# HOLTEK

HT2812
Single Sound Generator

Features

- Single power supply: 2.4V~3.3V
- Low standby current at 3V, 1μA (Typ.)
- Auto power-off function
- Speaker or direct piezo application

- Built-in envelope control circuit
- 1Hz~8Hz programmable LED flash output
- Minimum external components

General Description

The HT2812 is a CMOS LSI chip designed for use in sound effect products. It is equipped with tone circuit, noise circuit, and other control logic to generate different sounds including rifle gun, machine gun, booming sound, door bell, alarm etc. The customer supplied sound source can be analyzed and programmed into an internal ROM by changing a mask layer during device fabrication. The HT2812 is suitable for various toy applications.
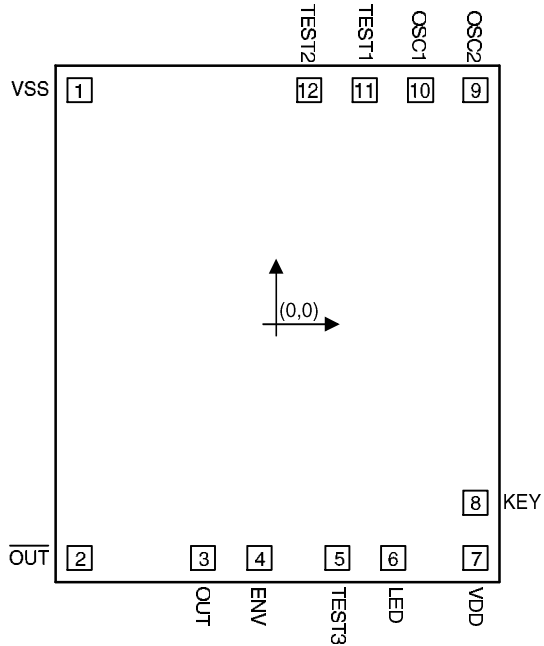
Pin Assignment

**HT2812
– 8 DIP**

**HT2812
– 8 DIP**

**HT2812
– 14 DIP**
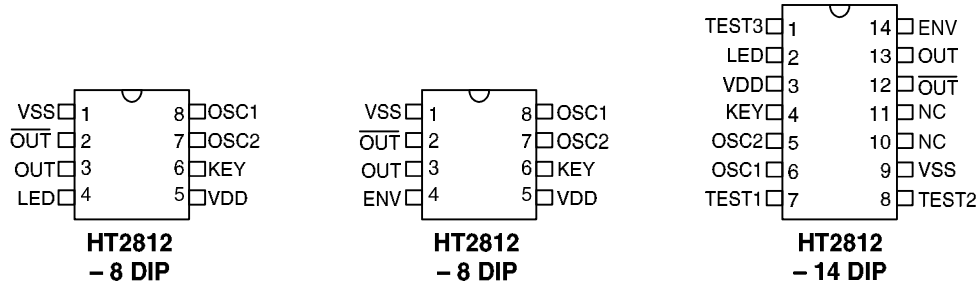
Block Diagram
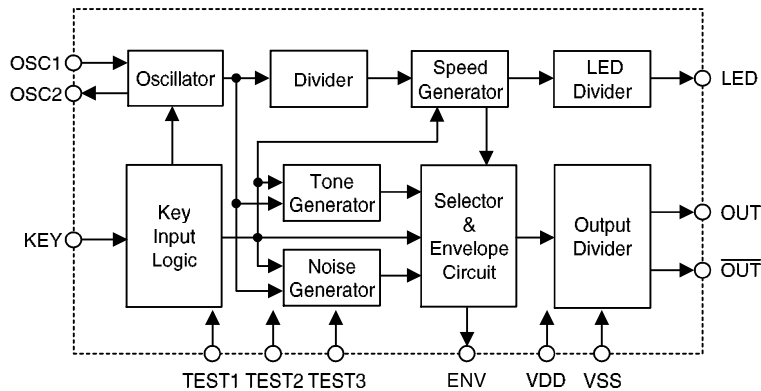
Pad Coordinates

Unit: mil

Pad No.	X	Y
1	−27.127	32.3
2	−27.127	−32.3
3	−10.127	−32.3
4	−2.307	−32.3
5	8.488	−32.3
6	16.138	−32.3
7	27.528	−32.3
8	27.528	−24.65
9	27.528	32.3
10	19.878	32.3
11	12.228	32.3
12	4.578	32.3

Chip size : 67×72 (mil)^2

* The IC substrate should be connected to VDD in the PCB layout artwork.

