3-pin microprocessor resets
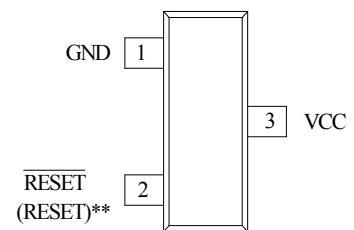
The ADV809 and ADV810 are cost–effective system supervisorcircuits designed to monitor VCC in digital systems and provide a resetsignal to the host processor when necessary. No external componentsare required.The reset output is driven active within 20 sec of VCC fallingthrough the reset voltage threshold. Reset is maintained active for aminimum of 140msec after VCC rises above the reset threshold.

TheADV810 has an active–high RESET output while the ADV809 hasan active–low $\overline{\text{RESET}}$ output. The output of the ADV809 isguaranteed valid down to VCC = 1V. Both devices are available in aSOT–23 package.

The ADV809/810 are optimized to reject fast transient glitches on

Features

♦ Precision V_{CC} Monitor for 3.0V, 3.3V, and 5.0V Supplies

♦ 140msec Guaranteed Minimum $\overline{\text{RESET}}$, RESET Output Duration

♦ $\overline{\text{RESET}}$ Output Guaranteed to V_{CC} = 1.0V (MAX809)

♦ Low 17µA Supply Current

♦ V_{CC} Transient Immunity

♦ Small SOT–23 Package

♦ No External Components

♦ Wide Operating Temperature: –40°C to 85°C

Typical Applications

♦ Computers

♦ Embedded Systems

♦ Battery Powered Equipment

♦ Critical µP Power Supply Monitoring

TYPICAL APPLICATION DIAGRAM

SOT–23

SOT–23 ∗

NOTE:*SOT–23 is equivalent to JEDEC (TO–236)
** $\overline{\text{RESET}}$ is for ADV809
** RESET is for ADV810

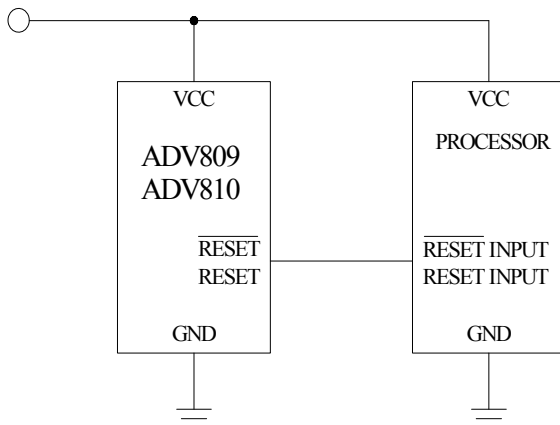### ORDERING INFORMATION

Device	Package	Shipping
ADV809xTR	SOT–23	3000 Tape/Reel
ADV810xTR	SOT–23	3000 Tape/Reel

NOTE: The "x" denotes a suffix for VCC threshold – see table below

Suffix	Reset VCC Threshold (V)
L	4.63
M	4.38
J*	4.00
T	3.08
S	2.93
R	2.63

NOTE: *J version is available for ADV809 only

Absolute Maximum Ratings

Pin Terminal Voltage with Respect to Ground

V_{CC} . . . . –0.3V to 6.0V
RESET, $\overline{RESET}$ . . . . –0.3V to (V_{CC} + 0.3V)
Input Current at V_{CC} 20mA
Output Current: RESET, $\overline{RESET}$ 20mA
Rate of Rise at V_{CC} 100V/µs

Power Dissipation (T_A= 70°C) 320mW
(Derate 4mW/°C above 70°C)
Operating Temperature Range . . . . . –40°C to 105°C
Storage Temperature Range . . . . –65°C to 160°C
Lead Temperature (soldering, 10 sec) . . . . . 300°C

These are stress ratings only and functional operation is not ADVlied.Exposure to absolute maximum ratings for prolonged time periods mayaffect device reliability

Electrical Characteristics

Unless otherwise noted V_{CC} is over the full voltage range, T_A = –40°C to 105°C.
Typical values at T_A = 25°C, V_{CC} = 5V for L/M/J devices, V_{CC} = 3.3V for T/S devices and V_{CC} = 3V for R devices.

