

# HA17555 Series

## Precision Timer

REJ03D0681-0100  
(Previous: ADE-204-064)  
Rev.1.00  
Jun 15, 2005

### Description

HA17555 Series are ICs designed for accurate time delays or oscillations. It provides both of trigger terminal and reset terminal in order to enable a wide scope of application including Mono Multi Vibrator and Astable Multi Vibrator, and the number of external components is fewer. Further, it's compatible with NE555 of singnetics.

### Features

- Mono multi vibrator can be constructed with one resistor and one capacitor.
- Astable multi vibrator can be constructed with two resistors and one capacitor.
- Delay time can be established widely from several  $\mu$  seconds to several hours.
- Pulse Duty can be controlled.
- The maximum value of both sink current and source current is 200mA.
- Direct connection of output to TTL is possible.
- Temperature/delay time ratio is 50 ppm/ $^{\circ}$ C (typ).
- Output is normally in the on and off states.

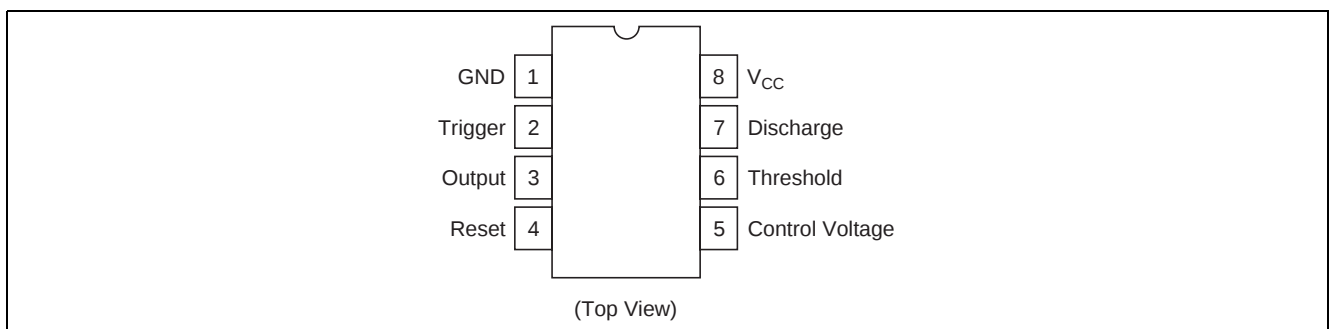
### Ordering Information

| Application    | Type No.  | Package Code (Previous Code) |
|----------------|-----------|------------------------------|
| Industrial use | HA17555PS | PRDP0008AF-A (DP-8B)         |
|                | HA17555FP | PRSP0008DE-B (FP-8DGV)       |
| Commercial use | HA17555   | PRDP0008AF-A (DP-8B)         |
|                | HA17555F  | PRSP0008DE-B (FP-8DGV)       |

### Applications

- Delay Time Generator (Mono Multi Vibrator)
- Pulse Generator (Astable Multi Vibrator)
- Pulse Width Modulator
- Pulse Location Modulator
- Miss Pulse Detector

