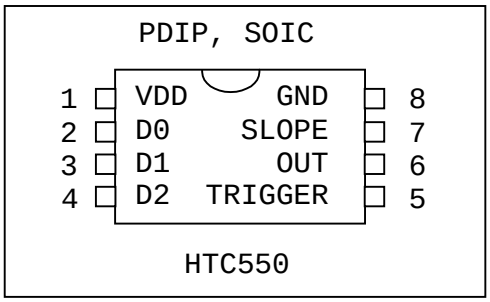
MONOSTABLE MULTIVIBRATOR

1.0 General description.

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



Features

- Single chip solutions for most pulse starching applications.
- No external components needed.
- Easy selection of pulse duration.
- Flexible selection of trigger slope.
- Up to ten percent precise output pulse duration in voltage and temperature range.
- 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	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 those values are for reference only. Actual values vary up to 10 percent depending upon VDD voltage and operational temperature.

Trigger edge versus SLOPE

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

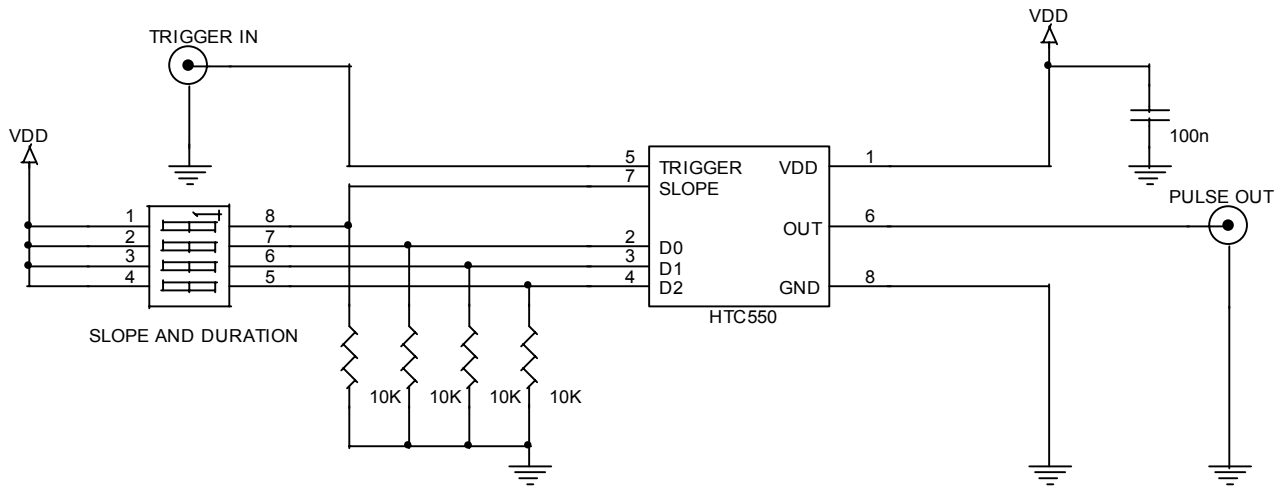
SLOPE	TRIGGER edge.
0	Falling edge
1	Rising edge.

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 resistor can be put from output to ground. After internal reset HTC550 enters Power Up State. At this state Slope pin is sampled and output is set low. After those steps HTC550 enters **Hunt** State.
2. **Hunt** for Trigger State. In this state HTC550 is hunting for trigger. Output is not changed during this state. Once part gets trigger it samples D[0:2] pins and goes to **Pulse** generation State.
3. **Pulse** Generation. In this State output pulse is generated per D[0:2] pins. Output goes high for specified duration then goes low and goes to **Rearm** State. Any triggers are ignored during this State.
4. **Rearm** State. During this state SLOPE pin is sampled and trigger is rearmed per this value. After finishing it goes into **Hunt** State.

3.0 Typical connection diagram.

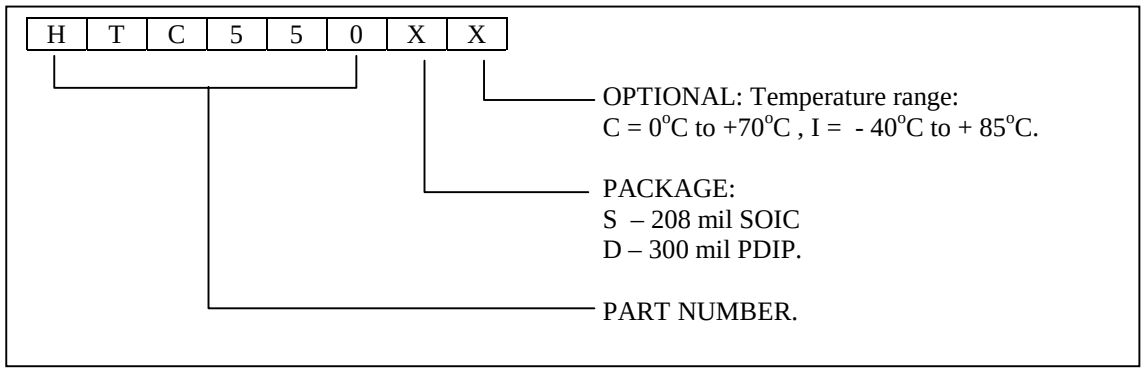


4.0 Electrical characteristics.

Voltage on VDD pin in respect to GND	+2.5 to +5.5V
Current consumption without load	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]

