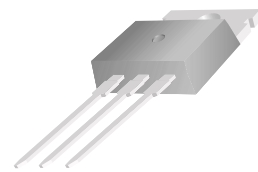
FAIRCHILD
SEMICONDUCTOR TM

LM317T (KA317) Adjustable Voltage Regulator (Positive)



TO-220

3-TERMINAL POSITIVE ADJUSTABLE REGULATOR

This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply 2.2A typical 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.

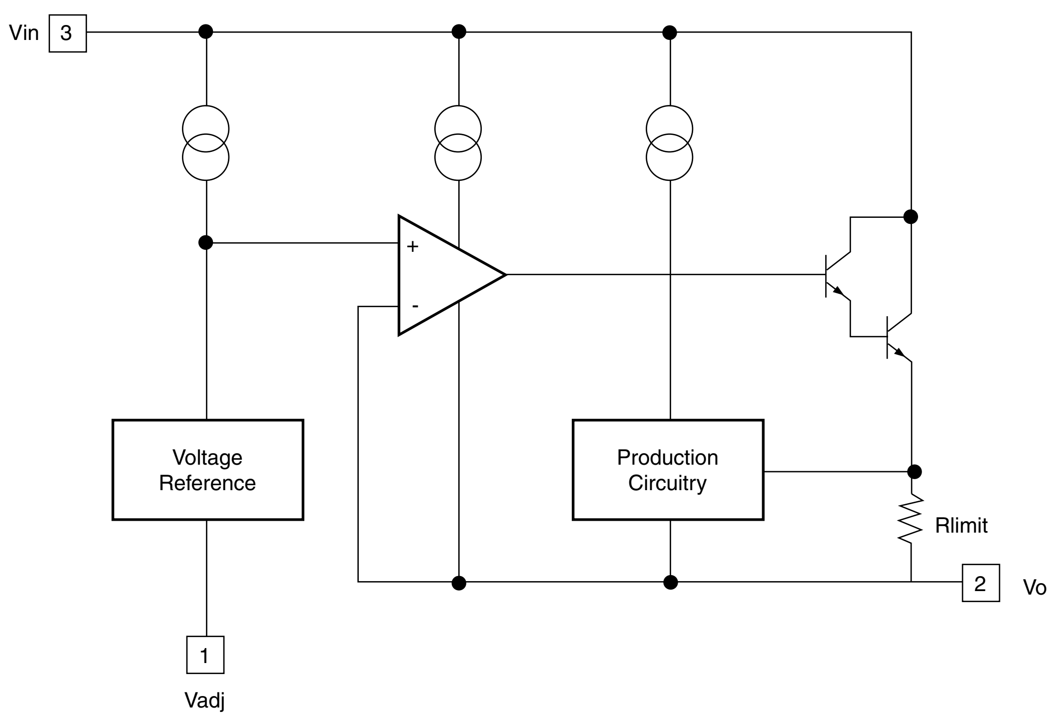
FEATURES

- Output Current 2.2A Typical
- Output Adjustable Between 1. 2V and 37V
- Internal Thermal-Overload Protection
- Internal Short-Circuit Current-Limiting
- Output Transistor Sate-Area Compensation
- TO-220 Package

ORDERING INFORMATION

Device	Package	Operating Temperature
LM317T (KA317)	TO-220	0°C ~ +125°C

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_A= +25°C, unless otherwise specified)

Characteristic	Symbol	Value	Unit
Input-Output Voltage Differential	V_I - V_O	40	V
Lead Temperature	T_{LEAD}	230	°C
Power Dissipation	P_D	Internally limited	W
Operating Temperature Range	T_{OPR}	0 ~ +125	°C
Storage Temperature Range	T_{STG}	-65 ~ +125	°C
Temperature Coefficient of Output Voltage	V_O/T	0.02	%/°C

