

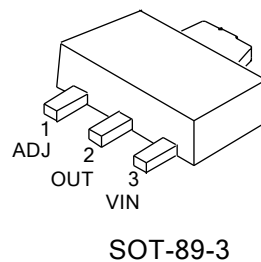
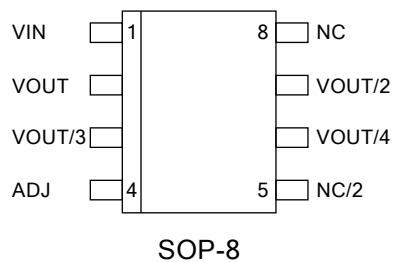
1.Description

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.

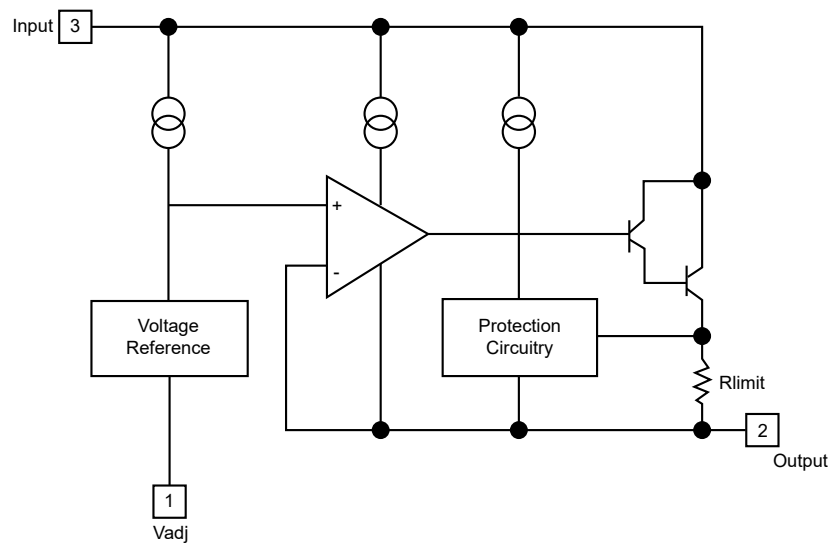
2.Features

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

3.Pinning information



4.Internal Block Diagram





5. Absolute Maximum Rating

Parameter		Symbol	Value	Units
Input-Output Voltage Differential		$V_I - V_O$	40	V
Lead Temperature		T_{LEAD}	230	°C
Power Dissipation	SOT-89	P_D	400	mW
	SOP-8		400	mW
Junction Temperature Range		T_J	-40 to 125	°C
Storage Temperature Range		T_{STG}	-55 to 125	°C
Temperature Coefficient of Output Voltage		$\Delta V_O / \Delta T$	±0.02	%/°C



6. Electrical Characteristics

($V_I - V_O = 5V$, $I_O = 40mA$, $-40^\circ C \leq T_J \leq +125^\circ C$, unless otherwise specified)

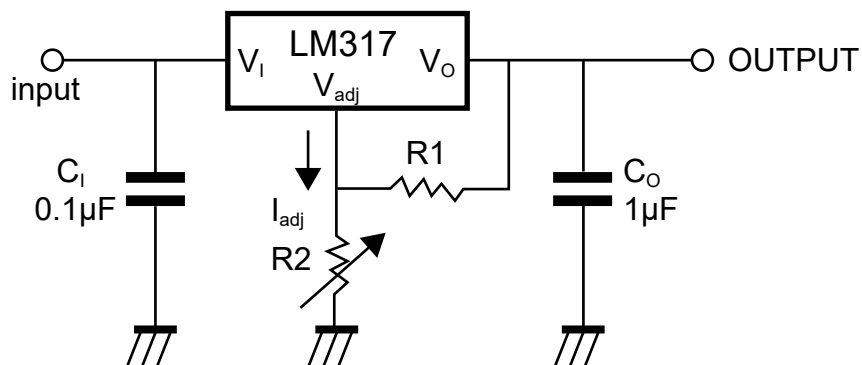
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Line Regulation (note1)	R_{line}	$T_A = 25^\circ C$, $3V \leq V_I - V_O \leq 40V$		0.01	0.04	% / V
		$3V \leq V_I - V_O \leq 40V$		0.02	0.07	
Load Regulation (note1)	R_{load}	$T_A = 25^\circ C$, $10mA \leq I_O \leq I_{MAX}$				
		$V_O < 5V$		10	25	mV
		$V_O \geq 5V$		0.1	0.5	% / V
		$10mA \leq I_O \leq I_{MAX}$				
		$V_O < 5V$		20	80	mV
		$V_O \geq 5V$		0.3	1.7	% / V
Adjustable Pin Current	I_{ADJ}			46	100	μA
Adjustable Pin Current Change	ΔI_{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}	$3V \leq V_{IN} - V_O \leq 40V$ $10mA \leq I_O \leq I_{MAX}$, $P_D \leq P_{MAX}$	1.2	1.25	1.3	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	$I_{O(MAX)}$	$V_I - V_O \leq 3-13V$, $P_D \leq P_{MAX}$	$T_A = 25^\circ C$	100	200	mA
		$V_I - V_O \leq 40V$, $P_D \leq P_{MAX}$		0.156	0.4	
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}	66	60		dB
		$C_{ADJ} = 10\mu F$ (note2)		75		
Long-Term Stability, $T_J = T_{HIGH}$	ST	$T_A = 25^\circ C$ for end point measurements, 1000HR		0.3	1	%
Thermal Resistance Junction to case	$R_{\theta JC}$			25.2		$^\circ C / W$