Absolute Maximum Ratings*

Supply Voltage .... −0.3V to 5V

Input Voltage .... V_{SS}–0.3 to V_{DD}+0.3V

Storage Temperature .... −50°C to 125°C

Operating Temperature .... 0°C to 70°C

*Note: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damageto the device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

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Electrical Characteristics

(Ta=25°C)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
		V_{DD}	Conditions				
V_{DD}	Operating Voltage	3V	—	2.4	3	3.3	V
I_{STB}	Standby Current	3V	—	—	1	5	µA
I_{DD}	Operating Current	3V	No load	—	300	600	µA
I_{OH}	Output Source Current	3V	V_{OH}=2.5V	−1	−2	—	mA
I_{OL}	Output Sink Current	3V	V_{OL}=0.5V	1	2	—	mA
I_{ENV}	ENV Source Current	3V	V_{OH}=2.5V	−1	−2	—	mA
I_{LED}	LED Source Current	3V	V_{OH}=2.5V	−1	−2	—	mA
F_{OSC}	Oscillator Frequency	—	R=330kΩ	—	64	—	kHz
V_{IH}	"H" Input Voltage	3V	—	2.4	—	—	V
V_{IL}	"L" Input Voltage	3V	—	—	—	0.6	V

Pad Description

| Pad No.	Pad Name	I/O	Description
1	VSS	—	Negative power supply, GND
2	$\overline{OUT}$	O	Sound output pad, out of phase to pad 3
3	OUT	O	Sound output pad
4	ENV	O	Sound envelope control pad
5	TEST3	I	For IC test only
6	LED	O	LED flash output pad
7	VDD	—	Positive power supply
8	$\overline{KEY}$	I	Key input pad, low active
9	OSC2	O	Oscillator output pad
10	OSC1	I	Oscillator input pad
11	TEST1	I	For IC test only
12	TEST2	I	For IC test only

Timing Diagram
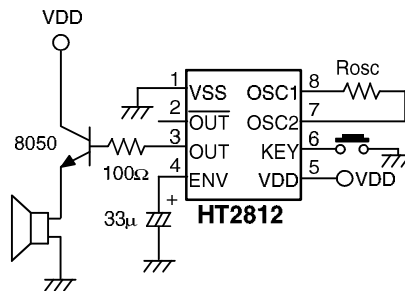
With an envelope
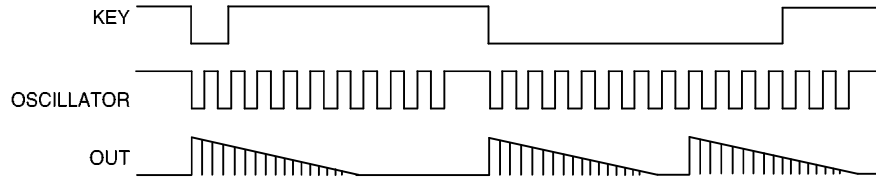
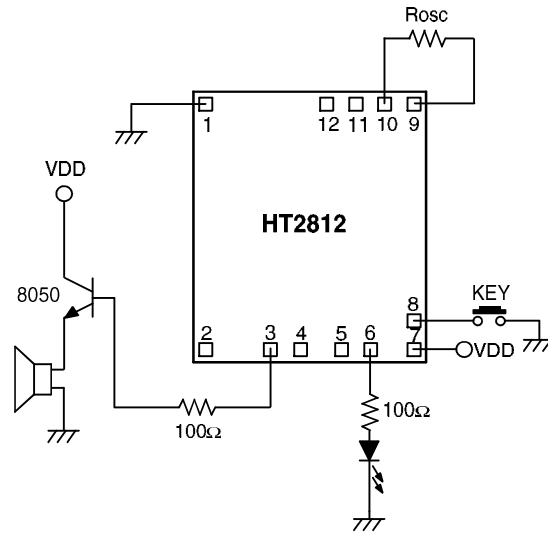

No envelope
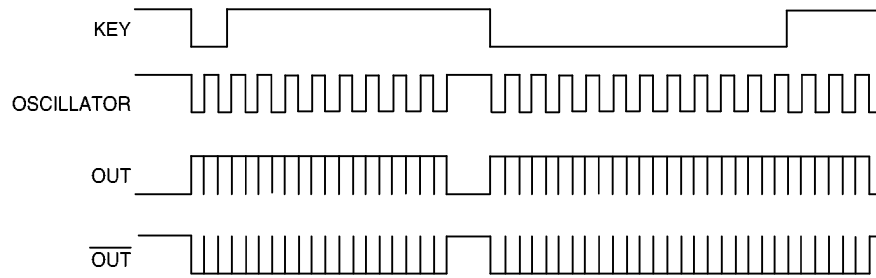
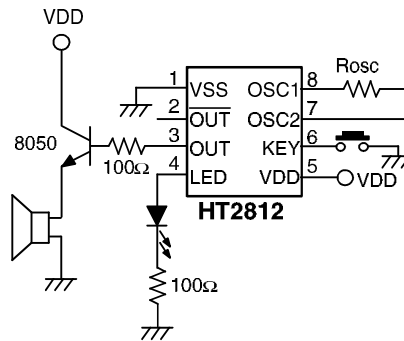## Application Circuits

