

### Features

- CMOS Metal-Gate process
- Operating voltage: 1.2V~4.5V
- Low standby current: 1 $\mu$ A at 3V
- Three driver outputs
- One-shot and on/off trigger
- Built-in oscillator
- Minimum external components
- 8 DIP/NSOP enclosed
- Options:
  - Flash frequency: 1.33Hz~2.67Hz
  - Output duty: 25%~100%
  - Number of flashes: 1~7

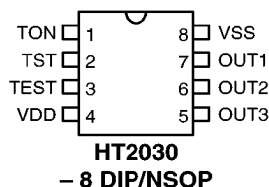
### General Description

The HT2030 is a low cost and low-power CMOS LSI designed for lamp or LED flash drivers. It has three flash outputs with 8mA (typical) driving current.

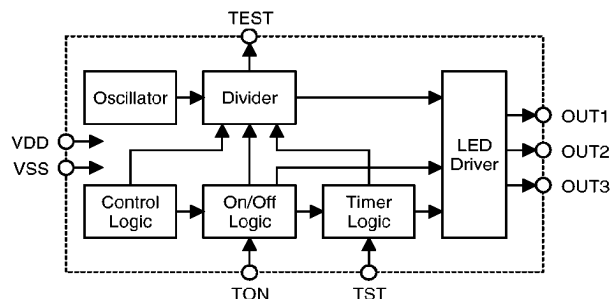
Two inputs are provided to trigger the operation of the HT2030, namely on/off toggle trigger and one shot trigger.

The HT2030 provides options such as flash frequency, LED driving duty and the number of flashes when the IC is operating in the one shot mode.

### Pin Assignment

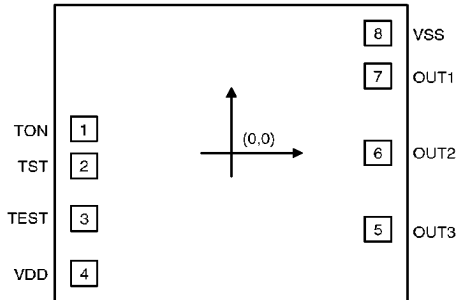


### Block Diagram



## Pad Coordinates

Unit: mil



Pad No.	X	Y	Pad No.	X	Y
1	-30.1	5.2	5	30	-16.3
2	-30.1	-2.7	6	30	0.1
3	-30.1	-13.95	7	30	16.5
4	-30.1	-25.7	8	30	25.7

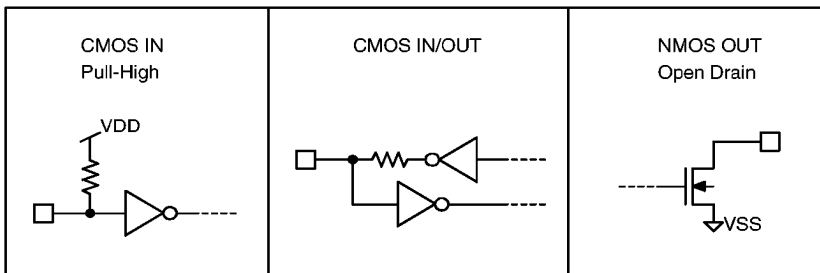
Chip size:  $63 \times 55$  (mil)<sup>2</sup>

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

## Pad Description

Pad No.	Pad Name	I/O	Internal Connection	Description
1	TON	I	CMOS Pull-High	On/off toggle trigger input Low active
2	TST	I	CMOS Pull-High	One shot trigger input Low active
3	TEST	I/O	CMOS	For IC test only
4	VDD	I	—	Power supply (positive)
5~7	OUT3~OUT1	O	NMOS open drain	Lamp/LED flash driving output
8	VSS	I	—	Power supply (negative)

## Approximate internal connection circuit



## Absolute Maximum Ratings

Supply Voltage ..... -0.3V to 6V      Input Voltage .....  $V_{SS}-0.3V$  to  $V_{DD}+0.3$   
 Storage Temperature ..... -50°C to 125°C      Operating Temperature ..... -20°C to 75°C

