

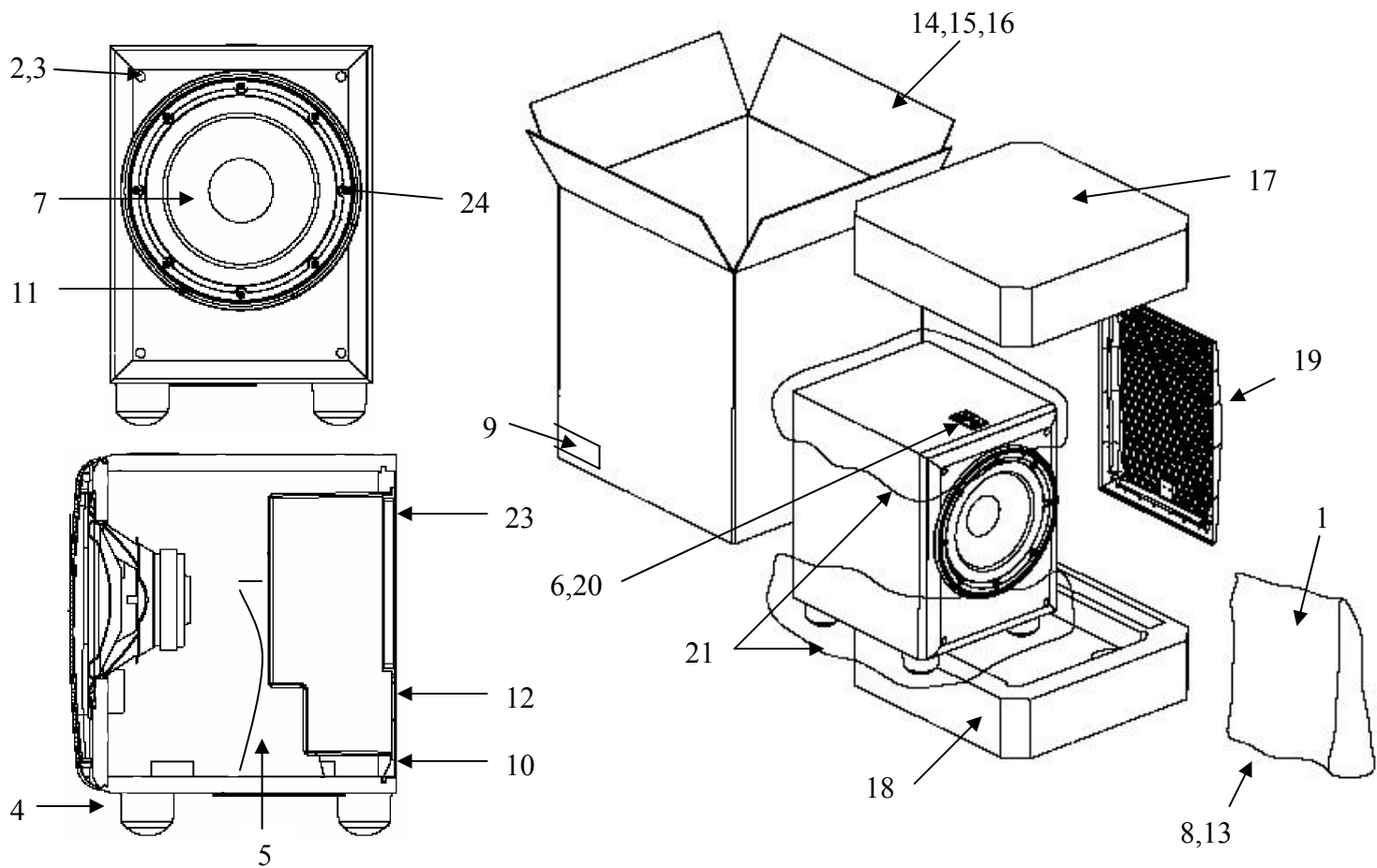


# Northridge E250P/230

## Service Manual



<b>Amplifier</b>	
<b>Power (RMS):</b>	<b>250 Watts</b>
<b>Driver:</b>	<b>300mm (12") PolyPlas</b>
<b>Inputs:</b>	<b>Line Level (switchable to LFE) and Speaker Level with 5-way binding posts</b>
<b>Outputs:</b>	<b>Speaker Level, High-Pass 5-way binding posts</b>
<b>Low-Pass</b>	
<b>Frequency:</b>	<b>Continuously variable from 50Hz – 150Hz</b>
<b>High-Pass</b>	
<b>Frequency:</b>	<b>150Hz when using speaker-level output</b>
<b>Frequency</b>	
<b>Response:</b>	<b>25Hz – low-pass crossover setting</b>
<b>Dimensions</b>	
<b>(H x W x D):</b>	<b>500mm x 365mm x 435mm</b>
<b>Weight:</b>	<b>20.1kg</b>



Item	Model	Part number	Description	Qty
1	E250PBLK/BE/CH	315953-001	BAG,ZIPLOCK,9X12	1,0000
2	E250P/230	333249-001	CUP,GRL-HLS	4,0000
3	E250PBE/CH	333249-003	CUP,GRL-INTRMZO	4,0000
4	E250PBLK/BE/CH	336486-001	FT,MOLDED,W/RBR INSRT	4,0000
5	E250PBLK/BE/CH	336799-001	ASY,PTB-STUDIO PB12	1,0000
6	E250PBLK/BE/CH	338125-002	ASY,LED-E150P/E250P	1,0000
7	E250PBLK/BE/CH	338128-002	ASY,XDUCER,WFR,12", E	1,0000
8	E250PBLK/BE/CH	338381-001	WARR,JBL,1YR/5YR,NEW	1,0000
9	E250PBLK/BE/CH	338836-001	LBL, COUNTRY OF ORIGI	2,0000
10	E250PBLK/BE/CH	350161-001	LBL,JBL"Assem. in Mex	1,0000
11	E250PBLK/BE/CH	351243-001	RING,TRIM,12"-E250P	1,0000
12	E250PBLK/BE/CH	351245-002	ASY,AMP-E250P/230V	1,0000
13	E250PBLK/BE/CH	351248-001	MNL,OWNER-E150P/E250P	1,0000
14	E250P/230	351249-004	CTN,OUTER,MSTR-E250P/	1,0000
15	E250PBE/230	351249-005	CTN,OUTER,MSTR-E250BE	1,0000
16	E250PCH/230	351249-006	CTN,OUTER,MSTR-E250CH	1,0000
17	E250PBLK/BE/CH	351252-001	PAD,END,TOP-E250P SER	1,0000
18	E250PBLK/BE/CH	351252-002	PAD,END,BTM-E250P SER	1,0000
19	E250PBLK/BE/CH	351307-001	ASY,GRL,FRNT-E250P	1,0000
20	E250PBLK/BE/CH	351348-001	ASY,LOGO/LEDPLATE	1,0000
21	E250PBLK/BE/CH	49790P	MICROFOAM,.062x20x18"	4,0000
22	E250PBLK/BE/CH	763-31110-40	SCR,#8X2.5,TR HD, PH	4,0000
23	E250PBLK/BE/CH	903401-012	SCR,PB,PPH,#6x.75,BLK	10,0000
24	E250PBLK/BE/CH	903802-016	SCR,PB,HXS,#8x1,ZINC	8,0000
25	E250PBLK/BE/CH	908302-012	SCR,PB,HXS,#6x.75,ZIN	4,0000

