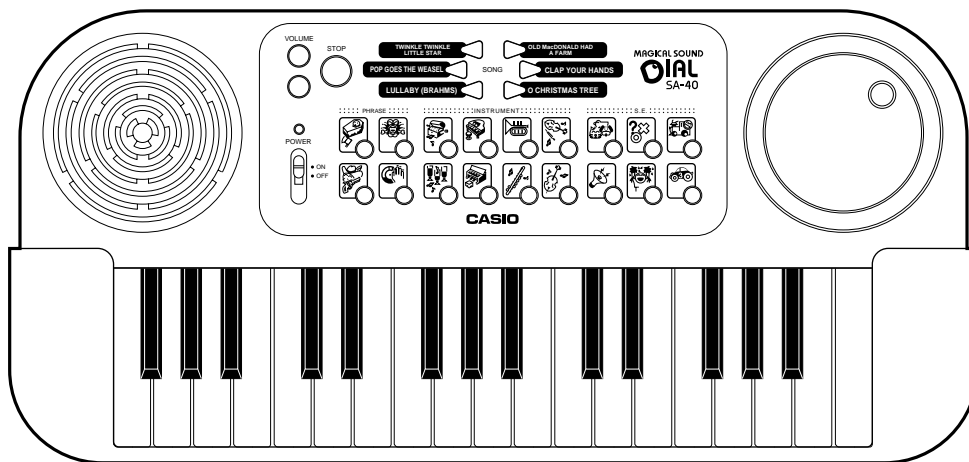


CASIO®

Service Manual

(with price)

SA-40



SA-40

ELECTRONIC KEYBOARD

INDEX

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SPECIFICATIONS

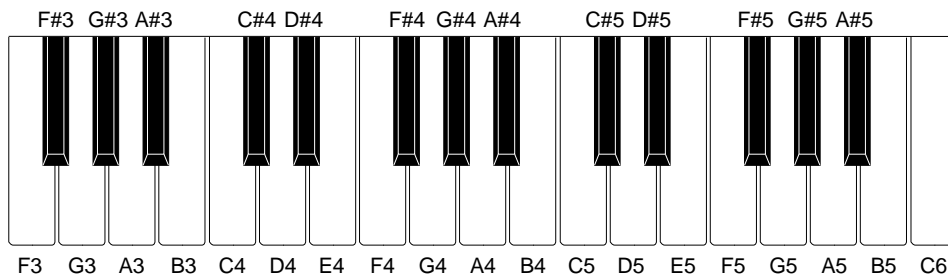
General

Number of Keys:	32
Polyphonic:	4-note
Preset Tones:	8
Preset Effects:	6
Preset Phrases:	4
Demonstration Tunes:	6
Function Dial:	Magical sound dial
Built-In Speaker:	8 cm dia. 1.0 W Input Rating: 1 pce.
Power Source:	5 AA size dry batteries Battery life: approx. 6 hours (SUM-3/R6P)
Power Consumption:	1.5 W
Dimensions (HWD):	58 x 439 x 205 mm (2-1/4 x 17-1/4 x 8-1/16 inches)
Weight:	0.99 kg (2.2 lbs) including batteries

