

### Features

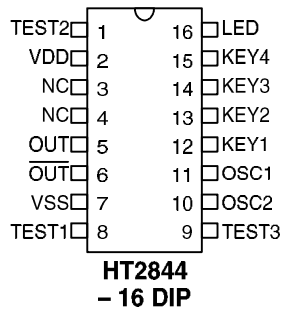
- Single power supply: 2.4V~3.3V
- Low standby current: 1 $\mu$ A (Typ.) at V<sub>DD</sub>= 3V
- Auto power-off function
- Eight different sound sections
- Speaker or direct piezo application
- LED flash drive output
- Minimal external components

### General Description

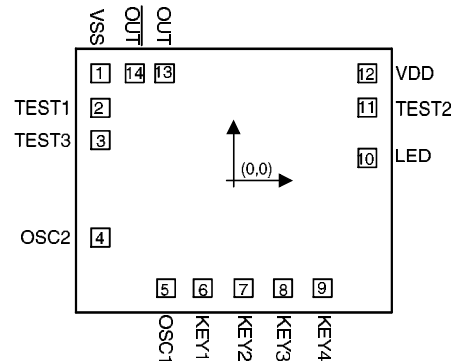
The HT2844 is a CMOS LSI chip designed for use in sound effect products. It is equipped with tone circuit, noise circuit, and other control logic to generate various sounds including rifle fire, machine gun, booming, door bell, Alarm,

and so forth. Customer's supplied sound source can be analyzed and programmed into an internal ROM by changing a mask layer during device fabrication. The HT2844 is suitable for various toy applications.

### Pin Assignment



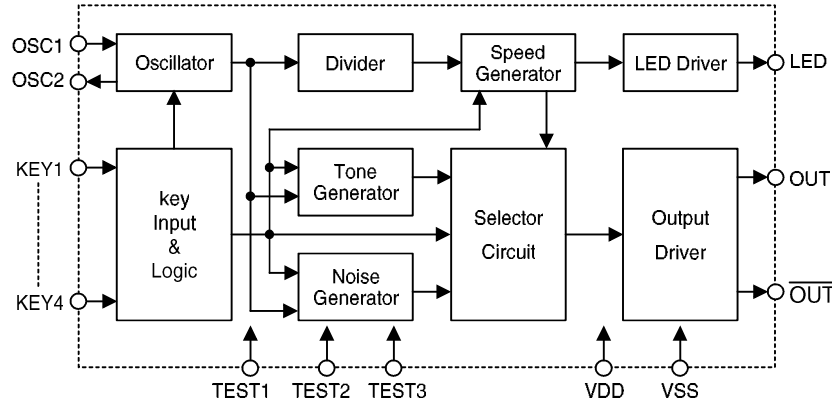
### Pad Assignment



Chip size: 81 × 67 (mil)<sup>2</sup>

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

**Block Diagram**



**Pad Coordinates**

Unit: mil

Pad No.	X	Y	Pad No.	X	Y
1	-33.53	27.05	8	12.45	-27.04
2	-33.53	18.30	9	22.40	-27.04
3	-33.53	10.22	10	33.62	5.72
4	-33.53	-14.34	11	33.62	18.38
5	-16.96	-27.04	12	33.62	27.05
6	-7.43	-27.04	13	-17.17	27.05
7	2.51	-27.04	14	-24.86	27.05

**Pin Description**

Pin No.	Pin Name	I/O	Description
1	TEST2	I/O	For IC test only
2	VDD	—	Positive power supply
3	NC	—	No connection
4	NC	—	No connection
5	OUT	O	Sound output
6	$\overline{\text{OUT}}$	O	Sound output, out of phase to pin 5
7	VSS	—	Negative power supply, GND
8	TEST1	I	For IC test only
9	TEST3	I/O	For IC test only
10	OSC2	O	Oscillator output
11	OSC1	I	Oscillator input

Pin No.	Pin Name	I/O	Description
12	KEY1	I	KEY1 input, low active
13	KEY2	I	KEY2 input, low active
14	KEY3	I	KEY3 input, low active
15	KEY4	I	KEY4 input, low active
16	LED	O	LED flash output

**Absolute Maximum Ratings\***

Supply Voltage ..... -0.3V to 5V      Storage Temperature..... -50°C to 125°C

Input Voltage..... V<sub>SS</sub>-0.3 to V<sub>DD</sub>+0.3V      Operating Temperature..... 0°C to 70°C