ELECTRICAL CHARACTERISTICS

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

Characteristic	Symbol	Test Conditions		Min	Typ	Max	Unit
Line Regulation	Rline	T_A = +25°C	3V ≤ V_I - V_O ≤ 40V		0.01	0.04	%/V
			3V ≤ V_I - V_O ≤ 40V		0.02	0.07	%/V
Load Regulation	Rload	T_A = +25°C, 10mA ≤ I_O ≤ I_{MAX} V_O < 5V 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	12	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°C		1.0	2.2 0.3		A
RMS Noise, % of V_{OUT}	e_N	T_A= +25°C, 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°C for end point measurements, 1000HR			0.3	1	%
Thermal Resistance Junction to Case	$R_{\theta JC}$				5		°C/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

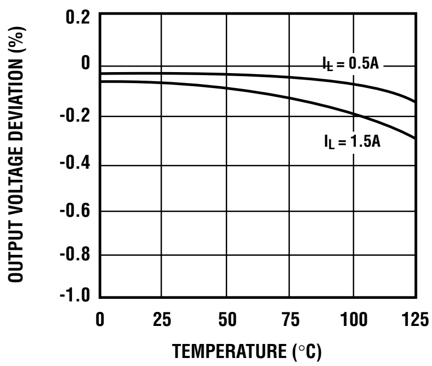


Fig. 2 Adjustment Current

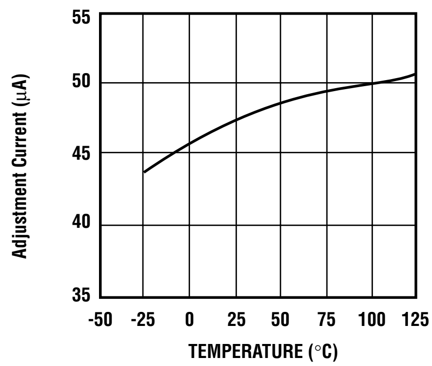


Fig. 3 Dropout Voltage

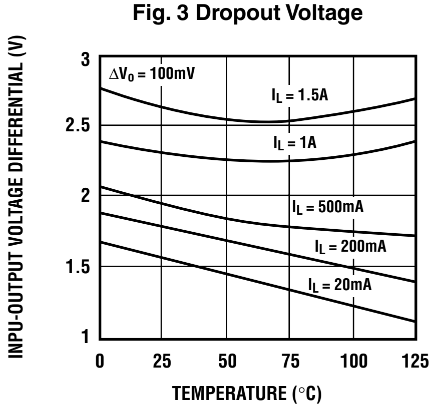
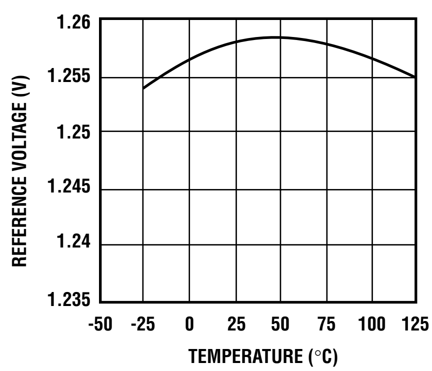
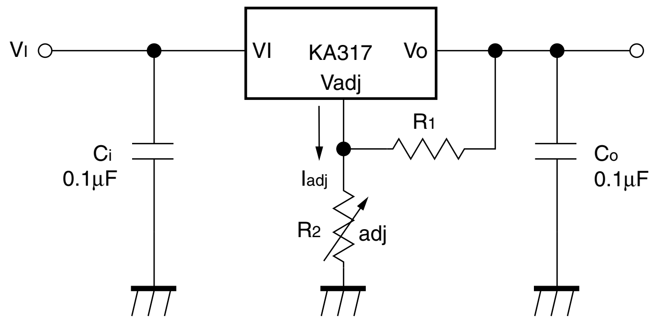


