

CASIO®

Service Manual

(without price)

M-100



M-100

ELECTRONIC KEYBOARD

CONTENTS

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SPECIFICATIONS

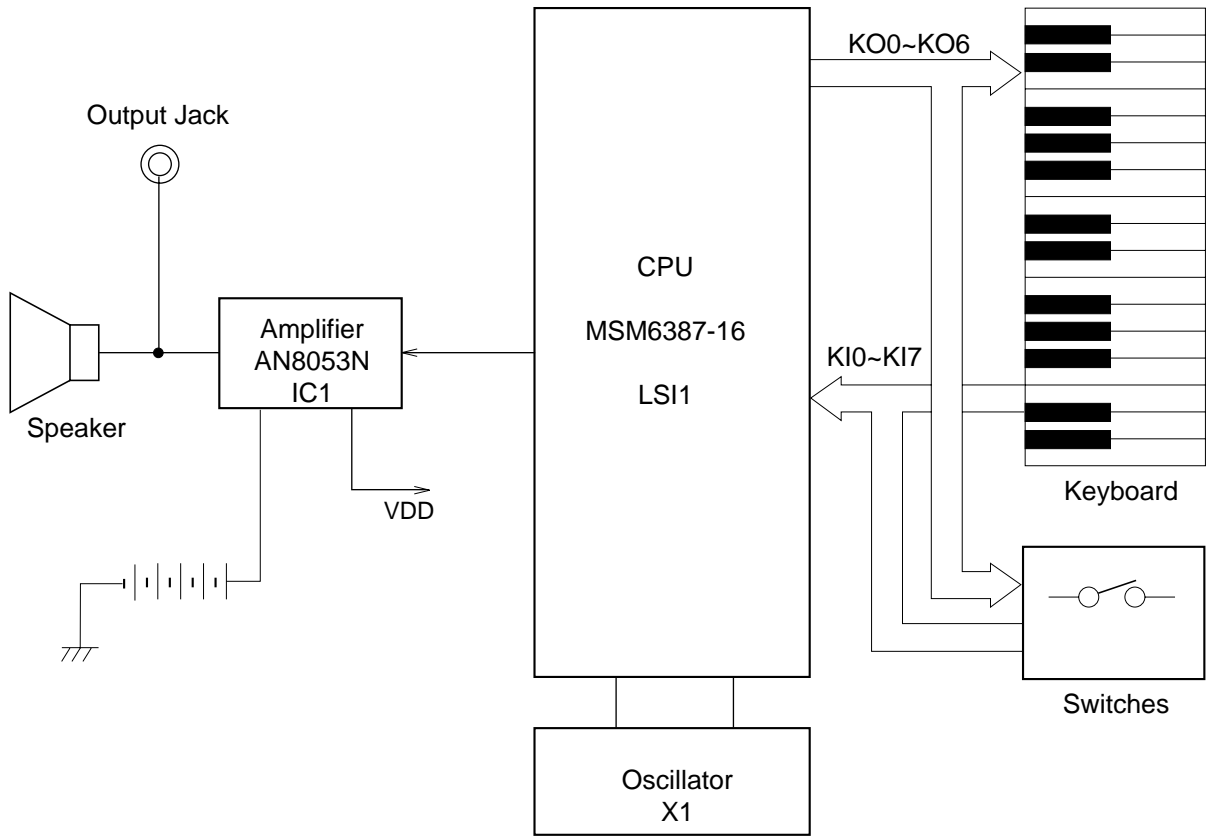
General

| | |
|-----------------------|---|
| Number of Keys: | 32 |
| 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, Ratin, Classical Funny Sounds: 8, including; Fanfare, Hpper, Computer Sound, Horror, Child's Play, Orient, Jungle, Comedy |
| Demonstration Tune: | Twinkle Twinkle Little Star Oh! Susanna Lullaby (Brahms) Little Brown Jug Jingle Bells |
| Built-In Speaker: | 6.5 cm dia. 1.0 W Input Rating: 1 pce. |
| Terminals: | Output Jack [Output Impedance:120 Ω , Output Voltage: 1.6 V (rms) MAX] AC Adapter Jack (DV 7.5 V) |
| Power Source: | DC: 4 AA size dry batteries Battery life: Approx. 5 hours (SUM-3/R6P) AC: AC Adapter AD-1 |
| Power Consumption: | 0.6 W |
| Dimensions (HWD): | 41 x 382 x 125 mm (1-5/8 x 15 x 5 inches) |
| Weight: | 0.5 kg (1.1 lbs) including batteries |

