

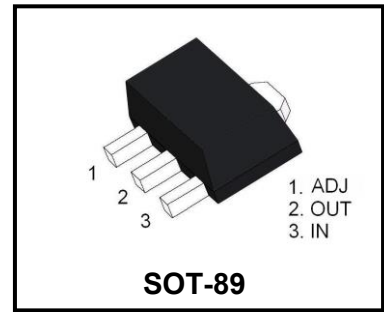
**3-Terminal 0.1A Positive Adjustable Regulator**

**Description**

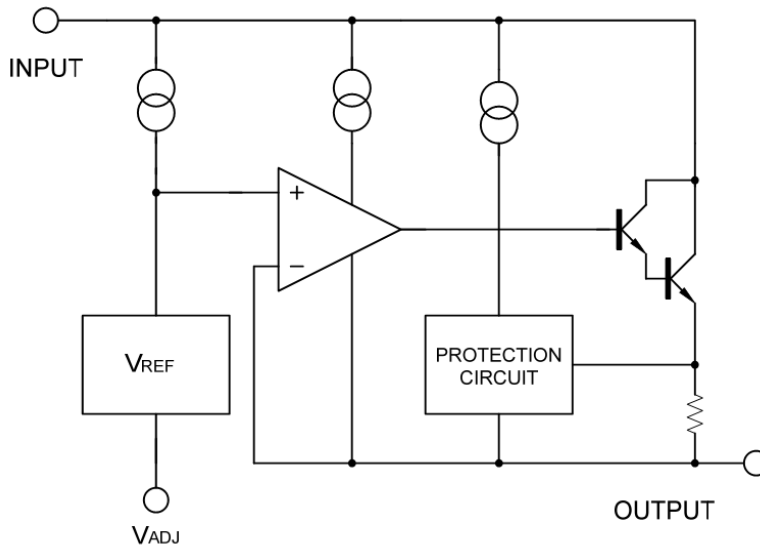
The LM317 is a monolithic integrated circuit, designed to supply 100mA of output current with voltage adjustable from 1.25V to 37V.

**Features**

- ◆ Output Voltage adjustable from 1.25 to 37V
- ◆ Output current in excess of 100mA
- ◆ Internal thermal overload protection
- ◆ Internal short circuit current limiting
- ◆ Output transistor safe area compensation



**Block Diagram**



**Absolute Maximum Ratings**

Symbol	Parameter	Value	Unit
$V_{i-o}$	Input-output Differential Voltage	40	V
$I_o$	Output Current	Intenrally Limited	
$V_o$	Out put Voltage	5	V
$T_{OP}$	Operating Junction Temperature	0~+125	°C
$T_{STG}$	Storage Temperature	-60~+150	°C

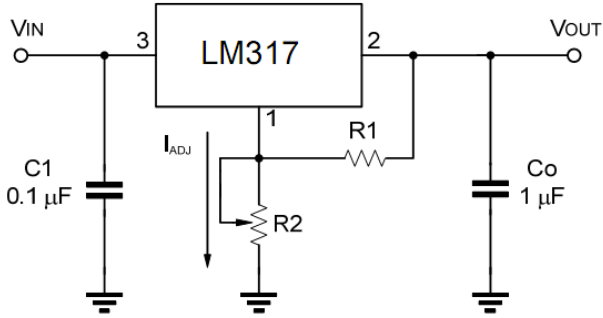
**Electrical Characteristics**

( $V_i - V_o = 5\text{ V}$ ,  $I_o = 500\text{ mA}$ ,  $I_{MAX} = 1.5\text{ A}$  and  $P_{MAX} = 20\text{ W}$ , unless otherwise specified)

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
Line Regulation	$\Delta V_o$	$V_i - V_o = 3\text{ to }40\text{ V}$ , $I_{LOAD} \leq 20\text{ mA}$			0.04	%V
Load Regulation	$\Delta V_o$	$I_o = 5\text{ mA} \sim 100\text{ mA}$	$V_{OUT} \leq 5\text{ V}$		25	mV
			$V_{OUT} \geq 5\text{ V}$		0.5	%
Adjustment Pin Current	$I_{ADJ}$	$T_j = 25^\circ\text{C}$			100	$\mu\text{A}$
Adjustment Pin Current	$\Delta I_{ADJ}$	$V_i - V_o = 3\text{ to }40\text{ V}$ , $I_o = 5\text{ mA} \sim 100\text{ mA}$			5	$\mu\text{A}$
Reference Voltage (between pin3 and pin1)	$V_{REF}$	$V_i - V_o = 3\text{ to }40\text{ V}$ $I_o = 5\text{ mA} \sim 100\text{ mA}$ , $P_D \leq 625\text{ mW}$	1.20	1.25	1.30	V
Minimum Load Current	$I_{L(min)}$	$V_i - V_o = 40\text{ V}$			10	mA
Maximum Output Current	$I_{O(max)}$	$V_i - V_o = 40\text{ V}$ , $P_D \leq 625\text{ mW}$			100	mA
RMS Noise vs. %of $V_{OUT}$	eN	$f = 10\text{ to }10\text{ KHz}$			0.01	%V
Ripple Rejection	RR	$V_{OUT} = 10\text{ V}$ , $f = 120\text{ Hz}$	$C_{ADJ} = 0$		65	dB
			$C_{ADJ} = 10\mu\text{F}$	60		dB

Note:  $C_{ADJ}$  is connected between Adjust pin and Ground.

