



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 μ s

Description

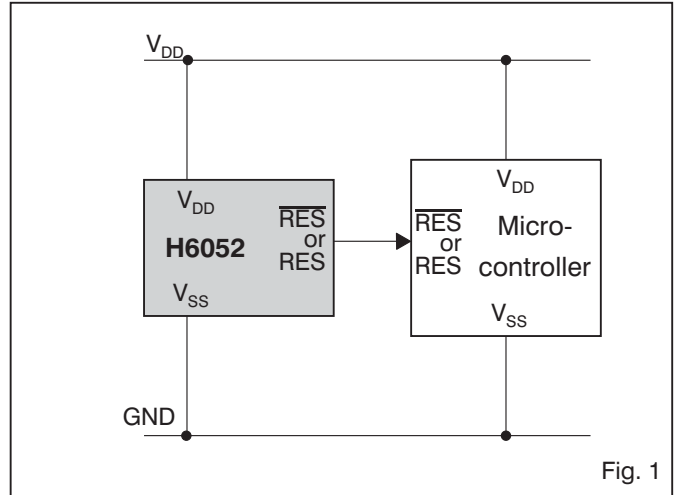
The H6052 is a CMOS device which monitors the supply voltage and controls the reset of the microprocessor. Upon the supply voltage rising above $V_{TH ON}$, the reset output, whether RES or \overline{RES} , will remain active ($RES = 1, \overline{RES} = 0$) for an additional 160 ms. This allows the system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

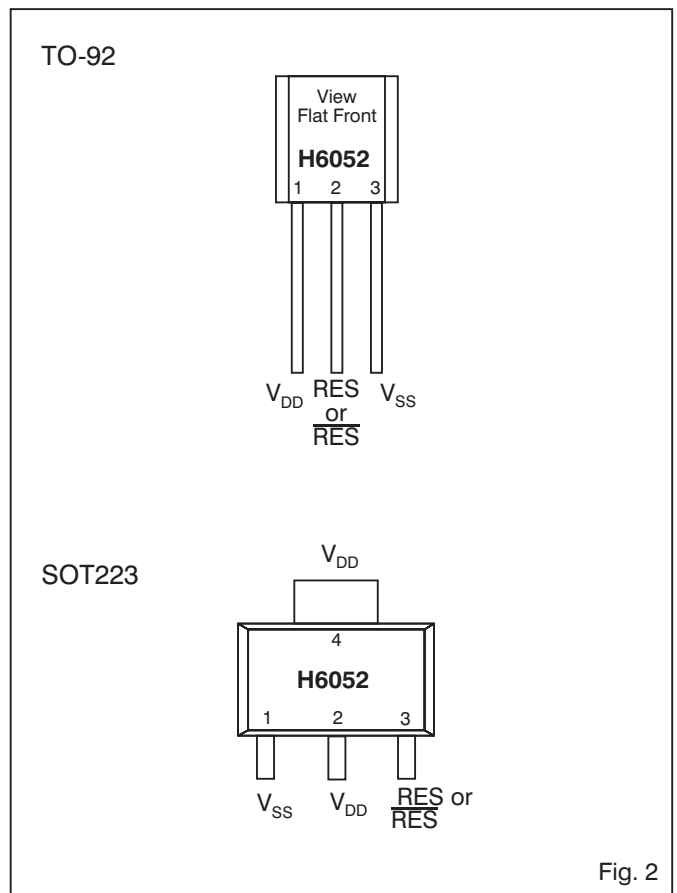
All microprocessor and microcontroller applications where an automatic restart of the microprocessor after power down is required:

- 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	μA
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, $V_{TH OFF} = V_{TH ON} - 0.8 V$

