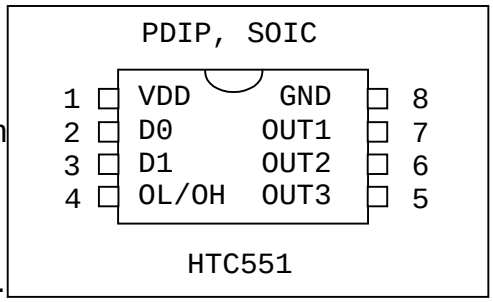
Power up sequencer

1.0 General description.

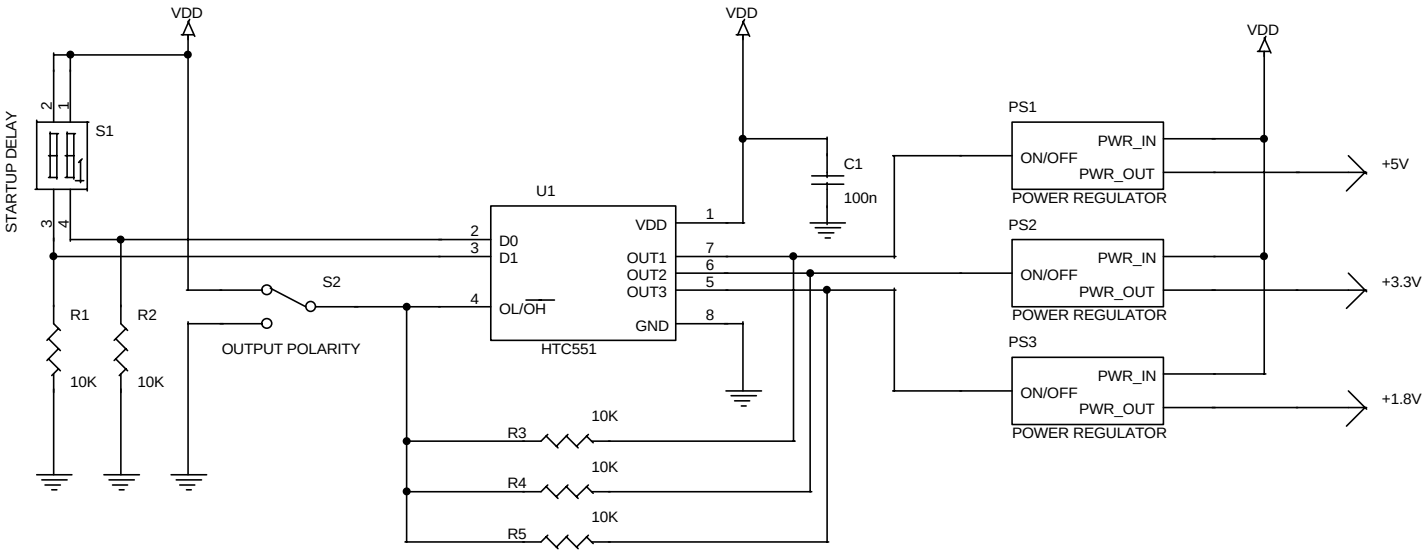
This circuit is designed to work as power up sequencer. It is very useful to control power up sequence of multiple power supply systems. Also might be used for delayed startup of power supply. This is especially useful for hot swapible system designs.



Features

- Single chip solutions for most power sequencing applications.
- Minimal external components.
- Easy selection of startup delay duration.
- Easy selection of output pulse polarity.
- Predictability and design ease.

Typical connection diagram



2.0 Functional Description.

At power up HTC551 goes through internal reset which lasts about 18mS. During this time OUT1, OUT2 and OUT3 pins are tri-stated. In order to keep PS1-PS3 from starting up during this period we use R3, R4 and R5 connected to OL/OH pin of HTC551. OL/OH pin is input and it determines polarity of control signal on OUT1-OUT3. This pin can be connected to VDD or GND. If this pin connected to VDD then ON State for power supplies control pin is low. After internal reset part drives OUT1- OUT3

to a OFF State (polarity is per OH/OL pin) and reads D[0:1] inputs. D[0:1] inputs determine startup delay for OUT1-OUT3 control outputs and can be connected directly to VDD or GND. Please see Startup delay selection table for available delays. After this delay expires OUT1, OUT2 and OUT3 change their state in following order:

1. OUT1 changes to ON State.
2. Delay for 10mS.
3. OUT2 changes ON State.
4. Delay for 10mS.
5. OUT3 changes ON State.
6. Delay for 10mS.

