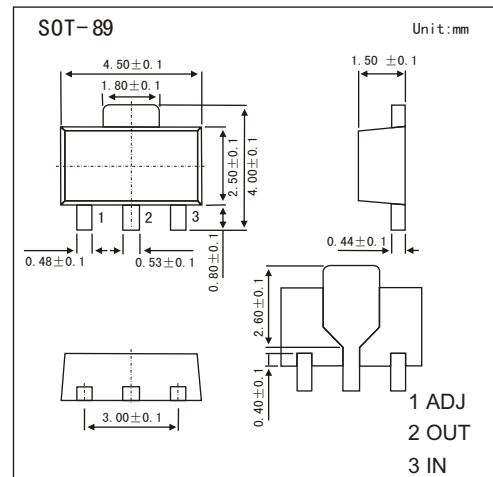


## 3-Terminal Positive Adjustable Regulator

### LM317

#### ■ Features

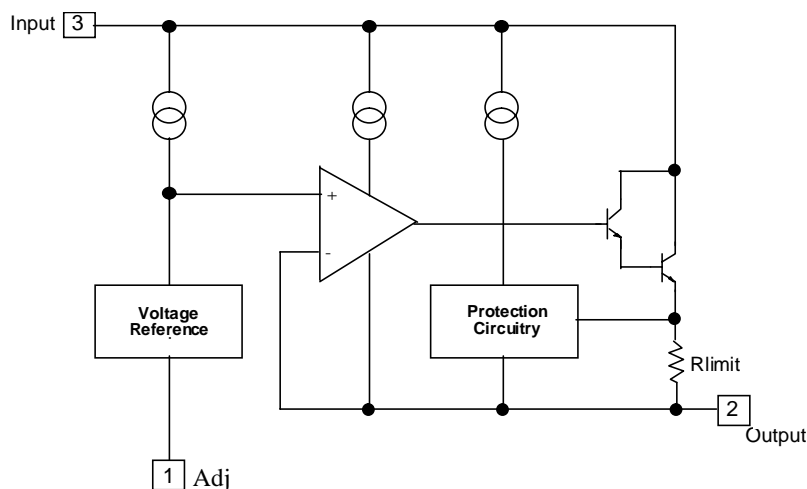
- Output Current In Excess of 1.5A
- Output Adjustable Between 1.2V and 37V
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe Operating Area Compensation



#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	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 to +125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 to +125	$^\circ\text{C}$

#### ■ Internal Block Diagram



# LM317

## ■ Electrical Characteristics ( $V_i - V_o = 5V$ , $I_o = 0.5A$ , $0^\circ C \leq T_J \leq +125^\circ C$ , $I_{MAX} = 1.5A$ , $P_{D_{MAX}} = 20W$ , unless otherwise specified)

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Line Regulation	$R_{line}$	$T_A = +25^\circ C, 3V \leq V_i - V_o \leq 40V$		0.01	0.04	% / V
		$3V \leq V_i - V_o \leq 40V$		0.02	0.07	% / V
Load Regulation	$R_{load}$	$T_A = +25^\circ C, 10mA \leq I_o \leq I_{MAX}, V_o < 5V$		18	25	mV% / $V_o$
		$T_A = +25^\circ C, 10mA \leq I_o \leq I_{MAX}, V_o \geq 5V$		0.4	0.5	
		$10mA \leq I_o \leq I_{MAX}, V_o < 5V$		40	70	mV% / $V_o$
		$10mA \leq I_o \leq I_{MAX}, V_o \geq 5V$		0.8	1.5	
Adjustable Pin Current	$I_{ADJ}$			46	100	$\mu A$
Adjustable Pin Current Change	$\Delta I_{ADJ}$	$3V \leq V_i - V_o \leq 40V$ $10mA \leq I_o \leq I_{MAX} P_D \leq P_{MAX}$		2.0	5	$\mu A$
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	$STT$			0.7		% / $V_o$
Minimum Load Current to Maintain Regulation	$I_{L(MIN)}$	$V_i - V_o = 40V$		3.5	12	mA
Maximum Output Current	$I_{O(MAX)}$	$V_i - V_o \leq 15V, P_D \leq P_{MAX}$ $V_i - V_o \leq 40V, P_D \leq P_{MAX}$ $T_A = 25^\circ C$	1.0	2.2 0.3		A
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 $C_{ADJ}$ $C_{ADJ} = 10 \mu F$	66	60 75		dB
Long-Term Stability, $T_J = THIGH$	$ST$	$T_A = +25^\circ C$ for end point measurements, 1000HR		0.3	1	%
Thermal Resistance Junction to Case	$R_{\theta JC}$			5		$^\circ C/W$

