rev 1.5

Low Power, 3.3V/3.0V µP Reset, Active HIGH, Push-Pull Output

General Description

The ASM1817 voltage supervisory device with low-power, 3.3V/ 3.0V µP Reset, active HIGH, Push-Pull output. Maximum supply current over temperature is a low 15µA (at 3.6V).

The ASM1817 generates an active HIGH reset signal whenever the monitored supply is out of tolerance. A precision reference and comparator circuit monitor power supply (V_{CC}) level. Tolerance level options are 5%, 10% and 20% percent. When an out-of-tolerance condition is detected, an internal power-fail signal is generated which forces an active HIGH reset signal. After V_{CC} returns to an in-tolerance condition, the reset signal remains active for 150ms to allow the power supply and system microprocessor to stabilize.

The ASM1817 is designed with a push-pull output stage and operates over the extended industrial temperature range. Devices are available in TO-92 and compact surface mount SOT-23 packages.

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

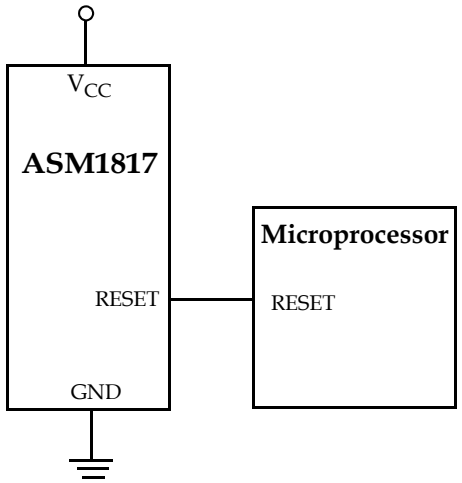
Key Features

- Low Supply Current
  - •20 µA maximum (5.5 V)
  - •15 µA maximum (3.6 V)
- Automatically restarts a microprocessor after power failure
- 150ms reset delay after V_{CC} returns to an in-tolerance condition
- Active HIGH power-up reset
- Precision temperature-compensated voltage reference and comparator
- Eliminates external components
- TO-92 and compact surface mount SOT-23 package
- Push-Pull output for minimum current drain
- Operating temperature -40°C to +85°C

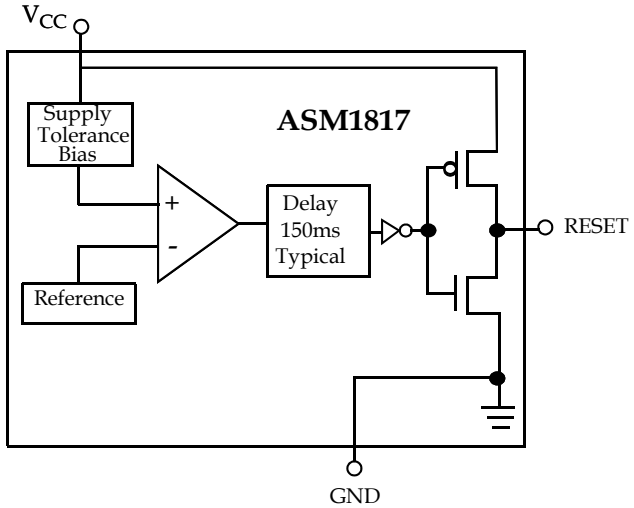
Applications

- Set-top boxes
- Cellular phones
- PDAs
- Energy management systems
- Embedded control systems
- Printers
- Single board computers

Typical Operating Circuit



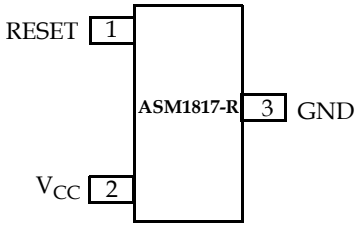
Block Diagram



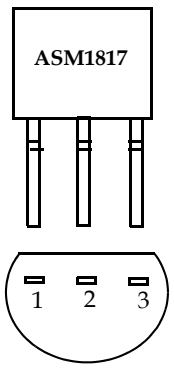
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Pin Configuration

SOT-23



TO-92



Pin Description

TO-92 Pin #	SOT-23 Pin #	Pin Name	Description
1	1	RESET	Active HIGH reset output
2	2	V_{CC}	Power supply input
3	3	GND	Ground

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Application Information

Operation - Power Monitor

The ASM1817 detects out-of-tolerance power supply conditions. It resets a processor during power-up, power-down and issues 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 RESET signal is asserted. On power-up, RESET is kept active (HIGH) for approximatley 150ms after the power supply voltage has reached the selected tolerance. This allows the power supply and microprocessor to stablize before RESET is released.

