

ADM1810–ADM1813/ADM1815–ADM1818

FEATURES

Reliable Low-Cost Voltage Monitor with Reset Output Supports Monitoring of Supplies Within 5%, 10%, 15%, and 20% Tolerances

Active High and Low Push-Pull Output Choices (ADM1810, ADM1812, ADM1815, and ADM1817)

Open Drain Output Choices (ADM1811, ADM1813, ADM1816, and ADM1818)

Can Be Used with a Manual Push Button to Generate a Reset (ADM1813, ADM1818)

Initialize Microprocessor Systems with Added Safety

APPLICATIONS

Microprocessor Systems

Computers

Controllers

Intelligent Instruments

Automotive Systems

GENERAL DESCRIPTION

The ADM181x range of voltage monitoring circuits can be used in any application where an electronic system needs to be reset when a voltage increases above or below a predetermined value.

Because of the “reset delay time” incorporated into the ADM181x series, these devices can provide a safe startup for electronic systems. Before a system initializes, the power supply must stabilize. Using the ADM181x series ensures that there are typically 150 ms for the power supply to stabilize before the system is reset and safe system initialization begins.

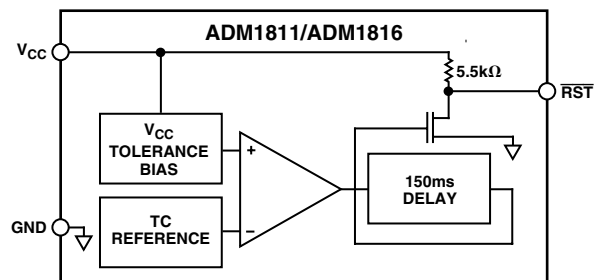
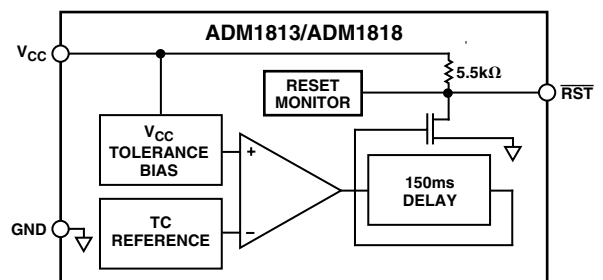
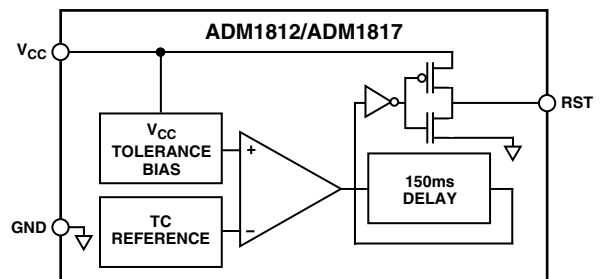
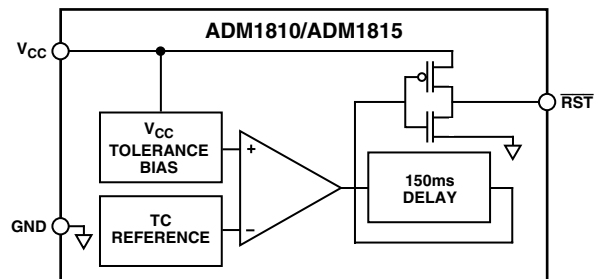
The ADM181x series of microprocessor reset circuits are available in low-cost, space-saving SOT-23 packages.

Table I. ADM1810–ADM1813/ADM1815–ADM1818 Features

	V _{CC} Nominal 5 V/3.3 V	Push- Pull/ Open- Drain*	Reset Active State	Manual Reset	Available Trip- Points (Given as % below Nominal V _{CC})
ADM1810	5 V	PP	Low	N	5%, 10%
ADM1811	5 V	OD	Low	N	5%, 10%
ADM1812	5 V	PP	High	N	5%, 10%
ADM1813	5 V	OD	Low	Y	5%, 10%
ADM1815	3.3 V	PP	Low	N	20%
ADM1816	3.3 V	OD	Low	N	20%
ADM1817	3.3 V	PP	High	N	20%
ADM1818	3.3 V	OD	Low	Y	10%, 20%

*Open drain with internal pull-up

FUNCTIONAL BLOCK DIAGRAMS



REV. A

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ADM1810–ADM1813/ADM1815–ADM1818–SPECIFICATIONS

($T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ unless otherwise noted.)

