# LM337

## 3-terminal 1.5A negative adjustable regulator

### Features

- Output current In excess of 1.5A
- Output voltage adjustable between -1.2V and - 37V
- Internal thermal-overload protection
- Internal short-circuit current limiting
- Output transistor safe-area compensation
- Floating operation for high-voltage applications
- Standard 3-pin TO-220 package and $D^2$ PAK

### Description

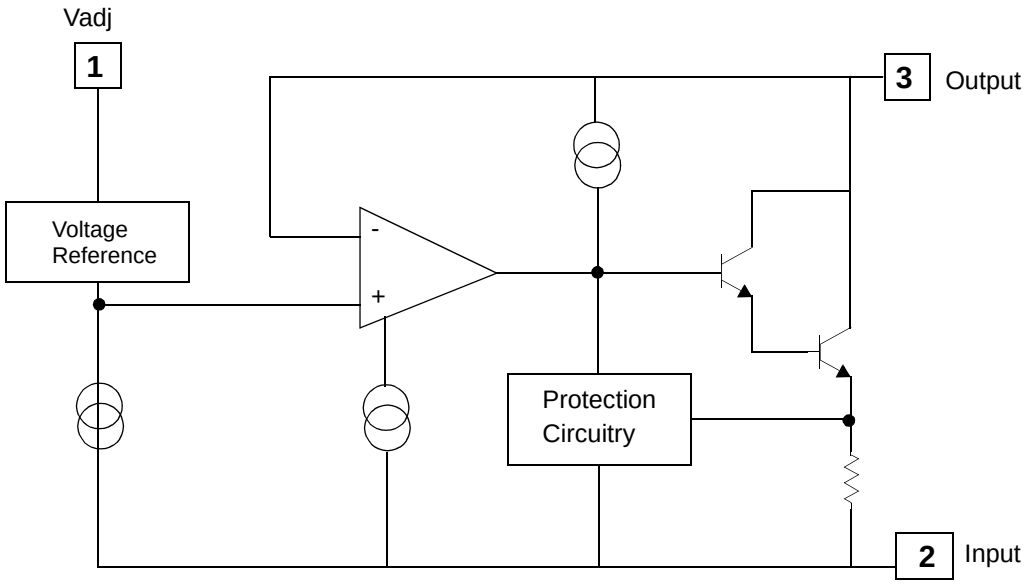
The LM337 is a 3-terminal negative adjustable regulator. It supply in excess of 1.5A over an output voltage range of -1.2V to - 37V. This regulator requires only two external resistor to set the output voltage. Included on the chip are current limiting, thermal overload protection and safe area compensation.

TO-220


D2-PAK


1. Adj 2. Input 3. Output

### Internal Block Diagram



## Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Input-Output Voltage Differential | $V_I$ - $V_O$ | 40 | V |
| Power Dissipation | $P_D$ | Internally limited | W |
| Operating Temperature Range | $T_{OPR}$ | 0 ~ +125 | °C |
| Storage Temperature Range | $T_{STG}$ | -65 ~+125 | °C |

## Electrical Characteristics

($V_I$ - $V_O$ = 5V, $I_O$ = 40mA, 0°C ≤ TJ ≤ +125°C, PDMAX = 20W, unless otherwise specified)

| Parameter | Symbol | Conditions | Min | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Line Regulation | $R_{line}$ | $T_A$ = +25°C<br>- 40V ≤$V_O$ - $V_I$ ≤ -3V | - | 0.01 | 0.04 | %/ V |
| | | - 40V ≤ $V_O$ - $V_I$ ≤ -3V | - | 0.02 | 0.07 | |
| Load Regulation | $R_{load}$ | $T_A$ = +25°C<br>10mA ≤ $I_O$ ≤0.5A | - | 15 | 50 | mV |
| | | 10mA ≤ $I_O$ ≤1.5A | - | 15 | 150 | |
| Adjustable Pin Current | $I_{ADJ}$ | - | - | 50 | 100 | µA |
| Adjustable Pin Current | $\Delta I_{ADJ}$ | $T_A$ =+ 25°C<br>10mA ≤ $I_O$ ≤1.5A<br>- 40V ≤ $V_O$ - $V_I$ ≤ -3V | - | 2 | 5 | µA |
| Reference Voltage | $V_{REF}$ | $T_A$ =+ 25°C | -1.213 | -1.250 | -1.287 | V |
| | | - 40V ≤ $V_O$ - $V_I$ ≤ -3V<br>10mA ≤ $I_O$ ≤ 1.5A | -1.200 | -1.250 | -1.300 | |
| Temperature Stability | $ST_T$ | - | - | 0.6 | - | % |
| Minimum Load Current to Maintain Regulation | | - 40V ≤ $V_O$ - $V_I$ ≤ -3V | - | 2.5 | 10 | mA |
| | | - 10V ≤ $V_O$ - $V_I$ ≤ -3V | - | 1.5 | 6 | |
| Output Noise | en | $T_A$ =+25°C 10Hz ≤ f ≤10KHz | - | 3×$V_{OUT}$ | - | $V/10^6$ |
| Ripple Rejection Ratio | | $V_O$ = -10V, f = 120Hz | - | 60 | - | dB |
| | | $C_{ADJ}$ = 10µF | 66 | 77 | - | |
| Long Term Stability | ST | $T_J$ = 125°C ,1000Hours | - | 0.3 | 1 | % |
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | - | - | 4 | - | °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.

