

# M62032FP

## VOLTAGE DETECTING, SYSTEM RESETTING IC

### GENERAL DESCRIPTION

The M62032FP is an IC for detection of two different input voltages to reset almost all logic circuits including MCU. It contains a delay circuit with which any delay time can be obtained only by adding an external capacitor. The IC is widely applicable to a battery check circuit, a level detection circuit, a waveform shaping circuit, etc.

### FEATURES

- A small number of external components
- Built-in 2 input voltage detection circuits
- Wide supply voltage range ..... 2 to 10V
- Small 8-pin package
- Open collector output

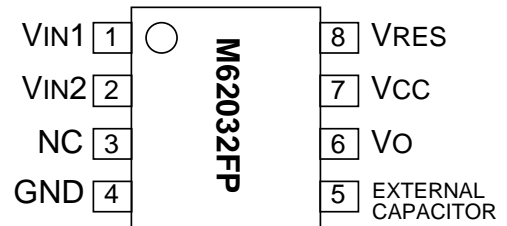
### APPLICATION

Reset circuit of MPU, MCU and logics

### RECOMMENDED OPERATING CONDITION

Supply voltage range ..... 2 to 10V

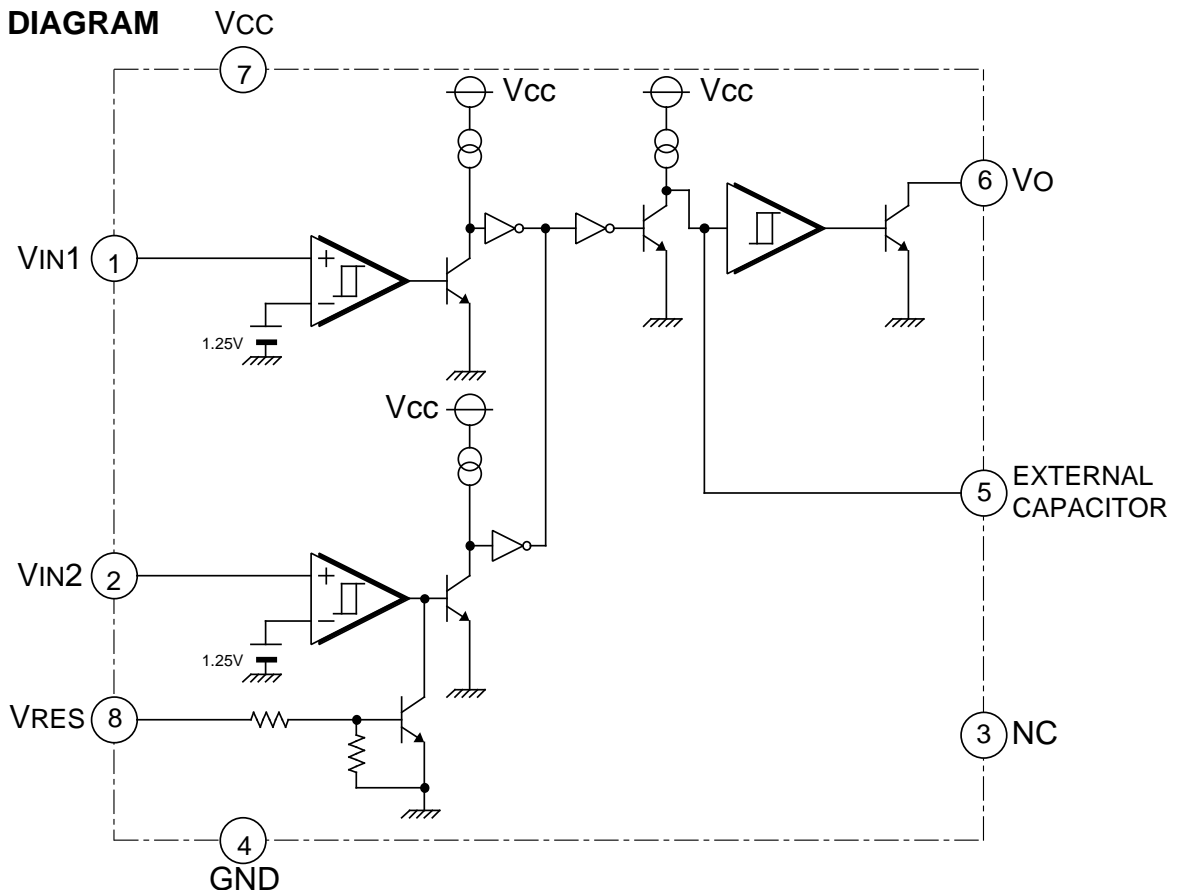
PIN CONFIGURATION (TOP VIEW)



