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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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HA17555 Series

Precision Timer



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/°C (typ).
- Output is normally in the on and off states.

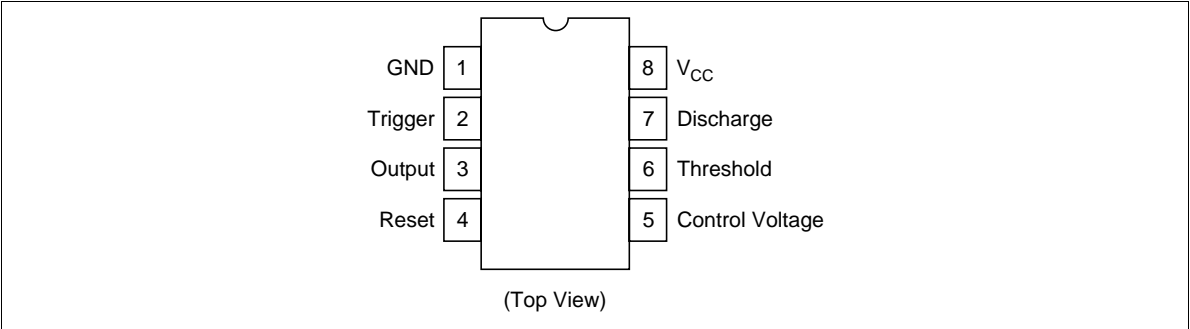
Ordering Information

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

Applications

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

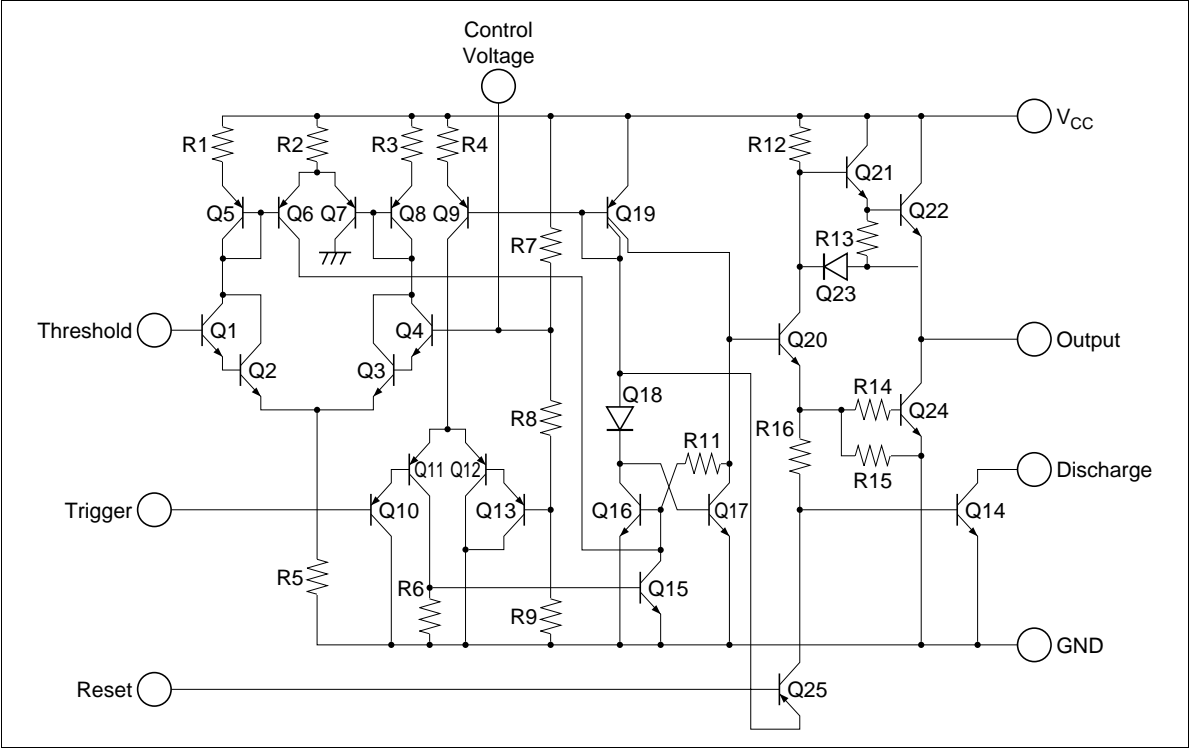
Pin Arrangement



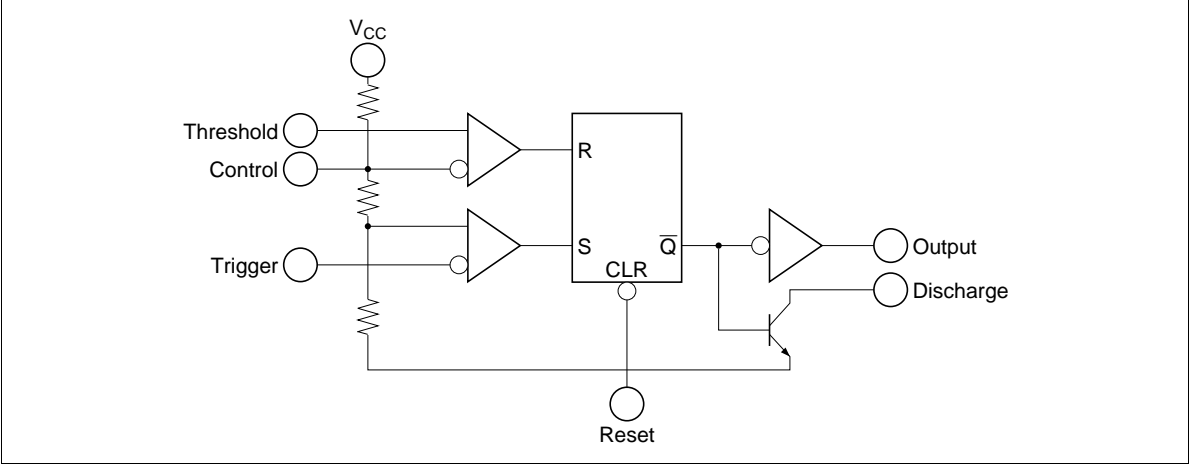
Pin Description

