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L1® Model I System

L1 Model I Power Stand, L1 Model I Cylindrical Radiator®,

R1 Remote Control and B1 Bass Module

US/Canada, Japan, European, UK and Australian Versions

Service Manual

Reference Number 302233-SM Rev. 04
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Safety Information

1. Parts that have special safety characteristics are identified by the ⚠ symbol on schematics or by special notes on the parts list. Use only replacement parts that have critical characteristics recommended by the manufacturer.

2. Make leakage current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the unit to the customer.
Use the following checks to perform these measurements:

A. Leakage Current Hot Check-With the unit completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 "Leakage Current for Appliances" and Underwriters Laboratories (UL) 6500 / IEC 60056 paragraph 9.1.1. With the unit AC switch first in the ON position and then in OFF position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the unit (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the unit power cord plug in the outlet and repeat test. ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE UNIT TO THE CUSTOMER.

B. Insulation Resistance Test Cold Check-(1) Unplug the power supply and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the unit. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and each exposed metallic cabinet part on the unit. When testing 3 wire products, the resistance measured to the product enclosure should be between 2 and infinite MOhms. Also, the resistance measured to exposed input/output connectors should be between 4 and infinite MOhms. When testing 2 wire products, the resistance measured to exposed input/output connectors should be between 4 and infinite MOhms. If it is not within the limits specified, there is the possibility of a shock hazard, and the unit must be repaired and rechecked before it is returned to the customer.

CAUTION: The Bose® L1® Model I System contains no user-serviceable parts. To prevent warranty infractions, refer servicing to warranty service stations or factory service.

Specifications

MECHANICAL

External Dimensions

L1® Model I Cylindrical Radiator®:	Height: 86.0 in (2184 mm) Width: 3.5 in (89 mm) Depth: 4.0 in (105 mm)
L1 Model I Power Stand:	Height: 5.0 in (127 mm) Width: 26.0 in (660 mm) Depth: 26.0 in (660 mm)
B1 Bass Module:	Height: 15.3 in (380 mm) Width: 10.3 in (257 mm) Depth: 18.0 in (457 mm)
R1 Remote:	Height: 1.6 in (40 mm) Width: 2.8 in (71 mm) Depth: 5.6 in (141 mm)

Weight

L1 Model I Cylindrical Radiator:	14.5 lbs (6 kg) Upper 16.0 lbs (7 kg) Lower
L1 Model I Power Stand:	35 lbs (16 kg)
B1 Bass Module:	25 lbs (12 kg)
R1 Remote:	0.6 lbs (0.27 kg)

Transducer Complement

L1 Model I Cylindrical Radiator:	24 x 2.25 in (57 mm) Drivers - 4 ohms
B1 Bass Module:	2 x 5.25 in (133 mm) Drivers - 8 ohms

ACOUSTICAL

Frequency Response

L1 Model I Cylindrical Radiator:	120 Hz to 15 kHz
B1 Bass Module:	40 Hz to 250 Hz
L1 Model I System (with system EQ):	40 Hz to 15 kHz

Port Tuning

L1 Model I Cylindrical Radiator:	114 Hz
B1 Bass Module:	44 Hz

Specifications

ELECTRICAL

Impedance

L1® Model I Cylindrical Radiator®:	4 ohms nominal, both sections in parallel
Lower Model I line array section:	8 ohms nominal
Upper Model I line array section:	8 ohms nominal
B1 Bass module (optional):	8 ohms nominal

System Power Handling
(Continuous full power per IEC-268-5 for duration of 100 hours)

L1 Model I Cylindrical Radiator:	250 W
B1 Bass module:	125 W

L1 Model I Power Stand

Rated Power:		2 x 250 W/Ch/4 ohm. (all channels operating)
Output Level:	Line Out:	Bal XLR, +4dBu
	Bass-Line Out:	Bal TRS, -4dBu (nom) +9dBu max Unbal TS, -10dBu (nom) +3dBu max
Efficiency:		80% minimum
THD at Rated Power:		1.0% Max @ 30 Hz - 15 KHz @ 4 ohms/Ch.
THD at -3dB (~125W):		0.25% Max @ 30 Hz - 15 KHz @ 4 ohms/Ch.
S/N ratio:		-80dB minimum, referenced to full power
Frequency Response:		40 Hz-15 KHz +/-3 dB @ R load = 4-16 ohms
Thermal:		Operate 2Ch. x 83 W Continuous @ 4 ohms, 50°C ambient with No Shut-Down
AC Power Rating:		US/Canada: 100-127V, 50/60Hz 1000W International: 220-240V, 50/60Hz 1000W
Max Power Draw:		1400 watts 50/60 Hz
Peak In Rush Current:		US/Canada: 32 A @ 120V, 60 Hz International: 16A @ 230V, 60Hz
Power Supply Voltages:		Channels 1 and 2 SMPS 27.5 VDC +/-2% Auxiliary supply #1 +5 VDC/1 A +/- 3% Auxiliary supply #2 +3.3 VDC/1.5 A +/- 3%
Fan 1.2.3.4 Voltage:		+24 VDC +/-1V

Differences between the PS1 Power Stand and the L1® Model I Power Stand

The L1 Model I Power Stand is very similar to the Personalized Amplification System PS1 Power Stand. There are some significant differences, however:

1. The line array is now powered by one 250W amplifier instead of two. The two line array sections (upper and lower) are now wired in parallel and powered by a single amplifier. Each line array section impedance is now 8 ohms, with the two sections wired in parallel, for a total of 4 ohms in operation. The line arrays sections used with the PS1 power stand were 4 ohms each. Due to optimization of the speaker to the amplifier, the overall output level of the L1 Model I system is virtually the same as the PAS system. There is a mechanical stop to prevent users from plugging a PAS line array into an L1 Model I power stand. Users can however insert an L1 Model I line array into a PAS PS1 Power Stand. This will not harm the unit, but will result in a lower output level (~1.5 dB less).

2. The Amp 1 IN, Amp 2 IN, Amp 3 IN, All Amps IN, Amp 1 OUT and Amp 2 OUT jacks have been removed from the L1 Model I Power Stand. These connectors were originally intended for users to access the power stand amplifiers in a stand-alone fashion. They were rarely used on the PS1 Power Stand.

CAUTION: Be sure to use only L1 Model I upper and lower line array sections with the L1 Model I power stand. It is physically possible to connect a PAS upper line array section onto an L1 Model I lower line array section. Doing so will result in an excessive current drain on the L1 Model I power stand amplifier board, possibly causing a failure.

Electrostatic Discharge Sensitive (ESDS) Device Handling

This unit contains ESDS devices. We recommend the following precautions when repairing, replacing or transporting ESDS devices:

- Perform work at an electrically grounded work station.
- Wear wrist straps that connect to the station or heel straps that connect to conductive floor mats.
- Avoid touching the leads or contacts of ESDS devices or PC boards even if properly grounded. Handle boards by the edges only.
- Transport or store ESDS devices in ESD protective bags, bins, or totes. Do not insert unprotected devices into materials such as plastic, polystyrene foam, clear plastic bags, bubble wrap or plastic trays.

Warranty

The Bose® L1 Model I System electronics are covered by a limited 1-year transferable warranty. The L1 Model I line array and the B1 bass module are covered by a 5-year limited warranty.

Part List Notes

1. This part is not normally available from Customer Service. Approval from the Field Service Manager is required before ordering.

2. The individual parts located on the PCBs are listed in the Electrical Part List.

3. ⚠ This part is critical for safety purposes. Failure to use a substitute replacement with the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards.

4. This part is referenced for informational purposes only. It is not stocked as a repair part. Refer to the next higher assembly for a replacement part.

Packaging Part List

L1® Model I Power Stand (see Figure 1)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty.	Note
-	Carton Kit, Includes Carton, Cardboard A & B, and Packing PE Foams 1 – 4.	307131	SVC-PS111+CKIT	1	
1	PS1 Filler Card Board - A	275437	1450-7370+1	2	
2	Carry Bag for Power Stand	275468	8901-4920-0	1	
3	Poly Bag for Carry Bag	-	1497-7572-0	1	4
4	Poly Bag	-	1497-1062-0	1	4
5	Owner's Manual, DVD Owner's Manual, CD, Japan	306618 306316-01	8901-5080+1 4115-0009+0	1	
6	Quickstart Guide	278815-02	-	1	
7	Poly Bag, 10"x12"	-	1497-4102-0	3	4
8	7-Pin MIDI Cable	035403	7012-6620-2	1	
9	PS1 Filler PE - Foam 4	275442	1493-0421+3	2	
10	PS1 Filler PE - Foam 2	275440	1493-0411+3	1	
11	L1 Model I Power Stand Assy	-	REF	1	4
12	Poly Bag for Power Stand	-	1497-7572-0	1	4
13	PS1 Filler PE - Foam 3	275441	1493-0401+3	2	
14	R1 Remote Control Assembly w/packaging	035394	SVC-PS111+REM	1	
15	PS1 Filler PE - Foam 1	275439	1493-0391+3	1	
16	PS1 Filler Card Board - B	275438	1450-7410+4	4	
17	Carton, PS1 Power Stand	275846	1436-4302+3-3	1	
18	Line Cord, 120V, 15A, US/Can	035393	-	1	3
	Line Cord, 230V, 15A, Euro	283048	SVC-PS121+AAC	1	
	Line Cord, 230V, 15A, Aus	283623	7012-5430+0	1	⚠
	Line Cord, 230V, 15A, UK	283624	7010-9810+0	1	
	Line Cord, 100V, 15A, Japan	298167	SVC-PS101+AAC	1	
19	Poly Bag for Fuse	-	1497-0332-0	1	4
20	Fuse, T15A, 125V/250V, 6.3x32mm, US/Can/Japan	307732	5120-0023+0	1	3 ⚠
	Fuse, T10A, 125V/250V, 6.3x32mm, Euro/UK/Aus	279425	5120-0170+0	1	

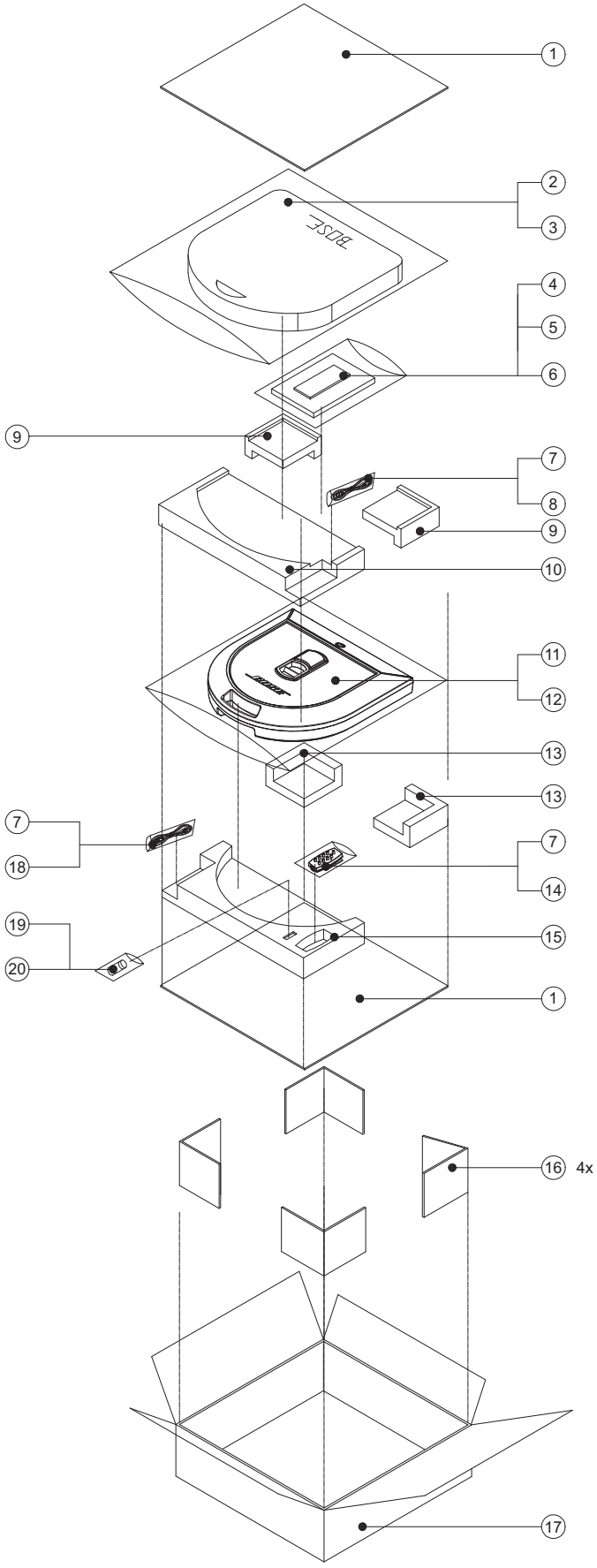


Figure 1. L1® Model I Power Stand Packaging View

Packaging Part List

L1® Model I Line Array (see Figure 2)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty.	Note
-	Carton Kit, Includes Cardboard A and B, and Packing PE Foams 1 - 5	307132	-	1	
1	Packing PE Foam 4	307719	1493-0461-0	1	
2	Packing PE Foam 2	307717	1493-0441-0	2	
3	Poly Bag	-	1497-7562-0	2	4
4	Packing PE Foam 1	307716	1493-0431-0	1	
5	Packing Cardboard A	307720	1450-7380-0	2	
6	Packing PE Foam 5	306626	1493-0471-0	1	
7	Line Source Lower Assembly	REF	-	1	
8	Line Source Upper Assembly	REF	-	1	
9	Line Source Carry Bag	275470	-	2	
10	Poly Bag for Carry Bag	-	-	2	4
11	Packing Cardboard B	306628	1450-7400-0	1	
12	Packing PE Foam 3	307718	1493-0451-0	1	
13	Carton, no fillers	306629	1437-9702+1-3	1	

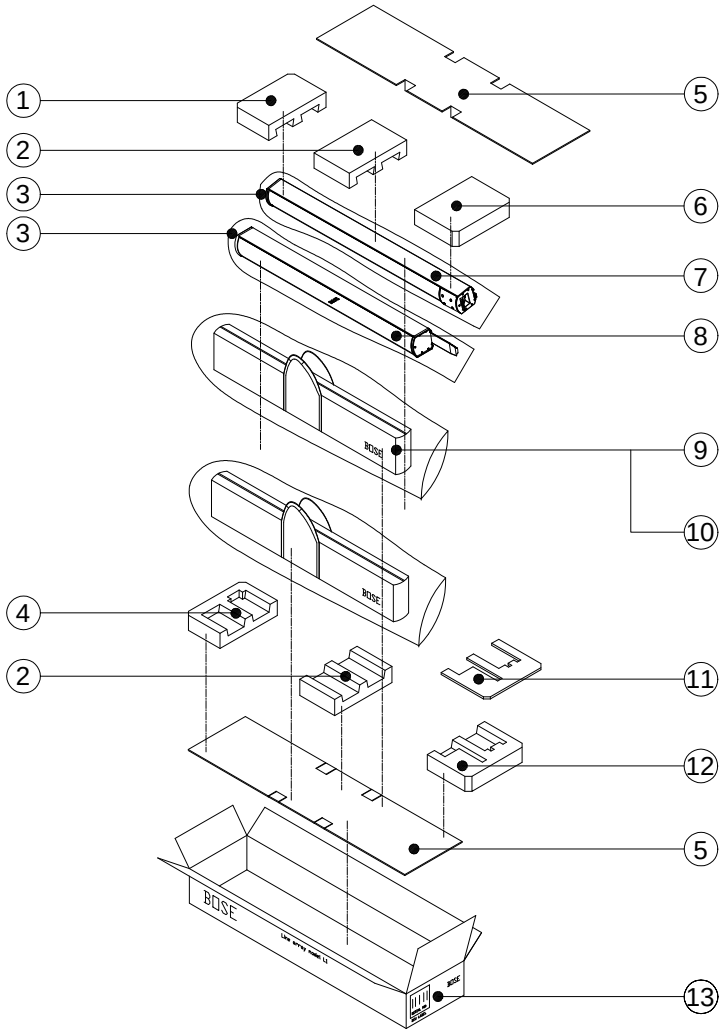


Figure 2. L1 Model I Line Array Packaging View

Packaging Part List

B1 Bass Module (see Figure 3)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty.	Note
-	Carton Kit – Includes All Fillers	307133	-	1	
1	Carton Filler, PE Foam	303838	-	2	
2	Poly Bag, 12x16x49”	-	1497-4552-0	1	
3	B1 Bass Module	REF	-	1	
4	Bass Module Carton, No Fillers	303837	-	1	
5	Bubble Bag for Cable	-	1497-1122-0	1	
6	4-Wire Speakon Cable Assembly	035404	7012-6620-2	1	
7	Poly Bag for Instruction Manual	-	1497-1062-0	1	
8	Owner's Manual	303154	-	1	
-	Carry Bag for Bass Module	035025	-	1	

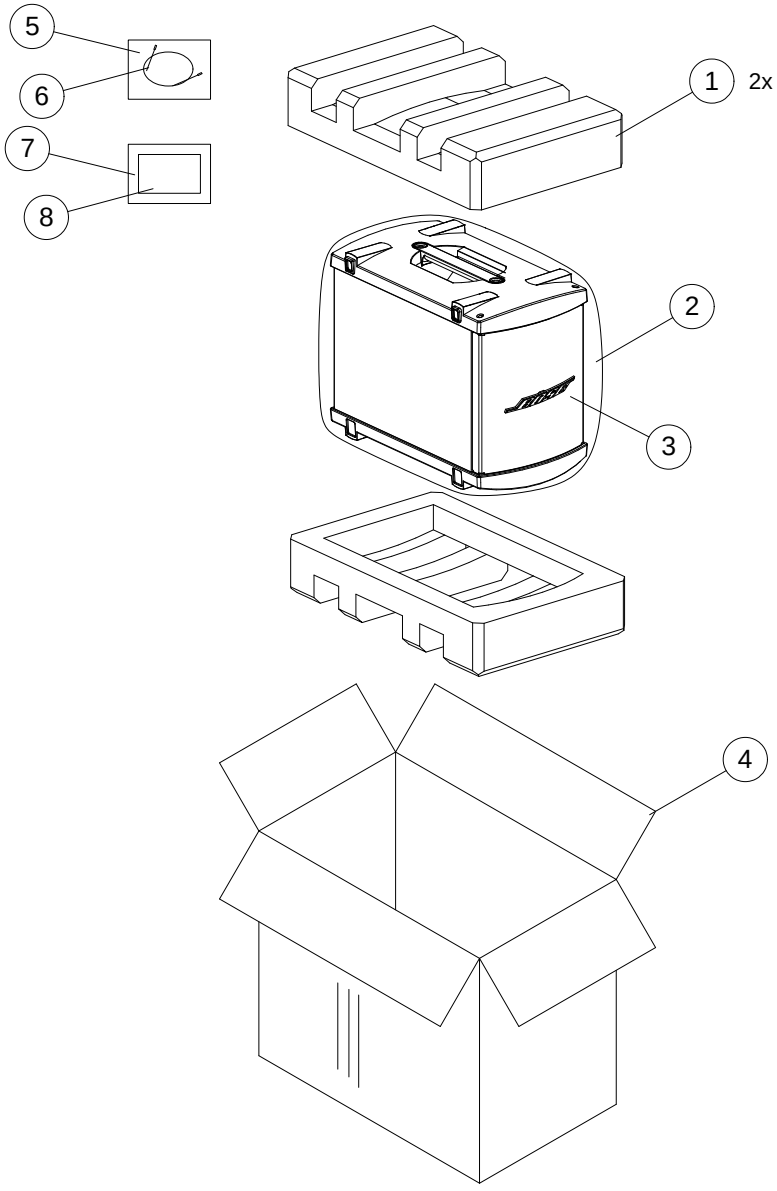


Figure 3. B1 Bass Module Packaging View

Main Part List

L1® Model I Power Stand (see Figure 4)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty	Note
1	Screw, Mach, M4x14, Blk, Zinc	276999	2904-4014-3000	19	
2	Screw, Mach, M4x8, Blk, Zinc	276997	2904-4008-3000	4	
3	Housing, Lower, Power Stand	264035	SVC-PS111+LCAB	1	
4	Power Stand Cavity Assembly, consists of:	306279	SVC-PS111+FOOT	1	
	Plate, Base, Power Stand	-	1404-9601-0	1	4
	PS1 Slide Spring	-	2510-3611-0	1	4
	Screw, Flat-CS, M2.6x8, BZ	-	2901-2608-3001	4	4
	Screw, Mach, M6x35mm, Blk, Zinc, Slide Block	-	2903-6035-3000	1	4
	Screw, Mach, M4x8	276997	2904-4008-3000	2	4
	Cavity, Aluminum, Power Stand	-	4135-3731-0	1	4
	Guide, Cavity, Power Stand	-	4135-3741-0	1	4
	Latch, Power Stand	-	4135-3751-0	1	4
	Slide, Power Stand	-	4135-3761-0	1	4
	Plate, Latch, Power Stand	-	4135-3771-0	1	4
	Post, Copper, Power Stand	-	4135-3971-0	1	4
	Pedal, Foot, Power stand	-	4154-6921-0	1	4
	Screw, Mach, M4x14, Blk, Zinc	276999	2904-4014-3000	4	
	Screw, Mach, M3x8, Blk, Latch Plate	-	2901-3008-3000	4	4
	Gasket, EVA, 5x500mm	-	4153-3331-0	2	4
5	Power Box Assembly, includes PCBs			1	1
	US/Canada, 120V	306280	SVC-PS111+PBOX		
	Euro, UK, Aus, 230V	306286	SVC-PS121+PBOX		
	Japan, 100V	312943	SVC-PS101+PBOX		
6	Screw, Mach, M3x10, Blk, Zinc	-	2900-3010-3030	16	4
7	Housing, Upper, Power Stand	264034	1466-4801-0	1	
8	Power Stand Protective Plug	035410	4154-7251-0	1	
9	Power Stand Foot Pedal	264039	4154-6921-0	1	
10	DSP PCB Assembly	283364	SVC-PS111+DSP	1	2
11	MCU PCB Assembly	306284	SVC-PS111+MCU	1	2
12	Input PCB Assembly	306283	SVC-PS111+INP1	1	2
13	Input Panel Assembly, includes DSP, MCU and Input PCBs			1	1
	US/Can, 120V	306281	SVC-PS111+PANEL		
	Euro, UK, Aus, 230V	306287	SVC-PS121+PANEL		
	Japan, 100V	312944	SVC-PS101+PANEL		
14	Power Stand Push Button	263979	2446-4901-0	4	
15	Screw, Mach, M3x10, Input Panel	277004	2911-3010-3000	18	
16	Power Stand V/R Knob	263986	2446-6301-0	4	
17	Power Stand Door Assy, includes:	273727	SVC-PS111+DOOR	1	
	Cover, I/O, Power Stand	-	1466-5001-0	1	4
	Knob, I/O Cover	-	2446-6001-0	1	4
	Latch, I/O Cover	-	4154-6931-0	1	4
	Latch Spring, I/O Cover	-	2510-3531-0	1	4
	Screw, M3x10, TTB, FH, BZ-PCB	277004	2911-3010-3000	1	
-	Power Stand Cavity Harness Assy	307730	SVC-PS111+MOLEX	1	
-	EQ Preset Label			1	
	US/Can	306317	3001-1756+0		
	Euro, UK, Aus	283831	3001-1756+0		
	Japan	311832	3001-2111+0		

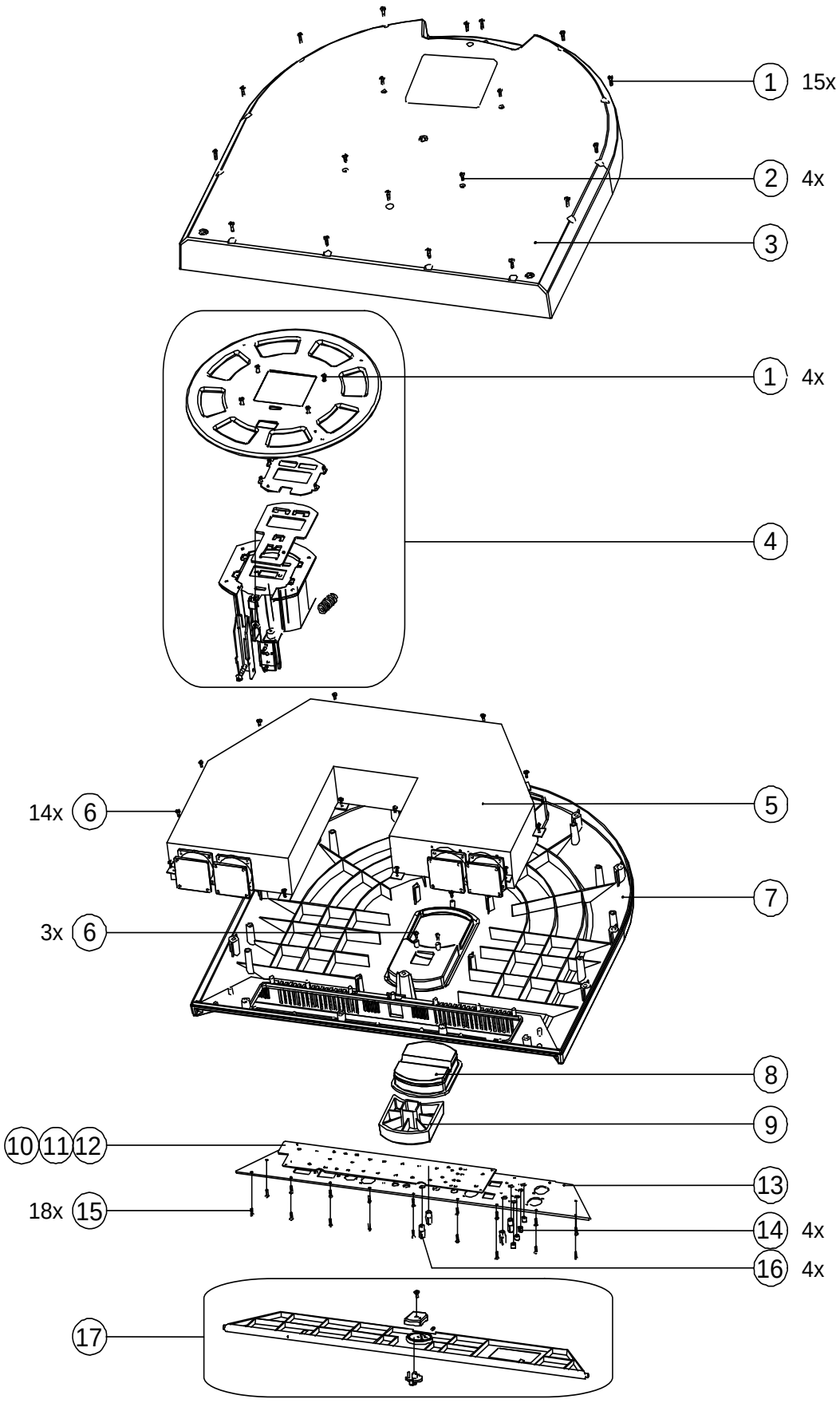


Figure 4. L1® Model I Power Stand Exploded View

Main Part List

L1® Model I Power Box (see Figure 5)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty	Note
1	Screw, Mach, M3x6mm, Blk, Zinc	277003	2904-3006-3000	24	
2	Screw, Mach, M3x10mm, w/washer	275435	2900-3010-3000	27	
3	D-Class Amp PCB Assembly, US/Can/Eu/UK/Aus (before 3/2/10) Japan, all DOM (all 3/2/10 and after)	 306282 312945	 SVC-PS111+DAMP SVC-PS101+DAMP	1	2
4	+/-27V SMPS PCB Assembly, US/Canada, Euro, UK, Aus Japan	 307734 312947	 SVC-PS111+AMPP SVC-PS101+AMPP	2	2
5	Aux Power Supply PCB Assembly, US/Canada, Euro, UK, Aus Japan	 307729 312946	 SVC-PS111+AUX SVC-PS101+AUX	1	2
6	Fan, 24VDC, 60x60x25mm, 80mA	279143	8913-4007-0	4	
7	Screw, Mach, M3x30mm, Blk, Zinc, Fan Mounting	277002	2904-3030-3000	16	
8	Washer, Spring, M3x0.9x5.0mm	-	2607-3009-0553	16	4
9	Washer, Metalid, 3.3, OD=8, T=0.5	-	2600-3005-0640	16	4
10	FCC Filter PCB Assembly US/Canada, Japan, 100/120V Euro, UK, Aus, 220-240V	 306285 306288	 SVC-PS111+FCC1 SVC-PS121+FCC2	1	2

Note: Item 3, D-Class Amp PCB Assembly, has been changed to part number 312945 for all voltage variants starting with DOM 0061 (3/2/10). US/Can/Eu/UK/Aus units built before 3/2/10 use part number 306282.

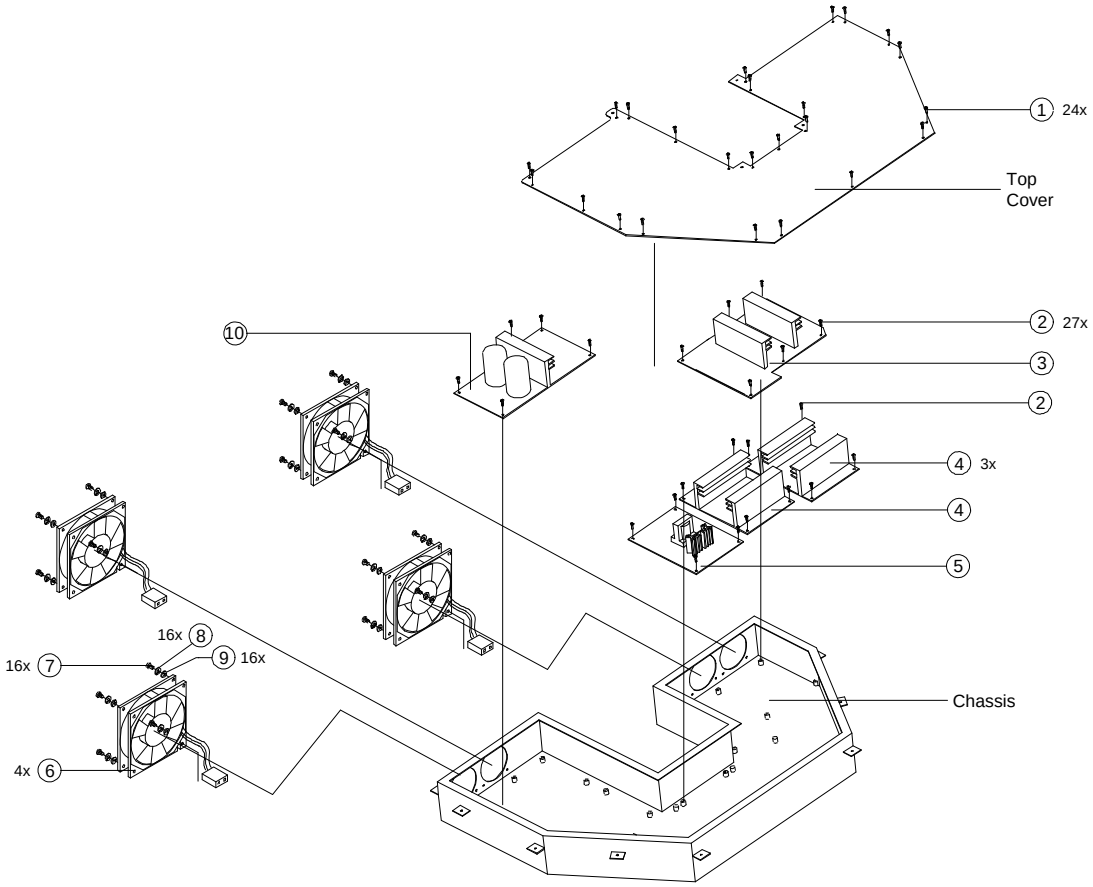


Figure 5. L1 Model I Power Box Exploded View

Main Part List

L1® Model I Input Panel Assembly (see Figure 6)

Item Number	Reference Designator	Description	Bose® Part Number	Vendor Part Number	Qty.	Note
1	MCU PCB, DSP PCB	PCB Support, 12MM High	-	4152-0911-0	6	4
2	VR101, VR102	Pot, 5k Ohm, 5KX1 10C	275451	4751-0620-0	2	
3	VR103, VR104	Pot, 20k Ohm, 20KAX1	275450	4751-0580-1	2	
4	SW102, SW104	Switch, Push, PS828L, 8x8 mm, MIC	275452	5200-3573-0-00	2	
5	-	PS1 Push Button Knob	263979	2446-4901-0	4	
6	J105, J106, J107, J108	Phone Jack, 6.4mm, 5-Pin	275447	2113-1340-0	7	
7	J112, J113	Phone Jack, 6.4mm, 9-Pin	275445	2113-1296-0	2	
8	J119	Neutrik Speakon Connector, NL4MD-V	275446	2113-1336-1	3	
9	-	Bracket, Speakon Jack	-	4135-3801-0	3	4
10	-	Knob, I/O Panel	-	2446-6301-0	4	4
11	J109	RCA Jack, White, 1P, GP 032-09BWG	275444	2113-1950-0	1	
12	J110	RCA Jack, Black, 1P, AU HQ032-09BBG	275443	2113-1169-1	1	
13	J101, J102	Conn., Neutrik, NCJ10FI-V-0	275449	2113-3046-0	2	
14	-	Push Wheel, Preset Switch	306318	-	2	
15	J103, J104	XLR Connector, Neutrik, 3PM	275448	2113-1698-0	2	
16	-	Fuse Holder, 15A/250VAC, R3-44A Type, 6.35x32mm, US/Canada, 120V Euro, UK, Aus 220-240V	 307731 279426	 4170-0021+0 4153-1100+0	1	3 ⚠
17	-	Screw, M3x10mm	277004	2911-3010-3000	16	
18		Screw, M3x12, Csk, Blk, Speakon Connector	-	2901-3012-3000	6	4
19	-	PS1 DIN Socket, 7-Pin	275454	2113-2013-0	1	
20		Screw, AC Inlet Jack, M3x12	-	2900-3012-3000	2	4
21	-	Fuse, US/Can/Japan 100/120V, T10A, 125V/250V, 6.35x32mm	307732	5120-0023+0	1	3
		Fuse, Euro, UK, Aus 220-240V, T10A, 125/250V, 6.35x32mm	279425	5120-0170-0		⚠
22	-	AC Inlet Jack	278847	2113-1144-0	1	3 ⚠
23	-	Switch, AC Power, SPST US/Canada, Japan, 100/120V Euro, UK, Aus 220-240V	 278848 279427	 5200-4826-0 5200-4873-0	1	3 ⚠
24	-	Washer, Spring, M3x0.9x5.5mm, BZ	-	2607-3009-0553	2	4
25	-	Nut, M3, Nickel	-	2640-3022-0544	2	4

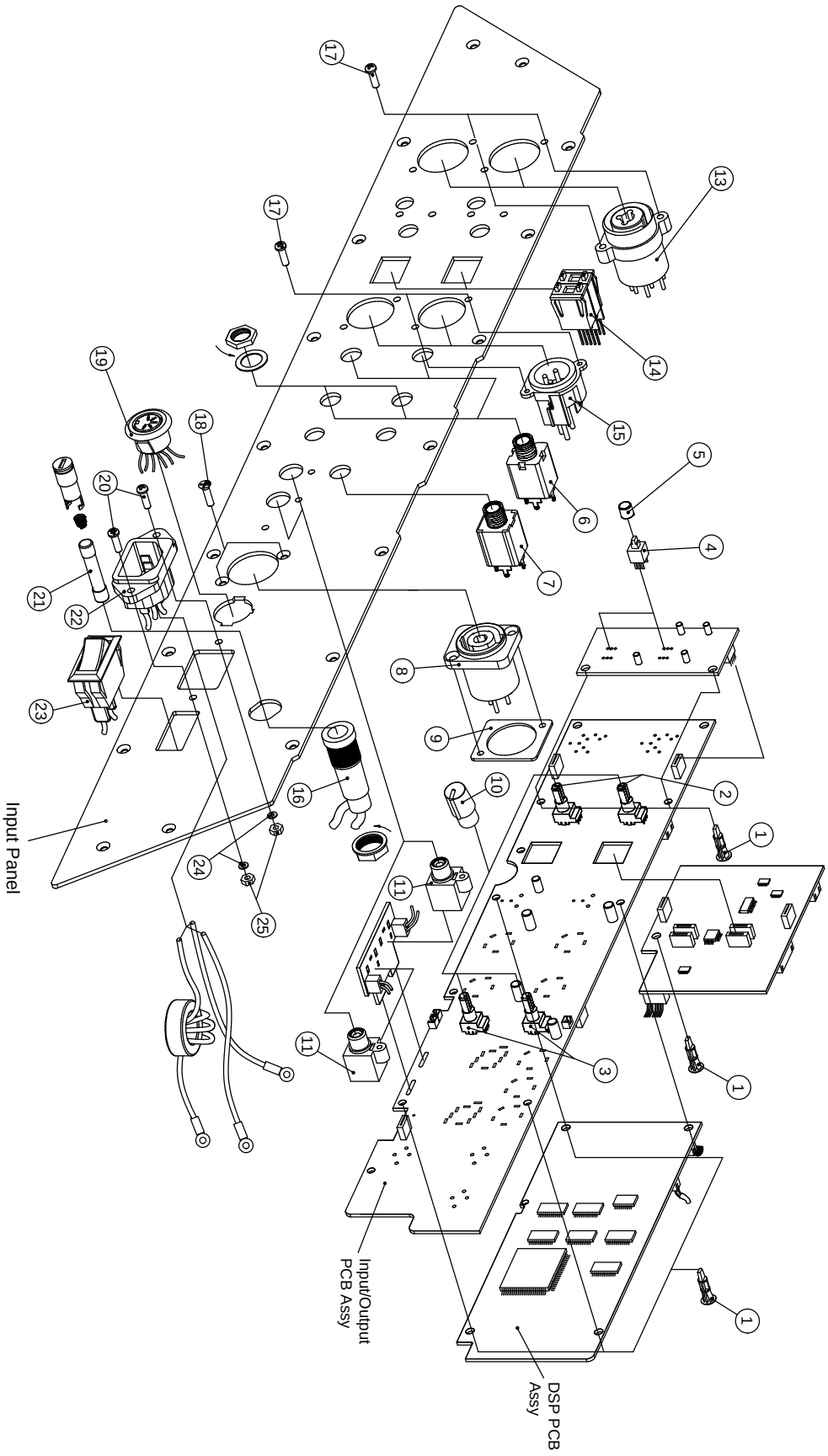


Figure 6. L1® Model I Input Panel Assembly Exploded View

Main Part List

Remote Control Assembly (see Figure 7)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty	Note
1	Knob, VR, Remote Control	263995	2446-5501+1	9	
2	Housing, Upper	263997	1466-3701+0	1	
3	LED, Red/Green, L-115W EGW	-	3700-4536+RG	2	4
4	Variable Resistor, 50KBx1, LM=20MM, RVO9AC-40-20F-B50K-OC	-	4751-0600+0	6	4
5	Variable Resistor, 50KBx1, LM=20MM, RVO9AC-40-20F-B50K	-	4751-0610+0	3	4
6	Screw, Tapping, 2x6MM	-	2954-2006+0000	4	4
7	Washer, Metal, M3x0.9x4MM	-	2600-3003+0402	4	4
8	PCB Assembly, Remote Control	-	1725-676A+0002	1	4
9	Fiber Sheet	-	3100-6341+0	1	4
10	DIN Socket, 7-Pin	-	2113-2013+0	2	4
11	Housing, Lower	263996	1466-3601+0	1	
12	Screw, 2.6x8MM, CS, Flat Black	-	2921-2608+3000	4	4
13	Product Label	-	3001-1742+0	1	4
14	Dual Lock Re-closable Fastener	-	3100-6311+0	1	4

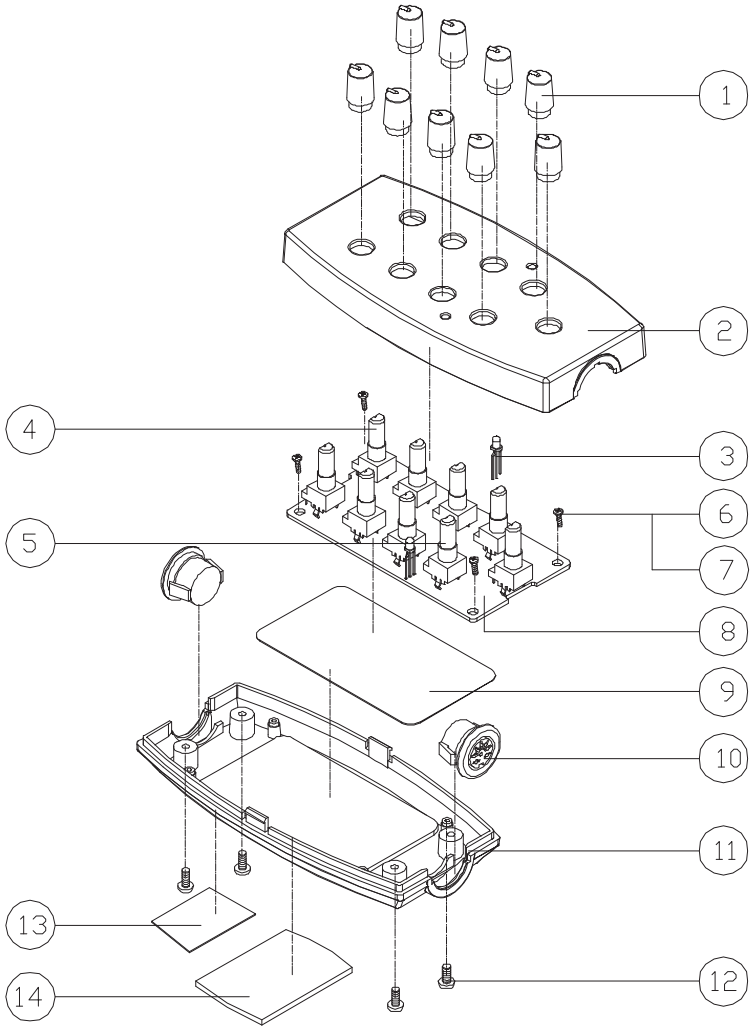


Figure 7. Remote Control Assembly Exploded View

Main Part List

L1® Model I Upper and Lower Line Source Arrays (see Figure 8)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty	Note
1	End-Cap #1 Assembly, consists of:	273753		1	
	End-Cap, Top, Upper, Line Source		4154-6661-0	1	4
	End-Cap Gasket		4149-0491-0	1	4
2	End-Cap #2 Assembly, consists of:	273787		1	
	End-Cap, Bottom, Upper, Line Source		4154-6671-0	1	4
	Gasket, Cap, Line Source		4149-0491-0	1	4
	Airproof Sheet, End Cap, Line Source		4154-6841-0	1	4
	Conn Assy, Molex, 4P, AWG#20, UL1007		7012-6615-0	1	4
	Plate, Connector, 4 Pin, Floating, LS		4135-3511-0	1	4
	Latch, Locking Mechanism, LS		4135-3541-0	1	4
	Cover, Locking Mechanism, LS		4135-3551-0	1	4
	Slide Locking Spring			1	4
	Slide, Latch, Locking Mechanism, LS		4154-6631-0	1	4
3	End-Cap #3 Assembly, consists of:	273788		1	
	End-Cap, Top, Lower, Line Source		4154-6641-0	1	4
	Gasket, Cap, Line Source		4149-0491-0	1	4
	Airproof Sheet, End Cap, Line Source		4154-6841-0	1	4
	Header, Vertical, Molex, 4P		2101-1438-0	1	4
	Plate, Connector, 4 Pin, Fixed, LS		4135-3501-0	1	4
	PCB, Molex, 10p & 4P		1725-684A-0000	1	4
	Conn Assy, AWG#20, UL1015, L=150mm		7012-6616-0	1	4
4	End-Cap #4 Assembly, consists of:	312010		1	
	End-Cap, Bottom, Lower, Line Source		4154-6651-0	1	4
	Gasket, Cap, Line Source		4149-0491-0	1	4
	Airproof Sheet, End Cap, Line Source		4154-6841-0	1	4
	Header, Vertical, Molex, 10P		2101-1437-0	1	4
	PCB, Molex, 10p & 4P		1725-684A-0000	1	4
	Plate, Connector, 10PIN, Fixed, LS		4135-3531-0	1	4
	Conn Assy, AWG#20, UL1015, L=150mm		7012-6616-0	1	4
5	Screw, M3x10, Tapping	-	2950-3010-3000	24	4
6	Line Source Driver Assembly	303836	SVC-WF+BSPAL2	24	
7	Line Source Driver Screws	-	-	96	4
8	Front Baffle, Upper, Assembly, consists of:	273836	-	1	
	Front Baffle-1		1404-9001-0	3	4
	Baffle Gasket-1		4149-0431-0	6	4
9	Front Baffle, Lower, Assembly, consists of:	273837		1	
	Front Baffle-2		1404-9101-0	1	4
	Baffle Gasket-1		4149-0431-0	6	4
10	Screws, Front Baffle	-	-	16	4
11	Grille, Lower, Assembly (w/gaskets)	263996	-	1	
12	Nameplate, Bose Logo, Line Source	264024	-		
13	Line Source Bayonet Assembly	035407	8901-4270-0	1	
14	Line Source Bayonet Screws	-	-	2	4
15	Grille, Upper, Assembly (w/gaskets)	264017	4135-3571-0	1	
16	Cover Plate, Lower Array	-	-	1	4
17	Screws, Lower Array Cover Plate	-	-	4	4
18	Washer, Lower Array Cover Plate	-	-	4	4
19	Nut, Lower Array Cover Plate	-	-	4	4

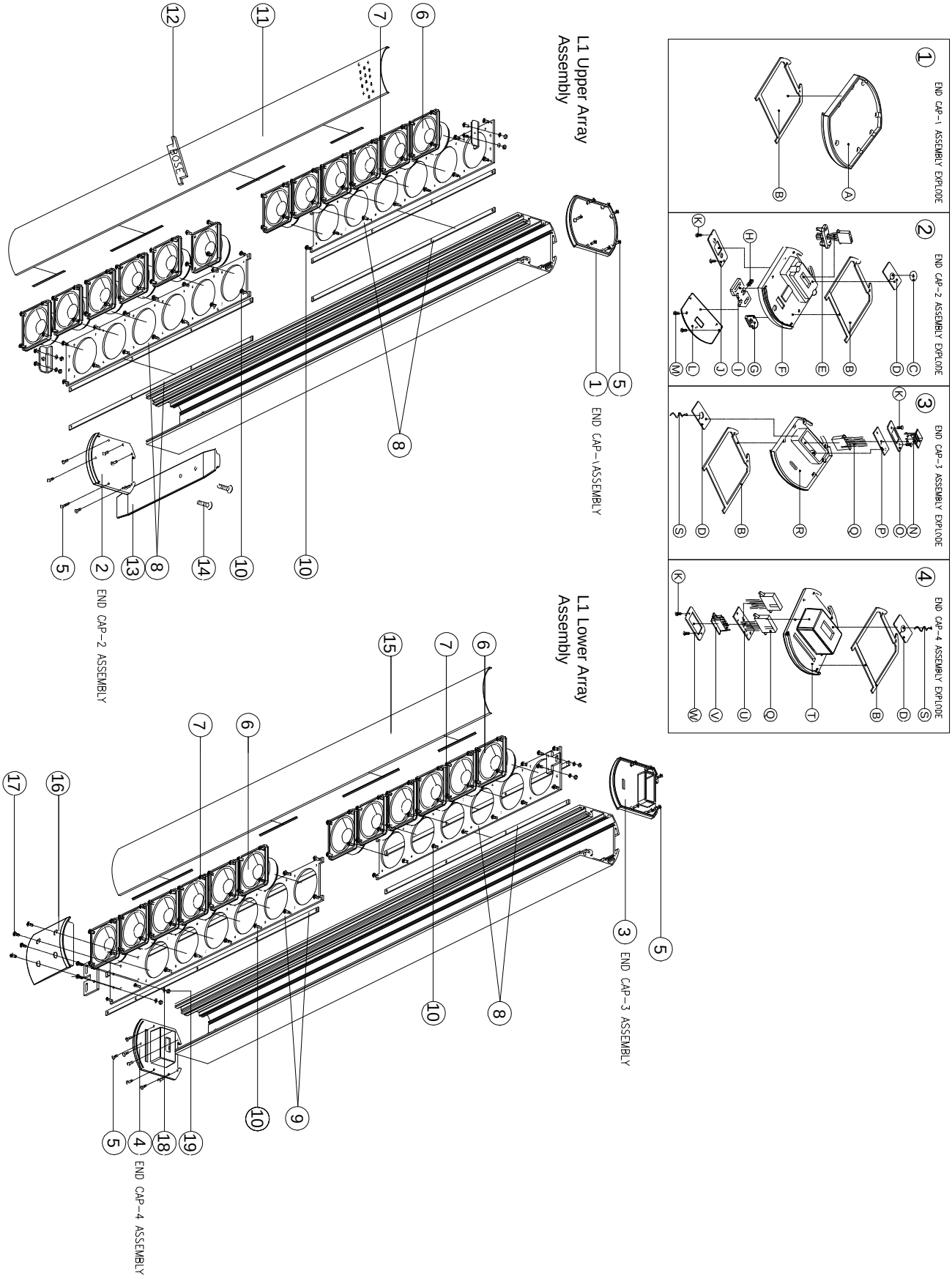


Figure 8. L1® Model I Line Array Exploded View

Main Part List

B1 Bass Module Exploded View (see Figure 9)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty	Note
1	Screw, M4 X 28, BK, B1 Grille	-	2908-4028-3400	4	4
2	Woofer Assembly	263998	SVC-FM040C-WF	2	
3	Gasket, Woofer Assembly	-	-	2	4
4	Screw, M4 X 16, BK, B1 Driver	-	2913-4016-3000	8	4
5	Grille Assembly	263992	SVC-FM040C-GRILL	1	
6	Gasket, Grille Assembly	-	-	2	4
7	Logo Assembly	-	-	1	4
8	B1 Terminal Panel Assembly	276409	SVC-FM040C-TML	1	
9	Screw, M3 X 12, BK, B1 Input Cup	-	2900-3012-3000	4	4
-	4-Wire Speakon to Speakon Cable Assembly, L=1.5M	035404	SVC-FM040C-CABLE	1	

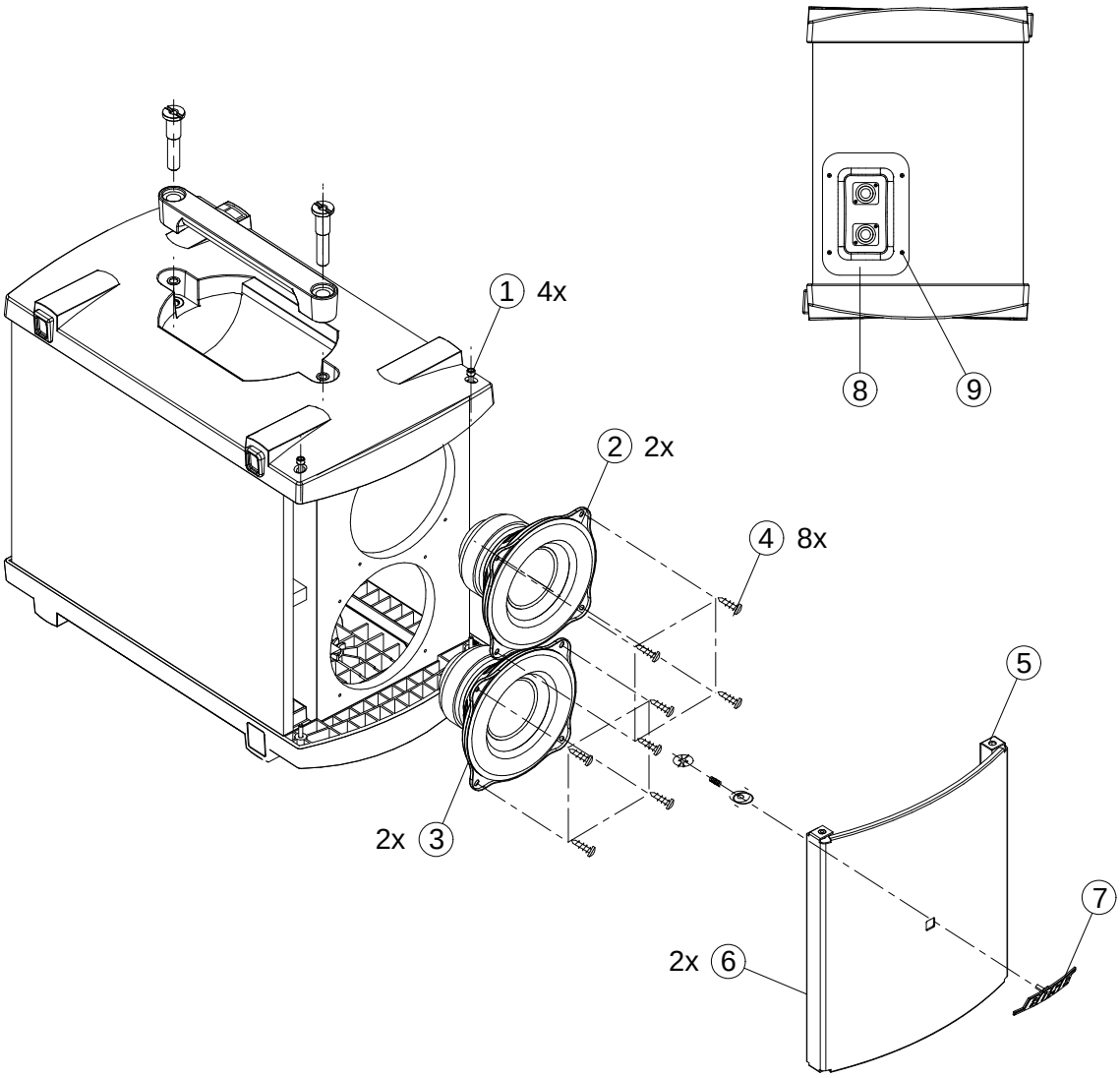


Figure 9. B1 Bass Module Exploded View

Electrical Part List

Input Panel PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R101	10M, RMG, 0805, 1/10W, 1%	4720-106A+J	4
R102	1M, RMG, 0805, 1/10W, 1%	4720-105A+J	4
R103	51 OHM, RMG, 0805, 1/10W, 1%	4720-510A+J	4
R104	1K, RMG, 0805, 1/10W, 1%	4720-102A+J	4
R105	15K, RMG, 0805, 1/10W, 1%	4720-153A+J	4
R106	51 OHM, RMG, 0805, 1/10W, 1%	4720-510A+J	4
R107	15K, RMG, 0805, 1/10W, 1%	4720-153A+J	4
R108	15K, RMG, 0805, 1/10W, 1%	4720-153A+J	4
R109	10K, RMG, 0805, 1/10W, 1%	4720-103J+J	4
R110	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R111	5.6K, RMG, 0805, 1/10W, 5%	4720-562J+J	4
R112	1M, RMG, 0805, 1/10W, 1%	4720-105J+J	4
R113	10K, RMG, 0805, 1/10W, 1%	4720-103J+J	4
R114	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R115	5.6K, RMG, 0805, 1/10W, 5%	4720-562J+J	4
R116	1M, RMG, 0805, 1/10W, 1%	4720-105J+J	4
R117	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R118	33K, RMG, 0805, 1/10W, 1%	4720-333A+J	4
R119	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R120	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R121	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R123	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R124	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R125	1.2K, RMG, 0805, 1/10W, 5%	4720-122J+J	4
R126	1.2K, RMG, 0805, 1/10W, 5%	4720-122J+J	4
R127	2K, RMG, 0805, 1/10W, 1%	4720-202A+J	4
R128	2K, RMG, 0805, 1/10W, 1%	4720-202A+J	4
R129	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R130	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R131	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R132	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R133	20 OHM, RMG, 0805, 1/10W, 5%	4720-200J+J	4
R134	1M, RMG, 0805, 1/10W, 1%	4720-105J+J	4
R135	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R136	10M, RMG, 0805, 1/10W, 1%	4720-106A+J	4
R137	1M, RMG, 0805, 1/10W, 1%	4720-105A+J	4
R138	100 OHM, RMG, 0805, 1/10W, 1%	4720-101A+J	4
R139	1K, RMG, 0805, 1/10W, 1%	4720-102A+J	4
R140	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R141	100 OHM, RMG, 0805, 1/10W, 1%	4720-101A+J	4
R142	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R150	15K, RMG, 0805, 1/10W, 1%	4720-153A+J	4
R152	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R153	33K, RMG, 0805, 1/10W, 1%	4720-333A+J	4
R154	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R155	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4

Electrical Part List

Input Panel PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R157	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R158	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R159	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R162	2K, RMG, 0805, 1/10W, 1%	4720-202A+J	4
R163	2K, RMG, 0805, 1/10W, 1%	4720-202A+J	4
R164	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R165	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R166	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R167	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R168	20 OHM, RMG, 0805, 1/10W, 5%	4720-200J+J	4
R169	1M, RMG, 0805, 1/10W, 1%	4720-105J+J	4
R170	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R171	300 OHM, RMG, 0805, 1/10W, 5%	4720-301J+J	4
R172	100 OHM, RMG, 0805, 1/10W, 1%	4720-101A+J	4
R173	12K, RMG, 0805, 1/10W, 1%	4720-123A+J	4
R174	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R175	300 OHM, RMG, 0805, 1/10W, 5%	4720-301J+J	4
R176	100 OHM, RMG, 0805, 1/10W, 1%	4720-101A+J	4
R177	12K, RMG, 0805, 1/10W, 1%	4720-123A+J	4
R178	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R179	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R180	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R181	51K, RMG, 0805, 1/10W, 5%	4720-513J+J	4
R182	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R183	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R185	51K, RMG, 0805, 1/10W, 5%	4720-513J+J	4
R186	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R187	51K, RMG, 0805, 1/10W, 5%	4720-513J+J	4
R188	150K, RMG, 0805, 1/10W, 5%	4720-154J+J	4
R189	1K, RMG, 0805, 1/10W, 1%	4720-102J+J	4
R190	1K, RMG, 0805, 1/10W, 1%	4720-102J+J	4
R191	30K, RMG, 0805, 1/10W, 5%	4720-303J+J	4
R192	2.2K, RMG, 0805, 1/10W, 5%	4720-222J+J	4
R193	3.3K, RMG, 0805, 1/10W, 5%	4720-332J+J	4
R197	51K, RMG, 0805, 1/10W, 5%	4720-513J+J	4
R198	150K, RMG, 0805, 1/10W, 5%	4720-154J+J	4
R199	1K, RMG, 0805, 1/10W, 1%	4720-102J+J	4
R200	1K, RMG, 0805, 1/10W, 1%	4720-102J+J	4
R201	30K, RMG, 0805, 1/10W, 5%	4720-303J+J	4
R202	2.2K, RMG, 0805, 1/10W, 5%	4720-222J+J	4
R204	3.3K, RMG, 0805, 1/10W, 5%	4720-332J+J	4
R207	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R208	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R209	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R210	12K, RMG, 0805, 1/10W, 1%	4720-123J+J	4
R211	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4

