



November 2003

ASM1233A

rev 1.0

Low Power, 3.3V, μ P Reset, Active LOW, Open-Drain Output

General Description

The ASM1233A is a voltage supervisor with low-power, 3.3V μ P Reset, with an active LOW, open-drain output. Maximum supply current over temperature is a low 15 μ A.

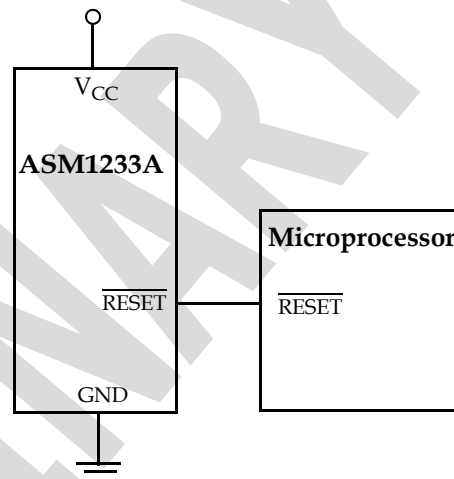
The ASM1233A generates an active LOW reset signal whenever the monitored supply is out of tolerance. A precision reference and comparator circuit monitor power supply (V_{CC}) level. The tolerance is 15% for the 3.3V, ASM1233A. When an out-of-tolerance condition is detected, an internal power-fail signal is generated which forces an active LOW reset signal. After V_{CC} returns to an in-tolerance condition, the reset signal remains active for 350ms to allow the power supply and system microprocessor to stabilize.

The ASM1233A is designed with an open-drain output stage and operates over the extended industrial temperature range. Devices are available in compact SOT-223 packages.

Other low power products in this family include the ASM1810/11/12/15/16/17, ASM1233D, and ASM1233M

- Embedded control systems
- Printers
- Single board computers

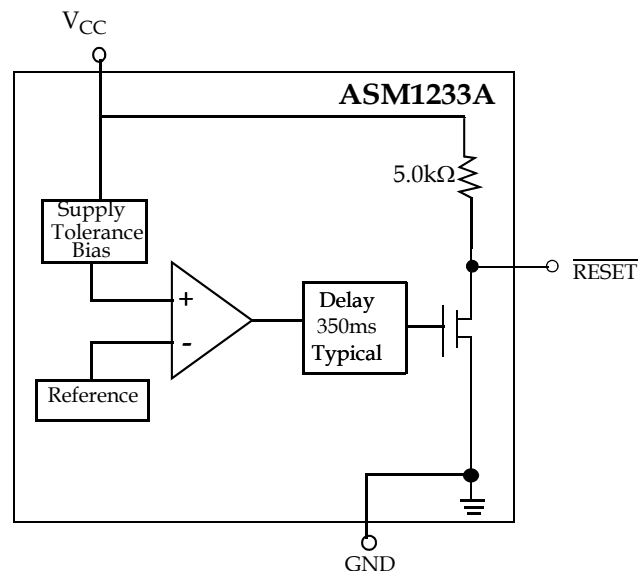
Typical Operating Circuit



Key Features

- Low Supply Current
 - 15 μ A maximum (3.6 V)
- Automatically restarts a microprocessor after power failure
- 350ms reset delay after V_{CC} returns to an in-tolerance condition
- Active LOW power-up reset, 5k Ω internal pull-up
- Precision temperature-compensated voltage reference and comparator
- Eliminates external components
- Low-cost SOT-223 package
- Operating temperature -40 $^{\circ}$ C to +85 $^{\circ}$ C

Block Diagram



Applications

- Set-top boxes
- Cellular phones
- PDAs
- Energy management systems

Alliance Semiconductor

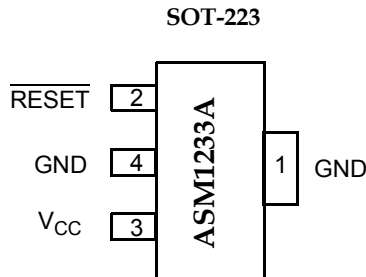
2575 Augustine Drive . Santa Clara, CA 95054 . Tel: 408.855.4900 . Fax: 408.855.4999 . www.alsc.com

Notice: The information in this document is subject to change without notice



rev 1.0

Pin Configuration



Pin Description

Pin#	Pin Name	Description
1	GND	Ground.
2	$\overline{\text{RESET}}$	Active LOW reset output.
3	V_{CC}	Power supply input.
4	GND	Ground.



rev 1.0

Application Information

Operation - Power Monitor

The ASM1233A detects out-of-tolerance power supply conditions. It resets a processor during power-up, power-down and generates a reset to the system processor when the monitored power supply voltage is below the reset threshold. When an out-of-tolerance V_{CC} voltage is detected, the $\overline{\text{RESET}}$ signal is asserted. On power-up, $\overline{\text{RESET}}$ is kept active (LOW) for approximately 350ms after the power supply voltage has reached the selected tolerance. This allows the power supply and microprocessor to stabilize before $\overline{\text{RESET}}$ is released.