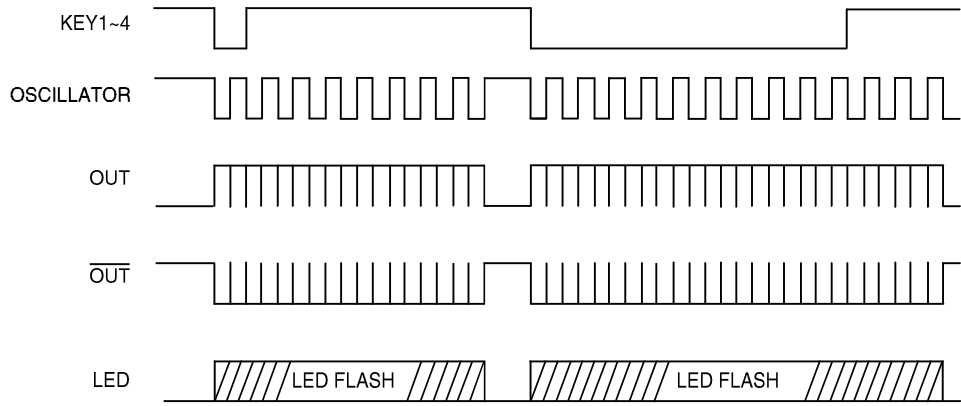
\*Note: Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and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

**Electrical Characteristics**

 (T<sub>a</sub>=25°C)

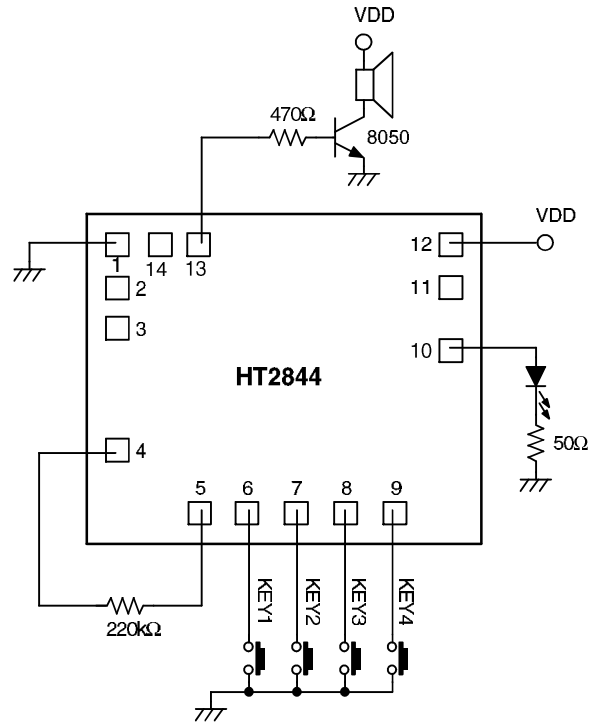
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V <sub>DD</sub>	Conditions				
V <sub>DD</sub>	Operating Voltage	—	—	2.4	3	3.3	V
I <sub>STB</sub>	Standby Current	3V	—	—	1	5	μA
I <sub>DD</sub>	Operating Current	3V	No load	—	300	600	μA
I <sub>OH</sub>	OUT Source Current	3V	V <sub>OH</sub> =2.5V	-1	-2	—	mA
I <sub>OL</sub>	OUT Sink Current	3V	V <sub>OL</sub> =0.5V	1	2	—	mA
I <sub>LED</sub>	LED Source Current	3V	V <sub>OL</sub> =2.5V	-1	-2	—	mA
F <sub>OSC</sub>	Oscillator Frequency	—	R=220kΩ	—	128	—	kHz
V <sub>IH</sub>	“H” Input Voltage	3V	—	2.4	—	—	V
V <sub>IL</sub>	“L” Input Voltage	3V	—	—	—	0.6	V

