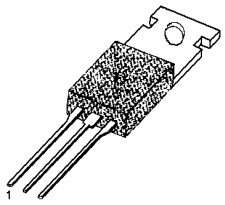
KA337 ADJUSTABLE VOLTAGE REGULATOR (NEGATIVE)

3-TERMINAL 1A NEGATIVE ADJUSTABLE REGULATOR

The KA337 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 resistors to set an output voltage and 1 capacitor to compensate frequency.

TO-22O



1: ADJ 2: Input 3: Output

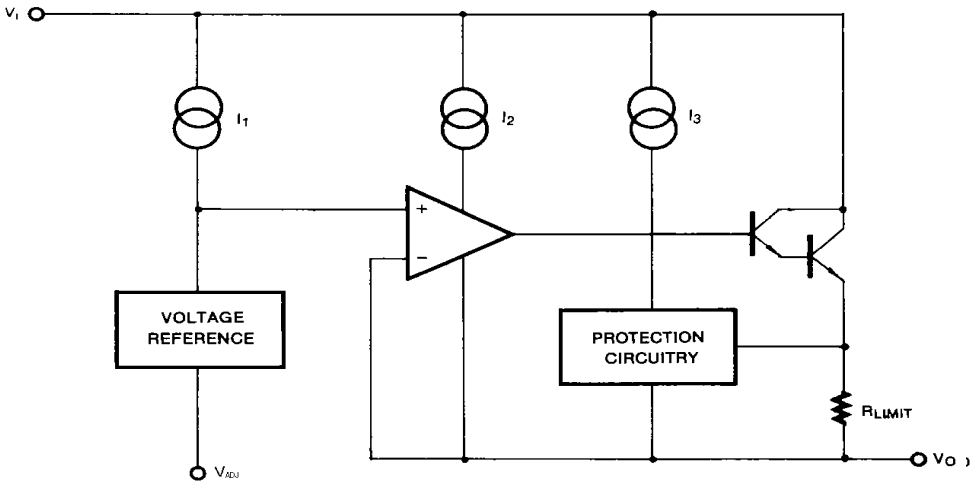
FEATURES

- Output current in excess of - 1.5A
- Output voltage adjustable between -1.2V & - 37V
- 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-pin. TO-220 package

ORDERING INFORMATION

Device	Package	Operating Temperature
KA337	TO-220	0 ~ + 125℃

BOLCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_A=25℃, unless otherwise specified)

Characteristic	Symbol	Value	Unit
Input-Output Voltage Differential	V_I - V_O	40	V
Power Dissipation	P_D	Internally limited	
Operating Temperature Range	T_{OPR}	0 ~ + 125	℃
Storage Temperature Range	T_{STG}	- 65 ~ + 150	℃

ELECTRICAL CHARACTERISTICS

(V_I - V_O = 5V, I_O = 0.5A, 0℃ ≤ T_J ≤ 125℃, P_{MAX} = 20W, unless otherwise specified)

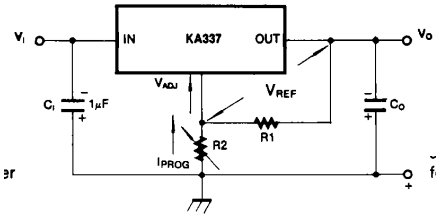
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Line Regulation	V_O	T_A = 25℃ - 40V ≤ V_O - V_I ≤ -3V		0.01	0.04	%/V
		- 40V ≤ V_O - V_I ≤ -3V		0.02	0.07	
Load Regulation	V_O	T_A = 25℃ 10mA ≤ I_O ≤ 0.5A		15	50	mV
		10mA ≤ I_O ≤ 1.5A		15	150	
Adjustable Pin Current	I_{ADJ}			50	100	μA
Adjustable Pin Current	ΔI_{ADJ}	T_A = 25℃ 10mA ≤ I_O ≤ 1.5A - 40V ≤ V_O - V_I ≤ -3V		2	5	μA
Reference Voltage	V_{REF}	T_A = 25℃	-1.213	-1.250	-1.287	V
		- 40V ≤ V_O - V_I ≤ -3V 10mA ≤ I_O ≤ 1.5A	-1.200	-1.250	-1.300	
Temperature Stability	I_{ST}			0.6		mA
Minimum Load Current	$I_{L(MIN)}$	- 40V ≤ V_O - V_I ≤ -3V		2.5	10	%
to Maintain Rejection		- 10V ≤ V_O - V_I ≤ -3V		1.5	6	
Output Noise	en	T_A = 25℃ 10Hz ≤ f ≤ 10KHz		3 × V_{OUT}		$V/10^6$
Ripple Rejection	RR	V_O = -10V, f = 120Hz		60		dB
		C_{ADJ} = 10 μF	66	77		
Long Term Stability	ST	T_J = 125℃,1000Hours		0.3	1	%
Thermal Resistance Junction to Case	R_{EJC}			4		℃/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 APPLICATIONS

ADJUSTABLE VOLTAGE REGULATOR

1 μF solid tantalum required only if the regulator is more than 10cm from the power supply filter capacitor



