

HA17555 Series

Precision Timer

HITACHI

ADE-204-064 (Z)

Rev. 0

Dec. 2000

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 μ 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.

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Ordering Information

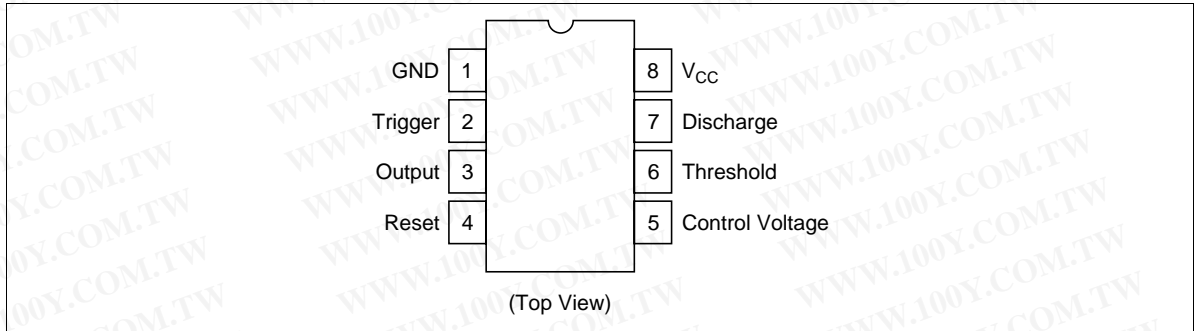
Application	Type No.	Package
Industrial use	HA17555PS	DP-8
	HA17555FP	FP-8D
Commercial use	HA17555	DP-8
	HA17555F	FP-8D

Applications

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

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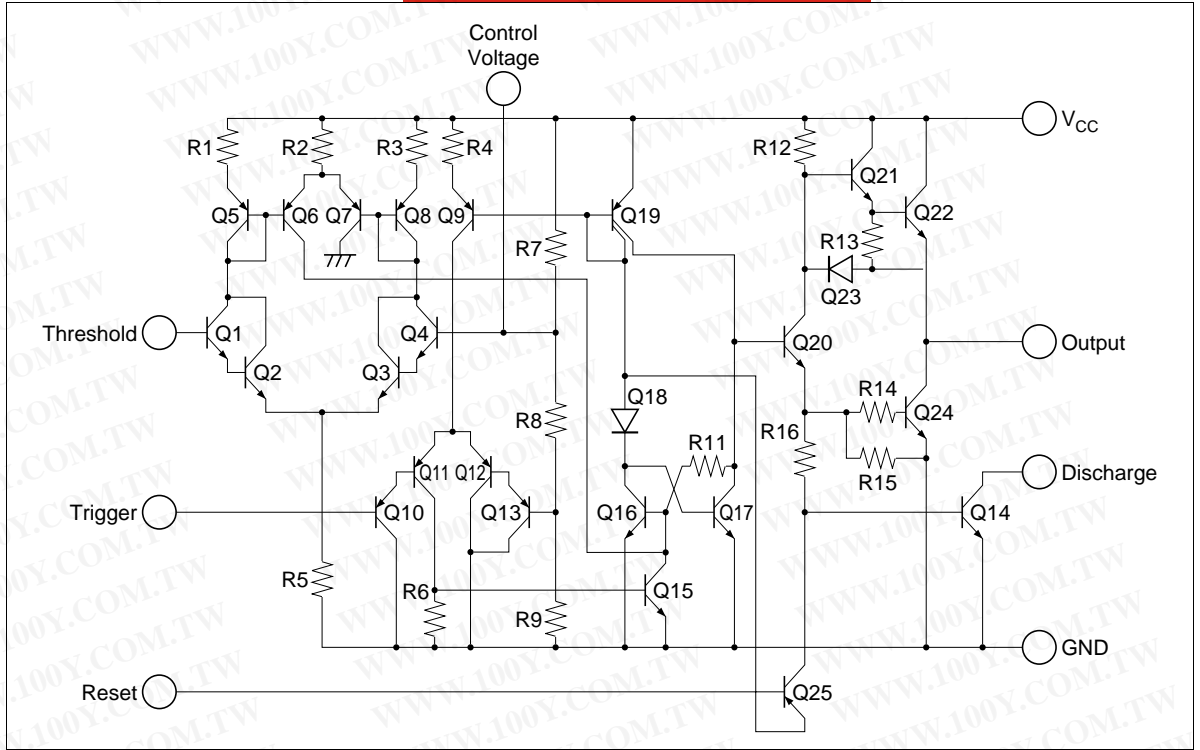
Pin Arrangement



