
Features

- Burr-Brown® PCM1739 (24-bit 105db SNR) Audio DAC
- Atmel 49BV1614 (1M x 16) 64-Mbit Flash Memory
- Reference Design Kit with Front Panel
- Debug and Stand-alone Modes

Description

The SAM9753PIA is a high quality stand-alone evaluation board based on the SAM9753 Integrated Digital Instrument and dedicated to digital piano and keyboard instruments.



Piano Module Reference Design and Evaluation Board for SAM9753

SAM9753PIA

Rev. 2629A–DRMSD–04/02



Hardware Configuration

The SAM9753PIA reference design kit includes a front panel designed to be connected to an 88 note velocity sensitive piano keyboard.

Operating Modes

The SAM9753PIA operates in two modes:

1. **Debug Mode:**
The board is connected to a 97PnP2 development board. The firmware can be downloaded and debugged into SRAM and the software used to program the Flash memories for stand-alone mode.
2. **Stand-alone Mode:**
In this mode the SAM9753 executes the program from the Flash memory and scans the front panel and the piano keyboard.

Connector Configuration

Table 1. SAM9753PIA Connector Configuration

Connector	Reference	Type	NAME
Midi	J1	Din	MIDI IN
	J2	DIn	MIDI OUT
	J4	DIn	MIDI THRU
Audio	J5	RCA	Rear Left Output
	J6	RCA	Rear Right Output
Power Supply	J3	9V/12V DC	DC Plug
Keyboard	JP1	2 x 10	Higher Part
	JP2	2 x 10	Lower Part
	JP3 ⁽¹⁾	1 x 4	Pedal Input
	JP4	2 x 17	Front Panel

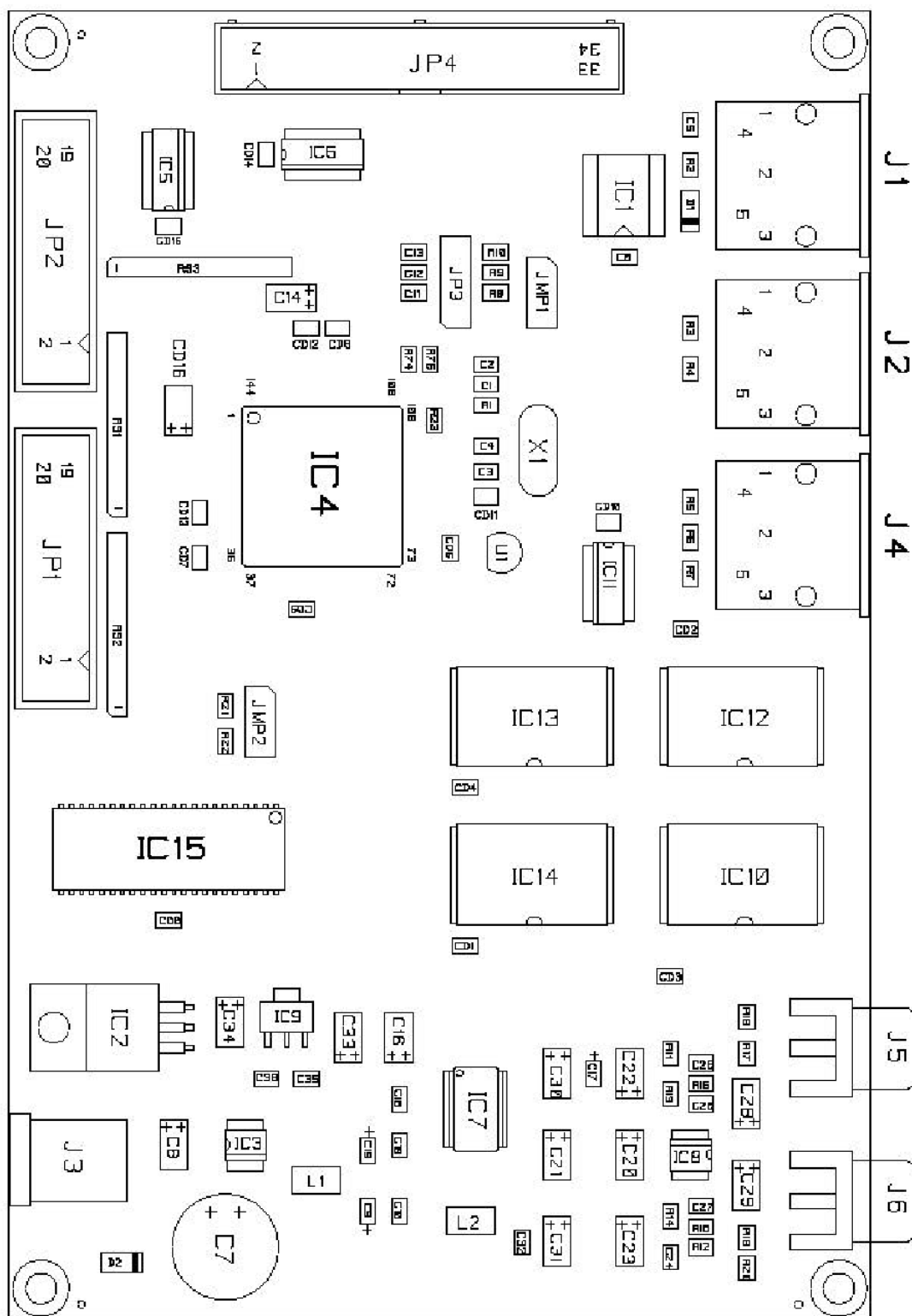
Note: 1. The JP3 connector is also used to connect the 97PnP2 board for remote debugging.

