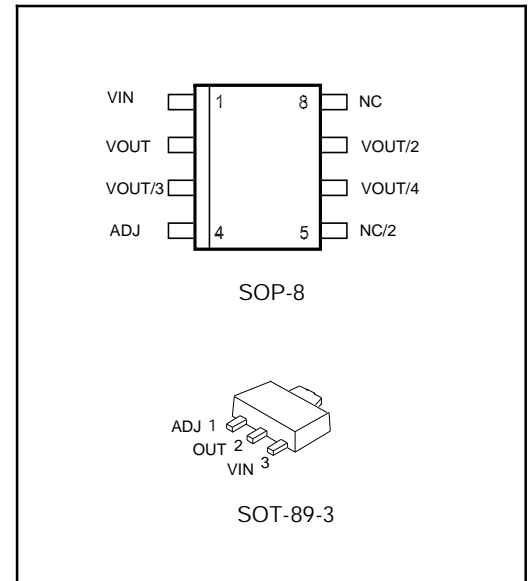


**DESCRIPTION**

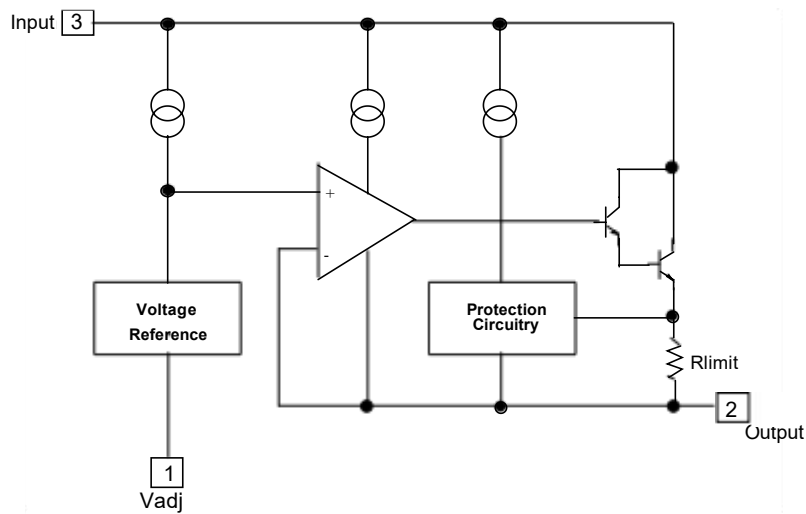
This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply more than 0.1A of load current with an output voltage adjustable over a 1.2 to 37V. It employs internal current limiting, thermal shut-down and safe area compensation.

**FEATURE**

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



**Internal Block Diagram**



**Absolute 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	SOT-89	400	mW
		SOP-8	400	
$T_J$	Operating Junction Temperature Range		-40~+125	°C
$T_{stg}$	Storage Temperature Range		-55~125	
$\Delta V_O/\Delta T$	Temperature Coefficient of Output Voltage		±0.02	%/°C

