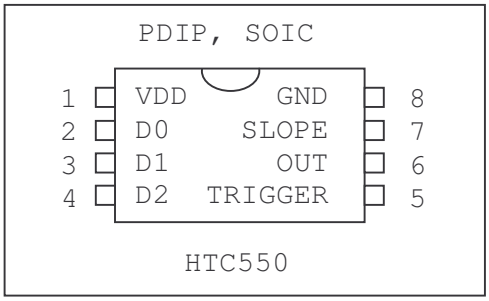
MONOSTABLE MULTIVIBRATOR

1.0 General Description

This circuit is designed to work as a monostable multivibrator. It is also a very useful pulse stretcher circuit. It provides a wide range of output pulse durations which are programmable. It does not require any tuning or external components and provides a 10% overall accurate pulse duration. It is very easy to use and simple to design.



Features

- Single chip solution for most pulse starching applications
- No external components needed
- Easy selection of pulse duration
- Flexible selection of trigger slope
- Up to 10% precision in output pulse duration in voltage and temperature range
- Predictability and design practicality

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	Period selector D0	Tie it to GND or VDD (see table)
3	D1	I	Period selector D1	Tie it to GND or VDD (see table)
4	D2	I	Period selector D2	Tie it to GND or VDD (see table)
5	TRIGGER	I	Trigger input	
6	OUT	O	Pulse output	
7	SLOPE	I	Trigger slope	VDD – rising edge, GND- falling
8	GND	P	Ground	Connects to digital ground

Pulse Width verses D[0:2]

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

D2	D1	D0	Pulse Width	Rearming Time	Hunting Time max(min)
0	0	0	1µS	12µS	19µS (14µS)
0	0	1	10µS	12µS	19µS (14µS)
0	1	0	100µS	12µS	19µS (14µS)
0	1	1	1mS	12µS	19µS (14µS)
1	0	0	10mS	12µS	19µS (14µS)
1	0	1	100mS	12µS	19µS (14µS)
1	1	0	1S	12µS	19µS (14µS)
1	1	1	10S	12µS	19µS (14µS)

Please note that these values are for reference only. Actual values vary up to 10%, depending upon VDD voltage and operational temperature.

Trigger Edge versus Slope

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

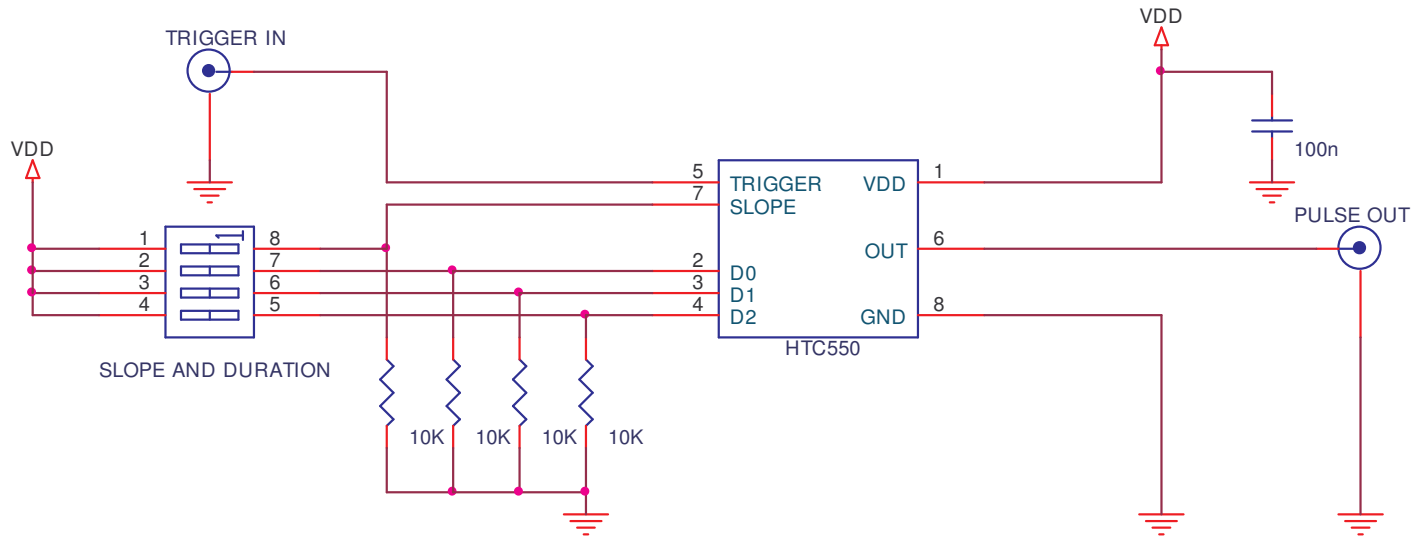
Slope	Trigger Edge
0	Falling edge
1	Rising edge

2.0 Functional Description

HTC550 has four operational states:

1. **Power Up State** Internal reset takes about 18mS once power is applied to the part. During those 18mS output is tri-stated. In order to keep output low during internal reset, the resistor can be put from the output to the ground. After internal reset, HTC550 enters into the power up state. In this state, the slope pin is sampled and output is set high. After this, HTC550 enters into **Hunt State**.
2. **Hunt for Trigger State** In this state, HTC550 hunts for the trigger. The output is not changed during this state. Once the part gets a trigger, it samples the D[0:2] pins and goes into **Pulse Generation State**.
3. **Pulse Generation** In this state, the output pulse is generated per D[0:2] pins. Output goes high for a specified duration, then goes low and goes into **Rearm State**, triggers are ignored during this State.
4. **Rearm State** During this state, the Slope pin is sampled and the trigger is rearmed per this value. After finishing, it goes into **Hunt State**.

3.0 Typical Connection Diagram



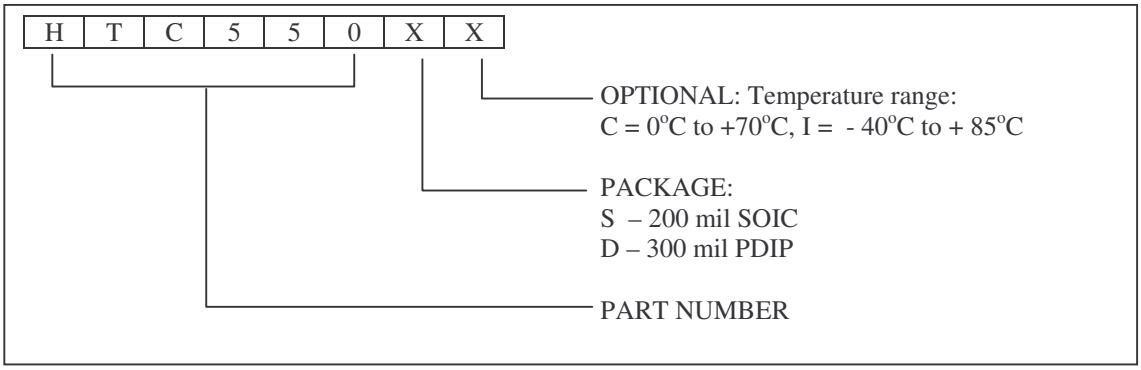
Note that in this schematic diagram we assume that the Trigger pin is driven by digital output from previous stage or a signal that is less then VDD and more then ground potential.

4.0 Electrical Characteristics

Voltage on VDD pin in respect to GND	+2.5 to +5.5V
Current into VDD pin with no load attached	3 mA[1]
TRIGGER rise time min	10nS[1]
TRIGGER fall time min	10nS[1]
TRIGGER high period min	1.04µS[1]
TRIGGER low period min	1.04µS[1]
TRIGGER input leakage	±5µA[1]
TRIGGER input high voltage	0.8VDD
TRIGGER input low voltage	0.2VDD
OUT output low voltage (5mA load)	0.4V[1]
OUT output low voltage (25mA load)	0.75V[1]
OUT output high voltage (5mA source)	VDD-0.7V[1]
OUT output source current max	25mA[1]
OUT output sink current max	25mA[1]

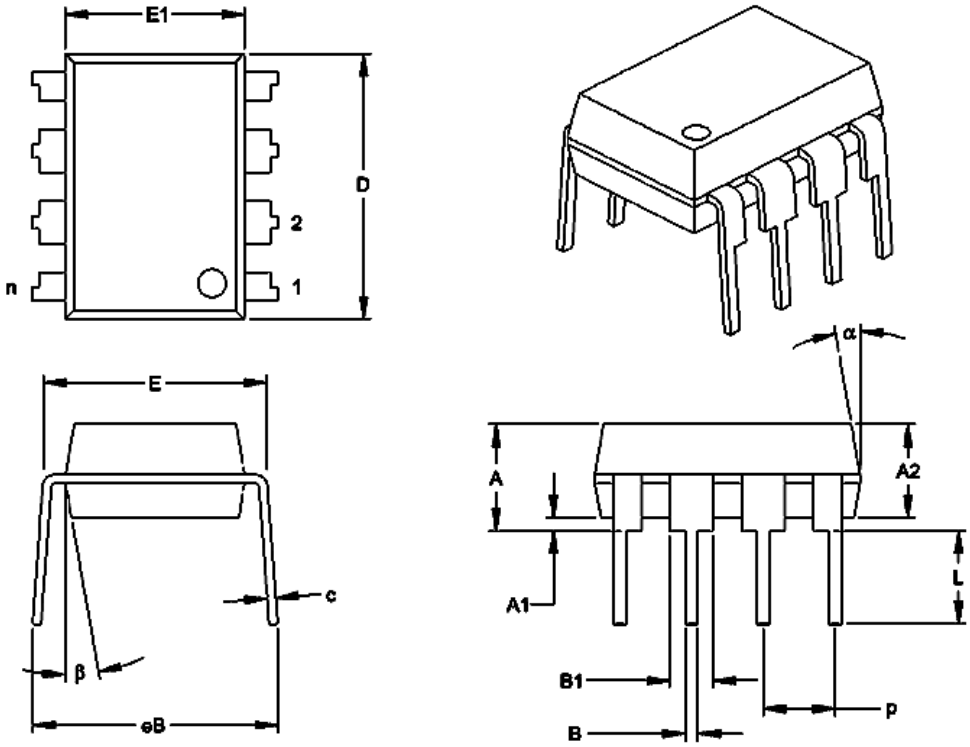
NOTES:
1. These values are characterized but not tested.