## Electrical Parts List

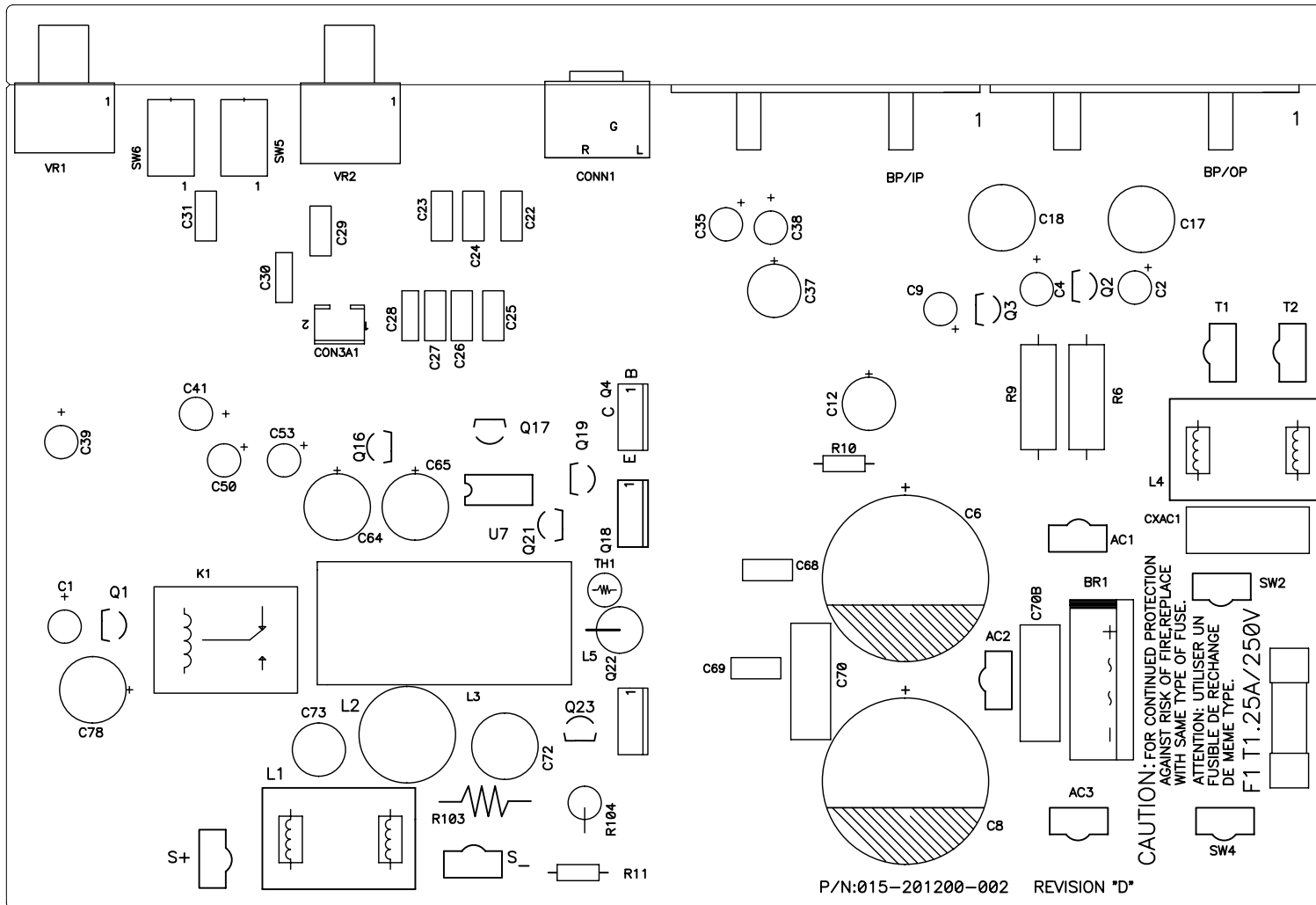
Part Number	Description		Qty	Reference designators
<i>Resistors</i>				
020-220497-120	Film Resistor	2K2 1/4W J	1	R11
021-100401-120	MOF Resistor	1K 1W J	1	R103
021-120403-020	MOF Resistor	1K2 3WS J	1	R9
021-120405-020	MOF Resistor	1K2 5WS J	1	R6
022-500003-020	KNP Resistor	0 ohms05 3WS J	1	R104
024-000098-120	SMD Resistor	0 ohms 1/8W J	2	R125, 126
024-100298-120	SMD Resistor	10 ohms 1/8W J	2	R81, 82
024-100398-120	SMD Resistor	100 ohms 1/8W J	1	R62
024-100498-120	SMD Resistor	1K 1/8W J	10	R79, 83, 92, 95, 96, 105, 108, 127, 65
024-100598-120	SMD Resistor	10K 1/8W J	30	R2, 17, 19, 20, 21, 37, 54, 58, 63, 69, 71, 72, 74, 75, 84, 88, 89, 97, 106, 109, 111, 113-117, 119, 120, 123, 124
024-100698-120	SMD Resistor	100K 1/8W J	6	R3, 22-25, 112
024-110598-100	SMD Resistor	11K 1/8W F	1	R98
024-120698-120	SMD Resistor	120K 1/8W J	1	R39
024-121598-100	SMD Resistor	12K1 1/8W F	1	R38
024-137698-100	SMD Resistor	137K 1/8W F	1	R32
024-150498-120	SMD Resistor	1K5 1/8W J	2	R67, 68
024-180598-120	SMD Resistor	18K 1/8W J	1	R29
024-187698-100	SMD Resistor	187K 1/8W F	1	R45
024-200598-120	SMD Resistor	20K 1/8W J	1	R94
024-220398-120	SMD Resistor	220 ohms 1/8W J	1	R90
024-220498-121	SMD Resistor	2K2 1/8W J	3	R1, 87, 61
024-220598-120	SMD Resistor	22K 1/8W J	1	R118
024-220798-120	SMD Resistor	2M2 1/8W J	2	R80, 121
024-237598-120	SMD Resistor	23K7 1/8W F	1	R48
024-243698-100	SMD Resistor	243K 1/8W F	1	R36
024-270498-120	SMD Resistor	2K7 1/8W J	2	R73, 64
024-300398-120	SMD Resistor	300 ohms 1/8W J	1	R55
024-300598-120	SMD Resistor	30K 1/8W J	1	R56
024-330498-120	SMD Resistor	3K3 1/8W J	9	R7, 8, 26, 27, 12-15, 59
024-330598-120	SMD Resistor	33K 1/8W J	2	R4, 5
024-360498-120	SMD Resistor	3K6 1/8W J	1	R28
024-390498-120	SMD Resistor	3K9 1/8W J	1	R93
024-390598-120	SMD Resistor	39K 1/8W J	1	R77
024-430498-100	SMD Resistor	4K3 1/8W F	1	R78
024-453598-100	SMD Resistor	45K3 1/8W F	1	R30
024-470298-120	SMD Resistor	47 ohms 1/8W J	2	R101, 102
024-470398-120	SMD Resistor	470 ohms 1/8W J	3	R76, 99, 100
024-470498-120	SMD Resistor	4K7 1/8W J	2	R85, 86
024-470598-120	SMD Resistor	47K 1/8W J	4	R44, 47, 49, 107
024-470698-120	SMD Resistor	470K 1/8W J	1	R70
024-470798-120	SMD Resistor	4.7M 1/8W J	1	R60
024-487498-100	SMD Resistor	4K87 1/8W F	2	R51, 53
024-510398-120	SMD Resistor	510 ohms 1/8W J	1	R57
024-560598-120	SMD Resistor	56K 1/8W J	1	R122
024-620398-100	SMD Resistor	620 ohms 1/8W F	2	R16, 18
024-680498-120	SMD Resistor	6.8K 1/8W J	6	R46, 91, 40, 41, 43, 42
024-680598-120	SMD Resistor	68K 1/8W J	6	R33, 34, 31, 50, 52, 66
024-820598-120	SMD Resistor	82K 1/8W J	1	R69
026-200595-269	VR2 FREQUENCY POT	PN:RD163121R034-20KBx2(EJ)	1	VR2
026-500495-252	VR1 LEVEL POT	P/N:RK163111R522-5KA (EJ)	1	VR1

