

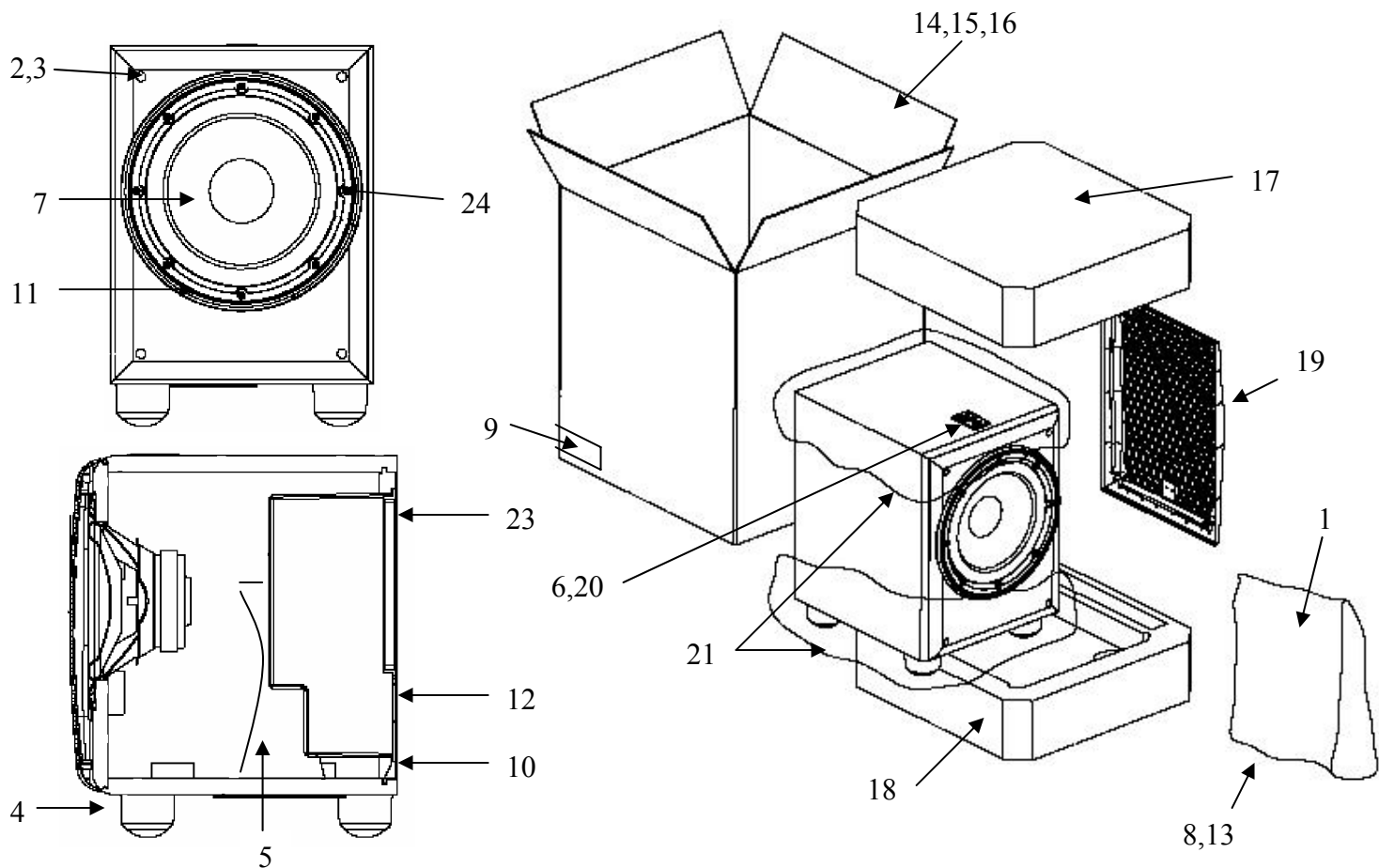


# Northridge E250P/230

## 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

<u>Destination</u>	<u>Description</u>	<u>Part No.</u>	
	Fuse Label	21x5mm	008-000200-160
	Label	97x74.8 t=0.254mm	008-001008-162
	Label	200.3x71.1 t=0.254mm	008-002071-000
	Gasket	12x15 t=5mm CR	008-061215-000
	Gasket	PN:L-32 200x20mm t=5mm PORON	008-062002-002
	Gasket	200x20mm t=2mm CR4305	008-062002-012
	Gasket	321x8 t=1mm CR	008-063208-000
	Gasket	93x4 t=1mm CR	008-069304-000
	Double-sided PCB;FR-4	199x124x1.6mm (PB-10/12) REV:E	015-201200-003
R11	Carbon film	2K2 1/4W J TAPING	020-220497-120
R103	MOF Resistor	1K 1W J	021-100401-120
R9	MOF Resistor	1K2 3WS J 8x20	021-120403-020
R6	MOF Resistor	1K2 5WS J 8x25	021-120405-020
R10	MOF Resistor	22R 2W(S) J MB TYPE 15x8	021-220202-120
R104	Resistor KNP	0R05 3WS J FK TYPE	022-500003-020
R125,126	SMD Resistor	0R 1/8W J 0805 TAPING	024-000098-120
R81,82	SMD Resistor	10R 1/8W J 0805 TAPING	024-100298-120
R62	SMD Resistor	100R 1/8W J 0805 TAPING	024-100398-120
R79,83,92,95,96, 105,108,127,65	SMD Resistor	1K 1/8W J 0805 TAPING	024-100498-120
R20,21	SMD Resistor	10K 1/8W F 0805 TAPING	024-100598-100
R2,17,19,37,54, 58,63,71,	SMD Resistor	10K 1/8W J 0805 TAPING	024-100598-120
R22-25	SMD Resistor	100K 1/8W F 0805 TAPING	024-100698-100
R3,112	SMD Resistor	100K 1/8W J 0805 TAPING	024-100698-120
R98	SMD Resistor	11K 1/8W F 0805 TAPING	024-110598-100
R39	SMD Resistor	120K 1/8W J 0805 TAPING	024-120698-120

