

T1 ToneMatch[®] Audio Engine


US/Canada, European, UK and Australian Versions



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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® T1 ToneMatch® Audio Engine contains no user-serviceable parts. To prevent warranty infractions, refer servicing to warranty service stations or factory service.

PROPRIETARY INFORMATION

THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF BOSE CORPORATION WHICH IS BEING FURNISHED ONLY FOR THE PURPOSE OF SERVICING THE IDENTIFIED BOSE PRODUCT BY AN AUTHORIZED BOSE SERVICE CENTER OR OWNER OF THE BOSE PRODUCT, AND SHALL NOT BE REPRODUCED OR USED FOR ANY OTHER PURPOSE.

Warranty

The Bose T1 ToneMatch Audio Engine is covered by a limited 2-year transferable warranty.

Specifications

Mechanical

Dimensions:	8.22" L x 6.52" W x 2.66" H 208.9 x 165.5 x 67.6mm
Weight (unpackaged):	2.14 lb (0.97 kg)

Electrical

A/D and D/A Conversion:	24 bit
Sampling Rate:	48 kHz
USB:	1:1 protocol, Type A to Type B cable
PC Requirements:	Microsoft Windows 2000, 2000 Pro, XP

Product Description

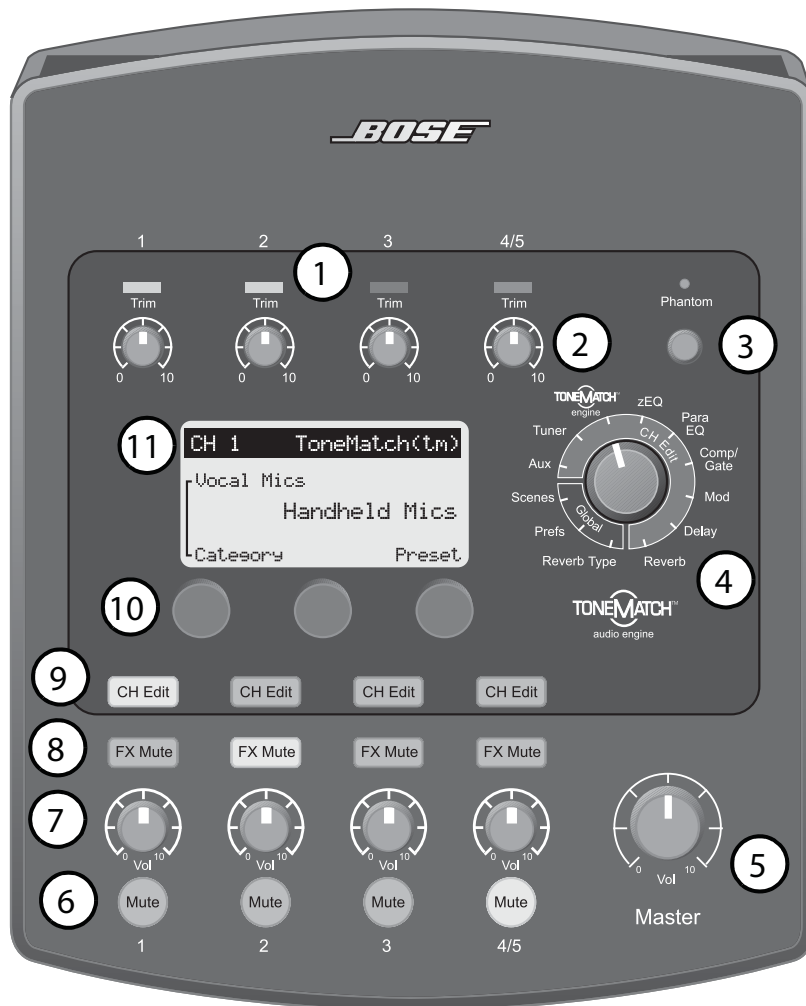
The Bose® T1 ToneMatch® audio engine provides the ultimate control for performing musicians. The T1 ToneMatch audio engine can be used with a Bose L1™ model II or model I system. When used with the Bose L1 model II or model I system, the T1 allows you to control the sound of your instrument as well as the output of the entire system. Using proprietary ToneMatch presets and associated zEQ tonal adjustments, the T1 enables you to preserve the natural sound of instruments or vocal microphones when amplified.

For convenient access, you can mount the T1 on a Cylindrical Radiator® loudspeaker or on a microphone stand using the optional microphone stand bracket. When used with the L1 model II system, the T1 operates on DC power received from the power stand. The optional T1 ToneMatch audio engine power supply is used to power the T1 when it is connected to an L1 model I system or a USB port on your computer.

Features and benefits

- Quick and easy-to-use interface
- One-cable connection to L1 model II loudspeaker ToneMatch port
- Mountable on a Cylindrical Radiator loudspeaker or a microphone stand
- High-quality, low-noise preamps in each channel, allowing the use of almost any instrument or microphone
- LED display and illuminated controls for playing on dimly-lit stages
- ToneMatch presets, a proprietary technology that optimizes system equalization to preserve the natural sound of specific instruments or microphones
- zEQ, working in conjunction with the ToneMatch technology, automatically adjusts the low, mid, and high frequency bands for the selected preset, allowing further tonal shaping
- Built-in chromatic tuner
- Performance scenes that can be saved and recalled
- Two flexible analog outputs
- System updates and ToneMatch presets available at www.Bose.com/musicians
- USB audio interface to your computer
- Compatible with L1 model I and model II systems

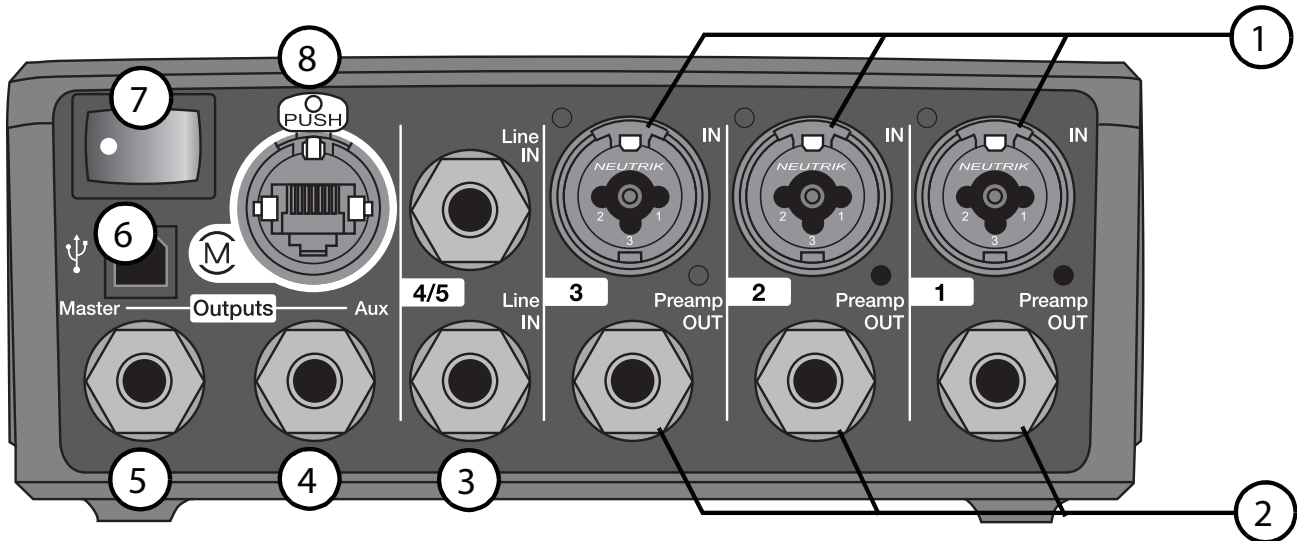
Front Panel Controls and Indicators



The control panel provides all the necessary controls and indicators for operation.

- 1. Input signal/clip LEDs (1-4/5)** – Displays the input signal status in color: Green indicates the presence of an input signal, yellow indicates a signal near clipping, and red indicates clipping.
- 2. Trim controls (1-4/5)** – Adjusts the input sensitivity for the respective channel.
- 3. Phantom power switch** – Applies +48V power to input channels 1-3. A red LED indicates that phantom power is on.
- 4. T1 rotary selector** – Allows access to both global and channel related parameters, which are adjusted using the editing controls.
- 5. MASTER volume control** – Adjusts the overall output level.
- 6. Mute buttons (1-4/5)** – Silences the audio output for the respective channel.
- 7. Volume controls (1-4/5)** – Adjusts the volume level for the respective channel.
- 8. FX mute buttons (1-4/5)** – Bypasses the Mod, Delay, and Reverb effects on the selected channel.
- 9. CH Edit buttons (1-4/5)** – Selects the channel you want to modify using the T1 rotary selector and display-related editing controls.
- 10. Editing controls** – These three rotary/push-button controls allow you to select or adjust items/values appearing on the display.
- 11. Display** – Provides function menus and system status information.

Rear Connection Panel



The rear panel provides all input/output connections.


- 1. IN** – Analog input channels 1-3. Accepts XLR balanced cables for microphones, or ¼” TRS balanced or TS unbalanced cables for high-impedance inputs such as guitars.
 - 2. Preamp OUT** – Preamp outputs for channels 1-3. Accepts ¼” TRS balanced or TS unbalanced cables.
 - 3. Line IN** – Analog input channels 4/5. Accepts ¼” TRS balanced or TS unbalanced cables for line-level inputs. Can be used for stereo input signals.
 - 4. Aux Output** – User-definable analog output. Can be configured for a pre-fader, post-EQ, and effects, or postfader output. Accepts ¼” TRS balanced or TS unbalanced cables.
 - 5. Master Output** – User-definable analog output. Can be configured for a pre- or post-Master volume analog output. Accepts ¼” TRS balanced or TS unbalanced cables.
 - 6. USB port** – A USB interface that allows you to connect the T1 to your computer. This feature enables you to stream audio to/from your computer, update the T1, and back up performance scenes.
 - 7. Power switch** – Turns the T1 audio engine on or off.
 - 8. ToneMatch™ port** – A digital output used by the L1™ model II system. Also delivers power to the T1 audio engine from the L1 model II power stand. Accepts the included ToneMatch cable.
- CAUTION:** Although the ToneMatch port accepts a standard RJ-45 connector, DO NOT connect the T1 to a computer or phone network. Damage to the T1 could result.

Electrostatic Discharge Sensitive (ESDS) Device Handling

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

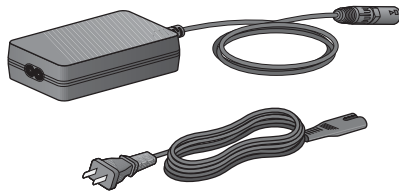
- Perform work at an electrically grounded work station.
- Wear wrist straps that connect to the station or heel straps that connect to conductive floor mats.
- Avoid touching the leads or contacts of ESDS devices or PC boards even if properly grounded. Handle boards by the edges only.
- Transport or 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.

Part List Notes

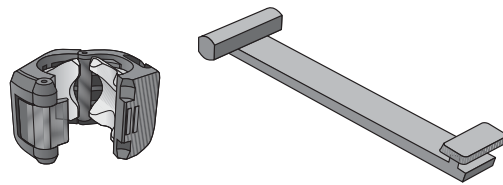
1. This part is not normally available from Customer Service. Approval from the Field Service Manager is required before ordering.
2. The individual parts located on the PCBs are listed in the Electrical Part List.
3.  This part is critical for safety purposes. Failure to use a substitute replacement 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.

Accessories

Description	Bose® Part Number	Vendor Part Number
T1 ToneMatch™ Power Supply	042533	-
Ethercon Cable Assy	042536	svc-sien11+cable
Carry Bag Accessory	042534	svc-sien11+bag
Microphone Stand Bracket	042535	-



T1 ToneMatch audio engine power supply



ToneMatch audio engine microphone stand bracket

Packaging Part List

T1 ToneMatch® Audio Engine (see Figure 1)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty.	Note
-	CARTON KIT, CONSISTS OF ITEMS 7, 8 AND 15 BELOW	312215	-	1	
1	CD ROM		-	1	
2	OWNER'S MANUAL	303150	4301-7273+0	1	
3	QUICKSTART GUIDE	303149	4301-7299+0	1	
4	POLYBAG	-	1497-4122+0	2	4
5	T1 TONEMATCH AUDIO ENG	REF	-	1	
6	NYLON CARRY BAG	042534	SVC-SIEN11+BAG	1	
7	UPPER PACKING TRAY	307723	SVC-SIEN11+TRAYU	1	
8	LOWER PACKING TRAY	307724	SVC-SIEN11+TRAYL	1	
9	RJ-45 ETHERCON CABLE	042536	SVC-SIEN11+CABLE	1	
10	L2 CARRIAGE	298750	4155-2721+0	1	
11	RETENTION SCREW	298751	4155-2731+0	1	
12	POLYBAG	-	1497-2812+0	1	4
13	L2 MOUNTING ARM	298749	4135-7071+0	1	
14	POLYBAG	-	1497-7222+0	1	4
15	GIFT BOX (CARTON)	298754	1481-0701+1	1	

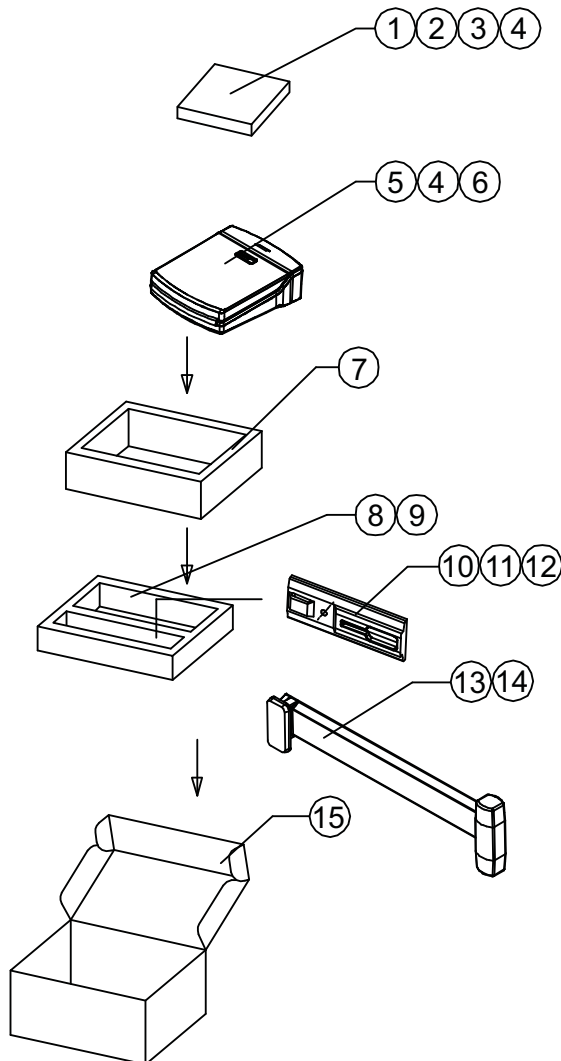


Figure 1. T1 ToneMatch Audio Engine Packaging View

Main Part List

T1 ToneMatch® Audio Engine (see Figure 2)

Item Number	Description	Bose® Part Number	Vendor Part Number	Qty.	Note
1	PANEL, REAR, I/O	298733	1406-3101+0	1	
2	HOUSING, TOP	298730	1468-0401+1	1	
3	HOUSING, BOTTOM	298731	1468-0501+1	1	
-	LID ASSY, CONSISTS OF ITEMS 4, 14, 24, 25, 26 AND 28 BELOW	305293	SVC-SIEN11+LID	1	
4	LID, PC+TPE	298746	1468-0701+1	1	
5	LCD PCB ASSY	305296	SVC-SIEN11+LCDB	1	
6	BOSE LOGO, ALUM	298742	2150-7221+0	1	
7	KNOB, CHANNEL VOLUME	298737	2447-4401+1	4	
8	KNOB, ROTARY	298739	2447-4501+1	3	
9	BUTTON, PHANTOM PWR	298743	2447-4601+1	1	
10	KNOB, TRIM	298741	2447-4801+1	4	
11	KNOB, MASTER VOLUME KNOB, SELECTOR	298738	2447-4901+1	2	
12	SPRING, 4x10x0.35	-	2510-3971+0	2	4
13	WASHER, SPRING, M3x0.9x5.5	-	2607-3009+0553	6	4
14	WASHER, SPRING, M9x1x11, BZ	307727	2607-9010+1103	1	
15	SCREW, MACH, PAN, M3x10	-	2900-3010+3000	6	4
16	SCREW, FLAT-CS, M3x5, B	-	2901-3005+3000	2	4
17	SCREW, MACH, FLAT-CS	-	2901-3006+3000	1	4
18	SCREW, M3x8, S29503008-3000	-	2920-3008+3000	8	4
19	B-TITE, 3x10, BLK, ZN	-	2954-3010+3000	2	4
20	CONNECTOR PCB ASSEMBLY	305297	SVC-SIEN11+I/O	1	
21	MOUNTING BKT, REAR	298749	4135-7071+0	1	
22	BRACKET, LCD	-	4135-7081+0	1	4
23	NUT, PLASTIC, M10x4.8	-	4155-1031+0	6	4
24	RETAINER, BSPASIEN+05CS11	301567	4155-2631+0	1	
25	LATCH, LID	298748	4155-2641+1	1	
26	LID RELEASE	298747	4155-2651+0	1	
27	PANEL, TOP, FX, PMMA	298732	4155-2661+1	1	
28	MOUNT, SWING ARM	301568	4155-2671+0	1	
29	CARRIAGE, 50x100	298750	4155-2721+0	1	
30	SCREW, RETENTION, 30x12	298751	4155-2731+0	1	
31	SPACER, NYLON, 5x10	-	4155-2791+0	4	4
32	KEYPAD 1, FX MUTE, SILICON	298744	4157-1251+0	1	
33	KEYPAD 2, FX MUTE, SILICON	298745	4157-1261+0	1	
34	RUBBER FOOT, 9x18x2	331349-001S	4157-1271+0	4	4
35	SWITCH, ROCKER, 2PIT	-	5200-4910+0	1	4
36	CONN WIRE, 2P, P2.0, #28	-	7012-6919+0	1	4
37	WIRE-CONN, 4P, P2.5, #24	-	7012-9180+0	1	4
38	MODULE, LCD, HDG12864L-7	299212	8902-0020+0	1	
39	MAIN PCB ASSEMBLY	298756	SVC-SIEN11+MAIN	1	

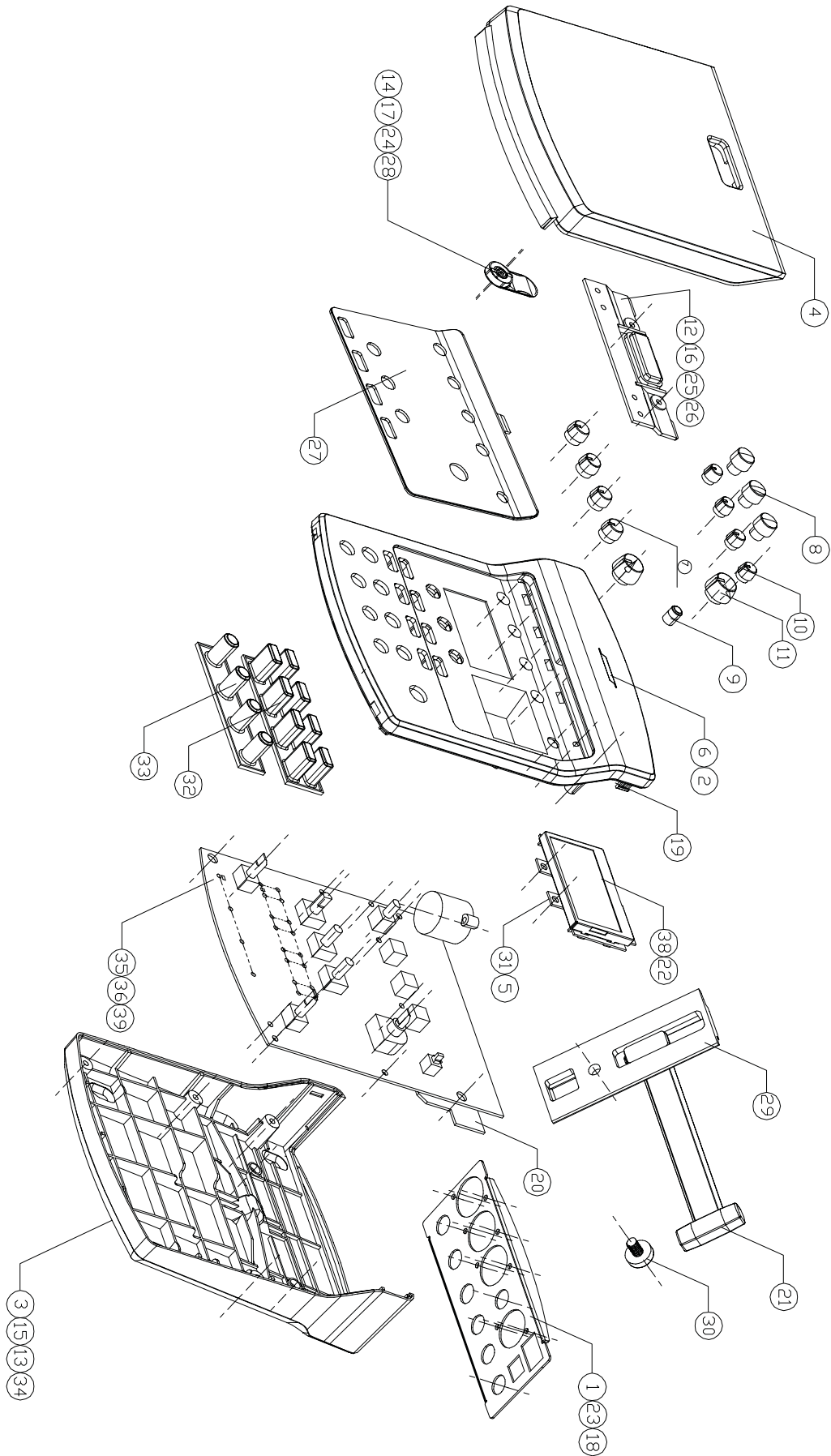


Figure 2. T1 ToneMatch® Audio Engine Exploded View

Electrical Part List

Input/Output PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R1	100K, RMG, 0603, 1/16W, 1%	4723-104A+P	4
R2	100K, RMG, 0603, 1/16W, 1%	4723-104A+P	4
R3	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R4	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R5	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R6	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R7	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R8	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R9	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R10	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R11	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R12	100 OHM, RMG, 0603, 1/16W, 1%	4723-101A+P	4
R13	100 OHM, RMG, 0603, 1/16W, 1%	4723-101A+P	4
R14	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R37	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R38	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R57	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R58	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R59	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R60	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R61	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R62	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R63	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R64	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R65	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R66	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R67	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R68	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R69	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R70	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R71	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R72	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R73	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R74	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R75	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R76	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R77	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R78	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R79	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R80	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R81	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R82	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R83	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R84	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R85	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R86	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4

