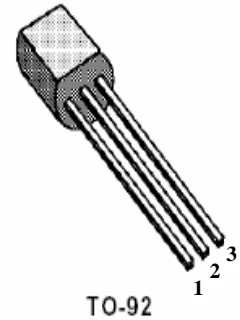


The IL317L is an adjustable 3-terminal positive voltage regulator capable of supplying in excess of 100 mA over an output voltage range of 1.2 V to 37 V. This voltage regulator is exceptionally easy to use and requires only two external resistors to set the output voltage. Further, it employs internal current limiting, thermal shutdown and safe area compensation, making them essentially blow – out proof.

The IL317L serves a wide variety of applications including local, on card regulation. This device can also be used to make a programmable output regulator, or by connecting a fixed resistor between the adjustment and output, the IL317L can be used as a precision current regulator.

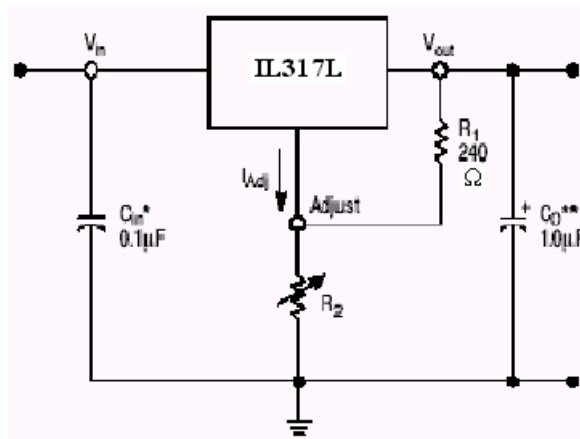


Pin 1. Adjust  
Pin 2. Vout  
Pin 3. Vin

### Features

- Output Current in Excess of 100 mA
- Output Adjustable Between 1.2 V and 37 V
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe-Area Compensation
- Floating Operation for High Voltage Applications
- Standard 3-Lead Transistor Package
- Eliminates Stocking Many Fixed Voltages

### Simplified Application



\*Cin is required if regulator is located an appreciable distance from power supply filter.

\*\*Co is not needed for stability, however, it does improve transient response.

$$V_{out} = 1.25 V (1 + R_2/R_1) + I_{adj}R_2$$

Since  $I_{adj}$  is controlled to less than 100µA, the error associated with this term is negligible in most applications.

### MAXIMUM RATINGS

| Rating   | Symbol          | Value              | Unit               |
|--|-----------------|--------------------|--------------------|
| Input-Output Differential                        | $V_I - V_O$     | 40                 | Vdc                |
| Power Dissipation                                | $P_D$           | Internally Limited | W                  |
| Case TO-92<br>$T_A = 25^\circ\text{C}$           | $R_{\theta JA}$ | 160                | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient          | $R_{\theta JC}$ | 83                 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case             |                 |                    |                    |
| Case SOIC-8 (Note 1)<br>$T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 180                | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient          | $R_{\theta JC}$ | 45                 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case             |                 |                    |                    |
| Operating Junction Temperature Range             | $T_j$           | -10 to +125        | $^\circ\text{C}$   |
| Storage Temperature Range                        | $T_{stg}$       | -65 to +150        | $^\circ\text{C}$   |

### ELECTRICAL CHARACTERISTICS

( $V_I - V_O = 5.0\text{ V}$ ;  $I_O = 40\text{ mA}$ ;  $T_A = 25^\circ\text{C}$ , unless otherwise noted,  $I_{\text{max}}$  and  $P_{\text{max}}$  (NOTE1))

