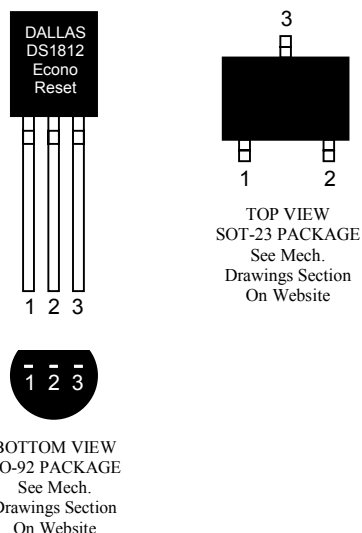


### FEATURES

- Automatically restarts a microprocessor after power failure
- Maintains reset for 150 ms after  $V_{CC}$  returns to an in-tolerance condition
- Reduces need for discrete components
- Precision temperature-compensated voltage reference and voltage sensor
- Low-cost TO-92, or space saving surface mount SOT-23 packages available
- Push-pull active high output
- Operating temperature  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

### PIN ASSIGNMENT



### PIN DESCRIPTION

#### TO-92

|   |          |                          |
|---|----------|--------------------------|
| 1 | RST      | Active High Reset Output |
| 2 | $V_{CC}$ | Power Supply             |
| 3 | GND      | Ground                   |

#### SOT-23

|   |          |                          |
|---|----------|--------------------------|
| 1 | RST      | Active High Reset Output |
| 2 | $V_{CC}$ | Power Supply             |
| 3 | GND      | Ground                   |

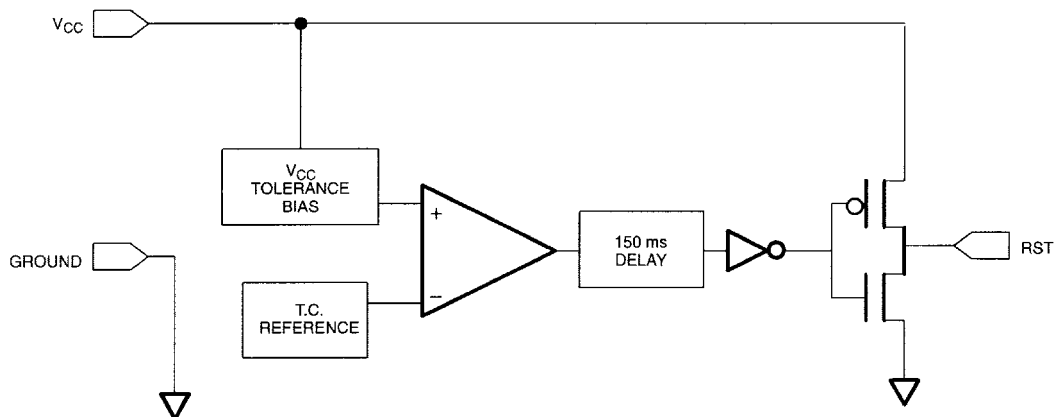
### DESCRIPTION

The DS1812 EconoReset uses a precision temperature reference and comparator circuit to monitor the status of the power supply ( $V_{CC}$ ). When an out-of-tolerance condition is detected, an internal power-fail signal is generated which forces reset to the active state. When  $V_{CC}$  returns to an in-tolerance condition, the reset signal is kept in the active state for approximately 150 ms to allow the power supply and processor to stabilize.

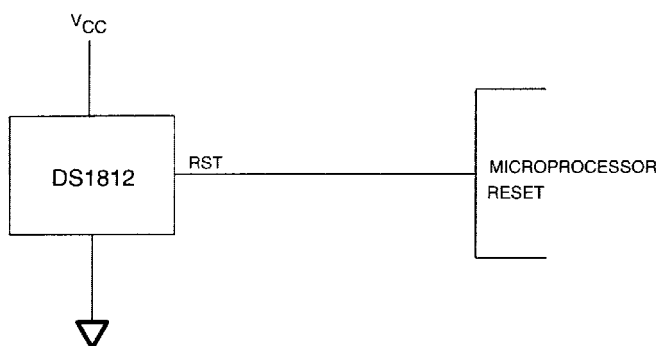
## OPERATION - POWER MONITOR

The DS1812 provides the function of detecting out-of-tolerance power supply conditions and warning a processor-based system of impending power failure. When  $V_{CC}$  is detected as out-of-tolerance, the RST signal is asserted. On power-up, RST is kept active for approximately 150 ms after the power supply has reached the selected tolerance. This allows the power supply and microprocessor to stabilize before RST is released.