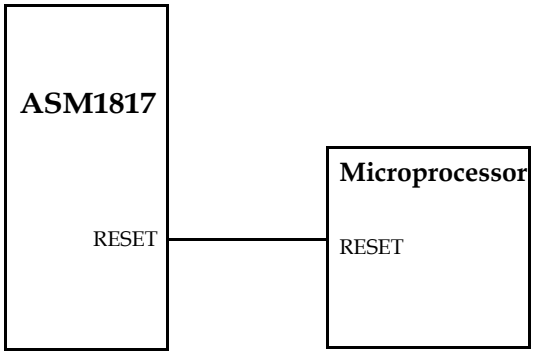


Figure 1: Typical Application

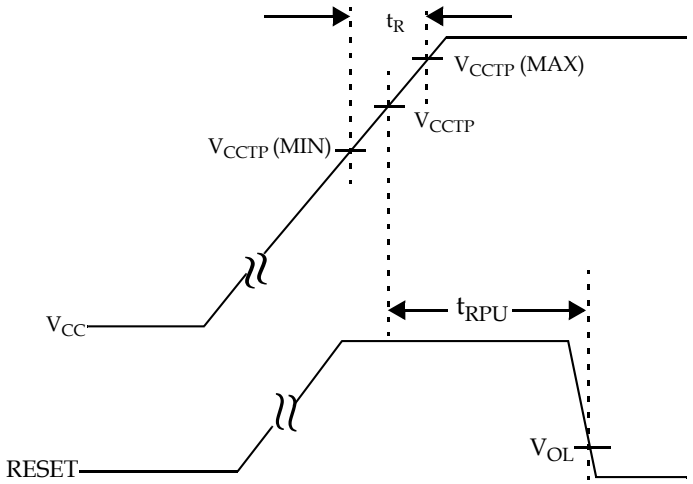


Figure 2: Timing Diagram: Power-Up

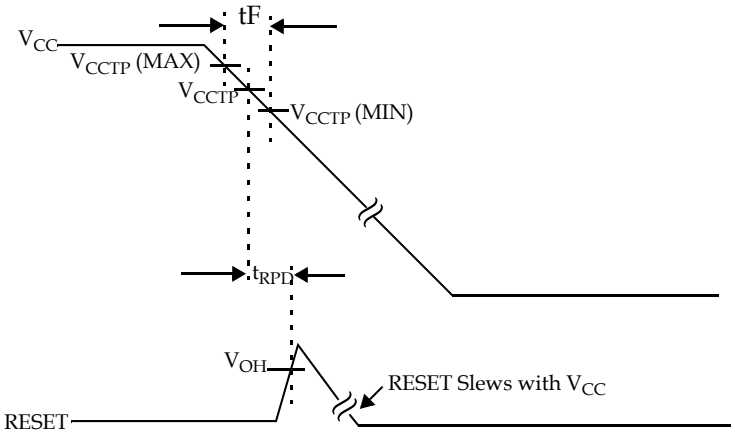


Figure 3: Timing Diagram: Power-Down

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Absolute Maximum Ratings

Parameter	Min	Max	Unit
Voltage on V_{CC}	-0.5	7	V
Voltage on 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
ESD rating HBM MM		 2 200	 KV V
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.			

