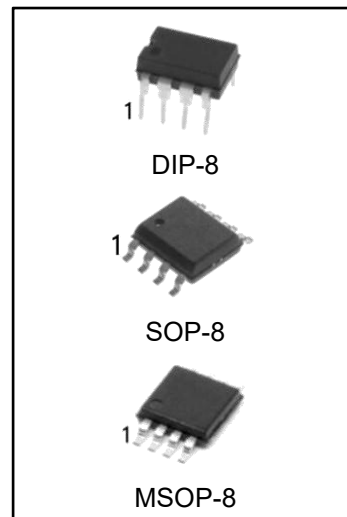


## CMOS general purpose timer

### Features

- Exact equivalent in most cases for SE/NE555.
- Low Supply Current.
- High speed operation – 500 kHz guaranteed.
- Wide operation supply voltage range – 2 to 18 volts.
- Timing from microseconds through hours.
- Operates in both astable and monostable modes.
- Adjustable duty cycle.
- High output source/sink driver can drive TTL/CMOS



### Ordering Information

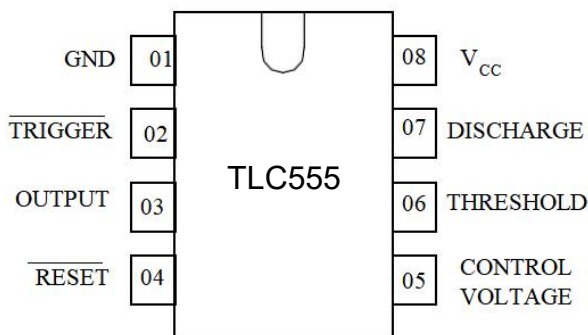
| DEVICE      | Package Type | MARKING      | Packing | Packing Qty  |
|-------------|--------------|--------------|---------|--------------|
| TLC555PG    | DIP-8        | TLC555       | TUBE    | 2000pcs/box  |
| TLC555DRG   | SOP-8        | TLC555       | REEL    | 2500pcs/reel |
| TLC555DRG4  | SOP-8        | TLC555       | REEL    | 4000pcs/reel |
| TLC555DGKRG | MSOP-8       | TLC555, C555 | REEL    | 3000pcs/reel |

## General Description

The TLC555 is CMOS RC timers providing significantly improved performance over the standard SE/NE555 and 355 timers, while at the same time being direct replacements for those devices in most applications. Improved parameters include low supply current, wide operating supply voltage range, low THRESHOLD, TRIGGER and RESET currents, no crowbaring of the supply current during output transitions, higher frequency performance and no requirement to decouple CONTROL VOLTAGE for stable operation.

Specifically, the TLC555 is stable controller capable of producing accurate time delays of frequencies.

## Pin Assignment



## Truth Table

| THRESHOLD      | TRIGGER        | RESET | OUTPUT | DISCHARGE |
|----------------|----------------|-------|--------|-----------|
| X              | X              | L     | L      | ON        |
| $> 2/3 V_{CC}$ | $> 1/3 V_{CC}$ | H     | L      | ON        |
| $< 2/3 V_{CC}$ | $> 1/3 V_{CC}$ | H     | STABLE | STABLE    |
| X              | $< 1/3 V_{CC}$ | H     | H      | OFF       |

**Maximum Ratings And Recommended Operating Conditions**

| Parameter, unit                                     | Symbol   | Recommended operating conditions |      | Maximum ratings |                      |
|---|--|----------------------------------|------|-----------------|----------------------|
|   |  | Value                            |      | Value           |                      |
|   |  | min                              | max  | min             | max                  |
| Supply Voltage, V                                   | V <sub>CC</sub>  | 2.0                              | 18.0 | 0               | 18.0                 |
| Output Current, mA                                  | I <sub>O</sub>   | -                                | 20   | -               | 100                  |
| Input Voltage, V                                    | V <sub>TH</sub> , V <sub>TRIG</sub> , V <sub>RST</sub> | -                                | -    | -0.3            | V <sub>CC</sub> +0.3 |
| Power Dissipation, mW                               | P <sub>D</sub>   | -                                | -    | -               | 200                  |
| Operating Temperature, °C                           | TOPR   | -40                              | 85   | -40             | 85                   |
| Storage Temperature, °C                             | T <sub>STG</sub>                                       | -                                | -    | -65             | 150                  |
| Lead Temperature, 1 mm from Case for 10 Seconds, °C | T <sub>SOLDER</sub>                                    | -                                | -    |                 | 245                  |

**Note:** Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is intended to be functional, but specific performance is not ensured.