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 _{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	Topr	–20 to +75	–20 to +70	°C
Storage temperature	Tstg	–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.

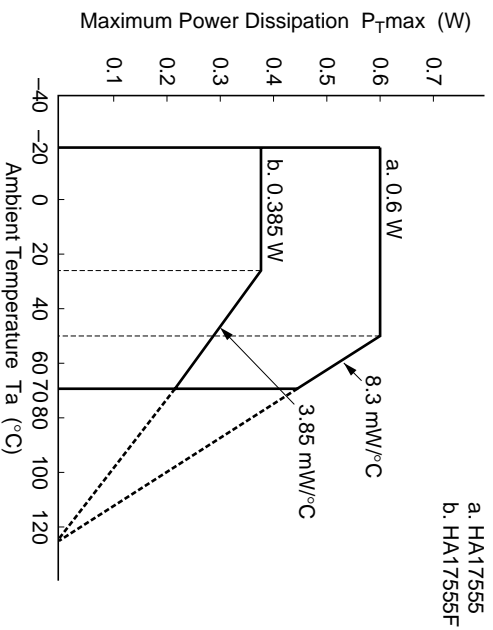
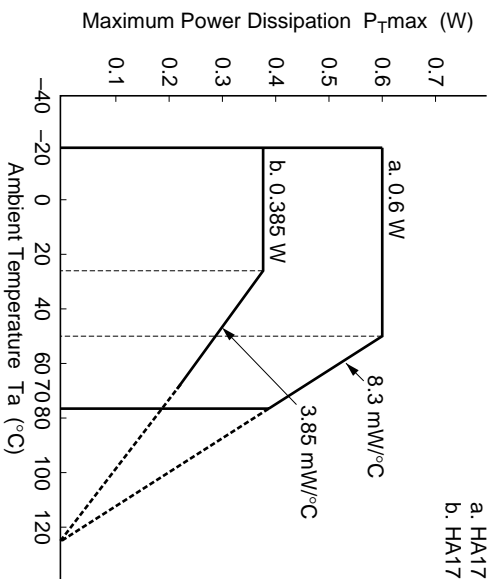
For the HA17555F/FP,

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.

HA17555 Series

- a. HA17555PS
- b. HA17555FP



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)	Et	—	1.0	—	%	
Timing error* ² (T_a dependency)	Et	—	50	—	ppm/ $^\circ\text{C}$	$T_a = -20$ to $+75^\circ\text{C}$
Timing error* ² (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	—	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	