This means that we will have following power sequencing from above schematics:

1. PS1 turns on after startup delay.
2. PS2 turns on 10mS after PS1.
3. PS3 turns on 10mS after PS3.

Please note that S1, S2, R1, R2 and C1 in schematics above are not necessary for functionality of HTC551.

Pin out description.

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

Pin	Name	I / O	Description	Notes
1	VDD	P	Power	+2.5V to +5.5V
2	D0	I	Startup delay selector D0	Tie it to GND or VDD (see table)
3	D1	I	Startup delay selector D1	Tie it to GND or VDD (see table)
4	OL/OH	I	OUTX ON State selector	VDD –Low on OUTX is ON State, GND- High on OUTX is ON State.
5	OUT3	O	Control output 1	Tie power supply ON/OFF pin.
6	OUT2	O	Control output 1	Tie power supply ON/OFF pin.
7	OUT1	O	Control output 1	Tie power supply ON/OFF pin.
8	GND	P	Ground	Connects to digital ground.

Startup Delay verses D[0:1]

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

D1	D0	Startup Delay
0	0	0.5 Second
0	1	1 Second
1	0	2 Second
1	1	3 Second

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

OUTX versus OL/OH

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

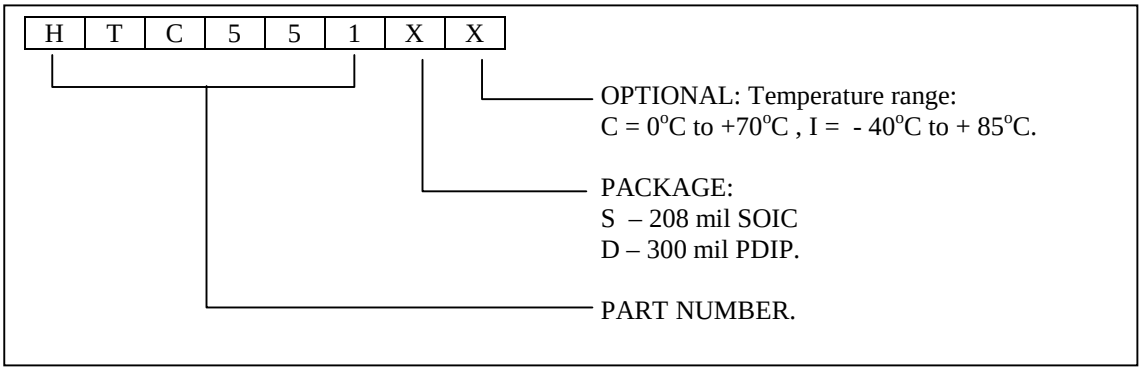
OL/OH	OUTX on State
0	HIGH
1	LOW

3.0 Electrical characteristics.

Voltage on VDD pin in respect to GND	+2.5 to +5.5V
Current consumption with no load attached	3 mA[1]
OUTX output source current max	25mA[1]
OUTX output sink current max	25mA[1]
OUTX output low voltage (5mA load)	0.4V[1]
OUTX output low voltage (25mA load)	0.75V[1]
OUTX output high voltage (5mA source)	VDD-0.7V[1]