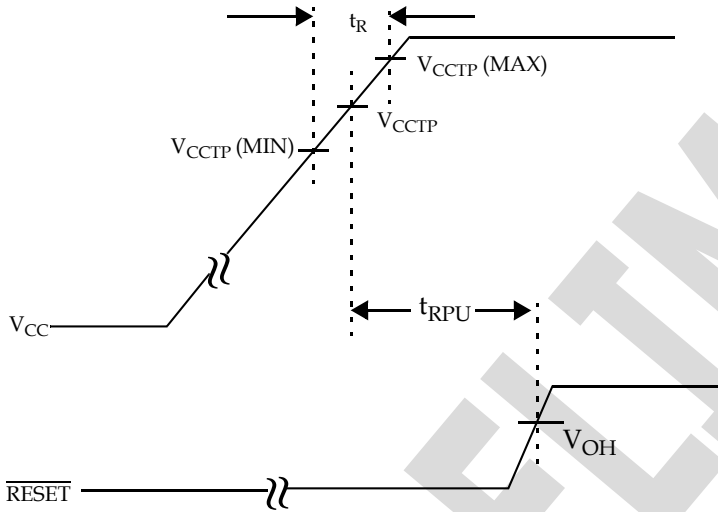


Figure 1: Timing Diagram: Power-Up

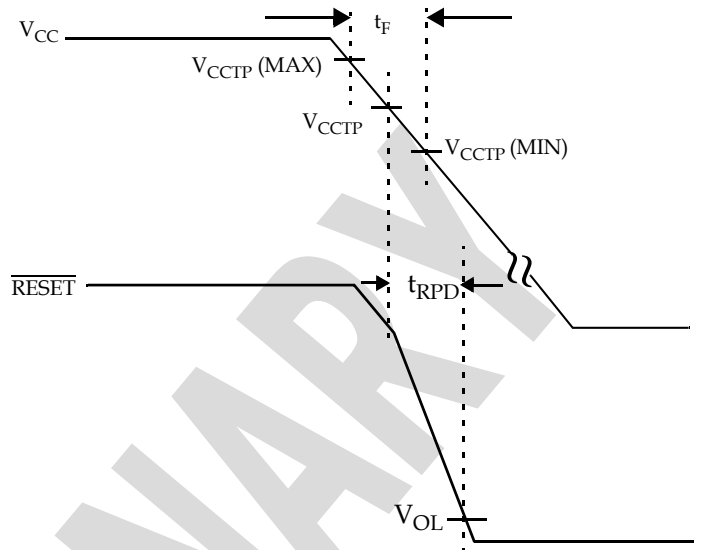


Figure 2: Timing Diagram: Power-Down



rev 1.0

Absolute Maximum Ratings

Parameter	Min	Max	Unit
Voltage on V_{CC}	-0.5	7	V
Voltage on \overline{RESET}	-0.5	$V_{CC} + 0.5$	V
Operating Temperature Range	-40	85	°C
Soldering Temperature (for 10 sec)		260	°C
Storage Temperature	-55	125	°C

NOTE: These are stress ratings only and functional use is not implied. Exposure to absolute maximum ratings for prolonged periods of time may affect device reliability.



rev 1.0

Electrical Characteristics

Unless otherwise noted, $V_{CC} = 1.2V$ to $5.5V$ and specifications are over the operating temperature range of $-40^{\circ}C$ to $+85^{\circ}C$.

All voltages are referenced to ground.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Supply Voltage	V_{CC}		1.2		5.5	V
Output Voltage	V_{OH}	$I_{OUT} < 500 \mu A$	$V_{CC} - 0.5V$	$V_{CC} - 0.1V$		V
Output Current	I_{OL}	Output = 0.4V, $V_{CC} \geq 2.7V$	+8			mA
Operating Current	I_{CC}	$V_{CC} < 3.6V$, \overline{RESET} output open		6	15	μA
V_{CC} Trip Point (ASM1233A-3)	V_{CCTP}		2.64	2.72	2.8	V
Voltage High Trip Level ASM1233A-3	V_{HTL}				3.14	V
Internal Pull-up Resistor	R_P		3.5	5.0	7.5	$k\Omega$
Output Capacitance	C_{OUT}				10	pF
V_{CC} Detect to \overline{RESET} Low	t_{RPD}			2	10	μs
V_{CC} Slew Rate ($V_{HTL} - V_{LTL}$)	t_F		300			μs
V_{CC} Slew Rate ($V_{LTL} - V_{HTL}$)	t_R		0			ns
V_{CC} Detect to \overline{RESET} High	t_{RPU}	$t_r = 5\mu s$	200	350	500	ms

Note: A $1k\Omega$ resistor maybe required in some applications for proper operation of the microprocessor reset control circuit.