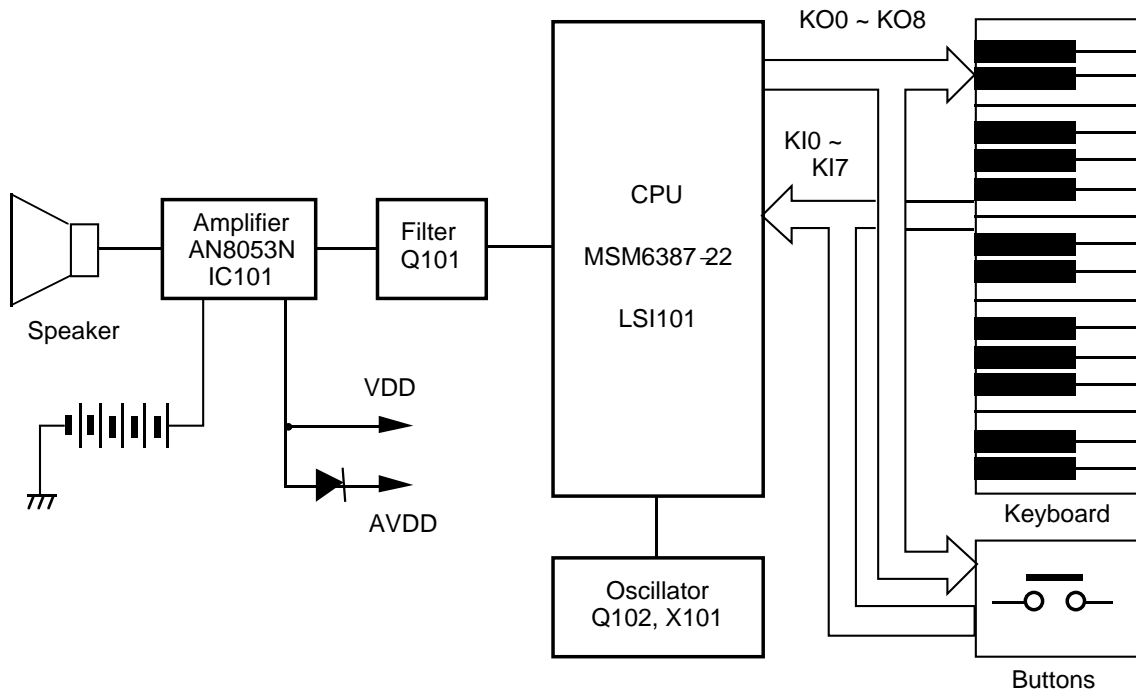
Electrical

Current Drain with 7.5 V DC:	
NoSound Output	33 mA +/-20%
Maximum Volume	170 mA +/-20%
with keys G3, A3, B3 and C4 pressed	
in Street Organ tone, Volume; Maximum	
Speaker output level at 4 Ω load:	640 mV +/-20%
with key C4 pressed in Street Organ tone	
Volume; Maximum	
Minimum Operating Voltage:	5.0 V

Nomenclature of Keys



BLOCK DIAGRAM



CIRCUIT DESCRIPTION

Key Matrix

	KI0	KI1	KI2	KI3	KI4	KI5	KI6	KI7
KO0	F3	F#3	G3	G#3	A3	A#3	B3	C4
KO1	C#4	D4	D#4	E4	F4	F#4	G4	G#4
KO2	A4	A#4	B4	C5	C#5	D5	D#5	E5
KO3	F5	F#5	G5	G#5	A5	A#5	B5	C6
KO4	Music box	Glass harp	Piano	Street organ	Trumpet	Flute	Violin	Wood bass
KO5			Volume Up	Train	Car	Quiz	Cheer	Animal
KO6		Volume Down	Stop	Siren	Horror	Country western	Carnival	Rap
KO7	Dial SW-A	Dial SW-B	Dial WS-C					
KO8	Song 1	Song 2	Song 3	Song 4	Song 5	Song 6		

Song 1: Twinkle Twinkle Little Stars
 Song 2: Pop Goes the Weasel
 Song 3: Lullaby (Brahms)

Song 4: Old MacDONALD Had a Farm
 Song 5: Clap Your hands
 Song 6: O Christmas Tree

CPU (LSI101: MSM6387-22)

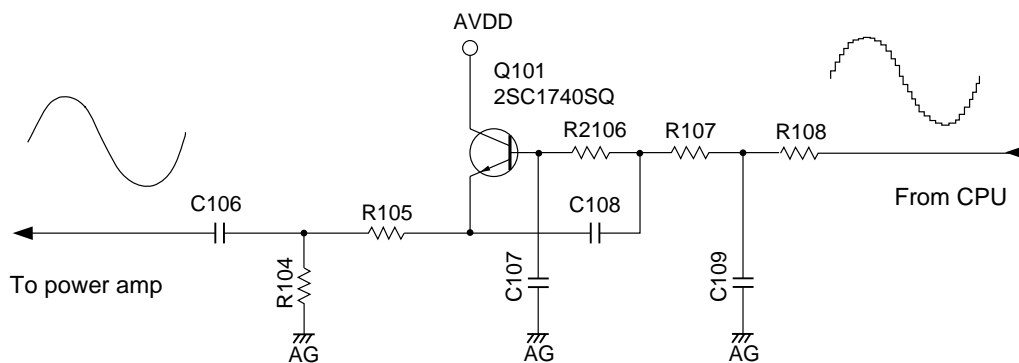
Containing a sound data ROM and a DAC (Digital to Analog Converter), the CPU provides sound waveform in accordance with the pressed key and the selected tone.

The following table shows the pin functions of LSI101.