<u>Destination</u>		<u>Description</u>	<u>Part No.</u>
R38	SMD Resistor	12K1 1/8W F 0805 TAPING	024-121598-100
R32	SMD Resistor	137K 1/8W F 0805 TAPING	024-137698-100
R67,68	SMD Resistor	1K5 1/8W J 0805 TAPING	024-150498-120
R29	SMD Resistor	18K 1/8W J 0805 TAPING	024-180598-120
R45	SMD Resistor	187K 1/8W F 0805 TAPING	024-187698-100
R94	SMD Resistor	20K 1/8W J 0805 TAPING	024-200598-120
R90	SMD Resistor	220R 1/8W J 0805 TAPING	024-220398-120
R1,87,61	SMD Resistor	2K2 1/8W J 0805 TAPING	024-220498-121
R118	SMD Resistor	22K 1/8W J 0805 TAPING	024-220598-120
R80,121	SMD Resistor	2M2 1/8W J 0805 TAPING	024-220798-120
R48	SMD Resistor	23K7 1/8W F 0805 TAPING	024-237598-120
R36	SMD Resistor	243K 1/8W F 0805 TAPING	024-243698-100
R73,64	SMD Resistor	2K7 1/8W J 0805 TAPING	024-270498-120
R55	SMD Resistor	300R 1/8W J 0805 TAPING	024-300398-120
R56	SMD Resistor	30K 1/8W J 0805 TAPING	024-300598-120
R7,8,12-15,59	SMD Resistor	3K3 1/8W J 0805 TAPING	024-330498-120
R4,5	SMD Resistor	33K 1/8W J 0805 TAPING	024-330598-120
R26,27	SMD Resistor	3K32 1/8W F 0805 TAPING	024-332498-100
R28	SMD Resistor	3K6 1/8W J 0805 TAPING	024-360498-120
R93	SMD Resistor	3K9 1/8W J 0805 TAPING	024-390498-120
R77	SMD Resistor	39K 1/8W J 0805 TAPING	024-390598-120
R78	SMD Resistor	4K3 1/8W F 0805 TAPING	024-430498-100
R30	SMD Resistor	45K3 1/8W F 0805 TAPING	024-453598-100
R101,102	SMD Resistor	47R 1/8W J 0805 TAPING	024-470298-120
R76,99,100	SMD Resistor	470R 1/8W J 0805 TAPING	024-470398-120
R85,86	SMD Resistor	4K7 1/8W J 0805 TAPING	024-470498-120
R44,47,49,107	SMD Resistor	47K 1/8W J 0805 TAPING	024-470598-120