## PB12 Electrical Parts List (Cont.) Revision 2 Only

Part Number	Description		Qty	Reference designators
<i>Capacitors</i>				
031-100244-100	SMD Ceramic Capacitor	0u01/50V K	7	C33, 45, 51, 66, 67, 5, 10
031-100343-100	SMD Capacitor	100pF/50V J	3	C16, 36, 58
031-100344-100	SMD Capacitor	0u1/50V K	16	C11, 42-44, 46-49, 52, 54, 55, 60, 63, 71, 74, 77
031-100364-100	SMD Capacitor	0.1uF/100V K	2	C3, 7
031-220344-100	SMD Capacitor	220pF/50V J	5	C14, 15, 20, 21, 19
031-330444-300	SMD Capacitor	3300pF/50V K	2	C40, 34
031-470244-102	SMD Capacitor	0u047/50V K	2	C62, 59
031-560243-100	SMD Capacitor	56pF/50V J	2	C57, 61
031-560343-102	SMD Capacitor	560pF/50V J	1	C56
032-100484-200	END PE Capacitor	1uF/250V K	2	C70, C70B
033-200645-300	NP Capacitor	200u/50V M	2	C17, 18
033-470444-270	NPE	4u7/50V K	1	C73
033-680464-270	NPE	6u8/100V K	1	C72
034-100525-300	Electrolytic Capacitor	10uF/25V M	1	C35
034-100625-300	Electrolytic Capacitor	100uF/25V M	1	C64
034-220525-301	Electrolytic Capacitor	22uF/25V M	6	C4, 9, 41, 39, 50, 53
034-220615-301	Electrolytic Capacitor	220uF/16V M	1	C37
034-330525-300	Electrolytic Capacitor	33uF/25V M	1	C1
034-330615-300	Electrolytic Capacitor	330uF/16V M	2	C12, 78
034-330780-300	Electrolytic Capacitor	3300uF/80V M	2	C6, 8
034-470415-301	Electrolytic Capacitor	4u7/50V M	1	C2
034-470615-301	Electrolytic Capacitor	470uF/16V M	1	C65
038-100363-300	MPE Capacitor	0u1/100V J	7	C68, 69, 26, 27, 28, 29, 30
038-150393-300	MPE Capacitor	0u15/63V J	1	C25
038-330393-300	MPE Capacitor	0u33/63V J	1	C31
039-100390-100	UL Capacitor	0u1/275V	1	CXAC1
<i>Semiconductors</i>				
051-000600-100	NPN Transistor	MPSW06RLRA	2	Q2, Q16
051-005600-100	NPN Transistor	MPSW56RLRA MPQ TO-92	1	Q3
051-222200-100	NPN Transistor	PN:MPS2222ARLRA TO-92	1	Q21
051-290700-100	NPN Transistor	P2N2907A TO-92	2	Q19, 23
051-540101-000	PNP Transistor	2N5401 TO-92	1	Q1
051-555100-000	NPN Transistor	2N5551 TO-92	1	Q17
052-400080-000	Bridge rectifier	PN:RS804 400V, 8A	1	BR1
053-211100-000	IC:Half-Bridge Driver	PN:IR2111	1	U7
054-000100-100	SMD Diode	ES1D 200V, 1A, 35ns	5	D5, 26, 29, 33, 38
054-001001-100	SMD Zener Diode	10V SOT-23 DZ23C10	1	D35
054-001500-100	SMD Zener Diode	15V SOT-23 DZ23C15	3	D6, 7, 9
054-007200-100	SMD IC Dual Op-Amp	TL072CDR SO-8 (TI)	2	U5, 6
054-007400-100	SMD IC Quad Op-Amp	PN:TL074CDR (TI)	2	U2, 3
054-033904-100	SMD TR NPN (MOTOROLA)	MMBT3904LT1 SOT23	6	Q11, 14, 13, 5, 8, 9
054-033906-100	SMD TR PNP (MOTOROLA)	MMBT3906LT1 SOT23	4	Q6, 10, 12, 15
054-045580-100	SMD Dual Op-Amp	NJM4558M-TE3 DMP-8	1	U4
054-050600-100	SMD Zener Diode	5.6V SOT-23 DZ23C5V6	3	D24, 36, 37
054-211400-100	SMD NPN Transistor	DTC114EK SMT3	1	Q7
054-414803-100	SMD Zener Diode	LL4148	26	D1-4, 8, 10-23, 27, 28, 30-32, 34, 39
054-540100-100	SMD PNP Transistor	MMBT5401 LT1	3	Q20, 24, 26
054-555100-100	SMD NPN Transistor	MMBT5551 LT1	1	Q25
051-003100-000	NPN Transistor	TIP31C TO-220	1	Q4
051-064000-000	MOSFET	IRF640 TO-220	2	Q18, 22