Pin No.	Terminal	In/ Out	Function
1, 2	TEST1, TEST2	—	Not used. Connected to ground.
3	RESET	In	Power ON reset terminal. On: +5 V Off: 0 V
4	AVDD	In	+5 V source for the built-in DAC
5	OUT	Out	Sound waveform output
6	AGND	In	Ground (0 V) source for the built-in DAC
7	GND	In	Ground (0 V) source
8	COSI	In	21.725 MHz clock pulse input
9	COSO	—	Not used
10	VDD	In	+5 V source
11 ~ 18	KI0 ~ KI7	In	Input terminals from keys and switches
19, 20	KO11, KO10	—	Not used.
21 ~ 30	KO9 ~ KO0	Out	Key and switch scan signal outputs

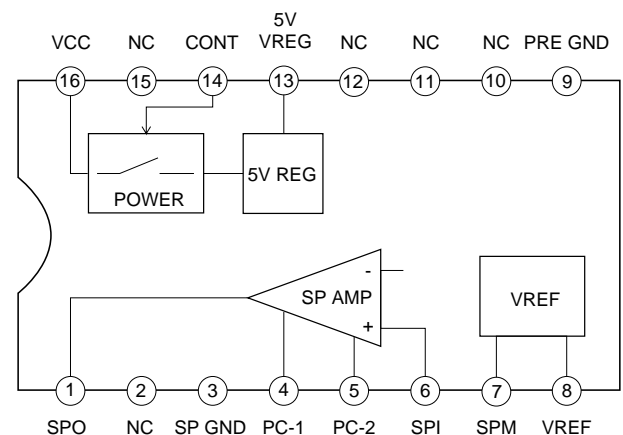
Filter Block

Since the sound signal from the CPU is a stepped waveform, the filter block is added to smooth the waveform.

