

Features

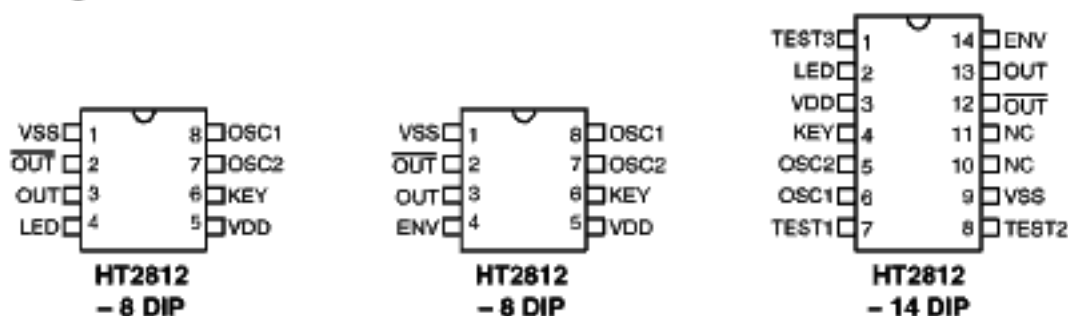
- Single power supply: 2.4V~3.3V
- Low standby current at 3V, 1μA (Typ.)
- Auto power-off function
- Speaker or direct piezo application
- Built-in envelope control circuit
- 1Hz~8Hz programmable LED flash output
- Minimum external components

General Description

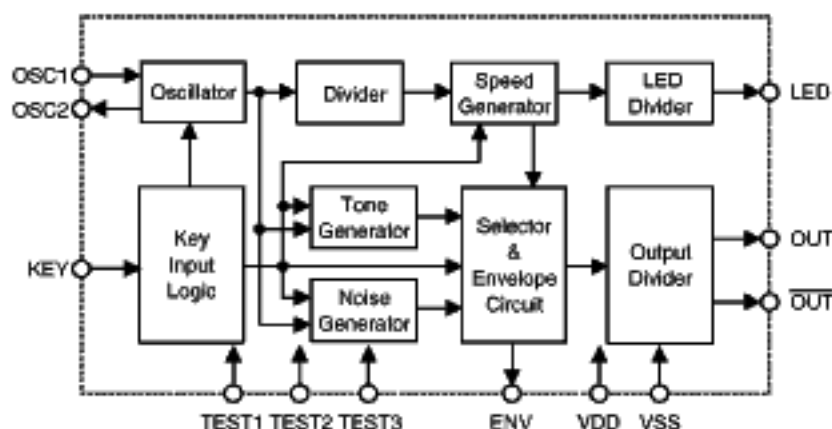
The HT2812 is a CMOS LSI chip designed for use in sound effect products. It is equipped with tone circuit, noise circuit, and other control logic to generate different sounds including rifle gun, machine gun, booming sound, door bell,

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

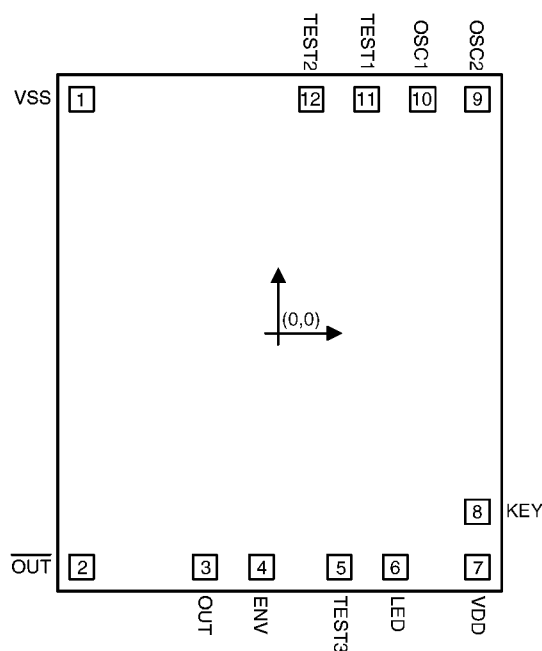


Block Diagram



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 : $67 \times 72 \text{ (mil)}^2$

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

Absolute Maximum Ratings*

Supply Voltage	-0.3V to 5V	Storage Temperature.....	-50°C to 125°C
Input Voltage	V _{SS} -0.3 to V _{DD} +0.3V	Operating Temperature	0°C to 70°C

*Note: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to 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.