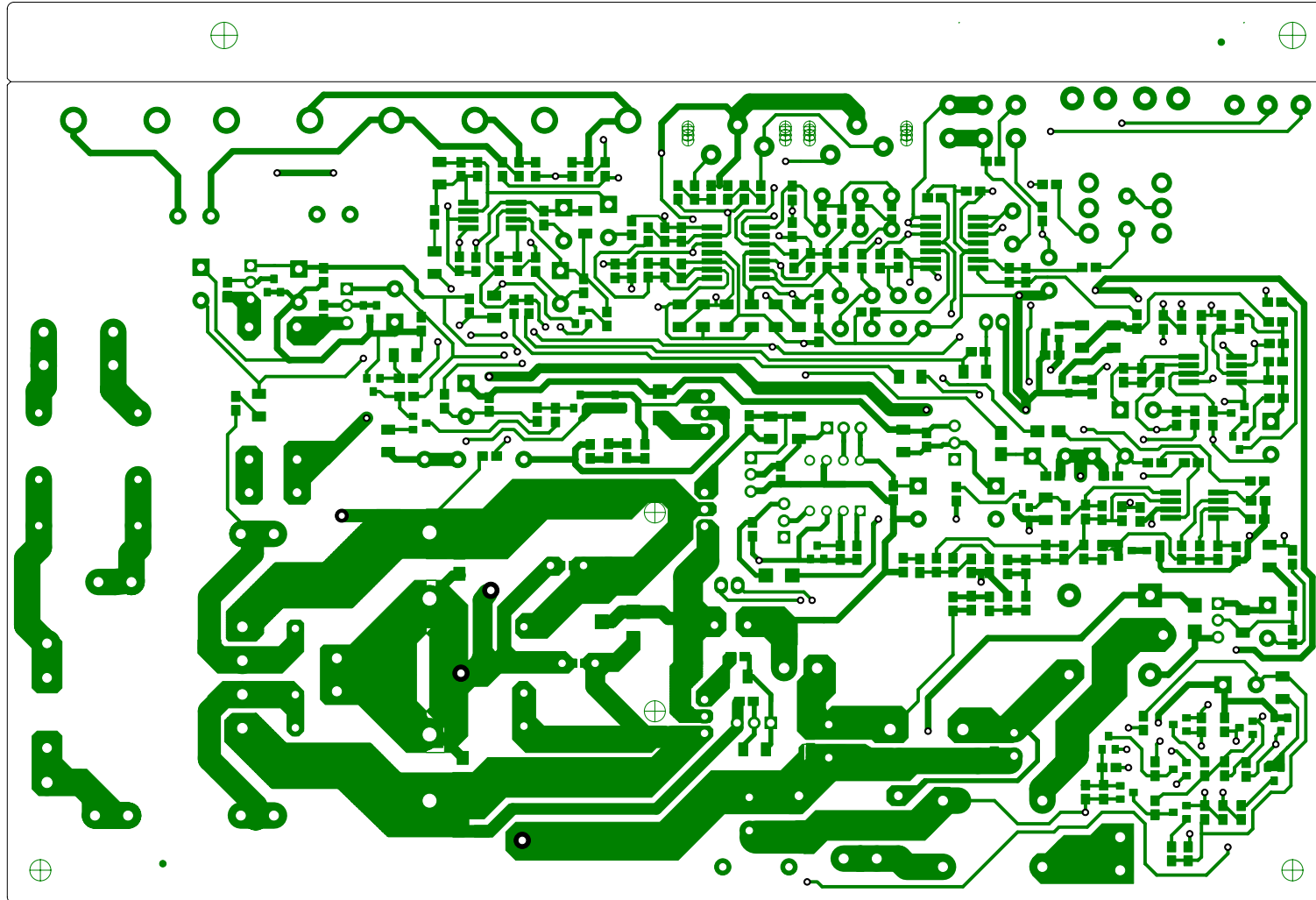
## Electrical Parts List

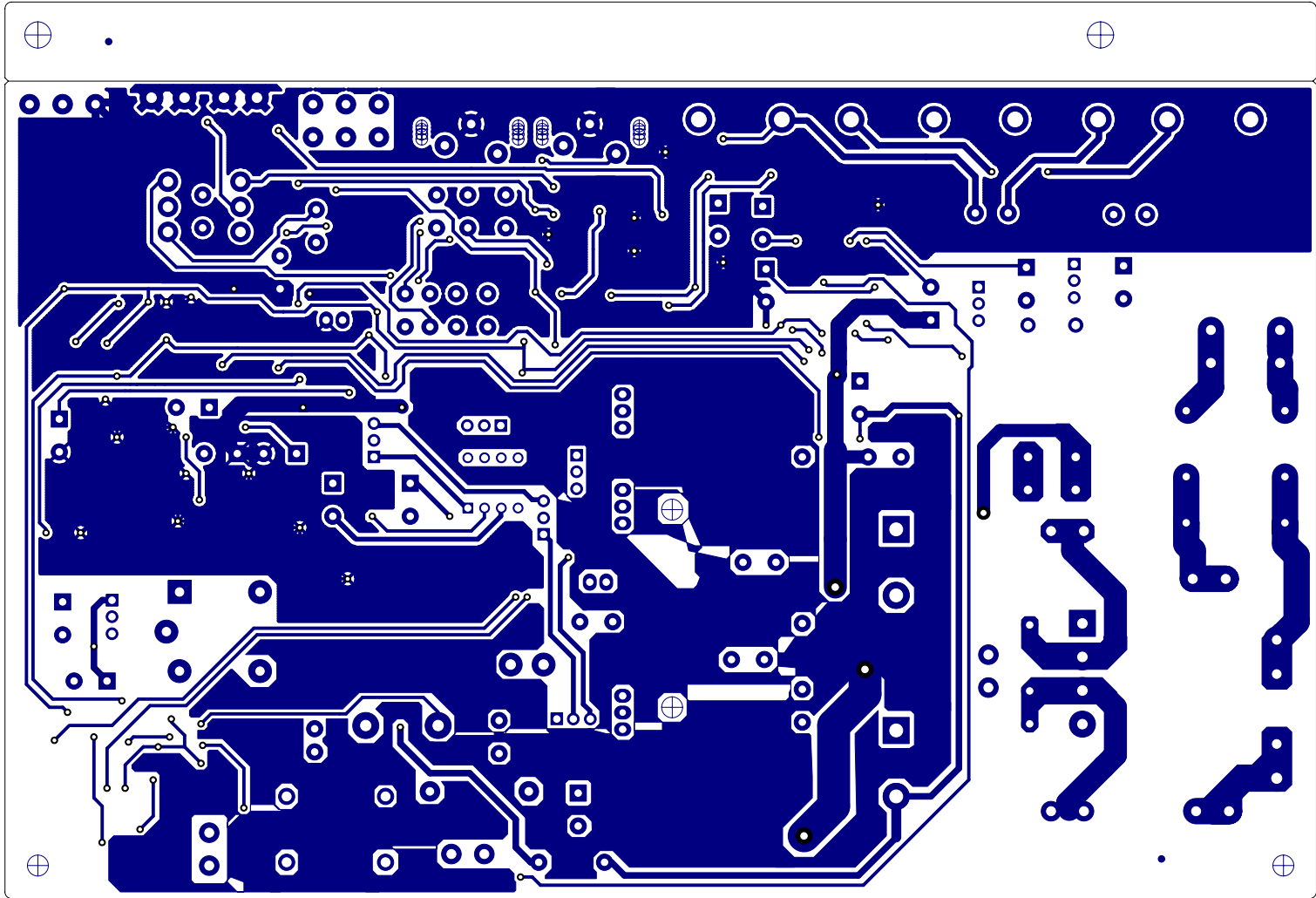
Part Number	Description		Qty	Reference designators
<i>Miscellaneous</i>				
041-115001-000	Bead Coil	YT-10911	1	L5
043-300101-000	Inductor	30uH YT-10033	1	L2
043-324300-000	Inductor	324uH YT-10778	1	
043-560200-000	Inductor	56uH YT-10779	1	
043-700101-000	Toroidal Inductor	70uH YT-10682	1	L3
044-100100-000	SMD Ferrite Bead	600R/100MHz 1206	2	FB1, FB2
072-010007-000	RCA Housing	SCJ-1020 2P(G) WHT, RED	1	CONN1
072-040039-000	Terminal	PC205 (t=0.8m/m) T205MA	1	S-
072-040064-000	Terminal	PC250(t=0.8), T250MA	1	S+
072-040096-000	Terminal	(t=0.8mm) PC187(0.8)	7	AC1, AC3, T1, T2, AC2, SW2, SW4
072-040169-000	Connector	2 PIN JS-1001-2 P:2.5mm	1	CONN3A
072-060170-000	Binding Posts	HI LEVEL Input/Output Jacks	4	BP/IP, BP/OP
XXX-XXXXX-XXX	Fuse	250V, 5*20mm	1	
073-050001-000	FUSE CLIP	P/N:CFFH1206	2	
074-030002-000	Toggle SW	P/N L101	2	SW5, SW6
074-300018-000	Relay	PN:943-1C-48D	1	K1
XXX-XXXXX-XXX	Power Transformer	230V	1	
061-020000-000	Level-Volume Knob	20 x 15 m/m UL 94V-0 Blk	2	
061-314002-000	Strain relief	SB4F-2	2	
063-010012-000	Clamps for output transistors	TRK-1	4	
063-531808-000	Rear plastic cover w/G	ABS	1	
073-032315-601	Heatsink	70 x 58 x 20 mm	1	
074-020018-000	Main Power switch	RF1003-BB4-0	1	
XXX-XXXXX-XXX	Power Cord 230V	SPT-2 BLK	1	
181-911600-161	Output wires	#16 AWG UL1007 Blk	1	
181-911655-135	Output wires	#16 AWG UL1007 Green	1	
181-921600-000	Output wires	#16 AWG UL1015 Blk	1	
181-921699-000	Output wires	#16 AWG UL1015 Wht	1	



