

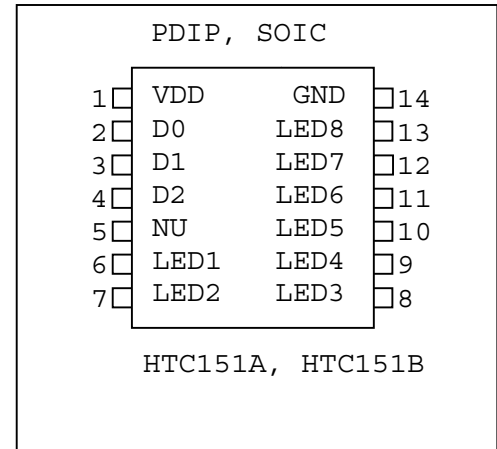
## HTC151 LED FLASHER

### 1.0 General description.

This circuit is designed to work as led flasher. LED's sequentially turn on and off according to the part used. D[0:2] inputs are used to control flashing frequency. There are seven different frequencies selectable. See D[0:2] input settings versus frequency table. HTC151 Can control up to 64 LED's (eight LED's per output @ 3mA each).

#### Features

- Minimum number of external components.
- Easy selection of alternating frequency.
- Predictability and design ease.



### Pin out description.

Abbreviations used: O - output, I - input, P - power.

Pin number	Name	I / O	Description	Notes
1	VDD	P	Power	+2.5V to +5.5V
2	D0	I	Frequency selector D0	Tie it to VDD or GND(see table below)
3	D1	I	Frequency selector D1	Tie it to VDD or GND(see table below)
4	D2	I	Frequency selector D2	Tie it to VDD or GND(see table below)
5	NU	I	Not used	Tie it to VDD or GND
6	LED 1	O	Output for LED1	Can source up to 25mA
7	LED 2	O	Output for LED2	Can source up to 25mA
8	LED 3	O	Output for LED3	Can source up to 25mA
9	LED 4	O	Output for LED4	Can source up to 25mA
10	LED 5	O	Output for LED5	Can source up to 25mA
11	LED 6	O	Output for LED6	Can source up to 25mA
12	LED 7	O	Output for LED7	Can source up to 25mA
13	LED 8	O	Output for LED8	Can source up to 25mA
14	GND	P	Ground	Ground pin

### Frequency selection per D [0:2]

Abbreviations used: 0 – connection to GND, 1 – connection to VDD.

D2	D1	D0	Switching frequency
0	0	0	1Hz
0	0	1	2Hz



---

---

0	1	0	3Hz
0	1	1	4Hz
1	0	0	5Hz
1	0	1	6Hz
1	1	0	7Hz
1	1	1	8Hz

Please note that those values are for reference only. Actual frequency can vary up to 10 percent depending upon VDD voltage and operational temperature.

## 2.0 Functional description.

HTC151 has two variations determined by part number. Common to all models of HTC151 is alternating frequency selection and pin-out. Please refer to “Typical connection diagram” used as reference. Frequency is changed when state of D [0:2] input pins change. Refer to “Frequency selection per D [0:2]” table for frequency selection. Note that Dip Switch could be omitted by hard wiring D [0:2] inputs to GND or VDD. This section describes operation of each HTC150 model separately. Each part uses different alternating algorithm.

### HTC151A

States:

1. LED1 is turned on and all others are off.
2. LED2 is turned on and all others are off.
3. LED3 is turned on and all others are off.
4. LED4 is turned on and all others are off.
5. LED5 is turned on and all others are off.
6. LED6 is turned on and all others are off.
7. LED7 is turned on and all others are off.
8. LED8 is turned on and all others are off.

State is changed at frequency selected by D [0:2].