Electrical Characteristics

(Ta=25°C)

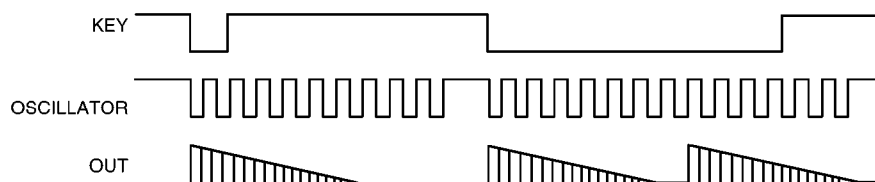
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
		V _{DD}	Conditions				
V _{DD}	Operating Voltage	3V	—	2.4	3	3.3	V
I _{STB}	Standby Current	3V	—	—	1	5	μA
I _{DD}	Operating Current	3V	No load	—	300	600	μA
I _{OH}	Output Source Current	3V	V _{OH} =2.5V	−1	−2	—	mA
I _{OL}	Output Sink Current	3V	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

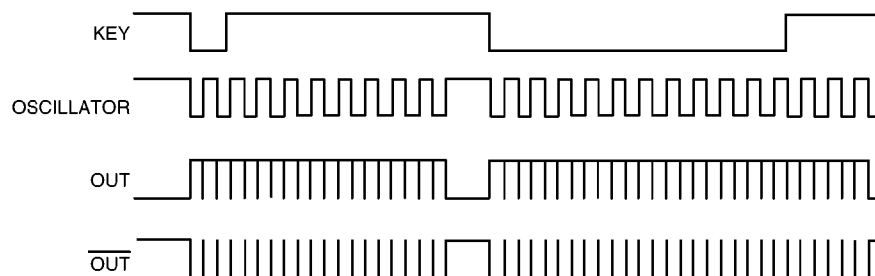
Pad No.	Pad Name	I/O	Description
1	VSS	—	Negative power supply, GND
2	OUT	O	Sound output pad, out of phase to pad 3
3	OUT	O	Sound output pad
4	ENV	O	Sound envelope control pad
5	TEST3	I	For IC test only
6	LED	O	LED flash output pad
7	VDD	—	Positive power supply
8	KEY	I	Key input pad, low active
9	OSC2	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

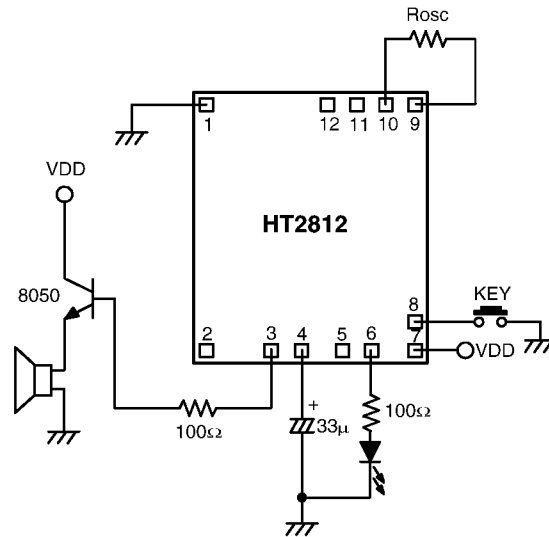


No envelope

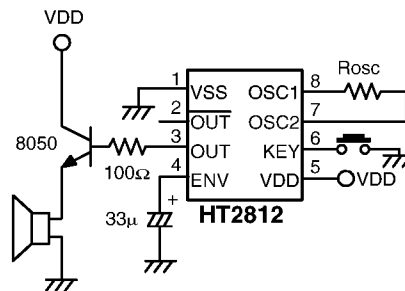


Application Circuits

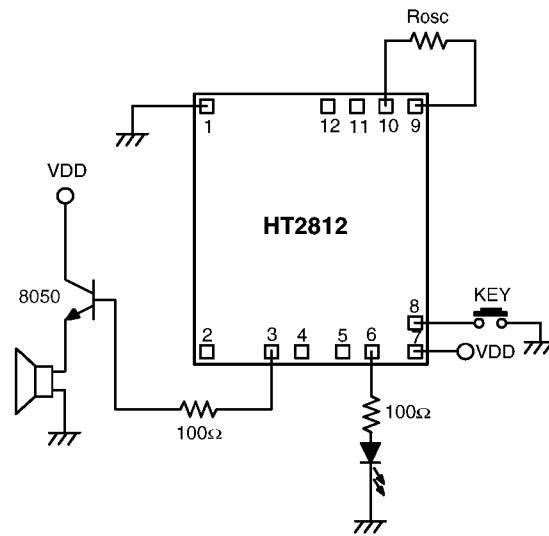
Speaker output with an envelope



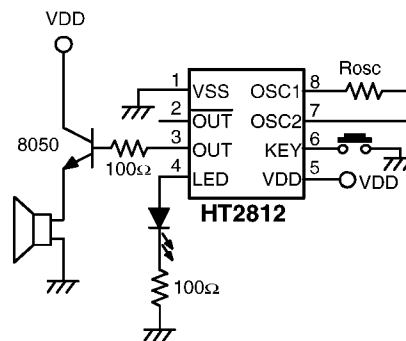
* The IC substrate should be connected to VDD in the PCB layout artwork.