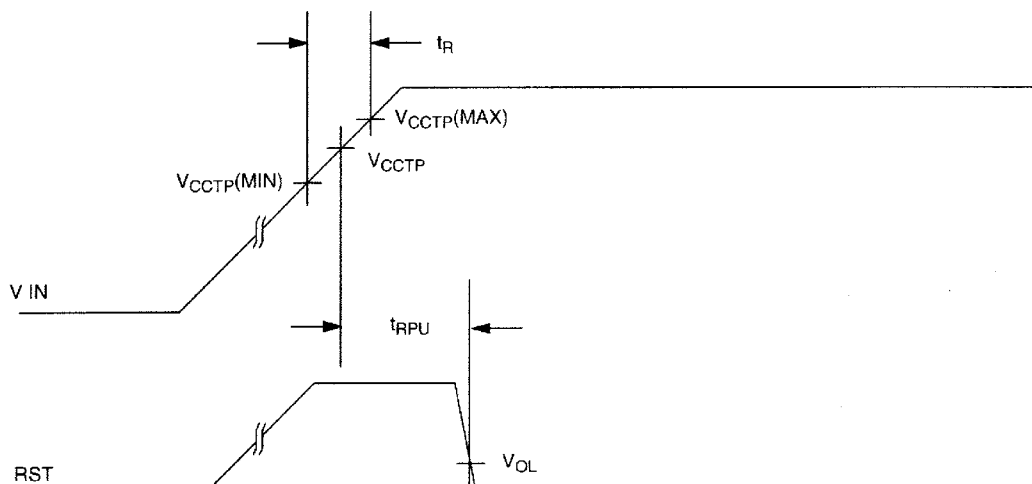
### BLOCK DIAGRAM (CMOS OUTPUT) Figure 1



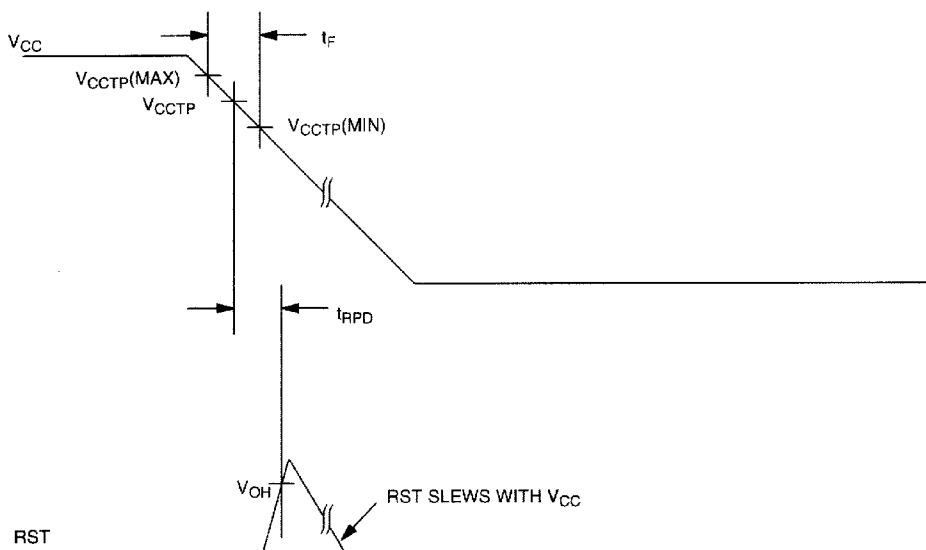
### APPLICATION EXAMPLE Figure 2



# TIMING DIAGRAM: POWER-UP Figure 3



# TIMING DIAGRAM: POWER-DOWN Figure 4



**ABSOLUTE MAXIMUM RATINGS\***

|                                                   |                                |
|---------------------------------------------------|--------------------------------|
| Voltage on V <sub>CC</sub> Pin Relative to Ground | -0.5V to +7.0V                 |
| Voltage on RST Relative to Ground                 | -0.5V to V <sub>CC</sub> +0.5V |
| Operating Temperature                             | -40°C to +85°C                 |
| Storage Temperature                               | -55°C to +125°C                |
| Soldering Temperature                             | 260°C for 10 seconds           |