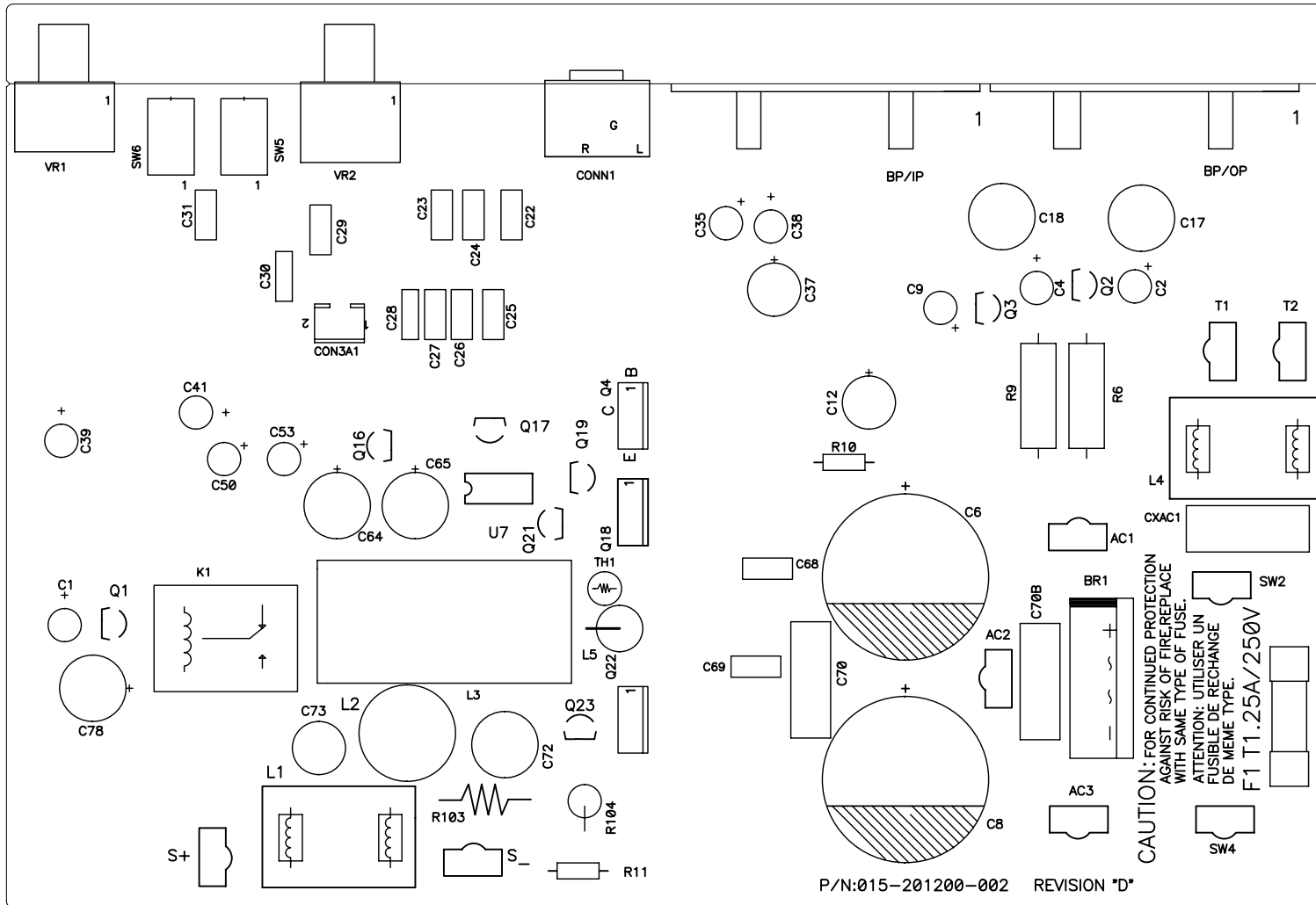
<u>Destination</u>		<u>Description</u>	<u>Part No.</u>
R70	SMD Resistor	470K 1/8W J 0805 TAPING	024-470698-120
R60	SMD Resistor	4M7 1/8W J 0805 TAPING	024-470798-120
R51,53	SMD Resistor	4K87 1/8W F 0805 TAPING	024-487498-100
R57	SMD Resistor	510R 1/8W J 0805 TAPING	024-510398-120
R122	SMD Resistor	56K 1/8W J 0805 TAPING	024-560598-120
R16,18	SMD Resistor	620R 1/8W F 0805 TAPING	024-620398-100
R46,91,40,41,43,42	SMD Resistor	6K8 1/8W J 0805 TAPING	024-680498-120
R33,34,31,50,52,66	SMD Resistor	68K 1/8W J 0805 TAPING	024-680598-120
R69	SMD Resistor	82K 1/8W J 0805 TAPING	024-820598-120
TH1	Thermister	TSE-103 K L:50mm	025-010300-000
VR2	VR	PN:RD163121R03D-20KBx2(EJ)	026-200595-269
VR1	VR 5KA	PN:RK163111R52B-5KA (EJ)	026-500495-252
C33,45,51,66,67,5,10	SMD Ceramic Capacitor	0u01/50V K 0805 X7R TAPING	031-100244-100
C16,36,58	SMD Capacitor	100pF/50V J 0805 NPO TAPING	031-100343-100
C11,42-44,46-49,52			
54,55,60,63,71,74,77	SMD Capacitor	0u1/50V K 0805 X7R TAPING	031-100344-100
C3,7	SMD Capacitor	0u1/250V K 1206 X7R TAPING	031-100384-100R
C14,15,20,21,19	SMD Capacitor	220pF/50V J 0805 NPO TAPING	031-220344-100
C40,34	SMD Capacitor	3300pF/50V K 0805 X7R TAPING	031-330444-300
C62,59	SMD Capacitor	0u047/50V K 0805 X7R TAPING	031-470244-102
C57,61	SMD Capacitor	56pF/50V J 0805 NPO TAPING	031-560243-100
C56	SMD Capacitor	560pF/50V J 0805 NPO TAPING	031-560343-102
C70,C70B	END Mylar Capacitor	1uF/250V K P:15	032-100484-200
C17,18	NP Capacitor	200u/50V M (R)1321 P:5	033-200645-300
C73	NPE Capacitor	4u7/50V K10 (R)8x13 SBE	033-470444-270
C72	NPE Capacitor	6u8/100V K10 (R)1020 GNE	033-680464-270
C35	Electrolytic Capacitor	10uF/25V M (R)0511 P:5 TAPING	034-100525-300

<u>Destination</u>		<u>Description</u>	<u>Part No.</u>
C64	Electrolytic Capacitor	100uF/25V M (R)6.3x11 P:5	034-100625-300
C4,9,41,39,50,53	Electrolytic Capacitor	22uF/25V M (R)5x11 P:5 TAPING	034-220525-301
C37	Electrolytic Capacitor	220uF/16V M (R)0611 P:5	034-220615-301
C1	Electrolytic Capacitor	33uF/25V M (R)0511 P:5	034-330525-300
C12,78	Electrolytic Capacitor	330uF/16V M (R)0812 P:5 TAPING	034-330615-300
C6,8	Electrolytic Capacitor	3300uF/80V M (R)22x48	034-330780-300
C2	Electrolytic Capacitor	4u7/50V M (R)0511 P:5 TAPING	034-470415-301
C65	Electrolytic Capacitor	470uF/16V M (R)0812 P:5 TAPING	034-470615-301
C68,69,26,27,28,29,30	MPE Capacitor	0u1/100V J TAPING	038-100363-300
C25	MPE Capacitor	0u15/63V J TAPING	038-150393-300
C31	MPE Capacitor	0u33/63V J TAPING	038-330393-300
CXAC1	Safety Capacitor	PN:HQX0.1K275VACx2 18x6x12mm	039-100384-100
L5	Bead Coil	YT-10911	041-115001-000
	Power X'fmr	YT-10913 150W/5.6Ω(230V/50Hz)	042-018600-000
L2	Inductor	30uH YT-10033	043-300101-000
	Inductor	324uH YT-10778	043-324300-000
	Inductor	56uH YT-10779	043-560200-000
FB1,FB2	SMD FERRITE BEAD	PN:321611 600R/100MHz 1206	044-100100-000
Q2,Q16	Transistor NPN	PN:MPSW06RLRA TO-92 TAPING(ON)	051-000600-100
Q4	Transistor	PN:TIP 31C TO-220 (MOSPEC)	051-003100-000
Q3	Transistor PNP	PN:MPSW56RLRA TO-92 TAPING(ON)	051-005600-100
Q21	Transistor NPN	PN:MPS2222ARLRA TO-92 TAPING	051-222200-100
Q19,23	Transistor PNP	PN:MPS2907A RLRA TO-92 TAPING	051-290700-100
Q1	Transistor PNP	PN:2N5401 TO-92 TAPING	051-540101-000
Q17	Transistor NPN	PN:2N5551 TO-92 TAPING	051-555100-000
Q18,22	MOSFET N-Channel	PN:IRF640N TO-220 (IR)	051-640001-000
BR1	Bridge Regulator	PN:RS804 400V,8A	052-400080-000