Electrical Part List

Input/Output PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R128	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R139	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R223	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R224	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R225	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R226	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R227	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R228	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R229	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R230	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R231	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R232	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R233	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R234	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R235	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R236	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R237	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R239	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R240	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R243	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R244	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R246	100 OHM, RMG, 0603, 1/16W, 1%	4723-101J+P	4
R284	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R292	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C5	330pF, CC, 0603/1608, 50V, 10%, 1X2	150F-331K+P-AC	4
C6	330pF, CC, 0603/1608, 50V, 10%, 1X2	150F-331K+P-AC	4
C7	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C8	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C9	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C10	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C11	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C12	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C13	330pF, CC, 0603/1608, 50V, 10%, 1X2	150F-331K+P-AC	4
C14	330pF, CC, 0603/1608, 50V, 10%, 1X2	150F-331K+P-AC	4
C15	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C16	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C17	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C18	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C19	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C20	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C21	330pF, CC, 0603/1608, 50V, 10%, 1X2	150F-331K+P-AC	4
C22	330pF, CC, 0603/1608, 50V, 10%, 1X2	150F-331K+P-AC	4
C23	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4

Electrical Part List

Input/Output PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C25	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C26	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C27	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C28	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C29	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C30	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C31	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C32	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C33	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C42	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C43	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C44	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C45	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C46	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C47	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C48	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C76	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C77	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C78	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C86	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C87	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C88	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C89	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C90	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C91	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C92	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C93	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C94	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C95	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C105	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C111	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C119	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C182	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C184	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C186	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C187	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C193	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C194	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C198	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C199	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C202	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C205	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C206	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C207	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C237	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C238	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4

Electrical Part List

Input/Output PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C239	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C240	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C241	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C242	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C243	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C244	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C336	22uF, CE, 16V, 20%, SMD, 5X5.8	157D-226M+3-IKC	4
C337	22uF, CE, 16V, 20%, SMD, 5X5.8	157D-226M+3-IKC	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
D13	BAV99, SOT23, PHILIPS	4840-8970+3	4
D14	BAV99, SOT23, PHILIPS	4840-8970+3	4

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
U7	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U8	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U13	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U15	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U17	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U18	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
CN504B	HOUSING, 2X8P, P2.54, STRAIGHT, F	2101-3160+0	4
J1	JACK, SOCKET, NRJ6HF, STEREO	BOSE P/N: 307875	
J6	JACK, SOCKET, NRJ6HF, STEREO	BOSE P/N: 307875	
J7	JACK, SOCKET, NRJ6HF, STEREO	BOSE P/N: 307875	
J8	JACK, SOCKET, NRJ6HF, STEREO	BOSE P/N: 307875	
J10	JACK, SOCKET, NRJ6HF, STEREO	BOSE P/N: 307875	
J11	JACK, SOCKET, NRJ6HF, STEREO	BOSE P/N: 307875	

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors

Reference Designator	Description	Vendor Part Number	Note
R3	100K, RMG, 0603, 1/16W, 1%	4723-104A+P	4
R4	100K, RMG, 0603, 1/16W, 1%	4723-104A+P	4
R6	10M, RMG, 0603/1608, 1/16W, 5%	4723-106J+P	4
R7	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R8	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R9	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R10	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R11	100K, RMG, 0603, 1/16W, 1%	4723-104A+P	4
R13	2K, RMG, 0603/1608, 1/16W, 1%	4723-202A+P	4
R14	100 OHM, RMG, 0603, 1/16W, 1%	4723-101A+P	4
R15	100 OHM, RMG, 0603, 1/16W, 1%	4723-101A+P	4
R16	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R17	10 OHM, RMG, 0603/1608, 1/16W, 5%	4723-100J+P	4
R18	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R19	6.8K, RMG, 0603/1608, 1/16W, 1%	4723-682A+P	4
R20	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R21	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R22	22 OHM, RMG, 0805, 1/10W, 1%	4720-220A+J	4
R23	22 OHM, RMG, 0805, 1/10W, 1%	4720-220A+J	4
R24	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R25	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R26	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R27	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R28	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R29	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P-R	4
R31	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R32	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R33	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R34	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R35	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R36	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R37	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R38	3.3K, RMG, 0603, 1/16W, 5%	4723-332J+P-R	4
R39	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R40	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R41	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R42	1M, RMG, 0805, 1/10W, 1%	4720-105A+J	4
R43	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P-R	4
R44	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R45	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R46	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R47	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R48	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R49	10M, RMG, 0603/1608, 1/16W, 5%	4723-106J+P	4
R50	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R51	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R52	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R53	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R54	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R55	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R56	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R57	3.3K, RMG, 0603, 1/16W, 5%	4723-332J+P-R	4
R58	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P-R	4
R59	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P-R	4
R60	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R61	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R62	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R63	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R64	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R65	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R66	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R67	4.7K, RMG, 0603/1608, 1/16W, 1%	4723-472A+P	4
R68	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R69	4.42K, RMG, 0603, 1/16W, 1%	4723-4421+P	4
R70	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R71	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R72	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R78	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R79	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R81	0 OHM, RMG, 1206, 1/8W, 1%	4721-000A+6	4
R82	3.3 OHM, RMG, 1206, 1/8W, 5%	4721-3R3J+6	4
R83	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R84	6.8K, RMG, 0603, 1/16W, 5%	4723-682J+P-R	4
R85	6.8K, RMG, 0603, 1/16W, 5%	4723-682J+P-R	4
R86	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R87	10K, RMG, 1206, 1/8W, 1%	4721-103A+6	4
R88	10K, RMG, 1206, 1/8W, 1%	4721-103A+6	4
R90	10M, RMG, 0603/1608, 1/16W, 5%	4723-106J+P	4
R91	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R92	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R93	1 OHM, RMG, 1206, 1/8W, 5%	4721-010J+6	4
R94	1K, RMG, 0805, 1/10W, 1%	4720-102A+J	4
R96	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R97	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R99	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R101	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R103	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R104	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R105	22 OHM, RMG, 0805, 1/10W, 1%	4720-220A+J	4
R106	22 OHM, RMG, 0805, 1/10W, 1%	4720-220A+J	4
R107	22 OHM, RMG, 0805, 1/10W, 1%	4720-220A+J	4
R108	22 OHM, RMG, 0805, 1/10W, 1%	4720-220A+J	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R109	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R110	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P-R	4
R112	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R113	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P-R	4
R115	10K, RMG, 1206, 1/8W, 1%	4721-103A+6	4
R116	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R117	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R118	10K, RMG, 1206, 1/8W, 1%	4721-103A+6	4
R119	10K, RMG, 1206, 1/8W, 1%	4721-103A+6	4
R120	10K, RMG, 1206, 1/8W, 1%	4721-103A+6	4
R121	1M, RMG, 0805, 1/10W, 1%	4720-105A+J	4
R122	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R123	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P-R	4
R124	1M, RMG, 0805, 1/10W, 1%	4720-105A+J	4
R125	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R126	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P-R	4
R127	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R128	0 OHM, RMG, 1206, 1/8W, 1%	4721-000A+6	4
R129	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R130	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R131	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R132	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R133	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R134	1K, RMG, 0805, 1/10W, 1%	4720-102A+J	4
R135	1K, RMG, 0805, 1/10W, 1%	4720-102A+J	4
R136	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R137	2.2K, RMG, 0603/1608, 1/16W, 1%	4723-222A+P	4
R138	6.8K, RMG, 0603/1608, 1/16W, 1%	4723-682A+P	4
R140	6.8K, RMG, 0603/1608, 1/16W, 1%	4723-682A+P	4
R141	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R142	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R143	2.2K, RMG, 0603/1608, 1/16W, 1%	4723-222A+P	4
R144	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R145	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R146	75 OHM, RMG, 0603/1608, 1/16W, 5%	4723-750J+P	4
R147	2.2K, RMG, 0603/1608, 1/16W, 1%	4723-222A+P	4
R148	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4
R149	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R150	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R151	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R152	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R153	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R154	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R155	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R156	12K, RMG, 0603, 1/16W, 1%	4723-123A+P	4
R157	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R158	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4
R162	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R163	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R164	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R167	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R168	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R170	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R171	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R172	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R173	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R174	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R175	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R176	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R177	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R178	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R179	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R180	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R181	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R182	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R183	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R184	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R185	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R186	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R187	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R188	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R189	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R190	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R191	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R192	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R193	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R194	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R195	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R196	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R197	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R198	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R199	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R200	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R201	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R202	91 OHM, RMG, 0603, 1/16W, 1%	4723-910A+P	4
R203	91 OHM, RMG, 0603, 1/16W, 1%	4723-910A+P	4
R204	91 OHM, RMG, 0603, 1/16W, 1%	4723-910A+P	4
R205	91 OHM, RMG, 0603, 1/16W, 1%	4723-910A+P	4
R206	91 OHM, RMG, 0603, 1/16W, 1%	4723-910A+P	4
R207	91 OHM, RMG, 0603, 1/16W, 1%	4723-910A+P	4
R208	91 OHM, RMG, 0603, 1/16W, 1%	4723-910A+P	4
R209	91 OHM, RMG, 0603, 1/16W, 1%	4723-910A+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R210	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R211	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R212	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R213	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R214	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R215	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R216	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R217	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R218	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R219	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R220	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R221	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R222	634 OHM, 0603, RMG, 1/16W, 1%	4723-6340+P	4
R238	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R241	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R242	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R245	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R247	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R248	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R249	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R250	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R251	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R252	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R253	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R254	0 OHM, RMG, 1206, 1/8W, 1%	4721-000A+6	4
R255	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R256	30.9K, RMG, 0603/1608, 1/16W, 1%	4723-3092+P	4
R257	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R258	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R259	9.1K, RMG, 0603/1608, 1/16W, 1%	4723-912A+P	4
R260	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R261	0 OHM, RMG, 1206, 1/8W, 1%	4721-000A+6	4
R262	1.2K, RMG, 0603, 1/16W, 1%	4723-122A+P	4
R263	470 OHM, RMG, 0603/1608, 1/16W, 1%	4723-471A+P	4
R264	14K, RMG, 0603/1608, 1/16W, 1%	4723-143A+P	4
R265	75 OHM, RMG, 0603/1608, 1/16W, 5%	4723-750J+P	4
R266	75 OHM, RMG, 0603/1608, 1/16W, 5%	4723-750J+P	4
R267	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R268	1.5K, RMG, 0603/1608, 1/16W, 1%	4723-152A+P	4
R269	1.5K, RMG, 0603/1608, 1/16W, 1%	4723-152A+P	4
R270	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R271	715 OHM, RMG, 0603, 1/16W, 1%	4723-7150+P	4
R272	715 OHM, RMG, 0603, 1/16W, 1%	4723-7150+P	4
R273	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R274	1.33K, RMG, 0603, 1/16W, 1%	4723-1331+P	4
R275	1.33K, RMG, 0603, 1/16W, 1%	4723-1331+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R276	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R277	4.42K, RMG, 0603, 1/16W, 1%	4723-4421+P	4
R278	4.42K, RMG, 0603, 1/16W, 1%	4723-4421+P	4
R279	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R280	2.32K, RMG, 0603, 1/16W, 1%	4723-2321+P	4
R281	2.32K, RMG, 0603, 1/16W, 1%	4723-2321+P	4
R282	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R283	240 OHM, RMG, 0603/1608, 1/16W, 5%	4723-241J+P	4
R287	6.8K, RMG, 0603/1608, 1/16W, 1%	4723-682A+P	4
R288	75 OHM, RMG, 0603/1608, 1/16W, 5%	4723-750J+P	4
R289	6.8K, RMG, 0603/1608, 1/16W, 1%	4723-682A+P	4
R290	75 OHM, RMG, 0603/1608, 1/16W, 5%	4723-750J+P	4
R291	47K, RMG, 0603/1608, 1/16W, 5%	4723-473J+P	4
R293	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R294	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R295	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R296	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R297	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R298	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R299	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R300	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R301	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R302	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R303	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R304	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R305	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R306	100K, RMG, 0603/1608, 1/16W, 5%	4723-104J+P	4
R307	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R308	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R309	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R310	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R311	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R312	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R313	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R314	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R315	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R316	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R317	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R318	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R319	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R320	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R321	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R322	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R323	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R324	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R325	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R326	1.5K, RMG, 1206, 1/8W, 5%	4721-152J+6	4
R327	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R328	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R329	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R330	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R331	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R332	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R333	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R334	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R335	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R336	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R337	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R338	30K, RMG, 0603/1608, 1/16W, 5%	4723-303J+P	4
R339	560K, RMG, 0603/1608, 1/16W, 1%	4723-564A+P	4
R340	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R341	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R342	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R343	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
R344	4.42K, RMG, 0603, 1/16W, 1%	4723-4421+P	4
R345	10 OHM, 0805, RMG, 1/10W, 5%	4720-100J+J	4
R346	10 OHM, RMG, 1206, 1/4W, 5%	4725-100J+6	4
R347	16K, RMG, 0603/1608, 1/16W, 1%	4723-163A+P	4
R348	499 OHM, RMG, 0805, 1/10W, 1%	4720-4990+J	4
R349	499 OHM, RMG, 0805, 1/10W, 1%	4720-4990+J	4
R350	499 OHM, RMG, 0805, 1/10W, 1%	4720-4990+J	4
R351	1.8K, RMG, 0603/1608, 1/16W, 1%	4723-182A+P	4
R352	27K, RMG, 0603/1608, 1/16W, 1%	4723-273A+P	4
R353	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R354	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R355	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R356	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R357	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R358	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R359	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R360	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R361	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R362	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R363	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R364	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R365	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R366	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R367	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R368	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R369	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R370	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R371	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R372	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R373	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R374	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R375	4.99K, RMG, 0603, 1/16W, 1%	4723-4991+P	4
R376	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R377	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R378	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R379	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R380	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R381	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R382	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R383	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R384	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R385	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R386	6.8K, RMG, 0603/1608, 1/16W, 1%	4723-682A+P	4
R387	150 OHM, RMG, 0603, 1/16W, 1%	4723-151A+P	4
R388	150 OHM, RMG, 0603, 1/16W, 1%	4723-151A+P	4
R389	150 OHM, RMG, 0603, 1/16W, 1%	4723-151A+P	4
R390	150 OHM, RMG, 0603, 1/16W, 1%	4723-151A+P	4
R391	150 OHM, RMG, 0603, 1/16W, 1%	4723-151A+P	4
R392	150 OHM, RMG, 0603, 1/16W, 1%	4723-151A+P	4
R393	270 OHM, RMG, 0603/1608, 1/16W, 1%	4723-271A+P	4
R394	270 OHM, RMG, 0603/1608, 1/16W, 1%	4723-271A+P	4
R395	270 OHM, RMG, 0603/1608, 1/16W, 1%	4723-271A+P	4
R396	270 OHM, RMG, 0603/1608, 1/16W, 1%	4723-271A+P	4
R397	270 OHM, RMG, 0603/1608, 1/16W, 1%	4723-271A+P	4
R398	270 OHM, RMG, 0603/1608, 1/16W, 1%	4723-271A+P	4
R399	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R400	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R401	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R402	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R403	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R404	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R405	1.5K, RMG, 0603/1608, 1/16W, 1%	4723-152J+P	4
R406	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R407	9.1K, RMG, 0603/1608, 1/16W, 1%	4723-912A+P	4
R408	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R410	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R411	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R412	1K, RMG, 0603/1608, 1/16W, 1%	4723-102A+P	4
R413	11K, RMG, 0603/1608, 1/16W, 1%	4723-113A+P	4
R414	0 OHM, RMG, 1206, 1/8W, 1%	4721-000A+6	4
R415	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4
R416	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4
R417	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4
R418	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R419	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4
R420	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4
R421	10 OHM, RMG, 1206, 1/4W, 5%	4725-100J+6	4
R501	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R502	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R503	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R504	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R505	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R508	470 OHM, RMG, 0805, 1/10W, 1%	4720-471A+J	4
R509	470 OHM, RMG, 0805, 1/10W, 1%	4720-471A+J	4
R510	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R511	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R512	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R513	RCFA, 10KX4, 0603, 1/16W, 5%	4703-103J+P-04	4
R515	RCFA, 10KX4, 0603, 1/16W, 5%	4703-103J+P-04	4
R516	1K, RMG, 0805, 1/10W, 1%	4720-102A+J	4
R518	10K, RMG, 0603/1608, 1/16W, 1%	4723-103A+P	4
R519	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R520	470 OHM, RMG, 0603/1608, 1/16W, 1%	4723-471J+P	4
R521	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R522	4.7K, RMG, 0603/1608, 1/16W, 5%	4723-472J+P	4
R523	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R524	1M, RMG, 0603, 1/16W, 1%	4723-105A+P	4
R525	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R526	330 OHM, RMG, 0603/1608, 1/16W, 5%	4723-331J+P	4
R527	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R528	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R529	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R532	3.09K, RMG, 0603, 1/16W, 1%	4723-3091+P	4
R533	1.5K, RMG, 0603/1608, 1/16W, 1%	4723-152A+P	4
R534	22 OHM, RMG, 0603/1608, 1/16W, 5%	4723-220J+P	4
R535	22 OHM, RMG, 0603/1608, 1/16W, 5%	4723-220J+P	4
R536	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R540	RCFA, 47KX4, 0603, 1/16W, 5%	4703-473J+P-04	4
R541	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R542	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R543	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R547	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R548	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R549	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R550	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R551	1K, RMG, 0603/1608, 1/16W, 5%	4723-102J+P	4
R552	1K, RMG, 0603/1608, 1/16W, 5%	4723-102J+P	4
R553	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R554	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R555	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Resistors (continued)

