

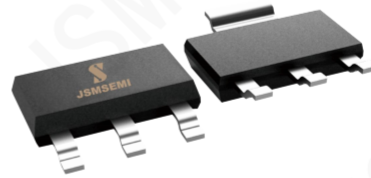
General Description

The LDL1117S is a series of low dropout three-terminal regulators with a dropout of 1.5V at 1 output current.

The LDL1117S series provides current limiting and the thermal shutdown. Its circuit includes an internal band gap reference to assure output voltage accuracy to be within 1% for 3.3V, 5.0V and adjustable versions or 2% for 1.2V version. Current limit is internal to ensure specified output current and controlled short-circuit current. On-chip thermal shut-down provides protection against any combination of overload and ambient temperature that would create excessive junction temperature. The LDL1117S has an adjustable version that can provide the output voltage from 1.25V to 12V with only 2 external resistors. The LDL1117S series is available in the industry standard SOT-223 power packages.

Features

- Low Dropout Voltage: 1.15V at 1A Output Current
- Internal Current Limit
- On-chip Thermal Shutdown
- Three-terminal Adjustable or Fixed 3.3V, 5.0V
- Operation Junction Temperature: -40 to 125°C

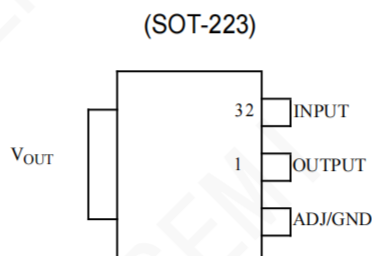


SOT-223

Applications

- PC Motherboard
- LCD Monitor
- Graphic Card
- DVD-video Player
- NIC/Switch
- Telecom Equipment
- ADSL Modem
- Printer and other Peripheral Equipment

Pin Configuration



Functional Block Diagram

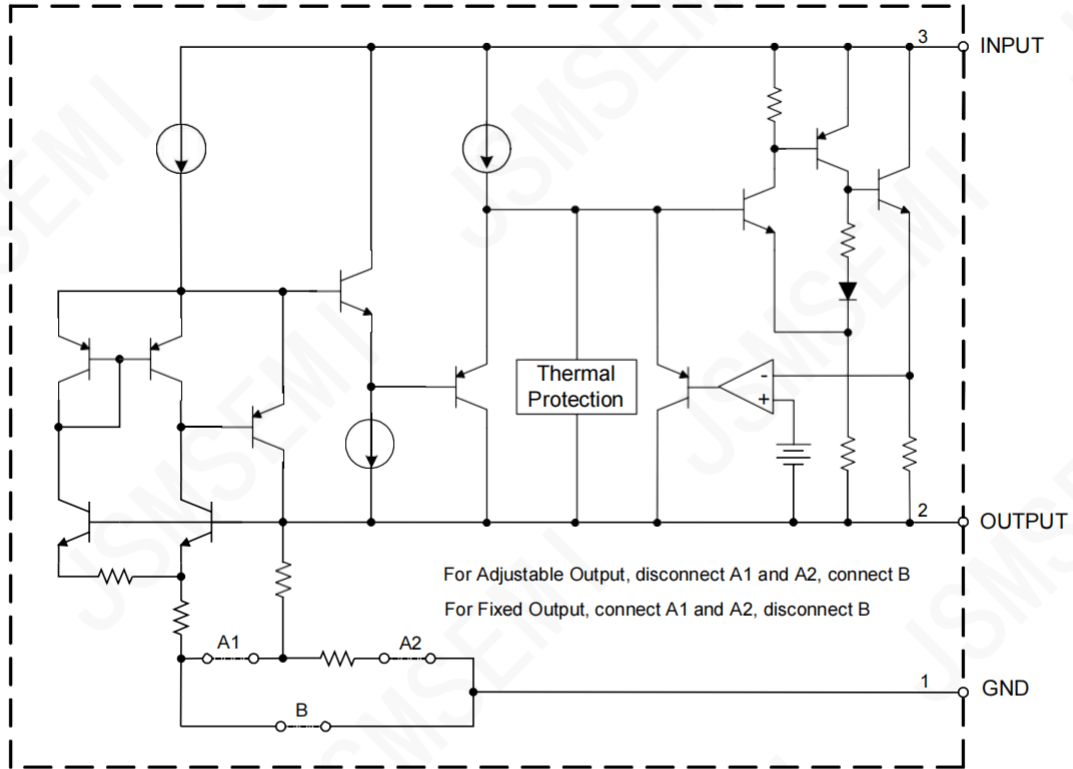


Figure 3. Functional Block Diagram of LDL1117S

Ordering Information


Package	Temperature Range	Part No.	Packing Type
		Tin Lead	
SOT-223	-40 to 125°C	LDL1117S33R	Tape & Reel
		LDL1117S33R	Tape & Reel

