To all our customers

Regarding the change of names mentioned in the document, such as Mitsubishi Electric and Mitsubishi XX, to Renesas Technology Corp.

The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

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

GENERAL 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.

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

FEATURES

• Built-in 2 functional circuits for detecting voltage
• Built-in delay circuit to provide long delay time
          (without external delay capacitors)
• Selectable 4 modes of delay time
          [25msec, 50msec, 100msec, 200msec(typ)]
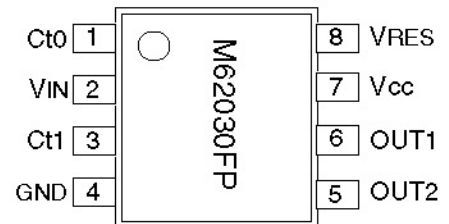• Few external components
• Small 8-pin SOP package

APPLICATION

• Reset circuits of MCU, MPU and logics
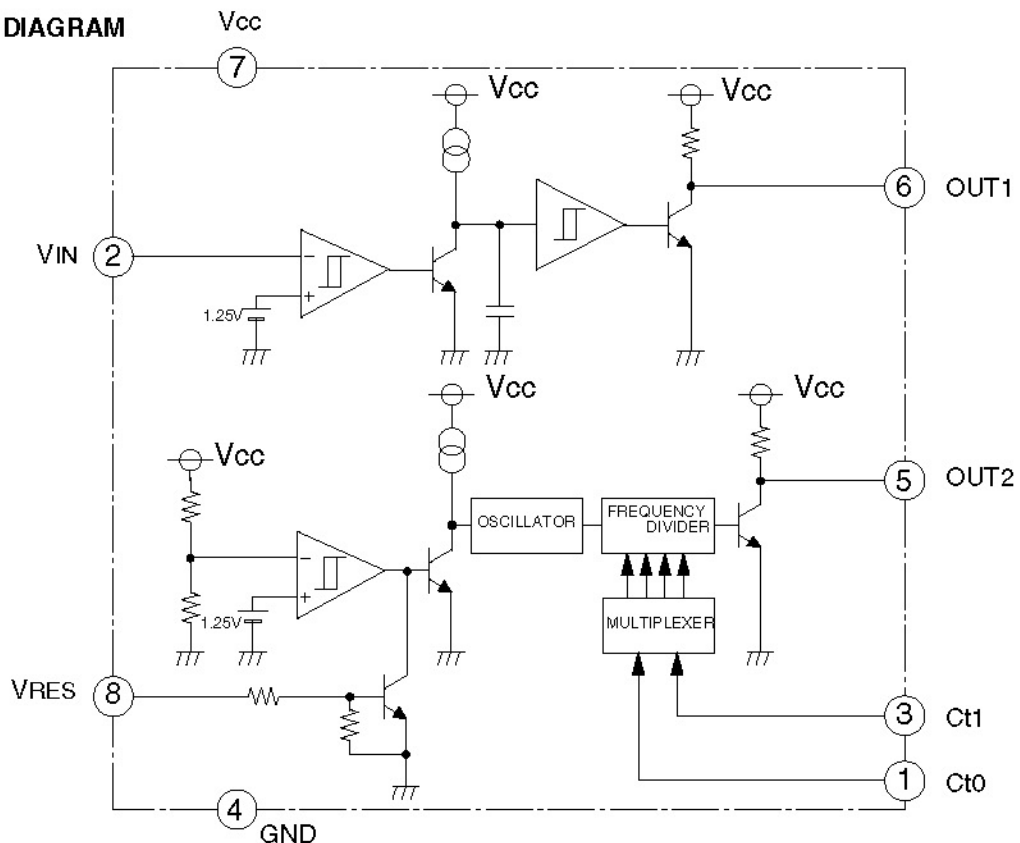
RECOMMEND OPERATING CONDITION

• Supply voltage range .... 2V to 10V

PIN CONFIGURATION (TOP VIEW)

	M62030FP	
Ct0 □ 1		8 □ VRES
VIN □ 2		7 □ Vcc
Ct1 □ 3		6 □ OUT1
GND □ 4		5 □ OUT2

Outline 8P2S-A

BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS (Ta=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
Vcc	Supply voltage		-0.3 to 10	V
ISINK1,2	Output Sink Current	Output1,2	8.0	mA
VO	Output voltage		-0.3 to 10	V
VRES	Self reset input voltage		-0.3 to 10	V
Pd	Power dissipation		300	mW
K_{theta}	Thermal Derating	Ta ≥ 25°C	3.0	mW/°C
Topr	Operating temperature		-20 to 75	°C
Tstg	Storage temperature		-40 to 125	°C