Electrical Part List

Input Panel PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R212	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R213	12K, RMG, 0805, 1/10W, 1%	4720-123J+J	4
R214	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R215	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R216	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R217	12K, RMG, 0805, 1/10W, 1%	4720-123J+J	4
R218	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R219	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R220	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R221	12K, RMG, 0805, 1/10W, 1%	4720-123J+J	4
R222	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R223	100 OHM, RMG, 0805, 1/10W, 1%	4720-101J+J	4
R224	2.7K, RMG, 0805, 1/10W, 5%	4720-272J+J	4
R225	2.7K, RMG, 0805, 1/10W, 5%	4720-272J+J	4
R226	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R227	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R229	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R230	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R231	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R232	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R234	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R235	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R238	5.6K, RMG, 0805, 1/10W, 5%	4720-562J+J	4
R239	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R240	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R241	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R242	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R243	5.6K, RMG, 0805, 1/10W, 5%	4720-562J+J	4
R244	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R245	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R246	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R247	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R248	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R249	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R250	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R251	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R252	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R253	560 OHM, RMG, 0805, 1/10W, 5%	4720-561J+J	4
R254	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R255	10K, RMG, 0805, 1/10W, 1%	4720-103A+J	4
R256	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R257	560 OHM, RMG, 0805, 1/10W, 5%	4720-561J+J	4
R258	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R259	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R260	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R261	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4

Electrical Part List

Input Panel PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
VR101	VAR RES, 5KX1, 10C, LM=25MM, RV09AC-40-25F-C5K	4751-0620+0	4
VR102	VAR RES, 5KX1, 10C, LM=25MM, RV09AC-40-25F-C5K	4751-0620+0	4
VR103	VAR RES, 20KAX1, LM=25MM, ALPHA, RV09AC-40-25F-A20K	4751-0580+1	4
VR104	VAR RES, 20KAX1, LM=25MM, ALPHA, RV09AC-40-25F-A20K	4751-0580+1	4

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C101	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C102	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C106	20pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-200J+J-BD	4
C107	20pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-200J+J-BD	4
C110	22uF, CE, 50V, 20%, RLT, 5X11	157F-226M+K-IU	4
C112	22uF, CE, 50V, 20%, RLT, 5X11	157F-226M+K-IU	4
C113	47uF, CE, 35V, 20%, RL, 5x11, SUN	157Q-476M+K-IUI	4
C114	47uF, CE, 35V, 20%, RL, 5x11, SUN	157Q-476M+K-IUI	4
C115	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C116	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C117	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C118	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C119	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C123	20pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-200J+J-BD	4
C124	20pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-200J+J-BD	4
C127	22uF, CE, 50V, 20%, RLT, 5X11	157F-226M+K-IU	4
C129	22uF, CE, 50V, 20%, RLT, 5X11	157F-226M+K-IU	4
C130	47uF, CE, 35V, 20%, RL, 5x11, SUN	157Q-476M+5-IUL	4
C131	47uF, CE, 35V, 20%, RL, 5x11, SUN	157Q-476M+5-IUL	4
C132	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C133	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C134	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C135	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C136	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C137	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C138	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C139	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C140	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C141	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C142	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C143	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C144	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C145	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C146	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C147	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4

Electrical Part List

Input Panel PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C148	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C149	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C150	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C151	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C152	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C153	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C156	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C157	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C158	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C159	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C160	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C161	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C162	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C163	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C164	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C165	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C166	47uF, CE, 50V, 20%, RLT, 6.3X11, SHOEI	157F-476M+K-LUI	4
C167	47uF, CE, 50V, 20%, RLT, 6.3X11, SHOEI	157F-476M+K-LUI	4
C168	1uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-105M+H-GME	4
C169	4.7uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-475M+H-GMK	4
C170	220uF, CE, 35V, 20%, RL, 8x11.5	157Q-227M+5-OV	4
C171	1uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-105M+H-GME	4
C172	4.7uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-475M+H-GMK	4
C173	220uF, CE, 35V, 20%, RL, 8x11.5	157Q-227M+5-OV	4
C174	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C175	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C176	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C177	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C178A	100uF, CE, 35V, 20%, RL, 8X11	157Q-107M+5-OU	4
C179A	100uF, CE, 35V, 20%, RL, 8X11	157Q-107M+5-OU	4
C182	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C183	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C184	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C185	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C186	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C187	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C188	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C189	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C190	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C191	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C192	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C193	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4

Electrical Part List

Input Panel PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C194	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C195	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C196	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C197	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C198	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C199	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C200	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C201	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C202	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C203	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C204	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C211	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C212	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C213	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C214	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C215	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C216	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C217	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C218	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C221	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C223	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C225	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C227	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C232	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C233	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C234	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C235	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C236	1000uF, CE, 16V, 20%, RL, 10x16	157D-108M+5-S5	4
C237	1000uF, CE, 16V, 20%, RL, 10x16	157D-108M+5-S5	4
C238	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C239	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C240	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C241	33pF CC 50V 5% 0805, 1.2x 2.0	150F-330J+J-BD	4
C242	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C243	20pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-200J+J-BD	4
C244	20pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-200J+J-BD	4
C245	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C246	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C247	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C248	820pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-821K+J-BD	4
C249	820pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-821K+J-BD	4

Electrical Part List

Input Panel PCB Assembly

Inductors

Reference Designator	Description	Vendor Part Number	Note
L101	COIL, 2.2uH, 20%, AL, BL7	1801-2R2M+M	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
D101	LL4148, SM	4804-1480+3	4
D102	LL4148, SM	4804-1480+3	4
D103	LL4148, SM	4804-1480+3	4
D104	LL4148, SM	4804-1480+3	4
D105	LL4148, SM	4804-1480+3	4
D106	LL4148, SM	4804-1480+3	4
D107	LL4148, SM	4804-1480+3	4
D108	LL4148, SM	4804-1480+3	4
D109	LL4148, SM	4804-1480+3	4
D110	LL4148, SM	4804-1480+3	4
D113	LL4148, SM	4804-1480+3	4
D114	LL4148, SM	4804-1480+3	4
D115	LL4148, SM	4804-1480+3	4
D116	LL4148, SM	4804-1480+3	4
D117	LL4148, SM	4804-1480+3	4
D118	LL4148, SM	4804-1480+3	4
D119	LL4148, SM	4804-1480+3	4
D120	LL4148, SM	4804-1480+3	4
D121	LL4148, SM	4804-1480+3	4
D122	LL4148, SM	4804-1480+3	4
D123	LL4148, SM	4804-1480+3	4
D124	LL4148, SM	4804-1480+3	4
D125	LL4148, SM	4804-1480+3	4
D126	LL4148, SM	4804-1480+3	4
D127	LL4148, SM	4804-1480+3	4
D127A	LL4148, SM	4804-1480+3	4
D128	LL4148, SM	4804-1480+3	4
D128A	LL4148, SM	4804-1480+3	4
D129	LL4148, SM	4804-1480+3	4
D130	LL4148, SM	4804-1480+3	4
D131	LL4148, SM	4804-1480+3	4
D132	LL4148, SM	4804-1480+3	4
D133	LL4148, SM	4804-1480+3	4
D134	LL4148, SM	4804-1480+3	4
D135	LL4148, SM	4804-1480+3	4
D136	LL4148, SM	4804-1480+3	4
D137	LL4148, SM	4804-1480+3	4
D138	LL4148, SM	4804-1480+3	4
D139	LL4148, SM	4804-1480+3	4
D140	LL4148, SM	4804-1480+3	4
D141	LL4148, SM	4804-1480+3	4
D142	LL4148, SM	4804-1480+3	4

Electrical Part List

Input Panel PCB Assembly

Diodes (continued)

Reference Designator	Description	Vendor Part Number	Note
D143	LL4148, SM	4804-1480+3	4
D144	LL4148, SM	4804-1480+3	4
Z101	ZENER, 1/2W, 5.6V, SMD	4837-5V69+3	4
Z102	ZENER, 0.2W, UDZS5.1B, ROHM, SM	483H-5V11+3	4
Z103	ZENER, 1/2W, 5.6V, SMD	4837-5V69+3	4
Z104	ZENER, 0.2W, UDZS5.1B, ROHM, SM	483H-5V11+3	4
Z105	ZENER, 1/2W, 3.3V, SMD, ROHM, UDZS3.3B	4837-3V31+3	4
Z106	ZENER, 1/2W, 3.3V, SMD, ROHM, UDZS3.3B	4837-3V31+3	4
Z107	ZENER, 1/2W, 5.6V, SMD	4837-5V69+3	4
Z108	ZENER, 1/2W, 5.6V, SMD	4837-5V69+3	4
Z109	ZENER, 1/2W, 5.6V, SMD	4837-5V69+3	4
Z110	ZENER, 1/2W, 5.6V, SMD	4837-5V69+3	4
LED101	L-115W, EGW/209EGW, RED/GR, ELE-LED02	3700-4536+RG	4
LED102	LED, 3MM, RED	3700-2522+R	4
LED103	L-115W, EGW/209EGW, RED/GR, ELE-LED02	3700-4536+RG	4
LED104	LED, 3MM, RED	3700-2522+R	4
LED105	L-115W, EGW/209EGW, RED/GR, ELE-LED02	3700-4536+RG	4

Transistors

Reference Designator	Description	Vendor Part Number	Note
Q101	9013H	4860-8720+5	4
Q102	2N3904/PS	4853-9040+5	4
Q103	2N3904/PS	4853-9040+5	4
Q104	9013H	4860-8720+5	4
Q105	2N3904/PS	4853-9040+5	4
Q106	2N3904/PS	4853-9040+5	4

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
U101	TL072CDR, DUAL J-FET, INPUT OP-AMP	3130-8020+0	4
U102	INA163UA, LOW NOISE, AM, SO-14	3132-0670+0	4
U103	TL072CDR, DUAL J-FET, INPUT OP-AMP	3130-8020+0	4
U105	INA163UA, LOW NOISE, AM, SO-14	3132-0670+0	4
U106	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U107	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U108	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U109	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U110	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U111	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U112	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U113	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U114	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4

Electrical Part List

Input Panel PCB Assembly

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
/J117	BRACKET, POWER STAND, 4P, SPK SOCKET	4135-3801+0	4
/J118	BRACKET, POWER STAND, 4P, SPK SOCKET	4135-3801+0	4
/J119	BRACKET, POWER STAND, 4P, SPK SOCKET	4135-3801+0	4
/LED	OIL SLEEVE, ID=1MM	1660-0010+0	4
/LED	LED SPACER, H=8.5	4157-0331+0	4
CN101A	5P, ST, WAFER, P=2.5, COULOMB	2102-051S+004	4
CN102A	5P, ST, WAFER, P=2.5, COULOMB	2102-051S+004	4
CN103A	JM24182-5P, WAFER	2101-9190+0	4
CN104A	CONN ASSY, 6P, P=2.5, L=180MM, SH, F/M	7012-6628+0	4
CN105B	CONNECTOR, 5PIN, P2.5, JST 05JQ-BT	2101-1371+0	4
CN106B	CONNECTOR, 5PIN, P2.5, JST 05JQ-BT	2101-1371+0	4
CN112A	CONN ASSY, 2P, P=2.5, #26, UL1533, L=170MM, BROWN, F/M	7012-6513+1	4
CN113A	CONN ASSY, 2P, P=2.5, F/M, L=150MM, UL1533, BLACK	7012-6514+0	4
CN115A	CONN ASSY, UL2547, #26, L=265, 3P, F/M, P2.5MM	7010-0070+1	4
CN119A	CONN ASSY, 5P, P=2.5, L=370MM, UL1007, #24, F/M	7012-6511+0	4
CN120A	JM24182-5P, WAFER	2101-9190+0	4
CN801B	WAFER, 2P, P2.5, RIGHT	2102-021R+004	4
CN805B	WAFER, 2P, P2.5, RIGHT	2102-021R+004	4
CN809B	WAFER, 2P, P2.5, RIGHT	2102-021R+004	4
GND1	CONN, WIRE, UL1015, 18AWG, GREEN WITH YELLOW, 200MM	7012-6739+0	4
GND2	CONN, WIRE, UL1015, 18AWG, GREEN WITH YELLOW, 200MM	7012-6739+0	4
J101	JACK, COMBO, NCJ10FI-V-0, NEUTRIK	2113-3046+0	4
J102	JACK, COMBO, NCJ10FI-V-0, NEUTRIK	2113-3046+0	4
J103	XLR CONNECTOR, 3PM, NEUTRIK	2113-1698+0	4
J104	XLR CONNECTOR, 3PM, NEUTRIK	2113-1698+0	4
J105	REAR PHONE JACK, 5 PIN	2113-1340+0	4
J106	REAR PHONE JACK, 5 PIN	2113-1340+0	4
J107	REAR PHONE JACK, 5 PIN	2113-1340+0	4
J108	REAR PHONE JACK, 5 PIN	2113-1340+0	4
J109	1P RCA JACK, WHITE COLOR, GP, 032-09BWG, HONG, Q1A0	2113-1950+0	4
J110	1P RCA JACK, BK, AU, HQ032-09BBG	2113-1169+1	4
J112	WASHER, METAL, M9X0.4X14, WZ	2600-9004+1402	4
J113	6.4MM PHONE JACK, 9 PIN	2113-1296+0	4
J113	WASHER, METAL, M9X0.4X14, WZ	2600-9004+1402	4
J119	SPEAKON, NEUTRIK, 4 WIRE, NL4MD-V	2113-1336+1	4
P101	HEADER, 2PIN, NVAR-02VS, JST, UL/CSA	2101-1498+0	4
P102	HEADER, 2PIN, NVAR-02VS, JST, UL/CSA	2101-1498+0	4
P103	HEADER, 2PIN, NVAR-02VS, JST, UL/CSA	2101-1498+0	4

Electrical Part List

Input Panel PCB Assembly

Miscellaneous (continued)

Reference Designator	Description	Vendor Part Number	Note
PANEL&MCUPCB	PCB SUPPORT, 12MM HIGH	4152-0911+0	4
PANEL-PANE3	PCB SUPPORT, 12MM HIGH	4152-0911+0	4
PL-DSP	PCB SUPPORT, 12MM HIGH	4152-0911+0	4
PL-MCU	CABLE TIE, 150MM*2.7MM, KFC005-00	6360-1371+0	4
SW102	PUSH SW, PS828L, 8x8mm, MIC	5200-3573+0-00	4
SW104	PUSH SW, PS828L, 8x8mm, MIC	5200-3573+0-00	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R381	11K, RMG, 0603/1608, 1/16W, 1%	4723-113A+P	4
R382	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R383	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R384	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R385	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R386	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R387	11K, RMG, 0603/1608, 1/16W, 1%	4723-113A+P	4
R388	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R389	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R390	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R391	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R392	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R393	11K, RMG, 0603/1608, 1/16W, 1%	4723-113A+P	4
R394	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R395	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R396	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R397	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R398	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R399	11K, RMG, 0603/1608, 1/16W, 1%	4723-113A+P	4
R400	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R401	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R402	5.6K, RMG, 0603/1608, 1/16W, 5%	4723-562J+P	4
R403	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R404	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R405	3K, RMG, 0603/1608, 1/16W, 5%	4723-302J+P	4
R406	3K, RMG, 0603/1608, 1/16W, 5%	4723-302J+P	4
R407	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R408	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R409	3.3K, RMG, 0603/1608, 1/16W, 5%	4723-332J+P	4
R410	3.3K, RMG, 0603/1608, 1/16W, 5%	4723-332J+P	4
R411	560 OHM, RMG, 0603/1608, 1/16W, 5%	4723-561J+P	4
R412	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R413	3K, RMG, 0603/1608, 1/16W, 5%	4723-302J+P	4
R414	3K, RMG, 0603/1608, 1/16W, 5%	4723-302J+P	4
R415	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R416	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R417	3.3K, RMG, 0603/1608, 1/16W, 5%	4723-332J+P	4
R418	3.3K, RMG, 0603/1608, 1/16W, 5%	4723-332J+P	4
R419	560 OHM, RMG, 0603/1608, 1/16W, 5%	4723-561J+P	4
R420	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R421	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R423	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R424	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R425	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R426	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R427	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R428	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R429	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R430	75 OHM, RMG, 0603/1608, 1/16W, 5%	4723-750J+P	4
R431	3K, RMG, 0603/1608, 1/16W, 5%	4723-302J+P	4
R432	75 OHM, RMG, 0603/1608, 1/16W, 5%	4723-750J+P	4
R433	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R434	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R435	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R436	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R437	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R438	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R439	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R450	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R451	220 OHM, RMG, 0603/1608, 1/16W, 5%	4723-221J+P	4
R452	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R453	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R454	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R455	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R456	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R457	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R458	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R459	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R460	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R461	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R462	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R463	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R464	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R465	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R466	150 OHM, RMG, 0603/1608, 1/16W, 5%	4723-151J+P	4
R472	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R473	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R474	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R475	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R476	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R477	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R478	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R479	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R480	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R481	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R482	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R483	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R484	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R485	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R486	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R487	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R488	3.3K, RMG, 0603/1608, 1/16W, 5%	4723-332J+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R489	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R490	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R491	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R492	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R493	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R494	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R495	470 OHM, 0603/1608, RMG, 1/16W, 5%	4723-471J+P	4
R496	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R497	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R498	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R499	1M, RMG, 0603/1608, 1/16W, 5%	4723-105J+P	4

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C10A	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C10C	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C10D	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C350	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C351	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C352	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C353	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C354	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C355	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C356	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C357	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C358	120pF, CC, 0603/1608, 50V, 5%, 1X2	150F-121J+P-AC	4
C359	120pF, CC, 0603/1608, 50V, 5%, 1X2	150F-121J+P-AC	4
C360	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C361	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C362	120pF, CC, 0603/1608, 50V, 5%, 1X2	150F-121J+P-AC	4
C363	120pF, CC, 0603/1608, 50V, 5%, 1X2	150F-121J+P-AC	4
C364	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C365	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C366	120pF, CC, 0603/1608, 50V, 5%, 1X2	150F-121J+P-AC	4
C367	120pF, CC, 0603/1608, 50V, 5%, 1X2	150F-121J+P-AC	4
C368	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C369	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C370	120pF, CC, 0603/1608, 50V, 5%, 1X2	150F-121J+P-AC	4
C371	120pF, CC, 0603/1608, 50V, 5%, 1X2	150F-121J+P-AC	4
C372	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C373	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C374	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C375	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C377	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C378	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C379	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C381	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C382	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C383	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C384	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C385	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C386	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C387	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C388	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C389	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C390	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C391	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C392	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C393	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C394	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C395	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C396	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C397	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C398	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C399	1uF, CE, 50V, 20%, RLT, 5X11, SHOEI	157F-105M+K-IUI	4
C400	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C401	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C402	1500pF, CC, 0603/1608, 50V, 10%	150F-152K+P-AC	4
C403	6800pF, CC, 0603/1608, 50V, 10%, 1X2	150F-682K+P-AC	4
C404	680pF, CTC, 0603, 0/60, 5%	15CH-681J+P-AC	4
C405	680pF, CTC, 0603, 0/60, 5%	15CH-681J+P-AC	4
C406	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C407	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C409	1500pF, CC, 0603/1608, 50V, 10%	150F-152K+P-AC	4
C410	6800pF, CC, 0603/1608, 50V, 10%, 1X2	150F-682K+P-AC	4
C411	680pF, CTC, 0603, 0/60, 5%	15CH-681J+P-AC	4
C412	680pF, CTC, 0603, 0/60, 5%	15CH-681J+P-AC	4
C413	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C416	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C417	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C418	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C419	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C420	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C421	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C422	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C423	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C424	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C425	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C426	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C427	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C428	100uF, CE, 10V, 20%, R5, 5X11	157C-107M+K-IU	4
C429	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C430	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C431	0.022uF, CC, 0603, 50V, 10%, 332102235R1	150F-223K+P-AC	4
C432	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C433	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C434	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C435	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C436	0.047uF, CC, 0603, 50V, 10%, 1x2	150F-473K+P-AC	4
C437	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C438	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C439	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C440	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C441	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C442	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C443	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C444	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C445	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C446	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C447	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C448	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C449	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C450	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4
C451	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C453	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C454	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C455	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C456	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C457	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C460	4.7uF, CE, 50V, 20%, RLT, 5X11, SC	157F-475M+K-IUI	4
C461	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C462	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C463	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C464	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C465	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C466	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C467	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C468	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C469	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C470	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C471	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C472	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C473	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C474	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C475	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C476	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C477	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C478	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C479	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C480	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C481	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C482	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C483	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C484	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C485	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C486	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C487	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C488	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C489	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C490	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C491	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C492	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C493	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C495	30pF, CC, 0603, 50V, 5%	150F-300J+P-AC	4
C496	30pF, CC, 0603, 50V, 5%	150F-300J+P-AC	4
C497	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C498	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C499	10uF, CE, 16V, 20%, RLT, 5X11	157D-106M+K-IU	4

Inductors and Ferrite Beads

Reference Designator	Description	Vendor Part Number	Note
FB381	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB382	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB383	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB431	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB432	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L10A	CHOKE, COIL, 10uH, 0603, 20%	1801-100M+P	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
D381	LL4148, SM	4804-1480+3	4
D382	LL4148, SM	4804-1480+3	4
D383	LL4148, SM	4804-1480+3	4
D384	LL4148, SM	4804-1480+3	4
D385	LL4148, SM	4804-1480+3	4
D386	LL4148, SM	4804-1480+3	4
D387	LL4148, SM	4804-1480+3	4
D388	LL4148, SM	4804-1480+3	4
D389	LL4148, SM	4804-1480+3	4
D390	LL4148, SM	4804-1480+3	4
D391	LL4148, SM	4804-1480+3	4
D392	LL4148, SM	4804-1480+3	4
D393	LL4148, SM	4804-1480+3	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Diodes

Reference Designator	Description	Vendor Part Number	Note
D394	LL4148, SM	4804-1480+3	4
D395	LL4148, SM	4804-1480+3	4
D396	LL4148, SM	4804-1480+3	4
D431	LL4148, SM	4804-1480+3	4
D432	LL4148, SM	4804-1480+3	4
LED461	LED, 3MM, GREEN, SP	3700-2489+G	4

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
U381	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U382	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U383	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U384	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U385	A/D, 192KHZ, CS5361-KSZ, S01C24L	3132-0240+0	4
U386	A/D, 192KHZ, CS5361-KSZ, S01C24L	3132-0240+0	4
U387	24BIT DAC W/VOL CTRL, CS4392-KZZ, TSSOP, 20P	3132-0730+0	4
U388	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U389	NJM78L05A-T3#ZZZB, REGULATOR	3130-0640+0	4
U431	CS8416-CSZ, REV:D, DIGITAL RECEIVER, 28PIN	3132-0720+1	4
U432	SN74LV32ADR, QUAD 2-IN AND GATE, SOT108-1/SO14	3132-0700+0	4
U433	SN74LV245ADWR, OCTAL B TRANSCEIVER, SOT163-1/SO	3132-0680+0	4
U435	CS8406-CSZ, DIGITAL TRANSMITTER, SOIC28	3132-0710+0	4
U461	ADSP-21065LKSZ-240, 208 PIN MQFP	3132-0740+0	4
U462	PAGE-WRITE EEPROM, SST29VF020-70-4C-NHE, SST	3132-5661+0-31	4
U463	SN74LV08ADR, QUAD 2-IN AND GATE, SOT108-1/SO14	3132-0690+0	4

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
CN104B	JM24182-6P, WAFER	2101-9150+0	4
CN112B	JM24182-2P, WAFER	2101-9120+0	4
CN113B	JM24182-2P, WAFER	2101-9120+0	4
CN115B	JM24182-3P, WAFER	2101-9140+0	4
CN341B	JM24182-6P, WAFER	2101-9150+0	4
CN381A	JM24182-4P, WAFER	2101-9130+0	4
T431	PULSE XFMR, 225uH, 0.35 OHM, 1=1, 100K	1806-3670+0	4
T432	PULSE XFMR, 225uH, 0.35 OHM, 1=1, 100K	1806-3670+0	4
XTAL431	CRYSTAL, 12.288MHZ+/-20PPM, HCMOS/TTL OSCILLATOR	2300-3060+0	4
XTAL461	CRYSTAL, 30 MHZ, 49U TYPE	2300-2300+0	4

Electrical Part List

Microprocessor (MCU) PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R301	100 OHM, RMG, 0805, 1/10W, 5%	4720-101J+J	4
R302	100 OHM, RMG, 0805, 1/10W, 5%	4720-101J+J	4
R303	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R304	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R307	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R308	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R309	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R310	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R311	100 OHM, RCF, 1W, 5%, AL	4708-101J+1	4
R312	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R313	100K, RMG, 0805, 1/10W, 5%	4720-104J+J	4
R341	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R342	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R345	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R346	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R347	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R348	100 OHM, RMG, 0805, 1/10W, 5%	4720-101J+J	4
R349	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R350	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R351	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R352	1K, RMG, 0805, 1/10W, 5%	4720-102J+J	4
R353	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R354	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R355	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R356	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R357	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R358	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R359	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R360	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R361	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R362	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R363	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R364	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R365	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R366	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R367	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R368	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R369	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R370	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R371	1M RMG 0805 1/10W 5%	4720-105J+J	4
R372	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R373	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R374	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R375	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R376	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4

Electrical Part List

Microprocessor (MCU) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R377	1K, RMG, 0805, 1/10W, 5%	4720-102J+J	4
R378	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C301	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C302	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C303	10uF, CE, 25V, 20%, RLR, 4X7, ELNA	157E-106M+H-GMK	4
C304	10uF, CE, 25V, 20%, RLR, 4X7, ELNA	157E-106M+H-GMK	4
C307	4.7uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-475M+H-GMK	4
C308	4.7uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-475M+H-GMK	4
C311	47uF, CE, 25V, 20%, RL, 5x9	157E-476M+5-IQ	4
C312	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C313	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C314	47uF, CE, 25V, 20%, RL, 5x9	157E-476M+5-IQ	4
C315	4.7uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-475M+H-GMK	4
C317	4.7uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-475M+H-GMK	4
C319	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C320	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C321	47uF, CE, 25V, 20%, RL, 5x9	157E-476M+5-IQ	4
C322	47uF, CE, 25V, 20%, RL, 5x9	157E-476M+5-IQ	4
C323	100uF, CE, 10V, 20%, RL, 5X7	157C-107M+5-IM	4
C324	100uF, CE, 10V, 20%, RL, 5X7	157C-107M+5-IM	4
C325	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C326	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C327	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C328	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C329	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C330	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C331	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C332	10uF, CE, 25V, 20%, RLR, 4X7, ELNA	157E-106M+H-GMK	4
C334	1uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-105M+H-GME	4
C335	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C336	1uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-105M+H-GME	4
C337	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C338	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C339	0.047uF, CC, 0805, 50V, 10%, 1.5X2.5	150F-473K+J-BD	4
C340	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C341	30pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-300J+J-BD	4
C342	30pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-300J+J-BD	4
C343	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C344	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C345	33pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-330J+J-BD	4
C346	1000pF, CC, 0805, 50V, 5%, 1.25X2.0	150F-102J+J-BDM	4

Electrical Part List

Microprocessor (MCU) PCB Assembly

Ferrite Beads and Inductors

Reference Designator	Description	Vendor Part Number	Note
FB301	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB302	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB303	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB304	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB305	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L341	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L342	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L343	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
D341	LL4148, SM	4804-1480+3	4
D342	LL4148, SM	4804-1480+3	4
D343	LL4148, SM	4804-1480+3	4
D344	LL4148, SM	4804-1480+3	4
D345	LL4148, SM	4804-1480+3	4
D346	LL4148, SM	4804-1480+3	4
D347	LL4148, SM	4804-1480+3	4
D348	LL4148, SM	4804-1480+3	4

Transistors

Reference Designator	Description	Vendor Part Number	Note
Q301	2SC4081106R, SM, HFE180-390, ROHM	4860-2050+3	4
Q302	2SC4081106R, SM, HFE180-390, ROHM	4860-2050+3	4

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
U301	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U302	EVC, TC9459BFG, SOP28, TOSHIBA	3132-3631+0	4
U342	S3P8475XZZ-QZ85, OTP, 44-QFP, MICRO	3131-9920+0	4
U343	OPTOCOUPLER, CNY17G-2, TEMIC	8900-9550+0	4
U344	74HC00, QUAD, 2I/P NAND GATE, SOP	3131-9050+0	4
U345	74LCX125M, S01C	3132-0770+0	4

Electrical Part List

Microprocessor (MCU) PCB Assembly

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
CN103B	CONNECTOR, 5 PIN, P2.5, JST 05JQ-BT	2101-1371+0	4
CN108B	FEMALE-HEADER, P=2.54MM, H=8.4MM, 157-102-10	2101-1507+0	4
CN109B	FEMALE-HEADER, P=2.54MM, H=8.4MM, 157-102-10	2101-1507+0	4
CN110B	FEMALE-HEADER, P=2.54MM, H=8.4MM, 157-102-10	2101-1507+0	4
CN111B	FEMALE-HEADER, P=2.54MM, H=8.4MM, 157-102-10	2101-1507+0	4
CN114B	8 PIN, RIGHT ANGLE, WAFER, PITCH 2.5	2102-081R+004	4
CN119B	WAFER, 5 PIN, P2.5	2102-051R+004	4
CN120B	CONNECTOR, 5 PIN, P2.5, JST 05JQ-BT	2101-1371+0	4
CN341A	CONN ASSY, TWISTED PAIRS, P=2.5, L=200MM, 6P-1, F/M	7012-6510+1	4
CN381B	CONN ASSY, 4P, P=2.5, L=135MM, UL1007, #24, F/M	7012-6508+1	4
CN409B	8 PIN, RIGHT ANGLE, WAFER, PITCH 2.5	2102-081R+004	4
CN813B	WAFER, 2P, P2.5, RIGHT	2102-021R+004	4
X341	CRYSTAL, 12.000MHZ, HC-49U	2300-2010+0	4

Electrical Part List

Amplifier PCB Assembly, Part Number 306282

Resistors

Reference Designator	Description	Vendor Part Number	Note
R824	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R825	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R826	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R827	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R828	39K, 1206, RMG, 1/8W, 1%	4721-393A+6	4
R829	5.6K, 1206, RMG, 1/8W, 1%	4721-562A+6	4
R830	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R831	5.6K, 1206, RMG, 1/8W, 1%	4721-562A+6	4
R832	270K, 1206, RMG, 1/8W, 5%	4721-274J+6	4
R833	1K, 1206, RMG, 1/8W, 1%	4721-102A+6	4
R834	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R835	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R836	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R837	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R838	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R839	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R840	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R841	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R842	7.5 OHM, RWR, 5W, 5%, AT, MOF	474B-7R5J+2	4
R843	1K, 1206, RMG, 1/8W, 1%	4721-102A+6	4
R844	7.5 OHM, RWR, 5W, 5%, AT, MOF	474B-7R5J+2	4
R845	27K, 1206, RMG, 1/8W, 1%	4721-273A+6	4
R846	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R847	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R848	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R849	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R850	39K, 1206, RMG, 1/8W, 1%	4721-393A+6	4
R851	5.6K, 1206, RMG, 1/8W, 1%	4721-562A+6	4
R852	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R853	5.6K, 1206, RMG, 1/8W, 1%	4721-562A+6	4
R854	270K, 1206, RMG, 1/8W, 5%	4721-274J+6	4
R855	1K, 1206, RMG, 1/8W, 1%	4721-102A+6	4
R856	1K, 1206, RMG, 1/8W, 1%	4721-102A+6	4
R857	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R858	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R859	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R860	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R861	7.5 OHM, RWR, 5W, 5%, AT, MOF	474B-7R5J+2	4
R862	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R863	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R864	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R865	5.6 OHM, 1206, RMG, 1/8W, 1%	4721-5R6A+6	4
R866	7.5 OHM, RWR, 5W, 5%, AT, MOF	474B-7R5J+2	4
R867	27K, 1206, RMG, 1/8W, 1%	4721-273A+6	4
R869	3.9K, 1206, RMG, 1/8W, 1%	4721-392A+6	4
R870	51 OHM, RCF, 1/4W, 5%, AT	4705-510J+2	4

Electrical Part List

Amplifier PCB Assembly, Part Number 306282

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R877	22K, 1206, RMG, 1/8W, 5%	4721-223J+6	4
R878	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R879	3.9K, 1206, RMG, 1/8W, 1%	4721-392A+6	4
R880	47K, 1206, RMG, 1/8W, 5%	4721-473J+6	4
R881	47K, 1206, RMG, 1/8W, 5%	4721-473J+6	4
R882	22K, 1206, RMG, 1/8W, 5%	4721-223J+6	4
R883	47K, 1206, RMG, 1/8W, 5%	4721-473J+6	4
R884	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R885	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R886	47K, 1206, RMG, 1/8W, 5%	4721-473J+6	4
R887	47K, 1206, RMG, 1/8W, 5%	4721-473J+6	4
R888	22K, 1206, RMG, 1/8W, 5%	4721-223J+6	4
R889	47K, 1206, RMG, 1/8W, 5%	4721-473J+6	4
R890	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R891	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R892	10K, 1206, RMG, 1/8W, 5%	4721-103J+6	4
R895	3.9K, 1206, RMG, 1/8W, 1%	4721-392A+6	4
R896	2.2K, 1206, RMG, 1/8W, 1%	4721-222A+6	4
R897	3.9K, 1206, RMG, 1/8W, 1%	4721-392A+6	4
R898	2.2K, 1206, RMG, 1/8W, 1%	4721-222A+6	4
R900	39K, 1206, RMG, 1/8W, 1%	4721-393A+6	4
R901	39K, 1206, RMG, 1/8W, 1%	4721-393A+6	4
R902	51 OHM, RCF, 1/4W, 5%, AT	4705-510J+2	4
R904	47K, 1206, RMG, 1/8W, 5%	4721-473J+6	4
R905	47K, 1206, RMG, 1/8W, 5%	4721-473J+6	4

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C852	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C853	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C854	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C855	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C856	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C857	1000uF, CE, 35V, 20%, 105C, RL, 12.5X25MM, PS TYPE, NIC	157Q-108M+5-X&TC	4
C858	1000uF, CE, 35V, 20%, 105C, RL, 12.5X25MM, PS TYPE, NIC	157Q-108M+5-X&TC	4
C859	0.1uF, CC, 1206, 100V, 20%	150H-104M+6-CF	4
C860	0.1uF, CC, 1206, 100V, 20%	150H-104M+6-CF	4
C861	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C862	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C863	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C864	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C865	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C866	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4

Electrical Part List

Amplifier PCB Assembly, Part Number 306282

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C867	1uF, CM, 63V, 5%, HMFS-5, RLT, 6.8X10.5, P=5MM, METALLIZD	153I-105J+K-MTM	4
C868	1uF, CM, 63V, 5%, HMFS-5, RLT, 6.8X10.5, P=5MM, METALLIZD	153I-105J+K-MTM	4
C869	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C870	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C871	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C872	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C873	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C874	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C875	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C876	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C877	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C878	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C879	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C880	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C881	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C882	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C883	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C884	0.015uF, CC, 0805, 50V, 20%, 1.2x2.0	150F-153M+J-BD	4
C885	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C886	0.015uF, CC, 0805, 50V, 20%, 1.2x2.0	150F-153M+J-BD	4
C887	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C888	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C889	0.33uF, CM, 63V, 5%, RBT, 7.5X6.5	153I-334J+V-NL	4
C890	1uF, CM, 63V, 5%, HMFS-5, RLT, 6.8X10.5, P=5MM, METALLIZD	153I-105J+K-MTM	4
C891	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C892	0.015uF, CC, 0805, 50V, 20%, 1.2x2.0	150F-153M+J-BD	4
C893	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C894	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C895	0.015uF, CC, 0805, 50V, 20%, 1.2x2.0	150F-153M+J-BD	4
C896	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C897	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C898	0.33uF, CM, 63V, 5%, RBT, 7.5X6.5	153I-334J+V-NL	4
C899	1uF, CM, 63V, 5%, HMFS-5, RLT, 6.8X10.5, P=5MM, METALLIZD	153I-105J+K-MTM	4
C900	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C901	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C902	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C903	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C905	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C906	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C907	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C908	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4

Electrical Part List

Amplifier PCB Assembly, Part Number 306282

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C909	1000uF, CE, 35V, 20%, 105C, RL, 12.5X25MM, PS TYPE, NIC	157Q-108M+5-X&TC	4
C910	1000uF, CE, 35V, 20%, 105C, RL, 12.5X25MM, PS TYPE, NIC	157Q-108M+5-X&TC	4
C911	0.1uF, CC, 1206, 100V, 20%	150H-104M+6-CF	4
C912	0.1uF, CC, 1206, 100V, 20%	150H-104M+6-CF	4
C913	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C914	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C915	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C916	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C917	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C918	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C919	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C920	1uF, CM, 63V, 5%, HMFS-5, RLT, 6.8X10.5, P=5MM, METALLIZD	153I-105J+K-MTM	4
C921	1uF, CM, 63V, 5%, HMFS-5, RLT, 6.8X10.5, P=5MM, METALLIZD	153I-105J+K-MTM	4
C922	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C923	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C924	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C925	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C926	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C927	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C928	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C929	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C930	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C931	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C932	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C933	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C934	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C935	47uF, CE, 63V, 20%, RLT, 8x11.5	157I-476M+K-OV	4
C936	0.22uF, CC, 1206, 100V, Y5V, +/-20%	150H-224M+6-CF	4
C937	0.015uF, CC, 0805, 50V, 20%, 1.2x2.0	150F-153M+J-BD	4
C938	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C939	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C940	0.015uF, CC, 0805, 50V, 20%, 1.2x2.0	150F-153M+J-BD	4
C941	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C942	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C943	0.33uF, CM, 63V, 5%, RBT, 7.5X6.5	153I-334J+V-NL	4
C944	1uF, CM, 63V, 5%, HMFS-5, RLT, 6.8X10.5, P=5MM, METALLIZD	153I-105J+K-MTM	4
C945	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C946	0.015uF, CC, 0805, 50V, 20%, 1.2x2.0	150F-153M+J-BD	4
C947	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C948	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C949	0.015uF, CC, 0805, 50V, 20%, 1.2x2.0	150F-153M+J-BD	4

Electrical Part List

Amplifier PCB Assembly, Part Number 306282

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C950	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C951	560pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-561K+J-BD	4
C952	0.33uF, CM, 63V, 5%, RBT, 7.5X6.5	153I-334J+V-NL	4
C953	1uF, CM, 63V, 5%, HMFS-5, RLT, 6.8X10.5, P=5MM, METALLIZD	153I-105J+K-MTM	4
C954	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C957	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C959	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C960	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C961	10uF, CE, 50V, 20%, RLT, 5X11	157F-106M+K-IU	4
C962	2.2uF, CE, 50V, 20%, RLT, 5X11	157F-225M+K-IU	4
C964	220uF, CE, 16V, 20%, RLT, 6.3X11, SC, SHOEI	157D-227M+K-LUI	4
C965	220uF, CE, 16V, 20%, RLT, 6.3X11, SC, SHOEI	157D-227M+K-LUI	4
C967	0.1uF, CC, 1206, 100V, 20%	150H-104M+6-CF	4
C968	0.1uF, CC, 1206, 100V, 20%	150H-104M+6-CF	4
C972	1000pF, CC, 50V, T-10%, 5X5, RLT, 335321025T	150F-102K+K-II	4
C973	1000pF, CC, 50V, T-10%, 5X5, RLT, 335321025T	150F-102K+K-II	4
C974	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C975	1000pF, CC, 50V, T-10%, 5X5, RLT, 335321025T	150F-102K+K-II	4
C976	1000pF, CC, 50V, T-10%, 5X5, RLT, 335321025T	150F-102K+K-II	4
C977	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4

Inductors and Ferrite Beads

Reference Designator	Description	Vendor Part Number	Note
L811	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L812	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L813	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L814	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L815	POWER INDUCTOR, 5.6A, DC, 27uH, +/20%, RCR1616-270M	1806-3639+0	4
L816	POWER INDUCTOR, 5.6A, DC, 27uH, +/20%, RCR1616-270M	1806-3639+0	4
L817	POWER INDUCTOR, 5.6A, DC, 27uH, +/20%, RCR1616-270M	1806-3639+0	4
L818	POWER INDUCTOR, 5.6A, DC, 27uH, +/20%, RCR1616-270M	1806-3639+0	4
L819	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L821	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L822	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L823	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L824	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4

Electrical Part List

Amplifier PCB Assembly, Part Number 306282

Inductors and Ferrite Beads

Reference Designator	Description	Vendor Part Number	Note
L825	POWER INDUCTOR, 5.6A, DC, 27uH, +/20%, RCR1616-270M	1806-3639+0	4
L826	POWER INDUCTOR, 5.6A, DC, 27uH, +/20%, RCR1616-270M	1806-3639+0	4
L827	POWER INDUCTOR, 5.6A, DC, 27uH, +/20%, RCR1616-270M	1806-3639+0	4
L828	POWER INDUCTOR, 5.6A, DC, 27uH, +/20%, RCR1616-270M	1806-3639+0	4
L829	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
D805	LL4148, SM	4804-1480+3	4
D806	LL4148, SM	4804-1480+3	4
D807	LL4148, SM	4804-1480+3	4
D808	LL4148, SM	4804-1480+3	4
D809	LL4148, SM	4804-1480+3	4
D810	LL4148, SM	4804-1480+3	4
D811	LL4148, SM	4804-1480+3	4
D812	LL4148, SM	4804-1480+3	4
D814	LL4148, SM	4804-1480+3	4
D815	LL4148, SM	4804-1480+3	4
DZ802	ZENER, 5.45-5.73V, 1/2W, ROHM, AT, MTZJ5.6B	4837-5B61+2	4
DZ803	ZENER, 5.45-5.73V, 1/2W, ROHM, AT, MTZJ5.6B	4837-5B61+2	4
DZ805	ZENER, 21.52~22.63V, 1/2W, ROHM, AT, MTZJT-7222D	4837-22D1+2	4
DZ806	ZENER, 21.52~22.63V, 1/2W, ROHM, AT, MTZJT-7222D	4837-22D1+2	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
Q803	KTC3875Y	4853-875Y+3	4
Q804	KTC3875Y	4853-875Y+3	4
Q805	KTA1504Y	4851-504Y+3	4
Q806	KTC3875Y	4853-875Y+3	4
Q807	KTA1504Y	4851-504Y+3	4
Q810	KTC3875Y	4853-875Y+3	4
Q811	SS8050, C/D, RLT	4860-0050+K	4
Q812	KTC3875Y	4853-875Y+3	4
Q813	SS8050, C/D, RLT	4860-0050+K	4

Electrical Part List

Amplifier PCB Assembly, Part Number 306282

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
U804	TDA8927J/N1, 2X80W, DIG POWER STAGE, PHILIPS	3131-8830+0	4
U805	TDA8927J/N1, 2X80W, DIG POWER STAGE, PHILIPS	3131-8830+0	4
U806	TDA8929T/N1, DIGITAL CONTROLLER, PHILIPS	3131-8840+0	4
U807	TDA8927J/N1, 2X80W, DIG POWER STAGE, PHILIPS	3131-8830+0	4
U808	TDA8927J/N1, 2X80W, DIG POWER STAGE, PHILIPS	3131-8830+0	4
U809	TDA8929T/N1, DIGITAL CONTROLLER, PHILIPS	3131-8840+0	4

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
/L830	PLASTIC CABLE TIE 97MM	6360-0011+0	4
/L831	PLASTIC CABLE TIE 97MM	6360-0011+0	4
/L832	PLASTIC CABLE TIE 97MM	6360-0011+0	4
/U802	SCREW, M3X10, W/S&F, WASHER, BLK	2900-3010+3030	4
/U804	WASHER, SPRING, M3X0.9X5.5, BZ	2607-3009+0553	4
/U804	SCREW, MACHINE, PAN, M3X8, CROSS-RECESS, BZ	2900-3008+3000	4
/U804	INSULATION SHEET FOR IC	3100-6591+0	4
/U804	HEATSINK, BS061C	5400-3785+1	4
/U805	SCREW, M3X10, W/S&F, WASHER, BLK	2900-3010+3030	4
/U805	INSULATION SHEET FOR IC	3100-6591+0	4
/U807	WASHER, SPRING, M3X0.9X5.5, BZ	2607-3009+0553	4
/U807	SCREW, MACHINE, PAN, M3X8, BZ	2900-3008+3000	4
/U807	SCREW, M3X10, W/S&F, WASHER, BLK	2900-3010+3030	4
/U807	INSULATION SHEET FOR IC	3100-6591+0	4
/U807	HEATSINK, BS061C	5400-3785+1	4
/U808	SCREW, M3X10, W/S&F, WASHER, BLK	2900-3010+3030	4
/U808	INSULATION SHEET FOR IC	3100-6591+0	4
CN802A	HEADER, 4P, P=5MM, VERT MNT, 9090-4V	2101-1380+0	4
CN805A	CONN ASSY, 2P, P=2.5, #26, UL1533, L=600MM, BLACK, F/M	7012-6512+0	4
CN806A	HEADER, 4P, P=5MM, VERT MNT, 9090-4V	2101-1380+0	4
CN807A	CONN ASSY, 4P, P=5.08, #20, L=300MM, W&B, W/JS-1114-04	7012-6791+0	4
CN809A	CONN ASSY, 2P, P=2.5, #26, UL1533, L=650MM, GREY, F/M	7012-6653+0	4
CN810A	HEADER, 4P, P=5MM, VERT MNT, 9090-4V	2101-1380+0	4
CN811A	SPK, TWIN WIRE, BLUE, #16, L=670MM, W/NVAR-02VS, P=7	7012-6652+1	4
CN812A	WAFER, JM24182-3P	2101-9140+0	4
CN813A	CONN ASSY, 2P, P=2.5, L=450MM, UL1007, #26, F/M	7012-6515+0	4

Electrical Part List

Amplifier PCB Assembly, Part Number 312945

Resistors

Reference Designator	Description	Vendor Part Number	Note
R801	10 OHM, RMG, 1206, 1/8W, 5%	4721-100J+6	4
R802	10 OHM, RMG, 1206, 1/8W, 5%	4721-100J+6	4
R803	3.9K, RMG, 0805, 1/10W, 5%	4720-392J+J	4
R804	3.9K, RMG, 0805, 1/10W, 5%	4720-392J+J	4
R805	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R806	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R807	5.6K, RMG, 0805, 1/10W, 5%	4720-562J+J	4
R808	5.6K, RMG, 0805, 1/10W, 5%	4720-562J+J	4
R809	30K, RMG, 0805, 1/10W, 5%	4720-303J+J	4
R810	39K, RMG, 0805, 1/10W, 5%	4720-393J+J	4
R811	51 OHM, RCF, 1/4W, AT, 5%	4705-510J+2	4
R812	39K, RMG, 0805, 1/10W, 5%	4720-393J+J	4
R813	3.9K, RMG, 0805, 1/10W, 5%	4720-392J+J	4
R814	2.2K, RMG, 0805, 1/10W, 5%	4720-222J+J	4
R815	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R816	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R817	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R818	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R819	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R820	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R821	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R822	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R823	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R824	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R825	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R826	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R827	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R828	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R829	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R830	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R831	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R832	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R833	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R834	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R835	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R836	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R837	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R838	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R839	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R840	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R841	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R842	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R843	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R844	10 OHM, RMG, 0805, 1/10W, 5%	4720-100J+J	4
R845	1K, RMG, 1206, 1/8W, 5%	4721-102J+6	4
R846	1K, RMG, 1206, 1/8W, 5%	4721-102J+6	4

Electrical Part List

Amplifier PCB Assembly, Part Number 312945

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R847	7.5 OHM, RWR, 5W, 5%, AT, MOF	474B-7R5J+2	4
R848	7.5 OHM, RWR, 5W, 5%, AT, MOF	474B-7R5J+2	4
R849	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R850	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R851	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R852	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R853	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R854	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R855	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R856	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R857	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R858	10 OHM, RMG, 1206, 1/4W, 5%	4725-100J+6	4
R860	10K, RMG, 0805, 1/10W, 5%	4720-103J+J	4
R861	15K, RMG, 0805, 1/10W, 5%	4720-153J+J	4
R901B	56K, RMG, 0805, 1/10W, 5%	4720-563J+J	4

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C801	1000uF, CE, 35V, 105C, 20%	157Q-108M+5-X&TC	4
C802	1000uF, CE, 35V, 105C, 20%	157Q-108M+5-X&TC	4
C803	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C804	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C805	220uF, CE, 35V, RLT, 8x11, 20%	157Q-227M+K-OV	4
C806	220uF, CE, 35V, RLT, 8x11, 20%	157Q-227M+K-OV	4
C807	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C808	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C809	330pF, CC, 0805, 50V, 10%	150F-331K+J-BD	4
C810	330pF, CC, 0805, 50V, 10%	150F-331K+J-BD	4
C813	1uF, CP, 63V, RLT, P5.0, 5%	158I-105J+K-MS	4
C814	1uF, CP, 63V, RLT, P5.0, 5%	158I-105J+K-MS	4
C815	150pF, CC, 0805, 50V, 10%	150F-151K+J-BD	4
C816	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C817	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C818	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C819	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C820	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C821	2.2uF, CE, 50V, RLT, 4X5, 20%	157F-225M+K-GII	4
C822	0.22uF, CC, 0805, 50V, 10%	150F-224K+J-BD	4
C823	220uF, CE, 35V, RLT, 8x11, 20%	157Q-227M+K-OV	4
C824	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C825	330pF, CC, 0805, 50V, 10%	150F-331K+J-BD	4
C826	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C827	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C828	33uF, CE, 63V, RLT, P5.0, 20%	157I-336M+K-LUR	4
C829	33uF, CE, 63V, RLT, P5.0, 20%	157I-336M+K-LUR	4
C830	0.1uF, CC, 1206, 100V, 10%	150H-104K+6-CF	4

Electrical Part List

Amplifier PCB Assembly, Part Number 312945

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C831	0.1uF, CC, 1206, 100V, 10%	150H-104K+6-CF	4
C832	0.1uF, CC, 1206, 100V, 10%	150H-104K+6-CF	4
C833	0.1uF, CC, 1206, 100V, 10%	150H-104K+6-CF	4
C834	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C835	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C836	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C837	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C838	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C839	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C840	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C841	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C842	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C843	100pF, CC, 0805, 100V, 10%	150H-101K+J-BD	4
C844	100pF, CC, 0805, 100V, 10%	150H-101K+J-BD	4
C845	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C846	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C847	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C848	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C849	100pF, CC, 0805, 100V, 10%	150H-101K+J-BD	4
C850	100pF, CC, 0805, 100V, 10%	150H-101K+J-BD	4
C851	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C852	100pF, CC, 0805, 100V, 10%	150H-101K+J-BD	4
C853	100pF, CC, 0805, 100V, 10%	150H-101K+J-BD	4
C854	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C855	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C856	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C857	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C858	100pF, CC, 0805, 100V, 10%	150H-101K+J-BD	4
C859	100pF, CC, 0805, 100V, 10%	150H-101K+J-BD	4
C860	470uF, CE, 35V, RLT, 20%	157Q-477M+K-S9RT	4
C861	470uF, CE, 35V, RLT, 20%	157Q-477M+K-S9RT	4
C862	470uF, CE, 35V, RLT, 20%	157Q-477M+K-S9RT	4
C863	470uF, CE, 35V, RLT, 20%	157Q-477M+K-S9RT	4
C864	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C865	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C866	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C867	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C868	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C869	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C870	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C871	0.1uF, CC, 0805, 50V, 20%	150F-104M+J-BD	4
C872	0.68uF, CP, 63V, RLT, P5.0, 5%	158I-684J+K-LP	4
C873	0.68uF, CP, 63V, RLT, P5.0, 5%	158I-684J+K-LP	4
C874	0.68uF, CP, 63V, RLT, P5.0, 5%	158I-684J+K-LP	4
C875	0.68uF, CP, 63V, RLT, P5.0, 5%	158I-684J+K-LP	4
C876	0.47uF, CP, 63V, RLT, P5.0, 5%	158I-474J+K-LP	4

Electrical Part List

Amplifier PCB Assembly, Part Number 312945

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C877	0.47uF, CP, 63V, RLT, P5.0, 5%	158I-474J+K-LP	4
C878	2.2uF, CE, 50V, RLT, 4X5, 20%	157F-225M+K-GII	4
C879	10uF, CE, 50V, RLT, 4X7, 20%	157F-106M+K-GM	4
C880	0.1uF, CC, 0805, 50V, 10%	150F-104K+J-BD	4
C901B	10uF, CE, 25V, RLT, P5.0, 20%	157E-106M+K-IUE	4

Inductors

Reference Designator	Description	Vendor Part Number	Note
L801	FERRITE BEAD, INDUCTOR	1808-0680+0	4
L802	FERRITE BEAD, INDUCTOR	1808-0680+0	4
L803	FERRITE BEAD, INDUCTOR	1808-0680+0	4
L804	FERRITE BEAD, INDUCTOR	1808-0680+0	4
L805	FERRITE COIL, 22uH, 20%	1807-220M+9	4
L806	FERRITE COIL, 22uH, 20%	1807-220M+9	4
L807	FERRITE COIL, 22uH, 20%	1807-220M+9	4
L808	FERRITE COIL, 22uH, 20%	1807-220M+9	4
L809	INDUCTOR, 4.7uH, 0805, 10%	1803-0104+0	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
D801	LL4148, SM	4804-1480+3	4
D802	LL4148, SM	4804-1480+3	4
D803	LL4148, SM	4804-1480+3	4
D804	LL4148, SM	4804-1480+3	4
D805	LL4148, SM	4804-1480+3	4
D806	LL4148, SM	4804-1480+3	4
D807	LL4148, SM	4804-1480+3	4
D808	LL4148, SM	4804-1480+3	4
DZ801	ZENER, 1/2W, 5.6V, SMD	4837-5V69+3	4
DZ802	ZENER, 1/2W, 22V, RLZTE-1122D	4837-22D1+3	4
DZ803	ZENER, 1/2W, 22V, RLZTE-1122D	4837-22D1+3	4

Transistors

Reference Designator	Description	Vendor Part Number	Note
Q801	SS8050, C/D, RLT	4860-0050+K	4
Q802	KTC3875Y	4853-875Y+3	4
Q803	KTC3875Y	4853-875Y+3	4
Q804	KTC3875Y	4853-875Y+3	4
Q805	KTA1504Y	4851-504Y+3	4
Q806	KTA1504Y	4851-504Y+3	4

Electrical Part List

Amplifier PCB Assembly, Part Number 312945

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
U801	TDA8929T/N1, DIGITAL	3131-8840+0	4
U802	CLASS D PWR COMPARATOR	3132-2991+0	4
U803	CLASS D PWR COMPARATOR	3132-2991+0	4

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
CN805A	CONN ASSY, 2P, P=2.5, #26	7012-6512+0	4
CN806A	HEADER, 4P, P=5MM, VERTICAL	2101-1380+0	4
CN807A	WIRE, 4P, P5.08, #20, UL1007	7012-6791+1	4
CN809A	CONN ASSY, 2P, P=2.5, #26	7012-6653+0	4
CN810A	HEADER, 4P, P=5MM, VERTICAL	2101-1380+0	4
CN811A	SPK, TWIN WIRE, BLUE, #16	7012-6652+1	4
CN812A	WAFER, JM24182-3P	2101-9140+0	4
CN813A	CONN ASSY, 2P, P=2.5	7012-6515+0	4
HEATSINK	INSULATION SHEET	3100-7421+0	4
HEATSINK	HEATSINK, CLASS D AMP	5401-0031+0	4
HEATSINK TO	MICA SHEET INSULATOR	3100-6701+0	4
AMP IC	CLIP-IC, STEEL	4135-6021+0	4
IC clip	M3X10MM, YELLOW ZN	2904-3010+0000	4
SCREW	SCREW, PH, M3X6	2900-3006+4000	4
SCREW	SCREW, M3X10, W/S&F	2900-3010+3030	4
WASHER	I/T, WASHER, M3X0.5X6.4, WZ	2606-3005+0642	4

Electrical Part List

27 Volt Switch-Mode Power Supply PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R503	8.2K, RCF, 1/4W, 5%, AT	4705-822J+2	4
R504	1K, RCF, 1/4W, 5%, AT	4705-102J+2	4
R505	1K, RCF, 1/4W, 5%, AT	4705-102J+2	4
R506	12K, RCF, 1/4W, 5%, AT	4705-123J+2	4
R507	51 OHM, RCF, 1/4W, 5%, AT	4705-510J+2	4
R508	51 OHM, RCF, 1/4W, 5%, AT	4705-510J+2	4
R509	51 OHM, RCF, 1/4W, 5%, AT	4705-510J+2	4
R510	51 OHM, RCF, 1/4W, 5%, AT	4705-510J+2	4
R511	100 OHM, RMF, 2W, 5%, ATS, METAL OXIDE	4719-101J+C-X	3,4 ⚠
R512	47 OHM, RMF, 2W, 5%, ATS, METAL OXIDE	4719-470J+C-X	3,4 ⚠
R513	47 OHM, RMF, 2W, 5%, ATS, METAL OXIDE	4719-470J+C-X	3,4 ⚠
R514	680 OHM, RMF, 1/4W, 1%, AT	4715-681A+2	4
R515	470 OHM, RCF, 1/4W, 5%, AT	4705-471J+2	4
R516	47K, RCF, 1/4W, 5%, AT	4705-473J+2	4
R517	33 OHM, RMF, 1/4W, 1%, AT	4715-330A+2	4
R518	750 OHM, RCF, 1W, 5%, AT	4708-751J+2	3,4 ⚠
R519	240 OHM, RCF, 1/4W, 5%, AT	4705-241J+2	4
R520	47 OHM, RMF, 1/4W, 1%, AT	4715-470A+2	4
R521	39K, RCF, 1/4W, 5%, AT	4705-393J+2	4
R522	3K, RCF, 1/4W, 5%, AT	4705-302J+2	4
R523	12K, RCF, 1/4W, 5%, AT	4705-123J+2	4
R524	47K, RCF, 1/4W, 5%, AT	4705-473J+2	4
R525	200K, RCF, 1/4W, 5%, AT	4705-204J+2	4
R526	12K, RCF, 1/4W, 5%, AT	4705-123J+2	4
R527	12K, RCF, 1/4W, 5%, AT	4705-123J+2	4
R528	47 OHM, RMF, 2W, 5%, ATS, METAL OXIDE	4719-470J+C-X	3,4 ⚠
R529	47 OHM, RMF, 2W, 5%, ATS, METAL OXIDE	4719-470J+C-X	3,4 ⚠
R530	22K, RMF, 1/4W, 1%, AT	4715-223A+2	4
R531	4.7K, RCF, 1/4W, 5%, AT	4705-472J+2	4
R532	47K, RCF, 1/4W, 5%, AT	4705-473J+2	4
R533	470 OHM, RCF, 1/2W, 5%, AT	4707-471J+2	4