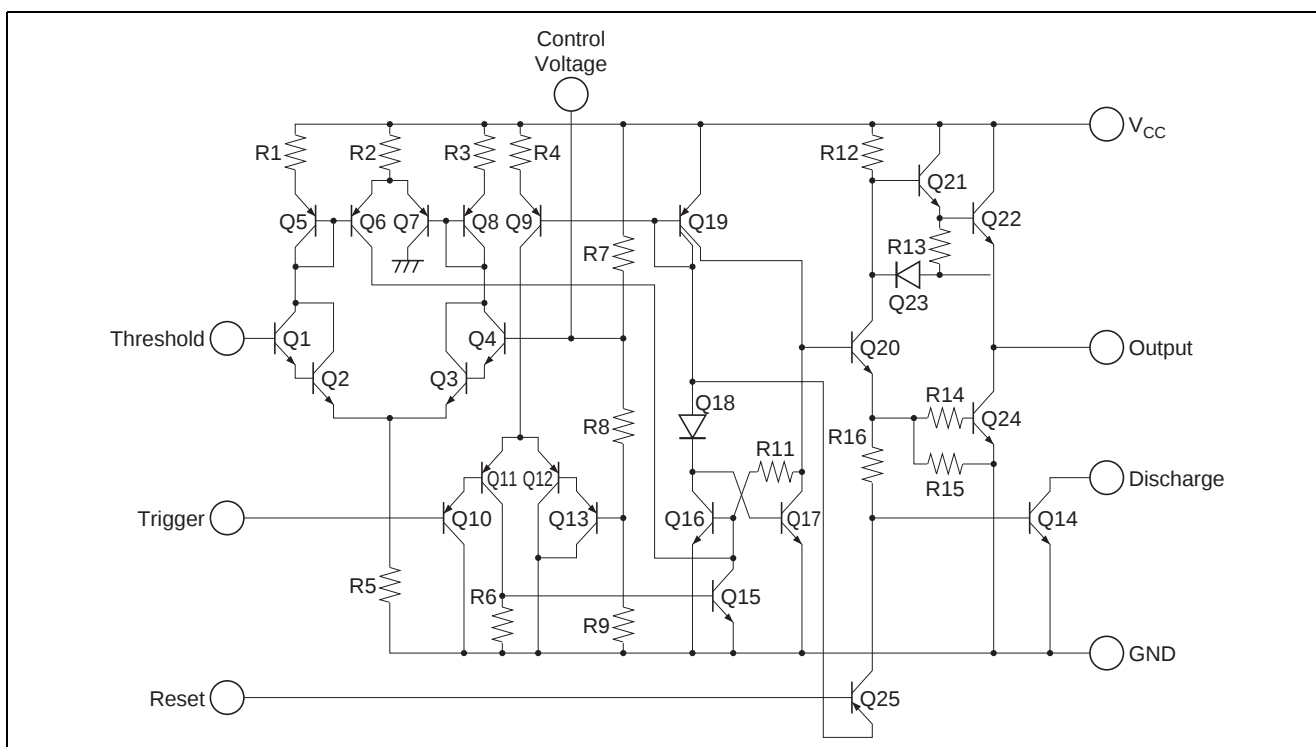
### Pin Arrangement



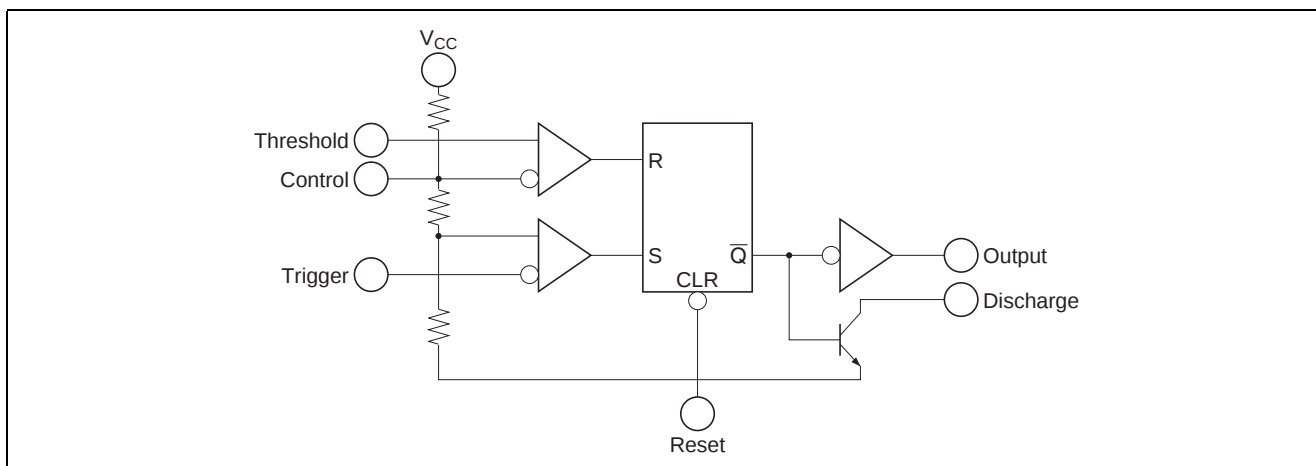
## Pin Description

| Pin No. | Function            |
|---------|---------------------|
| 1       | Ground pin          |
| 2       | Trigger pin         |
| 3       | Output pin          |
| 4       | Reset pin           |
| 5       | Control voltage pin |
| 6       | Threshold pin       |
| 7       | Discharge pin       |
| 8       | V <sub>CC</sub> pin |