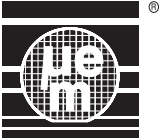
Table 3

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

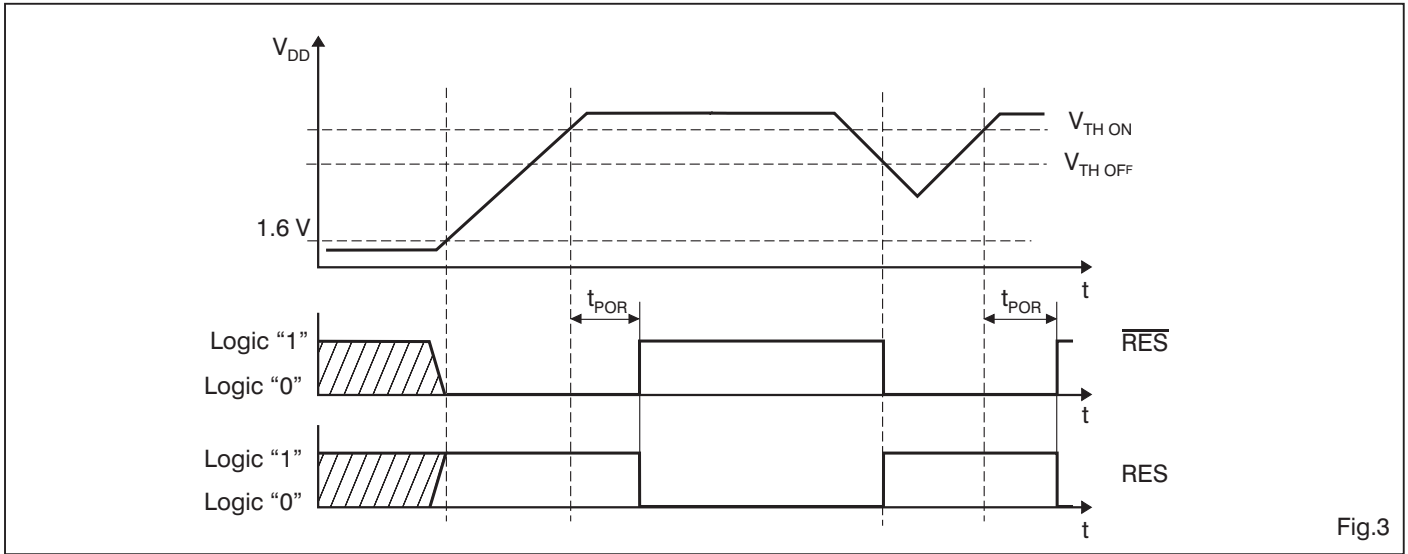


Fig.3

Block Diagram

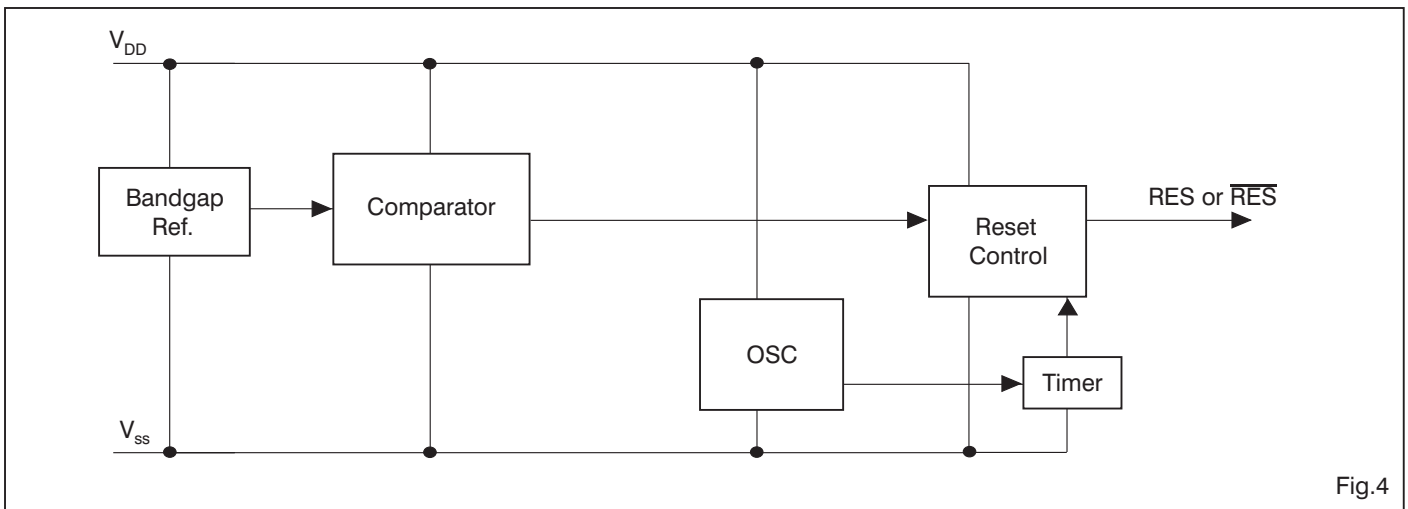


Fig.4

Typical Applications

