■ OVERVIEW

The M1107 series is Melody C-MOS LSI for playing musical tune by connecting only Battery and Piezo Buzzer as external components. Playing mode is one shot only without retrigger with extremely low current consumption after playing by the oscillation stop function and by the shifting function of pull-down resistance value depending on input level.
The M1107 series is suitable for low cost and long life of battery module such as Melody Greeting Cards, Toys, and etc.

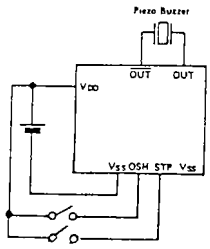
■ FEATURES

- No external parts
- Wide range operation voltage (1.2 ~ 3.6V)
- Low power consumption
- The oscillation stop function after playing
- One shot playing mode without retrigger
- Compulsory stop function
- The Shifting function of pull-down resistance value
- CR oscillation on chip
- Power on Initialize function
- 2 positions of Vss pads on chip
- Wide compass (G3-D7)

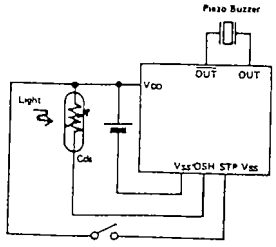
■ STANDARD CIRCUITS

2 types of circuits are available as standard circuits.

(1)



(2)

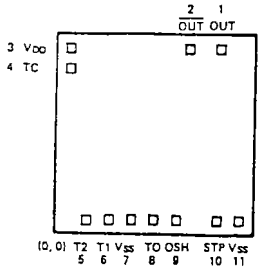


*1 – The M1107 series has 2 positions of Vss pads. Please select one pad according to your PCB design.
*2 – (1) for ONE-SHOT mode with compulsory stop function.
(2) for Cds application.

■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings	Unit
Supply voltage	V_{DD}—V_{SS}	−0.3 to 7.0	V
Input voltage	V_{IN}	V_{SS} −0.2 to V_{DD} +0.2	V
Operating temp.	T_{OPR}	−20 to +80	°C
Storage temp.	T_{STG}	−55 to +125	°C

■ PIN OUT



* No connection to pads 4, 5, 6 and 8

[Chip size 1.80 × 1.79 mm
Chip thickness 400 ± 30 µm]

■ ELECTRICAL CHARACTERISTICS

T_a=25°C, V_{SS}=0V, V_{DD}=1.5V

ITEM	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}			1.2	1.5	3.6	V
Stand-by Current	I_{DD1}	NO PLAYING OSH, STP-OPEN			0.01	0.3	µA
Current Consumption	I_{DD2}	PLAYING OUT, $\overline{OUT}$-OPEN			25	50	µA
Input Current	I_{IL}	V_{IL}=0.4V	LH, OSH	0.7	1.5	3.0	µA
	I_{IH}	V_{IH}=1.5V		0.7	1.5	3.0	
Output Current	I_{OL}	V_{OL}=0.75V	OUT, $\overline{OUT}$	2.0			mA
	I_{OH}	V_{OH}=0.75V		2.0			
Oscillating Frequency	fosc			35	50	65	kHz
Oscillation Start Voltage	V_{DDB}					1.2	V
Oscillation Stop Voltage	V_{DDS}					1.2	V

■ COORDINATES

[Unit µm]

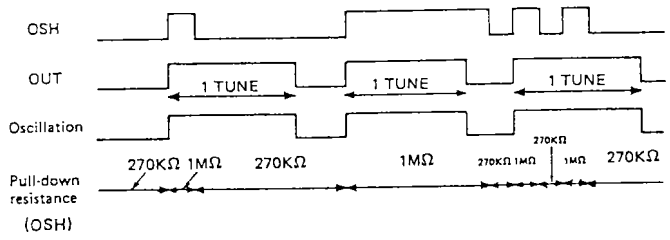
NO.	PAD	X	Y	NO.	PAD	X	Y
1	OUT	1325	1640	7	Vss	613	150
2	$\overline{OUT}$	994	1640	8	NC	819	150
3	VDD	150	1640	9	OSH	1076	150
4	NC	140	1404	10	STP	1432	150
5	NC	176	130	11	Vss	1650	150
6	NC	410	130				

■ PLAYING MODE

The playing mode of M1107 is one shot only without retrigger.
The melody starts and plays once completely when OSH is connected to VDD.
In case trigger pulse is input to STP during the play, the melody stops.

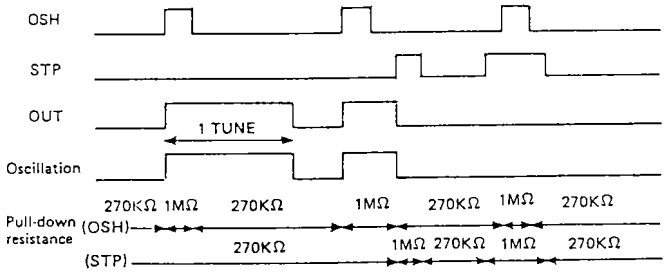
○START

The melody starts and plays once completely when OSH is connected to VDD.
If OSH becomes open or connected to VDD during the play, it keeps playing until the end of tune.



○STOP

When trigger pulse is input to STP during the play, the melody stops. When STP is connected to VDD, the melody doesn't start by connecting OSH to VDD.



■ POWER SAVE FUNCTION

The M1107 series has the Oscillation stop function after the play and the Shifting function of resistance value depending on input level ("H" level or "L" level) as shown above Time Chart. These 2 functions save idle power consumption and realize long-life of battery.

○ The Oscillation stop function ..... When the play ends, oscillation stops and circuits return to the stand-by condition regardless of input level of OSH andSTP.
In this mode, the current consumption is less than 3.3 μA (Max.).

○ The Shifting function of Pull-down resistance value ..... The pull-down resistance of OSH and STP is shifted as below (depending on input level, "H" or "L" level);
During VDD ("H" level) ..... 1 MΩ/1 input
During Vss ("L" level) ..... 270 KΩ/1 input
In case of Cds switch, the value of pull-down resistance is shifted about 1 MΩ/1 pin when the value of Cds resistance is decreased.
On the contrary, the value of pull-down resistance is about 270 KΩ/1 pin when the value of Cds resistance is increased.
These functions make total resistance value large and save current flow on LSI and Cds.