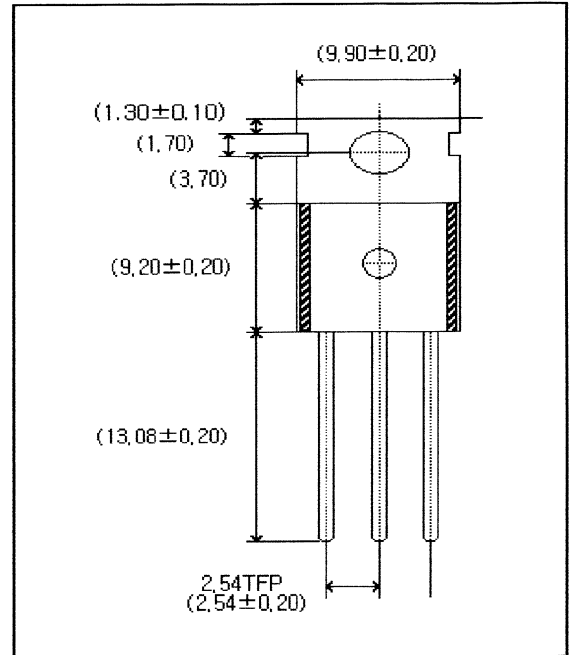


3-TERMINAL 1A POSITIVE ADJUSTABLE REGULATOR

This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply more than 1.5A 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.

FEATURES

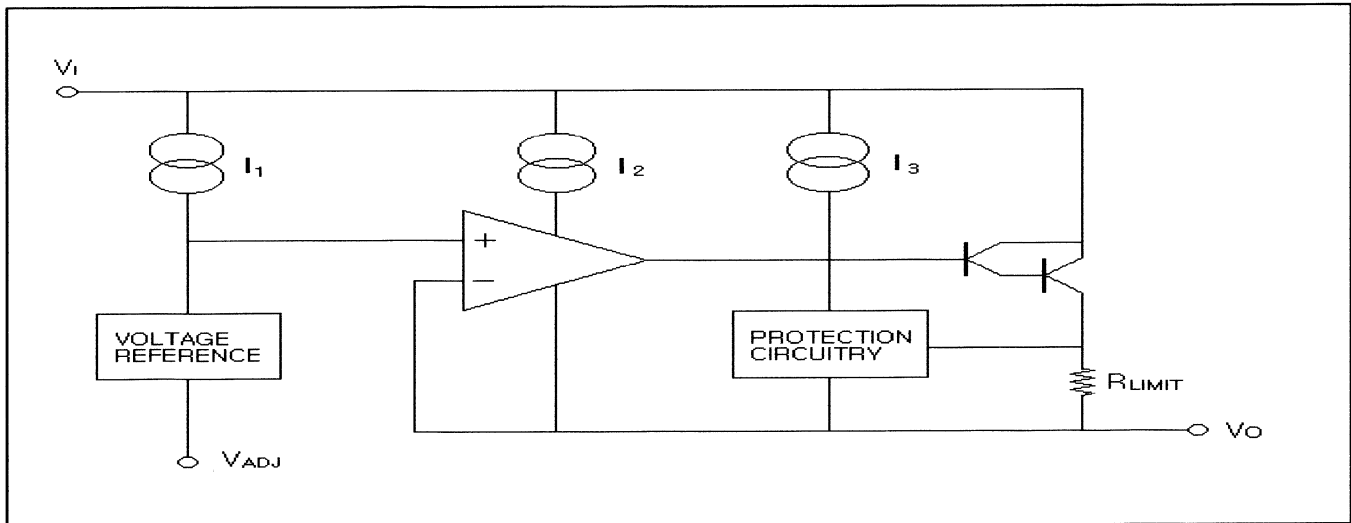
- ◇ Output current in Excess of 1.5A
- ◇ Output Adjustable Between 1.2V and 37V
- ◇ Internal Thermal-Overload Protection
- ◇ Internal Short-Circuit Current-Limiting
- ◇ Output Transistor Safe-Area Compensation



ORDERING INFORMATION

Device	Package	Operating Temperature
LM317	TO-220	0°C ~ 125°C

BLOCK DIAGRAM



For more information, or to purchase call 1-800-214-8769

ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

Characteristic	Symbol	Value	Unit
Input-output Voltage Differential	$V_I-V_O$	40	V
Lead Temperature	$T_{LEAD}$	230	$^\circ\text{C}$
Power Dissipation	$P_D$	Internally limited	—
Operating Temperature Range	$T_{OPR}$	0 ~ +125	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 ~ +125	$^\circ\text{C}$

