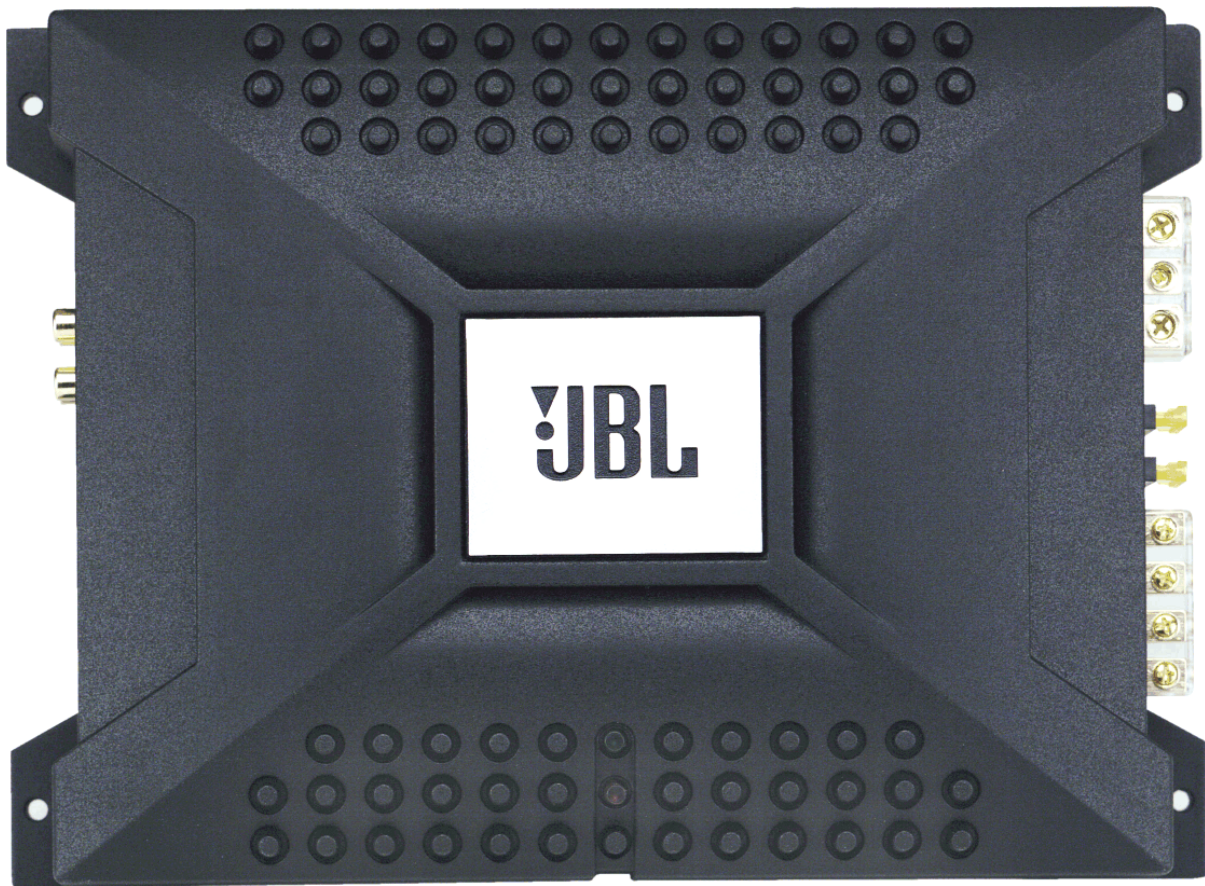


BP300.1



1 CHANNEL POWER AMPLIFIER

SERVICE MANUAL



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

Rev0 8/2004

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BP300.1 Specifications

Number of Channels	1
4 Ohms Stereo.	150W
2 Ohms Stereo	300W
T.H.D. @ 4 Ohms rated Power	0.10%
Frequency Response	10Hz ~ 320 Hz
Signal to noise Ratio	>90dB
Maximum Current Draw	29A
Fuse size.	20A x 2
Input Sensitivity.	250mV ~ 4V
Minimum Speaker Impedance.....	2 ohm
External Dimensions	
Length	11 9/16" (293mm)
Width	7 7/16" (189mm)
Depth	2 11/16 (68mm)

JBL continually strives to improve its products. New materials, production methods and design refinements are introduced into existing models without notice as a routine expression of our design philosophy. For this reason, BP Series Automotive Amplifiers may differ in some respects from their published specifications and descriptions, but will always equal or exceed the original specifications unless otherwise stated.

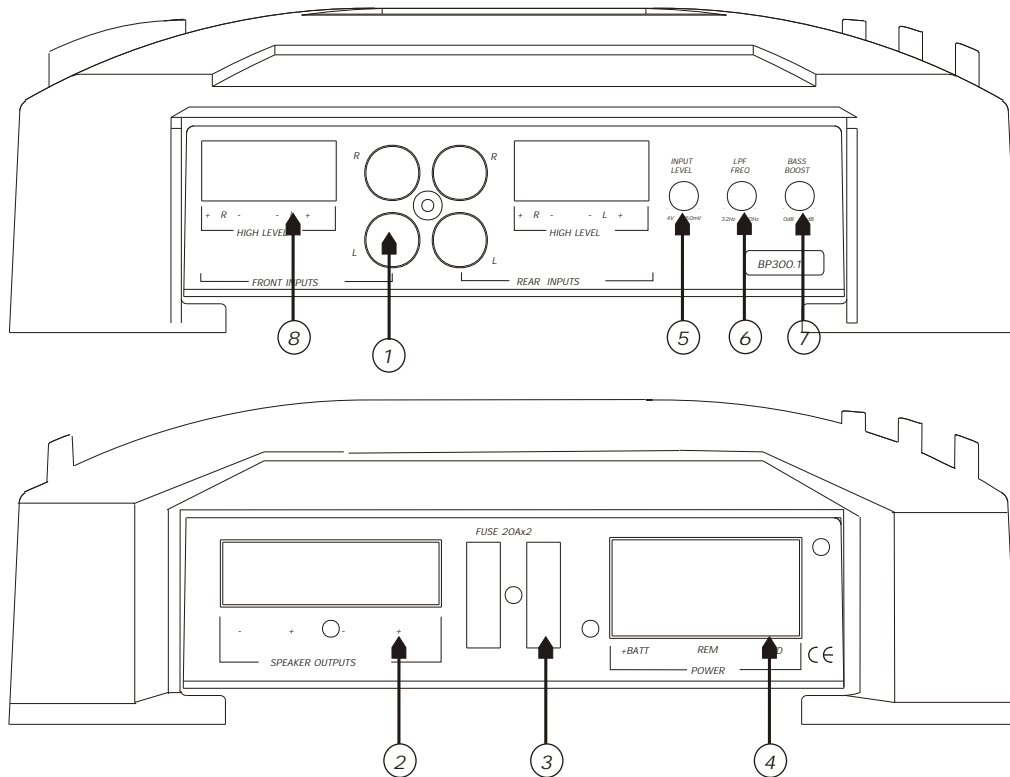
Features

- 1-Channel Operation
- Advanced MOSFET Oversized Floating Rail Power Supply
- Floating Ground Factory - Head - Unit Speaker - Level input
- Variable Input Sensitivity (250mV - 4V)
- Fully Complementary Output Stage with Class-A Voltage Amplification
- Gold-plated Power, Input and Output Connectors
- 2-Ohm Stable (Stereo)

Test Conditions and Notes

- All tests to be done, unless otherwise specified, from 20Hz to 40KHz at 14.4V DC into 4 ohm loads and adjust the units gain so that with a .775 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 4 ohm resistive loads having less than 10% reactive components at any frequency below 75KHz. 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.