Timing Diagram

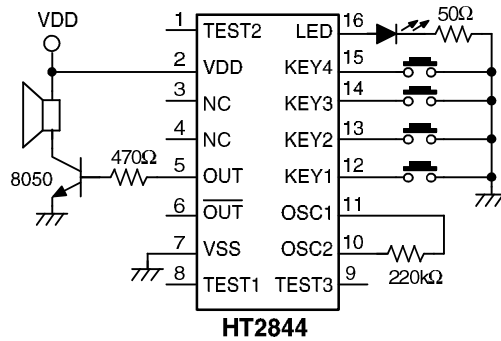


**Application Circuits (HT2844 — Four Toy Gun Sounds)**

- Speaker application

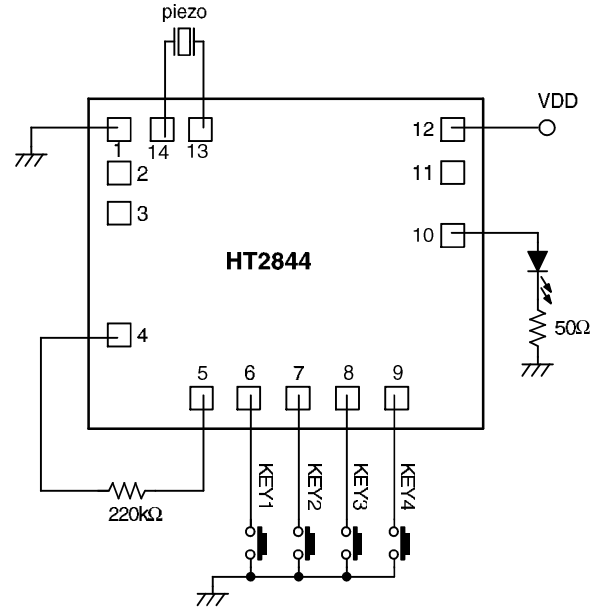


\* The IC substrate should be connected to VDD in the PCB layout artwork.

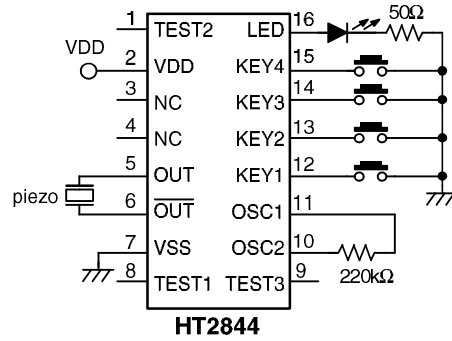


KEY1: Rifle Gun      KEY3: Bombing  
 KEY2: TV Game      KEY4: Machine Gun

- Piezo application



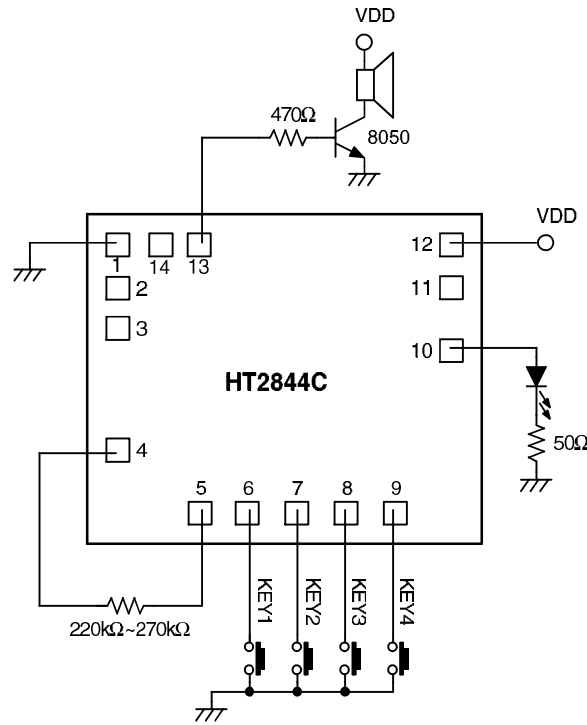
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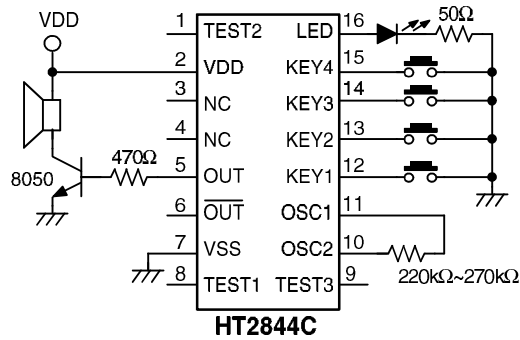
KEY1: Rifle Gun      KEY3: Bombing  
 KEY2: TV Game      KEY4: Machine Gun

