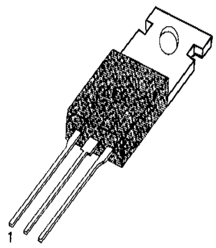
KA317 ADJUSTABLE VOLTAGE REGULATOR(POSITIVE)

3-TERMINAL 1A POSITIVE ADJUSTABLE REGULATOR

This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply more than 1.5A of load current with an output voltage adjustable over a 1.2 to 37V. It employs internal current limiting, thermal shut-down and safe area compensation.

TO-22O



1: Adj 2: Output 3: Input

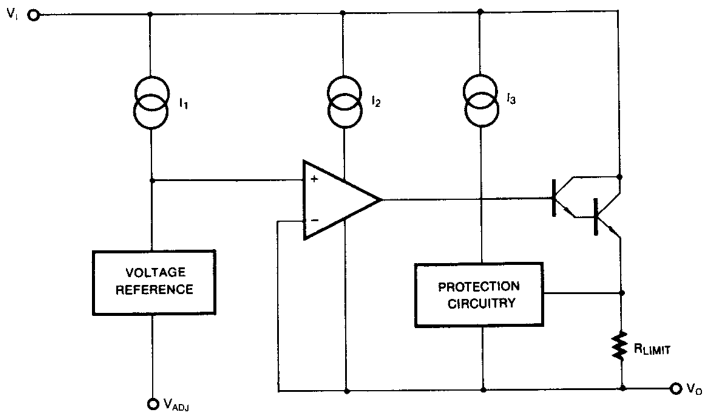
FEATURES

- Output Current In Excess of 1. 5A
- Output Adjustable Between 1. 2V and 37V
- Internal Thermal-Overload Protection
- Internal Short-Circuit Current-Limiting
- Output Transistor Sate-Area Compensation

ORDERING INFORMATION

Device	Package	Operating Temperature
KA317	TO-220	0℃ ~ 125℃

BLOCK DIAGRAM



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

Characteristic	Symbol	Vlaue	Unit
Input-Output Voltage Differential	V_I - V_O	40	V
Lead Temperature	T_{LEAD}	230	℃
Power Dissipation	P_D	Internally limited	–
Operating Temperature Range	T_{OPR}	0 ~ +125	℃
Storage Temperature Range	T_{STG}	-65 ~ + 125	℃

ELECTRICAL CHARACTERISTICS

(V_I - V_O = 5V, I_O = 0.5A, 0℃ ≤ T_J ≤ 125℃, I_{MAX} = 1.5A, P_{MAX} = 20W, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Line Regulation	ΔV_O	T_A = 0 ~ 125℃, 3V ≤ V_I - V_O ≤ 40V		0.01	0.04	%/V
		T_A = 0 ~ 125℃, 3V ≤ V_I - V_O ≤ 40V		0.02	0.07	%/V
Load Regulation	ΔV_O	T_A = 25℃, 10mA ≤ I_O ≤ I_{MAX} V_O ≤ 6V V_O ≥ 5V		 18 0.4	 25 0.5	 mV %/V_O
		10mA ≤ I_O ≤ I_{MAX} V_O ≤ 5V V_O ≥ 5V		 40 0.8	 70 1.5	 mV %/V_O
Adjustable Pin Current	I_{ADJ}			46	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	3V ≤ V_I - V_O ≤ 40V 10mA ≤ I_O ≤ I_{MAX} P ≤ P_{MAX}		2.0	5	μA
Reference Voltage	V_{REF}	3V ≤ V_{IN} - V_{OUT} ≤ 40V 10mA ≤ I_O ≤ I_{MAX} P_D ≤ P_{MAX}	1.20	1.25	1.30	V
Temperature Stability	ST_T			0.7		%/V_O
Minimum Load Current to Maintain Regulation	$L_{(MIN)}$	V_I - V_O = 40V		3.5	10	mA
Maximum Output Current	$I_{O(MAX)}$	V_I - V_O ≤ 15V, P_D ≤ P_{MAX} V_I - V_O ≤ 40V, P_D ≤ P_{MAX}, T_A=25℃	1.5 0.156	2.2 0.4		A
RMS Noise, % of V_{OUT}	e_N	T_A=25℃, 10Hz ≤ f ≤ 10KHz		0.003	0.01	%/V_O
Ripple Rejection	RR	V_O = 10V, f = 120Hz without C_{ADJ} C_{ADJ} = 10μF	 66	 60 75		dB
Long-Term Stability, T_J = T_{HIGH}	ST	T_A = 25℃ for end point measurements, 1000HR		0.3	1	%
Thermal Resistance Junction to Case	$R_{\theta JC}$			5		℃W

