



Microprocessor Reset IC

Features

- Precision Monitoring of +3V, +3.3V, and +5V Power-Supply Voltages
- Fully Specified Over Temperature
- Available in Three Output Configurations
 - Push-Pull $\overline{\text{RESET}}$ Output (G670L)
 - Push-Pull RESET Output (G670H)
 - Open-Drain $\overline{\text{RESET}}$ Output (G671L)
- 2ms max Power-On Reset Pulse Width
- 14 μA Supply Current
- Guaranteed Reset Valid to $V_{\text{CC}} = +1\text{V}$
- Power Supply Transient Immunity
- No External Components
- 3-Pin SOT-23, TO-92 and SOT-89 Packages
- 2% Threshold Accuracy

Applications

- Computers
- Controllers
- Intelligent Instruments
- Critical μP and μC Power Monitoring
- Portable / Battery-Powered Equipment
- Automotive

General Description

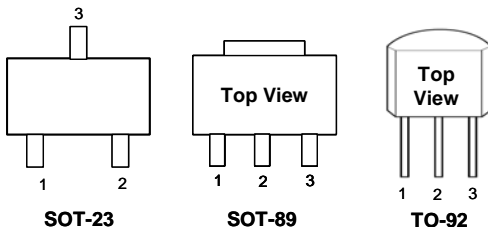
The G670/G671 are microprocessor (μP) supervisory circuits used to monitor the power supplies in μP and digital systems. They provide excellent circuit reliability and low cost by eliminating external components and adjustments when used with +5V, +3.3V, +3.0V- powered circuits.

These circuits perform a single function: they assert a reset signal whenever the V_{CC} supply voltage declines below a preset threshold. Reset thresholds suitable for operation with a variety of supply voltages are available.

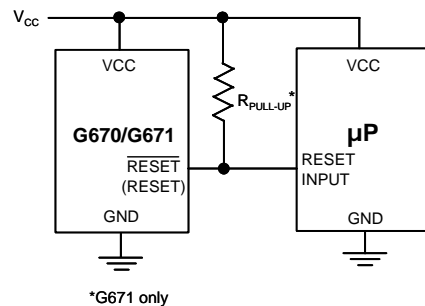
The G671L has an open-drain output stage, while the G670 have push-pull outputs. The G671L's open-drain $\overline{\text{RESET}}$ output requires a pull-up resistor that can be connected to a voltage higher than V_{CC} . The G670L have an active-low $\overline{\text{RESET}}$ output, while the G670H has an active-high RESET output. The reset comparator is designed to ignore fast transients on V_{CC} , and the outputs are guaranteed to be in the correct logic state for V_{CC} down to 1V.

Low supply current makes the G670/G671 ideal for use in portable equipment. The G670/G671 are available in 3-pin SOT-23, TO-92 and SOT-89 packages.

Pin Configuration



Typical Application Circuit



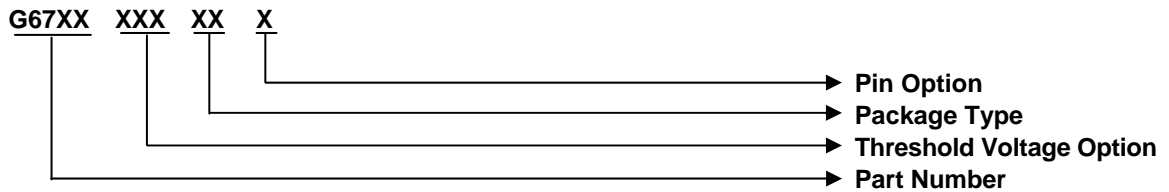


Ordering Information

| ORDER NUMBER | ORDER NUMBER (Pb free) | TEMP. RANGE | OUTPUT TYPE |
|--------------|------------------------|----------------|-----------------------|
| G670LxxxTDxB | G670LxxxTDxBf | -40°C ~ +105°C | Push-Pull Active Low |
| G670HxxxTDxB | G670HxxxTDxBf | -40°C ~ +105°C | Push-Pull Active High |
| G671LxxxTDxB | G671LxxxTDxBf | -40°C ~ +105°C | Open-Drain |
| G670LxxxT2xU | G670LxxxT2xUf | -40°C ~ +105°C | Push-Pull Active Low |
| G670HxxxT2xU | G670HxxxT2xUf | -40°C ~ +105°C | Push-Pull Active High |
| G671LxxxT2xU | G671LxxxT2xUf | -40°C ~ +105°C | Open-Drain |
| G670LxxxT7xU | G670LxxxT7xUf | -40°C ~ +105°C | Push-Pull Active Low |
| G670HxxxT7xU | G670HxxxT7xUf | -40°C ~ +105°C | Push-Pull Active High |
| G671LxxxT7xU | G671LxxxT7xUf | -40°C ~ +105°C | Open-Drain |

Note: U : Tape & Reel B: Bag

Order Number Identification



PART NUMBER

G670L : Push-Pull Active Low Output
 G670H : Push-Pull Active High Output
 G671L : Open-Drain Output

THRESHOLD VOLTAGE OPTION

* xxx specifies the threshold voltage.
 e.g. 263 denotes the 2.64V threshold voltage.

