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# HA17555 Series

Precision Timer

# HITACHI

ADE-204-064 (Z)  
Rev. 0  
Dec. 2000

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## 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

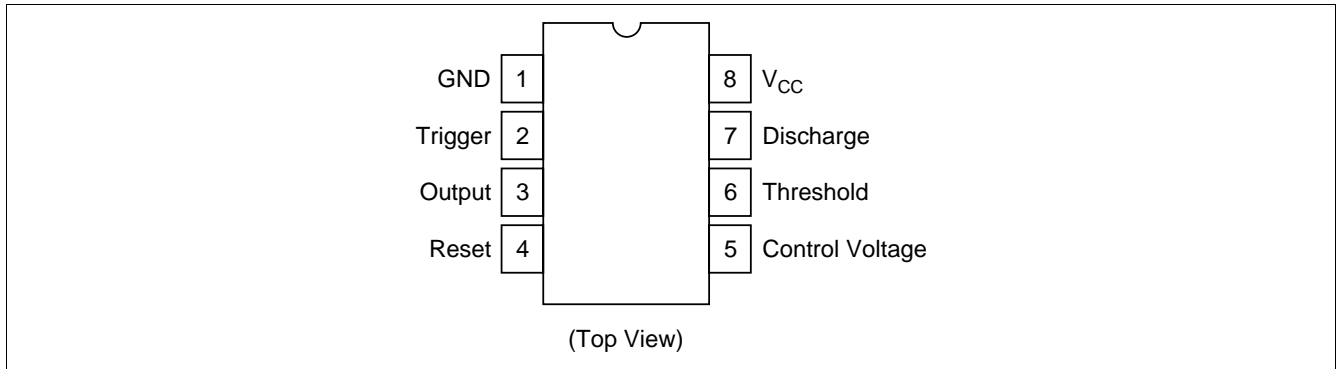
Application	Type No.	Package
Industrial use	HA17555PS	DP-8
	HA17555FP	FP-8D
Commercial use	HA17555	DP-8
	HA17555F	FP-8D