1 μF solid tantalum or 10 μF aluminum electrolytic required for stability

R1 is 120Ω Typical

$R2 = R1 \left(\frac{V_O}{V_{REF}} - 1\right)$ where $V_{REF} = -1.25V$ Typical

The KA337 is a 3-terminal floating regulator. In operation, the KA337 develops and maintains a nominal -1.25 volt reference V_{REF} between its output and adjustment terminals. This reference voltage is converted to a programming current (I_{PROG}) by R1 (see FIG. 2), and this constant current flows through R2 from ground. The regulated output voltage is given by:

$$V_O = V_{REF}\left(1 + \frac{R2}{R1}\right) + 1_{ADJ}\ R2$$

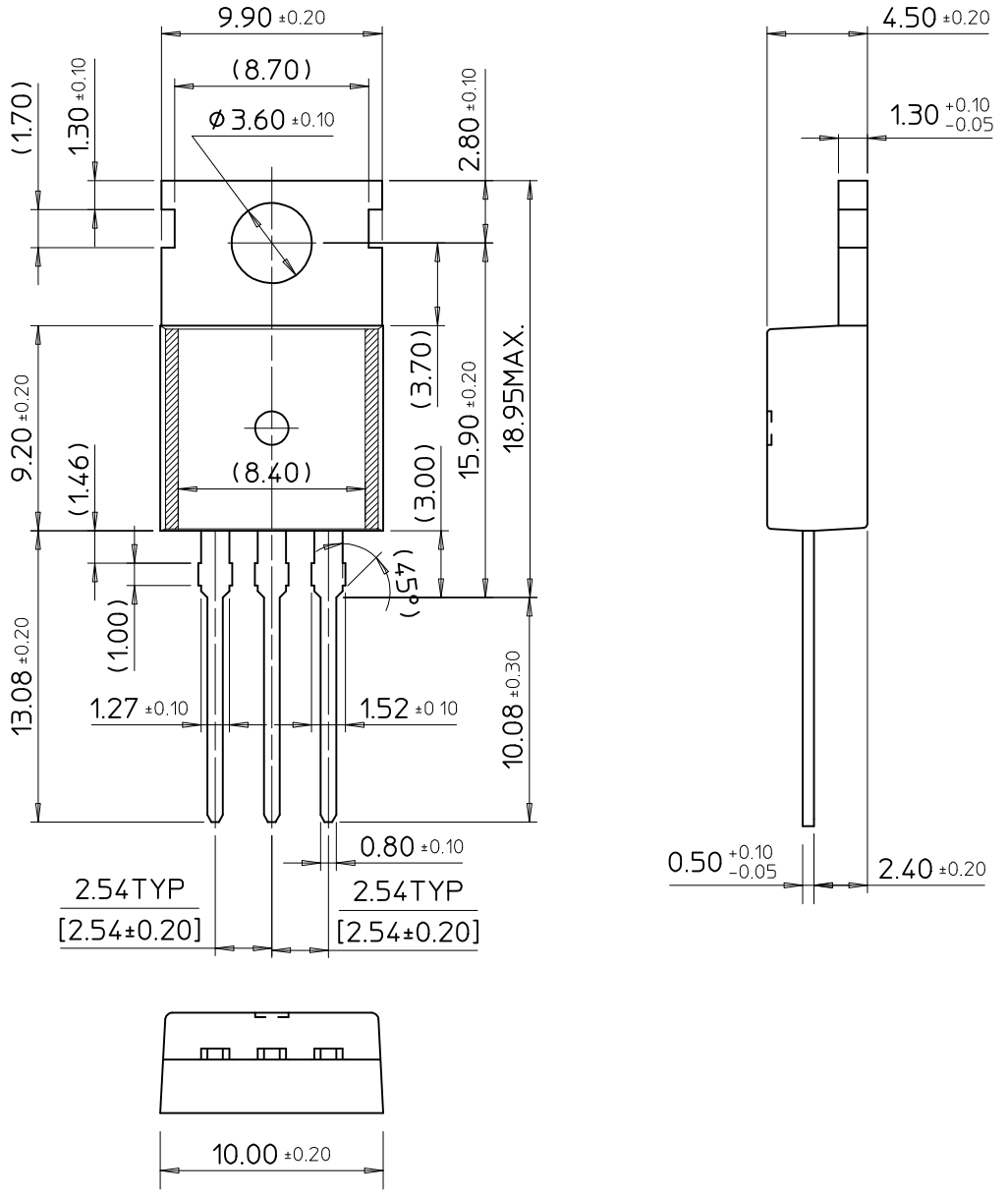
Since the current into the adjustment terminal (I_{ADJ}) represents an error term in the equation, the KA337 was designed to control I_{ADJ} to less than 100 μA and keep it constant. To do this, all quiescent operating current is returned to the output terminal. This imposes the requirement for a minimum load current. If the load current is less than this minimum, the output voltage will increase.
Since the KA337 is a floating regulator, it is only the voltage differential across the circuit that is important to performance, and operation at high voltages with respect to ground is possible.

LOAD REGULATION

The KA337 is capable of providing extremely good load regulation, but a few precautions are needed to obtain maximum performance. For best performance the programming resistor (R1) should be connected as close to the regulator as possible to minimize line drops which effectively appear in series with the reference, thereby degrading regulation. The ground end of R2 can be retumed near the load ground to provide remote ground sensing and improve load regulation.

TO–220

Dimensions in Milimeters



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