## Circuit Schematic



## Block Diagram



## Absolute Maximum Ratings

(Ta = 25°C)

| Item                            | Symbol              | HA17555PS/FP | HA17555/F   | Unit |
|---------------------------------|---------------------|--------------|-------------|------|
| Supply voltage                  | V <sub>CC</sub>     | 18           | 18          | V    |
| Discharge current               | I <sub>T</sub>      | 200          | 200         | mA   |
| Output source current           | I <sub>source</sub> | 200          | 200         | mA   |
| Output sink current             | I <sub>sink</sub>   | 200          | 200         | mA   |
| Power dissipation* <sup>1</sup> | P <sub>T</sub>      | 600/385      | 600/385     | mW   |
| Operating temperature           | T <sub>opr</sub>    | -20 to +75   | -20 to +70  | °C   |
| Storage temperature             | T <sub>stg</sub>    | -55 to +125  | -55 to +125 | °C   |

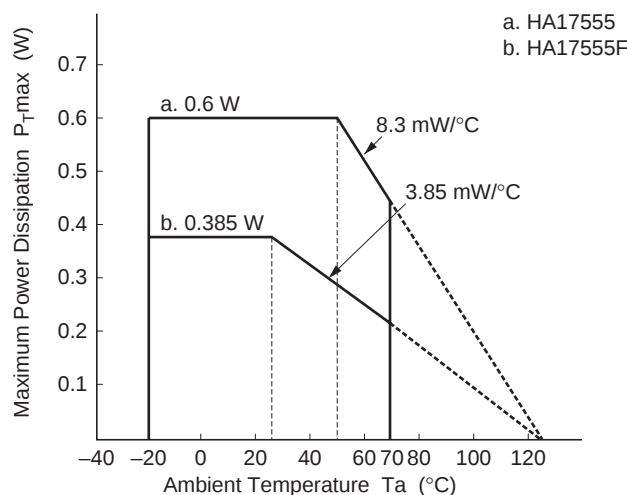
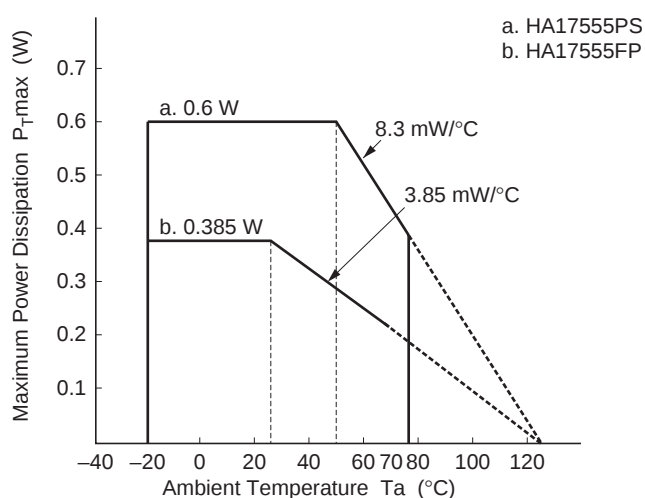
Note: 1. For the HA17555/PS,

This value applies up to Ta = 50°C; at temperatures above this, 8.3mW/°C derating should be applied.

For the HA17555F/FP,

This value applies up to Ta = 25°C; at temperatures above this, 3.85mW/°C derating should be applied.

See notes on SOP Package Usage in Reliability section.



