

CASIO®

Service Manual

(with price)

SA-5



SA-5

ELECTRONIC KEYBOARD

INDEX

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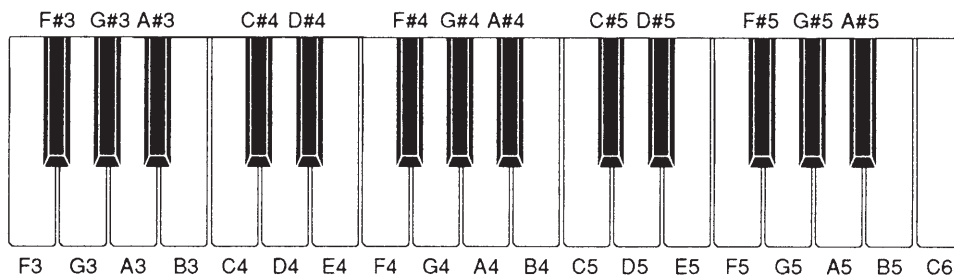
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SPECIFICATIONS

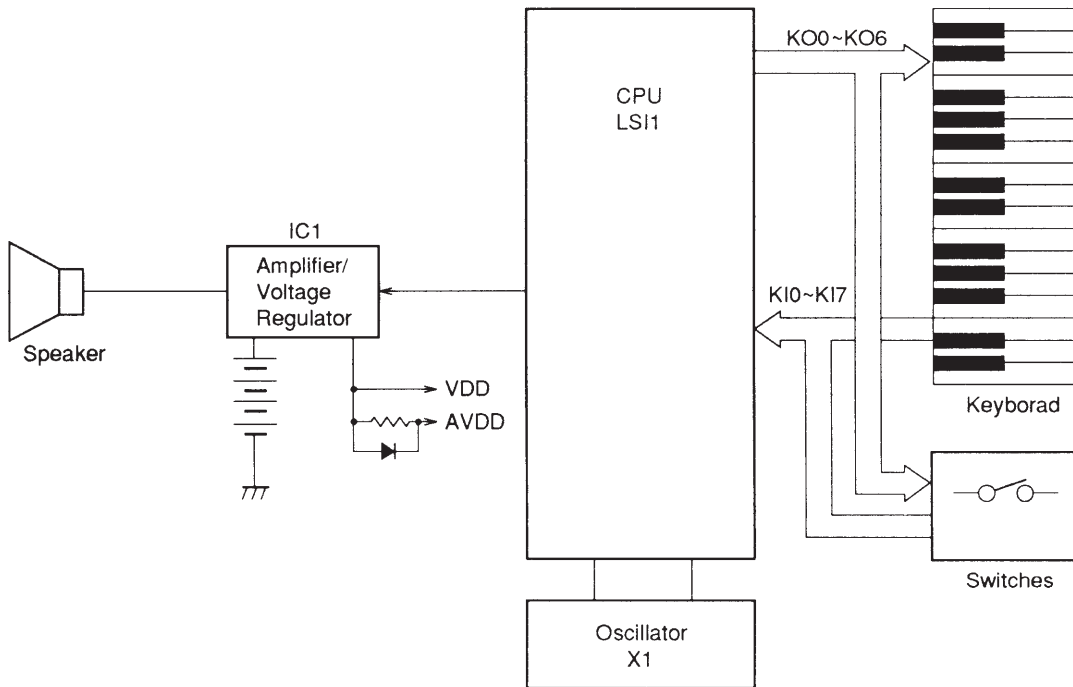
General

Number of Keys:	32 keys
Polyphonic:	2-note
Preset Tones:	25
Tone Edit Variations:	4
Patterns:	Auto-Rhythms : 8, including; 8-beat, 16-beat, Swing, Slow Rock, Shuffle, March, Samba, Waltz Accompaniments : 8, including; Rock, Pops, Jazz, Funk, House, Country, Latin, Classical Funny sounds : 8, including; Fanfare, Hopper, Computer Sound, Horror, Child's Play, Orient, Jungle, Comedy
Demonstration Tunes:	Twinkle Twinkle Little Star Oh! Susanna Lullaby (Brahms) Little Brown Jug Jingle Bells
Built-in Speaker:	6.5cm dia. 1.0W Output Rating: 1 pc.
Terminals:	Output Jack [Output Impedance: 120Ω, Output Voltage: 1.6V (rms) MAX], AC Adapter Jack (DC 7.5V)