Speaker output with an envelope
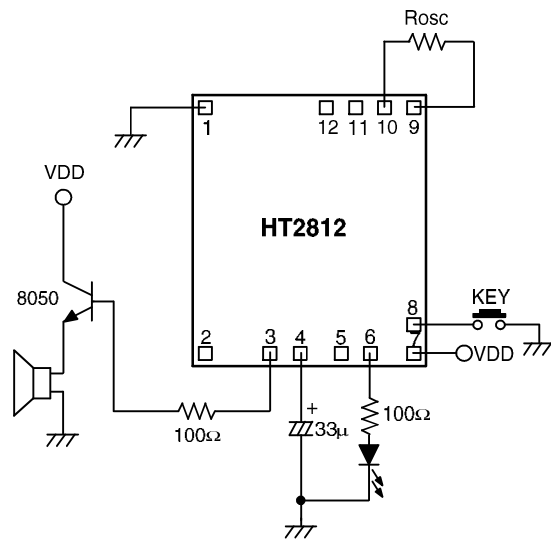
* The IC substrate should be connected to VDD in the PCB layout artwork.
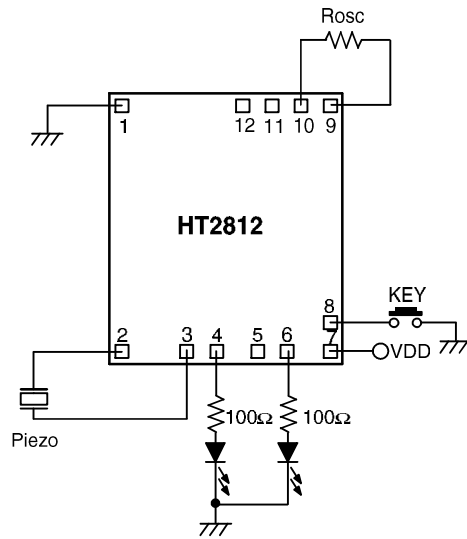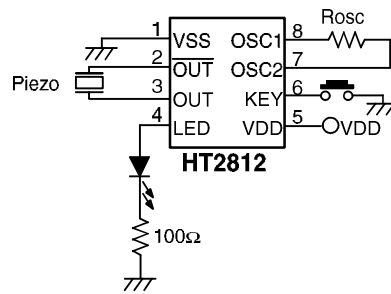
Speaker output without an envelope

* The IC substrate should be connected to VDD in the PCB layout artwork.
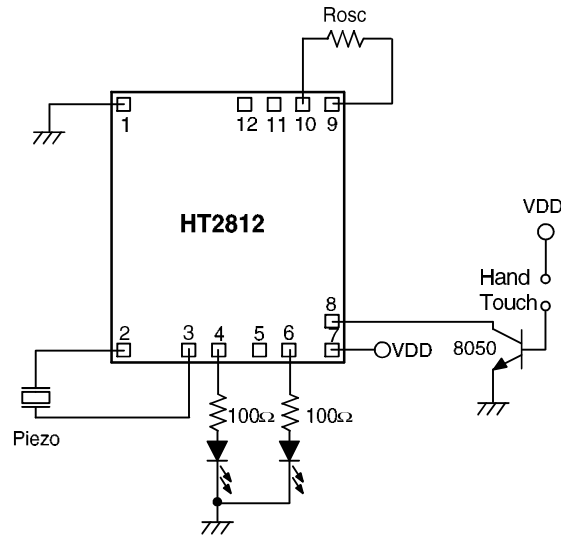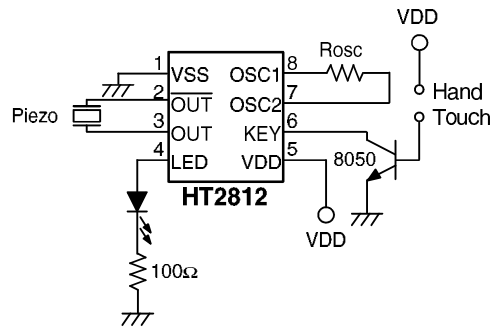
Piezo output without an envelope

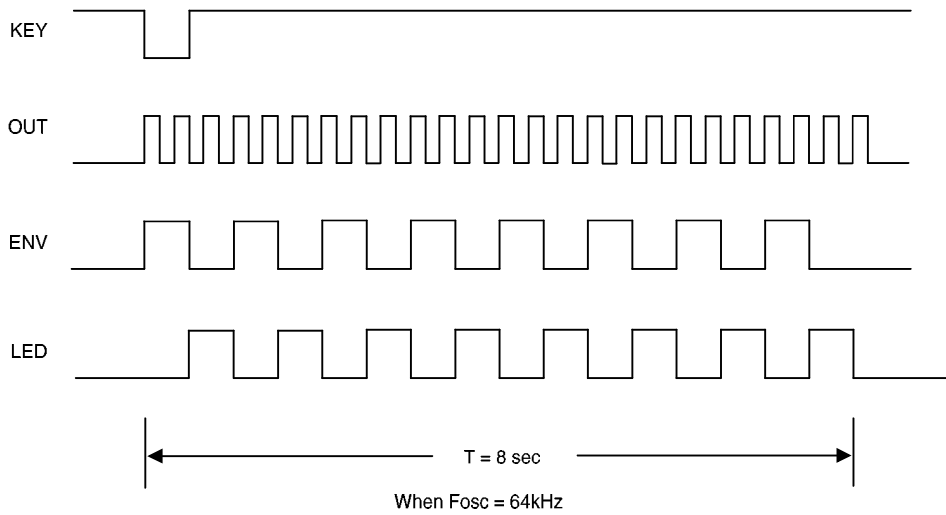* The IC substrate should be connected to VDD in the PCB layout artwork.