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## Applications

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

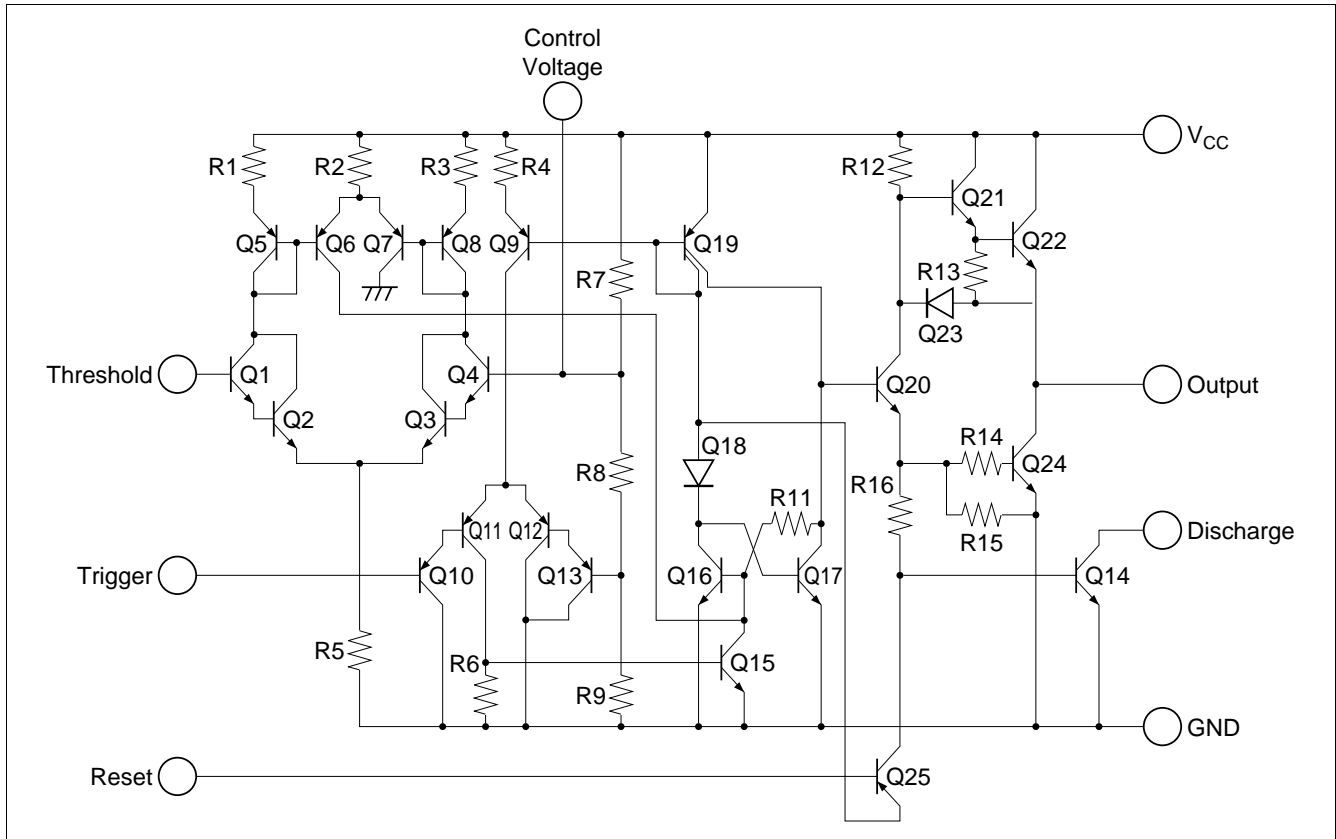
## Pin Arrangement



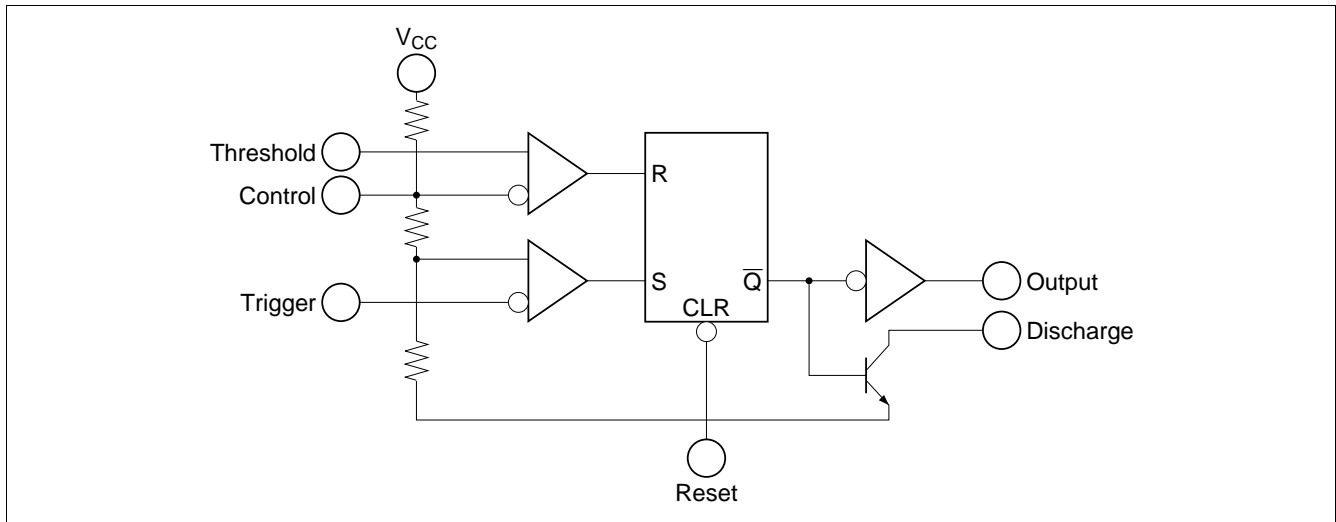
## Pin Description

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



# HA17555 Series

## 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*1	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

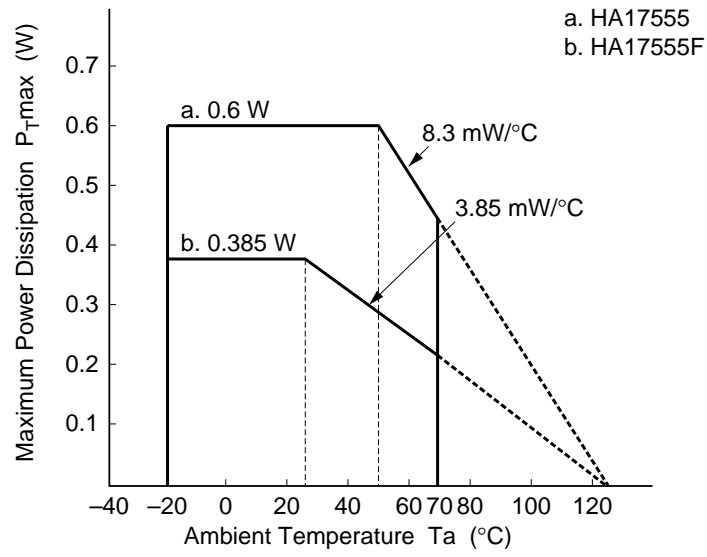
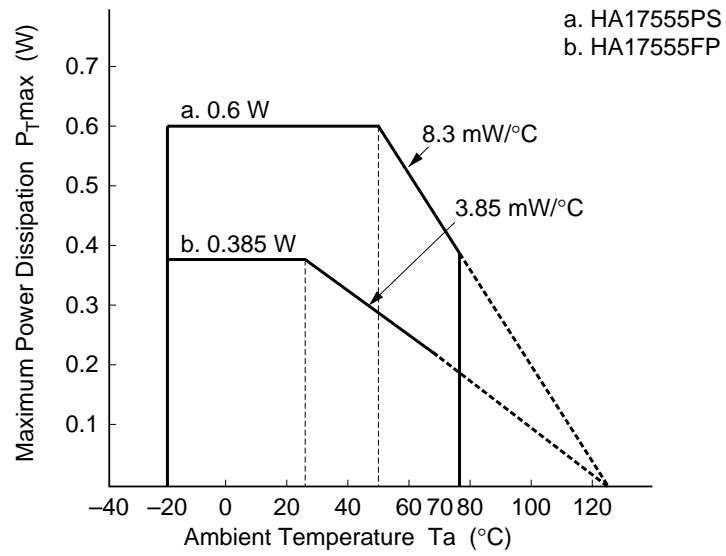
Note: 1. For the HA17555/PS,

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 ( $V_{CC} = 5$ to $15$ V, $T_a = 25^\circ\text{C}$ )

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Supply voltage* <sup>1</sup>	$V_{CC}$	4.5	—	16.0	V	
Supply current	$I_{CC}$	—	3.0	6.0	mA	$V_{CC} = 5$ V, $R_L = \infty$
	$I_{CC}$	—	10	15	mA	$V_{CC} = 15$ V, $R_L = \infty$
Timing error* <sup>2</sup> (Inherent error)	Et	—	1.0	—	%	
Timing error* <sup>2</sup> ( $T_a$ dependency)	Et	—	50	—	ppm/ $^\circ\text{C}$	$T_a = -20$ to $+75^\circ\text{C}$