* Load and line regulation are specified at constant junction temperature. Change in V_D due to heating effects must be taken into account separately. Pulse testing with low duty is used. (P_{MAX} = 20W)

TYPICAL PERFORMANCE CHARACTERISTICS

Fig. 1 LOAD REGULATION

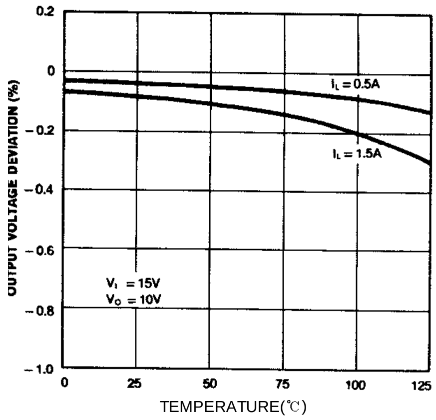


Fig. 2 ADJUSTMENT CURRENT

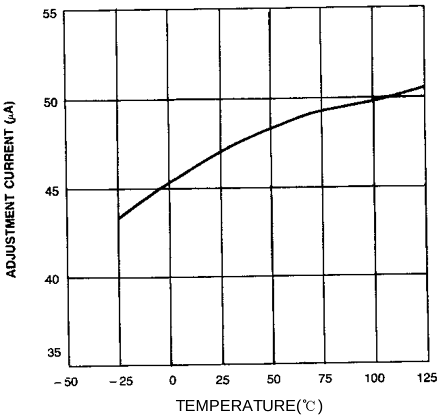


Fig. 3 DROPOUT VOLTAGE

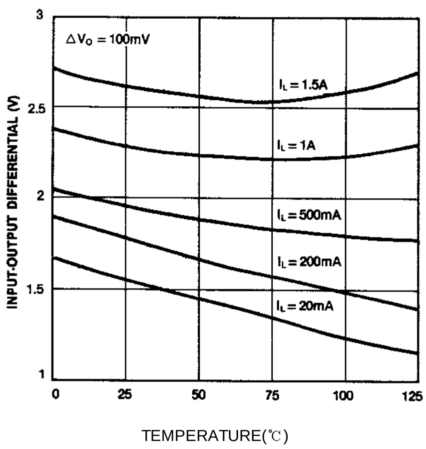
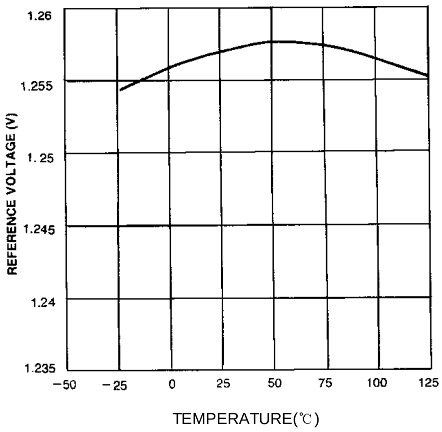
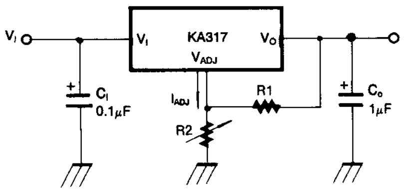