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Input Voltage (V_{CC}) Range	V_{CC}	T_A = 0°C to 70°C		1.1		5.5	V
		T_A = −40°C to 105°C		1.2		5.5	
Supply Current	I_{CC}	T_A = −40°C to 85°C	V_{CC} < 5.5V, L/M/J		9	15	µA
		T_A = −40°C to 85°C	V_{CC} < 3.6V, R/S/T		6	10	
		T_A = 85°C to 105°C	V_{CC} < 5.5V, L/M/J			25	
		T_A = 85°C to 105°C	V_{CC} < 3.6V, R/S/T			20	
Reset Threshold	V_{TH}	L devices	T_A = 25°C	4.56	4.63	4.70	V
			T_A = −40°C to 85°C	4.50		4.75	
			T_A = 85°C to 105°C	4.40		4.86	
		M devices	T_A = 25°C	4.31	4.38	4.45	
			T_A = −40°C to 85°C	4.25		4.50	
			T_A = 85°C to 105°C	4.16		4.56	
		J devices	T_A = 25°C	3.93	4.00	4.06	
			T_A = −40°C to 85°C	3.89		4.10	
			T_A = 85°C to 105°C	3.80		4.20	
		T devices	T_A = 25°C	3.04	3.08	3.11	
			T_A = −40°C to 85°C	3.00		3.15	
			T_A = 85°C to 105°C	2.92		3.23	
		S devices	T_A = 25°C	2.89	2.93	2.96	
			T_A = −40°C to 85°C	2.85		3.00	
			T_A = 85°C to 105°C	2.78		3.08	
		R devices	T_A = 25°C	2.59	2.63	2.66	
			T_A = −40°C to 85°C	2.55		2.70	
			T_A = 85°C to 105°C	2.50		2.76	
Reset Threshold Stability					30		ppm/°C
V_{CC} to Reset Delay		V_{CC} = V_{TH} to V_{TH} - 100mV			20		µs
Reset Active Timeout Period	V_{OL}	T_A = −40°C to 85°C		140	240	560	ms
		T_A = 85°C to 105°C		100		840	ms
Low $\overline{RESET}$ Output Voltage (ADV809)	V_{OL}	V_{CC} = V_{TH} min., I_{SINK} = 1.2mA, ADV809R/S/T				0.3	V
		V_{CC} = V_{TH} min., I_{SINK} = 3.2mA, ADV809L/M/J				0.4	
		V_{CC} > 1.1V, I_{SINK} = 50µA				0.3	
High $\overline{RESET}$ Output Voltage (ADV809)	V_{OH}	V_{CC} > V_{TH} max., I_{SOURCE} = 500µA, ADV809R/S/T		0.8V_{CC}			V
		V_{CC} > V_{TH} max., I_{SOURCE} =800µA, ADV809R/M/J		V_{CC} -1.5			
Low RESET Output Voltage (ADV810)	V_{OL}	V_{CC} = V_{TH} max., I_{SINK} = 1.2mA,ADV810R/S/T				0.3	V
		V_{CC} = V_{TH} max., I_{SINK} = 3.2mA, ADV810L/M/J				0.4	
High RESET Output Voltage (ADV810)	V_{OH}	1.8V < V_{CC} < V_{TH} min., I_{SOURCE} = 150µA		0.8V_{CC}			V

Notes: 1. Production testing done at T_A = 25°C. Over-temperature specifications guaranteed by design only.
2. RESET output is active LOW for the ADV809 and RESET output is active HIGH for the ADV810