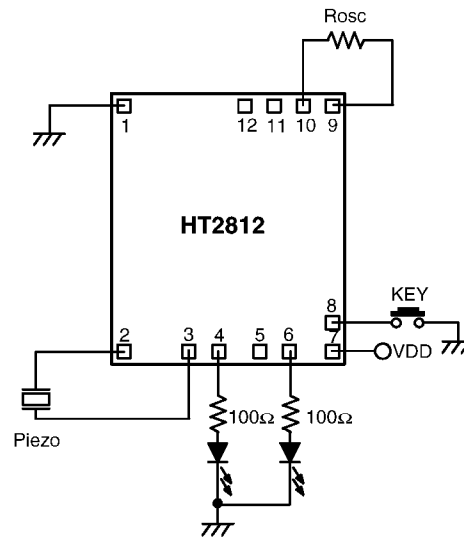
Speaker output without an envelope



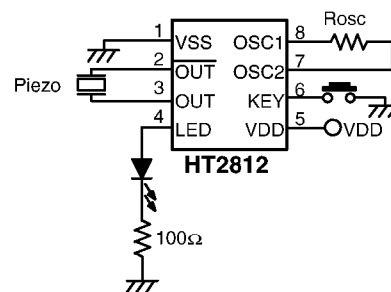
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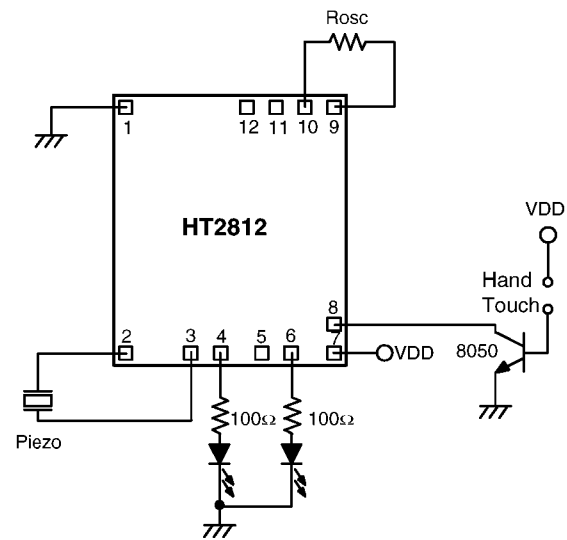
Piezo output without an envelope



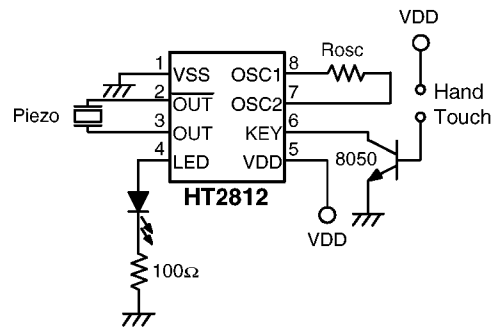
* The IC substrate should be connected to VDD in the PCB layout artwork.



