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April 1st, 2010
Renesas Electronics Corporation

Not recommend for new design

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Not recommend for new design

M62030FP

Voltage Detecting, System Resetting IC Series

REJ03D0785-0200
Rev.2.00
Jun 15, 2007

Description

The M62030FP is a voltage threshold detector designed for detection of an input voltage/supply voltage and generation of a system reset pulse for almost all logic circuits such as microcontroller.

In contains a delay circuit which provides 200 µs (Typ) delay and 4 modes of delays (25 ms, 50 ms, 100 ms, 200 ms (Typ)) in the input voltage detection type and in the supply voltage detection type, respectively.

Features

- Built-in two functional circuits for detecting voltage
- Built-in delay circuit to provide long delay time (without external delay capacitors)
- Selectable four modes of delay time (25 ms, 50 ms, 100 ms, 200 ms (Typ))
- Few external parts
- Small 8-pin SOP package

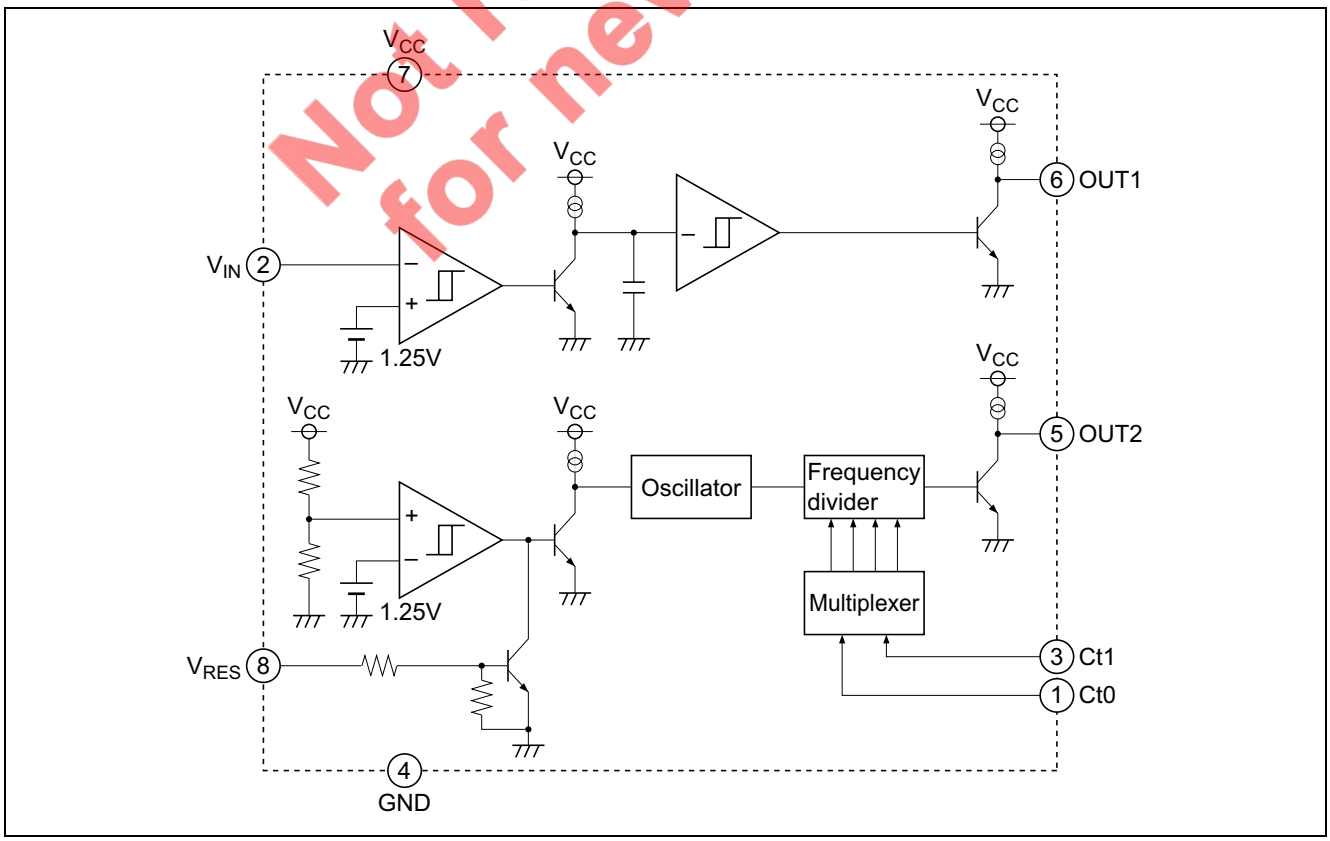
Application

- Reset circuits of MCU, MPU and logics

Recommended Operating Condition

- Supply voltage range: 2 V to 10 V

Block Diagram



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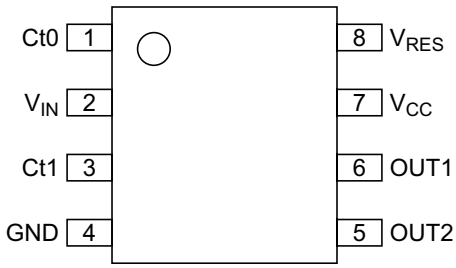
Pin Arrangement



(Top view)

Outline: PRSP0008DE-C (recommend)
PRSP0008DA-A (8P2S-A) (not recommend for new design)

Pin Description

Pin No.	Symbol	Functional Description
1	Ct0	Setting delay time. It is possible to set four kinds of delay times by inputting “H” or “L” into these two terminal.
3	Ct1	
2	V_{IN}	Detecting voltage input
4	GND	Ground
6	OUT1	Output terminal 1 (Delay time 200 µs settlement output)
5	OUT2	Output terminal 2 (Delay time variable type output)
7	V_{CC}	Supply voltage
8	V_{RES}	It outputs “L” and “H” to OUT2 terminal when the V_{RES} input is “H” and “L”, respectively.

	25 ms	50 ms	100 ms	200 ms
Ct0	L	H	H	L
Ct1	H	L	H	L

