

Features

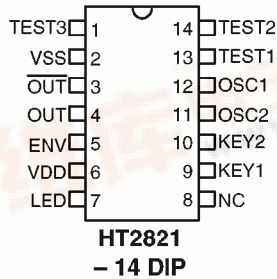
- Single power supply: 2.4V~3.3V
- Low standby current: 1μA (Typ.) at V_{DD}=3V
- Auto power-off function
- Two sections triggered by 2 input keys
- Built-in envelope control circuit
- Minimum external components
- Speaker or direct piezo application
- 1Hz~8Hz programmable LED flash output

General Description

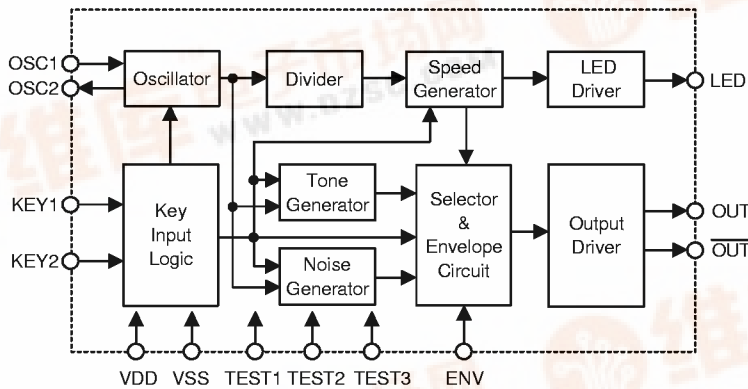
The HT2821 is a CMOS LSI chip designed for use in sound effect products. It is equipped with two sound sections, tone circuit, noise circuit, and other control logic to generate various sounds including rifle fire, machine gun fire, bombing, door bell, alarm, and so on.

Customers are required to supply their sound samples — e.g., cassette tapes, CDs etc.— that can be analyzed and programmed into the IC by changing a mask layer during device fabrication. The HT2821 is suitable for various toy applications.

Pin Assignment

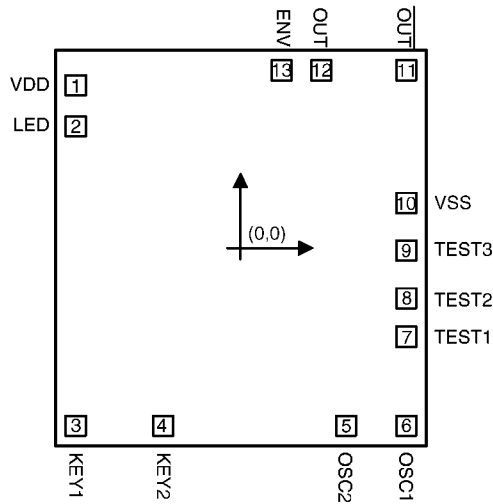


Block Diagram



Pad Coordinates

Unit: mil



Pad No.	X	Y	Pad No.	X	Y
1	-32.725	32.275	8	32.937	-9.946
2	-32.725	24.140	9	32.937	-0.510
3	-32.725	-35.275	10	32.937	8.925
4	-15.385	-35.275	11	32.937	35.275
5	20.952	-35.275	12	16.022	35.275
6	32.937	-35.275	13	8.202	35.275
7	32.937	-17.595			

 Chip size: $78 \times 83 \text{ (mil)}^2$

* 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.	Unit
		V _{DD}	Conditions				
V _{DD}	Operating Voltage	—	—	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

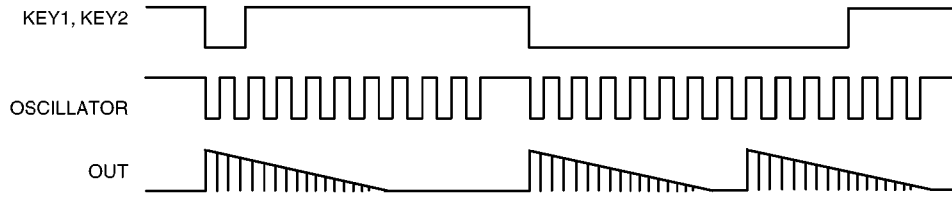
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{DD}	Conditions				
I _{LED}	LED Source Current	3V	V _{OH} =2.5V	-1	-2	—	mA
F _{OSC}	Oscillator Frequency	—	R=180kΩ	—	128	—	kHz
V _{IH}	“H” Input Voltage	3V	—	2.4	—	—	V
V _{IL}	“L” Input Voltage	3V	—	—	—	0.6	V