Jumper Configuration

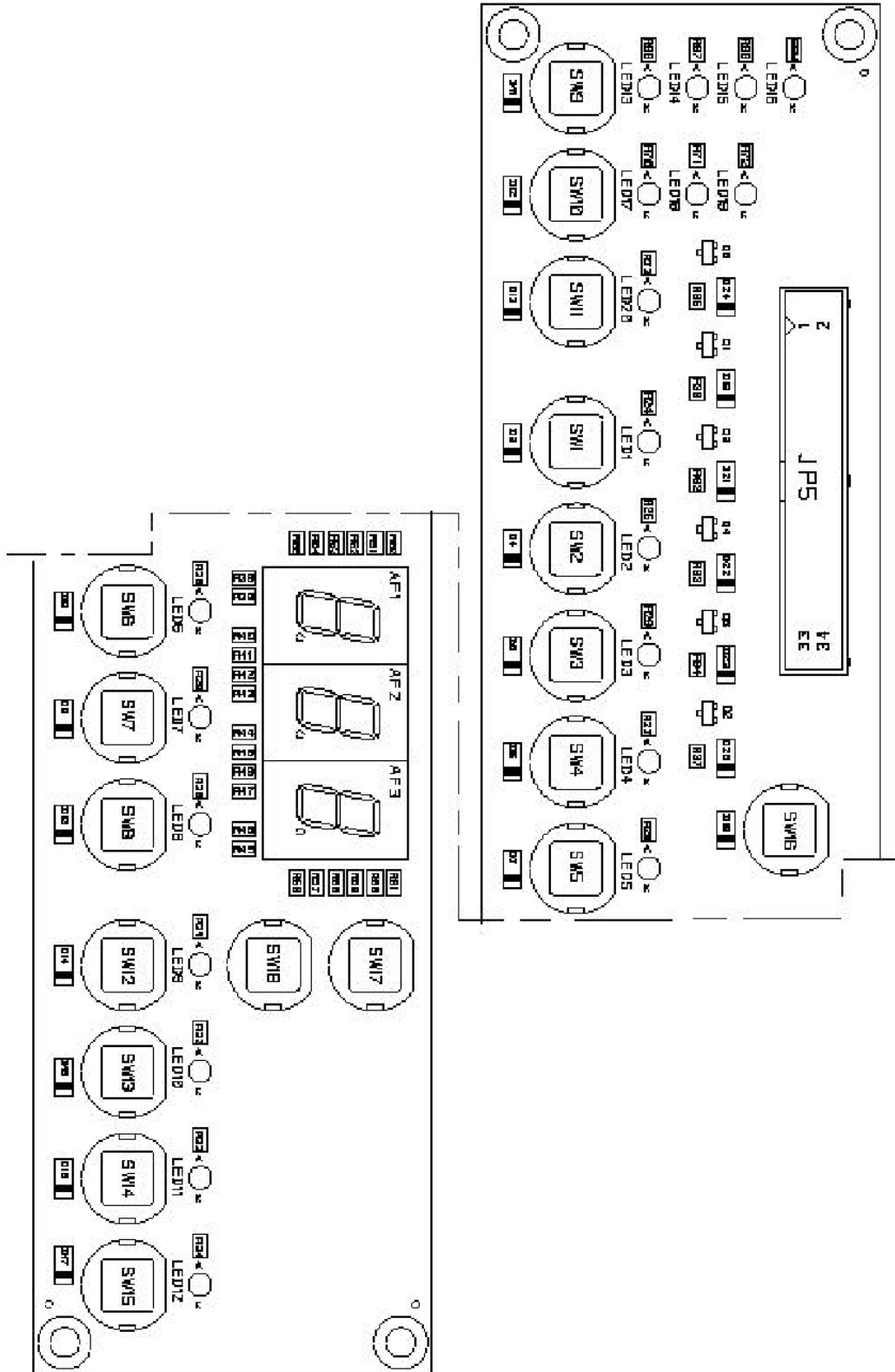
Table 2. Jumper Configuration

Reference	Default Setting	Description
JMP1	1–2	Stand Alone (1–2) or Debug Mode (2–3)
JMP2	1–2	Flash at Page 0 for Stand Alone Mode (1–2) or RAM at Page 0 for Debug Mode (2–3)