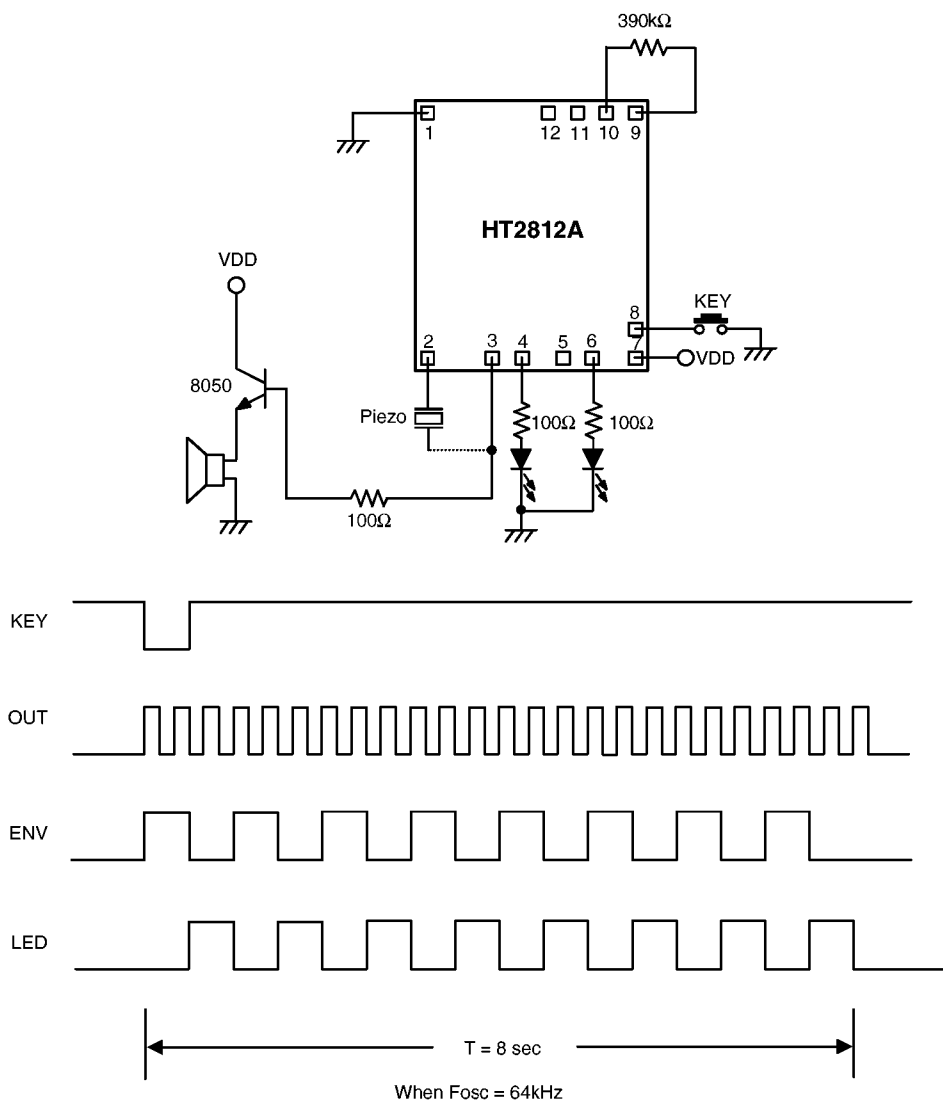
Hand touch trigger



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

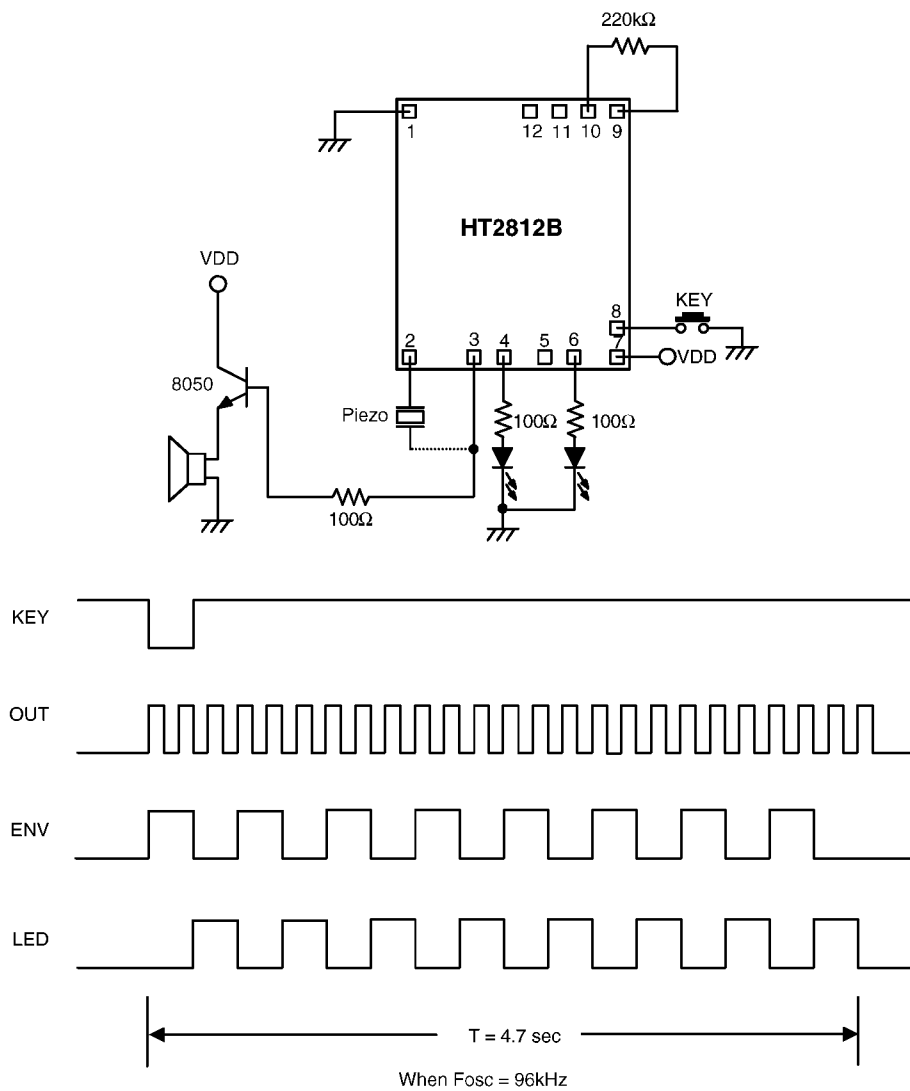


Application Circuit (HT2812A — Airplane)