Reference Designator	Description	Vendor Part Number	Note
R556	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R557	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R558	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R559	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R560	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R561	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R562	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R563	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R564	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R565	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R566	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R567	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R568	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R569	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R570	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R571	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R572	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R573	1K, RMG, 0603, 1/16W, 5%	4723-102J+P-R	4
R574	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R575	1 OHM, RMG, 0603, 1/16W, 5%	4723-1R0J+P-R	4
R576	1 OHM, RMG, 0603, 1/16W, 5%	4723-1R0J+P-R	4
R599	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R600	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R601	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R602	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R603	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R604	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R605	100 OHM, RMG, 0603/1608, 1/16W, 5%	4723-101J+P	4
R607	10K, RMG, 0603/1608, 1/16W, 5%	4723-103J+P	4
R608	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R610	1K, RMG, 0805, 1/10W, 1%	4720-102A+J	4
R611	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
R612	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
R613	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R614	RCFA, 47RX4, 0603, 1/16W, 5%	4703-470J+P-04	4
R615	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R617	47 OHM, RMG, 0603/1608, 1/16W, 5%	4723-470J+P	4
R618	12K, RMG, 0603, 1/16W, 1%	4723-123A+P	4
R619	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R621	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R622	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R623	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R624	0 OHM, RMG, 0603, 1/16W, 5%	4723-000J+P	4
R625	3.3K, RMG, 0603/1608, 1/16W, 1%	4723-332A+P	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C1	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C2	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C3	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C4	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C5	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C6	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C7	18pF, CC, 0603, 50V, 5%, 0.8X1.6	150F-180J+P-AC	4
C8	18pF, CC, 0603, 50V, 5%, 0.8X1.6	150F-180J+P-AC	4
C9	18pF, CC, 0603, 50V, 5%, 0.8X1.6	150F-180J+P-AC	4
C10	18pF, CC, 0603, 50V, 5%, 0.8X1.6	150F-180J+P-AC	4
C11	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C12	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C13	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C14	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C15	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C16	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C17	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C18	33pF, CC, 0603/1608, 50V, 5%, 1X2	150F-330J+P-AC	4
C19	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C20	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C21	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C23	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C24	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C25	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C26	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C27	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C28	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C29	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C30	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C31	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C32	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C33	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C34	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C35	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C36	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C37	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C38	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C39	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C40	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C41	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C42	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C43	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C44	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C45	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C46	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C47	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C48	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C49	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C50	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C51	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C52	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C53	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C54	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C55	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C56	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C57	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C58	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C59	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C60	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C61	22uF, CE, 63V, 20%, RLT, 5X11	157I-226M+K-IUY	4
C62	22uF, CE, 63V, 20%, RLT, 5X11	157I-226M+K-IUY	4
C63	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C64	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C65	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C66	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C67	220uF, CE, 63V, 20%, RLT, P5.0, 10X20, LOW ESR	157I-227M+K-S9R	4
C68	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C69	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C70	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C72	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C73	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C74	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C76	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C77	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C79	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C80	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C81	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C82	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C83	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C84	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C85	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C86	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C87	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C88	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C89	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C90	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C91	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C92	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C93	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C95	330pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-331K+J-BD	4
C96	100uF, CT, 10V, 20%, SMD, 3.2X6.0	154C-107M+3-FK	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C100	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C102	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C104	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C106	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C109	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C110	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C112	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C113	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C115	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C116	22uF, CE, 63V, 20%, RLT, 5X11	157I-226M+K-IUY	4
C117	22uF, CE, 63V, 20%, RLT, 5X11	157I-226M+K-IUY	4
C118	22uF, CE, 63V, 20%, RLT, 5X11	157I-226M+K-IUY	4
C120	22uF, CE, 63V, 20%, RLT, 5X11	157I-226M+K-IUY	4
C121	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C122	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C123	220uF, CE, 63V, 20%, RLT, P5.0, 10X20, LOW ESR	157I-227M+K-S9R	4
C124	220uF, CE, 63V, 20%, RLT, P5.0, 10X20, LOW ESR	157I-227M+K-S9R	4
C125	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C126	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C127	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C129	0.1uF, CC, 0805, 50V, 10%, 1.2X2.0	150F-104K+J-BD	4
C131	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C132	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C133	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C134	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C137	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C138	10uF, CT, 16V, 20%, SMD, 1.6X3.2	154D-106M+3-CF	4
C139	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C140	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C141	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C142	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C143	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C144	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C145	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C146	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C147	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C148	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C149	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C150	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C151	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C152	100uF, CE, 35V, 105C, 20%, RLR, 6.3X11, LOW ESR	157Q-107M+K-LUTR	4
C153	0.001uF, CC, 1206, 100V, 5%	150H-102J+6-CF	4
C154	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C155	47uF, CE, 63V, 20%, RLT, P5.0, 8X11.5, LOW ESR	157I-476M+K-OVR	4
C156	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C157	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C158	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C159	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C160	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C161	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C162	10uF, CT, 16V, 20%, SMD, 1.6X3.2	154D-106M+3-CF	4
C163	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C164	220uF, CE, 6.3V, 20%, RLT, 5X11, SHOEI	157B-227M+K-IUI	4
C165	220uF, CE, 6.3V, 20%, RLT, 5X11, SHOEI	157B-227M+K-IUI	4
C166	220uF, CE, 6.3V, 20%, RLT, 5X11, SHOEI	157B-227M+K-IUI	4
C167	220uF, CE, 6.3V, 20%, RLT, 5X11, SHOEI	157B-227M+K-IUI	4
C168	220uF, CE, 6.3V, 20%, RLT, 5X11, SHOEI	157B-227M+K-IUI	4
C169	220uF, CE, 6.3V, 20%, RLT, 5X11, SHOEI	157B-227M+K-IUI	4
C170	470uF, CE, 25V, 20%, RLT, 10X12.5	157E-477M+K-SXE	4
C171	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C172	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C173	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C174	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C175	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C176	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C177	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C178	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C179	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C180	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C181	470uF, CE, 25V, 20%, RLT, 10X12.5	157E-477M+K-SXE	4
C183	470uF, CE, 25V, 20%, RLT, 10X12.5	157E-477M+K-SXE	4
C185	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C188	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C189	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C190	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C191	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C192	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C195	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C196	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C197	470pF, CC, 0603, 50V, 5%	150F-471J+P-AC	4
C200	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C201	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C203	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C204	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C208	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C209	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C210	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C211	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
C212	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C213	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C214	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C215	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C216	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C217	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C218	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C219	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C22	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C220	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C222	220uF, CE, 35V, 105C, 20%, RLT, 8X11.5, LOW ESR	157Q-227M+K-OVTR	4
C223	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C224	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C225	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C226	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C227	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C228	100uF, CE, 35V, 105C, 20%, RLR, 6.3X11, LOW ESR	157Q-107M+K-LUTR	4
C229	1800pF, CC, 0603, 50V, 5%, 0.8X1.6	150F-182J+P-AC	4
C230	220pF, CC, 0603, 50V, 5%	150F-221J+P-AC	4
C231	47pF, CC, 0603, 50V, 5%, 1x2	150F-470J+P-AC	4
C232	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C233	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C234	100uF, CE, 35V, 105C, 20%, RLR, 6.3X11, LOW ESR	157Q-107M+H-LUTR	4
C235	220uF, CE, 35V, 105C, 20%, RLT, 8X11.5, LOW ESR	157Q-227M+U-OVR	4
C245	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C247	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C248	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C253	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C261	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C262	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C263	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C264	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C265	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C269	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C272	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C273	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C289	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C290	470pF, CC, 0603/1608, 50V, 10%, 1X2	150F-471K+P-AC	4
C291	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C292	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C293	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C294	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C297	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C301	100uF, CT, 6.3V, 20%, SMD, 3.5X2.8MM	154B-107M+3-FE	4
C302	100uF, CT, 6.3V, 20%, SMD, 3.5X2.8MM	154B-107M+3-FE	4
C303	100uF, CT, 6.3V, 20%, SMD, 3.5X2.8MM	154B-107M+3-FE	4
C304	100uF, CT, 6.3V, 20%, SMD, 3.5X2.8MM	154B-107M+3-FE	4
C305	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C306	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C308	1uF, CT, 16V, 20%, SMD, 1.6X3.2	154D-105M+3-CF	4
C309	1uF, CT, 16V, 20%, SMD, 1.6X3.2	154D-105M+3-CF	4
C310	47uF, CT, 16V, 85C, 10%, SMD, 6.0X3.2	154D-476K+3-KF	4
C311	47uF, CT, 16V, 85C, 10%, SMD, 6.0X3.2	154D-476K+3-KF	4
C312	2700pF, CC, 0603/1608, 50V, 10%	150F-272K+P-AC	4
C313	2700pF, CC, 0603/1608, 50V, 10%	150F-272K+P-AC	4
C314	2700pF, CC, 0603/1608, 50V, 10%	150F-272K+P-AC	4
C315	2700pF, CC, 0603/1608, 50V, 10%	150F-272K+P-AC	4
C316	1uF, CC, 0805, 10V, 10%	150C-105K+J-BD	4
C317	1uF, CC, 0805, 10V, 10%	150C-105K+J-BD	4
C318	1uF, CC, 0805, 10V, 10%	150C-105K+J-BD	4
C319	1uF, CC, 0805, 10V, 10%	150C-105K+J-BD	4
C320	1uF, CC, 0805, 10V, 10%	150C-105K+J-BD	4
C321	1uF, CC, 0805, 10V, 10%	150C-105K+J-BD	4
C324	1800pF, CC, 0603, 50V, 5%, 0.8X1.6	150F-182J+P-AC	4
C325	2700pF, CC, 0603/1608, 50V, 10%	150F-272K+P-AC	4
C326	220uF, CE, 35V, 105C, 20%, RLT, 8X11.5, LOW ESR	157Q-227M+U-OVR	4
C327	220uF, CE, 35V, 105C, 20%, RLT, 8X11.5, LOW ESR	157Q-227M+U-OVR	4
C330	47uF, CT, 16V, 85C, 10%, SMD, 6.0X3.2	154D-476K+3-KF	4
C331	47uF, CT, 16V, 85C, 10%, SMD, 6.0X3.2	154D-476K+3-KF	4
C333	22uF, CE, 16V, 20%, SMD, 5X5.8	157D-226M+3-IKC	4
C334	22uF, CE, 16V, 20%, SMD, 5X5.8	157D-226M+3-IKC	4
C339	6800pF, CC, 0603/1608, 50V, 10%, 1X2	150F-682K+P-AC	4
C340	6800pF, CC, 0603/1608, 50V, 10%, 1X2	150F-682K+P-AC	4
C342	1500pF, CC, 0603/1608, 50V, 10%	150F-152K+P-AC	4
C343	1500pF, CC, 0603/1608, 50V, 10%	150F-152K+P-AC	4
C345	2200pF, CC, 0603, 50V, 10%, 0.8x1.6	150F-222K+P-AC	4
C346	2200pF, CC, 0603, 50V, 10%, 0.8x1.6	150F-222K+P-AC	4
C347	220pF, CC, 0603, 50V, 5%	150F-221K+P-AC	4
C350	100uF, CE, 35V, 105C, 20%, RLR, 6.3X11, LOW ESR	157Q-107M+K-LUTR	4
C351	100uF, CE, 35V, 105C, 20%, RLR, 6.3X11, LOW ESR	157Q-107M+K-LUTR	4
C500	0.47uF, CC, 0805, 25V, 20%	150E-474M+J-BD	4
C501	0.47uF, CC, 0805, 25V, 20%	150E-474M+J-BD	4
C502	0.47uF, CC, 0805, 25V, 20%	150E-474M+J-BD	4
C503	0.47uF, CC, 0805, 25V, 20%	150E-474M+J-BD	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C504	0.47uF, CC, 0805, 25V, 20%	150E-474M+J-BD	4
C505	1uF, CC, 1206, 16V, 20%, 1.6X3.2	150D-105M+6-CF	4
C506	1uF, CC, 1206, 16V, 20%, 1.6X3.2	150D-105M+6-CF	4
C507	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C508	1uF, CC, 1206, 16V, 20%, 1.6X3.2	150D-105M+6-CF	4
C509	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C510	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C511	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C512	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C513	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C514	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C515	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C516	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C517	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C518	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C519	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C520	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C521	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C532	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C533	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C534	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C535	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C536	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C537	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C538	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C539	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C540	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C544	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C545	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C546	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C547	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C548	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C549	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C550	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C551	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C552	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C553	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C554	10uF, CT, 16V, 20%, SMD, 1.6X3.2	154D-106M+3-CF	4
C555	22pF, CC, 0603/1608, 50V, 10%, 1x2	150F-220K+P-AC	4
C556	22pF, CC, 0603/1608, 50V, 10%, 1x2	150F-220K+P-AC	4
C557	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C558	22pF, CC, 0603/1608, 50V, 10%, 1x2	150F-220K+P-AC	4
C559	22pF, CC, 0603/1608, 50V, 10%, 1x2	150F-220K+P-AC	4
C560	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C561	100pF, CC, 0603/1608, 50V, 5%, 1X2	150F-101J+P-AC	4
C562	47pF, CC, 0603, 50V, 5%, 1x2	150F-470J+P-AC	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C563	47pF, CC, 0603, 50V, 5%, 1x2	150F-470J+P-AC	4
C564	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C565	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C566	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C567	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C568	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C569	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C570	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C571	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C572	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C573	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C574	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C575	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C576	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C577	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C578	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C579	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C580	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C581	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C582	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C583	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C584	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C585	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C586	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C587	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C588	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C589	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C590	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C591	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C592	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C593	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C594	10uF, CT, 16V, 20%, SMD, 1.6X3.2	154D-106M+3-CF	4
C595	1uF, CT, 16V, 20%, SMD, 1.6X3.2	154D-105M+3-CF	4
C596	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C597	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C598	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C600	0.1uF, CC, 0603/1608, 50V, 10%, 1x2	150F-104K+P-AC	4
C601	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C602	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C603	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C604	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4
C605	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C606	1000pF, CC, 0603/1608, 50V, 10%, 1X2	150F-102K+P-AC	4
C607	10uF, CE, 16V, 20%, SMD, 4X5.4	157D-106M+3-GJ	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Capacitors (continued)

Reference Designator	Description	Vendor Part Number	Note
C608	1uF, CC, 1206, 16V, 20%, 1.6X3.2	150D-105M+6-CF	4
C610	0.01uF, CC, 0603, 50V, 10%, 1x2	150F-103K+P-AC	4
C611	1uF, CC, 1206, X7R, 50V, 10%, MURATA	150F-105K+6-CFM	4

Inductors

Reference Designator	Description	Vendor Part Number	Note
L1	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L2	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L3	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L4	INDUCTOR, 22uH, 20%, 8.1X8, B1000AS-220M=P3 SMD TOKO	1803-0103+0	4
L5	INDUCTOR, 22uH, 20%, 8.1X8, B1000AS-220M=P3 SMD TOKO	1803-0103+0	4
L6	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L7	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L8	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L9	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L10	INDUCTOR, 47uH, 20%, 8.4X8.3, SMD	1803-0110+0	4
L11	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L12	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L16	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L17	FERRITE BEAD, SMD, 125 OHM, ACB453215	1802-0630+0	4
L18	INDUCTOR, 47uH, 20%, 8.4X8.3, SMD	1803-0110+0	4
L19	INDUCTOR, 470uH, 20%, 12.8x12.8, SMD	1803-0111+0	4
L20	0 OHM, RMG, 1206, 1/8W, 1%	4721-000A+6	4
L500	FERRITE CHIP, 0603, BLM18AG102SN1D, MURATA	1808-0878+0	4

Diodes

Reference Designator	Description	Vendor Part Number	Note
D1	BAV99, SOT23, PHILIPS	4840-8970+3	4
D3	BAV99, SOT23, PHILIPS	4840-8970+3	4
D4	BAV99, SOT23, PHILIPS	4840-8970+3	4
D5	BAV99, SOT23, PHILIPS	4840-8970+3	4
D7	BAV99, SOT23, PHILIPS	4840-8970+3	4
D8	BAV99, SOT23, PHILIPS	4840-8970+3	4
D9	BAV99, SOT23, PHILIPS	4840-8970+3	4
D10	BAV99, SOT23, PHILIPS	4840-8970+3	4
D11	SCHOTTKY, 80V, 3A, SK38, DO-214AB, SM	480S-K380+3	4
D12	SCHOTTKY, 40V, 3A, ST, PS3L40S, DO-214AB, SMD, ST	480L-40S0+3	4
D13	1SS355TE-17, ROHM	4840-1660+0	4
D14	1SS355TE-17, ROHM	4840-1660+0	4
D15	BAV99, SOT23, PHILIPS	4840-8970+3	4
D16	BAV99, SOT23, PHILIPS	4840-8970+3	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Diodes (continued)

Reference Designator	Description	Vendor Part Number	Note
D17	BAV99, SOT23, PHILIPS	4840-8970+3	4
D18	SCHOTTKY, 40V, 3A, ST, PS3L40S, DO-214AB, SMD, ST	480L-40S0+3	4
D19	BAV99, SOT23, PHILIPS	4840-8970+3	4
D20	ZENER, 1/2W, 15V, 5%, SOD-123C, MMSZ5245BT1G	4837-15V9+3	4
D21	SCHOTTKY, 40V, 3A, ST, PS3L40S, DO-214AB, SMD, ST	480L-40S0+3	4
D22	SCHOTTKY, 40V, 3A, ST, PS3L40S, DO-214AB, SMD, ST	480L-40S0+3	4
D24	SCHOTTKY, SK16, DO-214AA, 60V, 1A, SMD, PANJIT	480S-K160+3	4
D25	SCHOTTKY, SK16, DO-214AA, 60V, 1A, SMD, PANJIT	480S-K160+3	4
D26	BAV99, SOT23, PHILIPS	4840-8970+3	4
D27	BAV99, SOT23, PHILIPS	4840-8970+3	4
D28	BAV99, SOT23, PHILIPS	4840-8970+3	4
D29	BAV99, SOT23, PHILIPS	4840-8970+3	4
D30	BAV99, SOT23, PHILIPS	4840-8970+3	4
D31	BAV99, SOT23, PHILIPS	4840-8970+3	4
D32	BAV99, SOT23, PHILIPS	4840-8970+3	4
D33	BAV99, SOT23, PHILIPS	4840-8970+3	4

Light Emitting Diodes

Reference Designator	Description	Vendor Part Number	Note
LED1	LED, OS, GN, LOW CURRENT, 525NM, SMD	3700-7834+G	4
LED2	LED, OS, GN, LOW CURRENT, 525NM, SMD	3700-7834+G	4
LED3	LED, OS, GN, LOW CURRENT, 525NM, SMD	3700-7834+G	4
LED4	LED, OS, GN, LOW CURRENT, 525NM, SMD	3700-7834+G	4
LED5	LOW CURRENT, SMD, LED, RED, 2mA	3700-7829+R	4
LED6	LOW CURRENT, SMD, LED, RED, 2mA	3700-7829+R	4
LED7	LOW CURRENT, SMD, LED, RED, 2mA	3700-7829+R	4
LED8	LOW CURRENT, SMD, LED, RED, 2mA	3700-7829+R	4
LED9	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED10	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED11	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED12	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED13	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED14	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED15	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED16	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED17	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED18	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED19	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED20	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED21	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Light Emitting Diodes (continued)

Reference Designator	Description	Vendor Part Number	Note
LED22	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED23	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED24	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED25	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED26	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED27	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED28	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED29	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4
LED30	LOW CURRENT, SMD, LED, RED, 2mA	3700-7829+R	4
LED31	LOW CURRENT, SMD, LED, BLUE	3700-7830+B	4

Transistors

Reference Designator	Description	Vendor Part Number	Note
Q1	MMBT4403LT1G, SMD	4854-4030+3	4
Q2	MMBT4403LT1G, SMD	4854-4030+3	4
Q3	MMBT4403LT1G, SMD	4854-4030+3	4
Q4	MMBT4403LT1G, SMD	4854-4030+3	4
Q5	MMBT4403LT1G, SMD	4854-4030+3	4
Q6	MMBT4403LT1G, SMD	4854-4030+3	4
Q7	MMBT4403LT1G, SMD	4854-4030+3	4
Q8	MMBT4403LT1G, SMD	4854-4030+3	4
Q9	MMBT4403LT1G, SMD	4854-4030+3	4
Q10	MMBT4403LT1G, SMD	4854-4030+3	4
Q11	MMBT4403LT1G, SMD	4854-4030+3	4
Q12	MMBT4403LT1G, SMD	4854-4030+3	4
Q13	MMBT4403LT1G, SMD	4854-4030+3	4
Q14	MMBT4403LT1G, SMD	4854-4030+3	4
Q15	MMBT4403LT1G, SMD	4854-4030+3	4
Q16	MMBT4403LT1G, SMD	4854-4030+3	4
Q17	MMBT4403LT1G, SMD	4854-4030+3	4
Q18	MMBT4403LT1G, SMD	4854-4030+3	4
Q19	MMBT4403LT1G, SMD	4854-4030+3	4
Q20	MMBT4403LT1G, SMD	4854-4030+3	4
Q21	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q22	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q23	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q24	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q25	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q26	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q27	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q28	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q29	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q30	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q31	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q32	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q33	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Transistors (continued)

