



LinearDimensions
SEMICONDUCTOR

LND555

PRECISION TIMING CIRCUIT

GENERAL DESCRIPTION

The LND555 is a monolithic timing circuit capable of producing accurate time delays or oscillation. In the time delay mode of operation, the timed interval is controlled by a single external resistor and capacitor network. In the astable mode of operation, the frequency and duty cycle may be independently controlled with two external resistors and a single external capacitor.

PIN CONFIGURATION

Gnd	□	1		8	□	Vcc
Trigger	□	2		7	□	Discharge
Out	□	3		6	□	Threshold
Reset	□	4		5	□	Control Voltage

FEATURES

- Timing from Microseconds to hours
- Astable or Monostable Operation
- Adjustable Duty Cycle
- TTL-Compatible Output Can Sink or Source UP to 200mA
- Temperature Stability of 0.005% per °C
- Direct Replacement for Signetics NE555 Timers

APPLICATIONS

- Precision timing
- Pulse generation
- Sequential timing
- Time delay generation
- Pulse width modulation
- Pulse position modulation
- Missing pulse detector



Absolute Maximum Rating

(T_A = 25°C, unless otherwise specified)

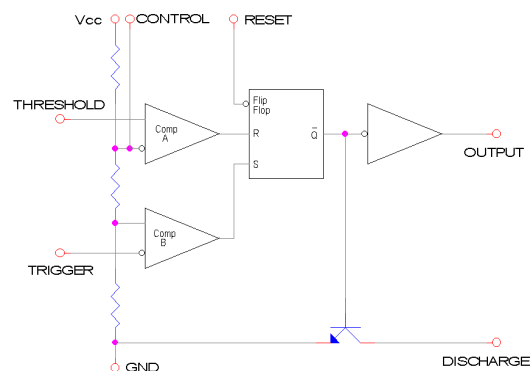
PARAMETER	MIN	MAX	UNITS
Supply Voltage, V _{CC}	4.5	16	V
Input Voltage(control, reset, threshold and trigger)		V _{CC}	
Output Current		±200	mA
Operating Free-Air Temperature		70	°C
Storage Temperature Range, TSTG	-65	+150	

Function Table

RESET	TRIGGER VOLTAGE	THRESHOLD VOLTAGE*	OUTPUT	DISCHARGE SWITCH
Low	Irrelevant	Irrelevant	Low	On
High	<1/3 V _{CC}	High	High	Off
High	>1/3 V _{CC}	>2/3 V _{CC}	Low	On
High	>1/3 V _{CC}	<2/3 V _{CC}	As previously established	

*Voltage Levels shown are normal

Block Diagram



RESET can override TRIGGER, which can override THRESHOLD



Electrical Characteristics

($T_A = 25^\circ\text{C}$, $V_{CC} = +5$ to $+15\text{V}$, unless otherwise specified)

Parameter	Test Conditions (see note 2)		Min	Typ	Max	Units
Operating Supply Voltage Range			4.5		16	V
Threshold Voltage Level	$V_{CC} = 15\text{V}$		8.8	10	11.2	V
	$V_{CC} = 5\text{V}$		2.4	3.3	4.2	V
Threshold Current(see Note 1)	(see Note 1)			30	250	nA
Trigger Voltage Level	$V_{CC} = 15\text{V}$		4.5	5	5.6	V
	$V_{CC} = 5\text{V}$		1.1	1.67	2.2	V
Trigger Current	Trigger at 0 V			0.5	2	μA
Reset Voltage Level			0.3	0.7	1	V
Reset Current	Reset at V_{CC}			0.1	0.4	mA
	Reset at 0V			-0.4	-1.5	
Discharge Leakage Current				20	100	nA
Control Voltage Level	$V_{CC} = 15\text{V}$		9	10	11	V
	$V_{CC} = 5\text{V}$		2.6	3.3	4	V
Low-Level Output Voltage	$V_{CC} = 15\text{V}$	$I_{OL} = 10\text{mA}$		0.1	0.25	V
		$I_{OL} = 50\text{mA}$		0.4	0.75	
		$I_{OL} = 100\text{mA}$		2	2.5	
	$V_{CC} = 5\text{V}$	$I_{OL} = 200\text{mA}$		2.5		
		$I_{OL} = 5\text{mA}$		0.25	0.35	
		$I_{OL} = 8\text{mA}$		0.3	0.4	
High- Level Output Voltage	$V_{CC} = 15\text{V}$	$I_{OL} = -100\text{mA}$	12.75	13.3		V
		$I_{OL} = -200\text{mA}$		12.5		
		$I_{OL} = -100\text{mA}$	2.75	3.3		
Supply Current	Output low, No Load	$V_{CC} = 15\text{V}$		10	15	mA
		$V_{CC} = 5\text{V}$		3	6	
	Output High, No Load	$V_{CC} = 15\text{V}$		9	13	
		$V_{CC} = 5\text{V}$		2	5	
Initial Error of Timing Interval (see Note 3)	Monostable (note 4)	$T_A = 25^\circ\text{C}$		1	3	%
	Astable (note 5)			5	13	
Temperature Coefficient of Timing Interval	Monostable	$T_A = \text{MIN to MAX}$		50	150	ppm/ $^\circ\text{C}$
	Astable			150	500	
Supply Voltage Sensitivity of Timing Interval	Monostable	$T_A = 25^\circ\text{C}$		0.1	0.5	%/V
	Astable			0.3	1	
Output Pulse Rise Time	$C_L = 15\text{pF}$, $T_A = 25^\circ\text{C}$			100	300	ns
Output Pulse Fall Time	$C_L = 15\text{pF}$, $T_A = 25^\circ\text{C}$			100	300	ns