## ■ Marking

Marking	LM317
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# LM317

## ■ Typical Characteristics

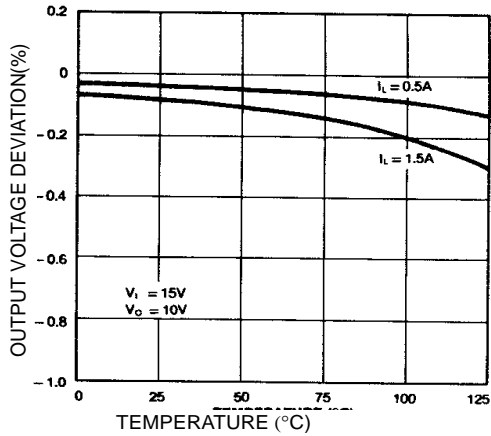


Figure 1. Load Regulation

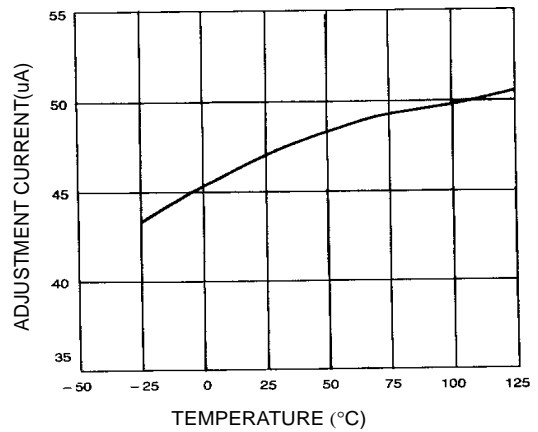


Figure 2. Adjustment Current

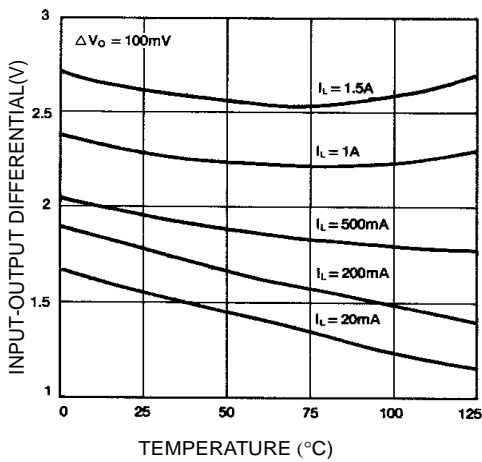


Figure 3. Dropout Voltage

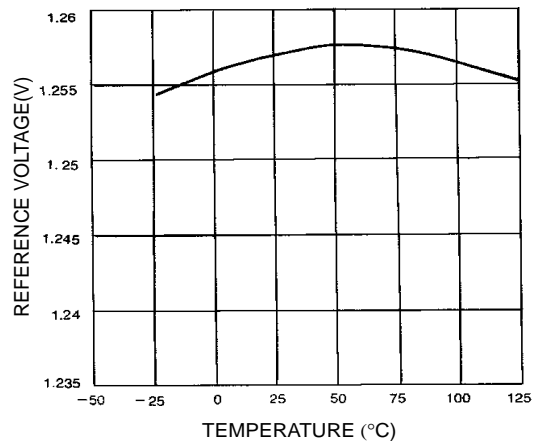


Figure 4. Reference Voltage