5.0 Ordering Information



6.0 Mechanical information.

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



Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
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	.360	.373	.385	9.14	9.46	9.78
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	α	5	10	15	5	10	15
Mold Draft Angle Bottom	β	5	10	15	5	10	15

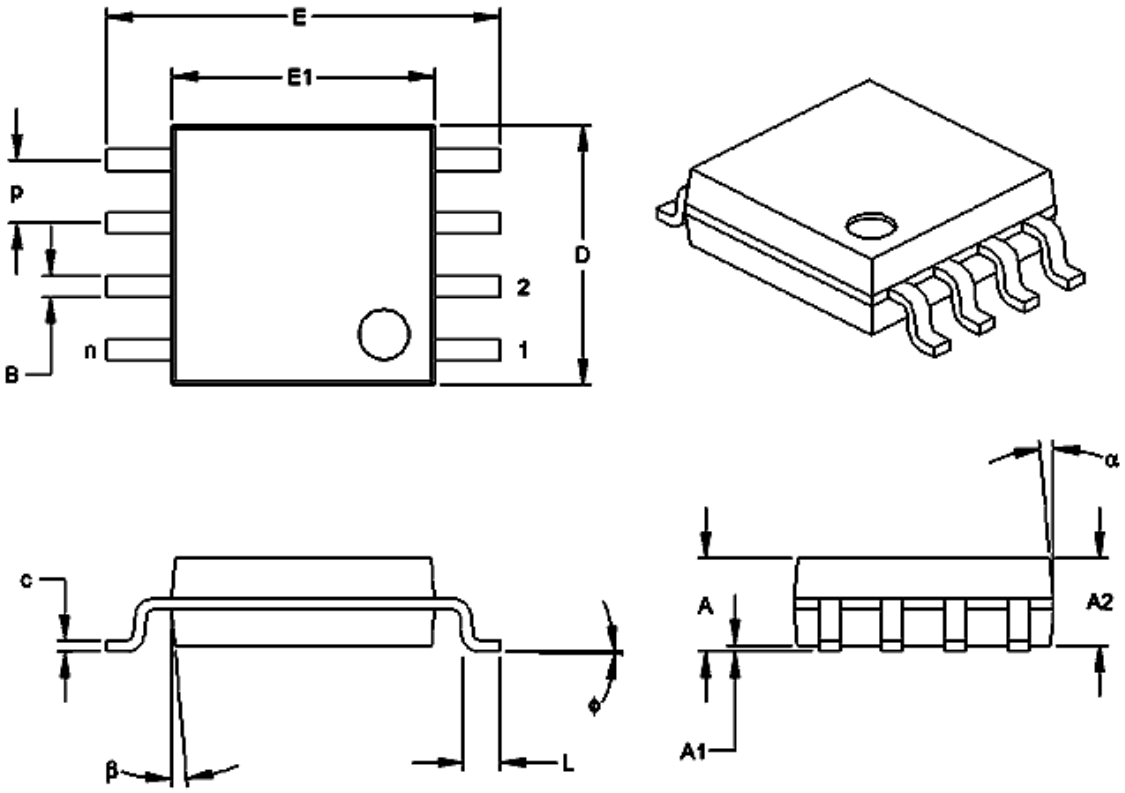
*Controlling Parameter

Notes:

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

JEDEC Equivalent:MS-001

8-Lead Plastic Small Outline (SM) – Medium, 208 mil (SOIC)



Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		8			8	
Pitch	P		.050			1.27	
Overall Height	A	.070	.075	.080	1.78	1.97	2.03
Molded Package Thickness	A2	.069	.074	.078	1.75	1.88	1.98
Standoff	A1	.002	.005	.010	0.05	0.13	0.25
Overall Width	E	.300	.313	.325	7.62	7.95	8.26
Molded Package Width	E1	.201	.208	.212	5.11	5.28	5.38
Overall Length	D	.202	.205	.210	5.13	5.21	5.33
Foot Length	L	.020	.025	.030	0.51	0.64	0.76
Foot Angle	ϕ	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	0.43	0.51
Mold Draft Angle Top	α	0	12	15	0	12	15
Mold Draft Angle Bottom	β	0	12	15	0	12	15

*Controlling Parameter

Notes:

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

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