Hand touch trigger

Rosc

12 11 10 9

1

HT2812

8

VDD

Hand
Touch

VDD   8050

2 3 4 5 6

Piezo

100Ω 100Ω

* The IC substrate should be connected to VDD in the PCB layout artwork.

VDD

Rosc

1 VSS OSC1 8
2 OUT OSC2 7   Hand
                    Touch
Piezo 3 OUT KEY   6
4 LED VDD   5 8050

HT2812   VDD

100Ω

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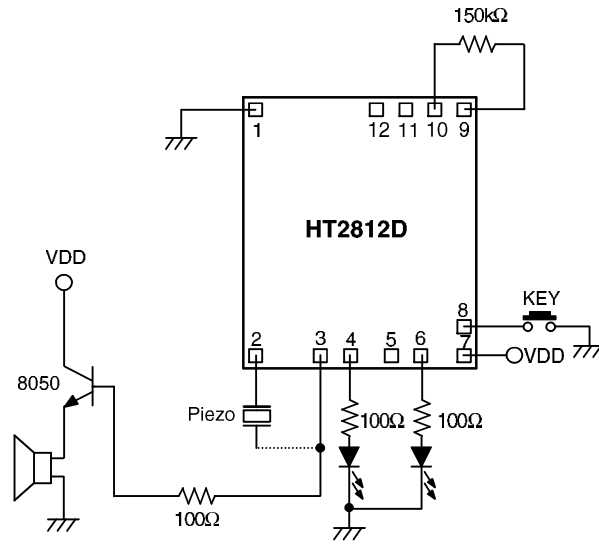## Application Circuit (HT2812A — Airplane)
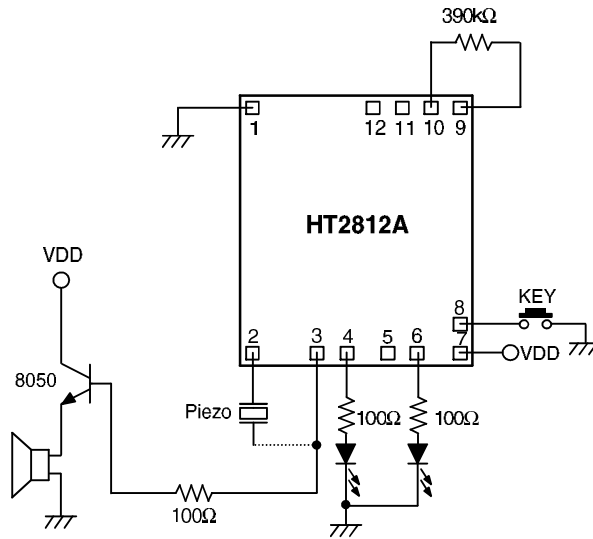
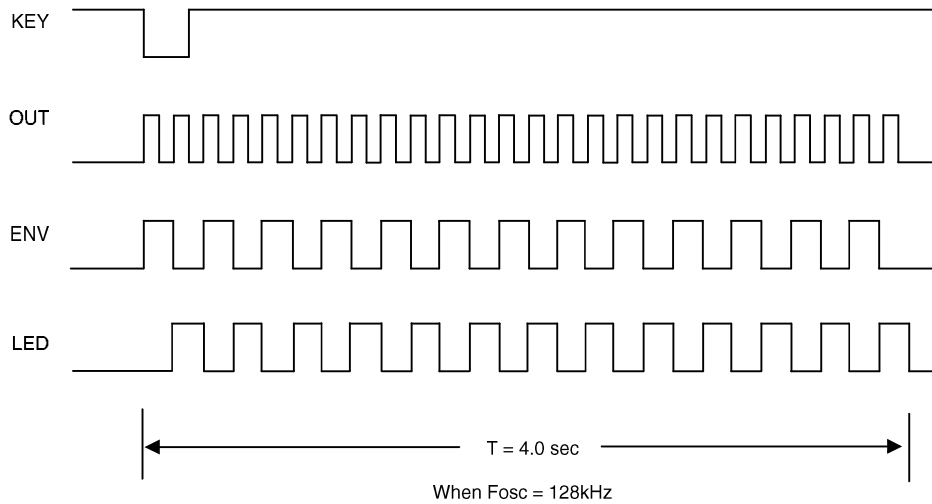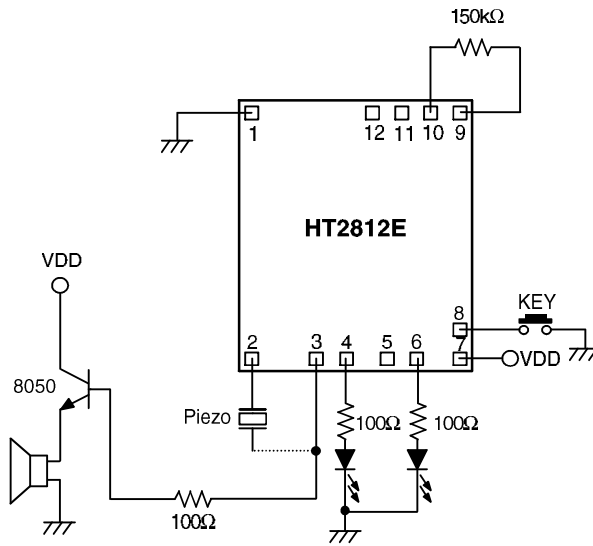* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812B — Rocket)
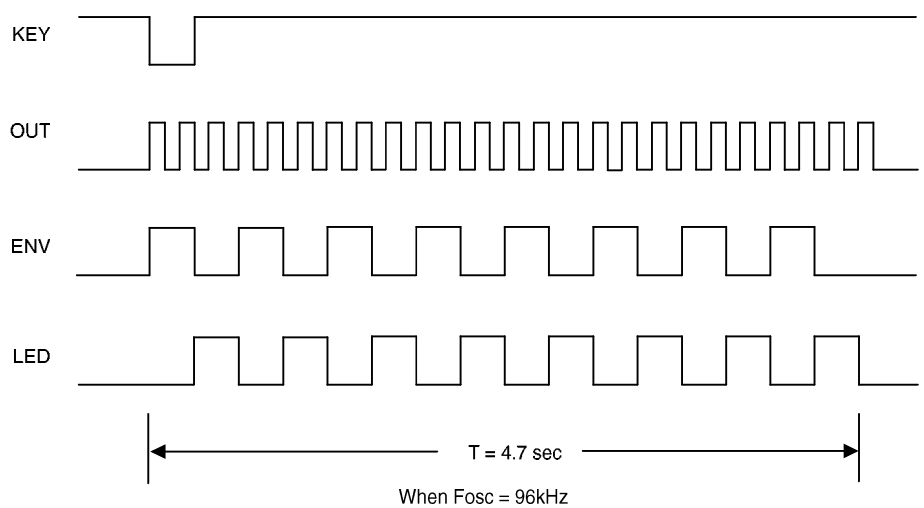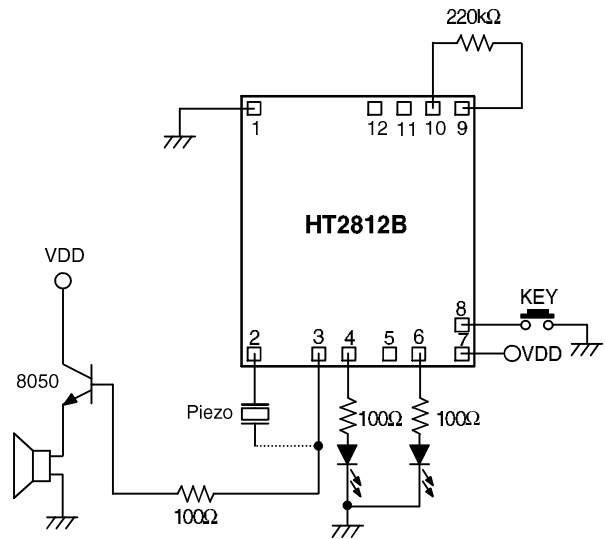
* The IC substrate should be connected to VDD in the PCB layout artwork.