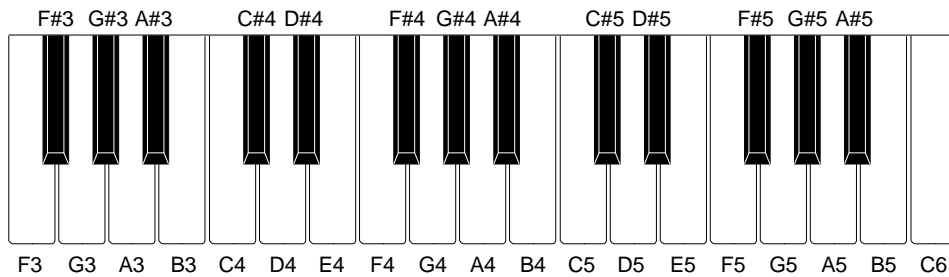
Electrical

| | |
|---|--------------------|
| Current Drain with 7.5 V DC: | |
| No Sound Output | 28 mA \pm 20% |
| Maximum Volume | 90 mA \pm 20% |
| with keys C4 and E4 pressed in Flute tone | |
| Volume: Maximum, Accmpaniment: Latin, | |
| Tempo: Maximum | |
| Sound Pressure Level at 10 cm away from the speaker | 100 dB \pm 10 dB |
| with key C6 pressed in Clarinet, Volume: Maximum | |
| Minimum Operating Voltage: | 5.0 V |

BLOCK DIAGRAM



Nomenclature of Keys



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 | Keyboard | Wind | String | Synth | S.E. | Tempo Up | Volume Up | Tone Edit |
| KO5 | | | Rhythm | Accomp. | Funny Accomp. | Stop | Tempo Down | Volume Down |
| KO6 | | | | | | | | Demo |

CPU (LSI1: MSM6387-16)

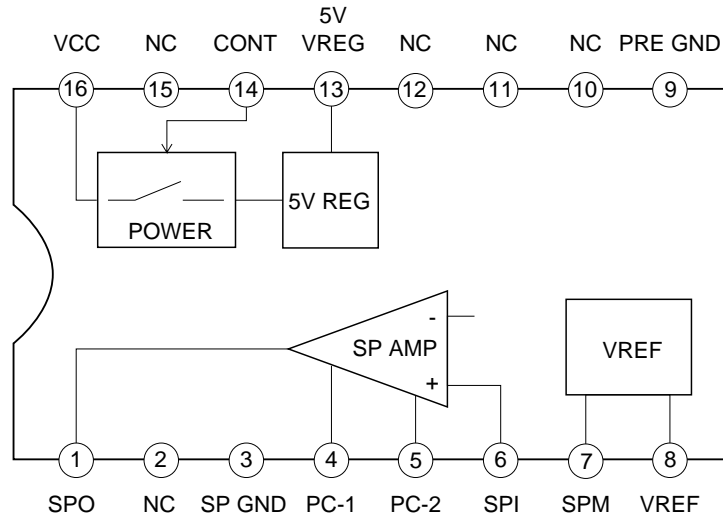
Containing a sound data ROM and a DAC (Digital to Analog Converter), the CPU provides sound waveform in accordance with the pressed key and the selected tone.