ELECTRICAL CHARACTERISTICS (Ta = -20 to 75°C, unless otherwise noted)

< Reset circuit 1 >

Symbol	Parameter	Test Conditions	Limits			Unit
			Min	Typ	Max	
VS1	Detecting voltage 1	Ta= 25°C	1.20	1.25	1.30	V
ΔVs1	Hysteresis voltage 1	Ta= 25°C	9	15	23	mV
TPLH1	Output "L to H" propagation delay time 1	CL=100pF,Ta= 25°C	80	200	500	µs
VOL1	Low output voltage 1	VIN<1.2V, IOL=5mA, Vcc=5V		0.2	0.4	V
VIN	Input voltage	Vcc ≤ 7V	-0.3		Vcc	V
		Vcc > 7V	-0.3		7.0	
IIN	Input Current	VIN=1.25V		100	500	nA

< Reset circuit 2 >

Symbol	Parameter	Test Conditions		Limits			Unit
				Min	Typ	Max	
VS2	Detecting voltage 2	Ta= 25°C		4.0	4.2	4.4	V
ΔVS2	Hysteresis voltage 2	Ta= 25°C		30	50	100	mV
TPLH2	Output "L to H" propagation delay time 2	Ct0 ="L", Ct1="H"	CL=100pF Ta= 25°C		25		ms
		Ct0 ="H", Ct1="L"			50		ms
		Ct0 ="H", Ct1="H" or opening			100		ms
		Ct0="L", Ct1="L"			200		ms
VOL2	Low output voltage 2	Vcc=4.0V,IOL=5mA			0.2	0.4	V
VRESH	Self Reset	Input High voltage	Ta= 25°C	2		Vcc	V
IRESH		Input High current	VRES=2V Ta= 25°C			80	µA
VRESL		Input Low voltage	Ta= 25°C	-0.3		0.8	V
VCt0,1H	Ct0 Ct1	Input High voltage	Ta= 25°C	1.4			V
VCt0,1L		Input Low voltage	Ta= 25°C			0.6	V
ICt0,1H		Input High current	Ta= 25°C		75		µA
ICt0,1L		Input Low current	Ta= 25°C		75		µA

ELECTRICAL CHARACTERISTICS (Ta = -20 to 75°C,unless otherwise noted)

< Common specification >

| Symbol	Parameter	Test Conditions	Limits			Unit
			Min	Typ	Max	
Vcc	Supply Voltage		2		10	V
Icc1	Circuit Current in OFF	Vcc=5V		1.0	2.0	mA
Icc2	Circuit Current in ON	Both circuit "ON" state. Contain pull-up resistor		2.0	4.0	mA
Vs/ΔT	Detecting Voltage Temperature Coefficient			0.01		%/°C
ΔVs/ΔT	The hysteresis voltage temperature coefficient			0.01		%/°C
TPLH/ΔT	Propagation delay time temperature coefficient			0.10		%/°C
VOH	Output High Voltage	IOH = -40µA	Vcc-0.6	Vcc-0.4	Vcc-0.2	V
TPHL	Output "H to L" propagation delay time	CL = 100pF		10		µs
VOPL [*1]	Threshold Operating Voltage	Ta = 25°C		0.67	0.8	V
R	Built-in pull-up resistor		5	10	15	kΩ

Note*1: Minimum supply voltage to keep output low

PIN DESCRIPTION

Terminal No.	Symbol	Functional Description				
1	Ct0	Setting delay time. It is possible to set 4 kinds of delay times by inputting "H" or "L" into these two terminal.		25ms	50ms	100ms	200ms
			Ct0	L	H	H	L
3	Ct1		Ct1	H	L	H	L
2	VIN	Detecting voltage input				
4	GND	Ground				
6	OUT1	Output terminal 1 (Delay time 200µs settlement output)				
5	OUT2	Output terminal 2 (Delay time variable type output)				
7	Vcc	Supply voltage				
8	VRES	It outputs "L"and "H" to OUT2 terminal when the VRES input is "H" and "L", respectively.				