Reference Designator	Description	Vendor Part Number	Note
Q34	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q35	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q36	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q37	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q38	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q39	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q40	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q41	NPN, BCP56-10, SOT223	485C-P560+3	4
Q42	MOSFET, N-CHANNEL, 60V, CEM4450, SO-8, SMD	4904-4500+3	4
Q43	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q44	MMBT4403LT1G, SMD	4854-4030+3	4
Q45	MMBT4403LT1G, SMD	4854-4030+3	4
Q46	MMBT4403LT1G, SMD	4854-4030+3	4
Q47	MMBT4403LT1G, SMD	4854-4030+3	4
Q48	MMBT4403LT1G, SMD	4854-4030+3	4
Q49	MMBT4403LT1G, SMD	4854-4030+3	4
Q50	MMBT4403LT1G, SMD	4854-4030+3	4
Q51	MMBT4403LT1G, SMD	4854-4030+3	4
Q52	MMBT4403LT1G, SMD	4854-4030+3	4
Q53	MMBT4403LT1G, SMD	4854-4030+3	4
Q54	MMBT4403LT1G, SMD	4854-4030+3	4
Q55	MMBT4403LT1G, SMD	4854-4030+3	4
Q56	MMBT4403LT1G, SMD	4854-4030+3	4
Q57	MMBT4403LT1G, SMD	4854-4030+3	4
Q58	MMBT4403LT1G, SMD	4854-4030+3	4
Q59	MMBT4403LT1G, SMD	4854-4030+3	4
Q60	MMBT4403LT1G, SMD	4854-4030+3	4
Q61	MMBT4403LT1G, SMD	4854-4030+3	4
Q62	MMBT4403LT1G, SMD	4854-4030+3	4
Q63	MMBT4403LT1G, SMD	4854-4030+3	4
Q64	MMBT4403LT1G, SMD	4854-4030+3	4
Q65	MMBT4403LT1G, SMD	4854-4030+3	4
Q66	MMBT4403LT1G, SMD	4854-4030+3	4
Q67	MMBT4403LT1G, SMD	4854-4030+3	4
Q68	NPN MMBT4401, SOT-23, HFE:20-300, SM	4854-4010+3	4
Q69	NPN MMBT4401, SOT-23, HFE:20-300, SM	4854-4010+3	4
Q70	NPN MMBT4401, SOT-23, HFE:20-300, SM	4854-4010+3	4
Q71	NPN MMBT4401, SOT-23, HFE:20-300, SM	4854-4010+3	4
Q72	NPN MMBT4401, SOT-23, HFE:20-300, SM	4854-4010+3	4
Q73	NPN MMBT4401, SOT-23, HFE:20-300, SM	4854-4010+3	4
Q74	MMBT4403LT1G, SMD	4854-4030+3	4
Q75	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q76	2N2222, SMD, MMBT2222ALT1G	4860-5410+3	4
Q77	KTC3875Y	4853-875Y+3	4
Q78	KTA1504Y	4851-504Y+3	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Integrated Circuits

Reference Designator	Description	Vendor Part Number	Note
U1	STEP-DOWN CONVERTER, MP1591DN, SOIC8N, MPS	3132-4711+0	4
U2	TL072CDR, DUAL J-FET, INPUT, OP-AMP	3130-8020+0	4
U3	BA4560F-E2, HIGH SLEW DUAL OP-AMP	3131-5330+0	4
U4	DC-DC CONVERTER, SMD, MC34063ADR2G, SOIC-8	3132-4041+0	4
U5	TL072CDR, DUAL J-FET, INPUT, OP-AMP	3130-8020+0	4
U6	BA4560F-E2, ROHM	3131-5330+0	4
U9	TL072CDR, DUAL J-FET, INPUT, OP-AMP	3130-8020+0	4
U11	BA4560F-E2, ROHM	3131-5330+0	4
U12	NJM2068M-#ZZZB, DUAL OP AMP	3130-6890+0	4
U14	BA4560F-E2, ROHM	3131-5330+0	4
U16	BA4560F-E2, ROHM	3131-5330+0	4
U19	NOR GATE X 4, 74HC02, SO14, ST	3132-3771+0	4
U20	CODEC, CS4272-CZZ, 28 PIN, TSSOP, CIRRUS LOGIC	BOSE P/N: 271836	
U21	CODEC, CS4272-CZZ, 28 PIN, TSSOP, CIRRUS LOGIC	BOSE P/N: 271836	
U22	STEP-DOWN CONVERTER, MP1591DN, SOIC8N, MPS	3132-4711+0	4
U23	STEP-DOWN CONVERTER, MP1591DN, SOIC8N, MPS	3132-4711+0	4
U24	HEX INVERTER, SN74LVCU04APW, TSSOP, 14 PIN	3132-4731+0	4
U25	REG, NCP1117ST33T3G, 3.3V, SOT-223, ONSEMI	3132-1481+0-11	4
U26	OR GATE, QUAD, 74HC32, SO14, ST	3132-3781+0	4
U29	TL494CDR, SMD, S0-16, PWM CONTROLLER	3132-0610+0	4
U500	RESET, MCP100T-315I/TT, SOT23, MICROCHIP	3132-4481+0	4
U501	SPI FLASH, 4M, AT45DB041D-SU, SOIC8	3132-4721+1	4
U502	LM393MNOPB	3131-6940+0	4
U503	DSP, ADSP-21366KBCZ136-BALL, CSP-BGA, ADI	BOSE P/N: 287375	
U506	USB, TAS1020B, TQFP48	3132-4811+0	4
U507	LATCH, 74HC373, TSSOP20	3132-4791+0	4
U508	LATCH, 74HC373, TSSOP20	3132-4791+0	4
U509	DECODER, 74HC138, TSSOP16	3132-4801+0	4
U510	K6R4008V1D/CY7C1049C, V33, SRAM, 512x8BIT	3132-1571+0	4
U511	LATCH, 74HC373, TSSOP20	3132-4791+0	4
U512	LATCH, 74HC373, TSSOP20	3132-4791+0	4
U513	LATCH, 74HC373, TSSOP20	3132-4791+0	4
U514	LATCH, 74HC373, TSSOP20	3132-4791+0	4
U515	LATCH, 74HC373, TSSOP20	3132-4791+0	4

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Integrated Circuits (continued)

Reference Designator	Description	Vendor Part Number	Note
U516	LATCH, 74HC373, TSSOP20	3132-4791+0	4
U517	LATCH, 74HC373, TSSOP20	3132-4791+0	4
U518	A/D, MCP3008, SO16	3132-4821+0	4

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
CN2	4P, ST, WAFER, P=2.5, COULOMB	2102-041S+004	4
CN500	CONNECTOR-FFC, 20P, P0.5, ST, FEM	2101-3159+0	4
CN501A	2P, ST, WAFER, P=2.0, COULOMB	2102-020S+003	4
CN504A	HEADER, 2X8P, P2.54, STRAIGHT, M	2101-3161+0	4
J2	JACK, PHONE, STEREO, 6P, BLACK, H=12.5	BOSE P/N: 305301	
J3	JACK, MIC, PHONE, COMBO, 11P, NCJ10FI-H-0, NEUTRIK	BOSE P/N: 296155	
J4	JACK, MIC, PHONE, COMBO, 11P, NCJ10FI-H-0, NEUTRIK	BOSE P/N: 296155	
J5	JACK, MIC, PHONE, COMBO, 11P, NCJ10FI-H-0, NEUTRIK	BOSE P/N: 296155	
J12	JACK, RJ45, ST-NE8FAH, 8 PIN, NEUTRIK	BOSE P/N: 296154	
J501	JACK, USB, 4P, 90 DEG	2113-3212+0	4
RT1	NTC THERMISTER, 5 0HM, 4A, NIOSP005L, UL/CSA/VDE	5202-0010+0	4
S512	ENCODER, ROTARY, 4 BIT, 12 POSITIONS, L=16.7, NOBLE	BOSE P/N: 299674	
S513	ENCODER, ROTARY, 2BIT, W/SW, L=20	BOSE P/N: 305295	
S514	ENCODER, ROTARY, 2BIT, W/SW, L=20	BOSE P/N: 305295	
S515	ENCODER, ROTARY, 2BIT, W/SW, L=20	BOSE P/N: 305295	
SW2	PUSH SW, PS828L, 8x8mm, MIC	5200-3573+0-00	4
T1	CHOKE, CM, 2200 OHMS AT 100MHZ, SM, DLW31SN222SQ2L, MURATA	1806-3966+0	4
T2	CHOKE, CM, 2200 OHMS AT 100MHZ, SM, DLW31SN222SQ2L, MURATA	1806-3966+0	4
T3	PULSE TRANSFORMER, 225uH, 0.35 OHM, 1=1, 100K	1806-3670+0	4
T4	PULSE TRANSFORMER, 225uH, 0.35 OHM, 1=1, 100K	1806-3670+0	4
VR1	VARIABLE RESISTOR, ROTARY, 10KX1, 20%, V, L=20, D SHAFT, 15C, ALPHA	BOSE P/N: 305294	
VR2	VARIABLE RESISTOR, ROTARY, 10KX1, 20%, V, L=20, D SHAFT, 15C, ALPHA	BOSE P/N: 305294	
VR3	VARIABLE RESISTOR, ROTARY, 10KX1, 20%, V, L=20, D SHAFT, 15C, ALPHA	BOSE P/N: 305294	
VR4	VARIABLE RESISTOR, ROTARY, 100KAX1, 20%, V, L20, D, LOW RESIDUAL, ALPHA	BOSE P/N: 307726	
VR500	VARIABLE RESISTOR, ROTARY, 10KXB2, 20%, V, L24, D SHAFT, NOBLE	BOSE P/N: 299673	
VR501	VARIABLE RESISTOR, ROTARY, 10KXB2, 20%, V, L24, D SHAFT, NOBLE	BOSE P/N: 299673	

Electrical Part List

Digital Signal Processor (DSP) PCB Assembly

Miscellaneous (continued)

Reference Designator	Description	Vendor Part Number	Note
VR502	VARIABLE RESISTOR, ROTARY, 10KBX2, 20%, V, L24, D SHAFT, NOBLE	BOSE P/N: 299673	
VR503	VARIABLE RESISTOR, ROTARY, 10KBX2, 20%, V, L24, D SHAFT, NOBLE	BOSE P/N: 299673	
VR504	VARIABLE RESISTOR, ROTARY, 10KBX2, 20%, V, L26.4, D SHAFT, NOBLE	BOSE P/N: 299832	
X1	CRYSTAL, 6MHZ +/-20PPM, SM, HC-49-SMD	2300-3291+0	4
X2	CRYSTAL, HC49, 12.288MHZ +/-20PPM, 4.7X13, SMD	2300-3284+0	4

Display PCB Assembly

Capacitors

Reference Designator	Description	Vendor Part Number	Note
C101	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4
C102	0 OHM, RMG, 0805, 1/10W, 5%	4720-000J+J	4
C103	0 OHM, RMG, 1206, 1/8W, 1%	4721-000A+6	4
C104	0 OHM, RMG, 0805, 1/10W, 5%	4720-000J+J	4
C105	1000pF, CC, 0805, 50V, 10%, 1.2x2.0	150F-102K+J-BD	4

Miscellaneous

Reference Designator	Description	Vendor Part Number	Note
-	CONN, WIRE, 2P, P2.0, #28, BLACK/RED, L=80MM	7012-6919+0	4

Disassembly Procedures

1. Bottom Housing Removal

1.1 Place the T1 onto a soft surface. Turn the T1 unit over onto the front panel. Using a Phillips-head screwdriver, remove the six screws that secure the bottom housing to the top housing.

1.2 At the bottom edge of the unit near the volume controls, carefully separate the bottom housing from the top housing. Lift off the bottom housing.



2. Top Housing Removal

2.1 Perform procedure 1.

2.2 Pull off the trim, rotary selector, master volume and channel volume knobs from the front panel.

2.3 Turn the unit over onto the front panel and remove the two screws that secure the DSP PCB and I/O PCB subassembly to the top housing.

2.4 Lift the DSP and I/O PCB sub-assembly off of the top housing.



Disassembly Procedures

3. Input / Output Panel Removal

3.1 Perform procedure 2.

3.2 Using a Phillips-head screwdriver, remove the six screws that secure the RJ45 and Neutrik® jacks to the I/O panel.

3.3 Remove the seven plastic nuts that secure the 1/4" phono jacks to the I/O panel. Slide off the I/O panel.

3.4 On the Main PCB, unplug the wiring harness for the ON/OFF switch at connector CN2.



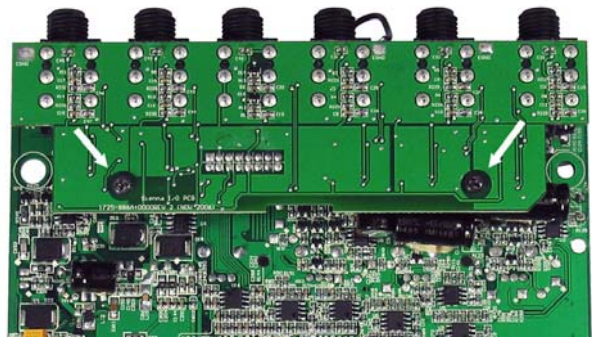
4. Input / Output PCB Assembly Removal

4.1 Perform procedure 3.

4.2 Using a Phillips-head screwdriver, remove the two screws that secure the I/O PCB to the two metal standoffs on the Main PCB.

4.3 Lift the I/O PCB straight off of the Main PCB to disengage it from connector CN504.

4.4 Unsolder the black ground wire located near C72 on the Main PCB.

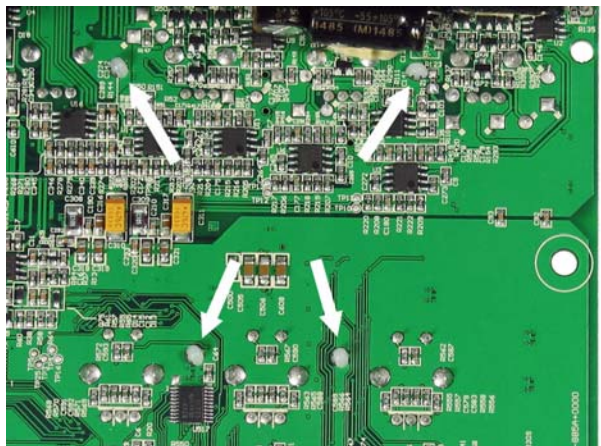


5. LCD PCB Assembly Removal

5.1 Perform procedure 2.

5.2 Using a pair of needle-nose pliers, compress the legs of the nylon standoffs that secure the LCD PCB assembly to the Main PCB assembly.

5.3 Carefully lift off the LCD PCB assembly and unplug the ribbon cable from the Main PCB at CN500. Unplug the DC power wire harness at CN501A.



Test Procedures

Equipment required:

- T1 power supply, product code 042533
- L1 Model II power stand
- B1 bass module
- 4-wire Neutrik® Speakon® bass cable
- Audio Signal Generator
- Audio Analyzer
- Input/Output cables
- 1 - XLR mic test cable
- 2 - 1/4" balanced TRS test cables
- 1 - RJ45 ToneMatch system cable
- 1 - USB Cable, Type A to Type B

Test Setup

- Connect the T1 power supply to the RJ45 ethercon connector on the UUT back panel.
- Connect the AC line cord to AC mains.

1. DSP Operational and SW Version Test

1.1 Plug in power supply, turn on unit, note the screen display.

1.2 Turn Selector Knob to "Prefs", turn the left button under the LCD "Menu" to select "Versions", press to select. Observe code versions. Refer to the examples below.

- DSP Firmware: 1.2
- Bose presets: 1.0
- Bose scenes: 1.0

2. Channel 1 to 5 Trim LED Tests

2.1 Connect a balanced TRS cable to the Line Input 1 jack on the T1.

2.2 Set the channel 1 trim knob, volume knob and the master volume knob to 5.

2.3 Apply a 1kHz, -45dBV signal to the channel 1 input.

2.4 Slowly increase the input level to +10dBV, noting at which point the channel 1 trim LED changes from green to yellow to red.

2.5 Verify that the channel 1 trim LED changes color at the following levels.

- Green: -30dBV, +/-2dBV
- Yellow: 0dBV, +/-2dBV
- Red: +8dBV, +/-2dBV

2.6 Repeat steps 2.1 to 2.5 for channels 2 and 3.

2.7 Repeat steps 2.1 to 2.4 for channels 4 and 5. Verify that the trim LEDs for channels 4 and 5 change color at the following levels.

- Green: -33dBV, +/-2dBV
- Yellow: -3dBV, +/-2dBV
- Red: +5dBV, +/-2dBV

3. Channel 1 to 5 Pushbutton Test

3.1 Press the channel 1 CH Edit button ON. Verify that it illuminates blue. Press the channel 1 CH Edit button again and verify that it is no longer illuminated.

3.2 Press the channel 1 FX Mute button ON. Verify that it illuminates blue. Press the channel 1 FX Mute button again and verify that it is no longer illuminated.

3.3 Press the channel 1 Mute button ON. Verify that it illuminates blue. Press the channel 1 Mute button again and verify that it is no longer illuminated.

3.4 Repeat steps 3.1 to 3.3 for channels 2 to 5.

4. Mic Input THD+N Test

4.1 Set the channel 1 trim knob, volume knob and the master volume knob to 5.

4.2 Using a balanced XLR mic input cable, apply a 1kHz, -20dBV input to the channel 1 input jack.

4.3 Measure the THD+N level at the channel 1 preamp out jack. Verify that it is <0.05% at -20dBV.

Test Procedures

4.4 Measure the THD+N level at the master output jack. Verify that it is <0.05% at -20dBV.

4.5 Repeat steps 4.1 to 4.4 for channels 2 and 3.

5. Line Input THD+N Test

5.1 Set the channel 1 trim knob, volume knob and the master volume knob to 5. Set AUX SEND to 50% for channels 1 to 5.

5.2 Using a balanced TRS input cable, apply a 1kHz, 0dBV input to the channel 1 input jack.

5.3 Measure the THD+N level at the AUX output jack. Verify that it is <0.05% at 0dBV.

5.4 Repeat steps 5.1 to 5.3 for channels 2 to 5.

6. Phantom Power Test

6.1 On the T1 front panel, press the Phantom power button to ON. Verify that the red LED lights.

6.2 With the Phantom power button on, measure the DC voltage level on the channel 1 XLR input jack. Measure pins 2 and 3 relative to pin 1 (GND).

6.3 Measure the DC voltage at pin 2 relative to pin 1. Verify that it is +48VDC. Measure the DC voltage at pin 3 relative to pin 1. Verify that it is +48VDC.

6.4 Repeat steps 6.1 to 6.3 for channels 2 and 3.

7. USB Test

7.1 Using a USB cable, connect the T1 to a computer running Windows 2000 or higher. Verify that the PC recognizes the USB port.

8. ToneMatch® Operational Test

8.1 Set up the L1 Model II system with the B1 bass module connected.

8.2 Connect the T1 unit under test to the L1 Model II power stand using the ToneMatch system cable.

8.3 Set the T1's channel 1 trim and volume knobs to 5. Set the master volume knob to 5, or less if needed for listening comfort.

8.4 Using a balanced XLR/Mic cable, apply a 20Hz, -55dBV signal to the channel 1 Mic/Line input.

8.5 Sweep the input frequency to the T1 from 20Hz to 20kHz. Listen to the output of the L1 Model II system. Listen for uniformity of sound level and clean sound output across the audio range.

Appendix

T1 ToneMatch® Test Cables

Note: In order to be able to properly test the T1 ToneMatch Audio Engine, you will need to make up a few test cables.

1. Balanced XLR Microphone Input Test Cable

Parts needed:

- 1 - XLR male connector
- 1 - Dual banana jack
- Shielded stereo cable, 6 feet

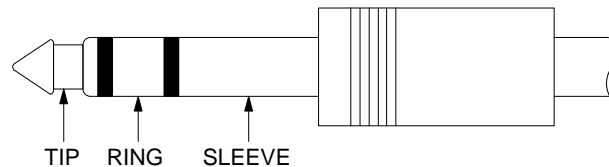
This cable is used to test the channel 1, 2 and 3 microphone inputs on the T1. These input jacks are dual purpose jacks that will accept either XLR or 1/4" TRS phono jack balanced inputs.

- Connect the dual banana jack 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.

2. Balanced 1/4" Test Cable

Parts needed:

- 1 - Tip/Ring/Sleeve (TRS) 1/4" phono jack
- 1 - Dual banana jack
- Shielded stereo cable, 6 feet



This cable is used to test the channel 1, 2, 3 and 4/5 line inputs and the preamp, master and aux outputs.

- Connect the TIP of the phono jack to one of the shielded twisted pair wires.
- Connect the RING of the phono jack to the other wire in the shielded twisted pair.
- Use an ohmmeter to determine which wire is connected to the TIP of the phono jack. Connect this wire to the positive (+) connection on the dual banana jack.
- Connect the wire connected to the RING of the phono jack to the banana jack negative (-) connection. The SLEEVE portion of the jack is the common ground where the cable's shield should be connected. Connect the shield at the phono jack end only.

Software Update Procedure

The Bose® L1™ Updater Software allows a customer to update the T1 ToneMatch® Audio Engine DSP firmware, ToneMatch Presets and ToneMatch Factory Scenes, as well as the L1 Model II power stand system EQ and firmware, if connected.

As part of a repair, you should perform this update procedure to bring the firmware on the customer's unit up to the latest revision level.

Required Equipment

- Computer with a USB 1.1 or 2.0 port and Microsoft® Windows® 2000 or higher installed
- T1 ToneMatch AC power supply, product code 042533, or an L1 Model II power stand with a ToneMatch system cable.
- USB cable, Type A to Type B

Update Procedure

1. Download the latest version of the L1 Updater software to your computer from the Bose Musicians web site at http://www.bose.com/controller?url=/musicians/downloads/tonematch_downloads.jsp

2. Connect one end of the USB cable to the T1 ToneMatch Audio Engine's USB port, located below the ON/OFF switch on the unit's rear panel. Connect the other end of the USB cable to a USB port on the PC.