**Dc Electrical Characteristics** (Voltages Referenced to GND)

| Parameter, units        | Symbol | Test Conditions |        | Value    |          | Temperature, °C |
|-------------------------|--------|-----------------|--------|----------|----------|-----------------|
|                         |        | IOL, IOH        | VCC, B | min      | max      |                 |
| Threshold Voltage, V    | VTH    |                 | 5.0    | 0.65 VCC | 0.70 VCC | 25 ± 10         |
|                         |        |                 |        | 0.60 VCC | 0.80 VCC | -20, 70         |
| Trigger voltage, V      | VTRIG  |                 | 5.0    | 0.31 VCC | 0.36 VCC | 25 ± 10         |
|                         |        |                 |        | 0.28 VCC | 0.40 VCC | -20, 70         |
| Reset voltage, V        | VRST   |                 | 2.0    | 0.4      | 1.0      | 25 ± 10         |
|                         |        |                 | 18.0   |          |          |                 |
|                         |        |                 | 2.0    | 0.2      | 1.5      | -20, 70         |
|                         |        |                 | 18.0   |          |          |                 |
| Control Voltage Lead, V | VCV    |                 |        | 0.65 VCC | 0.69 VCC | 25 10           |
|                         |        |                 |        | 0.60 VCC | 0.80 VCC | -20, 70         |
| Output voltage Low, V   | VOL    | IOL = 3.2 mA    | 5.0    |          | 0.4      | 25 ± 10         |
|                         |        | IOL = 20 mA     | 15.0   |          | 1.0      |                 |
|                         |        | IOL = 3.2 mA    | 5.0    |          | 0.6      | -20, 70         |
|                         |        | IOL = 20 mA     | 15.0   |          | 1.5      |                 |
| Output voltage High, V  | VOH    | IOH = -0.8 mA   | 5.0    | 4.0      |          | 25 ± 10         |
|                         |        |                 | 15.0   | 14.3     |          |                 |
|                         |        |                 | 5.0    | 3.5      |          | -20, 70         |
|                         |        |                 | 15.0   | 14.0     |          |                 |
| Supply Current, µA      | ICC    |                 | 2.0    |          | 200      | 25 ± 10         |
|                         |        |                 | 18.0   |          | 300      |                 |
|                         |        |                 | 2.0    |          | 400      | -20, 70         |
|                         |        |                 | 18.0   |          | 600      |                 |

## Ac Electrical Characteristics

| Parameter, unit                   | Symbol                                 | Test Conditions  |                     | Value |         | Tempe-<br>rature,<br>°C |
|-----------------------------------|--|--|---------------------|-------|---------|-------------------------|
|                                   |  | R <sub>L</sub> , C <sub>L</sub>                        | V <sub>CC</sub> , V | Min   | Max     |                         |
| Rise (Fall) Time of<br>Output, ns | t <sub>THL</sub> ,<br>t <sub>TLH</sub> | R <sub>L</sub> = 10 MΩ, C <sub>L</sub> = 10 pF         | 5.0                 | 35    | 75      | 25 ± 10                 |
|                                   |  |  |                     | 70    | 150     | -20, 70                 |
| Guaranteed Max<br>Osc Freq, kHz   | f <sub>MAX</sub>                       | Astable Operation                                      | 2.0-<br>18.0        | 500   |         | 25 ± 10                 |
|                                   |  |  |                     | 200   |         | -20, 70                 |
| Initial accuracy, %               |  | R <sub>L</sub> = 1 - 100 kΩ<br>C <sub>L</sub> = 0.1 μF |                     | 5     |         |                         |
| Drift with Temperature,<br>%/°C   | αf                                     |  | 5.0                 |       | 0.02    | -20, 70                 |
|                                   |  |  | 10.0                |       | 0.03    |                         |
|                                   |  |  | 15.0                |       | 0.06    |                         |
| Drift with Supply Voltage,<br>%/B | Δf                                     |  | 5.0                 |       | 3       | 25 ± 10                 |
|                                   |  |  |                     | 6     | -20, 70 |                         |