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Application Circuit (HT2812C — Siren II)
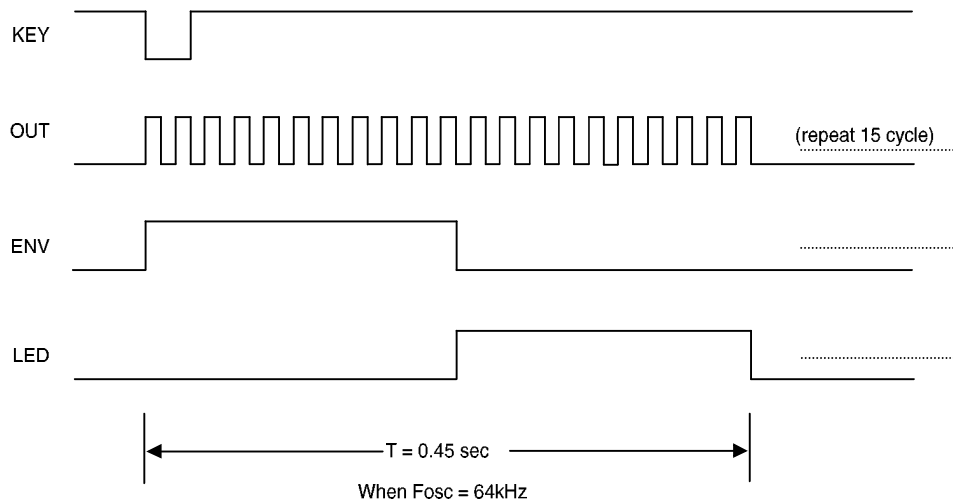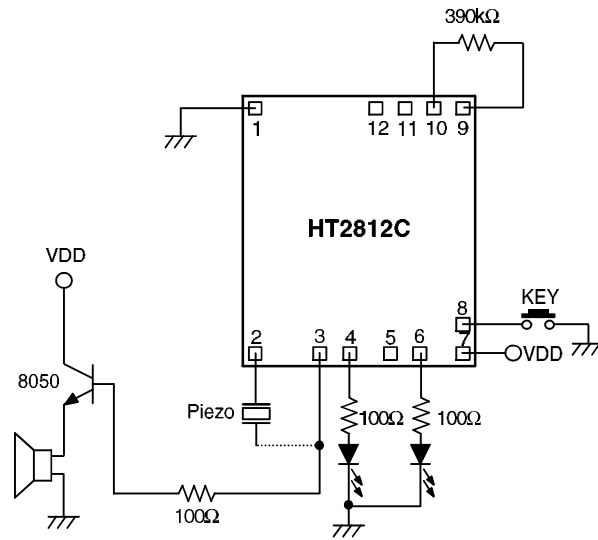
* The IC substrate should be connected to VDD in the PCB layout artwork.