<u>Destination</u>		<u>Description</u>	<u>Part No.</u>
U7	IC;DIP,DRIVER	PN:IR2111 8PIN (IR)	053-211100-000
D5,26,29,33,38	SMD DIODE	PN:ES1D 200V 1A TAPING	054-000100-100
D35	SMD ZENER DIODE	PN:BZX84C10 10V SOT-23 TAPING	054-001002-100
D6,7,9	SMD ZENER DIODE	PN:BZX84C15 15V SOT-23 TAPING	054-001501-100
U5,6	SMD IC	PN:TL072CDR SO-8 TAPING (TI)	054-007200-100
U2,3	SMD IC;(OP)	PN:TL074CDR TAPING (TI)	054-007400-100
Q7	SMD Transistor	PN:DTC114TKA SMT3 TAPING (ROHM)	054-011400-100
Q11,14,13,5,8,9	SMD Transistor	PN:MMBT3904LT1 SOT23 TAPING(ON)	054-033904-100
Q6,10,12,15	SMD Transistor	PN:MMBT3906LT1 SOT23 TAPING(ON)	054-033906-100
U4	SMD IC;(OP)	PN:NJM4558M-TE3 DMP-8 TAPING	054-045580-100
D24,36,37	SMD ZENER DIODE	PN:BZX84C5V6 5.6V SOT-23 TAPIN	054-050601-100
D1-4,8,10-23,27, 28,30-32,34,39	SMD DIODE	PN:LL4148 TAPING (Wishay)	054-414803-100
Q20,24,26	SMD Transistor (PNP)	PN:MMBT5401 LT1 SOT-23 TAPING	054-540100-100
Q25	SMD Transistor (NPN)	PN:MMBT5551 LT1 TAPING (ON)	054-555100-100
	Knob ABS	φ20x15m/m UL94V-0 BLK	061-020000-000
	Strain Relief	P/N SB4F-2	061-314002-000
	Rubber Foot	ID:6.2 OD:11.5 t=2mm	061-400014-000
	Myca	13x18mm TO-220	061-700044-000
	Bracket for Power Transistor	P/N:TRK-1	063-010012-000
	Plate	322x105.7x15mm BLK (94V0)ABS	063-321100-001
	Bucket	322x105.7x146.5mm BLK (94VO)	063-531808-000
	CABLE TIE	CV-120S	066-120300-900
	Fiber Washer	OD=8mm ID=3.2 t=1	071-100608-100
	Washer	ID=5.1 OD=12 t=1m/m	071-100851-000
	RCA Jack	SCJ-1020 2P(G) WHT,RED	072-010007-000
S-	Terminal	PC205 (t=0.8m/m) T205MA	072-040039-000

