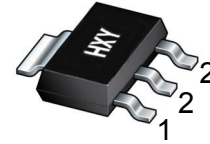




## FEATURES

- Internal thermal overload protection
- Internal short circuit current limiting
- Output transistor safe operating area compensation



SOT-223

1. Adj
2. Output
3. Input

## Package Marking and Ordering Information

Product ID	Pack	Marking	Units Tube
LM317	SOT-223	LM317	2500

## Maximum Ratings

Symbol	Parameter	Value	Unit
$V_I-V_O$	Input-Output Voltage Differential	40	V
$T_{LEAD}$	Lead Temperature	230	°C
$P_D$	Power Dissipation	Internally limited	W
$T_J$	Operating Junction Temperature Range	0~125	°C
$T_{stg}$	Storage Temperature Range	-55~+150	
$\Delta V_O / \Delta T$	Temperature Coefficient of Output Voltage	±0.02	%/°C



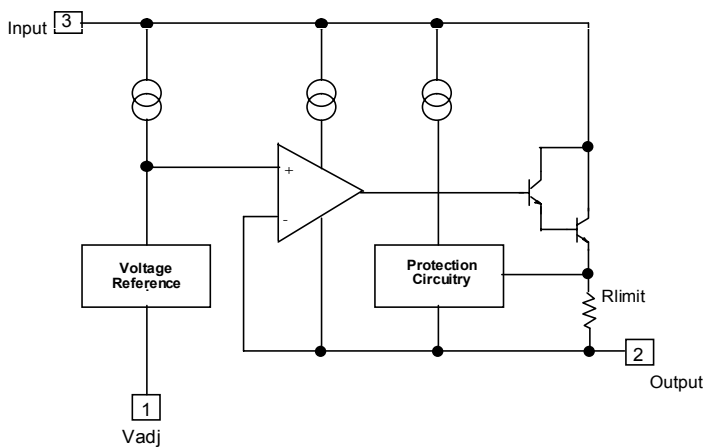
**Electrical Characteristics @25°C(V<sub>I</sub>-V<sub>O</sub>=5V,I<sub>O</sub>=500mA,I<sub>MAX</sub>=1.5A,P<sub>MAX</sub>=20W Unless Otherwise Specified)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Line Regulation(note1)	R <sub>line</sub>	T <sub>A</sub> =25°C 3V≤V <sub>I</sub> -V <sub>O</sub> ≤40V		0.01	0.04	%V
		3V≤V <sub>I</sub> -V <sub>O</sub> ≤40V		0.02	0.07	
Load Regulation(note1)	R <sub>load</sub>	T <sub>A</sub> =25°C, 10mA≤I <sub>O</sub> ≤I <sub>MAX</sub> V <sub>O</sub> <5V V <sub>O</sub> ≥5V		18 0.4	25 0.5	mV%/ V <sub>O</sub>
		10mA≤I <sub>O</sub> ≤I <sub>MAX</sub> V <sub>O</sub> <5V V <sub>O</sub> ≥5V		40 0.8	70 1.5	
Adjustable Pin Current	I <sub>ADJ</sub>	-		50	100	μA
Adjustable Pin Current Change	ΔI <sub>ADJ</sub>	3V≤V <sub>I</sub> -V <sub>O</sub> ≤40V 10mA≤I <sub>O</sub> ≤I <sub>MAX</sub> , P <sub>D</sub> ≤P <sub>MAX</sub>		0.2	5	
Reference Voltage	V <sub>REF</sub>	3V≤V <sub>I</sub> -V <sub>O</sub> ≤40V 10mA≤I <sub>O</sub> ≤I <sub>MAX</sub> , P <sub>D</sub> ≤P <sub>MAX</sub>	1.20	1.25	1.30	V
Temperature Stability	ST <sub>T</sub>	-		0.7		%/ V <sub>O</sub>
Minimum Load Current to Maintain Regulation	I <sub>L(Min)</sub>	V <sub>I</sub> -V <sub>O</sub> =40V		3.5	12	mA
Maximum Output Current	I <sub>O(Max)</sub>	V <sub>I</sub> -V <sub>O</sub> ≤15V, P <sub>D</sub> ≤P <sub>MAX</sub> V <sub>I</sub> -V <sub>O</sub> ≤40V, P <sub>D</sub> ≤P <sub>MAX</sub> T <sub>A</sub> =25°C	1.0	2.2 0.3		A
RMS Noise,% of V <sub>OUT</sub>	e <sub>N</sub>	T <sub>A</sub> =25°C, 10Hz≤f≤10kHz		0.003	0.01	%/ V <sub>O</sub>
Ripple Rejection	RR	V <sub>O</sub> =10V, f =120Hz without C <sub>ADJ</sub> C <sub>ADJ</sub> =10μF(note2)	66	60 75		dB
Long-Term Stability,T <sub>J</sub> =T <sub>HIGH</sub>	ST	T <sub>A</sub> =25°C for end point mesasurements,1000HR		0.3	1	%
Thermal Resistance Junction to case	R <sub>θJC</sub>	-		5		°C/W