Pin Description

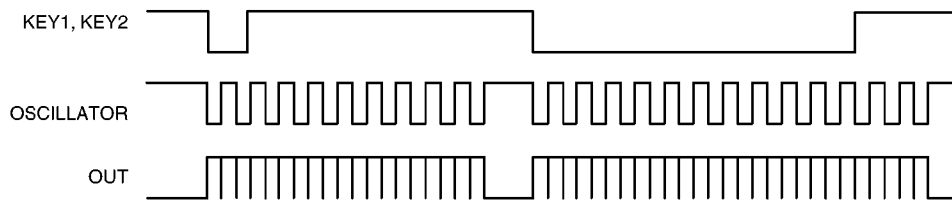
Pin No.	Pin Name	I/O	Description
1	TEST3	O	For IC test only
2	VSS	—	Negative power supply, GND
3	$\overline{\text{OUT}}$	O	Tone output, out of phase to pin 4
4	OUT	O	Tone output for driving a transistor
5	ENV	I	RC envelope effect
6	VDD	—	Positive power supply
7	LED	O	LED flash output
8	NC	—	No connection
9	KEY1	I	KEY1 input, active low
10	KEY2	I	KEY2 input, active low
11	OSC2	O	Oscillator output
12	OSC1	I	Oscillator input
13	TEST1	O	For IC test only
14	TEST2	O	For IC test only