PACKAGE TYPE

TD : TO-92
 T2 : SOT-89
 T7 : SOT-23

PIN OPTION

| 1 | 2 | 3 |
|-------------------------------|---------------------------|---------------------------|
| 1 : $\overline{\text{RESET}}$ | GND | V _{CC} |
| 2 : RESET | V _{CC} | GND |
| 3 : GND | $\overline{\text{RESET}}$ | V _{CC} |
| 4 : GND | V _{CC} | $\overline{\text{RESET}}$ |
| 5 : V _{CC} | GND | $\overline{\text{RESET}}$ |
| 6 : V _{CC} | $\overline{\text{RESET}}$ | GND |

*RESET for G670H

**Selector Guide**

| ORDER NUMBER | ORDER NUMBER (Pb free) | RESET THRESHOLD (V) | OUTPUT TYPE | TOP MARK |
|--------------|---------------------------|------------------------|-----------------|------------|
| | | | | TO-92 |
| G671L463TD5B | G671L463TD5Bf | 4.60 | Open-Drain | 663G xx |
| G671L438TD5B | G671L438TD5Bf | 4.32 | Open-Drain | 663F xx |
| G671L400TD5B | G671L400TD5Bf | 3.96 | Open-Drain | 663E xx |
| G671L330TD5B | G671L330TD5Bf | 3.30 | Open-Drain | 663D xx |
| G671L308TD5B | G671L308TD5Bf | 3.10 | Open-Drain | 663C xx |
| G671L293TD5B | G671L293TD5Bf | 2.91 | Open-Drain | 663B xx |
| G671L263TD5B | G671L263TD5Bf | 2.64 | Open-Drain | 663A xx |
| G670H463TD5B | G670H463TD5Bf | 4.60 | Push-Pull RESET | 662N xx |
| G670H438TD5B | G670H438TD5Bf | 4.32 | Push-Pull RESET | 662M xx |
| G670H400TD5B | G670H400TD5Bf | 3.96 | Push-Pull RESET | 662L xx |
| G670H330TD5B | G670H330TD5Bf | 3.30 | Push-Pull RESET | 662K xx |
| G670H308TD5B | G670H308TD5Bf | 3.10 | Push-Pull RESET | 662J xx |
| G670H293TD5B | G670H293TD5Bf | 2.91 | Push-Pull RESET | 662I xx |
| G670H263TD5B | G670H263TD5Bf | 2.64 | Push-Pull RESET | 662H xx |
| G670L463TD5B | G670L463TD5Bf | 4.60 | Push-Pull | 662G xx |
| G670L438TD5B | G670L438TD5Bf | 4.32 | Push-Pull | 662F xx |
| G670L400TD5B | G670L400TD5Bf | 3.96 | Push-Pull | 662E xx |
| G670L330TD5B | G670L330TD5Bf | 3.30 | Push-Pull | 662D xx |
| G670L308TD5B | G670L308TD5Bf | 3.10 | Push-Pull | 662C xx |
| G670L293TD5B | G670L293TD5Bf | 2.91 | Push-Pull | 662B xx |
| G670L263TD5B | G670L263TD5Bf | 2.64 | Push-Pull | 662A xx |

Note: TD: TO-92

Not all product options are ready for mass production, please contact factory for availability.

**Selector Guide**

| ORDER NUMBER | ORDER NUMBER (Pb free) | RESET THRESHOLD (V) | OUTPUT TYPE | TOP MARK |
|--------------|---------------------------|------------------------|-----------------|------------|
| | | | | SOT-89 |
| G671L463T25U | G671L463T25Uf | 4.60 | Open-Drain | 663G xx |
| G671L438T25U | G671L438T25Uf | 4.32 | Open-Drain | 663F xx |
| G671L400T25U | G671L400T25Uf | 3.96 | Open-Drain | 663E xx |
| G671L330T25U | G671L330T25Uf | 3.30 | Open-Drain | 663D xx |
| G671L308T25U | G671L308T25Uf | 3.10 | Open-Drain | 663C xx |
| G671L293T25U | G671L293T25Uf | 2.91 | Open-Drain | 663B xx |
| G671L263T25U | G671L263T25Uf | 2.64 | Open-Drain | 663A xx |
| G670H463T25U | G670H463T25Uf | 4.60 | Push-Pull RESET | 662N xx |
| G670H438T25U | G670H438T25Uf | 4.32 | Push-Pull RESET | 662M xx |
| G670H400T25U | G670H400T25Uf | 3.96 | Push-Pull RESET | 662L xx |
| G670H330T25U | G670H330T25Uf | 3.30 | Push-Pull RESET | 662K xx |
| G670H308T25U | G670H308T25Uf | 3.10 | Push-Pull RESET | 662J xx |
| G670H293T25U | G670H293T25Uf | 2.91 | Push-Pull RESET | 662I xx |
| G670H263T25U | G670H263T25Uf | 2.64 | Push-Pull RESET | 662H xx |
| G670L463T25U | G670L463T25Uf | 4.60 | Push-Pull | 662G xx |
| G670L438T25U | G670L438T25Uf | 4.32 | Push-Pull | 662F xx |
| G670L400T25U | G670L400T25Uf | 3.96 | Push-Pull | 662E xx |
| G670L330T25U | G670L330T25Uf | 3.30 | Push-Pull | 662D xx |
| G670L308T25U | G670L308T25Uf | 3.10 | Push-Pull | 662C xx |
| G670L293T25U | G670L293T25Uf | 2.91 | Push-Pull | 662B xx |
| G670L263T25U | G670L263T25Uf | 2.64 | Push-Pull | 662A xx |

Note: T2: SOT-89

Not all product options are ready for mass production, please contact factory for availability.