**Application Circuits (HT2844C — Four Animal Sounds)**

- Speaker application

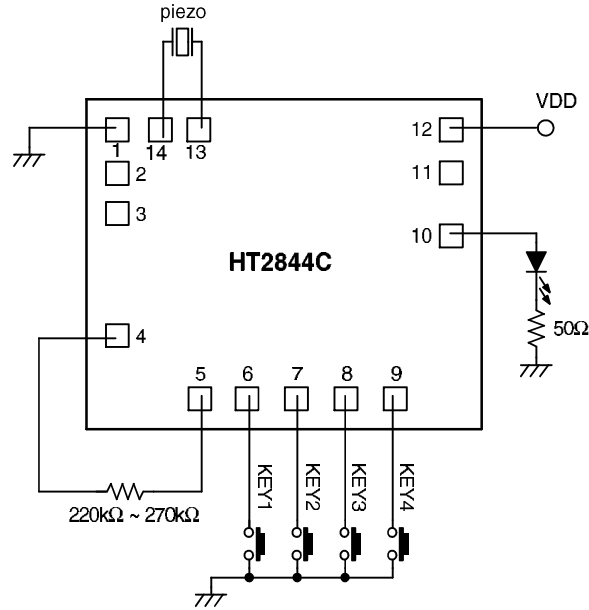


\* The IC substrate should be connected to VDD in the PCB layout artwork.