## Electrical Characteristics

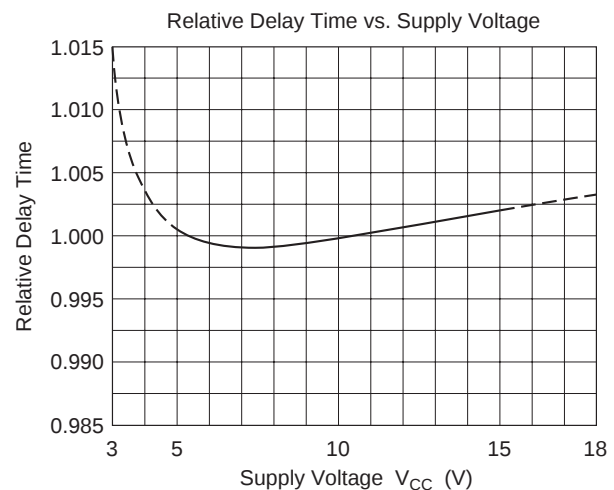
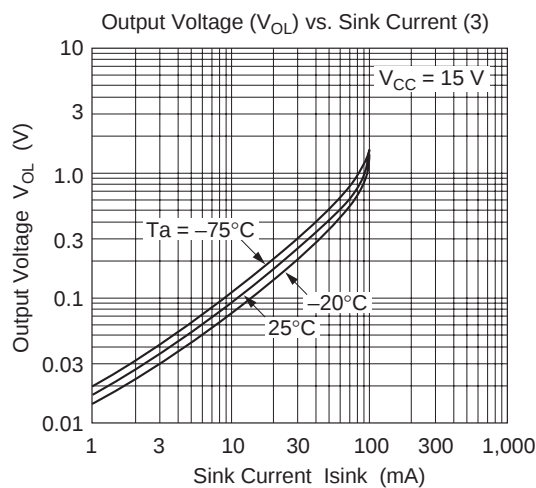
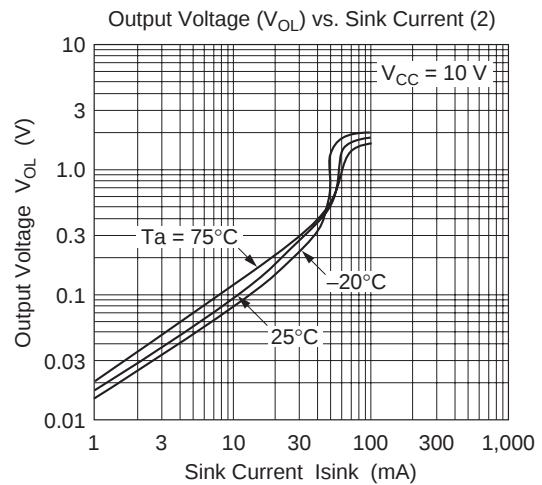
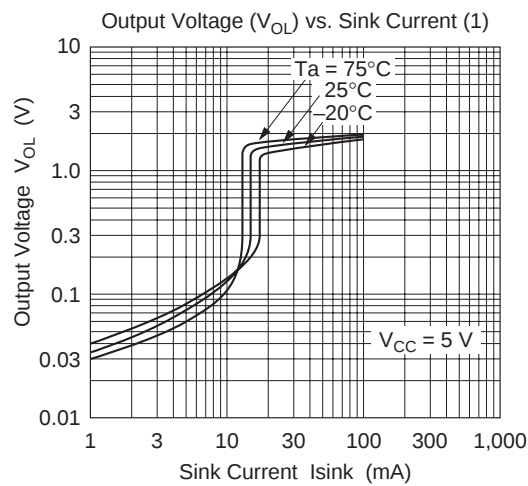
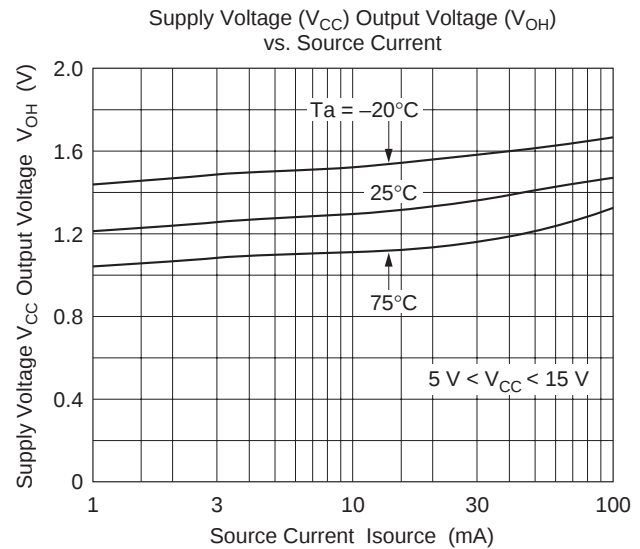
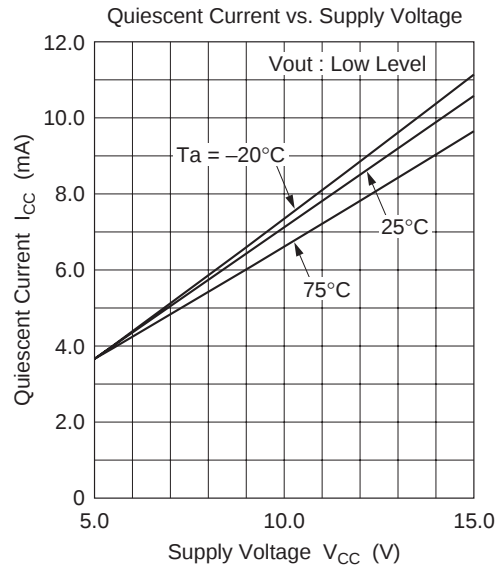
(V<sub>CC</sub> = 5 to 15 V, Ta = 25°C)

