



Reference Series

610a

1 CHANNEL POWER AMPLIFIER

SERVICE MANUAL



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

Rev0 5/2004

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Reference 610a 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:	250mV
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
7520a	34A	#8 AWG
7540a	85A	#8 AWG
5760a	87A	#8 AWG
310a	40A	#8 AWG
610a	69A	#6 AWG
1210a	115A	#4 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.

HIGH-LEVEL INPUT CONNECTIONS

The 7520a, 7540a and 5760a amplifiers are equipped with speaker-level inputs that allow you to add an amplifier to head units that do not have RCA line outputs. The speaker outputs for the source unit should be connected to the amplifier using the supplied connector (square four-wire plug). Remember to check for proper polarity. The 310a, 610a and 1210a amplifiers are not equipped with high-level inputs.

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 2. Speaker-level connector.

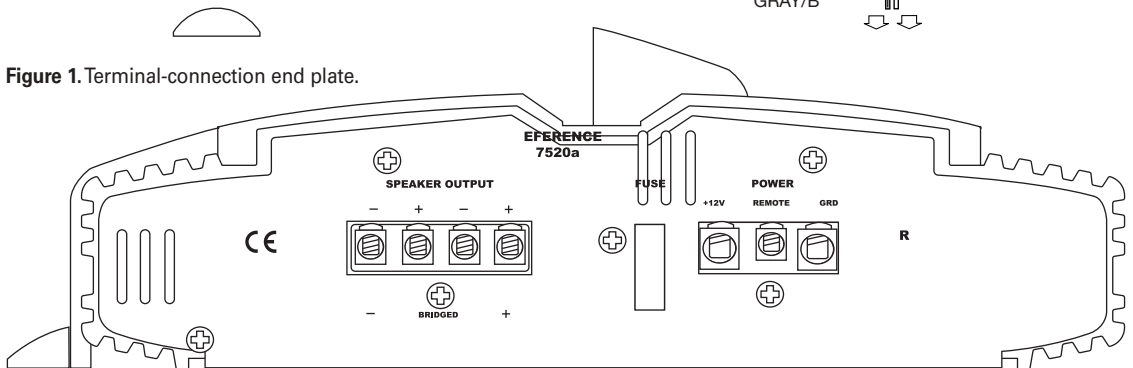
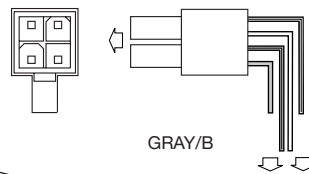


Figure 1. Terminal-connection end plate.

APPLICATIONS – 310a, 610a AND 1210a

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 (models 310a, 610a and 1210a).

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

NOTE: Minimum speaker load is 2 ohms.

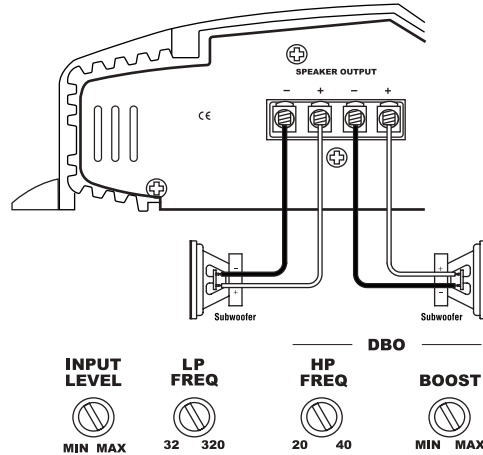


Figure 3. Reference subwoofer amplifier with two woofer connections.

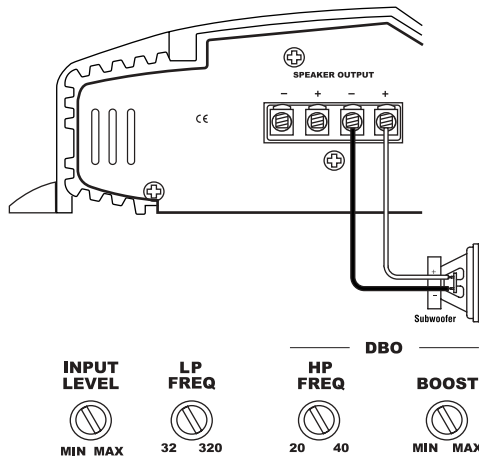


Figure 4. Reference subwoofer amplifier with one woofer connection.

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.

SETTING THE BASS BOOST

The 7520a, 7540a and 5760a are all equipped with a bass-boost control. This allows you to enhance the bass output of your system at 50Hz up to 12dB.

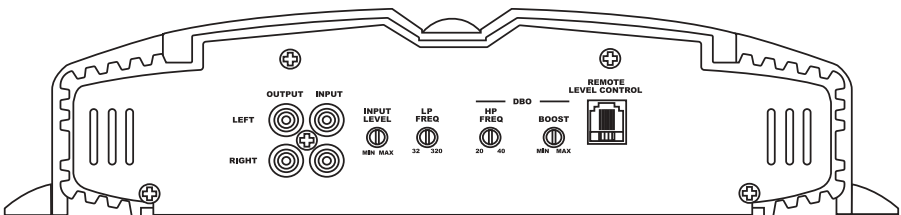
NOTE: Only rear channels of the 7540a are affected by the bass boost control.

AUX OUTPUT

Reference amplifiers (except 5760a) 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.



310a/610a/1210a

INSTALLATION AND SETUP (CONT.)

SETTING DBO™ (310a, 610a and 1210a)

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.

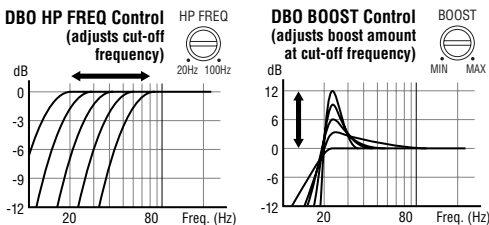
For bigger/fuller bass, adjust the HP FREQ between 35Hz and 45Hz; adjust the BOOST control according to your preference.

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.



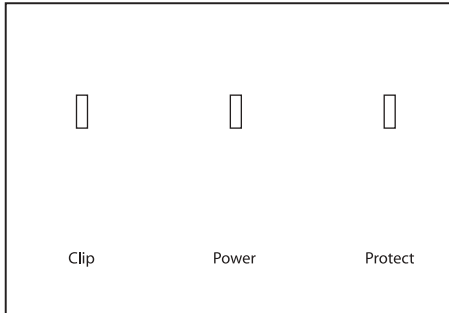
STATUS LEDs

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.

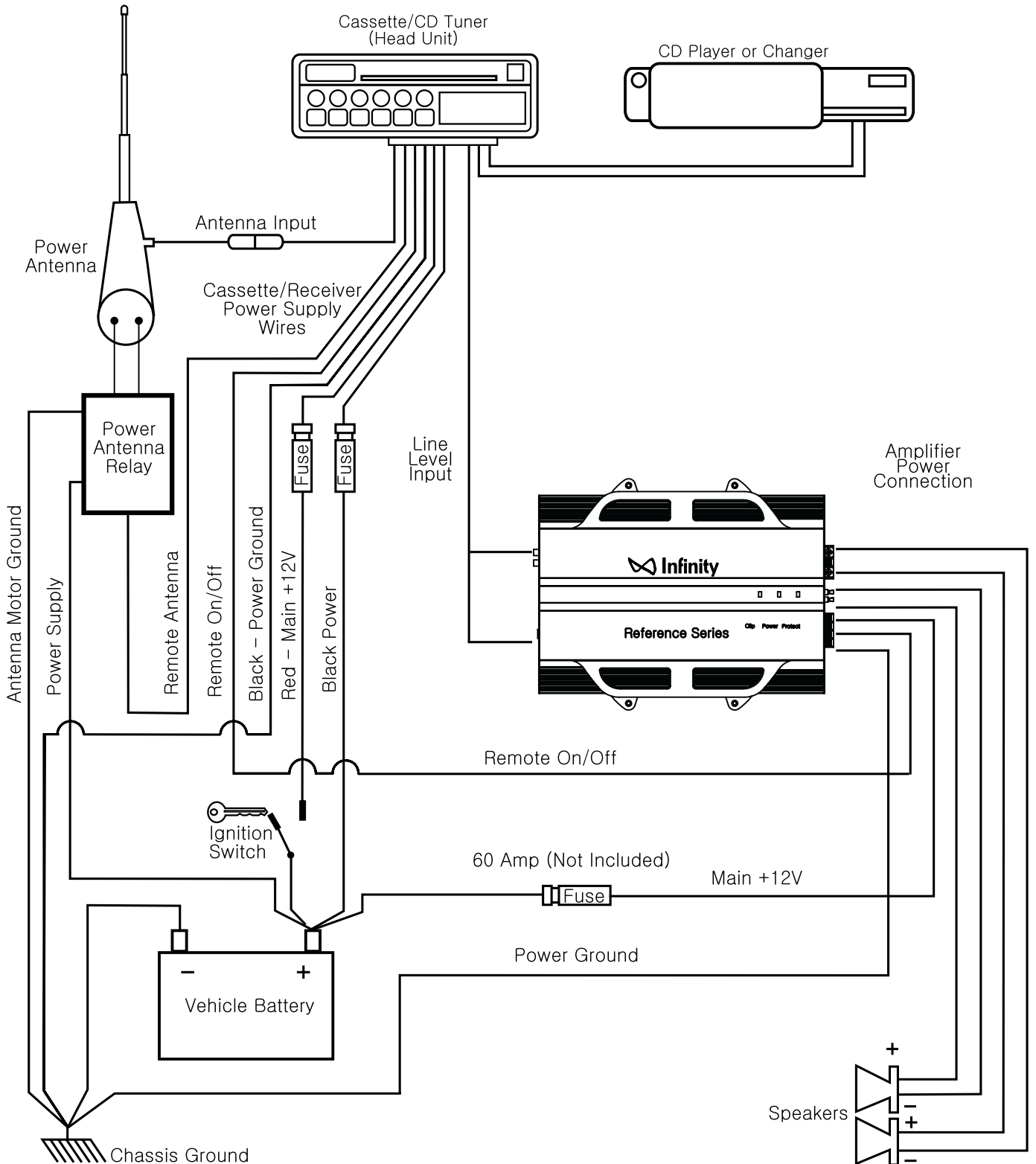
- **PROBLEM:**

Music lacks "punch"