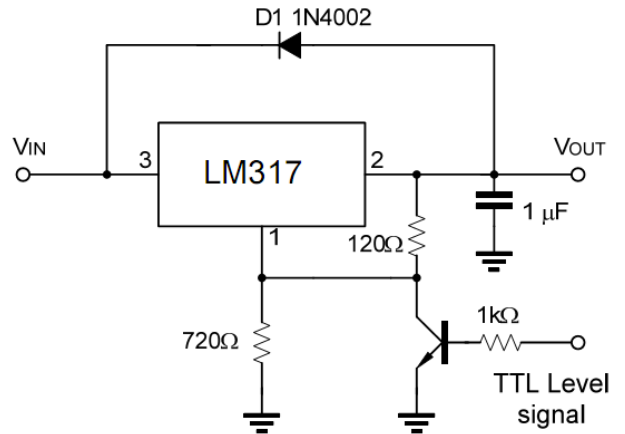
**Application Circuits**



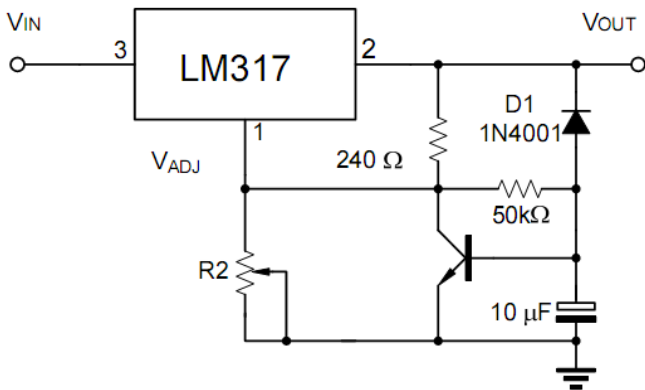
$$V_{out} = 1.25 * (1 + R2/R1) + I_{ADJ} * R$$

C1 is required when regulator is located an appreciated distance from power supply. Co is needed to improve transient response.