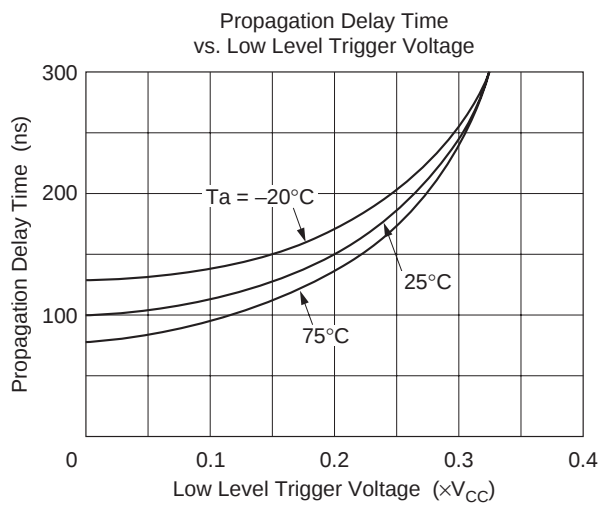
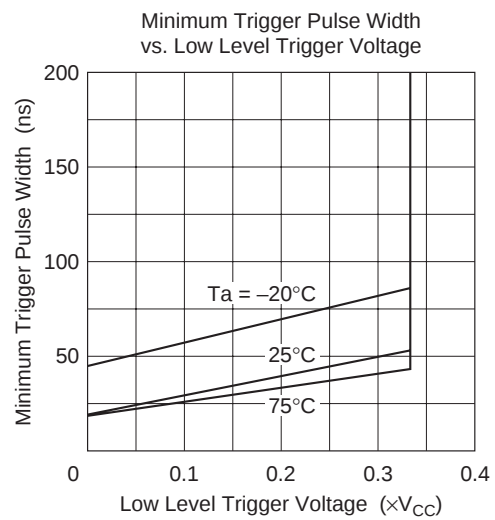
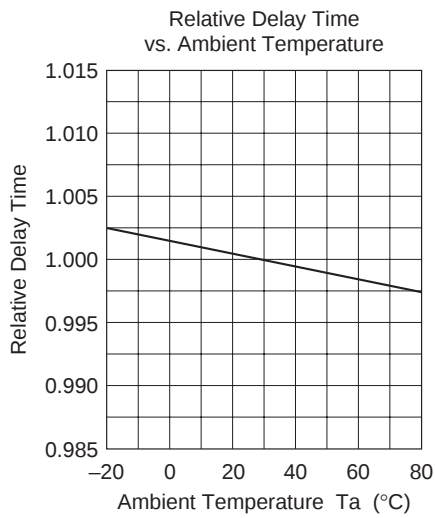
| Item                                               | Symbol                         | Min   | Typ  | Max  | Unit                | Test conditions                                      |
|----------------------------------------------------|--------------------------------|-------|------|------|---------------------|------------------------------------------------------|
| Supply voltage* <sup>1</sup>                       | V <sub>CC</sub>                | 4.5   | —    | 16.0 | V                   |                                                      |
| Supply current                                     | I <sub>CC</sub>                | —     | 3.0  | 6.0  | mA                  | V <sub>CC</sub> = 5 V, R <sub>L</sub> = ∞            |
|                                                    | I <sub>CC</sub>                | —     | 10   | 15   | mA                  | V <sub>CC</sub> = 15 V, R <sub>L</sub> = ∞           |
| Timing error* <sup>2</sup><br>(Inherent error)     | Et                             | —     | 1.0  | —    | %                   |                                                      |
| Timing error* <sup>2</sup><br>(Ta dependency)      | Et                             | —     | 50   | —    | ppm/°C              | Ta = -20 to + 75°C                                   |
| Timing error* <sup>2</sup><br>(Voltage dependency) | Et                             | —     | 0.01 | —    | %/V                 | V <sub>CC</sub> = 5 to 15 V                          |
| Threshold voltage                                  | V <sub>th</sub>                | —     | 2/3  | —    | V × V <sub>CC</sub> |                                                      |
| Trigger voltage                                    | V <sub>T</sub>                 | —     | 5.0  | —    | V                   | V <sub>CC</sub> = 15 V                               |
|                                                    | V <sub>T</sub>                 | —     | 1.67 | —    | V                   | V <sub>CC</sub> = 5 V                                |
| Trigger current                                    | I <sub>T</sub>                 | —     | 0.5  | —    | μA                  |                                                      |
| Reset voltage                                      | V <sub>R</sub>                 | 0.2   | 0.5  | 1.0  | V                   |                                                      |
| Reset current                                      | I <sub>R</sub>                 | —     | 0.1  | —    | mA                  |                                                      |