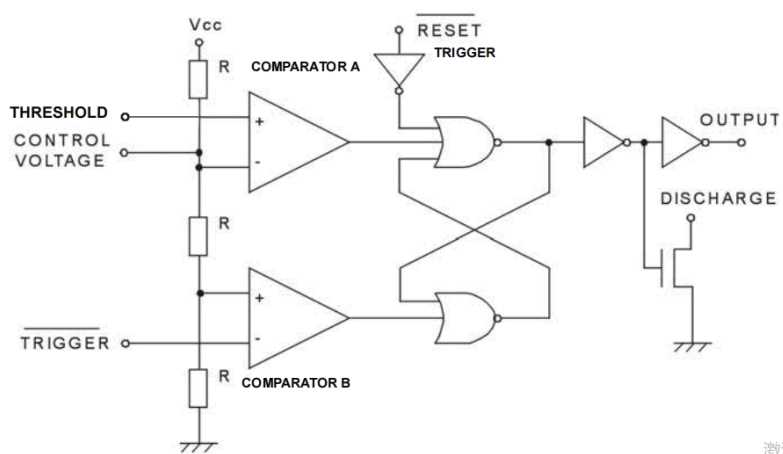


Figure 1. Block Diagram

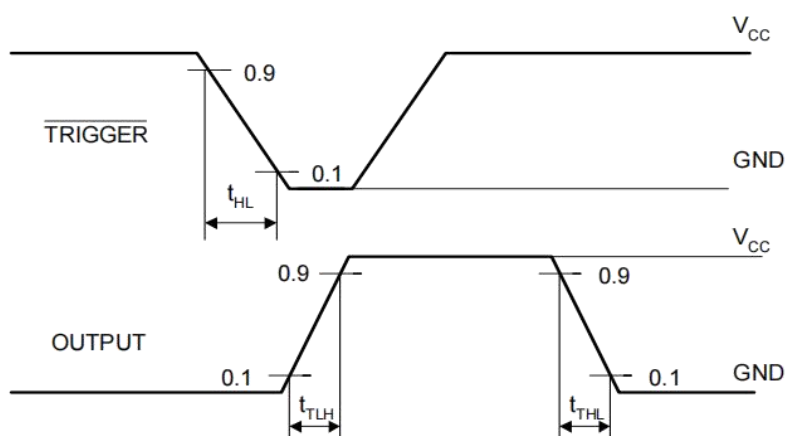
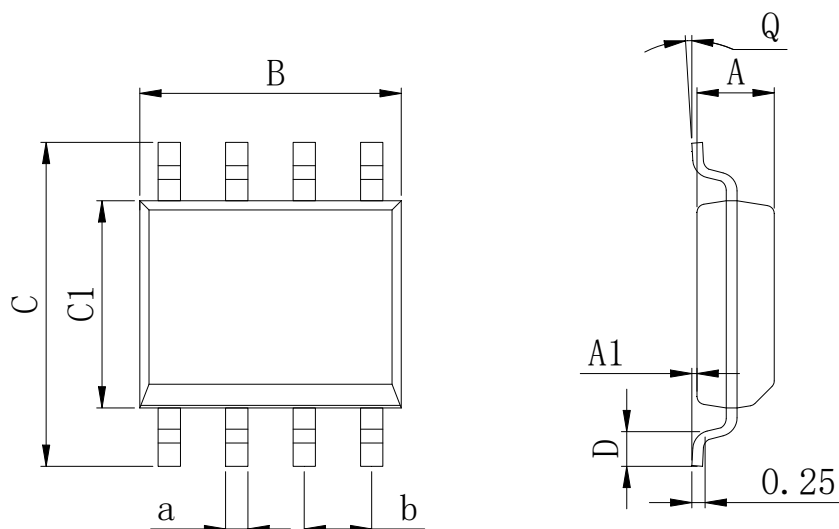


