM | R408 | 1 |

Electrical Parts List cont'd

| PART NO. | NOMENCATURE | DESCRIPTION | MFR PARTS | REF. NO | Q'TY |
|--------------|-------------|----------------------------|------------|---|------|
| RES-00-00018 | RESISTOR | METAL FILM 1/2WJ | 10 OHM | R220,221,222,228,229,320,321,322,328,329 | 10 |
| RES-00-00040 | RESISTOR | METAL FILM 1/2WJ | 22 OHM | R550,557 | 2 |
| IND-00-00020 | INDUCTOR | COIL AXIAL 5% | 100uH | L501 | 1 |
| CEC-00-00007 | CAPACITOR | CERAMIC TUBULAR 50V | 10pF | C105,106 | 2 |
| CEC-00-00020 | CAPACITOR | CERAMIC TUBULAR 50V | 22pF | C155,156,157,158 | 4 |
| CEC-00-00038 | CAPACITOR | CERAMIC TUBULAR 50V | 47pF | C510,511,517 | 3 |
| CEC-00-00028 | CAPACITOR | CERAMIC TUBULAR 50V | 330pF | C505,515,516 | 3 |
| CEC-00-00035 | CAPACITOR | CERAMIC TUBULAR 50V | 470pF | C109 | 1 |
| CEC-00-00004 | CAPACITOR | CERAMIC TUBULAR 50V | 102pF | C107,108,111,290,406 | 5 |
| CEC-00-00005 | CAPACITOR | CERAMIC TUBULAR 50V | 103pF | C524 | 1 |
| CEC-00-00037 | CAPACITOR | CERAMIC TUBULAR 50V | 473pF | C170,171,172,173,174,175,176,177,178,179 | 12 |
| CEC-00-00006 | CAPACITOR | CERAMIC TUBULAR 50V | 104pF | C180,181 C41,42,57,73,74,83,84,201,202,204 C205,211,261,262,301,302,304,305,341,401 C403,421,512,518,520,523,526,528,529,530 | 30 |
| ELC-00-00333 | CAPACITOR | ELECTROLYTIC"NP" | 22uF/16V | C504 | 1 |
| ELC-00-00218 | CAPACITOR | ELECTROLYTIC"SMS" | 1uF/50V | C113,408 | 2 |
| ELC-00-00223 | CAPACITOR | ELECTROLYTIC"SMS" | 2.2uF/50V | C525,531 | 2 |
| ELC-00-00229 | CAPACITOR | ELECTROLYTIC"SMS" | 4.7uF/50V | C71,81,114,407,513,522,527 | 7 |
| ELC-00-00195 | CAPACITOR | ELECTROLYTIC"SMS" | 10uF/16V | C110,112,533 | 3 |
| ELC-00-00197 | CAPACITOR | ELECTROLYTIC"SMS" | 22uF/16V | C101,102,103,104,115,121,151,152 | 8 |
| ELC-00-00198 | CAPACITOR | ELECTROLYTIC"SMS" | 47uF/16V | C260 | 1 |
| ELC-00-00199 | CAPACITOR | ELECTROLYTIC"SMS" | 100uF/16V | C75,85,404 | 3 |
| ELC-00-00214 | CAPACITOR | ELECTROLYTIC"SMS" | 100uF/35V | C72,82 | 2 |
| ELC-00-00200 | CAPACITOR | ELECTROLYTIC"SMS" | 220uF/16V | C270 | 1 |
| MYC-00-00020 | CAPACITOR | MYLAR 5% 100V | 102J | C245,345,405 | 3 |
| MYC-00-00019 | CAPACITOR | MYLAR 5% 100V | 103J | C285,385,514 | 3 |
| MYC-00-00044 | CAPACITOR | MYLAR 5% 100V | 683J | C117 | 1 |
| MYC-00-00045 | CAPACITOR | MYLAR 5% 100V | 823J | C116 | 1 |
| MYC-00-00094 | CAPACITOR | MYLAR 5% 100V | 104J | C222 | 1 |
| MYC-00-00199 | CAPACITOR | MYLAR 5% 400V "BOX" | 102J | C90 | 1 |
| MYC-00-00156 | CAPACITOR | MYLAR 5% 63V "TL TYPE" | 184J | C119 | 1 |
| MYC-00-00088 | CAPACITOR | MYLAR 5% 63V "TL TYPE" | 224J | C203,206,303,306 | 4 |
| MYC-00-00066 | CAPACITOR | MYLAR 5% 63V "TL TYPE" | 474J | C118 | 1 |
| MYC-00-00085 | CAPACITOR | MYLAR 5% 63V "TL TYPE" | 105J | C2,43,46,47,48,49,50,207,209,521 | 10 |
| ICO-00-00017 | I.C | DIP-14 | B52 | U504 | 1 |
| ICO-00-00055 | I.C | DIP-16 | F16 | U503 | 1 |
| ICO-00-00003 | I.C | DUAL OPAMP DIP-08 | TL072CP | U101,102,103,104,105 | 5 |
| ICO-00-00006 | I.C | OPAMP DIP-14 | TL074CN | U501 | 1 |
| ICO-00-00170 | I.C | VOLUME IC DIP-16 | NJM 13600D | IC101 | 1 |
| ICO-00-00095 | I.C | COMPORATOR IC DIP-08 | KIA393P | U401 | 1 |
| ICO-00-00157 | I.C | VOTAGE REGULATOR +12V 1A | KIA7812PI | U71 | 1 |
| ICO-00-00162 | I.C | VOTAGE REGULATOR -12V 1A | KIA7912PI | U81 | 1 |
| FET-00-00011 | F.E.T | N-CH POWER FET "TO-220" | IRFZ44R | Q51,52,53,61,62,63 | 6 |
| FET-00-00015 | F.E.T | N-CH POWER FET "TO-220" | IRF540 | Q217,218,317,318 | 4 |
| FET-00-00020 | F.E.T | P-CH POWER MOSFET "TO-220" | IRF9540 | Q211,212,213,311,312,313 | 6 |
| TRS-00-00096 | TRANSISTOR | SMALL SIGNAL PNP | KTA1381 | Q202,302 | 2 |
| TRS-00-00112 | TRANSISTOR | SMALL SIGNAL NPN | KTC3503 | Q201,301 | 2 |
| DIO-00-00152 | DIODE | FAST RECOVERY | YG225D2 | D74,75 | 2 |
| DIO-00-00048 | DIODE | FAST RECOVERY | 1N5404 | D2 | 1 |

Electrical Parts List cont'd

| PART NO. | NOMENCATURE | DESCRIPTION | MFR PARTS | REF. NO | Q'TY |
|--------------|-----------------------|-----------------------------|------------------------|--|------|
| RES-00-01239 | RESISTOR | MOR-S 1WJ | 2.2K OHM | R285,385 | 2 |
| RES-00-01112 | RESISTOR | MOR-S 2WJ | 2.2 OHM | R253 | 1 |
| RES-00-01067 | RESISTOR | MOR-S 2WJ | 10 OHM | R71,81 | 2 |
| RES-00-01222 | RESISTOR | MOR-S 2WJ | 47 OHM | R242,342 | 2 |
| RES-00-00844 | RESISTOR | MOR-S 2WJ | 100 OHM | R77 | 1 |
| RES-00-01078 | RESISTOR | MOR-S 2WJ | 1K OHM | R250,251 | 2 |
| RES-00-00853 | RESISTOR | MOR-S 2WJ | 2.2K OHM | R209,210,252,309,310,401 | 6 |
| RES-00-01099 | RESISTOR | MOR-S 2WJ | 3.9K OHM | R76,86 | 2 |
| RES-00-00947 | RESISTOR | SHUNT RESISTOR 5WJ | 0.01 OHM | R240,340 | 2 |
| REN-00-00001 | RESONATOR | 2.56MHz | ZTA2.56MG | X501 | 1 |
| ELC-00-00357 | CAPACITOR | ELECTROLYTIC"BP" | 10uF/100V | C221 | 1 |
| ELC-00-00009 | CAPACITOR | ELECTROLYTIC"BP" | 33/100V | C215 | 1 |
| ELC-00-00232 | CAPACITOR | ELECTROLYTIC"SMS" | 220/50V | C402 | 1 |
| ELC-00-00726 | CAPACITOR | ELECTROLYTIC"WL" | 1000/35V | C51,52,53,54,55,56 | 6 |
| ELC-00-00187 | CAPACITOR | ELECTROLYTIC "SHL" | 2200uF/50V | C76,77,86,87,208,210 | 6 |
| MYC-00-00076 | CAPACITOR | MYLAR 10% 100V "BOX TYPE" | 225K | C70,78,80,88,212,223,312,820 | 8 |
| COI-00-00096 | INDUCTOR | BAR COIL | CL-320 | L1 | 1 |
| COI-00-00093 | INDUCTOR | BAR COIL | CL-510 | L6,7 | 2 |
| COI-00-00073 | INDUCTOR | DRUM COIL | CL-2200 | L3 | 1 |
| COI-00-00070 | INDUCTOR | DRUM COIL | CL-1900C | L4 | 1 |
| GAP-00-029A0 | GAP PAD | | 25x50x5t | L4 | 1 |
| COR-TF-00409 | CORE | | 44 PHI MAG | T1 , 44PHI 4T(0.7X18):10T(0.7X4):4T(0.7X1) | 1 |
| TER-00-00163 | POWER | 3P TERMINAL | DST0010-00 | TER1 | 1 |
| TER-00-00034 | SPEAKER | 4P TERMINAL | TM0009-01 | TER2 | 1 |
| HOD-00-00006 | FUSE HOLDER | PCB TYPE | JSF08031P | FUSE1,2 | 2 |
| FUS-AT-00006 | AUTO FUSE | AUTO FUSE | 30A | SET(2)+ACCESSORY(2) | 4 |
| JAC-00-00043 | RCA JACK | GOLD PLATE(TOP RED) | DJB-554A | RCA101 | 1 |
| CON-00-00002 | WAFER | | LWL0640-02P | CLIP | 1 |
| CON-00-00033 | WAFER | | LWL0640-03P | 1ST POWER,2ND POWER | 2 |
| JUP-00-00003 | JUMPER | BAR JUMPER | 35m/m | BJ3 | 1 |
| JUP-00-00005 | JUMPER | BAR JUMPER | 55 m/m | BJ4 | 1 |
| JAC-00-00050 | MODULAR JACK 4P,BLACK | | DEK623PCB4-B | MOD1 | 1 |
| REL-10-00030 | RELAY | DC 40A 12V | NT90NAS-DC12VCB0.9REL1 | | 1 |
| THS-00-00013 | THERMISTOR | FTD5-350 | 50K | TH1 | 1 |
| VOL-00-00134 | SEMI VOLUME | 6PHI , 5KB(straight TYPE) | RG06P-5KB | VR501 | 1 |
| VOL-00-00335 | VOLUME | V12L5(9X5)G(PH2D)N15S | 15B20K x 2 | VR101 | 1 |
| VOL-00-00336 | VOLUME | V12L5(9X5)G(PH2D)N15S | 15C50K x 2 | VR102 | 1 |
| VOL-00-00352 | VOLUME | V12L5(9X5) G(PH2D)N 15S | B500 x 2 | VR103 | 1 |
| VOL-00-00353 | VOLUME | V12L5(9X5) G(4R)(PH2D)N 15S | A2Kx2+A200Kx2 | VR104 | 1 |
| TUB-00-00008 | TEFLON TUBE | 0.7 PHI | 10 m/m | TH1 | 2 |
| ICO-00-00021 | I.C | SMD PWM | TL494C | U1 | 1 |
| ICO-00-00094 | I.C | SMD "FLP-8" | KIA393F | U2,3 | 2 |
| TRS-00-00098 | TRANSISTOR | SMALL SIGNAL PNP,SOT-23 | KTA1504GR | Q3,4,5 | 3 |
| TRS-00-00113 | TRANSISTOR | SMALL SIGNAL NPN,SOT-23 | KTC3875GR | Q2,6 | 2 |
| DIO-00-00117 | DIODE | SWITCHING SIGNAL | RLS4148/LL4148 | D3,4,5,6 | 4 |