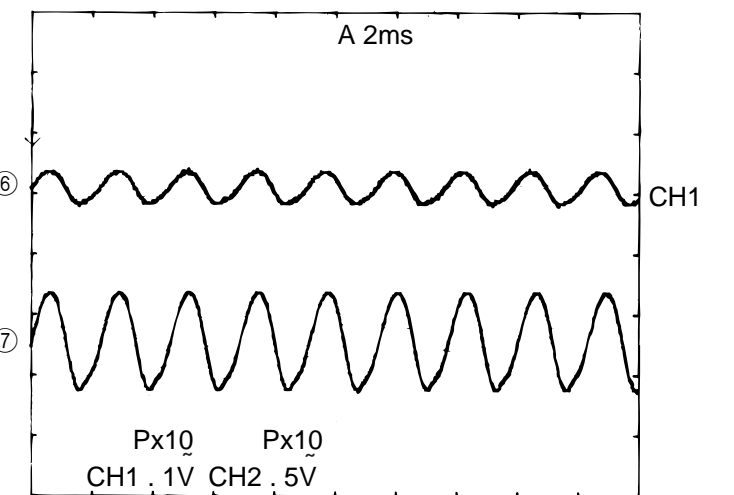
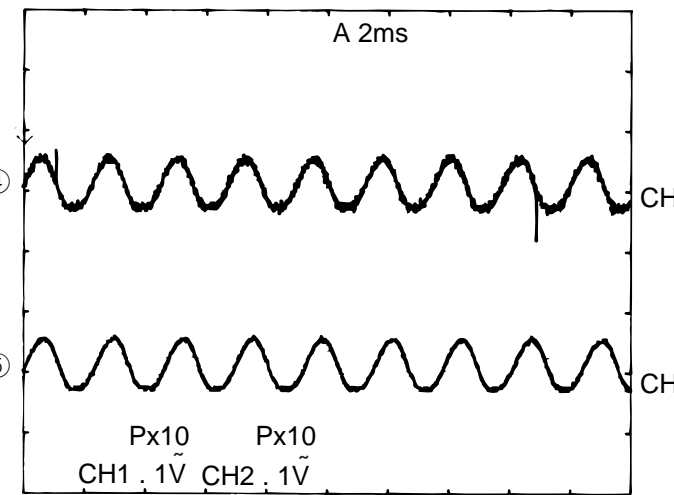
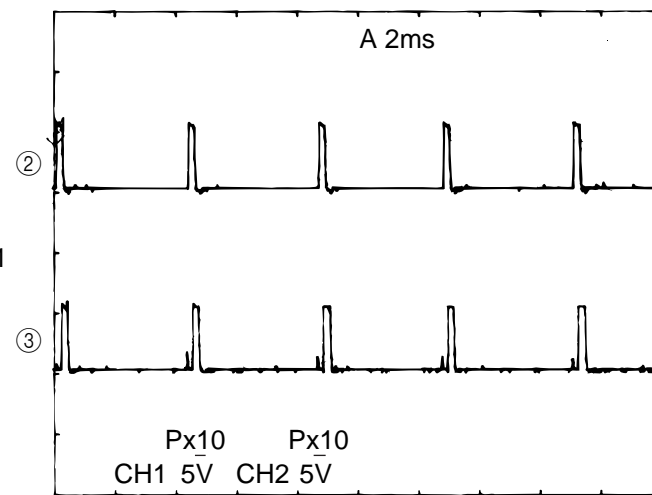
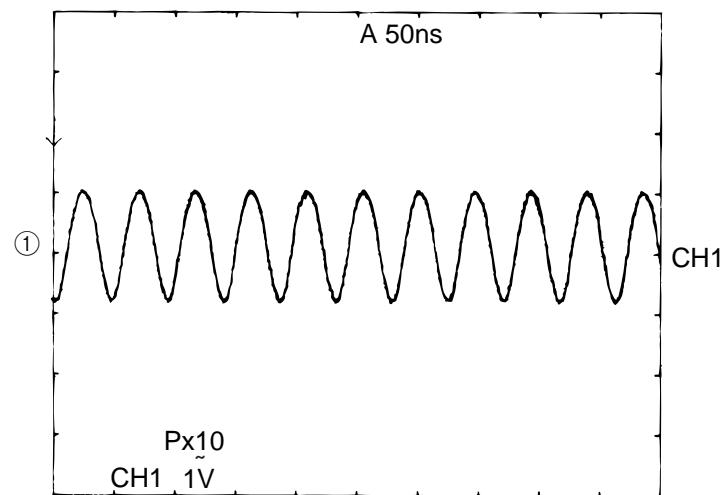