Power Source:	2-way AC or DC source AC: AC Adapter DC: 4 AA size dry batteries
Power Consumption:	0.6W (when powered by dry batteries) 0.8W (when powered by an AC Adapter)
Dimensions:	1-5/8"(H) × 15-1/16"(W) × 4-15/16"(D) (125mm(H) × 382mm (W) × 41mm(D))
Weight:	1.1 lbs. (0.5 kg) including batteries

Nomenclature of Keys



BLOCK DIAGRAM



CIRCUIT DESCRIPTION

Key and Switch Matrix

	KO0	KO1	KO2	KO3	KO4	KO5	KO6
KI0	F3	C#4	A4	F5	Keyboard		
KI1	F#3	D4	A#4	F#5	Wind		
KI2	G3	D#4	B4	G5	String	Rhythm	
KI3	G#3	E4	C5	G#5	Synth	Accomp.	
KI4	A3	F4	C#5	A5	S.E.	Funny Accomp.	
KI5	A#3	F#4	D5	A#5	Tempo▲	Stop	
KI6	B3	G4	D#5	B5	Volume▲	Tempo▼	
KI7	C4	G#4	E5	C6	Tone Edit	Volume▼	Demo

CPU (LSI1: MSM6387-16)

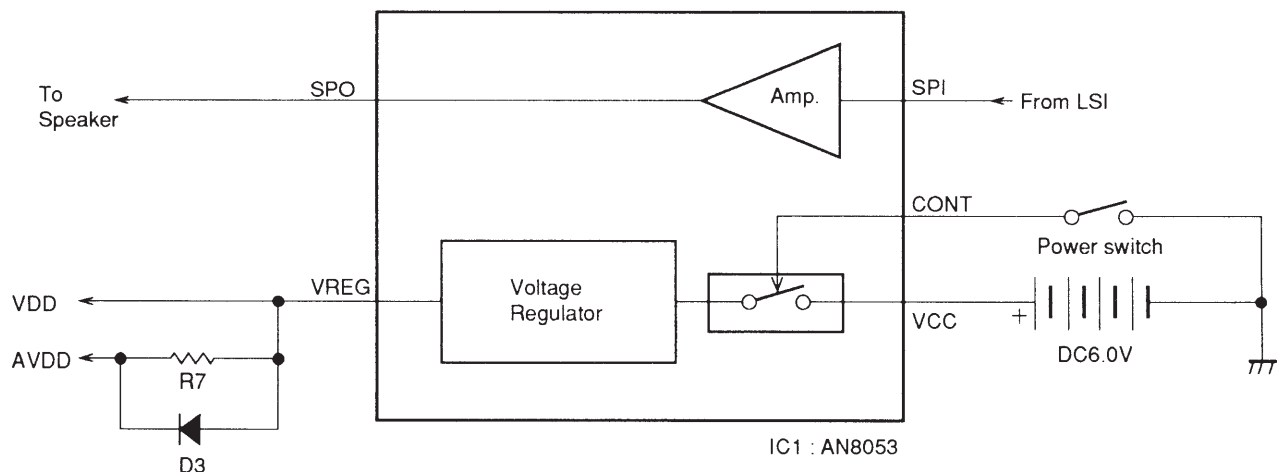
The CPU contains sound data ROM and DAC (Digital to Analog Converter), and provides the sound waveform in accordance with the pushed key and the selected tone.

The following table shows the pin function of the LSI.

