

### Features

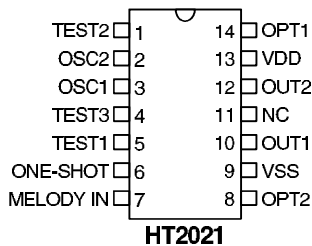
- CMOS Metal-Gate Process
- Operating voltage: 1.2V~4.5V
- Low stand-by current: 1 $\mu$ A at 3V
- Two lamp flash driver with a 10mA driving capability
- In-Phase or Out-of-Phase selection
- Synchronous flash with a melody interface
- 1/8 duty cycle output
- A built-in oscillator
- Minimum external components

### General Description

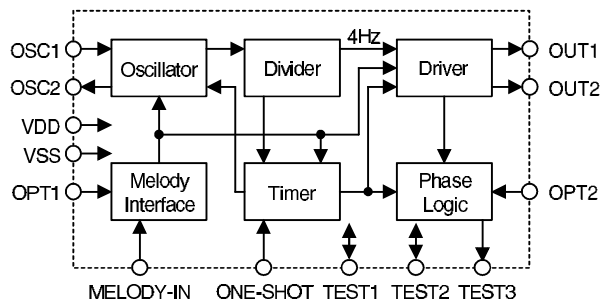
The HT2021 is a low cost, low-power CMOS LSI chip designed for lamp and LED flash drivers. It contains two 10mA flash drivers that can be driven in-phase or out-of-phase. The chip re-

quires only one external resistor for normal applications. It is suitable for use in products that require flashing lights, such as Christmas decoration, gift cards, and so on.

### Pin Assignment

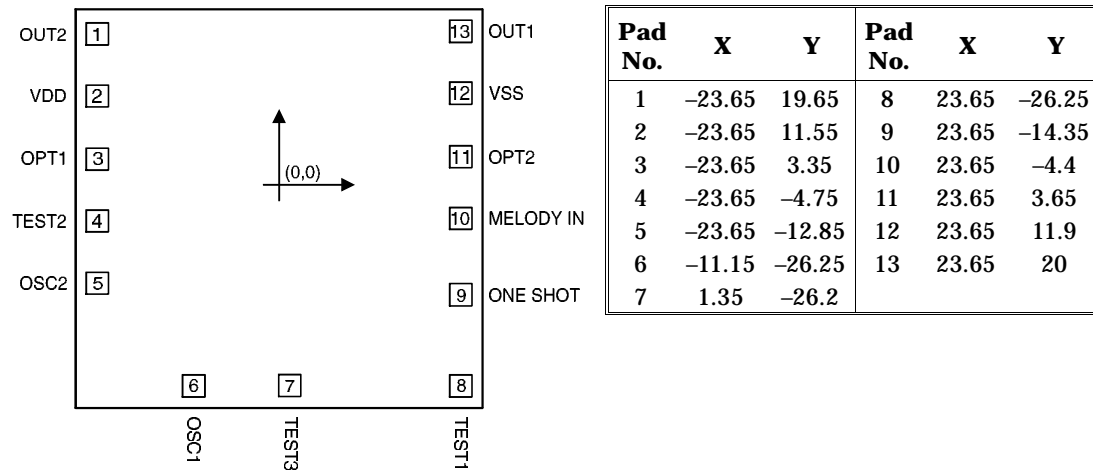


### Block Diagram



**Pad Coordinates**

Unit: mil


 Chip size:  $60 \times 65 \text{ (mil)}^2$ 

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

**Pad Description**

Pad No.	Pad Name	I/O	Description
1	OUT2	O	Lamp/LED flash drive output
2	VDD	I	Positive power supply
3	OPT1	I	Melody Interface selection
4	TEST2	I/O	For IC test only
5	OSC2	O	Oscillator output
6	OSC1	I	Oscillator input
7	TEST3	O	For IC test only
8	TEST1	I/O	For IC test only
9	ONE-SHOT	I	One shot control input
10	MELODY IN	I	Melody input from the melody IC
11	OPT2	I	In-Phase or Out-of-Phase selection
12	VSS	I	Negative power supply, GND
13	OUT1	O	Lamp/LED drive output

