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 μs

Description

The H6052 is a CMOS device whichmonitors 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).
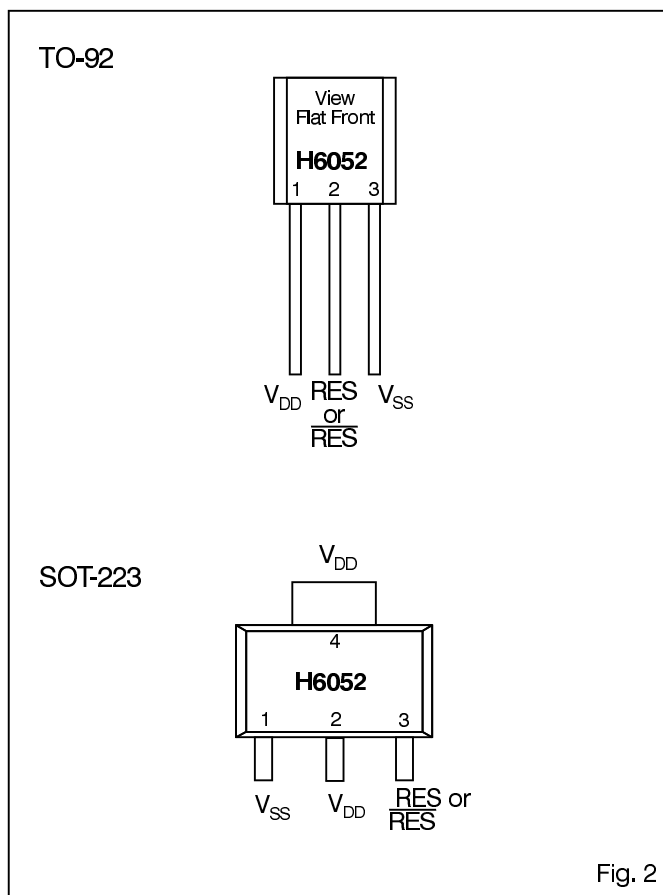
Applications

All microprocessor and microcontroller applications where an automatic restart of the micreoprocessor after power down is required:
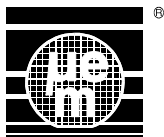
- White goods
- Brown goods
- Automotive electronics
- Industrial electronics

Typical Operating Configuration

Fig. 1

Pin Assignment

Fig. 2
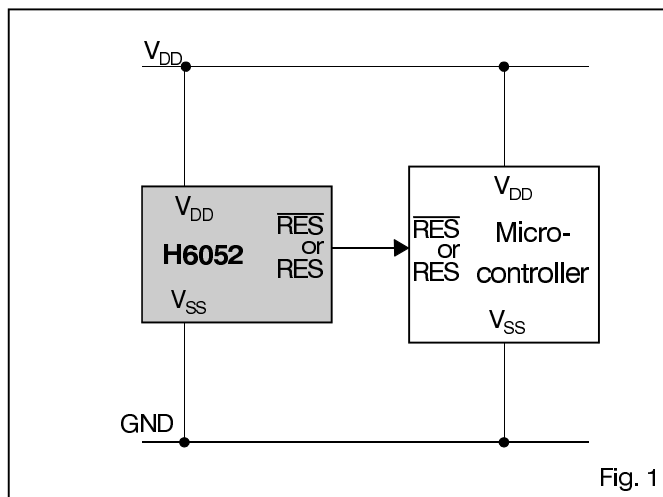
Absolute Maximum Ratings

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 ^{o}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	^{o}C
Positive supply voltage	V_{DD}	1.6		5.5	V

Table 2

Electrical Characteristics

V_{DD} = 5.0 V ±10%, T_A = -40 to +85°C, unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Supply current	I_{DD}	RES or $\overline{RES}$ open		80	140	µA
Supply voltage:						
Power on threshold*	$V_{TH\,ON}$	T_A = +25°C	3.6	4	4.4	V
Power off threshold*	$V_{TH\,OFF}$	T_A = +25°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 µA			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 µA	V_{DD} - 0.4			V

* $V_{TH\,ON}$ is related to $V_{TH\,OFF}$. Typically, $V_{TH\,OFF}$ = $V_{TH\,ON}$ - 0.8 V
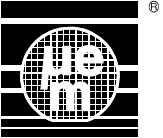
Table 3