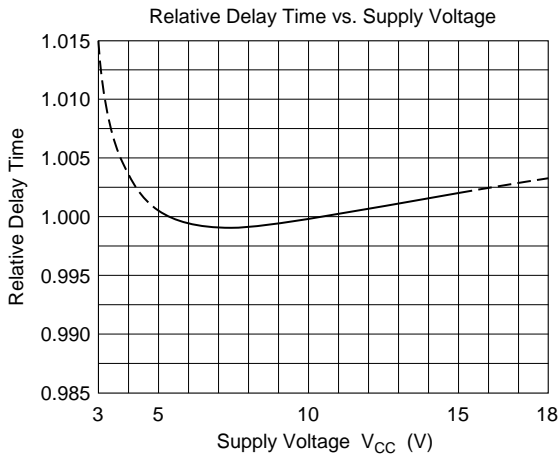
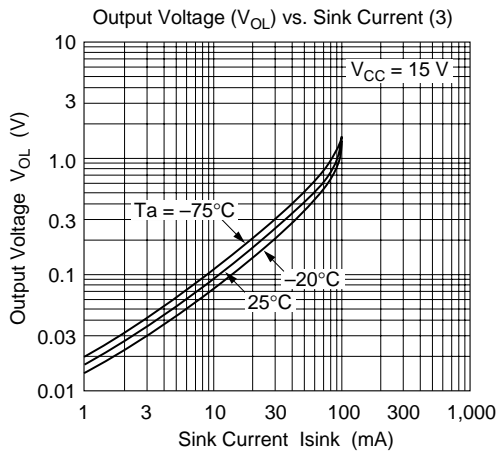
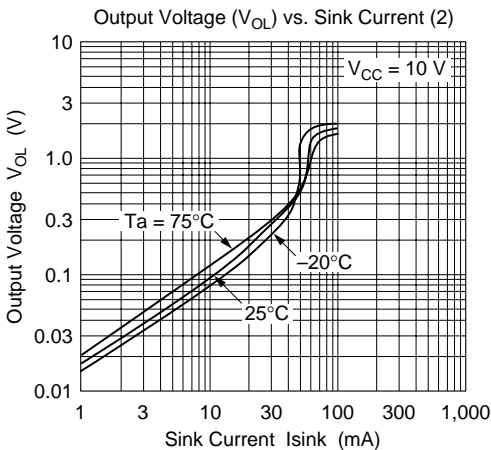
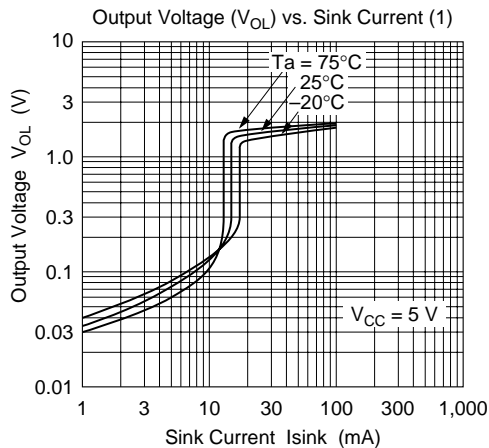
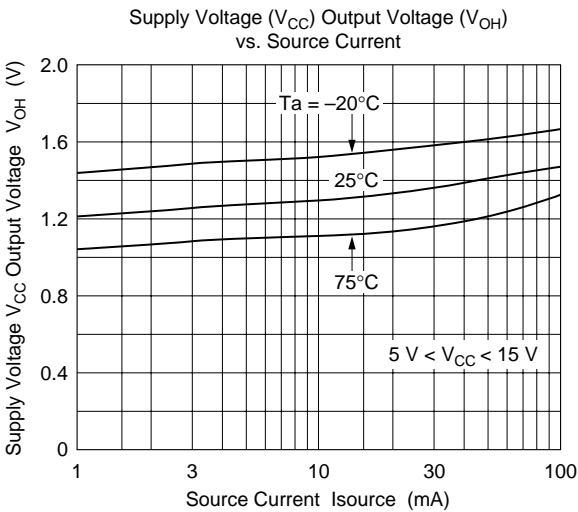
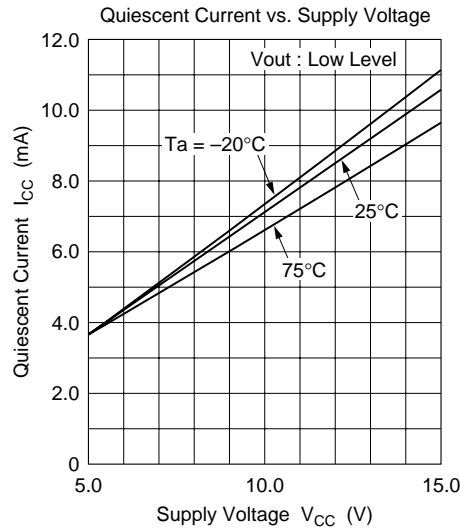
Notes: 1. When output is low (When it is high, I_{CC} is lower by 1 mA typically.)