Controls and Connections



Controls and Connections

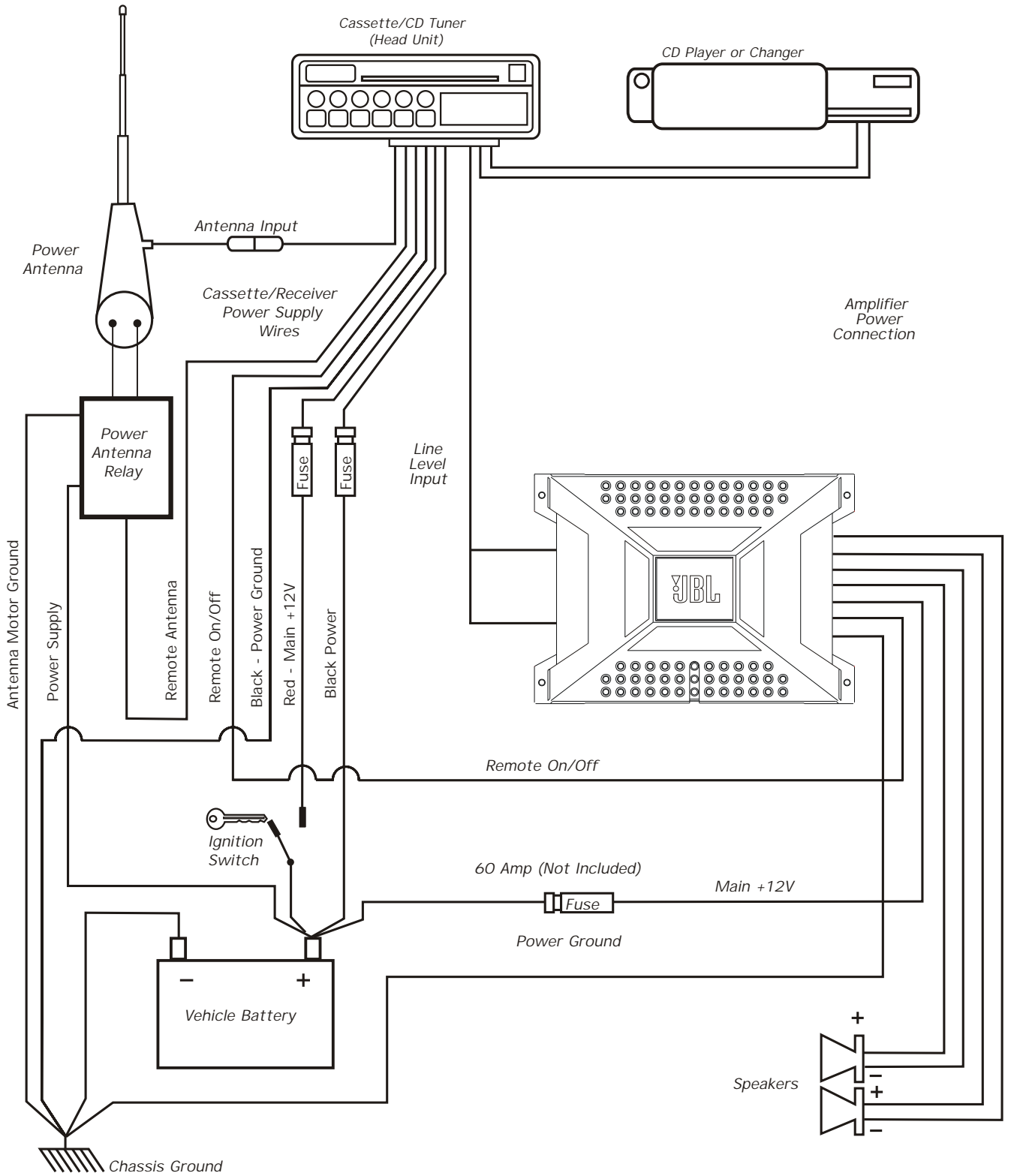
1. It allows left and right input channels to be connected to be amplifier using RCA plugs.
2. Speaker Output Connector - Connect speaker wiring to these connectors. See wiring instructions on page 4 for more information.
3. Fuse - Two 20 Amp ATC type Fuses.
4. Power Connection for 12V+, GND and REM connections for power wires. See wiring instructions on page 4 for more information.
5. Input-Level Control - Adjusts input sensitivity for pre-amp level and speaker level inputs.
6. The electronic crossover is a 12dB/oct. Low pass filter which can be Set at any frequency between 32Hz and 320Hz.
7. The bass boost control will provide up to 6dB of boost at 50Hz.
8. It allows left and right input channels such as high level speaker output signals to be the amplifier.

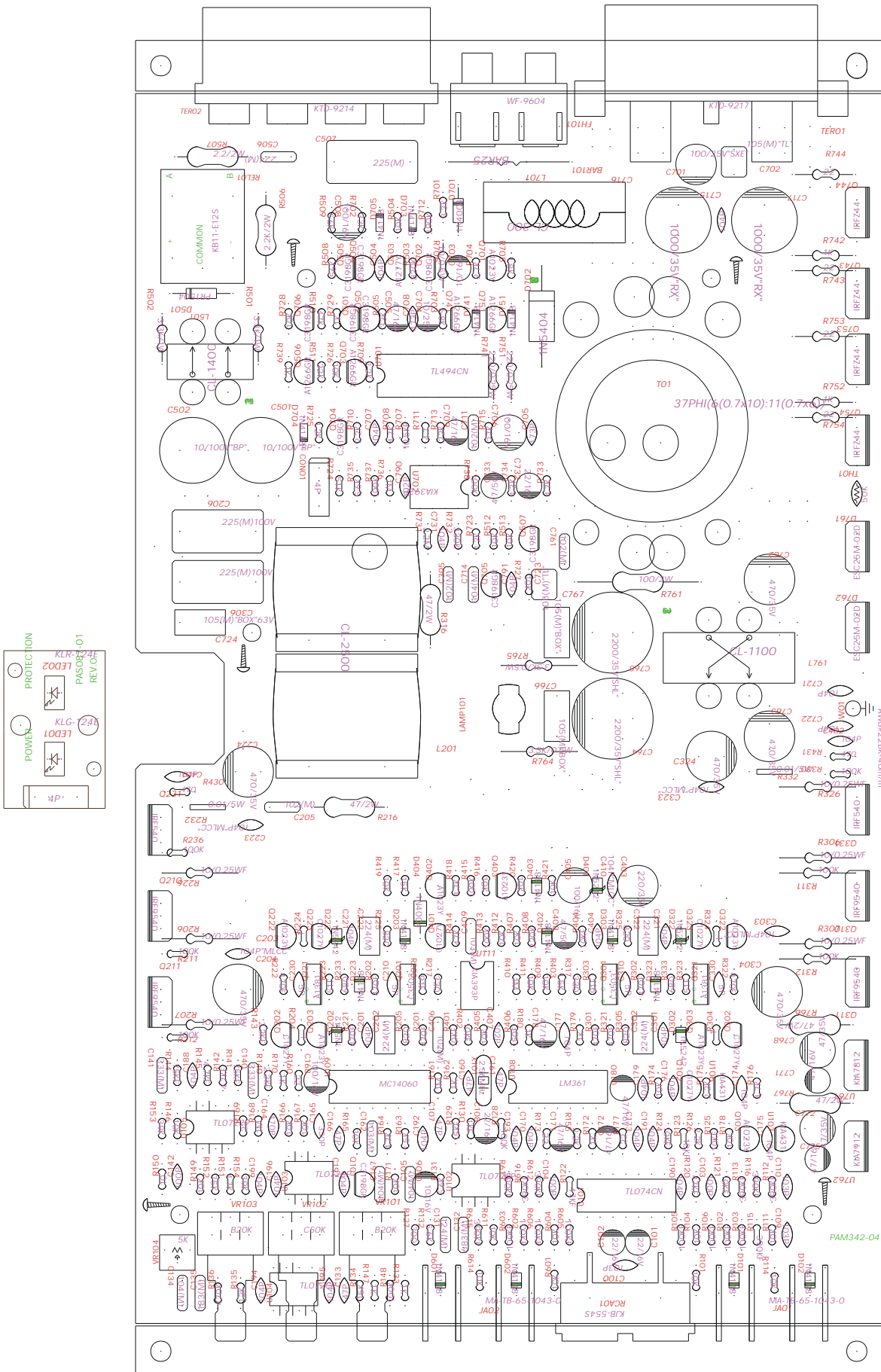
Mounting the Amplifier

The JBL BP Series amplifiers can be mounted in virtually any location inside the vehicle. However, make sure to keep the amplifier away from heater vents or ducts.

1. At the chosen site, use the amplifier as a mounting template and mark the locations of the four mounting holes.
2. Drill a small pilot hole at each marked location.
3. Mount the amplifier and securely tighten the mounting screws.