### HTC151B (Ping-Pong)

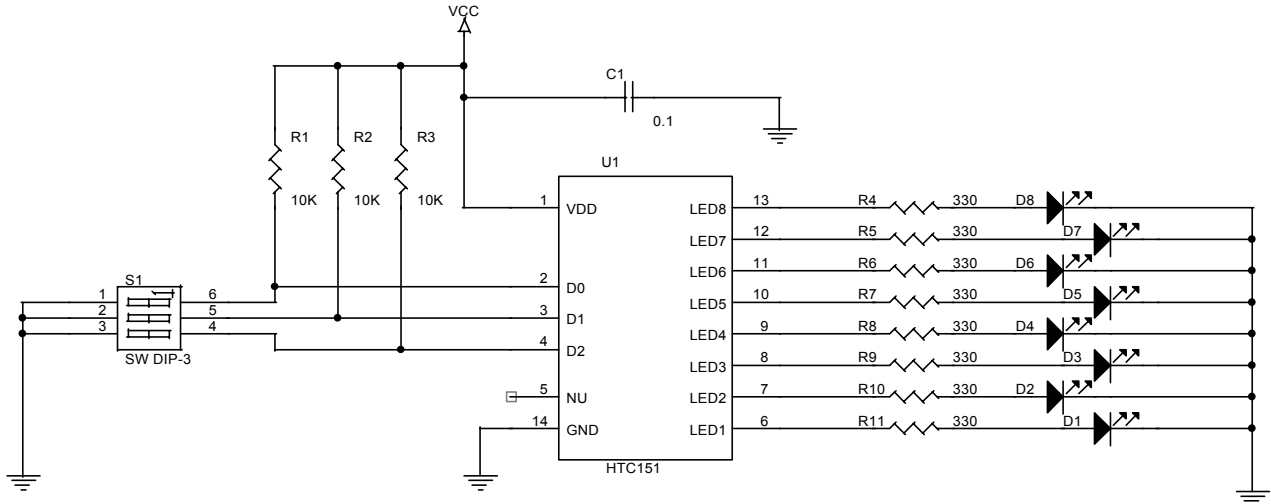
States:

1. LED1 is turned on and all others are off.
2. LED2 is turned on and all others are off.
3. LED3 is turned on and all others are off.
4. LED4 is turned on and all others are off.
5. LED5 is turned on and all others are off.
6. LED6 is turned on and all others are off.
7. LED7 is turned on and all others are off.
8. LED8 is turned on and all others are off.
9. LED7 is turned on and all others are off.
10. LED6 is turned on and all others are off.
11. LED5 is turned on and all others are off.
12. LED4 is turned on and all others are off.
13. LED3 is turned on and all others are off.
14. LED2 is turned on and all others are off.

State is changed at frequency selected by D[0:2].

The circuit will change the flashing frequency as soon as D0, D1 or D2 input pin state is changed. From that time next LED's start flashing at new frequency. The first LED starts over with the new frequency and it continues until the D0, D1 or D2 input pin state is changed again.

### 3.0 Typical connection diagram.



### 4.0 Electrical characteristics.

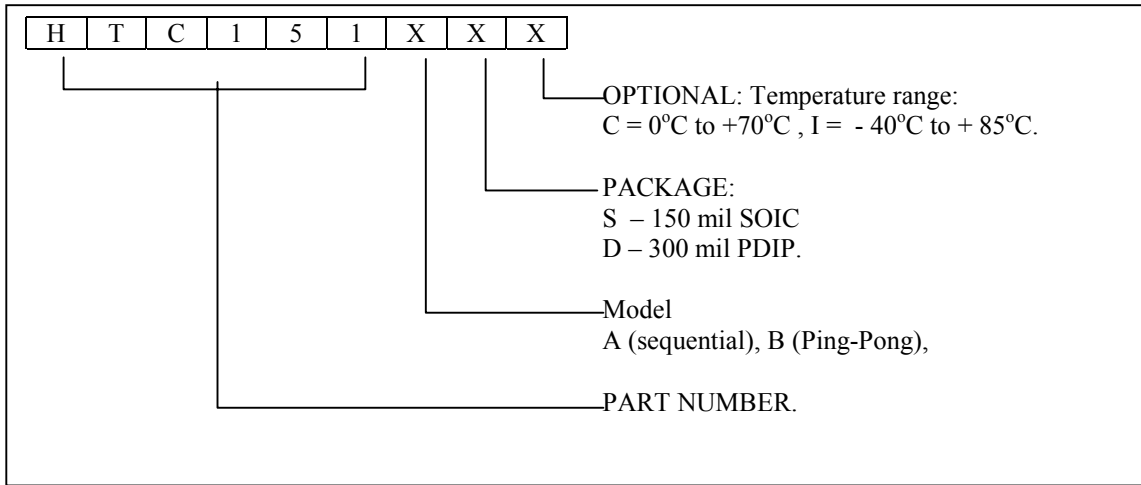
Operational Voltage.	+2.5 to +5.5V
Current consumption with no load attached	3 mA <sup>1</sup>
LEDx output low voltage (5mA load)	0.4V <sup>1</sup>
LEDx output low voltage (25mA load)	0.75V <sup>1</sup>
LEDx output high voltage (5mA source)	VDD-0.7V <sup>1</sup>
LEDx output source current max	25mA <sup>1</sup>
LEDx output sink current max	25mA <sup>1</sup>