**ELECTRICAL CHARACTERISTICS**

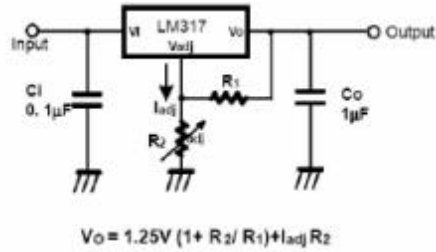
( $V_O-V_I=5V, I_O=0.5A, 0^\circ C \leq T_J \leq +125^\circ C, I_{MAX}=1.5A, P_{DMAX}=20W$ , unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Line Regulation(note1)	$R_{line}$	$T_A=25^\circ C$ $3V \leq V_I-V_O \leq 40V$		0.01	0.04	%V
		$3V \leq V_I-V_O \leq 40V$		0.02	0.07	
Load Regulation(note1)	$R_{load}$	$T_A=25^\circ C, 10mA \leq I_O \leq I_{MAX}$ $V_O < 5V$ $V_O \geq 5V$		18 0.4	25 0.5	mV
		$10mA \leq I_O \leq I_{MAX}$ $V_O < 5V$ $V_O \geq 5V$		40 0.8	70 1.5	% $V_O$
Adjustable Pin Current	$I_{ADJ}$	-		46	100	$\mu A$
Adjustable Pin Current Change	$\Delta I_{ADJ}$	$3V \leq V_I-V_O \leq 40V$ $10mA \leq I_O \leq I_{MAX}, P_D \leq P_{MAX}$		0.2	5	
Reference Voltage	$V_{REF}$	$3V \leq V_I-V_O \leq 40V$ $10mA \leq I_O \leq I_{MAX}, P_D \leq P_{MAX}$	1.20	1.25	1.30	V
Temperature Stability	$ST_T$	-		0.7		%/ $V_O$
Minimum Load Current to Maintain Regulation	$I_{L(MIN)}$	$V_I-V_O=40V$		3.5	5	mA
Maximum Output Current	$I_{O(MAX)}$	$V_I-V_O \leq 3-13V, P_D \leq P_{MAX}$ $V_I-V_O \leq 40V, P_D \leq P_{MAX}$	100	200 50		mA
RMS Noise,% of $V_{OUT}$	$e_N$	$T_A=25^\circ C, 10Hz \leq f \leq 10KHz$		0.003	0.01	%/ $V_O$
Ripple Rejection	RR	$V_O=10V, f=120Hz$ without $C_{ADJ}$ $C_{ADJ}=10\mu F$ (note2)	66	65 80		dB
Long-Term Stability, $T_J=T_{HIGH}$	ST	$T_A=25^\circ C$ for end point measurements, 1000 HR		0.3	1	%
Thermal Resistance Junction to case	$R_{\theta JC}$	-		25.2		°C/W

**Notes:**

- Load and line regulation are specified at constant junction temperature. Change in  $V_D$  due to heating effects must be taken into account separately. Pulse testing with low duty is used.( $P_{MAX}=20W$ )
- $C_{ADJ}$  - when used, is connected between the adjustment pin and ground.