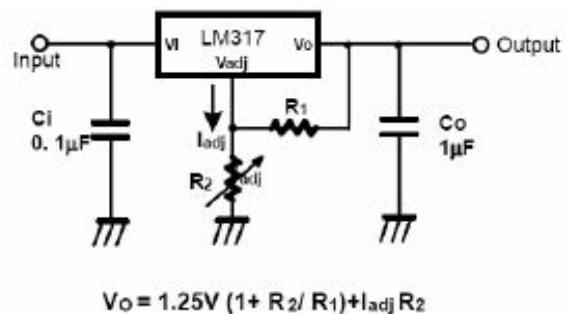
**Notes:**

1. Load and line regulation are specified at constant junction temperature. Change in V<sub>D</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.(P<sub>MAX</sub>=20W)
- 2.C<sub>ADJ</sub>. when used, is connected between the adjustment pin and ground.

**Internal Block Diagram**



**Typical Application**



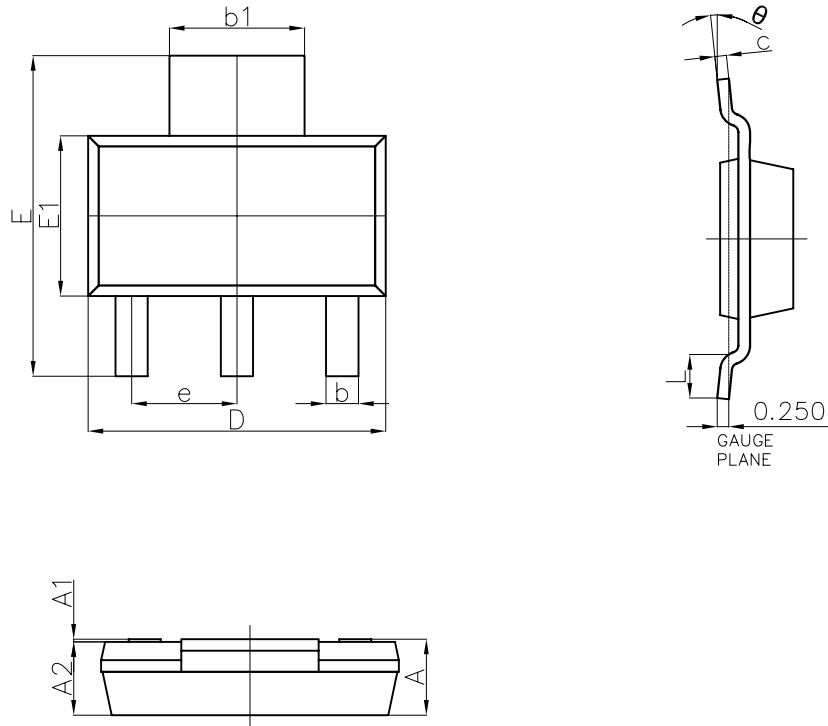
C<sub>i</sub> is required when regulator is located an appreciable distance from power supply filter.

C<sub>o</sub> is not needed for stability , however, it does improve transient response.

Since I<sub>ADJ</sub> is controlled to less than 100μA, the error associated with this term is negligible in most applications.



**SOT-223 Package Outline Dimensions**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	—	1.800	—	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	—	0.030	—
theta	0°	10°	0°	10°



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