The following table shows the pin functions of LSI1.

| Pin No. | Terminal | In/ Out | Function |
|---------|--------------|---------|--|
| 1, 2 | TEST1, TEST2 | — | Not used. Connected to ground. |
| 3 | RESET | In | Power ON reset input. On: +6 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, 9 | COSI, COSO | In/Out | 21.725 MHz clock pulse input/output |
| 10 | VDD | In | +5 V source |
| 11 ~ 18 | KI0 ~ KI7 | In | Input terminal from keys and switches |
| 19 ~ 23 | KO11 ~ KO7 | — | Not used. |
| 24 ~ 30 | KO6 ~ KO0 | Out | Key and switch scan signal output |

Amplifier/Voltage Regulator (IC1: AN8053N)

Consisting of an amplifier and a voltage regulator, AN8053N amplifies the sound signal from the CPU and also provides the CPU +5V source. The following figure shows the internal block of IC1.

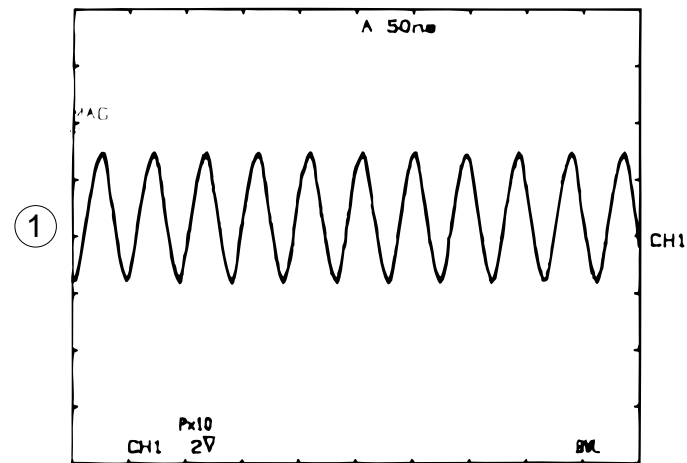
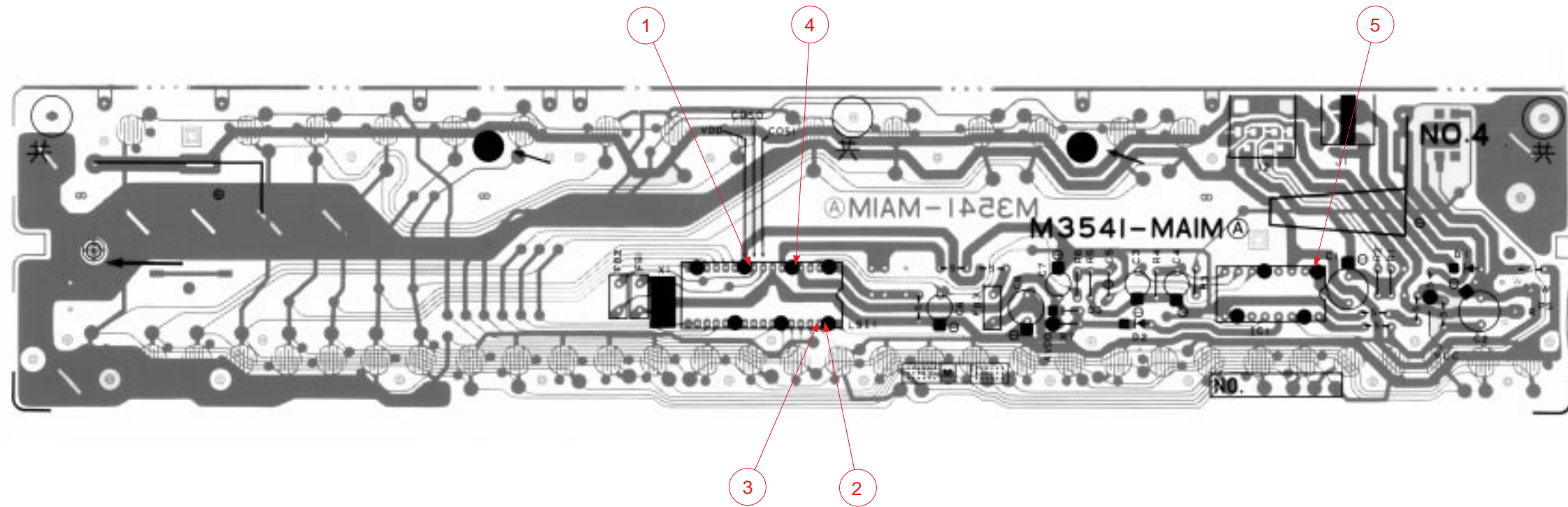