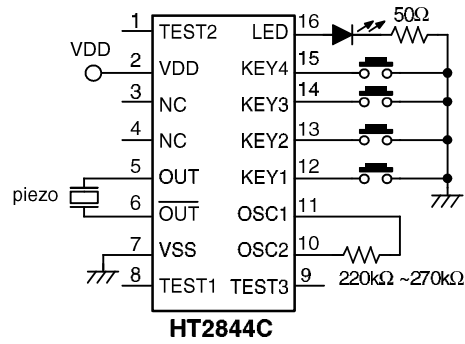


KEY1: Small Chicken      KEY3: Frog  
KEY2: Cricket              KEY4: Bird

• Piezo application



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

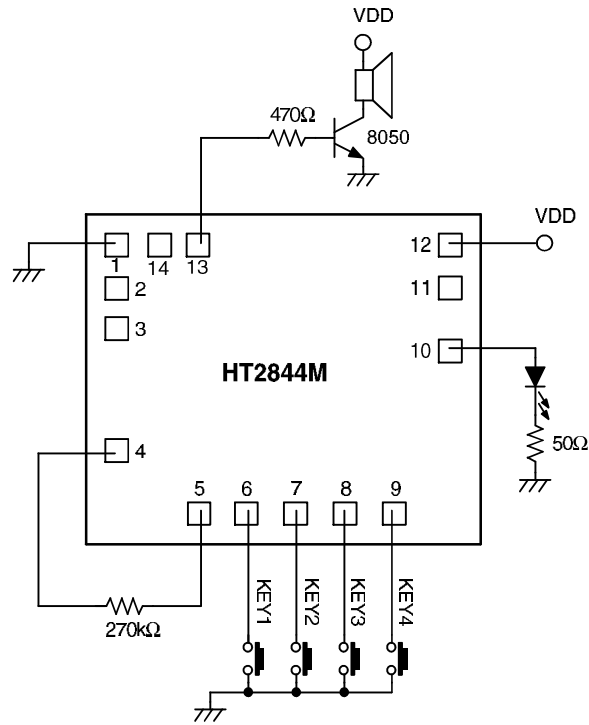


KEY1: Small Chicken      KEY3: Frog  
KEY2: Cricket              KEY4: Bird

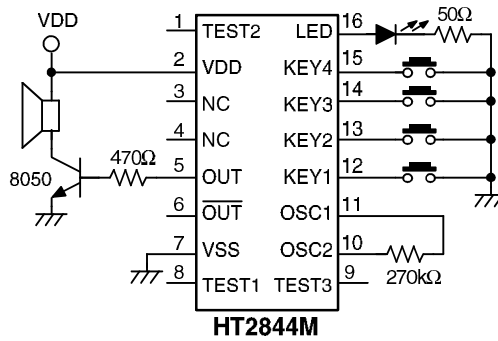


**Application Circuits (HT2844M — Four Helicopter Sounds)**

- Speaker application



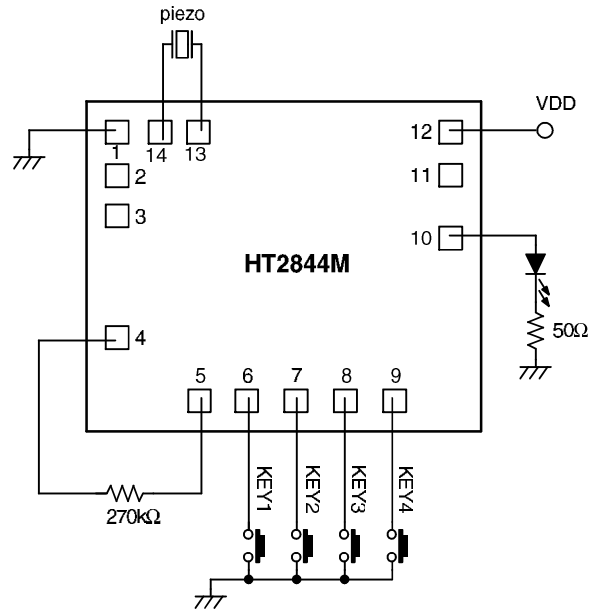
\* The IC substrate should be connected to VDD in the PCB layout artwork.



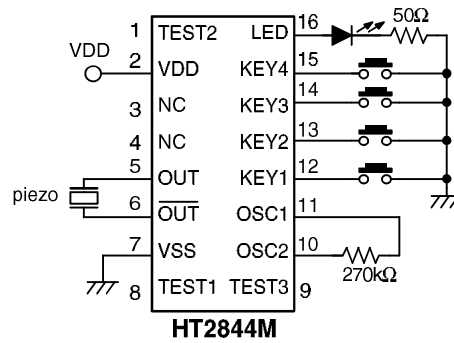
KEY1: High speed sound of propeller  
KEY2: Low speed sound of propeller

KEY3: Explosion  
KEY4: Machine Gun

• Piezo application



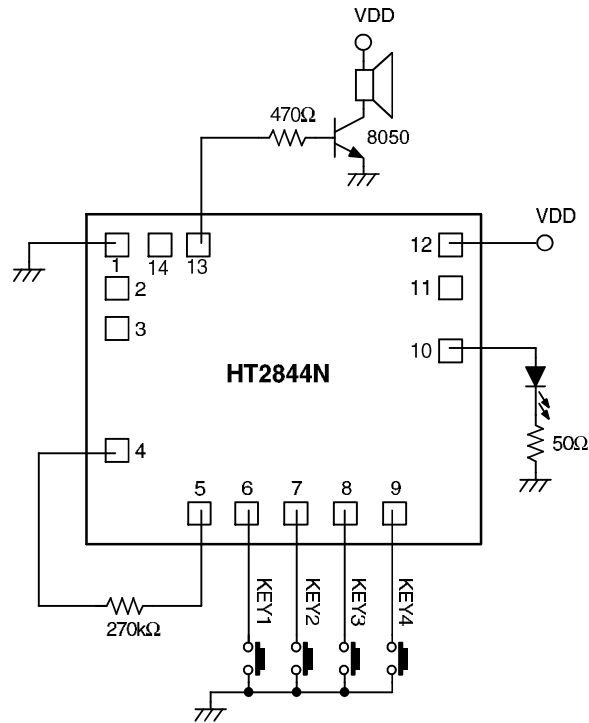
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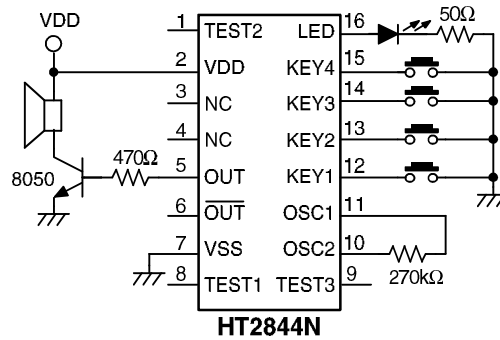
KEY1: High speed sound of propeller      KEY3: Explosion  
 KEY2: Low speed sound of propeller      KEY4: Machine Gun

**Application Circuits (HT2844N — Four Racing Car Sounds)**

- Speaker application



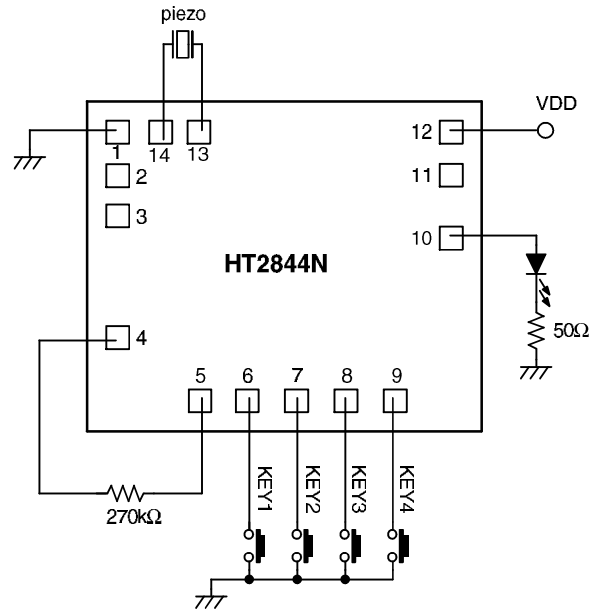
\* The IC substrate should be connected to VDD in the PCB layout artwork.