Pin Descriptions

Pin Number	Name	Function
1	GND	Ground
2 (ADV809)	$\overline{\text{RESET}}$	RESET is asserted LOW if Vcc falls below the reset threshold and remains LOW for the 240ms typical reset timeout period (140ms minimum) after Vcc exceeds the threshold.
2 (ADV810)	RESET	RESET is asserted HIGH if Vcc falls below the reset threshold and remains HIGH for the 240ms typical reset timeout period (140ms minimum) after Vcc exceeds the threshold.
3	Vcc	Power supply input voltage (3.0V, 3.3V, 5.0V)

Detailed Descriptions

Reset Timing

The reset signal is asserted–LOW for the ADV809 and HIGH for the ADV810–when the Vcc signal falls below the threshold trip voltage and remains asserted for 140ms minimum after the Vcc has risen above the threshold.
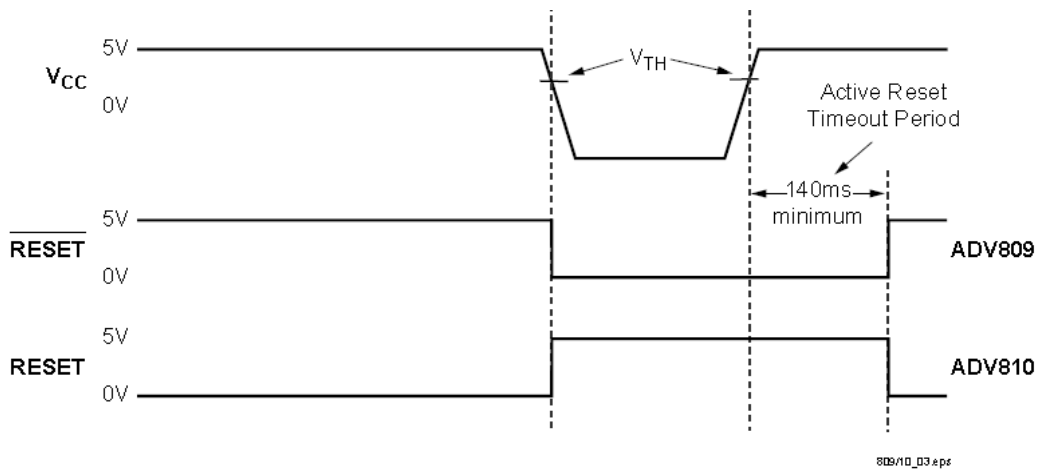
Figure 1. Reset Timing Diagram

Application Information

Negative Vcc Transients

The ADV809/810 protect µPs from brownouts and low Vcc. Short duration transients of 100mV amplitude and 20µs or less duration typically do not cause a false RESET

Valid Reset with Vcc under 1.1V

To ensure logic inputs connected to the ADV809 RESET pin are in a known state when Vcc is under 1.1V, a 100k⎮ pull-down resistor at RESET is needed. The value is not critical. A ull-up resistor to Vcc is needed with the ADV810.
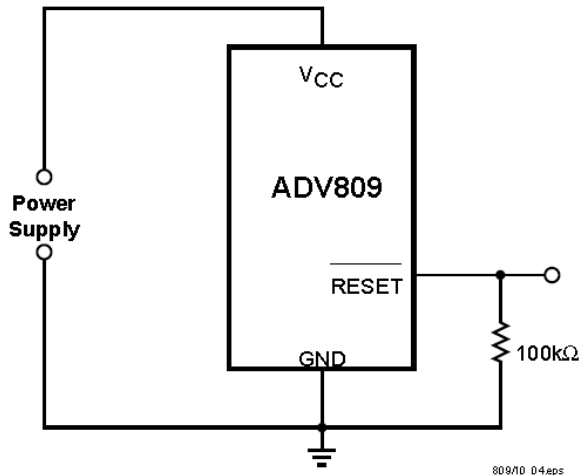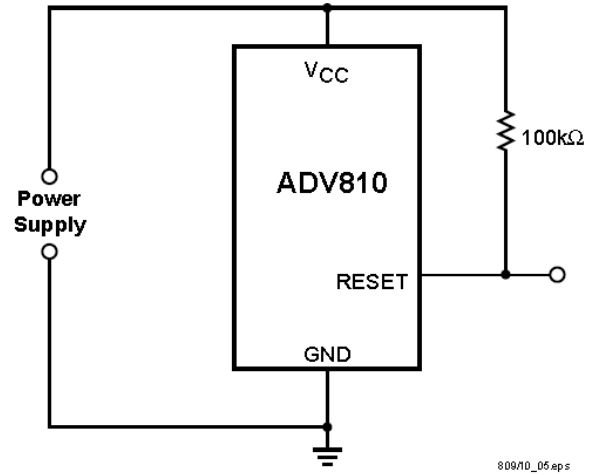