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_{IN}		20	V
Maximum Junction Temperature	T_J		150	°C
Storage Temperature	T_S	-65	150	°C
Lead Temperature (Soldering, 10sec)	T_{LEAD}		300	°C
ESD (Machine Model)	ESD		600	V

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_{IN}		15	V
Operating Junction Temperature Range	T_J	-40	125	°C

Electrical Characteristics (Continued)
LDL1117S33R Electrical Characteristics

 Operating Conditions: $V_{IN} \leq 10V$, $T_J = 25^\circ C$, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output Voltage	V_{OUT}	$I_{OUT} = 10mA$, $V_{IN} = 5.0V$ $10mA \leq I_{OUT} \leq 1A$, $4.75V \leq V_{IN} \leq 10V$	3.267 3.235	3.3 3.3	3.333 3.365	V
Line Regulation	ΔV_{OUT}	$I_{OUT} = 10mA$, $1.5V \leq V_{IN} - V_{OUT} \leq 10V$		1	6	mV
Load Regulation	ΔV_{OUT}	$V_{IN} - V_{OUT} = 2V$, $10mA \leq I_{OUT} \leq 1A$		1	10	mV
Dropout Voltage		$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.1A$		1.00	1.1	V
		$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.5A$		1.08	1.18	V
		$\Delta V_{OUT} = 1\%$, $I_{OUT} = 1.0A$		1.15	1.25	V
Current Limit	I_{LIMIT}	$V_{IN} - V_{OUT} = 2V$	1.25	1.35		A
Quiescent Current		$V_{IN} = V_{OUT} + 1.25V$		5	10	mA
Ripple Rejection		$f = 120Hz$, $C_{OUT} = 22\mu F$ Tantalum, $V_{IN} - V_{OUT} = 3V$, $I_{OUT} = 1A$	60	75		dB
Temperature Stability				0.5		%
Long -Term Stability		$T_A = 125^\circ C$, 1000hrs		0.3		%
RMS Output Noise (% of V_{OUT})		$T_A = 25^\circ C$, $10Hz \leq f \leq 10kHz$		0.003		%
Thermal Resistance, Junction to Case	θ_{JC}	SOT-223		15		$^\circ C/W$
Thermal Shutdown		Junction Temperature		150		$^\circ C$
Thermal Shutdown Hysteresis				25		$^\circ C$

Electrical Characteristics (Continued)
LDL1117S50R Electrical Characteristics

 Operating Conditions: $V_{IN} \leq 10V$, $T_J = 25^\circ C$, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output Voltage	V_{OUT}	$I_{OUT} = 10mA$, $V_{IN} = 7.0V$ $10mA \leq I_{OUT} \leq 1A$, $6.5V \leq V_{IN} \leq 12V$	4.950 4.900	5.0 5.0	5.050 5.100	V
Line Regulation	ΔV_{OUT}	$I_{OUT} = 10mA$, $1.5V \leq V_{IN} - V_{OUT} \leq 10V$		1	10	mV
Load Regulation	ΔV_{OUT}	$V_{IN} - V_{OUT} = 2V$, $10mA \leq I_{OUT} \leq 1A$		1	15	mV
Dropout Voltage		$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.1A$		1.00	1.1	V
		$\Delta V_{OUT} = 1\%$, $I_{OUT} = 0.5A$		1.08	1.18	V
		$\Delta V_{OUT} = 1\%$, $I_{OUT} = 1.0A$		1.15	1.25	V
Current Limit	I_{LIMIT}	$V_{IN} - V_{OUT} = 2V$	1.25	1.35		A
Quiescent Current		$V_{IN} = V_{OUT} + 1.25V$		5	10	mA
Ripple Rejection		$f = 120Hz$, $C_{OUT} = 22\mu F$ Tantalum, $V_{IN} - V_{OUT} = 3V$, $I_{OUT} = 1A$	60	75		dB
Temperature Stability				0.5		%
Long -Term Stability		$T_A = 125^\circ C$, 1000hrs		0.3		%
RMS Output Noise (% of V_{OUT})		$T_A = 25^\circ C$, $10Hz \leq f \leq 10kHz$		0.003		%
Thermal Resistance, Junction to Case	θ_{JC}	SOT-223		15		$^\circ C/W$
Thermal Shutdown		Junction Temperature		150		$^\circ C$
Thermal Shutdown Hysteresis				25		$^\circ C$