Pin No.	Terminal	In/Out	Pin Function
1, 2	TEST1, TEST2	—	Not used. Connected to the ground.
3	RESET	In	Power ON Reset Terminal. When the power switch is turned on, the terminal receives low level signal and the internal circuits of the LSI are initialized.
4	AVDD	In	+5V Source for the Built-in DAC
5	OUT	Out	Sound Waveform Output
6	AGND	In	Ground (0V) Source for the Built-in DAC
7	GND	In	Ground (0V) Source
8, 9	COSI, COSO	In/Out	21.725 MHz Clock Pulse Input/Output
10	VDD	In	+5V Source
11~18	KI0~KI7	In	Input Terminals from Keys and Switches
19, 23	KO11~ KO7	—	Not used.
21~30	KO7~KO0	Out	Key and Switch Scan Signal Output

Amplifier/Voltage Regulator (IC1 : AN8053)

Consisting of an amplifier and a voltage regulator, AN8053 amplifies the sound signal from the LSI and also provides +5V DC.

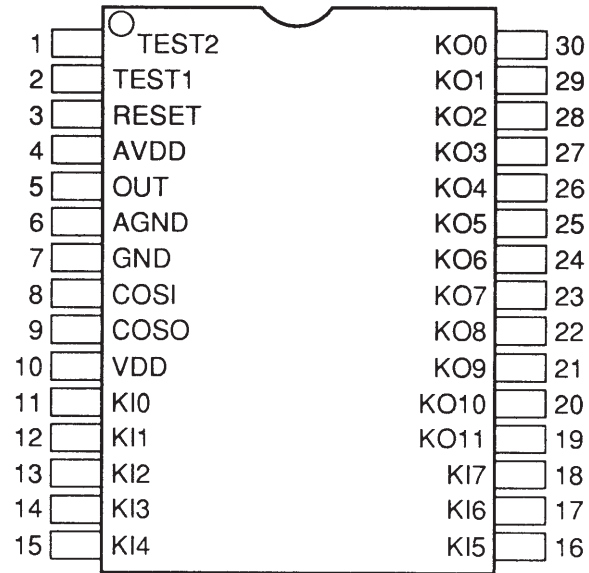


TROUBLESHOOTING

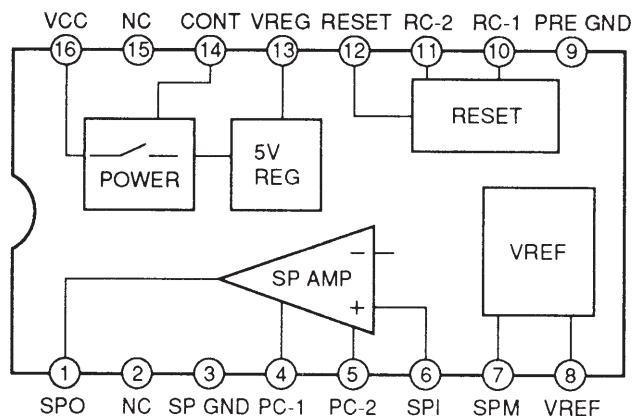
Trouble	Faulty Block	Checkpoint	
No sound at all	IC1 (AN8053)	Pin 13 should have +5V, +/- 0.5V.	
		Amplified waveform should be observed at pin 1.	
		Pin 12 should be low (zero) when power switch is turned on.	
	Power Switch	Switch Contact	
	LS11 (MSM6387)		Pins 24~30 should provide pulses.
			Pin 5 should have sound signal when keys are pushed.
	Oscillator X1	Pins 8 and 9 of the CPU should receive oscillation signal.	
Certain key(s) or switch(es) do(es) not work.	Key or Switch Contact		
	Open Circuit of KC or KI Lines		