Sound Board Layout



Front Panel Layout



Parts List and Schematics

Table 4 presents the SAM9753PIA Reference Design Evaluation Board bill of materials as revised 30 November, 2000.,

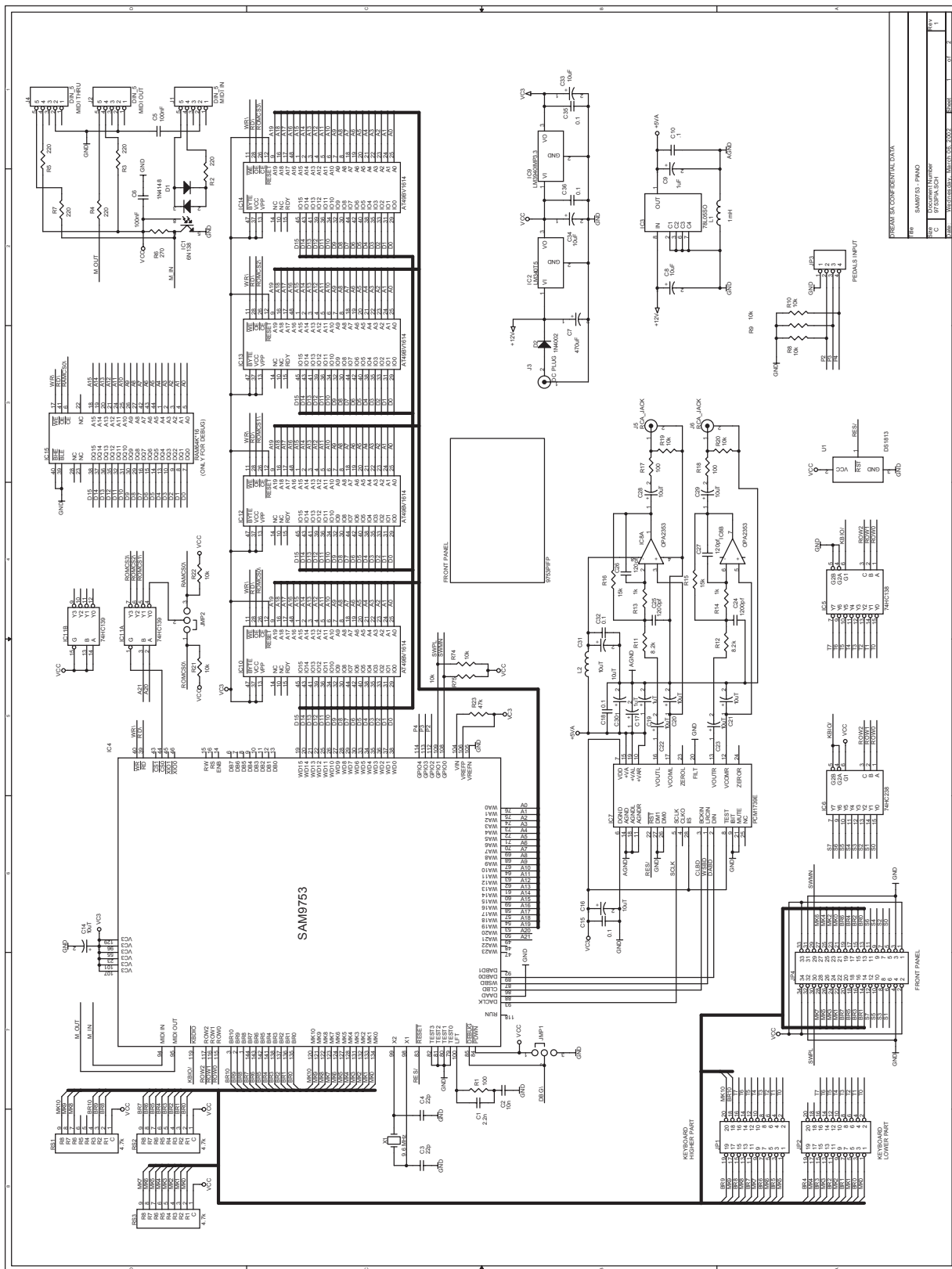
Table 3. Bill of Materials for SAM9753PIA