Electrical Parts List cont'd

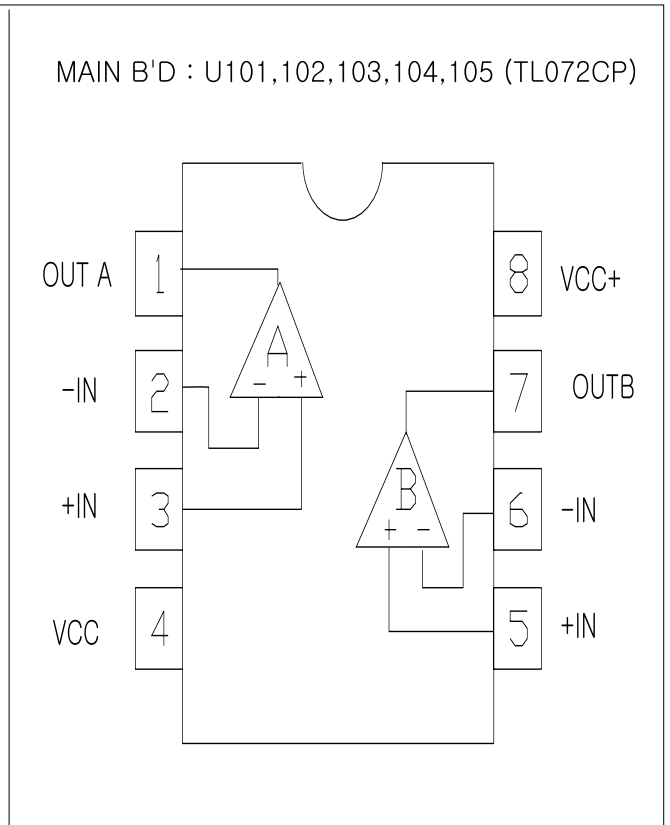
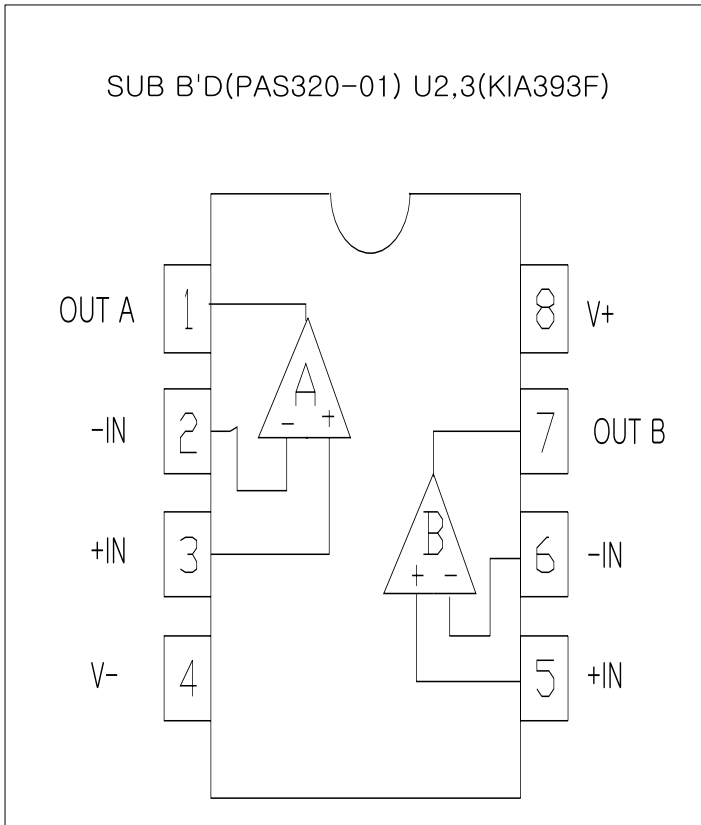
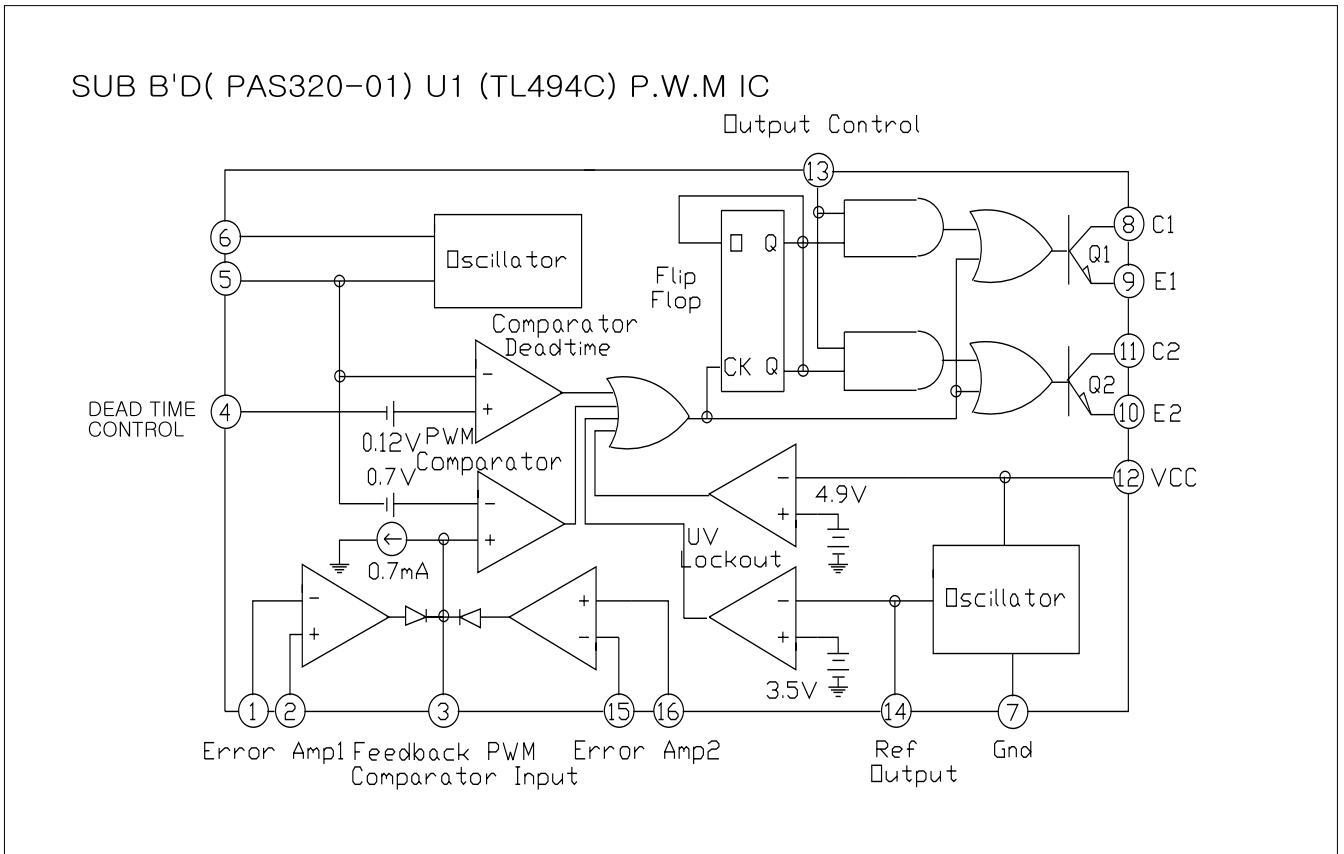
| PART NO. | NOMENCATURE | DESCRIPTION | MFR PARTS | REF. NO | Q'TY |
|--------------|-------------|----------------------|--------------------|---------------------|------|
| RES-12-00243 | RESISTOR | SMD "0805"1/10WF | 8.2K OHM | R6 | 1 |
| RES-08-00035 | RESISTOR | SMD "0805"1/10WF | 20K OHM | R32 | 1 |
| RES-08-00048 | RESISTOR | SMD "0805"1/10WF | 27K OHM | R33 | 1 |
| RES-08-00245 | RESISTOR | SMD "0805"1/10WF | 51K OHM | R29 | 1 |
| RES-08-00100 | RESISTOR | SMD "0805"1/10WF | 56K OHM | R5 | 1 |
| RES-08-00249 | RESISTOR | SMD "0805"1/10WF | 110K OHM | R28 | 1 |
| RES-08-00250 | RESISTOR | SMD "0805"1/10WF | 430K OHM | R4 | 1 |
| RES-08-00193 | RESISTOR | SMD "0805"1/10WJ | 4.7 OHM | R11 | 1 |
| RES-08-00163 | RESISTOR | SMD "0805"1/10WJ | 220 OHM | R30 | 1 |
| RES-08-00148 | RESISTOR | SMD "0805"1/10WJ | 1K OHM | R16,38,39 | 3 |
| RES-08-00129 | RESISTOR | SMD "0805"1/10WJ | 1.8K OHM | R2 | 1 |
| RES-08-00151 | RESISTOR | SMD "0805"1/10WJ | 2.2K OHM | R9,10 | 2 |
| RES-08-00156 | RESISTOR | SMD "0805"1/10WJ | 2.7K OHM | R3 | 1 |
| RES-08-00191 | RESISTOR | SMD "0805"1/10WJ | 4.7K OHM | R7,8,24,25,27 | 5 |
| RES-08-00201 | RESISTOR | SMD "0805"1/10WJ | 5.6K OHM | R17,18,19 | 3 |
| RES-08-00132 | RESISTOR | SMD "0805"1/10WJ | 10K OHM | R34 | 1 |
| RES-08-00164 | RESISTOR | SMD "0805"1/10WJ | 22K OHM | R12,14,15,22,26 | 5 |
| RES-08-00170 | RESISTOR | SMD "0805"1/10WJ | 27K OHM | R13 | 1 |
| RES-08-00130 | RESISTOR | SMD "0805"1/10WJ | 100K OHM | R20 | 1 |
| RES-08-00149 | RESISTOR | SMD "0805"1/10WJ | 1M OHM | R21,23,31,35 | 4 |
| RES-12-00189 | RESISTOR | SMD "1206"1/8WJ | 4.7 OHM | R1 | 1 |
| CEC-08-00002 | CAPACITOR | CHIP"0805" 50V 5% | 102P | C8 | 1 |
| CEC-08-00040 | CAPACITOR | CHIP"0805" 50V 5% | 473P | C5 | 1 |
| CEC-08-00004 | CAPACITOR | CHIP"0805" 50V 5% | 104P | C18,19,20,22 | 4 |
| TRS-00-00087 | TRANSISTOR | SMALL SIGNAL PNP | KTA1023Y | Q1 | 1 |
| TRS-00-00090 | TRANSISTOR | SMALL SIGNAL PNP | KTA1266GR | Q7,8 | 2 |
| RES-00-00038 | RESISTOR | METAL FILM 1/2WJ | 220 OHM | R36,37 | 2 |
| ELC-00-00229 | CAPACITOR | ELECTROLYTIC"SMS" | 4.7uF/50V | C4,9,11,17,23 | 5 |
| ELC-00-00197 | CAPACITOR | ELECTROLYTIC"SMS" | 22uF/16V | C15,16 | 2 |
| ELC-00-00199 | CAPACITOR | ELECTROLYTIC"SMS" | 100uF/16V | C10,12 | 2 |
| MYC-00-00020 | CAPACITOR | MYLAR 5% 100V | 102J | C13 | 1 |
| HED-00-00100 | HEADER PIN | PIN HEADER C-TYPE 6P | TM2007-C9G-06P | HP1 | 1 |
| HED-00-00228 | HEADER PIN | PIN HEADER C-TYPE 8P | TM2007-C9G-08P | HP2 | 1 |
| ICO-00-00095 | I.C | COMPARATOR DIP-8P | KIA393P | U90 | 1 |
| RES-00-00437 | RESISTOR | METAL FILM 1/5WF | 1K OHM | R97 | 1 |
| RES-00-00402 | RESISTOR | METAL FILM 1/5WF | 10K OHM | R95 | 1 |
| RES-00-00550 | RESISTOR | METAL FILM 1/5WF | 51K OHM | R96 | 1 |
| RES-00-00556 | RESISTOR | METAL FILM 1/5WF | 56K OHM | R94 | 1 |
| RES-00-00573 | RESISTOR | METAL FILM 1/5WF | 68K OHM | R93 | 1 |
| RES-00-00635 | RESISTOR | CARBON FILM 1/5WJ | 1M OHM | R98 | 1 |
| RES-00-00029 | RESISTOR | METAL FILM 1/2WJ | 1K OHM | R192,292 | 2 |
| CEC-00-00005 | CAPACITOR | CERAMIC TUBULAR 50V | 103P | C91,92,93 | 3 |
| CEC-00-00006 | CAPACITOR | CERAMIC TUBULAR 50V | 104P | C90 | 1 |
| DIO-00-00321 | LED | BLUE 3PHI | MS-L330CBHSK | LED1,2,3 | 3 |
| CON-00-00139 | WAFER | | LAL0640-2P | CLIP | 1 |
| CON-00-00140 | WAFER | | LAL0640-3P | 1ST POWER,2ND POWER | 2 |
| WIR-AS-00220 | WIRE ASS'Y | BK,RED | CHL0640-2P(300m/m) | CLIP | 1 |
| WIR-AS-00218 | WIRE ASS'Y | BK,RED,GREEN | CHL0640-3P(300m/m) | 1ST POWER | 1 |
| WIR-AS-00219 | WIRE ASS'Y | BK,YELLOW,GREEN | CHL0640-3P(300m/m) | 2ND POWER | 1 |