CAUSE and SOLUTION:

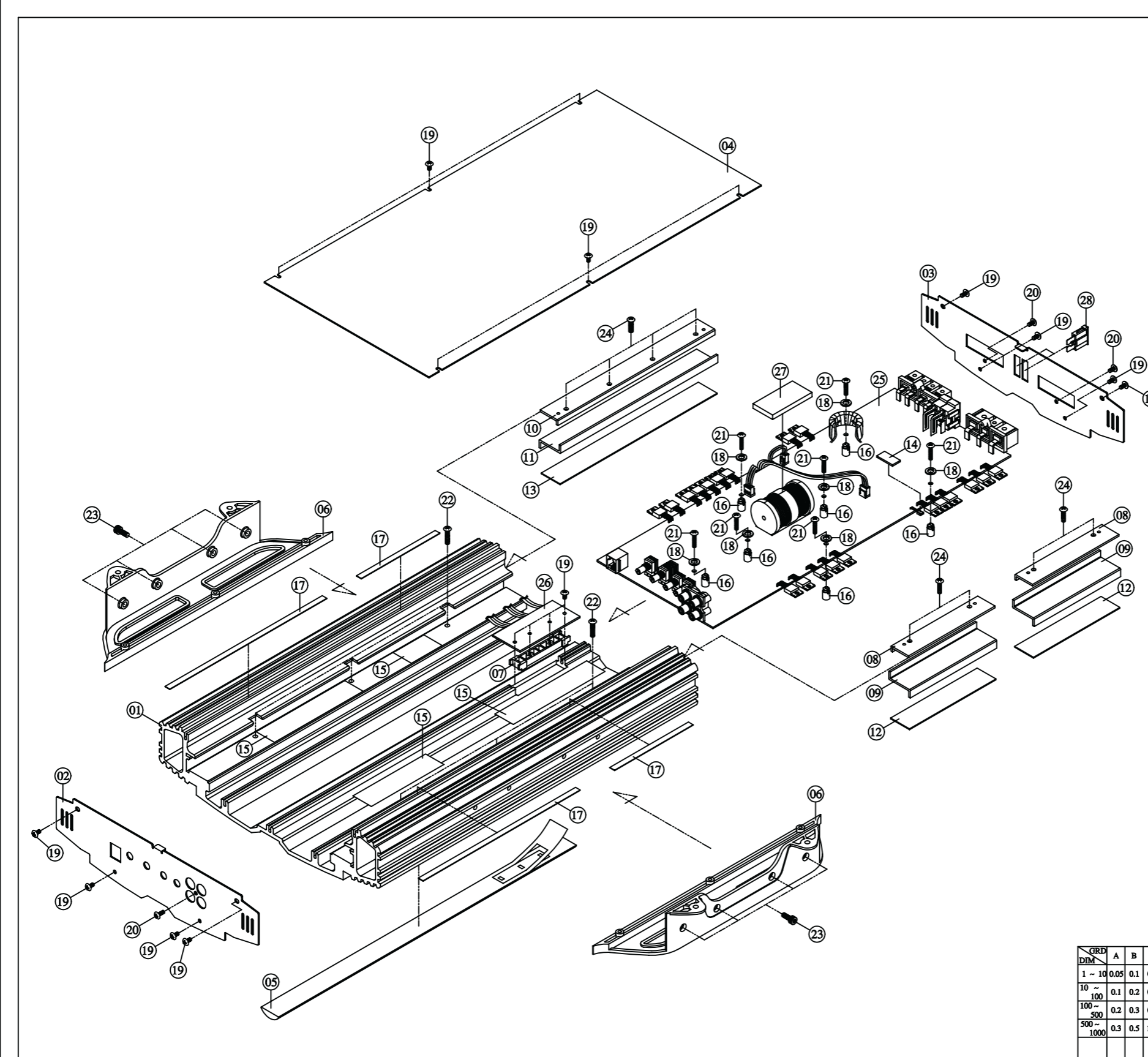
Speakers are not connected properly. Check speaker connections for proper polarity.

Typical System Configuration



REF610A Mechanical 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	PANEL-REAR	PAN-06-280AA	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, φ8.9×φ5.2×1.0(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

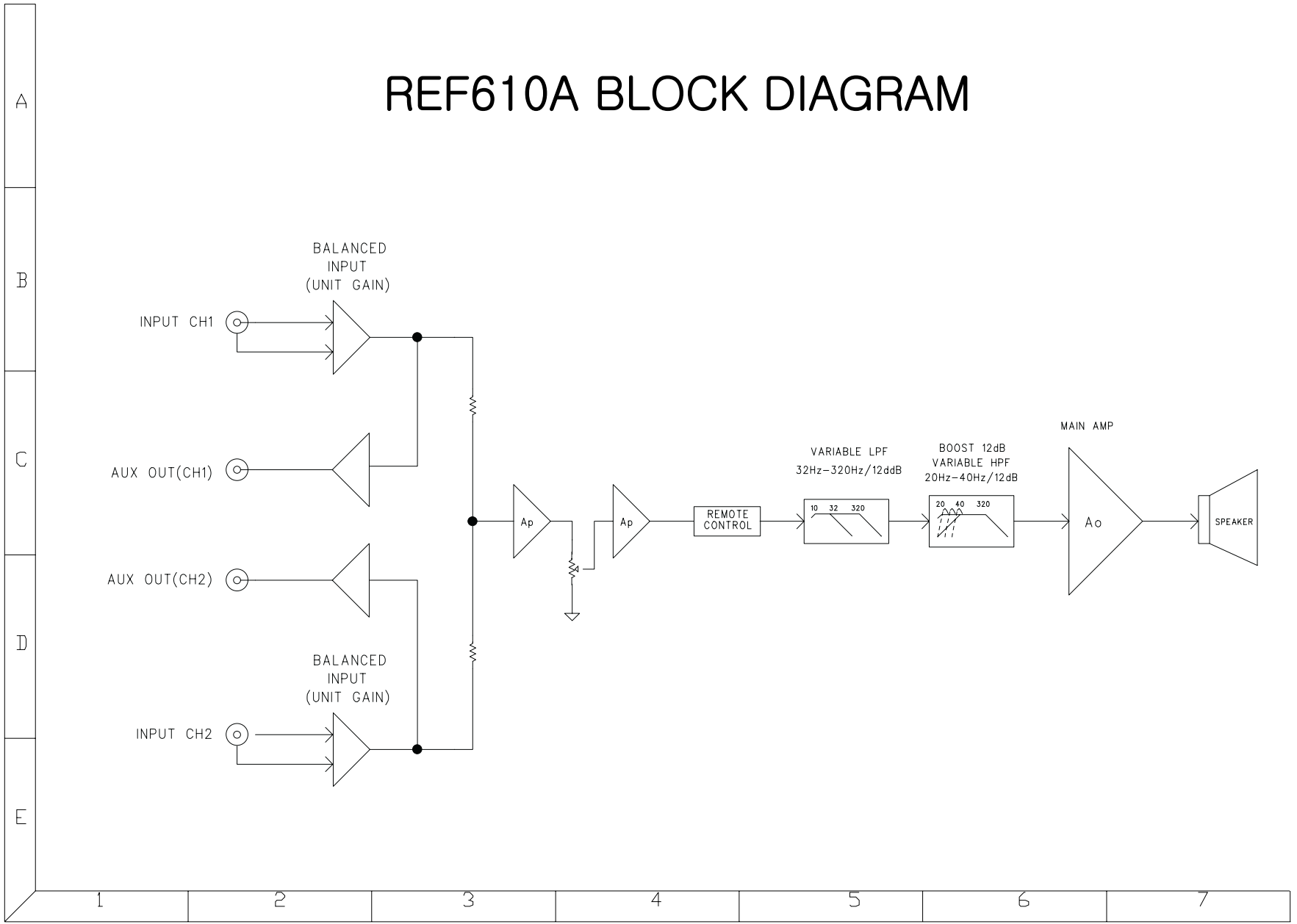
GRD DIM	A	B	C	THIRD ANGLE	UNIT	SCALE	DATE	MODEL	REF610a
1 ~ 10	0.05	0.1	0.2		MM	1:1	2004.04.10	DRAW NO	
10 ~ 100	0.1	0.2	0.3		DRAW	CHECK	APPRO	NAME	
100 ~ 500	0.2	0.3	0.5		H.Y.AN		D.W.SEO	EXPLODED VIEW	
500 ~ 1000	0.3	0.5	1.5					CODE NO.	ISSUE
									Φ