Fig. 4 Reference Voltage



Typical Application



$V_O = 1.25V (1 + R_2/R_1) + I_{adj} R_2$

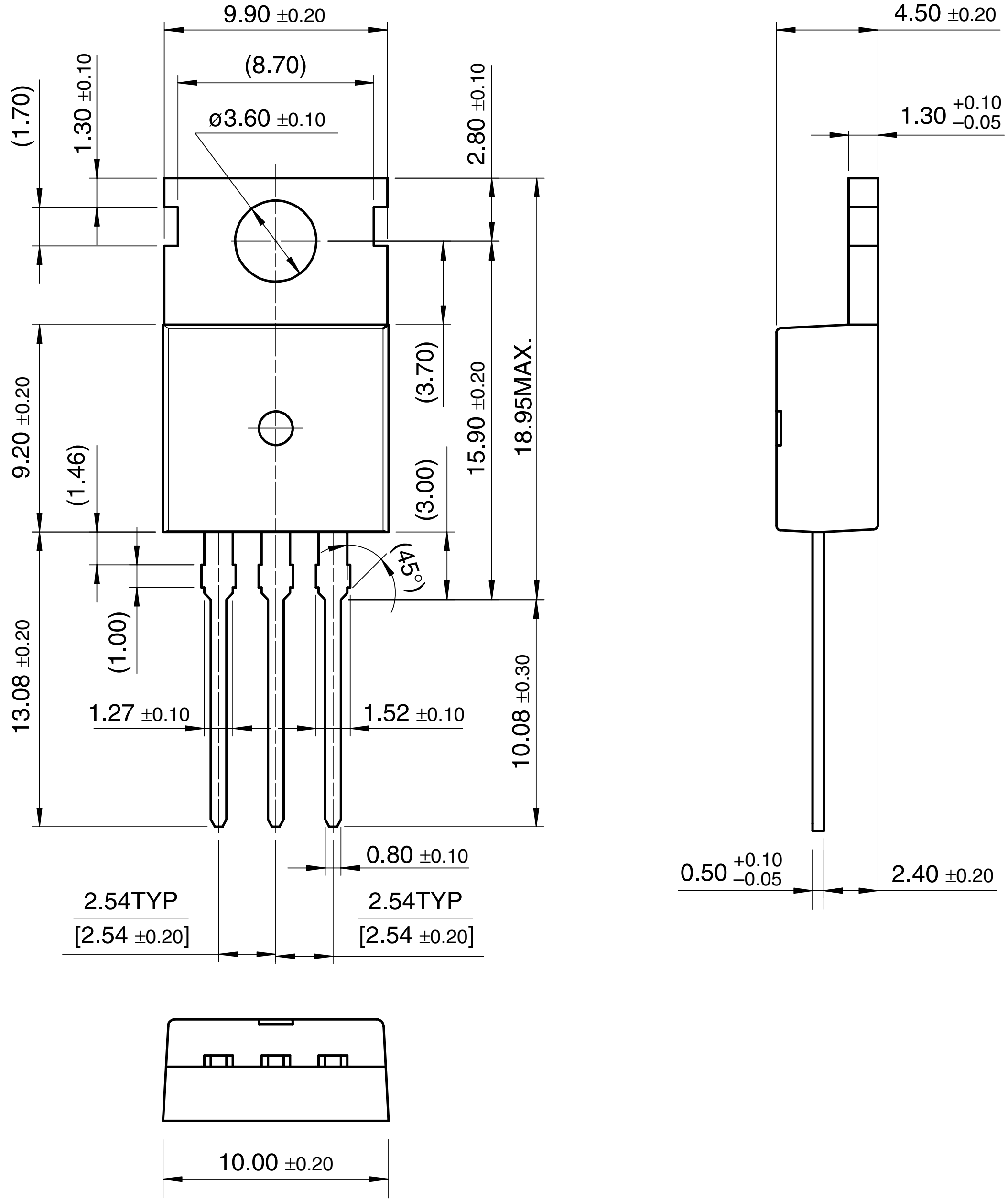
Fig. 5 Programmable Regulator

C_i is required when regulator is located at an appreciable distance from the power supply filter.
C_o improves transient response by reducing AC noise which is present at the output.
Since I ADJ is controlled to less than 100μA, the error associated with this term is negligible in most applications.

TO-220 Package Dimensions

FAIRCHILD SEMICONDUCTOR TM

TO-220 (FS PKG CODE AE)



Dimensions in Millimeters

August 1999, Rev B

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FACT™	QFET™	
FACT Quiet Series™	QS™	
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