Timing Diagram

With an envelope

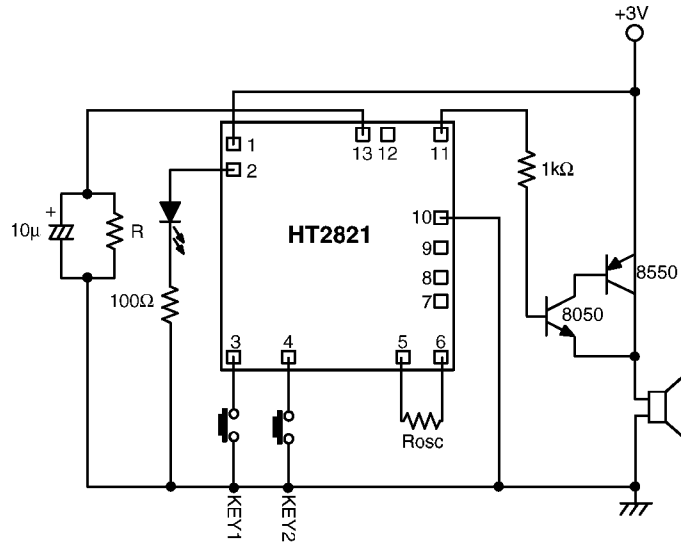


No envelope

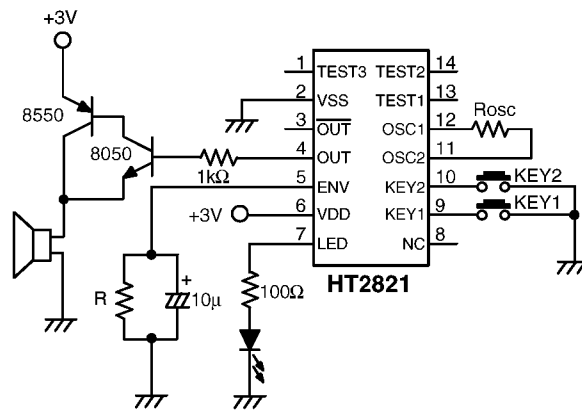


Application Circuits

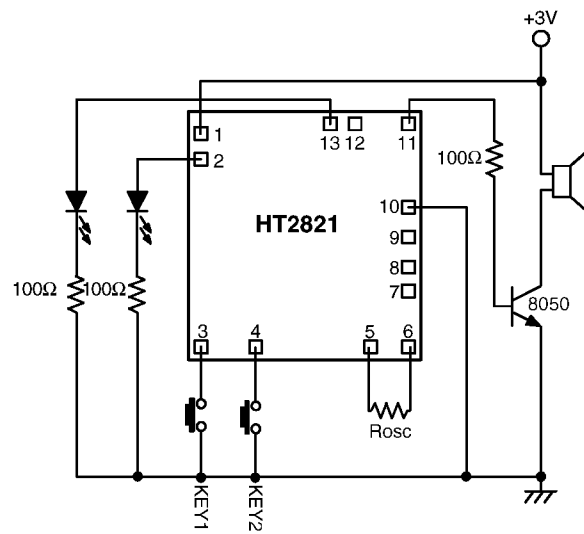
With an envelope



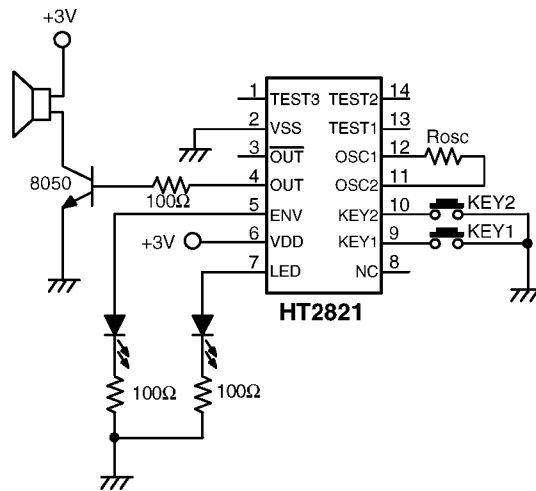
* The IC substrate should be connected to VDD in the PCB layout artwork.



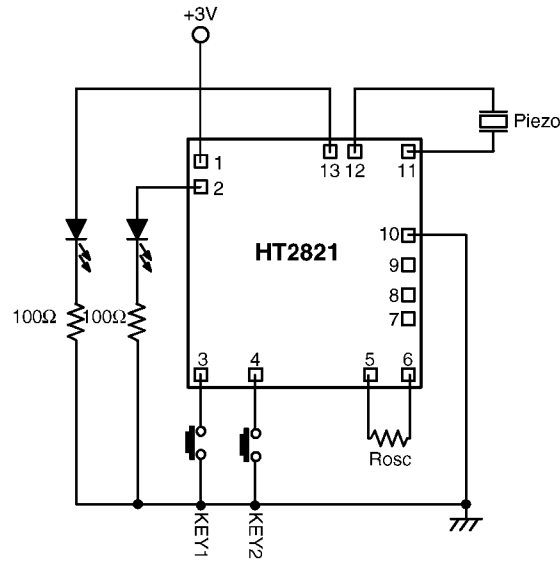
Without an envelope



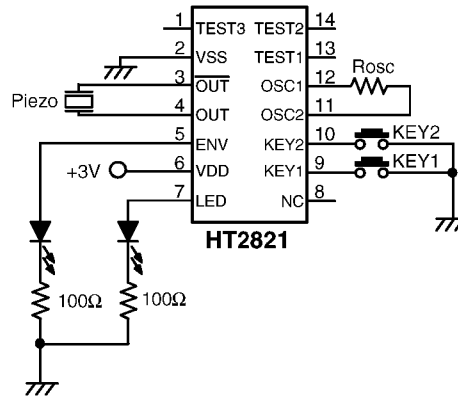
* The IC substrate should be connected to VDD in the PCB layout artwork.