FUNCTION DIAGRAM

Input voltage detecting type

Supply voltage detecting type
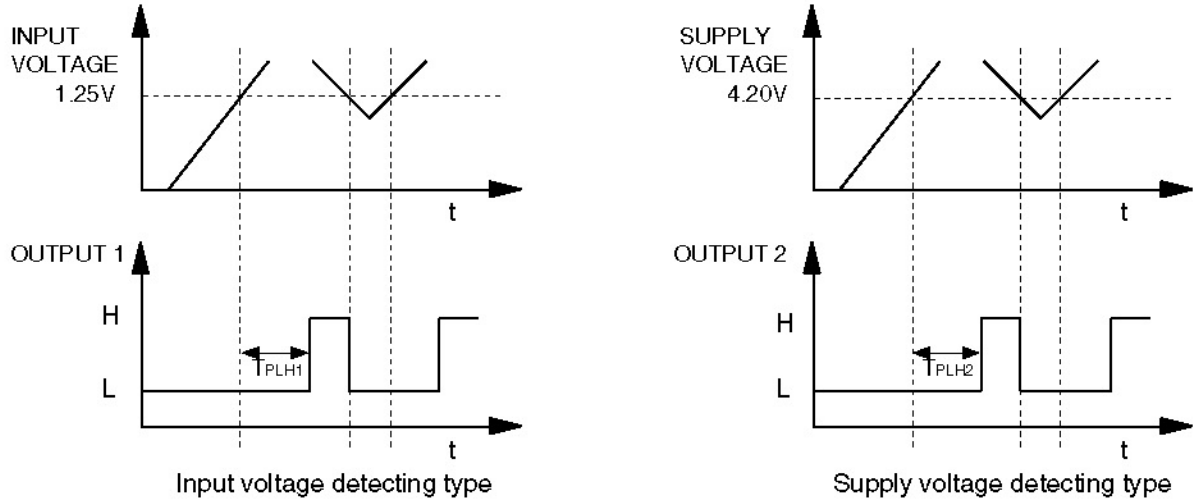
EXAMPLE OF APPLICATION CIRCUIT

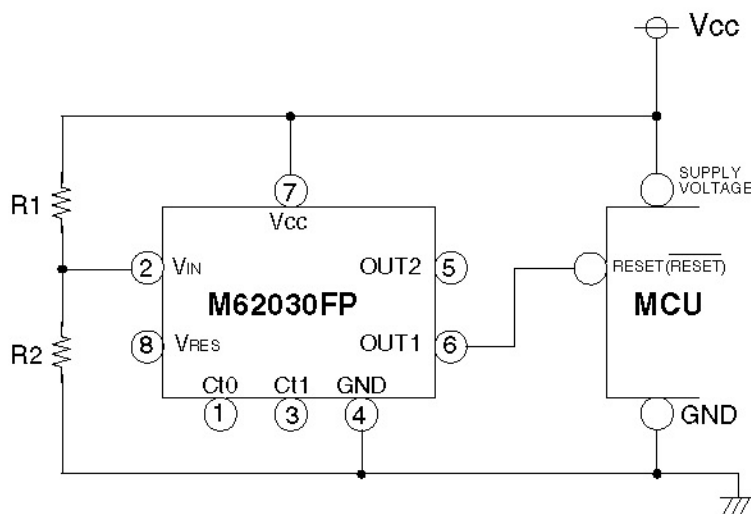1) The application to microprocessor system

    Note 1. 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 $1.25 \times (R1+R2)/ R2$ (v).

           The detecting supply voltage can be set between 2V and 10V.

    Note 2. The detecting voltage can be adjusted by changing R1 and/or R2 in the following circuit. The detection accuracy is ±4%.

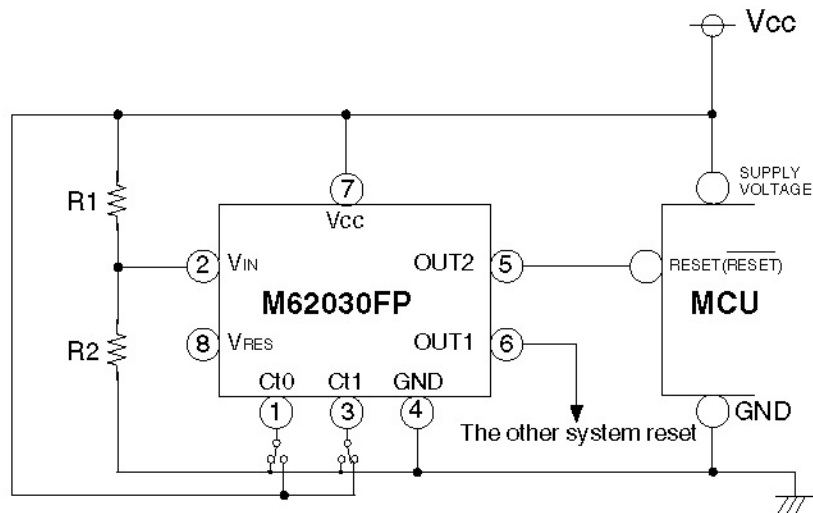   Note 3. It has a delay capacitor and the delay time is about 200µs.

2) The Variable setup time type

Note 1.   A delay time of the supply voltage detection type can be set to one among 25ms, 50ms, 100ms and 200ms by the combination of pin 1 and pin 3.