1 2 3 4 5 6 7 8 9

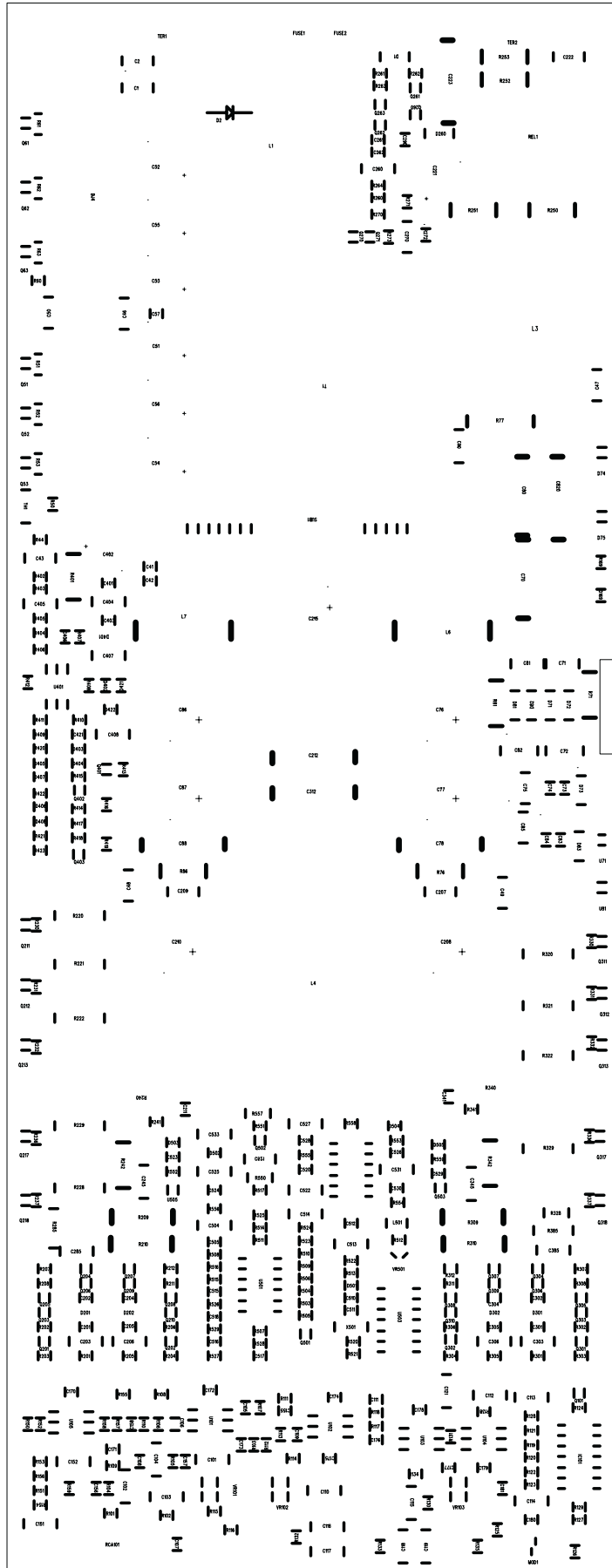
REF610A Parts List

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	EGI, 1.2t	P432C Painting & silk screen	1
PAN-06-280AA	PANEL-REAR	EGI, 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		420mm
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
POL-31-184A0	POLY BAG(A)	VINYL, 550.0x400.0x0.1t	SET	1
POL-31-007A0	POLY BAG(B)	VINYL, 160.0x280.0x0.03t	MANUAL	1
POL-31-008A0	POLY BAG(C)	VINYL, 80.0x100.0x0.03t	ACCESSORY	1
INN-42-010A0	SNOW PAD	EPS, 363.0x160.0x128.0		2
BOX-36-151AB	BOX-GIFT	SW#1(B), 530.0x368.0x133.0		1
BOX-39-162AA	BOX-CARTON	DW#2, 545.0x286.0X393.0		1/2
MAN-01-0197A	MANUAL	ART PAPER		1
SUB-00-001A0	SILICAGEL	3g		1
SUB-00-002A0	SCOTCH TAPE	WIDTH : 20mm		20cm
SUB-00-026A0	OPP TAPE	WHITE		3.2m
CAR-WA-0038A	WARRANTY CARD	ART PAPER		1
LAB-MD-0001A	STICKER	WHITE/BLACK		1
LAB-QC-0001A	QC STICKER	GOLD/BLACK		1
LAB-CE-0004A	CE STICKER	BLACK/WHITE		1
LAB-00-0427A	WINDOW STICKER	"INFINITY" LOGO		1
LAB-SR-0065A	SERIAL NO STICKER	WHITE/BLACK	"CODE 39" -> G/BOX, C/BOX	2
LAB-SR-0066A	SERIAL NO STICKER	WHITE/BLACK	PANEL, H/SINK	2
LAB-00-0423A	E-MARK STICKER	WHITE/BLACK		1
CAR-00-0061A	QUICK START GUIDE	ART PAPER		1

REF610A BLOCK DIAGRAM

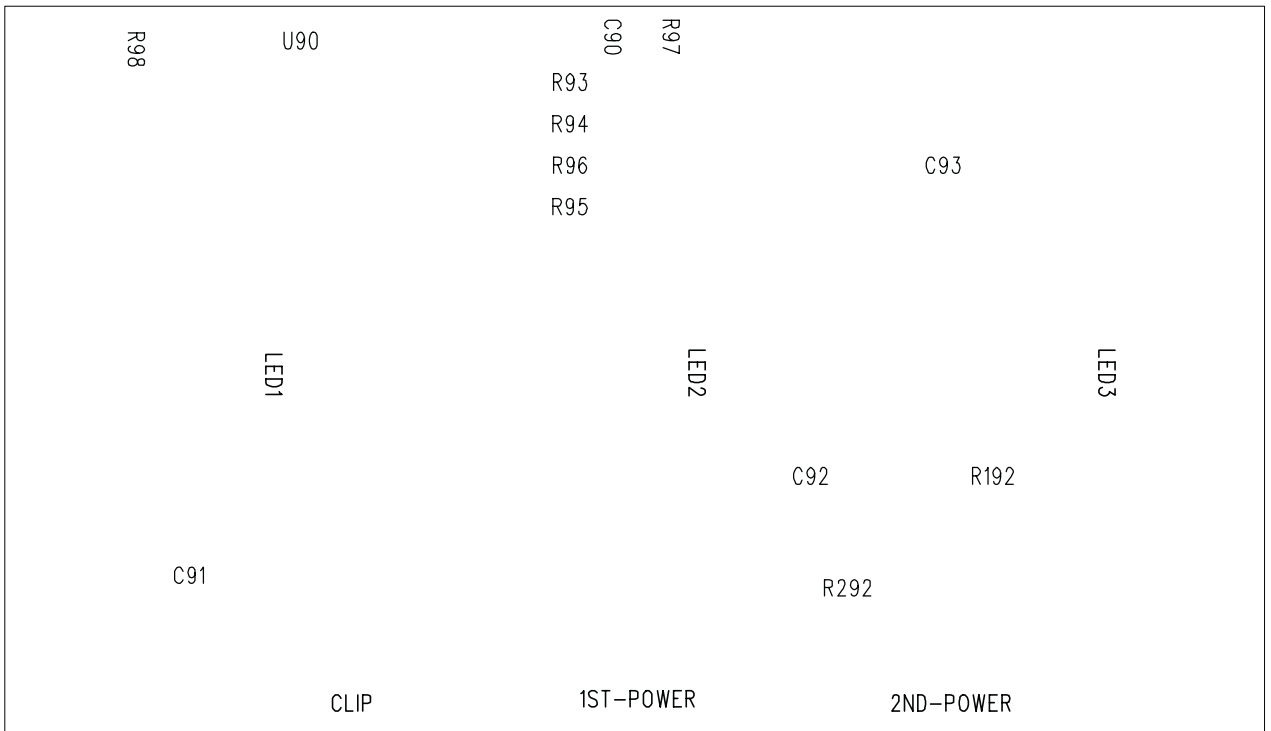
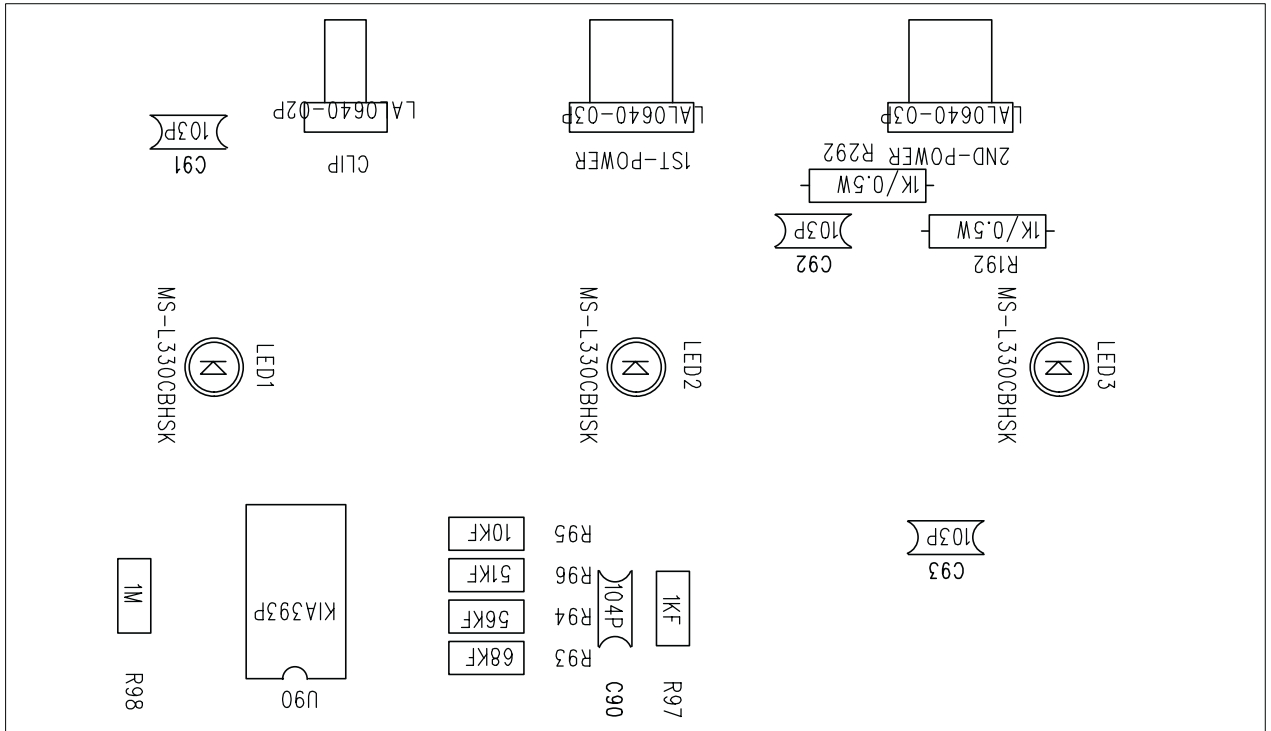


Printed Circuit Board (BOTTOM View)



Printed Circuit Board (SUB TOP/BOTTOM View)