Reference 611a Electrical Parts List Addendum

The following chart below represents the only electrical parts differences in 610a and 611a models:

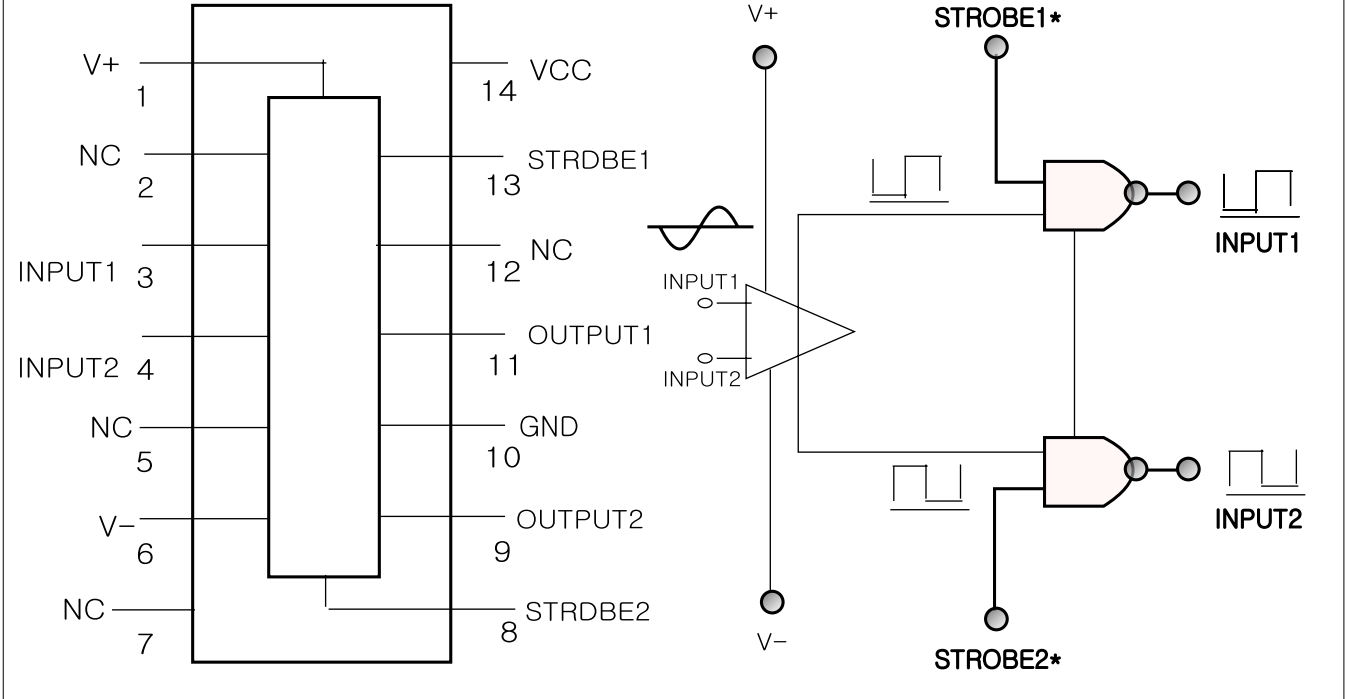
| | MODEL | PART NAME | PART NUMBER | SPEC | DESIGNATOR |
|---|-----------------|-------------------------|---------------------|------------------------------|-------------|
| 1 | REF 610a | RESISTOR | RES-00-00586 | 1/5WF 820 OHM | R116 |
| | REF 611a | RESISTOR | RES-00-00474 | 1/5WF 240 OHM | R116 |
| 2 | REF 610a | RESISTOR | RES-00-00482 | 1/5WF 2K OHM | R117 |
| | REF 611a | RESISTOR | RES-00-00554 | 1/5WF 560 OHM | R117 |
| 3 | REF 610a | POWER TERMINAL | TER-00-00163 | (3P) DST0010-00 | TER1 |
| | REF 611a | POWER TERMINAL | TER-00-00278 | (3P) DK-03B04-AG-5-UP | TER1 |
| 4 | REF 610a | SPEAKER TERMINAL | TER-00-00034 | (4P) TM0009-01 | TER2 |
| | REF 611a | SPEAKER TERMINAL | TER-00-00276 | (4P) DK-04A04-AG-5-UP | TER2 |

