The IL317 is an 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 regulators are exceptionally easy to use and require only two external resistors to set the output voltage. Further, they employ internal current limiting, thermal shutdown and safe area compensation, making them essentially blow-out proof.

The IL317 is 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.

- 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**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input - Output Voltage Differential</td>
<td>Vi - Vo</td>
<td>40</td>
<td>Vdc</td>
</tr>
<tr>
<td>Power Dissipation and Thermal Characteristics</td>
<td>PD</td>
<td>Internally Limited</td>
<td></td>
</tr>
<tr>
<td>Operating Junction Temperature Rang</td>
<td>TJ</td>
<td>-0 to +150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Junction Temperature Rang</td>
<td>Tstg</td>
<td>-65 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>
## Electrical Characteristics

(Vi-Vo= 5.0V, Io = 0.5 A, TJ = Tlow to Thigh (see Note 1); Imax = 1.5 A and Pmax = 20 W unless otherwise noted)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Regulation (TA=+25°C)</td>
<td>Regline</td>
<td>-</td>
<td>0.01</td>
<td>0.04</td>
<td>%/V</td>
</tr>
<tr>
<td>3.0V ≤ Vi - Vo ≤ 40 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Regulation (TJ=+25°C)</td>
<td>Regload</td>
<td>-</td>
<td>5.0</td>
<td>25</td>
<td>mV</td>
</tr>
<tr>
<td>10mA ≤ Io ≤ Imax,</td>
<td></td>
<td>-</td>
<td>0.1</td>
<td>0.5</td>
<td>%/Vo</td>
</tr>
<tr>
<td>Vin ≤ 5V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vin ≥ 5 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal Regulation (TA=+25°C)</td>
<td>-</td>
<td>0.03</td>
<td>0.07</td>
<td>%/W</td>
<td></td>
</tr>
<tr>
<td>20 ms Pulse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjustment Pin Current</td>
<td>IAdj</td>
<td>-</td>
<td>50</td>
<td>100</td>
<td>µA</td>
</tr>
<tr>
<td>Adjustment Pin Current Change</td>
<td>∆IAdj</td>
<td>-</td>
<td>0.2</td>
<td>5.0</td>
<td>µA</td>
</tr>
<tr>
<td>2.5 ≤ Vi - Vo ≤ 40 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10mA ≤ IL ≤ Imax, PD ≤ Pmax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference Voltage (Note 4)</td>
<td>Vref</td>
<td>1.2</td>
<td>1.25</td>
<td>1.3</td>
<td>V</td>
</tr>
<tr>
<td>3.0 ≤ Vi - Vo ≤ 40 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10mA ≤ IL ≤ Imax, PD ≤ Pmax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Regulation (Note 3)</td>
<td>Regline</td>
<td>-</td>
<td>0.02</td>
<td>0.07</td>
<td>%/V</td>
</tr>
<tr>
<td>3.0 V ≤ Vi - Vo ≤ 40 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Regulation (Note 3)</td>
<td>Regload</td>
<td>-</td>
<td>20</td>
<td>70</td>
<td>%/V</td>
</tr>
<tr>
<td>10mA ≤ Io ≤ Imax,</td>
<td></td>
<td>-</td>
<td>0.3</td>
<td>1.5</td>
<td>%/Vo</td>
</tr>
<tr>
<td>Vin ≤ 5V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vin ≥ 5 V</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature Stability (Tlow ≤ Tj ≤ Thigh)</td>
<td>Ts</td>
<td>-</td>
<td>0.7</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Minimum Load Current to Maintain Regulation (Vi - Vo = 40 V)</td>
<td>ILmin</td>
<td>-</td>
<td>3.5</td>
<td>10</td>
<td>mA</td>
</tr>
<tr>
<td>Maximum Output Current</td>
<td>Imax</td>
<td></td>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Vi - Vo ≤ 15 V, P ≤ 20 W</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vi - Vo = 40 V, P ≤ 20W, TA=+25°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMS Noise, % of Vo</td>
<td>N</td>
<td>-</td>
<td>0.003</td>
<td>-</td>
<td>%/Vo</td>
</tr>
<tr>
<td>TA=+25°C, 10 Hz ≤ f ≤ 10 kHz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ripple Rejection, Vo = 10 V, f = 120 Hz (Note 5)</td>
<td>RR</td>
<td></td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Without Cadj</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cadj = 10 µF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-Term Stability, Tj = Thigh (Note 6)</td>
<td>S</td>
<td>-</td>
<td>0.3</td>
<td>1.0</td>
<td>%/1.0 k Hrs</td>
</tr>
<tr>
<td>TA=+25°C for Endpoint Measurements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thermal Resistance Junction to Case</td>
<td>R_{JUC}</td>
<td>-</td>
<td>5.0</td>
<td>-</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

Notes:
1. Tlow = 0 °C, Thigh = +125 °C
2. Imax = 0.5 A, Pmax
3. Load and line regulation are specified at constant junction temperature. Changes in Vo 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. Cadj, 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.