

Features

- CMOS Metal-Gate Process Technology
- Operating voltage: 1.2V~4.5V
- Low standby current: 1 μ A Typ. at 3V
- Built-in oscillator (F_{OSC}: 32KHz)
- ON/OFF control function for the HT2013H, HT2013M, HT2013L
- 1/8 duty cycle output
- Directly driving an LED
- Minimum external components
- TO-92 package (only for the HT2012H, HT2014M, HT2014L)
- Flash rate options:
 - HT2013H \rightarrow about 4Hz
 - HT2012H \rightarrow about 4Hz (No ON/OFF control function)
 - HT2013M \rightarrow about 2Hz
 - HT2014M \rightarrow about 2Hz (No ON/OFF control function)
 - HT2013L \rightarrow about 1Hz
 - HT2014L \rightarrow about 1Hz (No ON/OFF control function)

General Description

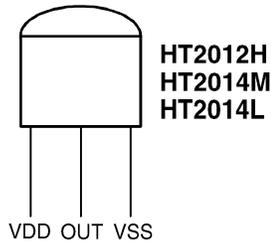
The HT201XX series is a low cost, low power CMOS LSI chip designed for lamp and LED flash drivers. It can be operated without any external components, thus suitable for applica-

tions on flashing badges, gift cards, flashing earrings, and other products that require flashing lights.

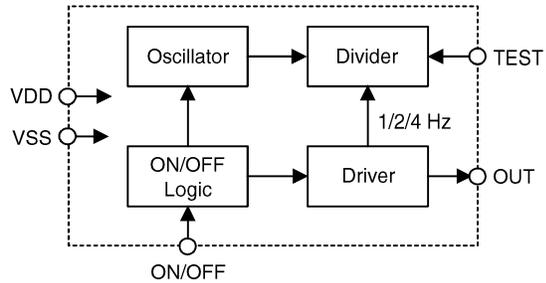
Selection Table

Part No.	Flash Rate	ON/OFF Control		Package	
		Yes	No	TO-92	Dice
HT2013H	4Hz	√			√
HT2012H	4Hz		√	√	√
HT2013M	2Hz	√			√
HT2014M	2Hz		√	√	√
HT2013L	1Hz	√			√
HT2014L	1Hz		√	√	√

Pin Assignment

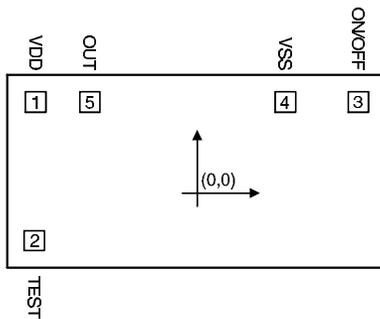


Block Diagram



Pad Coordinates

Unit: mil



Pad No.	X	Y
1	-23.9	13.5
2	-24.13	-7.055
3	23.89	13.5
4	13.09	13.5
5	-15.89	13.5

Chip size: 60×38 (mil)²

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

Pad Description

Pad No.	Pad Name	I/O	Internal Connection	Description
1	VDD	—	—	Power supply (positive)
2	TEST	—	—	For IC test only
3	ON/OFF	I	CMOS Pull-High	Lamp/LED flash ON/OFF control pad
4	VSS	—	—	Power supply (ground)
5	OUT	O	NMOS Open Drain	Lamp/LED flash output

Absolute Maximum Ratings

Supply Voltage -0.3V to 5.5V Storage Temperature..... -50°C to 125°C
 Input Voltage..... $V_{SS}-0.3V$ to $V_{DD}+0.3V$ Operating Temperature..... -20°C to 75°C

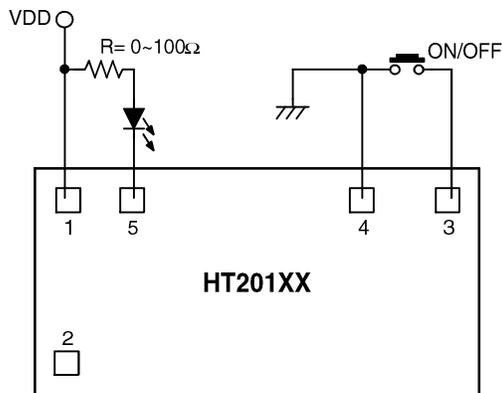
Electrical Characteristics

($T_a=25^\circ\text{C}$)

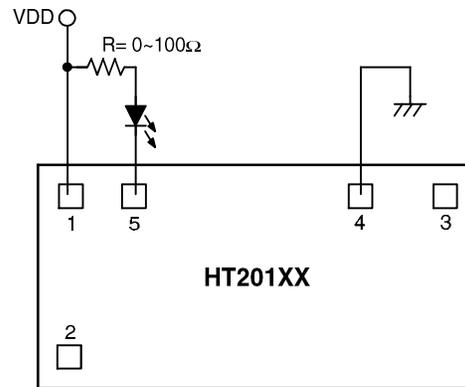
Symbol	Parameter	Test Condition		Min.	Typ.	Max.	Units
		VDD	Condition				
VDD	Operating Voltage	—	—	1.2	3	4.5	V
I _{STB}	Standby Current	3V	—	—	1	2	μA
I _{DD}	Operating Current	3V	No load	—	200	500	μA
I _{OL}	OUT Pad Sink Current	1.5V	$V_{OL}=0.15V$	5	12	—	mA
		3V	$V_{OL}=0.3V$	10	30	—	mA
F _{OSC}	System Frequency	3V	—	—	32K	—	Hz

Application Circuit

Chip form with ON/OFF control



Chip form without ON/OFF control



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

Package form application