\* This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

**RECOMMENDED DC OPERATING CONDITIONS** (-40°C to +85°C)

| PARAMETER      | SYMBOL          | MIN | TYP | MAX | UNITS | NOTES |
|----------------|-----------------|-----|-----|-----|-------|-------|
| Supply Voltage | V <sub>CC</sub> | 0.0 |     | 5.5 | V     | 1     |

**DC ELECTRICAL CHARACTERISTICS** (-40°C to +85°C; V<sub>CC</sub>=1.2V to 5.5V)

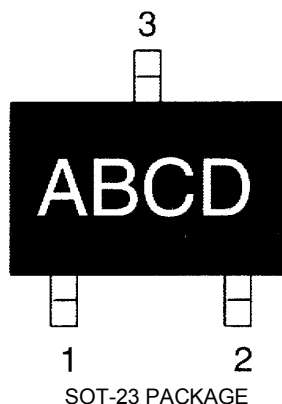
| PARAMETER                               | SYMBOL            | MIN                      | TYP                      | MAX  | UNITS   | NOTES |
|-----------------------------------------|-------------------|--------------------------|--------------------------|------|---------|-------|
| Output Voltage @ 0-500 $\mu$ A          | V <sub>OH</sub>   | V <sub>CC</sub><br>-0.5V | V <sub>CC</sub><br>-0.1V |      | V       | 1     |
| Output Current @ 2.4 volts              | I <sub>OH</sub>   |                          | 350                      |      | $\mu$ A | 2     |
| Output Current @ 0.4 volts              | I <sub>OL</sub>   | +10                      |                          |      | mA      | 2     |
| Operating Current V <sub>CC</sub> < 5.5 | I <sub>CC</sub>   |                          | 30                       | 40   | $\mu$ A | 3     |
| V <sub>CC</sub> Trip Point (DS1812-5)   | V <sub>CCTP</sub> | 4.50                     | 4.62                     | 4.75 | V       | 1     |
| V <sub>CC</sub> Trip Point (DS1812-10)  | V <sub>CCTP</sub> | 4.25                     | 4.35                     | 4.49 | V       | 1     |
| V <sub>CC</sub> Trip Point (DS1812-15)  | V <sub>CCTP</sub> | 4.00                     | 4.13                     | 4.24 | V       | 1     |
| Output Capacitance                      | C <sub>OUT</sub>  |                          |                          | 10   | pF      |       |

**AC ELECTRICAL CHARACTERISTICS** (-40°C to +85°C; V<sub>CC</sub>=1.2V to 5.5V)

| PARAMETER                                                                         | SYMBOL           | MIN | TYP | MAX | UNITS   | NOTES |
|-----------------------------------------------------------------------------------|------------------|-----|-----|-----|---------|-------|
| RESET Active Time                                                                 | t <sub>RST</sub> | 100 | 150 | 300 | ms      |       |
| V <sub>CC</sub> Detect to RST                                                     | t <sub>RPD</sub> |     | 2   | 5   | $\mu$ s |       |
| V <sub>CC</sub> Slew Rate<br>(V <sub>CCTP</sub> (MAX) to V <sub>CCTP</sub> (MIN)) | t <sub>F</sub>   | 300 |     |     | $\mu$ s |       |
| V <sub>CC</sub> Slew Rate<br>(V <sub>CCTP</sub> (MIN) to V <sub>CCTP</sub> (MAX)) | t <sub>R</sub>   | 0   |     |     | ns      |       |
| V <sub>CC</sub> Detect to RST                                                     | t <sub>RPU</sub> | 100 | 150 | 300 | ms      | 4     |

**NOTES:**

1. All voltages are referenced to ground.
2. Measured with  $V_{CC} \geq 2.7$  volts.
3. Measured with RST output open.
4.  $t_R = 5 \mu s$ .

**PART MARKING CODES**

“A”, “B”, & “C” represent the device type.

|     |   |        |
|-----|---|--------|
| 810 | - | DS1810 |
| 811 | - | DS1811 |
| 812 | - | DS1812 |
| 813 | - | DS1813 |
| 815 | - | DS1815 |
| 816 | - | DS1816 |
| 817 | - | DS1817 |
| 818 | - | DS1818 |

“D” represents the device tolerance.

|   |   |     |
|---|---|-----|
| A | - | 5%  |
| B | - | 10% |
| C | - | 15% |
| D | - | 20% |

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