TROUBLESHOOTING

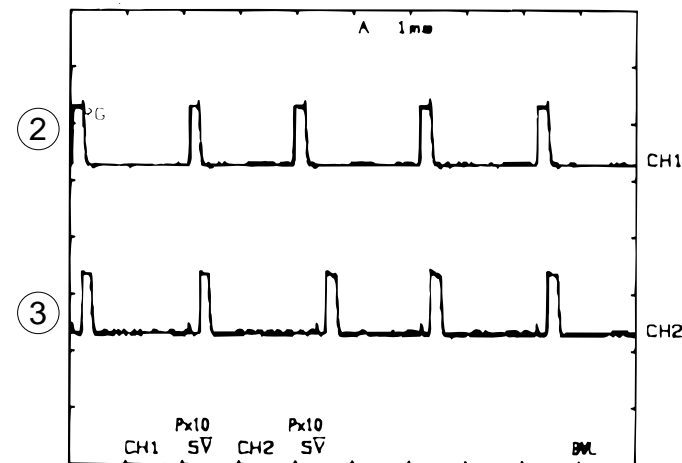
| Nature of Trouble F | Faulty Block | Checkpoint |
|---|--------------------------------|--|
| No sound at all | Power amp. (IC1: AN8053N) | Pin 13 should have +5V. An amplified waveform should be observed at pin 1. |
| | Power Switch | Voltage at pin 3 of the CPU should be raised from 0 V to +5 V when the power switch is turned on. Switch contact. |
| | CPU (LSI1: MSM6387-16) | Pins 24 ~ 30 should provide pulses. Pin 5 should provide a sound waveform when a key is pressed. |
| | Oscillator (X1) | Pins 8 and 9 of the CPU should receive an oscillation signal. |
| | Key or Switch Contact | |
| Certain key(s) or switch(es) do(es) not work. | Open Circuit on KO or KI Lines | |

