

## 1.2V TO 37V VOLTAGE REGULATOR

- OUTPUT VOLTAGE RANGE: 1.2 TO 37V
- OUTPUT CURRENT IN EXCESS OF 1.5A
- 0.1% LINE AND LOAD REGULATION
- FLOATING OPERATION FOR HIGH VOLTAGES
- COMPLETE SERIES OF PROTECTIONS: CURRENT LIMITING, THERMAL SHUTDOWN AND SOA CONTROL

### DESCRIPTION

The LM117/LM217/LM317 are monolithic integrated circuit in TO-220, TO-220FP, TO-3 and D<sup>2</sup>PAK packages intended for use as positive adjustable voltage regulators.

They are designed to supply more than 1.5A of load current with an output voltage adjustable over a 1.2 to 37V range.

The nominal output voltage is selected by means of only a resistive divider, making the device exceptionally easy to use and eliminating the stocking of many fixed regulators.

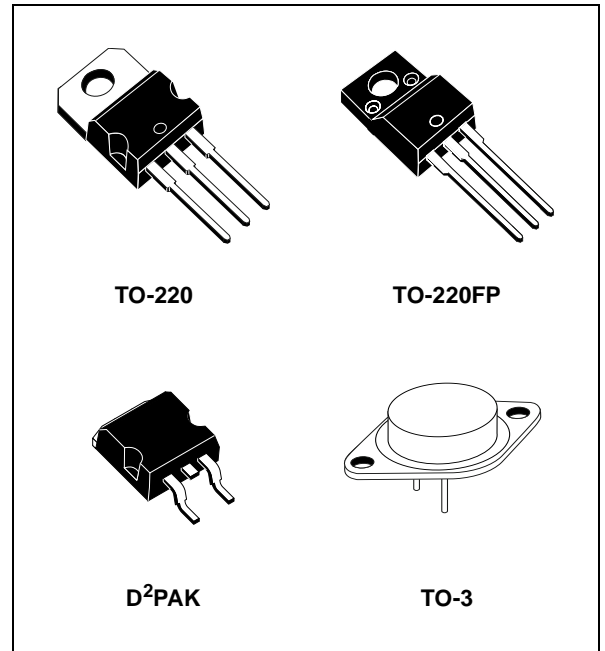
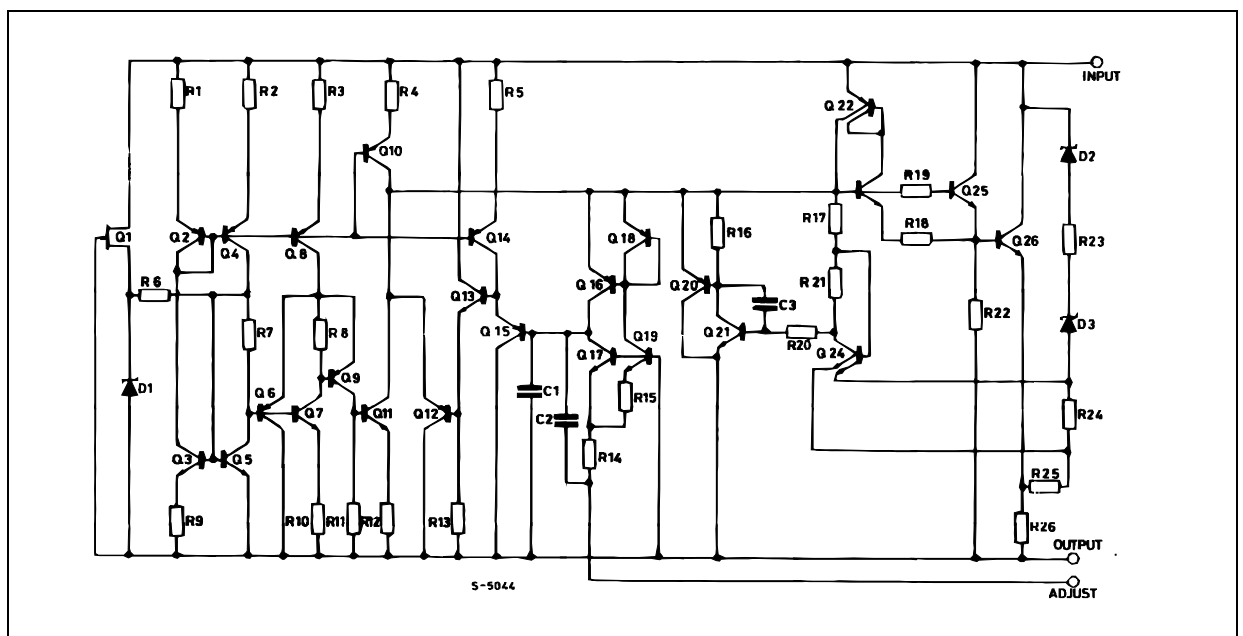


