

# LM556/NE556

## Dual Timer

### Features

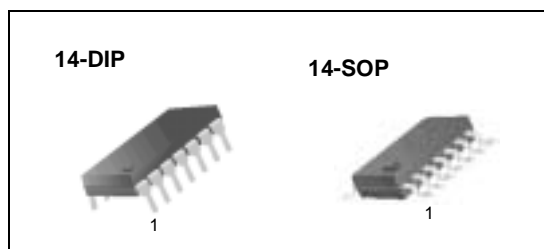
- Replaces Two LM555/NE555 Timers
- Operates in Both Astable And Monostable Modes
- High Output Current
- TTL Compatible
- Timing From Microsecond To Hours
- Adjustable Duty Cycle
- Temperature Stability Of 0.005% Per °C

### Applications

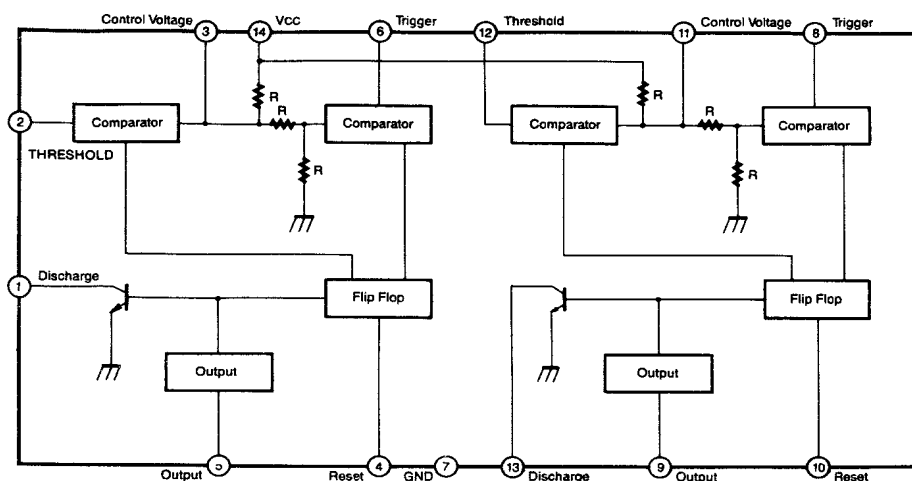
- Precision Timing
- Pulse Shaping
- Pulse Width Modulation
- Frequency Division
- Traffic Light Control
- Sequential Timing
- Pulse Generator
- Time Delay Generator
- Touch Tone Encoder
- Tone Burst Generator

### Description

The LM556/NE556 series dual monolithic timing circuits are a highly stable controller capable of producing accurate time delays or oscillation. The LM556/NE556 is a dual LM555. Timing is provided an external resistor and capacitor for each timing function. The two timers operate independently of each other, sharing only VCC and ground. The circuits may be triggered and reset on falling waveforms. The output structures may sink or source 200mA.



### Internal Block Diagram



**Absolute Maximum Ratings (T<sub>A</sub> = 25°C)**

Parameter	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	16	V
Lead Temperature (soldering 10sec)	T <sub>LEAD</sub>	300	°C
Power Dissipation	P <sub>D</sub>	600	mW
Operating Temperature Range LM556/NE556	T <sub>OPR</sub>	0 ~ + 70	°C
Storage Temperature Range	T <sub>STG</sub>	- 65 ~ + 150	°C

## Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Supply Voltage	$V_{CC}$	-	4.5	-	16	V
Supply Current *1(two timers) (low state)	$I_{CC}$	$V_{CC} = 5\text{V}$ , $R_L = \infty$ $V_{CC} = 15\text{V}$ , $R_L = \infty$	-	5 16	12 30	mA mA
Timing Error *2(monostable) Initial Accuracy Drift with Temperature Drift with Supply Voltage	ACCUR $\Delta t/\Delta T$ $\Delta t/\Delta V_{CC}$	$R_A = 2\text{K}\Omega$ to $100\text{K}\Omega$ $C = 0.1\mu\text{F}$ $T = 1.1\text{RC}$	-	0.75 50 0.1	-	% ppm/ $^\circ\text{C}$ %/V
Control Voltage	$V_C$	$V_{CC} = 15\text{V}$	9.0	10.0	11.0	V
		$V_{CC} = 5\text{V}$	2.6	3.33	4.0	V
Threshold Voltage	$V_{TH}$	$V_{CC} = 15\text{V}$	8.8	10.0	11.2	V
		$V_{CC} = 5\text{V}$	2.4	3.33	4.2	V
Threshold Current*3	$I_{TH}$	-	-	30	250	nA
Trigger Voltage	$V_{TR}$	$V_{CC} = 15\text{V}$	4.5	5.0	5.6	V
		$V_{CC} = 5\text{V}$	1.1	1.6	2.2	V
Trigger Current	$I_{TR}$	$V_{TR} = 0\text{V}$	-	0.01	2.0	$\mu\text{A}$
Reset Voltage*5	$V_{RST}$	-	0.4	0.6	1.0	V
Reset Current	$I_{RST}$	-	-	0.03	0.6	mA
Low Output Voltage	$V_{OL}$	$V_{CC} = 15\text{V}$ $I_{SINK} = 10\text{mA}$ $I_{SINK} = 50\text{mA}$ $I_{SINK} = 100\text{mA}$ $I_{SINK} = 200\text{mA}$	-	0.1 0.4 2.0 2.5	0.25 0.75 3.2	V
		$V_{CC} = 5\text{V}$ $I_{SINK} = 8\text{mA}$ $I_{SINK} = 5\text{mA}$		0.25 0.15	0.35 0.25	V
High Output Voltage	$V_{OH}$	$V_{CC} = 15\text{V}$ $I_{SOURCE} = 200\text{mA}$ $I_{SOURCE} = 100\text{mA}$	12.75	12.5 13.3	-	V
		$V_{CC} = 5\text{V}$ $I_{SOURCE} = 100\text{mA}$	2.75	3.3	-	V
Rise Time of Output	$t_R$	-	-	100	300	ns
Fall Time of Output	$t_F$	-	-	100	300	ns
Discharge Leakage Current	$I_{LKG}$	-	-	10	100	nA
Matching Characteristics*4 Initial Accuracy Drift with Temperature Drift with Supply Voltage	ACCUR $\Delta t/\Delta T$ $\Delta t/\Delta V_{CC}$	-	-	1.0 10 0.2	2.0 0.5	% ppm/ $^\circ\text{C}$ %/V
Timing Error (astable)*2 Initial Accuracy Drift with Temperature Drift with Supply Voltage	ACCUR $\Delta t/\Delta T$ $\Delta t/\Delta V_{CC}$	$V_{CC} = 15\text{V}$ $R_A, R_B = 1\text{K}\Omega$ to $100\text{K}\Omega$ $C = 0.1\mu\text{F}$	-	2.25 150 0.3	-	% ppm/ $^\circ\text{C}$ %/V

### Notes:

\*1. Supply current when output is high is typically 1.0mA less at  $V_{CC} = 5\text{V}$

\*2. Tested at  $V_{CC} = 5\text{V}$  and  $V_{CC} = 15\text{V}$

\*3. This will determine the maximum value of  $R_A + R_B$  for 15V operation.  
The maximum total  $R = 20\text{M}\Omega$ , and for 5V operation the maximum total  $R = 6.6\text{M}\Omega$ .

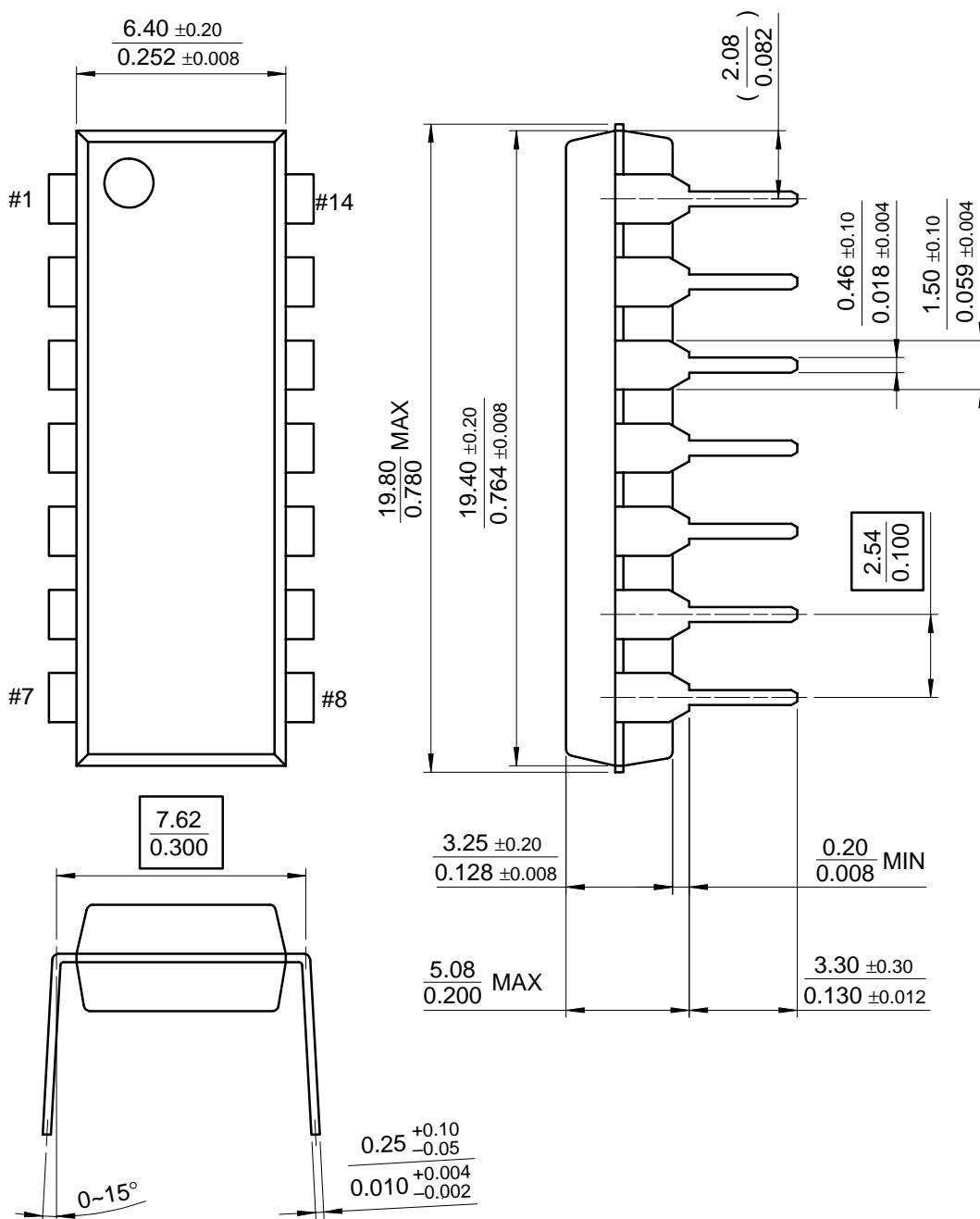
\*4. Matching characteristics refer to the difference between performance characteristics of each timer section in the monostable mode.