Outline 8P2S-A

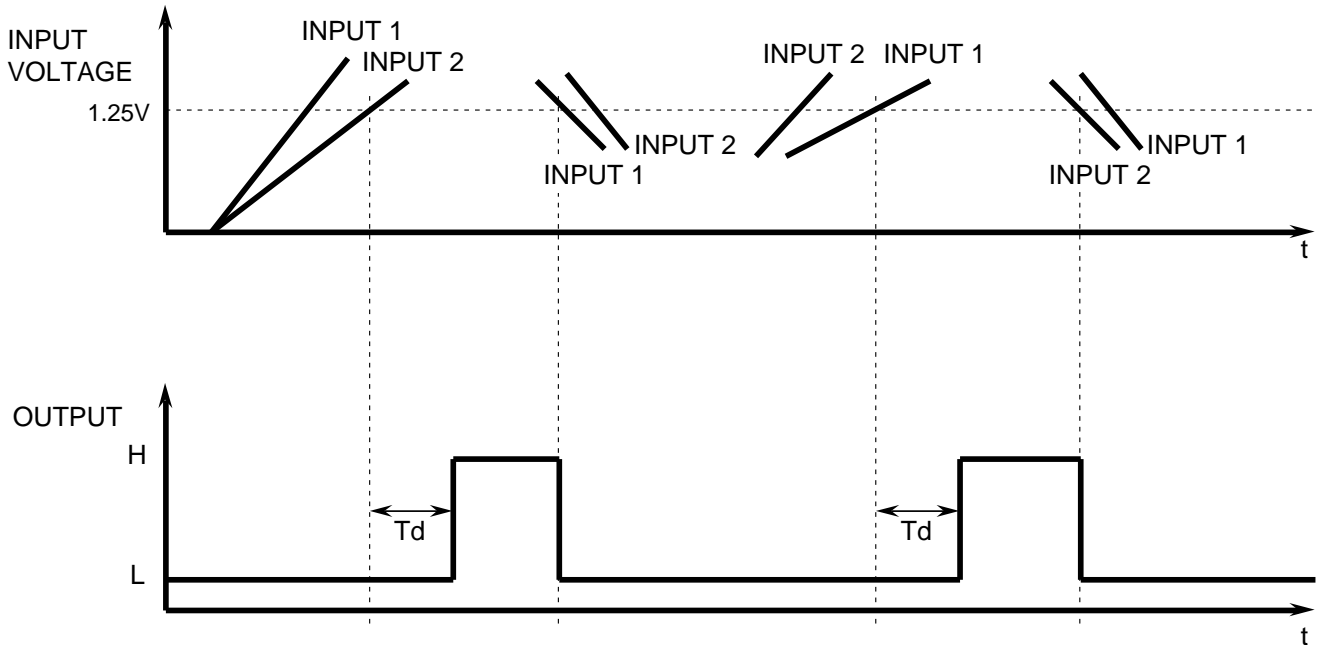
NC: NO CONNECTION

### BLOCK DIAGRAM



**M62032FP**

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**FUNCTIONAL DIAGRAM****TERMINAL DESCRIPTION**

Terminal No.	Symbol	Functional Description
①	VIN1	Detecting voltage input 1
②	VIN2	Detecting voltage input 2
③	NC	No connection
④	GND	Ground
⑤	EXTERNAL CAPACITOR	Delay capacitor connection
⑥	Vo	Output (open collector)
⑦	Vcc	Supply voltage
⑧	VRES	It outputs "L" and "H" to the Vo terminal when VRES input is "H" and "L", respectively.