Timing error* <sup>2</sup> (Voltage dependency)	Et	—	0.01	—	%/V	$V_{CC} = 5$ to $15$ V
Threshold voltage	$V_{th}$	—	2/3	—	$V \times V_{CC}$	
Trigger voltage	$V_T$	—	5.0	—	V	$V_{CC} = 15$ V
	$V_T$	—	1.67	—	V	$V_{CC} = 5$ V
Trigger current	$I_T$	—	0.5	—	$\mu\text{A}$	
Reset voltage	$V_R$	0.2	0.5	1.0	V	
Reset current	$I_R$	—	0.1	—	mA	
Threshold current	$I_{th}^{*3}$	—	0.1	0.25	$\mu\text{A}$	
Control voltage	$V_{CL}$	9	10	11	V	$V_{CC} = 15$ V
	$V_{CL}$	2.6	3.33	4.0	V	$V_{CC} = 5$ V
Output voltage	$V_{OL}$	—	0.1	0.25	V	$V_{CC} = 15$ V, $I_{sink} = 10$ mA
		—	0.4	0.75	V	$V_{CC} = 15$ V, $I_{sink} = 50$ mA
		—	2.0	2.5	V	$V_{CC} = 15$ V, $I_{sink} = 100$ mA
		—	2.5	—	V	$V_{CC} = 15$ V, $I_{sink} = 200$ mA
		—	0.25	0.35	V	$V_{CC} = 5$ V, $I_{sink} = 5$ mA
Output voltage	$V_{OH}$	—	12.5	—	V	$V_{CC} = 15$ V, $I_{source} = 200$ mA
		12.75	13.3	—	V	$V_{CC} = 15$ V, $I_{source} = 100$ mA
		2.75	3.3	—	V	$V_{CC} = 5$ V, $I_{source} = 100$ mA
Output rise time	$t_r$	—	100	—	ns	No loading
Output fall time	$t_f$	—	100	—	ns	No loading
Oscillation pulse width* <sup>4</sup>	tw	10.0	—	—	ns	