Integrated Circuit Diagrams

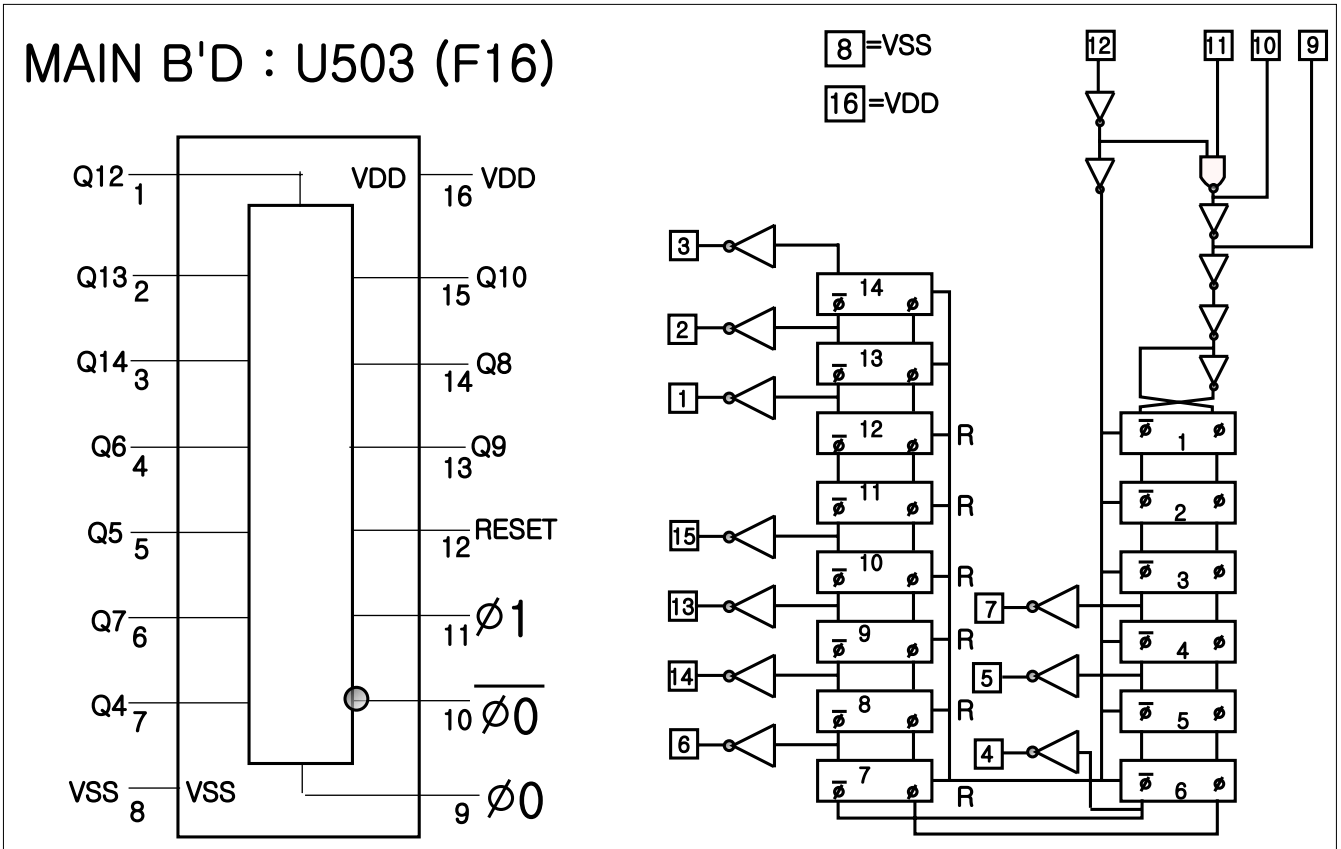


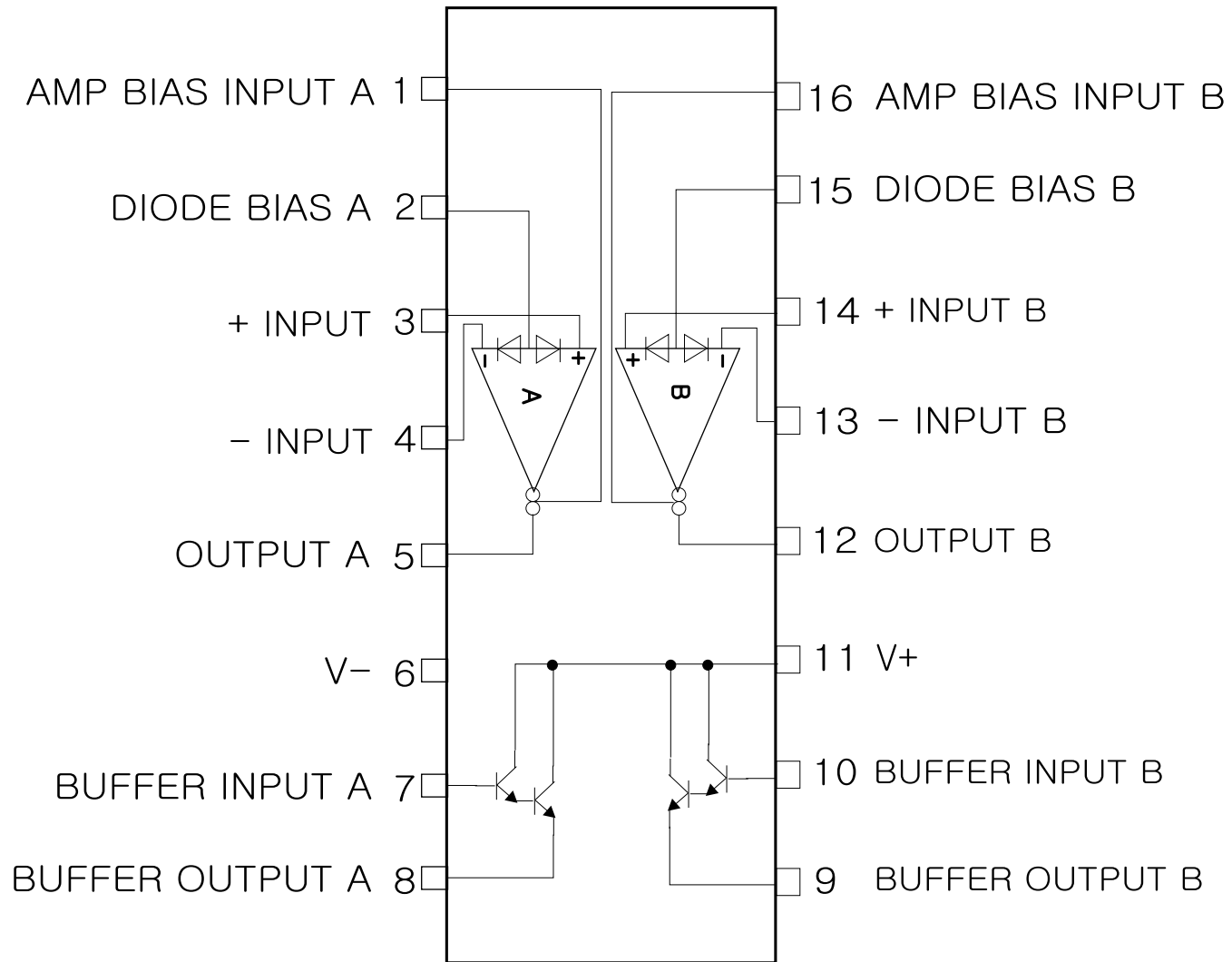
Integrated Circuit Diagrams

MAIN B'D : U504 (B52)



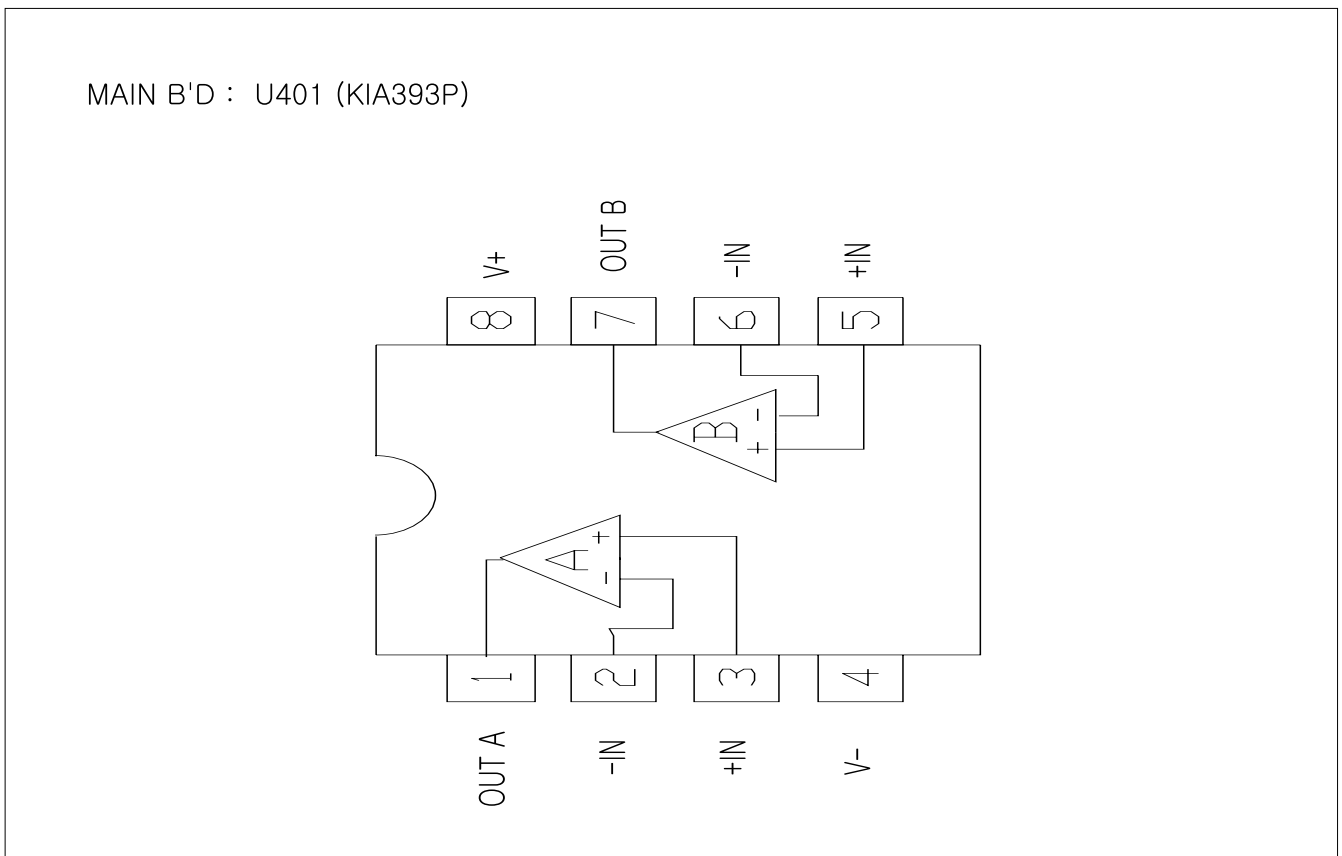
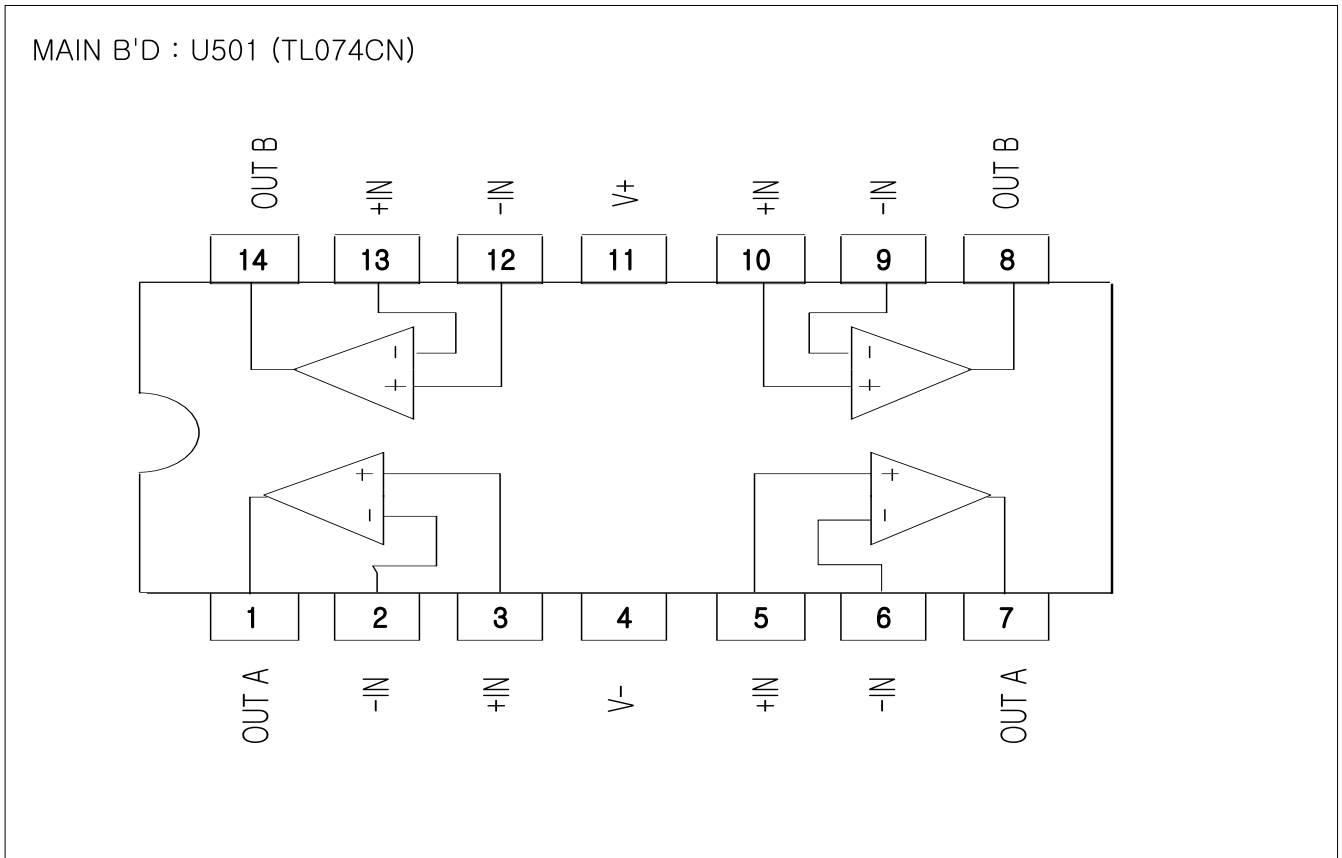
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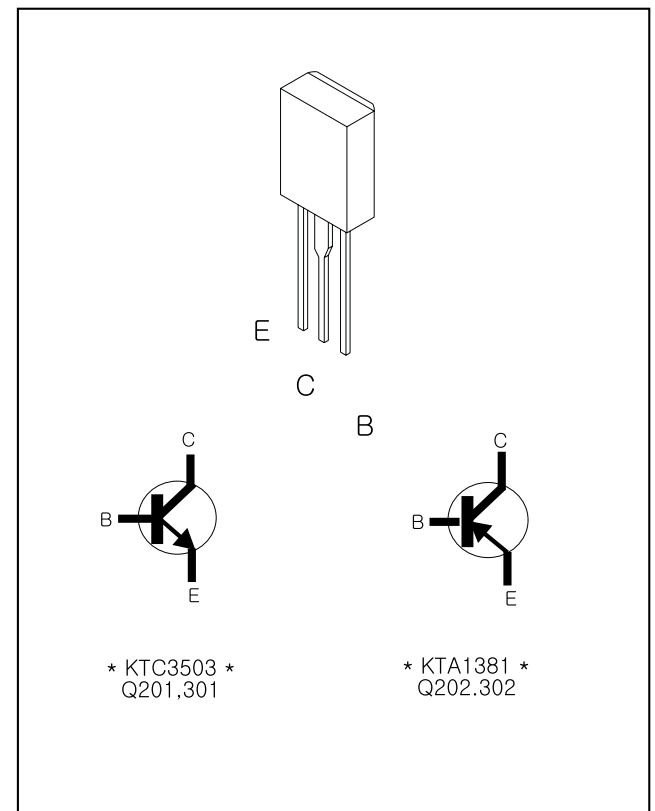
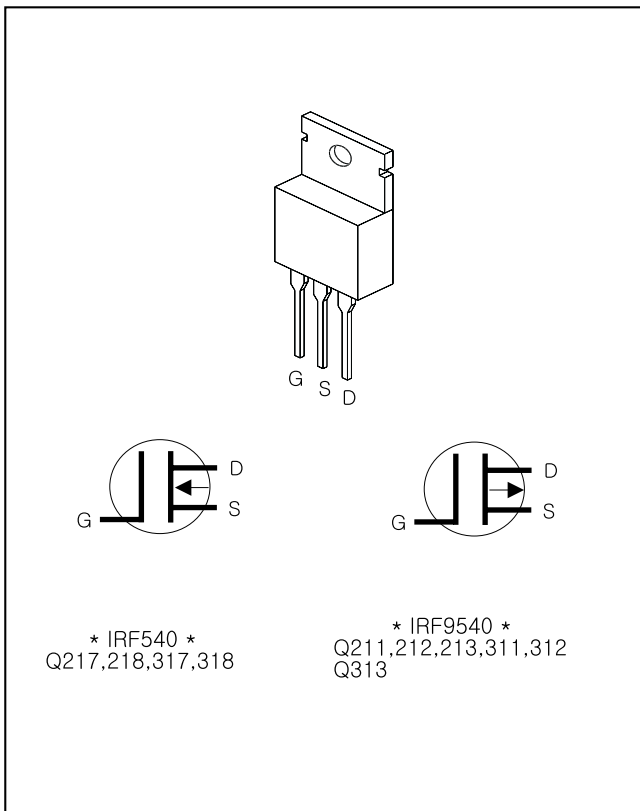
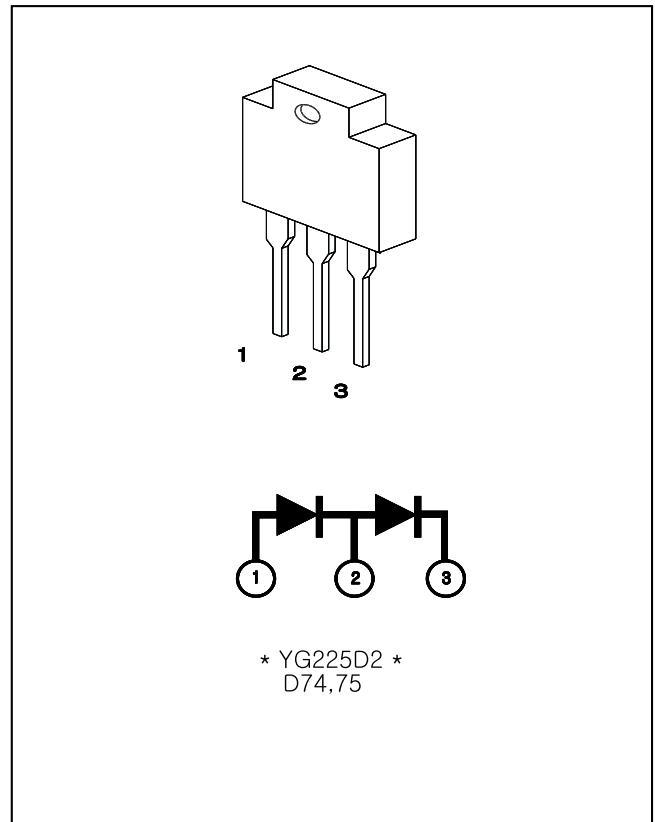
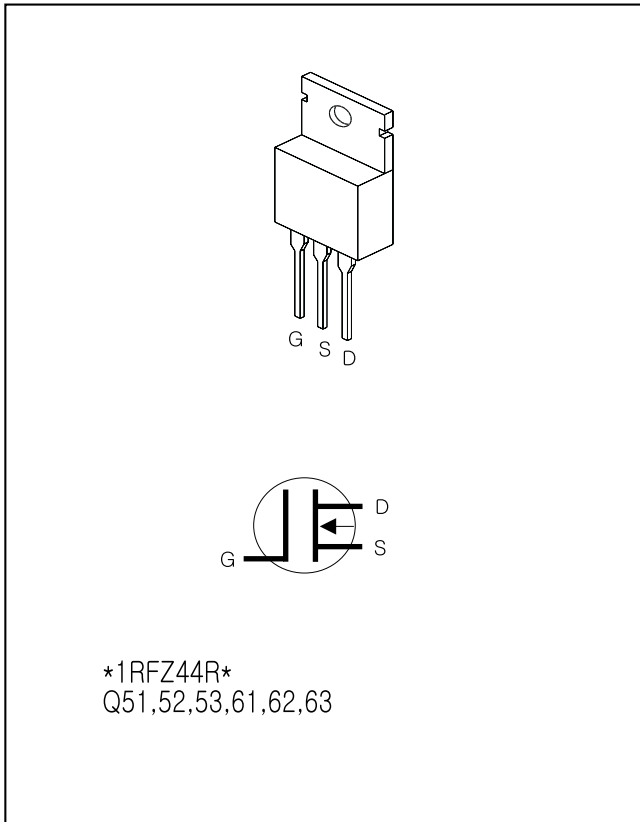