3. Connect the customer unit to a T1 Tonematch AC power supply. The power supply connects to the RJ45 jack located to the right of the ON/OFF switch on the rear panel. If you don't have a T1 AC power supply, you can power the T1 using an L1 Model II power stand and ToneMatch cable. Refer to the owner's guide on the Bose Musicians web site for more information.

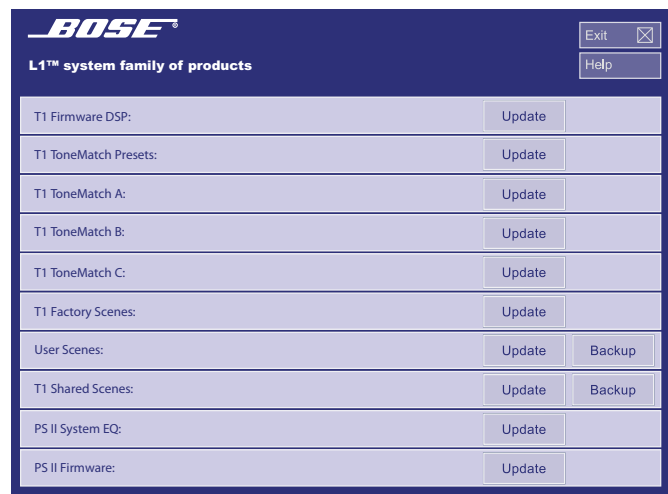
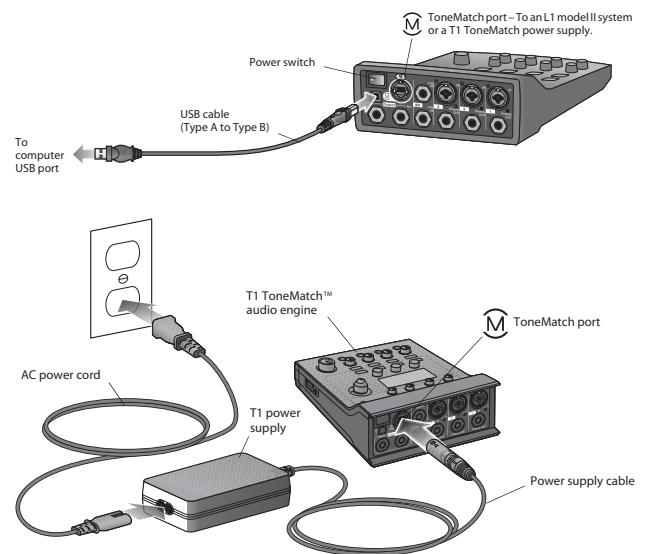
4. Turn on the customer unit. Verify that the computer recognizes the unit as a USB audio device.

5. On the computer, double click the L1 Updater icon to run the L1 Updater Software.

6. Follow the on-screen instructions to update the T1 Firmware DSP, T1 ToneMatch Presets and T1 Factory Scenes.

Notes:

- Do not update the T1 ToneMatch Preset Bank A, B or C. These are selected by the customer to be used on their specific equipment.
- Do not update the User Scenes or the T1 Shared Scenes. These are set up by the customer and any saved information will be lost if you update them.



L1 Updater Application Screen

Theory of Operation

General

This document refers to schematic revision 10.

The T1 ToneMatch® Audio Engine consists of a small, portable housing that contains Input and Output (I/O) connectors on an I/O PCB, a main PCB with user controls and an LCD display, as well as a removable top cover with storage for a mounting bracket.

The T1 is part of the second generation of the Personalized Amplifications System™ family of products from Bose®. It's designed to provide user interface, input / output capabilities and extensive tone shaping capabilities through digital signal processing. It is housed a very small portable enclosure that the musician can keep at the playing position.

The user interface of the T1 centers on the needs of the performing musician. Very important tasks, like adjusting volume or muting, need to be implemented with as little disruption and distraction to the player as possible. More advanced functions that are only adjusted between songs or during rests can require a little more attention from the user.

The T1's main use is with the L1 Model II powered speaker system, and provides seamless integration between the two. Connection between the T1 and the L1 Model II is done with a single cable that carries audio, communication and power, so that the T1 can operate without an external power supply or AC connection. A separate, external wall-wart type power supply is available as an option for those that desire it.

The T1 is designed for the needs of a single musician and not intended to be shared between players

I/O Connectors

- ToneMatch port – Ethercon connector for digital audio output to the L1 Model II,
- bi-directional communication with the L1 during SW updates, and power input for the T1
- USB type B connector
- Three combo connectors: XLR/ ¼" for mic and line inputs (channels 1, 2 and 3)
- Two ¼" balanced analog line-level input jack (channels 4 and 5)
- Three ¼" balanced analog line level output jacks (preamp outputs, chs 1, 2 and 3)
- Two ¼" balanced analog line-level output jacks (Master and Auxiliary outputs)

Controls

- Power Switch - Switches the system on and off
- Trim - Adjusts the level of the analog input signal on channels 1, 2, 3 and 4/5
- Selector - controls LCD display and the function selected
- LCD - controls softkeys for the LCD display
- Channel Volume - channels 1, 2, 3 and 4/5
- Master Volume - controls overall volume out of the T1
- CH(annel) Edit buttons (4) - select which channel's settings are seen on the display
- FX (effects) Mute buttons (4) - select which channel's effects are bypassed
- Mute buttons (4) - select which channels are muted
- Phantom button - turns the 48 VDC supply on channels 1, 2 and 3 on and off for condenser microphones.

Theory of Operation

Indicators

- Signal/Clip Indicator - Indicates status of the analog input signal:
- Green = normal
- Yellow = high level
- Red = overload
- Phantom - shows red when phantom power is on
- LCD - shows the menu items chosen by the selector knob

Signal Path

Mic and Line Inputs for channels 1, 2, and 3

Note: All reference designators apply to Channel 1. The circuits for channels 2 and 3 are identical.

The main component of the Mic Preamp is a differential amplifier using discrete bipolar transistors in order to achieve very low voltage noise. Q48 and Q63 are the main differential pair - they are paralleled with Q51 and 54, plus Q57 and 60, respectively. This is done in order to lower the effective base-emitter resistance, and therefore lower the input noise voltage.

The differential pair drives a buffer OpAmp U2B which is also used to null out the DC offset voltage at the collectors of the differential pair.

The differential pair is surrounded by 4 current sources: Q44, Q45, Q68 and Q72 which have a relatively stable base voltage set by the regulated power supply voltage and the ratio of R258 to R137 and R103. Current sources are used here in order to maintain a high output (collector) impedance that is independent of the actual current being supplied. Therefore, the gain of the complete stage is set by the ratio of R373+R367 to the sum of R361 and VR1A. The positive and negative current sources are offset in order to maximize both the input and output voltage swing capability of the differential pair. Input voltage swing is especially important at low gain settings, whereas output voltage swing is more important at high gain settings.

In addition to the core Preamp section, there are other additions to optimize performance with both dynamic and condenser microphones. The input impedance is maintained at approximately 1.8Kohms which is considered optimal for most dynamic mics. A switchable +48VDC phantom supply for condenser mics is generated in the power supply section, and is low-pass filtered by R135 and C124. R119 and R120 provide a balanced source of current for the mic, and C120 and C118 block this DC voltage from appearing at the DiffAmp's input. D10 and D9 clamp the DiffAmp's input to keep it within the power supply voltage range, even under fault conditions. These conditions include shorting the phantom power supply to ground, ESD pulses, and any overvoltage applied to the input.

The physical input connection is provided by a Neutrik® Combo-Jack, which incorporates a 1/4" TRS phone jack in addition to the XLR jack which is used for the Mic input. The 1/4" jack is used to connect an unbalanced line-level source, instead of a balanced mic-level source. The Line input maintains a very high input impedance and employs a FET-input OpAmp (U2A), thereby optimizing its use with magnetic pickups and other high-impedance sources. Since the Mic Preamp section maintains such a low noise floor, U2A's output can be fed directly into one of the DiffAmp's inputs, with R287 providing an appropriate amount of attenuation. When there is either no input connected or the XLR input is used, J5's TS terminal shorts the input to ground, and J5's SS terminal shorts U2A's output to ground. This insures zero noise contribution from the Line input section when it is not in use.

Theory of Operation

Numerous small capacitors in the range of 100-500pF are used to reduce susceptibility to incoming EMI.

Line inputs 4 and 5

Note: All reference designators apply to Channel 4. The circuits for channels 5 are identical.

J2 is a balanced ¼" TRS connector that provides a short to ground when no jack is inserted to keep input noise low. R3 and R4 provide a DC reference at ground to avoid DC shifts when inserting and removing cables. D15 and D16 provide clamping for high DC voltage inputs as well as other fault conditions like ESD. U12A is a low pass filter ($f = 33 \text{ kHz}$) with medium input impedance for line level signals in.

Channels 4 and 5 are summed at U12B and passed to the U21 codec.

Preamp Outputs

For channels 1, 2 and 3, the preamp outputs after the diff amp are routed through another set of buffers to convert them to balanced (U7 for channel 1) and present them at a ¼" output jack at line level.

The output jacks have 100 Ohm resistors in series to provide a low but finite output impedance. The signal is capacitively coupled for protection against external DC voltages, and referenced to ground through 47k Ohm resistors. Capacitors to ground provide paths for RF and ESD.

CODECS/DSP

Channels 1 and 2 are converted to balanced signals in U3 and U6, and then applied to codec U20. D30 – D33 provide clamping to the 5V rail to avoid latching up the codec inputs.

Similarly, channel 3 is applied to codec U21. Channels 4 and 5 are summed in U12 then applied to U21.

Signal Processing

The Figure below shows the signal processing flowchart

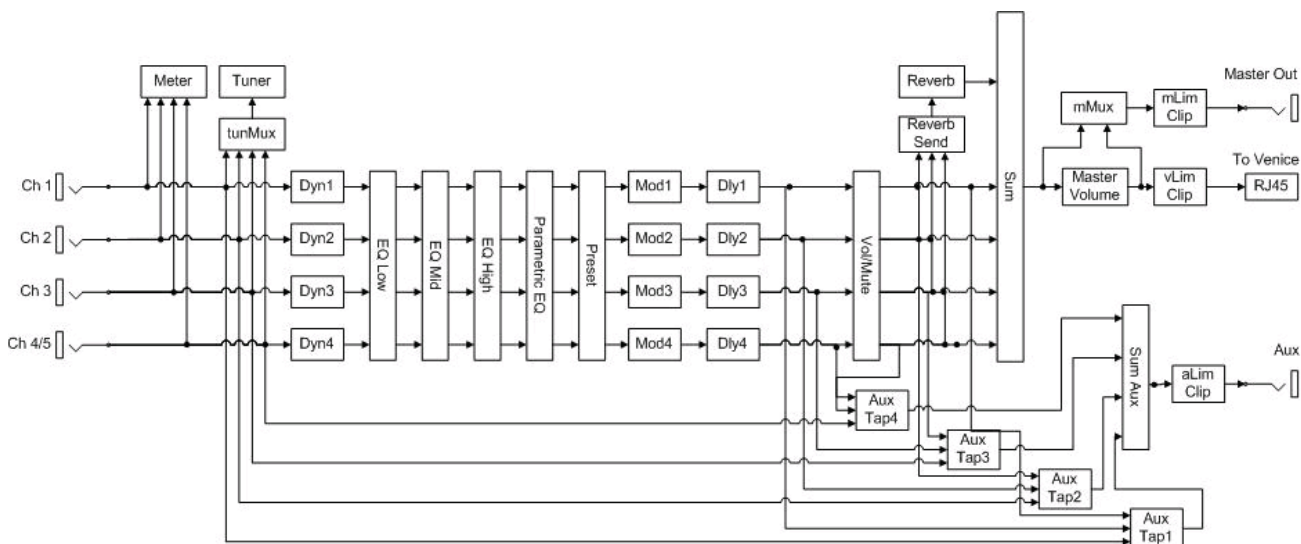


Figure 1: Audio Signal Processing (without USB)

Theory of Operation

Normal Channel Processing

Each input channel is fed through a dynamic processor into a three band equalizer and another parametric EQ section. Then the signal is filtered with a Bose® preset or ToneMatch® filter and volume/mute is applied. These post-fade signals are routed into three independent effects processor (Reverb, Modulator, and Delay). The master output signal is formed by the sum of the post-fade channel signal and the effects processors.

Aux

The aux section is formed by a multiplexer that taps the each channel signal at three different spots. These are

- a) Directly after the input (traditional “pre fade”)
- b) After the dynamics processor and the EQ section
- c) After the volume/mute control (traditional “post fade”)

The chosen signals are scaled and then summed into the Aux output signal

Master section

The output of the master summer is fed through the master volume control to the digital output to the L1 Model II powered speaker system. The source analog master output can be selected to be pre or post the master volume control. The output of the aux summer is send directly to the analog Aux output. All outputs have limiter/clipper to prevent hard clipping of the D/A converters in cases where the system is internally overdriven.

Master Output

The master output comes from U21, is filtered by U16, then converted to a balanced signal by U17 and fed out the Master Output jack.

Auxiliary Output

The auxiliary output comes from U21, is filtered by U16, then converted to a balanced signal by U18 and fed out the Aux Output jack.

ToneMatch Output

The S/PDIF signal from the DSP contains digital audio to the Venice power stand, and can also carry two-way communication for code updates.

The ethercon connector provides input and output for isolated S/PDIF – format digital signals. Pins 1 and 2 are the signal inputs; they are fed through common-mode choke T2 for RF isolation and T4 for electrical (DC) isolation. D17 clips the received signal, and it is passed through a low pass filter (C39, C40, C47, R266, R149, and R150) to U24, which acts as a comparator with hysteresis.

U24 is also used to square the transmit S/PDIF signal output, which is passed through transformers T3 and T1 to pins 3 and 6 on the ethercon connector.

Received S/PDIF signals are passed directly to the DSP.

Theory of Operation

USB Input/Output

The T1 provides a USB interface for connection to a Windows® PC. The interface will enable:

- a) audio streaming from the PC to the T1
- b) audio streaming from the T1 to a PC
- c) Updates of firmware, data sets and features
- d) Backup of user defined scenes and configurations

Upon initial connection the T1 will appear as a standard USB audio device. Audio streaming is possible through any standard Windows audio application that is capable of communicating with a standard audio device.

The update features is implemented through a proprietary Human Device Interface (HID) class interface. This requires a Bose® provided PC application.

USB audio streaming supports bi-directional. USB incoming audio is summed to mono and routed either to the master summer or added to the channel 4/5 inputs.

The outgoing USB signals are determined through two independent multiplexer. Each output can be selected from six different tap points: Channel 1, 2, 3, 4/5, aux sum, or master sum. All channel taps and the master tap are post-fade.

DC Power

A nominal +/-18VDC is brought in through J12. This can be created by an external power supply when the T1 is used without the L1 Model II power stand, or it can come from the L1 Model II. When the power stand supplies the voltage, it can range from +/- 16 to 29 VDC.

U1 and U4 switch the +/-18 V to +/-15VDC for audio and LED power.

U23 provides 5VDC, which is in turn linearly regulated down to 3.3V for the DSP I/O supply.

A 1.2V, 500 mA supply is also generated directly from the +18V rail, to supply the DSP core.

Switch 2 turns on the +48V supply for phantom power, which is applied to each microphone input through a 1K resistor and two 4.99K resistors to pins 2 and 3 of the microphone connector. This allows up to 14 mA of current into condenser mics.

Software Updates

Please see the Bose L1 Updater instructions for how to update T1 and L1 Model II power stand firmware.

Buses

DSP – CODECs

Audio is passed between DSP and Codec's with an I²S bus labeled DSP_BICK, DSP_LRCLK, SDIN and SDOUT.

CODEC control is accomplished through the DSP's primary and secondary SPI busses (for U20 and U21, respectively) on dedicated pins labeled SPI_MISO_A, SPI_CLK_A, SPI_MOSI_A, and SPI_MISO_B, SPI_CLK_B, SPI_MOSI_B

DSP – Boot Flash

The serial boot flash also communicates with the DSP through the primary SPI bus

Theory of Operation

DSP – Volume Controls

U518 is an A/D used to read volume knob settings. It also communicates with the DSP through the primary SPI bus.

DSP – USB

Audio is passed between DSP and the TAS1020A USB chip with an I²S bus labeled USB_BICK, USB_LRCLK, USB_SDIN1 and USB_SDO1.

Control of the TAS1020A is accomplished by bit-banging two flag pins (FLAG 2 and FLAG 3) of the DSP to create an I²C bus.

DSP – LCD

LCD control is done with the DSP's secondary SPI bus accessed through the Digital Audio Interface, labeled SPI_CLK_B and SPI_MOSI_B

Memory

Audio is written to and read from SRAM for effects including delay and reverb, The multiplexed address/data lines from the DSP are fed to latches controlled by the ALE line to address the SRAM. AD0-7 write and read data.

Encoders, Buttons, Channel and Master Volume controls

In order to read the many inputs required, the encoders and button outputs are applied to latches U511-14, which are polled by the DSP.

Address lines A21-23 are decoded in U509 to provide 8 control lines used as latch enables, latch output controls, and a chip select for the SRAM. The Latch output controls of U509 are NOR'd with the read enable to provide the appropriate signals for the latches.

LED Control and misc DSP outputs

Other DSP outputs are created by latching the A/D lines into U516-518. The latch enables are provided by NOR-ing the Latch enable outputs of U509 with the write enable pin.

Button backlight LEDs are kept on at a low intensity level by 30K resistors that always allow a small amount of current through the LED (e.g. R327 for LED 9). When the button is selected, and the DSP wishes to light the button more brightly, the 30K is bypassed by, for example, Q3 and Q21, in order to turn the LED on fully and highlight the button state.

