

# **KA317**

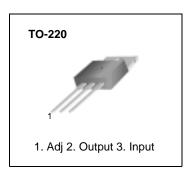
# 3-Terminal Positive Adjustable Regulator

### **Features**

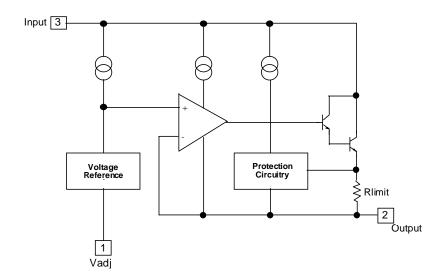
- Output Current In Excess of 1. 5A
- Output Adjustable Between 1. 2V and 37V
- Internal Thermal Overload Protection
- · Internal Short Circuit Current Limiting
- Output Transistor Safe Area Compensation
- TO-220 Package

### **Description**

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.



## **Internal Block Diagram**



## **Absolute Maximum Ratings**

Parameter	Symbol	Value	Unit
Input-Output Voltage Differential	V <sub>I</sub> - V <sub>O</sub>	40	V
Lead Temperature	TLEAD	230	°C
Power Dissipation	PD	Internally limited	W
Operating Junction Temperature Range	Tj	0 ~ +125	°C
Storage Temperature Range	TSTG	-65 ~+125	°C
Temperature Coefficient of Output Voltage	ΔVo/ΔΤ	±0.02	%/°C

### **Electrical Characteristics**

(VI-VO=5V, IO= 0.5A,  $0^{\circ}$ C  $\leq$  TJ  $\leq$  + 125 $^{\circ}$ C, IMAX = 1.5A, PDMAX =20W, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Тур.	Max.	Unit
Line Regulation (Note1)	Rline	T <sub>A</sub> = +25°C 3V ≤ V <sub>I</sub> - V <sub>O</sub> ≤ 40V	-	0.01	0.04	%/V
, ,		3V ≤ V <sub>I</sub> - V <sub>O</sub> ≤ 40V	-	0.02	0.07	%/V
Load Regulation (Note1)	Rload	$T_A = +25$ °C, $10$ mA $\leq I_O \leq I_{MAX}$ $V_O < 5$ V $V_O \geq 5$ V	-	18 0.4	25 0.5	mV %/VO
		10mA ≤ I <sub>O</sub> ≤ I <sub>MAX</sub> V <sub>O</sub> < 5V V <sub>O</sub> ≥ 5V	-	40 0.8	70 1.5	mV %/VO
Adjustable Pin Current	ladj	-	-	46	100	μΑ
Adjustable Pin Current Change	Δladj	$3V \le V_I - V_O \le 40V$ $10mA \le I_O \le I_{MAX}$ $P_D \le P_{MAX}$	-	2.0	5	μА
Reference Voltage	VREF	$3V \le V_{IN} - V_O \le 40V$ $10mA \le I_O \le I_{MAX}$ $P_D \le P_{MAX}$	1.20	1.25	1.30	V
Temperature Stability	STT	-	-	0.7	-	%/Vo
Minimum Load Current to Maintain Regulation	IL(MIN)	VI - VO = 40V	-	3.5	12	mA
Maximum Output Current	IO(MAX)	$V_I$ - $V_O \le 15V$ , $P_D \le P_{MAX}$ $V_I$ - $V_O \le 40V$ , $P_D \le P_{MAX}$ $T_A=25^{\circ}C$	1.0	2.2 0.3	-	А
RMS Noise, % of VOUT	eN	T <sub>A</sub> = +25°C, 10Hz ≤ f ≤ 10KHz	-	0.003	0.01	%/Vo
Ripple Rejection	RR	$V_O = 10V$ , $f = 120Hz$ without C <sub>ADJ</sub> C <sub>ADJ</sub> = $10\mu F$ (Note2)	66	60 75	-	dB
Long-Term Stability, T <sub>J</sub> = T <sub>HIGH</sub>	ST	T <sub>A</sub> = +25°C for end point measurements, 1000HR	-	0.3	1	%
Thermal Resistance Junction to Case	R <sub>θ</sub> JC	-	-	5	-	°C/W

### Note:

<sup>1.</sup> Load and line regulation are specified at constant junction temperature. Change in V<sub>D</sub> due to heating effects must be taken into account separately. Pulse testing with low duty is used. (P<sub>MAX</sub> = 20W)

<sup>2.</sup> CADJ, when used, is connected between the adjustment pin and ground.

## **Typical Perfomance Characteristics**

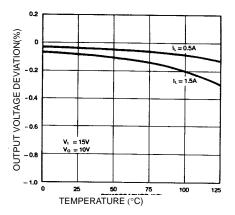


Figure 1. Load Regulation

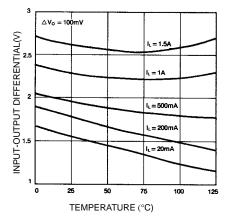


Figure 3. Dropout Voltage

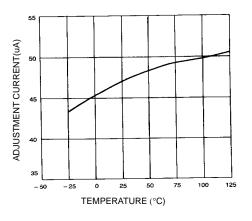


Figure 2. Adjustment Current

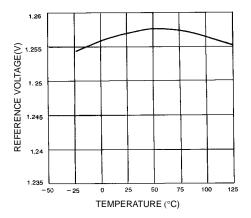
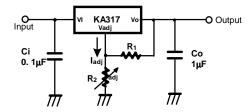


Figure 4. Reference Voltage

## **Typical Application**



 $V_0 = 1.25V (1 + R_2/R_1) + I_{adj}R_2$ 

Figure 5. Programmable Regulator

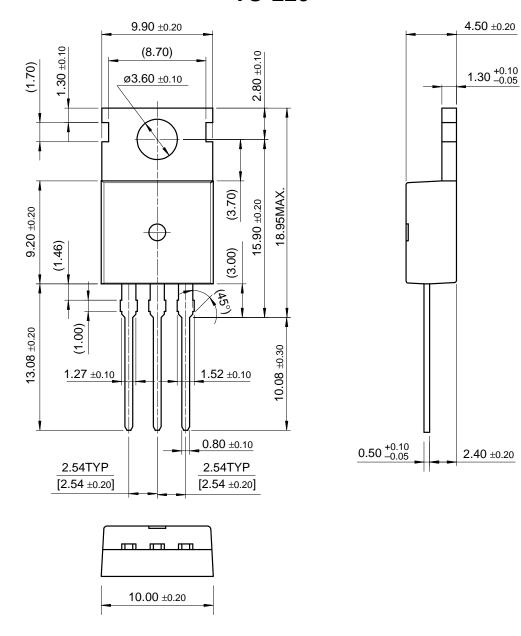
 $C_i$  is required when regulator is located an appreciable distance from power supply filter.  $C_0$  is not needed for stability, however, it does improve transient response.

Since  $I_{ADJ}$  is controlled to less than  $100\mu A$ , the error associated with this term is negligible in most applications.

## **Mechanical Dimensions**

## Package

**TO-220** 



# **Ordering Information**

Product Number	Package	Operating Temperature
KA317	TO-220	0°C to + 125°C

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