

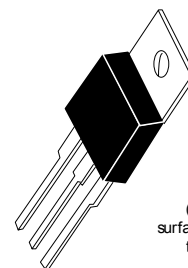
# IL317

## THREE-TERMINAL ADJUSTABLE OUTPUT POSITIVE VOLTAGE REGULATORS

The IL317 is adjustable 3-terminal positive voltage regulator capable of supplying in excess of 1.5 A over an output voltage range of 1.2 V to 37 V. These voltage regulator is exceptionally easy to use and require only two external resistors to set the output voltage. Further, it employ internal current limiting, thermal shutdown and safe area compensation, making them essentially blow-out proof.

The IL317 serve a wide variety of applications to make a programmable output regulator, or by connecting a fixed resistor between the adjustment and output, the IL317 series can be used as a precision current regulator.

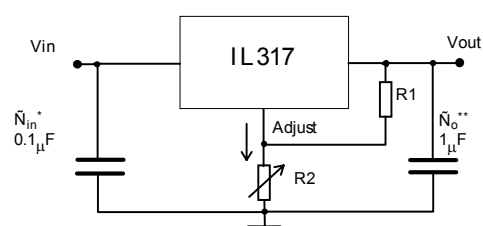
TO-220 AB



Pin 1. Ajust  
2. Vout  
3. Vin

(Heatsink surface connected to Pin 2.)

### Standard application



\* =  $C_{in}$  is required if regulator is located an appreciable distance from power supply filter.

\*\* =  $C_o$  is not needed for stability ; however, is does improve transient response.

$$V_{out} = 1.25V \left(1 + \frac{R2}{R1}\right) + I_{ADJ} * R2$$

Since  $I_{ADJ}$  is controlled to less then  $100 \mu A$ , the error associated with this term is negligible in most applications.

- Output Current in Excess of 1.5 Ampere
- Output Adjustable between 1.2 V and 37 V
- Internal Thermal Overload Protection
- Internal Short - Circuit Current Limiting Constant with Temperature
- Output Transistor Safe-Area Compensation
- Floating Operation for High Voltage Applications
- Standard 3-lead Transistor Packages
- Eliminates Stocking Many Fixed

### Maximum ratings

Rating	Symbol	Value	Unit
Input - Output Voltage Differential	$V_i - V_o$	40	Vdc
Power Dissipation and Thermal Characteristics	PD	Internally Limited	
Operating Junction Temperature Rang	$T_J$	-0 to +150	°C
Storage Junction Temperature Rang	$T_{stg}$	-65 to +150	°C

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### Electrical characteristics

( $V_i - V_o = 5.0V$ ,  $I_o = 0.5 A$ ,  $T_J = T_{low}$  to  $T_{high}$  (see Note 1);  $I_{max} = 1.5 A$  and  $P_{max} = 20 W$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Line Regulation ( $T_A = +25^\circ C$ ) $3.0V \leq V_i - V_o \leq 40 V$	Regline	-	0.01	0.04	%/V
Load Regulation ( $T_J = +25^\circ C$ ) $10mA \leq I_o \leq I_{max}$ , $V_{in} \leq 5V$ $V_{in} \geq 5 V$	Regload	-	5.0	25	mV
		-	0.1	0.5	%/V <sub>o</sub>
Thermal Regulation ( $T_A = +25^\circ C$ ) 20 ms Pulse	-	-	0.03	0.07	%/W
Adjustment Pin Current	I <sub>Adj</sub>	-	50	100	μA
Adjustment Pin Current Change $2.5 \leq V_i - V_o \leq 40 V$ $10mA \leq I_L \leq I_{max}$ , $PD \leq P_{max}$	ΔI <sub>Adj</sub>	-	0.2	5.0	μA
Reference Voltage (Note 4) $3.0 \leq V_i - V_o \leq 40 V$ $10mA \leq I_L \leq I_{max}$ , $PD \leq P_{max}$	V <sub>ref</sub>	1.2	1.25	1.3	V
Line Regulation (Note 3) $3.0 V \leq V_i - V_o \leq 40 V$	Regline	-	0.02	0.07	%/V
Load Regulation (Note 3) $10mA \leq I_o \leq I_{max}$ , $V_{in} \leq 5V$ $V_{in} \geq 5 V$	Regload	-	20	70	%/V
		-	0.3	1.5	%/V
Temperature Stability ( $T_{low} \leq T_J \leq T_{high}$ )	T <sub>s</sub>	-	0.7	-	
Minimum Load Current to Maintain Regulation ( $V_i - V_o = 40 V$ )	I <sub>Lmin</sub>	-	3.5	10	mA
Maximum Output Current $V_i - V_o \leq 15 V$ , $P \leq 20 W$ $V_i - V_o = 40 V$ , $P \leq 20W$ , $T_A = +25^\circ C$	I <sub>max</sub>	1.5	2.2	-	A
		0.15	0.4	-	
RMS Noise, % of V <sub>o</sub> $T_A = +25^\circ C$ , $10 Hz \leq f \leq 10 kHz$	N	-	0.003	-	%/V <sub>o</sub>
Ripple Rejection, V <sub>o</sub> = 10 V, f = 120 Hz (Note 5) Without C <sub>adj</sub> C <sub>adj</sub> = 10 μF	RR	-	65	-	dB
		66	80	-	
Long-Term Stability, T <sub>J</sub> = Thigh (Note 6) $T_A = +25^\circ C$ for Endpoint Measurements	S	-	0.3	1.0	%/1.0 k Hrs.
Thermal Resistance Junction to Case	R <sub>θJC</sub>	-	5.0	-	°C/W

Notes: (1)  $T_{low} = 0^\circ C$ ,  $T_{high} = +125^\circ C$

(2)  $I_{max} = 0.5 A$ ,  $P_{max}$

(3) Load and line regulation are specified at constant junction temperature. Changes in V<sub>o</sub> due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

(4) Selected devices with tightened tolerance reference voltage available.

(5) C<sub>adj</sub>, when used, connected between the adjustment pin and ground.

(6) Since Long - Term Stability cannot be measured on each device before shipment, this specification is an engineering estimate of average stability from lot to lot.