Circuit Board Layout Diagrams

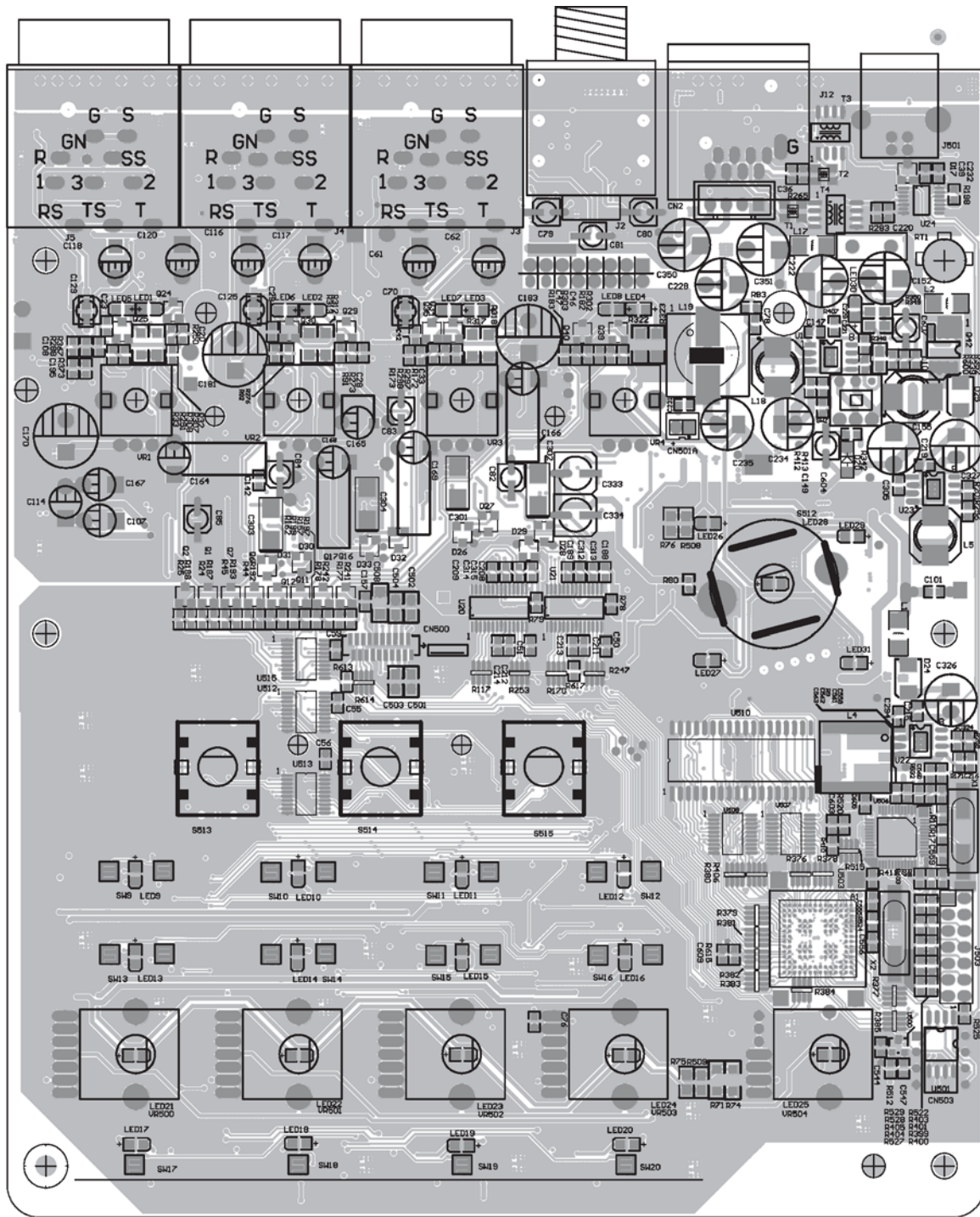


Figure 3. DSP PCB Top Component Layout and Etch

Circuit Board Layout Diagrams

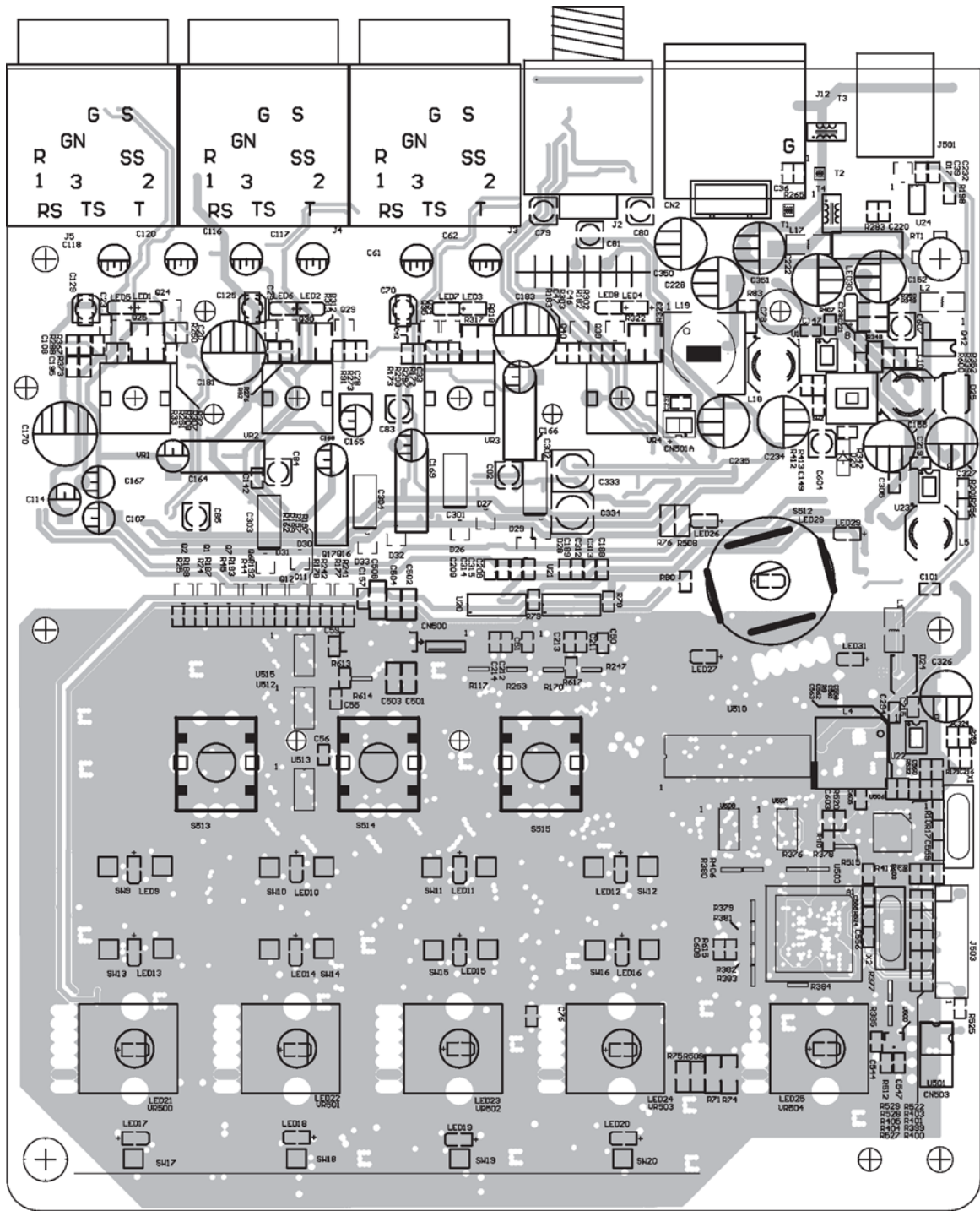


Figure 4. DSP PCB Top Component Layout and Power Layer Etch

Circuit Board Layout Diagrams

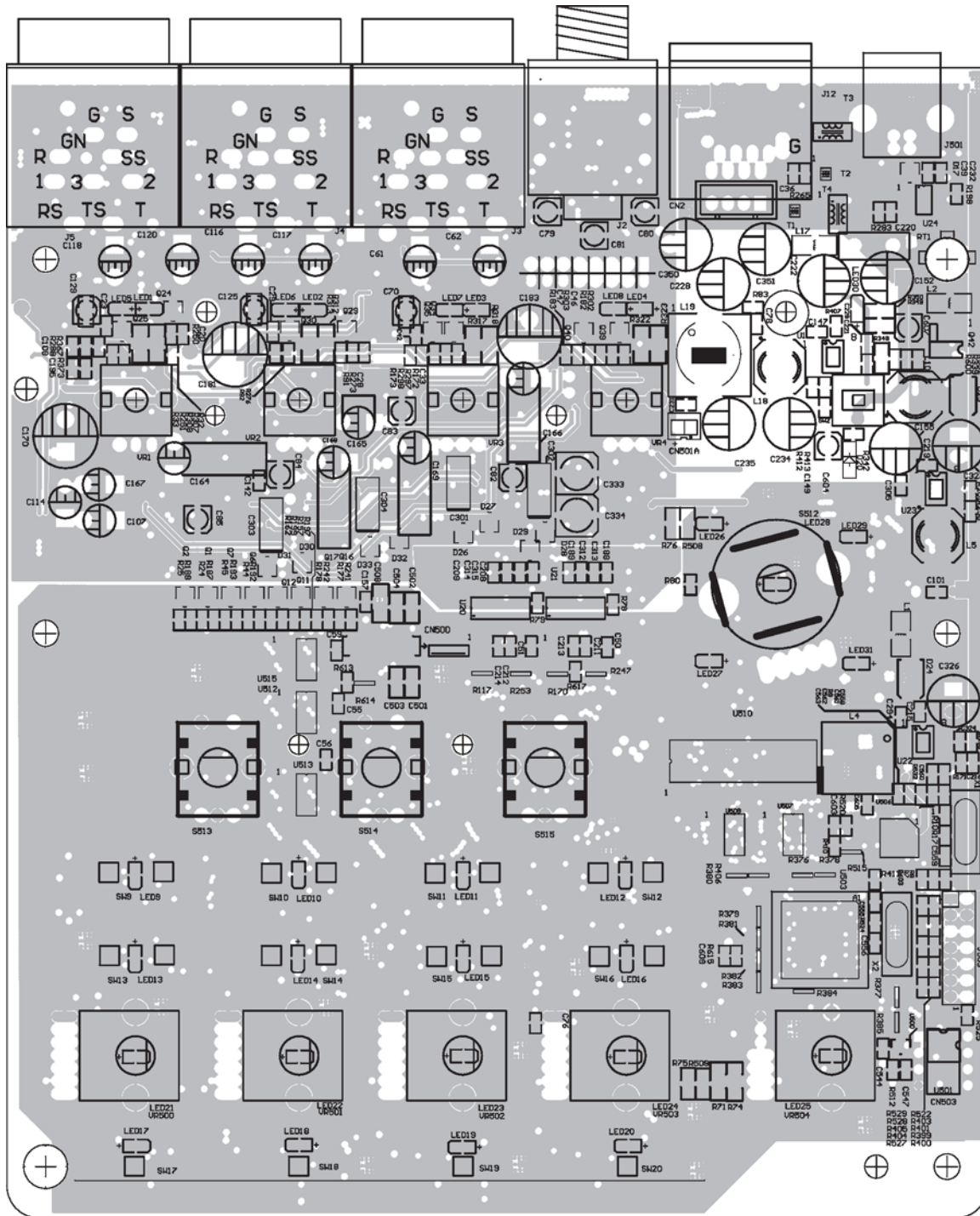


Figure 5. DSP PCB Top Component Layout and Ground Layer Etch

Circuit Board Layout Diagrams

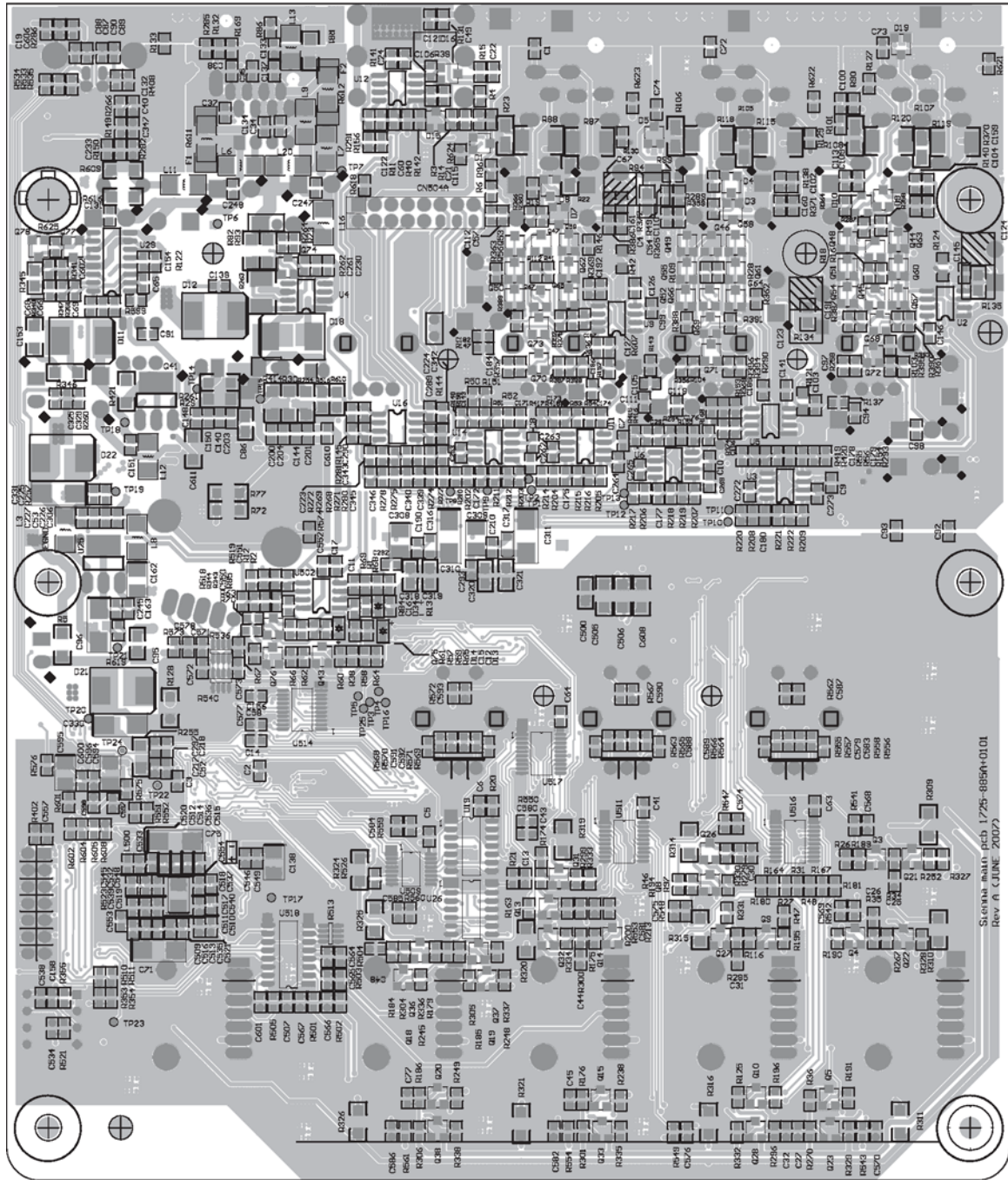


Figure 6. DSP PCB Bottom Component Layout and Etch

Circuit Board Layout Diagrams

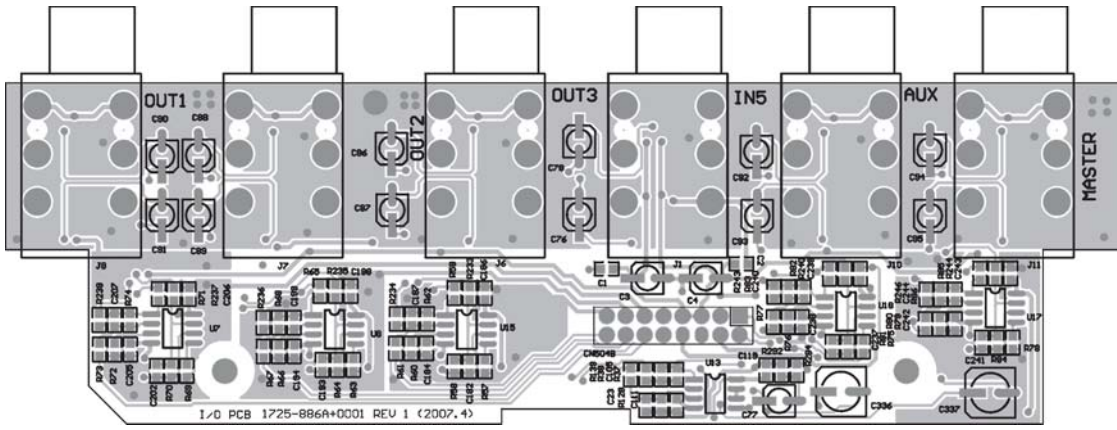


Figure 7. Input / Output PCB Top Component Layout and Etch

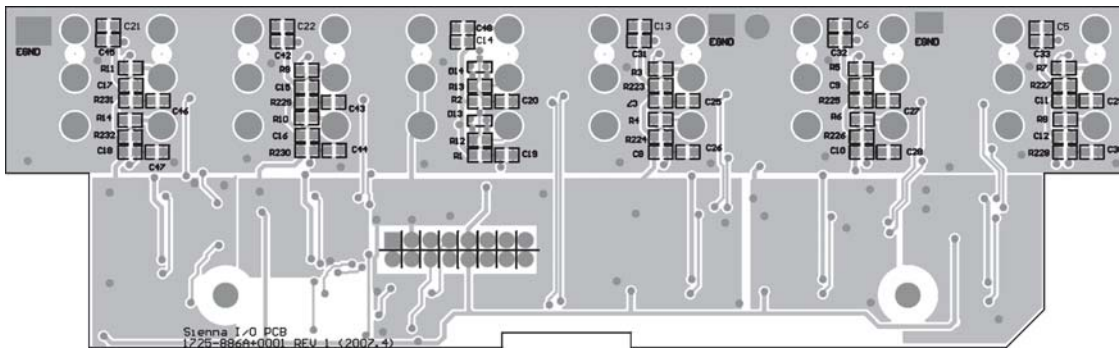
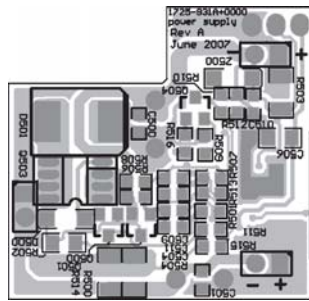
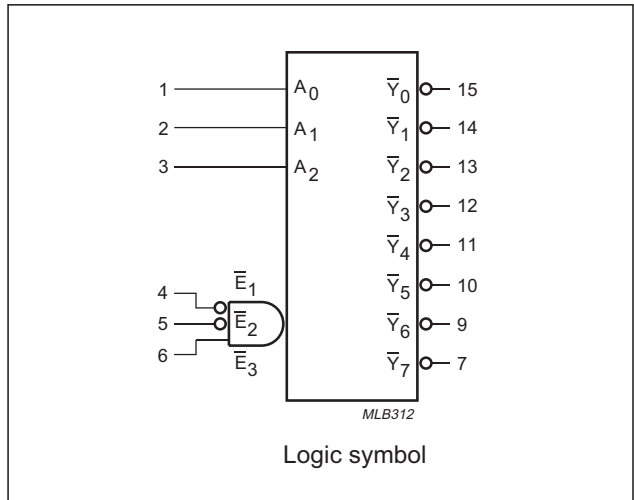
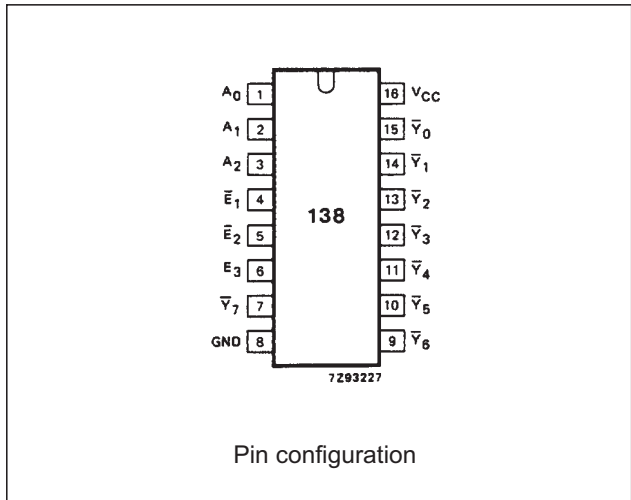


Figure 8. Input / Output PCB Bottom Component Layout and Etch



IC Diagrams



PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
1, 2, 3	A ₀ to A ₂	address inputs
4, 5	\bar{E}_1, \bar{E}_2	enable inputs (active LOW)
6	E ₃	enable input (active HIGH)
8	GND	ground (0 V)
15, 14, 13, 12, 11, 10, 9, 7	\bar{Y}_0 to \bar{Y}_7	outputs (active LOW)
16	V _{CC}	positive supply voltage

FUNCTION TABLE

INPUTS						OUTPUTS							
\bar{E}_1	\bar{E}_2	E ₃	A ₀	A ₁	A ₂	\bar{Y}_0	\bar{Y}_1	\bar{Y}_2	\bar{Y}_3	\bar{Y}_4	\bar{Y}_5	\bar{Y}_6	\bar{Y}_7
H	X	X	X	X	X	H	H	H	H	H	H	H	H
X	H	X	X	X	X	H	H	H	H	H	H	H	H
X	X	L	X	X	X	H	H	H	H	H	H	H	H
L	L	H	L	L	L	L	H	H	H	H	H	H	H
L	L	H	H	L	L	H	L	H	H	H	H	H	H
L	L	H	L	H	L	H	H	L	H	H	H	H	H
L	L	H	H	H	L	H	H	H	L	H	H	H	H
L	L	H	L	L	H	H	H	H	H	L	H	H	H
L	L	H	H	L	H	H	H	H	H	H	L	H	H
L	L	H	L	H	H	H	H	H	H	H	H	L	H
L	L	H	H	H	H	H	H	H	H	H	H	H	L

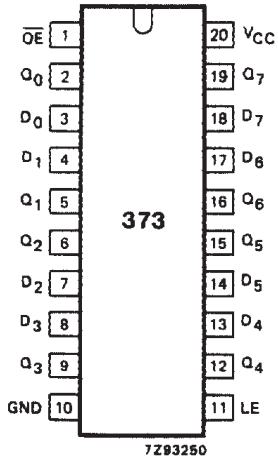
Notes

- H = HIGH voltage level
L = LOW voltage level
X = don't care

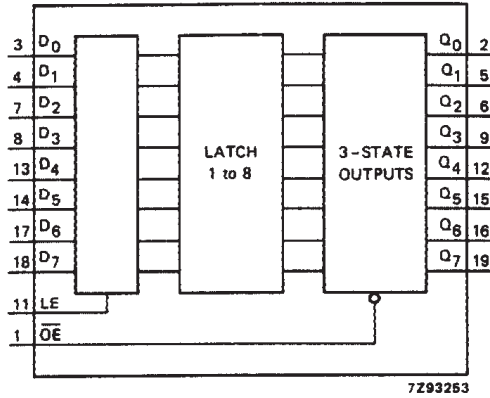
IC Diagrams

PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
1	\overline{OE}	3-state output enable input (active LOW)
2, 5, 6, 9, 12, 15, 16, 19	Q_0 to Q_7	3-state latch outputs
3, 4, 7, 8, 13, 14, 17, 18	D_0 to D_7	data inputs
10	GND	ground (0 V)
11	LE	latch enable input (active HIGH)
20	V_{CC}	positive supply voltage