Typical System Configuration





BP300.1 Parts List

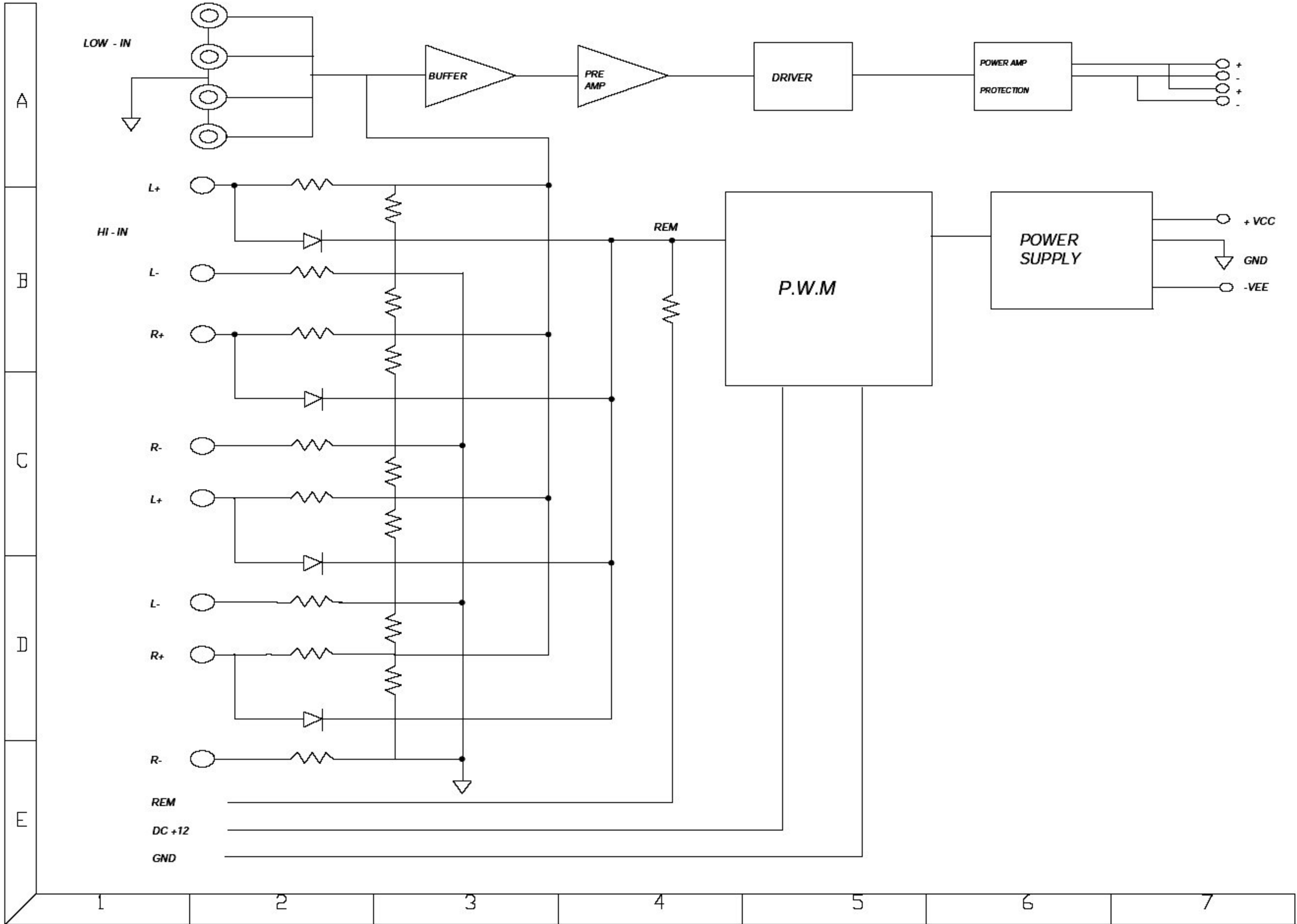
REF. NO	PART NO.	DESCRIPTION	Q'TY	REF. NO	PART NO.	DESCRIPTION	Q'TY
<i>Main PCB, Preamp, Crossover, Power Supply and Power Amplifier</i>				R419,420,421 R504,512,513 R601,604,611 R614,726,727 R728			
<i>F.E.T</i>				R102,103,105 R106,602,603 R605,606	RE212100300	METAL FILM 1/5W 1% (100K OHM)	8
Q210,211,310 Q311	FE195400000	P-CH MOSFET (IRF9540)	4	R112,113,115 R116,612,613 R615,616	RE212390300	METAL FILM 1/5W 1% (390K OHM)	8
Q231,331	FE105400000	N-CH MOSFET (IRF540)	2	R120,122	RE212047300	METAL FILM 1/5W 1% (47K OHM)	2
Q743,744,753 Q754	FE100440112	N-CH MOSFET (IRFZ44)	4	R121,123,124 R125,401,402 R404	RE212010300	METAL FILM 1/5W 1% (10K OHM)	7
<i>TRANSISTORS</i>				R126,155,175 R709,710	RE202022202	CARBON FILM 1/5W 5% (2.2K OHM)	5
Q101,501,502 Q504,505,507 Q702,704,705 Q706	TR031981100	SMALL SIGNAL NPN (C3198GR)	10	R127,163,403	RE202015202	CARBON FILM 1/5W 5% (1.5K OHM)	3
Q102,202,223 Q302,323,401	TR010273110	SMALL SIGNAL NPN (C1027Y)	6	R128,148,211 R212,236,311 R312,330,413 R415,737,738	RE202100302	CARBON FILM 1/5W 5% (100K OHM)	12
Q103,203,222 Q303,322,402 Q403,701	TR010233100	SMALL SIGNAL PNP (A1023Y)	8	R129	RE212027200	METAL FILM 1/5W 1% (2.7K OHM)	1
Q201,301	TR035030101	VIDEO NPN (2SC3503)	2	R130	RE212001300	METAL FILM 1/5W 1% (1K OHM)	1
Q221,321	TR013810201	VIDEO PNP (2SA1381)	2	R131,132,735	RE202056202	CARBON FILM 1/5W 5% (5.6K OHM)	3
Q503,506,703 Q741,751	TR012661200	SMALL SIGNAL PNP (A1266GR)	5	R133,147,162 R170,172,179 R180,729,739 R742,752	RE202001302	CARBON FILM 1/5W 5% (1K OHM)	11
<i>DIODES</i>				R134,417	RE202015302	CARBON FILM 1/5W 5% (15K OHM)	2
D101,102,203 D223,303,323 D402,403,601 D602,703,704 D705,741,751	D1041480000	SWITCHING SIGNAL (1N4148)	15	R135	RE202012302	CARBON FILM 1/5W 5% (12K OHM)	1
D202,222,302 D322,401	D1052420040	ZENER DIODE 0.5W 12V (1N5242)	5	R136	RE202470302	CARBON FILM 1/5W 5% (470K OHM)	1
D404,701	D1040040010	RECTIFIER (1N4004)	2	R140,143	RE212022200	METAL FILM 1/5W 1% (2.2K OHM)	2
D501	D1001504111	FAST RECOVERY (PR1504)	1	R141,144	RE212075300	METAL FILM 1/5W 1% (75K OHM)	2
D702	D1054040011	FAST RECOVERY (1N5404)	1	R142,145	RE212047200	METAL FILM 1/5W 1% (4.7K OHM)	2
D761,762	D1002502031	FAST RECOVERY (ESC25M-02D)	2	R150	RE202010002	CARBON FILM 1/5W 5% (10 OHM)	1
<i>I.C</i>				R151,164,176 R418,708,733	RE202047202	CARBON FILM 1/5W 5% (4.7K OHM)	6
U101	IC017007400	QUAD OP AMP (TLO74CN)	1	R152	RE202075302	CARBON FILM 1/5W 5% (75K OHM)	1
U102,103,104 U105	IC001007200	DUAL OP AMP (TLO72CP)	4	R153,154	RE202039302	CARBON FILM 1/5W 5% (39K OHM)	2
U106,107	IC051043100	SHUNT REGULATOR (KIA431)	2	R160,169,173 R177,743,744 R753,754	RE202022002	CARBON FILM 1/5W 5% (22 OHM)	8
U108	IC007030100	PRECISION COMPARATOR (LM361)	1	R161,168,410 R736	RE202010502	CARBON FILM 1/5W 5% (1M OHM)	4
U109	IC001140600	14-STAGE COUNTER (MC1406)	1	R201,202,221 R222,301,302 R321,322	RE212470000	METAL FILM 1/5W 1% (470 OHM)	8
U111,702	IC001039300	COMPARATOR (KIA393P)	2	R203,303	RE212091200	METAL FILM 1/5W 1% (91 OHM)	2
U701	IC017049400	P.W.M IC (TL494CN)	1	R204,224,304 R324	RE202010002	CARBON FILM 1/5W 5% (1 OHM)	4
U761	IC006781204	REGULATOR, 1A+12V (KIA7812)	1	R205,225,305 R325	RE202820002	CARBON FILM 1/5W 5% (820 OHM)	4
U762	IC006791204	REGULATOR 1A-12V (KIA7912)	1	R206,207,226 R306,307,326 R217,317	RE213010002	CARBON FILM 1/4W 1% (10 OHM)	6
<i>RESISTORS</i>				R216,316,766 R767	RE306047000	METAL FILM 2W 5% (47 OHM)	4
R101,104,111 R114,146,149 R165,166,167 R171,405,407 R714,718,409 R411,412,416	RE202010302	CARBON FILM 1/5W 5% (10K OHM)	31	R217,317	RE202330002	CARBON FILM 1/5W 5% (330 OHM)	2
				R223,323	RE212051000	METAL FILM 1/5W 1% (51 OHM)	2
				R232,332	RE306022200	SHUNT 5W 5% (0.01 OHM)	2