Figure 1: Schematic Diagram



**Table 1: Absolute Maximum Ratings**

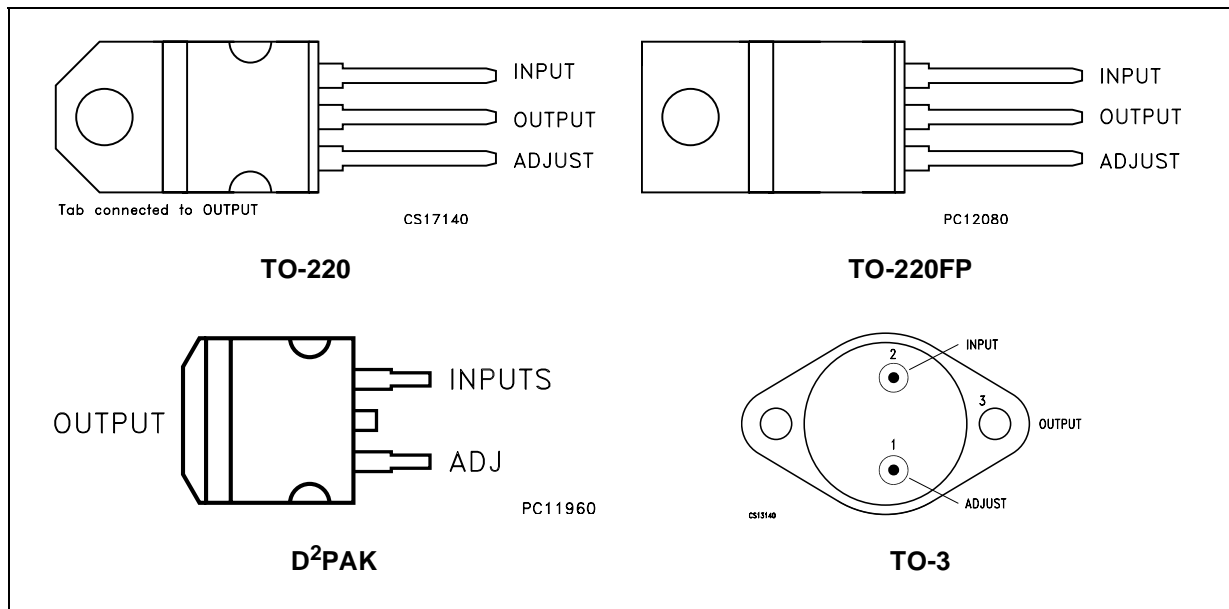
Symbol	Parameter	Value	Unit
$V_I - V_O$	Input-Reference Differential Voltage	40	V
$I_O$	Output Current	Internally Limited	
$T_{op}$	Operating Junction Temperature for:	LM117	-55 to 150
		LM217	-25 to 150
		LM317	0 to 125
$P_{tot}$	Power Dissipation	Internally Limited	
$T_{stg}$	Storage Temperature	-65 to 150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

**Table 2: Thermal Data**

Symbol	Parameter	D <sup>2</sup> PAK	TO-220	TO-220FP	TO-3	Unit
$R_{thj-case}$	Thermal Resistance Junction-case Max	3	3	5	4	°C/W
$R_{thj-amb}$	Thermal Resistance Junction-ambient Max	62.5	50	60	35	°C/W