Pin configuration



Functional diagram

FUNCTION TABLE

OPERATING MODES	INPUTS			INTERNAL LATCHES	OUTPUTS Q_0 to Q_7
	\overline{OE}	LE	D_n		
enable and read register (transparent mode)	L	H	L	L	L
enable and read register (transparent mode)	L	H	H	H	H
latch and read register	L	L	l	L	L
latch and read register	L	L	h	H	H
latch register and disable outputs	H	X	X	X	Z
latch register and disable outputs	H	X	X	X	Z

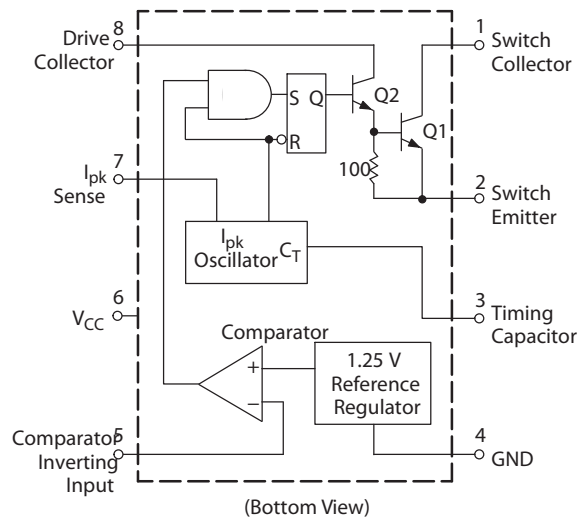
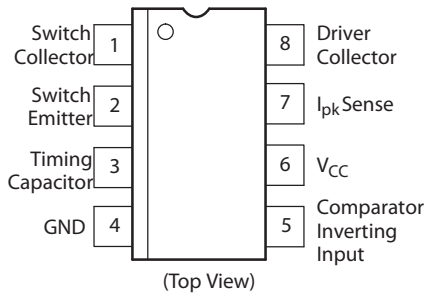
Notes

- H = HIGH voltage level
h = HIGH voltage level one set-up time prior to the HIGH-to-LOW LE transition
L = LOW voltage level
l = LOW voltage level one set-up time prior to the HIGH-to-LOW LE transition
X = don't care
Z = high impedance OFF-state

74HC373, Octal D-type latch

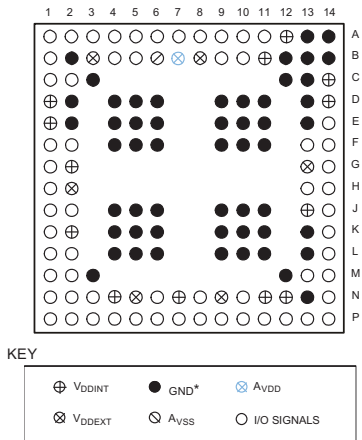


PIN CONNECTIONS

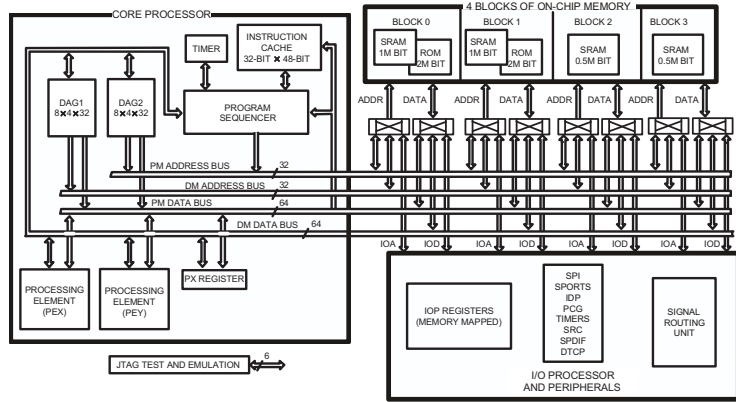


MC34063ADR2G, Inverting Switching Regulator

IC Diagrams



BGA Pin Assignments (Top View)



Functional Block Diagram—Processor Core

Pin Descriptions

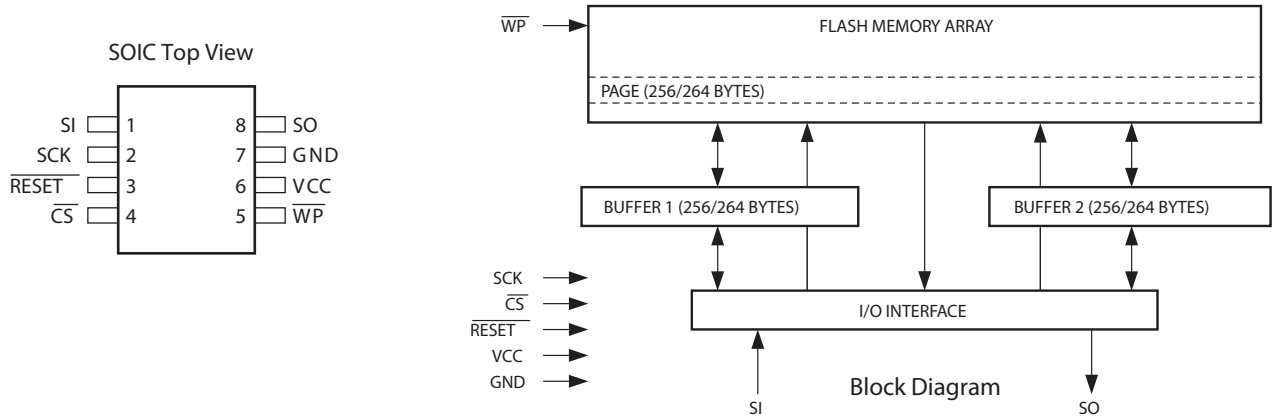
Pin	Type	State During and After Reset	Description
AD15–0	I/O/T (pu)	Three-state with pull-up enabled	Parallel Port Address/Data. The ADSP-2136x parallel port and its corresponding DMA unit output addresses and data for peripherals on these multiplexed pins. The multiplex state is determined by the ALE pin. The parallel port can operate in either 8-bit or 16-bit mode. Each AD pin has a 22.5 kΩ internal pull-up resistor.
\overline{RD}	O (pu)	Three-state, driven high ¹	Parallel Port Read Enable. \overline{RD} is asserted low whenever the processor reads 8-bit or 16-bit data from an external memory device. When AD15–0 are flags, this pin remains deasserted. \overline{RD} has a 22.5 kΩ internal pull-up resistor.
\overline{WR}	O (pu)	Three-state, driven high ¹	Parallel Port Write Enable. \overline{WR} is asserted low whenever the processor writes 8-bit or 16-bit data to an external memory device. When AD15–0 are flags, this pin remains deasserted. \overline{WR} has a 22.5 kΩ internal pull-up resistor.
ALE	O (pd)	Three-state, driven low ¹	Parallel Port Address Latch Enable. ALE is asserted whenever the processor drives a new address on the parallel port address pins. On reset, ALE is active high. However, it can be reconfigured using software to be active low. When AD15–0 are flags, this pin remains deasserted. ALE has a 20 kΩ internal pull-down resistor.
FLAG3–0	I/O/A	Three-state	Flag Pins. Each flag pin is configured via control bits as either an input or output. As an input, it can be tested as a condition. As an output, it can be used to signal external peripherals. These pins can be used as an SPI interface slave select output during SPI mastering. These pins are also multiplexed with the \overline{IRQx} and the TIMEXP signals.
DAI_P20–1	I/O/T (pu)	Three-state with programmable pull-up	Digital Audio Interface Pins. These pins provide the physical interface to the SRU. The SRU configuration registers define the combination of on-chip peripheral inputs or outputs connected to the pin and to the pin's output enable. The configuration registers of these peripherals then determines the exact behavior of the pin. Any input or output signal present in the SRU may be routed to any of these pins. The SRU provides the connection from the serial ports, input data port, precision clock generators and timers, sample rate converters and SPI to the DAI_P20–1 pins. These pins have internal 22.5 kΩ pull-up resistors which are enabled on reset. These pull-ups can be disabled in the DAI_PIN_PULLUP register.
SPICLK	I/O (pu)	Three-state with pull-up enabled	Serial Peripheral Interface Clock Signal. Driven by the master, this signal controls the rate at which data is transferred. The master may transmit data at a variety of baud rates. SPICLK cycles once for each bit transmitted. SPICLK is a gated clock that is active during data transfers, only for the length of the transferred word. Slave devices ignore the serial clock if the slave select input is driven inactive (HIGH). SPICLK is used to shift out and shift in the data driven on the MISO and MOSI lines. The data is always shifted out on one clock edge and sampled on the opposite edge of the clock. Clock polarity and clock phase relative to data are programmable into the SPICLK control register and define the transfer format. SPICLK has a 22.5 kΩ internal pull-up resistor.

IC Diagrams

Pin Descriptions (Continued)

Pin	Type	State During and After Reset	Description
SPIDS	I	Input only	Serial Peripheral Interface Slave Device Select. An active low signal used to select the processor as an SPI slave device. This input signal behaves like a chip select, and is provided by the master device for the slave devices. In multimaster mode the processor's SPIDS signal can be driven by a slave device to signal to the processor (as SPI master) that an error has occurred, as some other device is also trying to be the master device. If asserted low when the device is in master mode, it is considered a multimaster error. For a single-master, multiple-slave configuration where flag pins are used, this pin must be tied or pulled high to V_{DDEXT} on the master device. For processor to processor SPI interaction, any of the master processor's flag pins can be used to drive the SPIDS signal on the SPI slave device.
MOSI	I/O (O/D) (pu)	Three-state with pull-up enabled	SPI Master Out Slave In. If the ADSP-2136x is configured as a master, the MOSI pin becomes a data transmit (output) pin, transmitting output data. If the processor is configured as a slave, the MOSI pin becomes a data receive (input) pin, receiving input data. In a SPI interconnection, the data is shifted out from the MOSI output pin of the master and shifted into the MOSI input(s) of the slave(s). MOSI has a 22.5 k Ω internal pull-up resistor.
MISO	I/O (O/D) (pu)	Three-state with pull-up enabled	SPI Master In Slave Out. If the ADSP-2136x is configured as a master, the MISO pin becomes a data receive (input) pin, receiving input data. If the processor is configured as a slave, the MISO pin becomes a data transmit (output) pin, transmitting output data. In an SPI interconnection, the data is shifted out from the MISO output pin of the slave and shifted into the MISO input pin of the master. MISO has a 22.5 k Ω internal pull-up resistor. MISO can be configured as O/D by setting the OPD bit in the SPICTL register.
BOOTCFG1–0	I	Input only	Boot Configuration Select. This pin is used to select the boot mode for the processor. The BOOTCFG pins must be valid before reset is asserted.
CLKIN	I	Input only	Local Clock In. Used in conjunction with XTAL. CLKIN is the ADSP-2136x clock input. It configures the ADSP-2136x to use either its internal clock generator or an external clock source. Connecting the necessary components to CLKIN and XTAL enables the internal clock generator. Connecting the external clock to CLKIN while leaving XTAL unconnected configures the processors to use the external clock source such as an external clock oscillator. The core is clocked either by the PLL output or this clock input depending on the CLKCFG1–0 pin settings. CLKIN may not be halted, changed, or operated below the specified frequency.
XTAL	O	Output only ²	Crystal Oscillator Terminal. Used in conjunction with CLKIN to drive an external crystal.
CLKCFG1–0	I	Input only	Core/CLKIN Ratio Control. These pins set the start up clock frequency.
RSTOUT/CLKOUT	O	Output only	Local Clock Out/Reset Out. Drives out the core reset signal to an external device. CLKOUT can also be configured as a reset out pin. The functionality can be switched between the PLL output clock and reset out by setting Bit 12 of the PMCTREG register. The default is reset out.
RESET	I/A	Input only	Processor Reset. Resets the ADSP-2136x to a known state. Upon deassertion, there is a 4096 CLKIN cycle latency for the PLL to lock. After this time, the core begins program execution from the hardware reset vector address. The $\overline{\text{RESET}}$ input must be asserted (low) at power-up.
TCK	I	Input only ³	Test Clock (JTAG). Provides a clock for JTAG boundary scan. TCK must be asserted (pulsed low) after power-up or held low for proper operation of the processors.
TMS	I/S (pu)	Three-state with pull-up enabled	Test Mode Select (JTAG). Used to control the test state machine. TMS has a 22.5 k Ω internal pull-up resistor.
TDI	I/S (pu)	Three-state with pull-up enabled	Test Data Input (JTAG). Provides serial data for the boundary scan logic. TDI has a 22.5 k Ω internal pull-up resistor.
TDO	O	Three-state ⁴	Test Data Output (JTAG). Serial scan output of the boundary scan path.
TRST	I/A (pu)	Three-state with pull-up enabled	Test Reset (JTAG). Resets the test state machine. TRST must be asserted (pulsed low) after power-up or held low for proper operation of the ADSP-2136x. TRST has a 22.5 k Ω internal pull-up resistor.
EMU	O (O/D) (pu)	Three-state with pull-up enabled	Emulation Status. Must be connected to the processor's JTAG emulators target board connector only. EMU has a 22.5 k Ω internal pull-up resistor.
V_{DDINT}	P		Core Power Supply. Nominally +1.2 V dc for the K, B grade models, and 1.0 V dc for the Y and W grade models, and supplies the processor's core (13 pins).
V_{DDEXT}	P		I/O Power Supply. Nominally +3.3 V dc (6 pins).
A_{VDD}	P		Analog Power Supply. Nominally +1.2 V dc for the K, B grade models, and 1.0 V dc for the Y and W Grade models, and supplies the processor's internal PLL (clock generator).
A_{VSS}	G		Analog Power Supply Return.
GND	G		Power Supply Return. (54 pins)

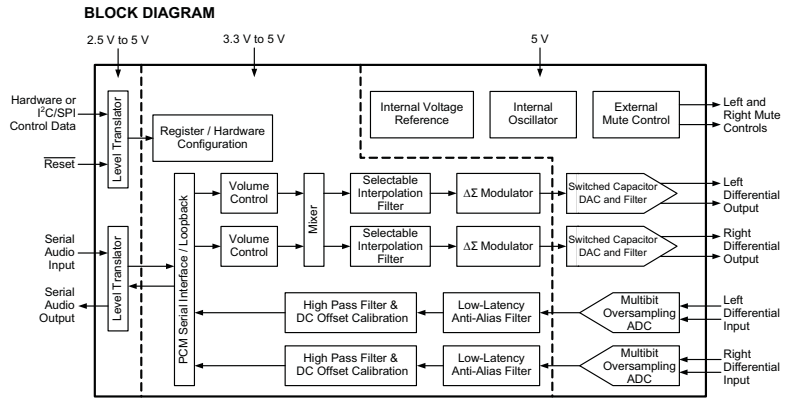
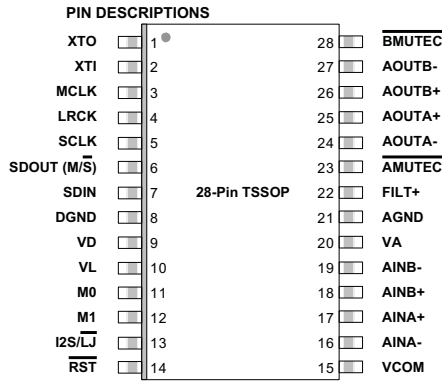
IC Diagrams



Pin Configurations

Symbol	Name and Function	Asserted State	Type
\overline{CS}	<p>Chip Select: Asserting the \overline{CS} pin selects the device. When the \overline{CS} pin is deasserted, the device will be deselected and normally be placed in the standby mode (not Deep Power-Down mode), and the output pin (SO) will be in a high-impedance state. When the device is deselected, data will not be accepted on the input pin (SI).</p> <p>A high-to-low transition on the \overline{CS} pin is required to start an operation, and a low-to-high transition is required to end an operation. When ending an internally self-timed operation such as a program or erase cycle, the device will not enter the standby mode until the completion of the operation.</p>	Low	Input
SCK	<p>Serial Clock: This pin is used to provide a clock to the device and is used to control the flow of data to and from the device. Command, address, and input data present on the SI pin is always latched on the rising edge of SCK, while output data on the SO pin is always clocked out on the falling edge of SCK.</p>	-	Input
SI	<p>Serial Input: The SI pin is used to shift data into the device. The SI pin is used for all data input including command and address sequences. Data on the SI pin is always latched on the rising edge of SCK. If the SER/BYTE pin is always driven low, the SI pin should be a "no connect".</p>	-	Input
SO	<p>Serial Output: The SO pin is used to shift data out from the device. Data on the SO pin is always clocked out on the falling edge of SCK. If the SER/BYTE pin is always driven low, the SO pin should be a "no connect".</p>	-	Output
\overline{WP}	<p>Write Protect: When the \overline{WP} pin is asserted, all sectors specified for protection by the Sector Protection Register will be protected against program and erase operations regardless of whether the Enable Sector Protection command has been issued or not. The \overline{WP} pin functions independently of the software controlled protection method. After the \overline{WP} pin goes low, the content of the Sector Protection Register cannot be modified.</p> <p>If a program or erase command is issued to the device while the \overline{WP} pin is asserted, the device will simply ignore the command and perform no operation. The device will return to the idle state once the \overline{CS} pin has been deasserted. The Enable Sector Protection command and Sector Lockdown command, however, will be recognized by the device when the \overline{WP} pin is asserted.</p> <p>The \overline{WP} pin is internally pulled-high and may be left floating if hardware controlled protection will not be used. However, it is recommended that the \overline{WP} pin also be externally connected to V_{CC} whenever possible.</p>	Low	Input
RESET	<p>Reset: A low state on the reset pin (\overline{RESET}) will terminate the operation in progress and reset the internal state machine to an idle state. The device will remain in the reset condition as long as a low level is present on the \overline{RESET} pin. Normal operation can resume once the \overline{RESET} pin is brought back to a high level.</p> <p>The device incorporates an internal power-on reset circuit, so there are no restrictions on the \overline{RESET} pin during power-on sequences. If this pin and feature are not utilized it is recommended that the \overline{RESET} pin be driven high externally.</p>	Low	Input
V_{CC}	<p>Device Power Supply: The V_{CC} pin is used to supply the source voltage to the device. Operations at invalid V_{CC} voltages may produce spurious results and should not be attempted.</p>	-	Power
GND	<p>Ground: The ground reference for the power supply. GND should be connected to the system ground.</p>	-	Ground

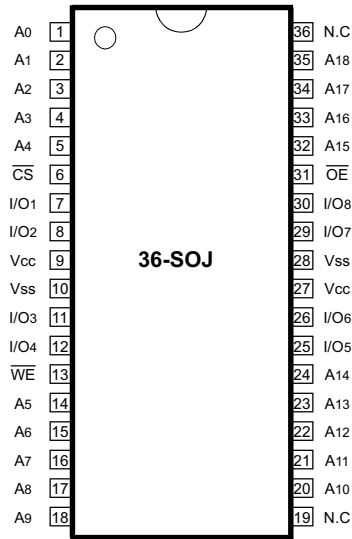
IC Diagrams



Pin Name	#	Pin Description
XTO XTI	1,2	Crystal Connections (Input/Output) - I/O pins for an external crystal which may be used to generate the master clock.
MCLK	3	Master Clock (Input/Output) - Clock source for the delta-sigma modulators.
LRCK	4	Left Right Clock (Input/Output) - Determines which channel, Left or Right, is currently active on the serial audio data line.
SCLK	5	Serial Clock (Input/Output) - Serial clock for the serial audio interface.
SDOUT (M/S)	6	Serial Audio Data Output (Output) - Output for two's complement serial audio data. This pin must be pulled-up or pulled-down to select Master or Slave Mode.
SDIN	7	Serial Audio Data Input (Input) - Input for two's complement serial audio data.
DGND	8	Digital Ground (Input) - Ground reference for the internal digital section.
VD	9	Digital Power (Input) - Positive power for the internal digital section.
VL	10	Logic Power (Input) - Positive power for the digital input/output interface.
M0	11	Mode Select 0 (Input) - In conjunction with M1, selects operating mode. Functionality is described in the Hardware Mode Speed Configuration table.
M1	12	Mode Select 1 (Input) - In conjunction with M0, selects operating mode. Functionality is described in the Hardware Mode Speed Configuration table.
I ² S/LJ	13	Serial Audio Interface Select (Input) - Selects either the left-justified or I ² S format for the Serial Audio Interface.
RST	14	Reset (Input) - The device enters a low power mode when this pin is driven low.
VCOM	15	Common Mode Voltage (Output) - Filter connection for internal common mode voltage.
AINA- AINA+ AINB+ AINB-	16, 17, 18, 19	Differential Analog Input (Input) - The full scale differential input signals are presented to the delta-sigma modulators. The full scale level is specified in the ADC Analog Characteristics specification table.
VA	20	Analog Power (Input) - Positive power for the internal analog section.
AGND	21	Analog Ground (Input) - Ground reference for the internal analog section.
FILT+	22	Positive Voltage Reference (Output) - Positive reference voltage for the internal sampling circuits.
AMUTE \overline{C}	23	Channel A Mute Control (Output) - This pin is active during power-up initialization, reset, muting, when master clock to left/right clock frequency ratio is incorrect, or power-down.
AOUTA- AOUTA+ AOUTB+ AOUTB-	24, 25, 26, 27	Differential Analog Audio Output (Output) - The full scale differential output level is specified in the Analog Characteristics specification table.
BMUTE \overline{C}	28	Channel B Mute Control (Output) - This pin is active during power-up initialization, reset, muting, when master clock to left/right clock frequency ratio is incorrect, or power-down.