| Characteristics  | Symbol                  | Min  | Max   | Unit          |
|--|-------------------------|------|-------|---------------|
| Reference Voltage ( $T_A = -10^\circ$ to $+125^\circ\text{C}$ )<br>$3.0\text{ V} \leq V_I - V_O \leq 40\text{ V}$ ,<br>$10\text{ mA} \leq I_O \leq I_{\text{max}}$ , $P_D \leq P_{\text{max}}$ | $V_O$                   | 1.20 | 1.30  | V             |
| Line Regulation (NOTE2)<br>$3.0\text{ V} \leq V_I - V_O \leq 40\text{ V}$ , $I_O = 5\text{ mA}$  | $\Delta V_{\text{ov}}$  | -    | 20    | mV            |
| Line Regulation ( $T_A = -10^\circ$ to $+125^\circ\text{C}$ )<br>(NOTE2)<br>$3.0\text{ V} \leq V_I - V_O \leq 40\text{ V}$ , $I_O = 5\text{ mA}$   | $\Delta V_{\text{ov}}$  | -    | 35    | mV            |
| Load Regulation (NOTE2)<br>$10\text{ mA} \leq I_O \leq I_{\text{max}}$ , $V_I = 6.25\text{ V}$   | $\Delta V_{\text{oi}}$  | -    | 6.25  | mV            |
| Load Regulation ( $T_A = -10^\circ$ to $+125^\circ\text{C}$ )<br>(NOTE2)<br>$10\text{ mA} \leq I_O \leq I_{\text{max}}$ , $V_I = 6.25\text{ V}$  | $\Delta V_{\text{oi}}$  | -    | 18.75 | mV            |
| Adjustment Pin Current   | $I_{\text{Adj}}$        | 10   | 100   | $\mu\text{A}$ |
| Adjustment Pin Current Change, $P_D \leq P_{\text{max}}$<br>$3.0\text{ V} \leq V_I - V_O \leq 40\text{ V}$ , $10\text{ mA} \leq I_O \leq I_{\text{max}}$                                       | $\Delta I_{\text{Adj}}$ | -    | 5     | $\mu\text{A}$ |
| Maximum Output Current, $P_D \leq P_{\text{max}}$  | $I_{\text{O MAX}}$      | 0.1  | -     | A             |
| Minimum Load Current to Maintain Regulation ( $V_I - V_O = 40\text{ V}$ )  | $I_{\text{Lmin}}$       | -    | 5     | mA            |
| Ripple Rejection<br>$V_O = 1.2\text{ V}$ , $f = 120\text{ Hz}$   | RR                      | 60   | -     | dB            |

#### NOTES:

- $I_{\text{max}} = 100\text{ mA}$ ,  $P_{\text{max}} = 625\text{ mW}$
- Load and line regulation are specified at constant junction temperature. Changes in  $V_O$  due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

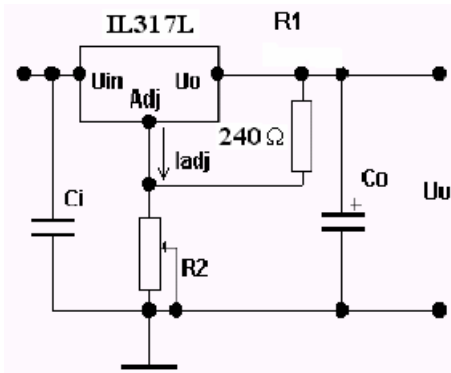


Fig.1 Test Circuit for  $V_O > 1.25\text{ V}$   
 $C_i = 0,1\mu\text{F}$ ,  $C_o = 1,0\mu\text{F}$ .  
 $V_O = 1,25(1 + R_2/R_1)I_{\text{Adj}} R_2$

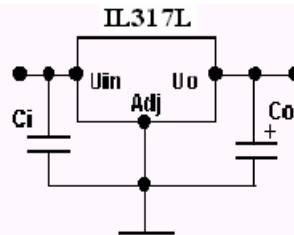


Fig.2 Test Circuit for  $V_O = 1.25\text{ V}$   
 $C_i = 0,1\mu\text{F}$ ,  $C_o = 1,0\mu\text{F}$ .