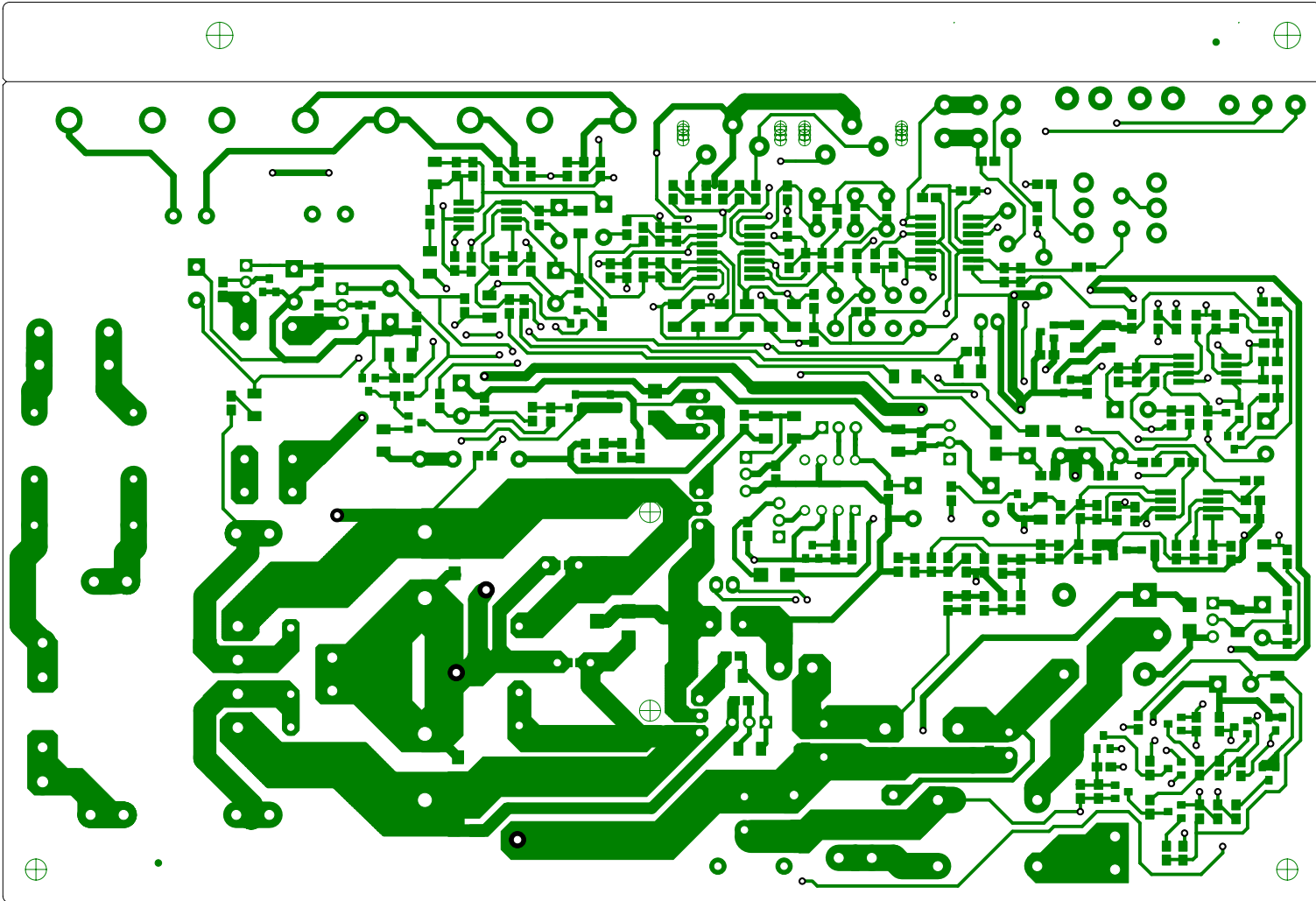
<u>Destination</u>		<u>Description</u>	<u>Part No.</u>
S+	Terminal	PC250(t=0.8),T250MA	072-040064-000
AC1,AC3,T1,T2, SW2,SW4,AC2	Terminal	(t=0.8mm) PC187(0.8)	072-040096-000
	Connector	2 PIN JS-1001-2 P:2.5mm	072-040169-000
	B.P.	W / Accessory Parts	072-060170-000
	BP Plug	PN:A414B-3A RCA JAM BLK	072-060213-000
	BP Plug	PN:A414R-3A RCA JAM RED	072-060214-000
	Black Anodized	70x58x20mm	073-032315-601
	Fuse Clip	P/N:CFFH1206	073-050001-000
	ROCKER SW (POWER)	PN:RF1003-BB4-0	074-020018-000
SW5,SW6	Toggle Switch	PN:L101-T2B4QE	074-030002-000
K1	Relay	PN:943-1C-48D	074-300018-000
	Tinned Plated Copper Wire	φ0.6x63m/m TAPING	080-060351-009
	Wire Set #22 UL1007	L=410mm	082-022241-001
	VDE Power Cable LF2-75	6 Feet 2PIN Black T187F	086-021818-030
	FUSE:VBS UTE	FUSE:1.25A,250V,5*20mm	093-205201-320
	Wire #16AWG UL1007	Black, L=610mm Transparent Sleeve both ends	181-911600-161
	Wire #16AWG UL1007	Green L=610mm Transparent Sleeve both ends	181-911655-135
	Wire BLK #18 UL1617	T187 L:140mm Transparent Sleeve both ends	181-981800-104
	Wire Wht #18 UL1617	T187 L:160mm Transparent Sleeve both ends	181-981899-101