Electrical Characteristics

Unless otherwise noted, V_{CC} = 1.2V to 5.5V and specifications are over the operating temperature range of -40°C to +85°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 µA	V_{CC} - 0.5V	V_{CC} - 0.1V		V
Output Current	I_{OH}	Output = 2.4V, $V_{CC} \geq$ 2.7V		350		µA
Output Current	I_{OL}	Output = 0.4V, $V_{CC} \geq$ 2.7V	+10			mA
Operating Current	I_{CC}	V_{CC} < 5.5V, RESET output open		8	20	µA
Operating Current	I_{CC}	$V_{CC} \leq$ 3.6V, RESET output open		6	15	µA
V_{CC} Trip Point (ASM1817R-5)	V_{CCTP}		2.98	3.06	3.15	V
V_{CC} Trip Point (ASM1817R-10)	V_{CCTP}		2.80	2.88	2.97	V
V_{CC} Trip Point (ASM1817R-20)	V_{CCTP}		2.47	2.55	2.64	V
Output Capacitance	C_{OUT}				10	pF
V_{CC} Detect to RESET Low	t_{RPD}			2	5	µs
V_{CC} Slew Rate (V_{CCTP} (MAX) to V_{CCTP} (MIN))	t_F		300			µs
V_{CC} Slew Rate (V_{CCTP} (MIN) to V_{CCTP} (MAX))	t_R		0			ns
V_{CC} Detect to RESET High	t_{RPU}	t_r = 5µs	100	150	250	ms
Note: The t_F value is for reference in defining values for t_{RPD} and should not be considered for proper operation or use.						

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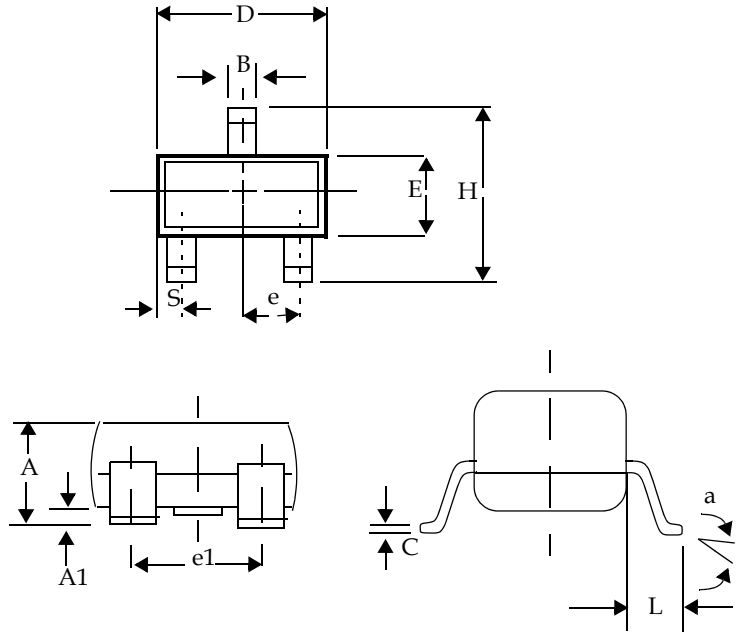
Family Selection Guide

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

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Package Dimension

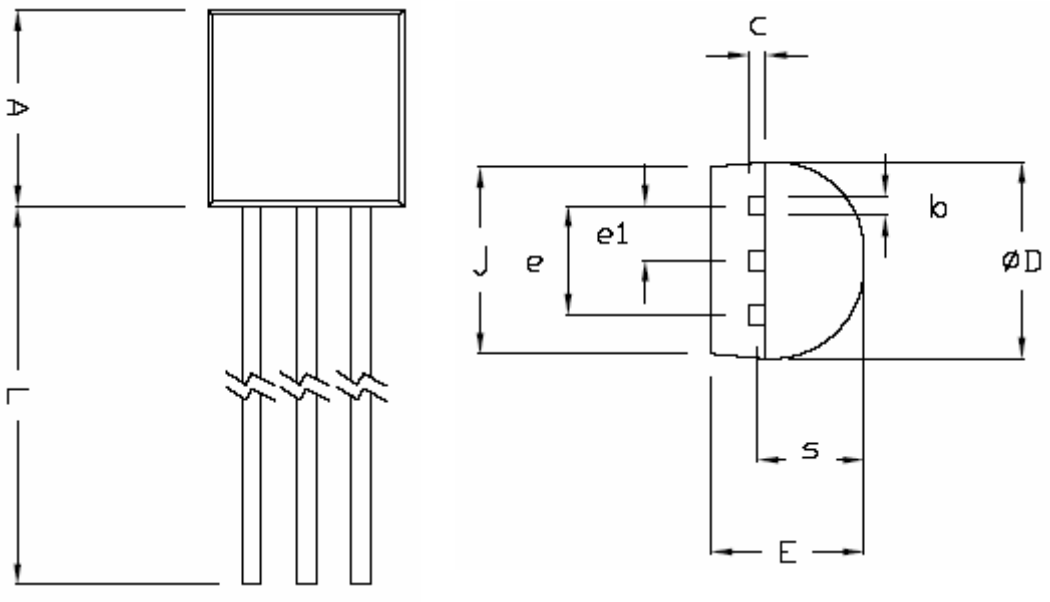
Plastic SOT-23 (3-Pin)