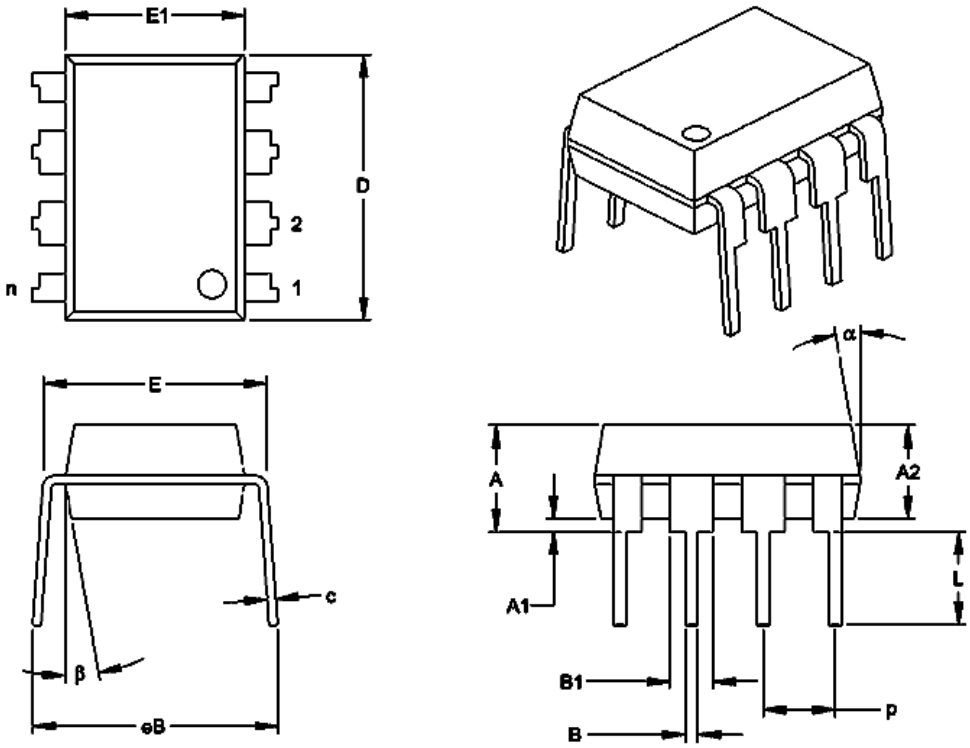
NOTES:
1. Those values are characterized but not tested.

4.0 Ordering information.



5.0 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

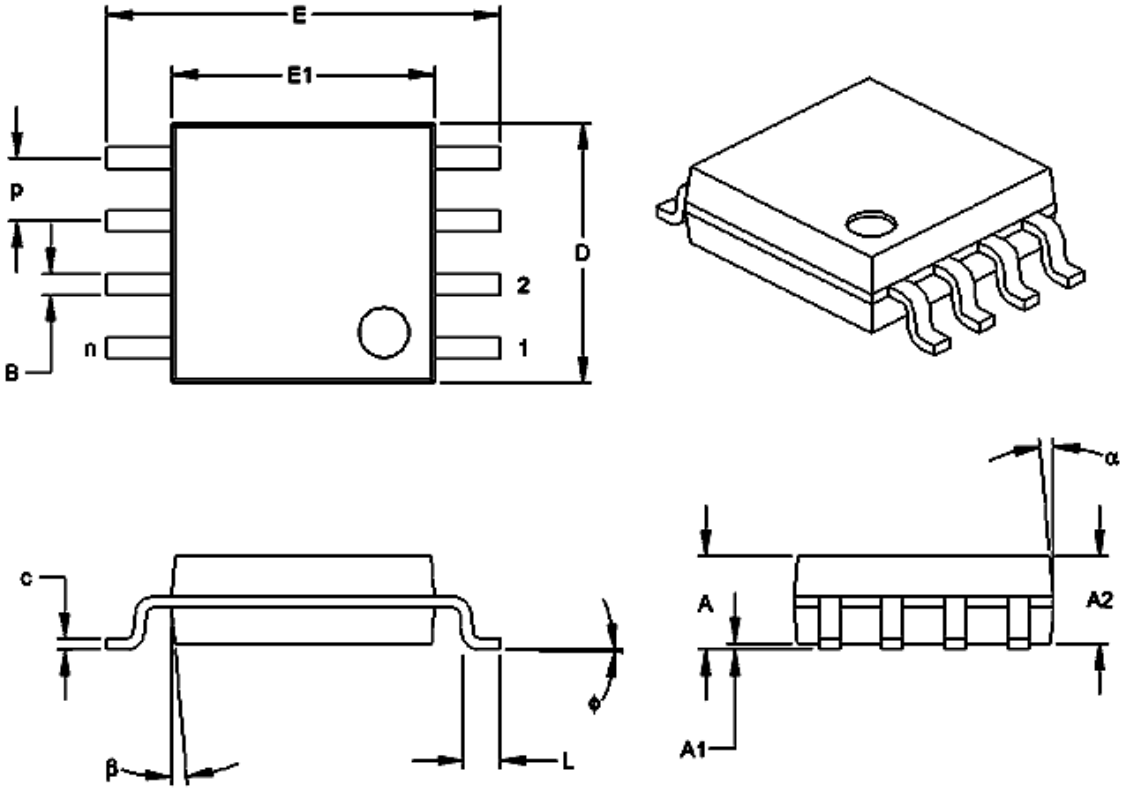
*Controlling Parameter

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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