IC LEAD IDENTIFICATION

LSI1 : MSM6387

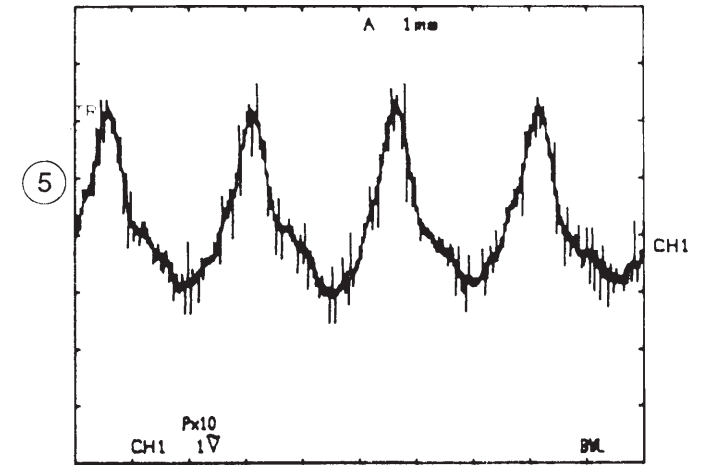
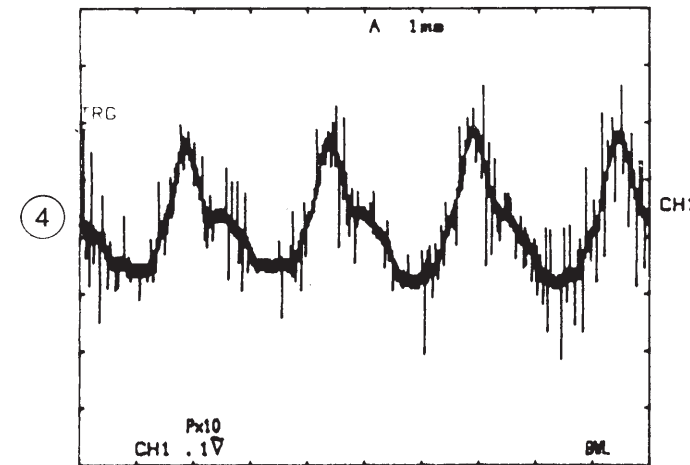
