

# 3-Pin Voltage Surveillance with Time-out

## Features

- Proper microprocessor restart after power up
- Processor reset at power down
- On-chip oscillator gives a typical POR of 160 ms
- Reset output working down to 1.6 V
- No external components required
- Very small mounting space
- TO-92 package
- SOT-223 package
- Sensitivity typically 10  $\mu$ s

## Description

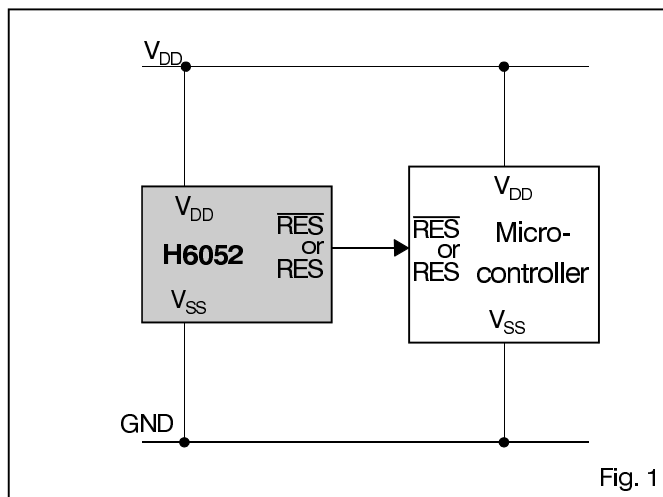
The H6052 is a CMOS device which monitors the supply voltage and controls the reset of the microprocessor. Upon the supply voltage rising above  $V_{TH ON}$ , the reset output, whether RES or  $\overline{RES}$ , will remain active ( $RES = 1, \overline{RES} = 0$ ) for an additional 160 ms. This allows the system voltage and the oscillator of the microprocessor system to stabilize before the system becomes fully active. When  $V_{DD}$  drops below  $V_{TH OFF}$ , the reset output goes active ( $RES = 1, \overline{RES} = 0$ ).

## Applications

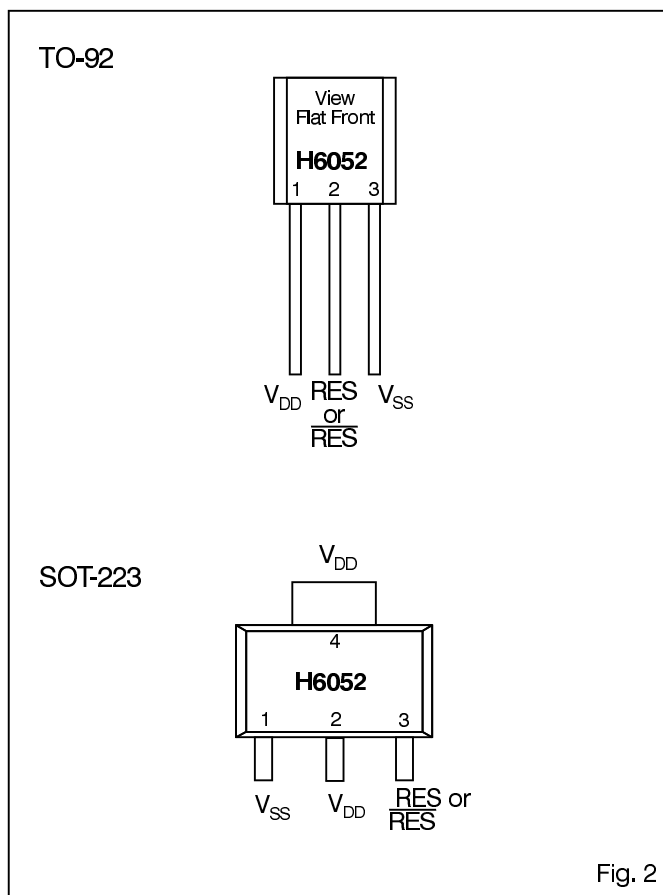
All microprocessor and microcontroller applications where an automatic restart of the microprocessor after power down is required:

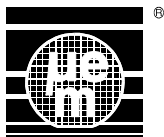
- White goods
- Brown goods
- Automotive electronics
- Industrial electronics

## Typical Operating Configuration



## Pin Assignment





## Absolute Maximum Ratings

Parameter	Symbol	Conditions
Voltage at $V_{DD}$ to GND	$V_{DD}$	-0.3V to +7 V
Min. voltage at RES or $\overline{RES}$	$V_{min}$	GND - 0.3 V
Max. voltage at RES or $\overline{RES}$	$V_{max}$	$V_{DD} + 0.3 V$
Storage temperature range	$T_{STO}$	-65° to +150 °C

Table 1

Stresses above these listed maximum ratings may cause permanent damage to the device. Exposure beyond specified operating conditions may affect device reliability or cause malfunction.

## Handling Procedures

This device has built-in protection against high static voltages or electric fields; however, anti-static precautions precautions be taken as for any other CMOS component. Unless otherwise specified, proper operation can only occur when all terminal voltages are kept within the supply voltage range. Unused inputs must always be tied to a defined logic voltage level.

## Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Units
Operating temperature	$T_A$	-40		+85	°C
Positive supply voltage	$V_{DD}$	1.6		5.5	V

Table 2

## Electrical Characteristics

$V_{DD} = 5.0 V \pm 10\%$ ,  $T_A = -40$  to  $+85^\circ C$ , unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Supply current	$I_{DD}$	RES or $\overline{RES}$ open		80	140	$\mu A$
Supply voltage:						
Power on threshold*	$V_{TH ON}$	$T_A = +25^\circ C$	3.6	4	4.4	V
Power off threshold*	$V_{TH OFF}$	$T_A = +25^\circ C$	2.8*	3.2*	3.6*	V
$\overline{RES}$ Output High Level	$V_{OH}$	$I_{OH} = 2 mA$	$V_{DD} - 0.4$			V
$\overline{RES}$ Output Low Level	$V_{OL}$	$V_{DD} = 3.5 V, I_{OL} = 2mA$			0.4	V
$\overline{RES}$ Output Low Level	$V_{OL}$	$V_{DD} = 1.6 V, I_{OL} = 400 \mu A$			0.4	V
RES Output Low Level	$V_{OL}$	$I_{OL} = 4 mA$			0.4	V
RES Output High Level	$V_{OH}$	$V_{DD} = 3.5 V, I_{OH} = 1.5 mA$	$V_{DD} - 0.4$			V
RES Output High Level	$V_{OH}$	$V_{DD} = 1.6 V, I_{OH} = 80 \mu A$	$V_{DD} - 0.4$			V

\*  $V_{TH ON}$  is related to  $V_{TH OFF}$ . Typically,  $V_{TH OFF} = V_{TH ON} - 0.8 V$