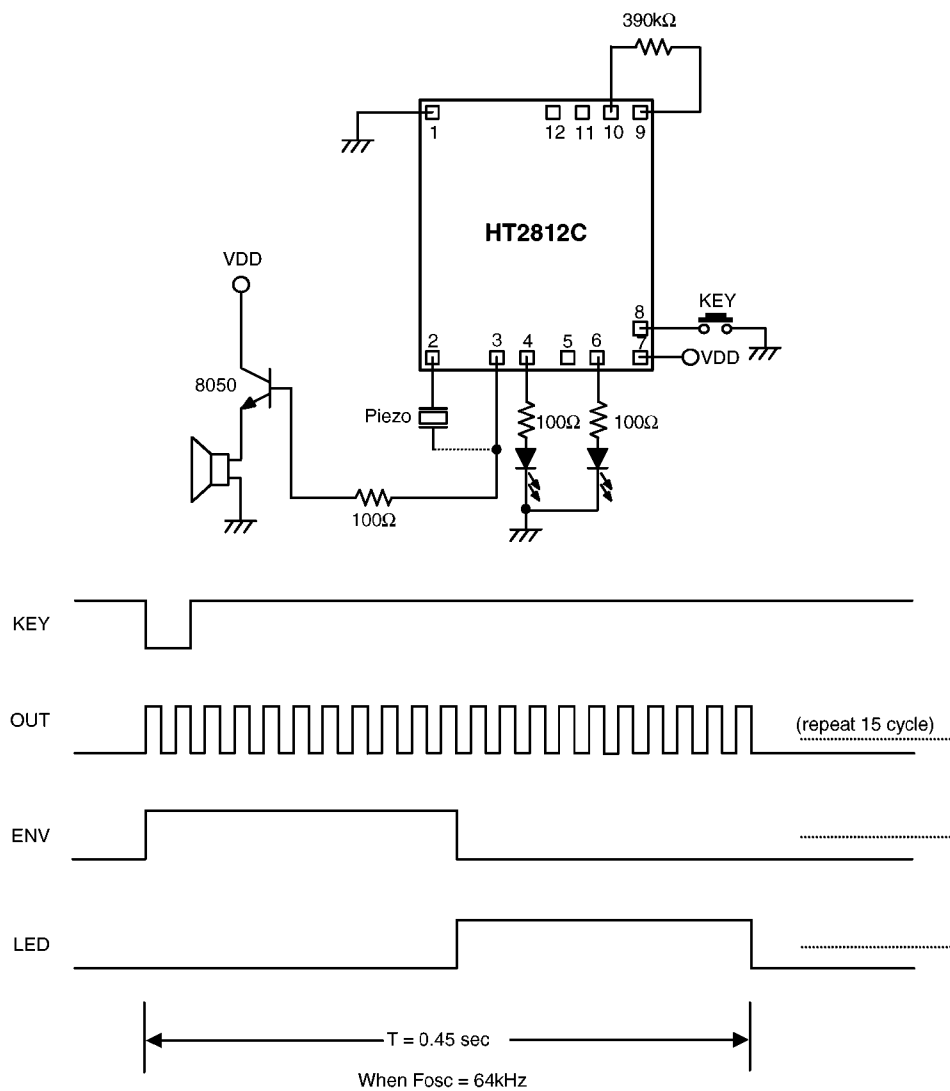
* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812B — Rocket)