Electrical Part List

27 Volt Switch-Mode Power Supply PCB Assembly

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C501	100pF, CC, 1000V, 10%, RLT, 6X3	150N-101K+K-KE	4
C502	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C503	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C504	2200uF, CE, 35V, 20%, 105C, RL, 16X31.5MM, LESR, PS, NIC	157Q-228M+5-5$TC	4
C505	2200uF, CE, 35V, 20%, 105C, RL, 16X31.5MM, LESR, PS, NIC	157Q-228M+5-5$TC	4
C506	2200uF, CE, 35V, 20%, 105C, RL, 16X31.5MM, LESR, PS, NIC	157Q-228M+5-5$TC	4
C507	22uF, CE, 400V, 20%, 105C, RL, 13x25, SRH	157T-226M+5-Y&T	4
C508	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C510	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C511	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C512	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C513	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C514	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C515	0.015uF, CM, 50V, 5%, RLT, 7.5X11.5	153F-153J+K-NVN	4
C516	0.01uF, CC, 50V, 10%, RLT, 5x5	150F-103K+K-II	4
C517	2200pF, CC, 50V, 10%, RLT, 5X5	150F-222K+K-II	4
C518	0.001uF, CM, 100V, 5%, RLT, 5X 9	153H-102J+K-IQ	4
C519	1uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-105M+H-GME	4
C520	100uF, CE, 50V, 20%, RLT, 8X12	157F-107M+K-OW	4
C522	2200uF, CE, 35V, 20%, 105C, RL, 16X31.5MM, LESR, PS, NIC	157Q-228M+5-5$TC	4
C523	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C524	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C525	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4

Ferrite Beads and Inductors

Reference Designator	Description	Vendor Part Number	Note
+/-27V	FERR BEAD, B15, RH, 12X15X, 7.3MM	1808-0750+0	4
D503	FERR BEAD, D3.5XH3, 43120203106, 1-P044	1808-9080+0	4
D504	FERR BEAD, D3.5XH3, 43120203106, 1-P044	1808-9080+0	4
FB513	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L501	CHOKE, O/P, S106-157A, LE-T27F	1806-3667+1	4
Q501	FERR BEAD, D3.5XH3, 43120203106, 1-P044	1808-9080+0	4
Q502	FERR BEAD, D3.5XH3, 43120203106, 1-P044	1808-9080+0	4
Q503	FERR BEAD, D3.5XH3, 43120203106, 1-P044	1808-9080+0	4
Q504	FERR BEAD, D3.5XH3, 43120203106, 1-P044	1808-9080+0	4

Electrical Part List

27 Volt Switch-Mode Power Supply PCB Assembly

Diodes

Reference Designator	Description	Vendor Part Number	Note
D501	RECTIFIER, UF4006-TGI, AT	4840-8530+2	4
D502	RECTIFIER, UF4006-TGI, AT	4840-8530+2	4
D503	MUR2020CTPBF, ULTRAFAST RECTIFIER, 20A, 200V, RL	480Y-B320+5	4
D504	MUR2020CTPBF, ULTRAFAST RECTIFIER, 20A, 200V, RL	480Y-B320+5	4
D505	1N4148TA, NS	4840-8060+2	4
D506	1N4148TA, NS	4840-8060+2	4
D507	1N4148TA, NS	4840-8060+2	4
D508	1N4148TA, NS	4840-8060+2	4
D509	RECTIFIER, UF4003-TGI, AT	4840-8520+2	4
D510	1N4148TA, NS	4840-8060+2	4
D511	1N4148TA, NS	4840-8060+2	4
D512	1N4148TA, NS	4840-8060+2	4
D513	1N4148TA, NS	4840-8060+2	4
D514	1N4148TA, NS	4840-8060+2	4
D515	1N4148TA, NS	4840-8060+2	4
SCR501	SCR, MCR100-6600V, 0.8A, MCR100-6RLRAG, RLT	4840-1700+K	4
Z501	ZENER, 1/2W, 18V, TEMIC, AT	4837-18V6+2	4
Z502	ZENER, 1/2W, 18V, TEMIC, AT	4837-18V6+2	4
Z503	ZENER, 1/2W, 18V, TEMIC, AT	4837-18V6+2	4
Z504	ZENER, 1/2W, 18V, TEMIC, AT	4837-18V6+2	4
Z505	ZENER, 1/2W, 18V, TEMIC, AT	4837-18V6+2	4
Z506	ZENER, 1/2W, 30V, 5%, TEMIC, AT	4837-30V6+2	4

Transistors

Reference Designator	Description	Vendor Part Number	Note
Q501	FET, IRF840PBF, IR	4860-8950+0	4
Q502	FET, IRF840PBF, IR	4860-8950+0	4
Q503	FET, IRF840PBF, IR	4860-8950+0	4
Q504	FET, IRF840PBF, IR	4860-8950+0	4
Q505	2N3904TA, RLT	4853-9040+K	4
Q506	2N3904TA, RLT	4853-9040+K	4
Q507	2N3906, RLT, TO92, PHILIPS	4860-2390+K	4
Q508	2N3906, RLT, TO92, PHILIPS	4860-2390+K	4

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
IC501	UC2842BN, DIP, 8PIN, ST, PWM CONTROLLER	3132-1210+1	4

Electrical Part List

27 Volt Switch-Mode Power Supply PCB Assembly

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
/D503	B-TITE, 3X14MM, BLK, ZN	2954-3014+3000	4
/D503	MICA T-400, T03P, 25X20M, TO-3P	3100-8050+0	4
/D503	IC PRESSURE BKT	4135-4401+0	4
/D504	WASHER, METAL, M3X0.5X8, NI	2600-3005+0804	4
/D504	SCREW, B-TITE, PH, M3X8MM, YZ, CROSS W/ WASHER	2950-3008+0020	4
/PCB	SCREW, M3X10, W/S&F, WASHER, BLK	2900-3010+3030	4
/Q501	WASHER, SPRING, M3X0.9X5.5, BZ	2607-3009+0553	4
/Q501	B-TITE, 3X14MM, BLK, ZN	2954-3014+3000	4
/Q501	MICA T-400, T03P, 25X20M, TO-3P	3100-8050+0	4
/Q501	IC PRESSURE BKT	4135-4401+0	4
/Q502	WASHER, SPRING, M3X0.9X5.5, BZ	2607-3009+0553	4
/Q502	B-TITE, 3X14MM, BLK, ZN	2954-3014+3000	4
/Q502	MICA T-400, T03P, 25X20M, TO-3P	3100-8050+0	4
/Q502	IC PRESSURE BKT	4135-4401+0	4
/Q503	WASHER, SPRING, M3X0.9X5.5, BZ	2607-3009+0553	4
/Q503	B-TITE, 3X14MM, BLK, ZN	2954-3014+3000	4
/Q503	MICA T-400, T03P, 25X20M, TO-3P	3100-8050+0	4
/Q503	IC PRESSURE BKT	4135-4401+0	4
/Q504	WASHER, SPRING, M3X0.9X5.5, BZ	2607-3009+0553	4
/Q504	B-TITE, 3X14MM, BLK, ZN	2954-3014+3000	4
/Q504	MICA T-400, T03P, 25X20M, TO-3P	3100-8050+0	4
/Q504	IC PRESSURE BKT	4135-4401+0	4
/TH501	WASHER, METAL, M3X0.5X8, NI	2600-3005+0804	4
/TH501	SCREW, B-TITE, PH, M3X8MM, YZ, CROSS W/ WASHER	2950-3008+0020	4
+/-27V	SHRINKAGE TUBE, ID=14MM	1660-0630+0	4
+/-27V	CONN, WIRE, UL1007, #18, W/4POLE TERMINAL, L=270MM	7012-6639+0	4
CN501	TERMINAL PIN, 250TAP, T=0.4MM, NICKEL, UL/JMT	4135-4351+0	4
CN502	TERMINAL PIN, 250TAP, T=0.4MM, NICKEL, UL/JMT	4135-4351+0	4
CN503	JM24182-4P, WAFER	2101-9130+0	4
CN605/CN613	CONN, WIRE, UL1015, #18, BK/RD, W/250, FEMALE, L=470MM	7012-6637+0	4
CN607/2CN501	CONN, WIRE, UL1015, #18, BK/RD, W/250, FEMALE, L=700MM	7012-6634+0	4
CN609/3CN501	CONN, WIRE, UL1015, #18, BK/RD, W/250, FEMALE, L=840MM	7012-6635+0	4
DAMP O/P WIR	SHRINKAGE TUBE, ID=25mm, UL/CSA	1660-1100+0	4
DAMP O/P WIR	CLAMP CORE FOR EMI/RFI SUPPRESSOR, ZCAT1518-0730	1808-0170+0	4
HS501	PC SHEET, 14X350X0.5 THK, NACDC521B+05CSD7	4154-1401+0	4
HS501	HEATSINK-1	5400-3782+0	4

Electrical Part List

27 Volt Switch-Mode Power Supply PCB Assembly

Miscellaneous (continued)

Reference Designator	Description	Vendor Part Number	Note
HS502	HEATSINK-2	5400-3783+0	4
JP501	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP502	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP503	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP504	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP505	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP506	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP507	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
T501	TT-9972, GATE DRIVER TRANSFORMER	1806-2372+0	3,4 ⚠
T502	CURRENT TRANSFORMER	1806-3668+0	3,4 ⚠
T503	TRANSFORMER, TS-ETD39A	1806-3666+1	3,4 ⚠
TH501	THERMISTOR, 100C, PTFM04BD222Q2N34B0	8910-0489+0	3,4 ⚠
TP501	SVR, B1K, H3, VZ067TL7B, 6.3X 6.8 HDK	4756-1026+3-07	4
TP502	SVR, B200R, H3, NVZ6TL1, 6.3 X6.8, HDK	4756-2016+3-06	4
V+/ACGND	SHRINKAGE TUBE, ID=25mm, UL/CSA	1660-1100+0	4
V+/ACGND	CLAMP CORE FOR EMI/RFI SUPPRESSOR, ZCAT1518-0730	1808-0170+0	4
-	HALO BUSHING, 0813C	2113-9535+0	4
-	SPRING PATCH FOR IC HEATSINK	2510-3741+0	4
-	INSULATION SHEET-1, POWER SUPPLIES	3100-6401+0	4
-	CONDUCTIVE COPPER FOIL	3100-6631+0	4
-	PLASTIC BUSHING	4154-0261+0	4
-	PORON-1 FOAM, POWER SUPPLIES	4157-0631+0	4

Electrical Part List

Auxiliary Power Supply PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R501	1K, RCF, 1/4W, 5%, AT	4705-102J+2	4
R502	1K, RCF, 1/4W, 5%, AT	4705-102J+2	4
R605	560K, RCF, 1/4W, 5%, AT	4705-564J+2	4
R606	560K, RCF, 1/4W, 5%, AT	4705-564J+2	4
R607	240K, RCF, 1/4W, 5%, AT	4705-244J+2	4
R608	240K, RCF, 1/4W, 5%, AT	4705-244J+2	4
R609	33K RMF, 2W, 5%, AT, METAL OXIDE	4719-333J+2-X	3,4 
R610	33K RMF, 2W, 5%, AT, METAL OXIDE	4719-333J+2-X	3,4 
R611	2.2 OHM, RCF, 1/4W, 5%, AT	4705-2R2J+2	4
R612	22 OHM, RCF, 1/4W, 5%, AT	4705-220J+2	4
R613	100 OHM, RCF, 1/4W, 5%, AT	4705-101J+2	4
R614	22 OHM, RCF, 1/4W, 5%, AT	4705-220J+2	4
R615	22K, RCF, 1/4W, 5%, AT	4705-223J+2	4
R616	2.2K, RCF, 1/2W, 5%, AT	4707-222J+2	4
R617	1K, RCF, 1/4W, 5%, AT	4705-102J+2	4
R618	1M, RCF, 1/4W, 5%, AT	4705-105J+2	4
R619	8.2K, RCF, 1/4W, 5%, AT	4705-822J+2	4
R620	1.2K, RCF, 1/4W, 5%, AT	4705-122J+2	4
R621	0.47 OHM, RMF, 3W, 5%, ATS, METAL OXIDE	471A-R47J+C-X	3,4 
R622	1K, RCF, 1/4W, 5%, AT	4705-102J+2	4
R623	10K, RCF, 1/4W, 5%, AT	4705-103J+2	4
R624	51K, RMF, 1/4W, 1%, AT	4715-513A+2	4
R625	3.9K, RMF, 1/4W, 1%, AT	4715-392A+2	4
R626	100 OHM, RCF, 1/4W, 5%, AT	4705-101J+2	4
R627	5.1K, RMF, 1/4W, 1%, AT	4715-512A+2	4
R628	22 OHM, RCF, 1/2W, 5%, AT	4707-220J+2	4
R629	22 OHM, RCF, 1/2W, 5%, AT	4707-220J+2	4
R630	47 OHM, RCF, 1/2W, 5%, AT	4707-470J+2	4
R631	47 OHM, RCF, 1/2W, 5%, AT	4707-470J+2	4
R632	100 OHM, RMF, 2W, 5%, ATS, METAL OXIDE	4719-101J+C-X	3,4 
R633	47K, RCF, 1/4W, 5%, AT	4705-473J+2	4
R634	3.9K, RCF, 1/4W, 5%, AT	4705-392J+2	4
R635	47K, RCF, 1/4W, 5%, AT	4705-473J+2	4
R636	4.7K, RCF, 1/4W, 5%, AT	4705-472J+2	4
R637	2K, RCF, 1/4W, 5%, AT	4705-202J+2	4
R638	4.7K, RCF, 1/4W, 5%, AT	4705-472J+2	4
R639	4.7K, RCF, 1/4W, 5%, AT	4705-472J+2	4
R640	56K, RMF, 1/4W, 1%, AT	4715-563A+2	4

Electrical Part List

Auxiliary Power Supply PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R642	750 OHM, RCF, 1/4W, 5%, AT	4705-751J+2	4
R643	4.7K, RCF, 1/4W, 5%, AT	4705-472J+2	4
R644	4.7K, RCF, 1/4W, 5%, AT	4705-472J+2	4
R645	4.7K, RCF, 1/4W, 5%, AT	4705-472J+2	4
R646	3.3K, RMF, 1/4W, 5%, AT	4715-332J+2	4
R647	12K, RCF, 1/4W, 5%, AT	4705-123J+2	4
R648	12K, RCF, 1/4W, 5%, AT	4705-123J+2	4
R649	2.2M, RCF, 1/4W, 5%, AT	4705-225J+2	4
R650	2.2M, RCF, 1/4W, 5%, AT	4705-225J+2	4
R653	120K, RCF, 1/4W, 5%, AT	4705-124J+2	4
R654	120K, RCF, 1/4W, 5%, AT	4705-124J+2	4
R655	1K, RCF, 1/4W, 5%, AT	4705-102J+2	4
R656	1K, RCF, 1/4W, 5%, AT	4705-102J+2	4
R657	16K, RCF, 1/4W, 5%, AT	4705-163J+2	4
R658	75K, RCF, 1/4W, 5%, AT	4705-753J+2	4

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C610	82uF, CE, 400V, 20%, 105C, RL, 16X31	157T-826M+5-5$	4
C611	0.047uF, CM, 630V, 10%, RL, 12.5X13.5	153M-473K+5-XZ	4
C612	100uF, CE, 50V, 20%, RLT, 8X12	157F-107M+K-OW	4
C613	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C614	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C615	100pF, CC, 1000V, 10%, RLT, 6X3	150N-101K+K-KE	4
C616	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C617	2200pF, CC, 50V, 10%, RLT, 5X5	150F-222K+K-II	4
C618	330pF, CC, 50V, 10%, RLT, 5X3	150F-331K+K-IE	4
C619	0.01uF, CC, 50V, 10%, RLT, 5x5	150F-103K+K-II	4
C620	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C621	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C622	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C623	470uF, CE, 35V, 20%, 105C, RL, 10X20	157Q-477M+5-S9T	4
C624	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C625	470uF, CE, 35V, 20%, 105C, RL, 10X20	157Q-477M+5-S9T	4
C626	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C627	1000uF, CE, 35V, 20%, 105C, RL, 12.5X25MM, PS TYPE, NIC	157Q-108M+5-X&TC	4
C628	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C629	470uF, CE, 35V, 20%, 105C, RL, 10X20	157Q-477M+5-S9T	4
C630	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C631	1000uF, CE, 35V, 20%, 105C, RL, 12.5X25MM, PS TYPE, NIC	157Q-108M+5-X&TC	4
C632	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C633	470uF, CE, 35V, 20%, 105C, RL, 10X20	157Q-477M+5-S9T	4
C634	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C635	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4

Electrical Part List

Auxiliary Power Supply PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C636	470uF, CE, 35V, 20%, 105C, RLT, 10X20, LOW ESR	157Q-477M+K-S9RT	4
C637	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C638	1000uF, CE, 35V, 20%, 105C, RL, 12.5X25MM, PS TYPE, NIC	157Q-108M+5-X&TC	4
C639	1000uF, CE, 35V, 20%, 105C, RL, 12.5X25MM, PS TYPE, NIC	157Q-108M+5-X&TC	4
C640	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C641	470uF, CE, 35V, 20%, 105C, RLT, 10X20, LOW ESR	157Q-477M+K-S9RT	4
C642	1000pF, CC, 1000V, 10%, RLT, 6X3	150N-102K+K-KE	4
C643	150pF, CC, 50V, 5%, RLT, 4X4	150F-151J+K-GG	4
C644	150pF, CC, 50V, 5%, RLT, 4X4	150F-151J+K-GG	4
C645	150pF, CC, 50V, 5%, RLT, 4X4	150F-151J+K-GG	4
C646	150pF, CC, 50V, 5%, RLT, 4X4	150F-151J+K-GG	4
C648	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C649	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C650	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C651	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C652	1uF, CE, 50V, 20%, RLR, 4X7, ELNA	157F-105M+H-GME	4
C654	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4
C655	0.1uF, CC, 50V, 10%, RLT, 5x5	150F-104K+K-II	4

Ferrite Beads and Inductors

Reference Designator	Description	Vendor Part Number	Note
FB602	FERR BEAD, 26430000101, FAIR-RITE	1808-0670+0	4
FB603	FERR BEAD, 26430000101, FAIR-RITE	1808-0670+0	4
FB604	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB605	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB606	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB607	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB608	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB609	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB610	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
FB611	FERR BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L607	CHOKE, COIL, 30uH, 20%, 2A	1806-3663+0	4
L608	CHOKE, COIL, 30uH, 20%, 2A	1806-3663+0	4
L609	CHOKE, COIL, 30uH, 20%, 2A	1806-3663+0	4
L610	CHOKE, COIL, 30uH, 20%, 2A	1806-3663+0	4
L611	CHOKE, COIL, 30uH, 20%, 2A	1806-3663+0	4

Electrical Part List

Auxiliary Power Supply PCB Assembly

Diodes

Reference Designator	Description	Vendor Part Number	Note
D601	RECTIFIER, UF4006-TGI, AT	4840-8530+2	4
D602	RECTIFIER, UF4003-TGI, AT	4840-8520+2	4
D603	1N4148TA, NS	4840-8060+2	4
D604	RECTIFIER, UF4006-TGI, AT	4840-8530+2	4
D605	UF304-3155, SW, ULTRAFAST RECT, AT	480F-3040+2	4
D606	SCHOTTKY, 3.3A, 100V, 31DQ10, IR	4840-8620+0	4
D607	SCHOTTKY, 3.3A, 100V, 31DQ10, IR	4840-8620+0	4
D608	SCHOTTKY, 3.3A, 100V, 31DQ10, IR	4840-8620+0	4
D609	1N5822, 3A, 40V, GW, AT	4805-8220+2	4
D610	1N4148TA, NS	4840-8060+2	4
D611	1N4148TA, NS	4840-8060+2	4
D612	1N4148TA, NS	4840-8060+2	4
D613	1N4148TA, NS	4840-8060+2	4
D614	1N4148TA, NS	4840-8060+2	4
D615	1N4148TA, NS	4840-8060+2	4
SCR601	SCR, MCR100-6600V, 0.8A, MCR100-6RLRAG, RLT	4840-1700+K	4
Z601	ZENER, 1/2W, 18V, TEMIC, AT	4837-18V6+2	4
Z602	ZENER, 1/2W, 15V, 5%, TEMIC, AT	4837-15V6+2	4

Transistors

Reference Designator	Description	Vendor Part Number	Note
Q601	FET, 2SK2645-01MR, 9A, 600V, RL	4902-6450+5	4
Q602	2N3904TA, RLT	4853-9040+K	4
Q603	BD140-10, HFE 63-160	4860-1430+5	4
Q604	2N3904TA, RLT	4853-9040+K	4
Q605	2N3904TA, RLT	4853-9040+K	4
Q606	2N3904TA, RLT	4853-9040+K	4
Q607	2N3904TA, RLT	4853-9040+K	4

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
IC601	UC2843B, DIP, 8PIN, ST, PWM CONT	3132-1220+1	4
IC602	PHOTOCOUPLER, LTV817A, DIP-4	481C-817A+3	3, 4 ⚠
IC603	TL431CLP, TI	485L-431C+5	4
IC604	TC4093BP, N/F, DIP, QUAD NAND GATE	3130-7140+0	4
IC605	CD4015BE, STATIC SHIFT REGISTER	3132-0750+0	4
IC606	PHOTOCOUPLER, LTV817A, DIP-4	481C-817A+3	3, 4 ⚠
IC607	TL431CLP, TI	485L-431C+5	4

Electrical Part List

Auxiliary Power Supply PCB Assembly

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
+/-27V	SHRINKAGE TUBE, ID=14MM	1660-0630+0	4
+/-27V	CONN, WIRE, UL1007, #18, W/4POLE TERMINAL, L=270MM	7012-6639+0	4
/PCB	SCREW, M3X10, W/S&F, WASHER, BLK	2900-3010+3030	4
/Q601	WASHER, METAL, M3X0.5X8, NI	2600-3005+0804	4
/Q601	SCREW, B-TITE, PH, M3X8MM, YZ, CROSS W/ WASHER	2950-3008+0020	4
/TH603	WASHER, METAL, M3X0.5X8, NI	2600-3005+0804	4
/TH603	SCREW, B-TITE, PH, M3X8MM, YZ, CROSS W/ WASHER	2950-3008+0020	4
CN501	TERMINAL PIN, 250TAP, T=0.4MM, NICKEL, UL/JMT	4135-4351+0	4
CN502	TERMINAL PIN, 250TAP, T=0.4MM, NICKEL, UL/JMT	4135-4351+0	4
CN605/CN613	CONN, WIRE, UL1015, #18, BK/RD, W/250, FEMALE, L=470MM	7012-6637+0	4
CN607/2CN501	CONN, WIRE, UL1015, #18, BK/RD, W/250, FEMALE, L=700MM	7012-6634+0	4
CN609/3CN501	CONN, WIRE, UL1015, #18, BK/RD, W/250, FEMALE, L=840MM	7012-6635+0	4
CN613	TERMINAL PIN, 250TAP, T=0.4MM, NICKEL, UL/JMT	4135-4351+0	4
CN614	TERMINAL PIN, 250TAP, T=0.4MM, NICKEL, UL/JMT	4135-4351+0	4
CN615	JM24182-4P, WAFER	2101-9130+0	4
CN616	JM24182-4P, WAFER	2101-9130+0	4
CN616/2CN503	CONN, WIRE, UL1007, #26, 4POLE, CONNECTORX2, L=360MM	7012-6633+0	4
CN617	JM24182-4P, WAFER	2101-9130+0	4
CN617/3CN503	CONN, WIRE, UL1007, #26, 4POLE, CONNECTORX2, L=480MM	7012-6630+0	4
CN618	JM24182-2P, WAFER	2101-9120+0	4
CN619	JM24182-2P, WAFER	2101-9120+0	4
CN620	JM24182-2P, WAFER	2101-9120+0	4
CN621	JM24182-2P, WAFER	2101-9120+0	4
CN622	JM24182-3P, WAFER	2101-9140+0	4
CN622/CN812A	CONN, WIRE, UL1007, #26, 3POLE, CONNECTORX2, L=380MM	7012-6631+0	4
CN623	JM24182-8P, WAFER	2101-9390+0	4
CN623/CN409B	CONN ASSY, 8P, P=2.5, L=600MM, UL1007, #24AWG, M/M	7012-6507+0	4
DAMP O/P WIR	SHRINKAGE TUBE, ID=25mm, UL/CSA	1660-1100+0	4
DAMP O/P WIR	CLAMP CORE FOR EMI/RFI SUPPRESSOR, ZCAT1518-0730	1808-0170+0	4
HS602	2617-4-B HEATSINK	5400-9320+0	4

Electrical Part List

Auxiliary Power Supply PCB Assembly

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
JP601	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP602	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP603	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP622	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP623	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP624	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
JP625	WJ ROLLER FORM, D=0.8MM	635L-0002+0	4
T601	PWR TRANSFORMER, ERL28, TS-EC28F	1806-3665+0	3,4 ⚠
TH603	THERMISTOR, 100C, PTFM04BD222Q2N34B0	8910-0489+0	3,4 ⚠
TP601	SVR, B2K, H3, NVZ6TL1, HDK	4756-2026+3-05	4
V+/ACGND	SHRINKAGE TUBE, ID=25mm, UL/CSA	1660-1100+0	4
V+/ACGND	CLAMP CORE FOR EMI/RFI SUPPRESSOR, ZCAT1518-0730	1808-0170+0	4
-	HALO BUSHING, 0813C	2113-9535+0	4
-	SPRING PATCH FOR IC HEATSINK	2510-3741+0	4
-	INSULATION SHEET-1, POWER SUPPLIES	3100-6401+0	4
-	CONDUCTIVE COPPER FOIL	3100-6631+0	4
-	PLASTIC BUSHING	4154-0261+0	4
-	PORON-1 FOAM, POWER SUPPLIES	4157-0631+0	4

Electrical Part List

FCC Filter PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R601	220K, RMF, 3W, 5%, ATS, METAL OXIDE	471A-224J+C-X	3, 4 ⚠
R603	100K, RCF, 1/2W, 5%, AT	4707-104J+2	3, 4 ⚠
R604	100K, RCF, 1/2W, 5%, AT	4707-104J+2	3, 4 ⚠

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C601	1uF, CM, 250V, 10%, CLASS X1, RL, 25X23.5	153R-105K+5-&#	3, 4 ⚠
C602	1uF, CM, 250V, 10%, CLASS X1, RL, 25X23.5	153R-105K+5-&#	3, 4 ⚠
C603	1500pF, CC, 400V, 20%, RL, 12.5X8, AH12E152MLO (US/CAN)	150T-152M+5-XO	3, 4 ⚠
C603	1000pF, CC, 400V, 20%, RL, Y5U, 9.5X8, AH09E102MLO (EURO)	150T-102M+5-RO	3, 4 ⚠
C604	1500pF, CC, 400V, 20%, RL, 12.5X8, AH12E152MLO (US/CAN)	150T-152M+5-XO	3, 4 ⚠
C604	1000pF, CC, 400V, 20%, RL, Y5U, 9.5X8, AH09E102MLO (EURO)	150T-102M+5-RO	3, 4 ⚠
C605	1500pF, CC, 400V, 20%, RL, 12.5X8, AH12E152MLO (US/CAN)	150T-152M+5-XO	3, 4 ⚠
C605	1000pF, CC, 400V, 20%, RL, Y5U, 9.5X8, AH09E102MLO (EURO)	150T-102M+5-RO	3, 4 ⚠
C606	1500pF, CC, 400V, 20%, RL, 12.5X8, AH12E152MLO (US/CAN)	150T-152M+5-XO	3, 4 ⚠
C606	1000pF, CC, 400V, 20%, RL, Y5U, 9.5X8, AH09E102MLO (EURO)	150T-102M+5-RO	3, 4 ⚠
C607	2200uF, CE, 200V, 20%, 105C, RL 35X50MM	157U-228M+5-^^T	3, 4 ⚠
C608	2200uF, CE, 200V, 20%, 105C, RL 35X50MM	157U-228M+5-^^T	3, 4 ⚠

Electrical Part List

FCC Filter PCB Assembly

Inductors

Reference Designator	Description	Vendor Part Number	Note
L601	FERR CORE, GPG252, UI=2500, T25X15X8-C (EURO)	1808-0760+1	3, 4 ⚠
L602	COMMON MODE CHOKE, MIN 3.6MH, T36X23X15	1806-3695+0	3, 4 ⚠
L603	COMMON MODE CHOKE, MIN 3.6MH, T36X23X15	1806-3695+0	3, 4 ⚠
L604	COMMON MODE CHOKE, LE-T25B	1806-3664+0	3, 4 ⚠

Diodes

Reference Designator	Description	Vendor Part Number	Note
DB601	BRIDGE RECT, 400V, MB354S, 35A (US/CAN)	4840-8630+0	3, 4 ⚠
DB601	BRIDGE RECT, 600V, 35A, KBPC3506, RL (EURO)	4803-5060+5	3, 4 ⚠

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
CN602	TERMINAL 3 POLE, DT-4N-B14W-03, DINKLE	2113-3045+0	3, 4 ⚠
CN605	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT	4135-4351+0	4
CN606	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT	4135-4351+0	4
CN607	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT	4135-4351+0	4
CN608	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT	4135-4351+0	4
CN609	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT	4135-4351+0	4
CN610	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT	4135-4351+0	4
CN611	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT (EURO)	4135-4351+0	4
CN612	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT (EURO)	4135-4351+0	4
CN613	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT (EURO)	4135-4351+0	4
CN614	TERMINAL PIN, 250TAP, T=0.4MM, NI, UL/JMT (EURO)	4135-4351+0	4
DB601	WASHER, METAL, M4X0.8X10, BZ (US/CAN)	2600-4008+1003	4
DB601	WASHER, SPRING, M4X1X7, NI (US/CAN)	2607-4010+0704	4
DB601	K5004025102, M4*25, 7.8MM, JGC046-00	2900-4025+3000	4
HS601	HEATSINK-4 (US/CAN)	5400-3784+0	4
JP610	WJ ROLLER FORM D=0.8MM	635L-0002+0	4

Electrical Part List

FCC Filter PCB Assembly

Miscellaneous (continued)

Reference Designator	Description	Vendor Part Number	Note
JP611	WJ ROLLER FORM D=0.8MM	635L-0002+0	4
JP612	WJ ROLLER FORM D=0.8MM	635L-0002+0	4
JP613	WJ ROLLER FORM D=0.8MM	635L-0002+0	4
JP614	WJ ROLLER FORM D=0.8MM (US/CAN)	635L-0002+0	4
JP615	WJ ROLLER FORM D=0.8MM (US/CAN)	635L-0002+0	4
JP616	WJ ROLLER FORM D=0.8MM (US/CAN)	635L-0002+0	4
JP617	WJ ROLLER FORM D=0.8MM (US/CAN)	635L-0002+0	4
TH601	SHRINKAGE TUBE, ID=1MM, UL (US/CAN)	1660-0890+0	4
TH601	NTC THERMISTER, SCK-2R515, 215 OHM, 15A, THINKING (US/CAN)	5202-0008+0	3, 4 
TH601	NTC THERMISTER, SCK-0512, 5 OHM, 12A, THINKING (EURO)	5202-0009+0	3, 4 
TH602	SHRINKAGE TUBE, ID=1MM, UL (US/CAN)	1660-0890+0	3, 4 
TH602	NTC THERMISTER, SCK-2R515, 215 OHM, 15A, THINKING (US/CAN)	5202-0008+0	3, 4 
TH602	NTC THERMISTER, SCK-0512, 5 OHM, 12A, THINKING (EURO)	5202-0009+0	3, 4 
VDR601	SHRINKAGE TUBE, ID=10MM, UL/CSA (US/CAN)	1660-0650+0	3, 4 
VDR601	TRANSIENT/SURGE ABSORBER, FNR-14K271, 270V, 10% (US/CAN)	8910-0820+0	3, 4 
VDR601	SURGE ABSORBER, TRANSIENT, 470V, 10%, JVR-14N471K (EURO)	2706-0001+0	3, 4 

Electrical Part List

Remote Control PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R701	22K, RMG, 0805, 1/10W, 5%	4720-223J+J	4
R702	100 OHM, RMG, 0805, 1/10W, 5%	4720-101J+J	4
R703	470 OHM, RMG, 0805, 1/10W, 5%	4720-471J+J	4
R704	470 OHM, RMG, 0805, 1/10W, 5%	4720-471J+J	4
R705	470 OHM, RMG, 0805, 1/10W, 5%	4720-471J+J	4
R706	470 OHM, RMG, 0805, 1/10W, 5%	4720-471J+J	4
R707	47K, RMG, 0805, 1/10W, 5%	4720-473J+J	4
R708	1K, RMG, 0805, 1/10W, 1%	4720-102A+J	4
R709	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R711	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R712	220 OHM, RMG, 0805, 1/10W, 5%	4720-221J+J	4
R713	2.2 OHM, RMF, 1/2W, 5%, AT, FUSIBLE	4717-2R2J+2-F	3, 4 ⚠
R714	1M, RMG, 0805, 1/10W, 5%	4720-105J+J	4
VR702	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K	4751-0610+0	4
VR703	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K	4751-0610+0	4
VR704	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K	4751-0610+0	4
VR705	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K-OC	4751-0600+0	4
VR706	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K-OC	4751-0600+0	4
VR707	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K-OC	4751-0600+0	4
VR708	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K-OC	4751-0600+0	4
VR709	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K-OC	4751-0600+0	4
VR710	VAR RES, 50KBx1, LM=20MM, ALPHA, RV09AC-40-20F-B50K-OC	4751-0600+0	4

Capacitors

Electrical Part List

Remote Control PCB Assembly

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C701	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C702	1uF, CE, 50V, 20%, RLT, 4X7	157F-105M+K-GM	4
C703	10uF, CE, 25V, 20%, RLT, P5.0, 5X11, ELNA	157E-106M+K-IUE	4
C704	100pF, CC, 0805, 50V, 10%, 1.2X2.0	150F-101K+J-BD	4
C706	0.01uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-103K+J-BD	4
C707	30pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-300J+J-BD	4
C708	30pF, CC, 0805, 50V, 5%, 1.2x 2.0	150F-300J+J-BD	4
C709	1uF, CE, 50V, 20%, RLT, 4X7	157F-105M+K-GM	4
C710	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C711	1uF, CE, 50V, 20%, RLT, 4X7	157F-105M+K-GM	4
C712	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C714	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C715	10uF, CE, 25V, 20%, RLT, P5.0, 5X11, ELNA	157E-106M+K-IUE	4
C716	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C717	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4

Ferrite Beads and Inductors

Reference Designator	Description	Vendor Part Number	Note
FB701	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L701	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L702	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4
L703	FERRITE BEAD INDUCTOR, BL01RN1A1F1J	1808-0680+0	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
D701	LL4148, SM	4804-1480+3	4
D702	LL4148, SM	4804-1480+3	4
D705	LL4148, SM	4804-1480+3	4
D706	LL4148, SM	4804-1480+3	4
D707	LL4148, SM	4804-1480+3	4
D708	LL4148, SM	4804-1480+3	4
D709	W1N4001-A(WA), AT	4804-0010+2	4
LED701	L-115W, EGW/209EGW, RED/GR, ELE-LED02	3700-4536+RG	4
LED701	LED SPACER, H=12.0MM	4171-0081+0	4
LED702	L-115W, EGW/209EGW, RED/GR, ELE-LED02	3700-4536+RG	4
LED702	LED SPACER, H=12.0MM	4171-0081+0	4
Z701	ZENER, 1/2W, 5.1V, AT, TEMIC	4837-5V16+2	4

Electrical Part List

Remote Control PCB Assembly

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
U701	CD74HC4051M96, SOIC	3132-0780+0	4
U702	S3P8475XZZ-QZ85, OTP, 44-QFP, MICROCONTROLLER	3131-9920+0	4
U703	OPTOCOUPLER, CNY17G-2, TEMIC	8900-9550+0	4
U704	74HC00, QUAD 2I/P NAND GATE, SOP	3131-9050+0	4

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
/R713	OIL SLEEVE, ID=0.5MM	1660-0900+0	4
CN701B	CONN ASSY, UL1007, #24AWG, P=2.5, L=120MM, 8P, W/TIN	7012-6505+0	4
CN702B	CONN ASSY, UL1007, #24AWG, P=2.5, L=120MM, 8P, W/TIN	7012-6505+0	4
REMOTE BOX	SOCKET, DIN, 7 PIN, TCS0837-0120177, HOSIDEN	2113-2013+0	4
XTAL701	CRYSTAL, 12.000MHZ, HC-49U	2300-2010+0	4

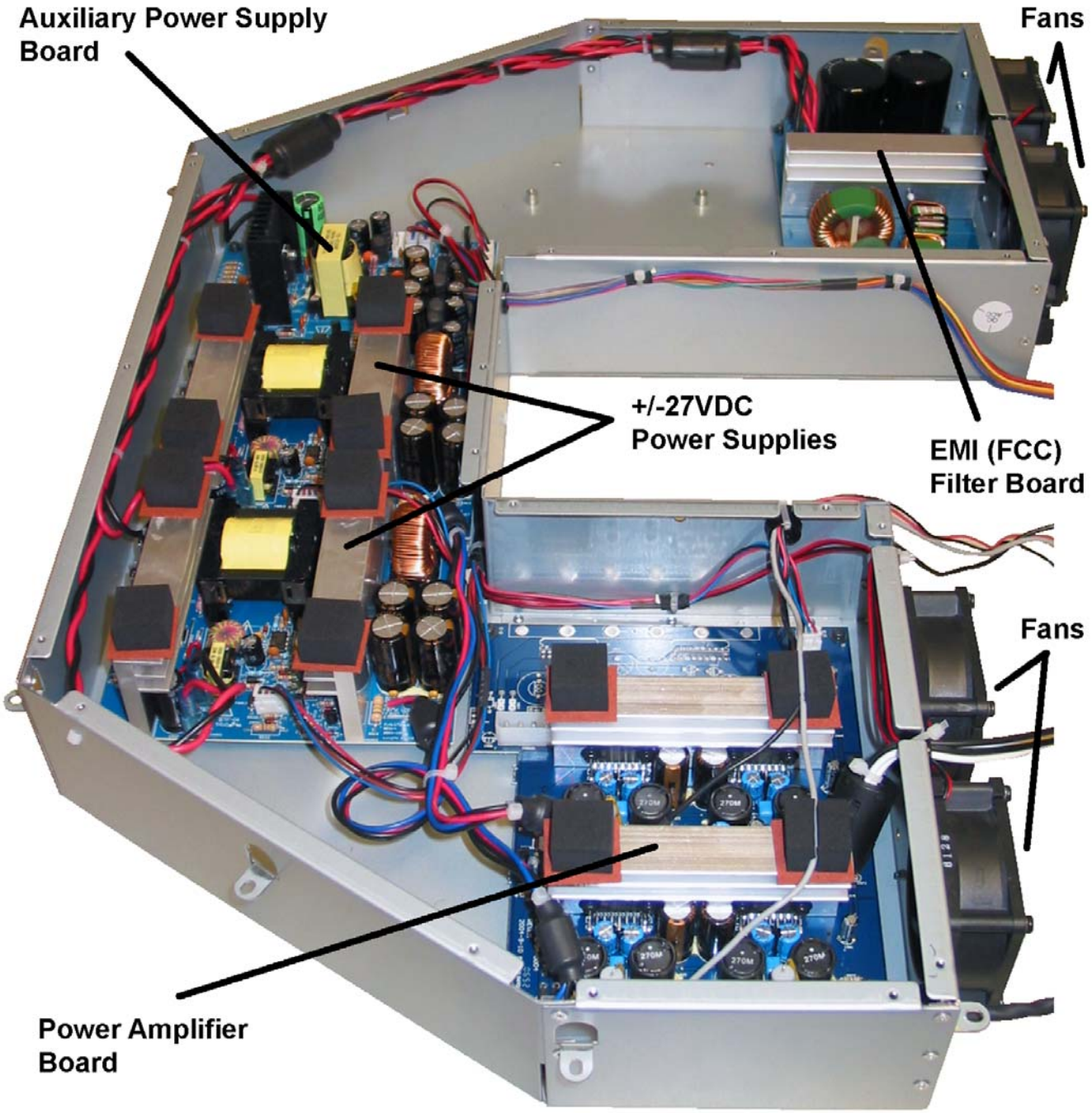


Figure 10. L1® Model I Power Stand Electronics Module with Top Cover Removed

Disassembly Procedures

L1® Model I Power Stand

Note: Refer to Figure 10 for the following procedures.

1. Lower Housing Removal

1.1 Place the power stand on a soft surface so that the line array opening faces down.

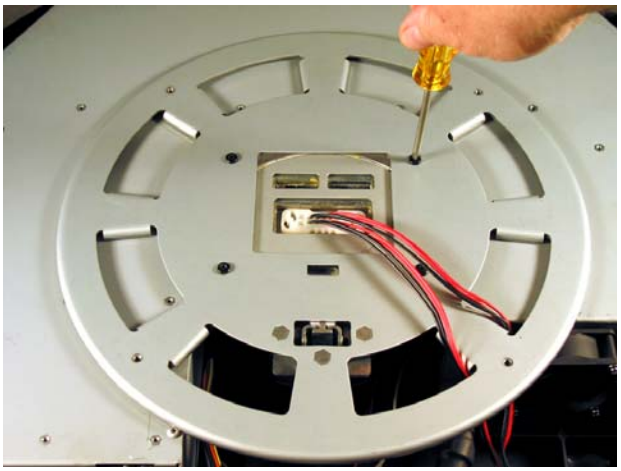
1.2 Using a Phillips-head screwdriver, remove the 19 screws that secure the lower housing to the upper housing. Lift off the lower housing.

2. Amplifier Housing Removal

2.1 Perform procedure 1.

2.2 Make a note of the wiring, and disconnect the wiring harnesses and connectors that run to the amplifier housing. The amplifier housing is the large metal box with the four fans.

2.3 Using a Phillips-head screwdriver, remove the four screws that secure the power stand base plate to the bottom of the line array cavity. Lift it off of the cavity. Be careful not to damage any wires.

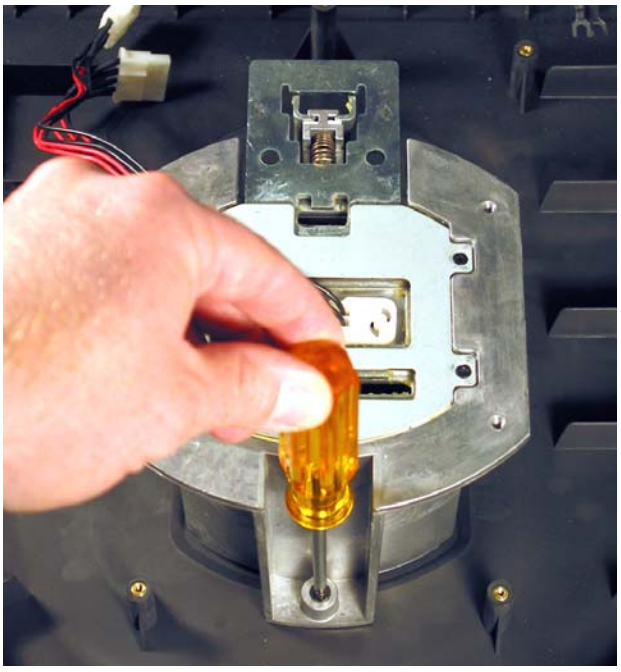


2.4 Once all of the wiring is disconnected, use a Phillips-head screwdriver to remove the 16 screws that secure the amplifier housing to the power stand upper housing. Carefully lift the amplifier housing out of the power stand upper housing.

3. Line Array Cavity Removal

3.1 Perform procedure 2.

3.2 Using a Phillips-head screwdriver, remove the three screws that secure the line array cavity to the upper housing. Lift the line array cavity off of the upper housing. The power stand foot pedal will disengage from the shaft.



Disassembly Procedures

4. Amplifier PCB Removal

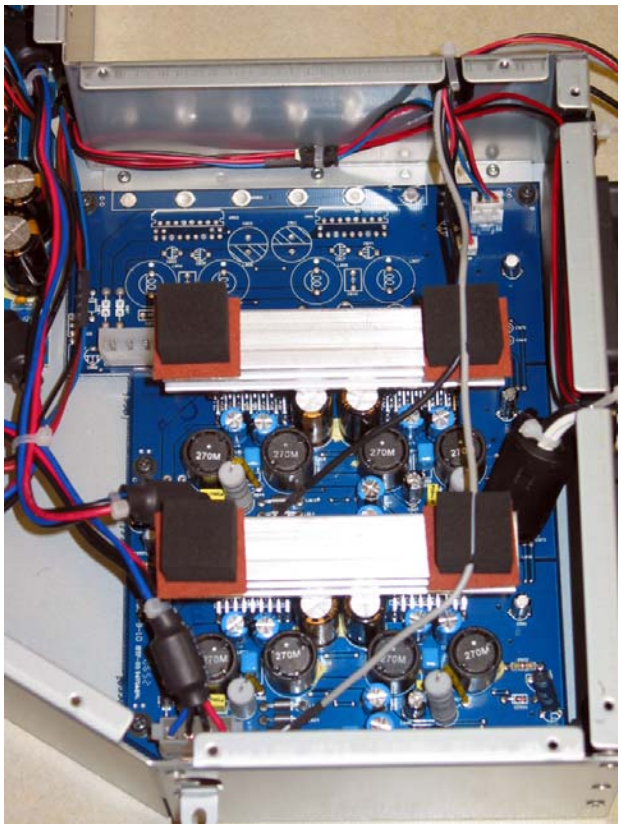
4.1 Perform procedure 2.

4.2 Make a note of the wiring and disconnect all of the wiring harnesses that connect the power supply box to the DSP PCB and to the microprocessor PCB.

4.3 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

4.4 Once you have the top cover off, make a note of the wiring configuration and unplug the wiring harnesses that connect to the amplifier PCB.

4.5 Using a Phillips-head screwdriver, remove the 6 screws that secure the amplifier PCB in place. Lift the amplifier PCB out of the chassis.



5. +/-27VDC SMPS Removal

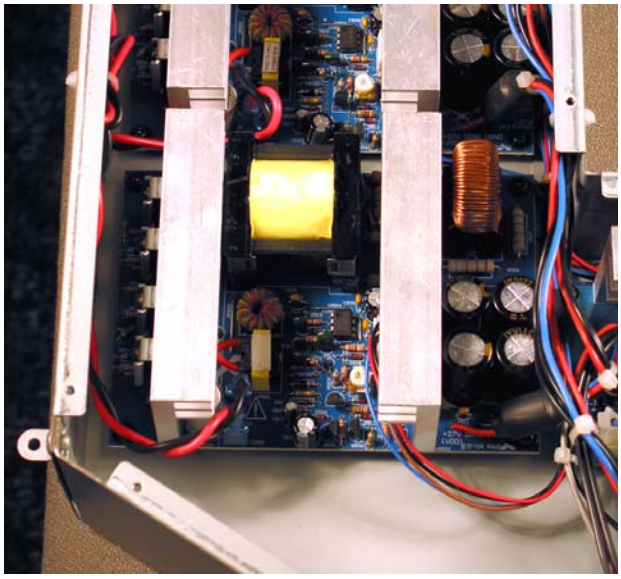
5.1 Perform procedure 2.

5.2 Make a note of the wiring and disconnect all of the wiring harnesses that connect the power supply box to the DSP PCB and to the microprocessor PCB.

5.3 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

5.4 Once you have the top cover off, make a note of the wiring configuration and unplug the wiring harnesses that connect to the switching DC power supply PCB you wish to remove.

5.5 Using a Phillips-head screwdriver, remove the 4 screws that secure power supply PCB in place. Lift the power supply PCB out of the chassis.



Disassembly Procedures

6. Auxiliary Power Supply Removal

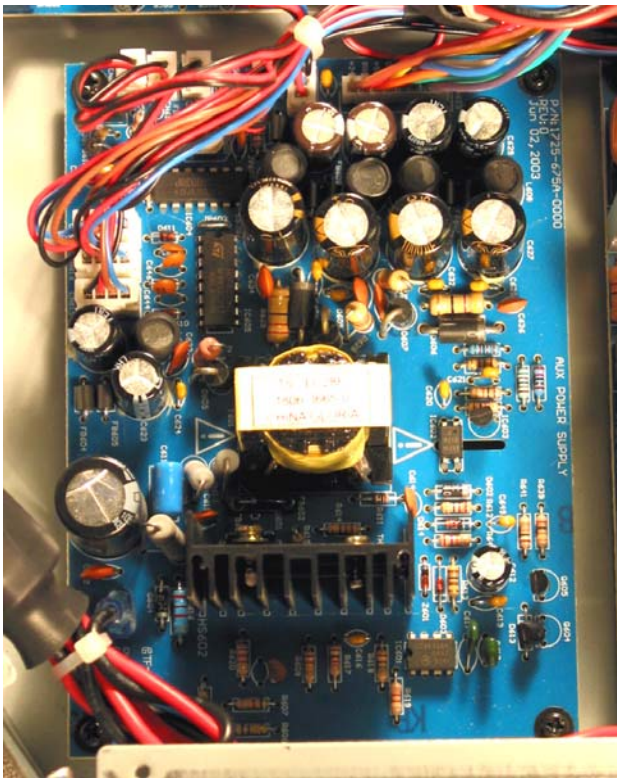
6.1 Perform procedure 2.

6.2 Make a note of the wiring and disconnect all of the wiring harnesses that connect the power supply box to the DSP PCB and to the microprocessor PCB.

6.3 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

6.4 Once you have the top cover off, make a note of the wiring configuration and unplug the wiring harnesses that connect to the switching DC power supply PCB you wish to remove.

6.5 Using a Phillips-head screwdriver, remove the 4 screws that secure the power supply PCB in place. Lift the power supply PCB out of the chassis.



7. EMI (FCC) Filter PCB Removal

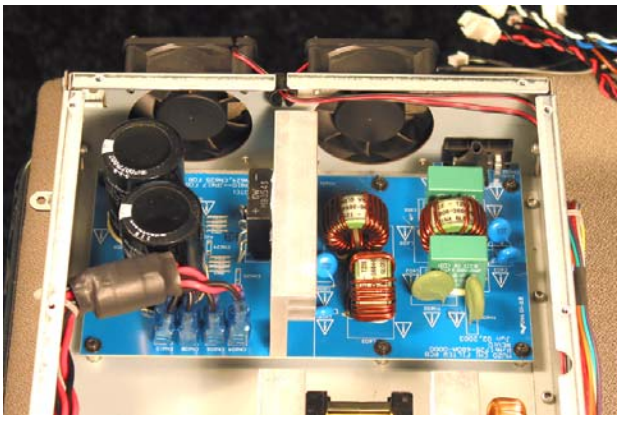
7.1 Perform procedure 2.

7.2 Make a note of the wiring and disconnect all of the wiring harnesses that connect the power supply box to the DSP PCB and to the microprocessor PCB.

7.3 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

7.4 Once you have the top cover off, make a note of the wiring configuration and unplug the wiring harnesses that connect to the EMI Filter PCB.

7.5 Using a Phillips-head screwdriver, remove the 4 screws that secure the EMI Filter PCB in place. Lift the EMI Filter PCB out of the chassis.



Disassembly Procedures

8. Chassis Fan Removal

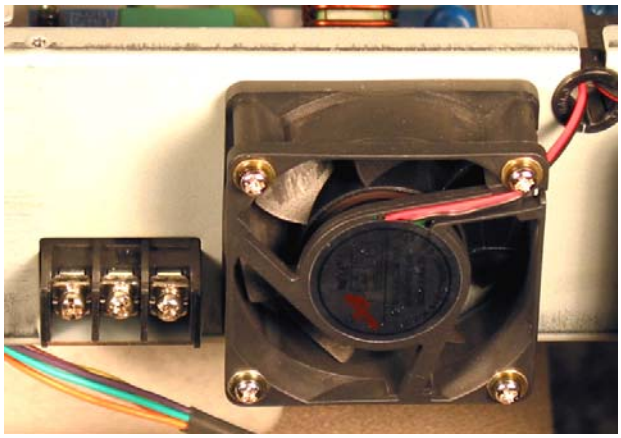
8.1 Perform procedure 2.

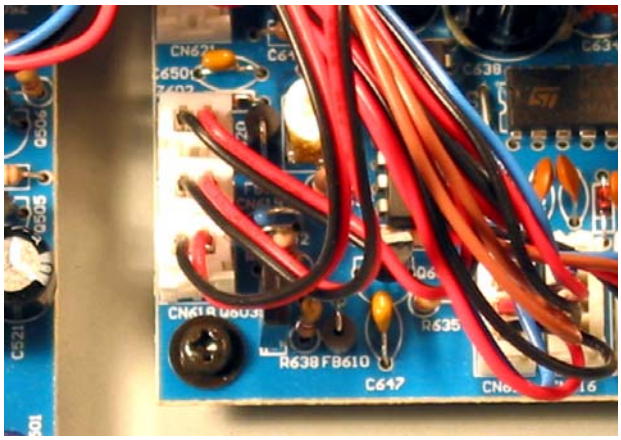
8.2 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

8.3 Using a Phillips-head screwdriver, remove the 4 screws that secure the fan to the chassis.

8.4 Follow the wire harness for the fan you are removing to the auxiliary power supply PCB and unplug it. Lift the fan out of the chassis.

Re-assembly note: When installing the new fan, be sure to match the orientation of the fan next to it so that it will move air in the proper direction when in use.





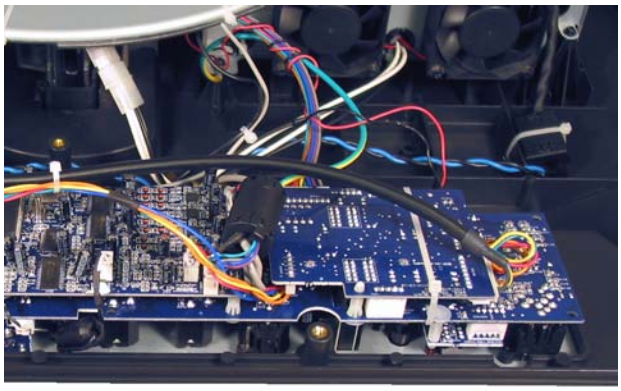
9. Microprocessor PCB Removal

9.1 Perform procedure 1.

9.2 Make a note of the wiring configuration and unplug the six wire harnesses from the connectors on the board.

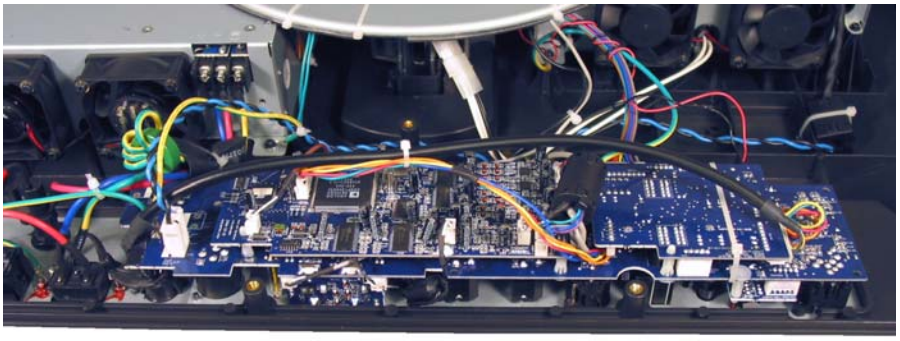
9.3 Lift the microprocessor PCB off of the connectors that engage it on the bottom of the board and the pins that connect to the preset switches.

Re-assembly note: When re-installing this PCB, be sure that all of the pins from the preset switches are straight and properly engage the connectors on the bottom of the microprocessor PCB.



Disassembly Procedures

10. DSP PCB Removal



10.1 Perform procedure 1.

10.2 Make a note of the wiring configuration and unplug the six wire harnesses from the connectors on the board.

10.3 Using a pair of needle-nose pliers, compress the bottoms of the plastic standoff posts used to attach the DSP PCB to the Input/Output PCB. Lift the DSP PCB off of the I/O PCB.

11. Input/Output PCB Removal

11.1 Perform procedures 9 and 10.

11.2 On the front panel of the power stand, remove the four knobs for the mic trim and level controls.

11.3 Using a nut driver, remove the nuts and washers for the 1/4 inch phono jacks.

11.4 Using a Phillips-head screwdriver, remove the screws that secure the XLR, Data in/out and Neutrik connectors to the front panel.

11.5 Lift the I/O PCB off of the input panel.

Disassembly Procedures

Line Array Procedures

Note: The line arrays are divided into a lower line array, which plugs directly into the power stand, and an upper line array, which uses a bayonet arrangement to align the upper array to the lower array for connection. All electrical connections are automatically made when the arrays are mounted into the power stand and the upper array is mounted to the lower array.

Note: Refer to Figure 8 for the following procedures.

1. Grille Removal

1.1 Using a Phillips-head screwdriver, remove the six screws that secure the end cap to the line array enclosure. Lift off the end cap. Unplug the molex connector from the speaker harness.

1.2 Grasp the edge of the grille and gently lift it away from the enclosure.

2. Nameplate Removal

2.1 Perform procedure 1.

2.2 On the back of the grille, unbend the legs of the logo. Lift off the nameplate.

3. Driver Removal

3.1 Perform procedure 1.

3.2 Using a Phillips-head screwdriver, remove the four screws that secure the driver to the enclosure.

3.3 Lift the driver out of the enclosure. Note the wiring configuration and cut the wires as close to the driver terminals as possible.

4. Upper Line Array Top End Cap Removal

4.1 Using a Phillips-head screwdriver, remove the seven screws that secure the end cap to the line array enclosure. Lift off the end cap.

Re-assembly note: Make sure that the end cap gasket is properly aligned to achieve an airtight seal.

5. Upper Line Array Bottom End Cap Removal

5.1 Using a Phillips-head screwdriver, remove the seven screws that secure the end cap to the line array enclosure. Lift the end cap away from the enclosure. Unplug the molex connector from the speaker harness.

Re-assembly note: Make sure that the end cap gasket is properly aligned to achieve an airtight seal.

6. Lower Line Array Top End Cap Removal

6.1 Using a Phillips-head screwdriver, remove the six screws that secure the end cap to the line array enclosure. Lift off the end cap. Unplug the molex connector from the speaker harness.

Re-assembly note: Make sure that the end cap gasket is properly aligned to achieve an airtight seal.

7. Lower Line Array Bottom End Cap Removal

7.1 Using a Phillips-head screwdriver, remove the seven screws that secure the end cap to the line array enclosure. Lift the end cap away from the enclosure. Unplug the molex connector from the speaker harness.

Re-assembly note: Make sure that the end cap gasket is properly aligned to achieve an airtight seal.

Disassembly Procedures

8. Front Cap Removal

8.1 Using a Phillips-head screwdriver, remove the four screws that secure the front cap to the bottom front of the line array enclosure. Lift the end cap away from the enclosure.

Bass Module Procedures

Note: Refer to Figure 9 for the following procedures.

1. Grille Removal

1.1 Using an allen wrench, remove the four screws that secure the grille to the upper and lower speaker end caps.

1.2 Lift off the grille.

2. Nameplate Removal

2.1 Perform procedure 1.

2.2 On the back of the grille, remove the retaining nut and spring from the post of the nameplate. Lift the nameplate off of the grille.

3. Driver Removal

3.1 Perform procedure 1.

3.2 Using a Phillips-head screwdriver, remove the four screws that secure the driver to the bass module enclosure.

3.3 Lift the driver out of the enclosure. Note the wiring configuration and cut the wires as close to the driver terminals as possible.

Re-assembly notes:
- When soldering the speaker harness wires to the new driver, be sure to observe polarity of the driver harness wires.
- Be sure to properly align the gasket behind the new driver to ensure an airtight fit.