**Selector Guide**

| ORDER NUMBER | ORDER NUMBER (Pb free) | RESET THRESHOLD (V) | OUTPUT TYPE | TOP MARK |
|--------------|---------------------------|------------------------|-----------------|----------|
| | | | | SOT-23 |
| G671L463T71U | G671L463T71Uf | 4.60 | Open-Drain | 669Gx |
| G671L438T71U | G671L438T71Uf | 4.32 | Open-Drain | 669Fx |
| G671L400T71U | G671L400T71Uf | 3.96 | Open-Drain | 669Ex |
| G671L330T71U | G671L330T71Uf | 3.30 | Open-Drain | 669Dx |
| G671L308T71U | G671L308T71Uf | 3.10 | Open-Drain | 669Cx |
| G671L293T71U | G671L293T71Uf | 2.91 | Open-Drain | 669Bx |
| G671L263T71U | G671L263T71Uf | 2.64 | Open-Drain | 669Ax |
| G670H463T71U | G670H463T71Uf | 4.60 | Push-Pull RESET | 668Nx |
| G670H438T71U | G670H438T71Uf | 4.32 | Push-Pull RESET | 668Mx |
| G670H400T71U | G670H400T71Uf | 3.96 | Push-Pull RESET | 668Lx |
| G670H330T71U | G670H330T71Uf | 3.30 | Push-Pull RESET | 668Kx |
| G670H308T71U | G670H308T71Uf | 3.10 | Push-Pull RESET | 668Jx |
| G670H293T71U | G670H293T71Uf | 2.91 | Push-Pull RESET | 668Ix |
| G670H263T71U | G670H263T71Uf | 2.64 | Push-Pull RESET | 668Hx |
| G670L463T71U | G670L463T71Uf | 4.60 | Push-Pull | 668Gx |
| G670L438T71U | G670L438T71Uf | 4.32 | Push-Pull | 668Fx |
| G670L400T71U | G670L400T71Uf | 3.96 | Push-Pull | 668Ex |
| G670L330T71U | G670L330T71Uf | 3.30 | Push-Pull | 668Dx |
| G670L308T71U | G670L308T71Uf | 3.10 | Push-Pull | 668Cx |
| G670L293T71U | G670L293T71Uf | 2.91 | Push-Pull | 668Bx |
| G670L263T71U | G670L263T71Uf | 2.64 | Push-Pull | 668Ax |

Note: T7: SOT-23

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Selector Guide

| ORDER NUMBER | ORDER NUMBER (Pb free) | RESET THRESHOLD (V) | OUTPUT TYPE | TOP MARK |
|--------------|---------------------------|------------------------|-----------------|----------|
| | | | | SOT-23 |
| G671L463T72U | G671L463T72Uf | 4.60 | Open-Drain | 667Gx |
| G671L438T72U | G671L438T72Uf | 4.32 | Open-Drain | 667Fx |
| G671L400T72U | G671L400T72Uf | 3.96 | Open-Drain | 667Ex |
| G671L330T72U | G671L330T72Uf | 3.30 | Open-Drain | 667Dx |
| G671L308T72U | G671L308T72Uf | 3.10 | Open-Drain | 667Cx |
| G671L293T72U | G671L293T72Uf | 2.91 | Open-Drain | 667Bx |
| G671L263T72U | G671L263T72Uf | 2.64 | Open-Drain | 667Ax |
| G670H463T72U | G670H463T72Uf | 4.60 | Push-Pull RESET | 666Nx |
| G670H438T72U | G670H438T72Uf | 4.32 | Push-Pull RESET | 666Mx |
| G670H400T72U | G670H400T72Uf | 3.96 | Push-Pull RESET | 666Lx |
| G670H330T72U | G670H330T72Uf | 3.30 | Push-Pull RESET | 666Kx |
| G670H308T72U | G670H308T72Uf | 3.10 | Push-Pull RESET | 666Jx |
| G670H293T72U | G670H293T72Uf | 2.91 | Push-Pull RESET | 666Ix |
| G670H263T72U | G670H263T72Uf | 2.64 | Push-Pull RESET | 666Hx |
| G670L463T72U | G670L463T72Uf | 4.60 | Push-Pull | 666Gx |
| G670L438T72U | G670L438T72Uf | 4.32 | Push-Pull | 666Fx |
| G670L400T72U | G670L400T72Uf | 3.96 | Push-Pull | 666Ex |
| G670L330T72U | G670L330T72Uf | 3.30 | Push-Pull | 666Dx |
| G670L308T72U | G670L308T72Uf | 3.10 | Push-Pull | 666Cx |
| G670L293T72U | G670L293T72Uf | 2.91 | Push-Pull | 666Bx |
| G670L263T72U | G670L263T72Uf | 2.64 | Push-Pull | 666Ax |

Note: T7: SOT-23

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**Selector Guide**

| ORDER NUMBER | ORDER NUMBER (Pb free) | RESET THRESHOLD (V) | OUTPUT TYPE | TOP MARK |
|--------------|---------------------------|------------------------|-----------------|----------|
| | | | | SOT-23 |
| G671L463T73U | G671L463T73Uf | 4.60 | Open-Drain | 671Gx |
| G671L438T73U | G671L438T73Uf | 4.32 | Open-Drain | 671Fx |
| G671L400T73U | G671L400T73Uf | 3.96 | Open-Drain | 671Ex |
| G671L330T73U | G671L330T73Uf | 3.30 | Open-Drain | 671Dx |
| G671L308T73U | G671L308T73Uf | 3.10 | Open-Drain | 671Cx |
| G671L293T73U | G671L293T73Uf | 2.91 | Open-Drain | 671Bx |
| G671L263T73U | G671L263T73Uf | 2.64 | Open-Drain | 671Ax |
| G670H463T73U | G670H463T73Uf | 4.60 | Push-Pull RESET | 670Nx |
| G670H438T73U | G670H438T73Uf | 4.32 | Push-Pull RESET | 670Mx |
| G670H400T73U | G670H400T73Uf | 3.96 | Push-Pull RESET | 670Lx |
| G670H330T73U | G670H330T73Uf | 3.30 | Push-Pull RESET | 670Kx |
| G670H308T73U | G670H308T73Uf | 3.10 | Push-Pull RESET | 670Jx |
| G670H293T73U | G670H293T73Uf | 2.91 | Push-Pull RESET | 670Ix |
| G670H263T73U | G670H263T73Uf | 2.64 | Push-Pull RESET | 670Hx |
| G670L463T73U | G670L463T73Uf | 4.60 | Push-Pull | 670Gx |
| G670L438T73U | G670L438T73Uf | 4.32 | Push-Pull | 670Fx |
| G670L400T73U | G670L400T73Uf | 3.96 | Push-Pull | 670Ex |
| G670L330T73U | G670L330T73Uf | 3.30 | Push-Pull | 670Dx |
| G670L308T73U | G670L308T73Uf | 3.10 | Push-Pull | 670Cx |
| G670L293T73U | G670L293T73Uf | 2.91 | Push-Pull | 670Bx |
| G670L263T73U | G670L263T73Uf | 2.64 | Push-Pull | 670Ax |

