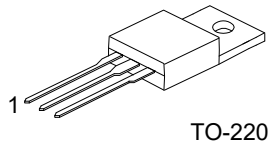
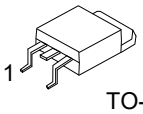
1.5A, ADJUSTABLE OUTPUT, NEGATIVE VOLTAGE REGULATOR



TO-220



TO-252

■ DESCRIPTION

The UTC **LM337A** is an adjustable 3-terminal negative voltage regulator capable of supplying in excess of 1.5A over an output voltage range of -1.2V to -37V. 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 it essentially blow-out proof.

The UTC **LM337A** 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 UTC **LM337A** can be used as a precision current regulator.

■ FEATURES

* Output Current in Excess of 1.5A
* Output Adjustable between -1.2V and -37V
* Internal Thermal Overload Protection
* Internal Short Circuit Current Limiting Constant with Temperature
* Output Transistor Safe-Area Compensation
* Floating Operation for High Voltage Applications
* Eliminates Stocking many Fixed Voltages

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
LM337AL-TA3-T	LM337AG-TA3-T	TO-220	ADJ	I	O	Tube
LM337AL-TN3-R	LM337AG-TN3-R	TO-252	ADJ	I	O	Tape Reel

Note: Pin Assignment: I: Input O: Output

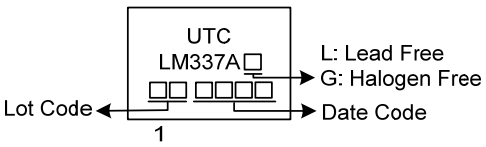
LM337AG-TA3-T

(1)Packing Type — (1) T: Tube, R: Tape Reel

(2)Package Type — (2) TA3: TO-220, TN3: TO-252

(3)Green Package — (3) G: Halogen Free and Lead Free L: Lead Free

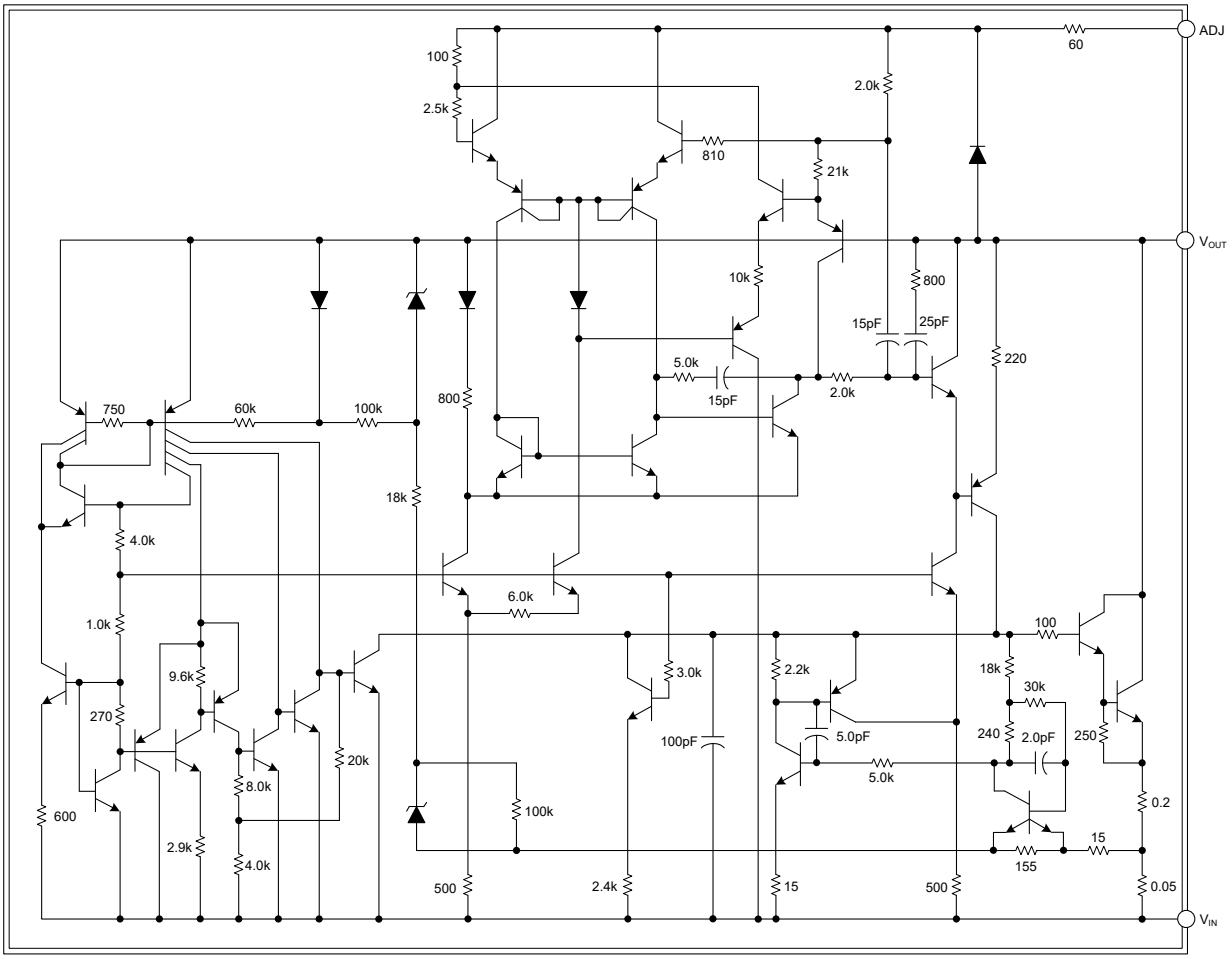
■ MARKING



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	ADJ	Adjust pin
2	V_{IN}	Input voltage pin for the regulator
3	V_{OUT}	Output voltage pin for the regulator