rev 1.0

Family Selection Guide

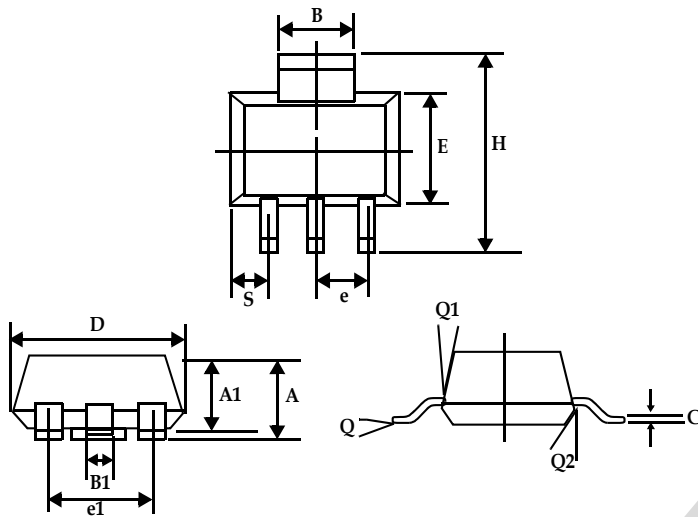
Part #	RESET Voltage (V)	RESET Time (ms)	Output Stage	RESET Polarity
ASM1810	4.620, 4.370, 4.120	150	Push-Pull	LOW
ASM1811	4.620, 4.350, 4.130	150	Open-Drain	LOW
ASM1812	4.620, 4.350, 4.130	150	Push-Pull	HIGH
ASM1815	3.060, 2.880, 2.550	150	Push-Pull	LOW
ASM1816	3.060, 2.880, 2.550	150	Open-Drain	LOW
ASM1817	3.060, 2.880, 2.550	150	Push-Pull	HIGH
ASM1233D	4.625, 4.375, 4.125	350	Open-Drain	LOW
ASM1233M	4.625, 4.375, 2.720	350	Open-Drain	LOW
ASM1233A	2.720	350	Open-Drain	LOW



rev 1.0

Package Information

SOT-223



Symbol	Dimensions in millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.067	0.060	1.70	1.50
A1	0.004	0.0008	0.10	0.02
B	0.124	0.116	3.15	2.95
B1	0.033	0.026	0.85	0.65
C	0.014	0.010	0.35	0.25
D	0.264	0.248	6.70	6.30
e	0.0905 NOM		2.30 NOM	
e1	0.181 NOM		4.50 NOM	
E	0.146	0.130	3.70	3.30
h	0.287	0.264	7.30	6.70
s	0.041	0.033	1.05	0.85
Q	10 ° MAX		10 ° MAX	
Q1	16°	10°	16°	10°
Q2	16°	10°	16°	10°



rev 1.0

Ordering Information

Part Number	RESET Output Voltage	RESET Tolerance	RESET Time	Open-Drain Output Stage*	RESET Polarity
ASM1233AZ-15	2.720 V	15%	350 ms	◆	LOW

* Internal 5kΩ resistor pull-up

PRELIMINARY



ASM1233A



Alliance Semiconductor Corporation
2575, Augustine Drive,
Santa Clara, CA 95054
Tel: 408 - 855 - 4900
Fax: 408 - 855 - 4999
www.alsc.com

Copyright © Alliance Semiconductor
All Rights Reserved
Preliminary Information
Part Number: ASM1233A
Document Version: 1.0

© Copyright 2003 Alliance Semiconductor Corporation. All rights reserved. Our three-point logo, our name and Intelliwatt are trademarks or registered trademarks of Alliance. All other brand and product names may be the trademarks of their respective companies. Alliance reserves the right to make changes to this document and its products at any time without notice. Alliance assumes no responsibility for any errors that may appear in this document. The data contained herein represents Alliance's best data and/or estimates at the time of issuance. Alliance reserves the right to change or correct this data at any time, without notice. If the product described herein is under development, significant changes to these specifications are possible. The information in this product data sheet is intended to be general descriptive information for potential customers and users, and is not intended to operate as, or provide, any guarantee or warrantee to any user or customer. Alliance does not assume any responsibility or liability arising out of the application or use of any product described herein, and disclaims any express or implied warranties related to the sale and/or use of Alliance products including liability or warranties related to fitness for a particular purpose, merchantability, or infringement of any intellectual property rights, except as express agreed to in Alliance's Terms and Conditions of Sale (which are available from Alliance). All sales of Alliance products are made exclusively according to Alliance's Terms and Conditions of Sale. The purchase of products from Alliance does not convey a license under any patent rights, copyrights; mask works rights, trademarks, or any other intellectual property rights of Alliance or third parties. Alliance does not authorize its products for use as critical components in life-supporting systems where a malfunction or failure may reasonably be expected to result in significant injury to the user, and the inclusion of Alliance products in such life-supporting systems implies that the manufacturer assumes all risk of such use and agrees to indemnify Alliance against all claims arising from such use.