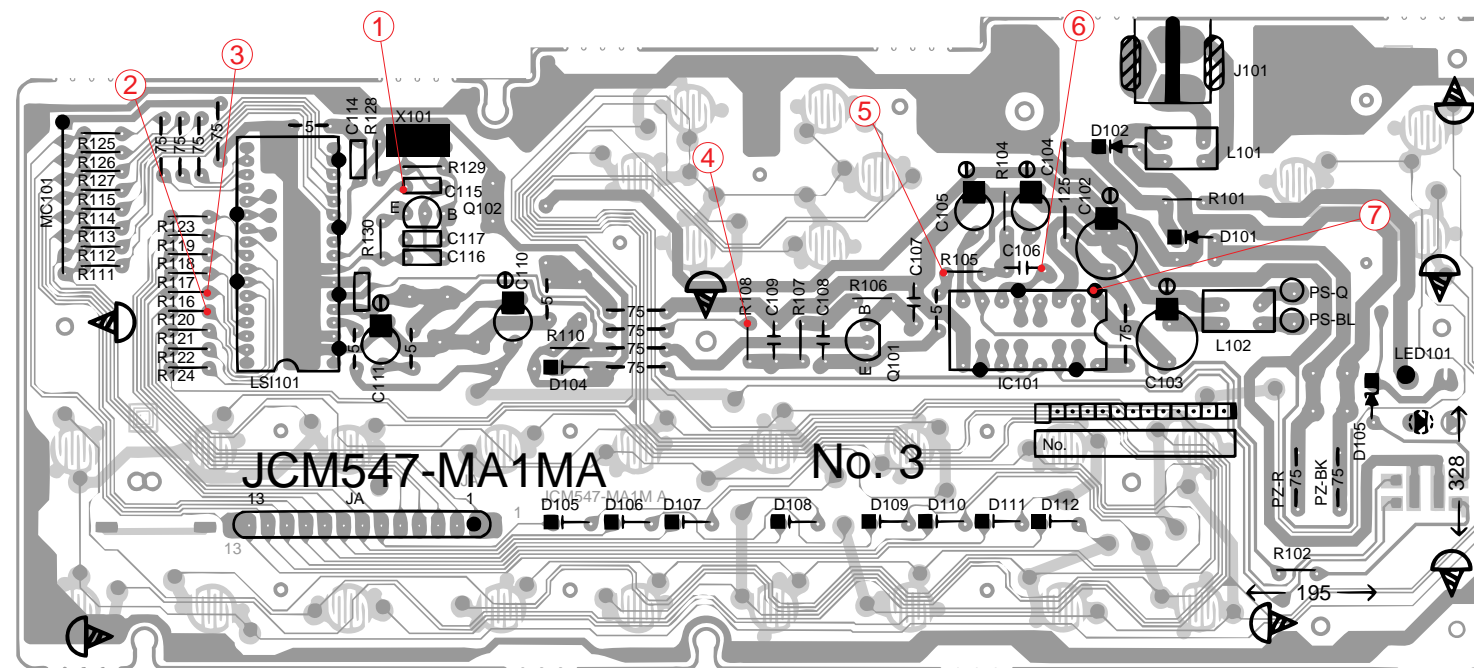


Amplifier/Voltage Regulator (IC101: AN8053N)

The right figure shows the internal block of IC101.



