



**Description**

SE5317 is a positive, linear regulator featuring a low quiescent current (35uA typ.) with low dropout voltage, making it ideal for battery powered applications. The space- saving SOT-23-5 package are attractive for "Pocket" and "Hand Held" applications.

SE5317 has Over Temperature Protection (OTP), and Over Current Protection (OCP) to prevent possible device failures due to improper or worst case applications.

SE5317 is stable with an output capacitor of 2.2µF or greater.

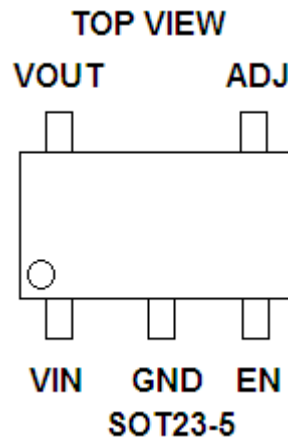
**Features**

- Very Low Dropout Voltage
- Guaranteed 300mA Output
- Typical accuracy within 2%
- 35uA Quiescent Current
- Over Temperature Protection (OTP)
- Over Current Protection (OCP)
- Power-Saving Shutdown Mode
- Space-Saving SOT-23-5
- Adjustable Output Voltages
- Low Temperature Coefficient
- RoHS Compliant and 100% Lead (Pb)-Free

**Applications**

- Instrumentation
- Portable Electronics
- Wireless Devices
- Cordless Phones
- PC Peripherals
- Battery Powered Widgets
- Electronic Scales

**Pin Configuration**

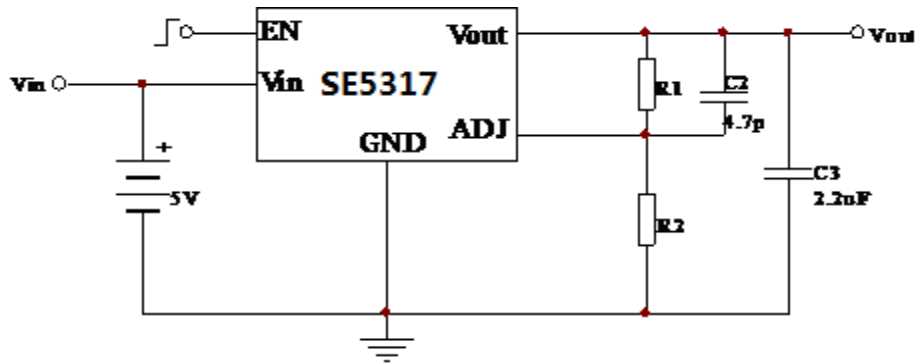


**Ordering/Marking Information**

Package	Ordering Information		Marking Information
	ADJ	SE5317-LF	<p>Starting with 3, a bar on top of 3 is for production year 2011, and underlined 3 is for year 2012. The naming pattern continues with consecutive characters for later years.</p> <p>"□" is for the week code. (A-Z: 1-26, a-z: 27-52)The last character "L" is for Lead-free process.</p> <p>A dot on top right corner is for PIN1.</p>



### Typical Application



$$V_{out} = 1.2 (R1 + R2) / R2 ; C2 \text{ is option}$$

### Absolute Maximum Rating

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	7	V
Enable Voltage	$V_{EN}$	-0.3 to $V_{IN}$	V
Output Voltage	$V_{OUT}$	-0.3 to 4.6	V
Power Dissipation	$P_D$	Internally Limited	
Thermal Resistance, Junction-to-Ambient	$\Theta_{JA}$	250 (SOT-23-5)	$^{\circ}\text{C}/\text{W}$
Lead Temperature (Soldering, 5 sec.)		260	$^{\circ}\text{C}$
Junction Temperature	$T_J$	-20 to +150	$^{\circ}\text{C}$
Storage Temperature	$T_S$	-40 to +150	$^{\circ}\text{C}$

### Recommended Operating Conditions

Parameter	Symbol	Value	Units
Supply Input Voltage Range	$V_{IN}$	2.5~5.5	V
Junction Temperature Range	$T_J$	-20 to +125	$^{\circ}\text{C}$