PAS328-01



REF610A 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

REF610A Parts List

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

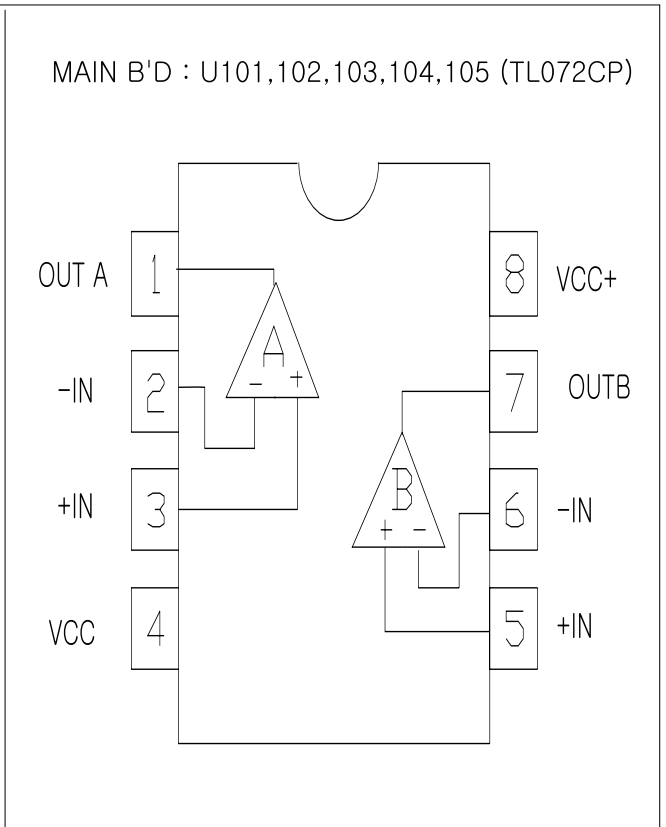
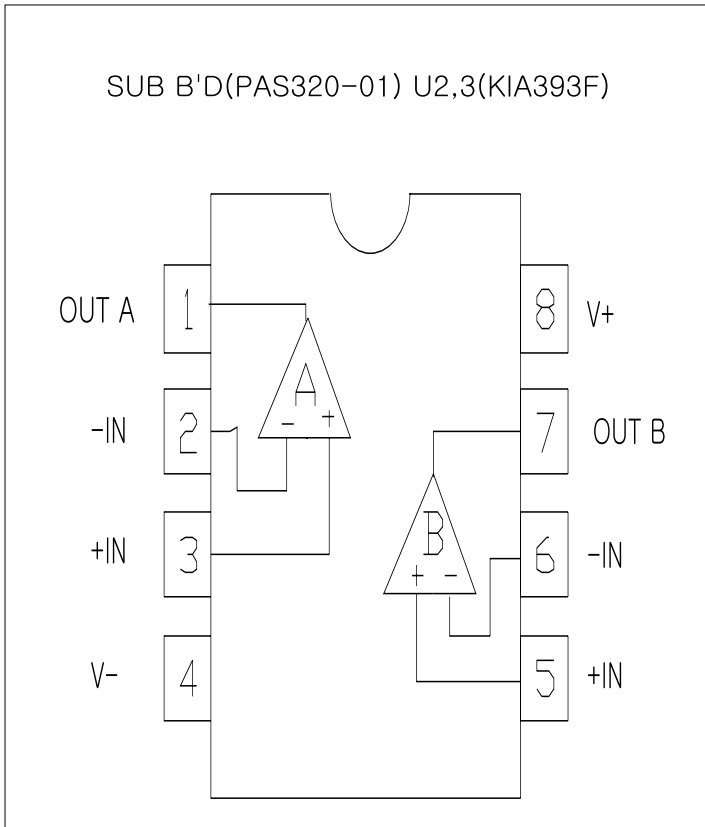
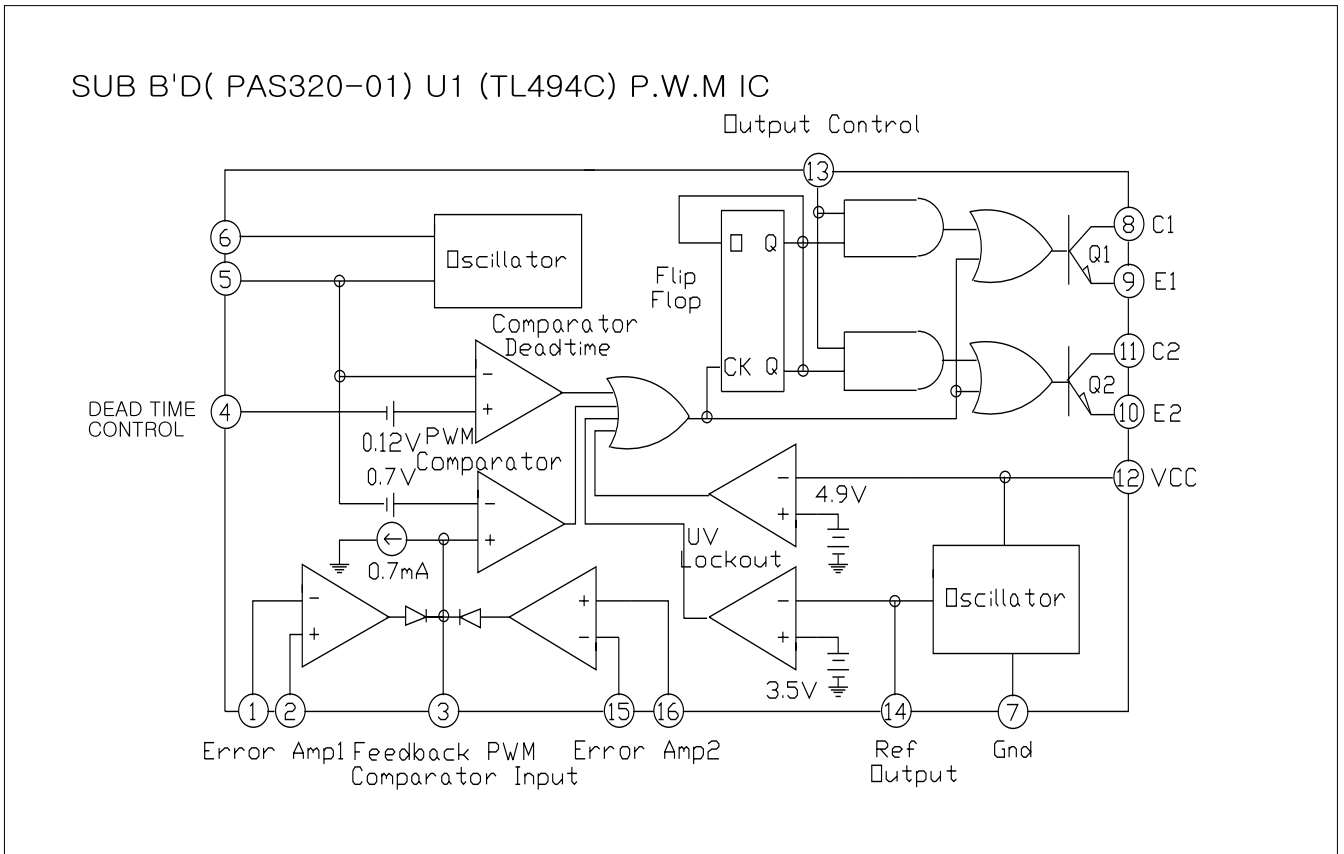
REF610A Parts List

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

REF610A Parts List

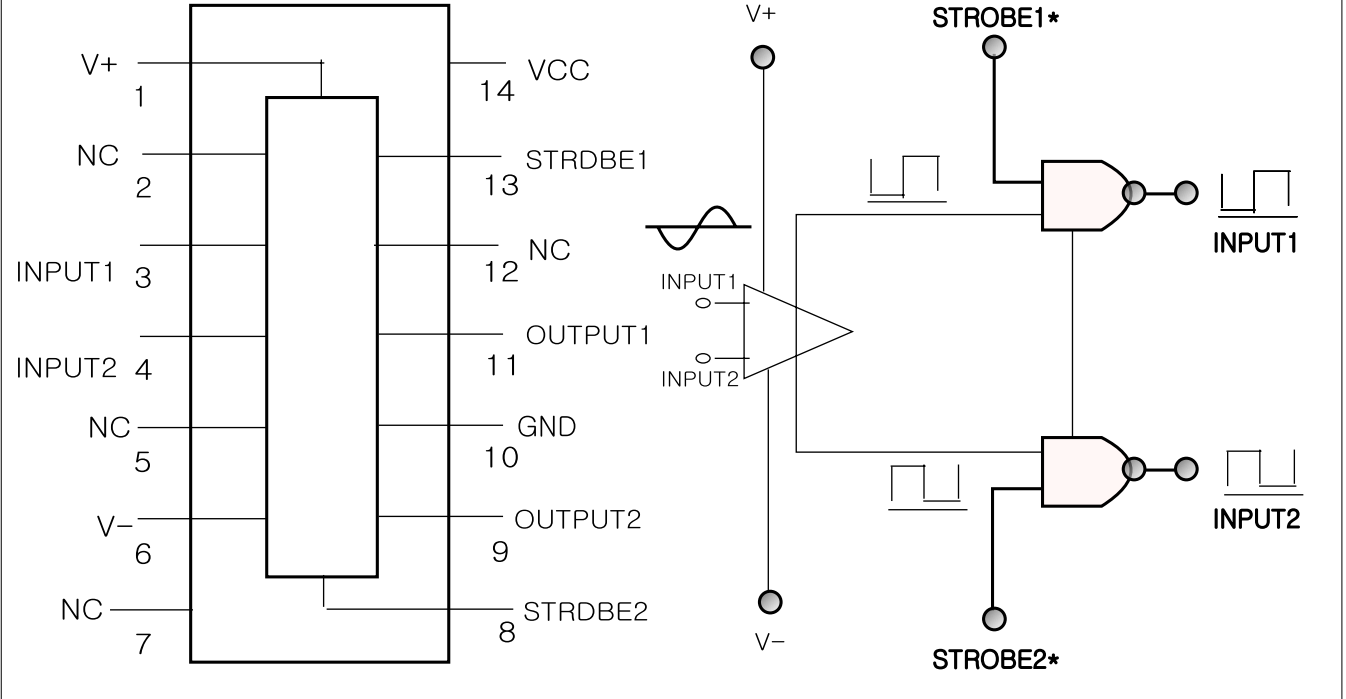
PART NO.	NOMENCATURE	DESCRIPTION	MFR PARTS	REF. NO	Q'TY
RES-12-00243	RESISTOR	SMD "0805"1/10WF	8.2K OHM	R6	1
RES-08-00035	RESISTOR	SMD "0805"1/10WF	20K OHM	R32	1
RES-08-00048	RESISTOR	SMD "0805"1/10WF	27K OHM	R33	1
RES-08-00245	RESISTOR	SMD "0805"1/10WF	51K OHM	R29	1
RES-08-00100	RESISTOR	SMD "0805"1/10WF	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