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Absolute Maximum Ratings

(Ta = 25°C, unless otherwise noted)

Item	Symbol	Rating	Unit	Conditions
Supply voltage	V_{CC}	–0.3 to +10	V	
Output sink current	Isink1, 2	8.0	mA	Output1, 2
Output voltage	V_O	–0.3 to +10	V	
Self reset input voltage	V_{RES}	–0.3 to +10	V	
Power dissipation	Pd	300	mW	
Thermal derating	Kθ	3.0	mW/°C	Ta ≥ 25°C
Operating temperature	Topr	–20 to +75	°C	
Storage temperature	Tstg	–40 to +125	°C	

Electrical Characteristics

(Ta = –20 to +75°C, unless otherwise noted)

Reset Circuit 1

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Detecting voltage 1	V_{S1}	1.20	1.25	1.30	V	Ta = +25°C
Hysteresis voltage 1	ΔV_{S1}	9	15	23	mV	Ta = +25°C
Output “L” to “H” propagation delay time	T_{PLH1}	80	200	500	µs	C_L = 100pF, Ta = +25°C
Low output voltage 1	V_{OL1}	—	0.2	0.4	V	V_{IN} < 1.2V, I_{OL} = 5mA
Input voltage	V_{IN}	–0.3 *1	—	V_{CC} *2	V	V_{CC} ≤ 7V
		–0.3 *1	—	7.0		V_{CC} > 7V
Input current	I_{IN}	—	100	500	nA	V_{IN} = 1.25V

Notes: 1. –2 V (Pulse width = 20 ns or less)
2. V_{CC} + 1 V (Pulse width = 20 ns or less)

Reset Circuit 2

Item		Symbol	Min	Typ	Max	Unit	Test Conditions	
Detecting voltage 2		V_{S2}	4.0	4.2	4.4	V	Ta = +25°C	
Hysteresis voltage 2		ΔV_{S2}	30	50	100	mV	Ta = +25°C	
Output “L” to “H” propagation delay time		T_{PLH2}	—	25	—	ms	Ct0 = “L”, Ct1 = “H”	CL = 100pF Ta = 25°C
			—	50	—		Ct0 = “H”, Ct1 = “L”	
			—	100	—		Ct0 = “H”, Ct1 = “H” or opening	
			—	200	—		Ct0 = “L”, Ct1 = “L”	
Low output voltage 2		V_{OL2}	—	0.2	0.4	V	V_{CC} = 4.0V, I_{OL} = 5mA	
Self reset	Input high voltage	V_{RESH}	2	—	V_{CC} *2	V	Ta = +25°C	
	Input high current	I_{RESH}	—	—	80	µA	V_{RES} = 2V, Ta = +25°C	
	Input low voltage	V_{RESL}	–0.3 *1	—	0.8	V	Ta = +25°C	
Ct0 Ct1	Input high voltage	$V_{Ct0, 1H}$	2.2	—	—	V	Ta = +25°C	
	Input low voltage	$V_{Ct0, 1L}$	—	—	1.8	V	Ta = +25°C	
	Input high current	$I_{Ct0, 1H}$	—	50	—	µA	Ta = +25°C	
	Input low current	$I_{Ct0, 1L}$	—	50	—	µA	Ta = +25°C	