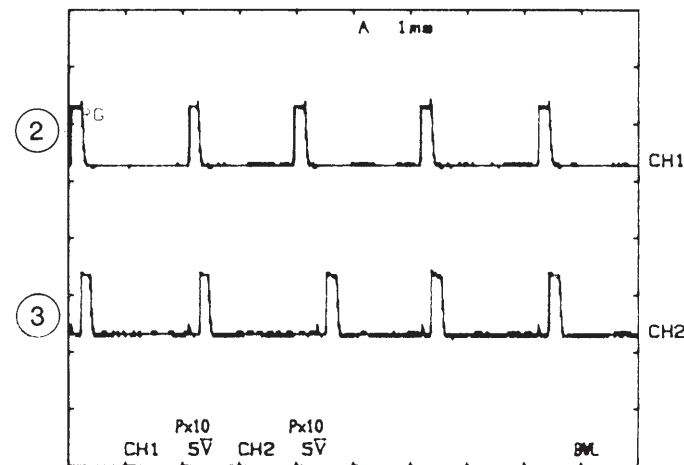
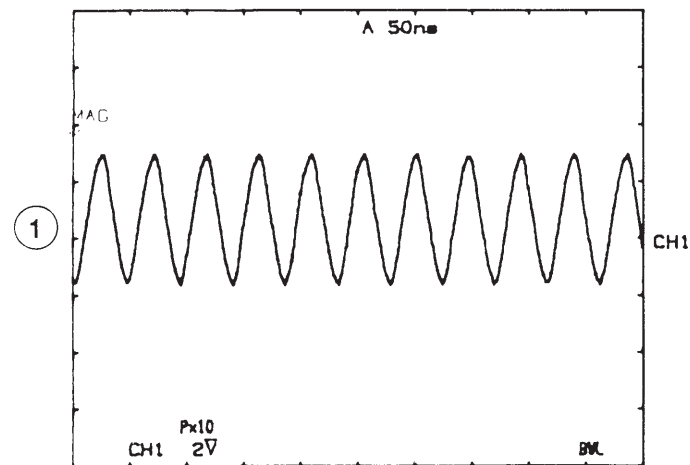
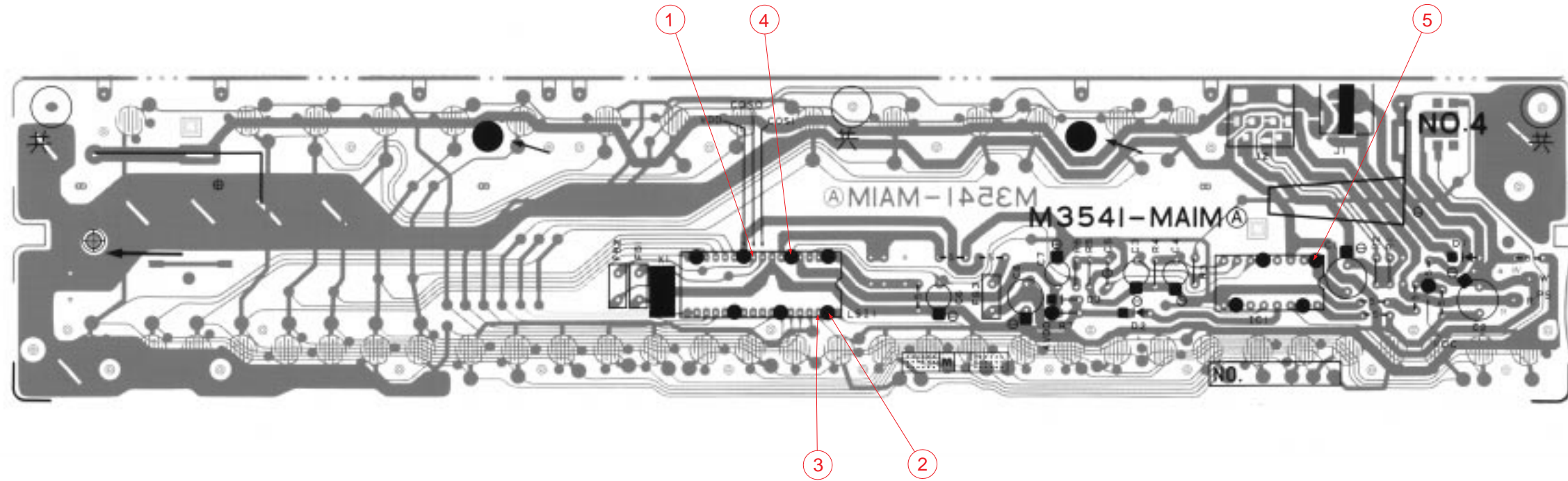