IC Diagrams

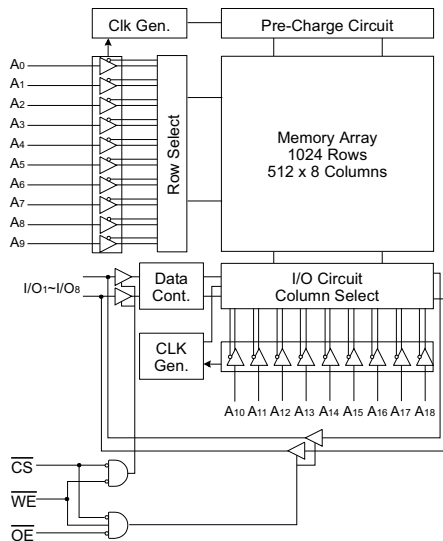
PINOUT DIAGRAM (TOP VIEW)



PIN FUNCTION

Pin Name	Pin Function
A ₀ - A ₁₈	Address Inputs
\overline{WE}	Write Enable
\overline{CS}	Chip Select
\overline{OE}	Output Enable
I/O ₁ ~ I/O ₈	Data Inputs/Outputs
V _{CC}	Power(+3.3V)
V _{SS}	Ground
N.C	No Connection

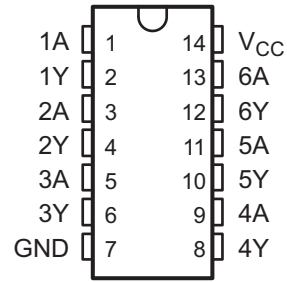
FUNCTIONAL BLOCK DIAGRAM



K6R4008V1D, SRAM

PINOUT DIAGRAM

(TOP VIEW)



LOGIC DIAGRAM, EACH INVERTER

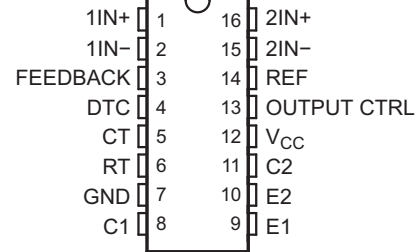


FUNCTION TABLE (EACH INVERTER)

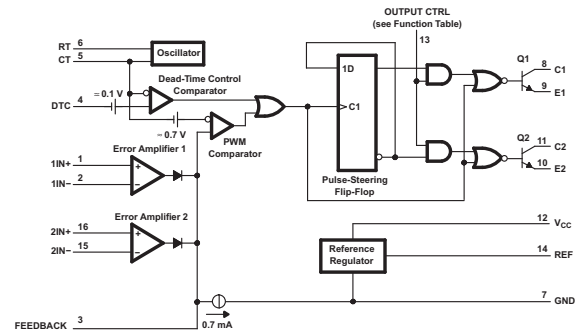
INPUT A	OUTPUT Y
H	L
L	H

SN74LVCU04A, Hex inverter

TOP VIEW



FUNCTIONAL BLOCK DIAGRAM

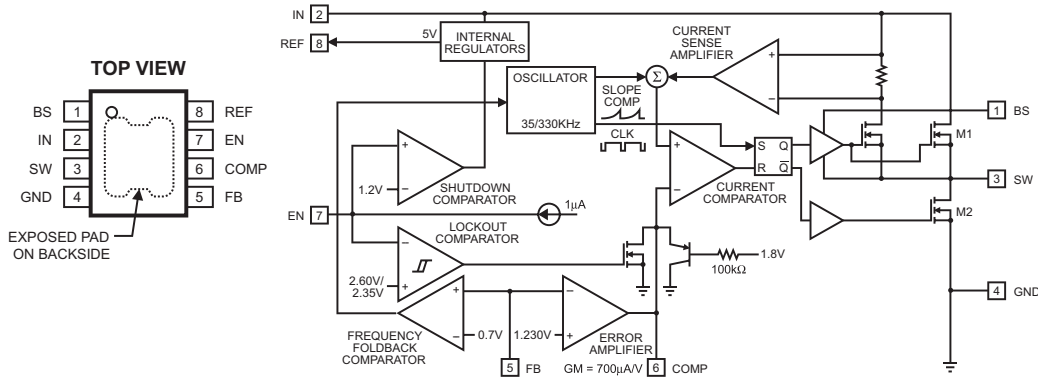


FUNCTION TABLE

INPUT TO OUTPUT CTRL	OUTPUT FUNCTION
V _I = GND	Single-ended or parallel output
V _I = V _{ref}	Normal push-pull operation

TL494, PWM Controller

IC Diagrams

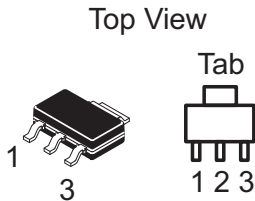


Functional Block Diagram

PIN FUNCTIONS

Pin #	Name	Description
1	BS	High-Side Gate Drive Boost Input. BS supplies the drive for the high-side N-Channel MOSFET switch. Connect a 10nF or greater capacitor from SW to BS to power the high-side switch.
2	IN	Power Input. IN supplies the power to the IC, as well as the step-down converter switches. Drive IN with a 6.5V to 32V power source. Bypass IN to GND with a suitably large capacitor to eliminate noise on the input to the IC. See <i>Input Capacitor</i> .
3	SW	Power Switching Output. SW is the switching node that supplies power to the output. Connect the output LC filter from SW to the output load. Note that a capacitor is required from SW to BS to power the high-side switch.
4	GND	Ground. For the MP1591DN, connect the Exposed Pad to pin 4.
5	FB	Feedback Input. FB senses the output voltage to regulate that voltage. Drive FB with a resistive voltage divider from the output voltage. The feedback threshold is 1.230V. See <i>Setting the Output Voltage</i> .
6	COMP	Compensation Node. COMP is used to compensate the regulation control loop. Connect a series RC network from COMP to GND to compensate the regulation control loop. In some cases, an additional capacitor from COMP to GND is required. See <i>Compensation</i> .
7	EN	Enable Input. EN is a digital input that turns the regulator on or off. Drive EN high to turn on the regulator and low to turn it off. For automatic startup, leave EN unconnected.
8	REF	Reference Output. REF is the 5V reference voltage output. It can supply up to 1mA to external circuitry. If used, bypass REF to GND with 10nF or greater capacitor. Leave REF unconnected if not used.

MP1591, 32V step-down converter

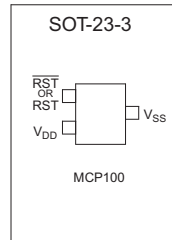


Pin: 1. Adjust/Ground
2. Output
3. Input

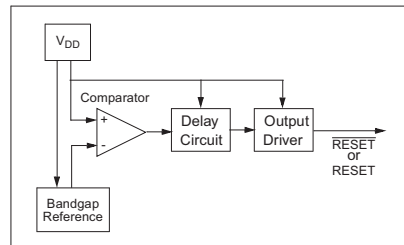
Heatsink tab is connected to Pin 2

NCP1117, Low-dropout Positive Voltage Regulator

PINOUT DIAGRAM



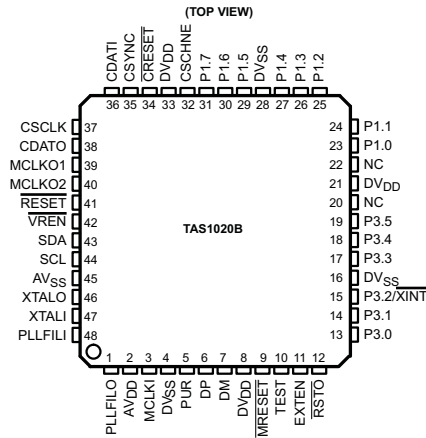
BLOCK DIAGRAM



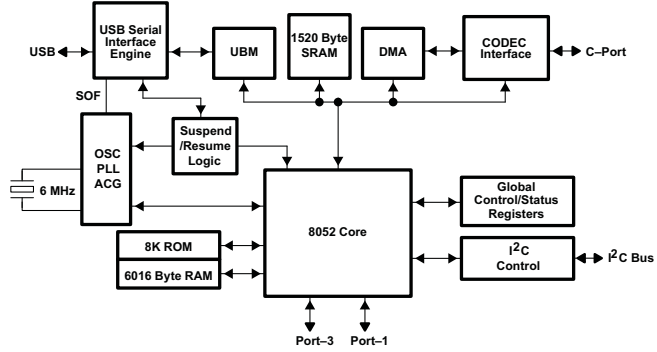
MCP100T, Reset

IC Diagrams

Terminal Assignments



Functional Block Diagram



Terminal Functions

TERMINAL			I/O	DESCRIPTION
NAME	PIN TYPE	NO.		
AVDD	Power	2		3.3-V analog supply voltage
AVSS	Power	45		Analog ground
CSCLK	CMOS	37	I/O	Codec port interface serial clock: CSCLK is the serial clock for the codec port interface used to clock the CSYNC, CDATO, CDATI, CRESET, AND CSCHNE signals.
CSYNC	CMOS	35	I/O	Codec port interface frame sync: CSYNC is the frame synchronization signal for the codec port interface.
CDATO	CMOS	38	I/O	Codec port interface serial data out
CDATI	CMOS	36	I/O	Codec port interface serial data in
CRESET	CMOS	34	I/O	Codec port interface reset output
CSCHNE	CMOS	32	I/O	Codec port interface secondary channel enable
DP	CMOS	6	I/O	USB differential pair data signal plus. DP is the positive signal of the bidirectional USB differential pair used to connect the TAS1020B device to the universal serial bus.
DM	CMOS	7	I/O	USB differential pair data signal minus. DM is the negative signal of the bidirectional USB differential pair used to connect the TAS1020B device to the universal serial bus.
DVDD	Power	8, 21, 33		3.3-V digital supply voltage
DVSS	Power	4, 16, 28		Digital ground
EXTEN	CMOS	11	I	External MCU mode enable: Input used to enable the device for the external MCU mode
MCLKI	CMOS	3	I	Master clock input. An input that can be used as the master clock for the codec port interface or the source for MCLKO2.
MCLKO1	CMOS	39	O	Master clock output 1: The output of the ACG that can be used as the master clock for the codec port interface and the codec.
MCLKO2	CMOS	40	O	Master clock output 2: An output that can be used as the master clock for the codec port interface and the codec used in I ² S modes for receive. This clock signal can also be used as a miscellaneous clock.
MRESET	CMOS	9	I	Master reset: An active low asynchronous reset for the device that resets all logic to the default state
NC		20,22		Not used
P1.[0:7]	CMOS	23, 24, 25, 26, 27, 29, 30, 31	I/O	General-purpose I/O port [bits 0 through 1]: A bidirectional 8-bit I/O port with an internal 100 μA active pullup
P3.[0:6]	CMOS	13, 14, 15, 17, 18, 19	I/O	General-purpose I/O port [bits 0 through 1]: A bidirectional I/O port with an internal 100 μA active pullup
PLLFILI	CMOS	48	I	PLL loop filter input: Input to on-chip PLL from external filter components
PLLFILO	CMOS	1	O	PLL loop filter output: Output from on-chip PLL to external filter components
PUR	CMOS	5	O	USB data signal plus pullup resistor connect. PUR is used to connect the pullup resistor on the DP signal from a high-impedance state to 3.3 V. When the DP signal is connected to 3.3-V the host PC detects the connection of the TAS1020B device to the universal serial bus.
RESET	CMOS	41	O	General-purpose active-low output which is memory mapped
RSTO	CMOS	12	O	Reset output: An output that is active while the master reset input or the USB reset is active
SCL	CMOS	44	O	I ² C interface serial clock
SDA	CMOS	43	I/O	I ² C interface serial data
TEST	CMOS	10	I	Test mode enable: Factory test mode
VREN	CMOS	42	O	General-purpose active-low output which is memory mapped
XINT	CMOS	15	I	External interrupt: An active low input used by external circuitry to interrupt the on-chip 8052 MCU
XTALI	CMOS	47	I	Crystal input: Input to the on-chip oscillator from an external 6-MHz crystal
XTALO	CMOS	46	O	Crystal Output: Output from the on-chip oscillator to an external 6-MHz crystal

TAS1020B, USB Streaming Controller

Troubleshooting

Problem	What to check
<p>T1 is plugged in, power switch is on, but no power.</p>	<p>Make sure you have power at the AC outlet. Try operating a lamp or other equipment from the same AC outlet or test the outlet using an AC outlet tester.</p> <p>If using the T1 with an L1™ model II system:</p> <ul style="list-style-type: none"> • Make sure the ToneMatch cable is properly connected to the audio engine and the L1 power stand. • Make sure the L1 power stand is turned on and the power LED is blue. <p>If using the T1 with an L1 model 1 system:</p> <ul style="list-style-type: none"> • Make sure the audio engine is properly connected to the T1 audio engine power supply. • If available, try a different audio engine power supply.
<p>T1 is on, but there is no sound.</p>	<ul style="list-style-type: none"> • Make sure the Master volume control is turned up. • Verify that the input channel(s) you want to hear are not muted. • Check that the volume control is turned up for the channel you want to hear. • Make sure the appropriate input channel trim control has been tuned up enough so that the green LED is on (indicating that there is a strong input signal). • Check the Prefs (Preference) Input and Output level meters to confirm that there is a signal at both the input and output stages. • Make sure volume control is turned up on your input source (instrument). • Connect your input source (instrument) to the audio engine using a different cable. • Plug your input source (instrument) directly into the L1™ power stand or a different amplifier to make sure the source is working. • Turn the audio engine off and wait 30 seconds. Then turn the unit on again. <p>If using the T1 with an L1 model II system:</p> <ul style="list-style-type: none"> • Turn off the power stand, re-seat the ToneMatch™ cable plug in the ToneMatch port and turn on the power stand again. • If available, try a different ToneMatch cable. If another ToneMatch cable is not available, try a standard Ethernet cable. • Connect the T1 Master output to the Analog Input on the power stand using a ¼" phone plug cable. Turn up the power stand trim control and verify that you hear sound. • Make sure the power LED on the power stand is blue. If it is red, the problem is in the power stand. <p>If using the T1 with an L1 model I system:</p> <ul style="list-style-type: none"> • Make sure the T1 Master output is connected to the Channel 3 or 4 Line IN on the power stand. Turn up the power stand Channel 3 / 4 line input level and verify that the system is producing sound. • If using the R1 remote control with the system, make sure the R1 Master volume is turned up. • Make sure the power LED on the power stand is green. If the LED is red or yellow, the problem is in the power stand.

Troubleshooting

Problem	What to check
Poor quality sound from a microphone or instrument connected to the T1.	<ul style="list-style-type: none"> • Make sure there is no unwanted zEQ or Para EQ equalization applied. • Verify that you have selected an appropriate ToneMatch engine preset for your microphone/instrument. If you do not want to use a ToneMatch engine preset, make sure ToneMatch is set to flat. • Make sure there are no unwanted effects (Comp/Gate, Mod, Delay, Reverb) on your input channel. Check the Status in the Prefs menu for any currently active effects. • Check that the T1 input Trim is adjusted properly for your microphone / instrument. The signal LED should be green; if the LED is red, lower the Trim level until it is green. • Try a different microphone or instrument cable. • Check the cable connecting your microphone or instrument to the T1 audio engine. Make sure the cable plug is fully inserted into the microphone / instrument output connector and the T1 input connector. • Check the settings (if any) on your microphone or instrument. • Check the batteries (if any) in your microphone or instrument.
Not hearing any effects.	<ul style="list-style-type: none"> • Check that you pressed the correct CH Edit button. • Make sure the FX Mute button is not pressed for the channel in question.
T1 not responding to control knobs	<ul style="list-style-type: none"> • Turn off the audio engine. Wait 30 seconds and turn the unit on again.
Master volume control has no effect.	<ul style="list-style-type: none"> • Verify that the Master output is configured for Post Master Volume operation in the Prefs menu under Master Out.
With nothing plugged into the T1 input connectors, a slight hum or buzz is heard from the L1 system.	<ul style="list-style-type: none"> • Plug the T1 and the L1 power stand into the same AC mains outlet. • Using an AC outlet tester, test the AC outlet that the T1 and/or the L1 power stand is plugged into for reversed or open hot, neutral and/or ground contacts. • If using an extension cord, make sure that the cord is also tested as above.
Too much, or not enough bass, mid-range or high frequencies.	<ul style="list-style-type: none"> • Make sure there is no unwanted zEQ or Para EQ equalization applied. • Verify that you have selected an appropriate ToneMatch engine preset for your microphone/instrument. If you do not want to use a ToneMatch engine preset, make sure ToneMatch is set to Flat in the Utility category.
Poor-sounding playback of a stereo recording using a CD player, MP3 player or other such device.	<ul style="list-style-type: none"> • Connect the left channel of the device to T1 input channel 4 and the right channel to T1 input channel 5. Channels 4 / 5 are designed for line-level inputs. • Disable any extended bass or EQ features when using CD or MP3 players. • If you are using recording software on a computer, check the software requirements. You may need to configure the software settings for 48kHz / 24-bit operation.

Troubleshooting

Problem	What to check
Poor-sounding playback of a stereo recording using a CD player, MP3 player or other such device. (cont.)	<p>If using the T1 with an L1 model I system:</p> <ul style="list-style-type: none"> • Do not use a female 1/8" stereo-to-male 1/4" stereo adapter when connecting a portable device to an input channel on the L1 model I power stand. The L1 model I input channels use a monaural (TS) connection. Use a stereo-to-mono adapter.
Microphone is encountering feedback.	<ul style="list-style-type: none"> • Orient the microphone so that it is not pointing directly at its respective L1 Cylindrical Radiator loudspeaker. • Try a different microphone. • Try a different position for the L1 system and/or the vocalist on stage. • Increase the distance from the L1 system to the microphone. • Reduce the HIGH frequencies by adjusting the zEQ on the microphone channel. • Try notching out a particular frequency that could be causing the feedback by adjusting the Para EQ on the microphone channel. • Temporarily bypass any audio effects used (Mod, Delay, Reverb) to see if they might be contributing to the feedback problem.
Aux output does not sound right.	<ul style="list-style-type: none"> • Check if the Aux output is configured for the desired tap point for each input channel. Refer to "routing input signals to the Aux input" on page 26 of the owner's guide. Note: No reverb comes from the Aux output even if the tap point is Pre or Post. • Verify that each input assigns the desired signal level to the Aux output.
Unable to send T1 audio to a computer through a USB connection.	<ul style="list-style-type: none"> • Check that the USB cable is properly connected to the audio engine and computer. • Try a different USB cable. • Make sure the audio engine is turned on. • Verify that the desired audio engine input channels are assigned to the left and right USB output channels. See "USB to PC" in the Prefs menu. • Make sure that the Trim level of the respective input channel is turned up enough so that the green LED is on, indicating that there is a strong input signal. • Check the Input and Output level meters under the Prefs menu to confirm that there is a signal at both the input and output stages. • Verify that your computer USB input is working properly by connecting another USB-compatible audio device. • If you are using recording software on a computer, check the software requirements. You may need to configure the software settings for 48kHz/24-bit operation.
Unable to send audio from a computer to the T1 via a USB connection.	<ul style="list-style-type: none"> • Check that the USB cable is properly connected to the audio engine and computer. • Try a different USB cable. • Make sure the audio engine is turned on. • Verify the computer is playing and that the audio setting is not disabled in your computer.

Troubleshooting

Problem	What to check
Unable to send audio from a computer to the T1 via a USB connection. (cont.)	<ul style="list-style-type: none"> • Check that the USB signal is assigned to the desired audio engine inputs. See “PC to USB” in the Prefs menu. • Verify that the audio engine input channels assigned to the incoming USB signal are not muted and their volume controls are turned up. • Make sure that the appropriate input channel Trim control is turned up enough so that the green LED is on (indicating that there is a strong input signal). • Check the Input and Output level meters under the Prefs menu to confirm that there is a signal at both the input and output stages. • Verify that your computer USB output is working by connecting another USB-compatible audio device. • If you are using recording software on a computer, check the software requirements. You may need to configure the software settings for 48kHz/24-bit operation.

Service Manual Revision History

Date	Revision Level	Description of Change	Change Driven By	Page(s) Affected
8/07	00	Document released at revision 00.	Service manual release	All
5/10	01	Added rubber foot part number, item 34 on main parts list, page 9.	New part number	9
3/12	02	Added Bose part numbers for high failure items to Main, DSP and I/O PCB parts lists	New part numbers	9, 14, 37-39
1/13	03	Web address change for T1 update downloads.	URL change	45

SPECIFICATIONS AND FEATURES SUBJECT TO CHANGE WITHOUT NOTICE

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