**Electrical Characteristic**

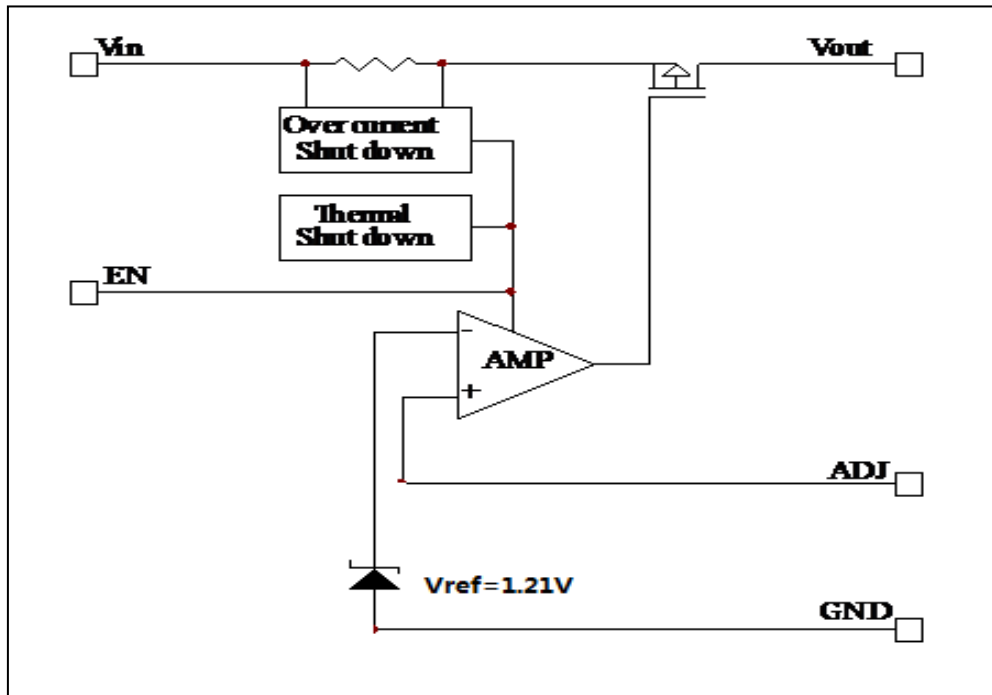
TA = 25°C, V<sub>IN</sub> = 5V unless otherwise noted

Parameter	Symbol	Test Condition		Min	Typ	Max	Units
Input Voltage Range	V <sub>IN</sub>			Note		5.5	V
Output Voltage	V <sub>O</sub>	I <sub>O</sub> =1mA		-2		2	%
Dropout Voltage	V <sub>Dropout</sub>	I <sub>O</sub> =300mA V <sub>O</sub> =V <sub>ONOM</sub> -2.0%	2.0V < V <sub>O(NOM)</sub> <= 2.8V		400		mV
			2.8V < V <sub>O(NOM)</sub> < 3.8V		300		
Output Current	I <sub>O</sub>	VO > 1.2V		300			mA
Current Limit	I <sub>LIM</sub>	VO > 1.2V			550		mA
Quiescent Current	I <sub>Q</sub>	IO=0mA			35	50	uA
Line Regulation	REG <sub>LINE</sub>	IO=5mA ; VIN=VO+1 to 5.5V			0.1		%/V
Load Regulation	REG <sub>LOAD</sub>	IO=1mA to 300mA			0.2		%
Over Temperature Shutdown	OTS				150		°C
Over Temperature Hysteresis	OTH				30		°C
VO Temperature	TC				30		ppm/°C
Power Supply Rejection	PSRR	IO=50mA	f=100Hz		70		dB
			f=1kHz		53		
Output Voltage Noise	eN	f=10Hz to 100kHz	Co=2.2uF		30		uVrms
ADJ Input Bias Current	I <sub>ADJ</sub>				30		nA
ADJ Reference Voltage	V <sub>REF</sub>			-2%	1.21	+2%	V
EN Input Threshold	V <sub>EH</sub>	VIN=2.7V to 6V		2.0		Vin	V
	V <sub>EL</sub>	VIN=2.7V to 6V		0		0.4	V
EN Input Bias Current	I <sub>EN</sub>	VEN=VIN, VIN=2.7V to 6V				0.1	uA
Shutdown Supply Current	I <sub>SD</sub>	VIN=5V, VO=0V, VEN < VEL			0.5	1	uA
Shutdown Output Voltage	V <sub>O,SD</sub>	IO=35mA, VEN < VEL		0		0.1	V