| Threshold current                                  | I <sub>th</sub> * <sup>3</sup> | —     | 0.1  | 0.25 | μA                  |                                                      |
| Control voltage                                    | V <sub>CL</sub>                | 9     | 10   | 11   | V                   | V <sub>CC</sub> = 15 V                               |
|                                                    | V <sub>CL</sub>                | 2.6   | 3.33 | 4.0  | V                   | V <sub>CC</sub> = 5 V                                |
| Output voltage                                     | V <sub>OL</sub>                | —     | 0.1  | 0.25 | V                   | V <sub>CC</sub> = 15 V, I <sub>sink</sub> = 10 mA    |
|                                                    |                                | —     | 0.4  | 0.75 | V                   | V <sub>CC</sub> = 15 V, I <sub>sink</sub> = 50 mA    |
|                                                    |                                | —     | 2.0  | 2.5  | V                   | V <sub>CC</sub> = 15 V, I <sub>sink</sub> = 100 mA   |
|                                                    |                                | —     | 2.5  | —    | V                   | V <sub>CC</sub> = 15 V, I <sub>sink</sub> = 200 mA   |
|                                                    |                                | —     | 0.25 | 0.35 | V                   | V <sub>CC</sub> = 5 V, I <sub>sink</sub> = 5 mA      |
| Output voltage                                     | V <sub>OH</sub>                | —     | 12.5 | —    | V                   | V <sub>CC</sub> = 15 V, I <sub>source</sub> = 200 mA |
|                                                    |                                | 12.75 | 13.3 | —    | V                   | V <sub>CC</sub> = 15 V, I <sub>source</sub> = 100 mA |
|                                                    |                                | 2.75  | 3.3  | —    | V                   | V <sub>CC</sub> = 5 V, I <sub>source</sub> = 100 mA  |
| Output rise time                                   | t <sub>r</sub>                 | —     | 100  | —    | ns                  | No loading                                           |
| Output fall time                                   | t <sub>f</sub>                 | —     | 100  | —    | ns                  | No loading                                           |
| Oscillation pulse width* <sup>4</sup>              | t <sub>w</sub>                 | 10.0  | —    | —    | ns                  |                                                      |