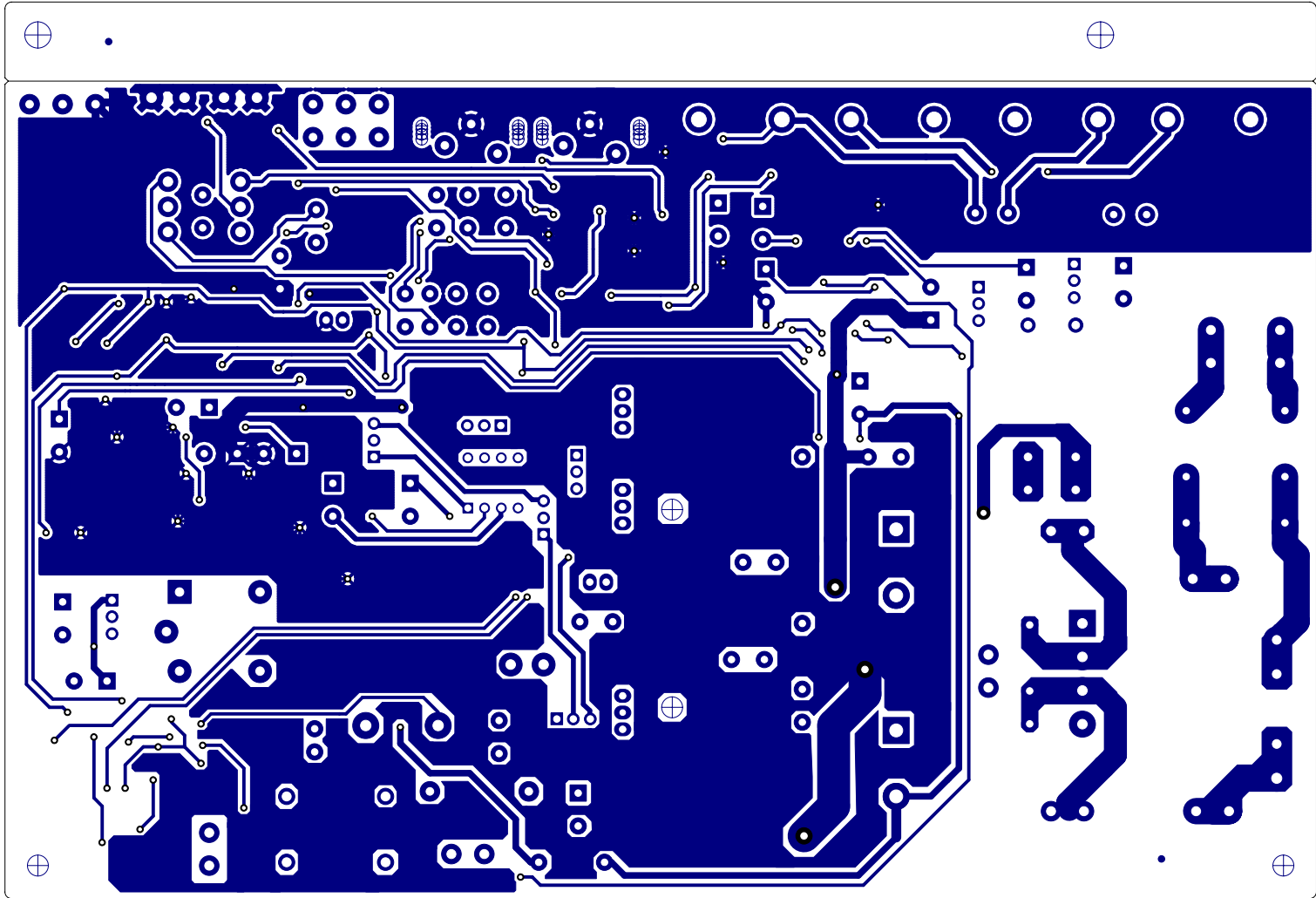




PB10/PB12 COMPONENT SIDE

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

# 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

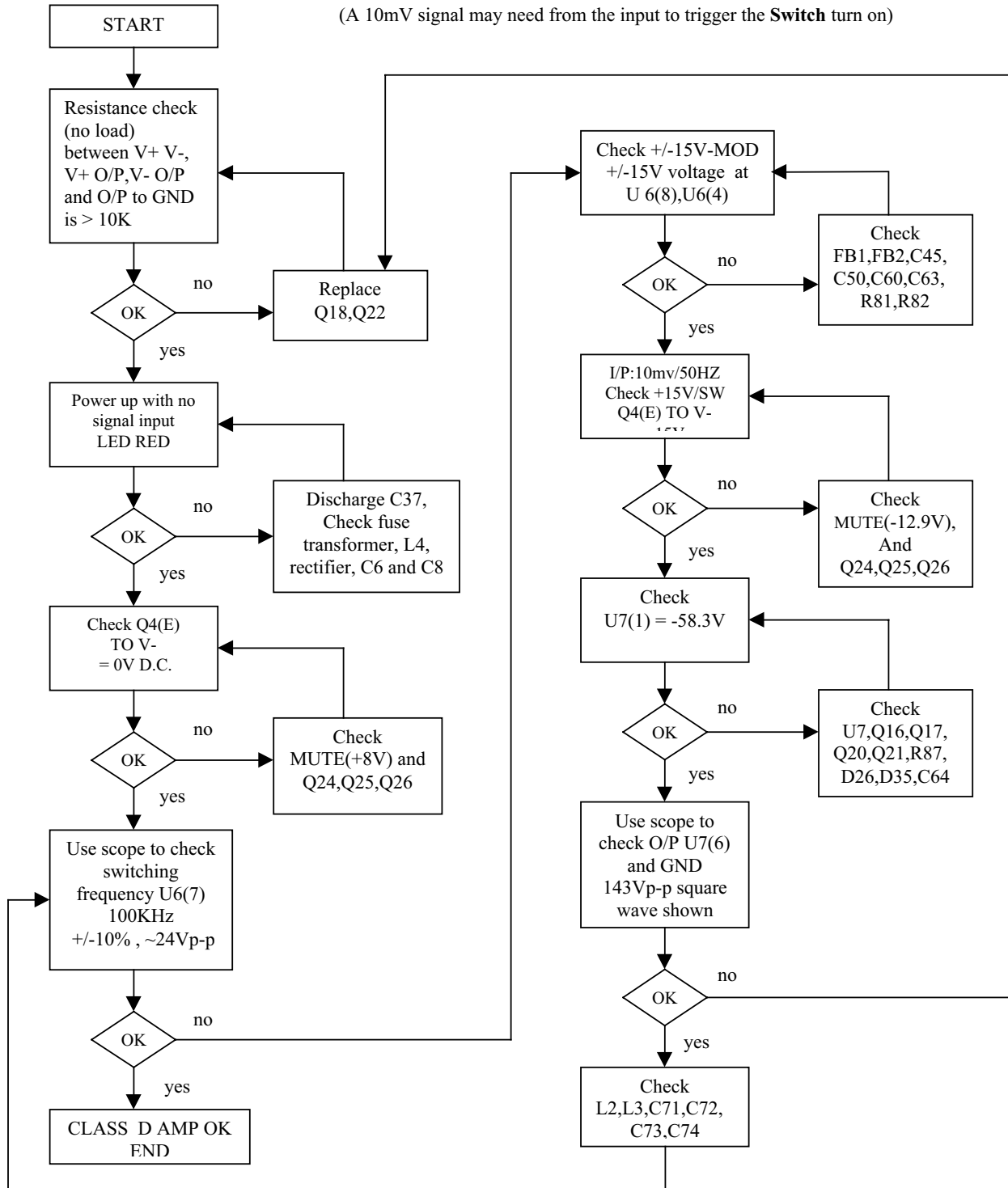
LFE switch Setting	Output
Normal	6V
LFE	18.32V

See flow chart next page for diagnostics.