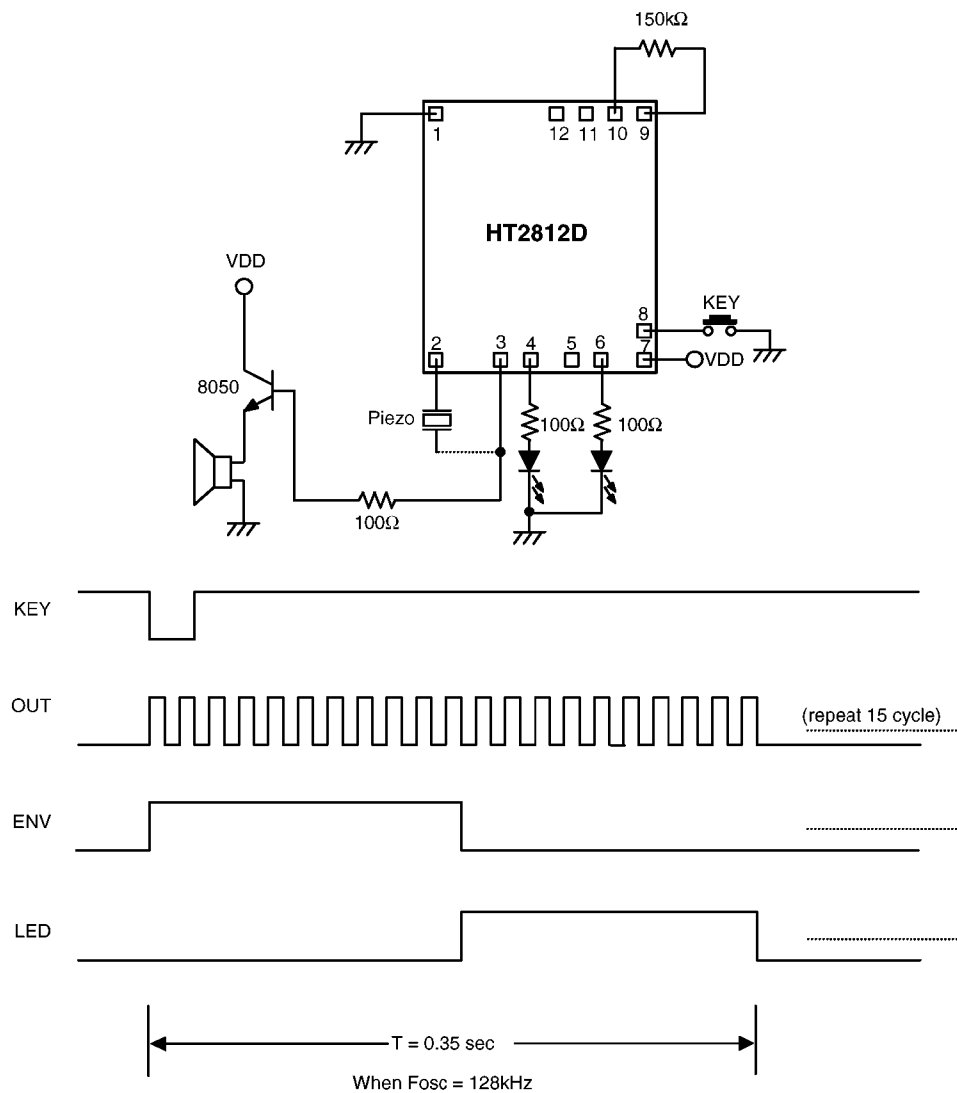
* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812C — Siren II)



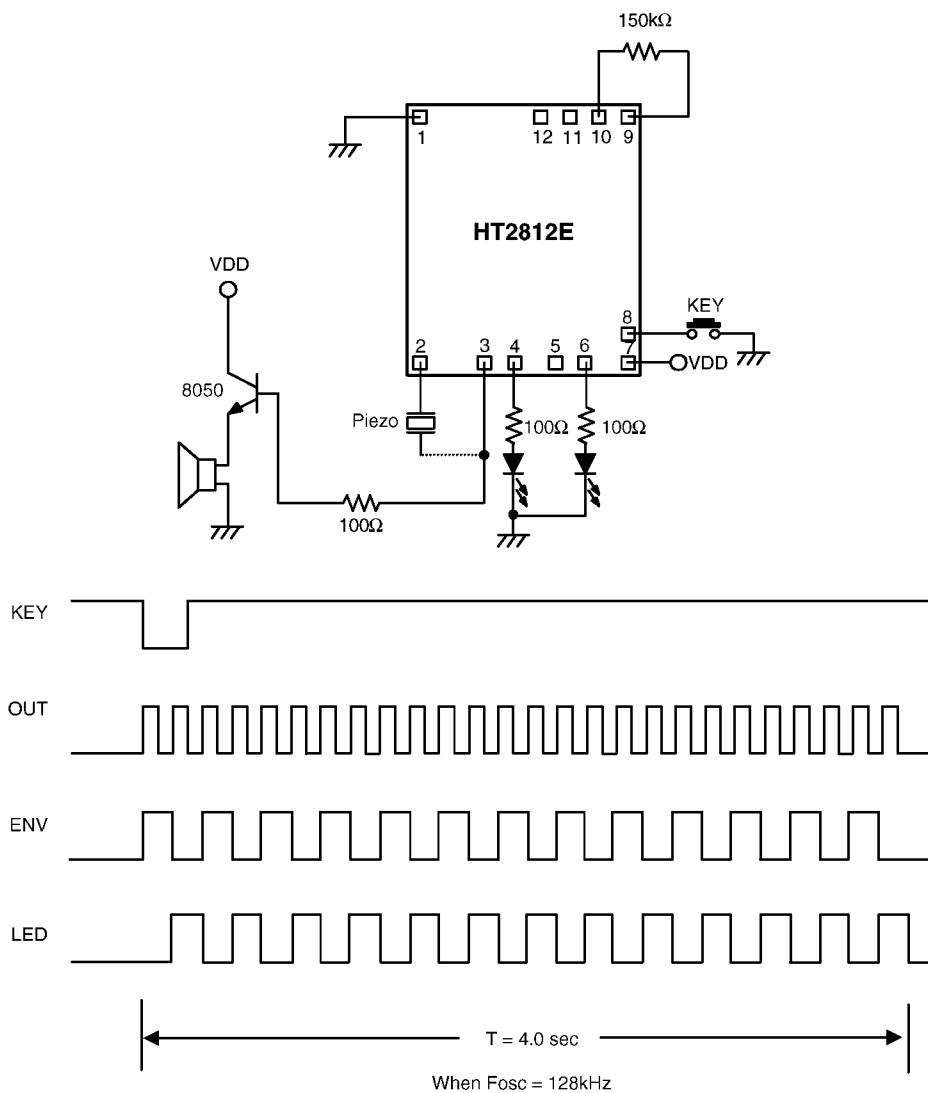
* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812D — Police Car)