MAIN B'D : IC101 (NJM13600D)

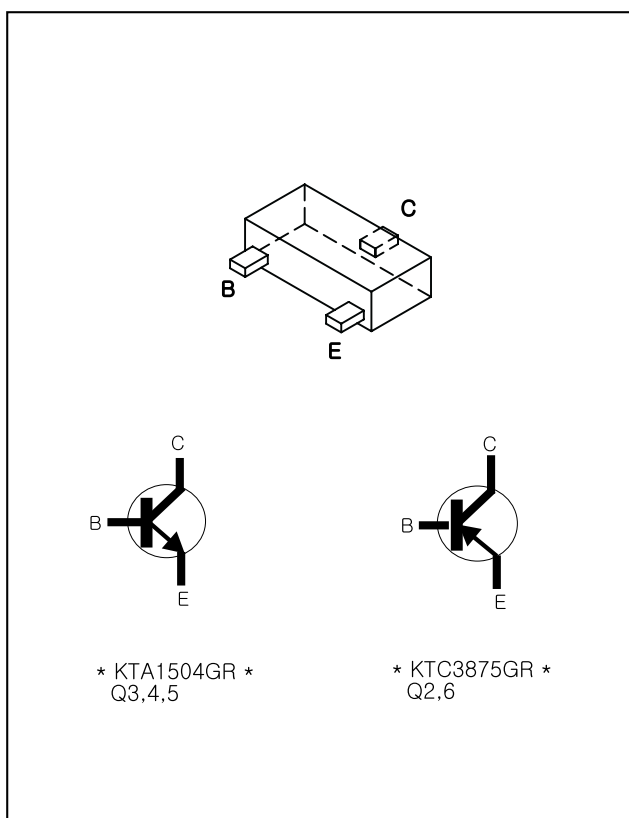
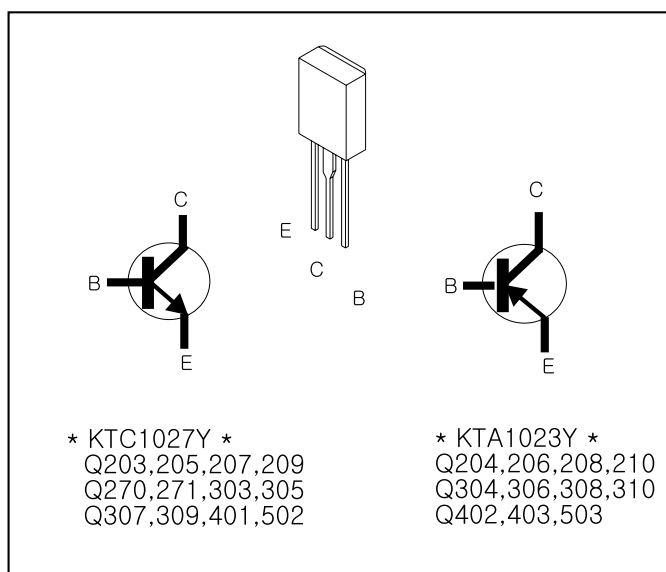
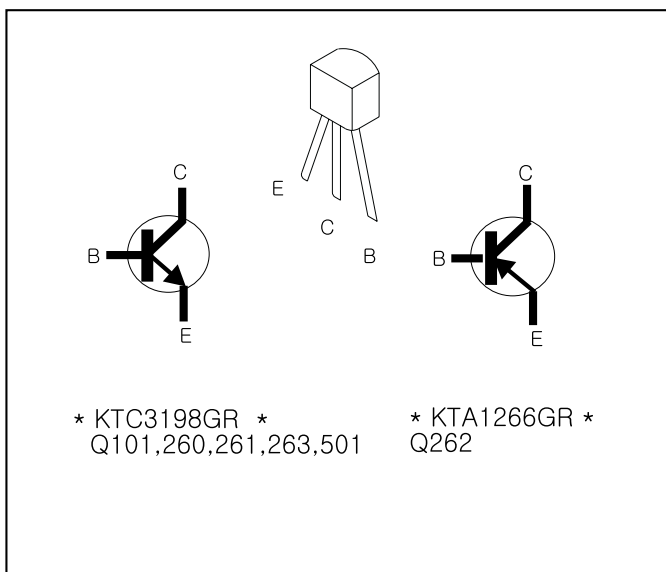
Integrated Circuit Diagrams