Timing Characteristics

V_{DD} = 5.0 V ±10%, T_A = -40 to +85°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°C	100	160	250	ms

Table 4

Timing Waveforms

Fig.3

Block Diagram

Fig.4
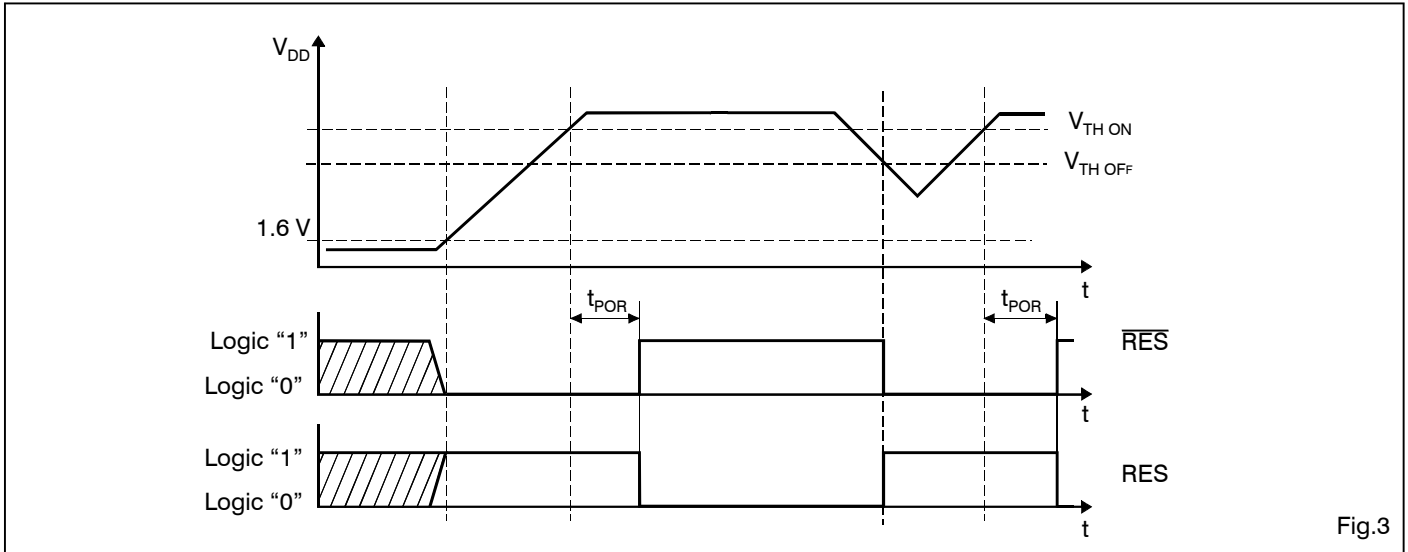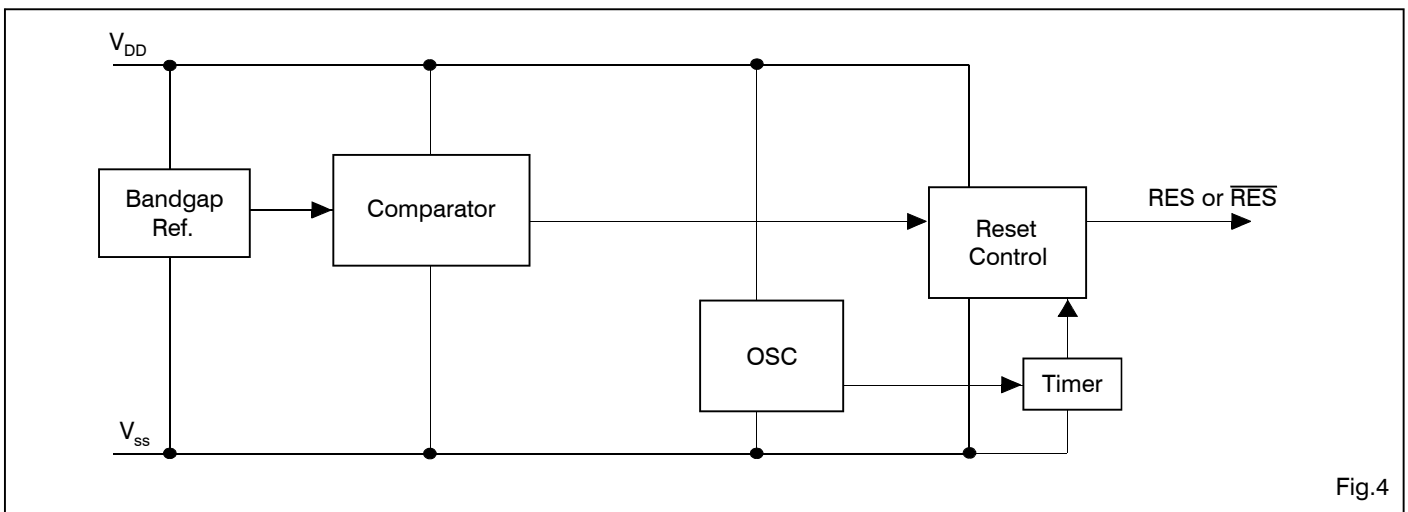
Pin Description

