

# KA317L

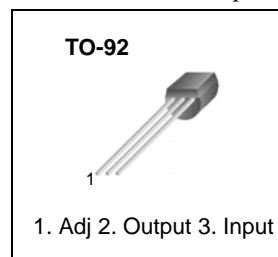
## 3-Terminal 0.1A Positive Adjustable Regulator

### Features

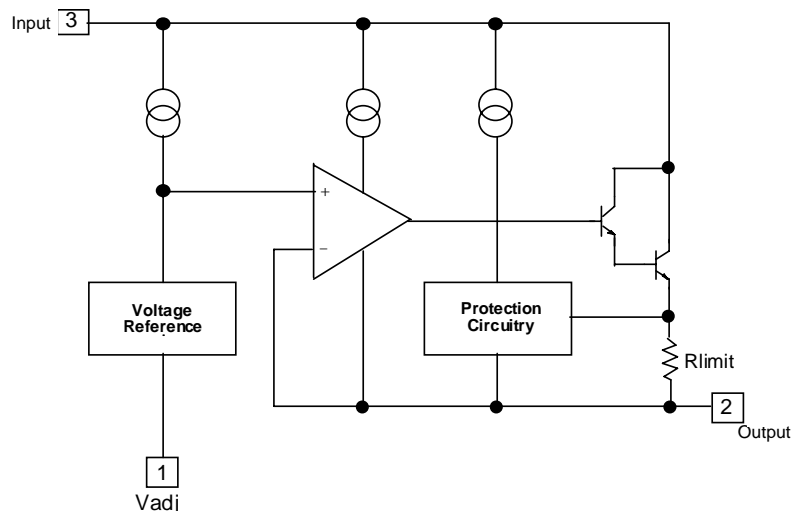
- Output Current in Excess of 100mA
- Output Adjustable Between 1.2V and 37V
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe Area Compensation
- Floating Operation For High Voltage Applications

### Description

The KA317L is a 3-terminal adjustable positive voltage regulator capable of supplying in excess of 100mA 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	$V_I - V_O$	40	V
Power Dissipation	$P_D$	Internally limited	W
Operating Junction Temperature Range	$T_J$	0 ~ +125	°C
Storage Temperature Range	$T_{STG}$	-65 ~ +125	°C

## Electrical Characteristics

( $V_I - V_O = 5V$ ,  $I_O = 40mA$ ,  $0^\circ C \leq T_J \leq +125^\circ C$ ,  $P_{DMAX} = 625mW$ , unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Line Regulation (Note1)	$R_{line}$	$T_A = +25^\circ C$ $3V \leq V_I - V_O \leq 40V$	-	0.01	0.04	%V
		$3V \leq V_I - V_O \leq 40V$	-	0.02	0.07	
Load Regulation (Note1)	$R_{load}$	$T_A = +25^\circ C$ $10mA \leq I_O \leq 100mA$ $V_O \leq 5V$ $V_O \geq 5V$	- -	5 0.1	25 0.5	mV %/V <sub>O</sub>
		$10mA \leq I_O \leq 100mA$ $V_O \leq 5V$ $V_O \geq 5V$	- -	20 0.3	70 1.5	mV %/V <sub>O</sub>
Adjustment Pin Current	$I_{ADJ}$	-	-	50	100	μA
Adjustment Pin Current Change	$\Delta I_{ADJ}$	$3V \leq V_I - V_O \leq 40V$ $10mA \leq I_O \leq 100mA$ $P_D < P_{DMAX}$	-	0.2	5	μA
Reference Voltage	$V_{REF}$	$3V < V_I - V_O < 40V$ $10mA \leq I_O \leq 100mA$ $P_D \leq P_{DMAX}$	1.20	1.25	1.30	V
Temperature Stability	$STT$	-	-	0.7	-	%
Minimum Load Current to Maintain Regulation	$I_{L(MIN)}$	$V_I - V_O = 40V$	-	3.5	10	mA
Maximum Output Current	$I_{O(MAX)}$	$V_I - V_O \leq 15V$ , $P_D < P_{DMAX}$	100	200	-	mA
		$V_I - V_O \leq 40V$ $P_D < P_{DMAX}$ , $T_A = +25^\circ C$	25	50	-	
RMS Noise, % of $V_{OUT}$	$e_N$	$T_A = +25^\circ C$ $10Hz < f < 10kHz$	-	0.003	-	%V <sub>O</sub>
Ripple Rejection	$RR$	$V_O = 10V$ , $f = 120Hz$ without $C_{ADJ}$	-	65	-	dB
		$C_{ADJ} = 10\mu F$	66	80	-	dB
Long-Term Stability	$ST$	$T_J = +125^\circ C$ , 1000Hours	-	0.3	-	%

### Note:

1. 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.

