

# LM337

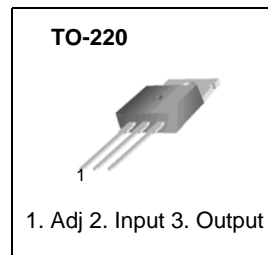
## 3-Terminal 1.5A Negative Adjustable Regulator

### Features

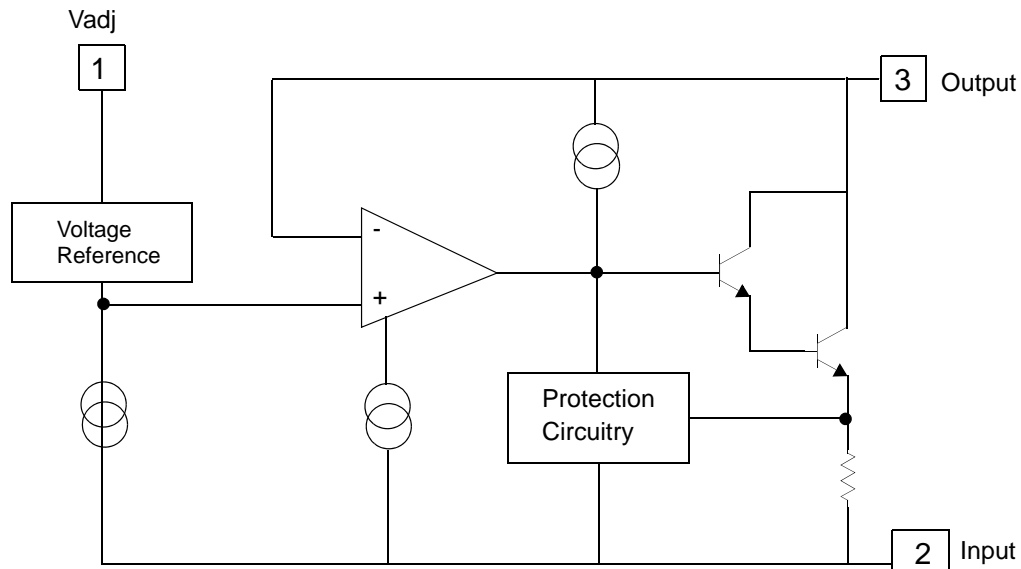
- Output Current in Excess of 1.5A
- Output Voltage Adjustable Between -1.2V and -37V
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe Area Compensation
- Floating Operation for High Voltage Applications
- Standard 3-Pin TO-220 Package

### Description

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



### Internal Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input-Output Voltage Differential	$ V_I - V_O $	40	V
Power Dissipation	PD	Internally limited	W
Operating Temperature Range	TOPR	0 ~ +125	°C
Storage Temperature Range	TSTG	-65 ~ +125	°C

## Electrical Characteristics

( $V_I - V_O = 5V$ ,  $I_O = 40mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $P_{DMAX} = 20W$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Line Regulation (Note1)	R <sub>line</sub>	$T_A = +25^\circ C$ $3V \leq  V_I - V_O  \leq 40V$	-	0.01	0.04	% / V
		$3V \leq  V_I - V_O  \leq 40V$	-	0.02	0.07	
Load Regulation (Note1)	R <sub>load</sub>	$T_A = +25^\circ C$ $10mA \leq I_O \leq 0.5A$	-	15	50	mV
		$10mA \leq I_O \leq 1.5A$	-	15	150	
Adjustable Pin Current	I <sub>ADJ</sub>	-	-	50	100	μA
Adjustable Pin Current Change	ΔI <sub>ADJ</sub>	$T_A = +25^\circ C$ $10mA \leq I_O \leq 1.5A$ $3V \leq  V_I - V_O  \leq 40V$	-	2	5	μA
Reference Voltage	V <sub>REF</sub>	$T_A = +25^\circ C$	-1.213	-1.250	-1.287	V
		$3V \leq  V_I - V_O  \leq 40V$ $10mA \leq I_O \leq 1.5A$	-1.200	-1.250	-1.300	
Temperature Stability	ST <sub>T</sub>	$0^\circ C \leq T_J \leq +125^\circ C$	-	0.6	-	%
Minimum Load Current to Maintain Regulation	I <sub>L(MIN)</sub>	$3V \leq  V_I - V_O  \leq 40V$	-	2.5	10	mA
		$3V \leq  V_I - V_O  \leq 10V$	-	1.5	6	
RMS Noise, % of V <sub>OUT</sub>	e <sub>N</sub>	$T_A = +25^\circ C$ $10Hz \leq f \leq 10kHz$	-	0.003	-	%
Ripple Rejection Ratio	RR	$V_O = -10V$ , $f = 120Hz$	-	60	-	dB
		C <sub>ADJ</sub> = 10μF (Note2)	66	77	-	
Long Term Stability	ST	$T_J = 125^\circ C$ , 1000Hours	-	0.3	1	%
Thermal Resistance Junction to Case	R <sub>θJC</sub>	-	-	4	-	°C/W

### Note:

- Load and line regulation are specified at constant junction temperature. Change in V<sub>O</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used.
- C<sub>ADJ</sub>, when used, is connected between the adjustment pin and ground.