Power On Reset

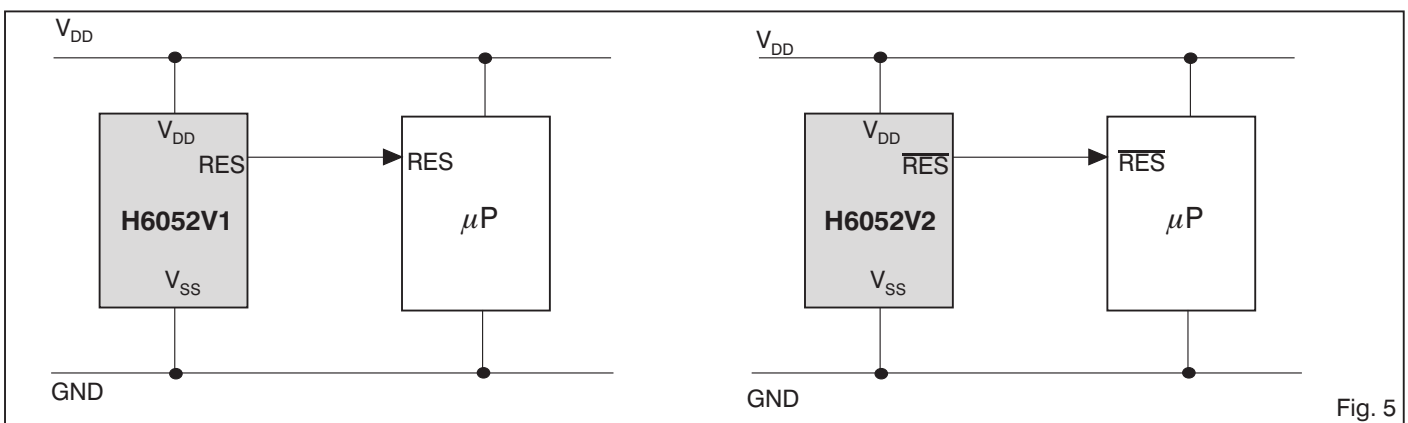


Fig. 5



Pin Description

TO-92

Pin	Name	Function
1	V_{DD}	Positive Supply
2	RES or $\overline{\text{RES}}$	Reset output (H6052V1) Reset output (H6052V2)
3	V_{SS}	Supply ground