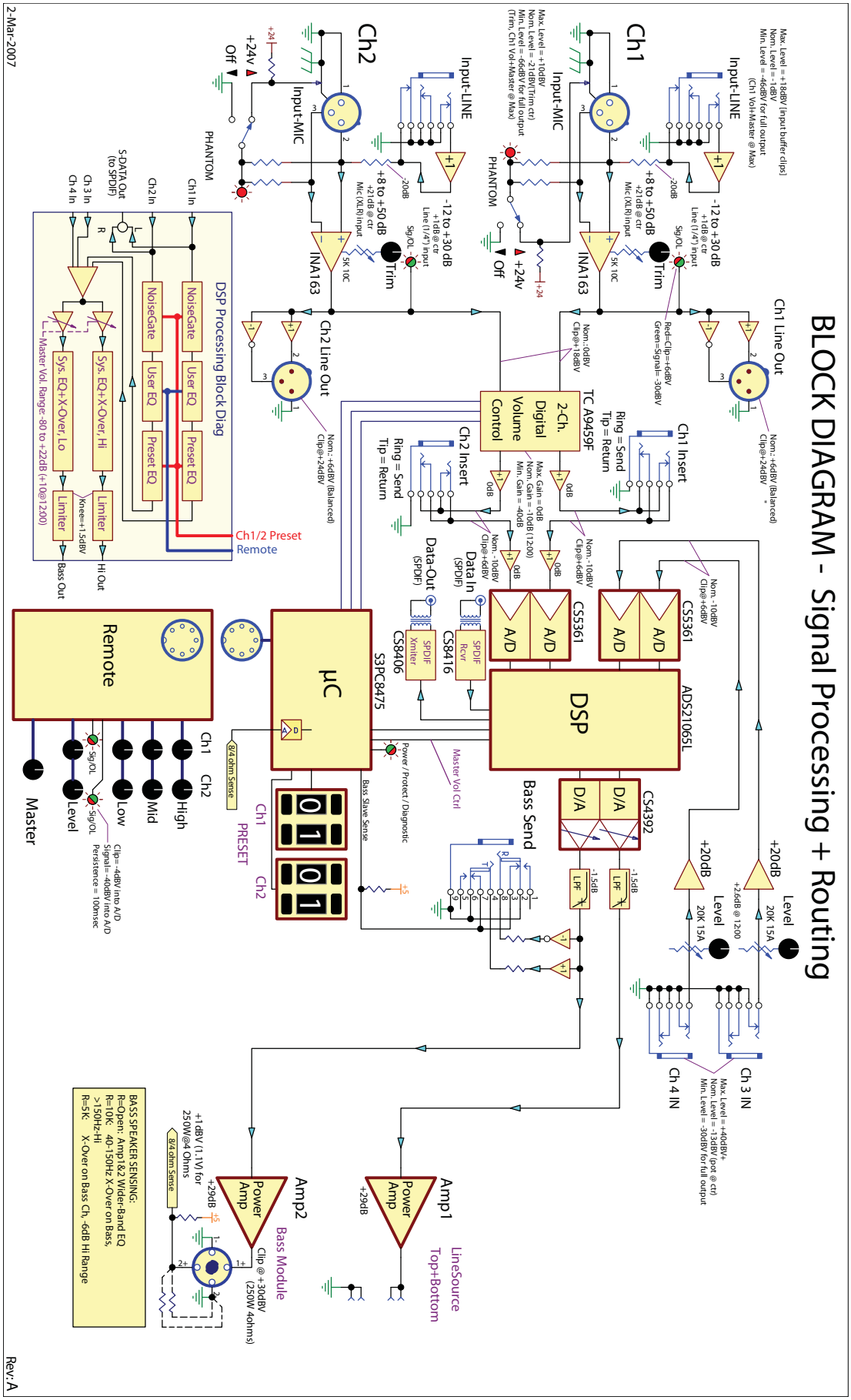
4. Input Panel Removal

4.1 Using a Phillips-head screwdriver, remove the four screws that secure the input panel to the bass module enclosure.

4.2 Lift the input panel away from the bass module enclosure.

4.3 Make a note of the wiring configuration and un-solder the speaker harness wires from the input panel.

Figure 11. L1® Model I Power Stand Block Diagram



Test Procedures

L1® Model I Power Stand Tests

Equipment Required
- dB Meter
- Digital Multi-meter
- Audio Signal Generator
- Distortion Meter
- 2 - 4 Ohm, 250 Watt Load Resistors
- Test cables, see Appendix

Overall System Tests

Notes:
1. Do not connect the R1 remote control for the following tests, unless specified. Powering up the power stand without the remote has the same effect as setting all of the controls on the remote to the midpoint.
2. On the front panel of the power stand, set the Channel 1 and Channel 2 Preset Select switches to 00. Short out the 2+ and 2- connections on the B1 Bass Module output connector using the test cable described in section 1 of the appendix of this manual. This will put the power stand into debug mode for the following tests. In this mode the crossover, the compressor and the EQ are disabled. The DSP will pass a flat response. The level controls and the clip indicators still operate in this mode.
3. Refer to Figure 11, L1 Model I Block Diagram, for the following procedures.

1. Channel 1 and 2 Mic Input Gain Tests

1.1 Connect the powerstand boot test cable to where the line array would usually sit. Details on this cable appear in the appendix.

1.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.

1.3 Using a balanced XLR male input cable, apply a 1 kHz, -30dBV signal to the channel 1 input.

1.4 Reference a dB meter to the input level. Measure the gain at the output of the powerstand boot cable described above. It should be +48.5 dB $\pm$ 3 dB.

1.5 Repeat steps 1.1 to 1.4 for the channel 2 Mic input.

2. Channel 1 and 2 Mic Input Frequency Response and Distortion Tests

2.1 Connect the powerstand boot test cable to where the line array would usually sit. Details on this cable appear in the appendix.

2.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the phantom power push button is not pushed in.

2.3 Using a balanced XLR male input cable, apply a 1 kHz, -30 dBV signal to the channel 1 input.

2.4 Use an 80kHz low-pass filter on your measuring equipment. Reference a dB meter to the input level. Measure the frequency response at the powerstand boot test cable. It should be 0 dB $\pm$ 3 dB from 30 Hz to 15 kHz.

2.5 Measure the total harmonic distortion (THD) level at the powerstand boot cable. It should be 0.25% max at 1 kHz and 1.5% max at 15 kHz.

2.6 Repeat steps 2.1 to 2.5 for the channel 2 Mic input.

Test Procedures

3. Channel 1 and 2 Mic Input Signal to Noise Ratio (Dynamic Range) Tests

3.1 Connect the powerstand boot test cable to where the line array would usually sit. Details on this cable appear in the appendix.

3.2 On the left hand side of the input/output panel, set the channel 1 mic trim control to the 6 setting. Ensure that the phantom power push button is not pushed in.

3.3 Using a balanced XLR male input cable, apply a 1 kHz, -30 dBV signal to the channel 1 input.

3.4 Reference a dB meter to the output level at the powerstand boot cable. Remove the input signal and measure the A-Weighted output level. It should be -80 dB minimum.

3.5 Repeat steps 3.1 to 3.4 for the channel 2 Mic input.

4. Channel 1 and 2 Mic Input Phantom Power Test

4.1 Plug an XLR connector into the channel 1 Mic input. Do not connect any cables to the channel 1 or channel 2 Mic inputs. Power on the unit.

4.2 Press the channel 1 phantom power switch. Verify that the LED lights. Measure the DC voltage level across pins 1 and 2 of the XLR connector. Verify that the DC level is +24Vdc $\pm$ 1Vdc relative to pin 1.

4.3 Measure the DC voltage level across pins 1 and 3 of the XLR connector. Verify that the DC level is +24Vdc $\pm$ 1Vdc relative to pin 1.

4.4 Repeat steps 4.1 to 4.3 for channel 2.

5. Channel 1 and 2 Line Input Gain Tests

5.1 Connect the powerstand boot test cable to where the line array would usually sit. Details on this connector appear in the appendix.

5.2 On the left hand side of the input/output panel, set the channel 1 mic trim control to the 6 setting. Ensure that the phantom power push button is not pushed in.

5.3 Using an unbalanced 1/4" phono jack input cable, apply a 1 kHz, -10 dBV signal to the channel 1 input.

5.4 Reference a dB meter to the input level. Measure the gain output at the powerstand boot connector. It should be +28.5 dB $\pm$ 4 dB.

5.5 On the signal generator, turn the input level all the way down. Verify that the channel 1 Signal/OL LED is off. Increase the signal generator level. Verify that the LED lights green. Increase the signal level again and verify that the LED lights red.
Note: You may have to increase the Mic Trim level on the PS1 channel 1 input as well to get the LED to light red.

5.5 Repeat steps 5.1 to 5.5 for the channel 2 Line input.

6. Channel 1 and 2 Line Input Frequency Reponse and Distortion Tests

6.1 Connect the powerstand boot test cable to where the line array would usually sit. Details on this connector appear in the appendix.

6.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.

6.3 Using an unbalanced 1/4" phono jack input cable, apply a 1 kHz, -10 dBV signal to the channel 1 input.

Test Procedures

6.4 Use an 80 kHz low-pass filter on your measuring equipment. Reference a dB meter to the input level. Measure the frequency response at the powerstand boot connector. It should be 0 dB ± 3 dB from 30 Hz to 15 kHz.

6.5 Measure the Total Harmonic Distortion (THD) level at the powerstand boot connector. It should be 0.25% max at 1 kHz and 1.5% max at 15 kHz.

6.6 Repeat steps 6.1 to 6.5 for the channel 2 Line input.

7. Channel 1 and 2 Line Input Signal to Noise Ratio (Dynamic Range) Tests

7.1 Connect the powerstand boot test connector to where the line array would usually sit. Details on this connector appear in the appendix.

7.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.

7.3 Using an unbalanced 1/4" phono jack input cable, apply a 1 kHz, -10 dBV signal to the channel 1 input.

7.4 Reference a dB meter to the output level at the powerstand boot connector. Remove the input signal and measure the A-Weighted output level. It should be -80 dB minimum.

7.5 Repeat steps 7.1 to 7.4 for the channel 2 Line input.

8. Channel 3 and 4 Line Input Gain Tests

8.1 On the left hand side of the input/output panel, set the channel 3 Level control to the 6 setting.

8.2 Using an unbalanced 1/4" phono jack input cable, apply a 1 kHz, -20 dBV signal to the channel 1 input.

8.3 Reference a dB meter to the input level. Measure the gain output at the Bass/Amp 3 OUT jack. It should be +40.1 dB ± 3 dB.

8.4 Repeat steps 8.1 to 8.3 for the channel 4 Line input.

9. Channel 3 and 4 Line Input Frequency Response and Distortion Tests

9.1 Connect the powerstand boot test connector to where the line array would usually sit. Details on this connector appear in the appendix.

9.2 On the left hand side of the input/output panel, set the channel 4 trim control to the 6 setting.

9.3 Using an unbalanced 1/4" phono jack input cable, apply a 1 kHz, -20 dBV signal to the channel 1 input.

9.4 Use an 80 kHz low-pass filter on your measuring equipment. Reference a dB meter to the input level. Measure the frequency response at the powerstand boot connector. It should be 0 dB ± 3 dB from 30 Hz to 15 kHz.

9.5 Measure the Total Harmonic Distortion (THD) level at the powerstand boot connector. It should be 0.25% max at 1 kHz and 1.5% max at 15 kHz.

9.6 Repeat steps 9.1 to 9.5 for the channel 4 Line input.

10. Channel 3 and 4 Line Input Signal to Noise Ratio (Dynamic Range) Tests

10.1 On the left hand side of the input/output panel, set the channel 3 Level control to the 6 setting.

10.2 Using an unbalanced 1/4" phono jack input cable, apply a 1 kHz, -10 dBV signal to the channel 1 input.

Test Procedures

10.3 Reference a dB meter to the output level at the Bass/Amp 3 OUT jack. Remove the input signal and measure the A-Weighted output level. It should be -80 dB minimum.

10.4 Repeat steps 10.1 to 10.3 for the channel 4 Line input.

11. Channel 1 and 2 Remote Control, Preset Switch and Insert Function Tests

11.1 Connect the power stand to a known good L1 model I line array. Set the channel 1 preset switch to 00. Connect the remote control to the unit using the remote control MIDI cable supplied with the power stand.

11.2 Connect an analog audio source to the Channel 1 line input 1/4 inch jack. This source can be a CD player with a music disc.

11.3 Adjust the trim level so that the LED is lit mostly green. The audio should sound normal.

11.4 With the audio playing, change the channel 1 preset to 97 and back to 00. The channel should mute gracefully when the preset switch is operated. The audio should fade back in again about a second after the switch has stopped operating.
Note: Preset 97 is a 1 kHz band pass (telephone-type sound). Preset 00 should sound normal.

11.5 Operate all channel 1 controls on the remote (high, mid, low, volume and master volume). All tone controls should have a clearly audible effect and operate smoothly. Channel volume may display a little “zipper” noise, which is normal.

Note: Channel volume all the way down does not mute the channel, but the output level should be very low. There is a small, but noticeable time delay between operating the control and the audible effect. This is normal. The master volume control should operate smoothly without any artifacts.

11.6 Insert a 1/4 inch phono jack all the way into the channel 1 Insert jack. The audio should sound normal.

11.7 Insert a 1/4 inch phono jack into the channel 3 Line IN jack and operate the volume control on the power stand. The audio should sound normal.

11.8 Repeat steps 11.1 to 11.7 for the channel 2 input.

12. Channel 1 Send, Line Output and Digital Output Tests

Note: For these tests you will need an external device that can accept both 1/4 inch and XLR inputs. A small mixer, such as a Mackie or Behringer with headphones connected works well for this. The master volume control on the remote control should be set all the way down to mute all sound coming from the unit under test.

12.1 Connect the power stand to a known good L1 model I line array. Set the channel 1 preset switch to 00. Connect the remote control to the unit using the remote control MIDI cable supplied with the power stand.

12.2 Connect an analog audio source to the Channel 1 Line IN 1/4 inch jack. This source can be a CD player with a music disc.

12.3 Adjust the trim level so that the LED is lit mostly green. The audio should sound normal.

12.4 Insert a 1/4 inch plug halfway into the channel 1 Insert jack. The audio should sound normal.

12.5 Connect the power stand channel 1 XLR Line OUT jack to the XLR input of the mixer. The audio should sound normal.

Note: The power stand puts out a “professional” +4dBu level. You may have to turn the the input trim control on the mixer all the way down to prevent overloading the signal and distorting it.

Test Procedures

12.6 Connect the Data Out jack of the PS1 to a device that accepts a 48 kHz S/PDIF data stream. The audio should sound normal.

13. Power Amplifier Tests

13.1 Connect the power stand to a known good L1 model I line array. Set the channel 1 preset switch to 00. Connect the remote control to the unit using the remote control MIDI cable supplied with the PS1.

13.2 Connect an analog audio source to the Channel 3 IN 1/4 inch phono jack. This source can be a CD player with a music disc.

13.3 Verify that audio comes from the L1 model I line array. The audio should sound clean and undistorted.

13.4 Verify that audio comes from the B1 bass module. The bass should be clean and undistorted.

14. High SPL System Sweep Test

CAUTION: This test will be extremely loud. Hearing protection is advised.

14.1 Connect a R1 remote control to the power stand under test. Set the channel 1 controls to mid-level. Set the master volume control on the remote to the 1 o'clock position. Set the channel 1 Mic Trim control on the PS1 to 6. Connect a L1 model I line array to the PS1. Connect a B1 bass module to the PS1.

14.2 Connect a signal generator to the channel 1 input on the PS1. Adjust the signal generator and/or trim control so that the Signal/OL LED is just below red.

14.3 Sweep the input frequency from 40 Hz to 14 kHz. Listen for any unusual noises and excessive distortion or drop-outs.

15. Bass Module Auto-EQ Test

15.1 Connect a L1 line array to the power stand. Connect an R1 remote control to the power stand. Connect a B1 bass module to the B1 Bass Module output jack on the power stand. Connect an audio source to the channel 1 and 2 inputs of the power stand.

15.2 Set the channel 1 and 2 level controls to identical settings so that both LEDs are mainly green.

15.3 While the audio is playing, disconnect the B1 bass module from the power stand. The system should mute and un-mute and audio should resume. The audio should sound normal, but not punchy (no deep bass).

15.4 Plug a dummy 1/4 inch phono jack into the Bass Line Out jack. The system should mute and un-mute again, but the audio should sound thinner than before.

15.5 Remove the dummy plug. The system should mute and un-mute and the audio should sound normal again.

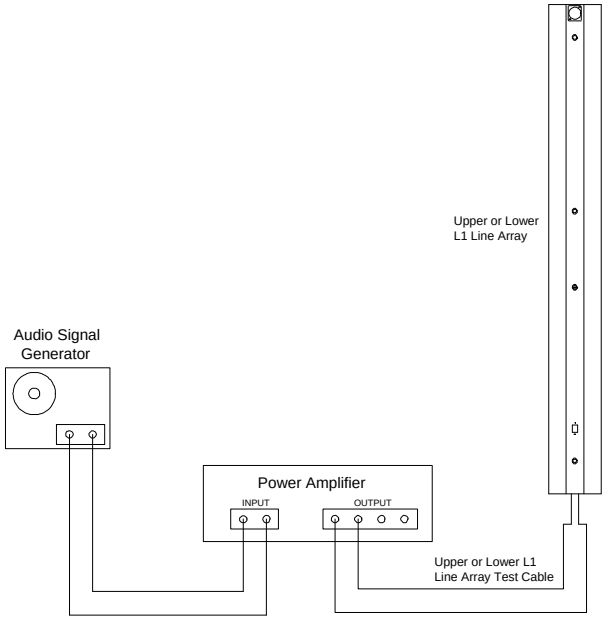
15.6 Re-connect the B1 bass module to the power stand. The audio should mute and un-mute again and sound normal.

15.7 Connect a second B1 bass module to the first one. The audio should mute and un-mute. The audio will sound very similar to having only one bass module attached. Disconnect the second bass module. The system should mute and un-mute and the audio should sound normal again.

Test Procedures

L1® Model I Line Array Tests

Set up the unit under test as shown below.



1. Air Leak Test

1.1 Apply a 100 Hz, 10 Vrms sine wave to the unit under test.

1.2 Listen carefully for air leaks from around the end cap, the transducers and the grille. Air leaks will be heard as a hissing or sputtering sound. All repairs must be hidden. Test duration should be 5 seconds minimum.

2. Transducer Rub and Tick Test

2.1 Remove the transducer you wish to test using the disassembly procedures in this manual. Do not unplug the wires at the transducer assembly terminals.

2.2 Connect a signal generator directly to the terminals of the transducer assembly under test.

2.3 Apply a 20 Hz, 5 Vrms signal to the transducer assembly.

2.4 Listen carefully for any extraneous noises such as rubbing, scraping or ticking.

Note: To distinguish between normal suspension noise and rubs or ticks, displace the cone slightly with your fingers. If the noise stays the same, it is normal suspension noise and the driver is good. Suspension noise will not be heard with program material.

3. Transducer Phase Test

3.1 Apply a DC voltage of 10V, positive applied to the positive tab of the dual banana jack on the line array test cable and negative applied to negative (gnd) tab.

3.2 All of the driver cones should move outward when the DC voltage is applied.

3.3 Rewire any incorrectly connected transducers.

4. L1 Model I Line Array Sweep Test

4.1 Set up the upper or lower line array section as shown in the figure on the previous page.

4.2 Apply a 100 Hz, 10 Vrms sine wave to the input.

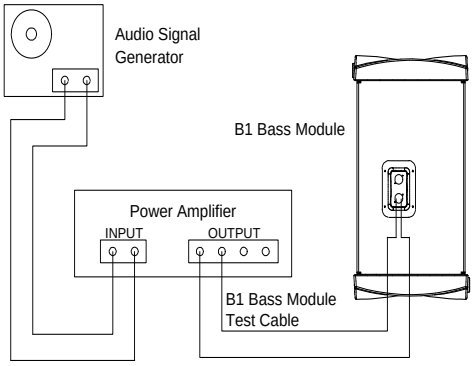
4.3 While listening to the output of the system, sweep the input frequency slowly from 100 Hz to 15 kHz.

4.4 Listen carefully for any extraneous noises such as buzzing and ticking.

Test Procedures

B1 Bass Module Tests

Set up the unit under test as shown below.



1. Air Leak Test

1.1 Apply a 100 Hz, 20 Vrms sine wave to the unit under test.

1.2 Listen carefully for air leaks from around the end cap, the transducers and the grille. Air leaks will be heard as a hissing or sputtering sound. All repairs must be hidden. Test duration should be 5 seconds minimum.

2. Transducer Rub and Tick Test

2.1 Remove the transducer you wish to test using the disassembly procedures in this manual. Do not unplug the wires at the transducer assembly terminals.

2.2 Connect a signal generator directly to the terminals of the transducer assembly under test.

2.3 Apply a 10 Hz, 10 Vrms signal to the transducer assembly.

2.4 Listen carefully for any extraneous noises such as rubbing, scraping or ticking.

Note: To distinguish between normal suspension noise and rubs or ticks, displace the cone slightly with your fingers. If the noise stays the same, it is normal suspension noise and the driver is good. Suspension noise will not be heard with program material.

3. Transducer Phase Test

3.1 Apply a DC voltage of 20V, positive applied to the positive tab of the dual banana jack on the bass module test cable and negative applied to negative (gnd) tab.

3.2 Notice carefully that all driver cones should move outward when the DC voltage is applied.

3.3 Rewire any incorrectly connected transducers.

4. System Sweep Test

4.1 Set up the system as shown in the figure at left.

4.2 Apply a 10 Hz, 20 Vrms sine wave to the input.

4.3 While listening to the output of the system, sweep the input frequency slowly from 10 Hz to 400 Hz.

4.4 Listen carefully for any extraneous noises such as buzzing and ticking.

Appendix

L1® Model I Power Stand Test Cables

Note: In order to be able to properly test the L1 Model I Power Stand, you will need to make a few test cables.

1. Amplifier Output Test Cable:

Parts needed:
1- Neutrik® Speakon® NL4FX Speakon X-Line/4 Pole connector.
4 - Dual banana jacks
2 - 10k ohm, 1/4 Watt resistors
16 or 18 AWG twisted pair wire, 6 feet
18 AWG twisted pair wire, 2 feet

This cable is used to connect the B1 Bass Module output jack to the load resistors used in the test procedures. The connector used is a Neutrik NL4FX Speakon X-Line / 4 Pole type. This connector has 4 terminals labeled 1+, 1-, 2+ and 2-. Terminals 1+ and 1- are used to connect to the load resistors. Use 18 or 16 AWG wire for these terminals. Use twisted pair wires to avoid inducing noise into the cable during use.

The 2+ and 2- terminals will be used to sense the loads connected to the Speakon connector when used with the B1 Bass Module jack. This jack automatically senses the load on this jack to properly tailor the EQ and output level for the connection of one or two bass modules. It does this by sensing the resistive value across terminals 2+ and 2-. The bass modules have a 10k ohm resistor across these terminals. When only one bass module is connected, the power stand sees the 10k resistance and sets the EQ and output level accordingly. When two bass modules are connected, it sees 5k and sets the EQ and output level accordingly. For the test cable, you will use 18 AWG twisted pair wire to a dual banana jack.

It is also useful to have 3 spare banana jacks, one with a short across it and 2 with a 10k Ohm, 1/4 Watt resistor each to simulate a bass module connected to the terminals.

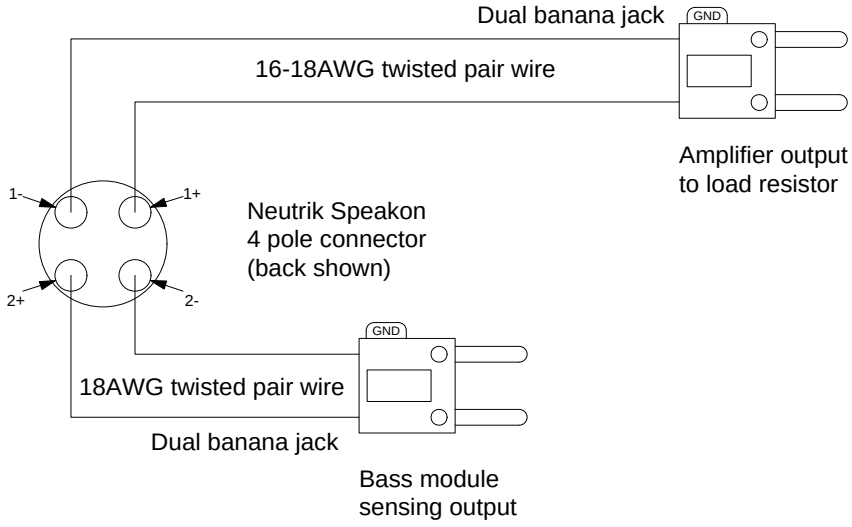


Figure 12. Amplifier Output Test Cable Wiring Diagram

Appendix

2. Powerstand Boot Test Cable

1 - 10 pin Molex female connector, Molex part number 39-01-3103
4 - Molex crimp-on pins for above connector
1 - dual banana jack
12 feet of 16 or 18AWG twisted pair wire

Cut the 12 foot length of twisted pair wire in half. Strip all of the wires back about 1/4 inch. Crimp the molex pins onto the wires. The positive (+) side of the twisted pair wires will go into pins 3 and 8 of the Molex connector. The negative (-) side of the twisted pair wires will go into pins 4 and 9 of the Molex connector. Connect the wires that go to pins 3 and 8 of the Molex connector to the positive (+) side of the dual banana jack. Connect the wires that go to pins 4 and 9 of the Molex connector to the negative (-) side of the dual banana jack.

This test cable plugs into the boot connector of the L1™ Model I Power Stand for all line array amplifier tests.

3. XLR Microphone Input Test Cable

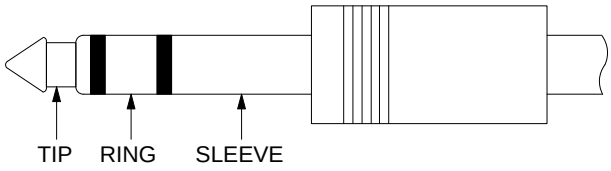
Parts needed:
1 - XLR male connector
1 - Dual banana jack
18 AWG shielded twisted pair wire, 6 feet

This cable is used to test the channel 1 and 2 microphone inputs on the power stand. These input jacks are dual purpose jacks that will accept either XLR or 1/4" TRS phono jack balanced inputs.

Connect the dual banana jack's positive (+) connection to pin 2 of the XLR jack. Connect the dual banana jack negative (-) connection to pin 3 of the XLR jack. Connect the cable shield to pin 1 of the XLR jack.

4. Line Input 1/4" Phono Jack Test Cable

Parts needed:
1 - Mono 1/4" phono jack
1 - Dual banana jack
18 AWG shielded twisted pair wire, 6 feet
This cable is used to test the channel 1 and 2 line inputs on the power stand.



Connect the dual banana jack's positive (+) connection to the tip connection of the 1/4" phono jack. Connect the dual banana jack negative (-) connection to the ring connection of the 1/4" phono jack.

Appendix

5. Insert Jack Test Cable

This cable is used to test the channel 1 and 2 insert jacks on the power stand. When you plug it into the channel 1 or channel 2 insert jack, you will be able to separate the sections of the electronics. Refer to the power stand block diagram on page 71. The RETURN dual banana jack will give you the output of the circuitry up to the output of the 2 channel digital volume control. The SEND dual banana jack will allow you to input a signal to test the circuitry after the insert jack, which is the input to the A/D converter and DSP.

Parts needed:
1 - Tip/Ring/Sleeve (stereo) 1/4" phono jack
2 - Dual banana jacks
Shielded stereo cable, 6 feet

For each of the shielded stereo pairs of wires, connect the dual banana jack's positive (+) connection to the center conductor. Connect the dual banana jack's negative (-) connection to the shield wires. Use an Ohmmeter to determine which of the center conductors is connected to the ring of the 1/4 inch TRS phono jack. Using a permanent black magic marker, label this dual banana connector SEND. Determine which of the center conductors is connected to the tip of the 1/4 inch TRS phono jack. Label this dual banana connector RETURN. The sleeve portion of the jack is the common ground where the shields are connected.

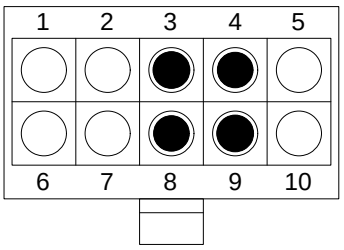
6. L1® Model I Line Array Test Cables

These two cables will allow you to test the upper and lower line array sections without an L1 Model I power stand. Use these cables for the line array test procedures in this service manual.

Lower Line Array Section Test Cable

Parts needed:
1 - 10 pin Molex male connector, Molex part number 39-00-0039 (F)
4 - Molex crimp-on pins for above connector, Molex part number 39-00-0039
1 - dual banana jack
12 feet of 16 or 18AWG twisted pair wire

Cut the 12 foot length of twisted pair wire in half. Strip all of the wires back about 1/4 inch. Crimp the molex pins onto the wires. The positive (+) side of the twisted pair wires will go into pins 3 and 8 of the Molex connector. The negative (-) side of the twisted pair wires will go into pins 4 and 9 of the Molex connector. Connect the wires that go to pins 3 and 8 of the Molex connector to the positive (+) side of the dual banana jack. Connect the wires that go to pins 4 and 9 of the Molex connector to the negative (-) side of the dual banana jack.



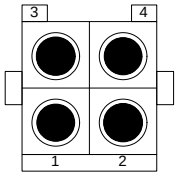
Molex Connector Rear View

Appendix

Upper Line Array Section Test Cable

Parts needed:
1 - 4 pin Molex male connector, Molex part number 39-01-2041
4 - Molex crimp-on pins for above connector, Molex part number 39-00-0041 (M)
1 - dual banana jack
12 feet of 16 or 18AWG twisted pair wire

Cut the 12 foot length of twisted pair wire in half. Strip all of the wires back about 1/4 inch. Crimp the molex pins onto the wires. The positive (+) side of the twisted pair wires will go into pins 2 and 4 of the Molex connector. The negative (-) side of the twisted pair wires will go into pins 1 and 3 of the Molex connector. Connect the wires that go to pins 2 and 4 of the Molex connector to the positive (+) side of the dual banana jack. Connect the wires that go to pins 1 and 3 of the Molex connector to the negative (-) side of the dual banana jack.

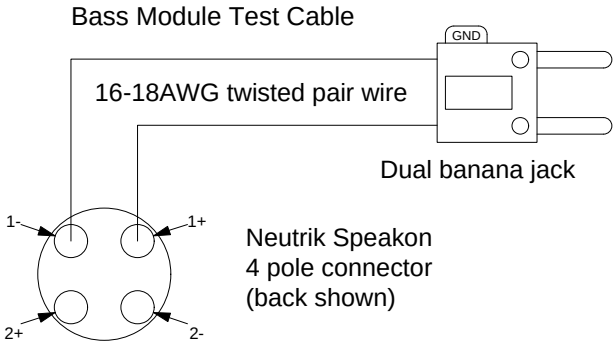


Molex Connector
Rear View

6. Bass Module Test Cable

Parts needed:
1 - Neutrik® Speakon® NL4FX connector
1 - dual banana jack
6 feet of 16 or 18AWG twisted pair wire

Strip all of the wires back about 1/4 inch. Connect the dual banana jack's positive (+) connection to the 1+ connection of the Speakon connector. Connect the dual banana jack negative (-) connection to the 1- connection of the Speakon connector.



Appendix

L1® Model I Power Stand Software Update Procedure

Required Equipment:

1- CD player with a S/PDIF digital output (do not use a Bose® Lifestyle® media center)
1- L1 Model I Power Stand update CD (see the instructions for creating this disc below)
1- S/PDIF video cable, part number 183200, or an audio cable with RCA connectors
1- L1 Model I Power Stand AC line cord

L1 Model I Power Stand Update CD Procedure:

- Go to the Bose Technical Service web page at http://intranet.bose.com/tsg (Bose internal repair centers) or http:serviceops.bose.com (external Bose affiliated repair centers).
- Navigate to the L1 Model I web page. The link to it is located on the Pro Products web page.
- Scroll down the page until you see the table that the link to the L1 Model I Power Stand software update is located in. Download the file to your computer's desktop.
- Using a CD burner and your CD burner software, burn the file onto a blank CD-R or CD-RW disc. Once this disc is successfully created, label the disc with the revision of the software.

Update Procedure:

- Plug the CD player into an AC mains outlet.
- Connect the S/PDIF cable to the Audio Outputs/Digital jack on the back of the CD player.
- Connect the other end of the S/PDIF cable to the DATA IN jack on the Power Stand's input panel. This jack is located in the middle of the panel. It's an RCA jack with a white center.
- Connect the Power Stand's AC line cord to the AC mains jack on the input panel. This jack is located on the right side next to the power switch.
- Connect the other end of the AC line cord to an AC mains outlet.
- Power up the Power Stand by moving the power switch to the ON position. Wait for the power LED to light steady green.
- Load the update CD into the CD player. Press the PLAY CD/DVD button on the remote control. The update process should begin.
- Wait about 5 seconds while the disc is playing. The green power LED on the Power Stand should blink rapidly, about 10 times per second. After about 10 seconds, the LED should begin to blink slower, about twice a second.
- The update process is complete. Power down the Power Stand. Disconnect the S/PDIF cable from the DATA IN jack.
- Verify proper operation of the Power Stand using the test procedures in this service manual before returning the unit to the customer.

Troubleshooting:

Problems with this update procedure are indicated by the Power Stand's power LED. Typical indicators are:

- LED stays a steady green.
- LED blinks slowly red

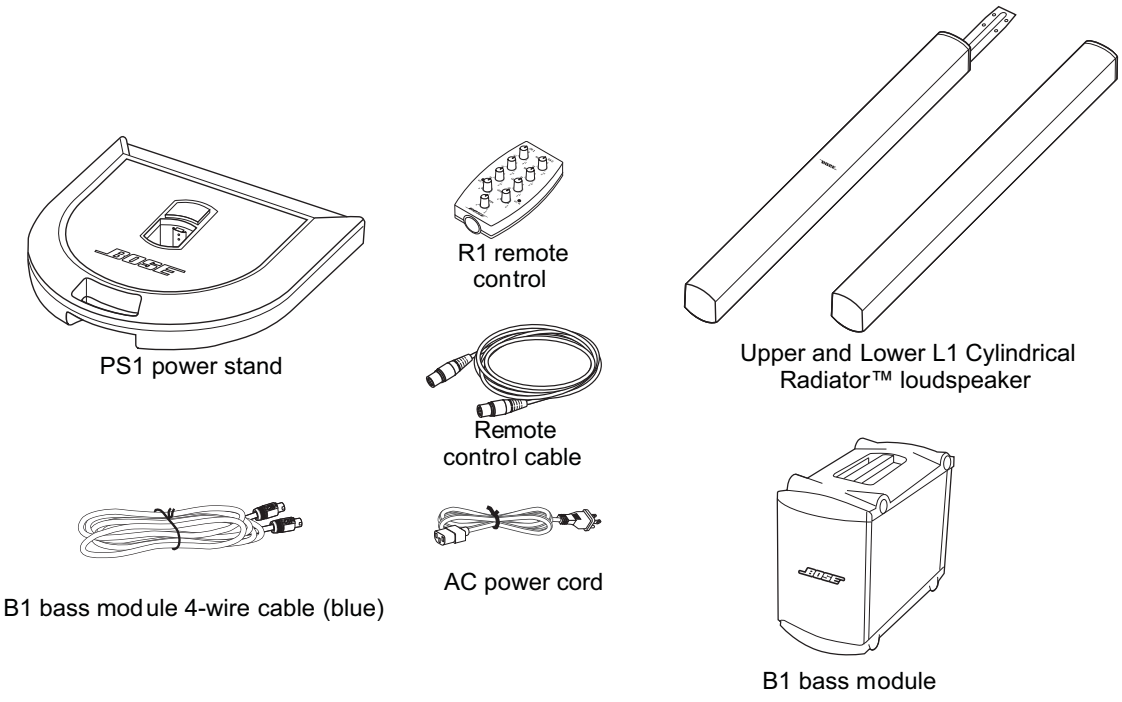
In either case, simply repeat the process above. Make sure you wait 5 seconds after power up of the Power Stand before playing the update disc. Ensure all of the cables are properly connected.

Theory of Operation

1. L1® Model I Power Stand

1.1 Overview

The L1 Model I System is essentially a Natural Amplification sound system, with the following components:
L1 Model I Power stand, two L1 Model I Cylindrical Radiator® line array sections, R1 remote control, B1 bass module, AC power cord, remote control cable and bass module loudspeaker cable (see below). **Note:** The B1 bass module is an optional component.



L1 Model I System Components

Changes from the Personalized Amplification System

The L1 Model I power stand is essentially a RoHS compliant update of the Personalized Amplifcation System. The unit remains functionally unchanged except for a few key points:
1. The line array is now powered by one 250W amplifier instead of two, as on the PAS power stand. The two line array sections are now wired in parallel and powered by a single amplifier. They are each 8 ohms, wired in parallel, for a total of 4 ohms in operation. Due to optimization of the speaker to the amplifier, the output level is virtually the same as the Personalized Amplification System power stand. There is a mechanical stop in the power stand cavity to prevent users from plugging a PAS line array into an L1 Model I power stand. Users can, however, insert an L1 Model I line array into a PAS power stand. This will not harm the unit, but will result is a few dB of loss in output.
2. All 'Auxiliary' speaker connectors on the power stand input panel have been removed. These connectors were originally used intended for users to access the power stand amplifiers in a stand-alone fashion. They were rarely used and were removed from the L1 Model I power stand.

Theory of Operation

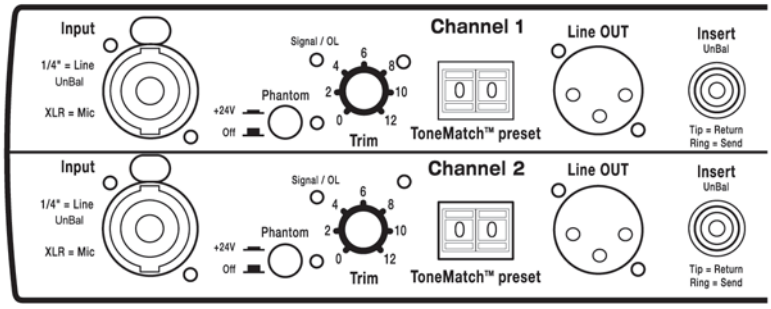
Features

The system has the following features:

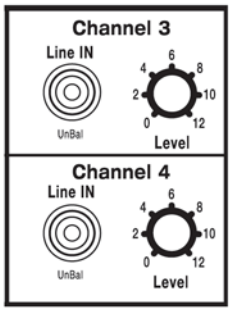
- All signal processing performed with DSP
- Remote control
- The ability to receive analog signal input and SPDIF digital signal input
- The ability to output analog signal and SPDIF digital signal.
- Channel volume control
- Master volume control
- Mixer
- Tone control
- 100 sets of parameter equalizer
- System equalizer for compensating speaker characteristic
- Noisegate
- Limiter
- Clip indicator
- DSP software update and 100 sets of preset coefficients update
- Power protection and amplification protection

The system delivers 250W of output power for each of the two amplifiers housed in the power stand. The system uses a 110V / 230V AC power supply, and has a 1M ohm input impedance at the audio Ch1/Ch2 line input connector and 1.25k ohm input impedance at the audio Ch1/Ch2 MIC connector. Input signal headroom is 2.1Vrms max. A user could operate the system from the input panel and the remote (refer to figures below).

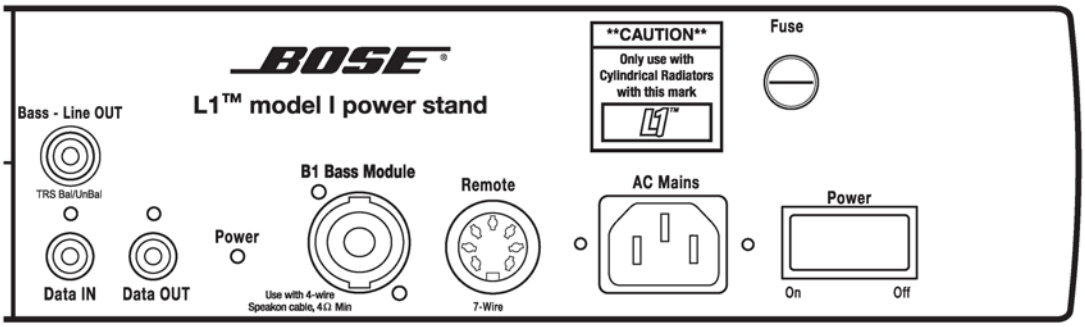
Channel 1/2



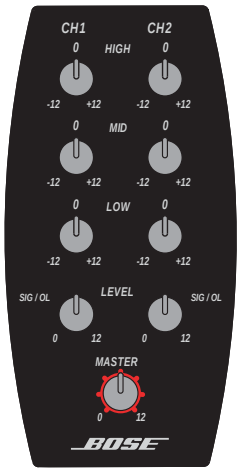
Channel 3/4



Bass, remote and AC power connections



Theory of Operation



R1 remote control

Note: Refer to L1® Model I power stand schematic sheets later in this service manual for the following information. The information inside the brackets [ ] is the component's grid location on the schematic sheet.

The power stand combines the traditional functions of a mixer, digital controller (system EQ and limiter), power amplifier and mechanical speaker stand. The power stand block diagram (figure 11 on page 71) shows the signal flow through the power stand.

The power stand contains eight PCB assemblies: an EMI (FCC) Filter PCB, two +/-27VDC switching power supply PCBs, and Auxiliary Power Supply PCB, 2 channels of amplification on a common PCB, an input panel PCB, DSP PCB, and MCU PCB.

Signal Routing

The power supply connects to the MCU PCB via a the 8 pin connector CN409 [microprocessor PCB sheet 2, A1], four channels of analog inputs on the panel are connected to the DSP PCB via a 6 pin connector CN104 [DSP PCB sheet 1, B1], analog output signals on the DSP panel are connected to input panel via a 3 pin connector CN115 [input panel PCB sheet 2, D1]. SPDIF IN on the input panel is connected to the DSP PCB via a 2 pin connector CN112 [DSP PCB sheet 2, B4], SPDIF OUT on the DSP PCB is connected to input panel via a 2 pin connector CN113 [DSP PCB sheet 2, C8].

For Channel 1 or 2 the signal is input either through the balanced XLR connector or through the ¼" unbalanced connector. The ¼" connector has a very high impedance (900k ohms) to allow direct connection of passive guitars or bass guitars. The signal is then amplified by the adjustable pre-amplifier. After the pre-amplifier, the signal can be accessed at the balanced XLR line level output.

Next the signal is routed through a digitally controlled analog volume control. Then, the signal is routed through the insert loop connector. If there is no plug in the insert jack, the signal will be routed through. Otherwise the signal will be routed to the "ring" of the connector and is expected to return from the "tip". The signal is then digitized in the A/D converters and processed in software.

Theory of Operation

Software provides the following functions

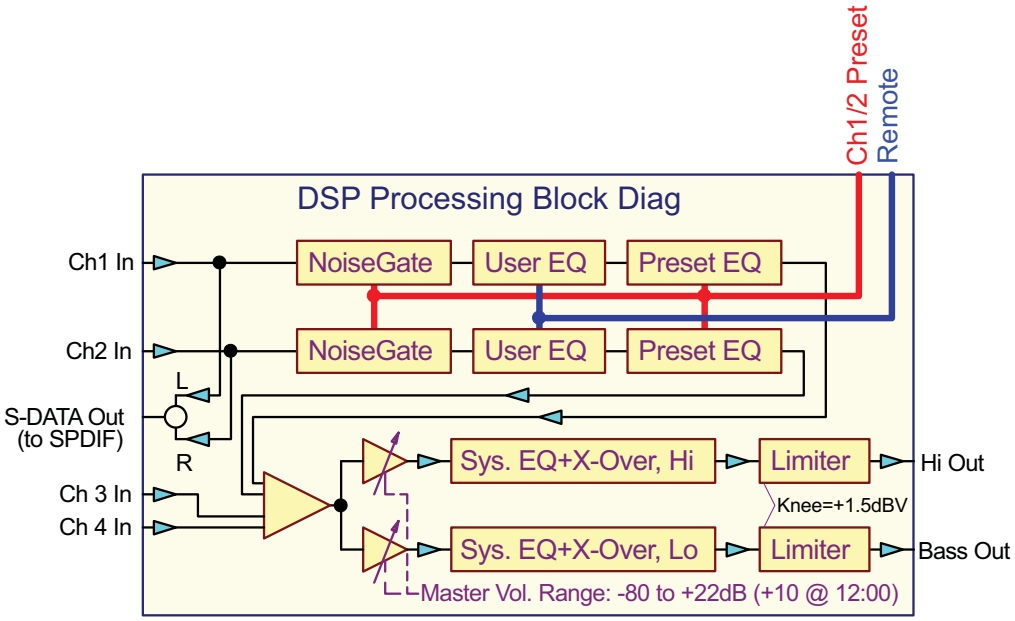
- Channel 1&2: measuring level for LED
- Channel 1&2: noise gate
- Channel 1&2: preset EQ
- Channel 1&2: channel volume
- Sum channels 1 to 4
- Master Volume Control
- System EQ and crossover (for L1 and B1)
- Limiter & soft clipper (for L1 and B1 amplifiers)

Signal Processing

Signal processing is mainly implemented by the DSP and includes the following functions:

- Noisegate & limiter
- Tone control & volume control
- Parameter equalize & System equalizer
- Clip calculate

The signal flow chart is as follows (refer to the block diagram below):

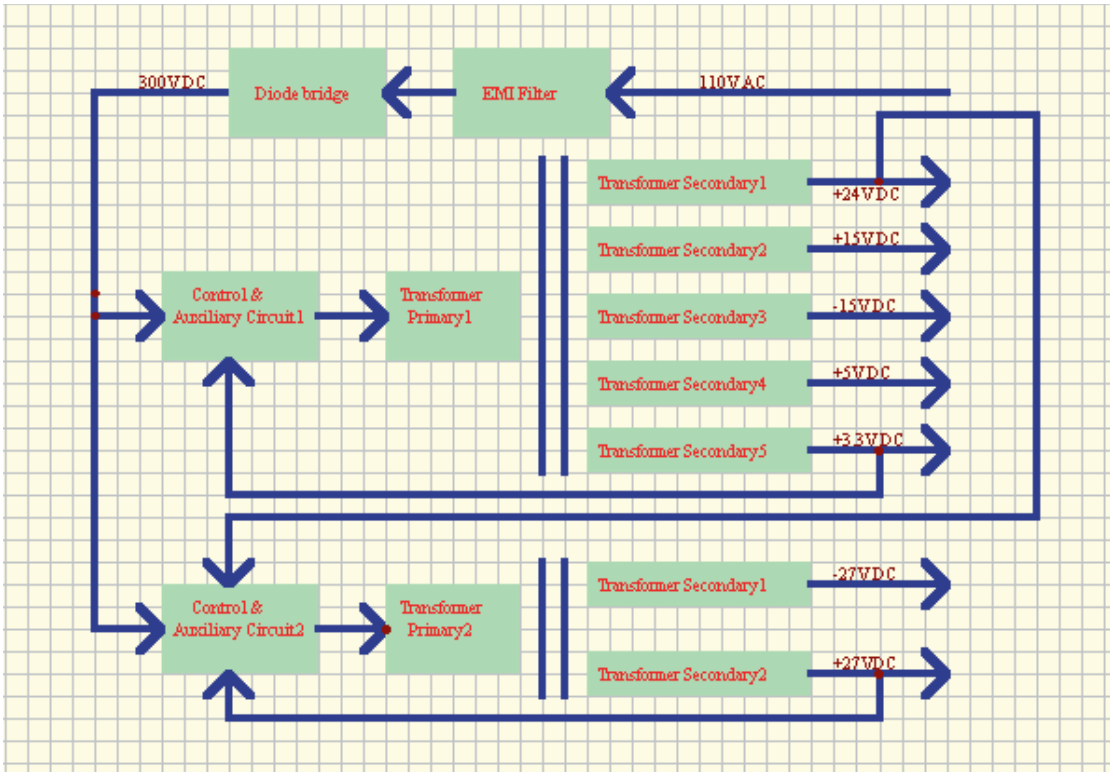


DSP Functional Block Diagram

Theory of Operation

Power supplies

To ensure that the system operates normally, the system must be supplied with seven different voltage levels, +3.3V, +5V, +15V, -15V, +24V, +27V, and -27V. Refer to the block diagram below.



DC Power Supply Block Diagram

110V AC is changed to about 300V DC, after passing through the EMI filter and the diode bridge. Then, the voltage signal is divided two ways: one DC voltage goes through the switch control & auxiliary circuit1 again, enters into the transformer primary1. The transformer1 has five secondary windings, the first outputs +24V DC (for the input panel), the second outputs +15V DC (for A/D, D/A buffer circuit), the third outputs –15V DC (for A/D, D/A buffer circuit), the fourth outputs +5V DC (for MCU and other ICs), the fifth outputs +3.3V DC (for DSP, A/D & D/A IC).

Another DC voltage goes through the switch control & auxiliary circuit2 and enters into transformer primary2. The transformer1 has two secondary, the first outputs -27V DC (for AMP), the second outputs +27V DC (for AMP).

Operation of the all voltage switching regulator is more complicated. The load of +3.3V is the heaviest, so we get this +3.3V as feedback a signal and send it to the switch control & auxiliary circuit1. When the system works, if +3.3V happens to waver, switch control & auxiliary circuit1 will change ‘open’ and ‘close’ time of switch circuit to regulate the transformer primary1, accordingly, the voltage of transformer1 secondary will keep stable. Of course, in this way, the effect of stabilization for +3.3V is best, and that for other voltage is worse.

Theory of Operation

The regulation of the power supply for AMP is like this: we get the +27V as feedback signal and send it to switch control & auxiliary circuit2. When system works, if +27V happens to waver, switch control & auxiliary circuit2 will change ‘open’ and ‘close’ time of switch circuit to regulate the transformer primary2, accordingly, the voltage of transformer2 secondary will keep stable.

When the system works, +5V can supply 100mA to MCU PCB, +3.3V can supply 260mA to DSP PCB, +15V can supply 200mA to DSP PCB, -15V can supply 150mA to DSP PCB, and the +24V can supply 50mA to the Input Panel PCB.

Microcontroller

A microcontroller on the MCU PCB is used for the following control functions:

- Relay DSP information to Remote
- Relay Remote information to DSP
- Control channel volume IC
- Check channel preset switch
- Check bass send state
- Check power & amplification protection
- Check the number of bass speakers connected to the power stand
- Indicate current system working status with a three color LED

These functions are explained in detail on the next page.

Relay DSP information to Remote

The DSP needs to transfer the clip state, channel volume data (cause the table for channel volume in the DSP), and the system working status to the MCU. The communication adopts software simulation UART, with two I/O pins as RX and TX. The communication rate is 4800bps, add a start bit and stop, so every sending byte has 10 bits. Data is sent according to frame format: frame head | every data | check sum. DSP will transfer a frame every 100ms, and every sending will take about 15ms.

The MCU needs to transfer the clip state to the Remote. The communication adopts hardware UART. Communication rate is 9600bps, Data is sent according to the MIDI protocol: MIDI channel number | MIDI parameter type | MIDI parameter value. The DSP will transfer a frame data every 100ms, and every sending will take about 3.5ms.

Relay Remote information to DSP

The remote needs to transfer the Ch1EQHi, Ch2EQHi, Ch1EQMi, Ch2EQMi, Ch1EQLo, Ch2EQLo, Ch1Volume, Ch1Volume, and the MasterVolume to MCU. The communication adopts hardware UART. Communication rate is 9600bps, Data is send according to MIDI protocol: MIDI channel number | MIDI parameter type | MIDI parameter value. DSP will transfer a frame data every 100ms, and every sending will take about 30ms.

The MCU needs to transfer the Ch1EQHi, Ch2EQHi, Ch1EQMi, Ch2EQMi, Ch1EQLo, Ch2EQLo, Ch1Volume, Ch1Volume, MasterVolume, Ch1Preset, Ch2Preset, BassChk, and the CheckSum to the DSP. The communication adopts software simulation UART, with two I/O pin as RX and TX. Communication rate is 4800bps, add start bit and stop, so every sending byte has 10 bits. Data is send according to frame format: every data | check sum. DSP will transfer a frame every 100ms, and every sending will take about 30ms.

Theory of Operation

Control channel volume IC
Because the design requires that the channel signal could change from –40dB to 0dB, we use a volume control IC. There are three pins used to control the volume control IC: CLK, DATA, STB. CLK, DATA and the STB time sequence is implemented by software.

Check channel preset switch
In the audio processing, there is a parameter equalizer, and the system supplies 100 sets of coefficients for this function. A user could choose a different coefficient to get different sound effects. This channel preset switch is a user interface to provide the function for choosing a different coefficient.

Check bass send state
There is a bass-line out plug on the input panel. Through this plug, the system can connect to one or more Bose® PackLite® Model A1 amplifiers to drive additional bass modules. The bass send state only has two logic states “0” or “1”, indicating unconnected and connected. Different states will choose different coefficients for the limiter and the system equalizer.

Check power & amplification protection
When the power supply and amplification have a problem, the system will indicate this to the user by an LED on the input panel. The power & amplification protection signal also only has two logic states “0” or “1”, indicating unprotected and protected.

Bass module sensing circuitry
On the bass connector, there are four pins. 1+ and 1- outputs bass signal, 2+ and 2- is used to check the number of bass modules connected to the power stand. When there is no bass module connected, the resistance value between 2+ and 2- is greater than 10k ohms, when one bass module is connected to the power stand, the resistance between 2+ and 2- is equal to 10k ohms, when two bass modules are connected, the resistance value between 2+ and 2- is equal to 5k ohms, when there are more than two bass loudspeakers, the resistance value between 2+ and 2- is less than 5k ohms. Once the system detects how many, if any bass modules are connected to the power stand, it will adjust the output level and the EQ accordingly to provide the proper outputs for that configuration.

System Status LED
On the input panel PCB, there is a three color LED. The different colors of this LED represent different operating conditions for the power stand.

- Green: operating normally
- Green blink fast: updating software or preset
- Green blink slowly: software update success
- Red blink slowly: software update failure
- Orange: power or amplification protection enabled (fault condition)

Theory of Operation

Codec

In the system, there are five codec ICs: U386 (for Ch1 & Ch2 A/D), U385 (for Ch3 & Ch4 A/D), U387 (for line & bass D/A) [DSP PCB sheet 1, B/C/D5], U431 (for SPDIF IN) [DSP PCB sheet 2, D3], U435 (for SPDIF OUT) [DSP PCB sheet 2, B6].

U386, U385, U387, U431, and U435 include the following functions:

- U386: Two channels of 24-bit ADC, one for Ch1 analog input and one for Ch2 analog input. The ADC will input signal levels in levels in excess of 2Vrms. Master mode.
- U385: Two channels of 24-bit ADC, one for Ch1 analog input and one for Ch2 analog input. The ADC will input signal levels in levels in excess of 2Vrms. Slave mode.
- U387: Two channels of 24-bit DAC, one for Line analog output and one for Bass analog output. Maximum output signal level is 2Vrms. Slave mode.
- U431: Two channels of 24-bit digital audio interface receiver.8:2 S/PDIF Input MUX, AES/SPDIF input pins selectable in hardware mode.
- U435: Two channels of 24-bit digital audio transmitter. Output Ch1/Ch2 input signal. Slave mode.
- A crystal oscillator which establishes the ADC/DAC/SPDIF OUT sampling rate, in this case, it is 12.288MHz / 256 = 48KHz.
- SPDIF IN sampling rate is the same as playing frequency, generally 44.1KHz.
- U386, U385, U387, U431, U435: Standalone Hardware mode.
- Word rate clock for the audio data on the SDOUT pin. Frequency will be the sample rate.
- Serial bit clock for audio data on the SDOUT pin.
- a serial bit stream containing the 24-bit audio data.
- U386, U385: 3-wire serial digital output port, U387: 3-wire serial digital input port,
- U431: 3-wire serial digital output port, U435: 3-wire serial digital input port. I^2S format digital data output/input these ports.

In addition, the timing of the data flow into and out of the DSP is driven by the codec. The serial ports on the DSP run asynchronously to the 30MHz clock which drives the DSP.

DSP

The DSP, U461 [DSP PCB sheet 3, B4] is an Analog Devices 21065L general purpose floating point digital signal processor. There are two of these DSP ICs used in the system. Each is capable of about 40MIPs of performance. The DSPs are mainly used to process sound effects. They provide:

- Two channels noise gate
- Two channels tone control
- Two channels clip calculate
- Two channels parameter equalizer
- Four channels mixer
- Two channels system equalizer
- Two channels limiter

The DSPs have no internal ROM, at boot time they load themselves from the external FLASH U462 [C7]. This boot process is more or less automatic, no intervention from the microcontroller is required.

The signal required to connect the DSPs to the boot FLASH include:

- An external data address bus (24 bits, of which 18 are used)
- An external data bus (32 bits, of which 8 are used)
- Bus control signals

Finally the signals are brought out through a D/A stereo converter. The “left” channel contains the signal for the L1, the “right” channel the signal for the bass module. The L1 signal is routed to power amp 1 and the B1 signal to power amp 2.

Internally the outputs of power amp 1 is routed to a Molex connector in the base of the power stand which connects to the L1 line array. The bass module is powered by power amp 2. The B1 signal is available as a balanced signal at the “Bass Line Out” TRS connector.

1.2 Gain Specifications

1.2.1 Purpose and Philosophy

The purpose of this specification is to define all relevant gain levels in the Bose® L1™ Model I power stand and to specify procedures, for how these gains can be measured.

We’ll do this primarily by specifying a “nominal” level at each point. The “nominal” level represents the desired operating point. This is the level where we anticipate that the bulk of operation occurs. Wherever warranted we will also do a headroom analysis in order to specify or derive the maximum acceptable level before a stage clips or overloads.

The gain structure is designed in a way so that there is one point that handles the main system constraint. This point is the digital limiter inside the DSP. If all levels are “nominal” the system should just reach full output, the digital limiter should just be starting to work and all other analog signals (except for the power amp, off course) should still have reasonable amounts of headroom. This design allows controlling the high-signal behavior of the system completely in software through the digital limiter and still offers good signal-to-noise properties.

1.2.2 Gains and Signal Levels

First, we need to define some reference levels for all the adjustable controls in the system. For the “nominal” signal levels, we assume certain settings in those controls, and define the gain of each adjustable section.

Theory of Operation

Control	Gain Range	Nominal	Comment
TRIM – Microphone PreAmp	+8dB to +50dB (XLR Balanced Input)	+21dB @ Pot center	Center vs. Max/Min dependent on Pot taper.
TRIM –Line PreAmp	-12dB to +30dB (1/4" Unbalanced Input)	+1dB @ Pot center	Center vs. Max/Min dependent on available Pot tapers.
Ch1, Ch2 Volume (Remote)	-40dB to 0dB	-10 dB @ Pot center	Adjustment range is restricted and log taper is implemented by a look-up table, in order to make this a usable control.
Master Volume (Remote)	-80dB to +22dB	+10 dB @ Pot center	Adjustment range is defined and log taper is implemented by a look-up table, in order to make this a usable control.

Adjustable Controls: Gain range and nominal settings

Next we define all the nominal signal levels for full power output. All signal levels are specified in dBV unbalanced unless otherwise noted. All levels in front of the DSP can be measured as such directly. The post-DSP peak output levels can only be observed when the limiter is switched off.