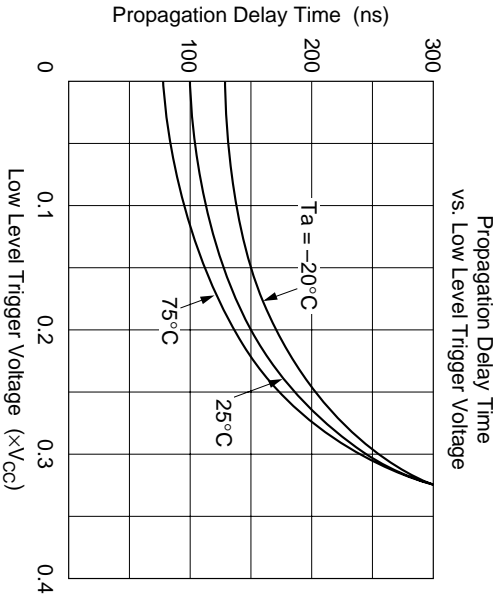
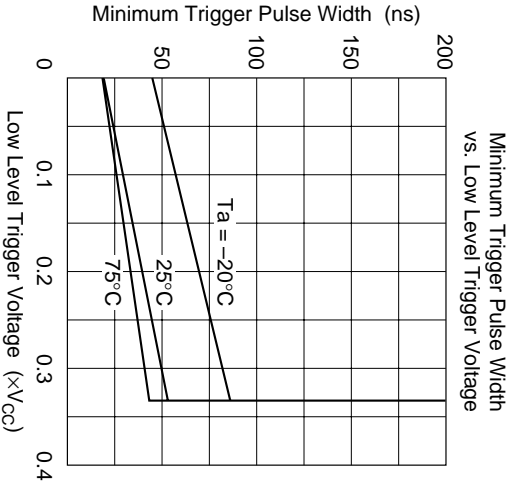
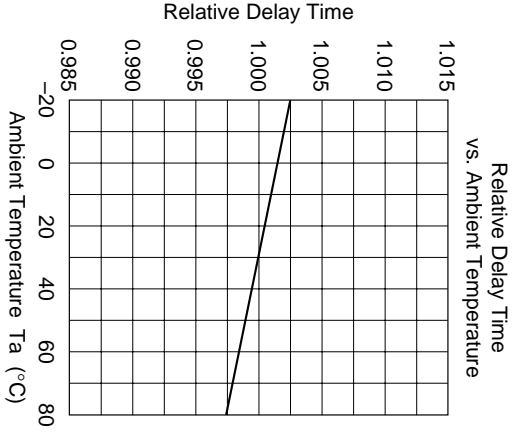
2. $R_A, R_B = 1$ k to 100 k Ω , $C = 0.1$ μF , $V_{CC} = 5$ V or 15 V.

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

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

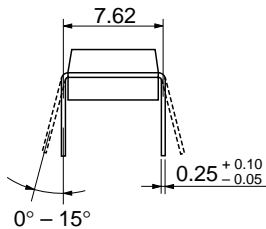
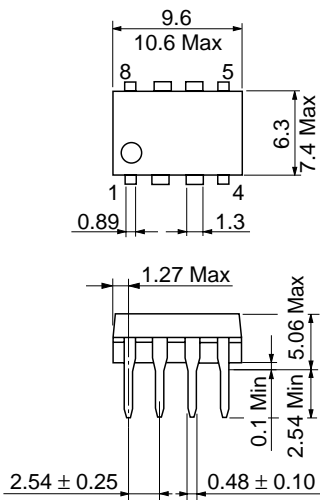
Characteristic Curves





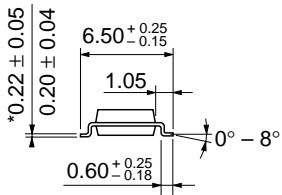
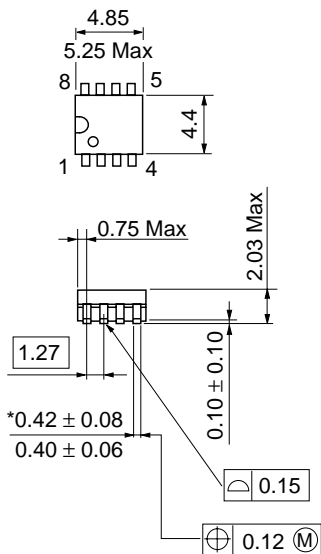
Package Dimensions

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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