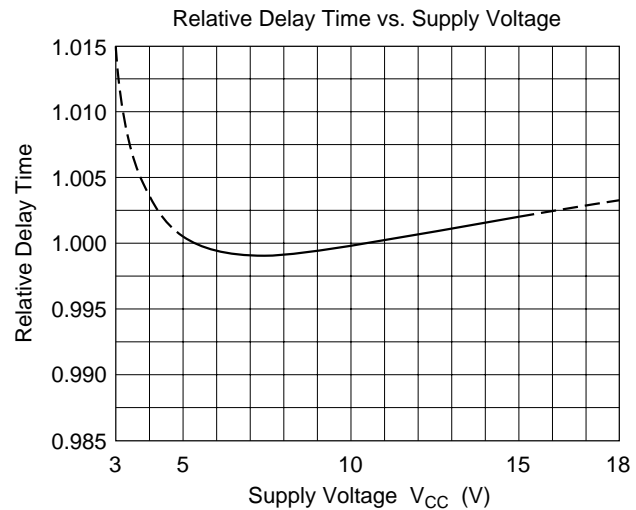
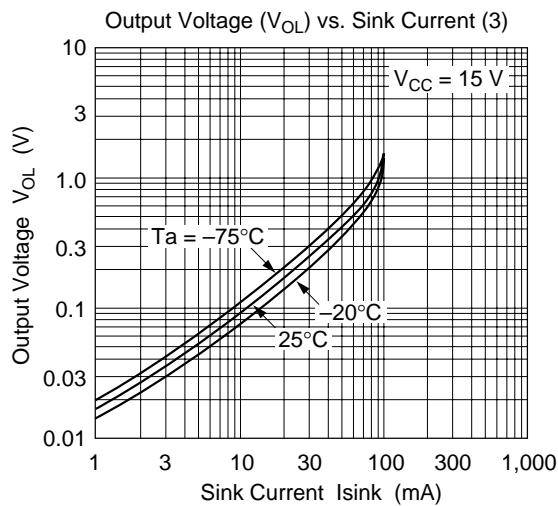
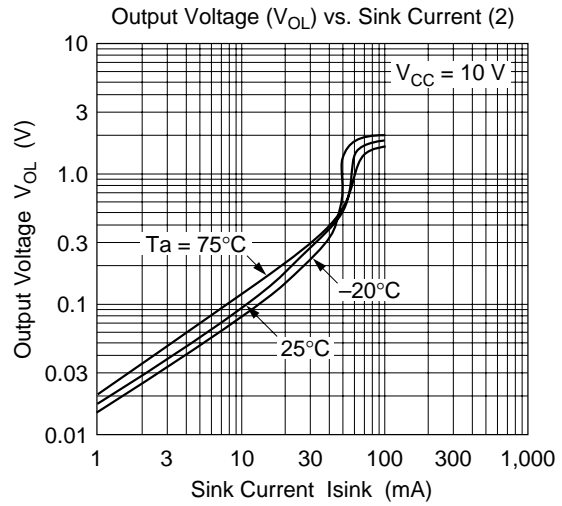
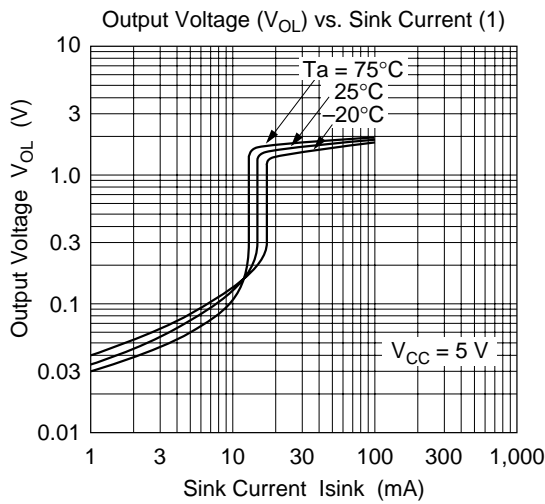
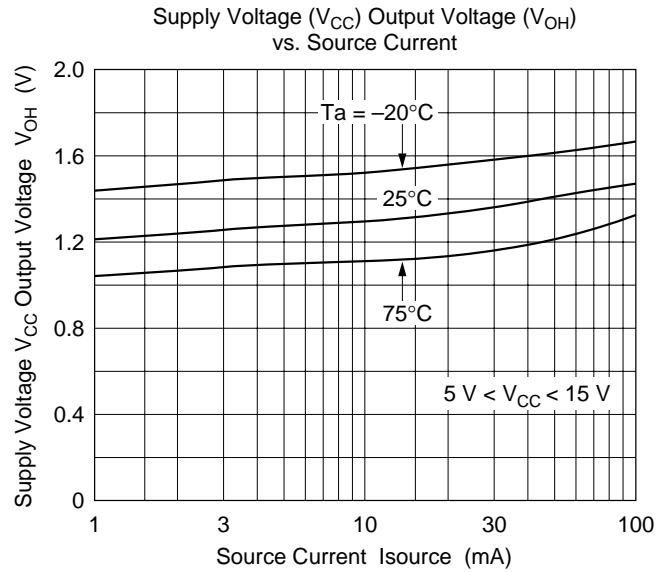
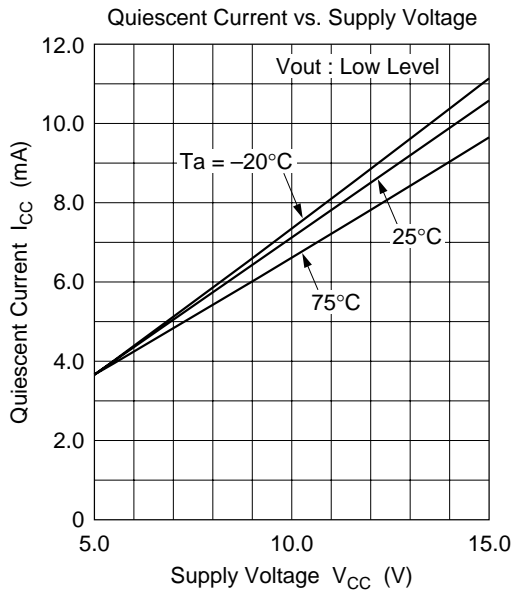
Notes: 1. When output is low (When it is high,  $I_{CC}$  is lower by 1 mA typically.)