PCB VIEW & MAJOR WAVEFORMS

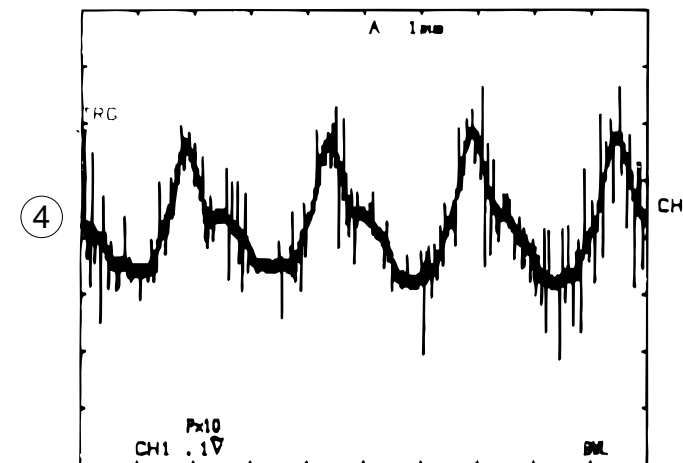
Top View



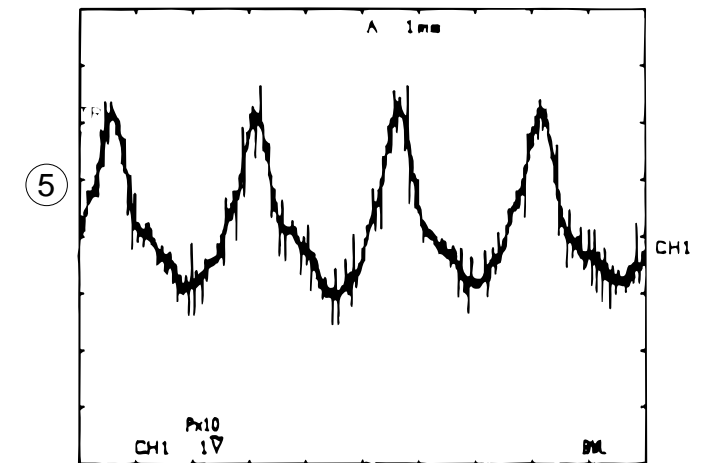
① Clock pulse COSO
MSM6387-16 Pin 9



② Key scan signal KO0
MSM6387-16 Pin 30
③ Key scan signal KO1
MSM6387-16 Pin 29

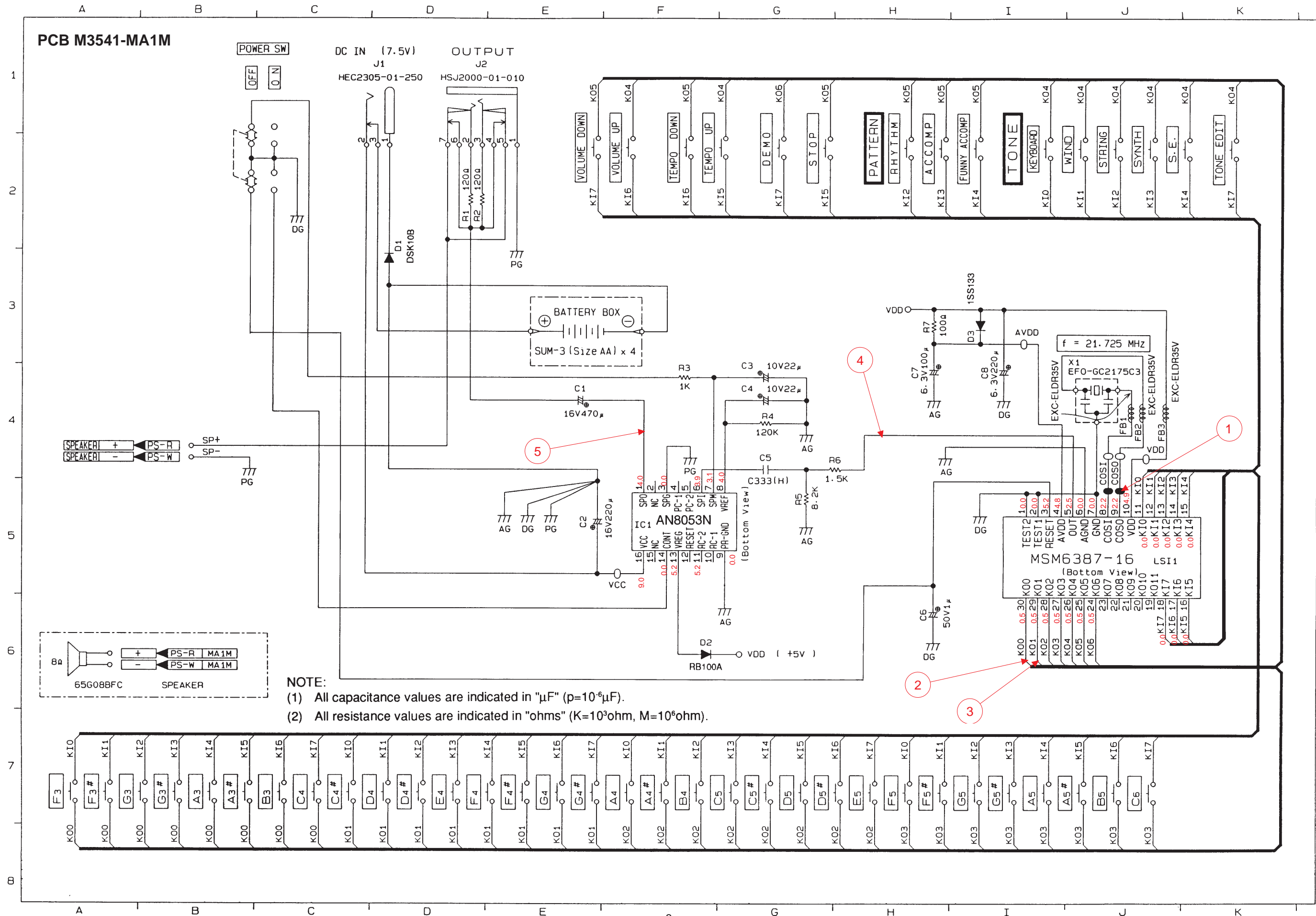


④ Sound output
MSM6387-16 Pin 5
Tone : Piano