BP300.1 Parts List

REF. NO	PART NO.	DESCRIPTION	Q'TY	REF. NO	PART NO.	DESCRIPTION	Q'TY
R233,333	RE202680002	CARBON FILM 1/5W 5% (680 OHM)	2	C105,134,137 C714	MC091412407	MYLAR 5% 63V "TL" (0.1uf)	4
R406	RE212150000	METAL FILM 1/5W 1% (150 OHM)	1	C131	MC091468307	MYLAR 5% 63V "TL" (0.12uf)	1
R408	RE202220302	CARBON FILM 1/5W 5% (220K OHM)	1	C132	MC091418307	MYLAR 5% 63V "TL" (0.068uf)	1
R414,510	RE202047302	CARBON FILM 1/5W 5% (47K OHM)	2	C135	MC091433307	MYLAR 5% 63V "TL" (0.018uf)	1
R430,431	RE202470002	CARBON FILM 1/5W 5% (470 OHM)	2	C140,141	MC001110300	MYLAR 5% 63V "TL" (0.033uf)	2
R501,502	RE305033201	METAL FILM 1W 5% (3.3K OHM)	2	C162,409	MC001110200	MYLAR 5% 50V (0.01uf)	2
R503	RE202820302	CARBON FILM 1/5W 5% (820K OHM)	1	C202,222,302 C322,506	MC091410507	MYLAR 5% 63V "BOX" (0.22uf)	5
R505,702	RE202033302	CARBON FILM 1/5W 5% (33K OHM)	2	C205,305,406 C711,761	MC001422401	MYLAR 5% 50V (0.001uf)	5
R506	RE306100000	METAL FILM 2W 5% (2.2K OHM)	1	C206,306,507	MC001222511	MYLAR 5% 100V "BOX" (2.2uf)	3
R507	RE306022800	METAL FILM 2W 5% (2.2 OHM)	1	C766,767,724	MC001410530	MYLAR 5% 63V "BOX" (1uf)	3
R508,509	RE202056302	CARBON FILM 1/5W 5% (56K OHM)	2	C702,723	MC091410507	MYLAR 5% 63V "TL" (1uf)	2
R511,713	RE202022302	CARBON FILM 1/5W 5% (22K OHM)	2	C103,104,142	CC011101100	CERAMIC DISK 50V "NPO" (100pF)	3
R701	RE202033202	CARBON FILM 1/5W 5% (3.3K OHM)	1	C107,133,160 C161,166	CC011470100	CERAMIC DISK 50V "NPO" (47pF)	5
R703	RE202068202	CARBON FILM 1/5W 5% (6.8K OHM)	1	C109,110	CC011473600	CERAMIC DISK 50V (0.01uf)	2
R704	RE202027202	CARBON FILM 1/5W 5% (2.7K OHM)	1	C164	CC011471200	CERAMIC DISK 50V (470pF)	1
R705	RE202018202	CARBON FILM 1/5W 5% (1.8K OHM)	1	C165	CC011331200	CERAMIC DISK 50V (330pF)	1
R706	RE204010002	CARBON FILM 1/2W 5% (10 OHM)	1	C170,173,174 C175,176,177 C179,188,190 C191,192,193 C194,195,196 C197,199,201 C221,301,321 C401,402,404 C707,715,721 C722,731,791 C504	CC011104600	CERAMIC DISK 50V (0.1uf)	31
R707	RE212105200	METAL FILM 1/5W 1% (10.5K OHM)	1	C203,223,303 C323,410	CC051104020	CERAMIC DISK 50V "MLCC" (0.1uf)	5
R711	RE202047802	CARBON FILM 1/5W 5% (4.7 OHM)	1	C210,230,310 C330	CC011050100	CERAMIC DISK 50V "NPO" (5pF)	4
R712	RE202390302	CARBON FILM 1/5W 5% (390K OHM)	1	C407,790	CC011102200	CERAMIC DISK 50V (0.001uf)	2
R715	RE202027302	CARBON FILM 1/5W 5% (27K OHM)	1	C705,708	CC011473500	CERAMIC DISK 50V (0.047uf)	2
R723,725	RE202012202	CARBON FILM 1/5W 5% (1.2K OHM)	2	CAPACITOR			
R724	RE202051302	CARBON FILM 1/5W 5% (51K OHM)	1				
R732	RE202330302	CARBON FILM 1/5W 5% (330K OHM)	1	MISCELLANEOUS			
R731	RE202022502	CARBON FILM 1/5W 5% (2.2M OHM)	1				
R734	RE202043202	CARBON FILM 1/5W 5% (4.3K OHM)	1	TH01	RE908010013	FTD5-350 (50K)	1
R741,751	RE203220002	CARBON FILM 1/4W 5% (220 OHM)	2	VR104	TH100500010	SEMI VOLUME	2
R761	RE306047000	METAL FILM 2W 5% (100 OHM)	1	VR101,103	VO131502290	VOLUME	2
R764,765	RE204033202	CARBON FILM 1/2W 5% (3.3K OHM)	2	VR102	VO112503512	VOLUME	1
C101,102,108 C732	EC040112200	ELECTROLYTIC "SMS" (22uF/16V)	4	RELO1	RL001211020	DC 12V,10A (KB11-E12S)	1
C106,703	EC040111000	ELECTROLYTIC "SMS" (10uF/16V)	2	X101	XR300256000	CRYSTAL (CSA256MG)	1
C168,405,508 C706	EC040111010	ELECTROLYTIC "SMS" (100uF/16V)	4	BAR101	JU100002500	BAR JUMPER (25m/m)	1
C171,172,178 C180,505,709 C771,775	EC040114700	ELECTROLYTIC "SMS" (47uF/16V)	8	CON01	CN001040001	LWL0640-4P	1
C204,224,304 C324,762,763	EC060114710	ELECTROLYTIC "SMS" (470uF/35V)	6	JA01,02	MATB6510430	NI PLATE	8
C403	EC060112210	ELECTROLYTIC "SMS" (220uF/35V)	1	RCA01	JA020554004	RCA JACK (KJB554S)	1
C408,733	EC070114760	ELECTROLYTIC "SMS" (4.7uF/50V)	2	L701	AR201250130	BAR COIL (CL-300)	1
C501,502	EC090201011	ELECTROLYTIC "BP" (10uF/100V)	2	L761	AR412231500	IRON 23PHI (CL-1100)	1
C701	EC050171010	ELECTROLYTIC "SXE" (100uF/25V)	1	L501	AR018170700	RING 14PHI (CL-1400)	1
C704	EC050111000	ELECTROLYTIC "SMS" (10uF/25V)	1	L201,301	IN027800610	DRUM CORE (CL-2500)	2
C716,717	EC061311021	ELECTROLYTIC "RX" (1000uF/35V)	2				
C764,765	EC060122220	ELECTROLYTIC "SHL" (2200uF/35V)	2				
C768,772	EC060114700	ELECTROLYTIC "SMS" (47uF/35V)	2				

BP300.1 Parts List

REF. NO	PART NO.	DESCRIPTION	Q'TY	REF. NO	PART NO.	DESCRIPTION	Q'TY
T01	TF137061161	CORE(37PHI)	1	SCREW	MNSCO034016	SMP 4x16 NI	7
T01	MOPCO346720	CORE COVER (36 PHI)	1	SCREW	MNSCO034056	SMP 4x56 (NI-P)	1
TER01	TE000921700	TERMINAL (KTD9217)	1	NUT	MONUO446320	M4 (NI-P)	1
TER02	TE000921400	TERMINAL (KTD9214)	1	PLAIN WASHER	MOPLO110910	PHI 4.2xPHI 15x1t	2
FH101	FH000960402	FUSE HOLDER (WF-9604)	1	PAPER WASHER	MOWAO110920	PAPER, PHI4.2xPHI18x0.5t	2
LAMP01	DS501408010	LAMP (14V 80mA)	1				
TH01	TB001000100	TEFLON TUBE(10m/m)	2				
FET,DIODE,IC	mP010010000	PAPER SPACE	13				
FUSE	FU030120201	2EA ACCY(20A)	4				
	WIO00220253	1007 AWG#22 BK 30m/m	1				
SUB PCB							
LEDO1	DI000124471	GREEN (KLG-124E)	1				
LEDO2	DI000124371	RED (KLR-124E)	1				
CON701	CN111040110	4P	1				
FET (Q744)	mP015008000	10x8x0.5t	1				
MECHANICAL							
MAIN HEAT SINK	MAHS6500372	AL/DIECASTING 292.8x210x67.5	1				
FRONT PANEL	MAFP6537980	EGI 1.5t	1				
REAR PANEL	MARP6537950	EGI 1.5t	1				
BOTTOM COVER	MABC6528080	AL, 258.5x199.5x1.5t	1				
BADGE	MAGB6510360	AL, 68.7x55.4x4t	1				
REFLECTOR	MAIL6537940	ACRYL/ORANGE 100.7x68.3x19.5	1				
LED CAP	MAIL6510240	ACRYL/CLEAR	1				
T.R BRACKET (G) "1066G"	MABRO210660	AL/BAR, 47x14x6.5t	2				
T.R BRACKET (H) "1067H"	MABRO210670	AL/BAR, 94x14x6.5	1				
T.R-BKT CUSHION (C)	MOCU0110710	FIBER, 47x14x1.5t	2				
T.R-BKT CUSHION (H)	MOCU0110740	FIBER, 94x14x1.5t	1				
SILICON PAD (G)	MASPO110861	SP1000, 50x23x0.3t	2				
SILICON PAD (H)	MASPO110871	SP1000, 98x23x0.3t	1				
RUBBER CUSHION (A)	MOCU0140970	RUBBER, 12x7x1.6t	1				
RUBBER CUSHION (C)	MOCU0111140	RUBBER PHI 18x10	1				
RUBBER CUSHION (F)	MOCU0111260	RUBBER PHI 18x6	1				
SCREW	MNSCO023008	SMB 3x8 NI	2				
SCREW	MNSCO053006	SMB 3x6 NI "W/W"	5				
SCREW	MNSCO053008	SMB 3x8 NI "W /W"	2				
SCREW	MBSCO012006	SMB 3x6 BK	4				
SCREW	MOSCO323008	STT3 BH 3x8 BK	4				
SCREW	MBSCO433008	STT2 PH 3x8 BK	5				
SCREW	MNSCO423006	STT2 BH 3x6 NI	2				



Service Bulletin JBL2000-04 - November 2000

Warranty labor rate: MINOR

To: All JBL Service Centers

Models: BP300.1, BP600.1, BP1200.1

Subject: Muting during intense bass passages

The JBL BP series amplifier is designed with the following protection circuits:

- Thermal (excess heat)
- DC voltage on the output terminals (overdriving or "clipping")
- Short Circuit (excessive current)