Integrated Circuit Diagrams

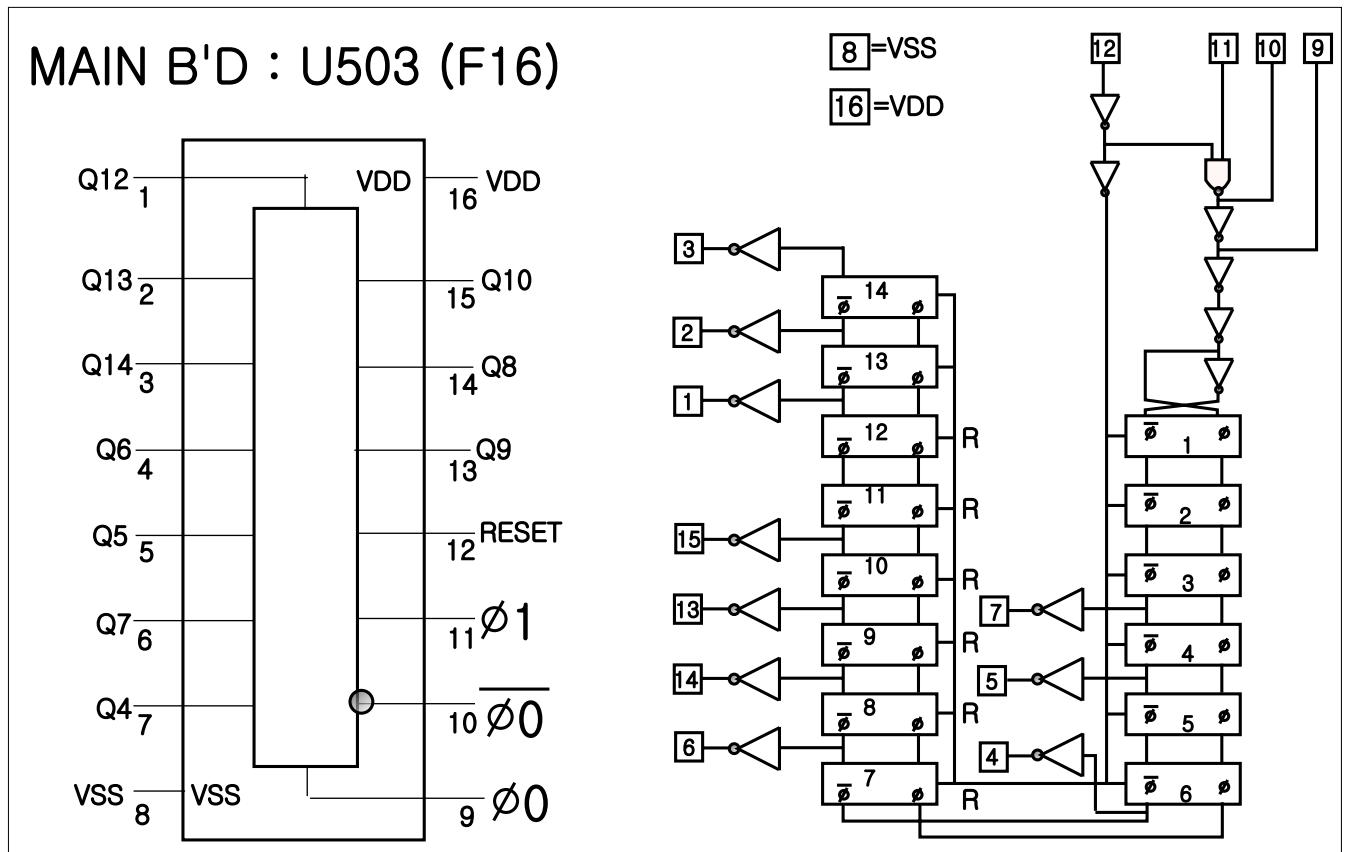


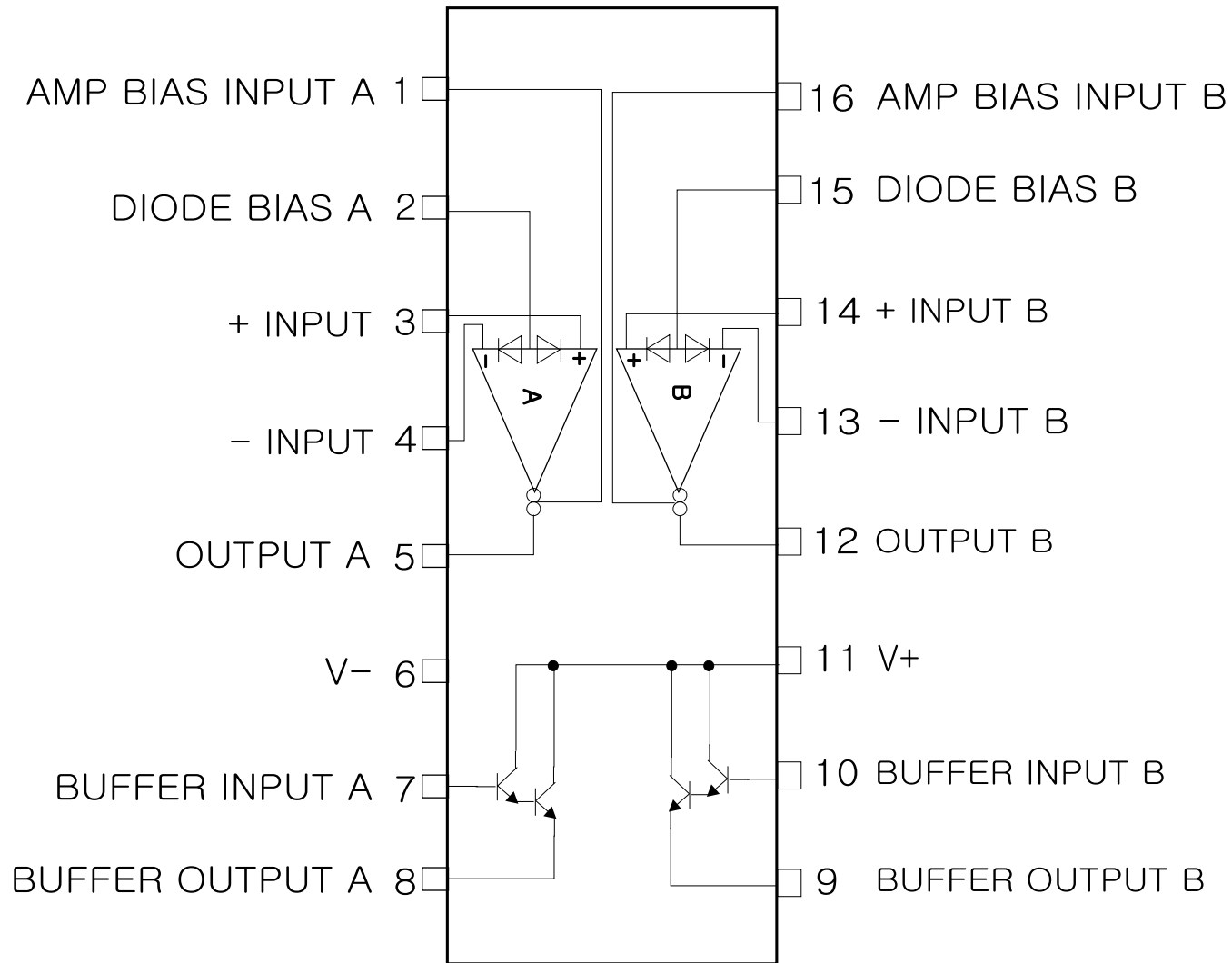
Integrated Circuit Diagrams

MAIN B'D : U504 (B52)



MAIN B'D : U503 (F16)

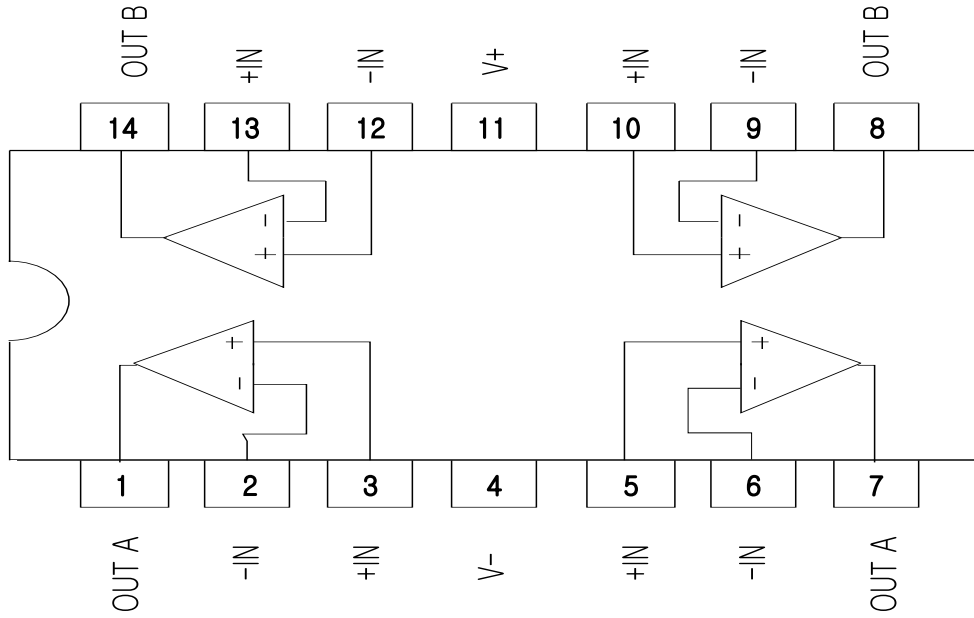




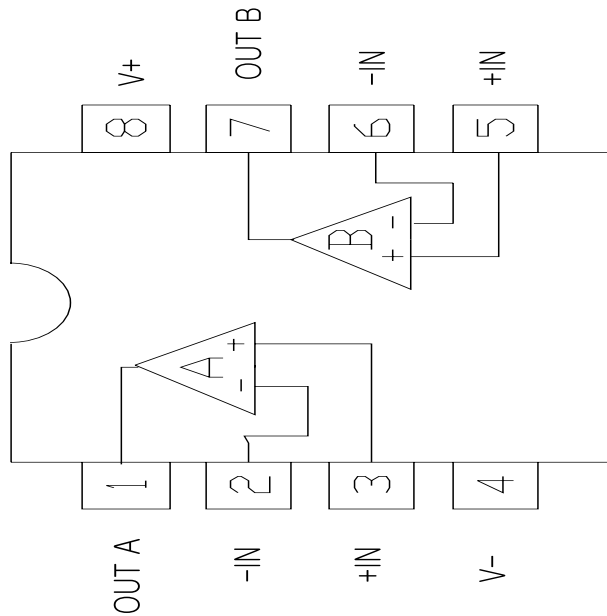
MAIN B'D : IC101 (NJM13600D)