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Input-Output Voltage Differential	V_I - V_O	40	V
Power Dissipation	P_D	Internally Limited	W
Operating Junction Temperature Range	T_J	-40 ~ +125	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

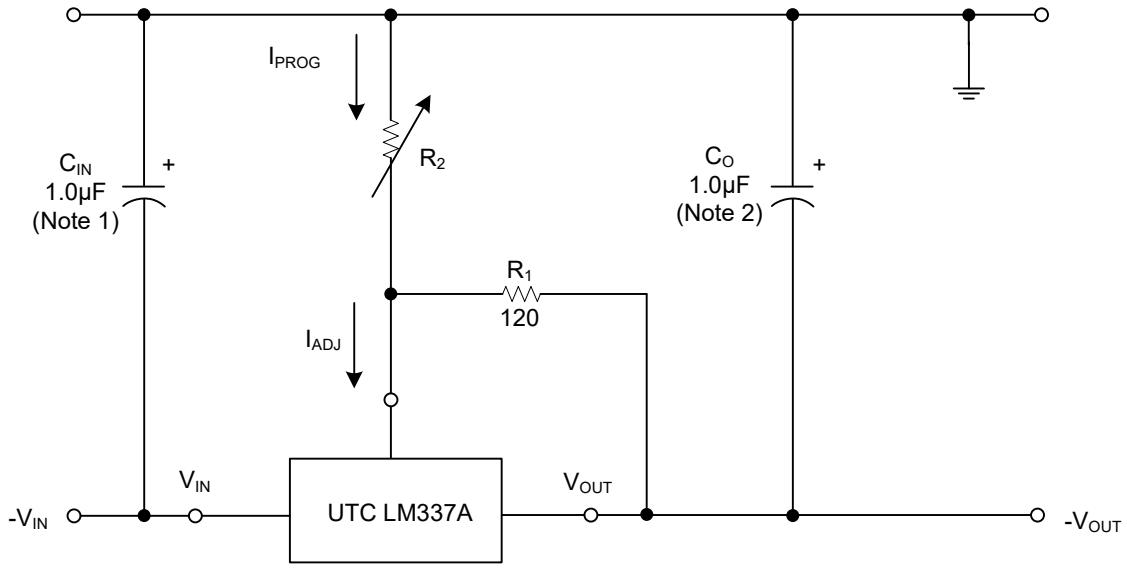
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	50	°C/W
	TO-252		103	°C/W
Junction to Case	TO-220	θ_{JC}	5	°C/W
	TO-252		12	°C/W

■ ELECTRICAL CHARACTERISTICS ($|V_I-V_O|$ = 5.0V, I_O = 0.5A)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Line Regulation (Note 1)	ΔV_{OUT}	T_A = +25°C, 3.0V ≤ $\|V_I-V_O\|$≤ 40V			0.01	0.04	%/V
Load Regulation (Note 1)	ΔV_{OUT}	T_A = +25°C,	$\|V_O\|$ ≤ 5.0V		15	50	mV
		10mA ≤ I_O ≤ I_{max}	$\|V_O\|$ ≥5.0V		0.3	1.0	%V_O
Adjustment Pin Current	I_{ADJ}				65	100	μA
Adjustment Pin Current Change	$\triangle I_{ADJ}$	2.5V ≤ $\|V_I-V_O\|$≤ 40V, 10mA≤ I_L ≤ I_{MAX}, P_D ≤P_{MAX}, T_A = +25°C			2.0	5.0	μA
Reference Voltage	V_{REF}	T_A = +25°C, 3.0V ≤ $\|V_I-V_O\|$ ≤ 40V		-1.213	-1.250	-1.287	V
		10mA ≤ I_O ≤ I_{MAX}, P_D ≤ P_{MAX}, T_J = T_{LOW} to T_{HIGH}		-1.20	-1.25	-1.30	V
Line Regulation (Note 1)	ΔV_{OUT}	3.0V ≤ $\|V_I-V_O\|$≤ 40V			0.02	0.07	%/V
Load Regulation (Note 1)	ΔV_{OUT}	10mA ≤ I_O ≤ I_{MAX}	$\|V_O\|$ ≤ 5.0V		20	70	mV
			$\|V_O\|$ ≥5.0V		0.3	1.5	%V_O
Temperature Stability	T_S	T_{LOW} ≤T_J ≤ T_{HIGH}			0.6		%V_O
Minimum Load Current to Maintain Regulation	I_{LMIN}	$\|V_I-V_O\|$ ≤ 10V			1.5	6.0	mA
		$\|V_I-V_O\|$ ≤ 40V			2.5	10	mA
Maximum Output Current	I_{MAX}	$\|V_I-V_O\|$ ≤ 15V, P_D ≤ P_{MAX}			1.5	2.2	A
		$\|V_I-V_O\|$ ≤40V, P_D ≤ P_{MAX}, T_J =+25°C			0.15	0.4	A
RMS Noise	N	% of V_O, T_A = +25°C, 10Hz ≤ f ≤ 10kHz			0.003		%V_O
Ripple Rejection	RR	V_O = -10V,	Without C_{ADJ}		60		dB
		f = 120Hz (Note 2)	C_{ADJ}=10μF	66	77		dB
Long-Term Stability	S	T_J = T_{HIGH} (Note 4), T_A = +25°C for Endpoint Measurements			0.3	1.0	%/1.0k Hrs.
Thermal Regulation		T_A = +25°C (Note 3), 10ms Pulse			0.003	0.04	%VO/W