CAUTION: FOR CONTINUED PROTECTION  
 AGAINST RISK OF FIRE, REPLACE  
 WITH SAME TYPE OF FUSE.  
 ATTENTION: UTILISER UN  
 FUSIBLE DE RECHANGE  
 DE MEME TYPE.  
 F1 T1.25A/250V

PB10/PB12 COMPONENT SIDE





PB10/PB12 COMPONENT SIDE





# Testing Procedure

## A. Power Amp Section

Resistance Check	Resistance from S+ (SPK O/P) to GND should be $>1M \Omega$ (NO LOAD)
	Resistance from V+ (C6 P+) to V- (C8 P-) gradually Fully CHARGED should read $>10k \Omega$
	Resistance from V+ (C6 P+) to S+ (SPK O/P) should read $>1M\Omega$
	Resistance from V- (C8 P-) to S+ (SPK O/P) should read $>1M \Omega$

## 2. Power Up LED RED

With a 5mV signal to Low level input, LED should change to GREEN

-Voltage measurements (DVM)

LED	OP AMP	
	P-U4(1)	P-U4(7)
RED	0Vrms	11.84VDC
GREEN	7.13Vrms	-12.93VDC

## 3. D.C. Operation

-Voltage measurements (DVM) on CLASS D POWER AMP

Between	V+	Q4(E)	Q1(C)	Q10(C)	U7(1)	U7(2)	U7(4)	U7(6)	U7(7)	U7(8)
And This Point	GND	V-	GND	GND	GND	GND	GND	GND	GND	GND
Get this Reading	71.7V	0V	-71.7V	0V	-71.7V	-71.5V	-71.2V	0V	0V	4.65V

## 4. Check Switching Frequency

- Oscilloscope - **USE THE PROBE TIP TO U6(7) TO GND**
- Reading 100kHz +/-10%,24Vp-p

## B. Pre Amp Section

### Line Level Input Sensitivity

-Set up                      Turn level, X'OVER FREQ POT Fully CW and LFE switch off  
 Generator Set at 200mV@50Hz  
 Signal to Line level input

## Testing Procedure

- Voltage measurements

OP AMP									SPEAKER
U2(1)	U2(14)	U2(8)	U3(7)	U3(1)	U3(14)	U3(8)	U5(7)	U5(1)	O/P
306.9mV	461mV	460mV	658mV	628mV	598mV	2.326V	2.02V	3.57V	23.33V