Table 5

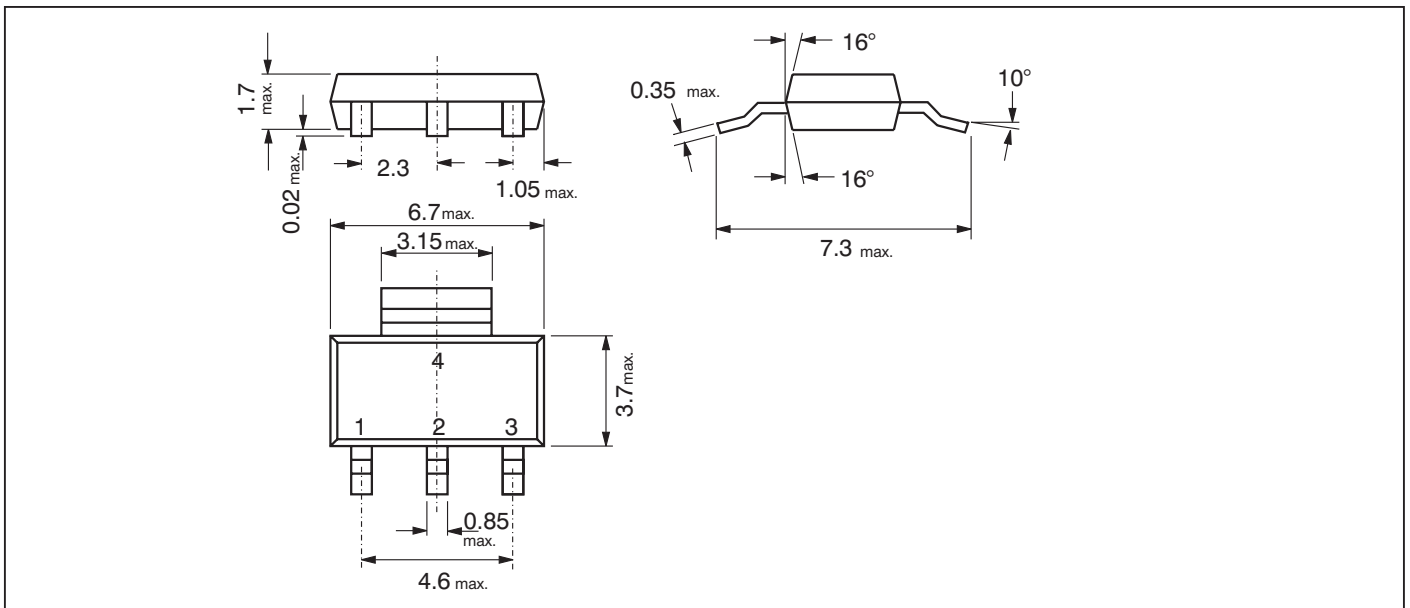
SOT223

Pin	Name	Function
1	V_{SS}	Supply ground
2	V_{DD}	Positive Supply
3	RES or $\overline{\text{RES}}$	Reset output (H6052V1) Reset output (H6052V2)
4	NC	No connection (pin 4 connected internally to pin 2)

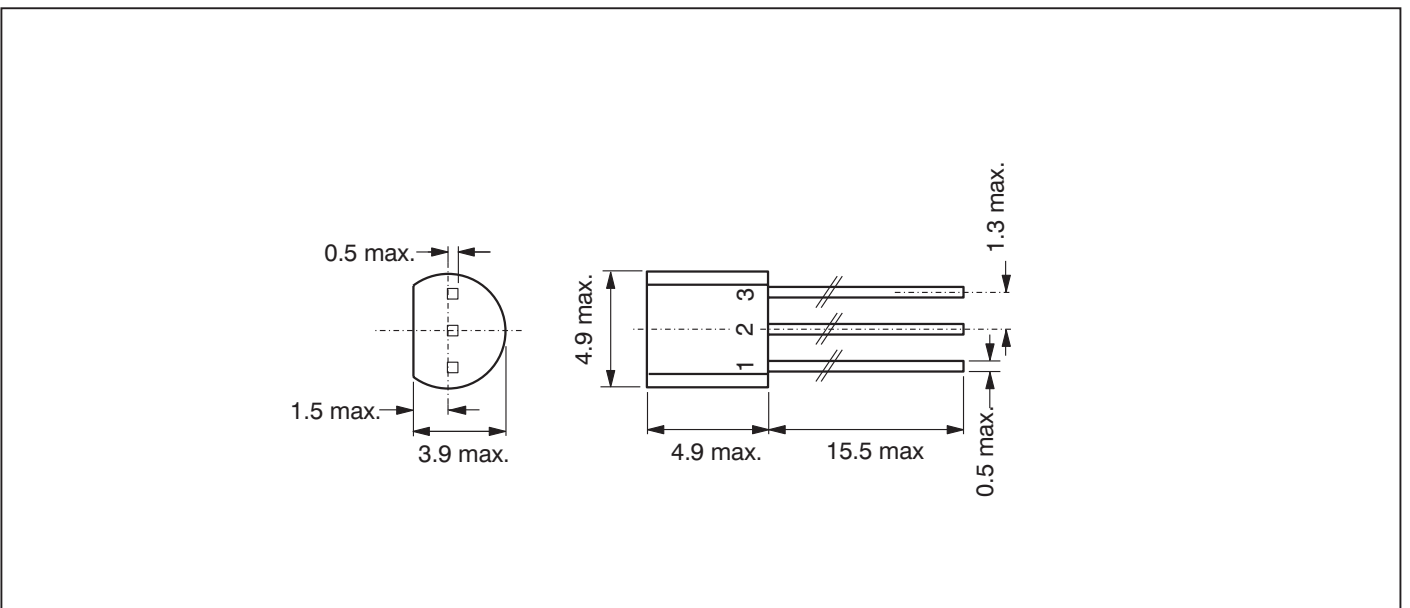
Table 6

Package and Ordering Information

Dimensions of SOT223 Package



Dimensions of TO-92 Package





H6052

Ordering Information

When ordering please specify the complete Part Number.

Part Number	Output Type	Package	Delivery Form	Package Marking
H6052V1TO3C	Reset active high	TO-92	Bulk	H60521
H6052V1TO3E		TO-92	Ammopack	H60521
H6052V1ST3B		SOT223	Tape & Reel	H60521
H6052V2TO3C	Reset active low	TO-92	Bulk	H60522
H6052V2TO3E		TO-92	Ammopack	H60522
H6052V2ST3B		SOT223	Tape & Reel	H60522

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