

## 4(3)-Pin $\mu$ P Voltage Monitors with Manual Reset Input

### Feature

- Precision Monitoring of 3V, 3.3V and 5V Power Supply Voltage.
- Guaranteed  $\overline{\text{RESET}} / \text{RESET}$  to  $V_{DD} = 1.1V$
- Accuracy of  $\pm 230mV$  for 5V Systems and  $\pm 150mV$  for 3V Systems over Temperature
- 30 $\mu$ A Typical Operating Current
- 6 Reset Threshold Voltage available.
- Push-pull Output
- Active Low  $\overline{\text{RESET}}$  Pin : MC101, Active High  $\text{RESET}$  Pin: MC102.
- Temperature Range : 0°C to +70°C
- No External Components

### Description

The MC101/102 are microprocessor supervisory circuits used to monitor power supplies in microprocessor and digital systems. They provide excellent circuit reliability and low cost by eliminating external powered or 3V-powered circuits. MC101/102 also provide a debounced manual reset input.

It also operates as protection from brown-out conditions when the supply voltage drops below a safe operating level. These devices are available with a choice of seven different reset threshold voltages and both have push-pull outputs.

The MC101 has low active  $\overline{\text{RESET}}$  pin, MC102 has a high active  $\text{RESET}$  pin

The MC101/102 will assert the  $\overline{\text{RESET}} / \text{RESET}$  signal whenever the voltage on the VDD pin is below the reset threshold voltage.

### Application

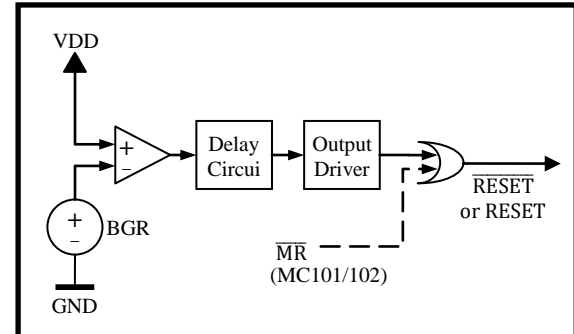
- Computers
- Controllers
- Intelligent Instruments

- Consumer Electronics

### [1-1] Ordering Information

Part	Suffix	Reset Threshold	Package
MC101 /102	L	4.63V	SOT143
	M	4.38V	
	J	4.00V	SOT23
	T	3.08V	TO92
	S	2.93V	SOT89
	R	2.63V	

### Block Diagram



## 1. ELECTRICAL CHARACTERISTICS

### 1.1 Absolute Maximum Ratings

V <sub>DD</sub> .....	6.0V
All in/outputs with respect to V <sub>SS</sub> .....	-0.3V to V <sub>DD</sub> +0.3V
Storage Temperature.....	-65°C to +150°C
Lead Temperature Range.....	+300°C
Input Current, V <sub>DD</sub> , $\overline{MR}$ .....	20mA
Output Current, $\overline{RESET}/RESET$ .....	20mA

**Note** : Stresses above those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

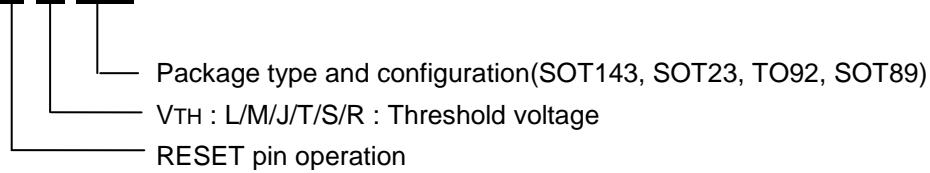
### 1.2 DC AND AC CHARACTERISTICS (V<sub>DD</sub> = 1.1 ~ 5.5V, T<sub>A</sub> : 0°C to +70°C)