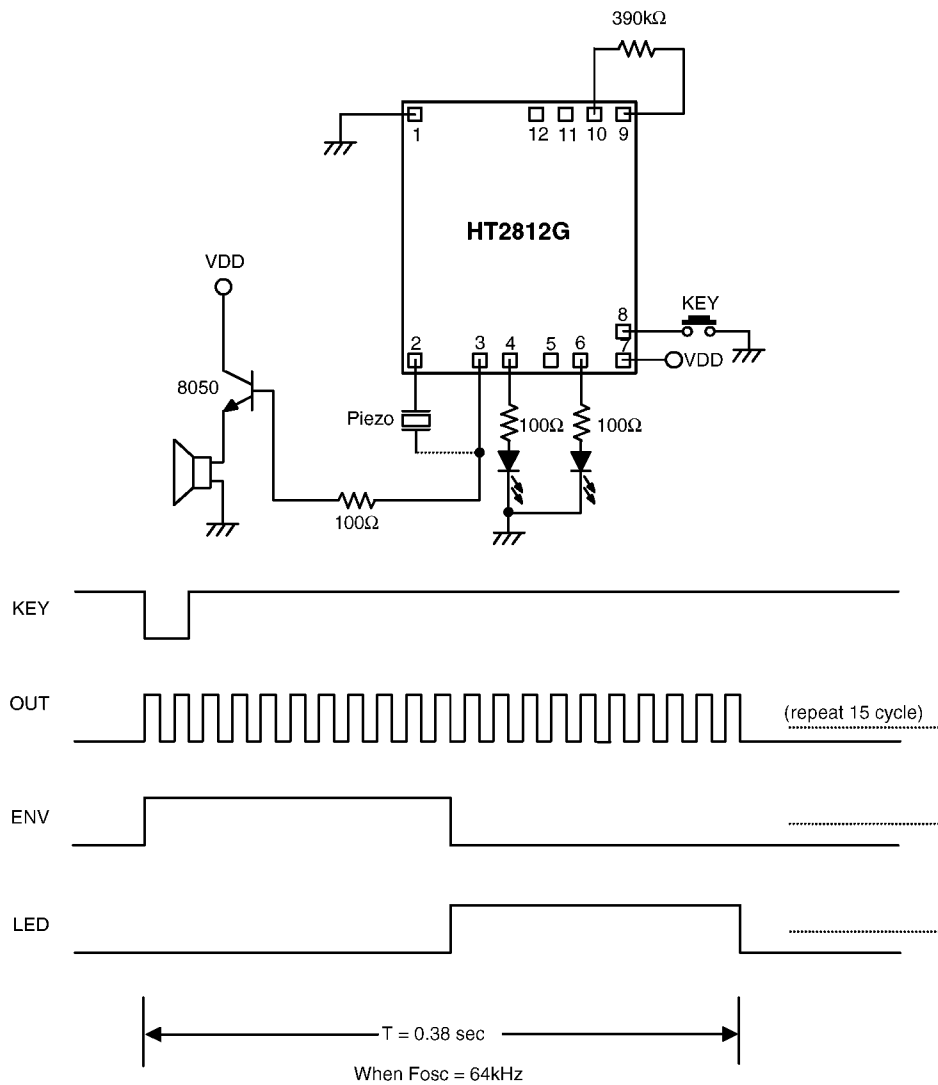
* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812E — Fire Brigade)