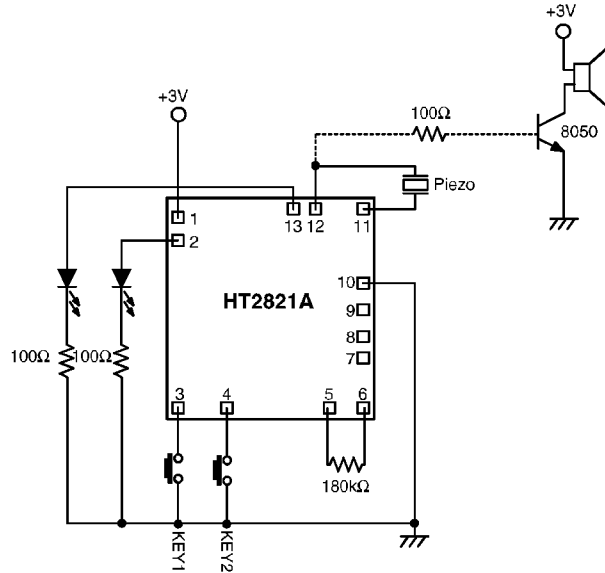
Drive piezo



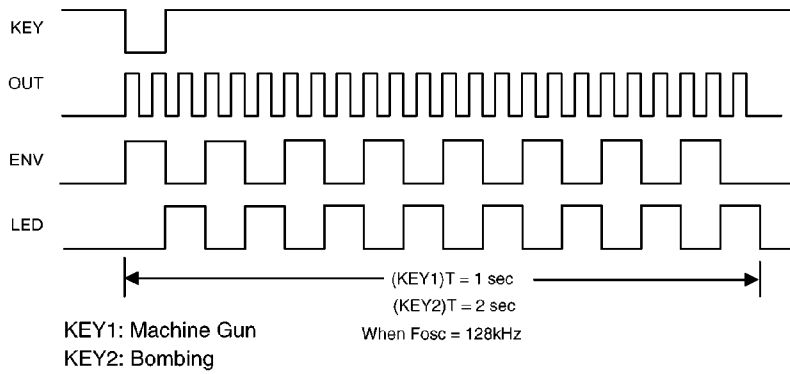
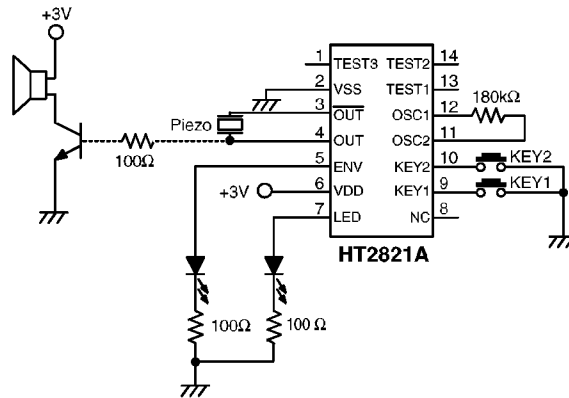
* The IC substrate should be connected to VDD in the PCB layout artwork.



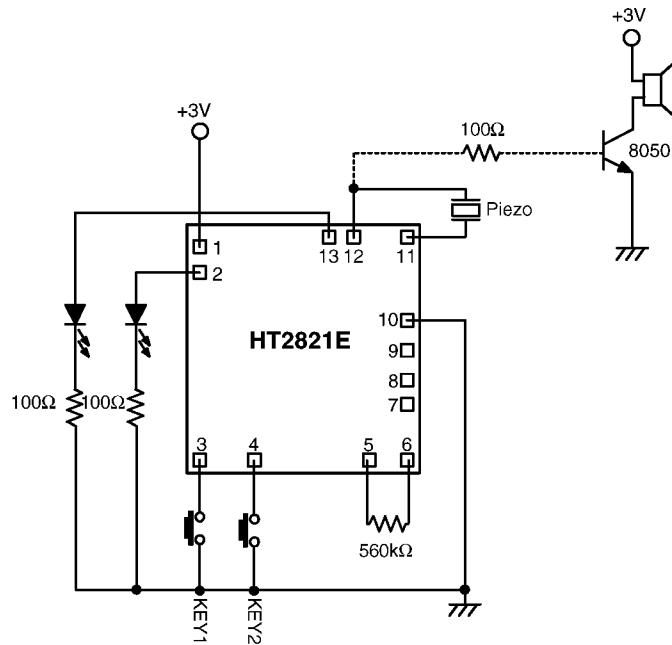
Application Circuits (HT2821A — Bombing & Machine Gun)



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



Application Circuits (HT2820E — Brake & Explosion)



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