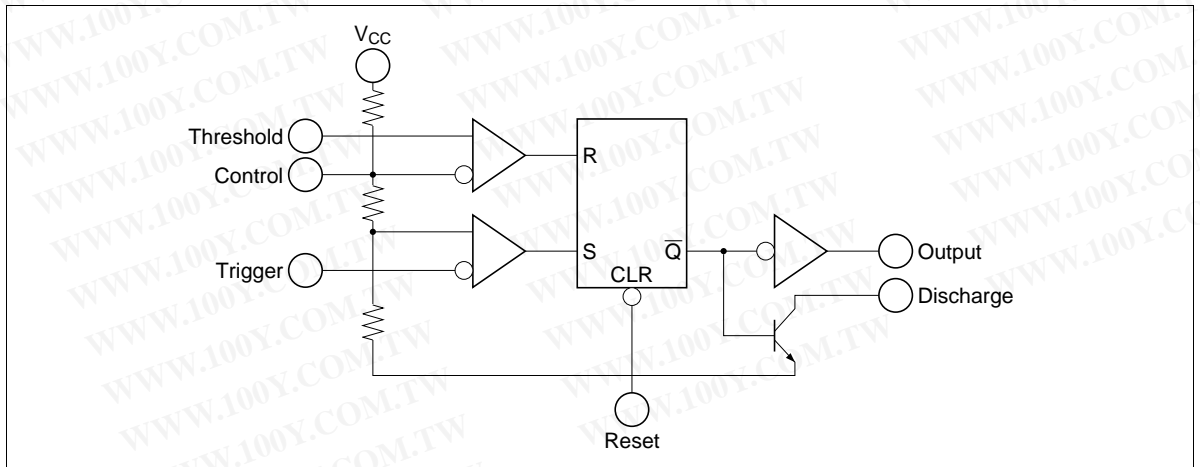
Pin Description

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 _{cc} pin

Circuit Schematic



Block Diagram



Absolute Maximum Ratings (Ta = 25°C)

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

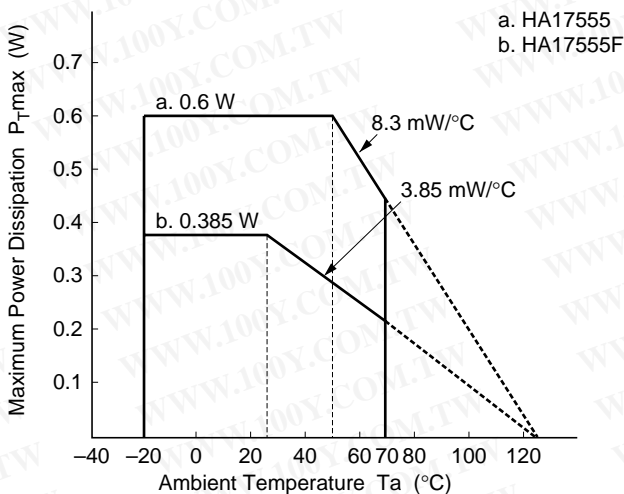
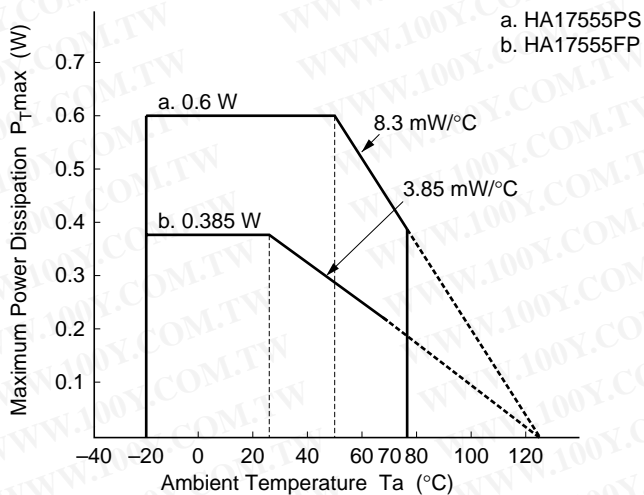
Note: 1. For the HA17555/PS,

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

For the HA17555/F/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.