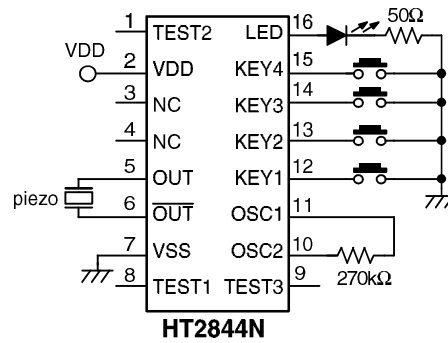
KEY1: Low speed sound of engine  
KEY2: High speed sound of engine

KEY3: Horn  
KEY4: Brake

• Piezo application



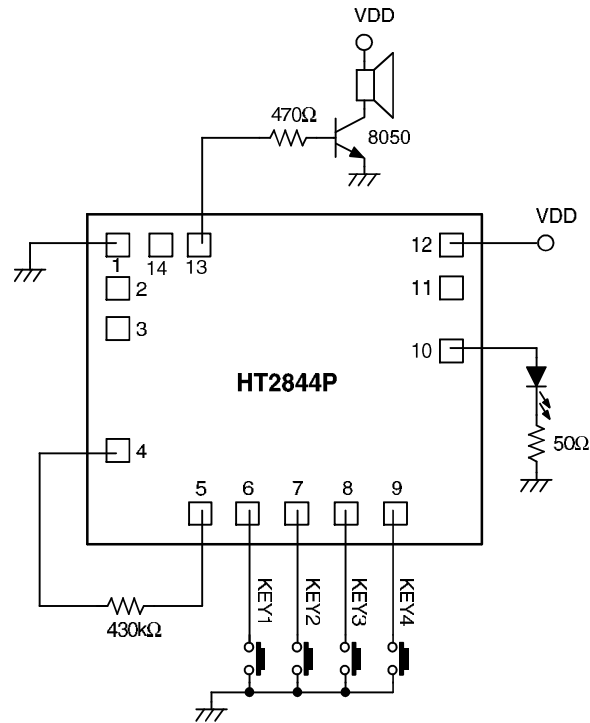
\* The IC substrate should be connected to VDD in the PCB layout artwork.



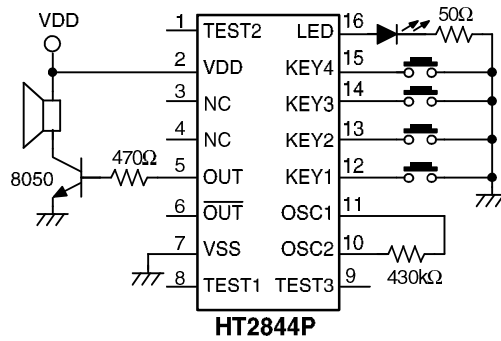
KEY1: Low speed sound of engine      KEY3: Horn  
 KEY2: High speed sound of engine      KEY4: Brake

**Application Circuits (HT2844P — Four Jet aircraft Sounds)**

- Speaker application

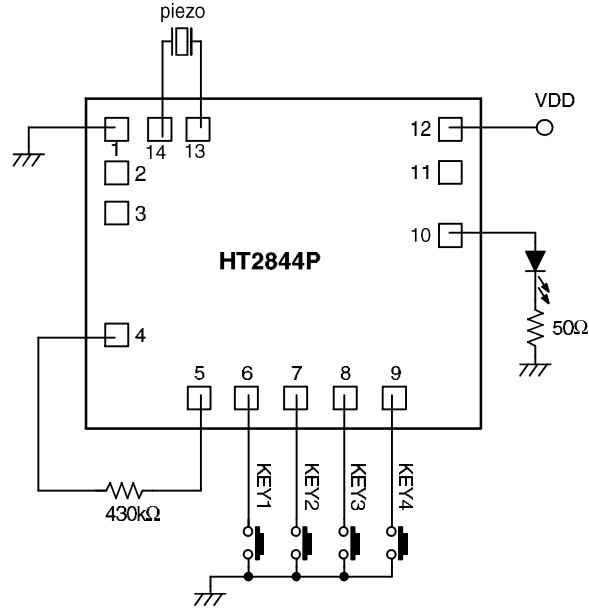


\* The IC substrate should be connected to VDD in the PCB layout artwork.

