

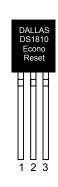
DS1810 5V EconoReset with Push-Pull Output

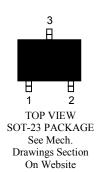
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FEATURES

- 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 output for low current operation
- Operating temperature -40°C to +85°C

PIN ASSIGNMENT







PIN DESCRIPTION

TO-92

1	RST	Active Low Reset Output
2	V_{CC}	Power Supply
3	GND	Ground

SOT-23

1	RST	Active Low Reset Output
2	V_{CC}	Power Supply
3	GND	Ground

DESCRIPTION

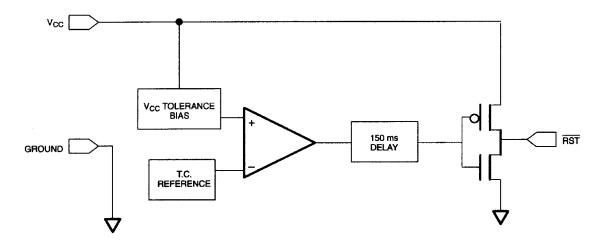
The DS1810 EconoReset uses a precision temperature reference and comparator circuit to monitor the status of the power supply (V_{CC}). When an out-of-tolerance condition is detected, an internal power-fail signal is generated which forces reset to the active state. When V_{CC} returns to an in-tolerance condition, the reset signal is kept in the active state for approximately 150 ms to allow the power supply and processor to stabilize.

1 of 5 041002

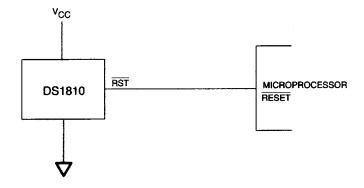
OPERATION - POWER MONITOR

The DS1810 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 \overline{RST} signal is asserted. On power-up, \overline{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 \overline{RST} is released.

BLOCK DIAGRAM (PUSH-PULL OUTPUT) Figure 1



APPLICATION EXAMPLE Figure 2

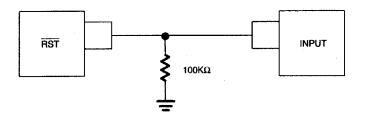


OUTPUT VALID CONDITIONS

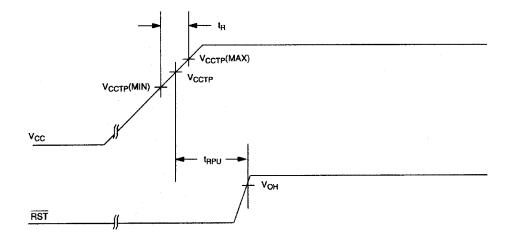
All versions of the DS1810 can maintain a valid output as long as V_{CC} remains above 1.2 volt. However, the \overline{RST} outputs on the DS1810 use a push-pull structure which can maintain a valid output below 1.2 volts on an input. To sink current below 1.2 volts, a resistor can be connected from \overline{RST} to Ground (see Figure 3). This arrangement will maintain a valid value on the \overline{RST} outputs even it V_{CC} approaches 0 volts. During both power-up and -down this arrangement will draw current when \overline{RST} is in the high state. A value of about 100 kg should be adequate to maintain a valid condition.

APPLICATION DIAGRAM:

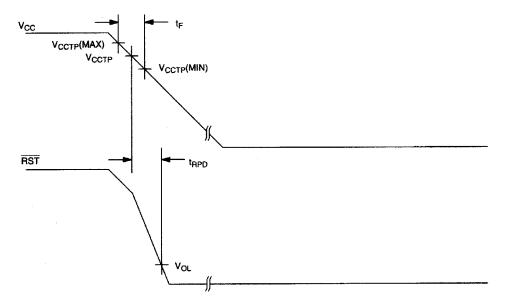
RST VALID TO 0 VOLTS VCC ON THE DS1810 Figure 3



TIMING DIAGRAM: POWER-UP Figure 4



TIMING DIAGRAM: POWER-DOWN Figure 5



ABSOLUTE MAXIMUM RATINGS*

 $\begin{array}{lll} \mbox{Voltage on V_{CC} Pin Relative to Ground} & -0.5 \mbox{V to } +7.0 \mbox{V} \\ \mbox{Voltage on RST} & \mbox{Relative to Ground} & -0.5 \mbox{V to } \mbox{V}_{CC} +0.5 \mbox{V} \\ \mbox{Operating Temperature} & -40 \mbox{°C to } +85 \mbox{°C} \\ \mbox{Storage Temperature} & -55 \mbox{°C to } +125 \mbox{°C} \\ \mbox{Soldering Temperature} & 260 \mbox{°C for } 10 \mbox{ seconds} \\ \end{array}$

RECOMMENDED DC OPERATING CONDITIONS

 $(-40^{\circ}C \text{ to } +85^{\circ}C)$

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Supply Voltage	V_{CC}	1.2		5.5	V	1

DC ELECTRICAL CHARACTERISTICS (-40°C to +85°C; V_{CC} =1.2V to 5.5V)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Output Voltage @ 0-500 μA	V_{OH}	V_{CC} -0.5 V	V _{CC} -0.1V		V	1
Output Current @ 2.4V	I_{OH}		350		μΑ	2
Output Current @ 0.4V	I_{OL}	+10			mA	2
Operating Current V _{CC} < 5.5	I_{CC}		30	40	μΑ	3
V _{CC} Trip Point (DS1810-5)	V_{CCTP}	4.50	4.62	4.75	V	1
V _{CC} Trip Point (DS1810-10)	V_{CCTP}	4.25	4.37	4.49	V	1
V _{CC} Trip Point (DS1810-15)	V_{CCTP}	4.00	4.12	4.24	V	1
Output Capacitance	C_{OUT}			10	pF	

AC ELECTRICAL CHARACTERISTICS (-40°C to +85°C; V_{CC} =1.2V to 5.5V)

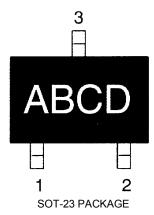
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
RESET Active Time	t_{RST}	100	150	300	ms	
V _{CC} Detect to RST	$t_{ m RPD}$		2	5	μs	
V _{CC} Slew Rate	t_{F}	300			μs	
$(V_{CCTP} (MAX) \text{ to } V_{CCTP} (MIN))$						
V _{CC} Slew Rate	t_R	0			ns	
$(V_{CCTP} (MIN) \text{ to } V_{CCTP} (MAX))$						
V _{CC} Detect to RST	$t_{ m RPU}$	100	150	300	ms	4

^{*} 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.

NOTES:

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

PART MARKING CODES



"A", "B", &"C" represent the device type.

810
811
812
813
815
816
817
818

"D" represents the device tolerance.

_		
Α	-	5%
В	-	10%
\mathbf{C}	-	15%
D	-	20%