Key : G4



⑤ Power Amp. output
AN8053N Pin 1
Tone : Piano
Key : G4
Volume : Max.

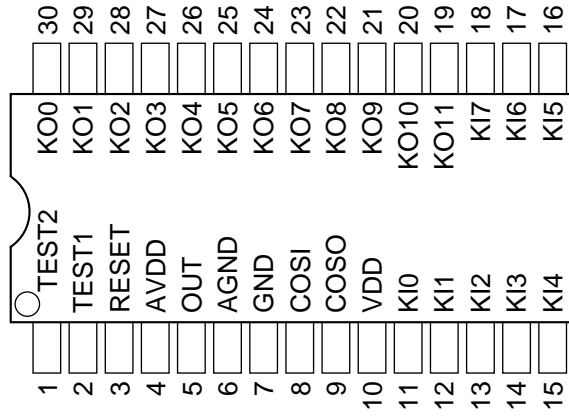
SCHEMATIC DIAGRAM



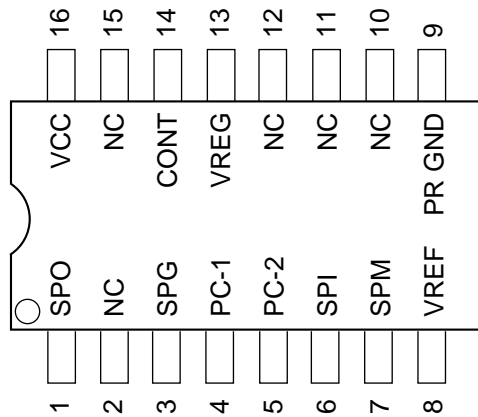
NOTE:
 (1) All capacitance values are indicated in "μF" (p=10⁻⁶μF).
 (2) All resistance values are indicated in "ohms" (K=10³ohm, M=10⁶ohm).