Typical Performance Characteristics

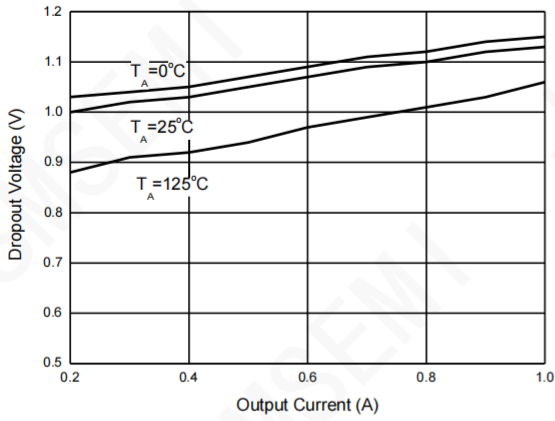


Figure 4. Dropout Voltage vs. Output Current

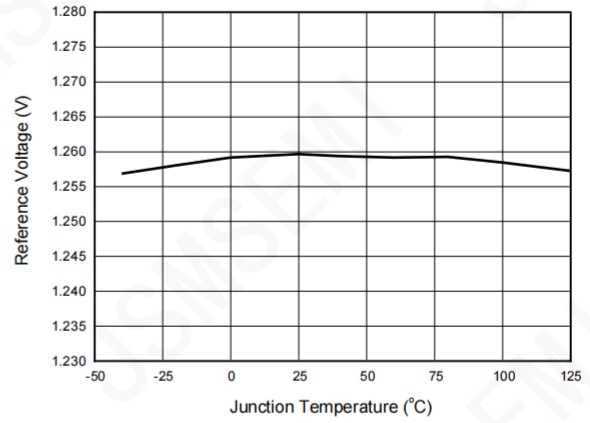


Figure 5. Reference Voltage vs. Junction Temperature

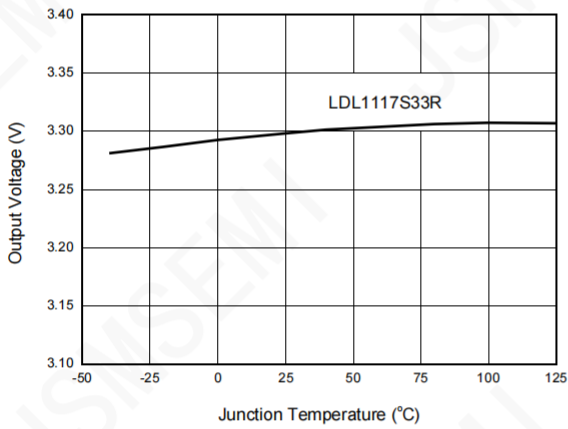


Figure 6. Output Voltage vs. Junction Temperature

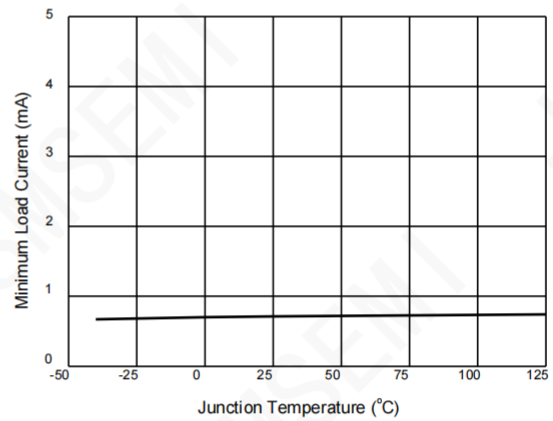


Figure 7. Minimum Load Current vs. Junction Temperature

Typical Performance Characteristics (Continued)