Item	Quantity	Reference	Part
1	3	AF1, AF2, AF3	LTS-6980HR
2	1	C1	2.2 nF
3	1	C2	10 nF
4	2	C3, C4	22 pF
5	2	C5, C6	100 nF
6	1	C7	470 μ F
7	3	C8, C33, C34	10 μ F
8	1	C9	1 μ F
9	1	C10	0.1 μ F
10	10	C14, C16, C20, C21, C22, C23, C28, C29, C30, C31	10 μ F, Tantalum
11	5	C15, C18, C32, C35, C36	0.1 μ F
12	2	C17, C19	1 μ F
13	2	C24, C25	1200 pF
14	2	C26, C27	120 pF
15	1	D1	1N4148
16	1	D2	1N4002
17	22	D3, D4, D5, D6, D7, D8, D9, D10, D11, D12, D13, D14, D15, D16, D17, D18, D19, D20, D21, D22, D23, D24	DIODE
18	1	IC1	6N138
19	1	IC2	LM340T5
20	1	IC3	78L05SO
21	1	IC4	SAM9753
22	1	IC5	74HC138
23	1	IC6	74HC238
24	1	IC7	PCM1739E
25	1	IC8	OPA2353
26	1	IC9	LM3940IMP3.3
27	4	IC10, IC12, IC13, IC14	AT49BV1614
28	1	IC11	74HC139
29	1	IC15	RAM 64K x 16
30	2	JMP1, JMP2	STRAP 2P
31	2	JP1, JP2	HEAD_10X2
32	1	JP3	HEAD_4
33	2	JP4, JP5	HEAD_17X2