Notes: 1. Load and line regulation are specified at constant junction temperature. Change in V_O because of heating effects is covered under the Thermal Regulation specification. Pulse testing with a low duty cycle is used.
2. C_{ADJ}, when used, is connected between the adjustment pin and ground.
3. Power dissipation within an IC voltage regulator produces a temperature gradient on the die, affecting individual IC components on the die. These effects can be minimized by proper integrated circuit design and layout techniques. Thermal Regulation is the effect of these temperature gradients on the output voltage and is expressed in percentage of output change per watt of power change in a specified time.
4. 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.

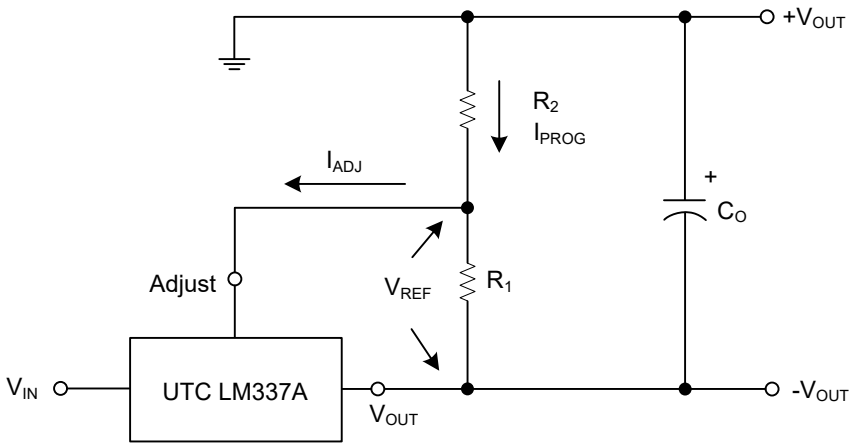
■ TYPICAL APPLICATION CIRCUIT



Notes: 1. C_{in} is required if regulator is located more than 4 inches from power supply filter.
A 1.0μF aluminum electrolytic is recommended.
2. C_O is necessary for stability. A 1.0μF aluminum electrolytic is recommended.

$$V_{OUT}=-1.25V\times(1+\frac{R2}{R1})$$

Figure 1. Standard Application



V_{REF}= -1.25V Typical

Figure 2. Basic Circuit Configuration

■ TYPICAL APPLICATION CIRCUIT

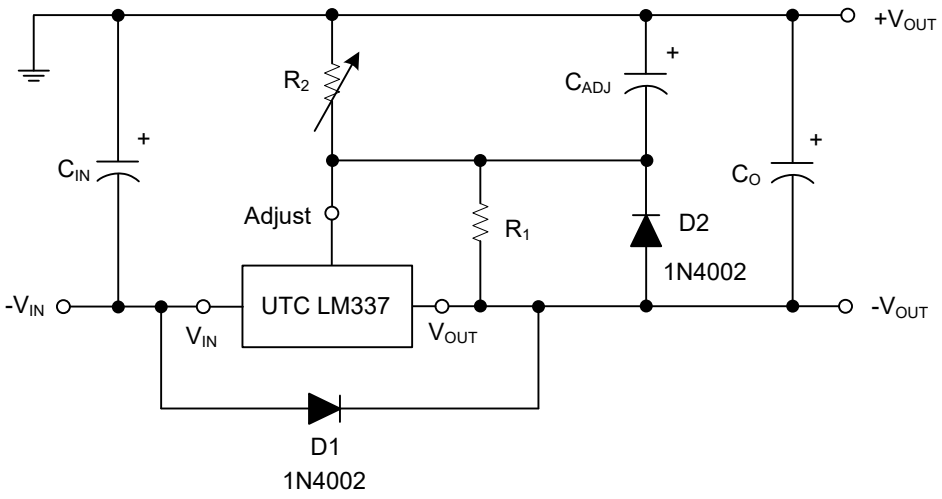


Figure 3. Voltage Regulator with Protection Diodes