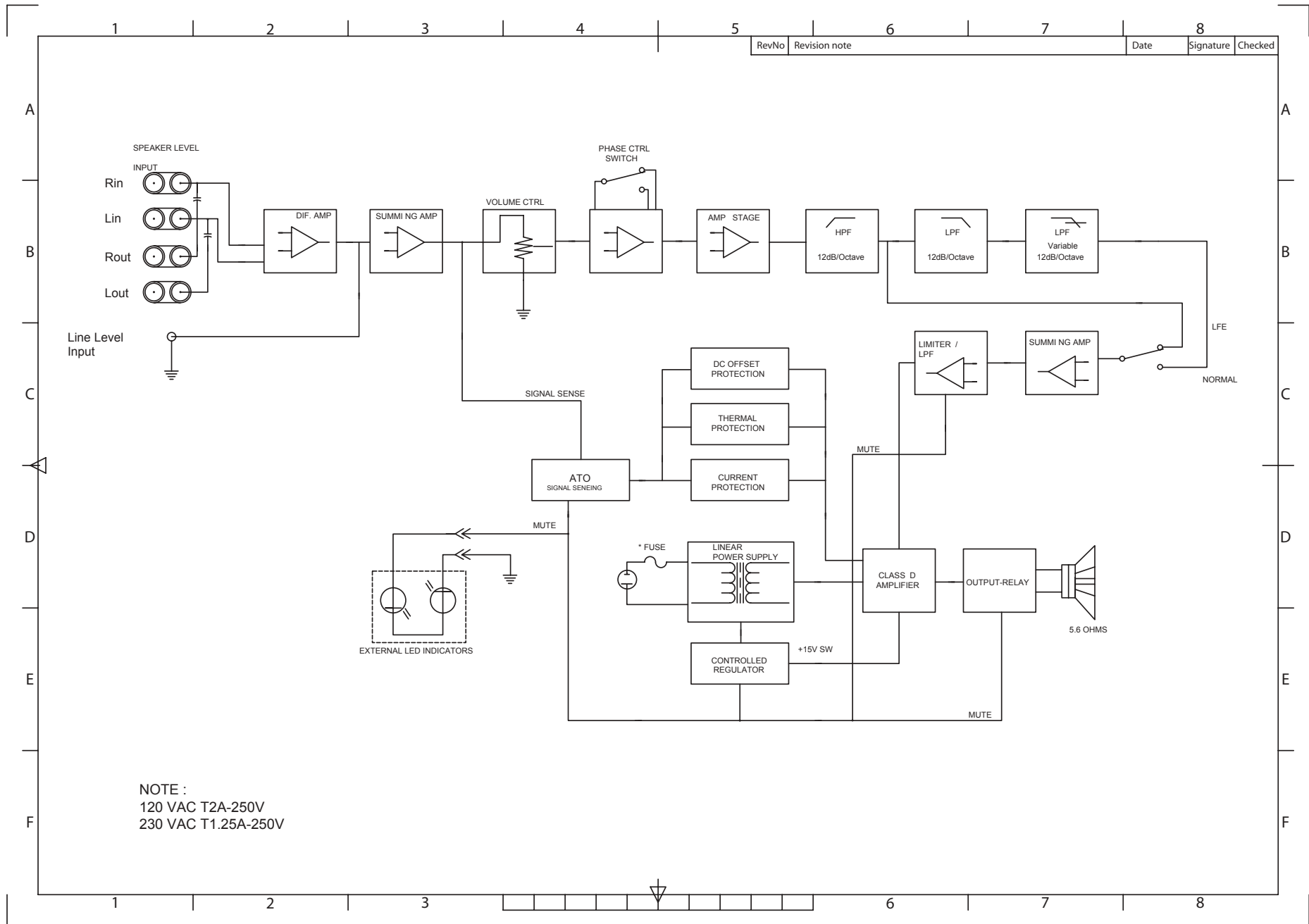
# Testing Procedure

## 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+.

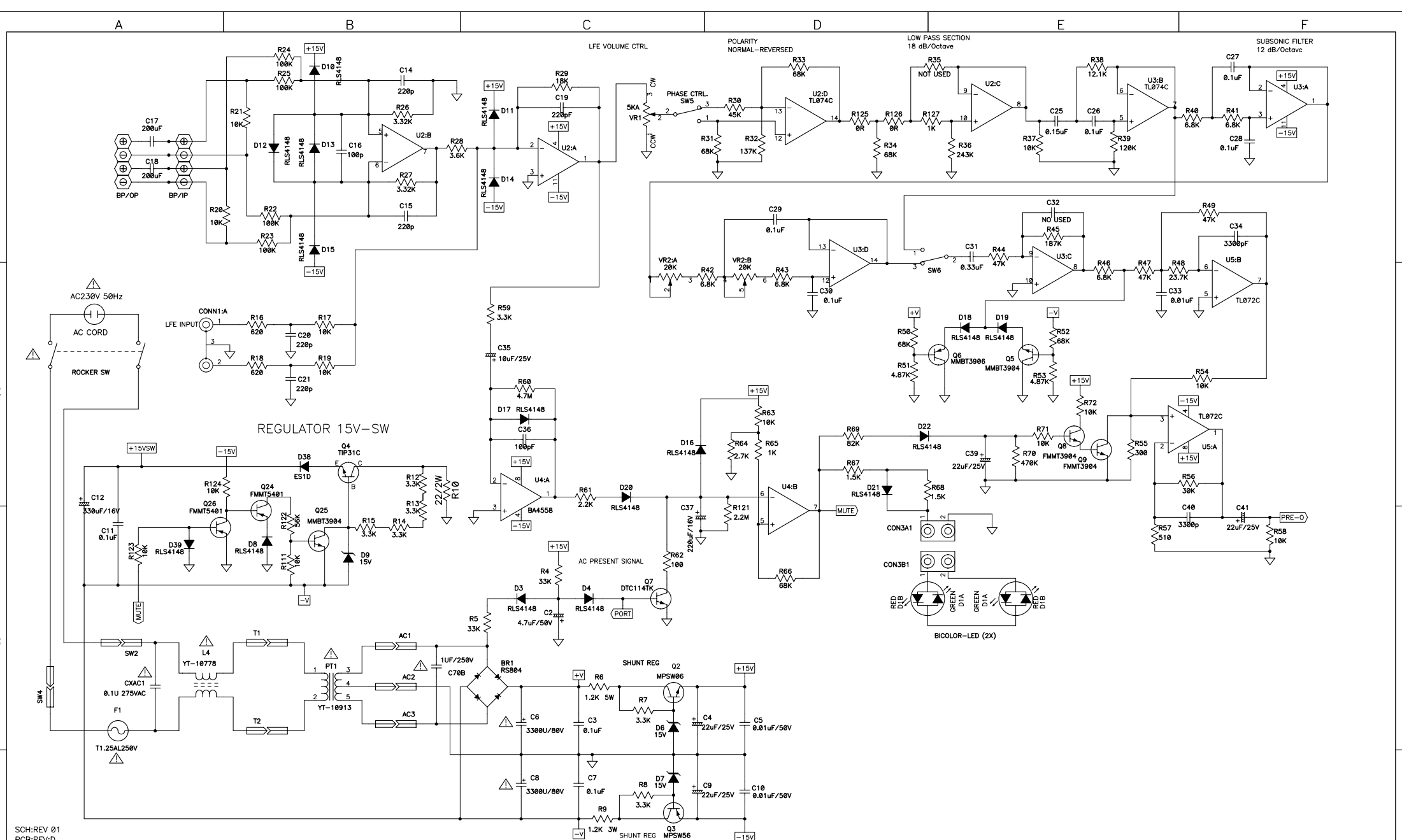


# Block Diagram







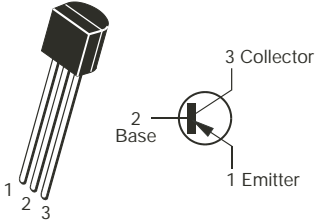


SCH:REV 01  
PCB:REV: D

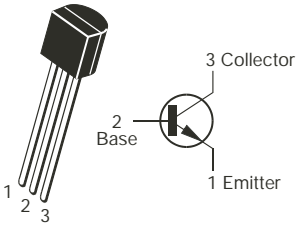
Rev:	Notes:	Date:	Rev:	Notes:	Draw by	Designed by	Checked by	Approved By	JBL
01	E250P(230V) Design	2003/01/21							: 422-0311002
									Model no: E250P (230V)
									Sch name: PRE AMP CKT
									Issue no: ET-01-21-4247
									Date: 2003/01/22
									Sheet: 14 Rev: 01
									Size: A2 Author: VITA

# Integrated Circuit Diagrams

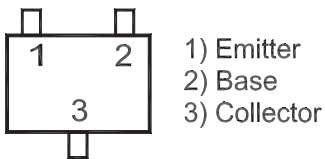