TO-92

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

Table 5

SOT-223

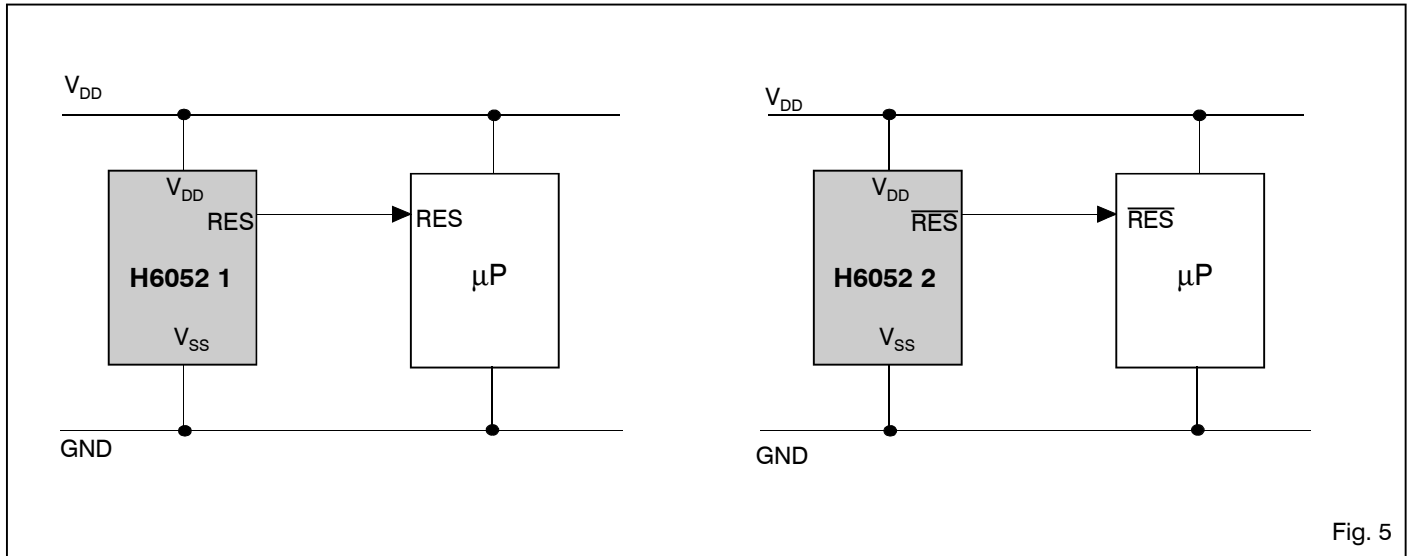| Pin	Name	Function
1	V_{SS}	Supply ground
2	V_{DD}	Positive Supply
3	RES or $\overline{RES}$	Reset output (H 6052 1)
		$\overline{Reset}$ output (H 6052 2)
4	NC	No connection (pin 4 connected internally to pin 2)

Table 6
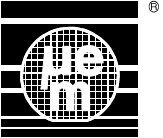
Typical Applications

Power On Reset

Fig. 5

Ordering Information

The H6052 is available in the following pacakges:

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

When ordering please specify complete part number and package.