Note: (a) OPTION 1 = 0 → No melody interface

OPTION 1 = 1 → Melody interface

(b) OPTION 2 = 0 → Out-of-phase

OPTION 2 = Open → In-phase

**Absolute Maximum Ratings**

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

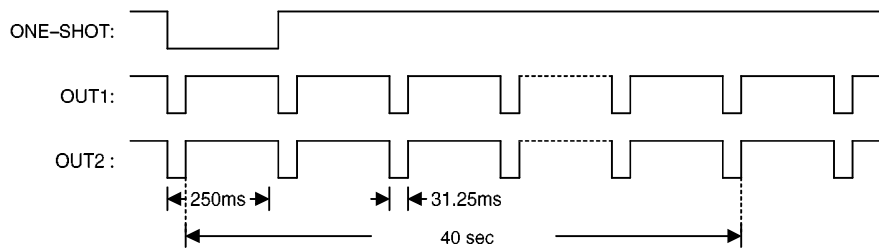
**Electrical Characteristics**

( $T_a=25^\circ C$ )

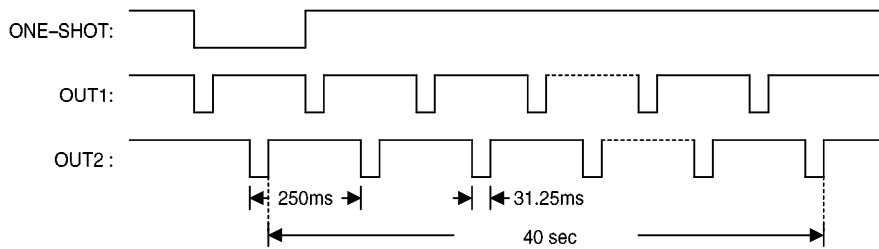
Symbol	Parameter	Test Condition		Min.	Typ.	Max.	Unit
		V <sub>DD</sub>	Condition				
V <sub>DD</sub>	Operating Voltage	—	—	1.2	3	4.5	V
I <sub>STB</sub>	Stand-by Current	3V	No load	—	1	2	μA
I <sub>DD</sub>	Operating Current	3V	—	—	200	500	μA
I <sub>OL</sub>	Output Sink Current	1.5V	V <sub>OL</sub> =0.5V	5	8	—	mA
		3V	V <sub>OL</sub> =0.5V	10	15	—	mA
F <sub>OSC</sub>	Oscillator Frequency	3V	—	—	128k	—	Hz