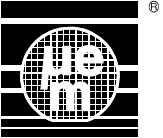
Table 3

## Timing Characteristics

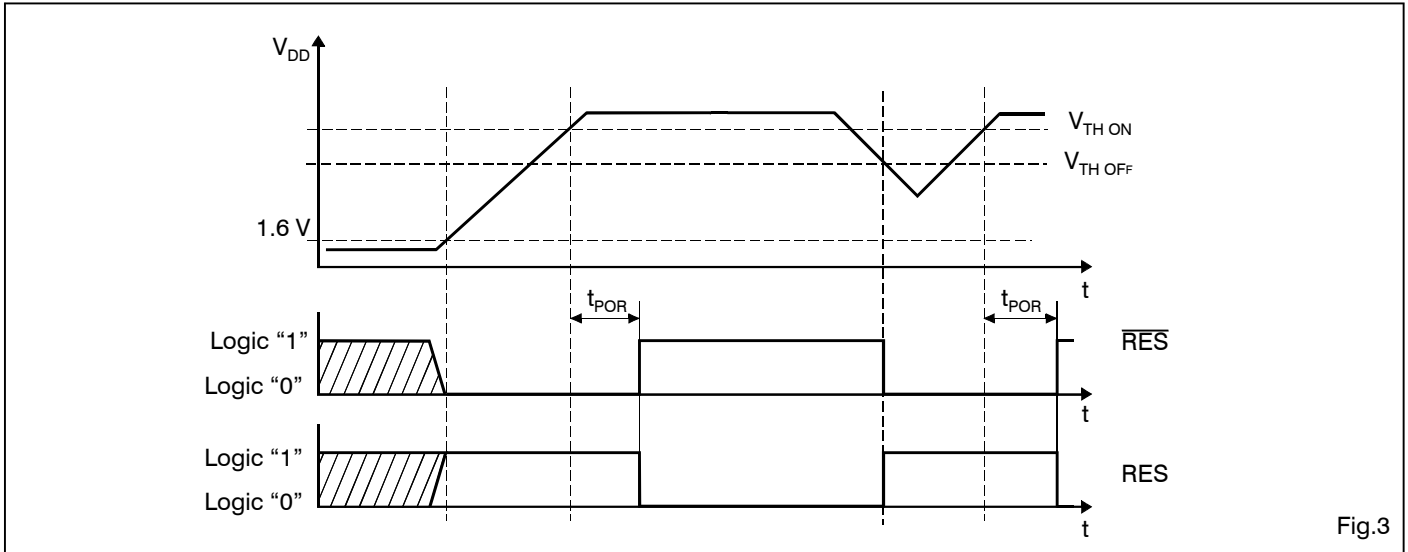
$V_{DD} = 5.0 V \pm 10\%$ ,  $T_A = -40$  to  $+85^\circ C$ , unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Power on reset	$t_{POR}$		70		350	ms
Power on reset	$t_{POR}$	$T_A = +25^\circ C$	100	160	250	ms