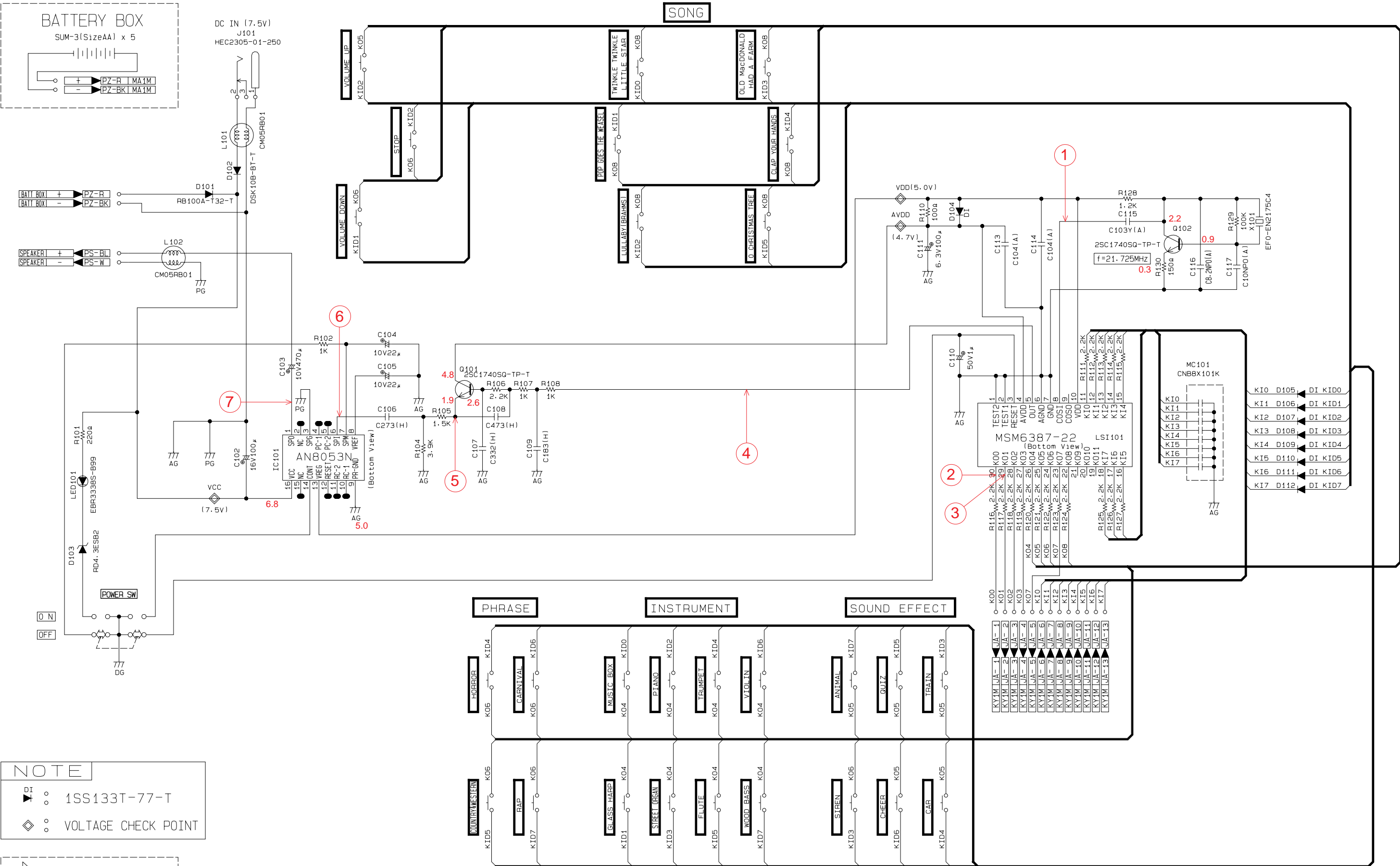
PCB VIEW AND MAJOR WAVEFORMS



Tone: Flute
Key: A4
Volume: Maximum

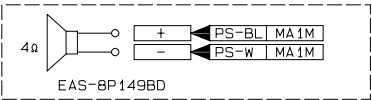
SCHEMATIC DIAGRAMS

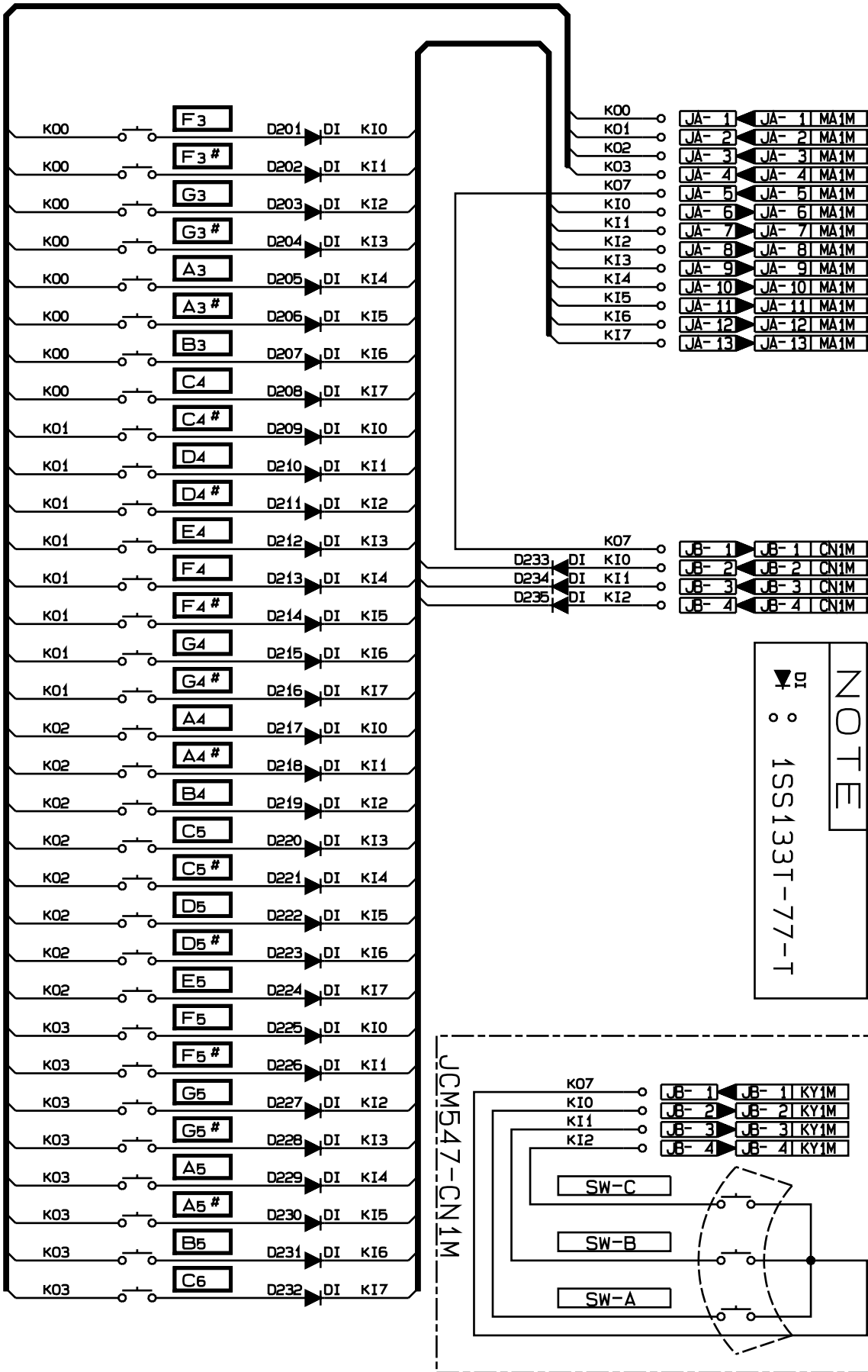
SONG



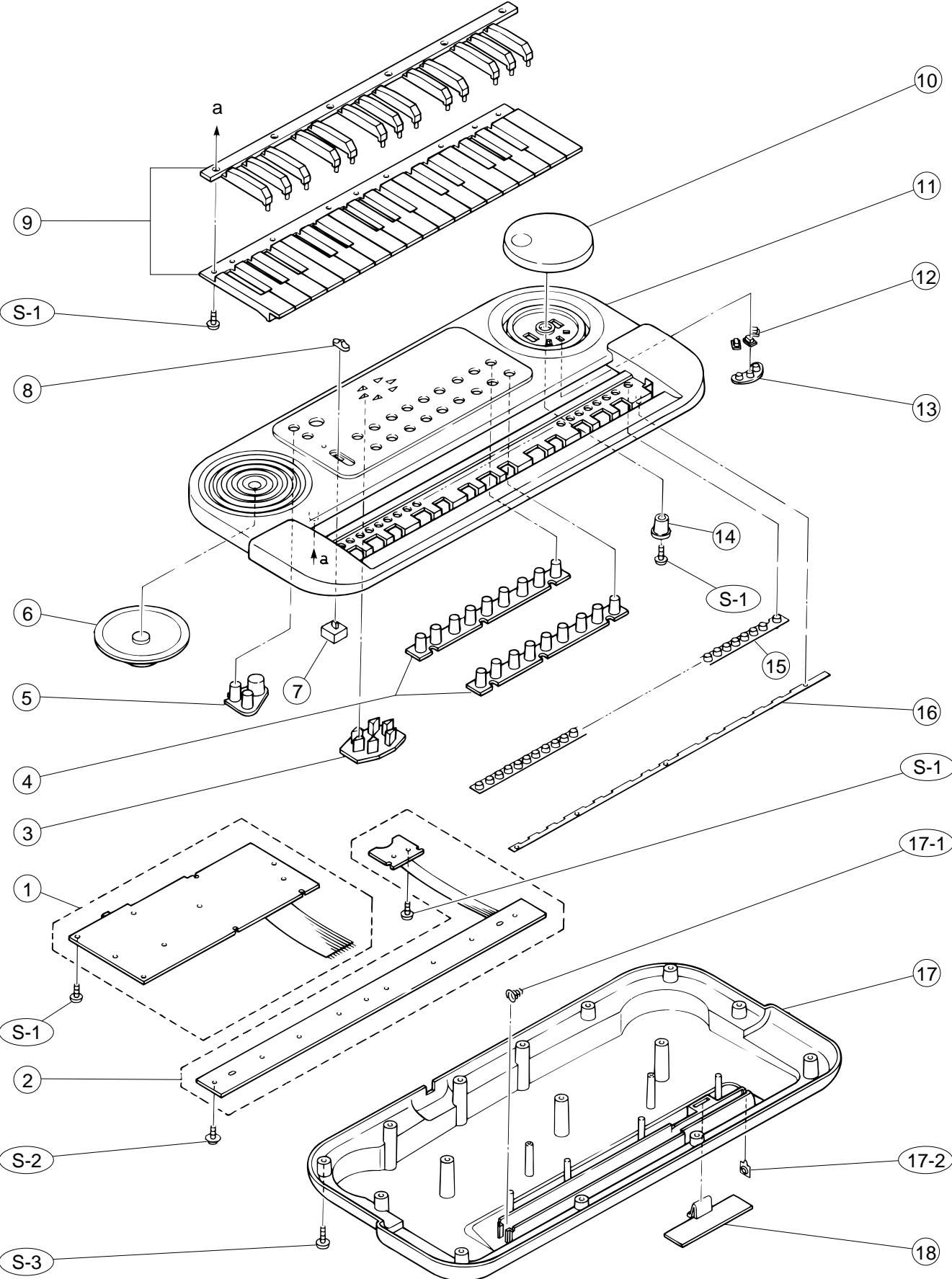
NOTE

DI : 1SS133T-77-T
 : VOLTAGE CHECK POINT





EXPLODED VIEW



PARTS LIST

SA-40

- Notes:
1. Prices and specifications are subject to change without prior notice.
 2. As for spare parts order and supply, refer to the "GUIDEBOOK for Spare parts Supply", published separately.
 3. The numbers in item column correspond to the same numbers in drawing.