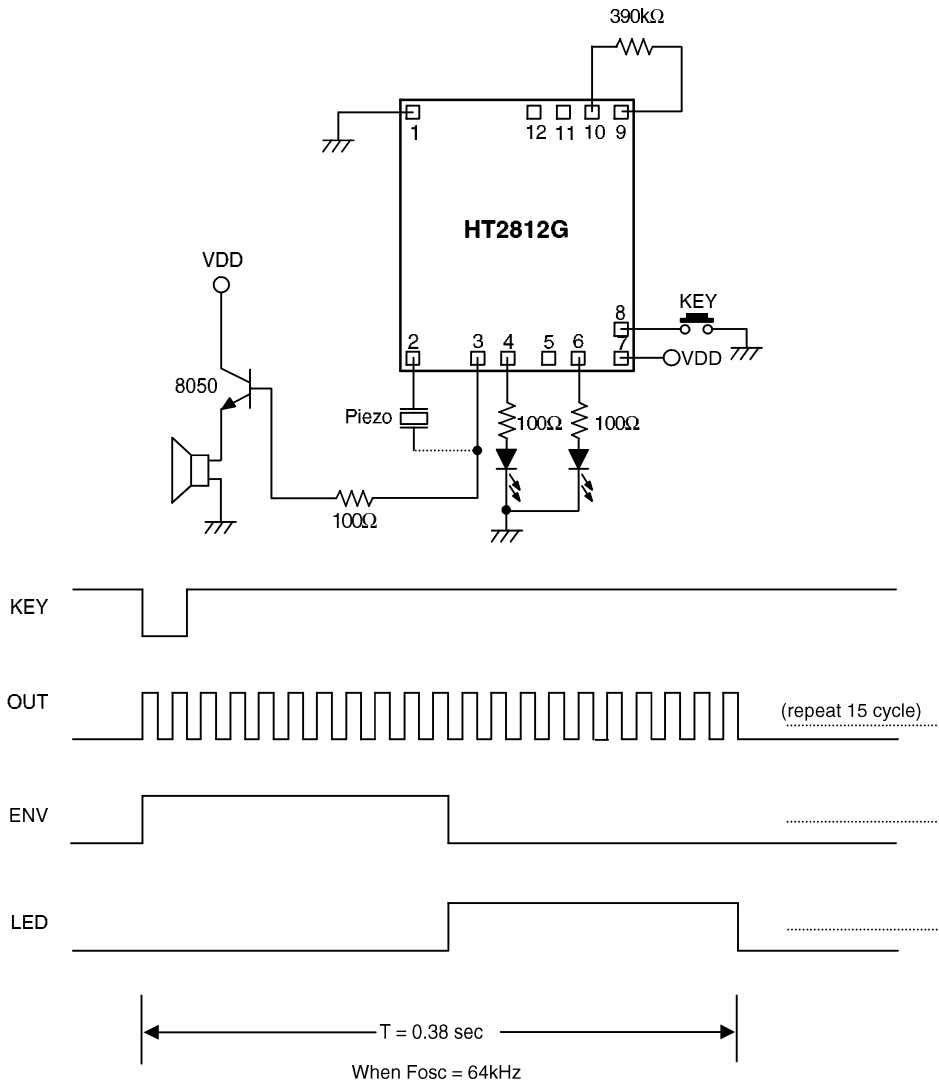## Application Circuit (HT2812D — Police Car)
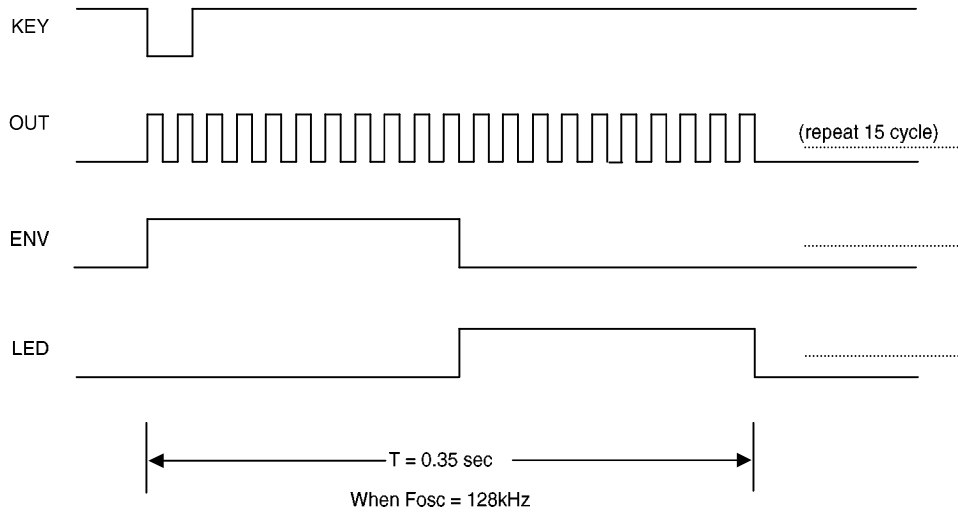
* The IC substrate should be connected to VDD in the PCB layout artwork.