Note1: Vin(min) = Vout + Vdropout



### Block Diagram





### Detailed Description

SE5317 is a CMOS regulator containing a PMOS pass transistor, voltage reference, error amplifier, over-current protection, thermal shutdown, and Power Good detection circuitry.

The P-channel pass transistor receives data from the error amplifier, over-current shutdown, and thermal protection circuits. During normal operation, the error amplifier compares the output voltage to an internal precision voltage reference. Over Temperature Protection (OTP) and Over Current Protection (OCP) circuits become active when the junction temperature exceeds 150°C, or the current exceeds 550mA, respectively. During OTP, the output voltage remains low. Normal operation is restored when the junction temperature drops below 120°C.

### External Capacitors

SE5317 is stable with an output capacitor to ground of 1.0 $\mu$ F or greater. Ceramic capacitors have the lowest ESR, and will offer the best AC performance. Conversely, Aluminum Electrolytic capacitors exhibit the highest ESR, resulting in the poorest AC response. Unfortunately, large value ceramic capacitors are comparatively expensive. One option is to parallel a 0.1 $\mu$ F ceramic capacitor with a 10 $\mu$ F Aluminum Electrolytic. The benefit is low ESR, high capacitance, and low overall cost.

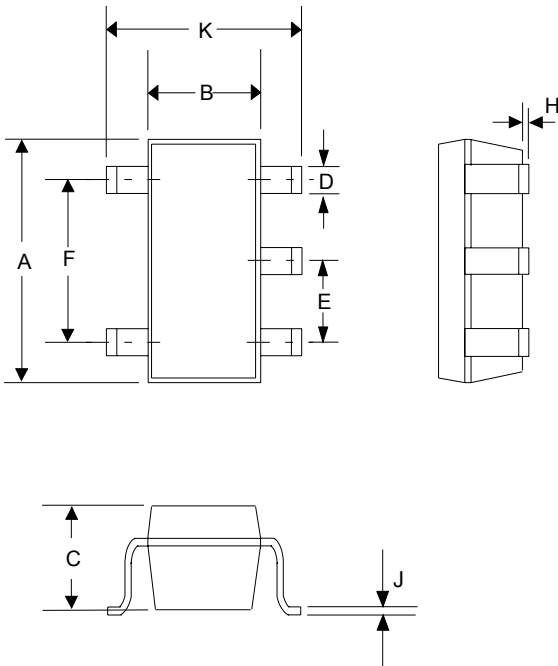
A second capacitor is recommended between the input and ground to stabilize  $V_{in}$ . The input capacitor should be at least 0.1 $\mu$ F to have a beneficial effect. All capacitors should be placed in close proximity to the pins. A "Quiet" ground termination is desirable. This can be achieved with a "Star" connection..

### Enable

The EN Pin is an enable control Pin, When The Enable pin pulled High, IC is enabled; when pulled low, the PMOS pass transistor shuts off, and all internal circuits are powered down. In this state, the quiescent current is less than 1 $\mu$ A. This pin behaves much like an electronic switch.



**OUTLINE DRAWING SOT-23-5L**



DIMENSIONS				
DIM	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.110	0.120	2.80	3.05
B	0.059	0.070	1.50	1.75
C	0.036	0.051	0.90	1.30
D	0.014	0.020	0.35	0.50
E	-	0.037	-	0.95
F	-	0.075	-	1.90
H	-	0.006	-	0.15
J	0.0035	0.008	0.090	0.20
K	0.102	0.118	2.60	3.00

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