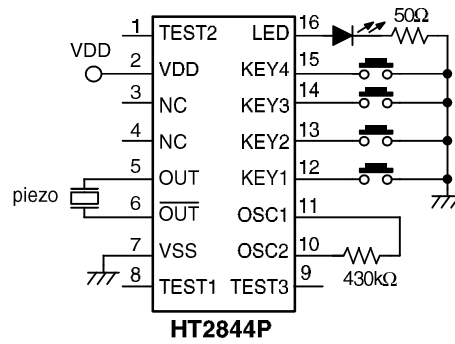


KEY1: Low speed sound of aircraft    KEY3: Missile  
 KEY2: High speed sound of aircraft    KEY4: Machine Gun

• Piezo application



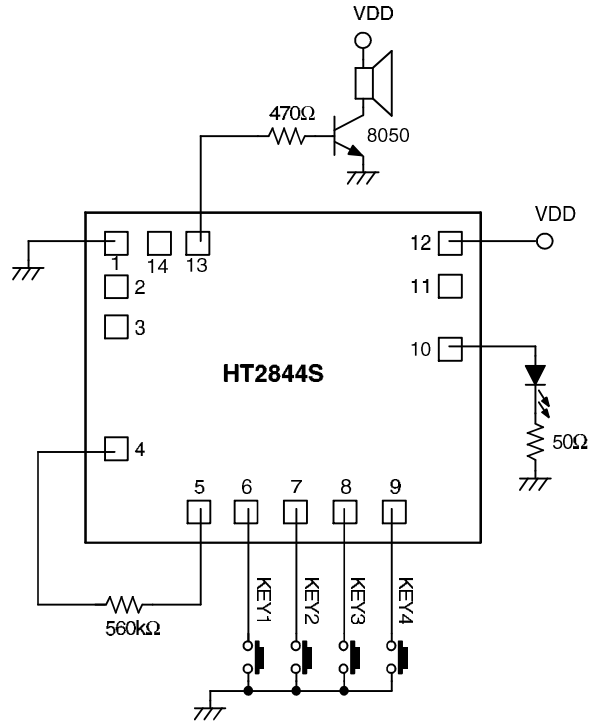
\* The IC substrate should be connected to VDD in the PCB layout artwork.



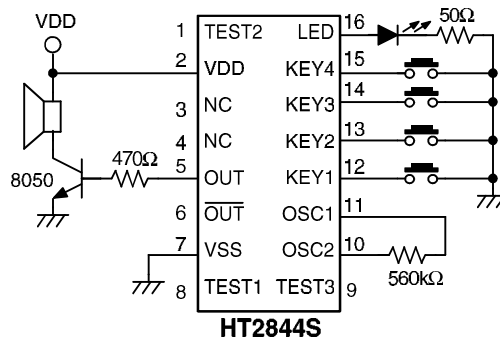
KEY1: Low speed sound of aircraft      KEY3: Missile  
 KEY2: High speed sound of aircraft    KEY4: Machine Gun

**Application Circuits (HT2844S — Four Morning Call Sounds)**

- Speaker application

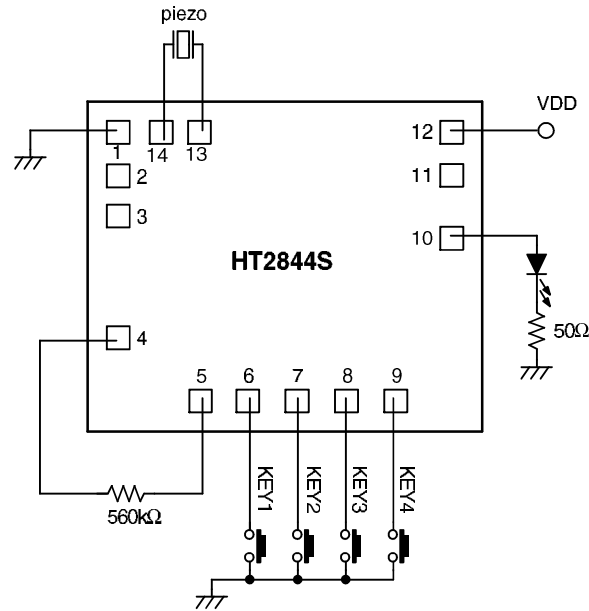


\* The IC substrate should be connected to VDD in the PCB layout artwork.

