

# LM337

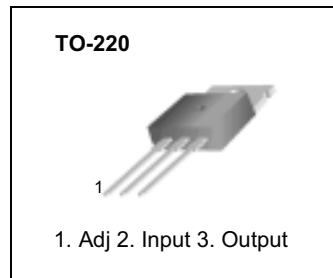
## 3-Terminal 1.5A Negative Adjustable Regulator

### Features

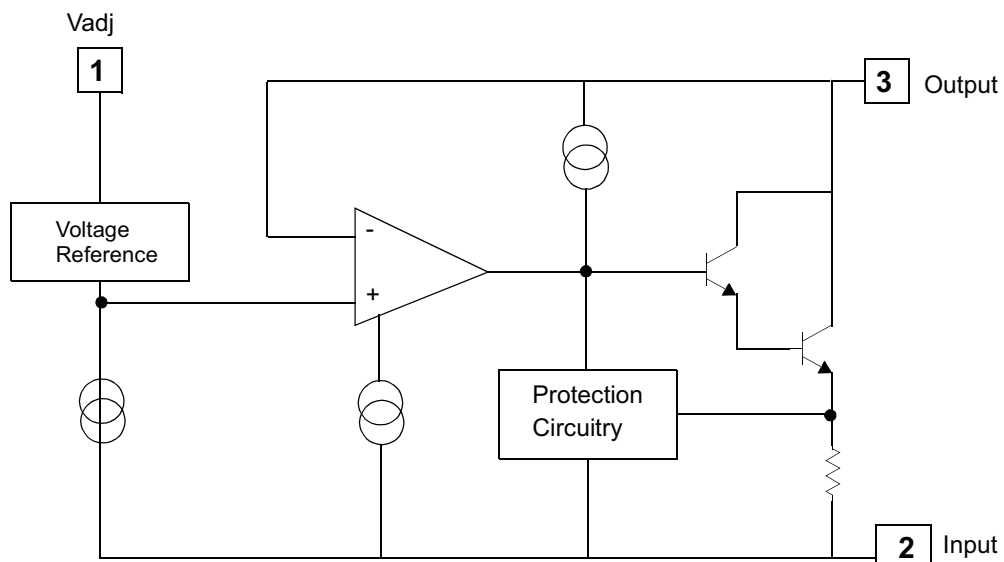
- Output current in excess of 1.5A
- Output voltage adjustable between -1.2V and -37V
- Internal thermal overload protection
- Internal short circuit current limiting
- Output transistor safe area compensation
- Floating operation for high voltage applications
- Standard 3-pin TO-220 package

### 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	
Output Noise	e <sub>N</sub>	$T_A = +25^\circ C$ $10Hz \leq f \leq 10KHz$	-	0.003	-	V/10 <sup>6</sup>
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:

1. 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.
2. C<sub>ADJ</sub>, when used, is connected between the adjustment pin and ground.

## Typical Application

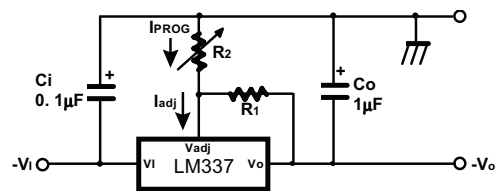


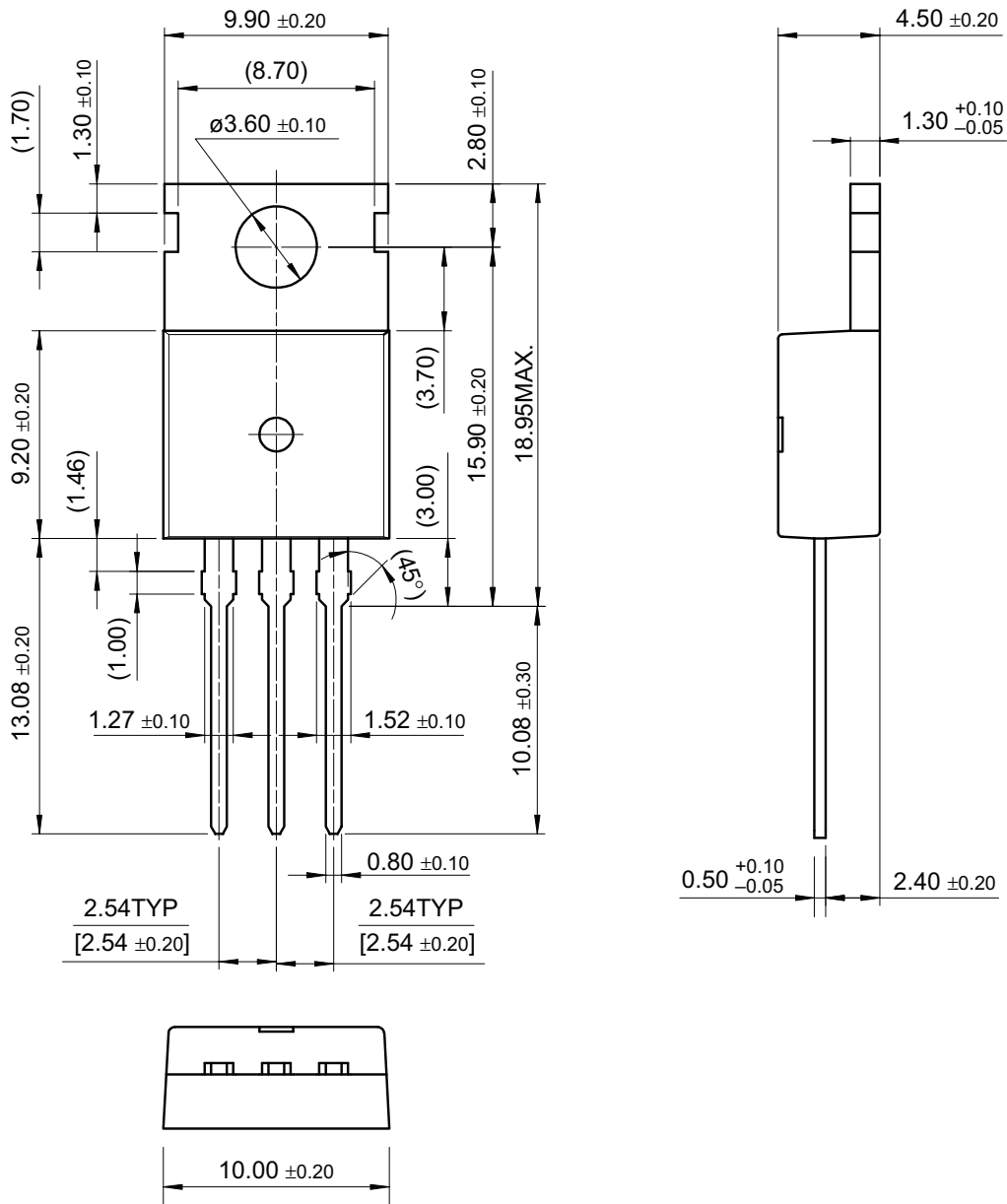
Figure 1. Programmable Regulator

- $C_i$  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.
- $V_o = -1.25V (1 + R_2/R_1)$

# Mechanical Dimensions

## Package

### TO-220



**Ordering Information**

<b>Product Number</b>	<b>Package</b>	<b>Operating Temperature</b>
LM337T	TO-220	0°C to + 125°C

**DISCLAIMER**

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

**LIFE SUPPORT POLICY**

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.