Fig. 4 REFERENCE VOLTAGE



TYPICAL APPLICATIONS

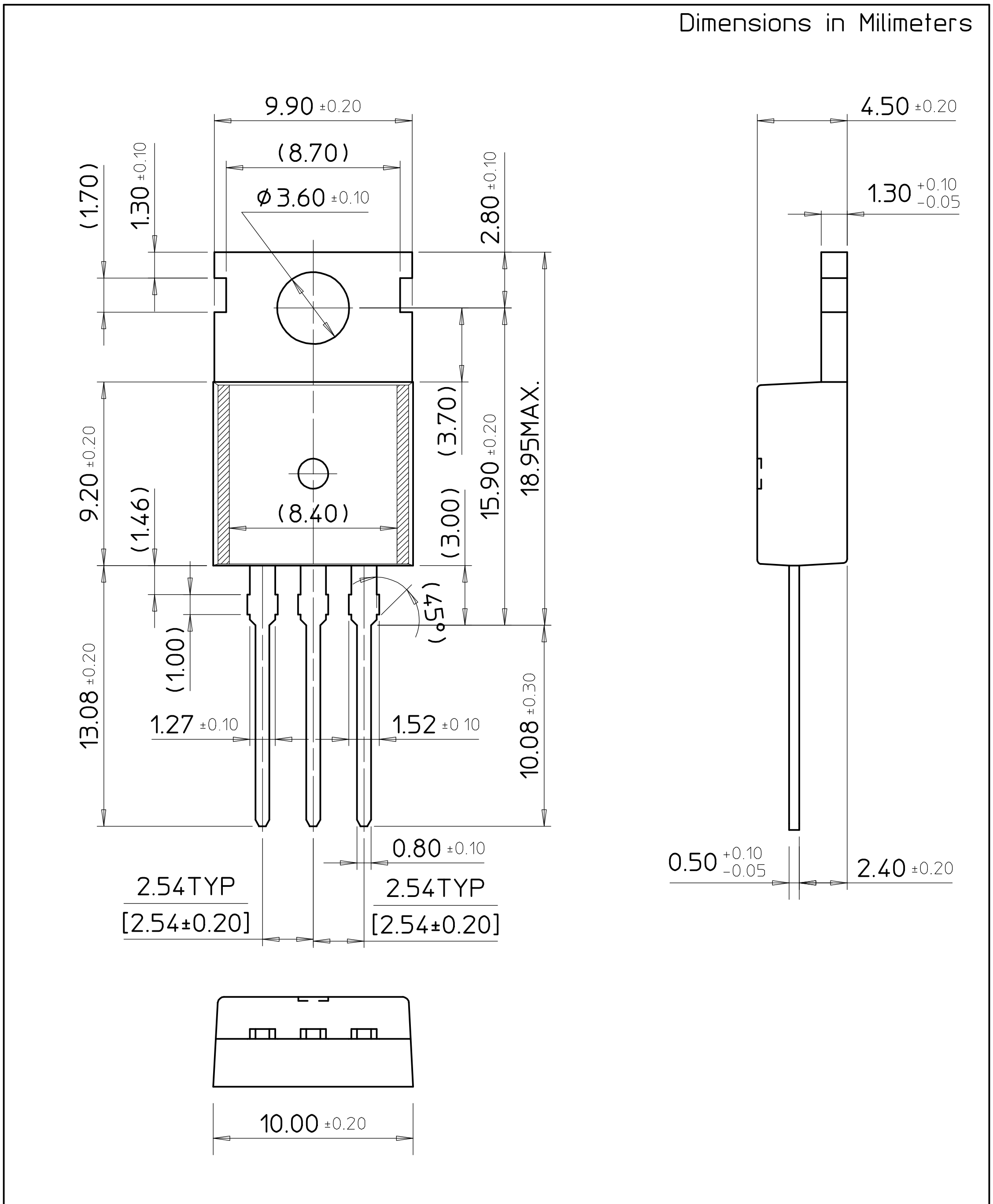
Fig. 5 Programmable Regulator



$$V_O = 1.25V\,(1 + \frac{R_2}{R_1}) + I_{ADJ}\,R_2$$

C_I is required when regulator is located an appreciable distance from power supply filter.
C_O is not needed for stability, however, it does improve transient response.
Since I_{ADJ} is controlled to less than 100μA, the error associated with this term is negligible in most applications.

TO-220



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