LM317L

3-terminal 0.1A positive adjustable regulator

Features

- Output current in excess of 100mA
- Output adjustable between 1.2V and 37V
- Internal thermal-overload protection
- Internal short-circuit current-limiting
- Output transistor safe-area compensation
- Floating operation for high-voltage applications

Description

The LM317L is a 3-terminal adjustable positive voltage regulator capable of supplying in excess of 100mA over an output voltage range of 1 .2V to 37V. This voltage regulator is exceptionally easy to use and requires only two external resistors to set the output voltage.

TO-92

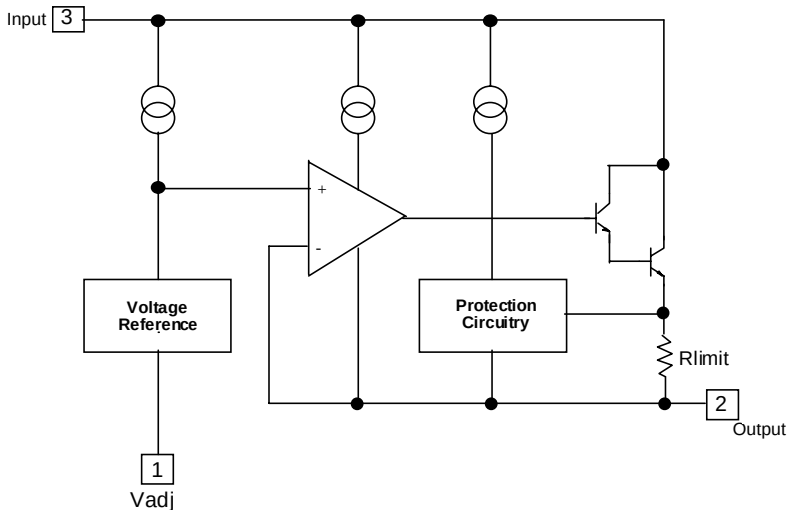
1

1. Adj 2. Output 3. Input

8-SOP

1

Internal Block Diagram



Rev. 1.0.1

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input-Output Voltage Differential	V_I - V_O	40	V
Power Dissipation	P_D	Internally limited	W
Operating Junction Temperature Range	T_j	0 ~ +125	°C
Storage Temperature Range	T_{STG}	-65 ~+125	°C

Electrical Characteristics

(V_I - V_O = 5V, I_O = 40mA, 0°C ≤ T_J ≤ +125°C, P_{DMAX} = 625mW, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
*Line Regulation	R_{line}	T_A = +25°C 3V ≤ V_I – V_O ≤ 40V	-	0.01	0.04	%/V
		3V ≤ V_I – V_O ≤ 40V	-	0.02	0.07	
*Load Regulation	R_{loal}	T_A = +25°C 10mA ≤ I_O ≤100mA V_O ≤ 5V V_O ≥5V	-	5 0.1	25 0.5	mV %/ V_O
		10mA ≤ I_O ≤ 100mA V_O ≤ 5V V_O ≥ 5V	-	20 0.3	70 1.5	mV %/ V_O
Adjustment Pin Current	I_{ADJ}	-	-	50	100	µA
Adjustment Pin Current Change	ΔI_{ADJ}	3V ≤ V_I - V_O ≤ 40V 10mA ≤ I_O ≤ 100mA P_D < P_{DMAX}	-	0.2	5	µA
Reference Voltage	V_{REF}	3V < V_I - V_O <40V 10mA ≤ I_O ≤100mA P_D ≤ P_{DMAX}	1.20	1.25	1.30	V
Temperature Stability	ST_T	-	-	0.7	-	%
Minimum Load Current to Maintain Regulation	$I_{L(MIN)}$	V_I - V_O = 40V	-	3.5	10	mA
Maximum output Current	$I_{O(MAX)}$	V_I - V_O ≤ 15V P_D < P_{DMAX}	100	200	-	mA
		V_I - V_O ≤ 40V P_D < P_{DMAX}, T_A = +25°C	25	50	-	
RMS Noise, % of V_{OUT}	e_N	T_A =+ 25°C 10Hz < f <10KHz	-	0.003	-	%/ V_O
Ripple Rejection	RR	V_O = 10V, f = 120Hz without C_{ADJ} C_{ADJ} = 10uF	66	65 80	-	dB
Long-Term Stability	ST	T_J = +125 °C, 1000 Hours	-	0.3	-	%