Transistor Diagrams

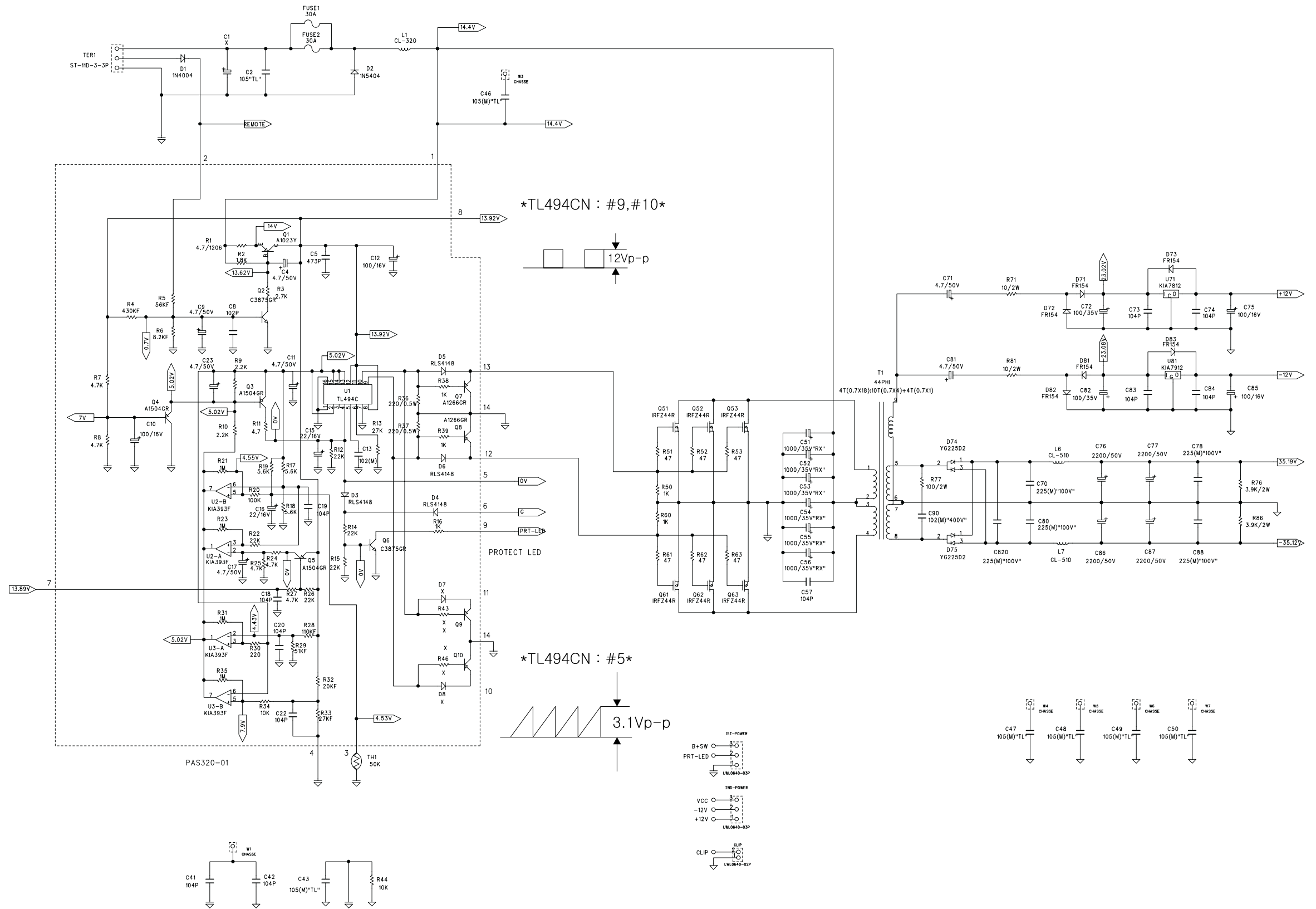


Transistor Diagrams

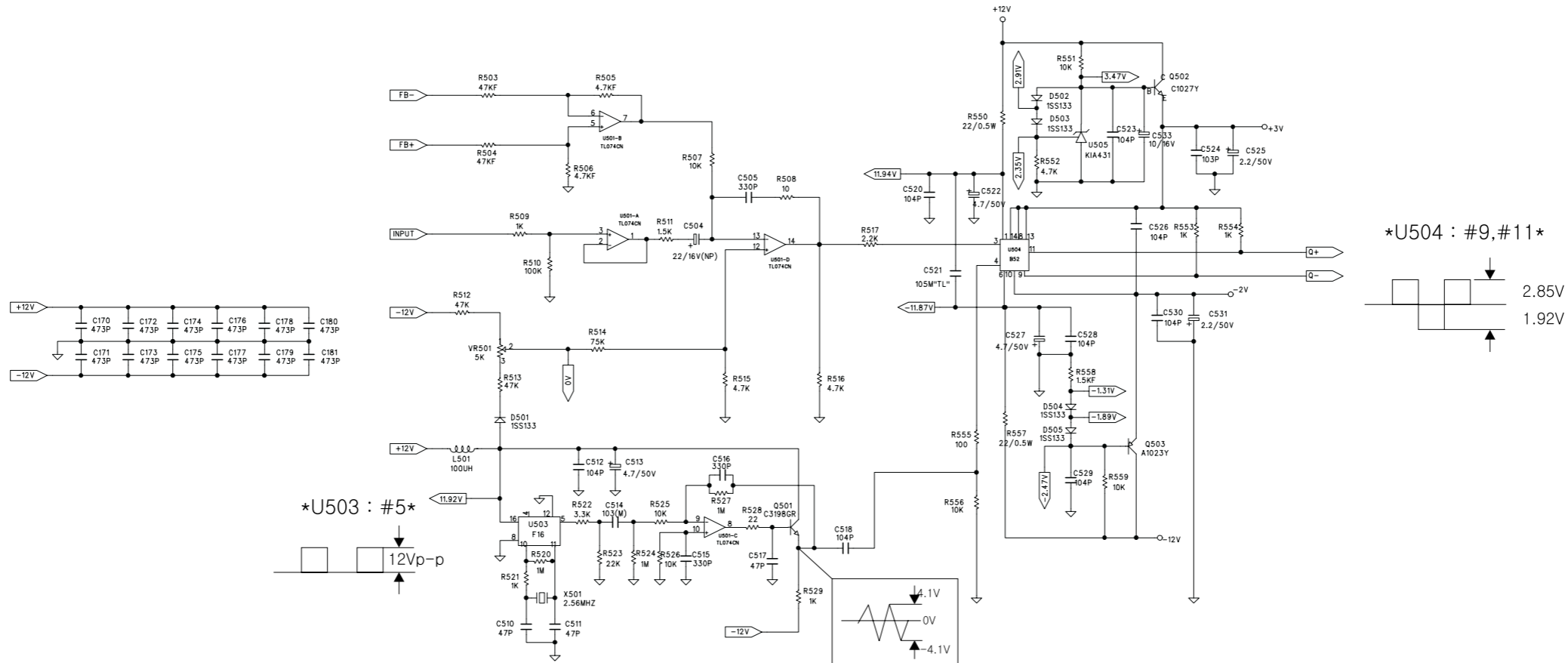
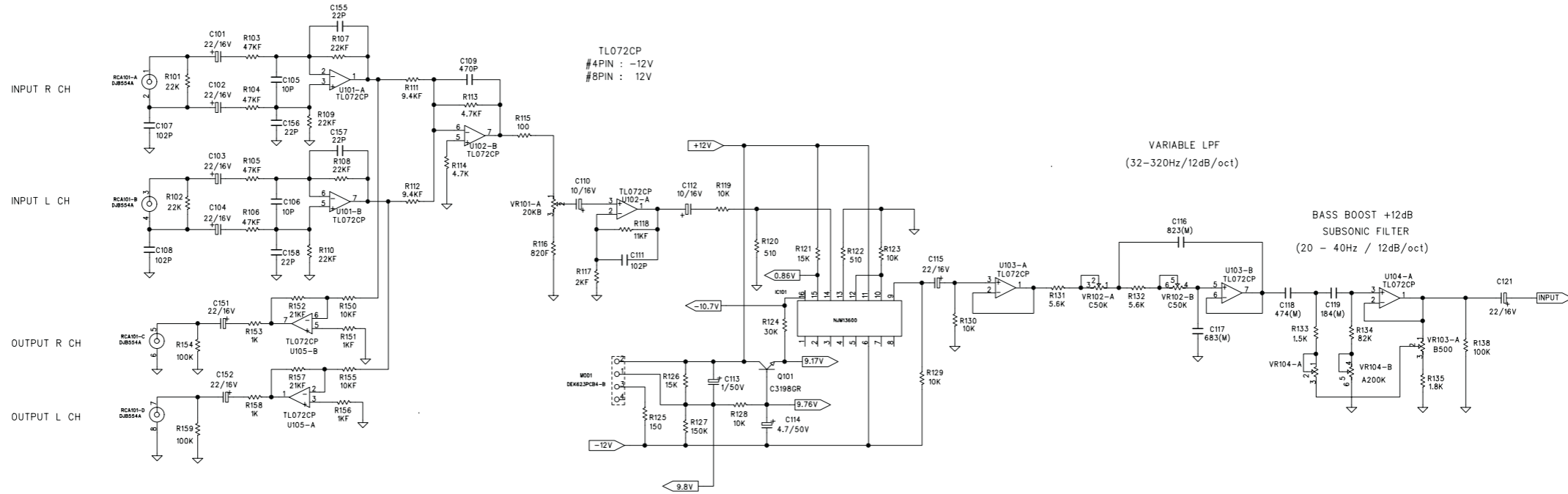


Power Amplifier (Sheet 1)