## ELECTRICAL CHARACTERISTICS

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

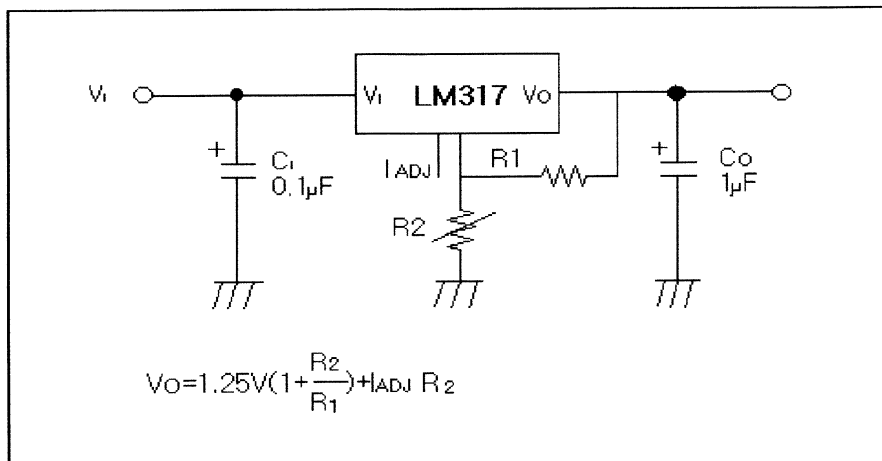
Characteristic	Symbol	Test condition	Min.	Typ.	Max.	Unit
Line Regulation	$\Delta V_O$	$T_A=0 \sim 125^\circ\text{C}$ $3\text{V}\leq V_I-V_O\leq 40\text{V}$		0.01	0.04	%/V
		$3\text{V}\leq V_I-V_O\leq 40\text{V}$		0.02	0.07	%/V
Load Regulation	$\Delta V_O$	$T_A=25^\circ\text{C}$ , $10\text{mA}\leq I_O\leq I_{MAX}$ $V_O\leq 6\text{V}$ $V_O\geq 5\text{V}$		18	25	mV
		$10\text{mA}\leq I_O\leq I_{MAX}$ $V_O\leq 5\text{V}$ $V_O\geq 5\text{V}$		0.4	0.5	%/ $V_O$
Adjustable Pin Current	$I_{ADJ}$			46	100	$\mu\text{A}$
Adjustable Pin Current Change	$\Delta I_{ADJ}$	$3\text{V}\leq V_I-V_O\leq 40\text{V}$ $10\text{mA}\leq I_O\leq I_{MAX}$ $P\leq P_{MAX}$		2.0	5	$\mu\text{A}$
Reference Voltage	$V_{REF}$	$3\text{V}\leq V_{IN}-V_{OUT}\leq 40\text{V}$ $10\text{mA}\leq I_O\leq I_{MAX}$ $P_D\leq P_{MAX}$	1.20	1.25	1.30	V
Temperature Stability	$ST_T$			0.7		%/ $V_O$
Minimum Load Current to Maintain Regulation	$L_{(MIN)}$	$V_I-V_O=40\text{V}$		3.5	10	mA
Maximum Output Current	$I_{O(MAX)}$	$V_I-V_O\leq 15\text{V}$ , $P_D\leq P_{MAX}$	1.5	2.2		A
		$V_I-V_O\leq 40\text{V}$ , $P_D\leq P_{MAX}$ , $T_A=25^\circ\text{C}$	0.156	0.4		
RMS Noise, % of $V_{OUT}$	$e_n$	$T_A=25^\circ\text{C}$ , $10\text{Hz}\leq f\leq 10\text{KHz}$		0.003	0.01	%/ $V_O$
Ripple Rejection	RR	$V_O=10\text{V}$ , $f=120\text{Hz}$ without $C_{ADJ}$		60		dB
		$C_{ADJ}=10\ \mu\text{F}$	66	75		
Long-Term Stability, $T_J=T_{HIGH}$	ST	$T_A=25^\circ\text{C}$ , for end point measurements, 1000HR		0.3	1	%
Thermal Resistance Junction to Case	$R_{\theta JC}$			5		$^\circ\text{C/W}$

\* 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 is used. ( $P_{MAX}=20\text{W}$ )

For more information, or to purchase call 1-800-214-8769

## TYPICAL APPLICATIONS

Fig.5 Programmable Regulator



$C_i$  is required when regulator is located in 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.