Notes: 1. –2 V (Pulse width = 20 ns or less)
2. V_{CC} + 1 V (Pulse width = 20 ns or less)

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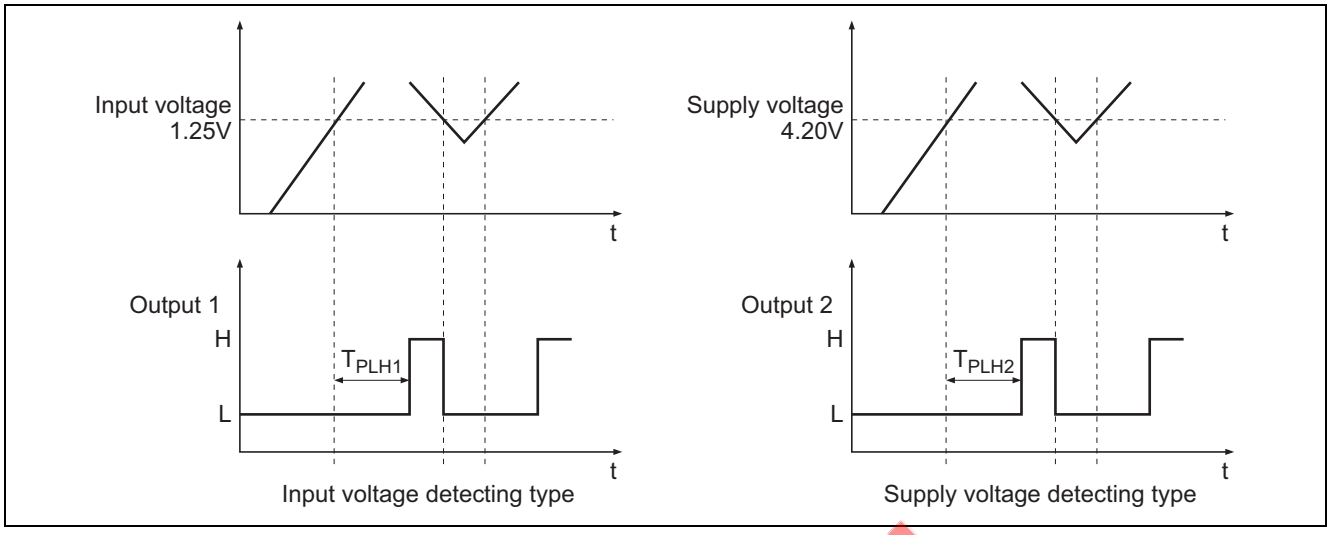
Common Specification

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Supply voltage	V_{CC}	2	—	10	V	
Circuit current in OFF	I_{CC1}	—	1.0	2.0	mA	V_{CC} = 5V
Circuit current in ON	I_{CC2}	—	2.0	4.0	mA	Both circuit “ON” state, contain pull-up resistor
Detecting voltage temperature coefficient	$V_S/\Delta T$	—	0.01	—	%/°C	
The hysteresis voltage temperature coefficient	$\Delta V_S/\Delta T$	—	0.01	—	%/°C	
Propagation delay time temperature coefficient	$T_{PLH}/\Delta T$	—	0.10	—	%/°C	
Output high voltage	V_{OH}	V_{CC}–0.6	V_{CC}–0.4	V_{CC}–0.2	V	I_{OH} = –40µA
Output “H” to “L” propagation delay time	T_{PHL}	—	10	—	µs	C_L = 100pF
Threshold operating voltage	V_{OPL}	—	0.7	—	V	Ta = +25°C
Built-in pull-up resistor	R	5	10	15	kΩ	

Notes: 3. The lowest power-supply voltage in which output Low can be maintained

Operating Waveform



Example of Application Circuit

1. The Application to Microcomputer System

a. The input voltage detection type can be used as the voltage supervisor of microprocessor system like the following circuit.
In this case, a detection power supply voltage is approximately 1.25 × (R1 + R2)/R2 (V).
The detecting supply voltage can be set between 2 V and 10 V.

b. The detecting voltage can be adjusted by changing R1 and/or R2 in the figure 1.
The detection accuracy is ±4%.

c. It has a delay capacitor and the delay time is about 200 µs.