Parameter	Conditions/Note	Min	Typ	Max	Unit
SUPPLY Voltage Current	(ADM1810/ADM1811/ADM1813) $V_{CC} < 5.5\text{ V}$, $\overline{\text{RST}}$ Output Open (ADM1812) $V_{CC} < 5.5\text{ V}$ (ADM1815/ADM1816/ADM1817/ADM1818) $V_{CC} < 5.5\text{ V}$, $\overline{\text{RST}}$ Output Open	1.2	30	5.5 40	V μA
OUTPUT CURRENT	@ 0.4 V, $V_{CC} \geq 2.7\text{ V}^*$ (ADM1810/ADM1812/ADM1815/ADM1817) @ 2.4 V, $V_{CC} \geq 2.7\text{ V}$	8	350		mA μA
OUTPUT VOLTAGE	(ADM1810/ADM1812/ADM1815/ADM1817) @ 0 μA to 500 μA	$V_{CC} - 0.5$	$V_{CC} - 0.1$		V
V_{CC} TRIP-POINT ADM1810–5, ADM1810–10, ADM1811–5, ADM1812–5, ADM1813–5 ADM1811–10, ADM1812–10, ADM1813–10 ADM1818–10 ADM1815–20, ADM1816–20, ADM1817–20, ADM1818–20		4.50 4.25 2.80	4.62 4.35 2.88	4.75 4.49 2.97	V V V
INTERNAL PULL-UP RESISTOR ADM1811/ADM1813/ADM1816/ADM1818		3.5	5.5	7.5	k Ω
OUTPUT CAPACITANCE				10	pF
RESET ACTIVE TIME		100	150	300	ms
V_{CC} DETECT TO $\overline{\text{RST}}$ Falling Rising	(ADM1810/ADM1811/ADM1812/ADM1813) (ADM1815/ADM1816/ADM1817/ADM1818) $t_R = 5\ \mu\text{s}$		5 7	10 15	μs μs
PUSH-BUTTON DETECT TO $\overline{\text{RST}}$	(ADM1813/ADM1818)	1			μs
PUSH-BUTTON RESET	(ADM1818) $2.7\text{ V} \leq V_{CC} \leq 3.3\text{ V}$ (ADM1813)	100 100	150 150	300 300	ms ms

*For ADM181x-20, $V_{CC} = V_{CCTP}$, sink current reduces to 8 mA.

Specifications subject to change without notice.

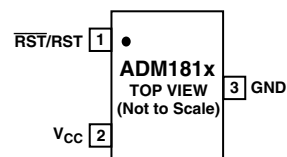
ADM1810–ADM1813/ADM1815–ADM1818

ABSOLUTE MAXIMUM RATINGS

(T_A = 25°C unless otherwise noted.)

V _{CC}	1.2 V to 5.5 V
Input Current	40 μA
Operating Temperature Range	–40°C to +85°C
Power Dissipation, RT-3 (SOT-23)	320 mW
Derate by 4 mW/°C Above 70°C	
θ _{JA} Thermal Impedance	333°C/W
Lead Temperature (Soldering, 10 sec)	300°C
Vapor Phase (60 sec)	215°C
Infrared (15 sec)	220°C
Storage Temperature Range	–65°C to +150°C
ESD Rating	3 kV

PIN CONFIGURATION



PIN FUNCTION DESCRIPTIONS

Pin	Mnemonic	Function
1	RST/RST	Reset Output. $\overline{\text{RST}}/\text{RST}$ remains active while V _{CC} is below the reset threshold, and remains active for 150 ms (typ) after V _{CC} rises above the reset threshold.
2	V _{CC}	Supply Voltage Being Monitored
3	GND	0 V. Ground Reference for All Signals.