### 2. High Level Input Sensitivity

-Set up Turn level, X'OVER FREQ POT Fully CW and LFE switch off  
Set Generator at 1.3V@50Hz  
Signal to High level input

-Voltage measurements 15.3V at speaker output

### 3. Low-Pass

-Set up Set Generator at 200 mV@100Hz  
Signal to Line level input  
Measure voltage at S+ speaker output

-Voltage measurement

X'OVER FREQ. Setting	Output
CW	14.03V
CCW	4.8V

### 4. LFE

-Set up Set Generator at 200mV@200Hz  
Signal to Line level input  
Measure voltage at S+ speaker output

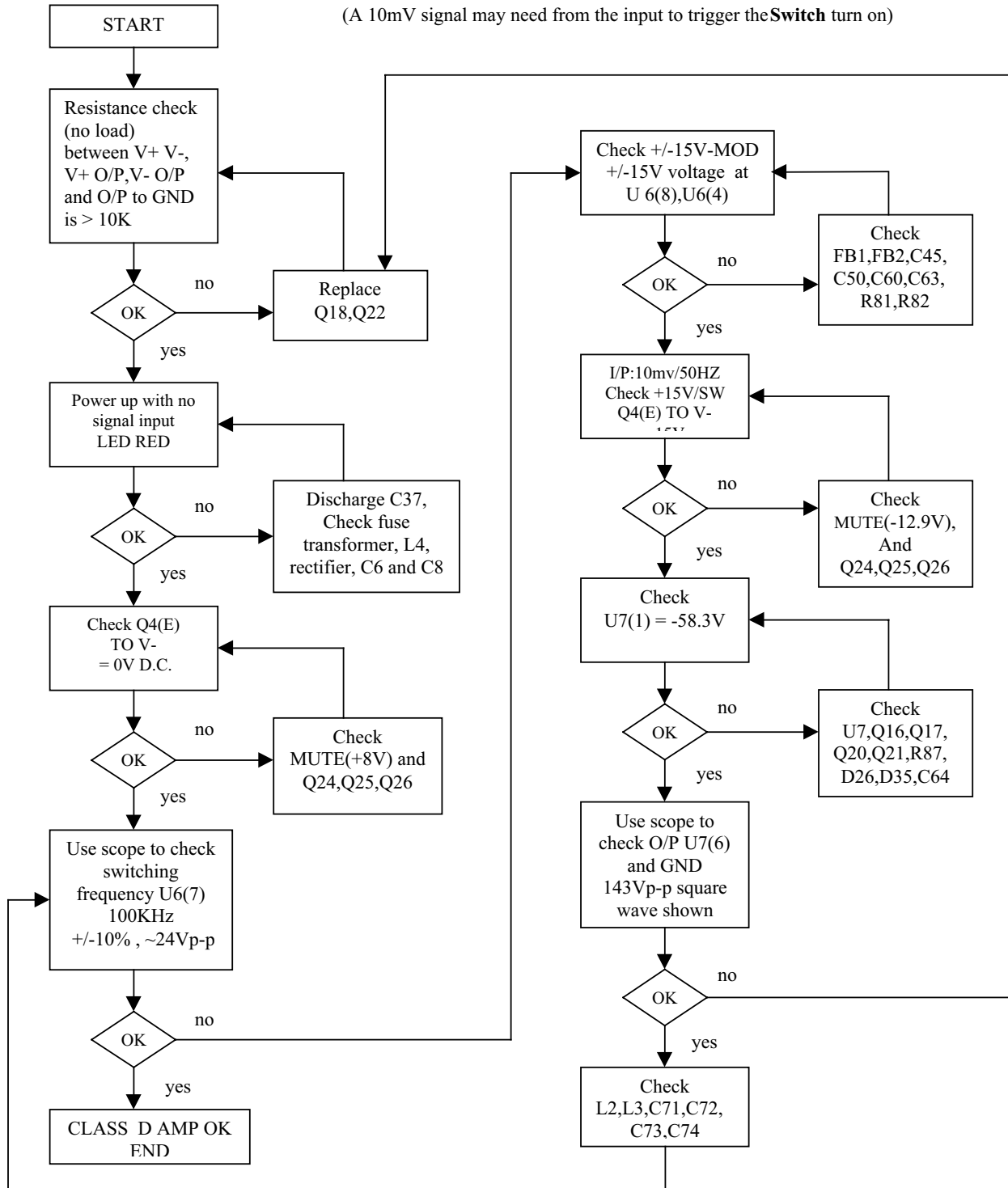
LFE switch Setting	Output
Normal	6V
LFE	18.32V

See flow chart next page for diagnostics.