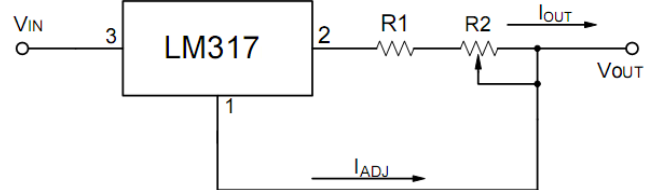
**Fig.1 Prgrammable Voltage Regulator**



**Fig.2 Regulator with ON-off controll**



**Fig.3 Soft Start Application**



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

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

$$5mA < I_{OUT} < 100mA$$

**Fig.4. Constant Current Application**

Typical Characteristic

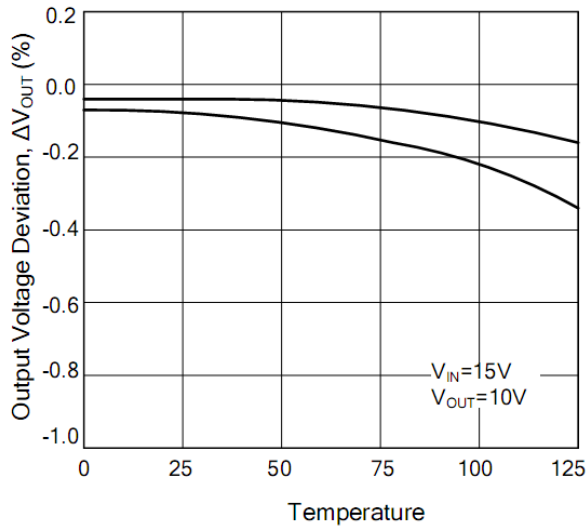


Fig.1. Load Regulation vs. temperature

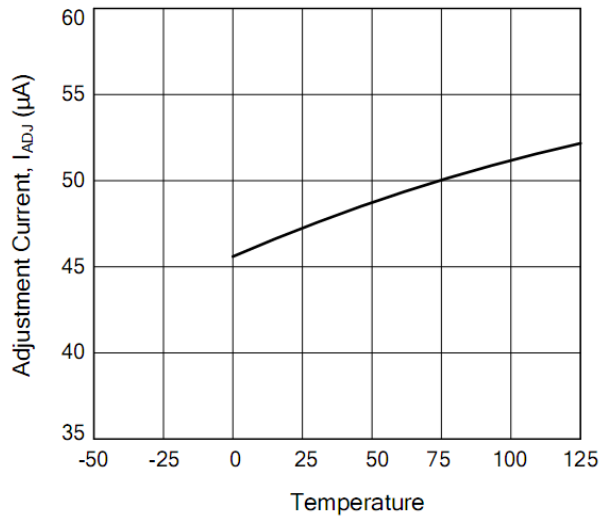


Fig.2. Adjustment Current vs. Temperature

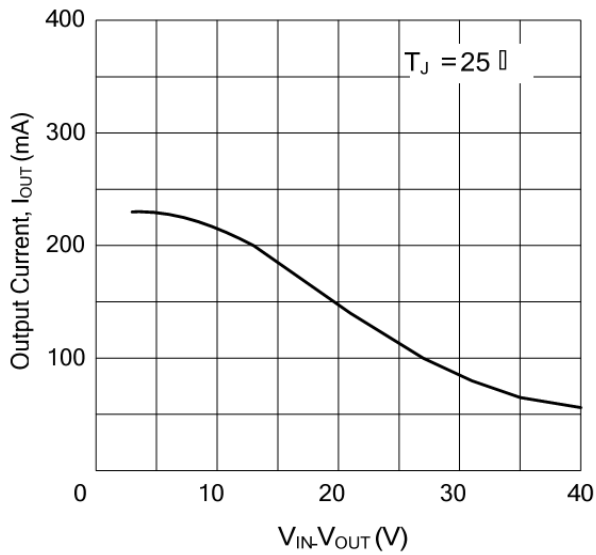


Fig.3. Currents Limit

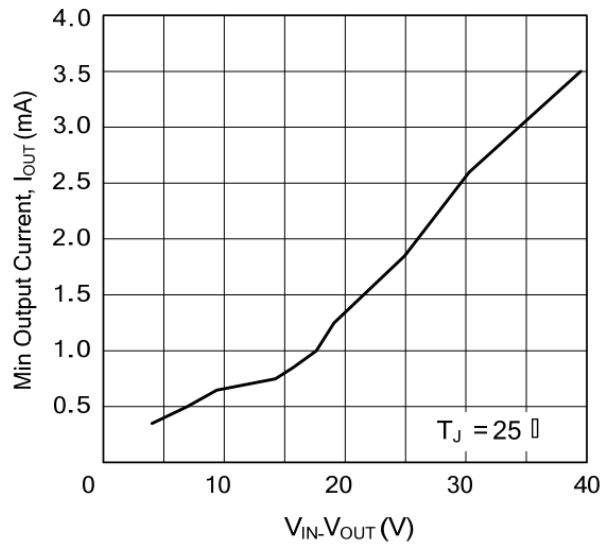
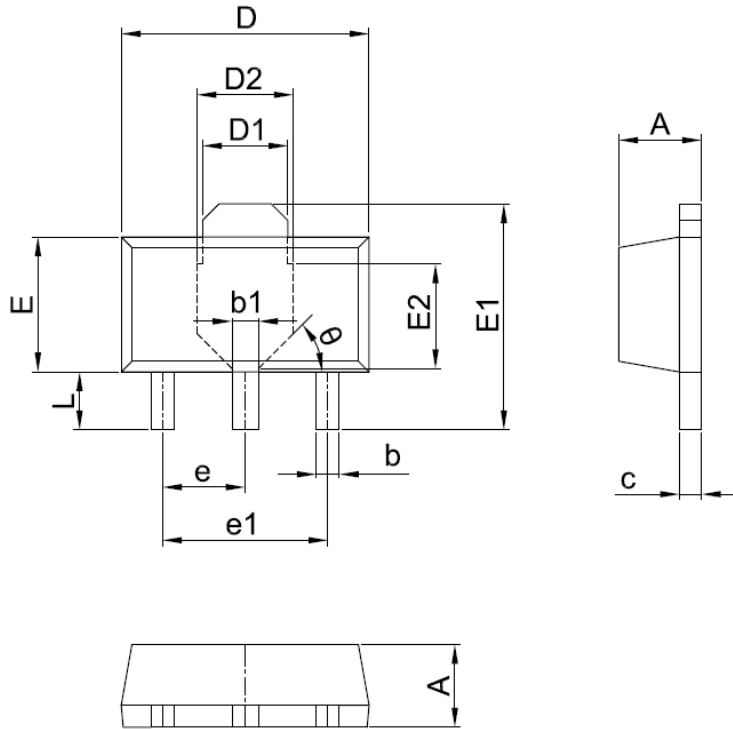


Fig.4. Minimum Operating Current

Package Outline

SOT-89



Symbol	Min.	Typ	Max.
A	1.40	1.50	1.60
b	0.32	0.42	0.52
b1	0.38	0.48	0.58
c	0.35	0.40	0.45
D	4.40	4.50	4.60
D1	1.45	1.55	1.65
D2	1.70	1.75	1.80
E	2.30	2.45	2.60
E1	3.95	4.10	4.25
E2	1.80	1.90	2.00
e	1.40	1.50	1.60
e1	2.80	3.00	3.20
L	0.90	1.05	1.20
θ		45°	

Product Specification Classification

Part Number	Package	Marking	Pack
LM317	SOT-89	YFW LM317	1000PCS/Tape