Note: T7: SOT-23

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Selector Guide

| ORDER NUMBER | ORDER NUMBER (Pb free) | RESET THRESHOLD (V) | OUTPUT TYPE | TOP MARK |
|--------------|---------------------------|------------------------|-----------------|----------|
| | | | | SOT-23 |
| G671L463T76U | G671L463T76Uf | 4.60 | Open-Drain | 665Gx |
| G671L438T76U | G671L438T76Uf | 4.32 | Open-Drain | 665Fx |
| G671L400T76U | G671L400T76Uf | 3.96 | Open-Drain | 665Ex |
| G671L330T76U | G671L330T76Uf | 3.30 | Open-Drain | 665Dx |
| G671L308T76U | G671L308T76Uf | 3.10 | Open-Drain | 665Cx |
| G671L293T76U | G671L293T76Uf | 2.91 | Open-Drain | 665Bx |
| G671L263T76U | G671L263T76Uf | 2.64 | Open-Drain | 665Ax |
| G670H463T76U | G670H463T76Uf | 4.60 | Push-Pull RESET | 664Nx |
| G670H438T76U | G670H438T76Uf | 4.32 | Push-Pull RESET | 664Mx |
| G670H400T76U | G670H400T76Uf | 3.96 | Push-Pull RESET | 664Lx |
| G670H330T76U | G670H330T76Uf | 3.30 | Push-Pull RESET | 664Kx |
| G670H308T76U | G670H308T76Uf | 3.10 | Push-Pull RESET | 664Jx |
| G670H293T76U | G670H293T76Uf | 2.91 | Push-Pull RESET | 664Ix |
| G670H263T76U | G670H263T76Uf | 2.64 | Push-Pull RESET | 664Hx |
| G670L463T76U | G670L463T76Uf | 4.60 | Push-Pull | 664Gx |
| G670L438T76U | G670L438T76Uf | 4.32 | Push-Pull | 664Fx |
| G670L400T76U | G670L400T76Uf | 3.96 | Push-Pull | 664Ex |
| G670L330T76U | G670L330T76Uf | 3.30 | Push-Pull | 664Dx |
| G670L308T76U | G670L308T76Uf | 3.10 | Push-Pull | 664Cx |
| G670L293T76U | G670L293T76Uf | 2.91 | Push-Pull | 664Bx |
| G670L263T76U | G670L263T76Uf | 2.64 | Push-Pull | 664Ax |

Note: T7: SOT-23

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**Absolute Maximum Ratings**

Terminal Voltage (with respect to GND)

 V_{CC} -0.3V to +6.0VRESET, $\overline{\text{RESET}}$ (push-pull) -0.3V to ($V_{CC} + 0.3V$) $\overline{\text{RESET}}$ (open drain) -0.3V to +6.0VInput Current, V_{CC} 20mAOutput Current, RESET, $\overline{\text{RESET}}$ 20mAContinuous Power Dissipation ($T_A = +70^\circ\text{C}$)SOT-23 (derate 4mW/ $^\circ\text{C}$ above +70 $^\circ\text{C}$) 100mWSOT-89 (derate 4mW/ $^\circ\text{C}$ above +70 $^\circ\text{C}$). 100mWTO-92 (derate 4mW/ $^\circ\text{C}$ above +70 $^\circ\text{C}$). 100mWOperating Temperature Range. -40 $^\circ\text{C}$ to +105 $^\circ\text{C}$ Storage Temperature Range. -65 $^\circ\text{C}$ to +150 $^\circ\text{C}$ Reflow Temperature (soldering, 10sec) +260 $^\circ\text{C}$

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Electrical Characteristics

($V_{CC} =$ full range, $T_A = -40^\circ\text{C}$ to +105 $^\circ\text{C}$, unless otherwise noted. Typical values are at $T_A = +25^\circ\text{C}$, $V_{CC} = 5V$ for 463/438/400/330 versions, $V_{CC} = 3.3V$ for 308/293 versions, and $V_{CC} = 3V$ for 263 version.) (Note 1)