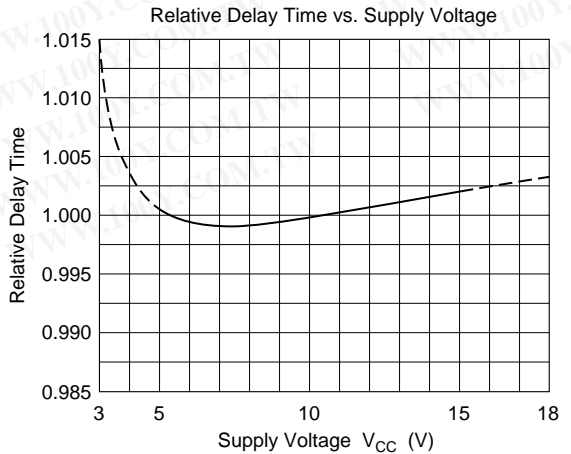
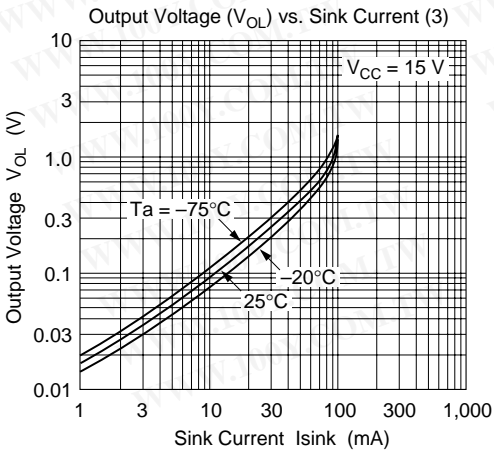
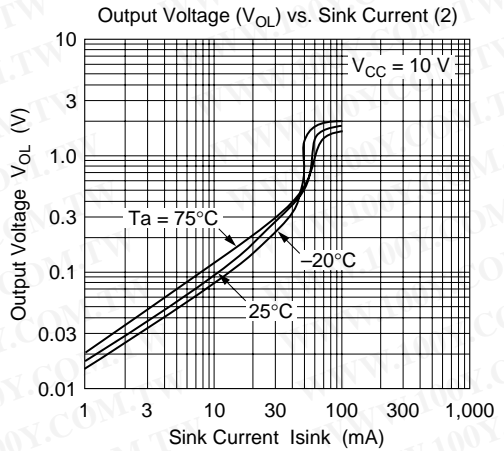
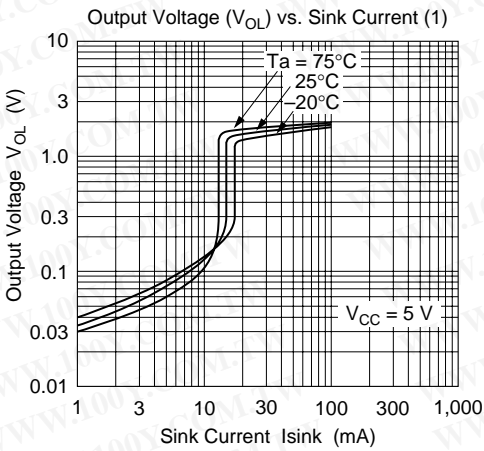
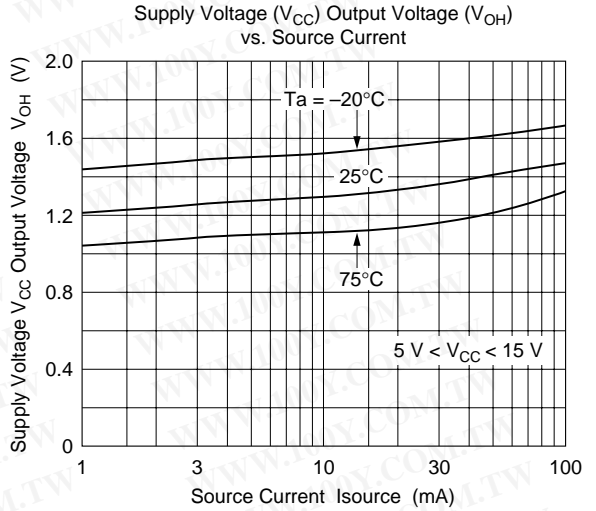
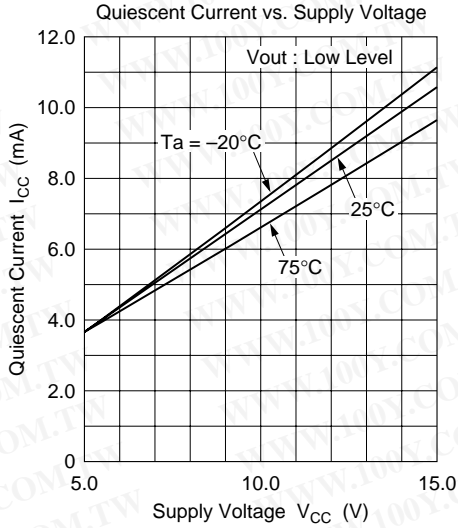
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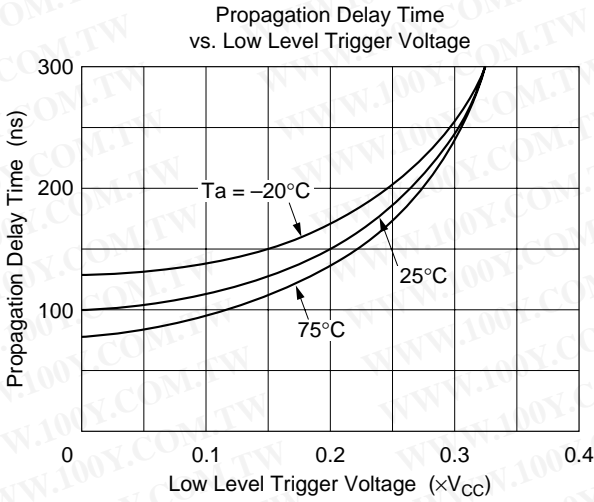
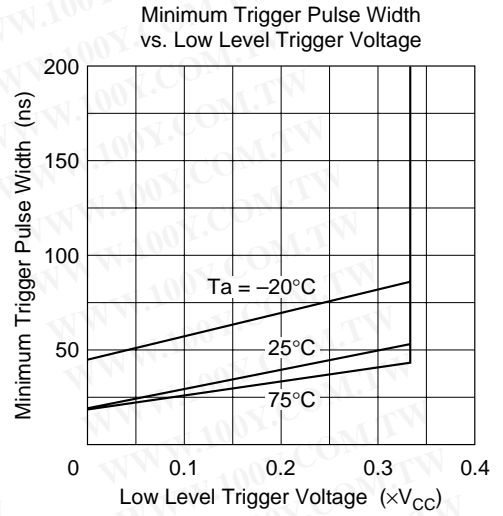
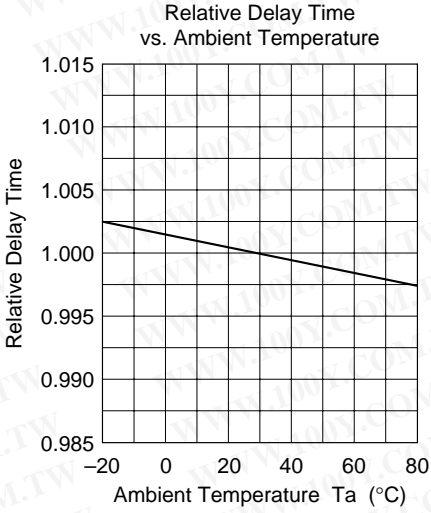
Electrical Characteristics ($V_{CC} = 5$ to 15 V, $T_a = 25^\circ\text{C}$)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Supply voltage* ¹	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* ² (Inherent error)	E_t	—	1.0	—	%	
Timing error* ² (T_a dependency)	E_t	—	50	—	ppm/ $^\circ\text{C}$	$T_a = -20$ to $+75^\circ\text{C}$
Timing error* ² (Voltage dependency)	E_t	—	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	—	μA	
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	μA	
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* ⁴	t_w	10.0	—	—	ns	