Integrated Circuit Diagrams

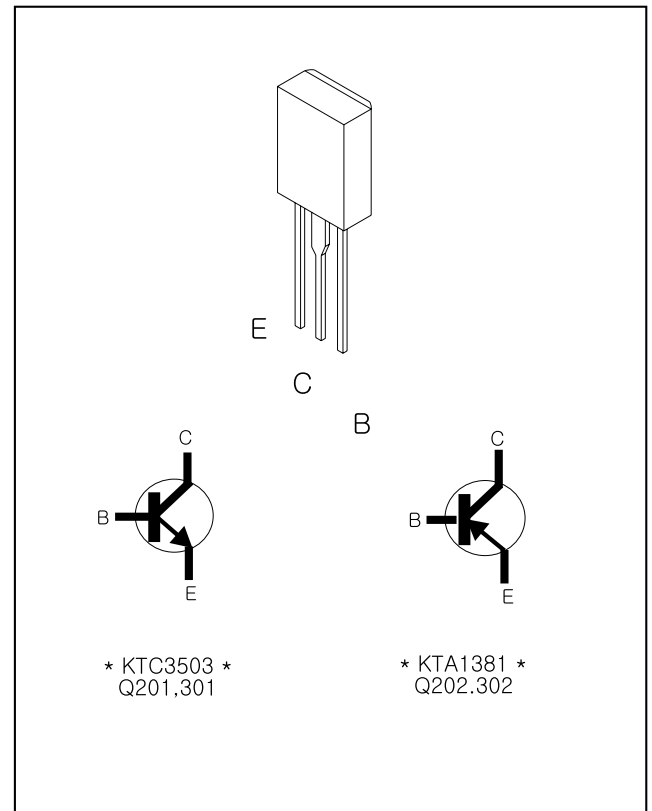
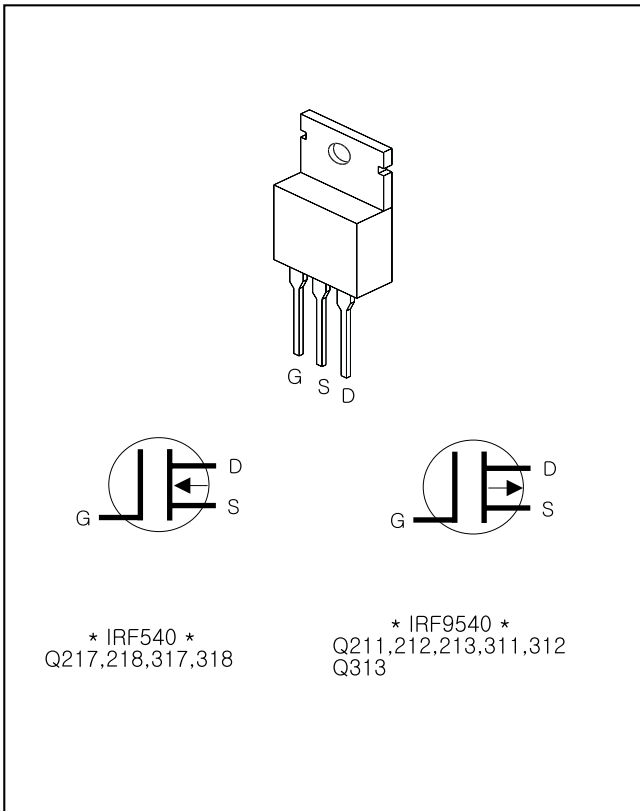
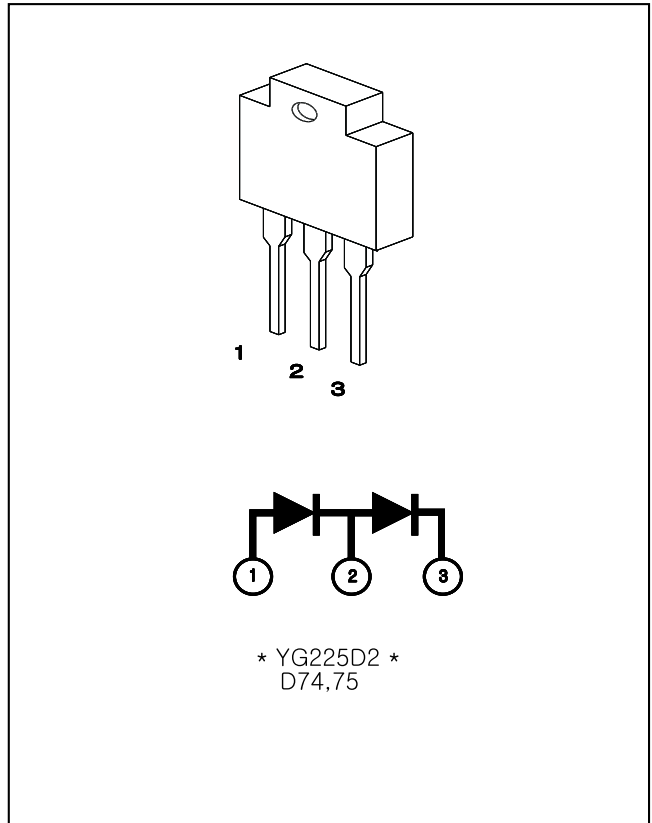
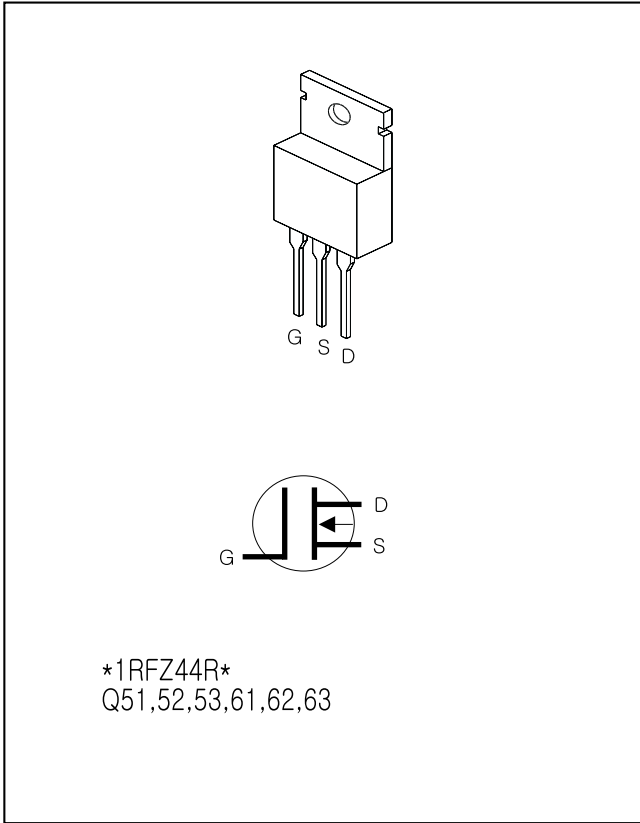
MAIN B'D : U501 (TL074CN)



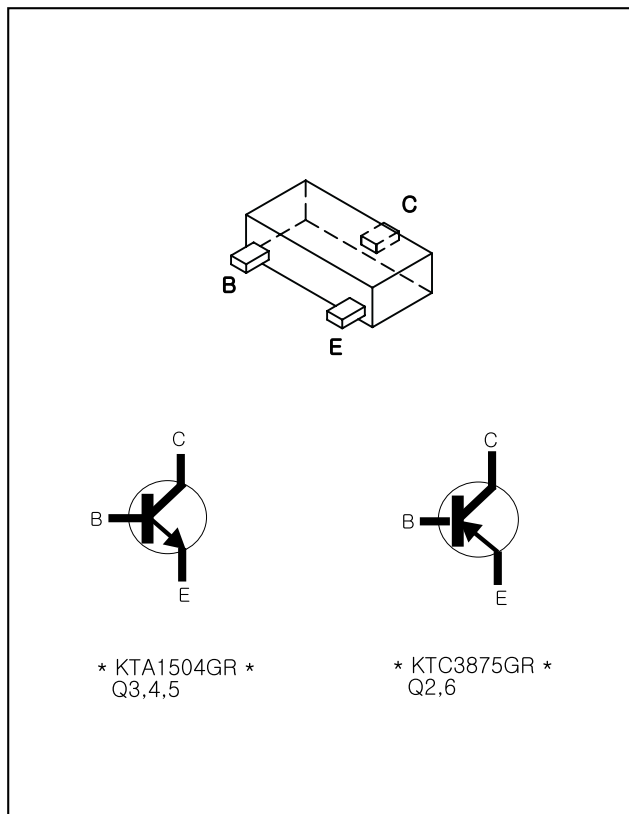
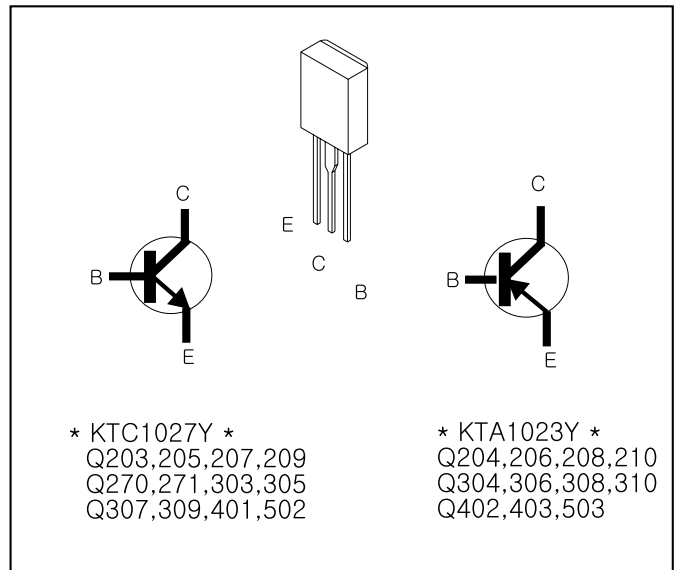
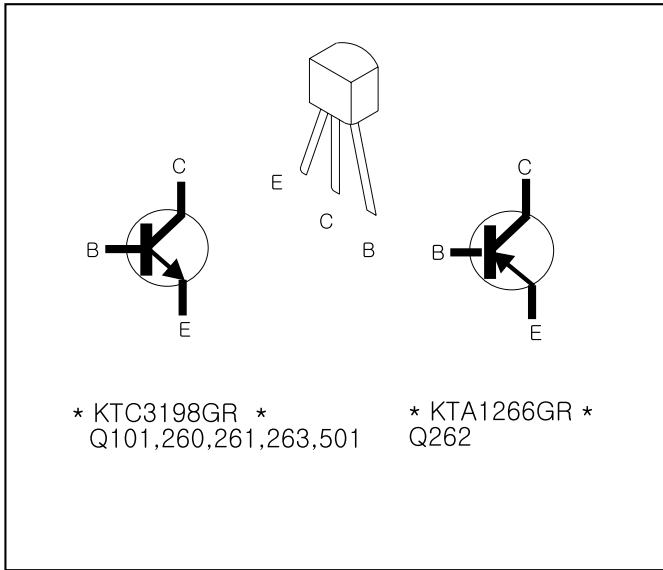
MAIN B'D : U401 (KIA393P)