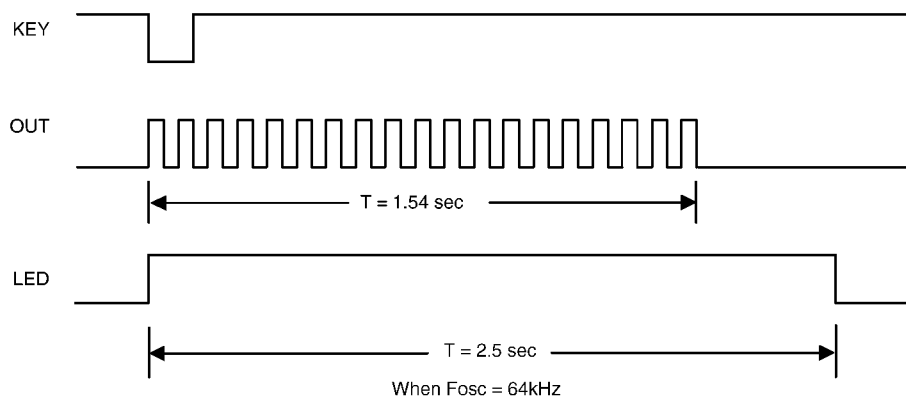
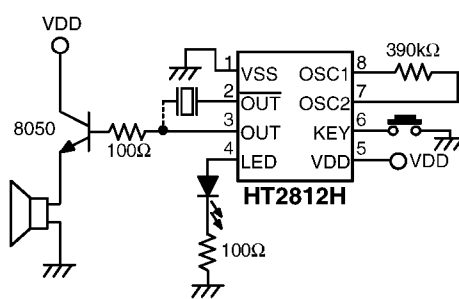


* The IC substrate should be connected to VDD in the PCB layout artwork.

Application Circuit (HT2812F — Siren I)



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

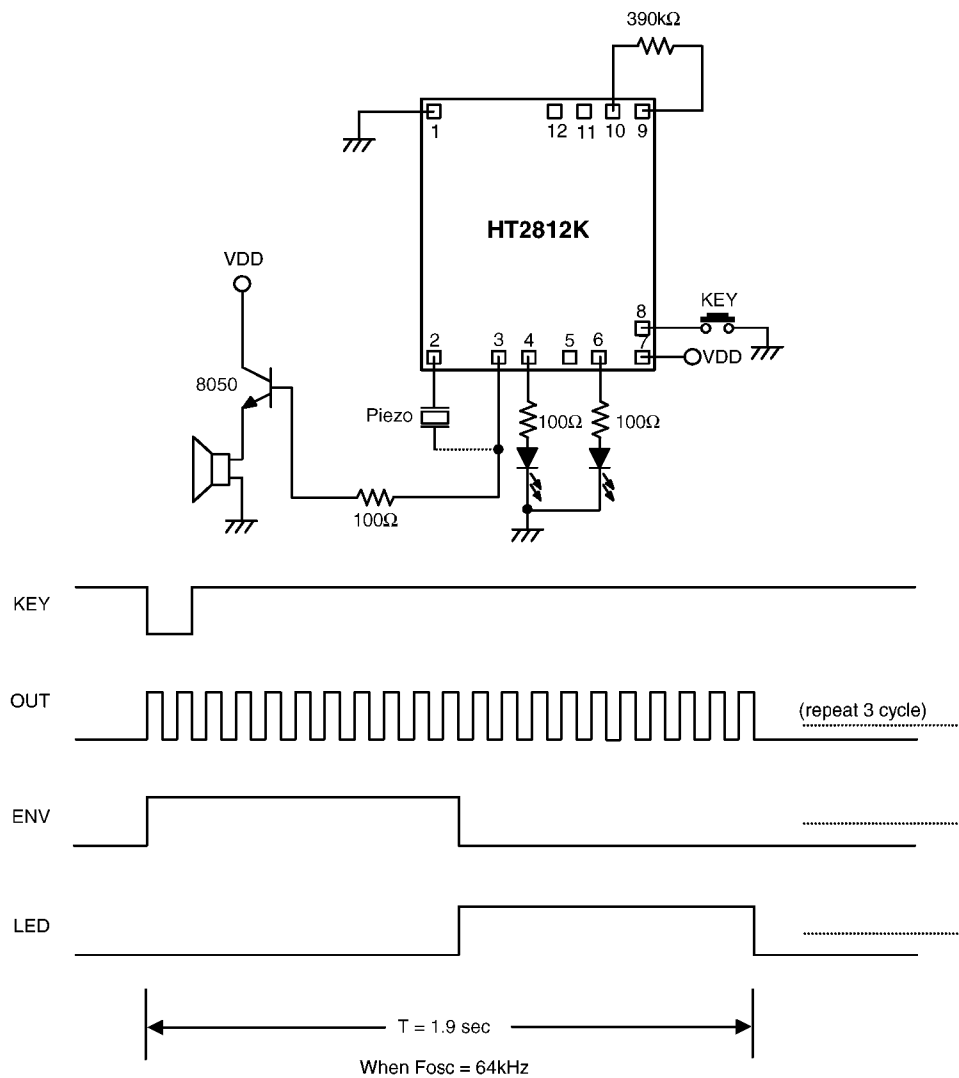


* The IC substrate should be connected to VDD in the PCB layout artwork.

[illegible]

10th July '97

Application Circuit (HT2812K — Ambulance Sound)



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