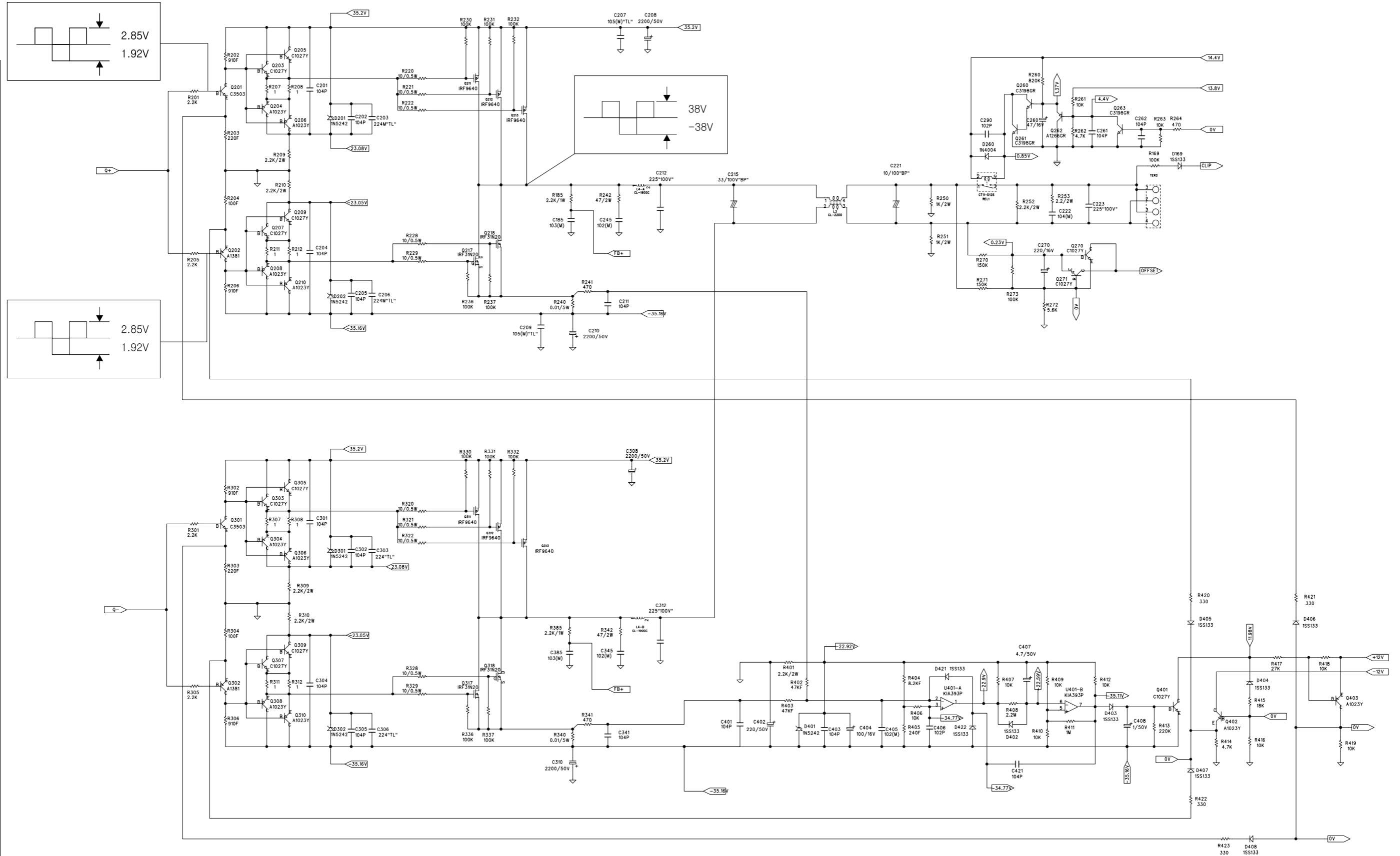
A
B
C
D
E
F
G



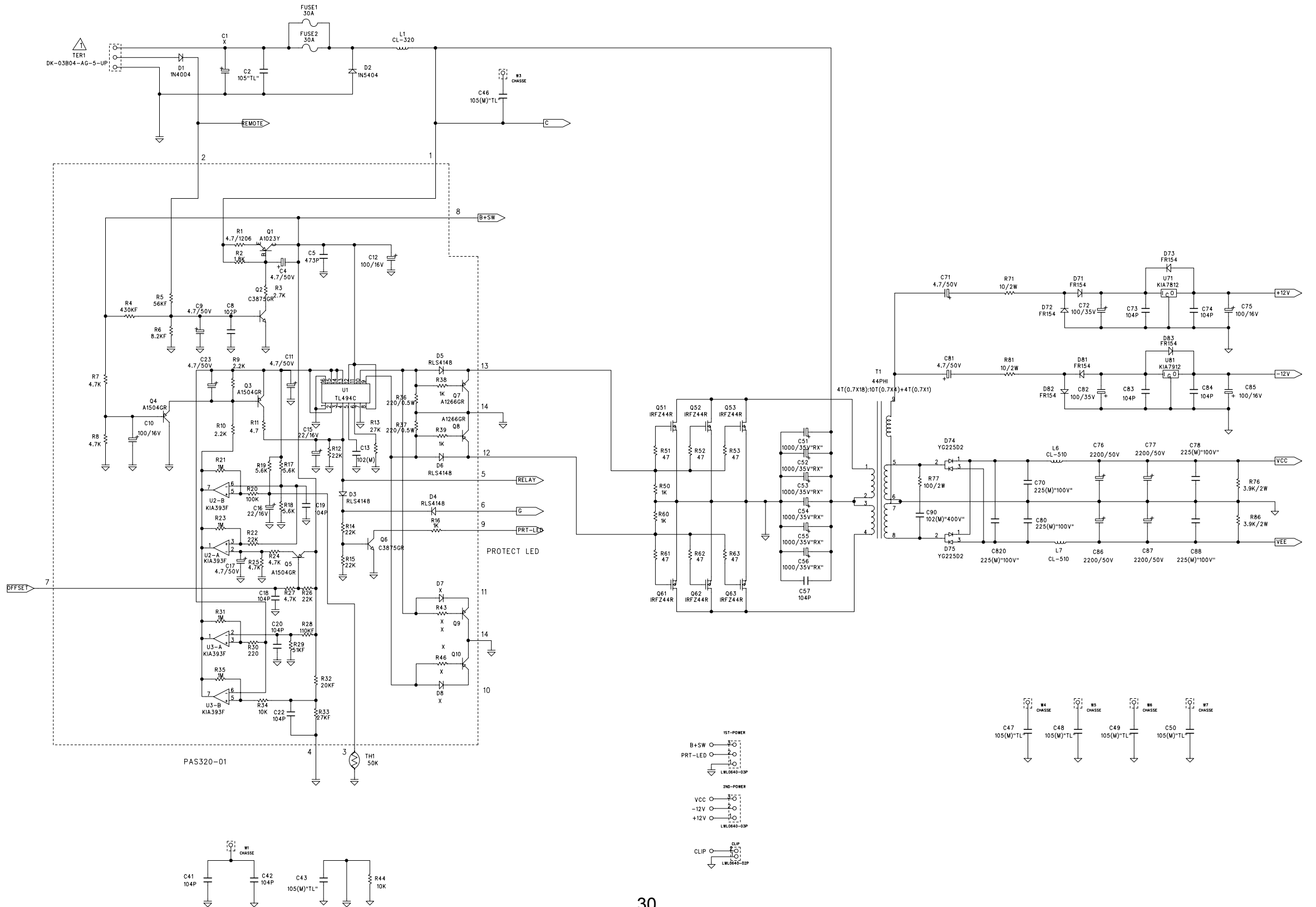
Power Amplifier (Sheet 2)



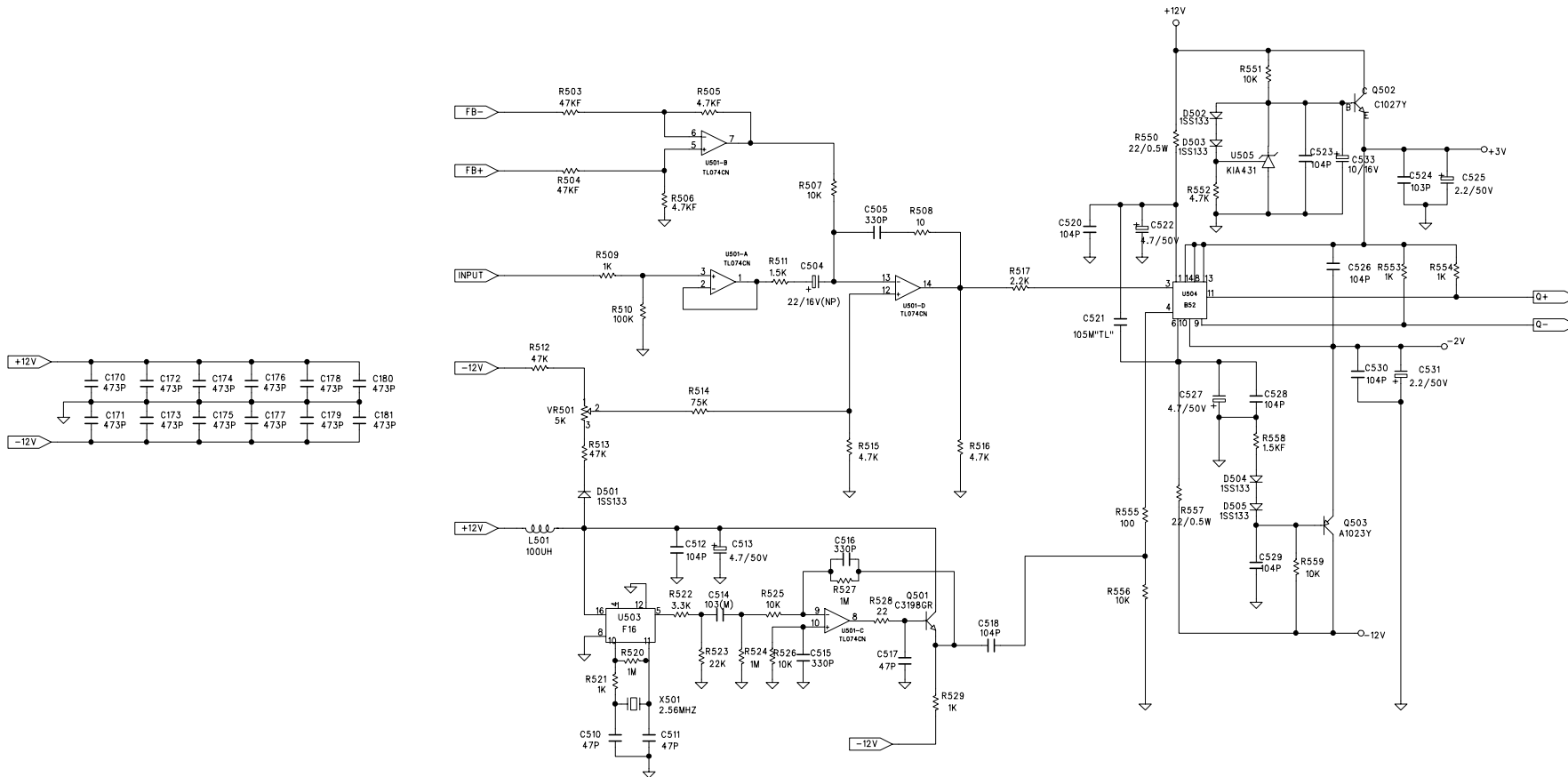
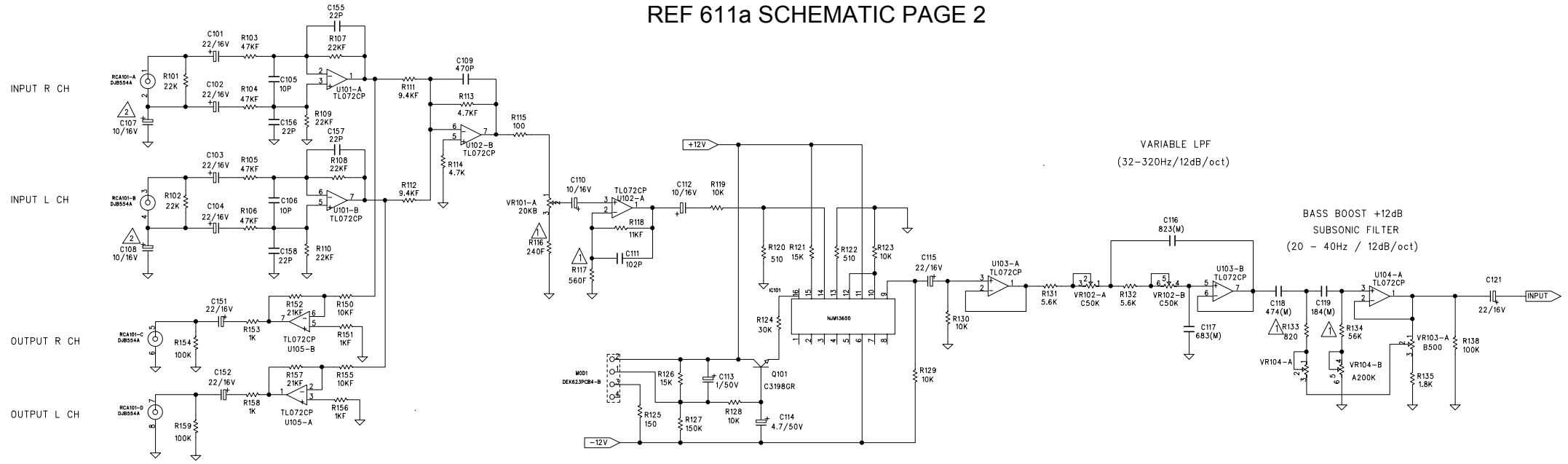
Power Amplifier (Sheet 3)