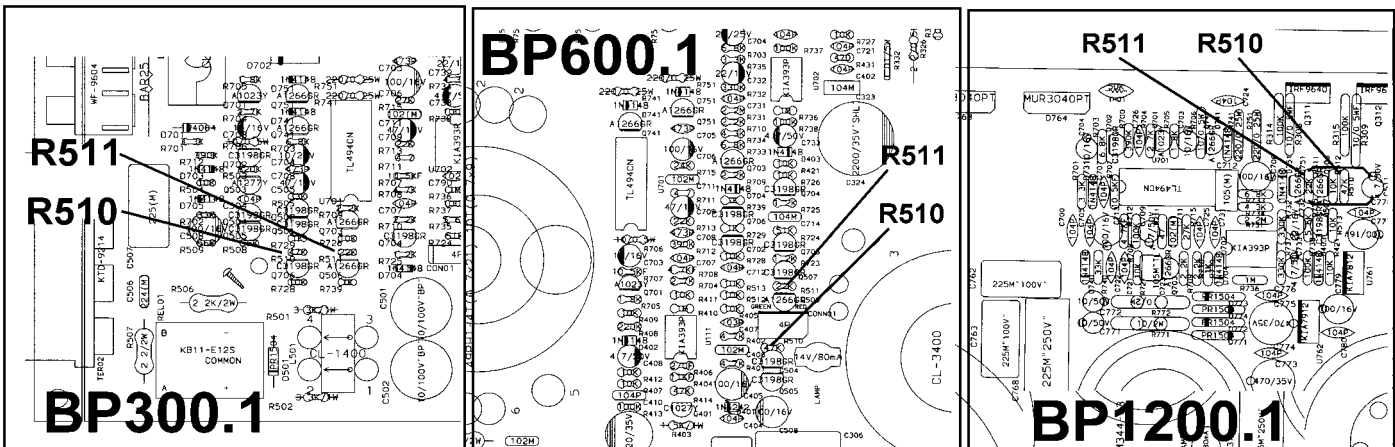
Under certain large signal conditions during intense bass passages, the unit will go into protection. These amplifiers are behaving as designed. As the unit is driven into hard clipping, the protection circuit found in BP Series amps was engineered to protect your loudspeakers from being destroyed by a severely clipped output signal. This can be remedied easily by turning the volume down somewhat on your music source.

In the event you receive a BP series amplifier with the complaint: "Under a large signal input, with music that is composed of high-level bass, the amplifier mutes for 2-3 seconds, and then returns to normal operation", the following modification will effectively increase the amount of clipping that is allowed to occur before the protection circuit engages by increasing the threshold at which the amplifier mutes - for the benefit of customers who use the amps in SPL competition, or for customers who insist on driving the amplifiers into this potentially hazardous zone.

- 1) Turn the amplifier upside-down and remove the Phillips screws holding the bottom cover on.
- 2) Locate and change R510 from 47K to 4.7K ohms 1/5W (JBL part# RE212047200).
- 3) Locate and change R511 from 22K to 2.2K ohms 1/4W (JBL part# QAF0450-222).
- 4) If it is not already present, add new part - 4.7uf 50v electrolytic capacitor (JLB part# EC070114760) in parallel with R511. Polarity: The negative side of the capacitor must be connected to the junction of R510/R511, which can be discovered with an ohmmeter.

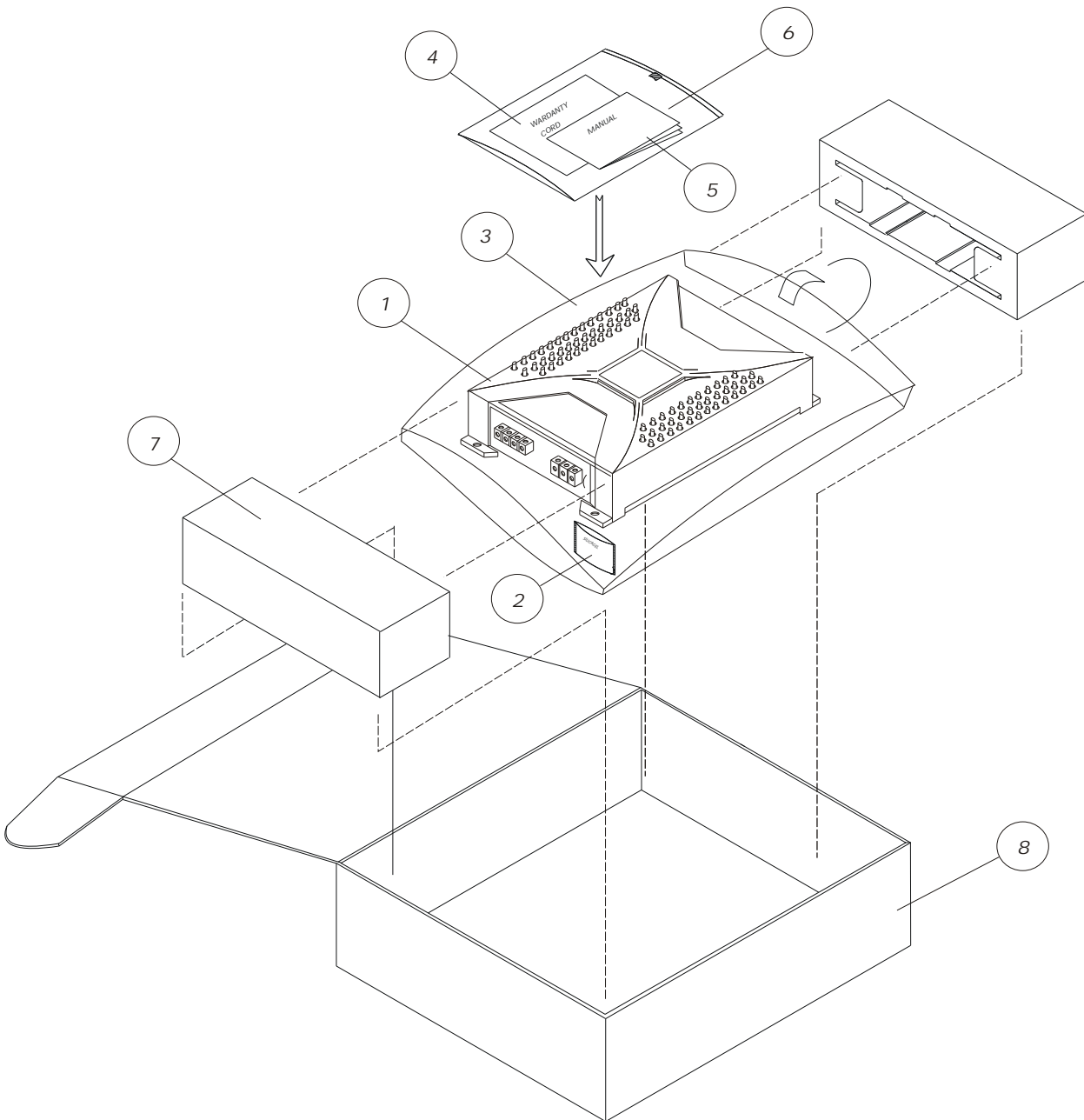
NOTE: Using the correct soldering techniques, you should be able to make these changes from the top of the PCB without its removal.

- 5) Replace bottom cover; test amplifier



Model	Serial number	Status	Action
BP300.1 BP600.1 BP1200.1	All Serial numbers affected	Modify if Needed	Change R510 from 47K to 4.7K ohms Change R511 from 22K to 2.2K ohms Add 4.7uf 50v electrolytic cap in parallel with R511