Parameter		Symbol	MIN	TYP	MAX	Unit	
Operating Voltage		V <sub>DD</sub>	1.1	-	5.5	V	
V <sub>DD</sub> Value to $\overline{RESET}/RESET$		V <sub>DDMIN</sub>	1.1	-	-	V	
Operating Current		I <sub>DD</sub>	-	30	80	μA	V <sub>DD</sub> =5.5V (No load)
Reset Threshold	MC10xL	V <sub>TH</sub>	4.40	4.63	4.86	V	T <sub>A</sub> = 0°C~70°C
	MC10xM		4.16	4.38	4.60		
	MC10xJ		3.80	4.00	4.20		
	MC10xT		2.93	3.08	3.23		
	MC10xS		2.78	2.93	3.08		
	MC10xR		2.50	2.63	2.76		
Threshold Hysteresis		V <sub>HYS</sub>	-	50	-	mV	
V <sub>DD</sub> to Reset Delay	MC10xL/M/J		-	40	-	μs	V <sub>OD</sub> = 250mV
	MC10xT/S/R		-	20	-		
$\overline{MR}$ Minimum Pulse Width		t <sub>MR</sub>	10	-	-	μs	
$\overline{MR}$ Glitch Immunity			-	100	-	ns	
$\overline{MR}$ to Reset to Propagation Delay		t <sub>MD</sub>	-	0.5	-	μs	
$\overline{MR}$ Input Threshold	MC101/102L/M/J	V <sub>IH</sub>	2.3	-	-	V	V <sub>DD</sub> >V <sub>TH</sub> (MAX)
		V <sub>IL</sub>	-	-	0.8		
	MC101/102T/S/R	V <sub>IH</sub>	0.7V <sub>DD</sub>	-	-		
		V <sub>IL</sub>	-	-	0.25V <sub>DD</sub>		
$\overline{MR}$ Pull-up Resistance			10	20	30	kΩ	
Reset Active Timeout Period	MC10xx	t <sub>RPB</sub>	300	400	500	ms	V <sub>DD</sub> = V <sub>TH</sub> (MAX)
				-			
RESET Output Voltage	MC102X	V <sub>OH</sub>	0.8V <sub>DD</sub>			V	I <sub>SOURCE</sub> =150uA, 1.8V<V <sub>DD</sub> <V <sub>TH</sub> (MIN)
	MC102T/S/R	V <sub>OL</sub>			0.3		V <sub>DD</sub> = V <sub>TH</sub> (MAX) I <sub>SINK</sub> = 1.2mA
	MC102L/M/J				0.4		V <sub>DD</sub> = V <sub>TH</sub> (MAX) I <sub>SINK</sub> = 3.2mA

Parameter		Symbol	MIN	TYP	MAX	Unit	
RESET Output Voltage	MC101T/S/R	V <sub>OL</sub>			0.3	V	V <sub>DD</sub> = V <sub>TH</sub> (MIN) I <sub>SINK</sub> = 1.2mA
	MC101L/M				0.4		V <sub>DD</sub> = V <sub>TH</sub> (MAX) I <sub>SINK</sub> = 3.2mA
					0.3		V <sub>DD</sub> > 1.0V I <sub>SINK</sub> = 50uA
	MC101T/S/R	V <sub>OH</sub>	0.8V <sub>DD</sub>				I <sub>SOURCE</sub> =500uA, V <sub>DD</sub> >V <sub>TH</sub> (MAX)
	MC101L/M		V <sub>DD</sub> -1.5				I <sub>SOURCE</sub> =800uA, V <sub>DD</sub> >V <sub>TH</sub> (MAX)

1.3 Device Name Information

MC10X X XX



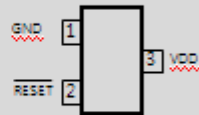
Threshold voltage

- L: 4.63V
- M: 4.38V
- J: 4.00V
- T: 3.08V
- S: 2.93V
- R: 2.63V

RESET pin operation

- 1: Active LOW reset
- 2: Active HIGH reset

Example: MC101S22



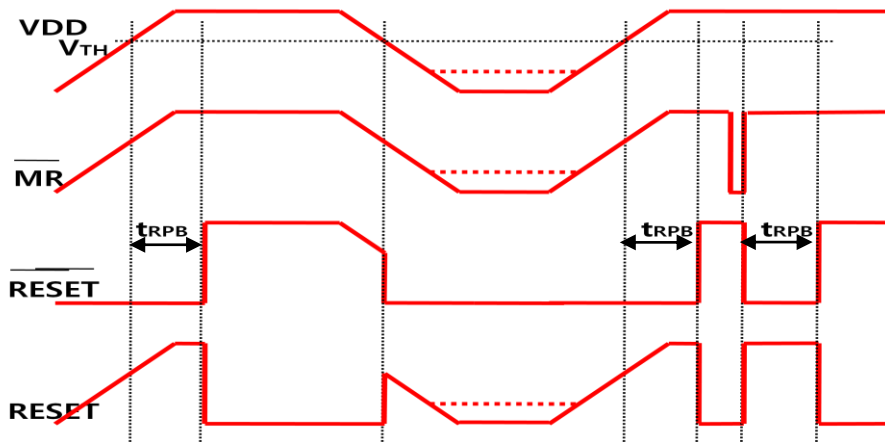
Threshold voltage: 2.93V

[ Package Pin Configuration ]

<p>01</p>	Reserved	Reserved
<p>02</p>	<p>12</p>	<p>22</p>
<p>03</p>	<p>13</p>	Reserved



1.4 Timing Diagram



1.5 Typical Application