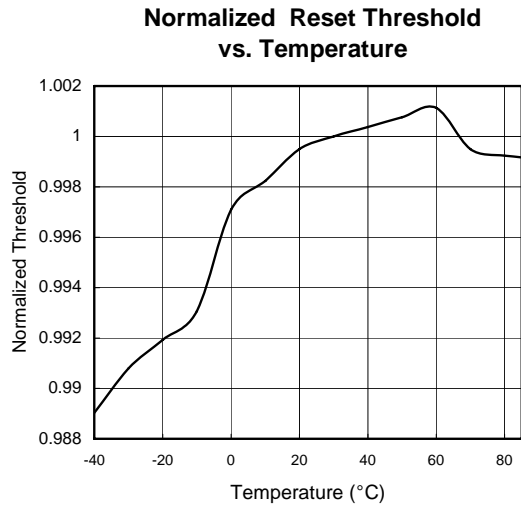
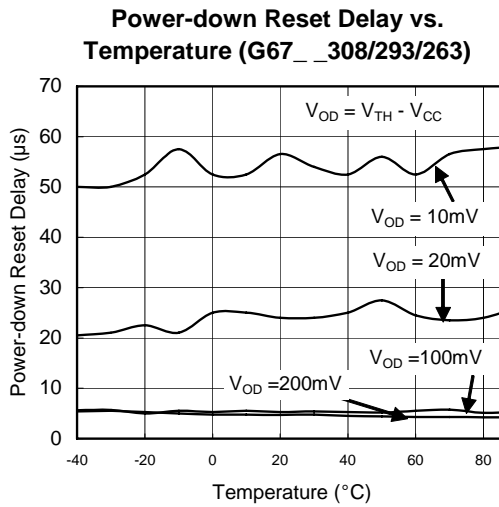
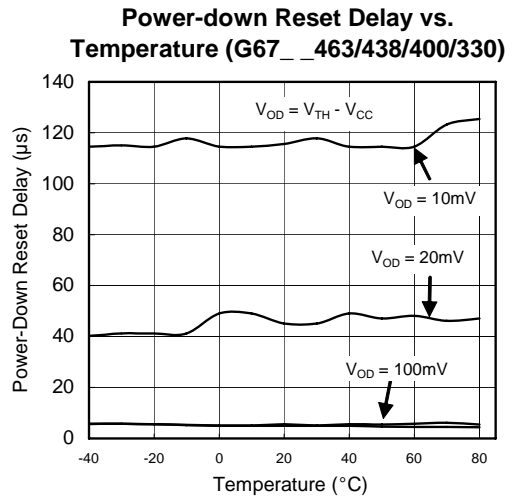
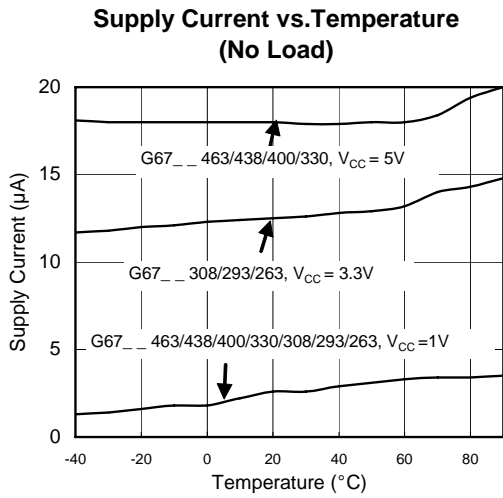
| PARAMETER | SYMBOL | CONDITION | MIN | TYP | MAX | UNIT |
|---|-------------------|--|------|------|------|-----------------------|
| V _{CC} Range | | T _A = 0 $^\circ\text{C}$ +70 $^\circ\text{C}$ | 1.0 | --- | 5.5 | V |
| | | T _A = -40 $^\circ\text{C}$ +105 $^\circ\text{C}$ | 1.2 | --- | 5.5 | |
| Supply Current | I _{CC} | V _{CC} < 5.5V, G67_463/438/400/330_ | --- | 16.5 | 25 | μA |
| | | V _{CC} < 3.6V, G67_308/293/263_ | --- | 13.9 | 22 | |
| Reset Threshold | V _{TH} | G67_463_ | 4.50 | 4.60 | 4.69 | V |
| | | G67_438_ | 4.23 | 4.32 | 4.40 | |
| | | G67_400_ | 3.88 | 3.96 | 4.04 | |
| | | G67_330_ | 3.24 | 3.30 | 3.37 | |
| | | G67_308_ | 3.04 | 3.10 | 3.16 | |
| | | G67_293_ | 2.86 | 2.91 | 2.96 | |
| Reset Threshold Hysteresis | V _{HYST} | | 3.60 | 5.30 | 7.00 | % |
| | | | | | | |
| Reset Threshold Tempco | | | --- | 40 | --- | ppm/ $^\circ\text{C}$ |
| V _{CC} to Reset Delay (Note 2) | | V _{CC} = V _{TH} to (V _{TH} - 100mV) | --- | 7 | --- | μs |
| Reset Active Timeout Period | | V _{CC} = V _{TH} max, | --- | --- | 2 | ms |
| RESET Output Current Low (push-pull active low, and open-drain active-low, G670L and G671L) | I _{OL} | V _{CC} = 2.5V, V _{RESET} = 0.5V | 8 | --- | --- | mA |
| RESET Output Current High (push-pull active low, G670L) | I _{OH} | V _{CC} = 5V, V _{RESET} = 4.5V, G670L463/438/400/330 | 4.5 | --- | --- | mA |
| | | V _{CC} = 3.3V, V _{RESET} = 2.8V, G670L308/293 | 3 | --- | --- | |
| | | V _{CC} = 3V, V _{RESET} = 2.5V, G670L263 | 2 | --- | --- | |
| RESET Output Current Low (push-pull active high, G670H) | I _{OL} | V _{CC} = 5V, V _{RESET} = 0.5V, G670H463/438/400/330 | 16 | --- | --- | mA |
| | | V _{CC} = 3.3V, V _{RESET} = 0.5V, G670H308/293 | 12 | --- | --- | |
| | | V _{CC} = 3V, V _{RESET} = 0.5V, G670H263 | 10 | --- | --- | |
| RESET Output Current High (push-pull active high, G670H) | I _{OH} | V _{CC} = 2.5V, V _{RESET} = 2V | 2 | --- | --- | mA |
| RESET Open-Drain Output Leakage Current (G671L) | | V _{CC} > V _{TH} , $\overline{\text{RESET}}$ deasserted | --- | --- | 1 | μA |

Note 1: Production testing done at $T_A = +25^\circ\text{C}$; limits over temperature guaranteed by design.

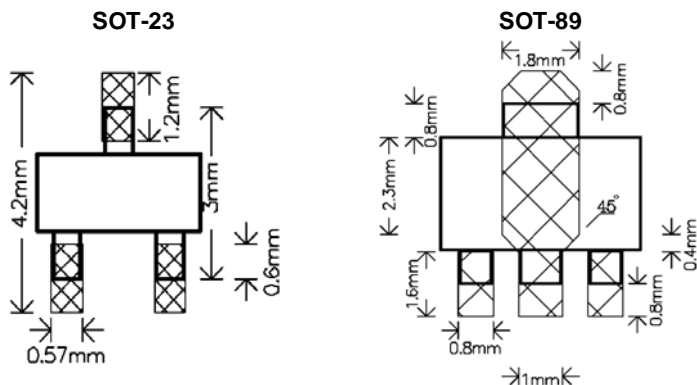
Note 2: RESET output is for G670L/G671L; While $\overline{\text{RESET}}$ output is for G670H.

Typical Operating Characteristics

(V_{CC} = full range, T_A = -40°C to $+105^{\circ}\text{C}$, unless otherwise noted. Typical values are at T_A = $+25^{\circ}\text{C}$, V_{CC} = 5V for 463/438/400 versions, V_{CC} = 3.3V for 308/293 versions, and V_{CC} = 3V for 263 version.)