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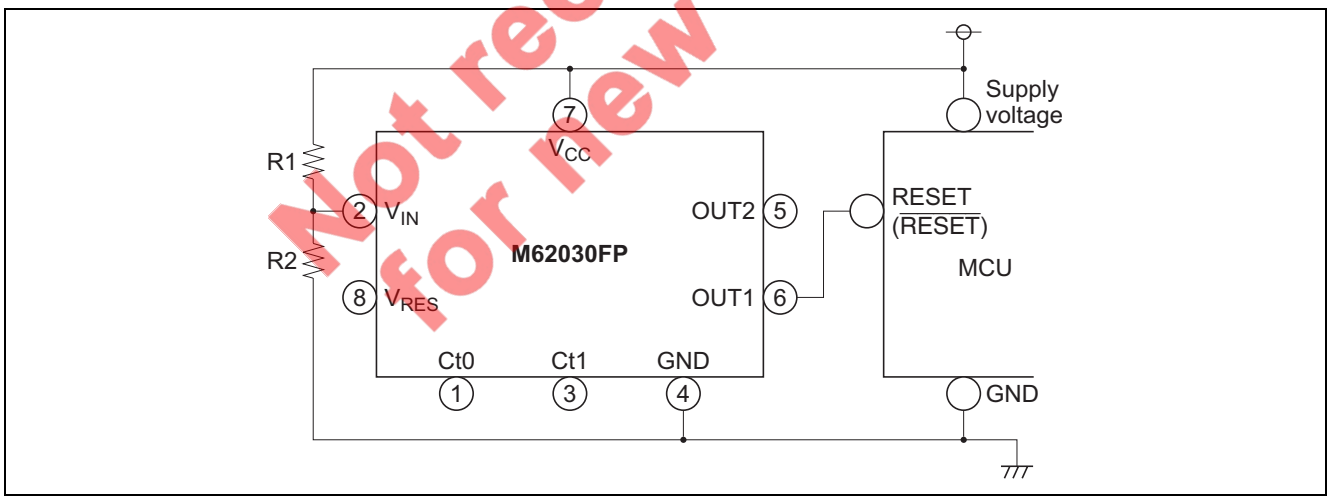

Figure 1 The Application to Microcomputer System

2. The Variable Setup Time Type

Note: A delay time of the supply voltage detection type can be set to one among 25 ms, 50 ms, 100 ms and 200 ms by the combination of pin1 and pin 3.