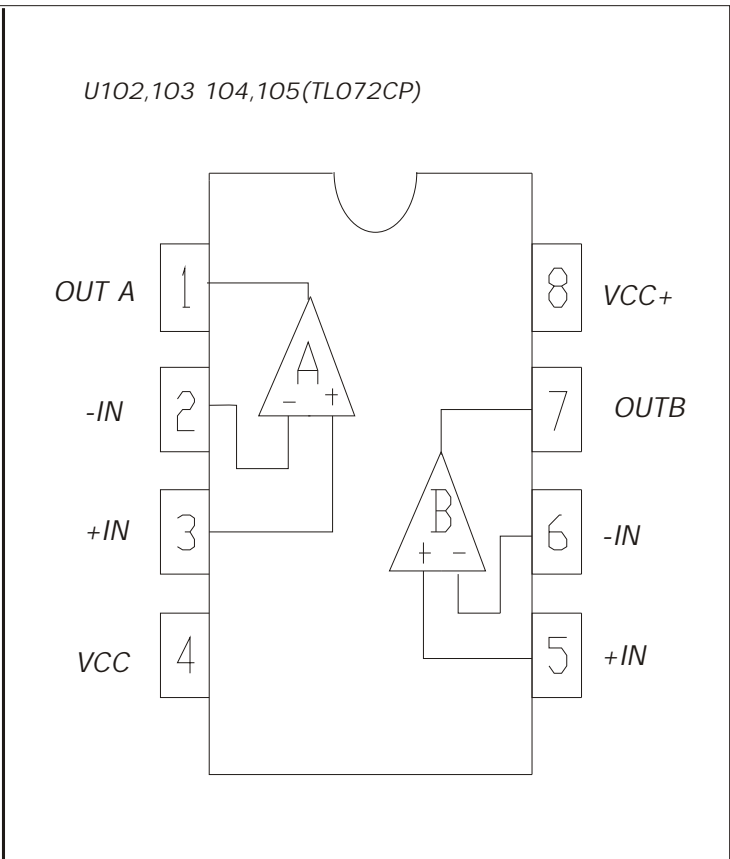
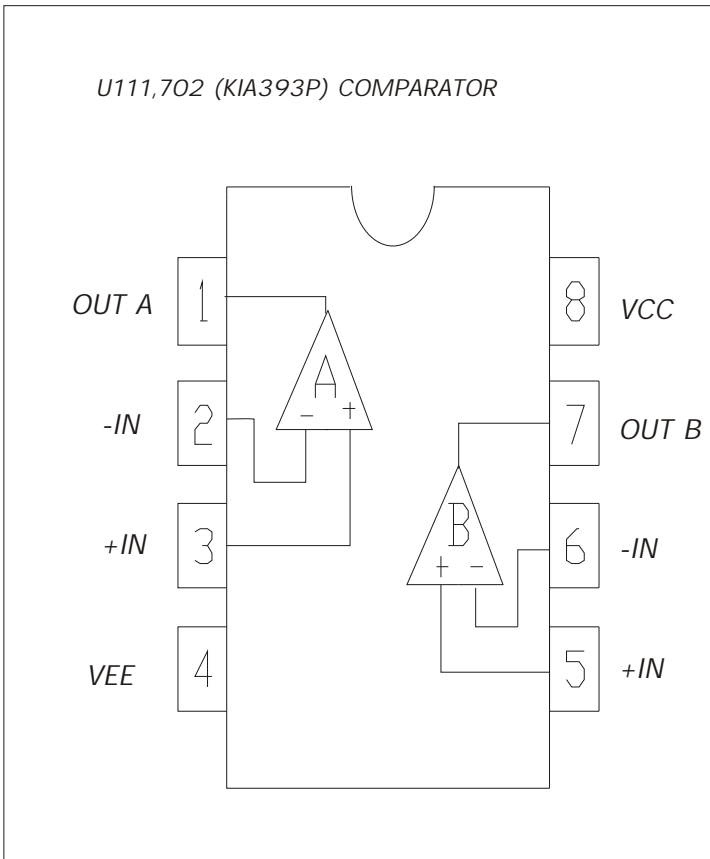
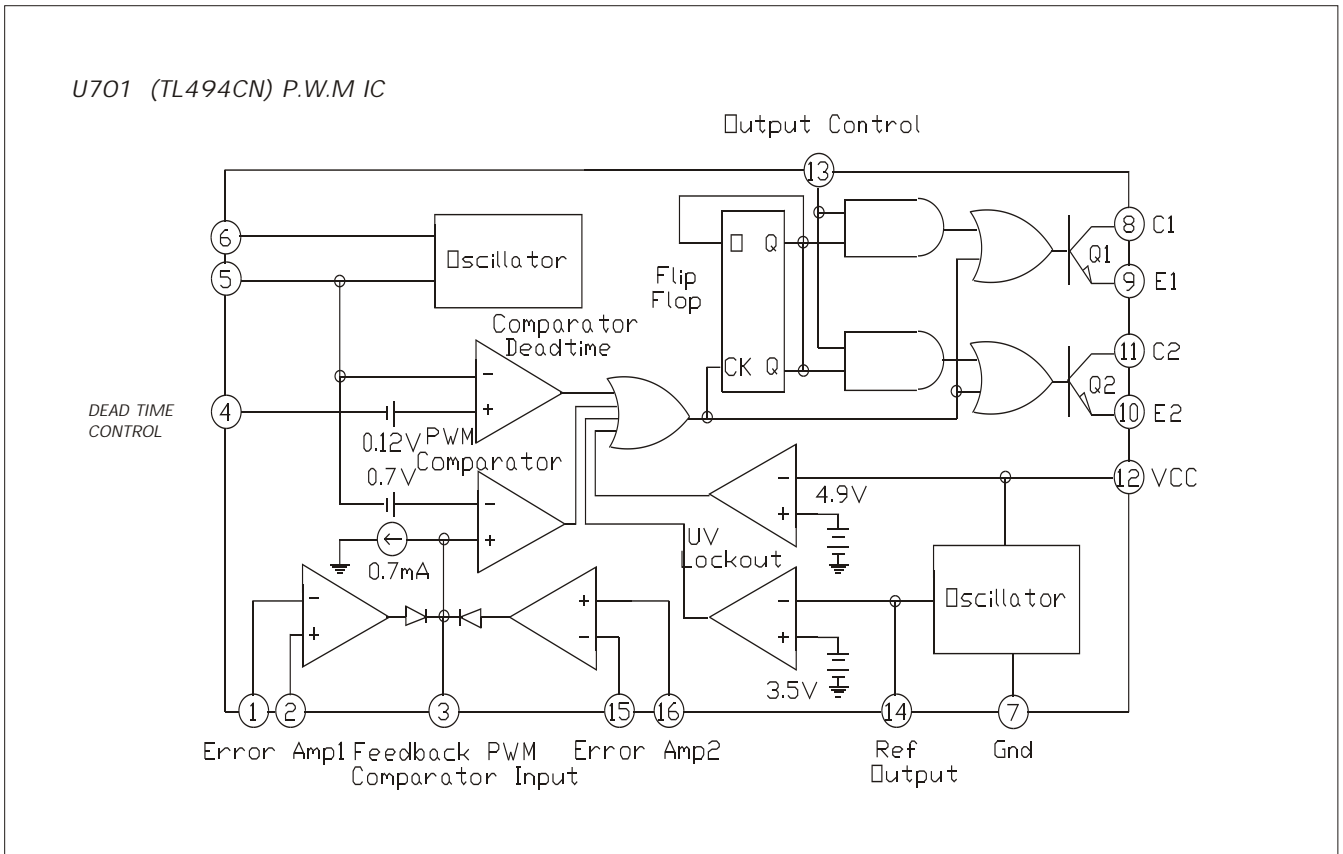
Packaging Exploded View