#### NOTES:

1. Those values are characterized but not tested.

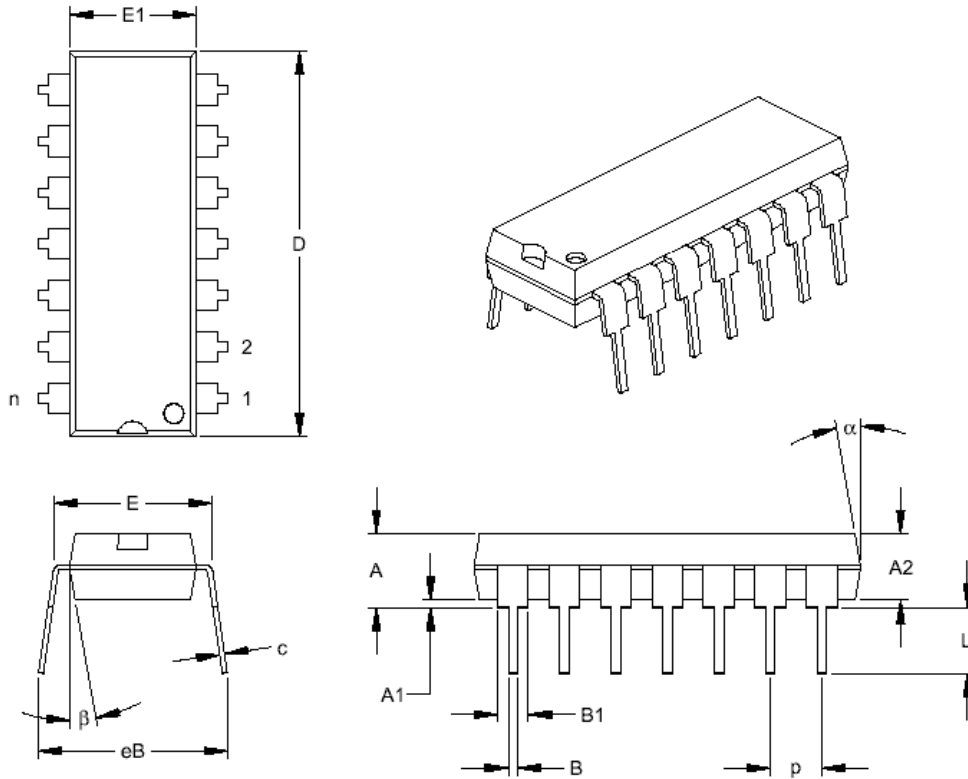


## 5.0 Ordering information.



## 6.0 Mechanical information .

### 14-Lead Plastic Dual In-line (P) – 300 mil (PDIP)



Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		14			14	
Pitch	p		.100			2.54	
Top to Seating Plane	A	.140	.155	.170	3.56	3.94	4.32
Molded Package Thickness	A2	.115	.130	.145	2.92	3.30	3.68
Base to Seating Plane	A1	.015			0.38		
Shoulder to Shoulder Width	E	.300	.313	.325	7.62	7.94	8.26
Molded Package Width	E1	.240	.250	.260	6.10	6.35	6.60
Overall Length	D	.740	.750	.760	18.80	19.05	19.30
Tip to Seating Plane	L	.125	.130	.135	3.18	3.30	3.43
Lead Thickness	c	.008	.012	.015	0.20	0.29	0.38
Upper Lead Width	B1	.045	.058	.070	1.14	1.46	1.78
Lower Lead Width	B	.014	.018	.022	0.36	0.46	0.56
Overall Row Spacing	eB	.310	.370	.430	7.87	9.40	10.92
Mold Draft Angle Top	$\alpha$	5	10	15	5	10	15
Mold Draft Angle Bottom	$\beta$	5	10	15	5	10	15