\*5. As reset voltage lowers, timing is inhibited and then the output goes low.

## Mechanical Dimensions

### Package

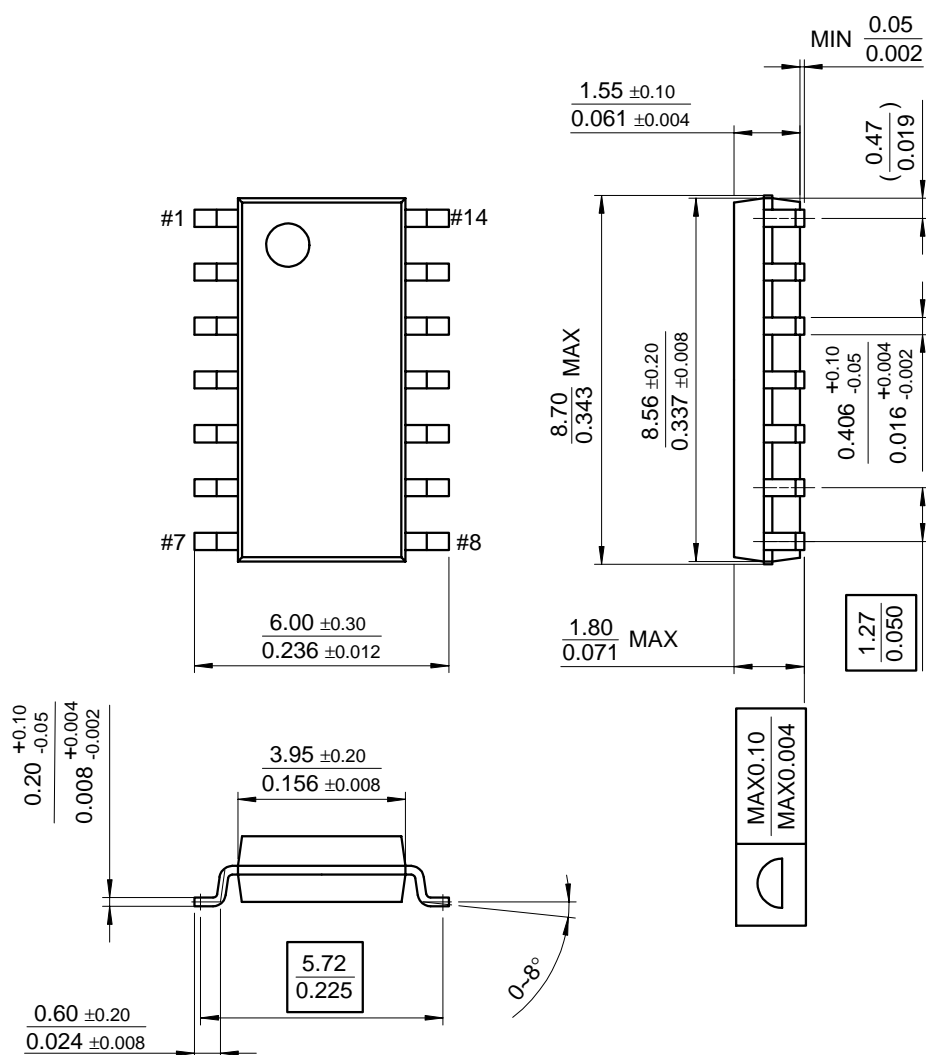
### 14-DIP



# Mechanical Dimensions (Continued)

## Package

### 14-SOP



## Ordering Information

Product Number	Package	Operating Temperature
LM556CN	14-DIP	0 ~ + 70°C
LM556CM	14-SOP	
NE556	14-DIP	
NE556D	14-SOP	



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