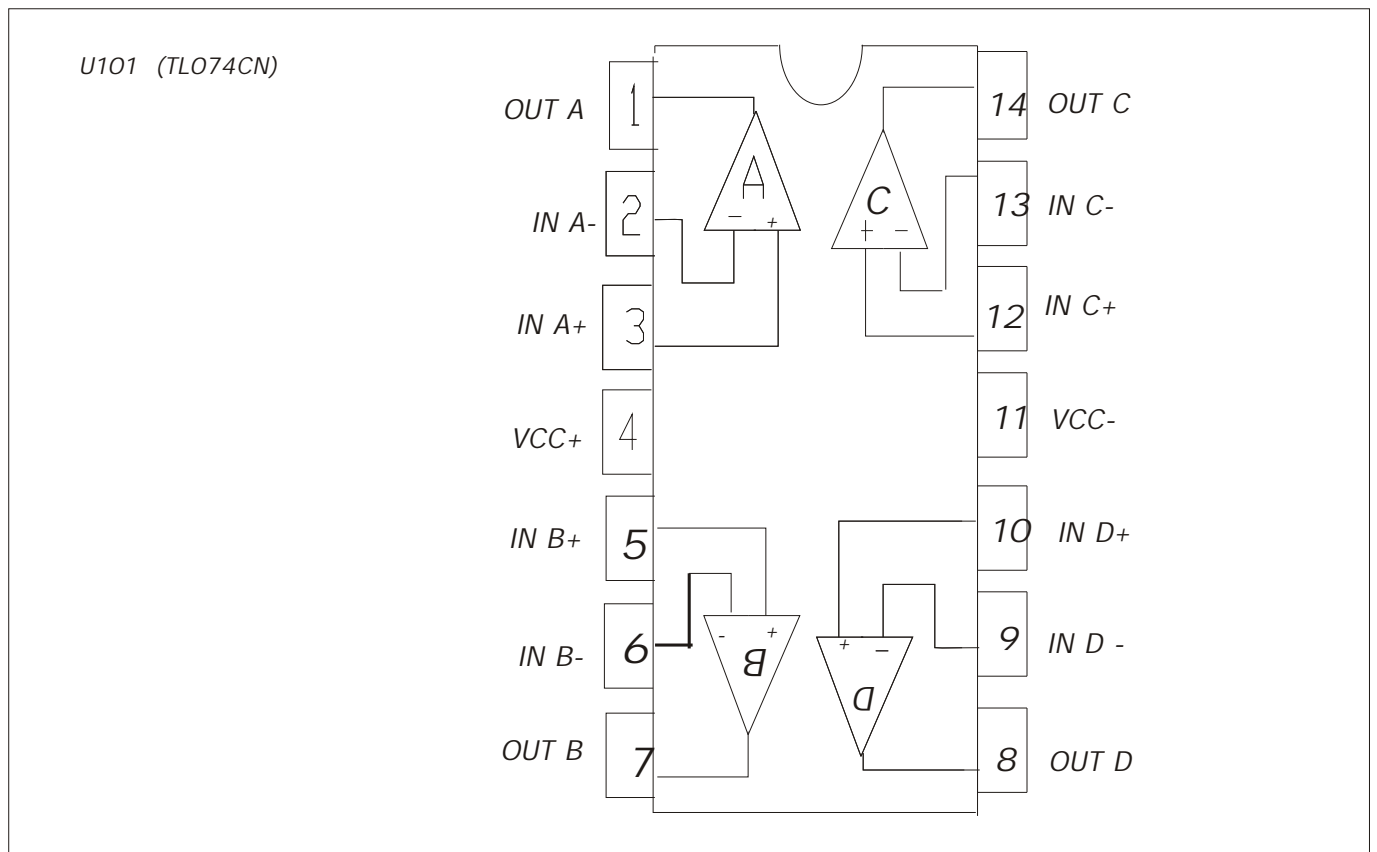
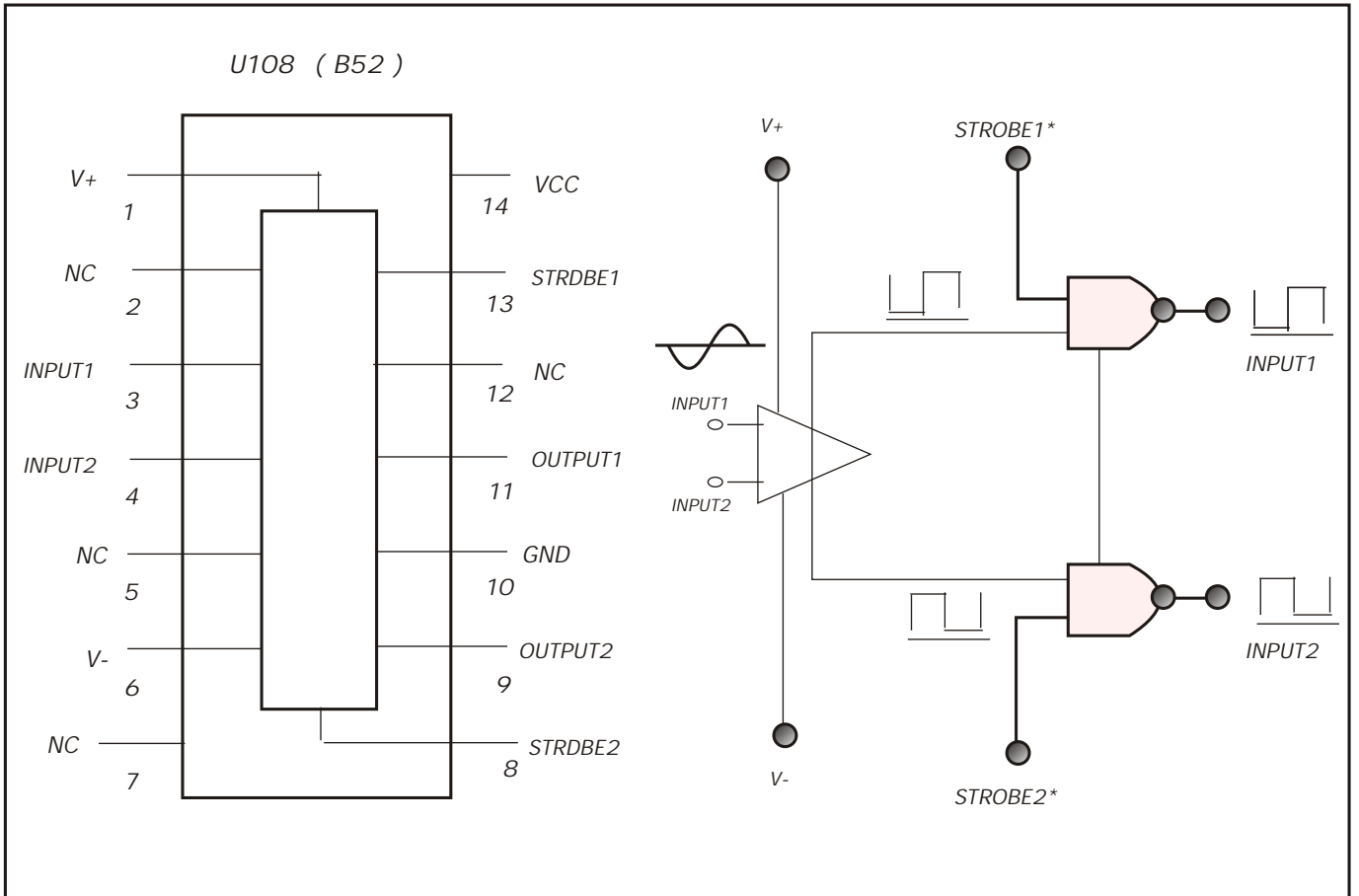
* PACKAGE *

1	BP300.1	SET	1	5	MOMA0147191	MANUAL	1
2	MOSG0147100	SILICAGEL	1	6	MAPB0141000	POLY BAG	1
3	MAPB0110810	POLY BAG	1	7	MASN0210840	SNOW PAD "L,R"	2
4	MOWT0147110	WARRANTY CARD	1	8	MAGB0038140	GIFT BOX	1