## Typical Application

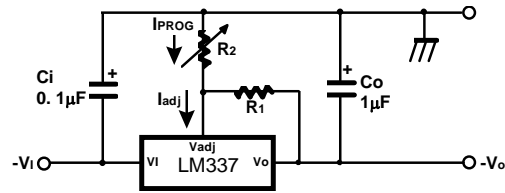


Figure 1. Programmable Regulator

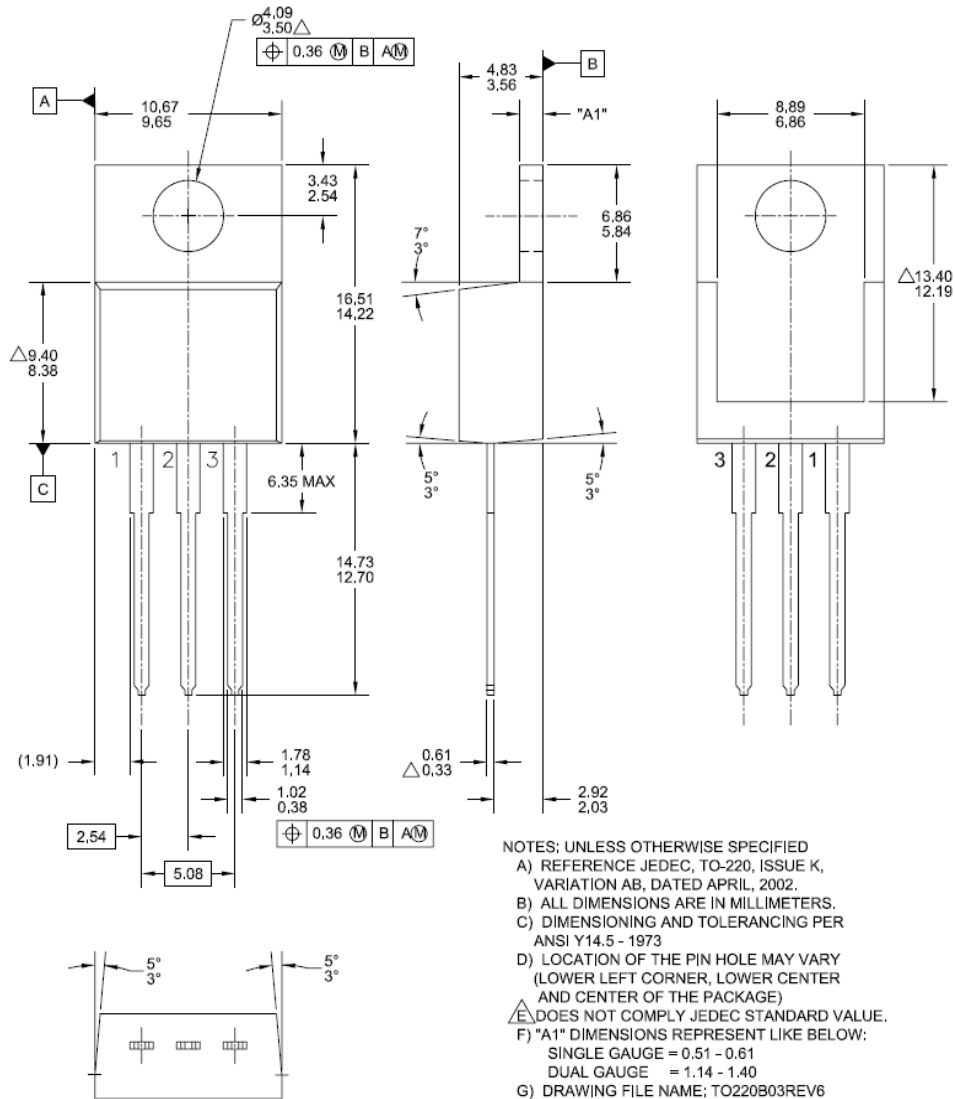
- $C_i$  is required if regulator is located more than 4 inches from power supply filter. A  $1.0\mu\text{F}$  solid tantalum or  $10\mu\text{F}$  aluminum electrolytic is recommended.
- $C_o$  is necessary for stability. A  $1.0\mu\text{F}$  solid tantalum or  $10\mu\text{F}$  aluminum electrolytic is recommended.
- $V_O = -1.25\text{V} (1 + R_2/R_1)$

# Mechanical Dimensions

## Package

Dimensions in millimeters

### TO-220[SINGLE GAUGE]



- NOTES: UNLESS OTHERWISE SPECIFIED
- A) REFERENCE JEDEC, TO-220, ISSUE K, VARIATION AB, DATED APRIL, 2002.
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONING AND TOLERANCING PER ANSI Y14.5 - 1973
  - D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
  - E) DOES NOT COMPLY JEDEC STANDARD VALUE.
  - F) "A1" DIMENSIONS REPRESENT LIKE BELOW:  
SINGLE GAUGE = 0.51 - 0.61  
DUAL GAUGE = 1.14 - 1.40
  - G) DRAWING FILE NAME: TO220B03REV6

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## Ordering Information

Product Number	Package	Operating Temperature
LM337T	TO-220	0°C to +125°C

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