Figure 2. Switching Waveforms

## Physical Dimensions

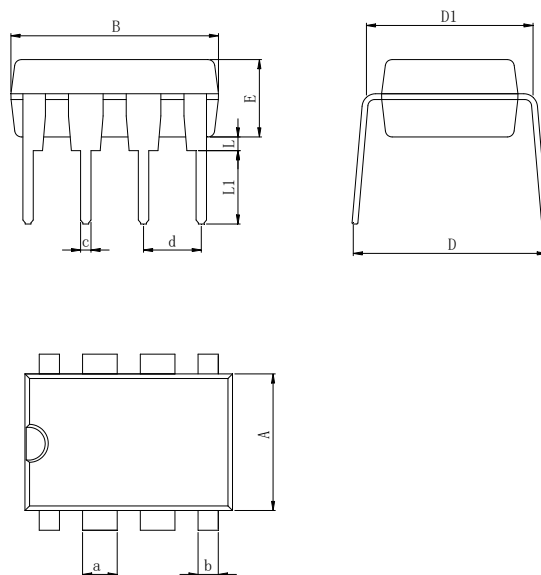
### SOP-8



Dimensions In Millimeters(SOP-8)

| Symbol: | A    | A1   | B    | C    | C1   | D    | Q  | a    | b        |
|---------|------|------|------|------|------|------|----|------|----------|
| Min:    | 1.35 | 0.05 | 4.90 | 5.80 | 3.80 | 0.40 | 0° | 0.35 | 1.27 BSC |
| Max:    | 1.55 | 0.20 | 5.10 | 6.20 | 4.00 | 0.80 | 8° | 0.45 |          |

### DIP-8

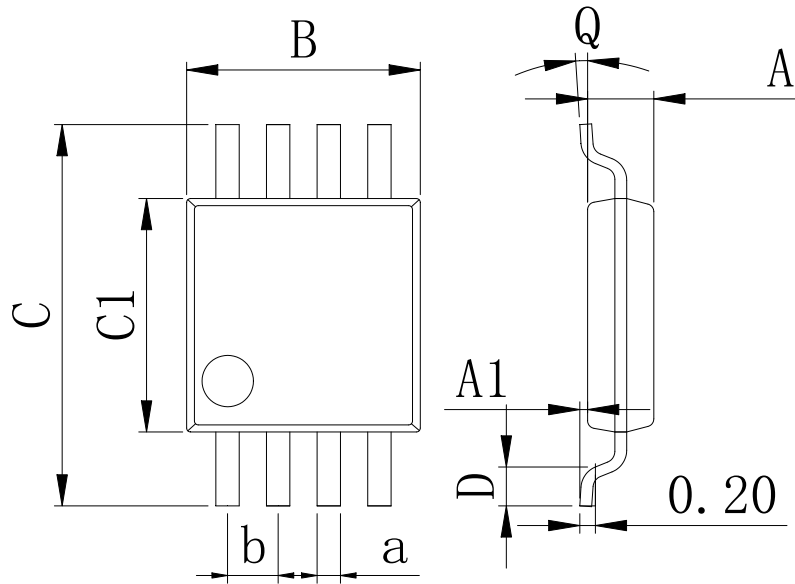


Dimensions In Millimeters(DIP-8)

| Symbol: | A    | B    | D    | D1   | E    | L    | L1   | a    | b    | c    | d        |
|---------|------|------|------|------|------|------|------|------|------|------|----------|
| Min:    | 6.10 | 9.00 | 8.10 | 7.42 | 3.10 | 0.50 | 3.00 | 1.50 | 0.85 | 0.40 | 2.54 BSC |
| Max:    | 6.68 | 9.50 | 10.9 | 7.82 | 3.55 | 0.70 | 3.60 | 1.55 | 0.90 | 0.50 |          |

## Physical Dimensions

MSOP-8



| Dimensions In Millimeters(MSOP-8) |      |      |      |      |      |      |    |      |          |
|-----------------------------------|------|------|------|------|------|------|----|------|----------|
| Symbol:                           | A    | A1   | B    | C    | C1   | D    | Q  | a    | b        |
| Min:                              | 0.80 | 0.05 | 2.90 | 4.75 | 2.90 | 0.35 | 0° | 0.25 | 0.65 BSC |
| Max:                              | 0.90 | 0.20 | 3.10 | 5.05 | 3.10 | 0.75 | 8° | 0.35 |          |

## Revision History

| REVISION<br>NUMBER | DATE   | REVISION  | PAGE |
|--------------------|--------|---|------|
| V1.0               | 2015-3 | New   | 1-9  |
| V1.1               | 2023-9 | Update encapsulation type、Add annotation for Maximum Ratings. | 1、 3 |



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