ORDERING GUIDE

Model*	Trip-Point	Package Option	Brand Information
ADM1810-5ART-REEL	4.62 V	RT-3 (SOT-23)	MZV
ADM1810-5ART-RL7	4.62 V	RT-3 (SOT-23)	MZV
ADM1810-10ART-REEL	4.35 V	RT-3 (SOT-23)	MZT
ADM1810-10ART-RL7	4.35 V	RT-3 (SOT-23)	MZT
ADM1811-5ART-REEL	4.62 V	RT-3 (SOT-23)	M1V
ADM1811-5ART-RL7	4.62 V	RT-3 (SOT-23)	M1V
ADM1811-10ART-REEL	4.35 V	RT-3 (SOT-23)	M1T
ADM1811-10ART-RL7	4.35 V	RT-3 (SOT-23)	M1T
ADM1812-5ART-REEL	4.62 V	RT-3 (SOT-23)	MTV
ADM1812-5ART-RL7	4.62 V	RT-3 (SOT-23)	MTV
ADM1812-10ART-REEL	4.35 V	RT-3 (SOT-23)	MTT
ADM1812-10ART-RL7	4.35 V	RT-3 (SOT-23)	MTT
ADM1813-5ART-REEL	4.62 V	RT-3 (SOT-23)	M3V
ADM1813-5ART-RL7	4.62 V	RT-3 (SOT-23)	M3V
ADM1813-10ART-REEL	4.35 V	RT-3 (SOT-23)	M3T
ADM1813-10ART-RL7	4.35 V	RT-3 (SOT-23)	M3T
ADM1815-20ART-REEL	2.55 V	RT-3 (SOT-23)	M5A
ADM1815-20ART-RL7	2.55 V	RT-3 (SOT-23)	M5A
ADM1816-20ART-REEL	2.55 V	RT-3 (SOT-23)	M6A
ADM1816-20ART-RL7	2.55 V	RT-3 (SOT-23)	M6A
ADM1817-20ART-REEL	2.55 V	RT-3 (SOT-23)	M7A
ADM1817-20ART-RL7	2.55 V	RT-3 (SOT-23)	M7A
ADM1818-10ART-REEL	2.88 V	RT-3 (SOT-23)	M8E
ADM1818-10ART-RL7	2.88 V	RT-3 (SOT-23)	M8E
ADM1818-20ART-REEL	2.55 V	RT-3 (SOT-23)	M8A
ADM1818-20ART-RL7	2.55 V	RT-3 (SOT-23)	M8A

RL7 or REEL7 are in reels of 3,000 parts. REEL are in reels of 10,000 parts.

All models in bold are ex-stock. Consult factory for availability.

*Only available in reels.

CAUTION

ESD (electrostatic discharge) sensitive device. Electrostatic charges as high as 4000 V readily accumulate on the human body and test equipment and can discharge without detection. Although the ADM1810–ADM1813/ADM1815–ADM1818 features proprietary ESD protection circuitry, permanent damage may occur on devices subjected to high-energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.



ADM1810–ADM1813/ADM1815–ADM1818

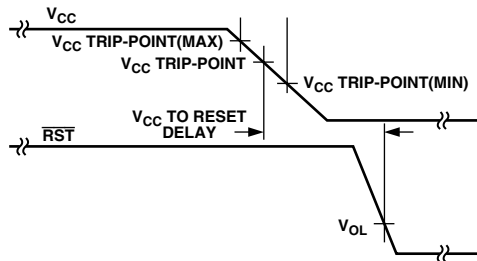


Figure 1. Power-Down Timing Diagram

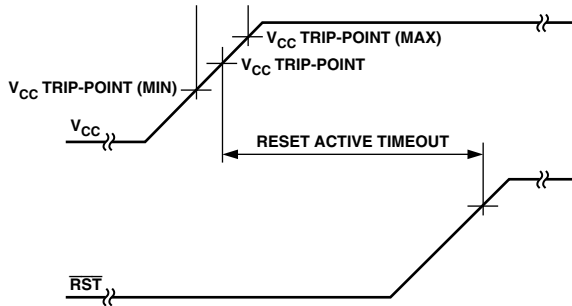


Figure 2. Power-Up Timing Diagram

ADM1813 AND ADM1818

The ADM1813 and ADM1818 are low-cost voltage monitoring devices featuring an open drain output and optional push-button reset function.