Point	Nominal	Peak	Comment
Line In, Trim @ Max	-30dBV un-bal	- 12 dBV	Ch1 / Ch2 Vol. + Master @ 12:00. Maximum input limited by input INA163 output clipping.
Line In, Trim @ 12:00	-1dBV dBV un-bal	+17 dBV	Ch1 / Ch2 Vol. + Master @ 12:00. Maximum input limited by input INA163 output clipping.
Line In, Trim @ min	+12dBV un-bal	+18 dBV	Ch1 / Ch2 Vol. + Master @ 12:00. Maximum input limited by input Buffer.
Mic., Trim @ max	-50 dBV balanced	-32 dBV balanced	This nominal = the output level of a Shure SM58 microphone that is exposed to 104 dBSPL.
Mic., Trim @ 12:00	-21 dBV balanced	-3 dBV Balanced	
Mic., Trim @ min	-8 dBV balanced	+10dBV balanced	This nominal = the output level of an AKG C4000 microphone that is exposed to 120 dBSPL.
Ch1, Ch2 Line out XLR	+6 dBV balanced	+24 dBV balanced	
Dig. Vol. Control, input	0 dBV	+18dBV	
Dig. Vol. Control, output	-10 dBV	+18dBV	The nominal gain setting here is -10dB for the volume control +20 max out assumes Volume @ Max. (+10 max)
Insert Send	-10 dBV	+8dBV, +18dBV	Peak @ 12:00 / Max Volume. Nominal is conservative but should also work well for cheap stomp boxes
Insert Return	-10 dBV	+6dBV	Assumes FX device in loop is set for unity gain Peak limited by A/D input overload.
A/D input	-10 dBV	+4.5dBV	Assumes max voltage at the A/D = +6dBV=0dBFS, D/A output filter gain = -1.5dB
D/A output	0 dBV	+4.5dBV (debug) 0dBV (normal)	The total excess gain in the DSP will be 16 dB, with a nominal setting of +10dB. Again we assume 0dBFS = +6dBV. It is the responsibility of the digital limiter to ensure that power amp does not clip, i.e. that the output will not exceed 0 dBV
Bass Out	0 dBV	0/+4.5dBV +6/10.5bal	Limiter engaged (normal operation) / Debug Bass Out can be used Balanced / Un-balanced
Amp In	0 dBV	0 dBV	Nominal levels throughout the system are referenced to full output power, so nominal & peak are the same
Amp Out	30 dBV	30 dBV	This is maximum output at clip level ~250W @ 4 ohms

Nominal and Peak Signal Levels

The minimum input level that would allow the system to reach full output (with all gain controls all the way up) is -72 dBV. This is the output level of a Shure SM58 being exposed to about 78 dB SPL and should be sufficient for almost any application.

This gain scaling puts the main responsibility for the high-signal performance of the system on the digital limiters. The limiters need to make sure that the output never exceeds 0dBV. The extra 6 dB headroom in the DSP can be used to compensate for gain variance in the power amp and to allow the DSP to overdrive the power amps for very short periods of time. It may turn out, that, for certain instruments, this will be required to achieve maximum SPL at acceptable sound quality.

1.2.3 LED Trigger Level

The system has also two signal/clip LED indicators. The signal LED should turn on as soon as the level reaches -30 dB versus nominal level and the clip LED should light at +6 dB versus nominal level.

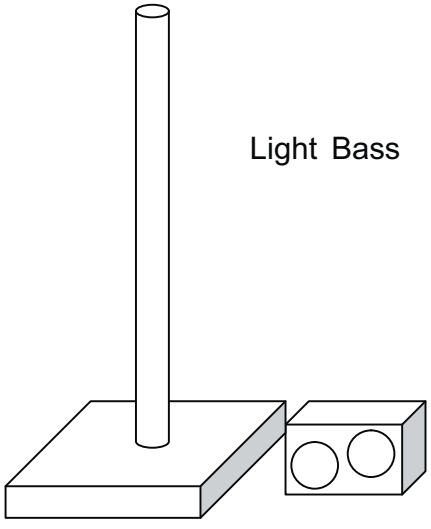
Control	Signal	Clip	Comment
Input LED	-30 dBV	+6 dBV	At Mic/Line PreAmp Output. All levels unbalanced (at internal measurement points)
Remote LED	-40 dBV	-4 dBV	At A/D input. This corresponds to -46 dBFS and -10 dBFS respectively. There is 10 dB headroom between the clip indicator coming on and the point where the A/D would actually clip

LED Trigger Levels

1.3 Auto-detection, Operational Modes and Debug Mode

1.3.1 Rational and Operational Modes

The system can be set up in a variety of different bass configurations. There is some concern, for example, that a system consisting of a power stand, line array and a single bass module may not produce enough bass output for (e.g.) bass players or a kick drum. A second bass module can be added to the power stand, but for some players this will still not provide enough bass. In these cases, you would need to connect a Bose® PackLite® Model A1 amplifier to the bass out Neutrik® connector on the power stand input panel. You could then connect two additional bass modules to this amplifier for the additional bass level required. If even more bass is required, additional PackLite amps can be daisy-chained to the original amp, each driving two bass modules. It is not recommended to use more than eight bass modules total with a single power stand.



Ideally, at low levels all bass configurations should produce the same spectral balance, and the main difference between a system using one bass module and the system using eight bass modules should be that the system with eight bass modules can produce 18dB more SPL before the limiter kicks in.

If we label the system with 2 bass modules “nominal” and assign it a relative level of 0dB, we would have to apply the following gains to achieve equal spectral balance.

Total number of bass modules	Ideal EQ Gain	Actual EQ Gain	Comments
2	0 dB	0 dB	
1	+6dB	+6dB	
4	- 6 dB	-6 dB	
6	-9.5 dB	-6 dB	
8	-12 dB	-6 dB	

Ideal and actual bass EQ gains

1.3.2 Implementation

The power stand detects:

a) The number of bass modules B1 connected to the bass out Neutrik connector. This is done by measuring the impedance between pins 2+ and 2- of the connector. The B1 bass module has a 10k ohm resistor between those to pins.

b) The insertion of a 1/4" jack into the “Bass Line Out”. A normalling connection of this jack is connected directly to a flag pin on the DSP.

Depending on these detections, the power stand will change system EQ and limiter settings. This information is collected by the DSP and determines EQ and limiter settings through a lookup table:

Number of Bass Modules	Impedance, Amp3 2+ - 2-	Bass Send connected	Bass EQ	LA EQ	Comment
0	infinity	No	0	0	No bass module: L1: Select highpass at 110Hz B1: 40-110Hz flat bandpass
1	10k ohm	No	1	1	L1: crossover at 180 Hz B1: “nominal EQ” +6 dB
2	5k ohm	No	2	1	L1: crossover at 180 Hz B1: “nominal EQ”
0	Infinity	Yes	3	2	This mode is for use with external powered sub. L1: crossover at 180 Hz B1: flat 40Hz to 180Hz
1	10k ohm	Yes	4	1	Undefined state, user may be using an external 3rd party device with a single B1 L1: crossover at 180 Hz B1: “nominal EQ”
2	5k ohm	Yes	5	1	This is the nominal case with an additional external power stand connected L1: crossover at 180 Hz B1: “nominal EQ” -6 dB
??	0	Either	6	0	Debug Mode: all EQ and limiters are by-passed.

EQ lookup table for all operational modes

1.3.3 Debug Mode

Debug mode is entered when a resistance of 1k ohm or less is detected between pins 2- and 2+ at the bass output Neutrik® connector. In debug mode, all system EQ's are set to "flat" and the internal limiters are bypassed. Most measurements should be done in debug mode.

A simple way to switch between the different modes is to create a "dummy" cable that brings out pins 2- and 2+ to a banana plug. The modes can be switched by applying different numbers of 10k ohm resistors or a short between the leads of the banana plug. Pins 1+ and 1- of the "dummy" cable can still be routed to a Neutrik Speakon® connector to attach B1 bass modules.

1.4 Power Supply Electronics

The L1™ Model I power stand is powered by a total of three distinct switch-mode power supplies. All of these are fed approximately 340VDC from the single input filter PC Board which contains numerous EMI filtering components, in addition to a bridge rectifier and storage capacitors C607 and C608 [EMI (FCC) Filter PCB sheet1, C4]. NTC thermistors TH601 & TH602 [C2] provide added resistance at start-up to lower the inrush current.

Two identical board assemblies provide a separate ±27VDC to each of the power amplifier channels. These are regulated with a transformer-coupled, two-FET forward converter topology. Isolation is provided by the main transformer T503 [27 Volt Power Supply PCB sheet 1, C4], and by the gate-drive transformer T502 [A3]. In addition to the internal over-current protection provided in the controller IC, there is an external input which shuts down an individual channel's power supply if a fault is sensed by the respective amplifier channel.

The third SMPS PC Board assembly, known as the Auxiliary Power Supply, provides all of the other low-voltage, low-power DC voltages required by the remainder of the power stand electronics. These are ±15V, +24V, +5V and +3.3V. They are regulated with a direct-coupled, single-FET flyback converter topology. Isolation is provided by the main flyback transformer T601 [Auxiliary Power Supply PCB sheet 1, C2], and by two opto-couplers IC602 and IC606 [B3]. Feedback for regulation is derived from the 3.3V digital and +15V analog outputs. Regulation of the other outputs depends on close coupling of transformer T601's secondaries.

The +24V output is used to power the cooling fans [sheet 2, D3], which are in turn driven in proportion to the output signal level. +24V is also used to provide phantom power for the microphone inputs. +5 and +3.3V outputs are used primarily to power the DSP, A/D & D/A converters, microcontrollers, remote control communications, etc. The ±15V outputs power the numerous Op Amps and other analog circuitry.

1.5 Audio Signal Path

1.5.1 General Notes - All Analog Inputs and Outputs

All user-accessible inputs and outputs are protected from RF interference (EMI) and static discharge (ESD) by rail-rail diode clamps, spark gaps, and RC filtering. Extensive filtering is also applied to speaker, power and remote connections to prevent transmitted or received interference. All analog inputs and outputs are configured as non-inverting, i.e. all ins and outs are in phase with each other. Standard polarity conventions apply; XLR connectors are wired pin 2 pos, pin 3 neg.

The remote control does not carry any analog signals, rather it transmits MIDI code bi-directionally over an 8-conductor MIDI cable.

1.5.2 Preamplifier

The INA163 low-noise instrumentation amplifier forms the core of the preamplifier section. Gain of both the Mic and Line inputs is determined by the impedance between the RG pins 12 and 3, which consists of Trim control VR101/102 [input panel PCB sheet 1, A3 and C3] and R133/ R168. The balanced microphone input is protected from EMI, ESD and DC voltages (including phantom power) by a rail-rail diode clamp, spark gaps, and numerous R's and C's. The un-balanced Line input is buffered by FET-input OpAmp U101A [D2] / U103A [B2] to maintain the very high input impedance which is often required by instruments with magnetic pickups. R105 and 107 attenuate the Line input to an appropriate level as it is fed into the INA163.

Input "combo-jacks" J101 and J102 [C1, A1] are configured so that outputs from buffer amps U101A & U103A are shorted to ground when a ¼" plug is not inserted into J101 or J102 – this eliminates the OpAmps's noise contribution when the Mic input is in use, or when the channel is not being used. U101B and U103B provide "DC servo" feedback to the INA163's to effectively null out any DC that would appear on their outputs.

Phantom Power

Condenser microphones are popular for many applications; they require a balanced external power source applied equally to pins 2 & 3 of the XLR-type microphone connector. In addition to an on/off switch and pilot LED, additional circuitry is provided to enable the +24VDC Phantom power supplies to ramp up and down at a relatively slow rate, thereby preventing turn-on and turn-off pops and clicks.

1.5.3 Line Out

The Ch1 and Ch2 XLR balanced Line Outputs are driven by OpAmps U106 and U107 [A6, C6]. These stages translate the internal PreAmp output signal to a differential balanced output.

1.5.4 Digitally Controlled Analog Volume

Ch1 and Ch2 Volume controls are implemented though a Toshiba TCA9459F chip, U302 [micro-processor PCB sheet 1, C3]. This chip contains a resistor ladder and a series of analog switches that attenuate the input according to serial commands from the microcontroller. At-tenuation of 0dB to -89dB (plus "off") is available in steps of 1dB, but the power stand's software contains a look-up table to access a subset of these steps. This optimizes the feel of the control over the range of 0 to -40dB. The range is restricted to prevent the user from inadvertently turning the signal path completely off.

1.5.5 Channel Insert

J105 and J106 [input panel PCB sheet 1, B5] are stereo ¼" jacks configured with the output ("Send") connected to the Ring terminal, and the input ("Return") connected to the tip. Usually, this would be used with a special "insert Y-cord" to route the Ch1 or Ch2 signal to an external effects device such as a reverb, chorus, etc. If a 2-conductor (mono) ¼" plug is fully inserted, the signal will be routed directly into the A/D converter, bypassing all of Ch1 or Ch2's PreAmp and Channel Volume control circuitry.

1.5.6 Channel 3 & 4 Inputs

The input signals are received through J107 [C8] /J108 [A8]. These are unbalanced 1/4" jacks which short the input to ground if nothing is inserted. The signal is attenuated by VR103/ VR104, AC coupled, buffered and amplified through U108A/U108B and then routed to the A/D converter U385 [DSP PCB sheet 1, D5] (Crystal CS5361). Because there is no active circuitry between the inputs and the level controls, judicious setting of the controls can allow Ch3 and Ch4 to accept very high input levels.

1.5.7 Analog to Digital Converters (Analog)

The power stand has two stereo A/D converters Crystal CS5361. U386 [C5] receives channels 1 and 2, U385 receives channels 3 and 4. Each channel signal is received on the DSP board through CN104 [B1]. Each signal is AC-coupled, buffered and balanced through op-amp pairs (U381A/B – U384A/B). All eight resulting signals are clipped with diode pairs and routed to the A/D chips.

1.5.8 Digital to Analog Converter (Analog)

The stereo D/A converter U387 [B5] is of type Crystal CS4392. It has two symmetrical outputs that get turned into an unbalanced signal through difference amplifier U388A [D7] /U388B [B7]. These OpAmp sections also form additional 2-pole low-pass filters that help remove out-of-band components from the audio output. The “left” output contains the signal for L1 Model I Cylindrical Radiator® loudspeaker and the “right” output contains the signal for the B1 bass module. These get routed through CN115 back to the input panel board.

1.5.9 Power Amp Inputs and Bass Line Out

J113 Bass Line Out jack [input panel PCB sheet 2, D3] provides a TRS balanced & buffered version of the “right” / bass output from the D/A. Both + and – signals are resistor-isolated so that either balanced or unbalanced ¼” phone connections may be used.

An “All-Amps-In” connector J112 [C1] allows a single input to drive both amplifiers equally. J112’s switching configuration allows both high and low frequency channels to drive the appropriate channels when the All-Amps-In connector isn’t in use, and allows the addition of a buffer U112A [B3] to maintain a greater than 10k ohm input impedance when the connector is used.

1.5.10 Power Amplifiers

Note: Refer to the Digital Amplifier PCB schematic sheets for the following information.

Each of the power stand’s 2 amplifier channels is implemented with a 2-chip Class-D solution from Philips. The two identical channels are located on one PCB assembly, but they are kept independent by separate power supply, I/O and control connections. Each TDA8929T PWM controller (U806 and U809) [sheets 2, 3 and 4, C4] interfaces directly to two TDA8927J (U804, U805, U807 and U808) power output stages. Normally, only one 8927 is used, but in our case, the two halves of each 8927 are operated in parallel (doubling the available output current), and the two paralleled chips are driven out of phase to achieve the bridged output configuration. Current sharing between the two halves of the 8927 chips is achieved by a separate output LC filter for each section. The direct interface allows excess current in any one of the output stages to immediately shut down all drive signals from the 8929 controller chip.
Numerous bypassing and filtering elements are added to the power amplifier to mitigate the effects of the high currents at the nominal switching frequency of about 300 kHz.

In addition to the overcurrent shutdown path (amp shuts down power supply), there is other outboard circuitry added to shut down an amplifier channel if the corresponding power supply voltage is too low (usually due to extreme overdrive), and also another path to shut down a channel’s power amp and power supply if excess DC voltage appears at the output.

1.6 Digital Audio

1.6.1 Overview

The power stand contains a DSP Analog Devices 21065L, U461 [DSP PCB sheet 3, B4] and a one time programmable micro-controller U342 [microprocessor PCB sheet 2, C3]. The microcontroller essentially interfaces to all peripherals and communicates the information from/to the peripherals to the DSP which contains most of the intelligence of the system. In addition the microcontroller acts as a watchdog for the DSP, i.e. it will reset the DSP if the DSP chip hangs up.

1.6.2 Audio Clocking

The audio signal processing is done at 48 kHz which gets created by an internal 12.288 MHz (= 256*48kHz) oscillator. XTAL431 [DSP PCB sheet 2, B3] and distributed through U434 [B5]. The power stand can receive SPDIF through the DATA In connector, but this data is received asynchronously to the actual audio data. This is different from most other Bose® products, where the master clock is derived from a digital input (if it exists).

Digital audio is transported through an I^2S interface (Serial data, Bit clock, Left/Right clock). U386 [DSP PCB sheet 1, C5] (channel 1/2 A/D) generates the bit clock and the Left/Right clock. These clocks get buffered through U433 [DSP PCB sheet 2, C5] and routed to U385 [DSP PCB sheet 1, D4] (channel 3/4 A/D), U387 [B4] (D/A), SPORT 1 (serial port 1) of the DSP, and the SPDIF transmitter U435 [DSP PCB sheet 2, B7] (Crystal 8046).

1.6.3 Digital to Analog and Analog to Digital Converters (Digital)

Both A/D converters (U385/U386) and the D/A (U387) are hardware configured. U386 is configured as a master and U385 as a slave. The DSP can reset the A/D through FLAG3 and the D/A through FLAG2. The data is received by the DSP on SPORT1 (serial port 1) channel A (U385) and channel B (U386). The DSP transmits the audio data again on SPORT1 (serial port 1) channel A (to the D/A, U387) and channel B (SPDIF transmitter, U435).

1.6.4 SPDIF Interface

The SPDIF output provides the unprocessed audio received from channel 1 and 2. It is basically a digital copy of the input signals to U386. The audio is sent by the DSP through channel B on SPORT1 in I^2S mode and received by U435, a Crystal 8046 SPDIF transmitter. U435 can be reset by the DSP through FLAG1. U435 generates proper SPDIF signals and these get routed through a transformer T431, through CN113 back to the Data Out connector on the panel board.

The “Data In” SPDIF input is NOT designed to receive actual audio, but to receive data that is disguised as a SPDIF bit stream. The SPDIF input is clocked independent from the rest of the system. The signal is received on the “Data In” connector on the panel board and routed through CN112 to the DSP board and received by Crystal 8416 SPDIF receiver (U431), which performs clock and data recovery. The data is transferred through an I^2S interface to the DSP and received through SPORT0 on channel A. The DSP evaluates the data asynchronously. The DSP can reset U431 through FLAG0 and can monitor the whether the U431 has valid audio through FLAG8.

1.7 Digital Signal Processor

1.7.1 Architecture

The DSP is an Analog Devices ADSP21065L processor. It boots from an EEPROM SST20LE020, U462 [DSP PCB sheet 3, C7]. U462 accessed through boot memory space and through external memory space 3. Either BMS or MS3 on the DSP will chip enable U462 and then a standard write/read enable interface is used to address U462. The DSP is reset by the microcontroller through RESET. Chip clock is locally provided through XTAL461 [A2] at 30 MHz resulting in a 60 MHz internal clock speed.

1.7.2 Interface to Microcontroller

Besides the audio peripherals described in the previous section, the DSP only interface to the microcontroller. The DSP receives data on FLAG4 (P10 on the micro), transmits data on FLAG5 (P11 on the micro) and FLAG11/P12 provide clocking. RESET/P13 provides the reset for the DSP and the watchdog functionality. The interface signals are routed through CN341 [microprocessor PCB sheet 2, C8] between DSP and microcontroller board.

1.7.3 Internal LED

The DSP displays a “heartbeat” signal to an internal LED on the DSP board though FLAG10.

1.8 Microcontroller

1.8.1 Overview

The microcontroller is clocked by X341 [D3] (12 MHz) and provides interfaces between nearly all peripherals.

Pins	Interface	Type
P24-P27	Preset switch CH 1, single digit	static
P20-P23	Preset switch CH 2, tens digit	static
P4-P7	Preset switch CH 1, single digit	static
P0-P3	Preset switch CH 1, tens digit	static
P10-P13	DSP Interface	SPI
P14-P15	Remote	Modified MIDI
P37/ADC7	B1 detection from AMP3 Out	Analog
P34	Power Amp Protection/Trouble	Static
P33	Power Supply Protection	Static
P30-P32	Interface to volume control chip	I^2C
P44-P45	Power LED (red/green)	static
P43	Bass Sent detection from “Bass Line Out”	static

Peripheral pins on the microcontroller

1.8.2 Interface to Remote

Relay of DSP information to the Remote. The DSP in the power stand needs to transfer the clip state, channel volume data (cause the table for channel volume in the DSP), system working status to MCU. The communication adopts software simulation UART, with two I/O pins as RX and TX. Communication rate is 4800bps, add start bit and stop, so every sending byte has 10 bits. Data is send according to frame format: frame head | every data | check sum. DSP will transfer a frame every 100ms, and every sending will take about 15ms.

The MCU needs to transfer the clip state information to the remote control. The communication protocol adopts hardware UART. The communication rate is 9600bps, Data is sent according to MIDI protocol: MIDI channel number | MIDI parameter type | MIDI parameter value. DSP will transfer a frame data every 100ms, and every sending will take about 3.5ms.

Relay of Remote information to the Power Stand DSP. The remote needs to transfer the Ch1EQHi, Ch2EQHi, Ch1EQMi, Ch2EQMi, Ch1EQLo, Ch2EQLo, Ch1Volume, Ch1Volume, and MasterVolume information to the power stand MCU PCB. The communication adopts hardware UART. The communication rate is 9600bps, Data is sent according to the MIDI protocol: MIDI channel number | MIDI parameter type | MIDI parameter value. DSP will transfer a frame data every 100ms, and every sending will take about 30ms.

The power stand MCU PCB needs to transfer the Ch1EQHi, Ch2EQHi, Ch1EQMi, Ch2EQMi, Ch1EQLo, Ch2EQLo, Ch1Volume, Ch1Volume, MasterVolume, Ch1Preset, Ch2Preset, BassChk, and CheckSum information to the DSP. The communication adopts software simulation UART, with two I/O pins as RX and TX. Communication rate is 4800bps, add start bit and stop, so every sending byte has 10 bits. Data is sent according to frame format: every data | check sum. DSP will transfer a frame every 100ms, and every sending will take about 30ms.

1.9 Software and User Interface

The Bose® L1® Model I system has a simple user interface which is mostly implemented in software. In this chapter we describe how most of the functions are implemented.

1.9.1 Gain Staging

Gain staging is the process of properly adjusting the gain of the system. The goal is to set the gains as high as possible (to optimized signal/noise) without overdriving or clipping any electronic components. In contrast to home-audio products, musical instrument and microphones have a large variation of output gains and gain staging is typically required.

On Channel 1 and 2, the user needs to set the trim control on the power stand so that the overload LED just turns red for the loudest anticipated input signals and then back up a little. This is done purely in analog and the goal is to not overload the preamplifier.

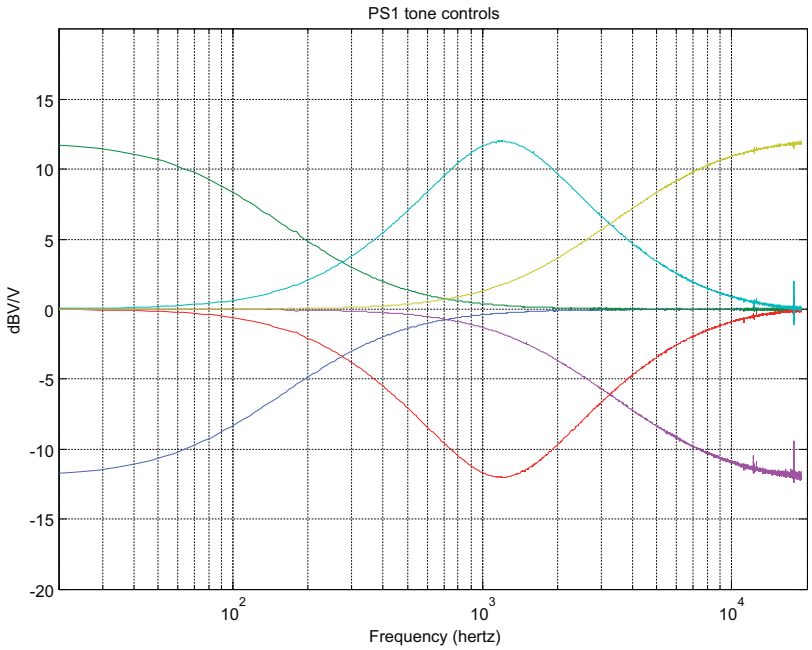
Next the user should adjust the channel volume on the remote so that the LED on the remote does not turn red. The LEDs are calibrated so that for sine wave input, nothing connected to the insert loop, and the channel volume at the 12 o’clock setting both LEDs turn red at the same level.

1.9.2 Channel Volume

The microcontroller polls the remote in regular intervals, about 10 times per second. The microcontroller then maps the settings to a range from -40 to 0 dB and programs the volume control chip U302 through its digital control interface. The volume control should span a range of 40 dB with a linear (in dB) range from -30dB to -10dB from all the way down to 12 o’clock and a range from -10dB to 0dB for 12 o’clock to “all the way up” setting.

1.9.3 Tone Controls

The microcontroller polls the remote in regular intervals. The microcontroller transfers the tone control settings to the DSP which implements them for each channel as shown in the diagram on the next page.



Power Stand Tone Control Range

1.9.4 Master Volume

The microcontroller polls the remote in regular intervals. The microcontroller transfers the master volume setting to the DSP which implements them for each channel. The master volume should mute the system if all the way down and then ramp up to a nominal value of 0dB at the center position. From the center position to “all the way up” the master volume increases the gain by another 12 dB.

1.9.5 Preset Switching

The microcontroller polls the preset switches on the panel board in regular intervals and transfers the values to the DSP. If the DSP detects a change in the setting, it will mute the respective channel, load the new filter coefficients according to a lookup table, clear the filter state coefficients and un-mute the channel again. This takes about 1 to 2 seconds.

Presets are basically a spectral correction (like an EQ) to the signal. Preset “00” corresponds to flat. An easy preset to check is 97 which is a 1 kHz band pass filter (“telephone” sound). In addition to the spectral EQ, there is also a noise gate available.

1.9.6 Bass Line Out Detection

The microcontroller polls the normalling switch on the Bass Line Out connector in regular intervals and transfers its state to the DSP. If the DSP detects a change in the state, it will mute the entire power stand, latch in new system EQ coefficients through a lookup table, clear the system EQ state variables and un-mute the power stand. This takes about 1 to 2 seconds.

1.9.7 Bass Module Detection

The microcontroller measures the resistance between the pins 2- and 2+ of the Amp3 Out connector in regular intervals and transfers the setting to the DSP. If the DSP detects a big enough change in the setting, it will mute the entire power stand, latch in new system EQ coefficients through a lookup table, clear the system EQ state variables and un-mute the power stand. This takes about 1 to 2 seconds.

Theory of Operation

1.10 Power Cycling

1.10.1 Power Up

When power is first applied, 110V AC is applied to the primary side of the transformer1, and at the secondary side of the transformer1 will charge up +24V, +15V, -15V, +5V, +3.3V. And after 7 ms, they become stable almost at the same time. But +27V/-27 for amplification is late other voltage about 6ms.

Power-up time complies with the following sequence:

- With +3.3V, +5V, +15V, -15V, the ADC/DAC/buffer circuit/MCU starts to work
- After power on 15ms, amplifier starts to work
- DSP uses RC reset. After about 300ms, DSP starts to work
- After DSP starts to work, DSP first resets ADC, then digital receiver, and then digital transmitter, then DAC. Every reset time is 100ms
- After power on about 700ms, latest DAC's reset is completed

At this point, normal signal processing commences. But in order to get correct remote value & preset number & number of bass, DSP mutes input signal, and it should no more than 1.5 seconds from the time power is applied until the time audio appears at the speaker output.

1.10.2 Power Down

Upon power-down the muting circuitry comprised of Q810, Q811, DZ805, R895 and C959 [digital amplifier PCB sheet 3, D2] is responsible to mute any noise coming out from the output of U387 CS4392 Digital-to-Analog converter.

The principle is to detect the voltage VDDA falling below 22 volts. This will cut off the DZ805 Zener diode and Q810 NPN transistor. This in turn will turn on Q811 NPN transistor and pull the voltage of U806 pin 6 from 5 volt to 0 volt. This action will shut down the class-D amplifier U804 and U805 so that any noise will be muted.

1.11 Software and Preset / EQ Updates

The power stand software and Preset /EQ files can be updated via the Data In jack J109 [input panel PCB sheet 2, A1] on the PS1 input panel. Refer to the software update procedures in the appendix of this service manual.

2. Remote R1

The Remote is a wired remote, connected to the PS1 power stand via an 8 pin MIDI cable. There are a total of nine knobs on the remote, their functions is as follow:

- Knob for tone regulation
- Knob for channel volume control
- Knob for master volume control
- Two LEDs to indicate clip

The communication between the remote control and the PS1 power stand uses the MIDI protocol, operating at 9600baud. The remote control is non-repairable.

Theory of Operation

3. L1® Model I Cylindrical Radiator® Loudspeaker

The L1 Cylindrical Radiator speaker array consists of two sections, an upper and lower section, with 12 drivers each for a total of 24 drivers. The lower array section plugs directly into the cavity in the center of the L1 Model I power stand. Electrical connections are made via Molex connectors in the power stand and the bottom of the lower array section. The upper section of the line array plugs directly into the top of the bottom section, aligned by a bayonet pin. Electrical connection is made by another Molex connector to the top of the lower array section. The result is that there are no cables needed to connect the line array sections to the power stand.

There is no crossover or protection circuitry in either section of the line array. All protection and EQ is performed in the power stand. The drivers of both sections are replaceable, as are the grilles and the Bose® logo.

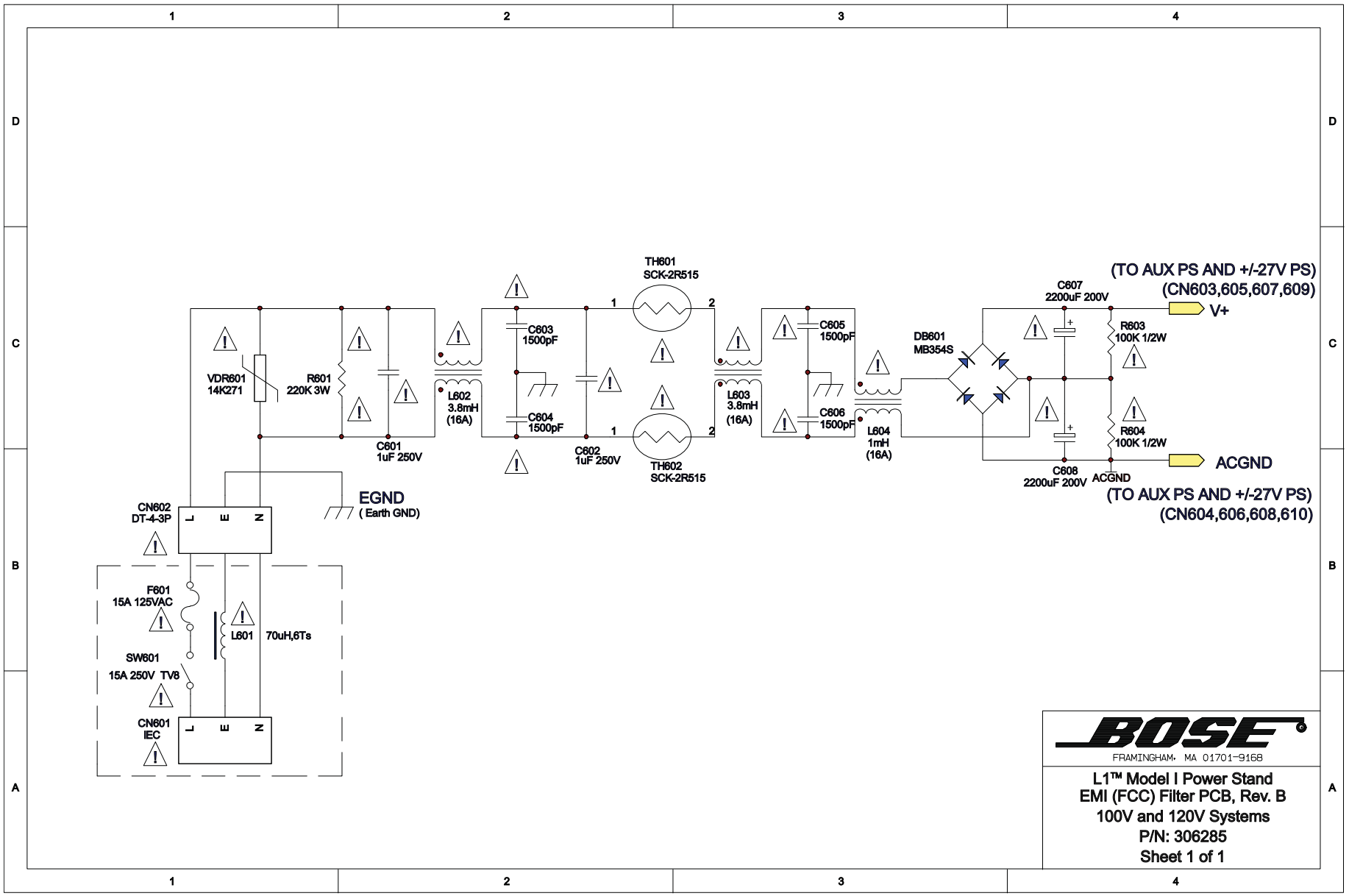
4. Bass Module B1

The B1 bass module is a dedicated passive unit that houses two 5 1/4” drivers. The input is via two 4-pole Neutrik® Speakon® connectors on the rear panel. Both of these inputs are paralleled, allowing you to jumper multiple bass modules together. There are no crossover or protection ciricuit components located on the input panel. All EQ and protection is performed in the PS1 power stand.

Pins 1+ and 1- of the input connector are used to apply the input signal to the bass module. Pins 2+ and 2- are connected to a 10k ohm resistor on the bass module rear panel PCB. This allows the power stand to detect how many bass modules are connected to it from the Bass Out connector.

If the power stand sees a 10k resistance, it knows that there is only one bass module connected and adjusts the output level and EQ accordingly. If it sees 5k ohm resistance, it then knows that there are 2 bass modules connected, and again, adjusts the output level and EQ accordingly. If the power stand sees an infinite resistance, it knows that there is no bass module connected and adjusts accordingly.

The woofers in the bass module are replaceable. The input panel, grille and Bose® logo are also replaceable.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R601
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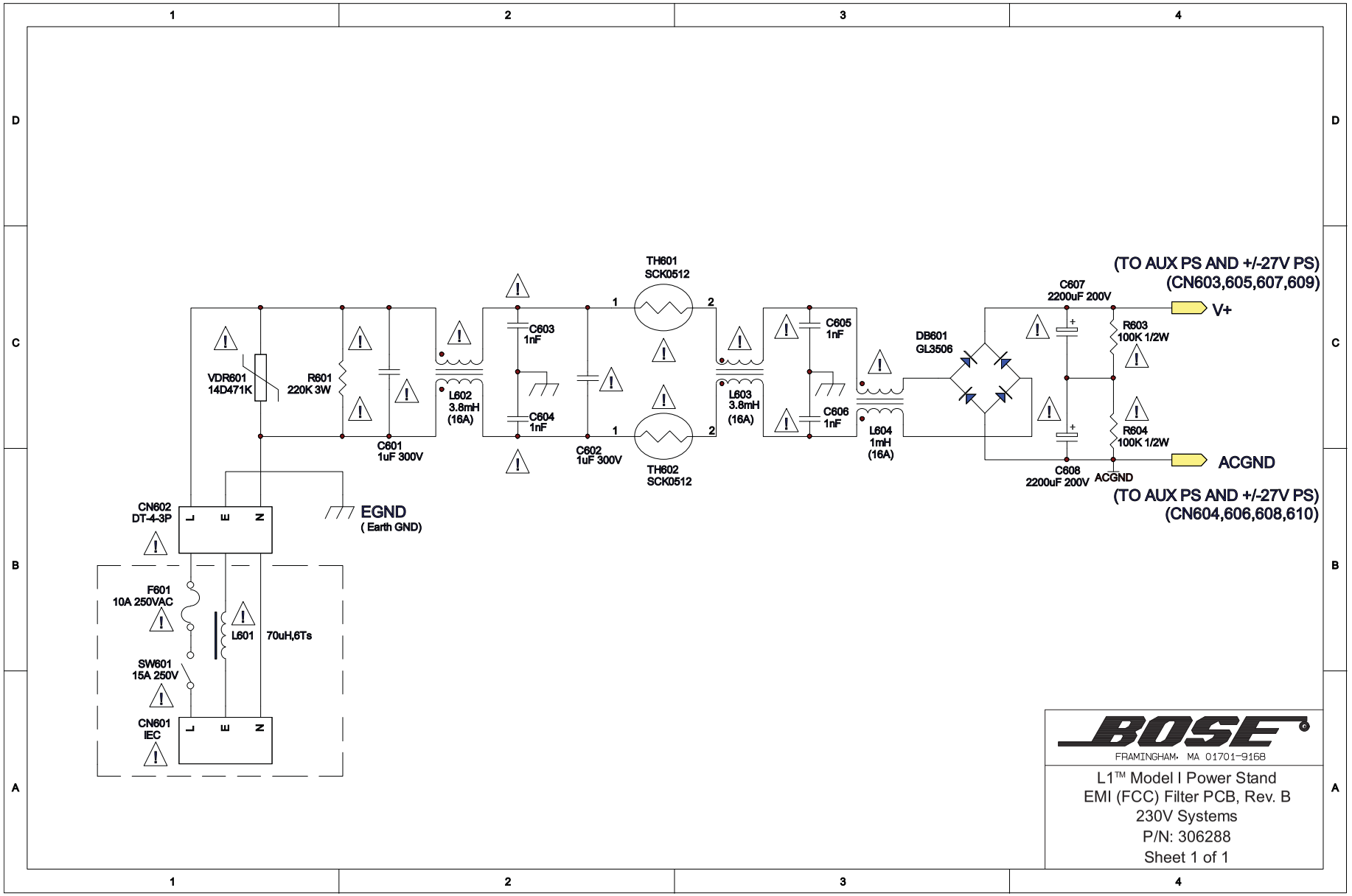
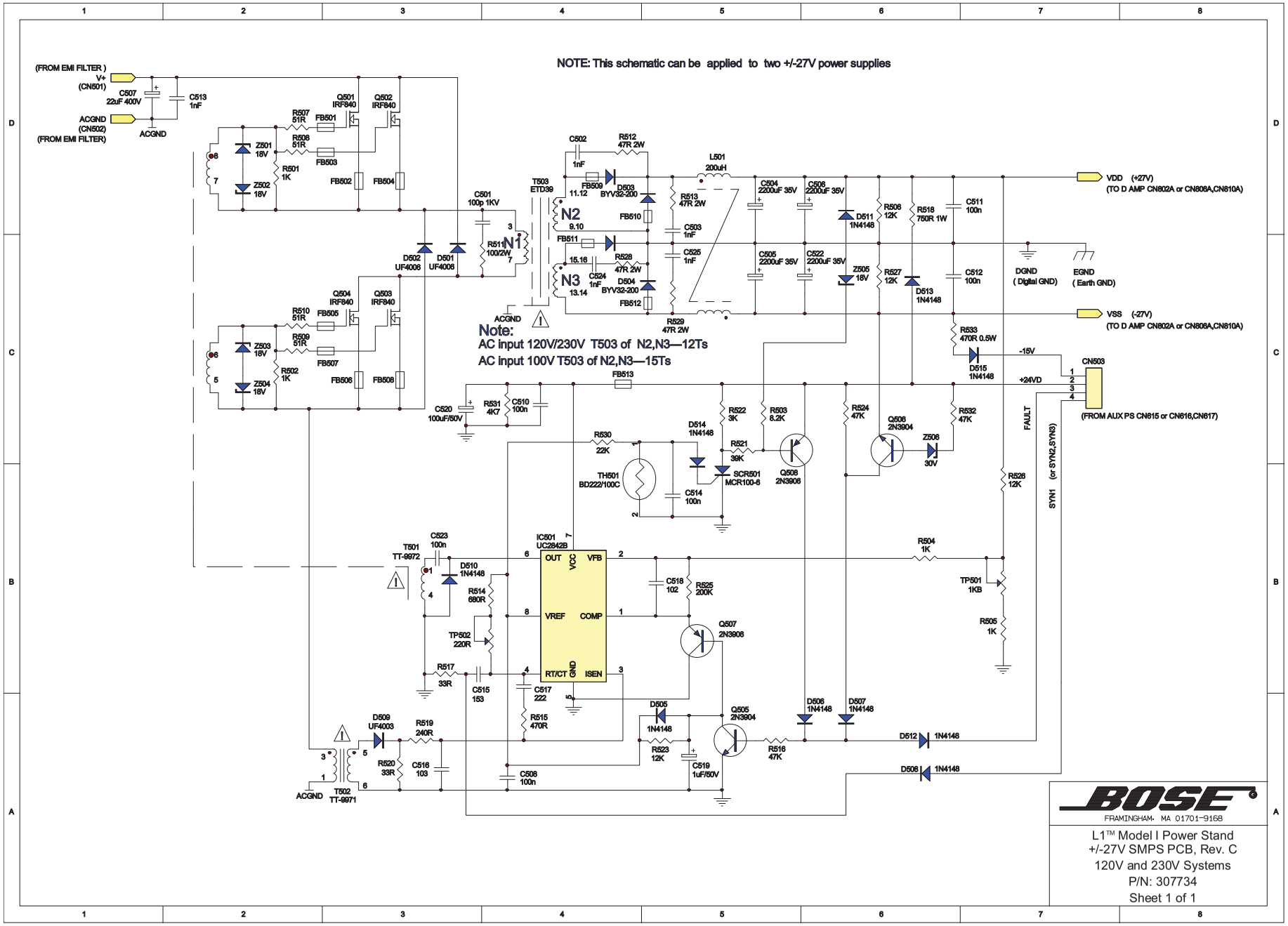
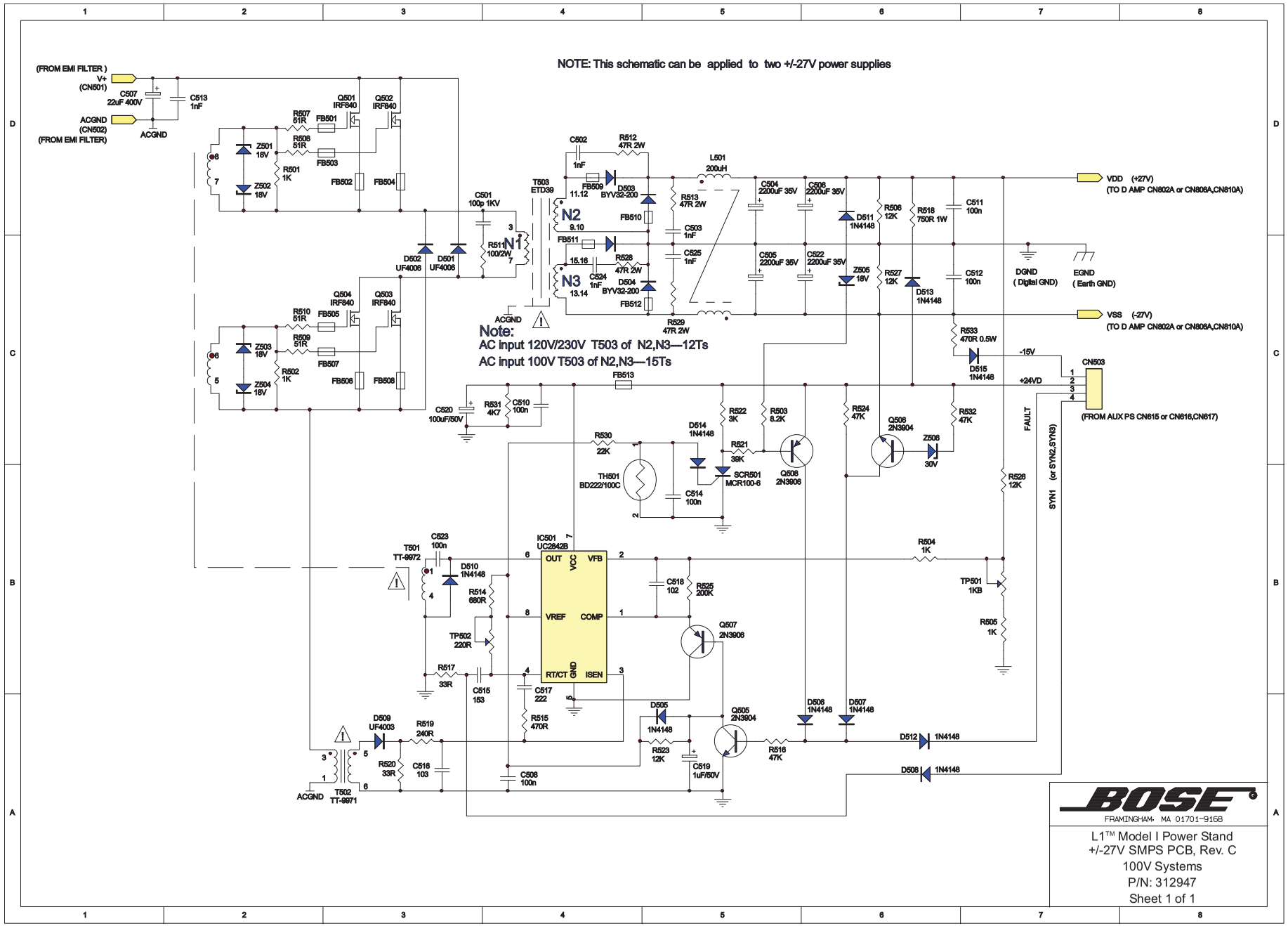
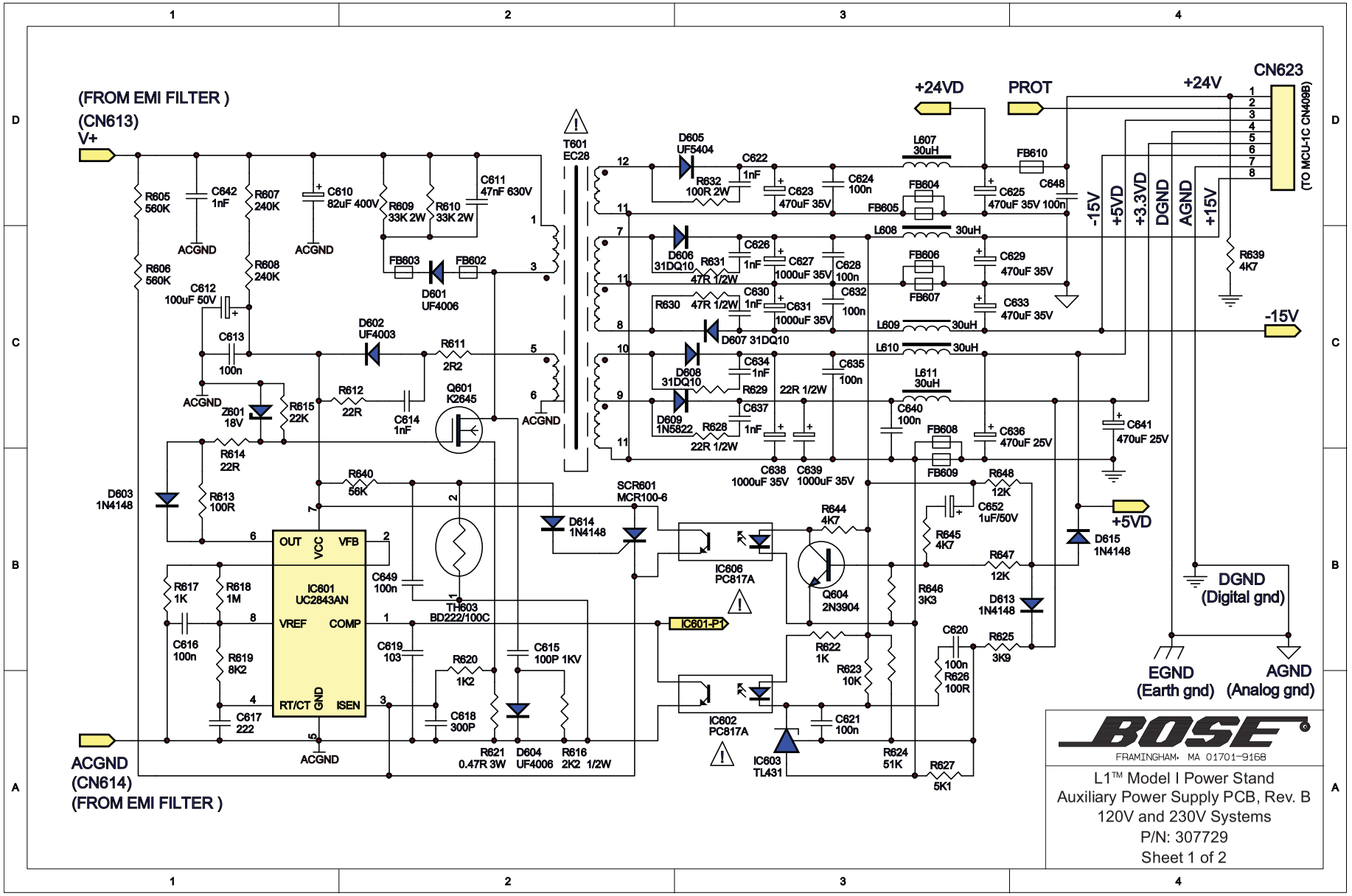
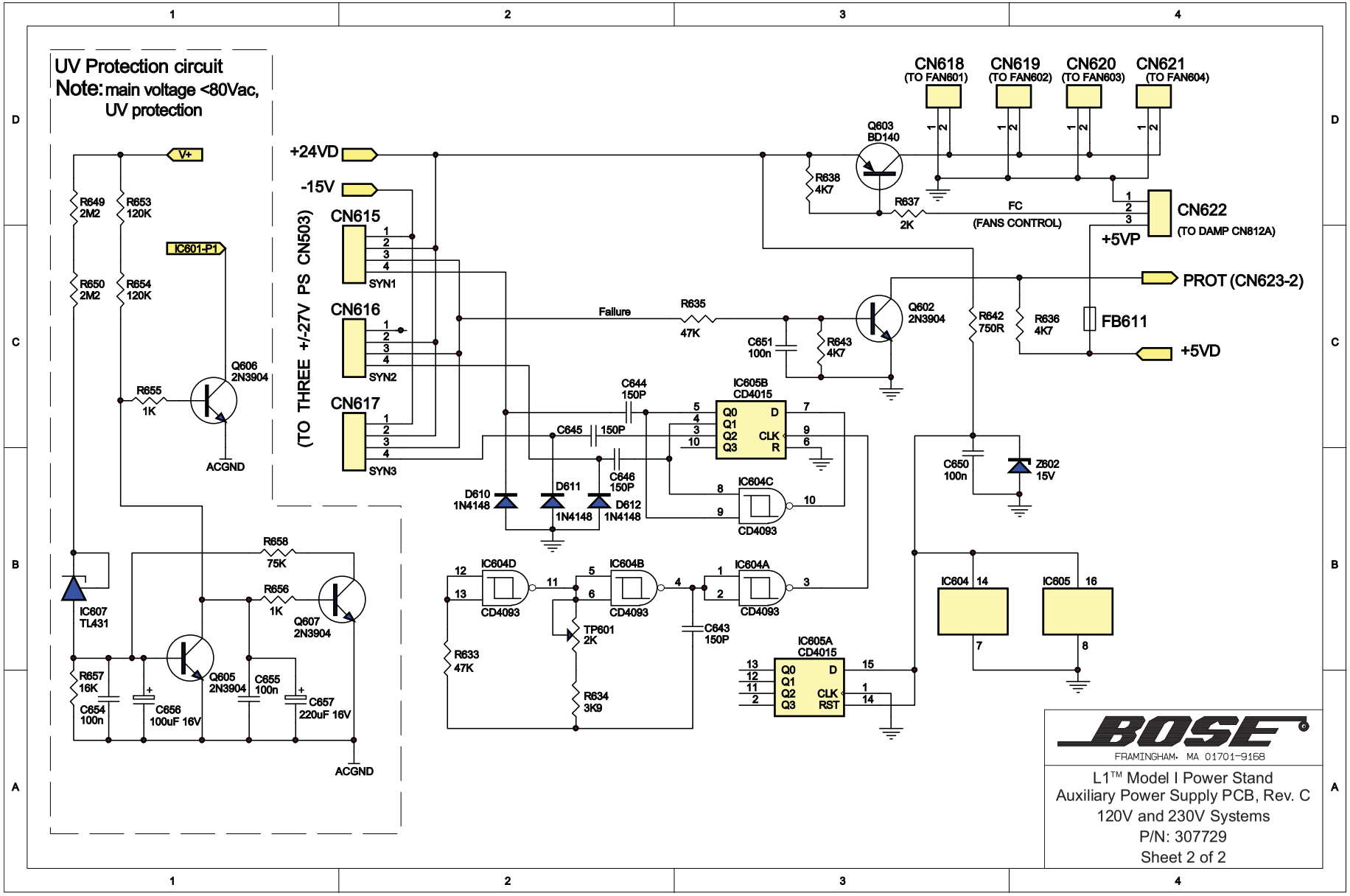
C601
1uF 250V
EGND
(Earth GND)
L602
3.8mH
(16A)
C603
1500pF
C604
1500pF
C602
1uF 250V
TH601
SCK-2R515
TH602
SCK-2R515
L603
3.8mH
(16A)
C605
1500pF
C606
1500pF
L604
1mH
(16A)
DB601
MB354S
C607
2200uF 200V
C608
2200uF 200V
R603
100K 1/2W
R604
100K 1/2W
ACGND
(TO AUX PS AND +/-27V PS)
(CN603,605,607,609)
V+
(TO AUX PS AND +/-27V PS)
(CN604,606,608,610)
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
EMI (FCC) Filter PCB, Rev. B
100V and 120V Systems
P/N: 306285
Sheet 1 of 1

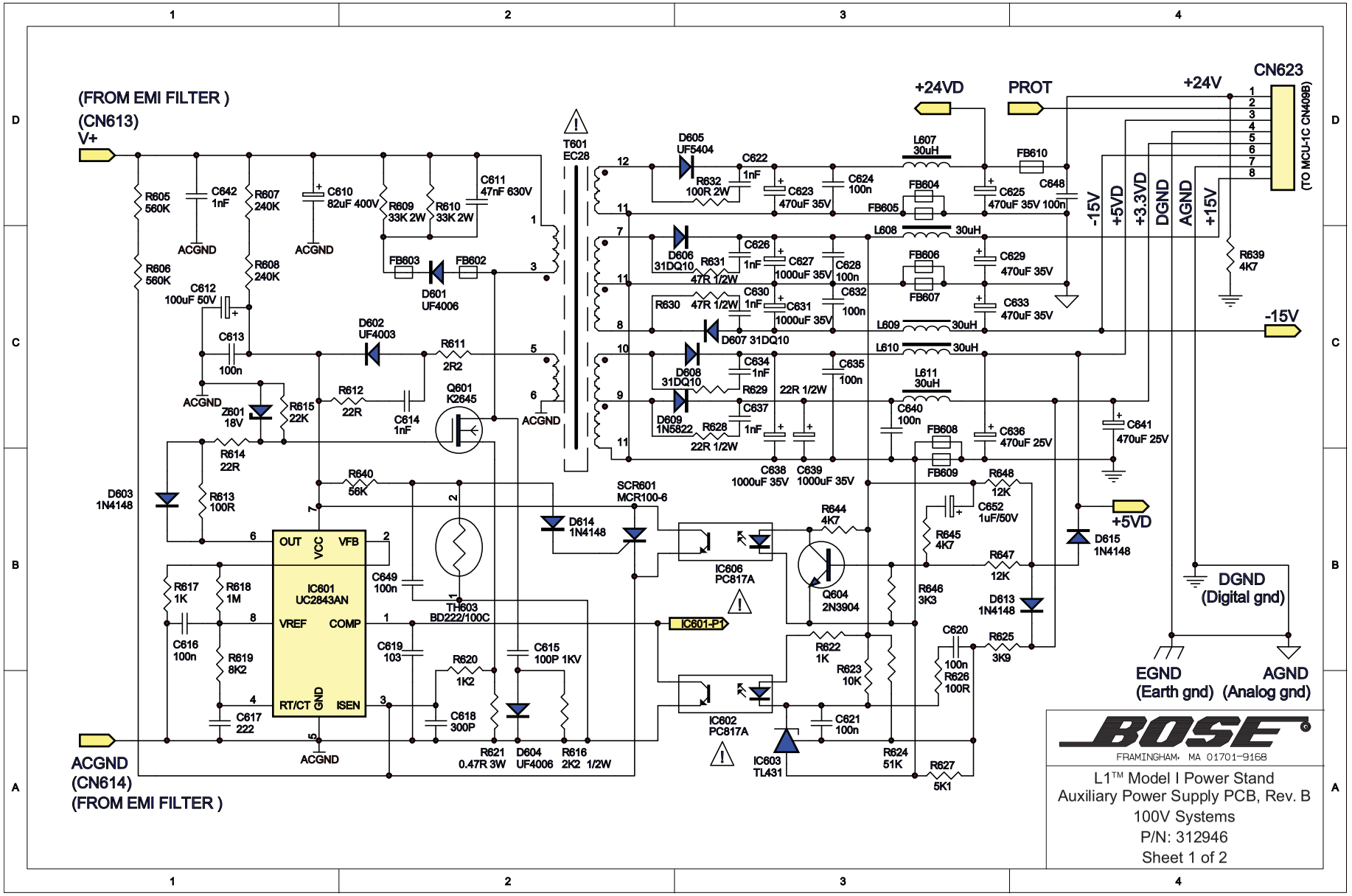

1
2
3
4
D
C
B
A
(TO AUX PS AND +/-27V PS)
(CN603,605,607,609)
TH601
SCK0512
C607
2200uF 200V
V+
C603
1nF
R603
100K 1/2W
VDR601
14D471K
R601
220K 3W
DB601
GL3506
C605
1nF
L602
3.8mH
(16A)
L603
3.8mH
(16A)
C606
1nF
L604
1mH
(16A)
C604
1nF
R604
100K 1/2W
C601
1uF 300V
C602
1uF 300V
TH602
SCK0512
C608
2200uF 200V
ACGND
(TO AUX PS AND +/-27V PS)
(CN604,606,608,610)
CN602
DT-4-3P
L
E
N
EGND
(Earth GND)
F601
10A 250VAC
L601
70uH,6Ts
SW601
15A 250V
CN601
IEC
L
E
N
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
EMI (FCC) Filter PCB, Rev. B
230V Systems
P/N: 306288
Sheet 1 of 1