IC LEAD IDENTIFICATION

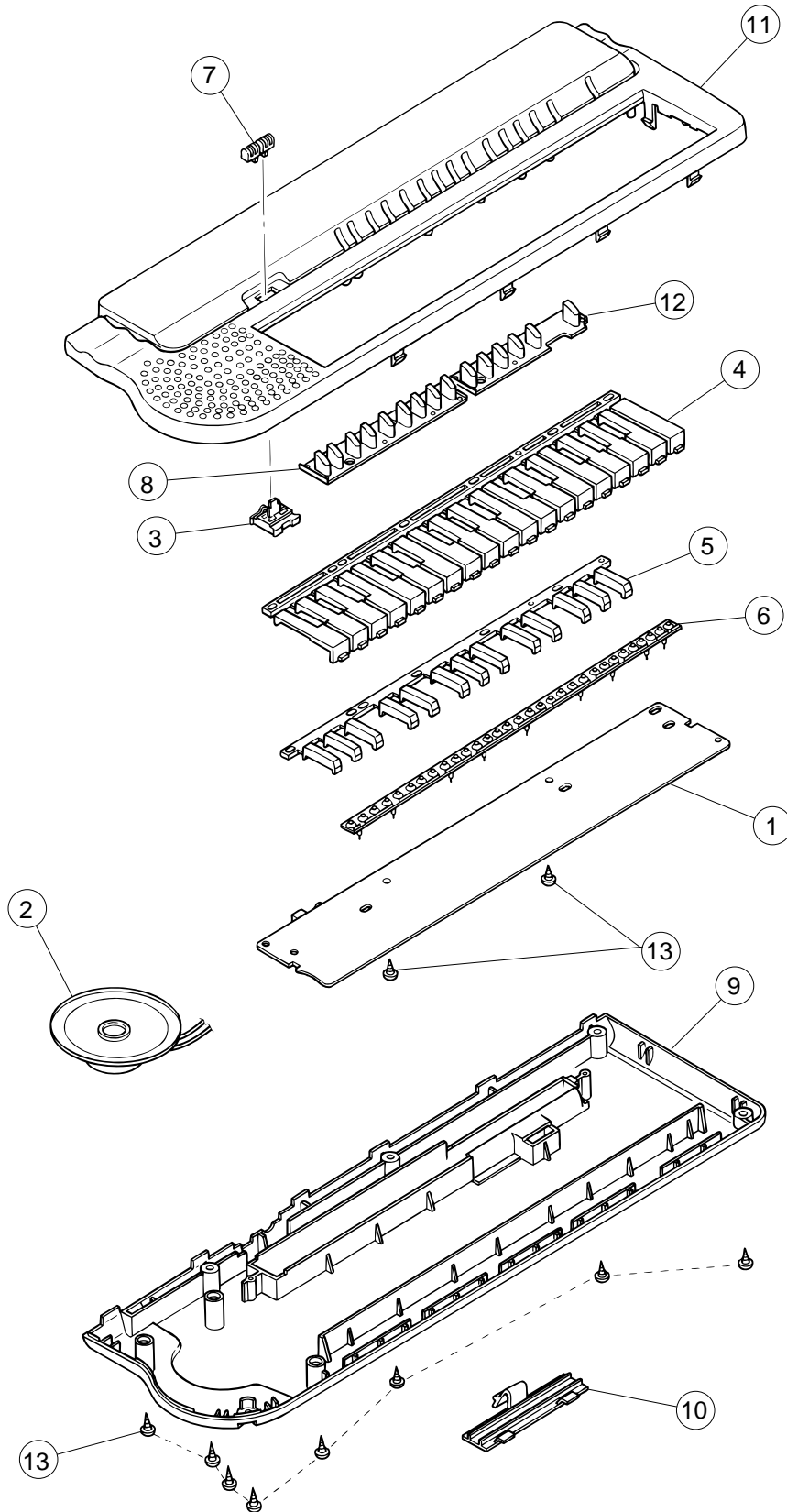
LSI1: MSM6387-03



IC1: AN8053N



EXPLODED VIEW



PARTS LIST

M-100

- 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.