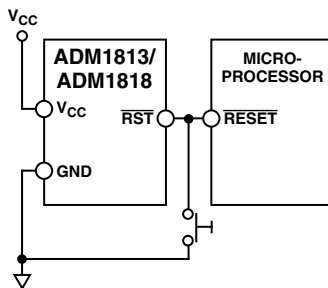


Figure 3. ADM1813/ADM1818 Typical Application

An optional push-button reset switch can be connected between $\overline{\text{RST}}$ and ground. Pressing this switch will pull the reset output low. If the push-button reset button pulls the $\overline{\text{RST}}$ output low for a period greater than 1 μs , then, when the reset button releases the $\overline{\text{RST}}$ line to float high, the $\overline{\text{RST}}$ line will stay low for a further 150 ms typical.

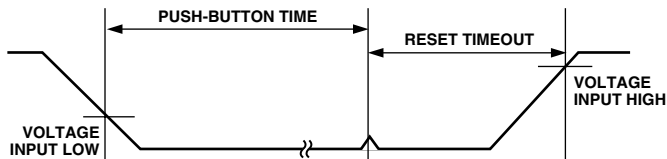


Figure 4. Push-Button Reset Timing Diagram

The ADM1818 range has options that allow the user to monitor 3.3 V supplies with 10% and 20% tolerance options; the ADM1813 range has options that allow the user to monitor 5 V supplies with 5% and 10% tolerance options.

ADM1810, ADM1812, ADM1815, AND ADM1817

The ADM1812 is a 5 V low-cost voltage monitor with an active high push-pull output. The ADM1812 supports a 5% or 10% tolerance. The ADM1810 is similar to the ADM1812, except that the ADM1810 has an active low push-pull output.

The ADM1817 is a 3.3 V voltage monitor with an active high push-pull output. The ADM1817 supports a 20% tolerance. The ADM1815 is similar to the ADM1817, except that the ADM1815 has an active low push-pull output.

The ADM1810/ADM1812/ADM1815/ADM1817 can be connected directly to most microprocessor reset inputs without the need for external components.

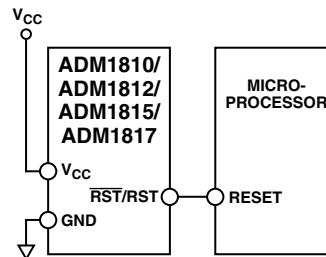


Figure 5. ADM1810/ADM1812/ADM1815/ADM1817 Typical Application

ADM1811 AND ADM1816

The ADM1811 is a low-cost voltage monitor with an open drain output. The ADM1811 is designed to monitor 5 V supplies. The ADM1811 range comes in two different variants that allow the monitoring of a 5 V supply with a tolerance of 5% or 10%. The ADM1816 is a 3.3 V version of the ADM1811 and supports a 20% tolerance option.

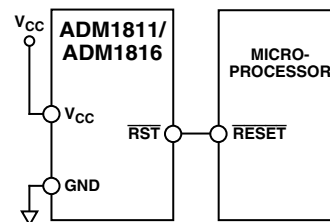


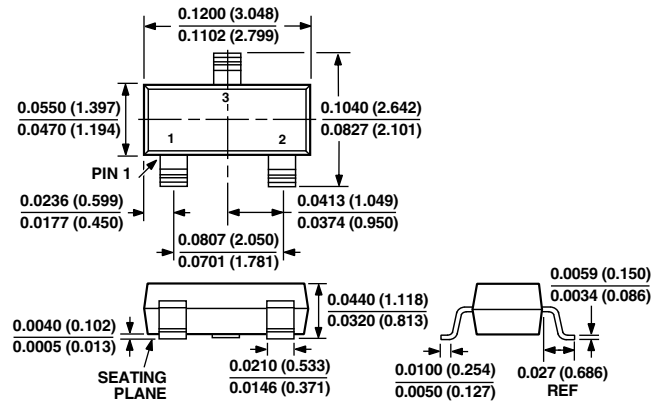
Figure 6. ADM1811/ADM1816 Typical Application

ADM1810-ADM1813/ADM1815-ADM1818

OUTLINE DIMENSIONS

Dimensions shown in inches and (mm).

3-Lead Plastic Surface-Mount Package (SOT-23) (RT-3)



ADM1810–ADM1813/ADM1815–ADM1818

Revision History

Location	Page
Data Sheet changed from REV. A to REV. A.	
Addition of Table I	1
Edits to ORDERING GUIDE	3
Addition of new text to ADM1813 and ADM1818 section	4