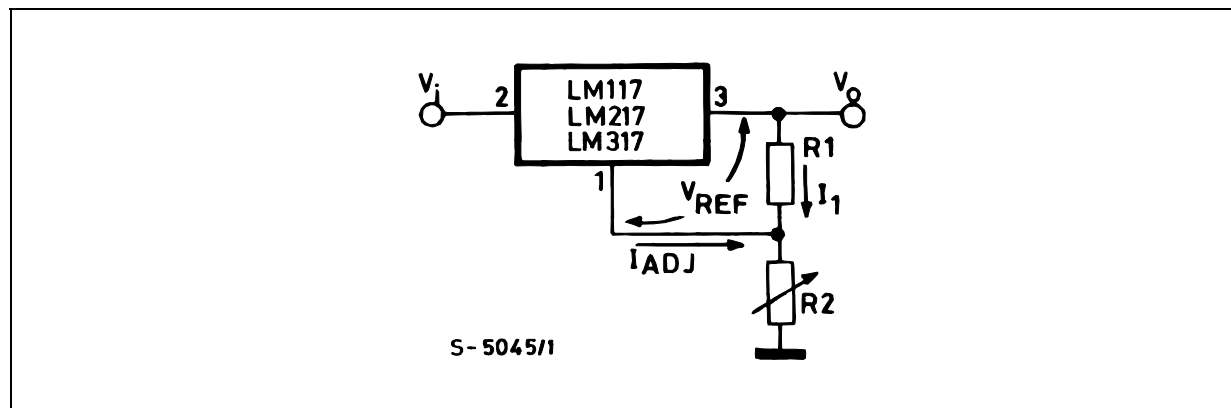
**Figure 2: Connection Diagram (top view)**



**Table 3: Order Codes**

TYPE	TO-220	D <sup>2</sup> PAK	TO-220FP	TO-3
LM117				LM117K
LM217	LM217T	LM217D2T		LM217K
LM317	LM317T	LM317D2T	LM317P	LM317K

Figure 3: Basic Adjustable Regulator



**Table 4: Electrical Characteristics For LM117/LM217** ( $V_I - V_O = 5\text{ V}$ ,  $I_O = 500\text{ mA}$ ,  $I_{MAX} = 1.5\text{ A}$  and  $P_{MAX} = 20\text{ W}$ ,  $T_J = -55\text{ to }150^\circ\text{C}$  for LM117,  $T_J = -25\text{ to }150^\circ\text{C}$  for LM217, unless otherwise specified).

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$\Delta V_O$	Line Regulation	$V_I - V_O = 3\text{ to }40\text{ V}$	$T_J = 25^\circ\text{C}$	0.01	0.02	%V
				0.02	0.05	
$\Delta V_O$	Load Regulation	$V_O \leq 5\text{ V}$ $I_O = 10\text{ mA to }I_{MAX}$	$T_J = 25^\circ\text{C}$	5	15	mV
				20	50	
		$V_O \geq 5\text{ V}$ $I_O = 10\text{ mA to }I_{MAX}$	$T_J = 25^\circ\text{C}$	0.1	0.3	%
				0.3	1	
$I_{ADJ}$	Adjustment Pin Current			50	100	$\mu\text{A}$
$\Delta I_{ADJ}$	Adjustment Pin Current	$V_I - V_O = 2.5\text{ to }40\text{ V}$ $I_O = 10\text{ mA to }I_{MAX}$		0.2	5	$\mu\text{A}$
$V_{REF}$	Reference Voltage (between pin 3 and pin 1)	$V_I - V_O = 2.5\text{ to }40\text{ V}$ $I_O = 10\text{ mA to }I_{MAX}$ $P_D \leq P_{MAX}$	1.2	1.25	1.3	V
$\Delta V_O/V_O$	Output Voltage Temperature Stability			1		%
$I_{O(min)}$	Minimum Load Current	$V_I - V_O = 40\text{ V}$		3.5	5	mA
$I_{O(max)}$	Maximum Load Current	$V_I - V_O \leq 15\text{ V}$ $P_D < P_{MAX}$	1.5	2.2		A
		$V_I - V_O = 40\text{ V}$ $P_D < P_{MAX}$		0.4		
		$T_J = 25^\circ\text{C}$				
eN	Output Noise Voltage (percentage of $V_O$ )	$B = 10\text{ Hz to }100\text{ KHz}$ $T_J = 25^\circ\text{C}$		0.003		%
SVR	Supply Voltage Rejection (*)	$T_J = 25^\circ\text{C}$ $f = 120\text{ Hz}$	$C_{ADJ} = 0$	65		dB
			$C_{ADJ} = 10\mu\text{F}$	66	80	

(\*)  $C_{ADJ}$  is connected between pin 1 and ground.