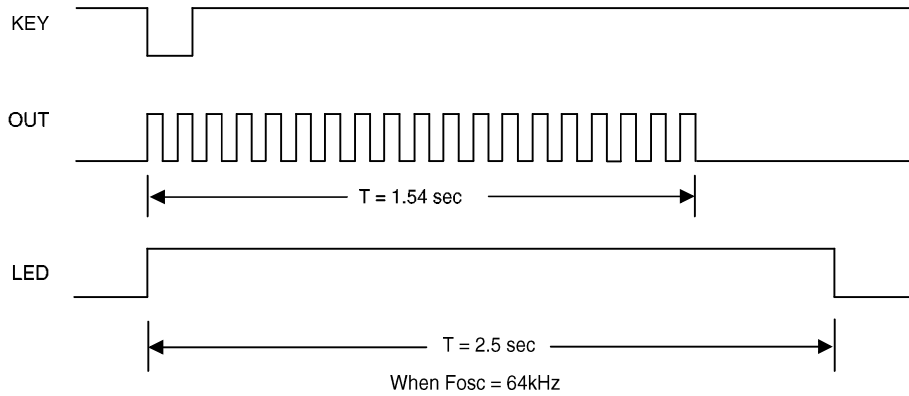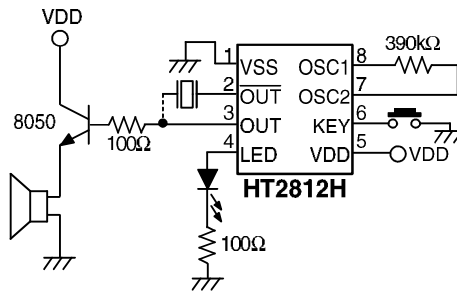## Application Circuit (HT2812E — Fire Brigade)

* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812F — Siren I)

390kΩ

1   12 11 10 9

HT2812G

VDD

8   KEY

8050   2   3   4   5   6   7   VDD

Piezo   100Ω   100Ω

100Ω

KEY

OUT   (repeat 15 cycle)

