KA317M 3-Terminal 0.5A Positive Adjustable Regulator

Features

• Output Current in Excess of 0.5A

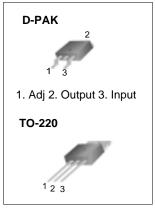
AIRCHILD

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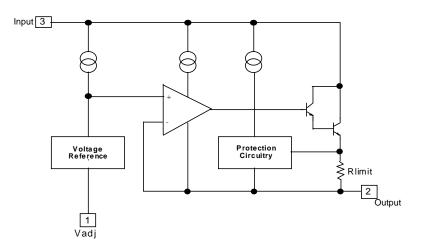
- Output Adjustable Between 1.2V and 37V
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe Area Compensation
- Floating Operation for High Voltage Applications

Description

The KA317M is a 3-Terminal adjustable positive voltage regulator capable of supplying in excess of 500mA 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.



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Output Voltage Differential	VI - VO	40	V
Power Dissipation	PD	Internally limited	W
Thermal Resistance Junction-Air D-PAK (Note1,2)	RθJA	100	°C/W
Operating Junction Temperature Range	Тј	0 ~ +125	٥C
Storage Temperature Range	TSTG	-65 ~+125	٥C

Electrical Characteristics

(VI-VO=5V, IO= 0.1A, $0^{\circ}C \le T_J \le + 125^{\circ}C$, PDMAX = 7.5W, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit	
Line Regulation (Note3)	Rline	$T_A = +25^{\circ}C, \ 3V \le V_I - V_O \le 40V$	-	0.01	0.04	%/ V	
		$3V \le V_I - V_O \le 40V$	-	0.02	0.07		
Load Regulation (Note3)	Rload	$\begin{array}{l} T_A =+ 25^\circ C, \ 10mA \ \leq I_O \leq 0.5A \\ V_O \leq 5V \\ V_O \geq 5V \end{array}$	-	5 0.1	25 0.5	mV %/ Vo	
		$\begin{array}{l} 10mA \leq I_Q \leq 0.5A \\ V_Q \leq 5V \\ V_Q \geq 5V \end{array}$	-	20 0.3	70 1.5	mV %/ Vo	
Adjustment Pin Current	IADJ	-	-	50	100	uA	
Adjustment Pin Current Change	ΔI _{AD} J	$\begin{array}{l} 3V \leq V_I - V_O \leq 40V \\ 10mA \leq I_O \leq 0.5A, \ P_D < P_{DMAX} \end{array}$	-	0.2	5	uA	
Reference Voltage	VREF	$\begin{array}{l} 3V < V_I - V_O < 40V \\ 10mA \ \leq I_O \leq 0.5A, \ P_D < P_{DMAX} \end{array}$	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	10	mA	
Maximum Output Current	IO(MAX)	VI - VO ≤15V, PD < PDMAX	0.5	0.9	-	A	
		VI - V _O = 40V P _D < P _{DMAX} , T _A =+ 25°C	0.15	0.25	-		
RMS Noise, % of VOUT	eN	T _A = +25°C, 10Hz < f < 10KHz	-	0.003	-	%/ Vo	
Ripple Rejection	RR	Vo = 10V, f = 120Hz without CADJ CADJ = 10uF (Note4)	66	65 80	-	dB	
Long-Term Stability	ST	TJ =+ 125°C, 1000Hours	-	0.3	1	%/1000Hrs	

Note :

1. Thermal resistance test board

Size: 76.2mm * 114.3mm * 1.6mm(1S0P) JEDEC standard: JESD51-3, JESD51-7

2. Assume no ambient airflow.

- 3. 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 cycle is used.
- 4. CADJ, when used, is connected between the adjustment pin and ground.

Typical Performance Characteristics

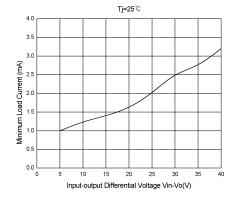


Figure 1. Minimum Load Current

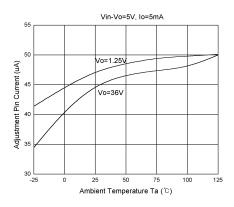


Figure 3. Adjustment Pin Current vs. Temperature

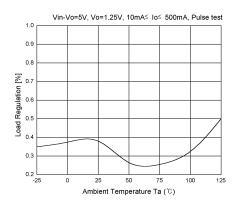


Figure 5. Load Regulation vs. Temperature

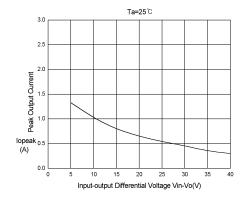


Figure 2. Peak Output Current vs. Input-Output Differential Voltage

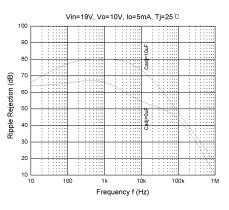


Figure 4. Ripple Rejection vs. Frequency

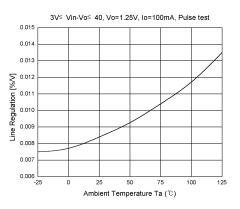


Figure 6. Line Regulation vs. Temperature

Typical Performance Characteristics (Continued)