2N5401  
Q1



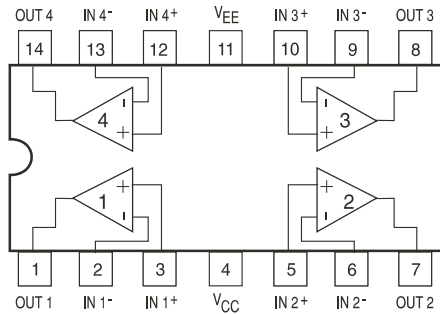
MPSW06RLRA,  
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MPS2222ARLRA,  
2N2907A, 2N5551,  
Q2, 16, 3, 21, 19, 23, 17



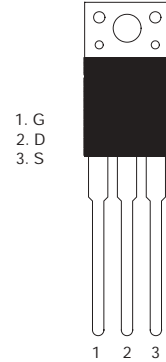
MMBT3904LTI SOT23,  
MMBT3906LTI SOT23,  
DTC114EK SMT3,  
MMBT5401 LTI,  
MMBT5551 LTI  
Q11, 14, 13, 5, 8, 9, 6, 10,  
12, 15, 7, 20, 24, 26, 25



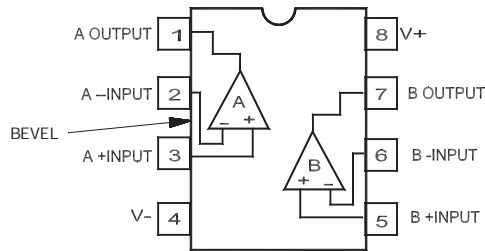
OPAMP, QUAD  
TL074CDR  
U2, 3



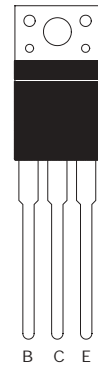
MOSFET IRF640  
Q18, 22



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



TIP31C  
Q4



IR2111 HALF-BRIDGE  
DRIVER  
U7