ENV

LED

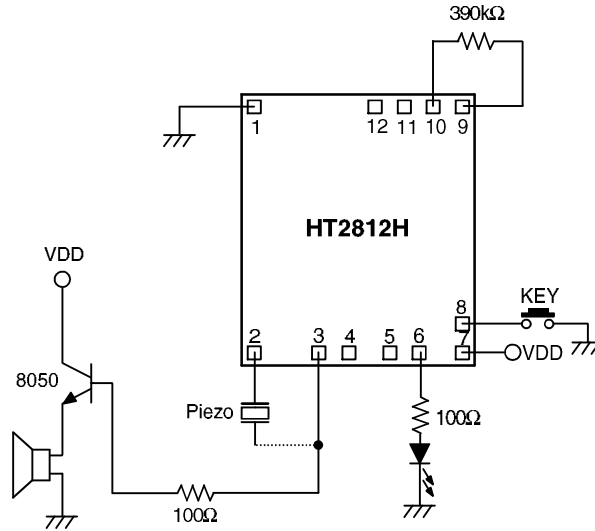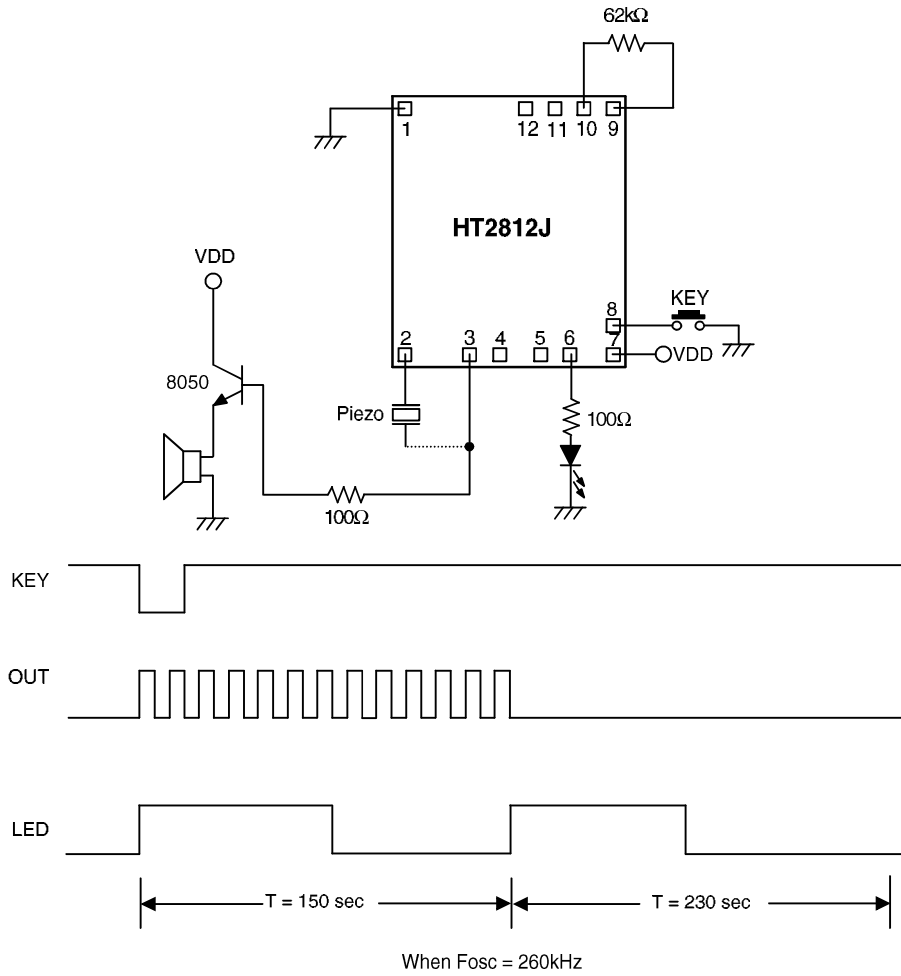T = 0.38 sec
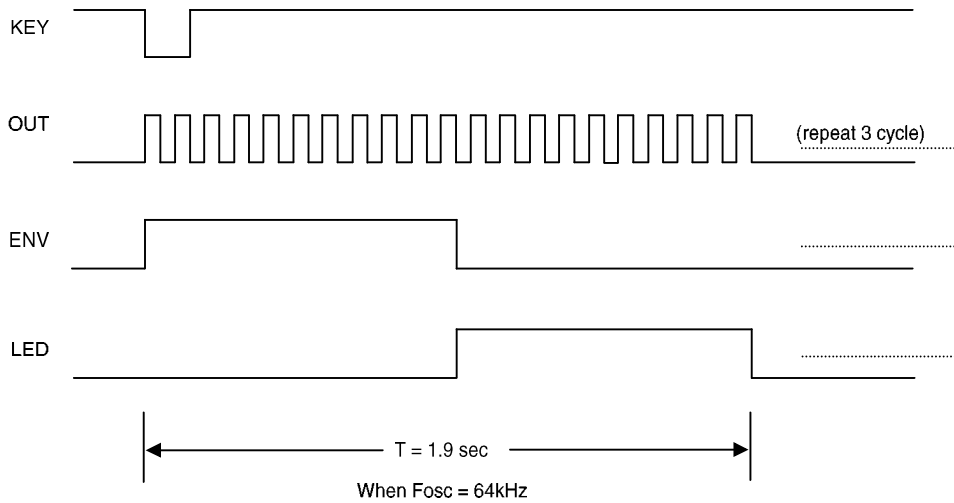
When Fosc = 64kHz

* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812H — Dialing Tone)

* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812J — Chicken Sound)
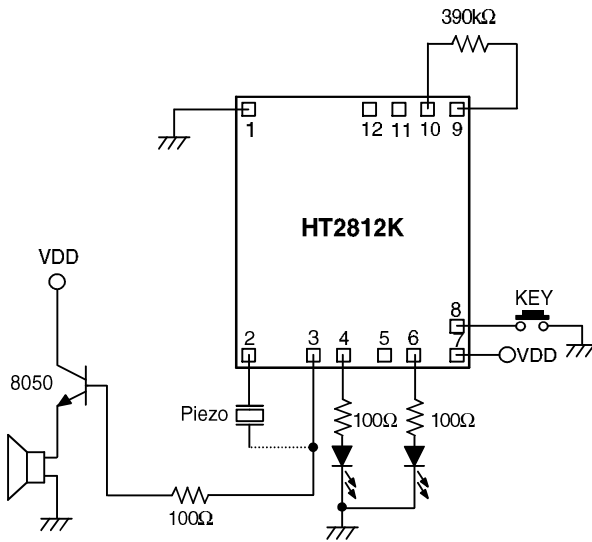

When Fosc = 260kHz

* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812K — Ambulance Sound)

* The IC substrate should be connected to VDD in the PCB layout artwork.