Recommended Minimum Footprint



Pin Description

| NAME | FUNCTION |
|---------------|---|
| GND | Ground |
| (G671L/G670L) | $\overline{\text{RESET}}$ Output remains low while V_{CC} is below the reset threshold, and for at most 2ms after V_{CC} rises above the reset threshold. |
| RESET (G670H) | RESET Output remains high while V_{CC} is below the reset threshold, and for at most 2ms after V_{CC} rises above the reset threshold. |
| VCC | Supply Voltage (+5V, +3.3V, +3.0V) |

Detailed Description

A microprocessor's (μP 's) reset input starts the μP in a known state. The G671L/G670L/G670H assert reset to prevent code-execution errors during power-up, power-down, or brownout conditions. They assert a reset signal whenever the V_{CC} supply voltage declines below a preset threshold, keeping it asserted for at most 2ms after V_{CC} has risen above the reset threshold. The G671L uses an open-drain output, and the G670L/G670H have a push-pull output stage. Connect a pull-up resistor on the G671L's $\overline{\text{RESET}}$ output to any supply between 0 and 5.5V.

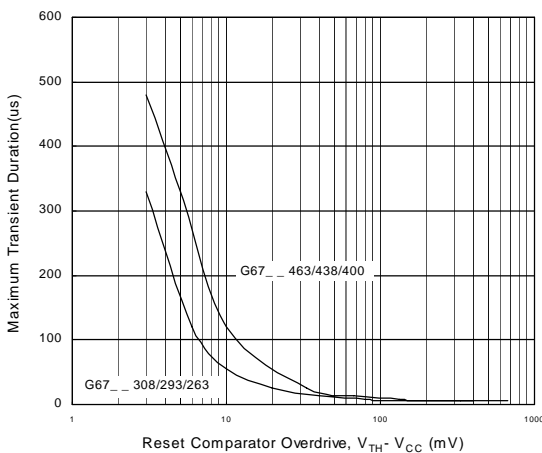


Figure 1. Maximum Transient Duration Without Causing a Reset Pulse vs. Reset Comparator Overdrive

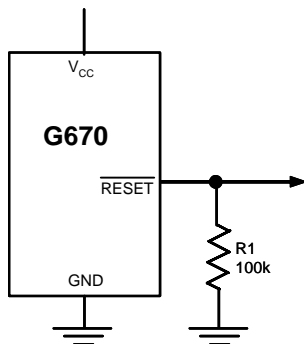


Figure 2. $\overline{\text{RESET}}$ Valid to $V_{CC} = \text{Ground}$ Circuit

Applications Information

Negative-Going V_{CC} Transients

In addition to issuing a reset to the μP during power-up, power-down, and brownout conditions, the G671L/G670H/G670L are relatively immune to short-duration negative-going V_{CC} transients (glitches).

Figure 1 shows typical transient duration vs. reset comparator overdrive, for which the G671L/G670H/G670L do not generate a reset pulse. The graph was generated using a negative-going pulse applied to V_{CC} , starting 0.5V above the actual reset threshold and ending below it by the magnitude indicated (reset comparator overdrive). The graph indicates the maximum pulse width a negative-going V_{CC} transient can have without causing a reset pulse. As the magnitude of the transient increases (goes farther below the reset threshold), the maximum allowable pulse width decreases. Typically, for the G67__463 and G67__438, a V_{CC} transient that goes 100mV below the reset threshold and lasts 7 μs or less will not cause a reset pulse. A 0.1 μF bypass capacitor mounted as close as possible to the V_{CC} pin provides additional transient immunity.

Ensuring a Valid Reset Output Down to $V_{CC} = 0$

When V_{CC} falls below 1V, the G670 $\overline{\text{RESET}}$ output no longer sinks current—it becomes an open circuit. Therefore, high-impedance CMOS logic inputs connected to $\overline{\text{RESET}}$ can drift to undetermined voltages. This presents no problem in most applications since most μP and other circuitry is inoperative with V_{CC} below 1V. However, in applications where $\overline{\text{RESET}}$ must be valid down to 0V, adding a pull-down resistor to $\overline{\text{RESET}}$ causes any stray leakage currents to flow to ground, holding $\overline{\text{RESET}}$ low (Figure 2). R1's value is not critical; 100k Ω is large enough not to load $\overline{\text{RESET}}$ and small enough to pull $\overline{\text{RESET}}$ to ground. A 100k Ω pull-up resistor to V_{CC} is also recommended for the G671L if $\overline{\text{RESET}}$ is required to remain valid for $V_{CC} < 1\text{V}$.

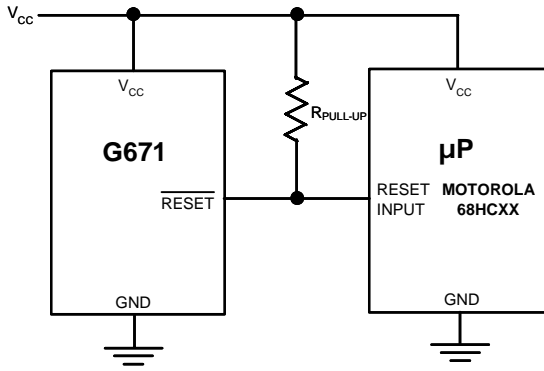


Figure 3. Interfacing to μ Ps with Bidirectional Reset I/O

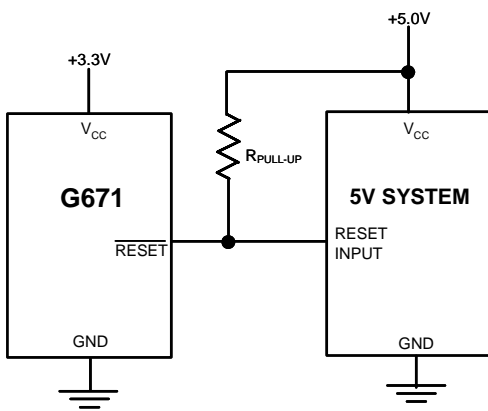


Figure 4. G671L Open-Drain $\overline{\text{RESET}}$ Output Allows Use with Multiple Supplies

Interfacing to μ Ps with Bidirectional Reset Pins

Since the $\overline{\text{RESET}}$ output on the G671L is open drain, this device interfaces easily with μ Ps that have bidirectional reset pins, such as the Motorola 68HC11. Connecting the μ P supervisor's $\overline{\text{RESET}}$ output directly to the microcontroller's (μ C's) $\overline{\text{RESET}}$ pin with a single pull-up resistor allows either device to assert reset (Figure 3).