- Notes:
- When output is low (When it is high, I_{CC} is lower by 1 mA typically.)
 - $R_A, R_B = 1$ k to 100 k Ω , $C = 0.1$ μF , $V_{CC} = 5$ V or 15 V.
 - $(R_A + R_B)$ at $V_{CC} = 15$ V is determined by the value of I_{th} . It is 20 M Ω Max.
 - Output pulse width at mono multi circuit. Output high level pulse width at astable circuit.

Characteristic Curves

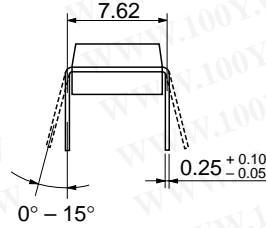
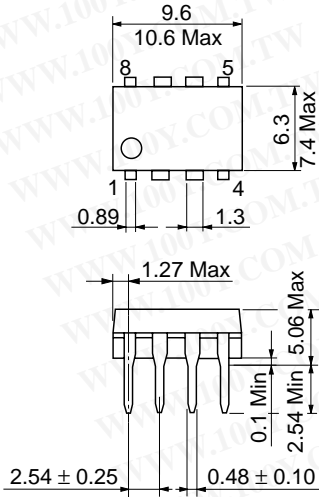




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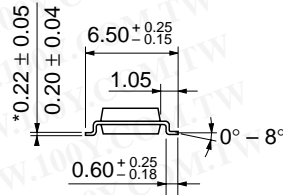
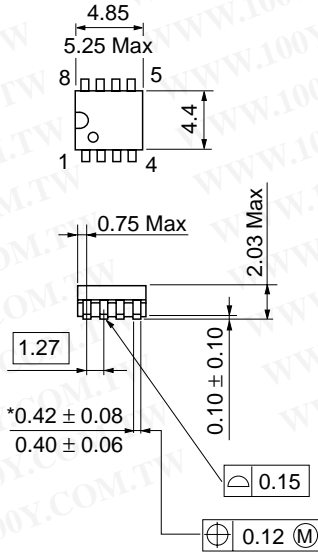
Package Dimensions

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

Cautions

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