## D.C. Characteristics

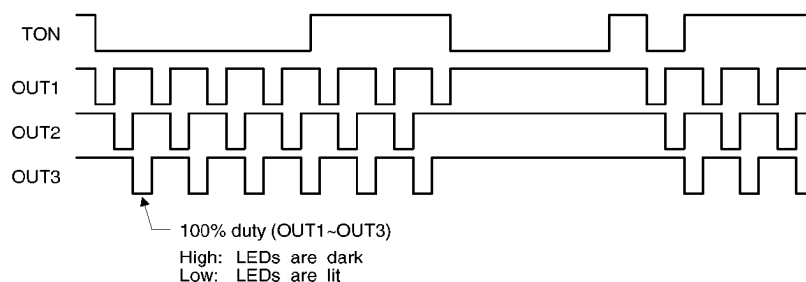
(Ta=25°C)

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V <sub>DD</sub>	Conditions				
V <sub>DD</sub>	Operating Voltage	—	—	1.2	3	4.5	V
I <sub>STB</sub>	Standby Current	3V	—	—	1	2	μA
I <sub>DD</sub>	Operating Current	3V	No Load F <sub>OSC</sub> =60kHz	—	80	160	μA
		4.5V		—	210	420	μA
I <sub>OL</sub>	Output Sink Current	3V	V <sub>OL</sub> =0.3V	5	8	—	mA
		4.5V	V <sub>OL</sub> =0.4V	10	16	—	mA
I <sub>IL</sub>	TON, TST Input Current	3V	V <sub>IL</sub> =0V	—	1	2	μA
		4.5V		—	2	4	μA
F <sub>OSC</sub>	Oscillator Frequency	3V	—	—	60	—	kHz

## Functional Description

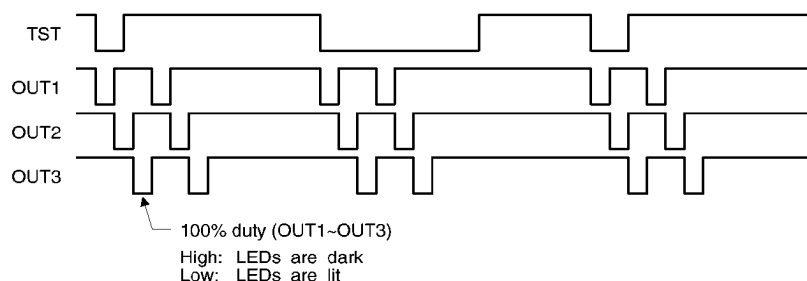
### On/off trigger mode

The system is in the stand by state after the power is turned on. Then, TON should be connected to VSS momentarily so that the system can enter the on/off mode and the 3 outputs can drive the LEDs (the output NMOS is turned on at this time). However, if TON is momentarily re-connected low, the system goes into the stand-by state again (the output NMOS is switched off).



### One shot trigger mode

The system goes into the one shot mode if TST is connected to VSS momentarily. In the one shot mode, the system will drive the 3 LEDs several times (the number of flashes is two for the HT2030).



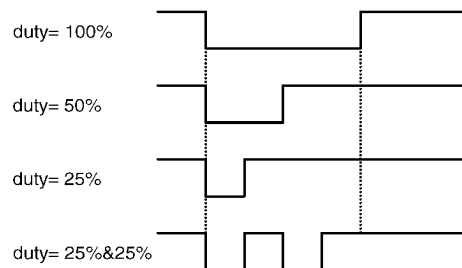
### Option

The user can select any combination of options by changing one mask layer. The option table and waveform are shown as follows:

Function	Options
Flash frequency	1.33Hz, 1.78Hz, 2.22Hz, 2.67Hz
LED driving duty	25%, 50%, 25% & 25%, 100%
Number of flashes (in one shot mode)	1~7 times

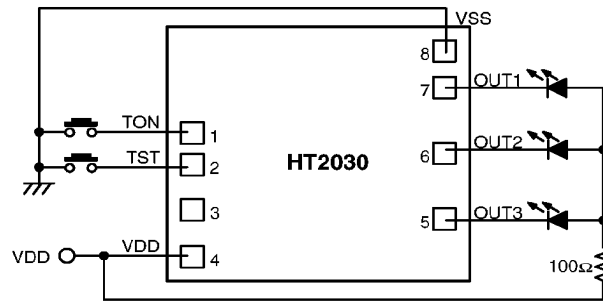
For the HT2030, the flash frequency is 2.67Hz (it takes 0.375 seconds to complete a 3-LED flash cycle), LED driving duty is 25% and the number of flashes is two by default.

OUT1~OUT3



## Application Circuit

### Chip form



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

### Package form