**M62032FP****VOLTAGE DETECTING, SYSTEM RESETTING IC****ABSOLUTE MAXIMUM RATINGS** (Ta=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Ratings	Unit
V <sub>CC</sub>	Supply Voltage		10	V
I <sub>SINK</sub>	Output Sink Current		8.0	mA
V <sub>O</sub>	Output Voltage		10	V
V <sub>RES</sub>	Self Reset Input Voltage		10	V
P <sub>d</sub>	Power Dissipation		300	mW
K <sub>theta</sub>	Thermal Derating	T <sub>a</sub> 25°C	3.0	mW/°C
T <sub>opr</sub>	Operating Temperature		-20 to +75	°C
T <sub>stg</sub>	Storage Temperature		-40 to +125	°C

**ELECTRICAL CHARACTERISTICS** (Ta=25°C, unless otherwise noted)

&lt;Reset circuit1&gt;

Symbol	Parameter	Test Conditions	Limits			Unit
			Min	Typ	Max	
VS1	Detecting Voltage 1		1.20	1.25	1.30	V
VS1	Hysteresis Voltage 1		9	15	23	mV
VIN	Input Voltage Range	V <sub>CC</sub> 7V	-0.3		V <sub>CC</sub>	V
		V <sub>CC</sub> > 7V	-0.3		7.0	
I <sub>IN</sub>	Input Current	V <sub>IN</sub> = 1.25V		100	500	nA
I <sub>PD</sub>	Constant Current			-1		uA
V <sub>OL</sub>	Low Output Voltage 1	I <sub>OL</sub> = 5mA		0.2	0.4	V
tpd1	Delay Time	C <sub>d</sub> = 0.01uF		10		mS
tpdmax	Maximum Delay Time	C <sub>d</sub> = 0.68uF		680	1130	

\* The delay time can be varied by changing the connecting capacitance (Cd).

$$T_{pd} = CV/I = C_d \times 1(V)/1(\mu A) = C_d \times 1E6 \text{ (sec)}$$

\*\*When delay time setting goes over 100msec, add a condenser for chattering protection (0.01uF) to the output.

&lt;Reset circuit2&gt;