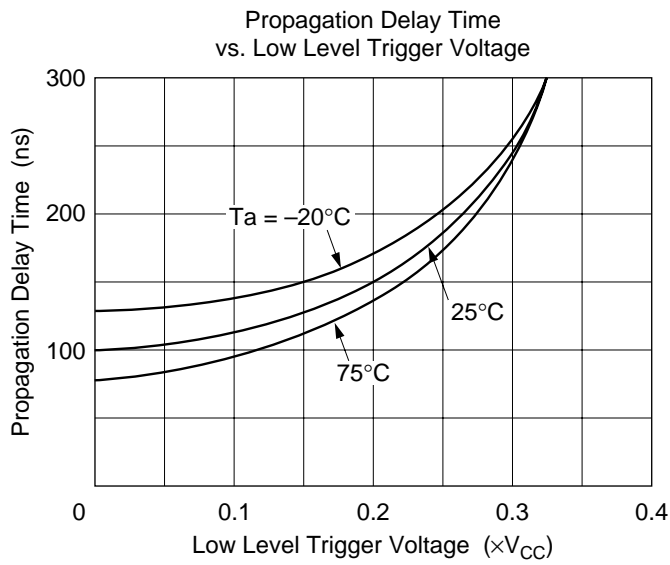
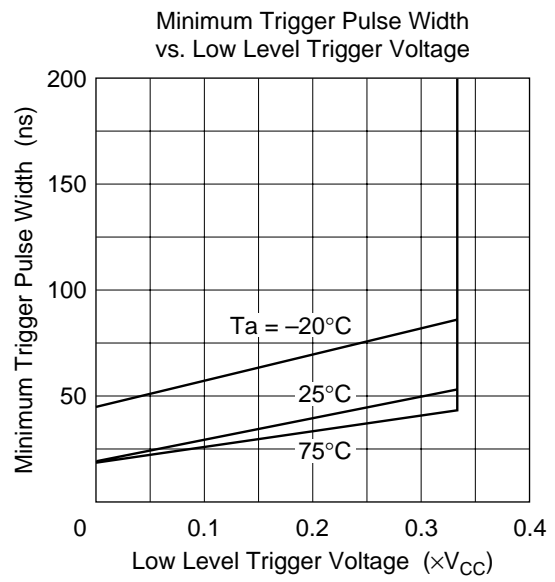
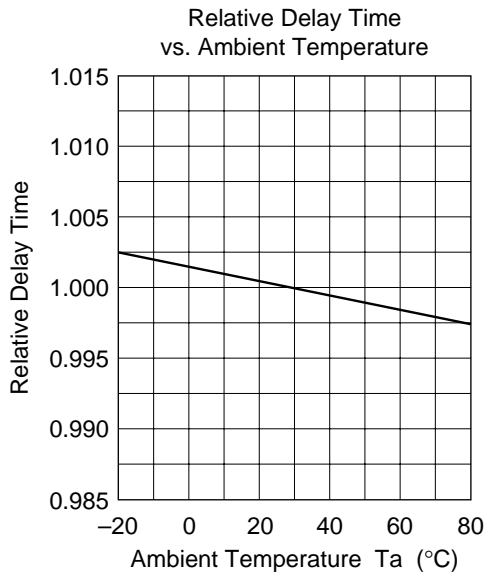
2.  $R_A, R_B = 1$  k to  $100$  k $\Omega$ ,  $C = 0.1$   $\mu\text{F}$ ,  $V_{CC} = 5$  V or  $15$  V.