Transistor Diagrams

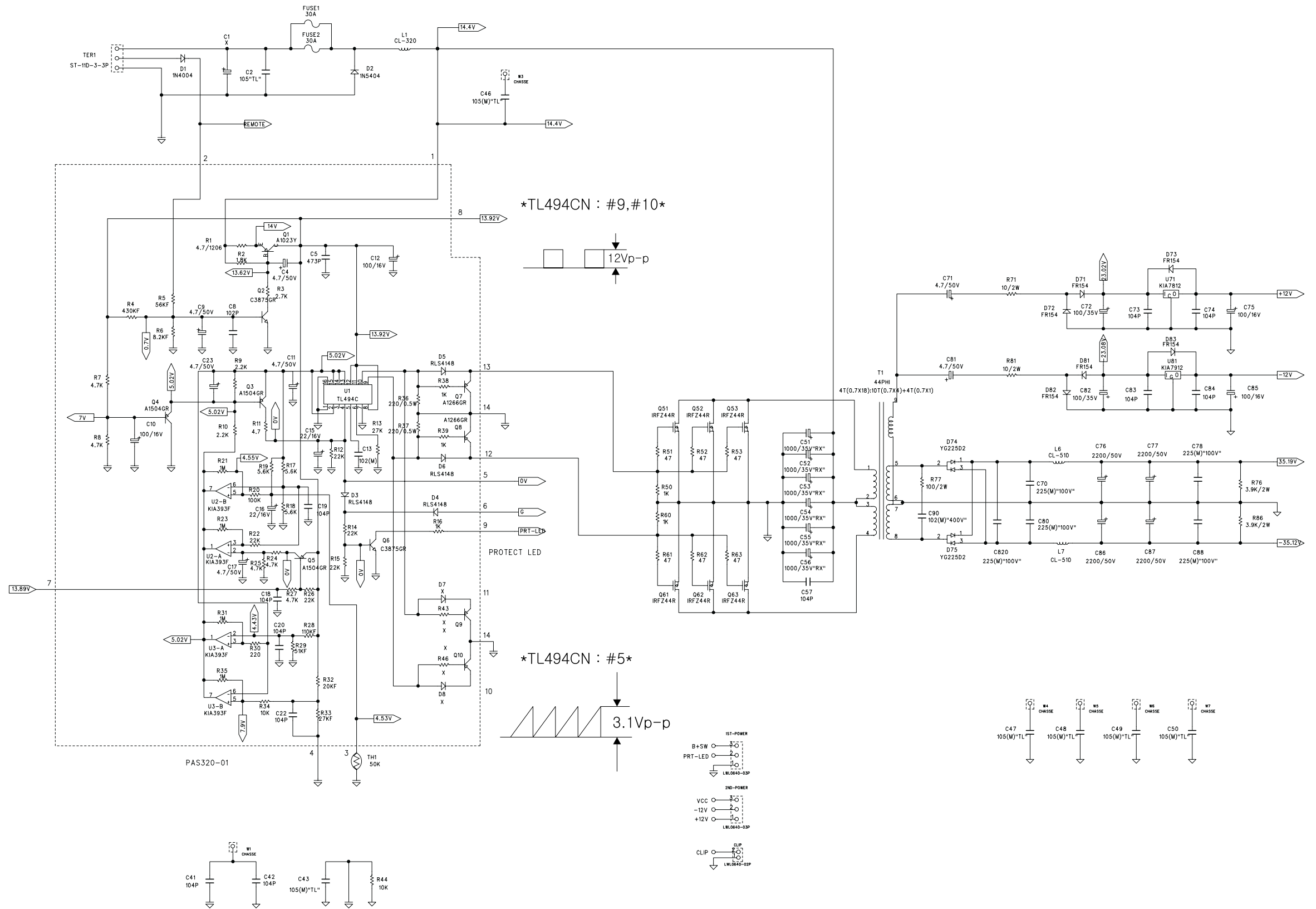


Transistor Diagrams



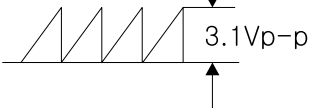
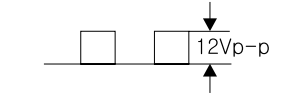
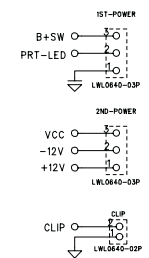
Power Amplifier (Sheet 1)

A
B
C
D
E
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G

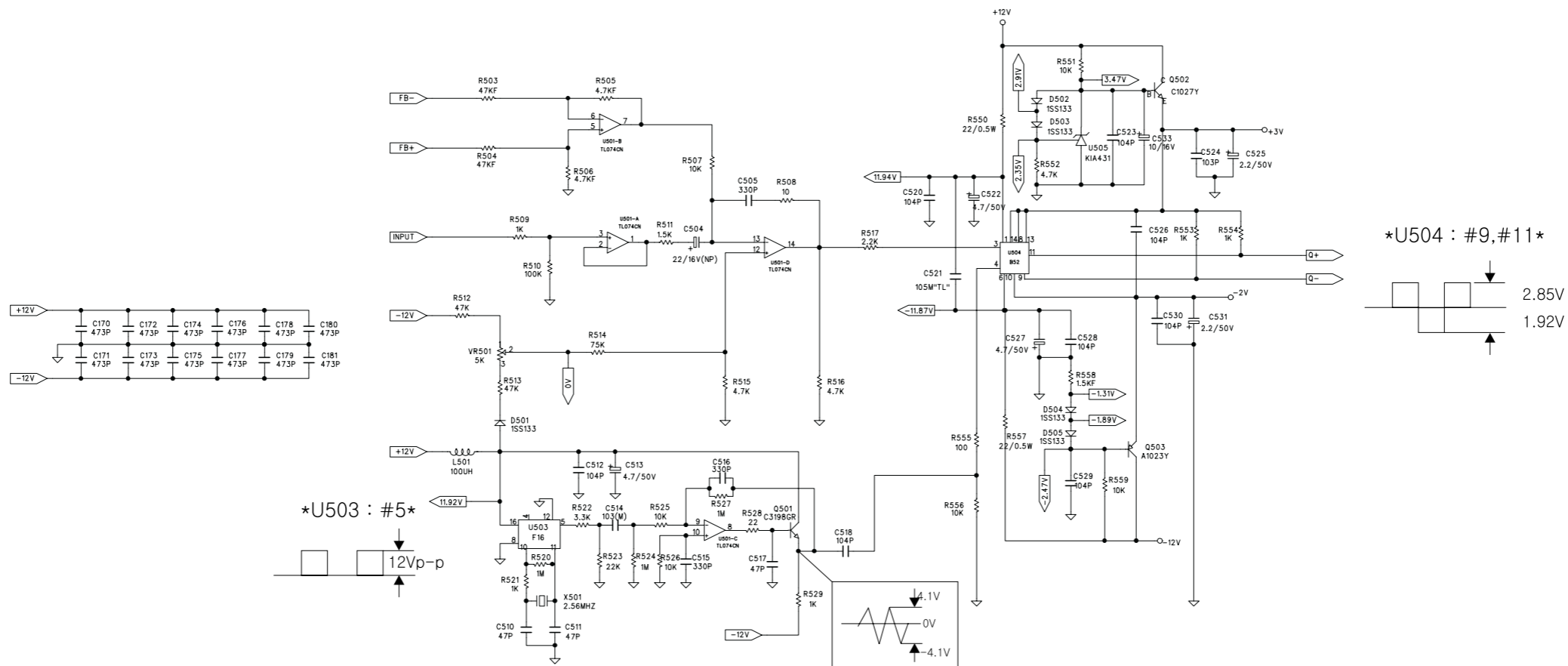
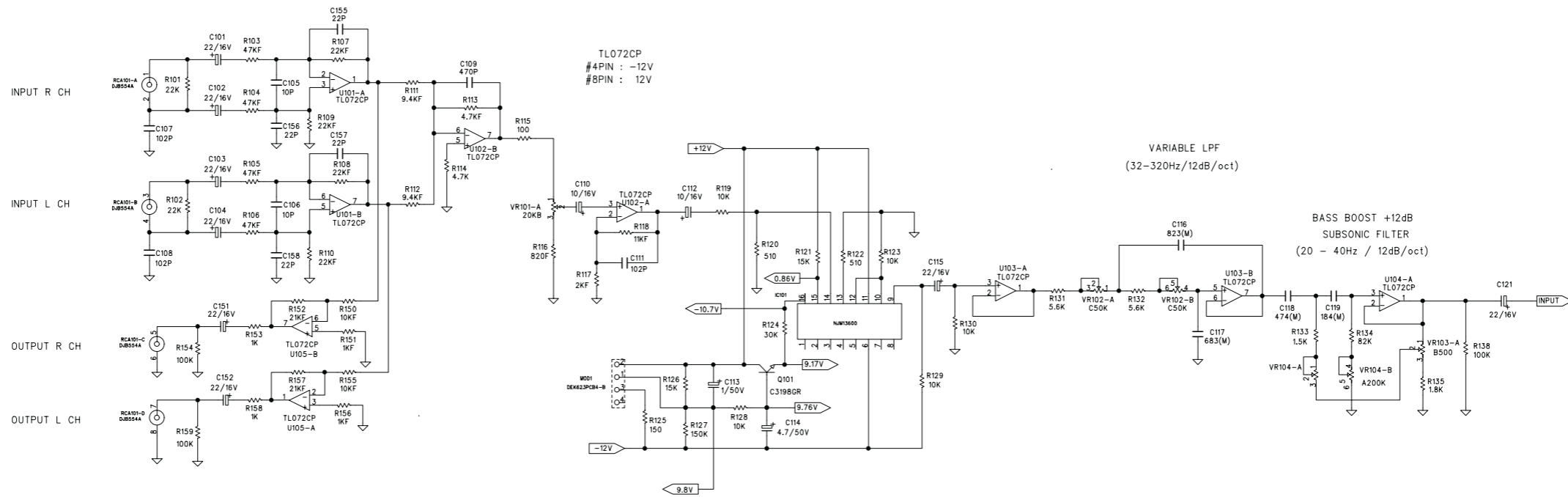