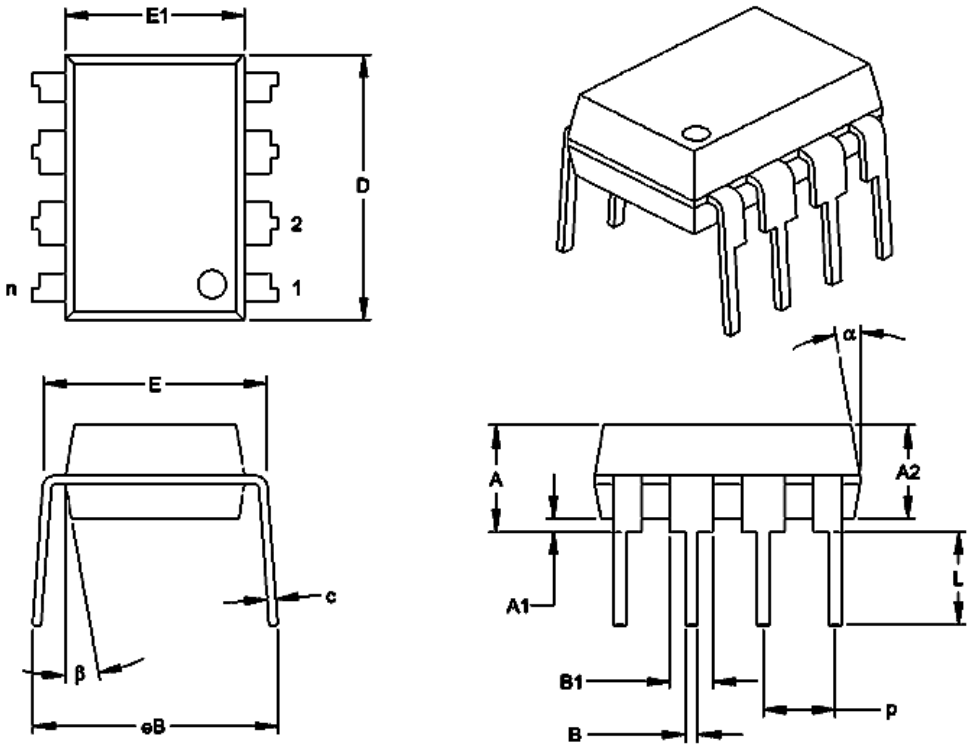
NOTES:
1. Those values are characterized but not tested.

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

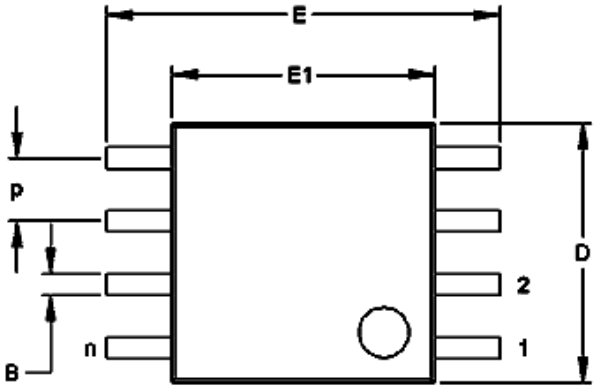
*Controlling Parameter

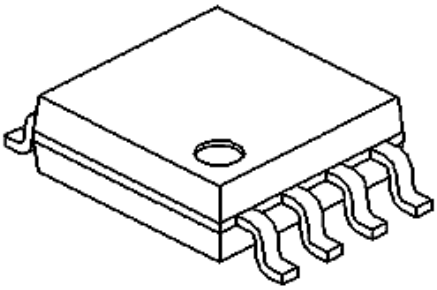
Notes:

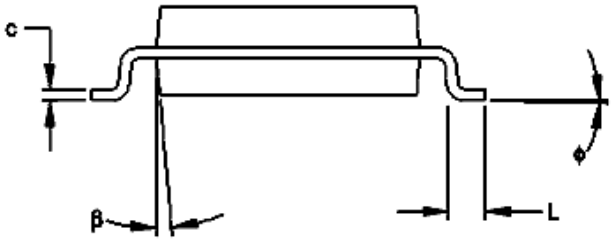
Dimensions D and E1 do not include mold flash protrusions. Mold flash or protrusions shell not exceed .010” (0.254mm)per side.

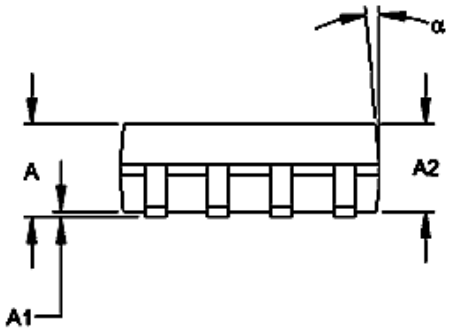
JEDEC Equivalent:MS-001

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 not exceed .010” (0.254mm)per side.

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