3. ( $R_A + R_B$ ) at  $V_{CC} = 15$  V is determined by the value of  $I_{th}$ . It is  $20$  M $\Omega$  Max.

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

Characteristic Curves

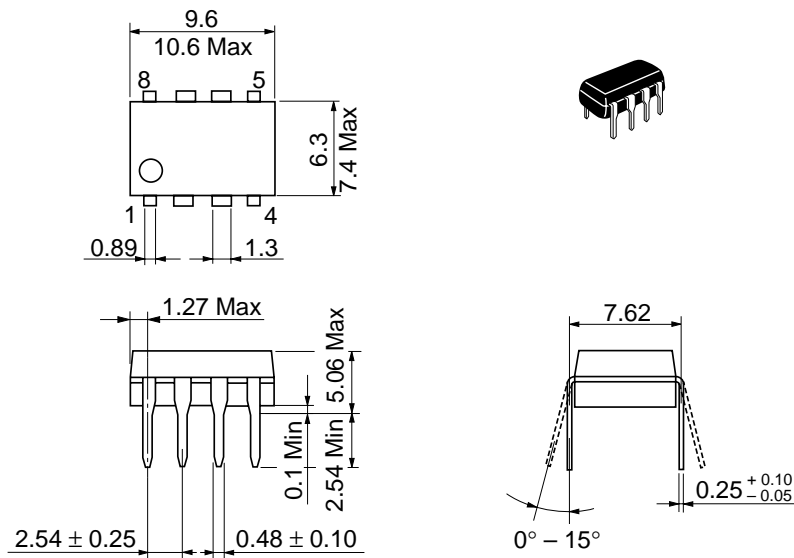






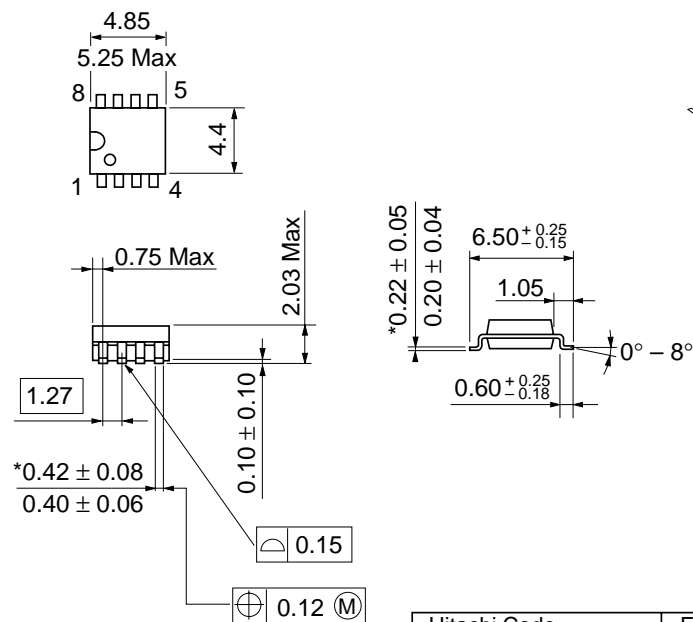
Package Dimensions

Unit: mm



Hitachi Code	DP-8
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.54 g

Unit: mm



\*Dimension including the plating thickness  
Base material dimension

Hitachi Code	FP-8D
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.10 g

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