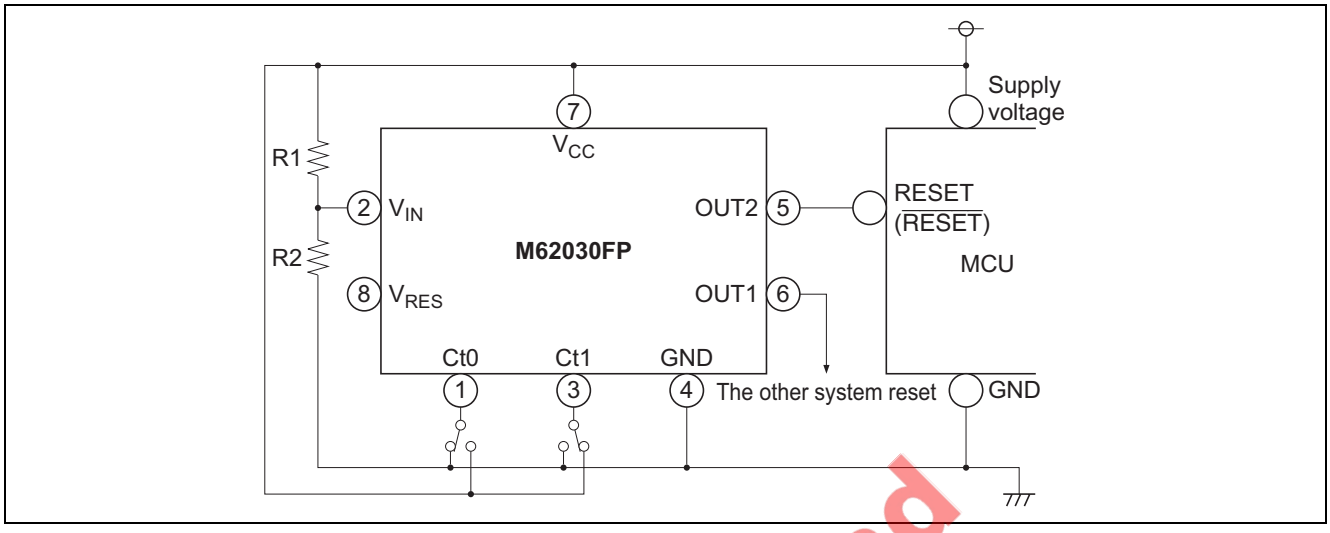

Figure 2 The Variable Setup Time Type

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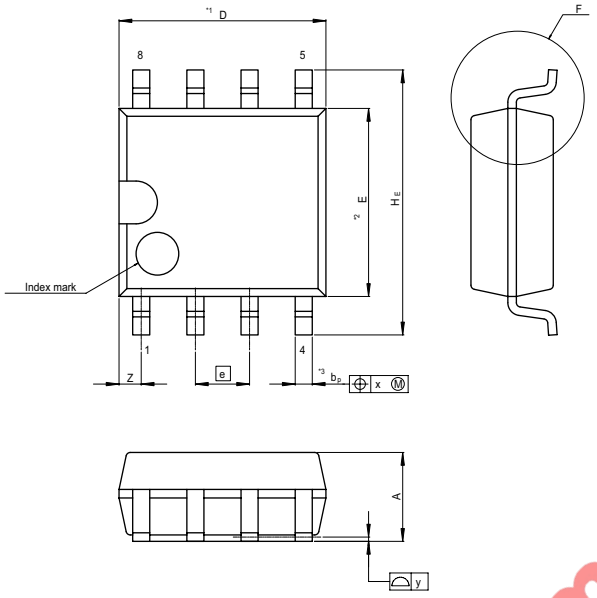
Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP8-4.4x4.85-1.27	PRSP0008DE-C	—	0.1g



NOTE)
1. DIMENSIONS"*1 (Nom)"AND"*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION"*3"DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	4.65	4.85	5.05
E	4.2	4.4	4.6
A_2	—	1.85	—
A_1	0.00	0.1	0.20
A	—	—	2.03
b_p	0.34	0.4	0.46
b_1	—	—	—
c	0.15	0.20	0.25
c_1	—	—	—
θ	0°	—	8°
H_E	5.7	6.2	6.5
e	1.12	1.27	1.42
x	—	—	0.12
y	—	—	0.10
Z	—	—	0.75
L	0.25	0.45	0.65
L_1	—	0.90	—

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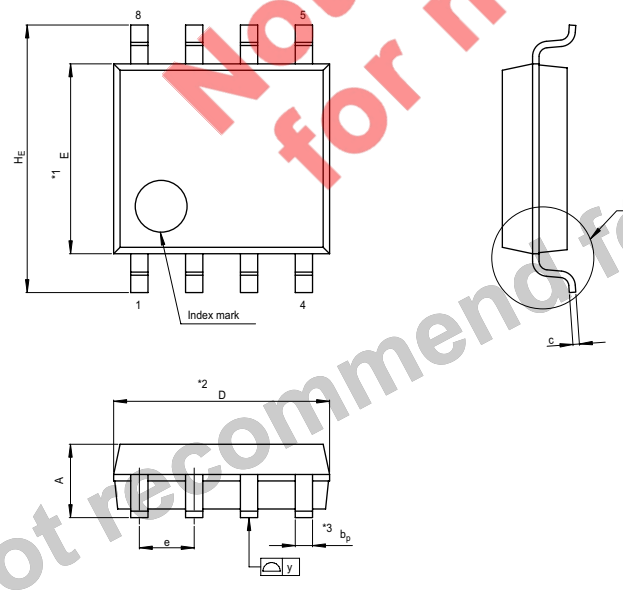
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP8-4.4x5-1.27	PRSP0008DA-A	8P2S-A	0.07g



NOTE)
1. DIMENSIONS "*1" AND "*2" DO NOT INCLUDE MOLD FLASH.
2. DIMENSION "*3" DOES NOT INCLUDE TRIM OFFSET.

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	4.8	5.0	5.2
E	4.2	4.4	4.6
A_2	—	1.5	—
A_1	0.05	—	—
A	—	—	1.9
b_p	0.35	0.4	0.5
c	0.13	0.15	0.2
θ	0°	—	10°
H_E	5.9	6.2	6.5
e	1.12	1.27	1.42
y	—	—	0.1
L	0.2	0.4	0.6

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