Notes:

1. This parameter influences the maximum value of the timing resistors R_A and R_B in the circuit on Figure 1. For example, when $V_{CC}=5V$, the maximum value is $R=R_A+R_B=3.4\text{ M}\Omega$, and $V_{CC}=15V$, the maximum value is $10\text{M}\Omega$.
2. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
3. Timing interval error is defined as the difference between the measured value and the average value of a random sample from each process run.
4. Values specified are for a device in a monostable circuit similar to Figure.2, with component values as follow: $R_A=2\text{K}\Omega$ to $100\text{K}\Omega$, $C=0.1\mu\text{F}$.
5. Values specified are for a device in an astable circuit similar to Figure.1, with component values as follow: $R_A, R_B=1\text{K}\Omega$ to $100\text{K}\Omega$, $C=0.1\mu\text{F}$.

Typical Application Data

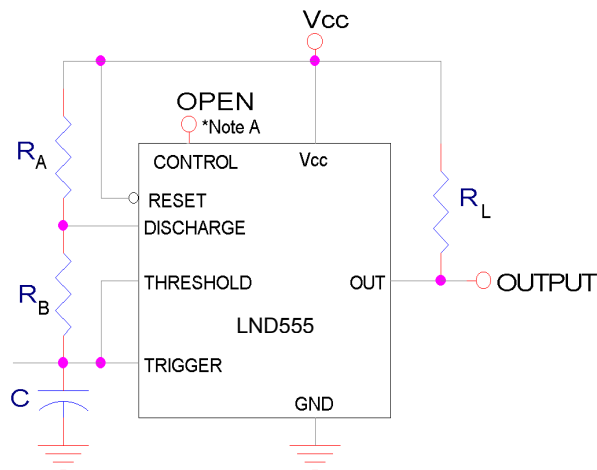


Figure 1 :Circuit for Astable Operation

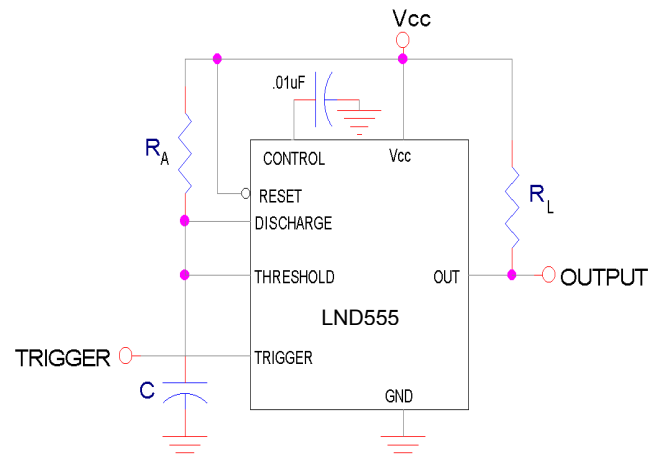


Figure 2 : Circuit for Monostable Operation

Note A : Bypassing the control voltage input to the ground with a capacitor may improve operation. This should be evaluated for individual applications