Integrated Circuit Diagrams



Integrated Circuit Diagrams



Transistor Diagrams

* KTC3198GR *
Q101,501,502,504,505
Q507,702,704,705,706

* KTA1266GR *
Q503,506,703,741,751

* IRF540 *
Q231,331

* IRF9540 *
Q210,211,310,311

* IRFZ44 *
Q743,744,753,754

* ESC25M-02D *
D761,762

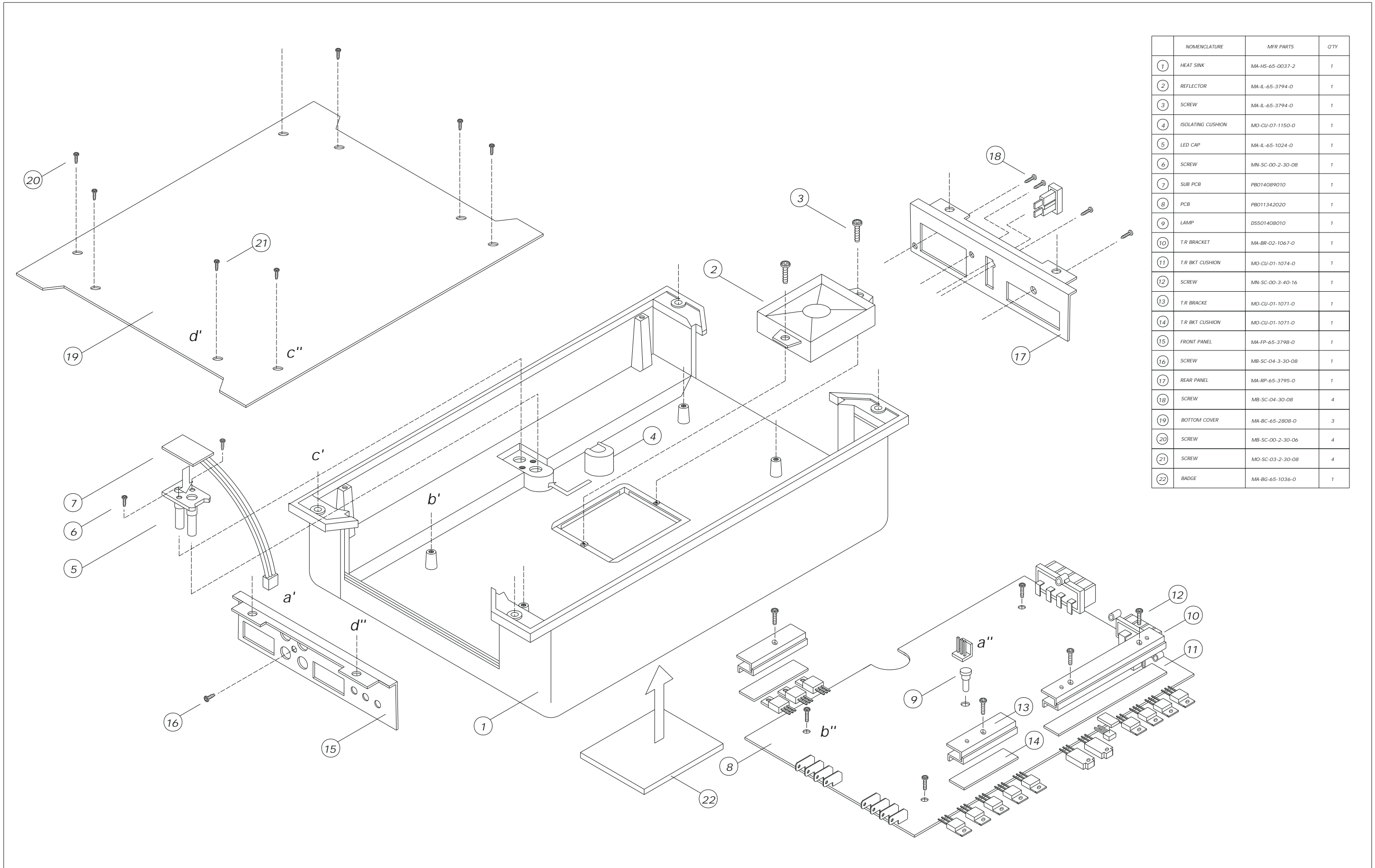
* KTC1027Y *
Q102,202,223,302,323
Q401

* 2SC3503 *
Q201,301

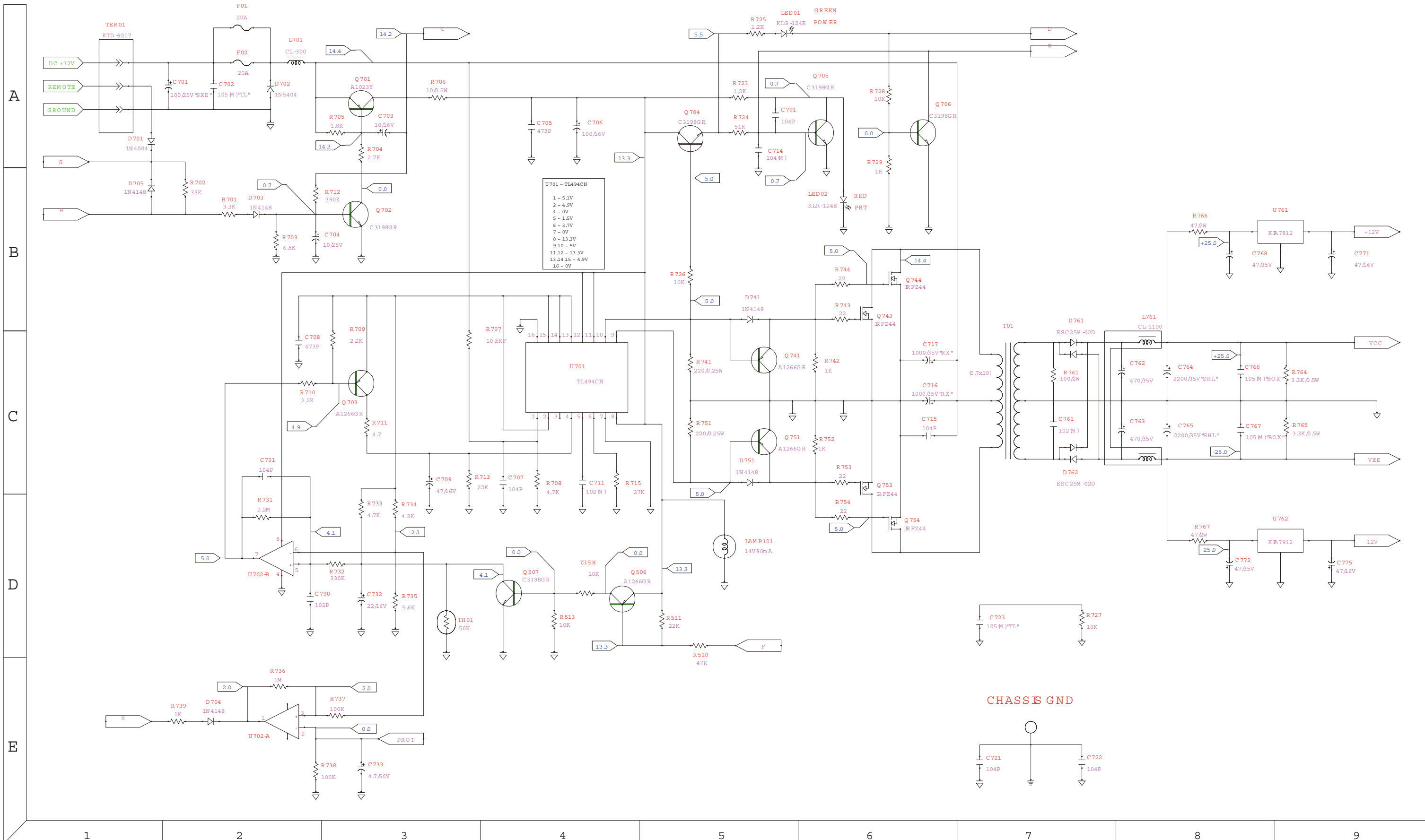
* KTA1023Y *
Q103,203,222,303,322
Q402,403,701

* 2SA1381 *
Q221,321

BP-300.1 Mechanical Exploded View



	NOMENCLATURE	MFR PARTS	QTY
1	HEAT SINK	MA-HS-65-0037-2	1
2	REFLECTOR	MA-IL-65-3794-0	1
3	SCREW	MA-IL-65-3794-0	1
4	ISOLATING CUSHION	MO-CU-07-1150-0	1
5	LED CAP	MA-IL-65-1024-0	1
6	SCREW	MN-SC-00-2-30-08	1
7	SUB PCB	PB014089010	1
8	PCB	PB011342020	1
9	LAMP	DSS01408010	1
10	T.R BRACKET	MA-BR-02-1067-0	1
11	T.R BKT CUSHION	MO-CU-01-1074-0	1
12	SCREW	MN-SC-00-3-40-16	1
13	T.R BRACKE	MO-CU-01-1071-0	1
14	T.R BKT CUSHION	MO-CU-01-1071-0	1
15	FRONT PANEL	MA-FP-65-3798-0	1
16	SCREW	MB-SC-04-3-30-08	1
17	REAR PANEL	MA-RP-65-3795-0	1
18	SCREW	MB-SC-04-30-08	4
19	BOTTOM COVER	MA-BC-65-2808-0	3
20	SCREW	MB-SC-00-2-30-06	4
21	SCREW	MO-SC-03-2-30-08	4
22	BADGE	MA-BG-65-1036-0	1



A

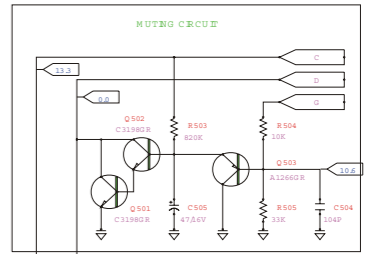
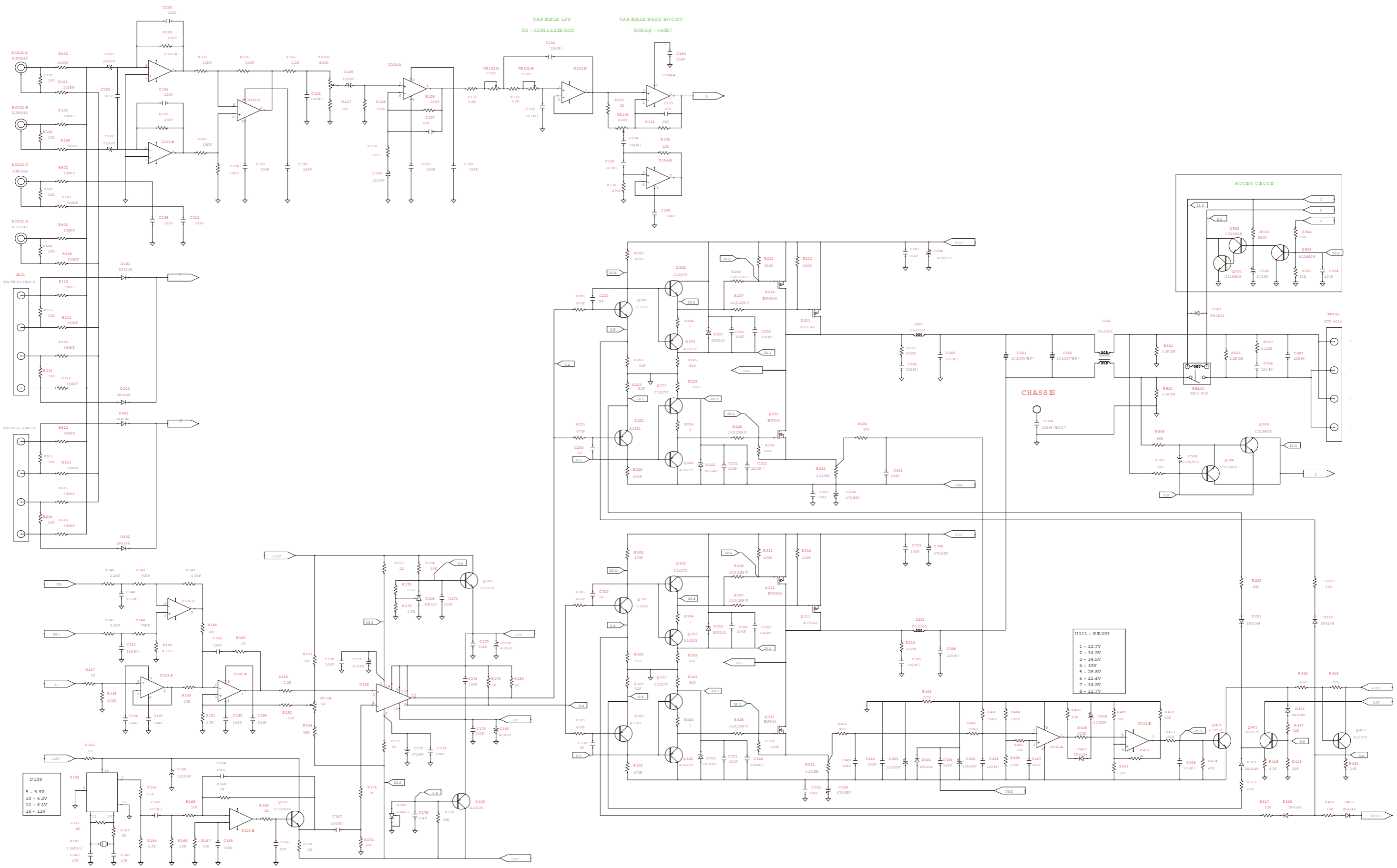
B

C

D

E

F



CHASSIS

U111 - KR393

1	22.7V
2	34.9V
3	34.5V
4	35V
5	28.8V
6	22.4V
7	34.9V
8	22.7V