IC1 : AN8053

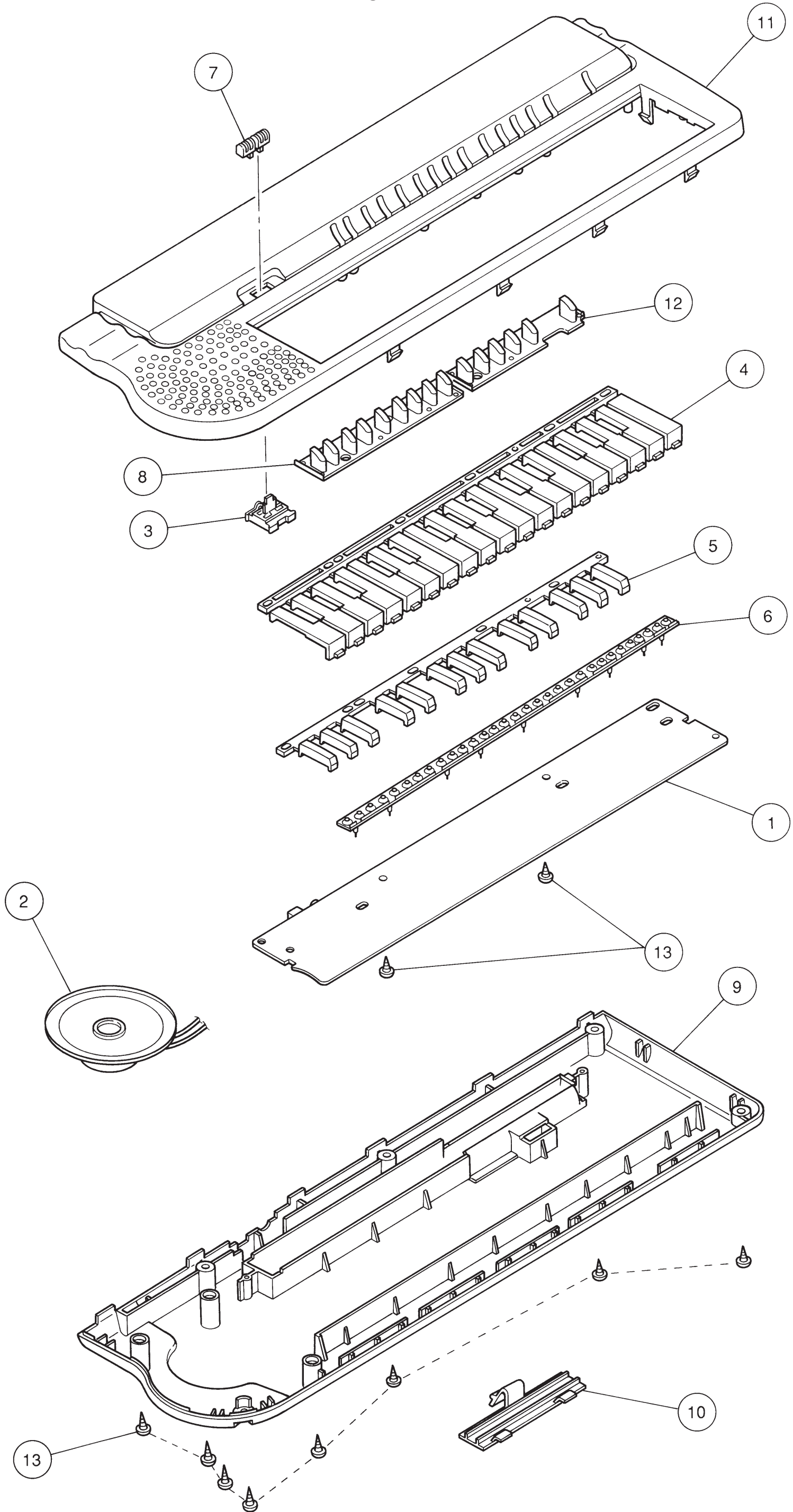


PCB VIEW & MAJOR WAVEFORM

TOP View



EXPLODED VIEW



PARTS LIST

SA-5

- 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.

RECOMMENDED SPARE PARTS

Keeping in a stock of the parts listed below, most repairs can be completed.

Note: For your stock control, the fast moving items are marked with ** and *.

** item generally moves faster than *.

New parts are marked with N.

<u>Mark</u>	<u>Code No.</u>	<u>Parts Name</u>	<u>Specification</u>	<u>Price</u>	<u>Interchangeable parts</u>
N**	2011 4767	LSI, CPU	MSM6387-16SS-K-106	520	
**	2114 1596	IC, Power amp.	AN8053	120	
*	2590 0742	Ceramic osc.	EFO-GC2175C3	65	
**	3501 3731	DC jack	HEC2305-01-250	30	
*	3501 4382	Jack	HSJ2000-01-010	56	
N *	3831 0644	Speaker	65G08BFC	120	
	6917 1591	Contact rubber	M210605A-1	80	
N**	6917 1571	White key set	M210610A-1	69	
**	6917 1580	Black key set	M210609-1	41	
N	6921 6790	Slide knob	M311913-1	9	
N *	6921 6820	Battery cover	M311910-1	12	
N *	6921 6880	Battery cover	M311910-2	12	

Assembly parts

N *	6921 6710	PCB ass'y M3541-MA1M	M211608*1	1,100	
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Note: This PCB assembly is not covered by the spare parts allowance.

The PCB assembly is not always kept in stock.

Its delivery time may be longer than usual, or it may be unavailable after discontinuing the production.

