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## **NTE955M NTE955S NTE955SM Integrated Circuit Timing Circuit**

### **Description:**

The NTE955 series timing circuit is a highly stable controller capable of producing accurate time delays, or oscillation. Additional terminals are provided for triggering or resetting if desired. In time delay mode of operation, the time is precisely controlled by one external resistor and capacitor. For astable operation as an oscillator, the free running frequency and the duty cycle are both accurately controlled with two external resistors and one capacitor. The circuit may be triggered and reset on falling waveforms, and the output structure can source or sink up to 200mA or drive TTL circuits.

### **Features:**

- Direct Replacement for 555 Timers
- Timing from Microseconds through Hours
- Operates in Both Astable and Monostable Modes
- Adjustable Duty Cycle
- High Current Output Can Source or Sink 200mA
- Output and Supply TTL Compatible TTL
- Temperature Stability of 0.005% per °C
- Normally "ON" or Normally "OFF" Output
- Available in Three Types:
  - NTE955M – 8-Lead DIP
  - NTE955S – 8-Lead SIP
  - NTE955SM – SOIC-8 (Surface Mount)

### **Applications:**

- Precision Timing
- Pulse Generation
- Sequential Timing
- Time Delay Generation
- Pulse Width Modulation
- Pulse Position Modulation
- Linear Ramp Generator

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Power Supply Voltage, $V_{CC}$ .....	18V
Discharge Current (Pin7), $I_7$ .....	200mA
Power Dissipation, $P_D$ .....	625mW
Derate Above $25^\circ\text{C}$ .....	5mW/ $^\circ\text{C}$
Operating Temperature Range, $T_A$ .....	$0^\circ$ to $+70^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Lead Temperature (During Soldering, 10sec), $T_L$ .....	$+260^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Operating Supply Voltage Range	$V_{CC}$		4.5	–	16	V	
Supply Current	$I_{CC}$	$R_L = \infty$ , Low State, Note 2	$V_{CC} = 5\text{V}$	–	3.0	6.0	mA
			$V_{CC} = 15\text{V}$	–	10	15	mA
Timing Error		$R = 1\text{k}\Omega$ to $100\text{k}\Omega$ , Note 3		–	1.0	–	%
Initial Accuracy $C = 0.1\mu\text{F}$				–	50	–	ppm/ $^\circ\text{C}$
Drift with Temperature				–	0.1	–	%/V
Drift with Supply Voltage							
Threshold Voltage	$V_{TH}$		–	0.667	–	$\times V_{CC}$	
Trigger Voltage	$V_T$	$V_{CC} = 5\text{V}$	–	1.67	–	V	
		$V_{CC} = 15\text{V}$	–	5.0	–	V	
Reset Voltage	$V_R$		0.4	0.7	1.0	V	
Reset Current	$I_R$		–	0.1	–	mA	
Threshold Current	$I_{TH}$	Note 4	–	0.1	0.25	$\mu\text{A}$	
Discharge Leakage Current (Pin7)	$I_{dis}$		–	–	100	nA	
Control Voltage Level	$V_{CL}$	$V_{CC} = 5\text{V}$	2.6	3.33	4.0	V	
		$V_{CC} = 15\text{V}$	9.0	10	11	V	
Output Voltage Low	$V_{OL}$	$V_{CC} = 5\text{V}$	$I_{SINK} = 5\text{mA}$	–	0.25	0.35	V
		$V_{CC} = 15\text{V}$	$I_{SINK} = 10\text{mA}$	–	0.1	0.25	V
			$I_{SINK} = 50\text{mA}$	–	0.4	0.75	V
			$I_{SINK} = 100\text{mA}$	–	2.0	2.5	V
			$I_{SINK} = 200\text{mA}$	–	2.5	–	V
Output Voltage High	$V_{OH}$	$V_{CC} = 5\text{V}$		2.75	3.3	–	V
		$V_{CC} = 15\text{V}$	$I_{SOURCE} = 100\text{mA}$	12.75	13.3	–	V
			$I_{SOURCE} = 200\text{mA}$	–	12.5	–	V
Rise Time of Output	$t_{OLH}$		–	100	–	ns	
Fall Time of Output	$t_{OHL}$		–	100	–	ns	

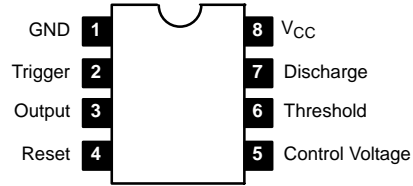
Note 2. Supply current when output is high is typically 1mA less.

Note 3. Tested at  $V_{CC} = 5\text{V}$  and  $V_{CC} = 15\text{V}$ . Monostable mode.

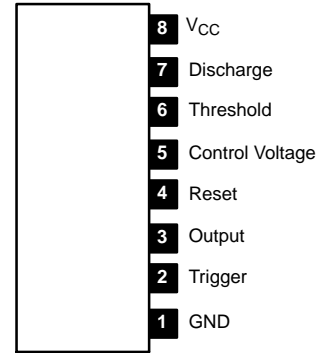
Note 4. This will determine the maximum value of  $R_A = R_B$  for 15V operation. The maximum total  $R = 20\text{M}\Omega$ .

## Pin Connection Diagram

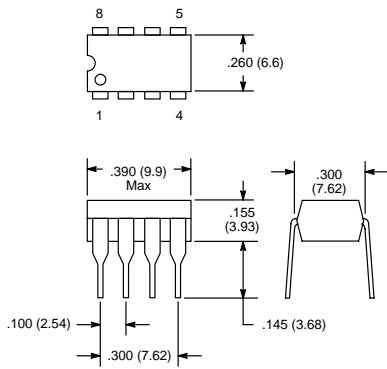
### NTE955M, NTE955SM



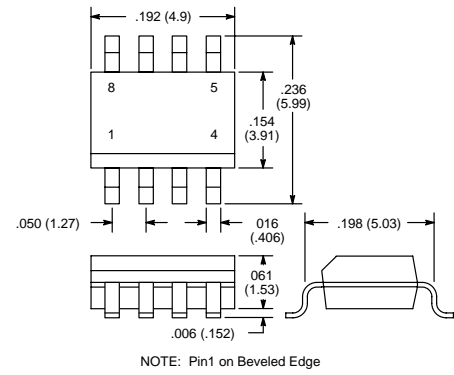
### NTE955S (Front View)



### NTE955M



### NTE955SM



### NTE955S