- Load and Line regulation are specified at constant junction temperature. Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Typical Application

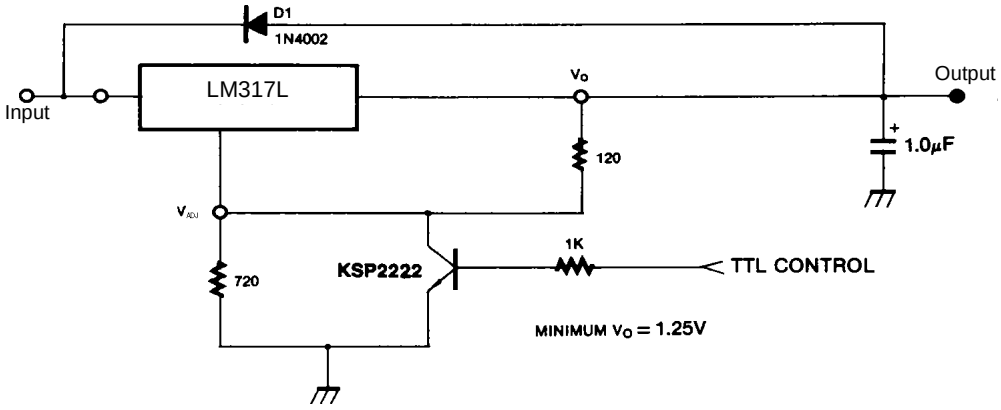


Figure 1. 5V Electronic Shutdown Regulator

D1 protects the device during an input short circuit.

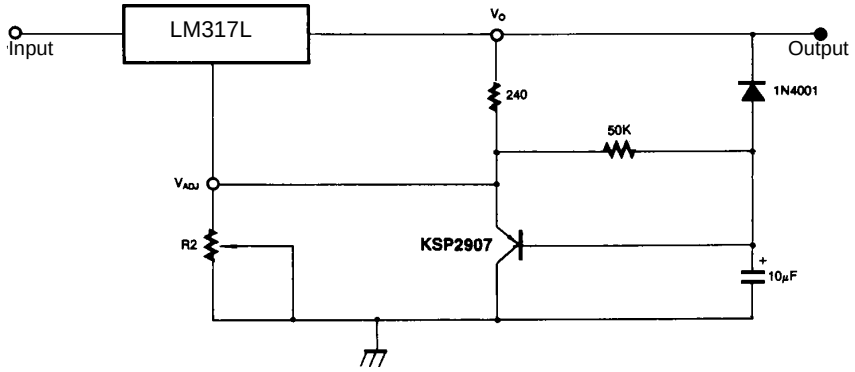
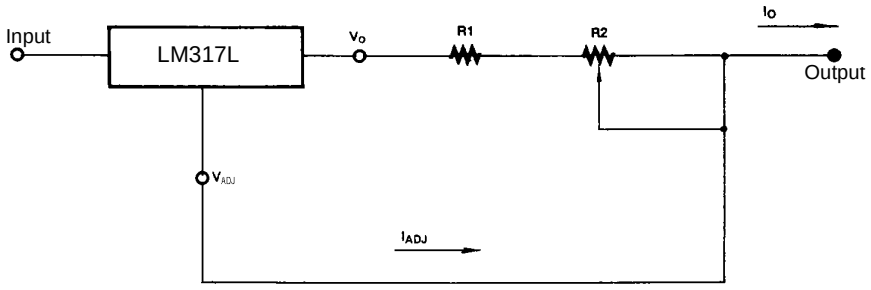


Figure 2. Slow Turn-On Regulator



$$I_{OMAX} = \left(\frac{V_{REF}}{R1}\right) + I_{ADJ} \cong \frac{1.25V}{R1}$$

$$I_{OMIN} = \left(\frac{V_{REF}}{R1 + R2}\right) + I_{ADJ} \cong \frac{1.25V}{R1 + R2}$$