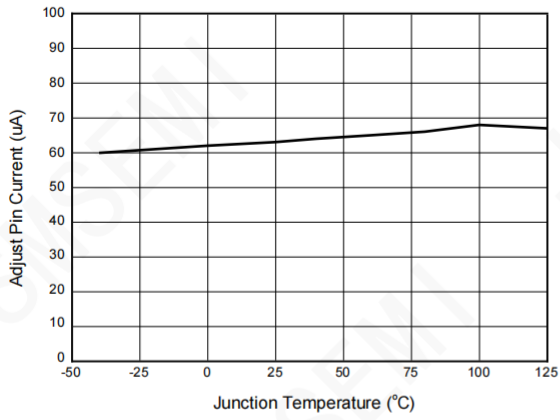


Figure 8 . Adjust Pin Current vs. Temperature

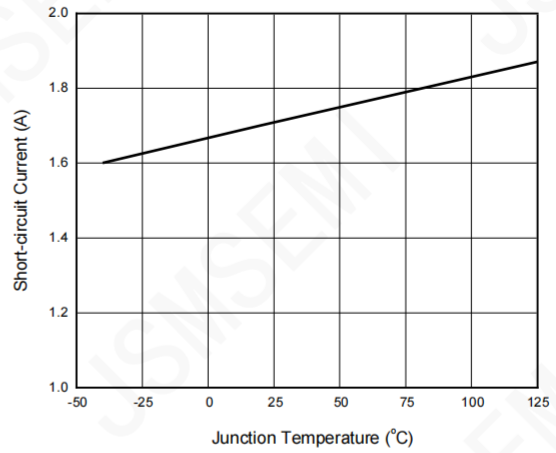


Figure 9 . Short-Circuit Current vs. Junction Temperature

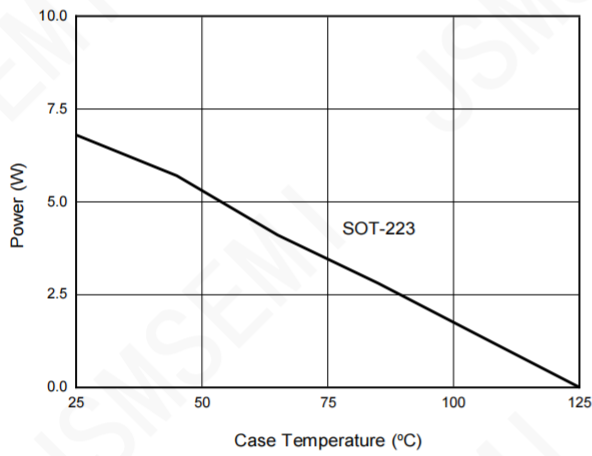


Figure 10. Maximum Power Dissipation

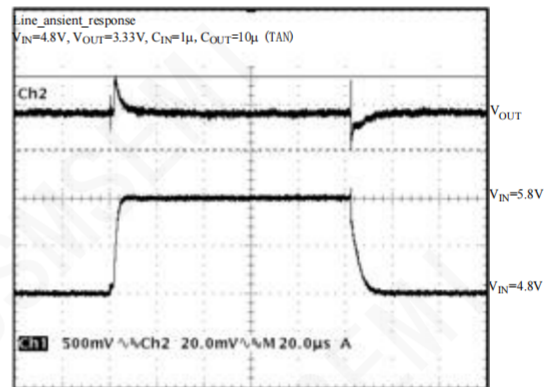


Figure 11. Line transient Response

Typical Performance Characteristics (Continued)

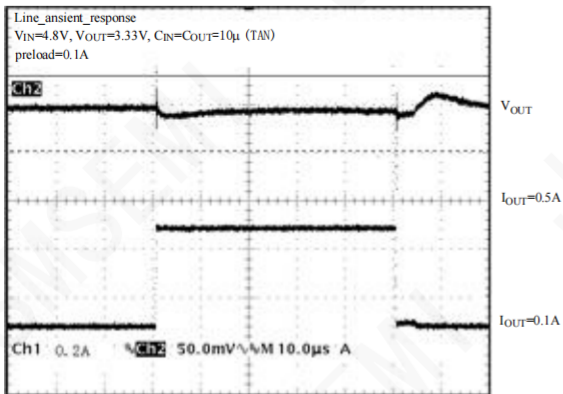


Figure 12. Load transient Response

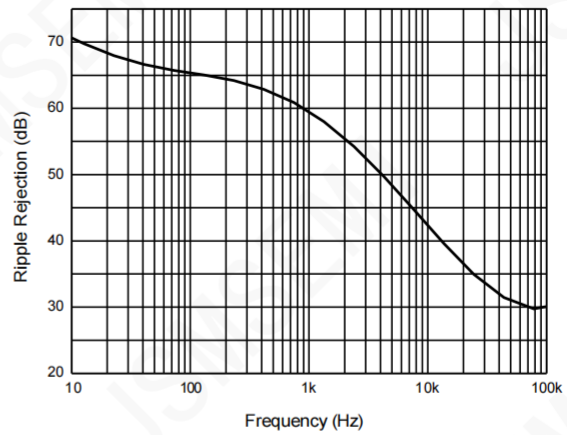


Figure 13. Ripple Rejection vs. Frequency

Typical Applications

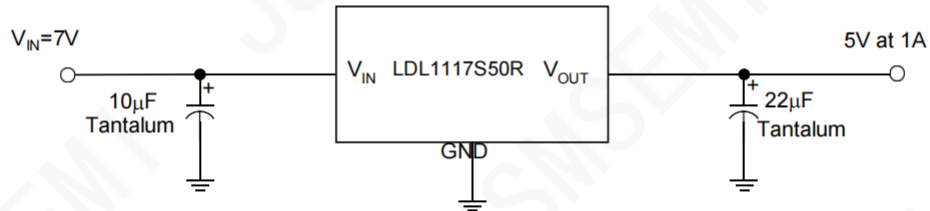


Figure 15. Typical Applications of LDL1117S

Mechanical Dimensions

SOT-223

Unit: mm(inch)