Notes: 1. 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. ($P_{MAX} = 20W$)

2. C_{ADJ} - when used, is connected between the adjustment pin and ground.



7. Typical Application



$$V_O = 1.25V(1 + R2/R1) + I_{adj} R2$$

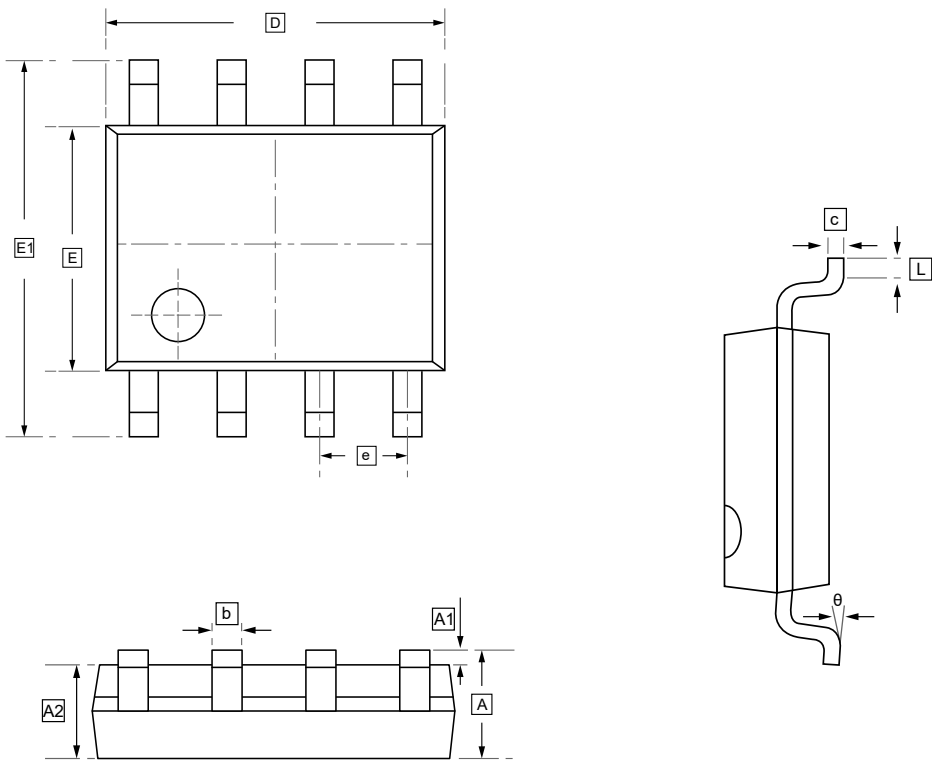
C_i is required when regulator is located an appreciable distance from power supply filter.

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.



8.1SOP-8 Package Outline Dimensions

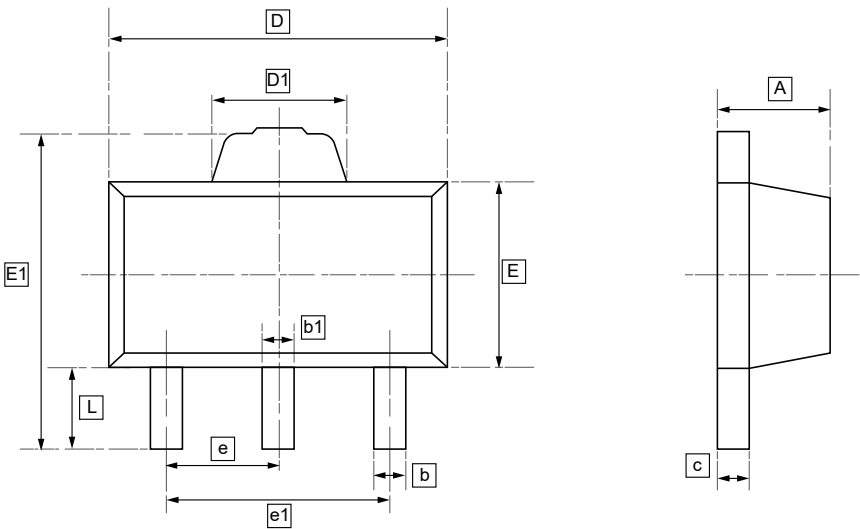


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.100	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.250	1.550	0.510	0.250	5.100	4.000	6.200	(BSC)	1.270	8°



8.2SOT-89 Package Outline Dimensions

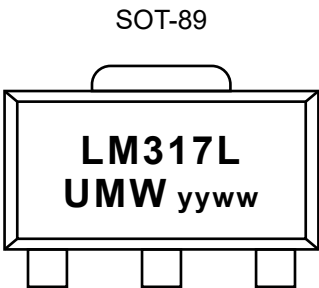
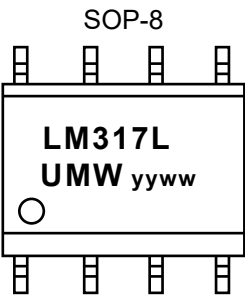


DIMENSIONS (mm are the original dimensions)

Symbol	A	b	b1	c	D	D1	E	E1	e	e1	L
Min	1.400	0.320	0.360	0.350	4.400	1.400	2.300	3.940	1.500	2.900	0.900
Max	1.600	0.520	0.560	0.440	4.600	1.800	2.600	4.250	TYP	3.100	1.100



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW LM317LD	LM317L	SOP-8	2500	Tape and reel
UMW LM317LIPK	LM317L	SOT-89	1000	Tape and reel



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