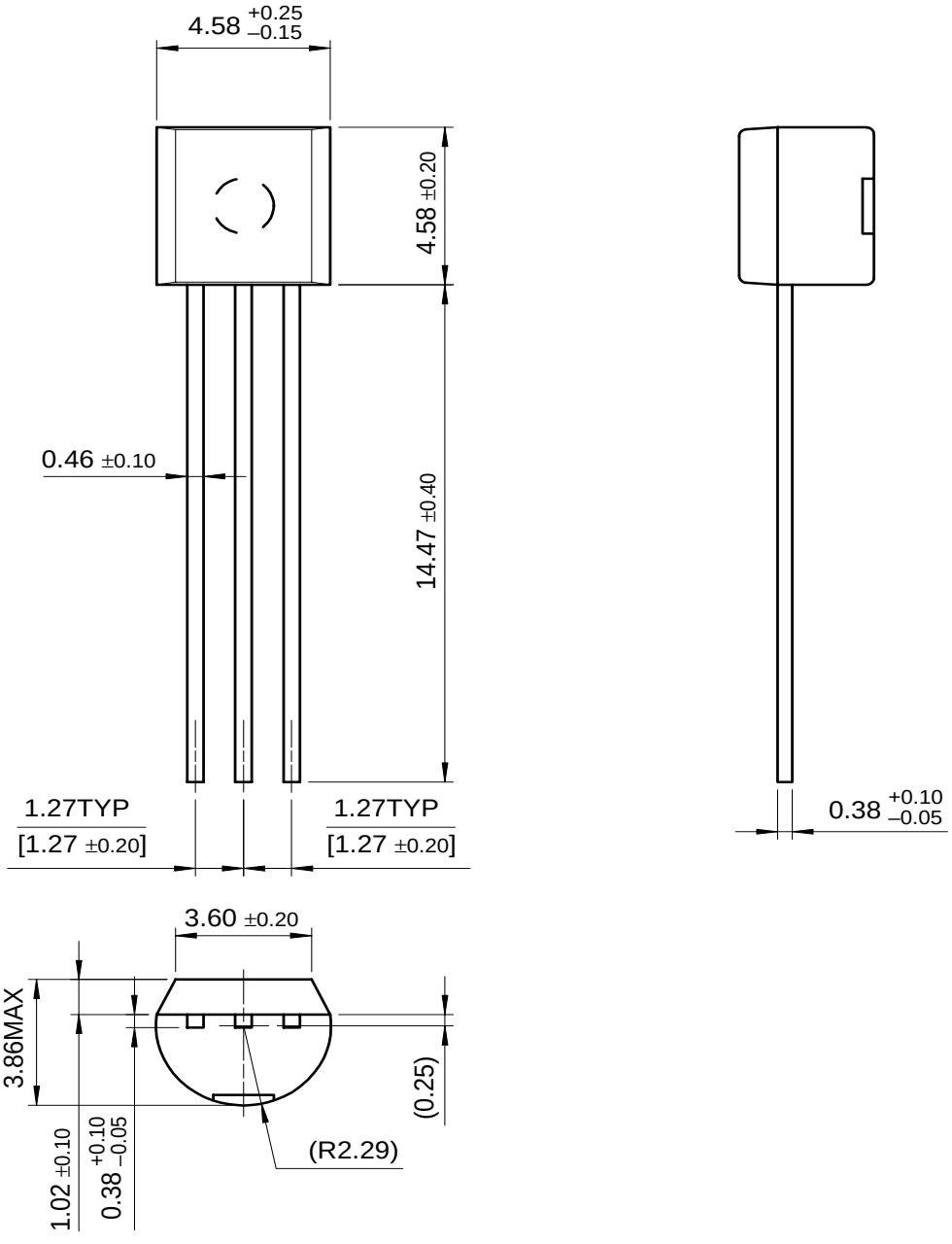
$5mA < I_O < 500mA$

Figure 3. Current Regulator

Mechanical Dimensions

Package

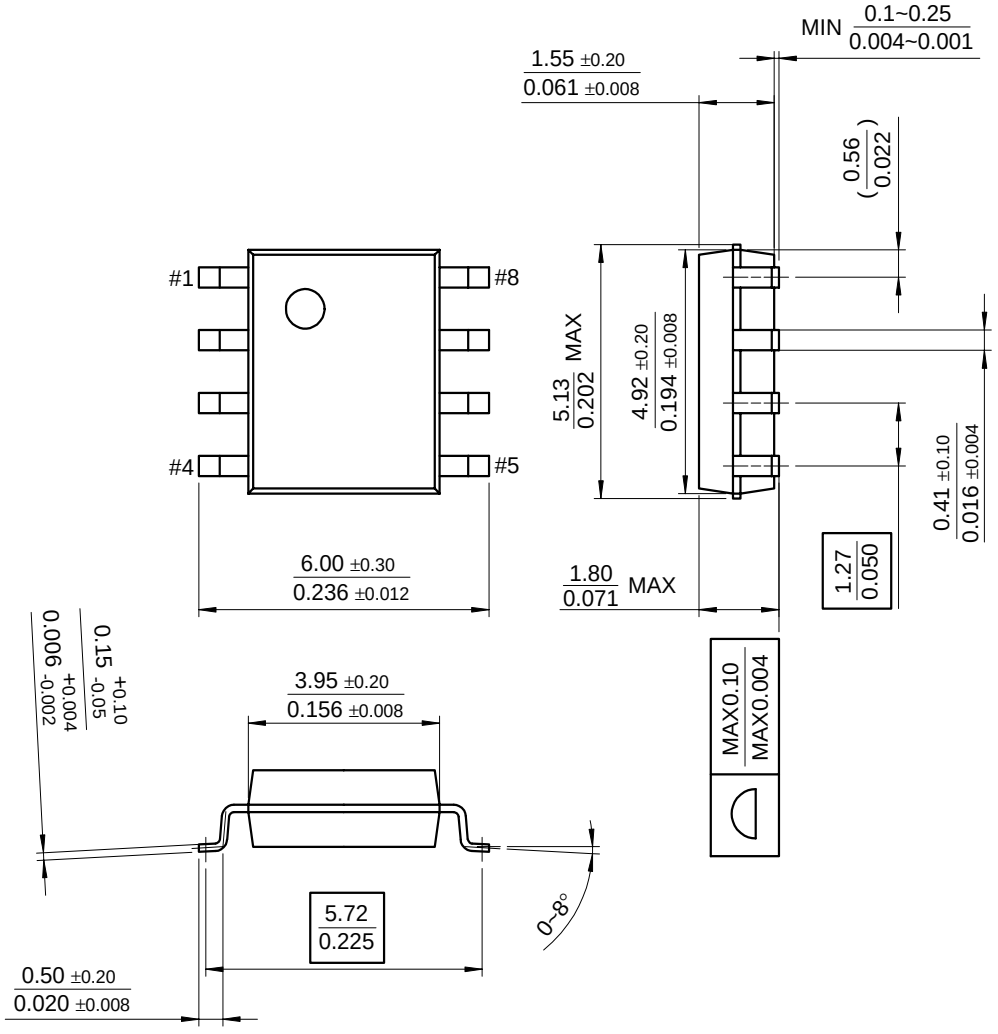
TO-92



Mechanical Dimensions (Continued)

Package

8-SOP


MIN 0.1~0.25 / 0.004~0.001
1.55 ±0.20 / 0.061 ±0.008
0.56 / 0.022
#1
#8
#4
#5
5.13 / 0.202 MAX
4.92 ±0.20 / 0.194 ±0.008
0.41 ±0.10 / 0.016 ±0.004
6.00 ±0.30 / 0.236 ±0.012
1.80 / 0.071 MAX
1.27 / 0.050
MAX0.10 / MAX0.004
0.15 +0.10 -0.05 / 0.006 +0.004 -0.002
3.95 ±0.20 / 0.156 ±0.008
5.72 / 0.225
0~8°
0.50 ±0.20 / 0.020 ±0.008

Ordering Information

Product Number	Package	Operating Temperature
LM317LZ	TO-92	0°C to + 125°C
LM317LM	8-SOP	

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