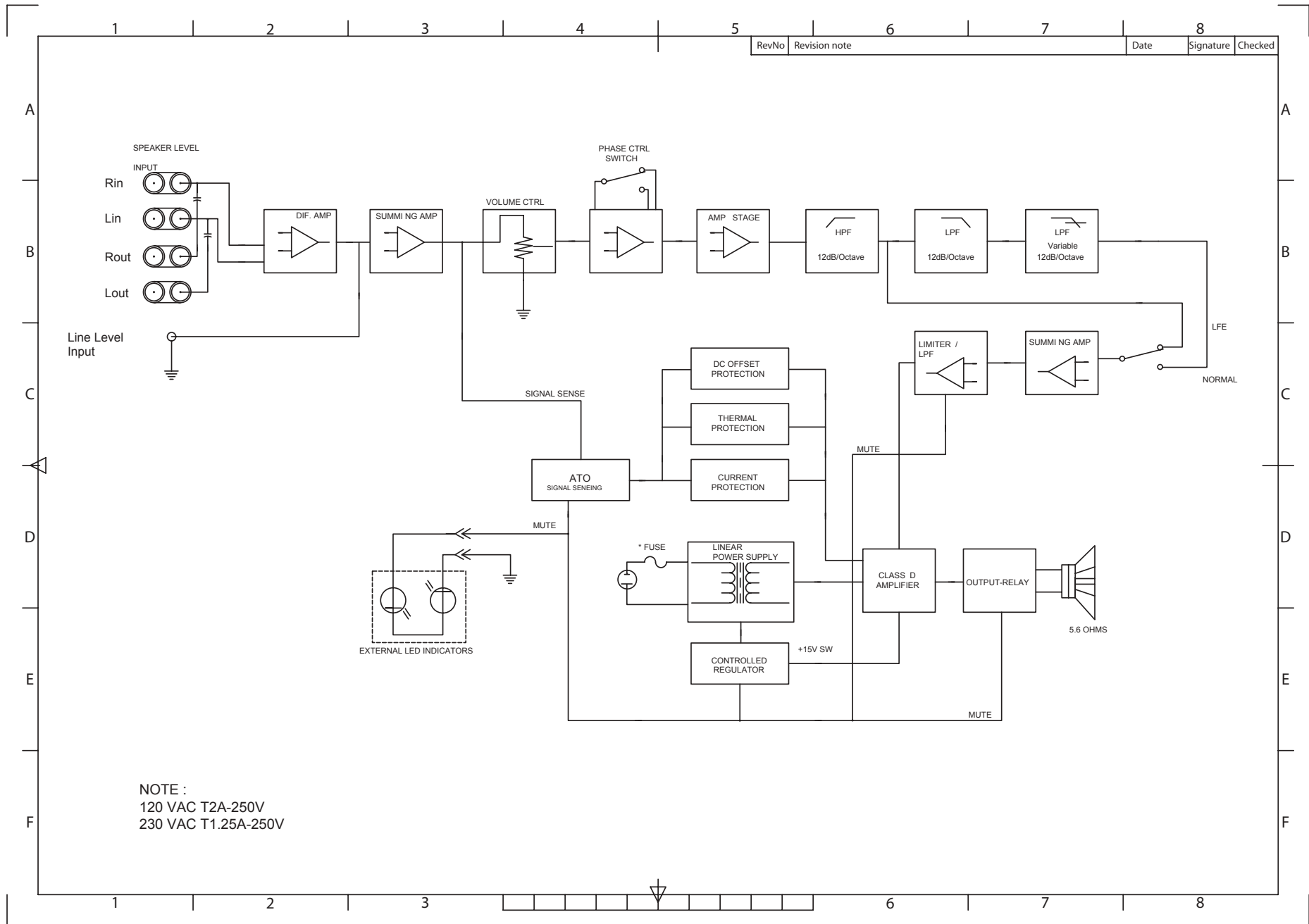
# Testing Procedure

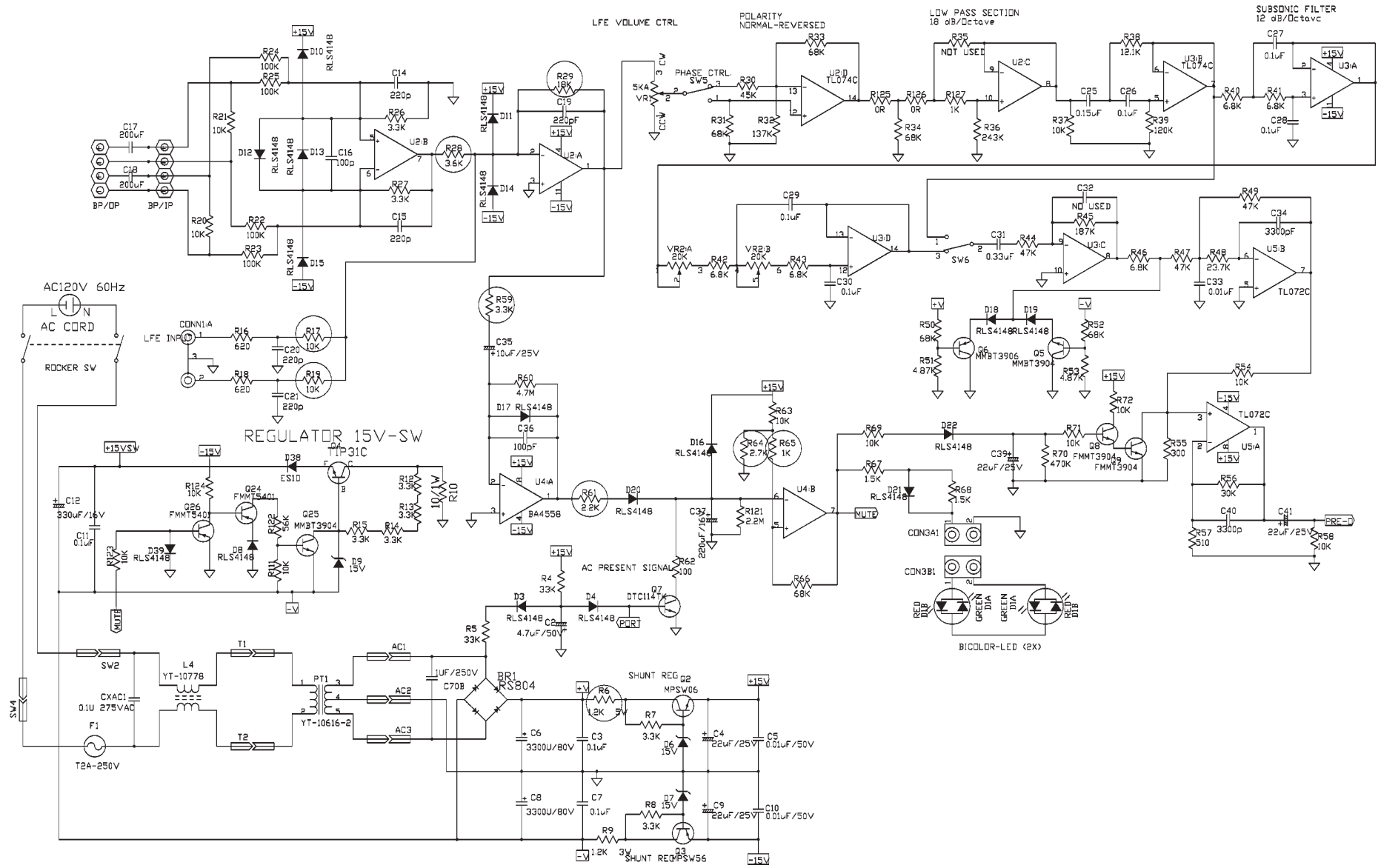
## POWER MODULE TESTING FLOW CHART

CAUTION : SPEAKER OUTPUT IS FLOATING AND IS **NOT** PROTECTED AGAINST A SHORT TO GROUND. ALL TEST INSTRUMENTS CONNECTED TO THE OUTPUT **MUST** BE FLOATING. ATTACH THE SCOPE PROBE TIP TO S - and REFERENCE LEAD TO S+.