## Typical Application

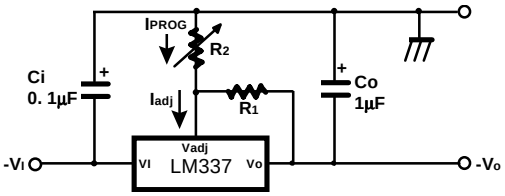


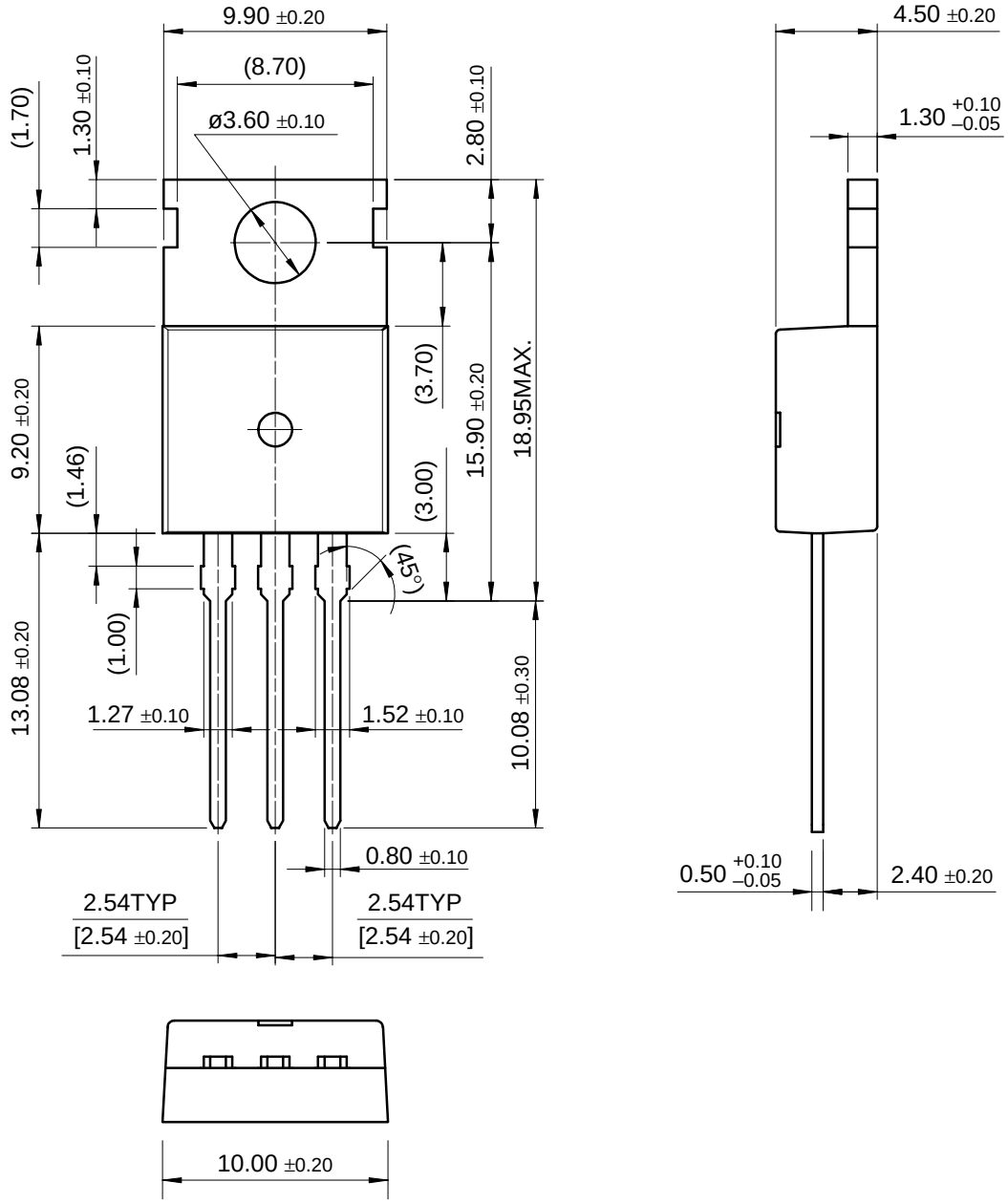

**Figure 1. Programmable Regulator**

- Ci is required if regulator is located more then 4 inches from power supply filter.
  A 1.0µF solid tantalum or 10µF aluminum electrolytic is recommended.
  Co is necessary for stability. A 1.0µF solid tantalum or 10µF aluminum electrolytic is recommended.
- $V_O$= -1.25V (1+$R_2$/$R_1$)