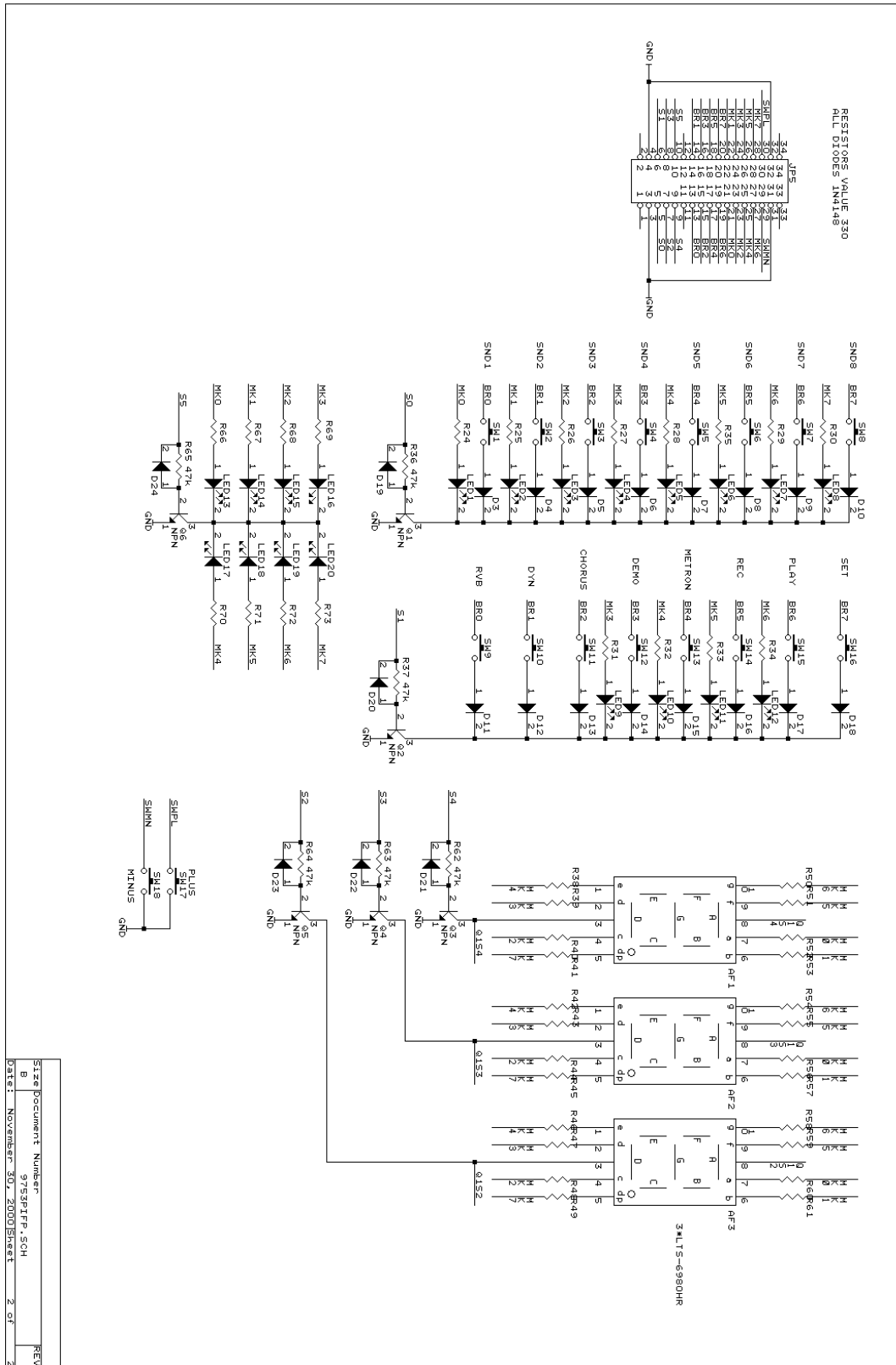
Table 3. Bill of Materials for SAM9753PIA (Continued)

Item	Quantity	Reference	Part
34	1	J1	DIN_5 MIDI
35	1	J2	DIN_5 MIDI
36	1	J3	DC PLUG
37	1	J4	DIN_5 MIDI
38	2	J5, J6	RCA_JACK
39	18	LED1, LED2, LED3, LED4, LED5, LED7, LED8, LED9, LED10, LED12, LED13, LED14, LED15, LED16, LED17, LED18, LED19, LED20,	LED
40	2	LED 6, LED11	LED
41	1	L1	1 μ H
42	1	L2	47 μ H
43	6	Q1, Q2, Q3, Q4, Q5, Q6	NPN
44	3	RS1, RS2, RS3	4.7k Ω
45	3	R1, R17, R18	100 Ω
46	5	R2, R3, R4, R5, R7	220 Ω
47	1	R6	270 Ω
48	9	R8, R9, R10, R19, R20, R21, R22, R74, R75	10k Ω
49	2	R11, R12	8.2k Ω
50	2	R13, R14	1k Ω
51	2	R15, R16	15k Ω
52	4	R23, R36, R37, R65	47k Ω
53	34	R24, R25, R38, R39, R40, R41, R42, R43, R44, R45, R46, R47, R48, R49, R50, R51, R52, R53, R54, R55, R56, R57, R58, R59, R60, R61, R66, R67, R68, R69, R70, R71, R72, R73	330 Ω
54	10	R26, R27, R28, R29, R30, R31, R32, R33, R34, R35	330 Ω
55	3	R62, R63, R64	2.2k Ω
56	18	SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8, SW9, SW10, SW11, SW12, SW13, SW14, SW15, SW16, SW17, SW18	SW_PUSH
57	1	U1	DS1813
58	1	X1	9.6 MHz

Schematic Diagram for SAM9753PIA Soundboard



Schematic Diagram for Front Panel



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