G671L Open-Drain $\overline{\text{RESET}}$ Output Allows Use with Multiple Supplies

Generally, the pull-up connected to the G671L will connect to the supply voltage that is being monitored at the IC's V_{CC} pin. However, some systems may use the open-drain output to level-shift from the monitored supply to reset circuitry powered by some other supply (Figure 4). Note that as the G671L's V_{CC} decreases below 1V, so does the IC's ability to sink current at $\overline{\text{RESET}}$. Also, with any pull-up, $\overline{\text{RESET}}$ will be pulled high as V_{CC} decays toward 0. The voltage where this occurs depends on the pull-up resistor value and the voltage to which it is connected.

Benefits of Highly Accurate Reset Threshold

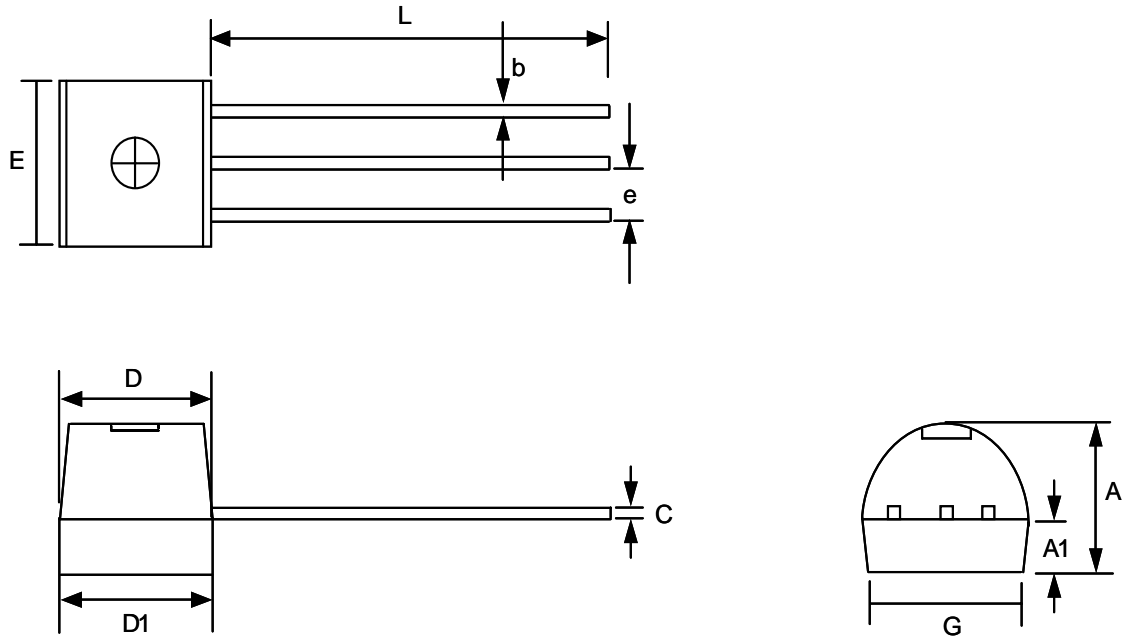
Most μ P supervisor ICs have reset threshold voltages between 5% and 10% below the value of nominal supply voltages. This ensures a reset will not occur within 5% of the nominal supply, but will occur when the supply is 10% below nominal.

When using ICs rated at only the nominal supply $\pm 5\%$, this leaves a zone of uncertainty where the supply is between 5% and 10% low, and where the reset may or may not be asserted.

The G67_463/G67_308 use highly accurate circuitry to ensure that reset is asserted close to the 5% limit, and long before the supply has declined to 10% below nominal.