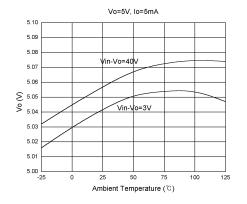


Figure 7. Outputvoltage vs. Temperature

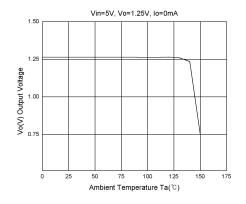


Figure 8. Thermal Shutdown

Typical Application

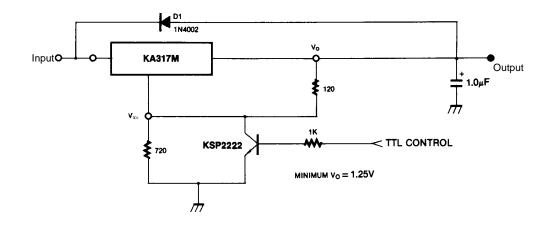


Figure 1. 15V Electronic Shutdown Regulator

D1 protects the device during an input short circuit.

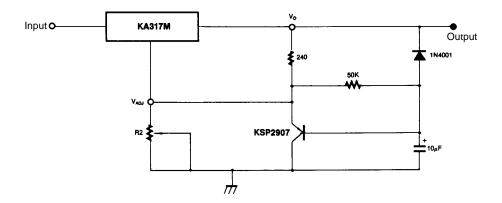


Figure 2. Slow Turn-On Regulator

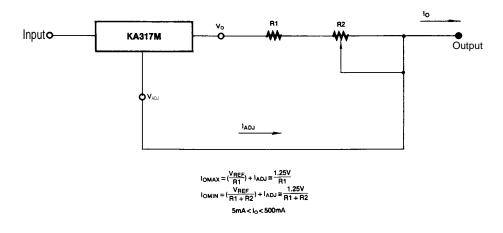
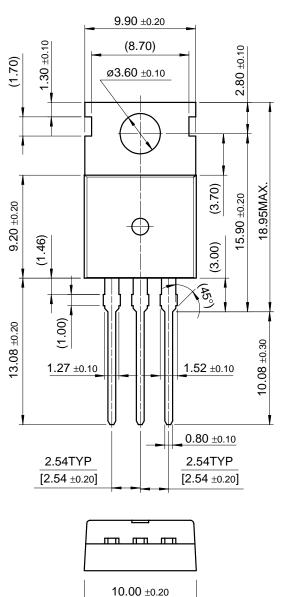
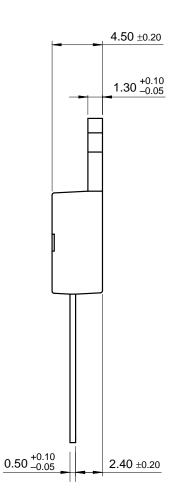


Figure 3. Current Regulator

Mechanical Dimensions

Package





Dimensions in millimeters

TO-220

Mechanical Dimensions (Continued)

Package



6.60 ±0.20 0.70 ±0.20 5.34 ± 0.30 2.30 ± 0.10 (0.50) (0.50) (4.34) 0.50 ± 0.10 0.60 ± 0.20 6.10 ± 0.20 0.91 ±0.10 **9.50** ±0.30 2.70 ±0.20 **MIN0.55** Đ 0.80 ±0.20 0.89 ±0.10 MAX0.96 0.76 ± 0.10 0.50 ± 0.10 1.02 ±0.20 2.30TYP 2.30TYP [2.30±0.20] [2.30±0.20] 2.30 ± 0.20 6.60 ±0.20 (5.34)(5.04) (0.70) (0.90) (1.00) (1.50)(3.05) 6.10 ± 0.20 (2XR0.25) 9.50 ±0.30 2.70 ±0.20 (0.10) 0.76 ± 0.10

D-PAK

Ordering Information

Product Number	Package	Operating Temperature
KA317M	TO-220	0 ~ 125 ℃
KA317MR	D-PAK	0~125 C

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