

LM556/NE556

Dual Timer

Features

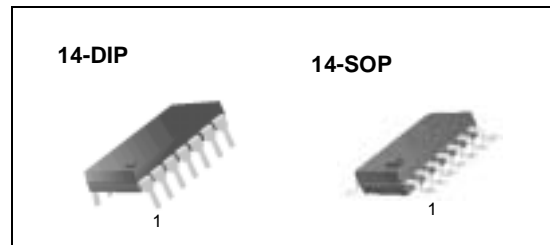
- Replaces Two LM555/NE555 Timers
- Operates in Both Astable And Monostable Modes
- High Output Current
- TTL Compatible
- Timing From Microsecond To Hours
- Adjustable Duty Cycle
- Temperature Stability Of 0.005% Per °C

Applications

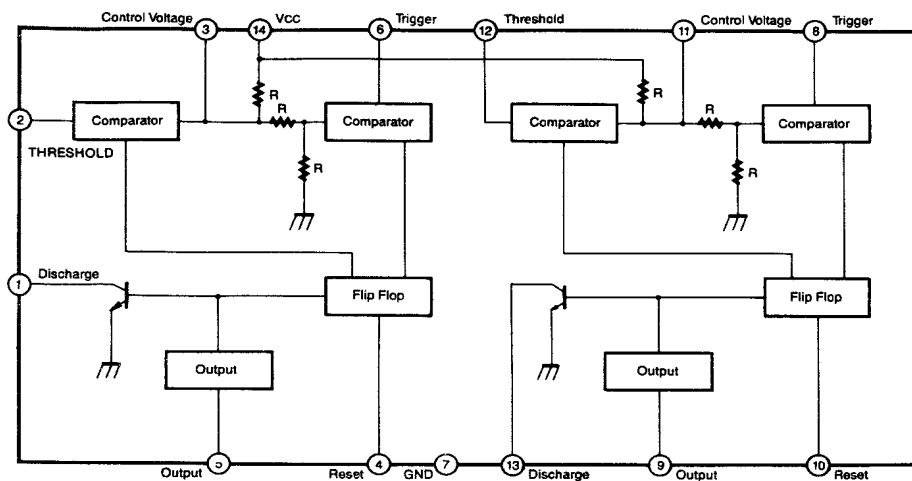
- Precision Timing
- Pulse Shaping
- Pulse Width Modulation
- Frequency Division
- Traffic Light Control
- Sequential Timing
- Pulse Generator
- Time Delay Generator
- Touch Tone Encoder
- Tone Burst Generator

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_A = 25°C)

| Parameter | Symbol | Value | Unit |
|--|-------------------|--------------|------|
| Supply Voltage | V _{CC} | 16 | V |
| Lead Temperature (soldering 10sec) | T _{LEAD} | 300 | °C |
| Power Dissipation | P _D | 600 | mW |
| Operating Temperature Range LM556/NE556 | T _{OPR} | 0 ~ + 70 | °C |
| Storage Temperature Range | T _{STG} | - 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 | μA |
| 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 $R = 6.6\text{M}\Omega$.

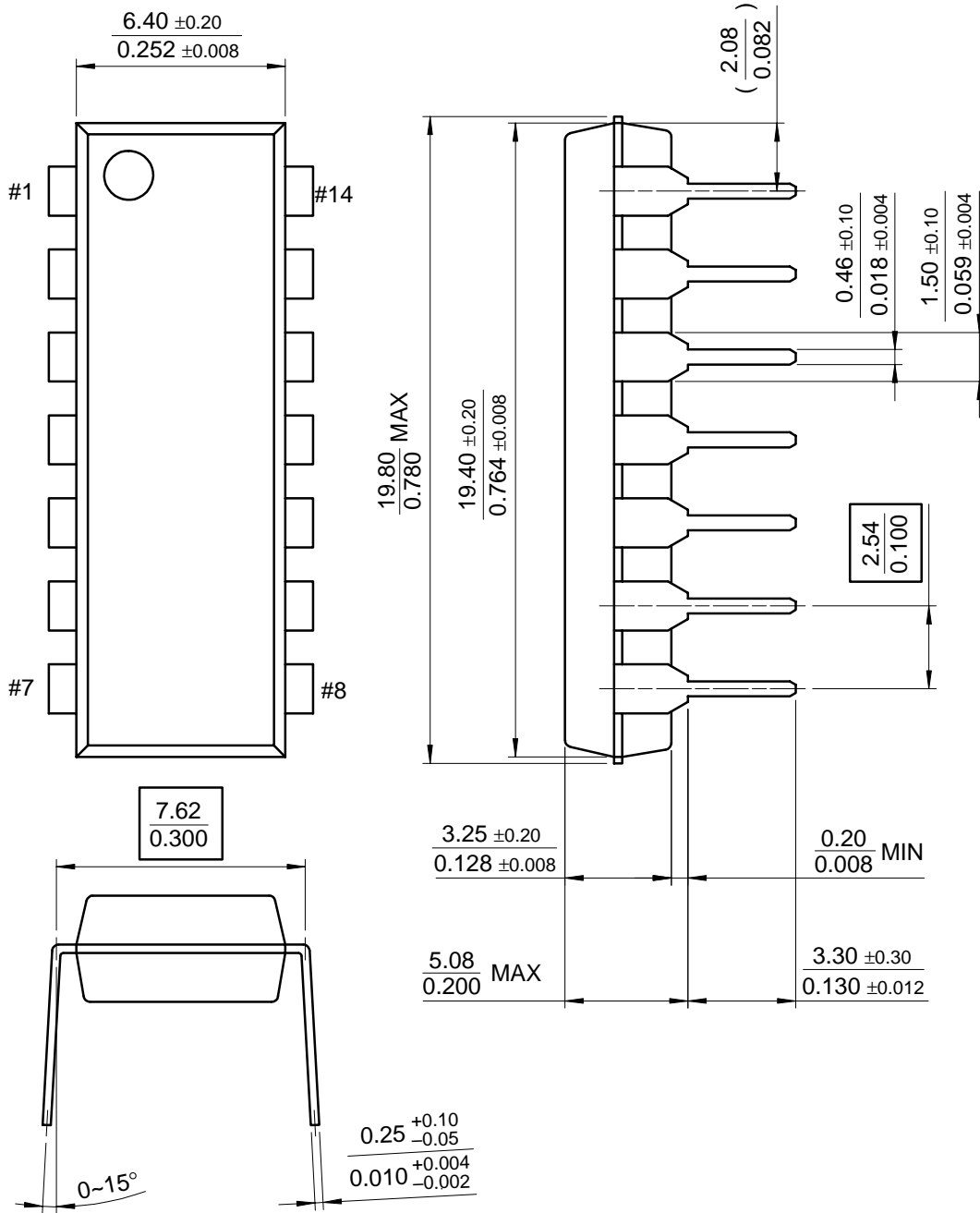
*4. Matching characteristics refer to the difference between performance characteristics of each timer section in the monostable mode.

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

Mechanical Dimensions

Package

14-DIP



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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