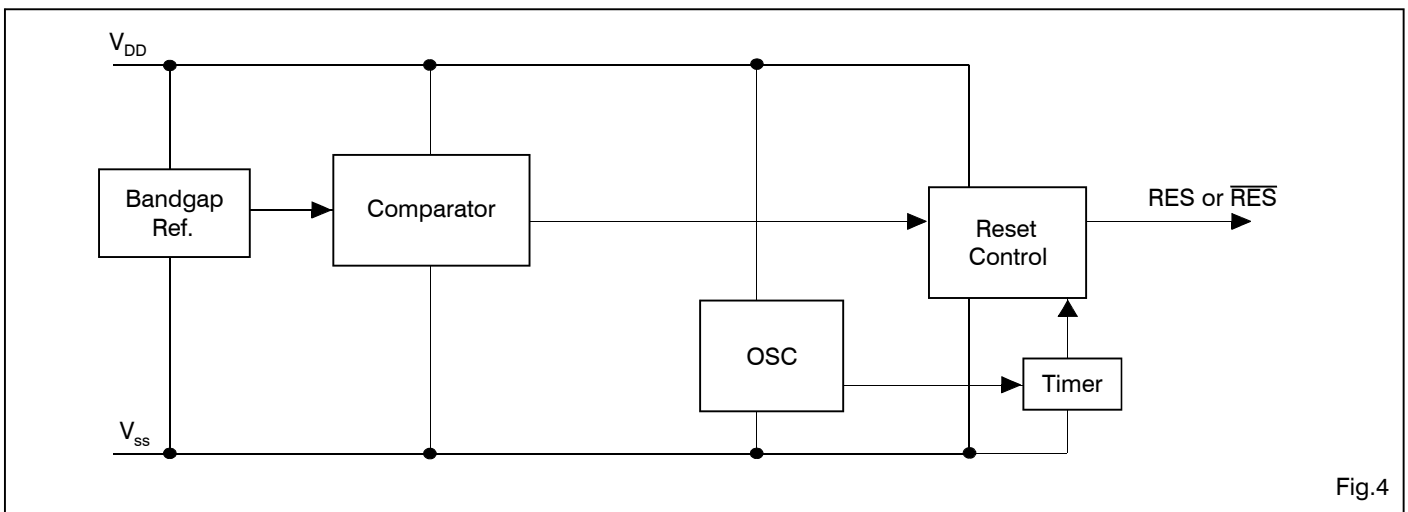
Table 4



## Timing Waveforms



## Block Diagram



## Pin Description

### TO-92

Pin	Name	Function
1	$V_{DD}$	Positive Supply
2	RES or $\overline{RES}$	Reset output (H6052 1) Reset output (H 6052 2)
3	$V_{SS}$	Supply ground

Table 5

### SOT-223

Pin	Name	Function
1	$V_{SS}$	Supply ground
2	$V_{DD}$	Positive Supply
3	RES or $\overline{RES}$	Reset output (H 6052 1) Reset output (H 6052 2)
4	NC	No connection (pin 4 connected internally to pin 2)

Table 6



## Typical Applications

### Power On Reset

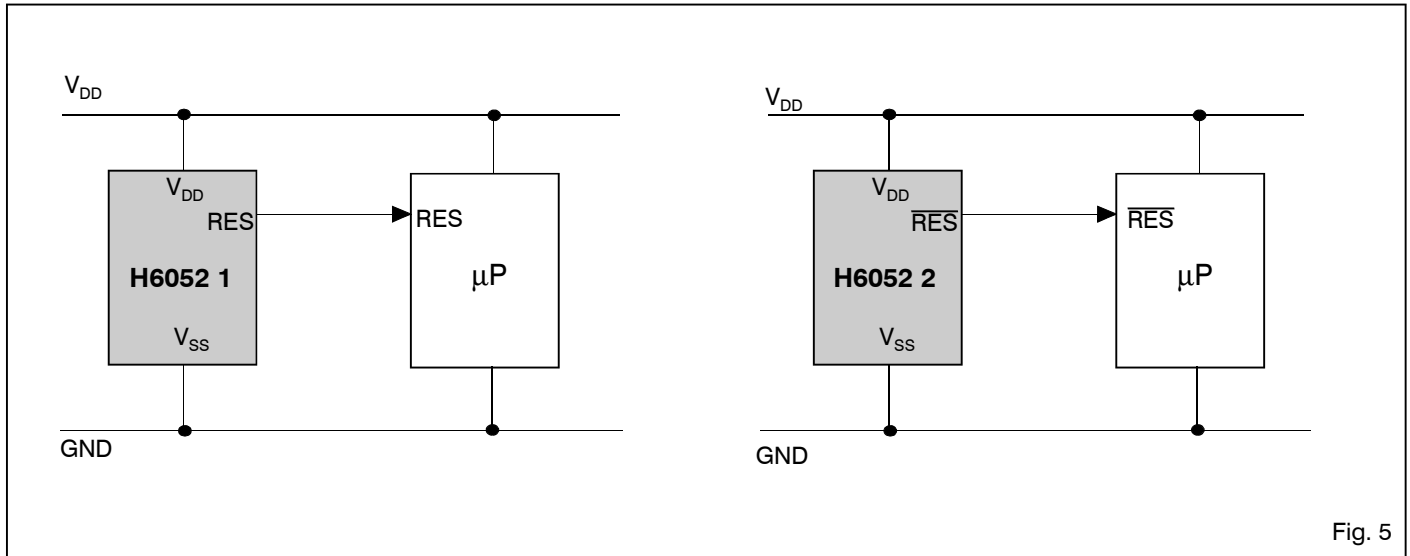


Fig. 5

### Ordering Information

The H6052 is available in the following packages:

Part number:	Package;	
H6052 1	TO-92	Reset Output
H6052 1	SOT-223	$\overline{\text{Reset}}$ Output
H6052 2	TO-92	$\overline{\text{Reset}}$ Output
H6052 2	SOT-223	Reset Output

When ordering please specify complete part number and package.

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