REF 611a SCHEMATIC PAGE 1

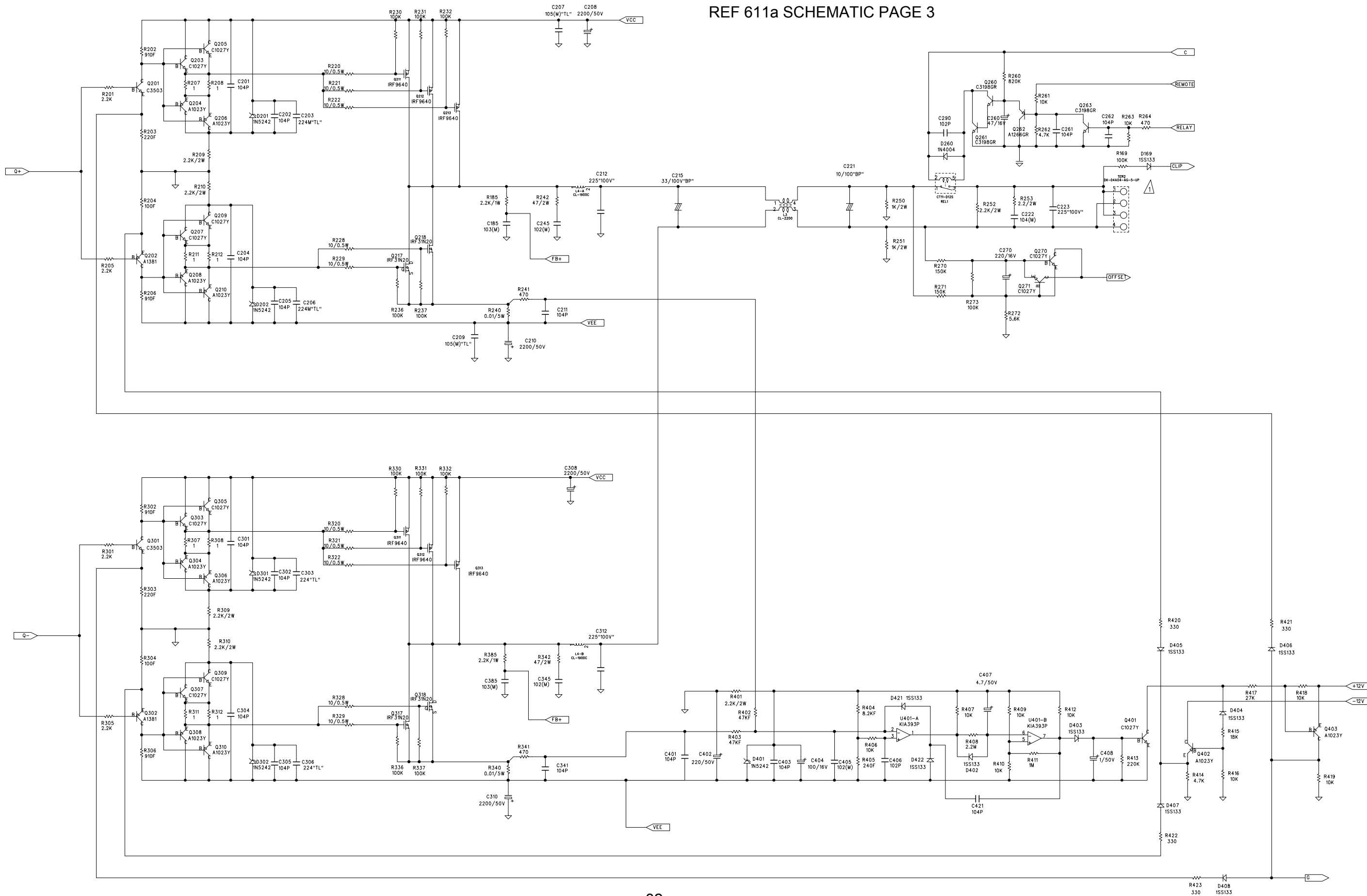


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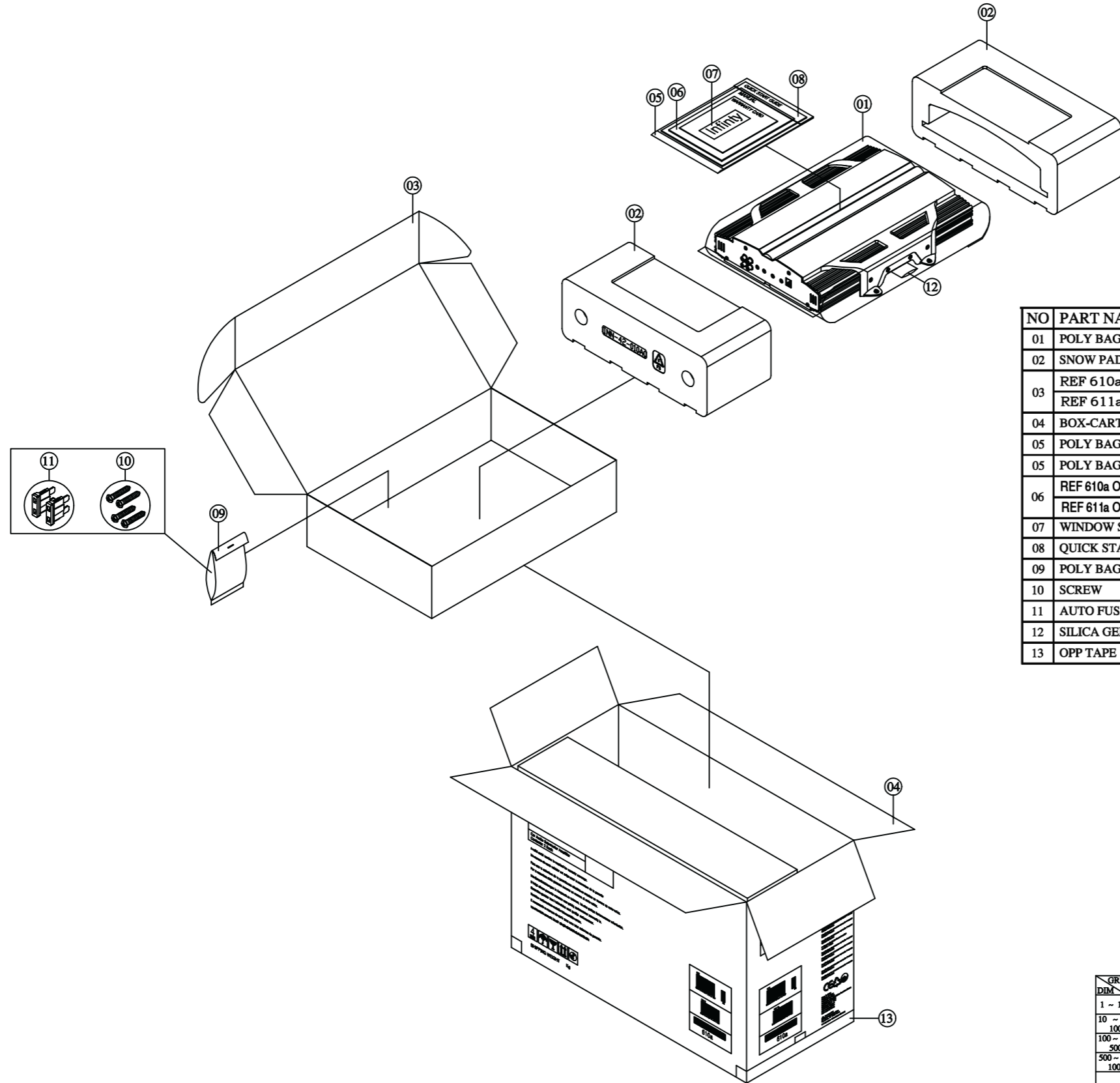


Power Amplifier

REF 611a SCHEMATIC PAGE 3



PACKING EXPLODED VIEW



| NO | PART NAME | PART # | DESCRIPTION | Q'TY |
|----|-------------------------|--------------|----------------------------|-------|
| 01 | POLY BAG(A) | | VINYL, 550.0x400.0x0.1t | 1EA |
| 02 | SNOW PAD | INN-42-010A0 | EPS, 363.0x160.0x128.0 | 2EA |
| 03 | REF 610a BOX-GIFT | BOX-36-151AB | SW#1(B), 530.0x368.0x133.0 | 1EA |
| | REF 611a BOX-GIFT | BOX-36-151AY | SW#1(B), 530.0x368.0x133.0 | 1EA |
| 04 | BOX-CARTON | | DW#2, 545.0x286.0X393.0 | 1/2EA |
| 05 | POLY BAG(B) | | VINYL, 260.0x350.0x0.03t | 1EA |
| 06 | POLY BAG(B) | | VINYL, 260.0x350.0x0.03t | 1EA |
| 06 | REF 610a OWNER'S MANUAL | MAN-01-0197A | ART PAPER | 1EA |
| | REF 611a OWNER'S MANUAL | MAN-01-0197Z | ART PAPER | 1EA |
| 07 | WINDOW STICKER | LAB-00-0427A | "INFINITY" LOGO | 1EA |
| 08 | QUICK START GUIDE | CAR-00-0061A | ART PAPER | 1EA |
| 09 | POLY BAG(C) | | VINYL, 80.0x100.0x0.03t | 1EA |
| 10 | SCREW | SC4-NO-40250 | STT1 OH 4x25 NI-P | 4EA |
| 11 | AUTO FUSE | FUS-AT-00006 | 30A | 2EA |
| 12 | SILICA GEL | | 3g | 1EA |
| 13 | OPP TAPE | | TRANSPARENCY | 3.2m |

| GRD | A | B | C | THIRD | UNIT | SCALE | DATE | MODEL | REP610a |
|-----|------------|------|-----|-------|--------|-------------------------------------|---------|------------|---------------|
| DIM | 1 ~ 10 | 0.05 | 0.1 | 0.2 | ANGLE | MM | 1:1 | 2004.04.10 | DRAW NO. |
| | 10 ~ 100 | 0.1 | 0.2 | 0.3 | DRAW | CHECK | APPRO | NAME | EXPLODED VIEW |
| | 100 ~ 500 | 0.2 | 0.3 | 0.5 | H.Y.AN | <input checked="" type="checkbox"/> | D.W.SEO | CODE NO. | |
| | 500 ~ 1000 | 0.3 | 0.5 | 1.5 | | | | ISSUE | |
| | | | | | | | | | Φ |