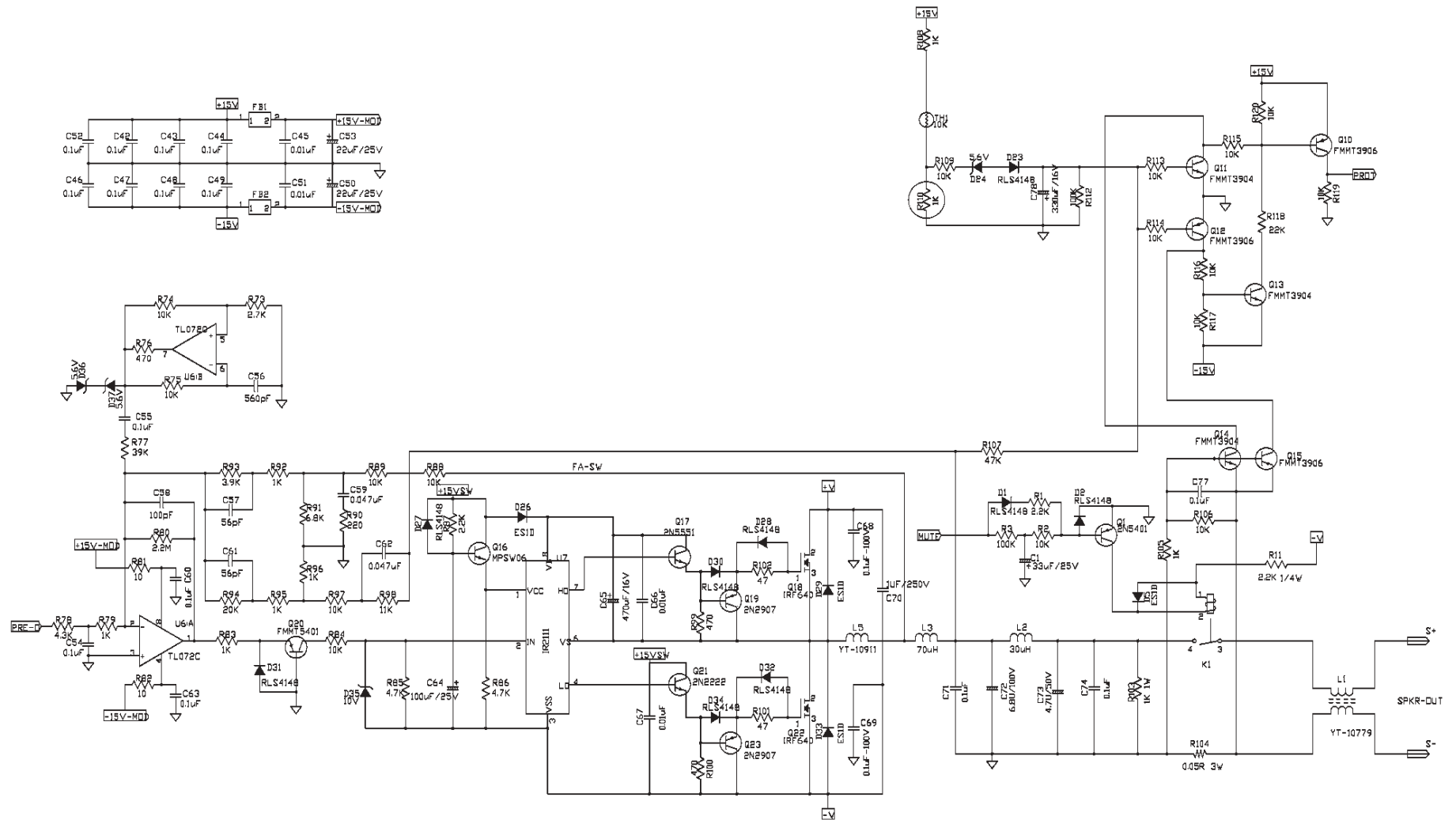


# Block Diagram





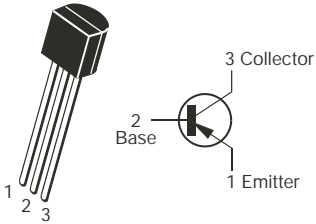
PRE-AMP



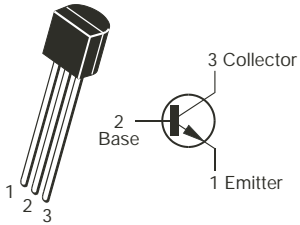
POWER-AMP

# Integrated Circuit Diagrams

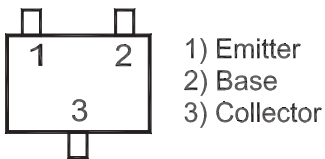
2N5401  
Q1



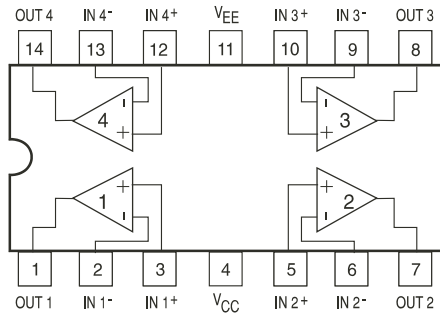
MPSW06RLRA,  
MPSW56RLRAMPQ,  
MPS2222ARLRA,  
2N2907A, 2N5551,  
Q2, 16, 3, 21, 19, 23, 17



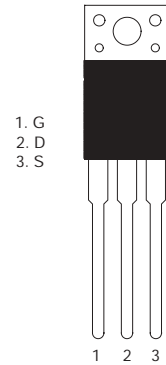
MMBT3904LTI SOT23,  
MMBT3906LTI SOT23,  
DTC114EK SMT3,  
MMBT5401 LTI,  
MMBT5551 LTI  
Q11, 14, 13, 5, 8, 9, 6, 10,  
12, 15, 7, 20, 24, 26, 25



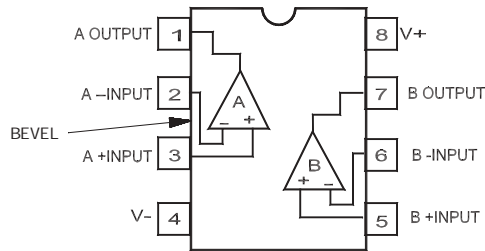
OPAMP, QUAD  
TL074CDR  
U2, 3



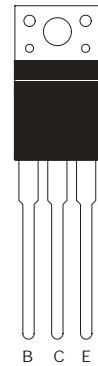
MOSFET IRF640  
Q18, 22



OPAMP, DUAL  
TL072CDR SO-8,  
NJM4558M-TE3  
U5, 6, 4



TIP31C  
Q4



IR2111 HALF-BRIDGE  
DRIVER  
U7