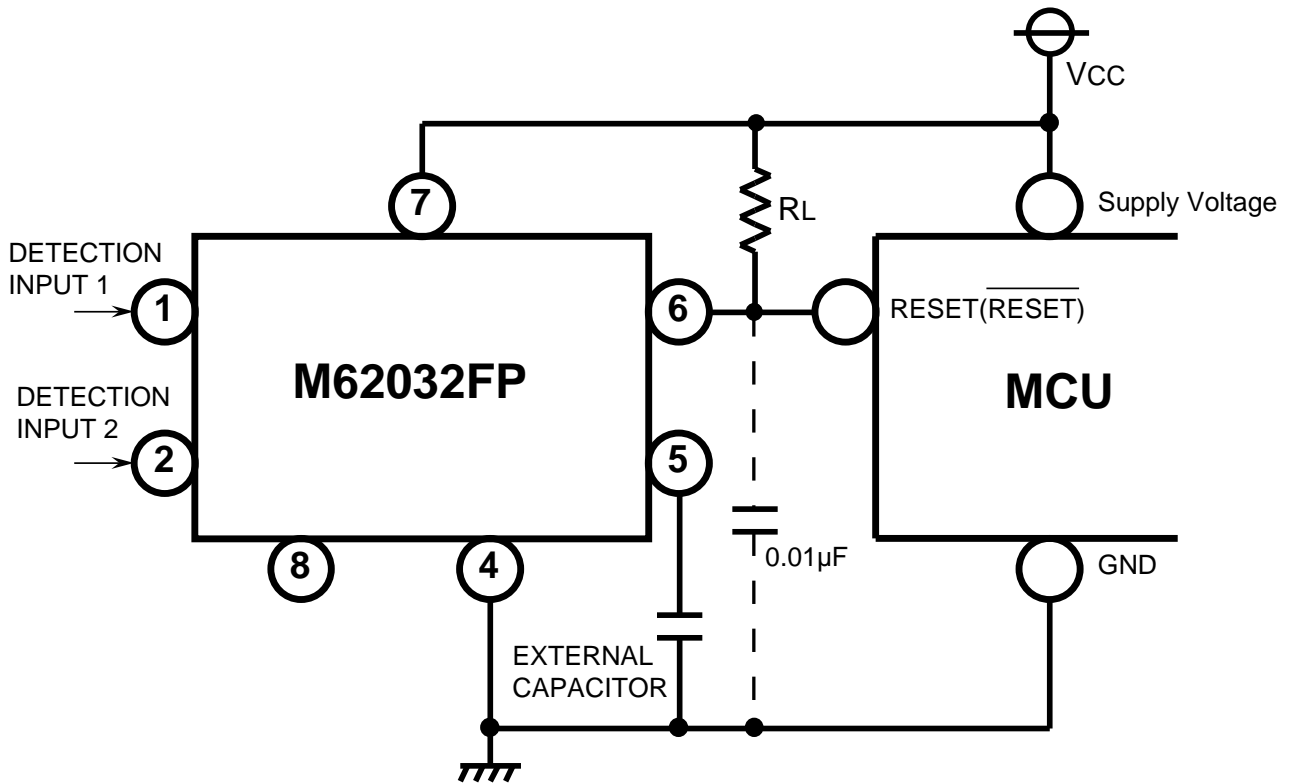
Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
VS2	Detecting Voltage2		1.20	1.25	1.30	V
VS2	Hysteresis Voltage2		9	15	23	mV
VIN	Input Voltage Range	V <sub>CC</sub> 7V	-0.3		V <sub>CC</sub>	V
		V <sub>CC</sub> > 7V	-0.3		7.0	
I <sub>IN</sub>	Input Current	V <sub>IN</sub> = 1.25V		100	500	nA

**Common specification**

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
V <sub>CC</sub>	Supply Voltage Range		2		10	V
I <sub>CC</sub>	Circuit Current in OFF	V <sub>CC</sub> = 5V		0.7	1.4	mA
VS/ T	Detecting Voltage Temperature Coefficient			0.01		%/°C
VS/ T	The Hysteresis Voltage Temperature Coefficient			0.01		%/°C
TPLH/ T	Propagation Delay Time Temperature Coefficient			0.10		%/°C
I <sub>OH</sub>	Output Leak Current				1	uA
T <sub>PHL</sub>	Output "L" Propagation Delay Time	CL = 100pF		10		μs
V <sub>OPL</sub>	Threshold Operating Voltage	RL = 2.2k , V <sub>OL</sub> 0.4V		0.67	0.80	V
		RL = 100k , V <sub>OL</sub> 0.4V		0.55	0.70	
V <sub>RESH</sub>	Self reset	Input high voltage	2		V <sub>CC</sub>	V
I <sub>RESH</sub>		Input high current			80	μA
V <sub>RESL</sub>		Input low voltage	-0.3		0.8	V

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**AN EXAMPLE OF THE APPLICATION CIRCUIT**

\* A forced reset signal (high) into pin 8 from outside can reset this IC (low output) regardless of input signals to pins 1 and 2.

⚠ Mitsubishi Electric 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 design, in order to prevent fires from spreading, redundancy, malfunction or other mishap.