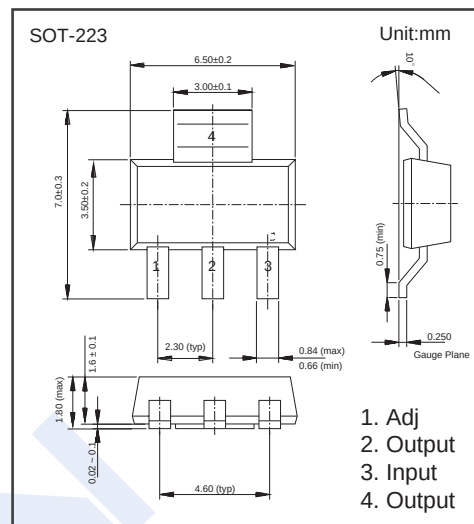


Three Terminal Positive Voltage Regulator

KA100M317

■ Features

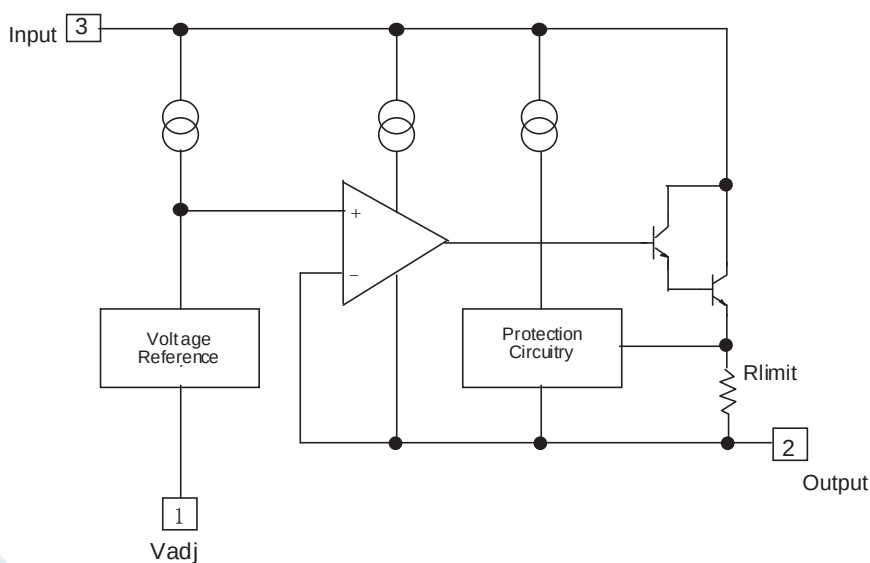
- Internal thermal overload protection
- Internal short circuit current limiting
- Output transistor safe operating area compensation
- This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply more than 1.5A of load current with an output voltage adjustable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



■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Input-Output Voltage Differential	$V_i - V_o$	40	V
Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T$	± 0.02	%/ $^\circ\text{C}$
Power Dissipation	P_D	Internally limited	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	5	$^\circ\text{C}/\text{W}$
Lead Temperature	T_{LEAD}	230	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	150	
Storage Temperature Range	T_{stg}	-55 to 150	

■ Internal Block Diagram



Three Terminal Positive Voltage Regulator

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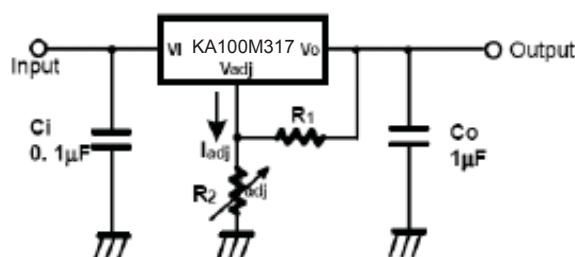
■ Electrical Characteristics ($V_O - V_I = 5V$, $I_O = 0.5A$, $0^\circ C \leq T_J \leq +125^\circ C$, $I_{MAX} = 1.5A$, $P_{MAX} = 20W$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Line Regulation	R_{line}	$3V \leq V_I - V_O \leq 40V$ $T_a = 25^\circ C$		0.01	0.04	% / V
		$3V \leq V_I - V_O \leq 40V$		0.02	0.07	
Load Regulation	R_{load}	$T_a = 25^\circ C$, $10mA \leq I_O \leq I_{MAX}$	$V_O < 5V$	18	25	mV% / V_O
			$V_O \geq 5V$	0.4	0.5	
		$10mA \leq I_O \leq I_{MAX}$	$V_O < 5V$	40	70	
			$V_O \geq 5V$	0.8	1.5	
Adjustable Pin Current	I_{ADJ}			46	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	$3V \leq V_I - V_O \leq 40V$ $10mA \leq I_O \leq I_{MAX}$, $P_D \leq P_{MAX}$		2	5	
Reference Voltage	V_{REF}	$3V \leq V_I - V_O \leq 40V$ $10mA \leq I_O \leq I_{MAX}$, $P_D \leq P_{MAX}$	1.2	1.25	1.3	V
Temperature Stability	ST_T			0.7	1.5	% / V_O
Minimum Load Current to Maintain Regulation	$I_{L(min)}$	$V_I - V_O = 40V$		3.5	12	mA
Maximum Output Current	$I_{O(max)}$	$V_I - V_O \leq 15V$, $P_D \leq P_{MAX}$	1	2.2		A
		$V_I - V_O \leq 40V$, $P_D \leq P_{MAX}$ $T_a = 25^\circ C$		0.3		
RMS Noise, % of V_{OUT}	e_n	$T_a = 25^\circ C$, $10Hz \leq f \leq 10kHz$		0.003	0.01	% / V_O
Ripple Rejection	RR	$V_O = 10V$, $f = 120Hz$ without C_{ADJ}		60		dB
		$V_O = 10V$, $f = 120Hz$, $C_{ADJ} = 10\mu F$	66	75		
Long-Term Stability, $T_J = T_{HIGH}$	ST	$T_a = 25^\circ C$ for end point measurements, 1000HR		0.3	1	%

■ Marking

Marking	K317
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■ Typical Application



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

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 $100\mu A$, the error associated with this term is negligible in most applications.