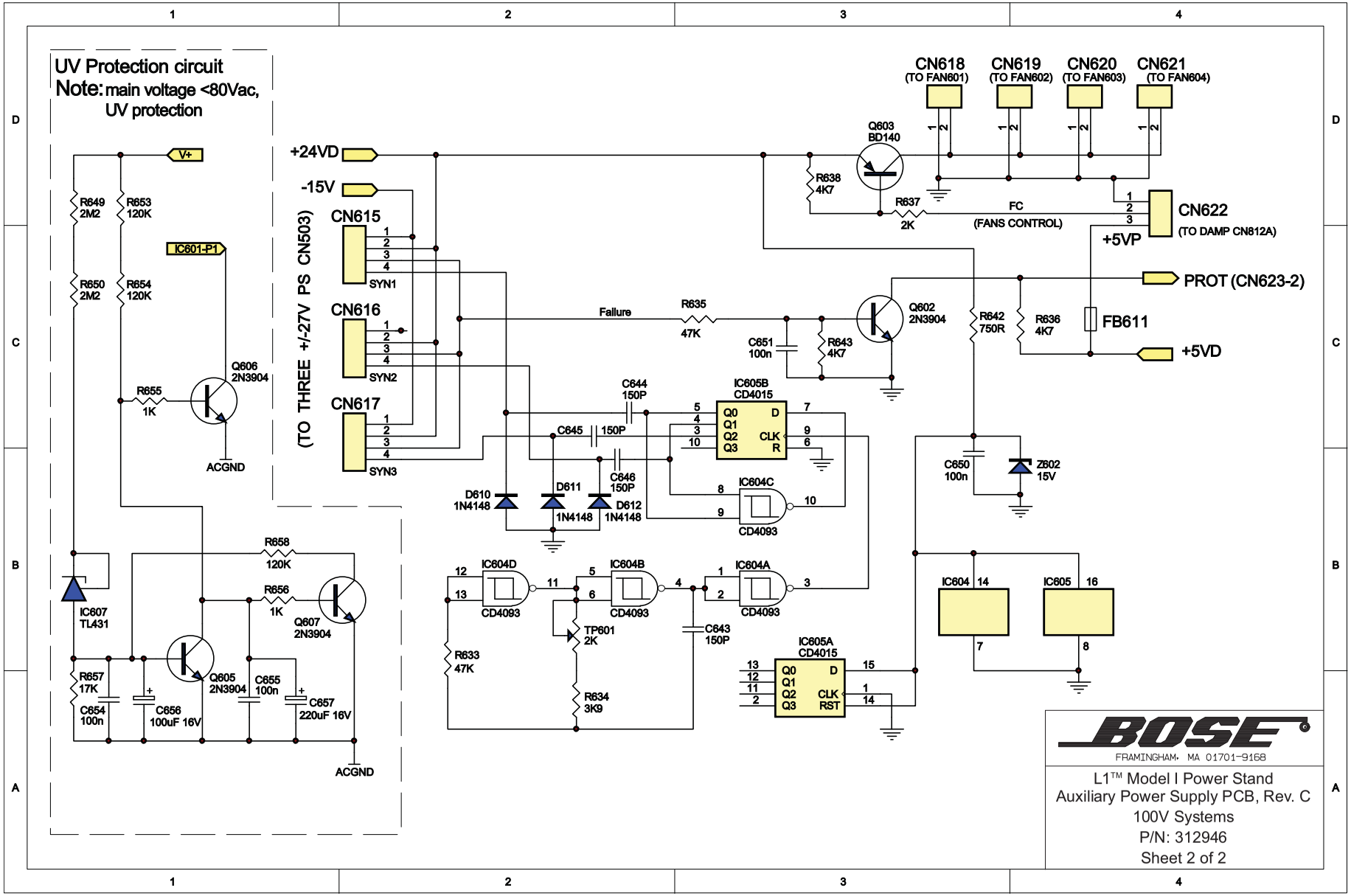

NOTE: This schematic can be applied to two +/-27V power supplies
(FROM EMI FILTER)
V+
(CN501)
ACGND
(CN502)
(FROM EMI FILTER)
C507
22uF 400V
C513
1nF
ACGND
Q501
IRF840
Q502
IRF840
R507
51R
FB501
R508
51R
FB503
Z501
18V
R501
1K
Z502
18V
FB502
FB504
C501
100p 1KV
T503
ETD39
N1
N2
9.10
N3
13.14
11.12
15.16
C502
1nF
R512
47R 2W
FB509
D503
BYV32-200
FB510
FB511
R528
47R 2W
C524
1nF
D504
BYV32-200
FB512
R529
47R 2W
L501
200uH
R513
47R 2W
C503
1nF
C525
1nF
C504
2200uF 35V
C506
2200uF 35V
C505
2200uF 35V
C522
2200uF 35V
D511
1N4148
R506
12K
R518
750R 1W
C511
100n
Z505
18V
R527
12K
D513
1N4148
C512
100n
VDD (+27V)
(TO D AMP CN802A or CN808A,CN810A)
DGND
(Digital GND)
EGND
(Earth GND)
VSS (-27V)
(TO D AMP CN802A or CN808A,CN810A)
R533
470R 0.5W
D515
1N4148
-15V
+24VD
CN503
(FROM AUX PS CN615 or CN616,CN617)
D502
UF4006
D501
UF4006
Q504
IRF840
Q503
IRF840
R510
51R
FB505
R509
51R
FB507
Z503
18V
R502
1K
Z504
18V
FB506
FB508
ACGND
Note:
AC input 120V/230V T503 of N2,N3—12Ts
AC input 100V T503 of N2,N3—15Ts
FB513
C520
100uF/50V
R531
4K7
C510
100n
R530
22K
TH501
BD222/100C
D514
1N4148
C514
100n
R522
3K
R521
39K
SCR501
MCR100-6
R503
6.2K
Q508
2N3906
R524
47K
Q506
2N3904
Z506
30V
R532
47K
R526
12K
FAULT
SYN1 (or SYN2,SYN3)
T501
TT-9972
C523
100n
D510
1N4148
R514
680R
TP502
220R
R517
33R
C515
153
IC501
UC2842B
OUT
VCC
VFB
VREF
COMP
RT/CT
GND
ISEN
C518
102
R525
200K
Q507
2N3906
C517
222
R515
470R
R504
1K
TP501
1KB
R505
1K
D505
1N4148
Q505
2N3904
R523
12K
C519
1uF/50V
R516
47K
D506
1N4148
D507
1N4148
D512
1N4148
D508
1N4148
D509
UF4003
R519
240R
R520
33R
C516
103
C508
100n
T502
TT-9971
ACGND
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
+/-27V SMPS PCB, Rev. C
120V and 230V Systems
P/N: 307734
Sheet 1 of 1

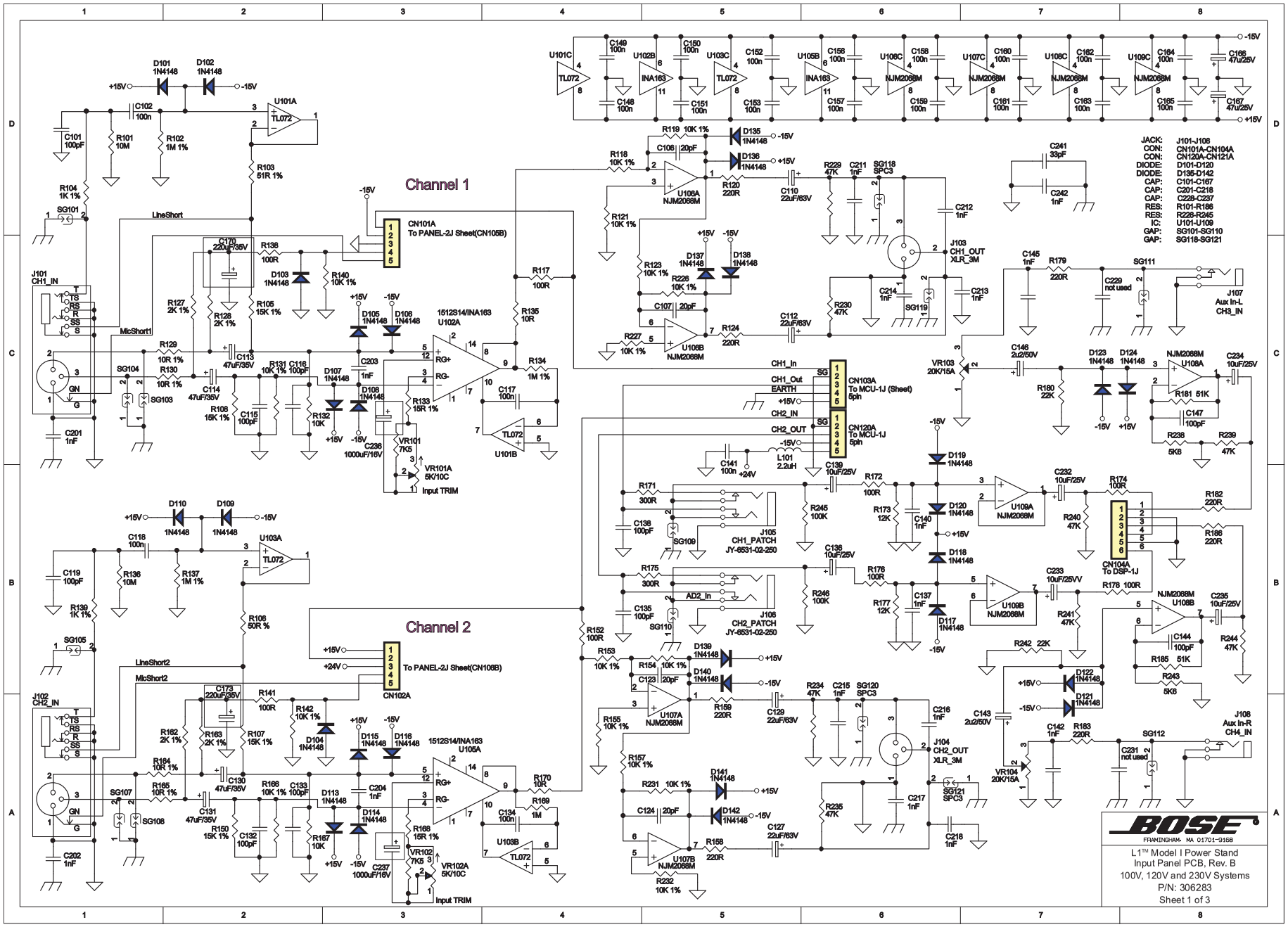

NOTE: This schematic can be applied to two +/-27V power supplies
(FROM EMI FILTER) V+ (CN501)
ACGND (CN502) (FROM EMI FILTER)
C507 22uF 400V
C513 1nF
ACGND
Q501 IRF840
Q502 IRF840
R507 51R
R508 51R
R501 1K
FB501
FB502
FB503
FB504
Z501 18V
Z502 18V
C501 100p 1KV
R511 100/2W
D502 UF4006
D501 UF4006
T503 ETD39
N1 7
N2 9.10
N3 13.14
C502 1nF
R512 47R 2W
FB509 11.12
D503 BYV32-200
FB510
FB511
15.16
R528 47R 2W
C524 1nF
D504 BYV32-200
FB512
C503 1nF
C525 1nF
R529 47R 2W
L501 200uH
C504 2200uF 35V
C505 2200uF 35V
C506 2200uF 35V
C522 2200uF 35V
D511 1N4148
D513 1N4148
Z505 18V
R506 12K
R527 12K
R518 750R 1W
C511 100n
C512 100n
VDD (+27V) (TO D AMP CN802A or CN808A,CN810A)
DGND (Digital GND)
EGND (Earth GND)
VSS (-27V) (TO D AMP CN802A or CN808A,CN810A)
R533 470R 0.5W
D515 1N4148
-15V
+24VD
CN503
(FROM AUX PS CN615 or CN616,CN617)
Q504 IRF840
Q503 IRF840
R510 51R
R509 51R
R502 1K
FB505
FB506
FB507
FB508
Z503 18V
Z504 18V
Note:
AC input 120V/230V T503 of N2,N3—12Ts
AC input 100V T503 of N2,N3—15Ts
FB513
C520 100uF/50V
R531 4K7
C510 100n
R530 22K
TH501 BD222/100C
D514 1N4148
SCR501 MCR100-6
R521 39K
R522 3K
R503 8.2K
Q508 2N3906
R524 47K
Q506 2N3904
Z506 30V
R532 47K
FAULT
SYN1 (or SYN2,SYN3)
R526 12K
T501 TT-9972
C523 100n
D510 1N4148
R514 680R
TP502 220R
R517 33R
C515 153
IC501 UC2842B
OUT VCC VFB
VREF COMP
RT/CT GND ISEN
C518 102
R525 200K
Q507 2N3906
R504 1K
TP501 1KB
R505 1K
C517 222
R515 470R
D505 1N4148
Q505 2N3904
R523 12K
C519 1uF/50V
R516 47K
D506 1N4148
D507 1N4148
D512 1N4148
D508 1N4148
D509 UF4003
R519 240R
R520 33R
C516 103
T502 TT-9971
ACGND
C508 100n
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
+/-27V SMPS PCB, Rev. C
100V Systems
P/N: 312947
Sheet 1 of 1

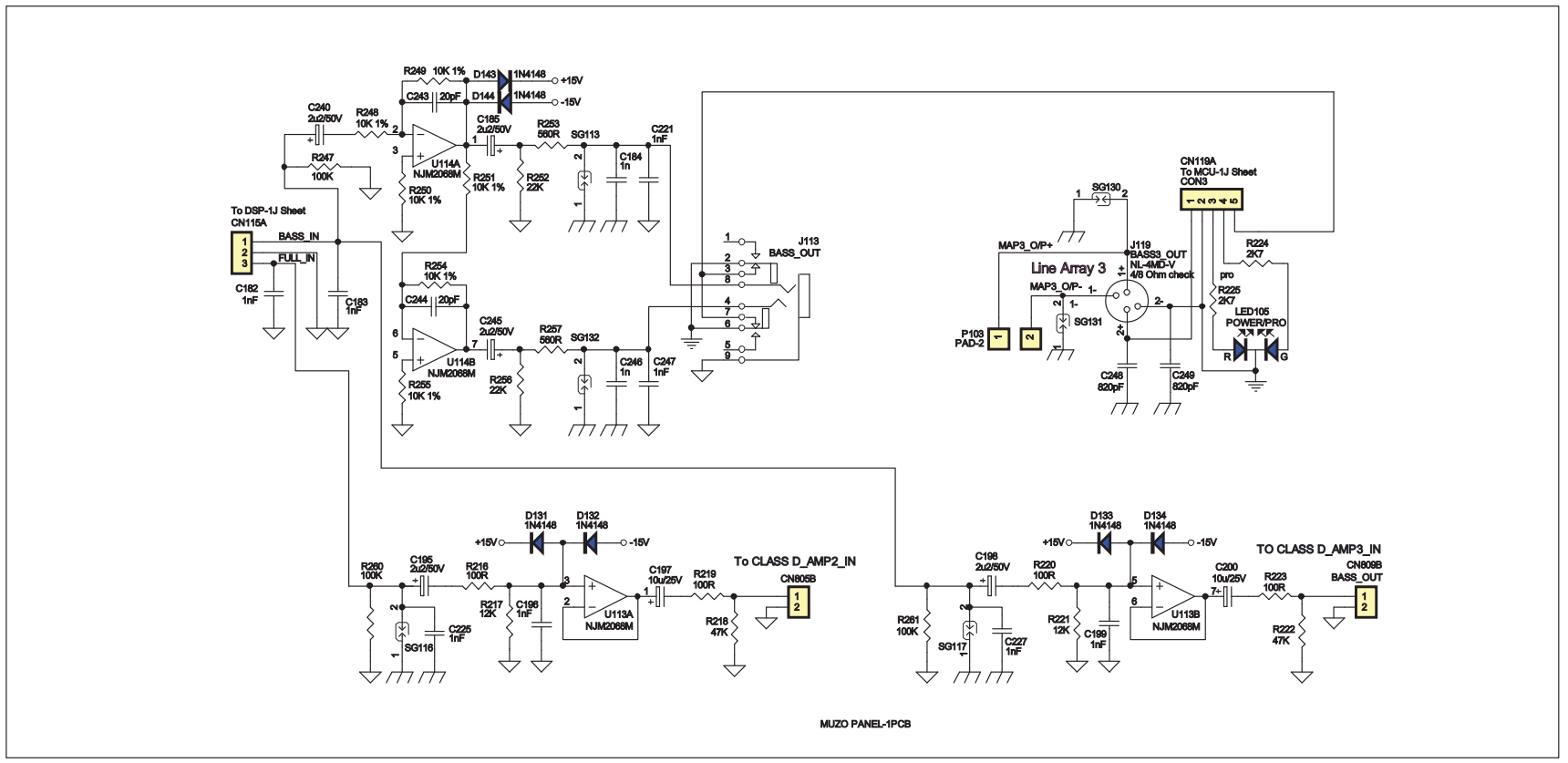

(FROM EMI FILTER)
(CN613)
V+
ACGND
(CN614)
(FROM EMI FILTER)
T601
EC28
IC601
UC2843AN
OUT
VCC
VFB
VREF
COMP
RT/CT
GND
ISEN
TH603
BD222/100C
Q601
K2645
Q604
2N3904
SCR601
MCR100-6
IC606
PC817A
IC602
PC817A
IC603
TL431
IC601-P1
+24VD
PROT
+24V
CN623
(TO MCU-1C CN409B)
-15V
+5VD
+3.3VD
DGND
AGND
+15V
DGND
(Digital gnd)
EGND
(Earth gnd)
AGND
(Analog gnd)
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Auxiliary Power Supply PCB, Rev. B
120V and 230V Systems
P/N: 307729
Sheet 1 of 2

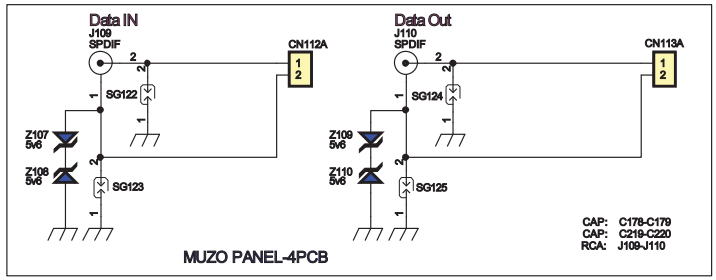

UV Protection circuit
Note: main voltage <80Vac, UV protection
V+
R649 2M2
R650 2M2
R653 120K
R654 120K
IC601-P1
R655 1K
Q606 2N3904
ACGND
R658 75K
R656 1K
Q607 2N3904
IC607 TL431
R657 16K
C654 100n
C656 100uF 16V
Q605 2N3904
C655 100n
C657 220uF 16V
ACGND
+24VD
-15V
(TO THREE +/-27V PS CN503)
CN615
SYN1
CN616
SYN2
CN617
SYN3
Failure
R635 47K
C651 100n
R643 4K7
Q602 2N3904
C644 150P
C645 150P
C646 150P
IC605B CD4015
D610 1N4148
D611 1N4148
D612 1N4148
IC604C CD4093
IC604D CD4093
IC604B CD4093
IC604A CD4093
TP601 2K
R633 47K
R634 3K9
C643 150P
IC605A CD4015
CN618 (TO FAN601)
CN619 (TO FAN602)
CN620 (TO FAN603)
CN621 (TO FAN604)
Q603 BD140
R638 4K7
R637 2K
FC (FANS CONTROL)
CN622 (TO DAMP CN812A)
+5VP
PROT (CN623-2)
R642 750R
R636 4K7
FB611
+5VD
C650 100n
Z602 15V
IC604
IC605
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Auxiliary Power Supply PCB, Rev. C
120V and 230V Systems
P/N: 307729
Sheet 2 of 2


(FROM EMI FILTER)
(CN613)
V+
ACGND
(CN614)
(FROM EMI FILTER)
T601
EC28
IC601
UC2843AN
OUT
VCC
VFB
VREF
COMP
RT/CT
GND
ISEN
TH603
BD222/100C
Q601
K2645
Q604
2N3904
SCR601
MCR100-6
IC606
PC817A
IC602
PC817A
IC603
TL431
IC601-P1
+24VD
PROT
+24V
CN623
(TO MCU-1C CN409B)
-15V
+5VD
+3.3VD
DGND
AGND
+15V
DGND
(Digital gnd)
EGND
(Earth gnd)
AGND
(Analog gnd)
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Auxiliary Power Supply PCB, Rev. B
100V Systems
P/N: 312946
Sheet 1 of 2

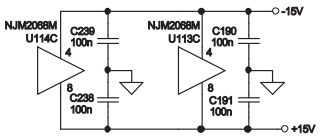

UV Protection circuit
Note: main voltage <80Vac, UV protection
V+
R649 2M2
R653 120K
R650 2M2
R654 120K
IC601-P1
R655 1K
Q606 2N3904
ACGND
R658 120K
R656 1K
Q607 2N3904
IC607 TL431
R657 17K
C654 100n
C656 100uF 16V
Q605 2N3904
C655 100n
C657 220uF 16V
ACGND
+24VD
-15V
(TO THREE +/-27V PS CN503)
CN615
SYN1
CN616
SYN2
CN617
SYN3
Failure
R635 47K
C651 100n
R643 4K7
Q602 2N3904
C644 150P
C645 150P
C646 150P
IC605B CD4015
D610 1N4148
D611 1N4148
D612 1N4148
IC604C CD4093
IC604D CD4093
IC604B CD4093
IC604A CD4093
R633 47K
TP601 2K
R634 3K9
C643 150P
IC605A CD4015
Q603 BD140
R638 4K7
R637 2K
FC (FANS CONTROL)
CN618 (TO FAN601)
CN619 (TO FAN602)
CN620 (TO FAN603)
CN621 (TO FAN604)
CN622 (TO DAMP CN812A)
+5VP
PROT (CN623-2)
R642 750R
R636 4K7
FB611
+5VD
C650 100n
Z602 15V
IC604 14
IC605 16
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Auxiliary Power Supply PCB, Rev. C
100V Systems
P/N: 312946
Sheet 2 of 2


Channel 1
Channel 2
JACK: J101-J106
CON: CN101A-CN104A
CON: CN120A-CN121A
DIODE: D101-D120
DIODE: D135-D142
CAP: C101-C167
CAP: C201-C218
CAP: C228-C237
RES: R101-R186
RES: R226-R245
IC: U101-U109
GAP: SG101-SG110
GAP: SG118-SG121
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Input Panel PCB, Rev. B
100V, 120V and 230V Systems
P/N: 306283
Sheet 1 of 3



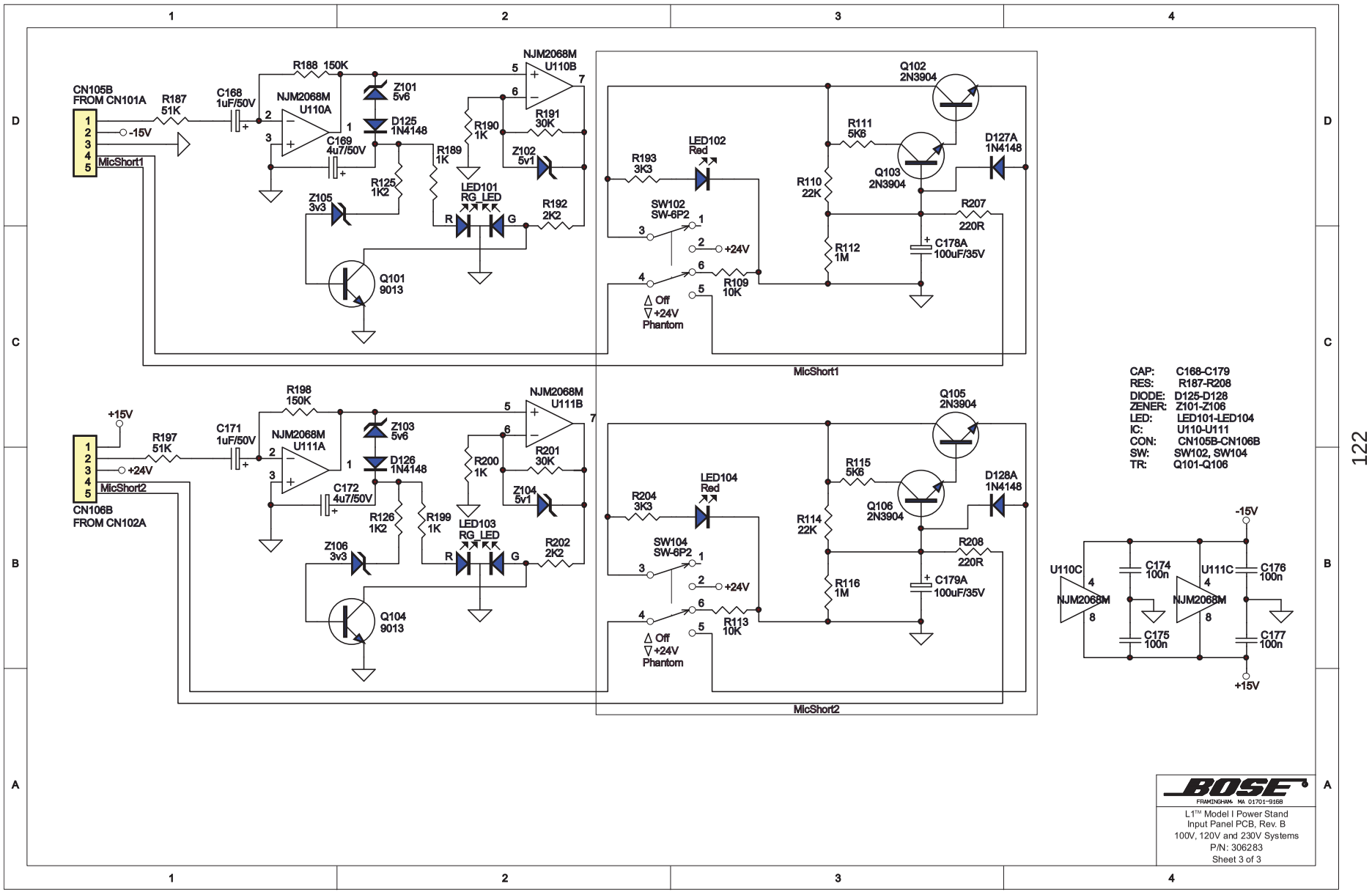


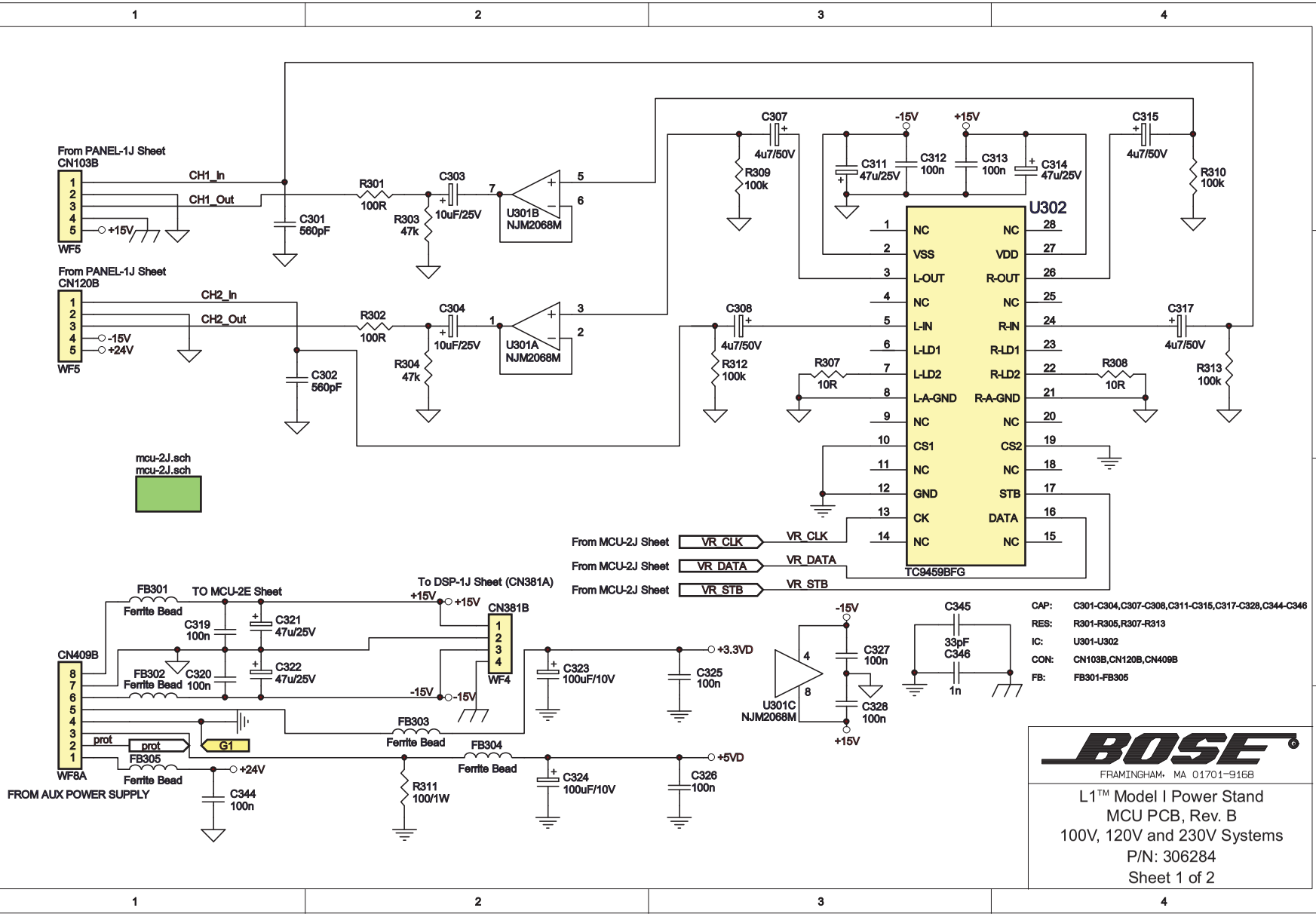
CAP: C178-C200
CAP: C219-C227
CAP: C236-C240
RES: R207-R225
RES: R245-R246
IC: U112-U114
LED: LED105
PAD: P101-P103
JACK: J112-J119
JACK: J107-J108
CON: CN112A-CN119A
CON: CN801B-CN809B
DIODE: D127-D134
GAP: SG113-SG117
GAP: SG122-SG131

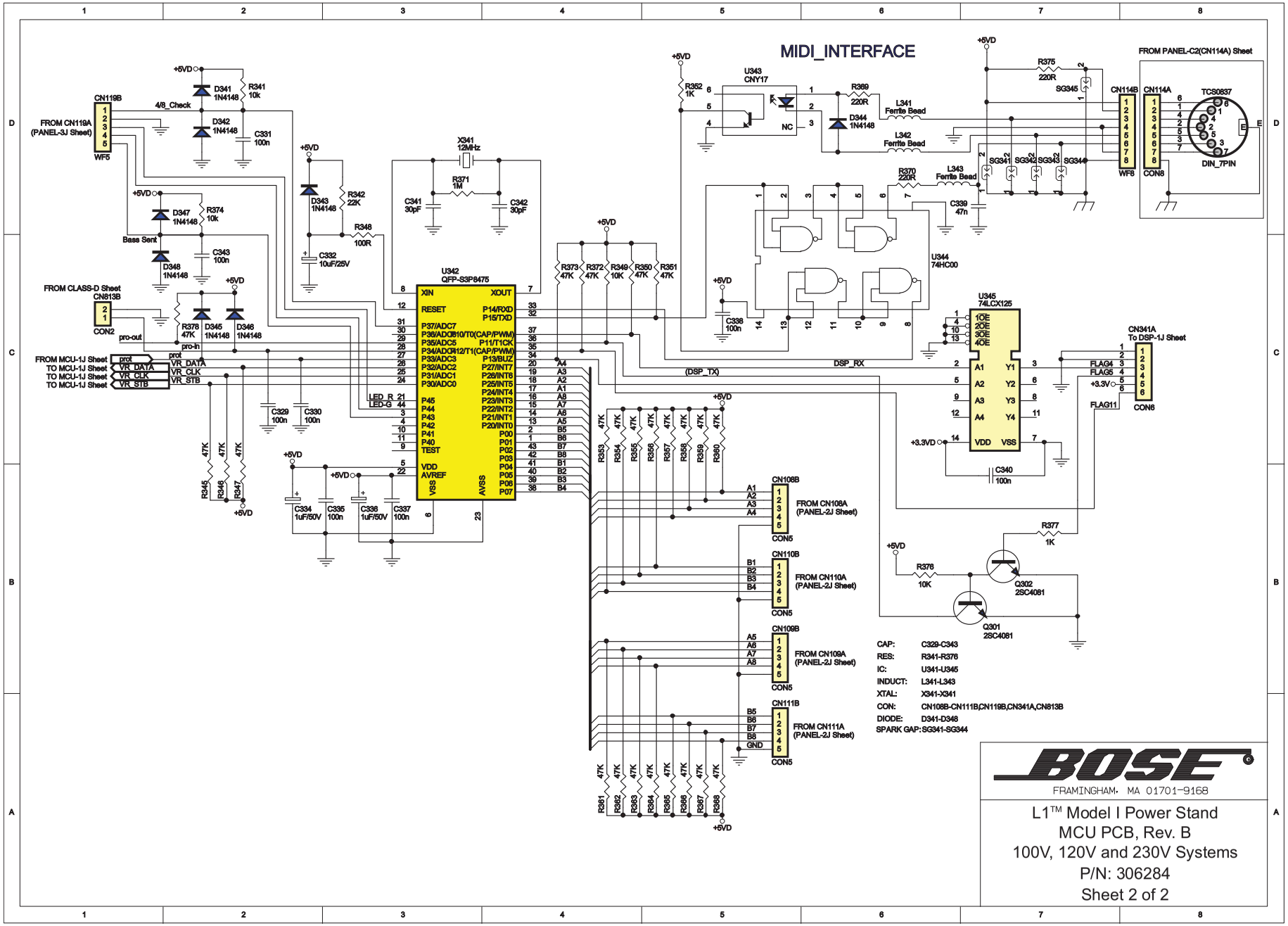


BOSE
FRAMINGHAM, MA 01701-9168

L1™ Model I Power Stand
Input Panel PCB, Rev. B
100V, 120V and 230V Systems
P/N: 306283
Sheet 2 of 3


CN105B
FROM CN101A
R187
51K
C168
1uF/50V
R188 150K
NJM2068M
U110A
Z101
5v6
D125
1N4148
C169
4u7/50V
R189
1K
R190
1K
NJM2068M
U110B
R191
30K
Z102
5v1
R125
1K2
Z105
3v3
LED101
RG_LED
R192
2K2
Q101
9013
-15V
MicShort1
R193
3K3
LED102
Red
SW102
SW-6P2
+24V
R109
10K
Off
+24V
Phantom
Q102
2N3904
R111
5K6
R110
22K
Q103
2N3904
D127A
1N4148
R207
220R
R112
1M
C178A
100uF/35V
MicShort1
CN106B
FROM CN102A
R197
51K
C171
1uF/50V
R198
150K
NJM2068M
U111A
Z103
5v6
D126
1N4148
C172
4u7/50V
R199
1K
R200
1K
NJM2068M
U111B
R201
30K
Z104
5v1
R126
1K2
Z106
3v3
LED103
RG_LED
R202
2K2
Q104
9013
+15V
+24V
MicShort2
R204
3K3
LED104
Red
SW104
SW-6P2
+24V
R113
10K
Off
+24V
Phantom
Q105
2N3904
R115
5K6
R114
22K
Q106
2N3904
D128A
1N4148
R208
220R
R116
1M
C179A
100uF/35V
MicShort2
CAP: C168-C179
RES: R187-R208
DIODE: D125-D128
ZENER: Z101-Z106
LED: LED101-LED104
IC: U110-U111
CON: CN105B-CN106B
SW: SW102, SW104
TR: Q101-Q106
-15V
U110C
NJM2068M
C174
100n
C175
100n
U111C
NJM2068M
C176
100n
C177
100n
+15V
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Input Panel PCB, Rev. B
100V, 120V and 230V Systems
P/N: 306283
Sheet 3 of 3

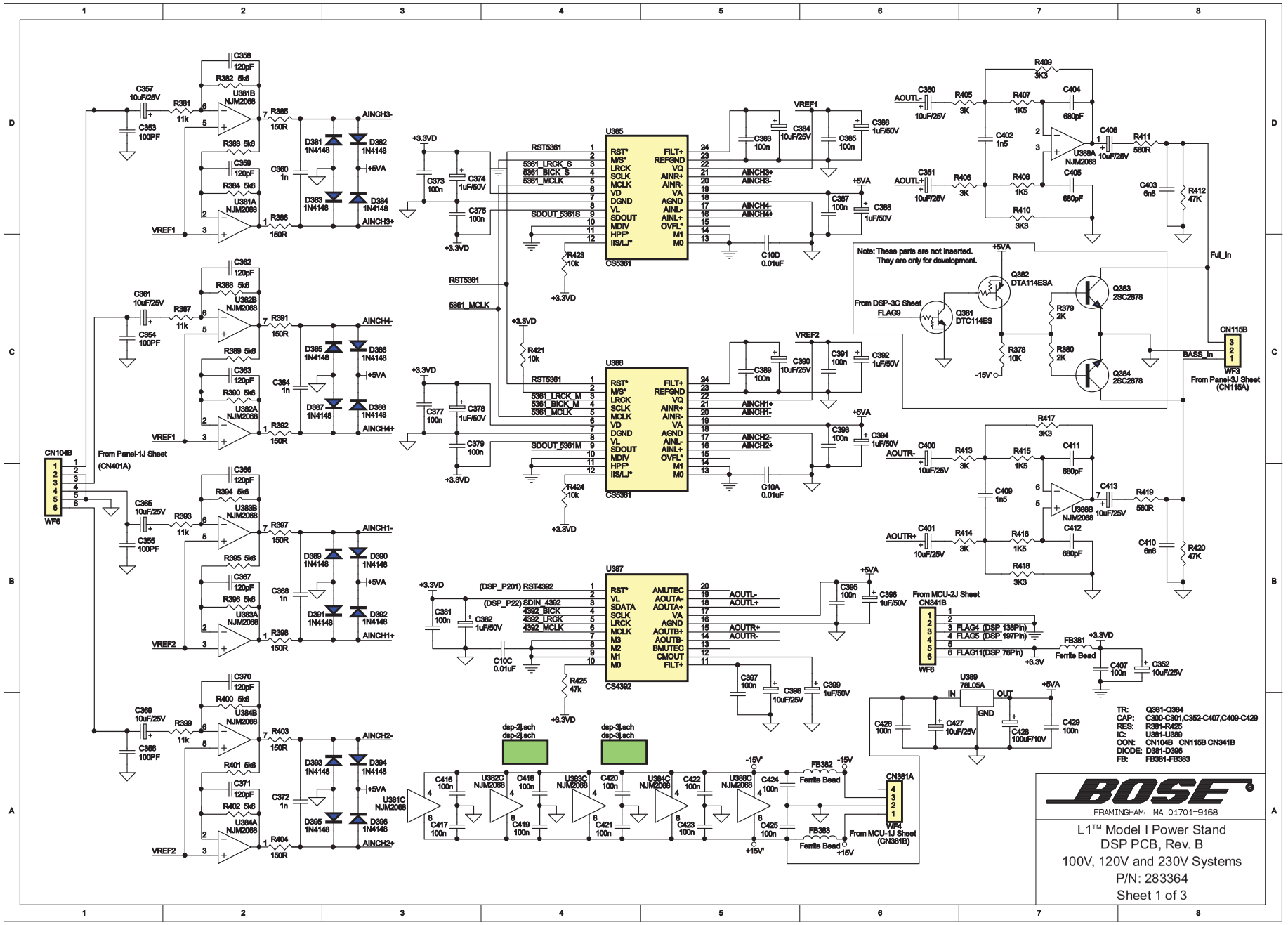

From PANEL-1J Sheet
CN103B
CH1_In
CH1_Out
+15V
WF5
R301
100R
C303
10uF/25V
R303
47k
C301
560pF
U301B
NJM2068M
From PANEL-1J Sheet
CN120B
CH2_In
CH2_Out
-15V
+24V
WF5
R302
100R
C304
10uF/25V
R304
47k
C302
560pF
U301A
NJM2068M
C307
4u7/50V
R309
100k
C308
4u7/50V
R312
100k
-15V
+15V
C311
47u/25V
C312
100n
C313
100n
C314
47u/25V
C315
4u7/50V
R310
100k
C317
4u7/50V
R313
100k
U302
NC
VSS
L-OUT
NC
L-IN
L-LD1
L-LD2
L-A-GND
NC
CS1
NC
GND
CK
NC
NC
VDD
R-OUT
NC
R-IN
R-LD1
R-LD2
R-A-GND
NC
CS2
NC
STB
DATA
NC
TC9459BFG
R307
10R
R308
10R
mcu-2J.sch
mcu-2J.sch
From MCU-2J Sheet
VR_CLK
VR_CLK
From MCU-2J Sheet
VR_DATA
VR_DATA
From MCU-2J Sheet
VR_STB
VR_STB
FB301
Ferrite Bead
TO MCU-2E Sheet
C319
100n
C321
47u/25V
FB302
Ferrite Bead
C320
100n
C322
47u/25V
CN409B
prot
prot
G1
FB305
Ferrite Bead
+24V
C344
100n
FROM AUX POWER SUPPLY
WF8A
To DSP-1J Sheet (CN381A)
+15V
+15V
CN381B
WF4
-15V
-15V
FB303
Ferrite Bead
FB304
Ferrite Bead
R311
100/1W
C323
100uF/10V
C324
100uF/10V
+3.3VD
C325
100n
+5VD
C326
100n
U301C
NJM2068M
-15V
C327
100n
C328
100n
+15V
C345
33pF
C346
1n
CAP: C301-C304,C307-C308,C311-C315,C317-C328,C344-C346
RES: R301-R305,R307-R313
IC: U301-U302
CON: CN103B,CN120B,CN409B
FB: FB301-FB305
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
MCU PCB, Rev. B
100V, 120V and 230V Systems
P/N: 306284
Sheet 1 of 2

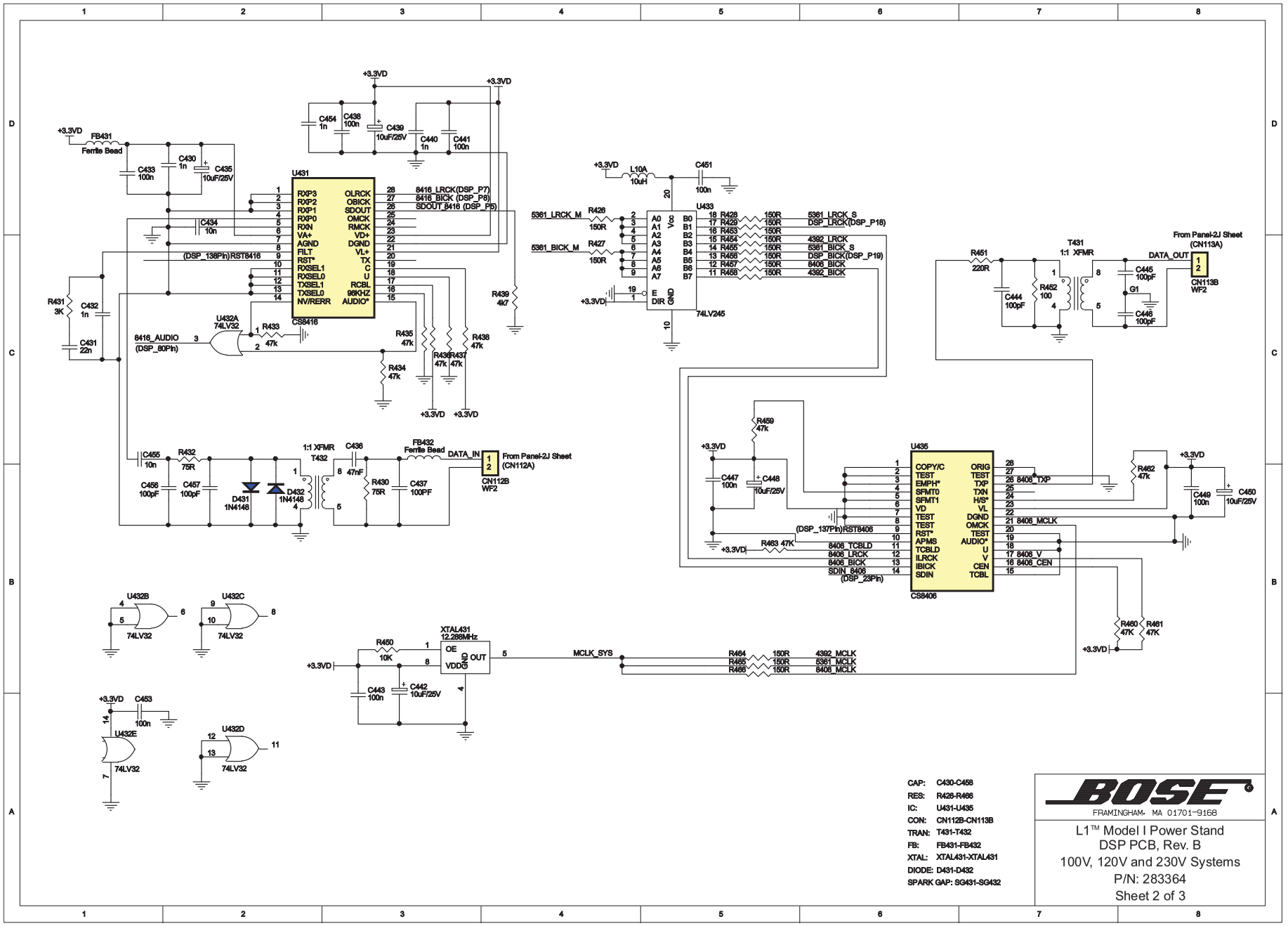


BOSE

FRAMINGHAM, MA 01701-9168

L1™ Model I Power Stand
MCU PCB, Rev. B
100V, 120V and 230V Systems
P/N: 306284
Sheet 2 of 2

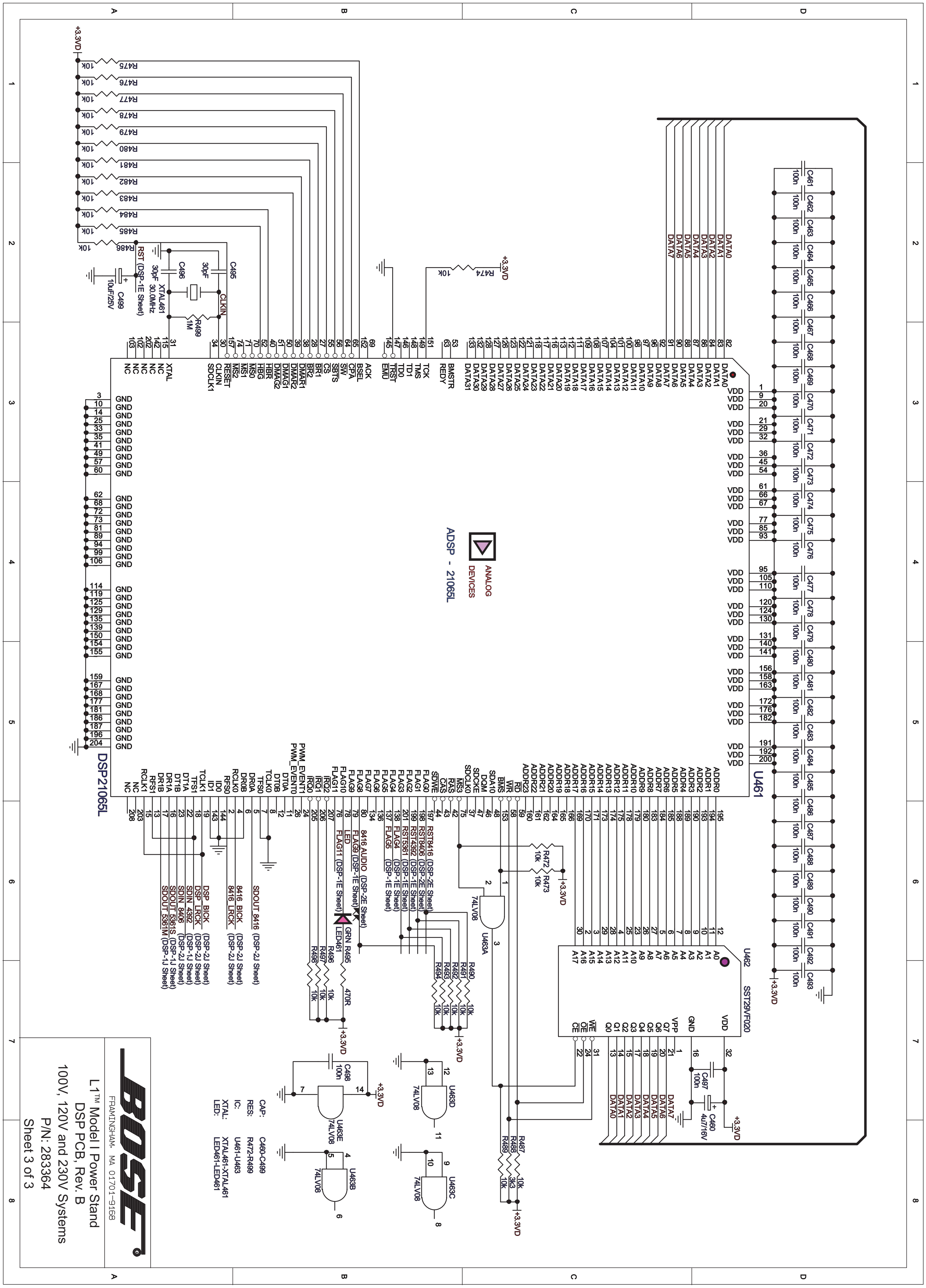

C358 120pF
R382 5k6
U381B NJM2068
C357 10uF/25V
R381 11k
C353 100PF
R383 5k6
C359 120pF
R384 5k6
U381A NJM2068
VREF1
R385 150R
R386 150R
D381 1N4148
D382 1N4148
D383 1N4148
D384 1N4148
C360 1n
+5VA
AINCH3-
AINCH3+
C362 120pF
R388 5k6
U382B NJM2068
C361 10uF/25V
R387 11k
C354 100PF
R389 5k6
C363 120pF
R390 5k6
U382A NJM2068
VREF1
R391 150R
R392 150R
D385 1N4148
D386 1N4148
D387 1N4148
D388 1N4148
C364 1n
+5VA
AINCH4-
AINCH4+
C366 120pF
R394 5k6
U383B NJM2068
C365 10uF/25V
R393 11k
C355 100PF
R395 5k6
C367 120pF
R396 5k6
U383A NJM2068
VREF2
R397 150R
R398 150R
D389 1N4148
D390 1N4148
D391 1N4148
D392 1N4148
C368 1n
+5VA
AINCH1-
AINCH1+
C370 120pF
R400 5k6
U384B NJM2068
C369 10uF/25V
R399 11k
C356 100PF
R401 5k6
C371 120pF
R402 5k6
U384A NJM2068
VREF2
R403 150R
R404 150R
D393 1N4148
D394 1N4148
D395 1N4148
D396 1N4148
C372 1n
+5VA
U381C NJM2068
AINCH2-
AINCH2+
CN104B
WF6
From Panel-1J Sheet
(CN401A)
+3.3VD
C373 100n
C374 1uF/50V
C375 100n
U385
CS5361
RST5361
5361_LRCK_S
5361_BICK_S
5361_MCLK
SDOUT_5361S
5361_MCLK
R423 10k
R421 10k
C383 100n
C384 10uF/25V
C385 100n
C386 1uF/50V
C387 100n
C388 1uF/50V
C10D 0.01uF
VREF1
+5VA
AINCH3+
AINCH3-
AINCH4-
AINCH4+
U386
CS5361
RST5361
5361_LRCK_M
5361_BICK_M
5361_MCLK
SDOUT_5361M
R424 10k
C377 100n
C378 1uF/50V
C379 100n
C389 100n
C390 10uF/25V
C391 100n
C392 1uF/50V
C393 100n
C394 1uF/50V
C10A 0.01uF
VREF2
AINCH1+
AINCH1-
AINCH2-
AINCH2+
U387
CS4392
(DSP_P201) RST4392
(DSP_P22) SDIN_4392
4392_BICK
4392_LRCK
4392_MCLK
R425 47k
C381 100n
C382 1uF/50V
C10C 0.01uF
C395 100n
C396 1uF/50V
C397 100n
C398 10uF/25V
C399 1uF/50V
AOUTL-
AOUTL+
AOUTR+
AOUTR-
dsp-2.sch
dsp-3.sch
C416 100n
C417 100n
C418 100n
C419 100n
C420 100n
C421 100n
C422 100n
C423 100n
C424 100n
C425 100n
U382C NJM2068
U383C NJM2068
U384C NJM2068
U388C NJM2068
-15V
+15V
FB382 Ferrite Bead
FB383 Ferrite Bead
CN381A
WF4
From MCU-1J Sheet
(CN381B)
R409 3K3
C360 10uF/25V
R405 3K
R407 1K5
C404 680pF
C402 1n5
U388A NJM2068
C406 10uF/25V
R411 560R
C351 10uF/25V
R406 3K
R408 1K5
C405 680pF
R410 3K3
C403 6n8
R412 47K
Note: These parts are not inserted.
They are only for development.
Q382 DTA114ESA
Q383 2SC2878
Q384 2SC2878
Q381 DTC114ES
From DSP-3C Sheet
FLAG9
R379 2K
R378 10K
R380 2K
-15V
+5VA
Full_In
BASS_In
CN115B
WF3
From Panel-3J Sheet
(CN115A)
R417 3K3
C400 10uF/25V
R413 3K
R415 1K5
C411 680pF
C409 1n5
U388B NJM2068
C413 10uF/25V
R419 560R
C401 10uF/25V
R414 3K
R416 1K5
C412 680pF
R418 3K3
C410 6n8
R420 47K
From MCU-2J Sheet
CN341B
FLAG4 (DSP 138Pin)
FLAG5 (DSP 197Pin)
FLAG11(DSP 76Pin)
WF6
FB381 Ferrite Bead
+3.3V
C407 100n
C352 10uF/25V
U389 78L05A
IN
OUT
GND
C426 100n
C427 10uF/25V
C428 100uF/10V
C429 100n
TR: Q381-Q384
CAP: C300-C301,C352-C407,C409-C429
RES: R381-R425
IC: U381-U389
CON: CN104B CN115B CN341B
DIODE: D381-D396
FB: FB381-FB383
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
DSP PCB, Rev. B
100V, 120V and 230V Systems
P/N: 283364
Sheet 1 of 3

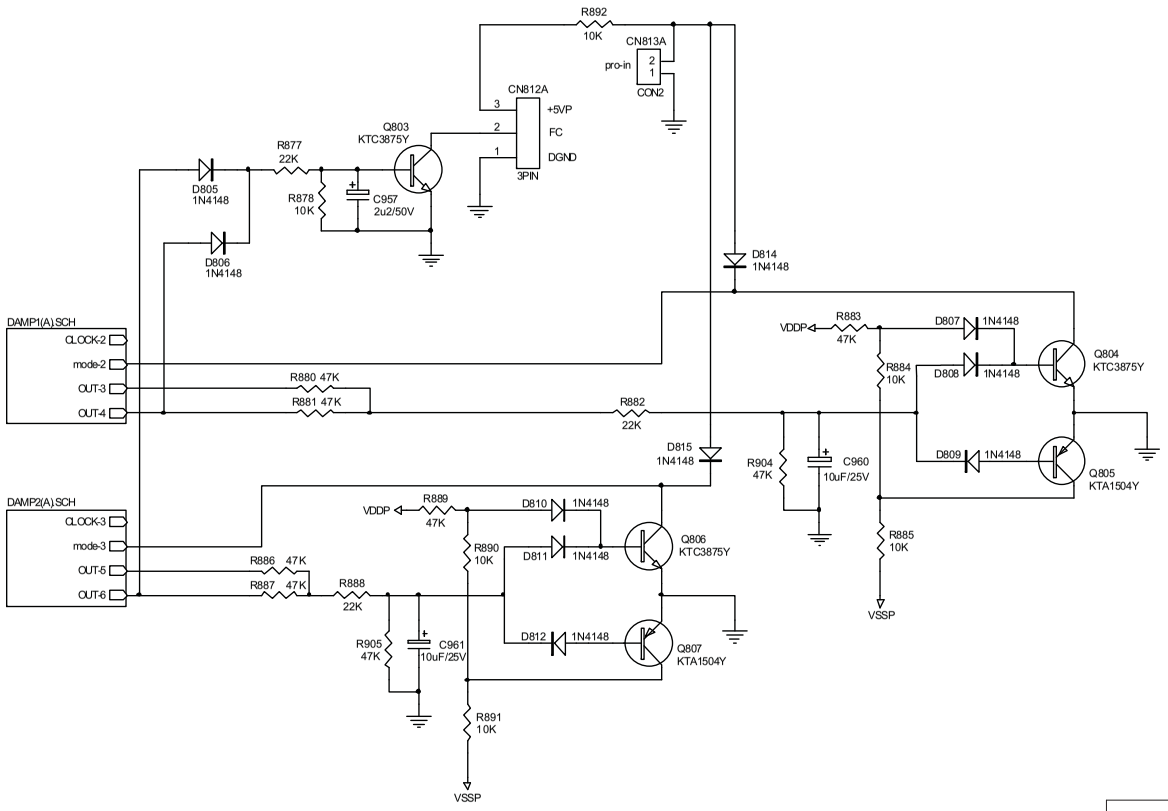


CAP: C430-C458
RES: R426-R466
IC: U431-U435
CON: CN112B-CN113B
TRAN: T431-T432
FB: FB431-FB432
XTAL: XTAL431-XTAL431
DIODE: D431-D432
SPARK GAP: SG431-SG432