**Timing Diagram**

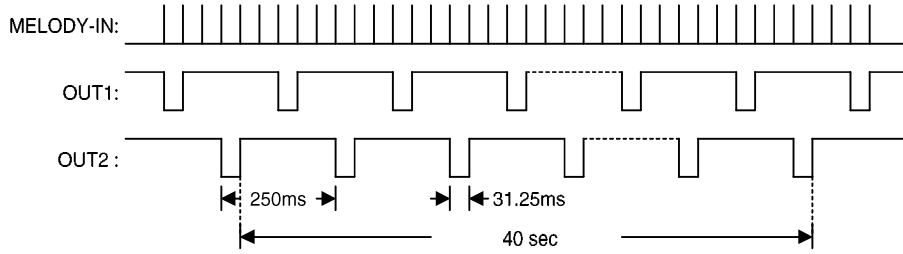
**In-phase output: (when fosc=128kHz)**



**Out-of-phase output: (when fosc=28kHz)**

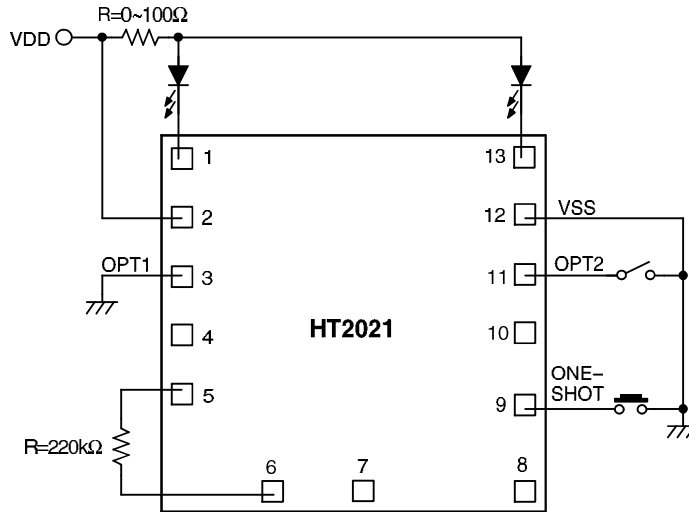


**Melody interface timing: (out-of-phase)**

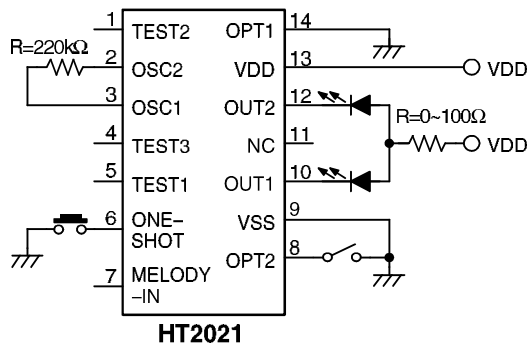


**Application Circuit**

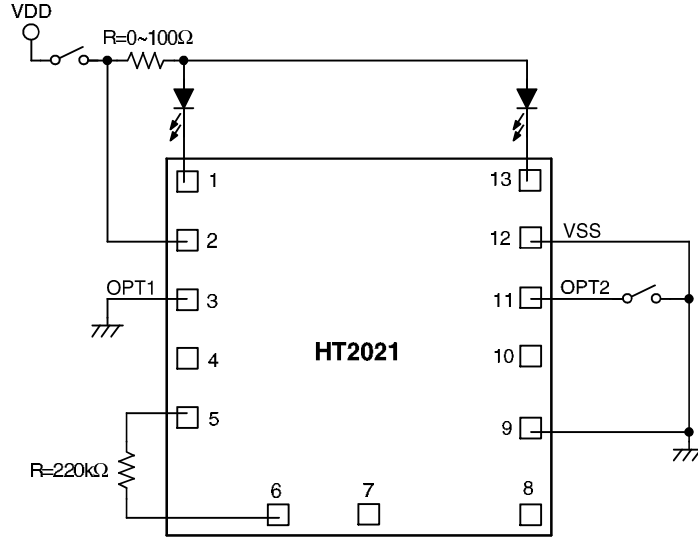
**One-shot mode**



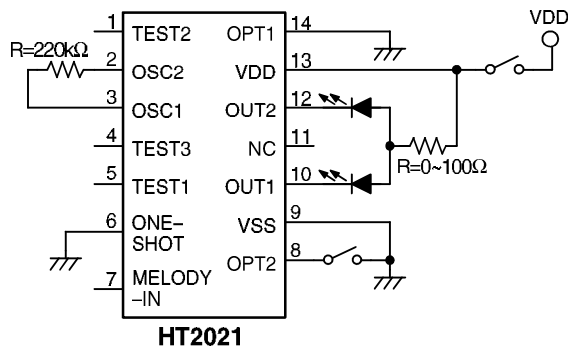
\* The IC substrate should be connected to VDD in the PCB layout artwork.



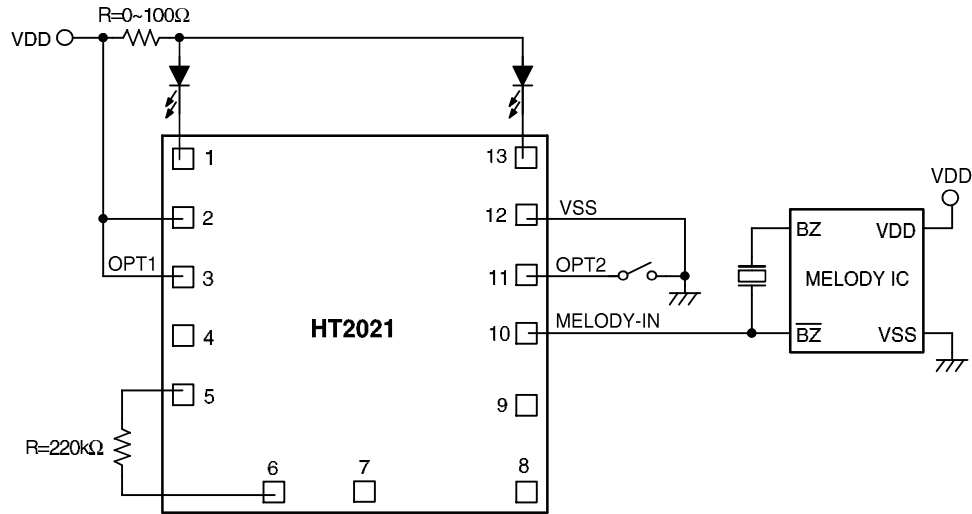
Power-on mode



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



Interface with a melody chip



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