Figure 2. RESET Valid with V_{CC} Under 1.1V

Figure 3. RESET Valid with V_{CC} Under 1.1V

Bi-directional Reset Pin Interfacing

The ADV809/810 can interface with µP/µC bi-directional reset pins by connecting a 4.7k⎮ resistor in series with the ADV809/810 reset output and the µP/µC bi-directional reset pin.
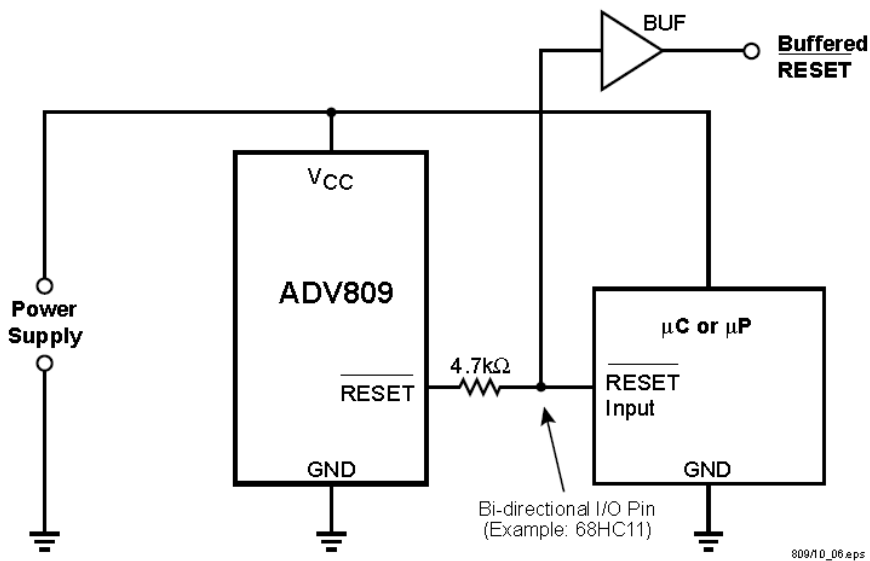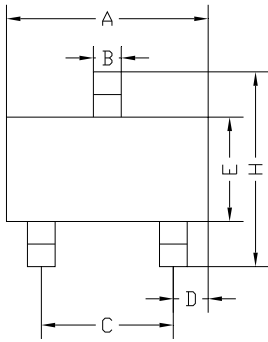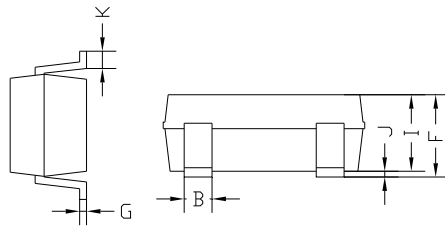

Figure 4. Bi-directional Reset Pin Interfacing

Package Dimensions

SOT-23 Mechanical drawing

1.Top View   2.Side View

SOT-23 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.77	3.03	0.109	0.119
B	0.35	0.45	0.014	0.018
C	1.77	2.03	0.070	0.080
D	0.51	0.61	0.020	0.024
E	1.5	1.65	0.059	0.065
F	1.00	1.20	0.039	0.047
G	0.135	0.185	0.005	0.007
H	2.20	3.00	0.087	0.118
I	1.00	1.20	0.039	0.047
J	0	0.1	0	0.004
K	0.25		0.001	