BOSE
FRAMINGHAM, MA 01701-9168

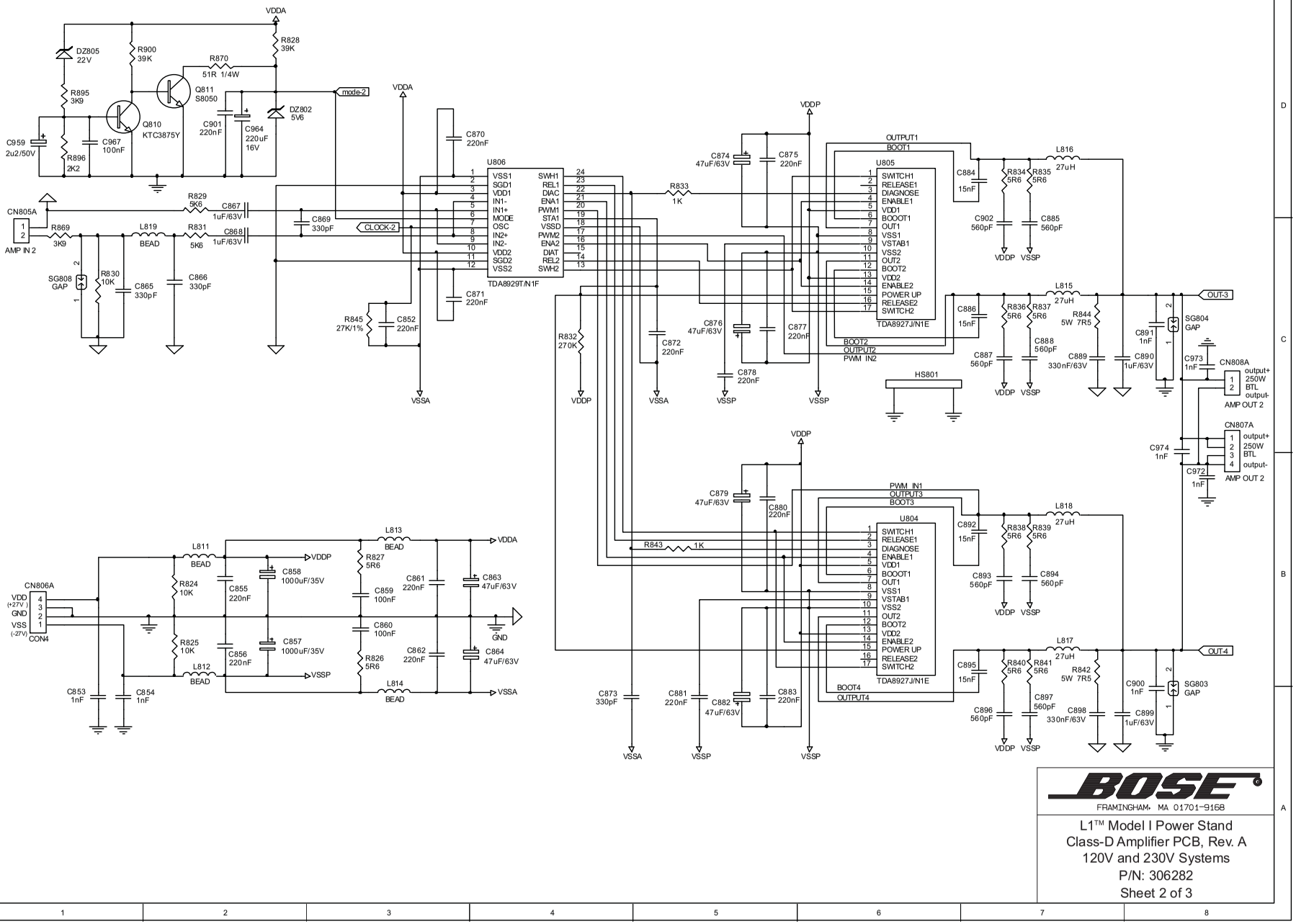
L1™ Model I Power Stand
DSP PCB, Rev. B
100V, 120V and 230V Systems
P/N: 283364
Sheet 2 of 3


ANALOG DEVICES
ADSP - 21065L
U461
DSP21065L
U462
SST29VF020
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
DSP PCB, Rev. B
100V, 120V and 230V Systems
P/N: 283364
Sheet 3 of 3
CAP: C460-C499
RES: R472-R499
IC: U461-U463
XTAL: XTAL461-XTAL461
LED: LED461-LED461



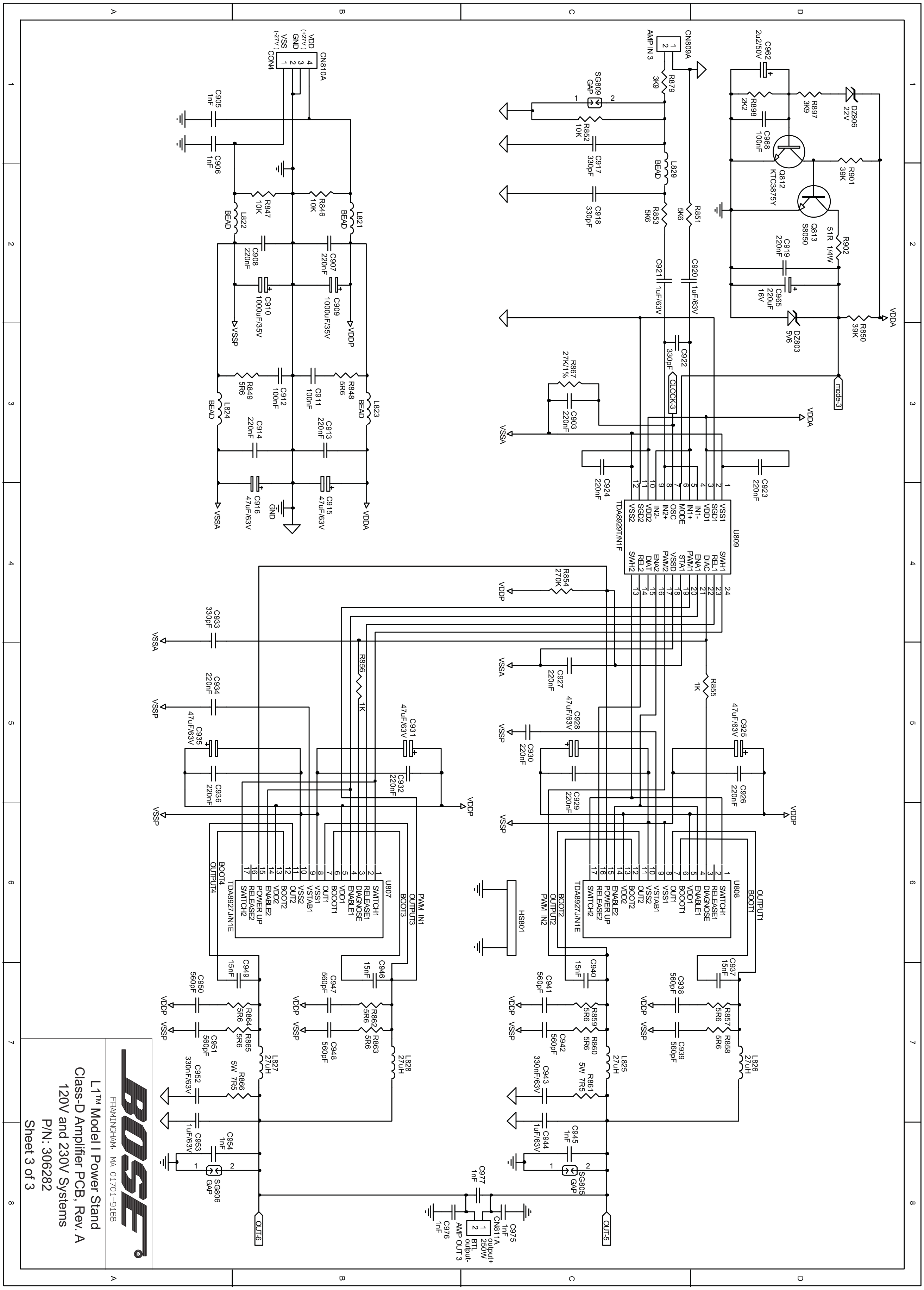
BOSE®
FRAMINGHAM, MA 01701-9168

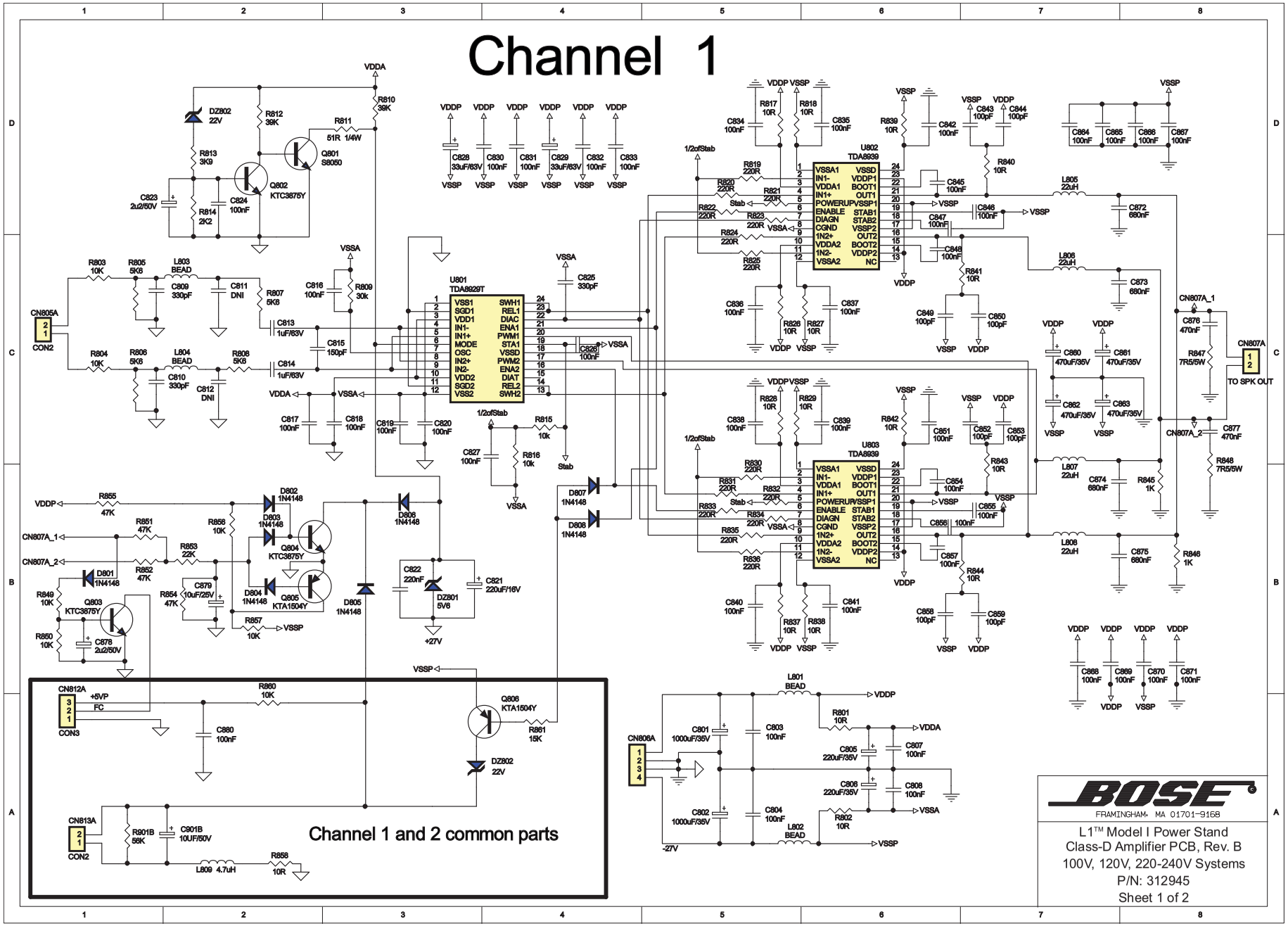
L1™ Model I Power Stand
Class-D Amplifier PCB, Rev. A
120V and 230V Systems
P/N: 306282
Sheet 1 of 3

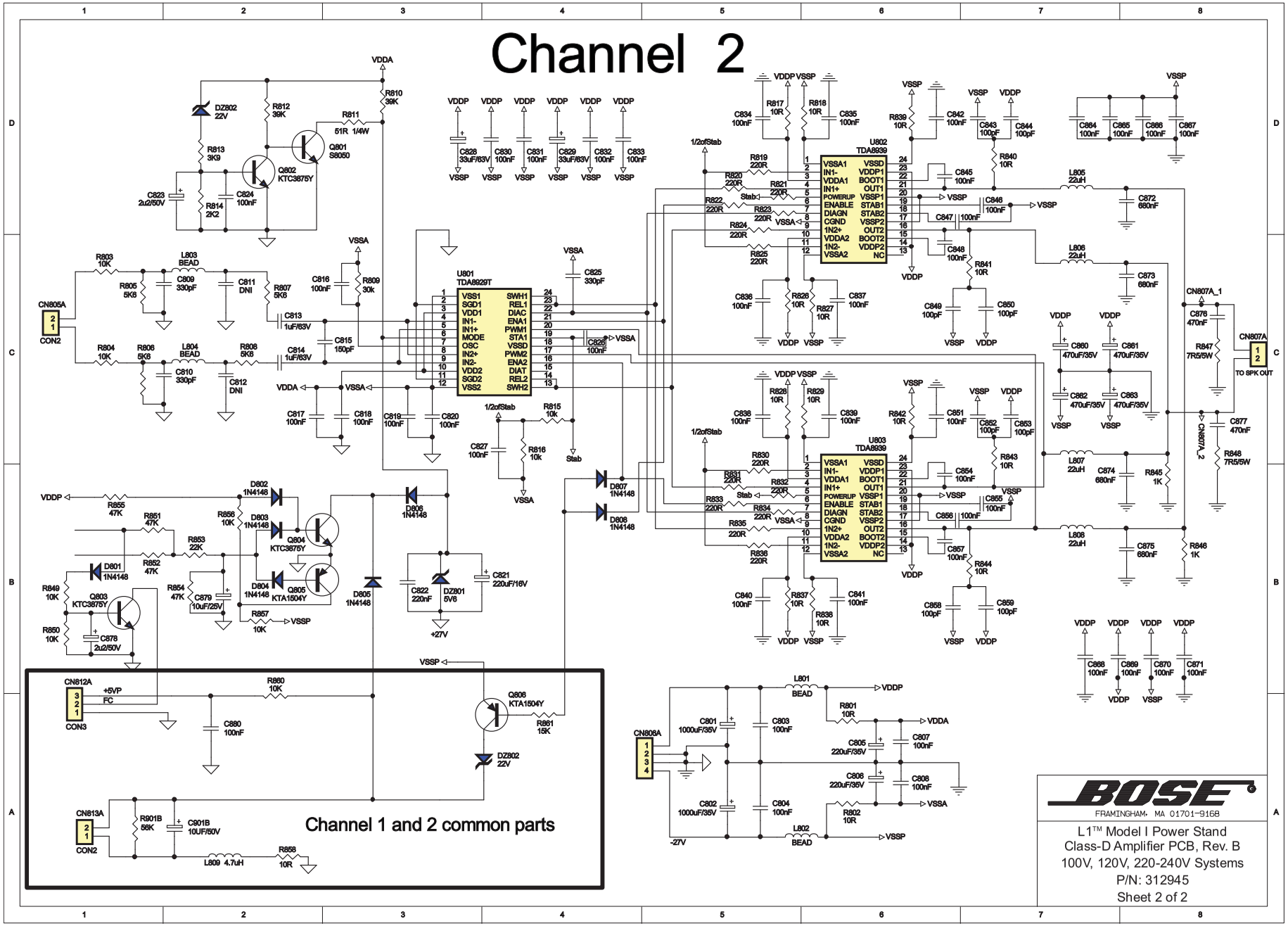


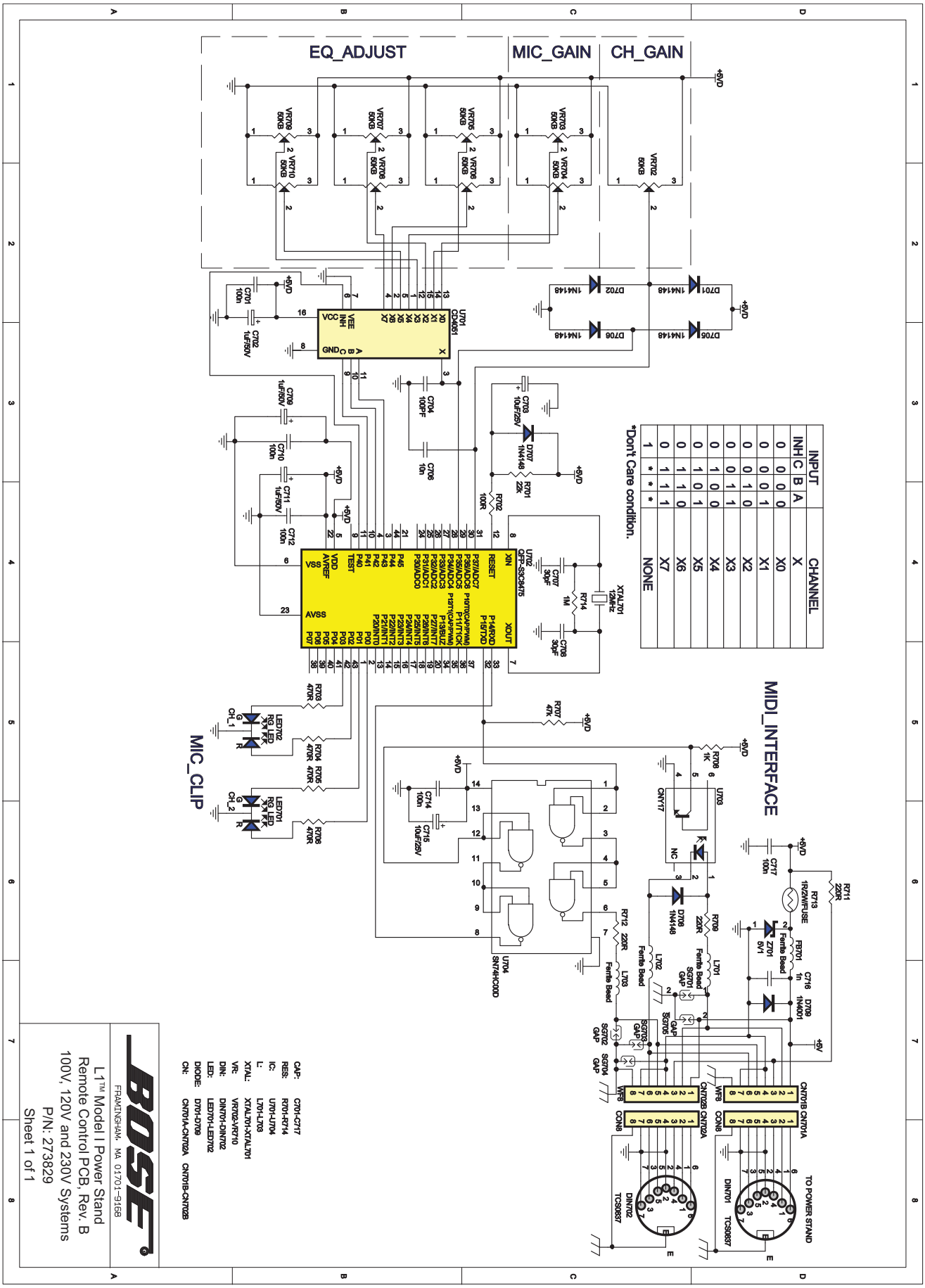
BOSE
FRAMINGHAM, MA 01701-9168

L1™ Model I Power Stand
Class-D Amplifier PCB, Rev. A
120V and 230V Systems
P/N: 306282
Sheet 2 of 3


FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Class-D Amplifier PCB, Rev. A
120V and 230V Systems
P/N: 306282
Sheet 3 of 3


Channel 1
Channel 1 and 2 common parts
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Class-D Amplifier PCB, Rev. B
100V, 120V, 220-240V Systems
P/N: 312945
Sheet 1 of 2


Channel 2
Channel 1 and 2 common parts
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Class-D Amplifier PCB, Rev. B
100V, 120V, 220-240V Systems
P/N: 312945
Sheet 2 of 2


EQ_ADJUST
MIC_GAIN
CH_GAIN
MIC_CLIP
MIDI_INTERFACE
*Don't Care condition.
INPUT
INH C B A
CHANNEL
X
X0
X1
X2
X3
X4
X5
X6
X7
NONE
TO POWER STAND
BOSE
FRAMINGHAM, MA 01701-9168
L1™ Model I Power Stand
Remote Control PCB, Rev. B
100V, 120V and 230V Systems
P/N: 273829
Sheet 1 of 1

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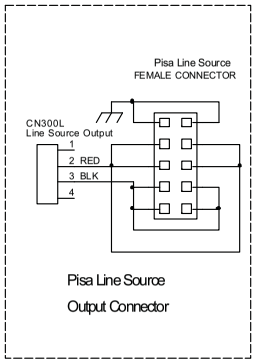
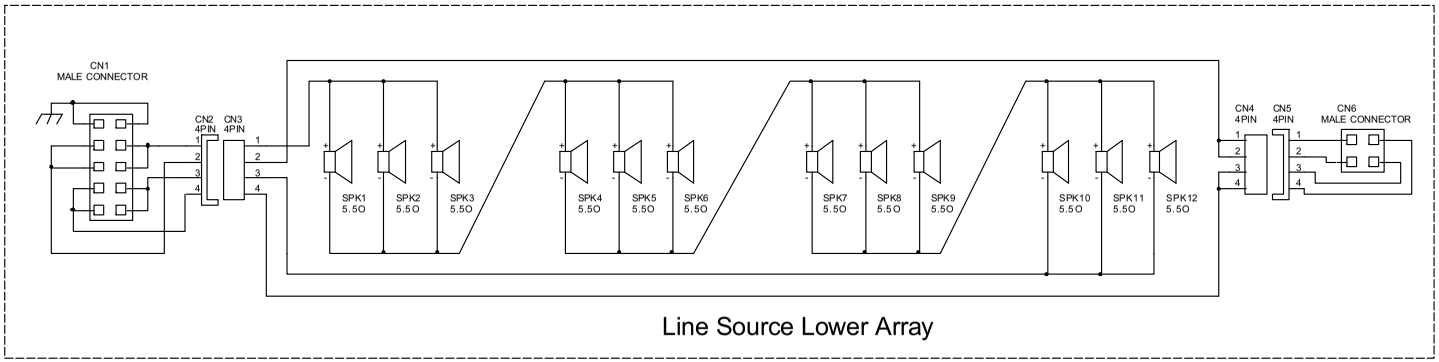
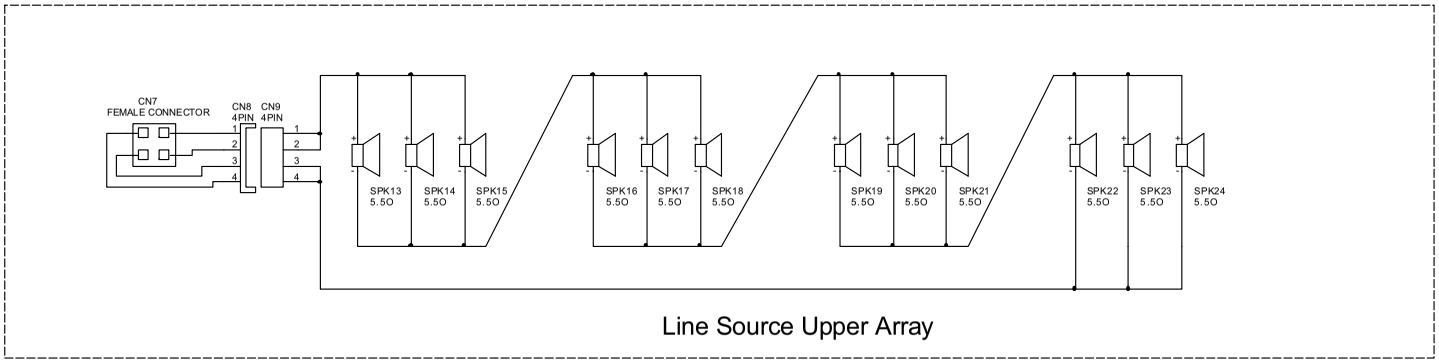






BOSE
FRAMINGHAM, MA 01701-9168

L1™ Model I Line Array
Wiring Diagram
100V, 120V and 230V Systems
Sheet 1 of 1

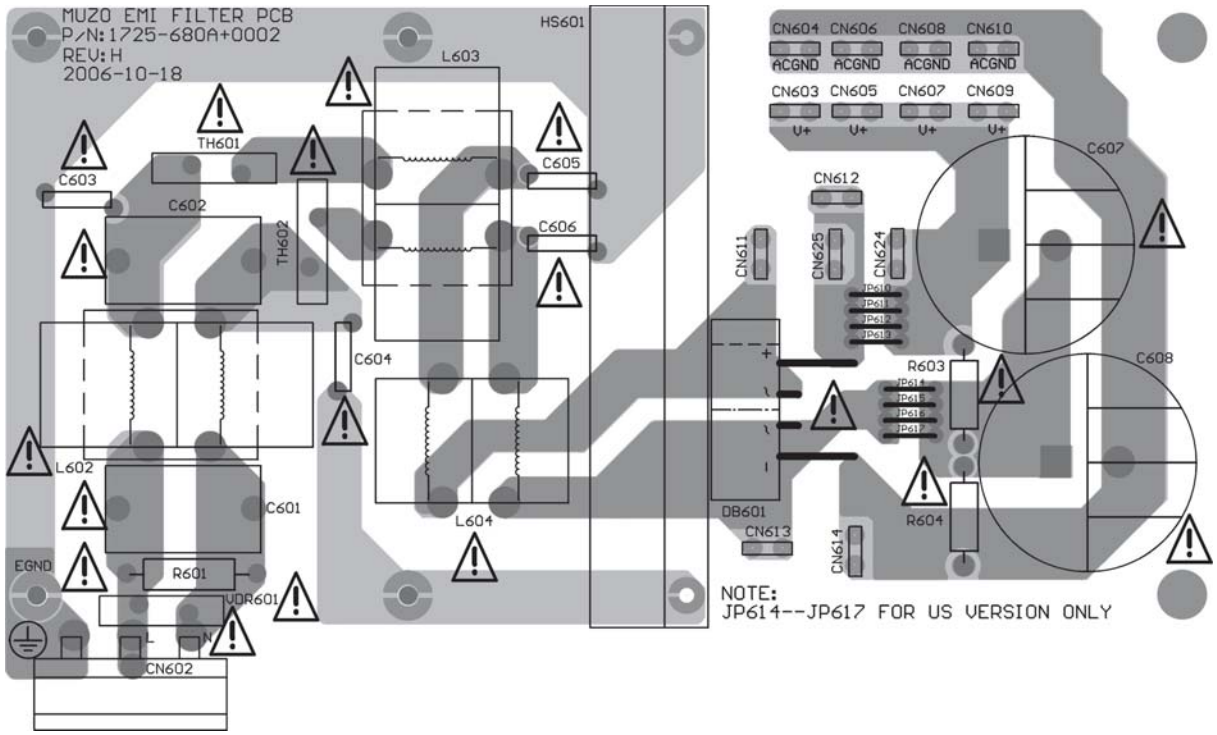


Figure 13. EMI (FCC) Filter PCB Assembly Board Layout

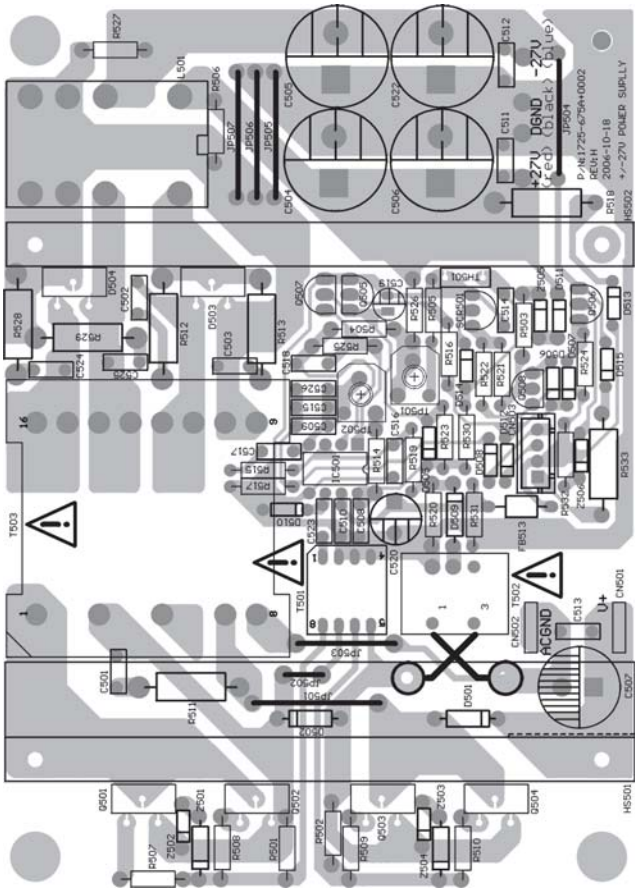


Figure 14. +/-27V SMPS PCB Assembly Board Layout

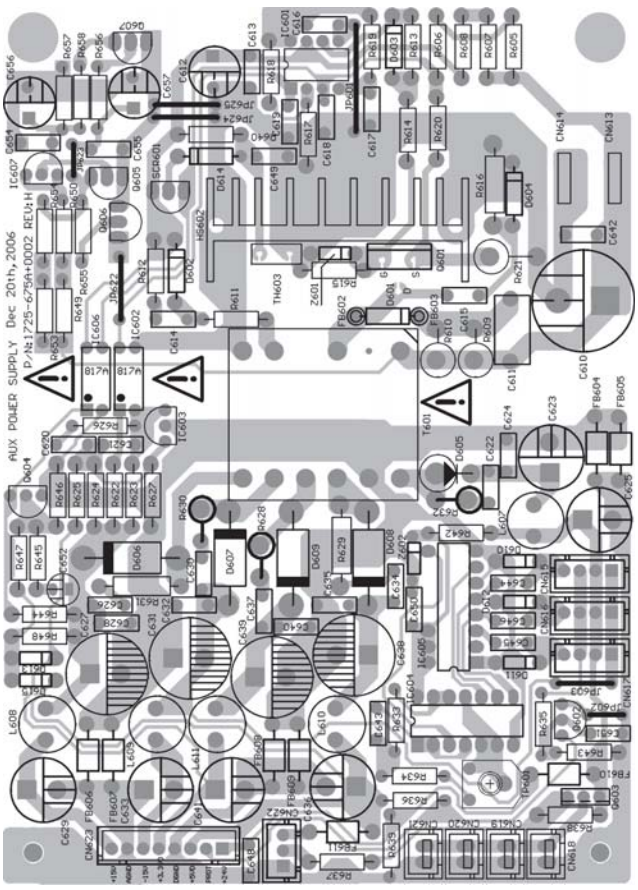


Figure 15. Auxiliary P/S PCB Assembly Board Layout

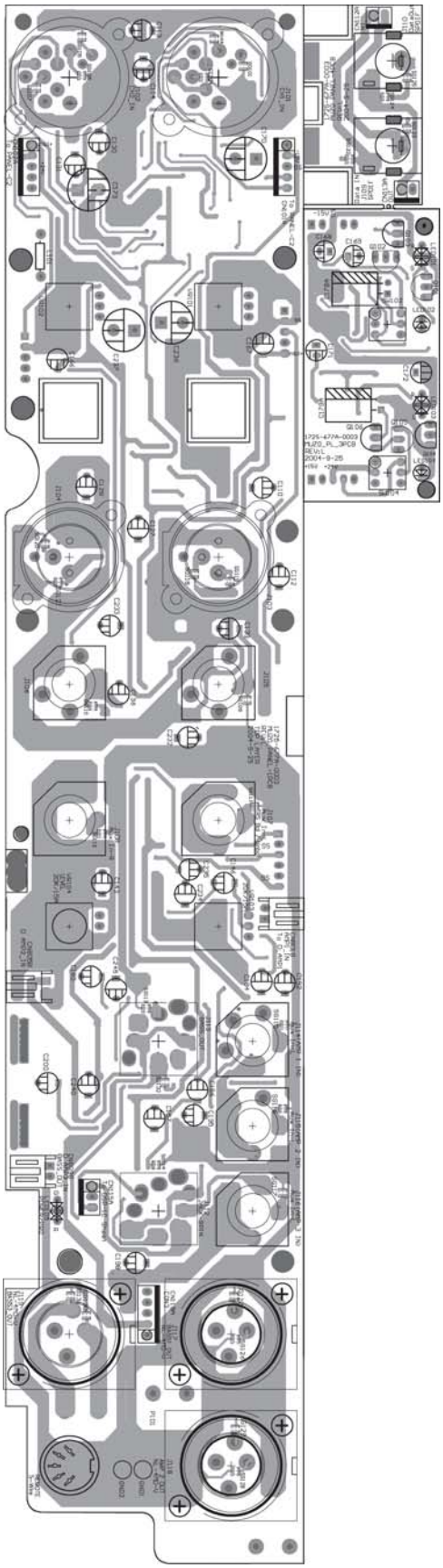


Figure 16. Input Panel PCB Assembly Top Etch Board Layout

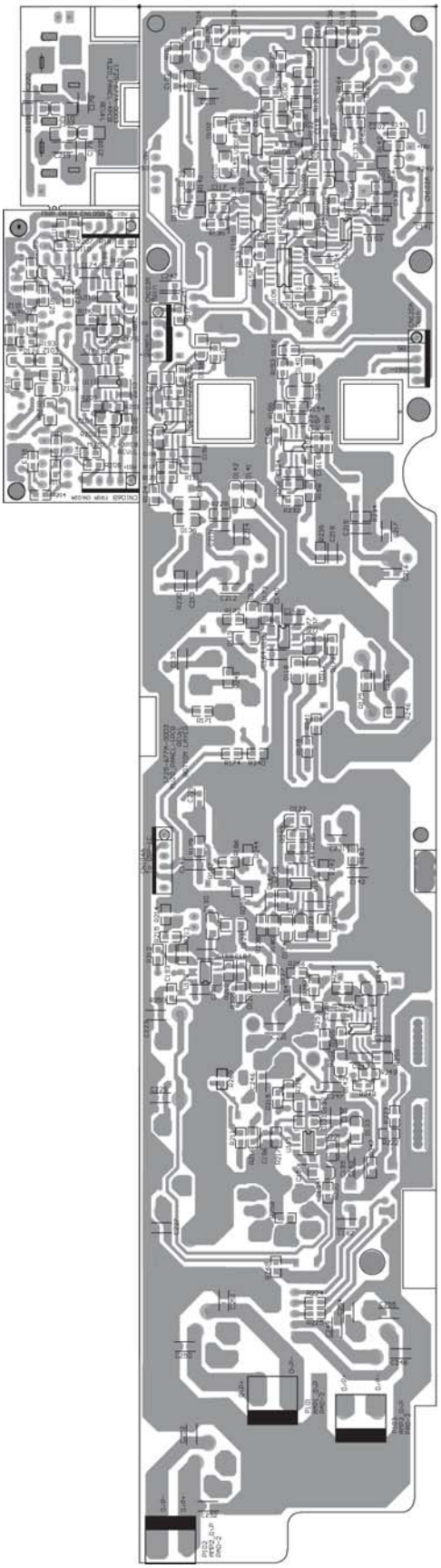


Figure 17. Input Panel PCB Assembly Bottom Etch Board Layout

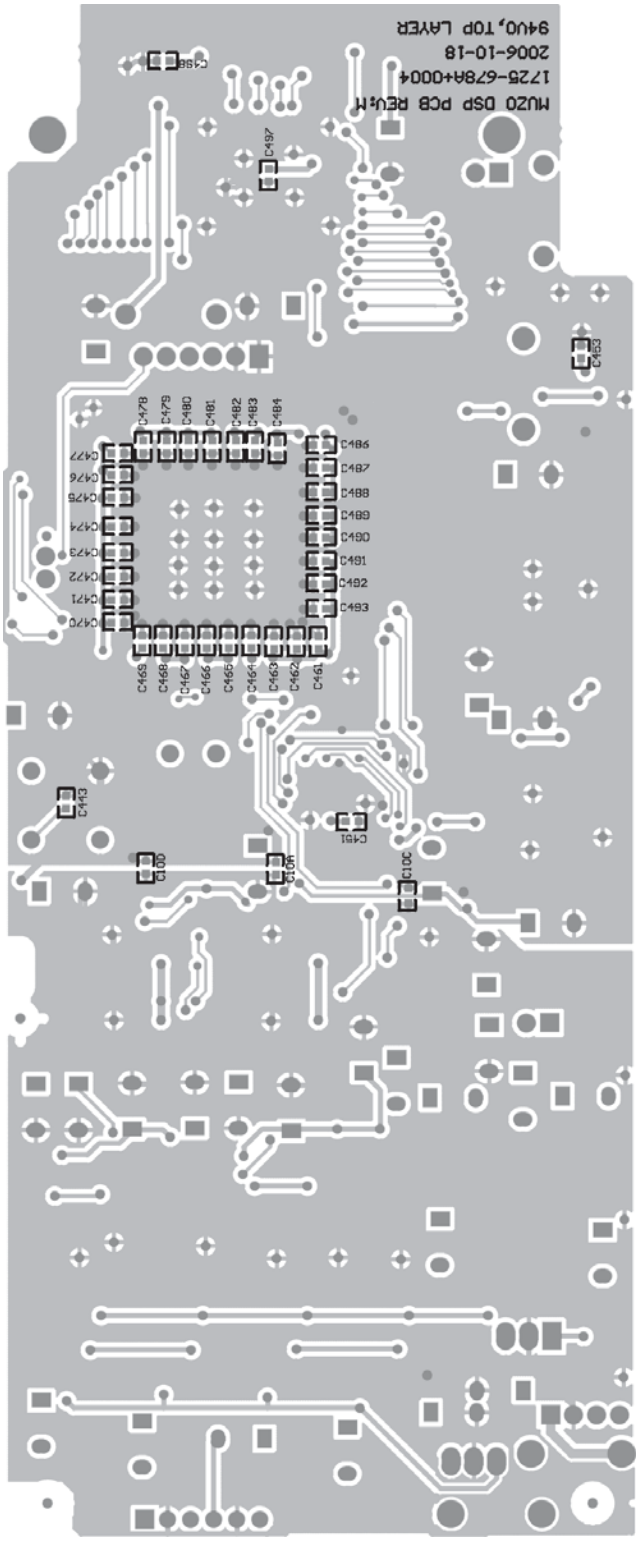


Figure 18. DSP PCB Assembly
Top Etch Board Layout

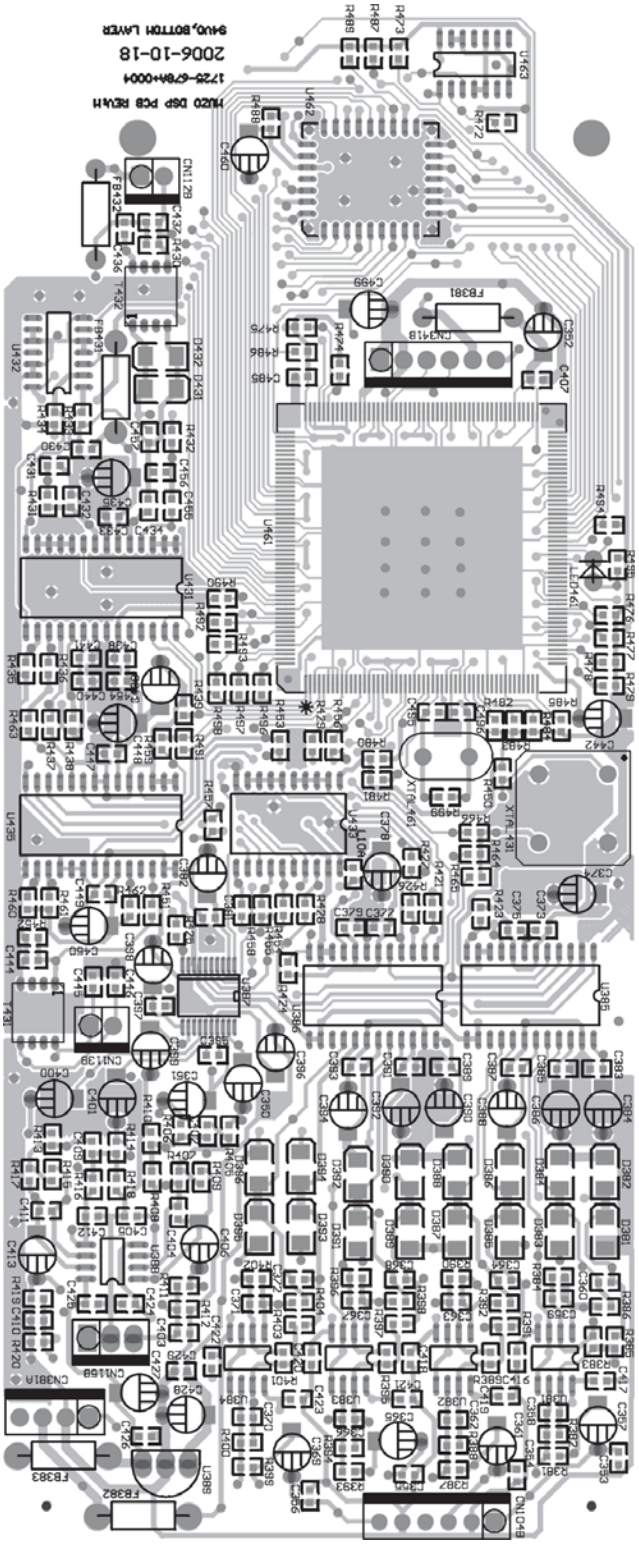


Figure 19. DSP PCB Assembly
Bottom Etch Board Layout

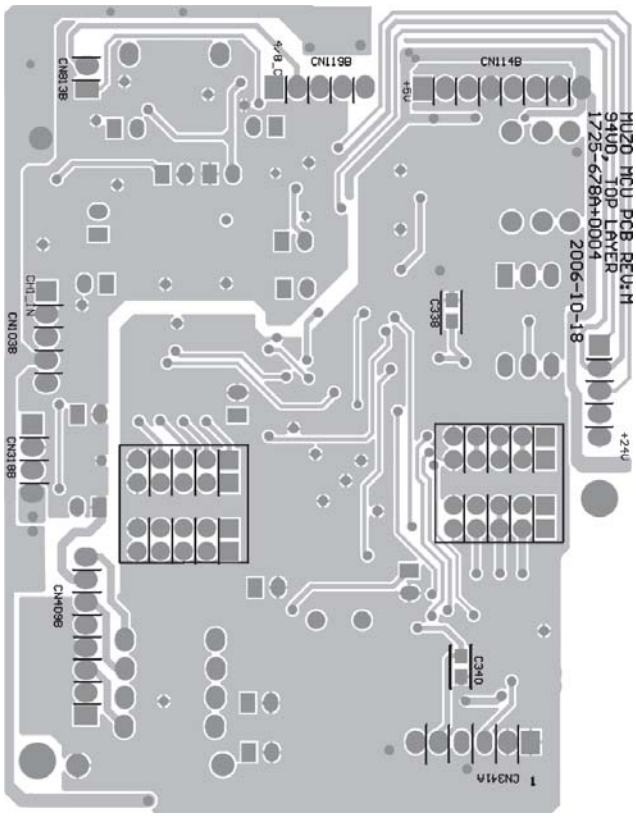


Figure 20. MCU PCB Assembly Top Etch Board Layout

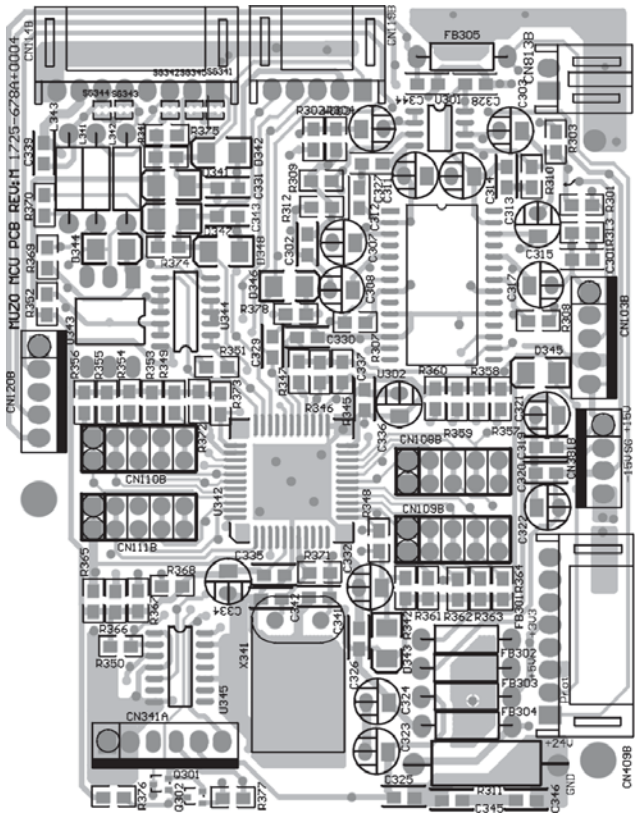


Figure 21. MCU PCB Assembly Bottom Etch Board Layout

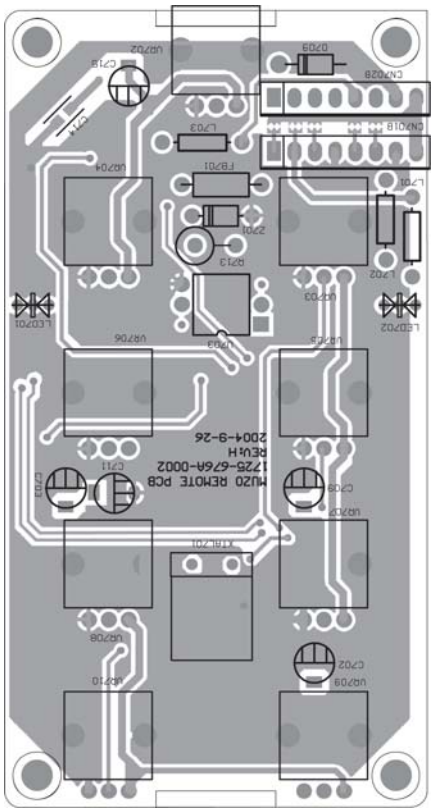


Figure 22. Remote Control PCB Assembly Top Etch Board Layout

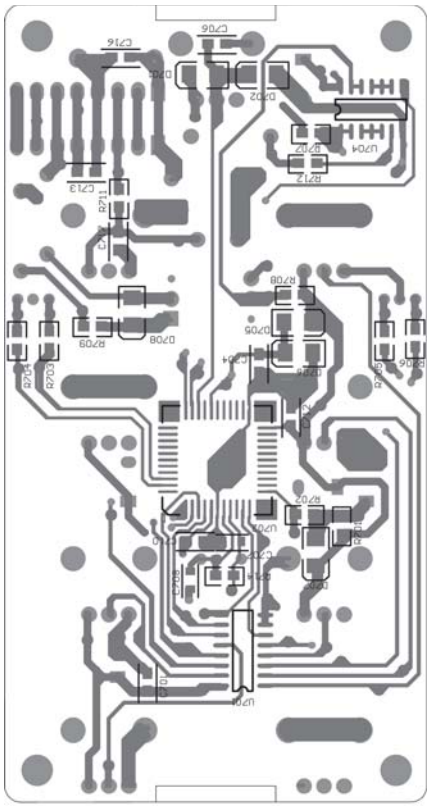


Figure 23. Remote Control PCB Assembly Bottom Etch Board Layout

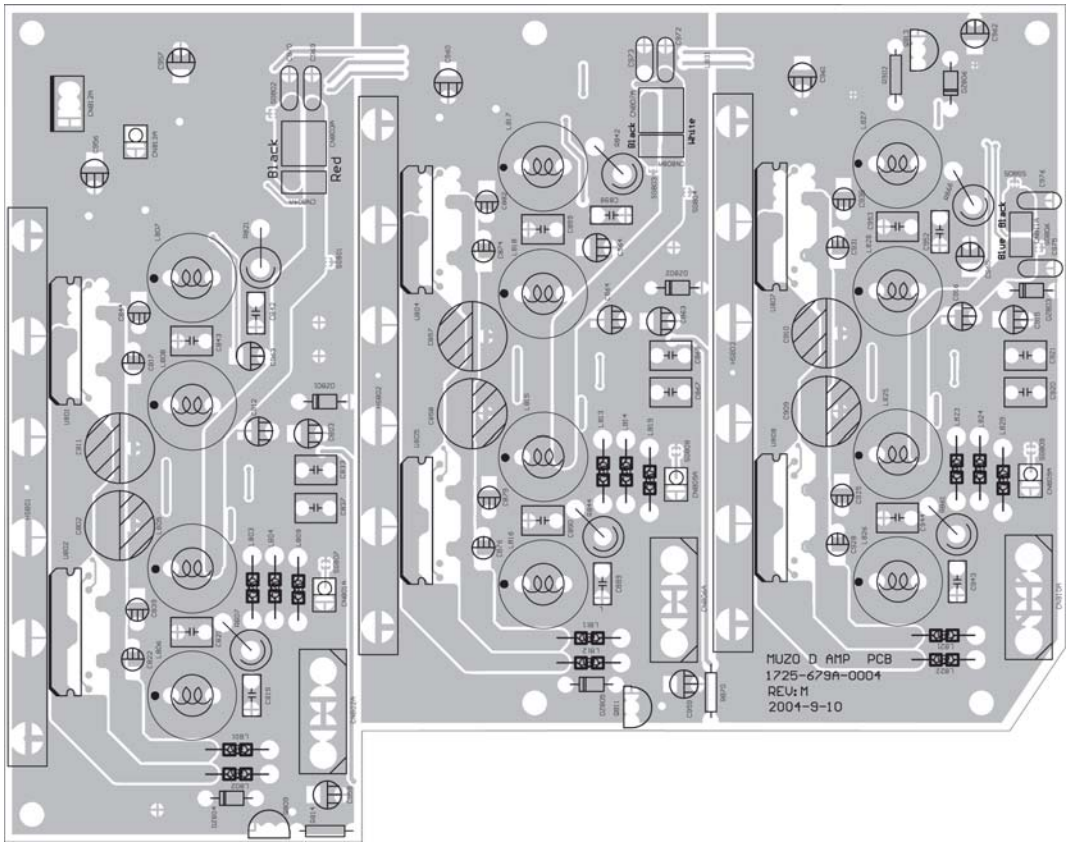


Figure 24. Class-D Amplifier PCB Assembly, P/N: 306282, Top Etch Layout

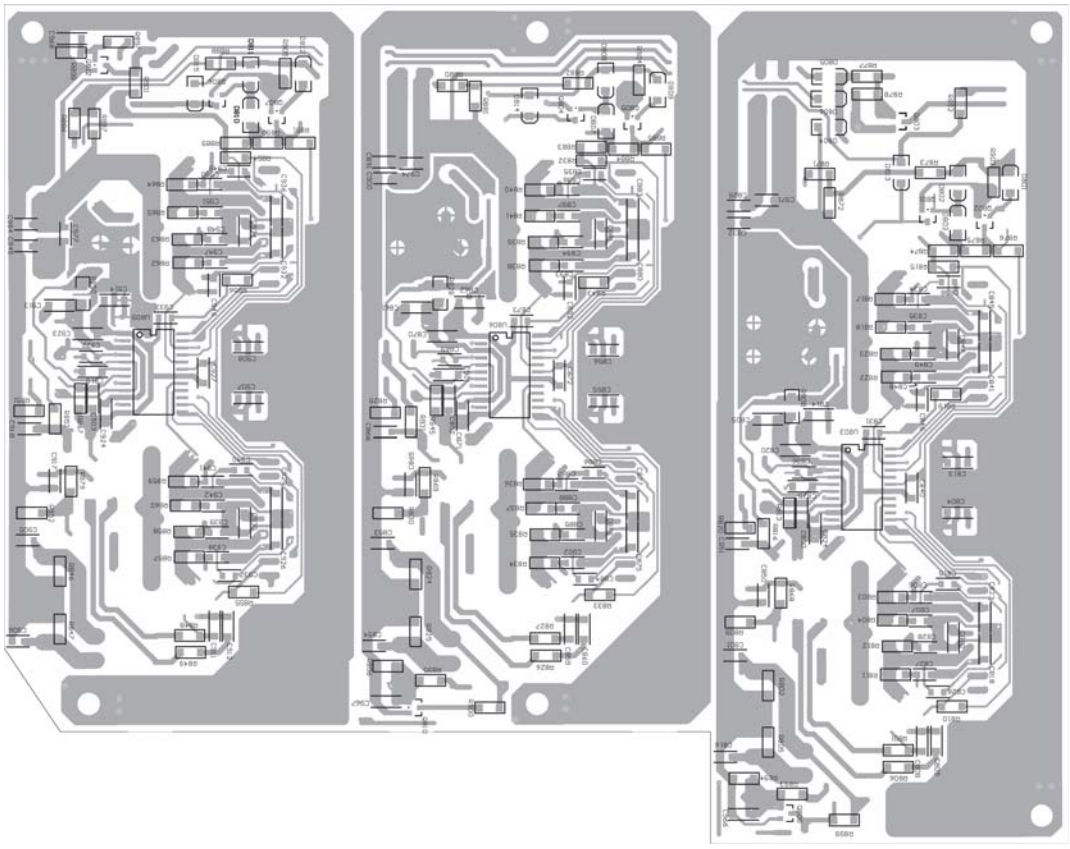


Figure 25. Class-D Amplifier PCB Assembly, P/N: 306282, Bottom Etch Layout

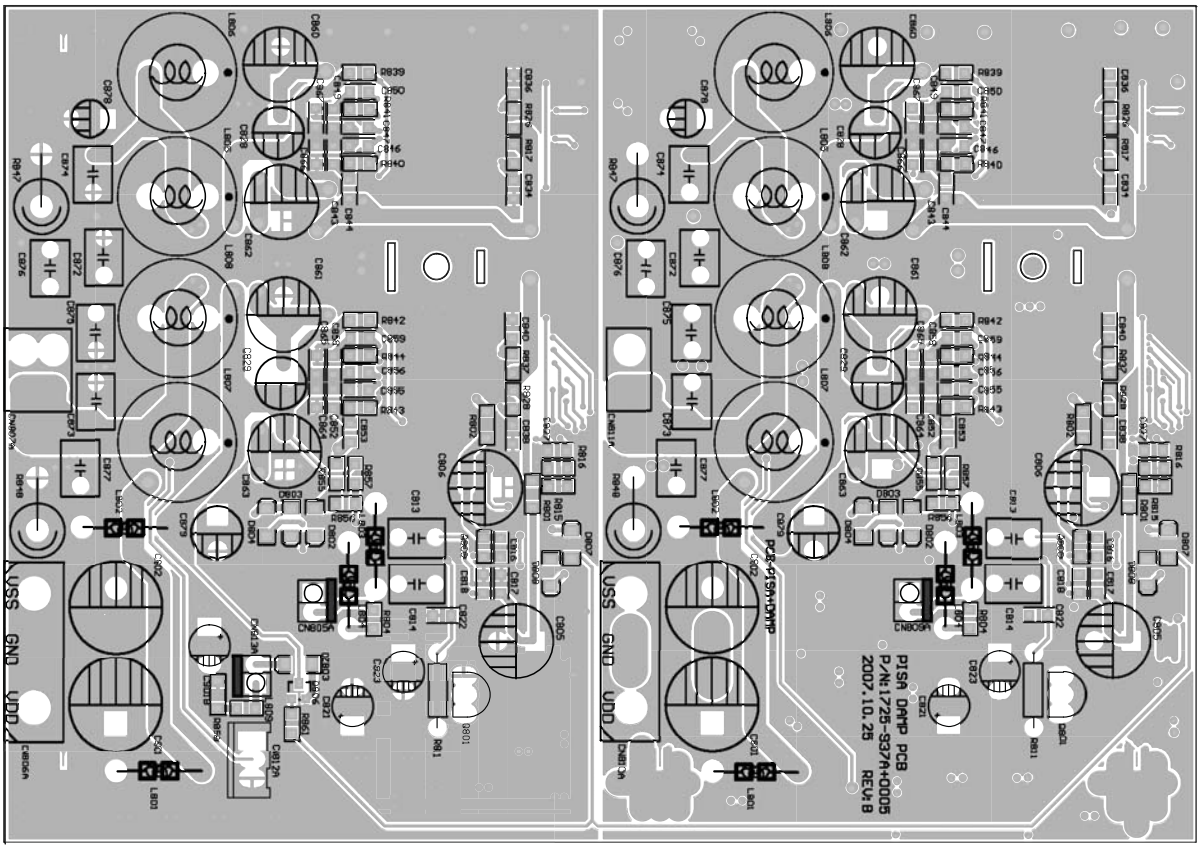


Figure 26. Class-D Amplifier PCB Assembly, P/N: 312945, Top Etch Layout

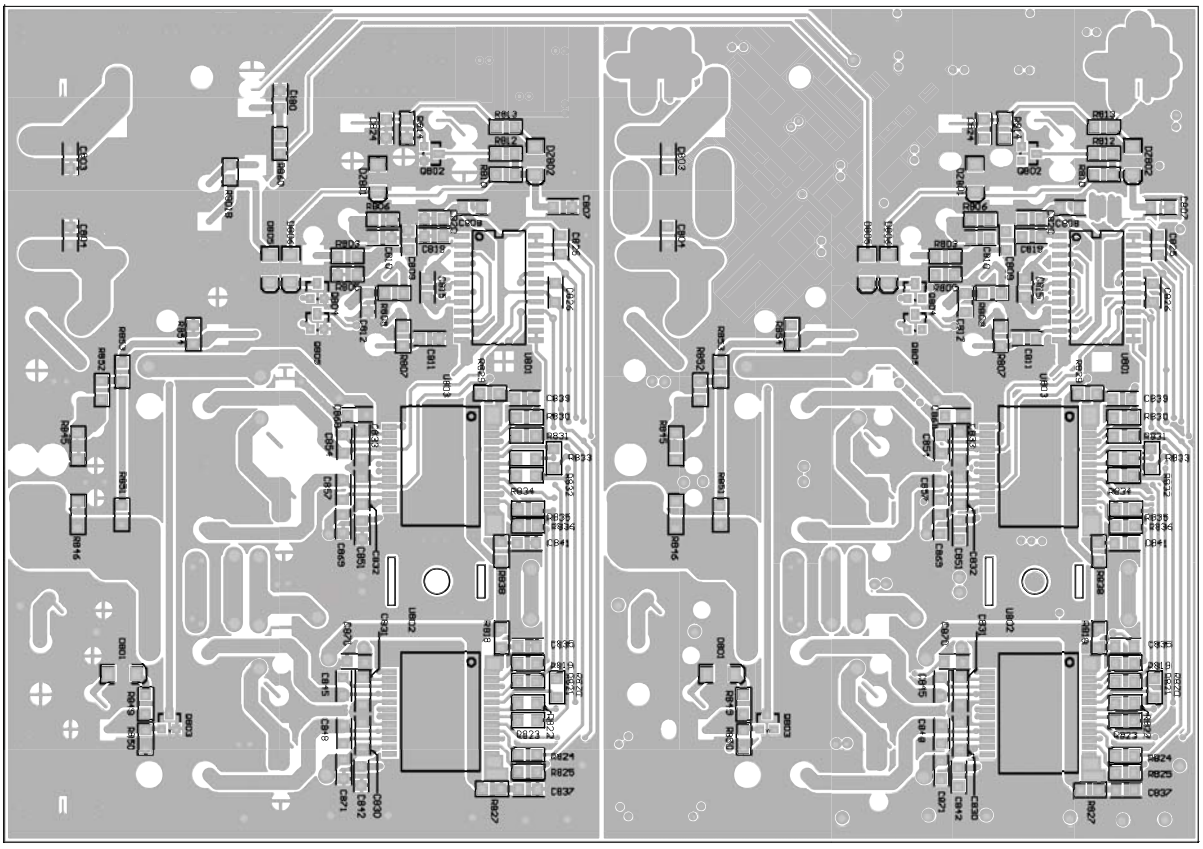
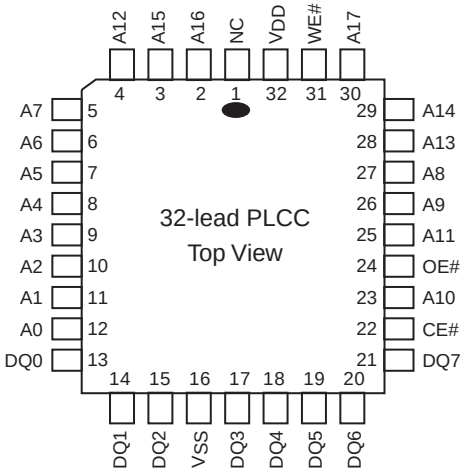
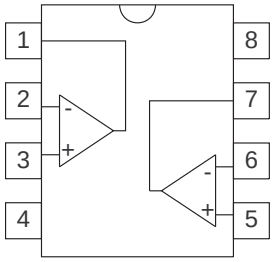


Figure 27. Class-D Amplifier PCB Assembly, P/N: 312945, Bottom Etch Layout

IC Diagrams



29LE020 EEPROM Pinout Diagram



1. Output1
2. Inverting input1
3. Non-inverting input 1
4. -Vcc
5. Non-inverting input 2
6. Inverting input 2
7. Output 2
8. +Vcc

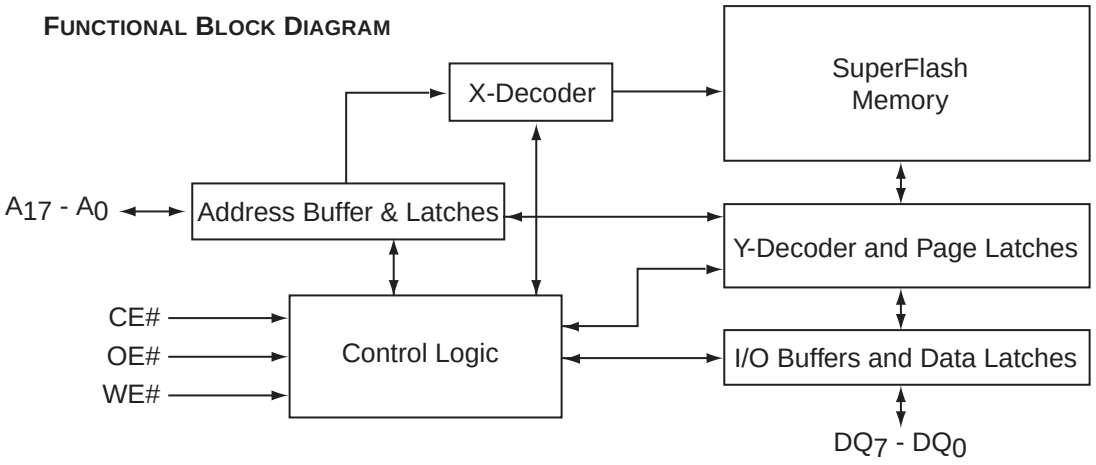
TLO72, Dual Op-Amp

PIN DESCRIPTION

Symbol	Pin Name	Functions
A_{17}-A_7	Row Address Inputs	To provide memory addresses. Row addresses define a page for a Write cycle.
A_6-A_0	Column Address Inputs	Column Addresses are toggled to load page data
DQ_7-DQ_0	Data Input/output	To output data during Read cycles and receive input data during Write cycles. Data is internally latched during a Write cycle. The outputs are in tri-state when OE# or CE# is high.
CE#	Chip Enable	To activate the device when CE# is low.
OE#	Output Enable	To gate the data output buffers.
WE#	Write Enable	To control the Write operations.
V_{DD}	Power Supply	To provide: 5.0V supply (4.5-5.5V) for SST29EE020 3.0V supply (3.0-3.6V) for SST29LE020 2.7V supply (2.7-3.6V) for SST29VE020
V_{SS}	Ground	
NC	No Connection	Unconnected pins.