PARTS LIST

N	Item	Code No.	Parts Name	Specification	Q	FOB Japan N.R.Yen Unit Price	R
Electrical Parts							
N	1	6923 3400	PCB ass'y JCM547-MA1M	M240093*1	1	1,650	B
N	LSI101	2011 9387	LSI	MSM6387-22	1	440	A
	IC101	2114 3269	IC	AN8053N	1	110	A
	Q101, Q102	2220 1387	Transistor	2SC1740SQ-TP-T	2	13	B
	D101	2390 1323	Diode	RB100A-T32-T	1	29	B
	D102	2390 0371	Diode	DSK10B-BT-T	1	11	B
	D103	2310 7848	Zener diode	RD4.3ESB2-T1-T	1	12	B
	D104 ~ D112	2390 1344	Diode	1SS133T-77-T	9	3	B
	J101	3501 3731	Power jack	HEC2305-01-250	1	30	A
N	JA	3719 4438	Ribbon cable	DF5H13080-8000M	1	26	C
	L101, L102	3841 1057	Common mode coil	CM05RB01	2	63	C
N	LED101	2370 1106	LED	MPR3338S-B99	1	24	B
	MC101	2845 0168	Module capacitor	CNB8X101K	1	58	C
N	X101	2590 1897	Ceramic oscillator	EFO-EN2175C4	1	60	B
N	2	6923 3410	PCB ass'y JCM574-KY1M	M240094*1	1	450	B
	D201 ~ D235	2390 1344	Diode	1SS133T-77-T	35	3	B
	JB	3719 4431	Ribbon cable	DF5H04105-80008000	1	15	C
N	2-1	4317 5440	Blank PCB JCM547-CN1M	M240092-2	1	49	C
Mechanical Parts							
N	3	6923 3450	Rubber button, 6-contact	M340025-1	1	120	B
N	4	6923 3440	Rubber button, 9-contact	M340024-1	2	150	B
N	5	6923 3430	Rubber button, 3-contact	M340023-1	1	90	B
	6	3831 0378	Speaker	EAS-8P149BD	1	160	B
	7	6909 5890	Slide contact	CSB-12D	1	35	B
	8	6906 7532	Slide knob	M311360-7	1	12	A
	9	6906 4374	Key set, NM	M411026D*1	1	210	A
N	10	6923 3510	Dial	M240024-1	1	100	C
N	11	6923 3542	Upper case (Light gray)	M240044B*1	1	900	C
N	11	6923 4392	Upper case (Black)	M240044B*2	1	900	C
N	12	6923 3061	Button	M340026-1	3	33	C
N	13	6923 3460	Contact rubber	M340027-1	1	40	B
N	14	6923 3520	Coupling	M340028-1	1	35	C
	15	6917 1080	Key contact rubber	M310878-1	1	87	A
	16	6917 3383	Key stopper	M42611C-3	1	24	C
N	17	6923 3531	Lower case (Light gray)	M240045A*1	1	500	C
N	17	6923 4481	Lower case (Black)	M240045A*2	1	500	C
	17-1	6912 2630	Battery spring (-)	M42382-1	1	14	B
	17-2	6345 2238	Battery spring (+)	A42606B-1	1	5	B
N	18	6906 7261	Battery cover (Light gray)	M312197A*1	1	300	B
N	18	6906 7511	Battery cover (Black)	M312197A*3	1	300	B
	S-1	1909 2682	Screw	2.6 x 8	16	2	C
	S-2	1909 4589	Screw	2.6 x 8	8	2	C
	S-3	1909 5573	Screw	2.6 x 10	15	2	C

Notes: N – New parts
M – Minimum order/supply quantity
R – Rank

Description of Capacitors

A general description of capacitors is shown in the following table.

The description consists of Type, Value, Rated Voltage and Tolerance.

When you need a capacitor, please find a substitution in your country by yourselves referring to the description.

Ref. No of Capacitor	Description
C102	Electrolytic, 100 μ F, 16 V, \pm 20%
C103	Electrolytic, 470 μ F, 10 V, \pm 20%
C104, C105	Electrolytic, 22 μ F, 10 V, \pm 20%
C106	Semiconductive, 0.027 μ F, 50 V, \pm 10%
C107	Semiconductive, 3300 pF, 50 V, \pm 10%
C108	Semiconductive, 0.047 μ F, 50 V, \pm 10%
C109	Semiconductive, 0.018 μ F, 50 V, \pm 10%
C110	Electrolytic, 1 μ F, 50 V, \pm 20%
C111	Electrolytic, 100 μ F, 6.3 V, \pm 20%
C113, C114	Ceramic, 0.1 μ F, 50 V, +80/-20%
C115	Ceramic, 0.01 μ F, 50 V, \pm 20%
C116	Ceramic, 8.2 pF, 50 V, \pm 10%
C117	Ceramic, 10 pF, 50 V, \pm 5%

Description of Resistors

A general description of resistors is shown in the following table.

The description consists of Type, Value, Rated Wattage and Tolerance.

When you need a resistor, please find a substitution in your country by yourselves referring to the description.

Note:

All resistors are carbon film, 1/5 watt, \pm 5% otherwise specified.

Ref. No of Resistor	Description
R101	220 Ω
R102, R107, R108	1 k Ω
R104	3.9 K Ω
R105	1.5 K Ω
R106, R111 ~ R127	2.2 K Ω
R110	100 Ω
R128	1.2 Ω
R129	100 K Ω
R130	150 Ω

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