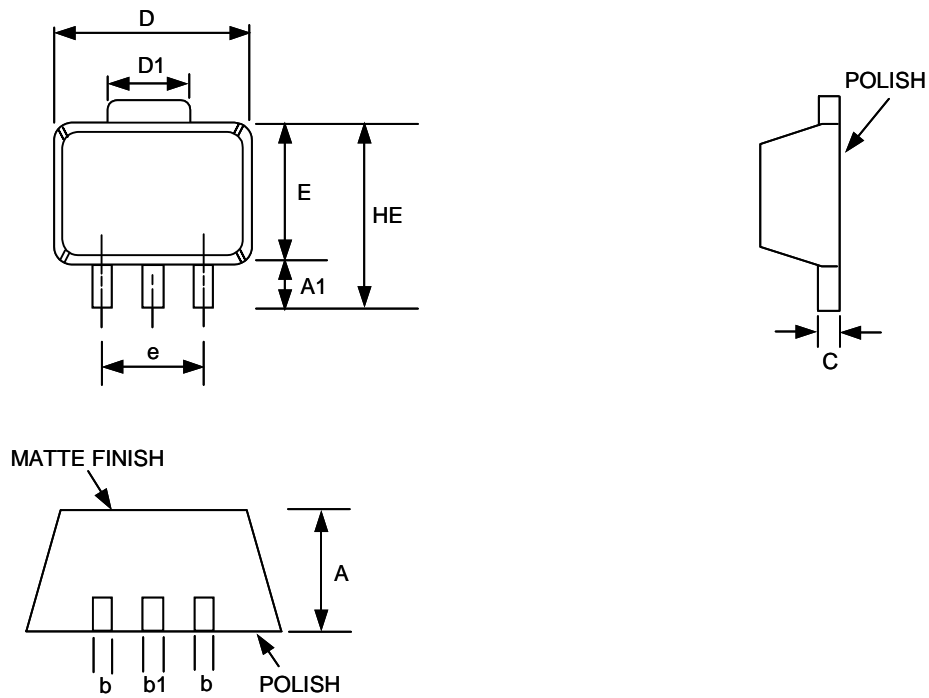


Package Information



TO-92 (TD) Package

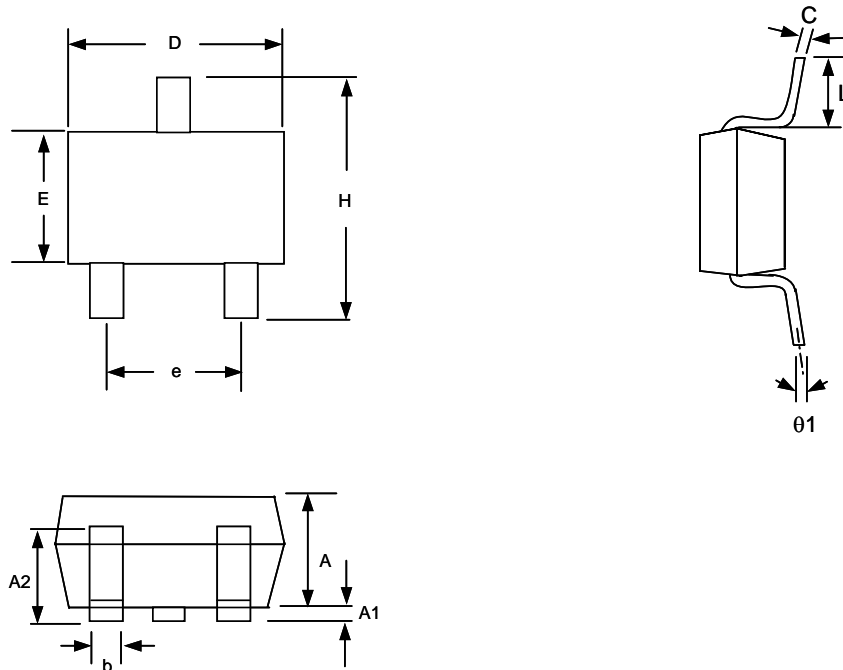
| SYMBOL | MILLIMETER | | INCH | |
|--------|------------|-------|-------|-------|
| | MIN | MAX | MIN | MAX |
| A | 3.35 | 3.86 | 0.132 | 0.152 |
| A1 | 1.0414 | 1.55 | 0.041 | 0.061 |
| b | 0.254 | 0.508 | 0.010 | 0.020 |
| E | 4.34 | 4.85 | 0.171 | 0.191 |
| C | 0.254 | 0.508 | 0.010 | 0.020 |
| L | 14.53 | 15.04 | 0.572 | 0.592 |
| e | 1.143 | 1.397 | 0.045 | 0.055 |
| G | 3.683 | 4.191 | 0.145 | 0.165 |
| D | 4.29 | 4.80 | 0.169 | 0.189 |
| D1 | 4.34 | 4.85 | 0.171 | 0.191 |



SOT-89 (T2) Package

| SYMBOL | DIMENSIONS IN MILLIMETER | | | DIMENSIONS IN INCH | | |
|--------|--------------------------|-------|-------|--------------------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.40 | 1.50 | 1.60 | 0.055 | 0.059 | 0.063 |
| A1 | 0.80 | 1.04 | ----- | 0.031 | 0.041 | ----- |
| b | 0.36 | 0.42 | 0.48 | 0.014 | 0.016 | 0.018 |
| b1 | 0.41 | 0.47 | 0.53 | 0.016 | 0.018 | 0.020 |
| C | 0.38 | 0.40 | 0.43 | 0.014 | 0.015 | 0.017 |
| D | 4.40 | 4.50 | 4.60 | 0.173 | 0.177 | 0.181 |
| D1 | 1.40 | 1.60 | 1.75 | 0.055 | 0.062 | 0.069 |
| HE | ----- | ----- | 4.25 | ----- | ----- | 0.167 |
| E | 2.40 | 2.50 | 2.60 | 0.094 | 0.098 | 0.102 |
| e | 2.90 | 3.00 | 3.10 | 0.114 | 0.118 | 0.122 |

Package Information



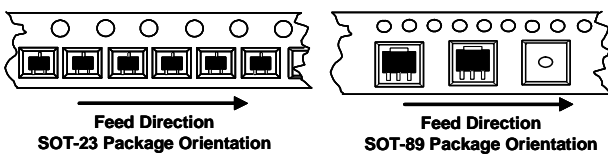
SOT-23 (T7) Package

Note:

1. Package body sizes exclude mold flash protrusions or gate burrs
2. Tolerance ± 0.1000 mm (4mil) unless otherwise specified
3. Coplanarity: 0.1000mm
4. Dimension L is measured in gage plane

| SYMBOL | DIMENSIONS IN MILLIMETER | | |
|------------|--------------------------|-----------|-------|
| | MIN | NOM | MAX |
| A | 1.00 | 1.10 | 1.30 |
| A1 | 0.00 | ----- | 0.10 |
| A2 | 0.70 | 0.80 | 0.90 |
| b | 0.35 | 0.40 | 0.50 |
| C | 0.10 | 0.15 | 0.25 |
| D | 2.70 | 2.90 | 3.10 |
| E | 1.40 | 1.60 | 1.80 |
| e | ----- | 1.90(TYP) | ----- |
| H | 2.60 | 2.80 | 3.00 |
| L | 0.37 | ----- | ----- |
| $\theta 1$ | 1° | 5° | 9° |

Taping Specification



| PACKAGE | Q'TY/REEL | Q'TY/BY BAG |
|---------|-----------|-------------|
| TO-92 | ----- | 2,000 ea |
| SOT-89 | 1,000 ea | ----- |
| SOT-23 | 3,000 ea | ----- |

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