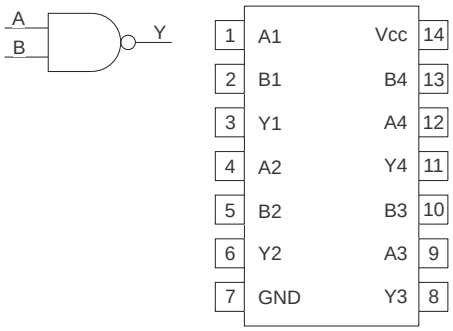
29LE020 EEPROM Pinout Table

FUNCTIONAL BLOCK DIAGRAM



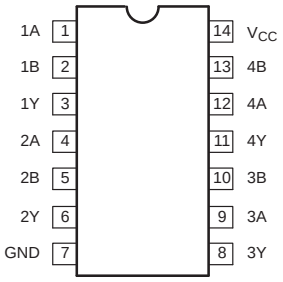
29LE020 EEPROM Block Diagram

IC Diagrams

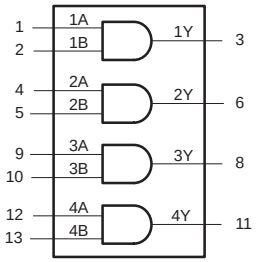


74HC00, Quad 2 Input Nand Gate

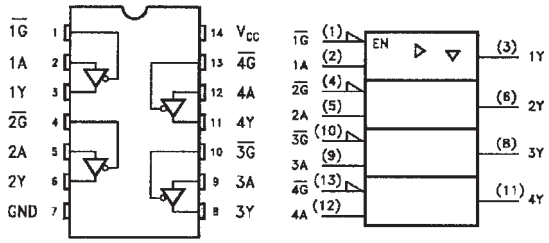
PIN CONFIGURATION



LOGIC SYMBOL



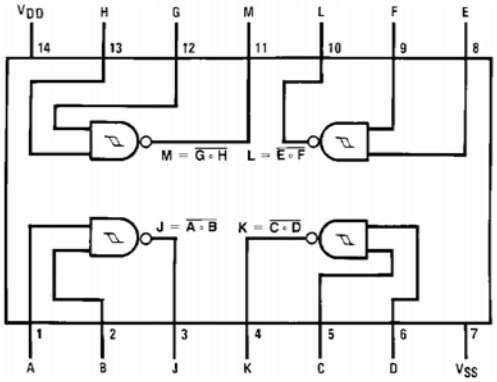
74LV08 Quad AND Gate



PIN No	SYMBOL	NAME AND FUNCTION
1, 4, 10, 13	$\overline{1G}$ TO $\overline{4G}$	Output Enable Input
2, 5, 9, 12	1A TO 4A	Data Inputs
3, 6, 8, 11	1Y TO 4Y	Data Outputs
7	GND	Ground (0V)
14	V_{CC}	Positive Supply Voltage

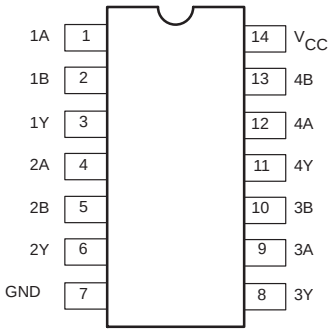
74LCX125 Quad Buffer

Pin Assignments for SOIC and DIP



Top View

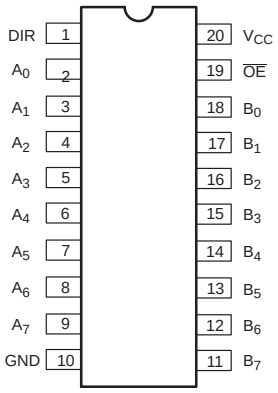
CD4093BC Quad NAND Gate



PIN DESCRIPTION

PIN NUMBER	SYMBOL	NAME AND FUNCTION
1, 4, 9, 12	1A ± 4A	Data inputs
2, 5, 10, 13	1B ± 4B	Data inputs
3, 6, 8, 11	1Y ± 4Y	Data Outputs
7	GND	Ground (0 V)
14	V_{CC}	Positive supply voltage

74LV32 Quad AND Gate

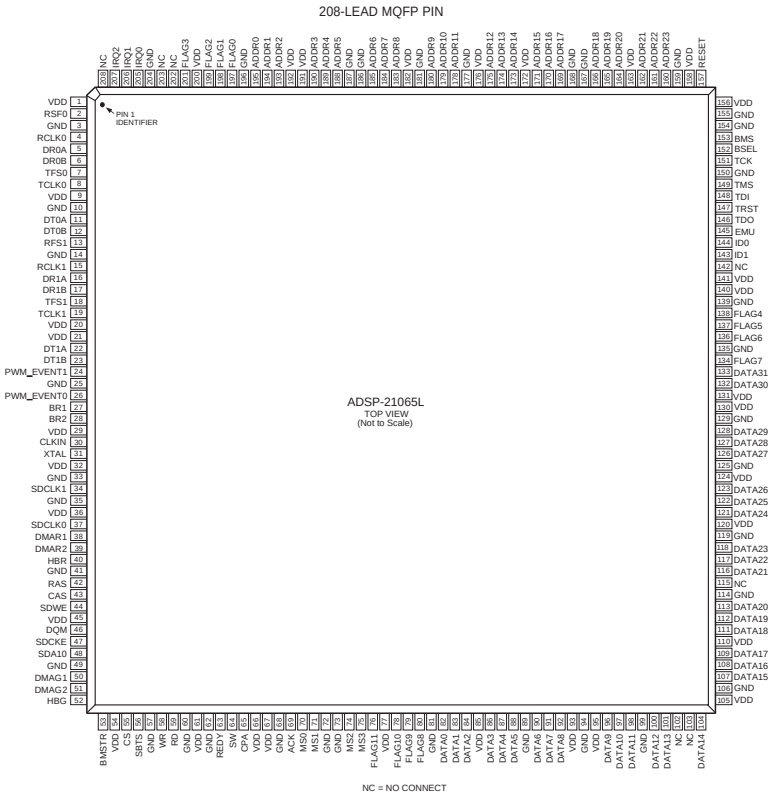


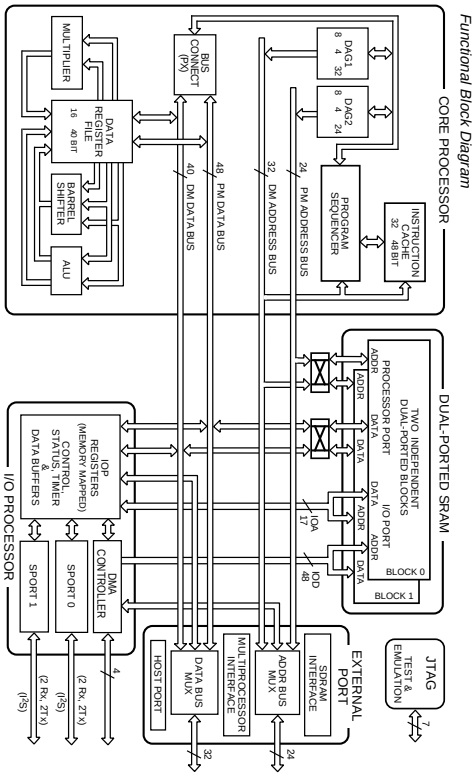
PIN DESCRIPTION

PIN NUMBER	SYMBOL	FUNCTION
1	DIR	Direction
2, 3, 4, 5, 6, 7, 8, 9	A_0 to A_7	Data inputs/outputs
10	GND	Ground (0 V)
18, 17, 16, 15, 14, 13, 12, 11	B_0 to B_7	Data inputs/outputs
19	$\overline{OE}$	Output enable input (active LOW)
20	V_{CC}	Positive supply voltage

74LV245 Octal Bus Transciever

IC Diagrams



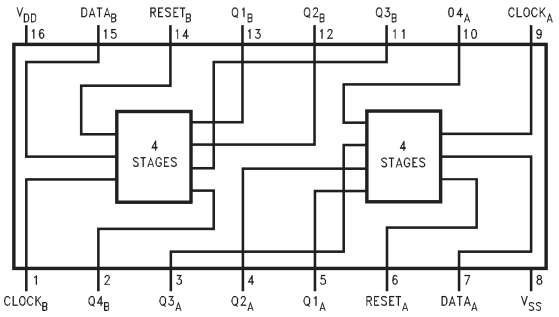


208-LEAD MQFP PIN CONFIGURATION

Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name
1	VDD	43	CAS	85	VDD	127	DATA28	169	ADDR17
2	RFS0	44	SDWE	86	DATA3	128	DATA29	170	ADDR16
3	GND	45	VDD	87	DATA4	129	GND	171	ADDR15
4	RCLK0	46	DQM	88	DATA5	130	VDD	172	VDD
5	DR0A	47	SDCKE	89	GND	131	VDD	173	ADDR14
6	DR0B	48	SDA10	90	DATA6	132	DATA30	174	ADDR13
7	TFS0	49	GND	91	DATA7	133	DATA31	175	ADDR12
8	TCLK0	50	DMAG 1	92	DATA8	134	FLAG7	176	VDD
9	VDD	51	DMAG 2	93	VDD	135	GND	177	GND
10	GND	52	HBG	94	GND	136	FLAG6	178	ADDR11
11	DT0A	53	BMSTR	95	VDD	137	FLAG5	179	ADDR10
12	DT0B	54	VDD	96	DATA9	138	FLAG4	180	ADDR9
13	RFS1	55	CS	97	DATA10	139	GND	181	GND
14	GND	56	SBTS	98	DATA11	140	VDD	182	VDD
15	RCLK1	57	GND	99	GND	141	VDD	183	ADDR8
16	DR1A	58	WR	100	DATA12	142	NC	184	ADDR7
17	DR1B	59	RD	101	DATA13	143	ID1	185	ADDR6
18	TFS1	60	GND	102	NC	144	ID0	186	GND
19	TCLK1	61	VDD	103	NC	145	EMU	187	GND
20	VDD	62	GND	104	DATA14	146	TDO	188	ADDR5
21	VDD	63	REDY	105	VDD	147	TRST	189	ADDR4
22	DT1A	64	SW	106	GND	148	TDI	190	ADDR3
23	DT1B	65	CPA	107	DATA15	149	TMS	191	VDD
24	PWM_EVENT1	66	VDD	108	DATA16	150	GND	192	VDD
25	GND	67	VDD	109	DATA17	151	TCK	193	ADDR2
26	PWM_EVENT0	68	GND	110	VDD	152	BSEL	194	ADDR1
27	BR1	69	ACK	111	DATA18	153	BMS	195	ADDR0
28	BR2	70	MS0	112	DATA19	154	GND	196	GND
29	VDD	71	MS1	113	DATA20	155	GND	197	FLAG0
30	CLKIN	72	GND	114	GND	156	VDD	198	FLAG1
31	XTAL	73	GND	115	NC	157	RESET	199	FLAG2
32	VDD	74	MS2	116	DATA21	158	VDD	200	VDD
33	GND	75	MS3	117	DATA22	159	GND	201	FLAG3
34	SDCLK1	76	FLAG11	118	DATA23	160	ADDR23	202	NC
35	GND	77	VDD	119	GND	161	ADDR22	203	NC
36	VDD	78	FLAG10	120	VDD	162	ADDR21	204	GND
37	SDCLK0	79	FLAG9	121	DATA24	163	VDD	205	IRQ0
38	DMAR 1	80	FLAG8	122	DATA25	164	ADDR20	206	IRQ1
39	DMAR 2	81	GND	123	DATA26	165	ADDR19	207	IRQ2
40	HBR	82	DATA0	124	VDD	166	ADDR18	208	NC
41	GND	83	DATA1	125	GND	167	GND		
42	RAS	84	DATA2	126	DATA27	168	GND		

IC Diagrams

Dual-In-Line Package



CLU	D	R	Q_1	Q_n
L	0	0	0	$Q_{nb\ 1}$
L	1	0	1	$Q_{nb\ 1}$
K	X	0	Q_1	Q_n
X	X	1	0	0

Connection Diagram and Truth Table

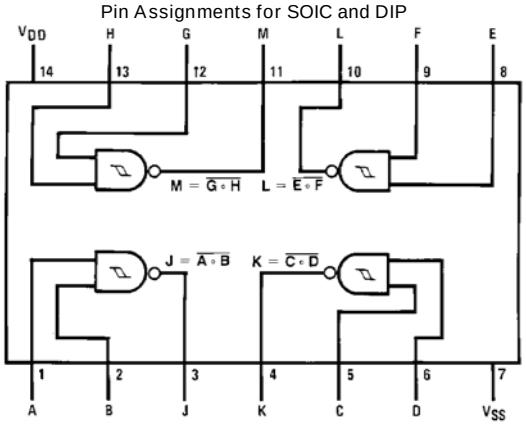
U Level change

X e Don't care case

(No change)

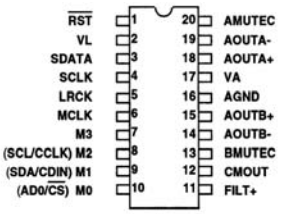
CD4015BC Static Shift Register

Pin Assignments for SOIC and DIP

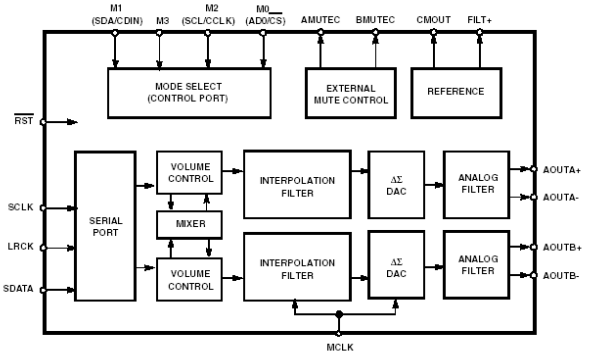


Top View

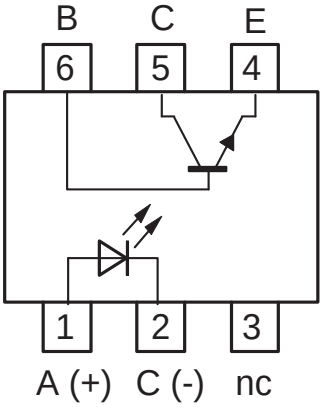
CD4093BC Quad Nand Gate



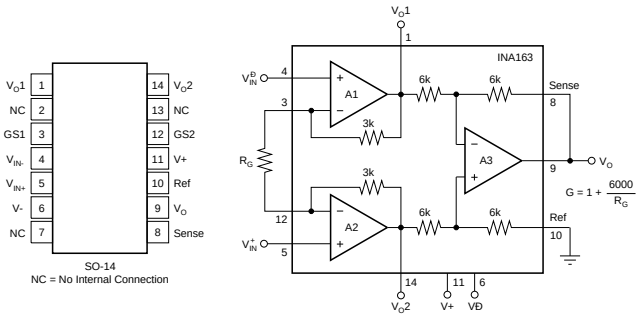
$\overline{RST}$	1	**Reset** (*Input*) - Powers down device and resets all internal registers to their default settings.
VL	2	**Logic Power** (*Input*) - Positive power for the digital input/output.
SDATA	3	**Serial Audio Data** (*Input*) - Input for two's complement serial audio data.
SCLK	4	**Serial Clock** (*Input/Output*) - Serial clock for the serial audio interface.
LRCK	5	**Left Right Clock** (*Input/Output*) - Determines which channel, Left or Right, is currently active on the serial audio data line.
MCLK	6	**Master Clock** (*Input*) - Clock source for the delta-sigma modulator and digital filters.
FILT+	11	**Positive Voltage Reference** (*Output*) - Positive reference voltage for the internal sampling circuits.
CMOUT	12	**Common Mode Voltage** (*Output*) - Filter connection for internal quiescent voltage.
AMUTEC BMUTEC	20 13	**Mute Control** (*Output*) - The Mute Control pin goes high during power-up initialization, reset, muting, power-down or if the master clock to left/right clock frequency ratio is incorrect.
AOUTB- AOUTB+ AOUTA+ AOUTA	14 15 18 19	**Differential Analog Output** (*Outputs*) - The full scale differential analog output level is specified in the Analog Characteristics specification table.
AGND	16	**Ground** (*Input*)
VA	17	**Analog Power** (*Input*) - Positive power for the analog section.
Control Port Mode Definitions		
M3	7	**Mode Selection** (*Input*) - This pins should be tied to GND level during control port mode.
SCL/CCLK	8	**Serial Control Port Clock** (*Input*) - Serial clock for the serial control port.
SDA/CDIN	9	**Serial Control Data** (*Input/Output*) - SDA is a data I/O line in I^2C mode. CDIN is the input data line for the control port interface in SPI mode.
AD0/$\overline{CS}$	10	**Address Bit 0 (I^2C) / Control Port Chip Select (SPI)** (*Input/Output*) - AD0 is a chip address pin in I^2C mode; $\overline{CS}$ is the chip select signal for SPI format.
Stand-Alone Mode Definitions		
M3 M2 M1 M0	7 8 9 10	**Mode Selection** (*Input*) - Determines the operational mode of the device.
DSD_A DSD_B	3 4	**DSD Data** (*Input*) - Input for Direct Stream Digital serial audio data.
DSD_Mode	5	**DSD Mode** *(Input)* - In stand alone mode, this pin must be set to a logic '1' for operation of DSD Mode.
DSD_SCLK	7	**DSD Serial Clock** (*Input/Output*) - Serial clock for the Direct Stream Digital audio interface.



CS4392-KZ Digital to Analog Converter (DAC)

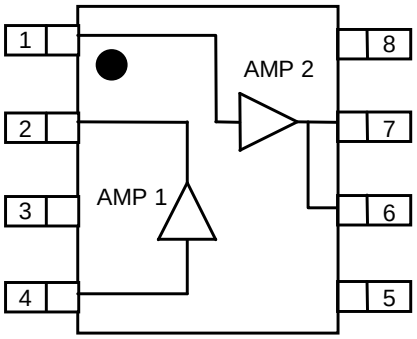


CNY17G-2 Optocoupler

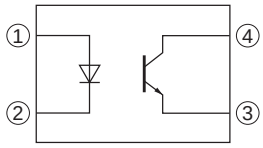


INA163 Low Noise Op-Amp

IC Diagrams

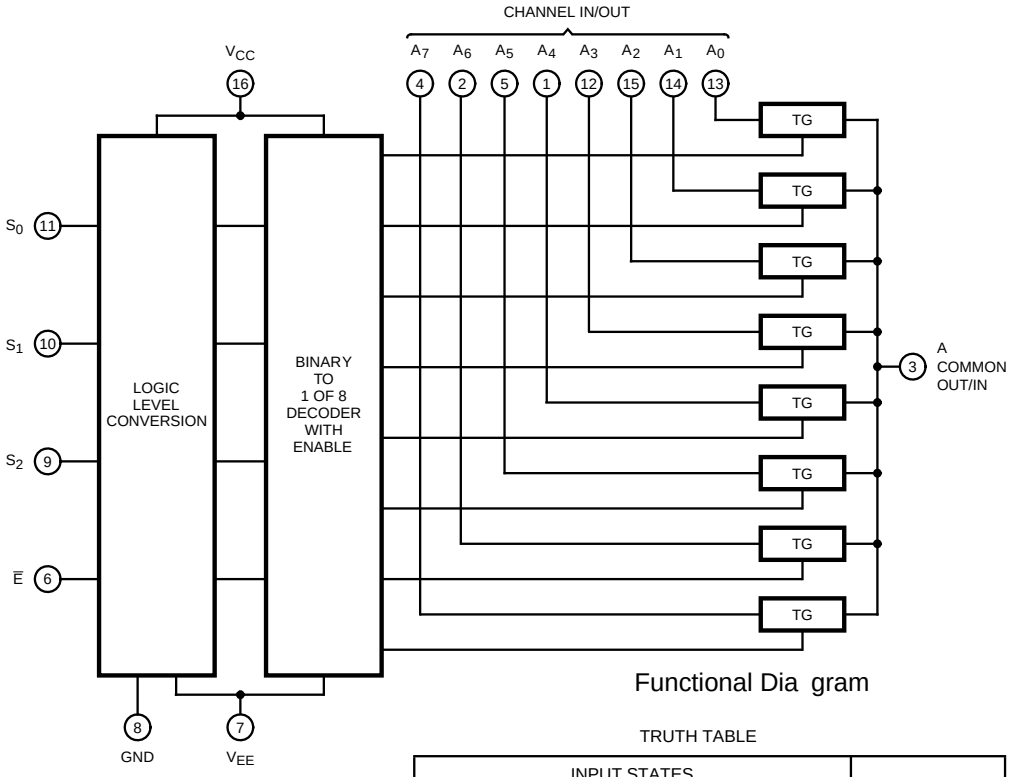


NJM78L05 Op-Amp



① Anode
② Cathode
③ Emitter
④ Collector

PC817A Photocoupler

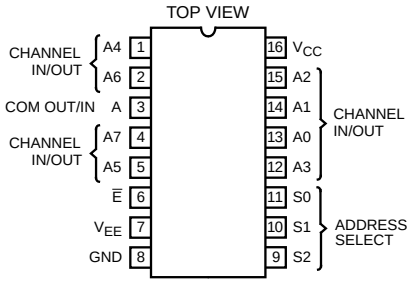


Functional Dia gram

TRUTH TABLE

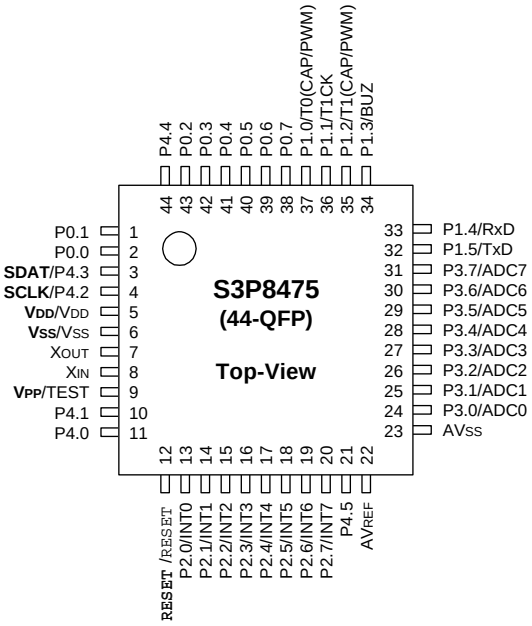
INPUT STATES				ÒONÓ CHANNELS
ENABLE	S_2	S_1	S_0	
L	L	L	L	A0
L	L	L	H	A1
L	L	H	L	A2
L	L	H	H	A3
L	H	L	L	A4
L	H	L	H	A5
L	H	H	L	A6
L	H	H	H	A7
H	X	X	X	None

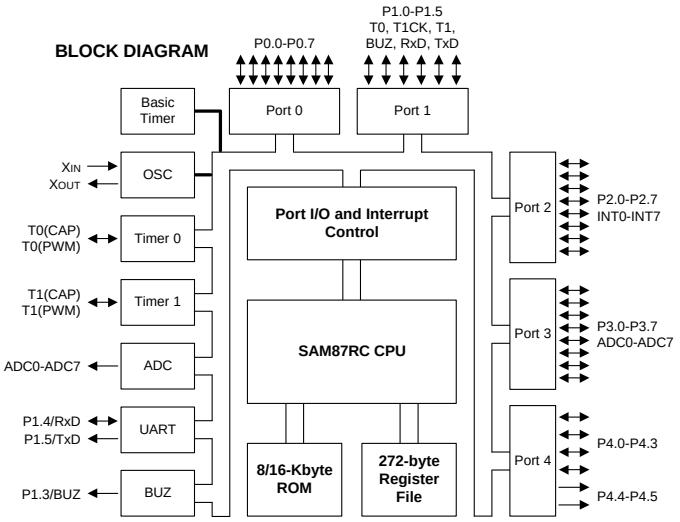
X = Don't Care



CD74HC4051 Analog Multiplexer

IC Diagrams

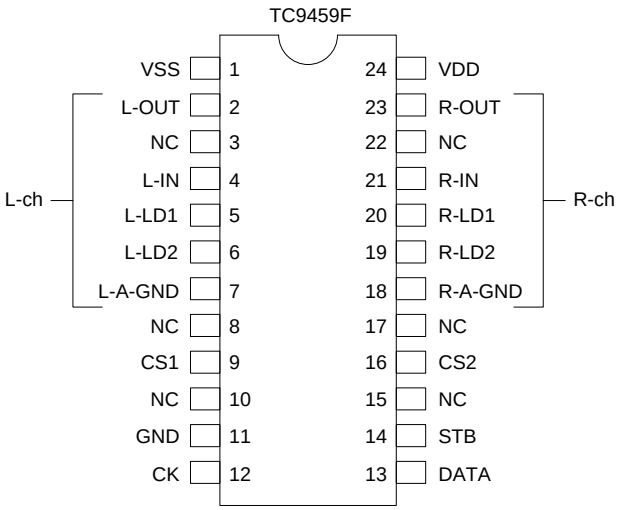


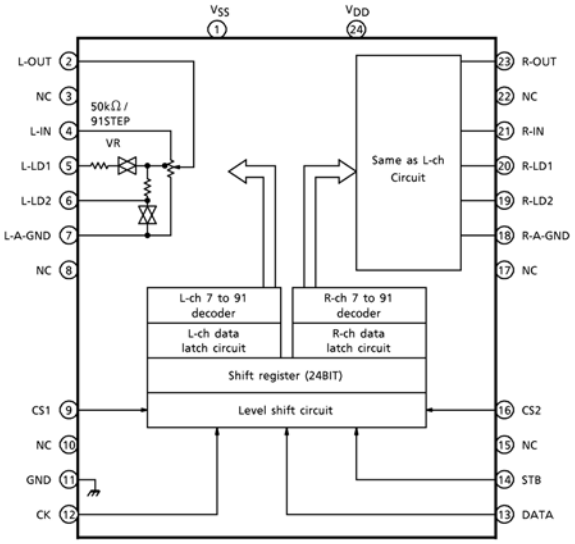


NOTE: The bolds indicate an OTP pin name.

Pin Name	Pin Type	Pin Description	Circuit Number	Pin Number	Share Pins
P0.0–P0.7	I/O	Nibble-programmable I/O port for Schmitt trigger input or push-pull, open-drain output. Pull-up resistors are assignable by software.	E	2-1, 43-38	–
P1.0–P1.5	I/O	Bit-programmable I/O port for Schmitt trigger input or push-pull output. Pull-up resistors are assignable by software. Port 1 pin can also by used as alternative function (T0, T1CK, T1, BUZ, RxD, TxD)	D	37-32	T0, T1CK, T1, BUZ, RxD, TxD
P2.0–P2.7	I/O	Bit-programmable I/O port for Schmitt trigger input or push-pull output. Pull-up resistors are assignable by software. Port 2 pins can also be used as external interrupt.	D	13-20	INT0-INT7
P3.0–P3.7	I/O	Bit-programmable I/O port for Schmitt trigger input or push-pull output. Pull-up resistors are assignable by software. Port 3 pins can also be used as A/D converter by software.	F	24-31	ADC0-ADC7
P4.0–P4.3	I/O	Bit-programmable I/O port for Schmitt trigger input or push-pull, open-drain output. Pull-up resistors are assingable by software.	E	11-10, 4-3	–
P4.4–P4.5	O	Push-pull output only	C	44, 21	–
X_{IN}, X_{OUT}	–	Crystal or ceramic oscillator signal for system clock.	–	8, 7	–
RESET	I	System reset signal input pin.	B	12	–
TEST	I	Test signal input pin (for factory use only; muse be connected to V_{SS})	–	9	–
AV_{REF}, AV_{SS}	–	A/D converter reference voltage input and ground	–	22, 23	–
V_{DD}, V_{SS}	–	Voltage input pin and ground	–	5, 6	–
T0	I/O	Timer 0 capture input or PWM output pin	D	37	P1.0
T1CK	I	Timer 1 external clock input pin	D	36	P1.1
T1	I/O	Timer 1 capture input or PWM output pin	D	35	P1.2
BUZ	O	200Hz-20kHz frequency output for buzzer sound	D	34	P1.3
RxD	I/O	UART receive and transmit input or output	D	33	P1.4
TxD	O	UART transmit output	D	32	P1.5
INT0-INT7	I	External interrupt input	E	13-20	P2.0-P2.7
ADC0-ADC7	I	A/D converter input	F	24-31	P3.0-P3.7

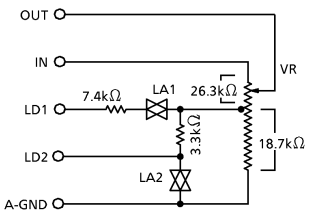
IC Diagrams



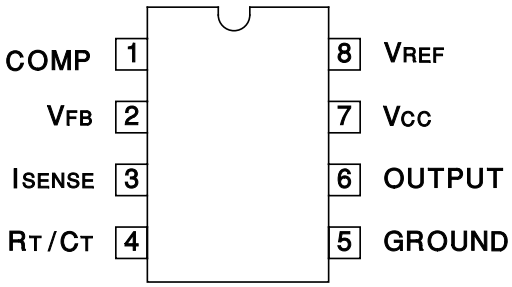


PIN DESCRIPTION

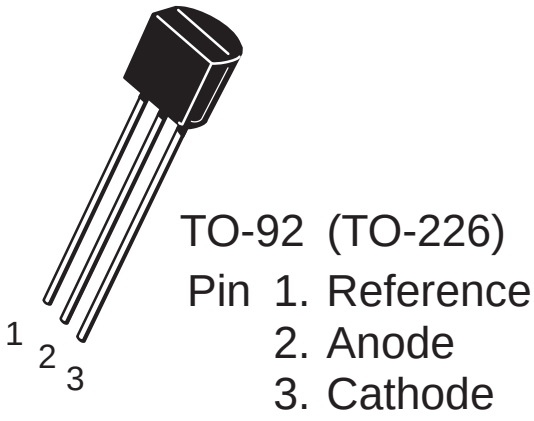
Numeral in ( ) means the pin No. of TC9459F.

PIN No.	SYMBOL	PIN NAME	FUNCTION	REMARK
1 (1)	V_{SS}	Negative power supply pin	When using dual power supplies: V_{DD} = 6.0~17V, GND = 0V, V_{SS} = −6.0~−17V When using a single power supply: V_{DD} = 6.0~18V, GND = V_{SS} = 0V	—
28 (24)	V_{DD}	Positive power supply pin		
13 (11)	GND	Digital GND pin		
3 (2)	L-OUT	Volume output pin	• Volume circuit  LA1: LOUDNESS "ON" = ON, LOUDNESS "OFF" = OFF LA2: LOUDNESS "ON" = OFF, LOUDNESS "OFF" = ON	—
26 (23)	R-OUT			
5 (4)	L-IN	Volume input pin		
24 (21)	R-IN			
6 (5)	L-LD1	Loudness tap output pin		
23 (20)	R-LD1			
7 (6)	L-LD2			
22 (19)	R-LD2			
8 (7)	L-A-GND	Analog GND pin		
21 (18)	R-A-GND			
10 (9)	CS1	Chip select input pin	Up to 4 chips on the same bus can be used by switching over chip select code.	—
19 (16)	CS2			
14 (12)	CK	Clock input pin	Data transfer clock input	Low threshold value input pin
15 (13)	DATA	Data input pin	Volume setup serial data input	
16 (14)	STB	Strobe input pin	Data write strobe input	
2 (3)	NC	No connection	—	—
27 (22)				
4				
25				
9 (8)				
20 (17)				
11				
18				
12 (10)				
17 (15)				

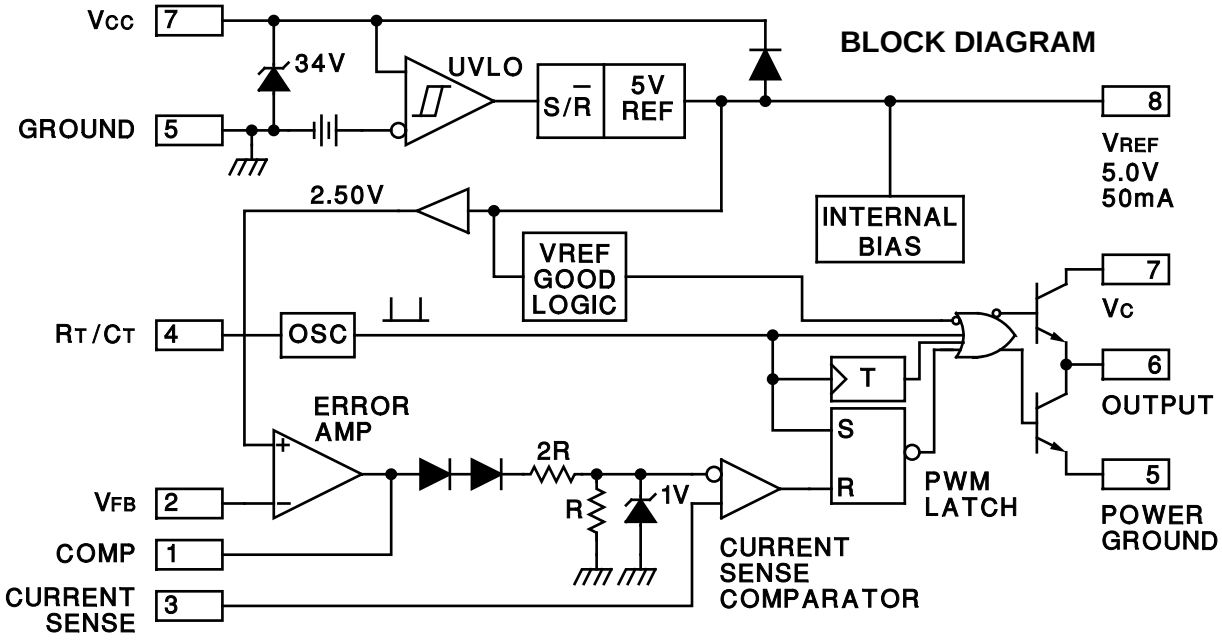
IC Diagrams



UC2842 PWM Controller Pinout Diagram



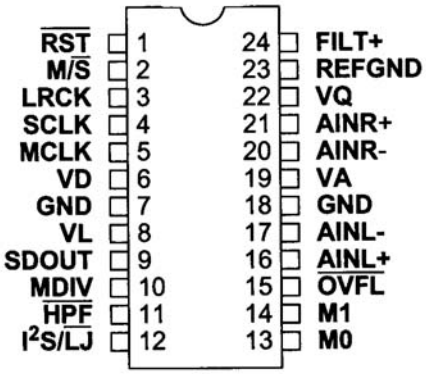
TL431CLP (TO-92)

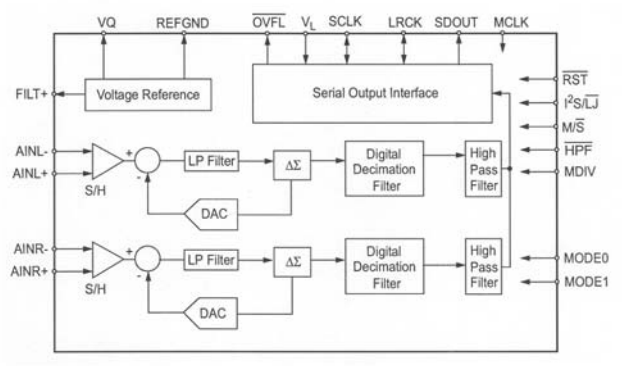


Note 1: Toggle flip flop used only in 1844 and 1845.

UC2842 PWM Controller Block Diagram

IC Diagrams

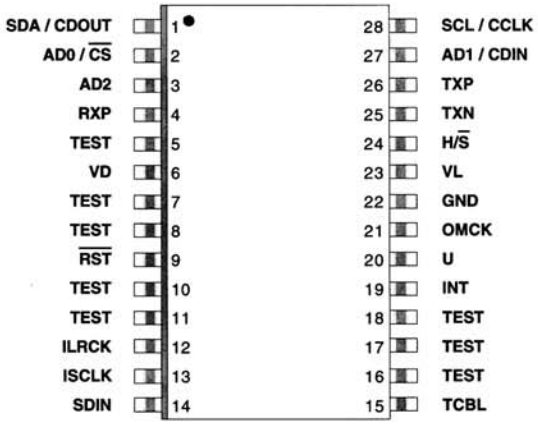


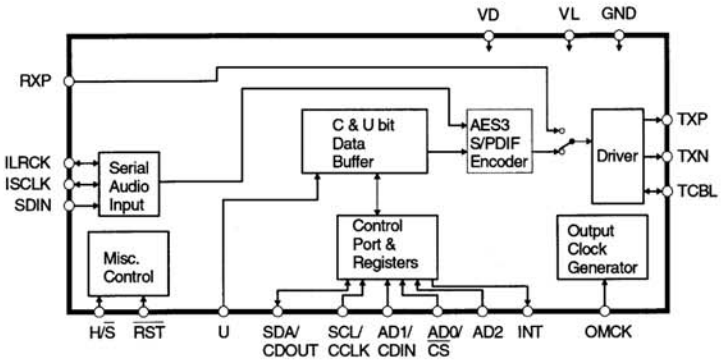


Pin Name	#	Pin Description
RST	1	**Reset** (*Input*) - The device enters a low power mode when low.
M/S	2	**Master/Slave Mode** *(Input)* - Selects operation as either clock master or slave.
LRCK	3	**Left Right Clock** (*Input/Output*) - Determines which channel, Left or Right, is currently active on the serial audio data line.
SCLK	4	**Serial Clock** (*Input/Output*) - Serial clock for the serial audio interface.
MCLK	5	**Master Clock** (*Input*) - Clock source for the delta-sigma modulator and digital filters.
VD	6	**Digital Power** (*Input*) - Positive power supply for the digital section.
GND	7,18	**Ground** (*Input*) - Ground reference. Must be connected to analog ground.
VL	8	**Logic Power** (*Input*) - Positive power for the digital input/output.
SDOUT	9	**Serial Audio Data Output** (*Output*) - Output for two's complement serial audio data.
MDIV	10	**MCLK Divider** *(Input)* - Enables a master clock divide by two function.
HPF	11	**High Pass Filter Enable** *(Input)* - Enables the Digital High-Pass Filter.
I2S/LJ	12	**Serial Audio Interface Format Select** (*Input*) -Selects either the left-justified or I2S format for the SAI.
M0 M1	13, 14	**Mode Selection** (*Input*) - Determines the operational mode of the device.
OVFL	15	**Overflow** *(Output, open drain)* - Detects an overflow condition on both left and right channels.
AINL+ AINL-	16, 17	**Differential Left Channel Analog Input** (*Input*) - Signals are presented differentially to the delta-sigma modulators via the AINL+/- pins.
VA	19	**Analog Power** (*Input*) - Positive power supply for the analog section.
AINR- AINR+	20, 21	**Differential Right Channel Analog Input** (*Input*) -Signals are presented differentially to the delta-sigma modulators via the AINR+/- pins.
VQ	22	**Quiescent Voltage** *(Output)* - Filter connection for the internal quiescent reference voltage.
REF_GND	23	**Reference Ground** (*Input*) - Ground reference for the internal sampling circuits.
FILT+	24	**Positive Voltage Reference** (*Output*) - Positive reference voltage for the internal sampling circuits.

CS5361 AD Converter Pinout and Table

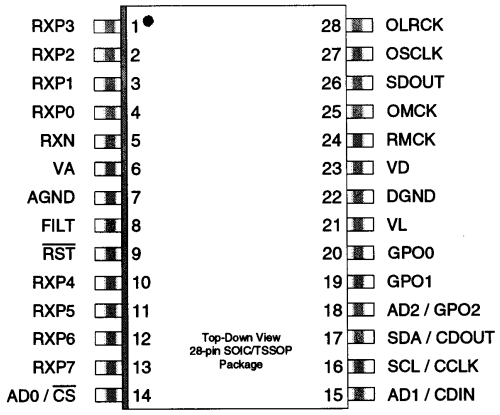
IC Diagrams

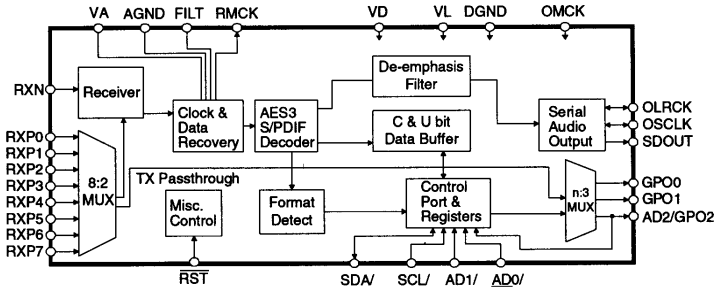




VD	6	**Digital Power** (*Input*) - Digital core power supply. Typically +3.3 V or +5.0 V.
VL	23	**Logic Power** (*Input*) - Input/Output power supply. Typically +3.3 V or +5.0 V.
GND	22	**Ground** (*Input*) - Ground for I/O and core logic.
$\overline{\text{RST}}$	9	**Reset** (*Input*) - When $\overline{\text{RST}}$ is low, the CS8406 enters a low power mode and all internal states are reset. On initial power up, $\overline{\text{RST}}$ must be held low until the power supply is stable, and all input clocks are stable in frequency and phase. This is particularly true in hardware mode with multiple CS8406 devices, where synchronization between devices is important.
H/$\overline{\text{S}}$	24	**Hardware/Software Control Mode Select** (*Input*) -Determines the method of controlling the operation of the CS8406, and the method of accessing CS and U data. In software mode, device control and CS and U data access is primarily through the control port, using a microcontroller. To select Software mode, this pin should be permanently tied to GND.
TXN **TXP**	25 26	**Differential Line Drivers** (*Output*) - These pins transmit biphase encoded data. The drivers are pulled low while the CS8406 is in the reset state.
OMCK	21	**Master Clock** (*Input*) - The frequency can be set through the control port registers.
ISCLK	13	**Serial Audio Bit Clock** (*Input/Output*) - Serial bit clock for audio data on the SDIN pin.
ILRCK	12	**Serial Audio Input Left/Right Clock** (*Input/Output*) - Word rate clock for the audio data on the SDIN pin.
SDIN	14	**Serial Audio Data Port** (*Input*) - Audio data serial input pin.
SDA/CDOUT	1	**Serial Control Data I/O (I²C Mode) / Data Out (SPI)** (*Input/Output*) - In I²C Mode, SDA is the control I/O data line. SDA is open drain and requires an external pull-up resistor to VL. In SPI mode, CDOUT is the output data from the control port interface on the CS8406
SCL/CCLK	28	**Control Port Clock** (*Input*) - Serial control interface clock and is used to clock control data bits into and out of the CS8406. In I²C mode, SCL requires an external pull-up resistor to VL.
AD0/$\overline{\text{CS}}$	2	**Address Bit 0 (I²C Mode) / Control Port Chip Select (SPI)** (*Input*) - A falling edge on this pin puts the CS8406 into SPI control port mode. With no falling edge, the CS8406 defaults to I²C mode. In I²C mode, AD0 is a chip address pin. In SPI mode, $\overline{\text{CS}}$ is used to enable the control port interface on the CS8406
AD1/CDIN	27	**Address Bit 1 (I²C Mode) / Serial Control Data In (SPI)** (*Input*) - In I²C mode, AD1 is a chip address pin. In SPI mode, CDIN is the input data line for the control port interface.
AD2	3	**Address Bit 2 (I²C Mode)** (*Input*) - Determines the AD2 address bit for the control port in I²C mode, and should be connected to GND or VL. If SPI mode is used, the AD2 pin should be connected to either GND or VL.
RXP	4	**Auxiliary AES3 Receiver Port** (*Input*) - Input for an alternate, already AES3 coded, audio data source.
INT	19	**Interrupt** (*Output*) - Indicates key events during the operation of the CS8406. All bits affecting INT may be unmasked through bits in the control registers. Indication of the condition(s) that initiated an interrupt are readable in the control registers. The polarity of the INT output, as well as selection of a standard or open drain output, is set through a control register. Once set true, the INT pin goes false only after the interrupt status registers have been read and the interrupt status bits have returned to zero.
TCBL	15	**Transmit Channel Status Block Start** (*Input/Output*) - When operated as output, TCBL is high during the first sub-frame of a transmitted channel status block, and low at all other times. When operated as input, driving TCBL high for at least three OMCK clocks will cause the next transmitted sub-frame to be the start of a channel status block.

IC Diagrams

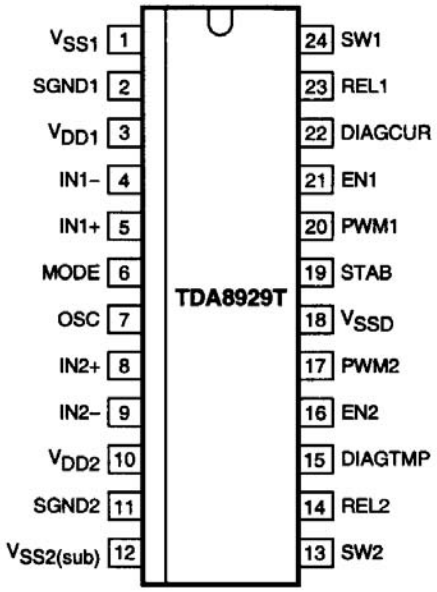




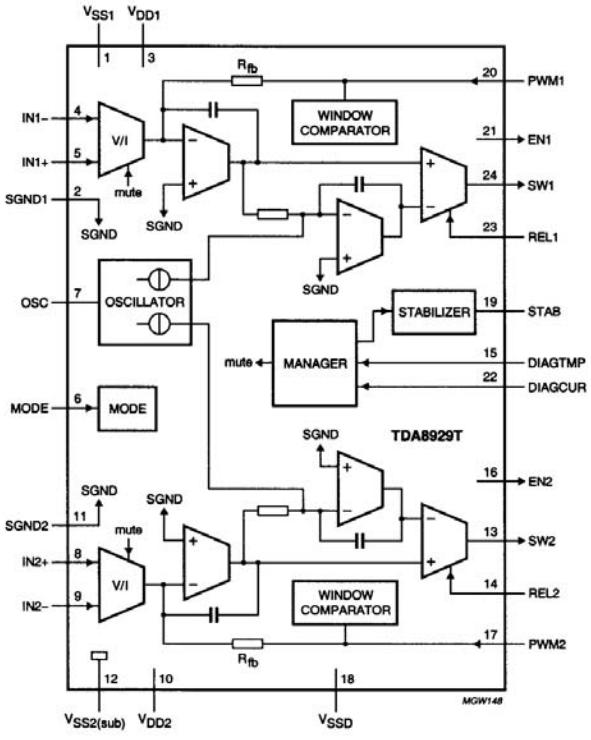
	SOIC / TSSOP	QFN	
VA	6	3	**Analog Power** (*Input*) - Analog power supply. Nominally +3.3 V. This supply should have as little noise as possible since noise on this pin will directly affect the jitter performance of the recovered clock
VD	23	20	**Digital Power** (*Input*) – Digital core power supply. Nominally +3.3 V
VL	21	18	**Logic Power** (*Input*) – Input/Output power supply. Nominally +3.3 V or +5.0 V
AGND	7	4	**Analog Ground** (*Input*) - Ground for the analog circuitry in the chip. AGND and DGND should be connected to a common ground area under the chip.
DGND	22	19	**Digital & I/O Ground** (*Input*) - Ground for the I/O and core logic. AGND and DGND should be connected to a common ground area under the chip.
RST	9	6	**Reset** (*Input*) - When RST is low, the CS8416 enters a low power mode and all internal states are reset. On initial power up, RST must be held low until the power supply is stable, and all input clocks are stable in frequency and phase.
FILT	8	5	**PLL Loop Filter** (*Output*) - An RC network should be connected between this pin and analog ground. For minimum PLL jitter, return the ground end of the filter network directly to AGND. See "Appendix C: PLL Filter" on page 55 for more information on the PLL and the external components.
RXP0	4	1	**Positive AES3/SPDIF Input** (*Input*) - Single-ended or differential receiver inputs carrying AES3 or S/PDIF encoded digital data. The RXP[7:0] inputs comprise the 8:2 S/PDIF Input Multiplexer. The select line control is accessed using the Control 4 register (04h). Unused multiplexer inputs should be left floating or tied to AGND. See "Appendix A: External AES3/SPDIF/IEC60958 Receiver Components" on page 51 for recommended input circuits.
RXP1	3	28	
RXP2	2	27	
RXP3	1	26	
RXP4	10	7	
RXP5	11	8	
RXP6	12	9	
RXP7	13	10	
RXN	5	2	**Negative AES3/SPDIF Input** (*Input*) - Single-ended or differential receiver input carrying AES3 or S/PDIF encoded digital data. Used along with RXP[7:0] to form an AES3 differential input. In single-ended operation this should be AC coupled to ground through a capacitor. See "Appendix A: External AES3/SPDIF/IEC60958 Receiver Components" on page 51 for recommended input circuits.
OMCK	25	22	**System Clock** (*Input*) - When the OMCK System Clock Mode is enabled using the SWCLK bit in the Control 1 register, the clock signal input on this pin is automatically output through RMCK on PLL unlock. OMCK serves as the reference signal for OMCK/RMCK ratio expressed in register 18h. See "OMCK System Clock Mode" on page 18.
RMCK	24	21	**Input Section Recovered Master Clock** (*Output*) - Input section recovered master clock output from the PLL. Frequency defaults to 256x the sample rate (F_s) and may be set to 128x through the RMCKF bit in the Control 1 register (01h). RMCK may also be set to high impedance by the RXD bit in the Control 4 register (04h).
OSCLK	27	24	**Serial Audio Output Bit Clock** (*Input/Output*) - Serial bit clock for audio data on the SDOUT pin
OLRCK	28	25	**Serial Audio Output Left/Right Clock** (*Input/Output*) - Word rate clock for the audio data on the SDOUT pin. Frequency will be the output sample rate (Fs)
SDOUT	26	23	**Serial Audio Output Data** (*Output*) - Audio data serial output pin. This pin must be pulled high to VL through a 47 kΩ resistor to place the part in Software Mode.
SDA / CDOUT	17	14	**Serial Control Data I/O (I²C) / Data Out (SPI)** (*Input/Output*) - In I²C mode, SDA is the control I/O data line. SDA is open drain and requires an external pull-up resistor to VL. In SPI mode, CDOUT is the output data from the control port interface on the CS8416. See section 6. Control Port Interface.
SCL / CCLK	16	13	**Control Port Clock** (*Input*) - Serial control interface clock and is used to clock control data bits into and out of the CS8416. CCLK is an open drain ouput and requires an external pull-up resistor to VL. See section 6. Control Port Interface.
AD0 / CS	14	11	**Address Bit 0 (I²C) / Control Port Chip Select (SPI)** (*Input*) - A falling edge on this pin puts the CS8416 into SPI control port mode. With no falling edge, the CS8416 defaults to I²C mode. In I²C mode, AD0 is a chip address pin. In SPI mode, CS is used to enable the control port interface on the CS8416. See "Control Port Description" on page 23.
AD1 / CDIN	15	12	**Address Bit 1 (I²C) / Serial Control Data In (SPI)** (*Input*) - In I²C mode, AD1 is a chip address pin. In SPI mode, CDIN is the input data line for the control port interface. See "Control Port Description" on page 23.
AD2 / GPO2	18	15	**General Purpose Output 2** *(Output)* - If using the I²C control port, this pin must be pulled high or low through a 47 kΩ resistor. See "Control Port Description" on page 23 and "General Purpose Outputs" on page 19 for GPO functions.
GPO1	19	16	**General Purpose Output 1** *(Output)* - See "General Purpose Outputs" on page 19 for GPO functions.
GPO0	20	17	**General Purpose Output 0** *(Output)* - See "General Purpose Outputs" on page 19 for GPO functions.

IC Diagrams

SYMBOL	PIN	DESCRIPTION
V_{SS1}	1	negative analog supply voltage channel 1
SGND1	2	signal ground channel 1
V_{DD1}	3	positive analog supply voltage channel 1
IN1–	4	negative audio input channel 1
IN1+	5	positive audio input channel 1
MODE	6	mode select input (standby/mute/operating)
OSC	7	oscillator frequency adjustment, or tracking input
IN2+	8	positive audio input channel 2
IN2–	9	negative audio input channel 2
V_{DD2}	10	positive analog supply voltage channel 2
SGND2	11	signal ground channel 2
$V_{SS2(sub)}$	12	negative analog supply voltage channel 2 (substrate)
SW2	13	digital switch output channel 2
REL2	14	digital control input channel 2
DIAGTMP	15	digital input for temperature limit error report from power stage
EN2	16	digital control output for enable channel 2 of power stage
PWM2	17	input for feedback from PWM output power stage channel 2
V_{SSD}	18	negative digital supply voltage; reference for digital interface to power stage
STAB	19	pin for a decoupling capacitor for internal stabilizer
PWM1	20	input for feedback from PWM output power stage channel 1
EN1	21	digital control output for enable channel 1 of power stage
DIAGCUR	22	digital input for current error report from power stage
REL1	23	digital control input channel 1
SW1	24	digital switch output channel 1

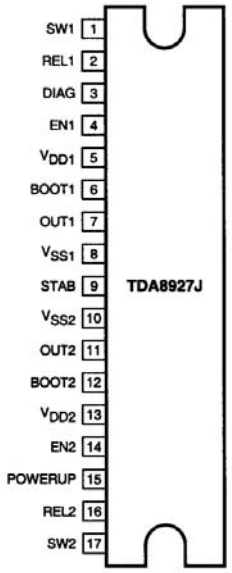


Pin configuration

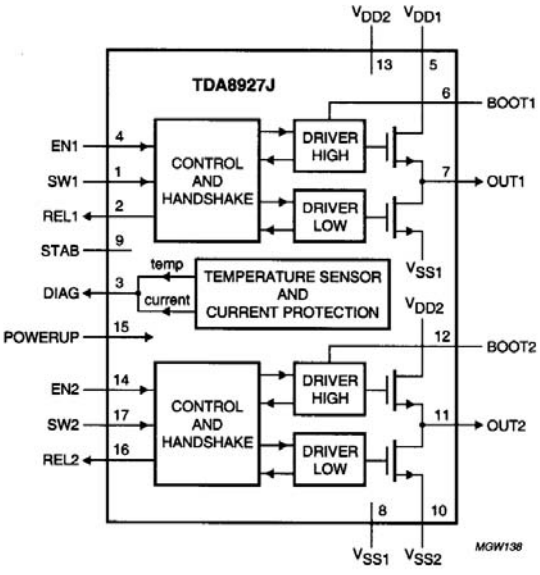


IC Diagrams

SYMBOL	PIN	DESCRIPTION
SW1	1	digital switch input; channel 1
REL1	2	digital control output; channel 1
DIAG	3	digital open-drain output for overtemperature and overcurrent report
EN1	4	digital enable input; channel 1
V_{DD1}	5	positive power supply; channel 1
BOOT1	6	bootstrap capacitor; channel 1
OUT1	7	PWM output; channel 1
V_{SS1}	8	negative power supply; channel 1
STAB	9	decoupling internal stabilizer for logic supply
V_{SS2}	10	negative power supply; channel 2
OUT2	11	PWM output; channel 2
BOOT2	12	bootstrap capacitor; channel 2
V_{DD2}	13	positive power supply; channel 2
EN2	14	digital enable input; channel 2
POWERUP	15	enable input for switching on internal reference sources
REL2	16	digital control output; channel 2
SW2	17	digital switch input; channel 2



Pin configuration



Service Manual Revision History

Date	Revision Level	Description of Change	Change Driven By	Pages Affected
4/07	00	Document released at revision 00.	Service manual release	All
12/07	01	Part number change, line array end cap #4.	Part number change	17
2/08	02	Added Japan version information.	New voltage version added	7, 11, 13, 14, 48-52, 112, 115, 118-127, 131-133, 139
5/09	03	Vendor part number changes for carton kit, carton, packing and fillers.	Vendor part number changes	7
4/10	04	1. Added page for the Line Array wiring diagram 2. D-Class Amplifier PCB Assembly, part number 312945 now used for all voltage variations DOM 0061 (3/2/10) and after. Had been used on 100V only previously.	1. New information 2. Part number change for system DOM 3/2/10 and after.	134 13, 131, 132

SPECIFICATIONS AND FEATURES SUBJECT TO CHANGE WITHOUT NOTICE

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