## Typical Application

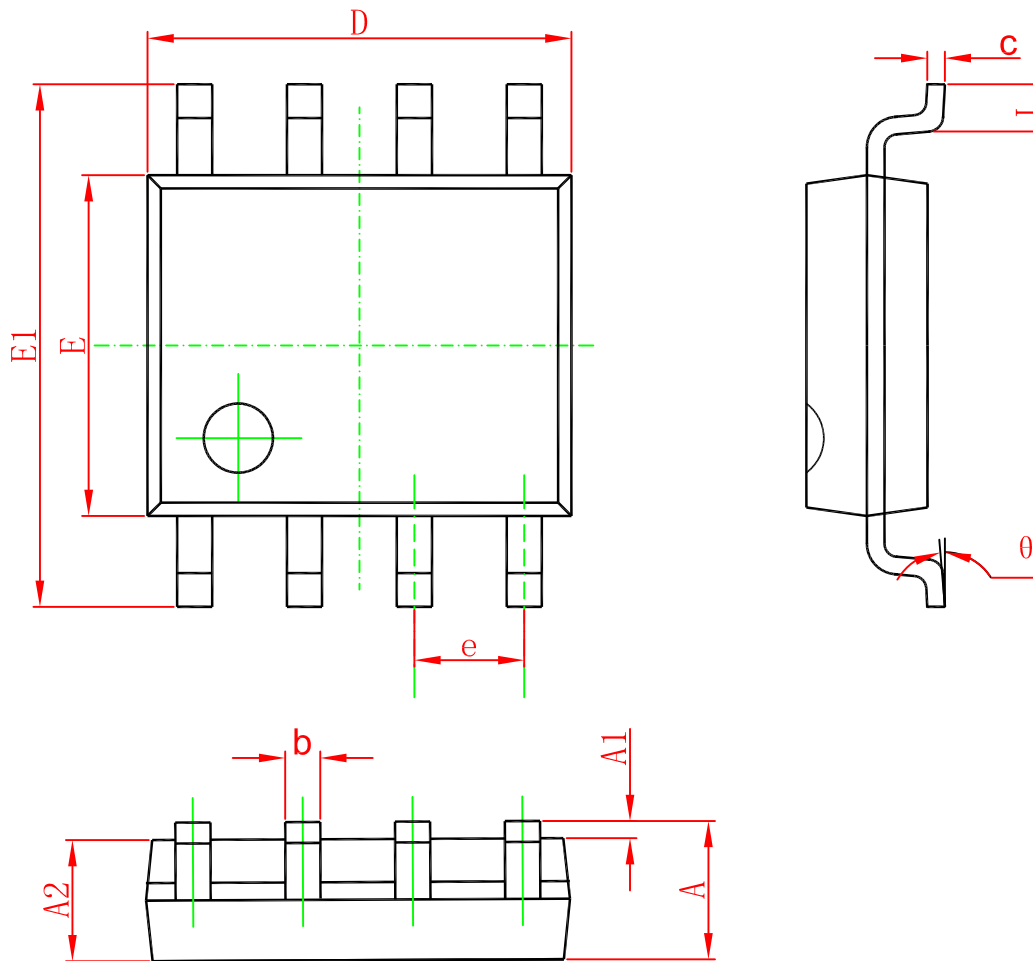


$C_i$  is required when regulator is located an appreciable distance from power supply filter.

$C_o$  is not needed for stability, however, it does improve transient response.

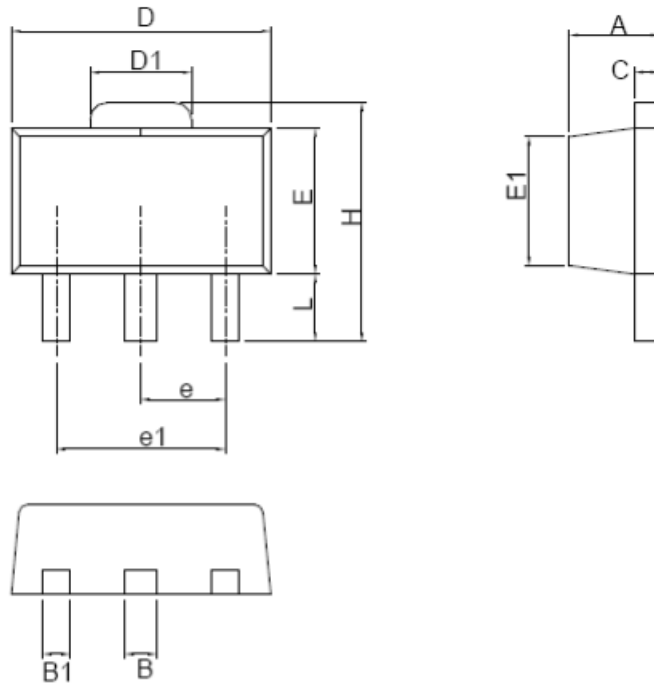
Since  $I_{ADJ}$  is controlled to less than  $100\mu A$ , the error associated with this term is negligible in most applications.

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
$\theta$	0°	8°	0°	8°

SOT-89



SYMBOL	SOT-89			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.40	1.60	0.055	0.063
B	0.44	0.56	0.017	0.022
B1	0.36	0.48	0.014	0.019
C	0.35	0.44	0.014	0.017
D	4.40	4.60	0.173	0.181
D1	1.62	1.83	0.064	0.072
E	2.29	2.60	0.090	0.102
E1	2.13	2.29	0.084	0.090
e	1.50 BSC		0.059 BSC	
e1	3.00 BSC		0.118 BSC	
H	3.94	4.25	0.155	0.167
L	0.89	1.20	0.035	0.047

## Ordering information

Order Code	Package	Baseqty	Deliverymode
UMW LM317LD	SOP-8	2500	Tape and reel
UMW LM317LIPK	SOT-89	1000	Tape and reel

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