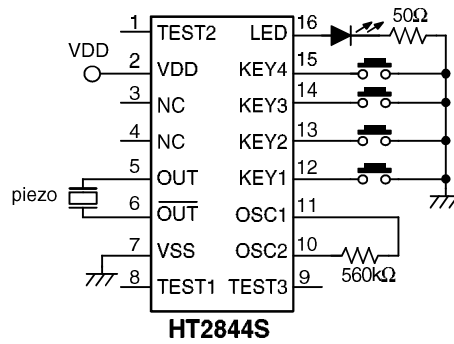


KEY1: Phone      KEY3: Ambulance  
 KEY2: Siren      KEY4: Melody (London bridge is falling down)

• Piezo application



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

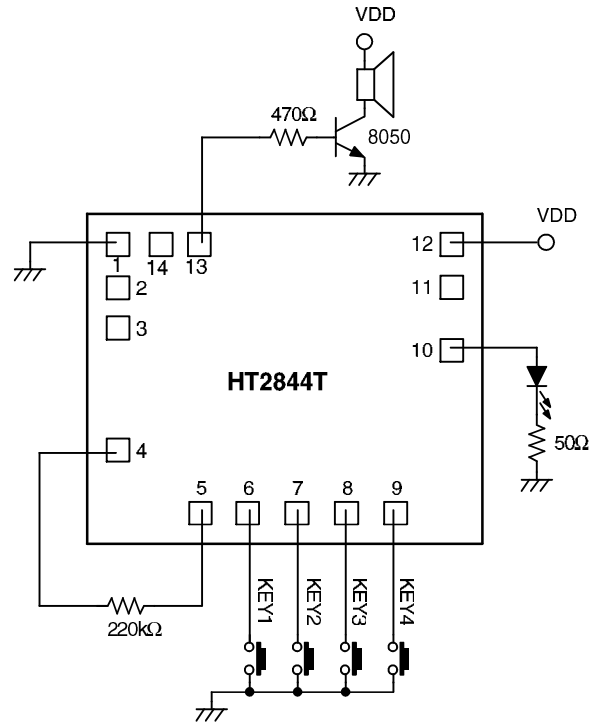


KEY1: Phone      KEY3: Ambulance  
 KEY2: Siren      KEY4: Melody (London bridge is falling down)

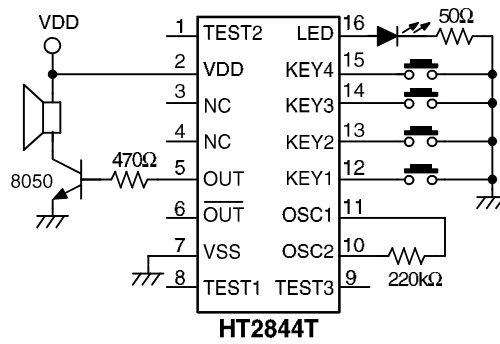


**Application Circuits (HT2844T — Four Alarm Sounds)**

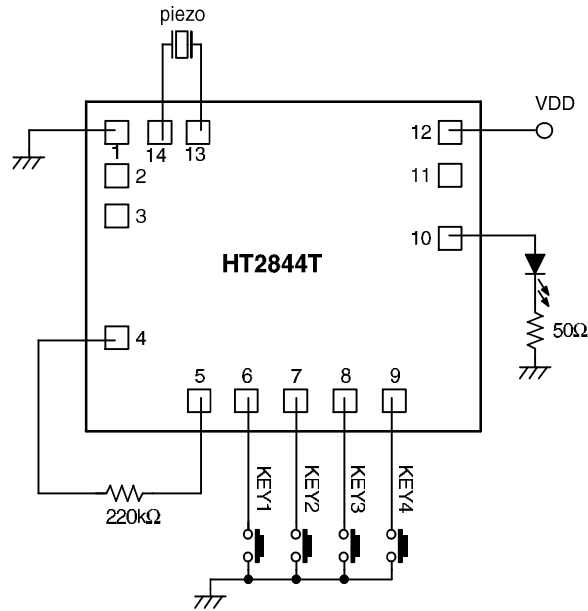
- Speaker application



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



• Piezo application



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