| N | Item | Code No. | Parts Name | Specification | Q | M | FOB Japan N.R.Yen Unit Price | R | * |
|-------------------------|-------|-----------|--------------------------|---------------------|----|----|------------------------------------|---|---|
| Electrical Parts | | | | | | | | | |
| | LSI1 | 2011 4767 | LSI | MSM6387-16SS-106 | 1 | 1 | | A | E |
| | IC1 | 2114 3269 | Monolithic IC | AN8053N | 1 | 1 | | A | B |
| | D1 | 2390 0371 | Diode | DSK10B-BT-T | 1 | 10 | | B | A |
| | D2 | 2390 1316 | Diode | SB10-04A3-BT-T | 1 | 5 | | B | A |
| | D3 | 2390 1344 | Diode | 1SS133T-77-T | 1 | 20 | | C | A |
| | X1 | 2590 0742 | Ceramic oscillator | EFO-GC2175C3 | 1 | 1 | | A | B |
| | R3 | 2606 1141 | Carbon film resistor | R-20-1K-J-T23-T | 1 | 20 | | C | A |
| | R7 | 2606 1169 | Carbon film resistor | R-20-100-J-T23-T | 1 | 20 | | C | A |
| | R5 | 2606 1239 | Carbon film resistor | R-20-8.2K-J-T23-T | 1 | 20 | | C | A |
| | R6 | 2606 1274 | Carbon film resistor | R-20-1.5K-J-T23-T | 1 | 20 | | C | A |
| | R4 | 2606 1554 | Carbon film resistor | R-20-120K-J-T23-T | 1 | 20 | | C | A |
| | R1/2 | 2606 1617 | Carbon film resistor | R-20-120-J-T23-T | 2 | 20 | | C | A |
| | C1 | 2802 9777 | Electrolytic capacitor | 16RE3-470-T20-T | 1 | 20 | | C | A |
| | C8 | 2805 3061 | Electrolytic capacitor | 6.3RE2-220-T2-T | 1 | 10 | | C | A |
| | C3/4 | 2805 3134 | Electrolytic capacitor | 10RE2-22-T2-T | 2 | 20 | | C | A |
| | C6 | 2807 1023 | Electrolytic capacitor | 50RE2-1-T2-T | 1 | 10 | | C | A |
| | C7 | 2807 1091 | Electrolytic capacitor | 6.3RE2-100-T2-T | 1 | 10 | | C | A |
| | C2 | 2807 1710 | Electrolytic capacitor | 16RE3-220-T2-T | 1 | 20 | | C | A |
| | C5 | 2813 2254 | Semiconductive capacitor | DD405SR333K16-T | 1 | 20 | | C | A |
| | FB1~3 | 2845 3220 | Ferrite beads | EXC-ELDR35V-T | 3 | 20 | | C | A |
| | J1 | 3501 3731 | DC jack | HEC2305-01-250 | 1 | 5 | | A | A |
| | J2 | 3501 4382 | Jack | HSJ2000-01-010 | 1 | 5 | | C | B |
| | | 4317 3570 | Blank PCB M3541-MA1M | M111577-1 | 1 | 1 | | C | B |
| | | 6917 1762 | B spring (+) A210 | M410913B-1 | 1 | 10 | | B | A |
| | | 6921 6210 | B spring (-) 700B | M412171-1 | 1 | 10 | | B | A |
| | 1 | 6921 6710 | PCB ass'y M3541-MA1M | M211608*1 | 1 | 1 | | B | L |
| Mechanical Parts | | | | | | | | | |
| | 2 | 3831 0644 | Speaker | 65G08BFC | 1 | 1 | | B | B |
| | 3 | 6909 7380 | SL contact 9D | CSB-09D | 1 | 10 | | B | A |
| | 4 | 6917 1571 | White key set M210 | M210610A-1 | 1 | 5 | | A | B |
| | 5 | 6917 1580 | Black key set M210 | M210609-1 | 1 | 10 | | A | A |
| | 6 | 6917 1591 | Contact rubber M210 | M210605A-1 | 1 | 5 | | B | B |
| | 7 | 6921 6790 | Slide knob 541 | M311913-1 | 1 | 10 | | B | A |
| N | 8 | 6922 7680 | Rubber button 541A | M311911-2 | 1 | 1 | | C | B |
| | 9 | 6921 6810 | Lower case | M111516-1 | 1 | 1 | | C | B |
| | 10 | 6921 6820 | Battery cover | M311910-1 | 1 | 5 | | B | A |
| N | 11 | 6922 7750 | Upper case | M111515-6 | 1 | 1 | | C | C |
| N | 12 | 6922 7520 | Rubber button 541B | M311912-3 | 1 | 1 | | C | B |
| | 13 | 5150 1101 | Screw | P-Tight 2.3 x 8 ZMC | 10 | 50 | | C | A |
| N | | 6922 9480 | Rating label | M411126-16 | 1 | 10 | | C | A |

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

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