N	Item	Code No.	Parts Name	Specification	Applicable	Q	M	FOB Japan N.R.Yen Unit Price	R	*
PCB ASS'Y										
N		2011 4767	LSI	MSM6387-16SS-106	SA-5 Common	1		520	A	E
		2114 1596	Monolithic IC	AN8053	SA-5 Common	1		120	A	B
		2390 0371	Diode	DSK10B-BT-T	SA-5 Common	1	10	11	B	A
		2390 1316	Diode	SB10-04A3-BT-T	SA-5 Common	1	5	28	B	A
		2390 1344	Diode	1SS133T-77-T	SA-5 Common	1	20	3	C	A
		2590 0742	Ceramic oscillator	EFO-GC2175C3	SA-5 Common	1		65	A	B
		2606 1141	Carbon film resistor	R-20-1K-J-T23-T	SA-5 Common	1	20	2	C	A
		2606 1169	Carbon film resistor	R-20-100-J-T23-T	SA-5 Common	1	20	2	C	A
		2606 1239	Carbon film resistor	R-20-8.2K-J-T23-T	SA-5 Common	1	20	2	C	A
		2606 1274	Carbon film resistor	R-20-1.5K-J-T23-T	SA-5 Common	1	20	2	C	A
		2606 1554	Carbon film resistor	R-20-120K-J-T23-T	SA-5 Common	1	20	2	C	A
N		2606 1617	Carbon film resistor	R-20-120-J-T23-T	SA-5 Common	2	20	2	C	A
		2802 9777	Electrolytic capacitor	16RE3-470-T20-T	SA-5 Common	1	20	29	C	A
		2805 3061	Electrolytic capacitor	6.3RE2-220-T2-T	SA-5 Common	1	10	26	C	A
		2805 3134	Electrolytic capacitor	10RE2-22-T2-T	SA-5 Common	2	20	14	C	A
		2807 1023	Electrolytic capacitor	50RE2-1-T2-T	SA-5 Common	1	10	15	C	A
		2807 1091	Electrolytic capacitor	6.3RE2-100-T2-T	SA-5 Common	1	10	18	C	A
		2807 1710	Electrolytic capacitor	16RE3-220-T2-T	SA-5 Common	1	20	21	C	A
		2813 2254	Semiconductive capacitor	DD405SR333K16-T	SA-5 Common	1	20	6	C	A
		2845 3220	Ferrite beads	EXC-ELDR35V-T	SA-5 Common	3	20	12	C	A
		3501 3731	DC jack	HEC2305-01-250	SA-5 Common	1	5	30	A	A
		3501 4382	Jack	HSJ2000-01-010	SA-5 Common	1	5	56	C	B
N		4317 3570	Blank PCB M3541-MA1M	M111577-1	SA-5 Common	1		130	C	B
		6917 1762	B spring A210	M410913B-1	SA-5 Common	1		5	B	A
N		6921 6210	B spring 700B	M412171-1	SA-5 Common	1	20	12	B	A
N	1	6921 6710	PCB ass'y M3541-MA1M	M211608*1	SA-5 Common	1		1,100	B	L
CASE ASS'Y										
N	2	3831 0644	Speaker	65G08BFC	SA-5 Common	1		120	B	B
	3	6909 7380	SL contact 9D	CSB-09D	SA-5 Common	1	20	26	B	A
N	4	6917 1571	White key set M210	M210610A-1	SA-5 Common	1	5	69	A	B
	5	6917 1580	Black key set M210	M210609-1	SA-5 Common	1	10	41	A	A
	6	6917 1591	Contact rubber M210	M210605A-1	SA-5 Common	1	5	80	B	B
N	7	6921 6790	Slide knob 541	M311913-1	SA-5 Common	1	20	9	B	A
N	8	6921 6800	Rubber button 541A	M311911-1	SA-5 Common	1	5	75	C	B
N	9	6921 6810	Lower case	M111516-1	SA-5 Glay, Ivory	1		140	C	B
N	9	6921 6850	Lower case	M111516-2	SA-5 Red, Blue	1		140	C	B
N	10	6921 6820	Battery cover	M311910-1	SA-5 Glay, Ivory	1	5	12	B	A
N	10	6921 6880	Battery cover	M311910-2	SA-5 Red, Blue	1	5	12	C	A
N	11	6921 6830	Upper case	M111515-1	SA-5 Glay	1		230	C	C
N	11	6921 6860	Upper case	M111515-2	SA-5 Ivory	1		230	C	C
N	11	6921 6890	Upper case	M111515-3	SA-5 Red	1		230	C	C
N	11	6921 6900	Upper case	M111515-4	SA-5 Blue	1		230	C	C
N	12	6921 6840	Rubber button 541B	M311912-1	SA-5 Glay, Red	1	5	50	C	A
N	12	6921 6870	Rubber button 541B	M311912-2	SA-5 Ivory, Blue	1	5	50	C	A
SCREW										
N	13	5150 1101	Screw	P-Tight 2.3 x 8 ZMC	SA-5 Common	10	20	2	C	A

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

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