	Inches		Millimeters	
	Min	**Max**	**Min**	**Max**
Plastic SOT-23 (3-Pin)				
A	0.030	0.046	0.75	1.17
A1	0.002	0.006	0.05	0.15
B	0.012	0.020	0.30	0.50
C	0.003	0.008	0.08	0.20
D	0.110	0.120	2.80	3.04
E	0.047	0.055	1.20	1.40
e	0.037 BSC		0.95 BSC	
e1	0.075 BSC		1.9 BSC	
H	0.083	0.104	2.10	2.64
L	0.016	0.024	0.40	0.60
a	0^{o}	8^{o}	0^{o}	8^{o}
S	NA		NA	

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To-92 (3-Pin)



	Dimensions in Inches		Dimensions in Millimeters	
	Min	Max	Min	Max
TO-92				
A	0.175	0.185	4.445	4.699
b	0.016	0.020	0.406	0.508
C	0.014	0.016	0.356	0.406
ϕD	0.175	0.185	4.445	4.699
E	0.138	0.144	3.505	3.658
e	0.098	0.102	2.489	2.591
e1	0.045	0.055	1.143	1.397
j	0.168	0.174	4.269	4.420
L	0.500	0.585	12.7	14.86
s	0.095	0.099	2.413	2.515

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Ordering Information

Device Summary							
Part Number**	**RESET Output Voltage (V)**	**RESET Tolerance (%)**	**RESET Time (ms)**	**Push-Pull Output Stage**	**SOT-23 Package**	**RESET Polarity**	**Package Marking**
TIN - LEAD DEVICES							
ASM1817R-5	3.06	5	150	◆	◆	HIGH	RPLL
ASM1817R-10	2.88	10	150	◆	◆	HIGH	RQLL
ASM1817R-20	2.55	20	150	◆	◆	HIGH	RRLL
LEAD FREE DEVICES							
ASM1817R-5F	3.06	5	150	◆	◆	HIGH	KPLL
ASM1817R-10F	2.88	10	150	◆	◆	HIGH	KQLL
ASM1817R-20F	2.55	20	150	◆	◆	HIGH	KRLL
Part Number**	**RESET Output Voltage (V)**	**RESET Tolerance (%)**	**RESET Time (ms)**	**Push-Pull Output Stage**	**TO-92 Package**	**RESET Polarity**	**Package Marking**
TIN - LEAD DEVICES							
ASM1817-5	3.06	5	150	◆	◆	HIGH	ASM1817-5
ASM1817-10	2.88	10	150	◆	◆	HIGH	ASM1817-10
ASM1817-20	2.55	20	150	◆	◆	HIGH	ASM1817-20
LEAD FREE DEVICES							
ASM1817-5F	3.06	5	150	◆	◆	HIGH	ASM1817-5F
ASM1817-10F	2.88	10	150	◆	◆	HIGH	ASM1817-10F
ASM1817-20F	2.55	20	150	◆	◆	HIGH	ASM1817-20F

** Add /T to Part Number for Tape and Reel (i.e ASM18xx-x/T)
LL- Lot Code

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