Notes: 1. When output is low (When it is high, I<sub>CC</sub> is lower by 1 mA typically.)2. R<sub>A</sub>, R<sub>B</sub> = 1 k to 100 kΩ, C = 0.1 μF, V<sub>CC</sub> = 5 V or 15 V.3. (R<sub>A</sub> + R<sub>B</sub>) at V<sub>CC</sub> = 15 V is determined by the value of I<sub>th</sub>. It is 20 MΩ Max.

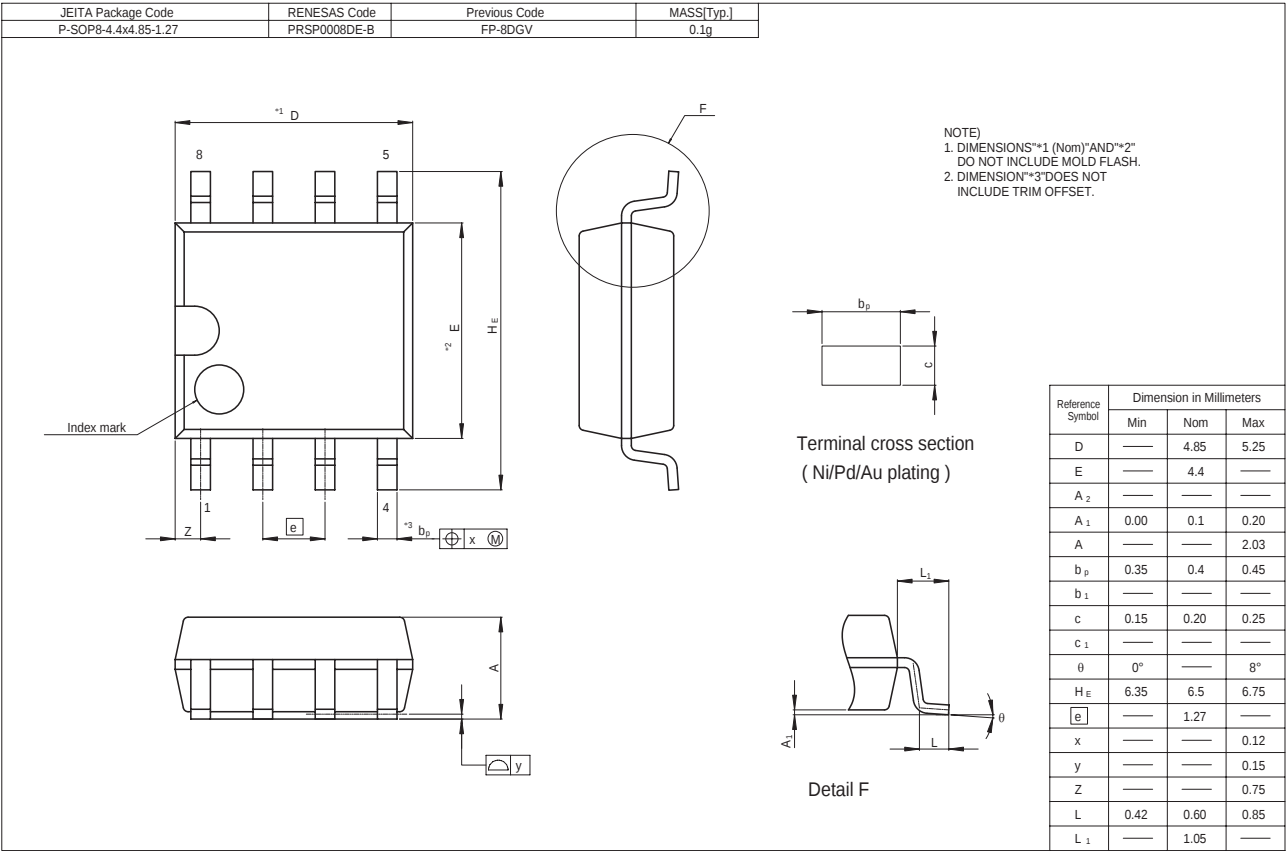
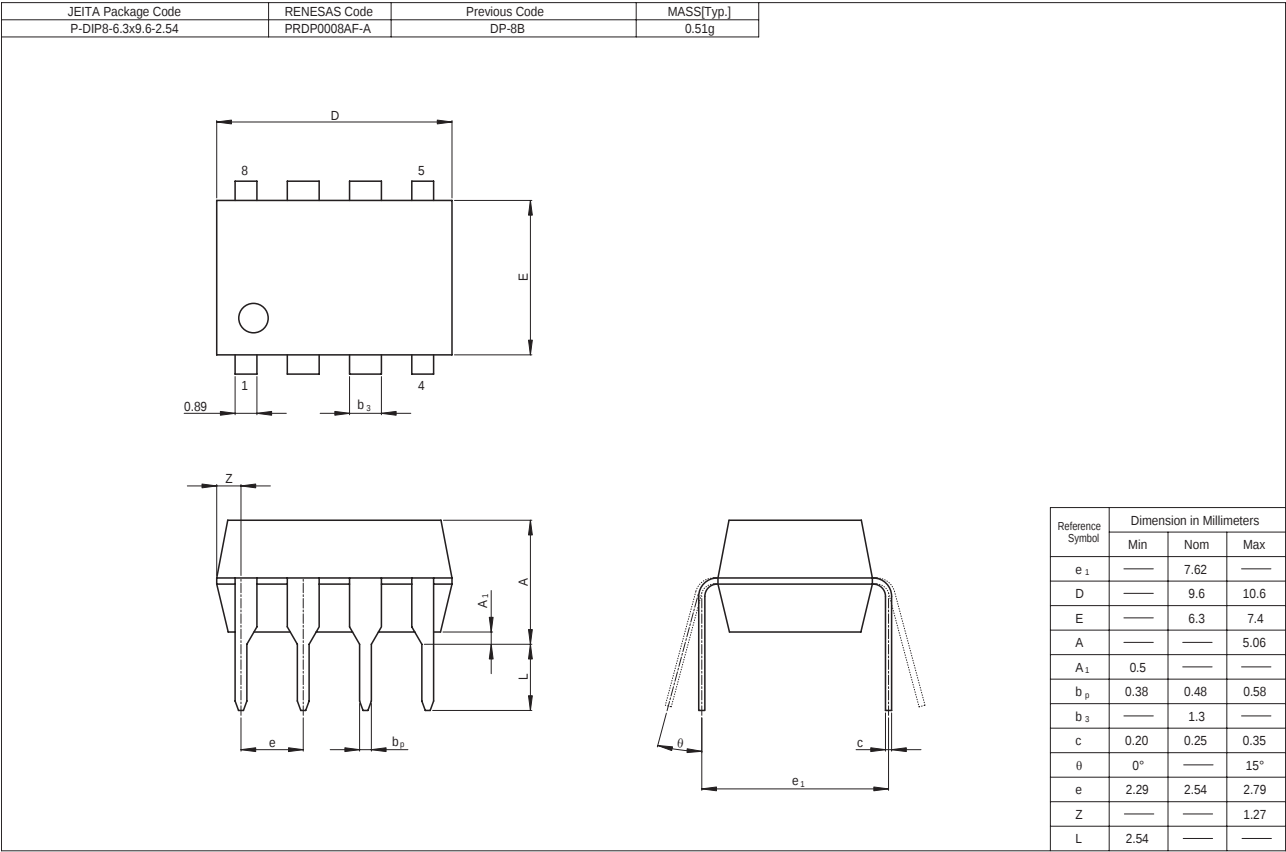
4. Output pulse width at mono multi circuit. Output high level pulse width at astable circuit.

## Characteristic Curves





Package Dimensions



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