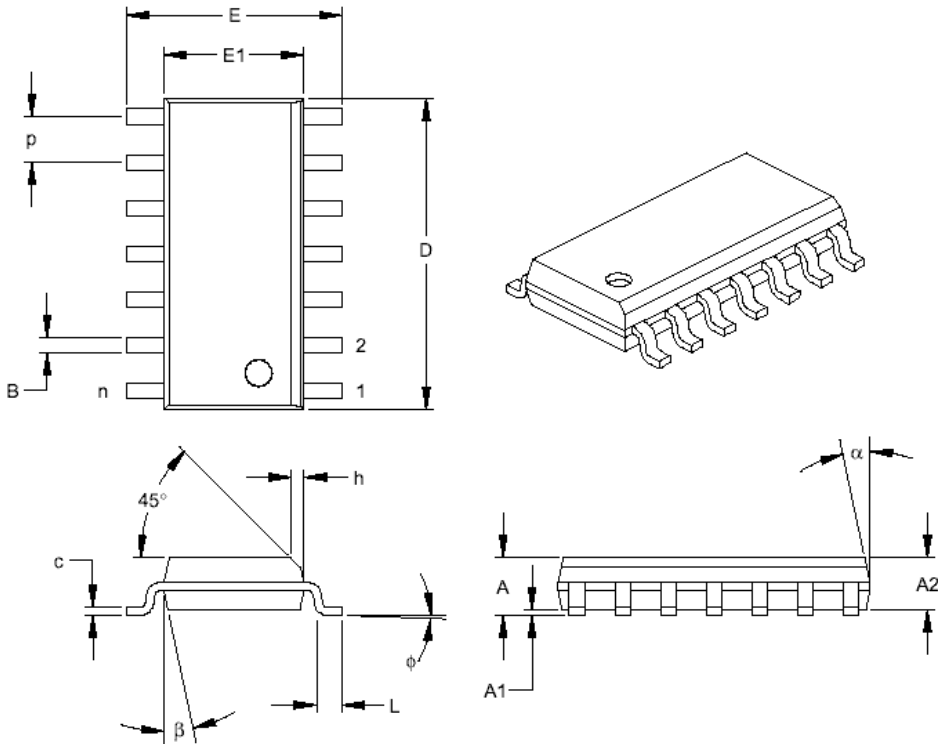
\*Controlling Parameter

Notes:

Dimensions D and E1 do not include mold flash protrusions. Mold flash or protrusions shall not exceed .010" (0.254mm) per side.

JEDEC Equivalent:MS-001

14-Lead Plastic Small Outline (SO) – Narrow, 150 mil (SOIC)



Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		14			14	
Pitch	P		.050			1.27	
Overall Height	A	.053	.061	.069	1.35	1.55	1.75
Molded Package Thickness	A2	.052	.056	.061	1.32	1.42	1.55
Standoff	A1	.004	.007	.010	0.10	0.18	0.25
Overall Width	E	.228	.236	.244	5.79	5.99	6.20
Molded Package Width	E1	.150	.154	.157	3.81	3.90	3.99
Overall Length	D	.337	.342	.347	8.56	8.69	8.81
Chamfer Distance	h	.010	.015	.020	0.25	0.38	0.51
Foot Length	L	.016	.033	.050	0.41	0.84	1.27
Foot Angle	$\phi$	0	4	8	0	4	8
Lead Thickness	c	.008	.009	.010	0.20	0.23	0.25
Lead Width	B	.014	.017	.020	0.36	0.42	0.51
Mold Draft Angle Top	$\alpha$	0	12	15	0	12	15
Mold Draft Angle Bottom	$\beta$	0	12	15	0	12	15

\*Controlling Parameter

Notes:

Dimensions D and E1 do not include mold flash protrusions. Mold flash or protrusions shall not exceed .010" (0.254mm) per side.

JEDEC Equivalent:MS-013



HTC makes no warranty, express, statutory implied or by description, regarding information set forth herein or regarding the freedom of described devices from patent infringement. HTC makes no warranty or merchantability or fitness for any purposes. HTC reserves right to discontinue production and change specifications and prices at any time and without notice. HTC's products are intended for use in commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment, are specifically not recommended without additional processing by HTC for such applications.

High Tech Chips, Inc.

[www.hightechips.com](http://www.hightechips.com)

[info@hightechips.com](mailto:info@hightechips.com)