## Mechanical Dimensions

### Package

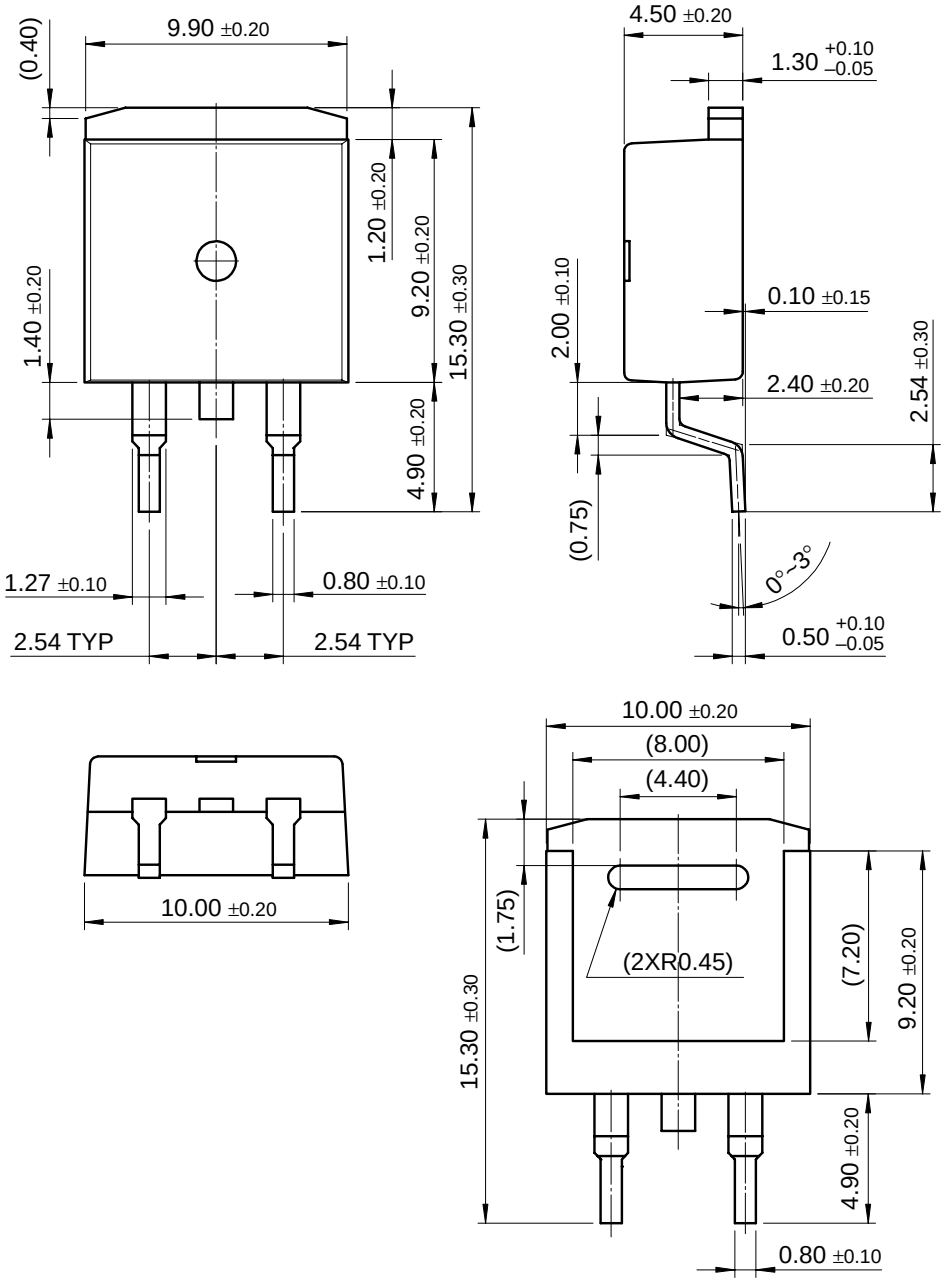
TO-220



## Mechanical Dimensions (Continued)

### Package

$D^2$-PAK



## Ordering Information

| Product Number | Package | Operating Temperature |
|---|---|---|
| LM337T | TO-220 | 0°C to + 125°C |
| LM337D2T | $D^2$-PAK | |

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