TL494CN : #9,#10

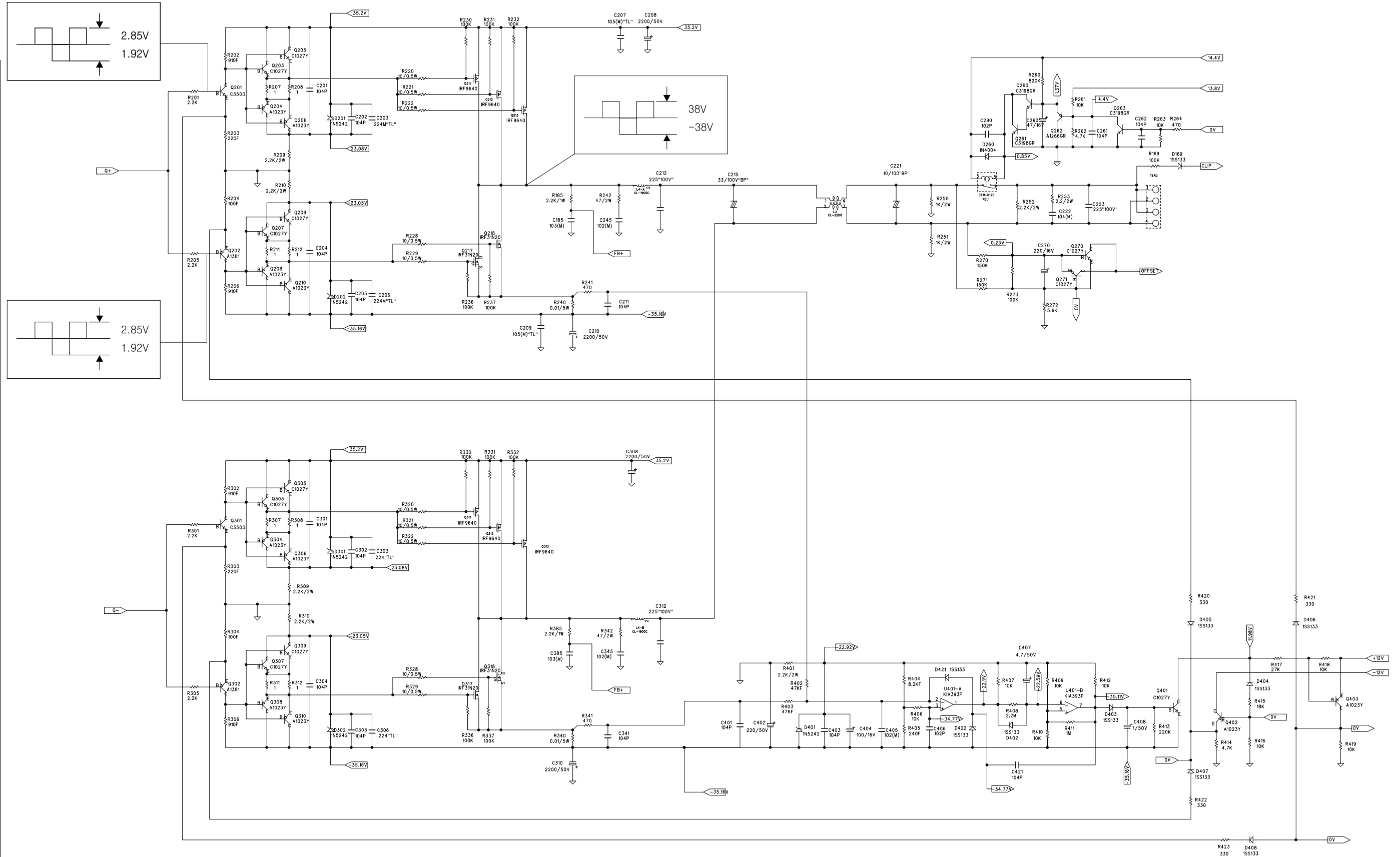
TL494CN : #5



Power Amplifier (Sheet 2)

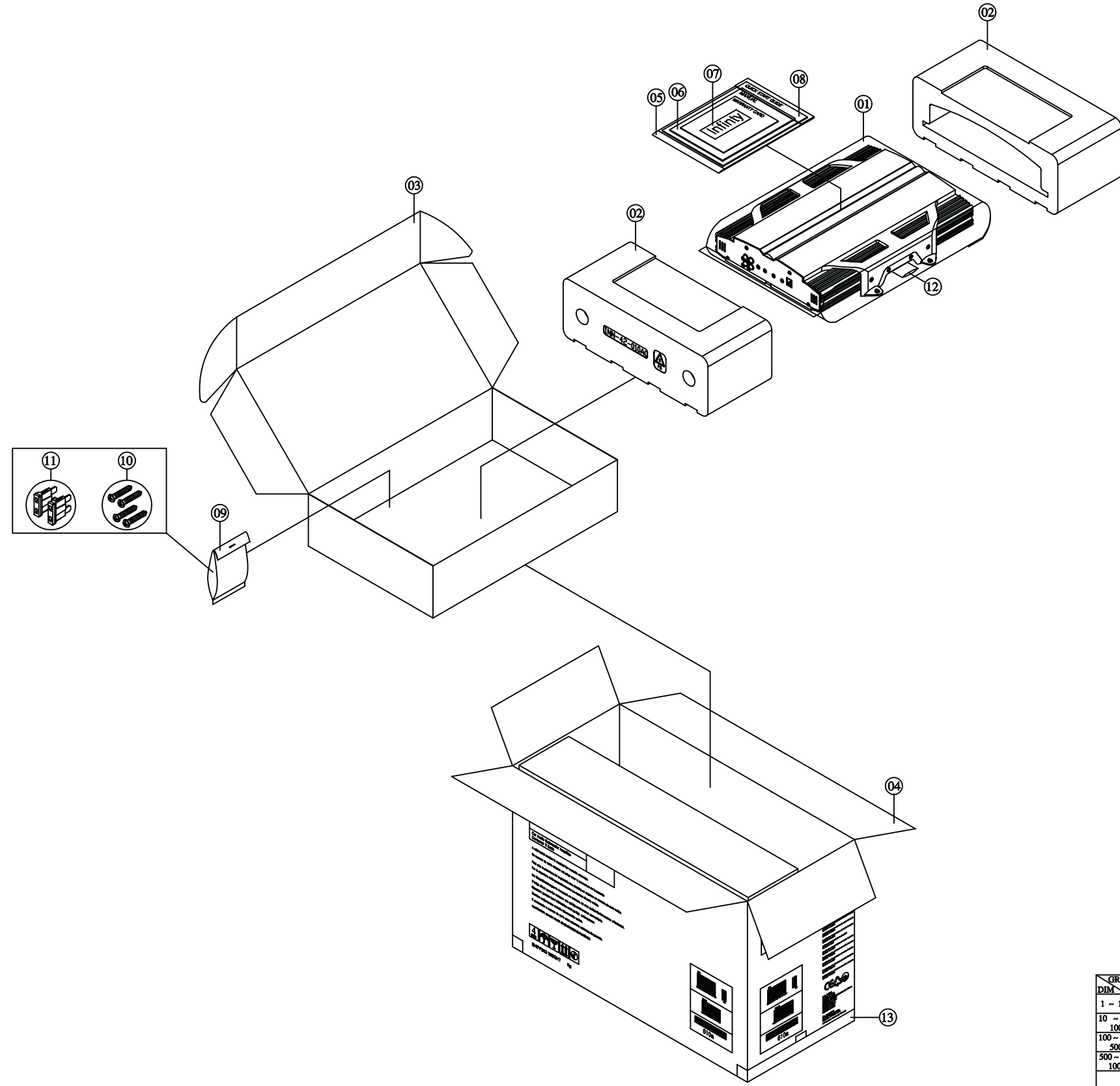


Power Amplifier (Sheet 3)



REF610A Packing Exploded View

A
B
C
D
E
F
G



NO	PART NAME	MIFR PARTS	DESCRIPTION	QTY
01	POLY BAG(A)		VINYL, 550.0x400.0x0.1t	1EA
02	SNOW PAD	INN-42-010A0	EPS, 363.0x160.0x128.0	2EA
03	BOX-GIFT	BOX-36-151AB	SW#1(B), 530.0x368.0x133.0	1EA
04	BOX-CARTON	BOX-39-162AA	DW#2, 545.0x286.0x393.0	1/2EA
05	POLY BAG(B)		VINYL, 260.0x350.0x0.03t	1EA
06	MANUAL		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 NLP	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	REF610a
DIM				ANGLE	MM	1:1	2004.04.10	DRAW NO	
1 ~ 10	0.05	0.1	0.2					NAME	
10 ~ 100	0.1	0.2	0.3	DRAW	CHECK	APPRO		EXPLODED VIEW	
100 ~ 500	0.2	0.3	0.5	H.Y.AN		D.W.SEO			
500 ~ 1000	0.3	0.5	1.5						
								CODE NO.	ISSUE
									Φ

1 2 3 4 5 6 7 8 9