## Typical Application

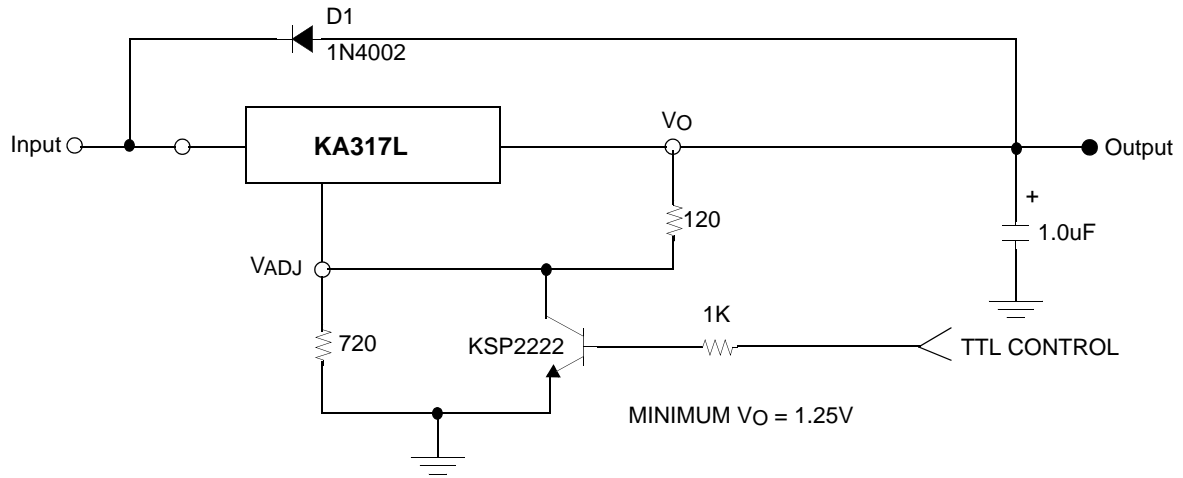


Figure 1. 5V Electronic Shutdown Regulator

D1 protects the device during an input short circuit.

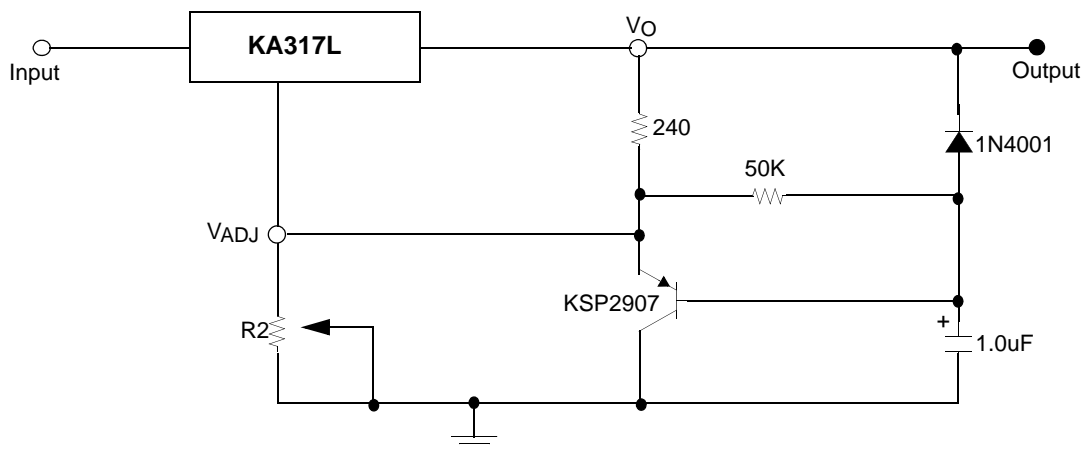


Figure 2. Slow Turn-On Regulator

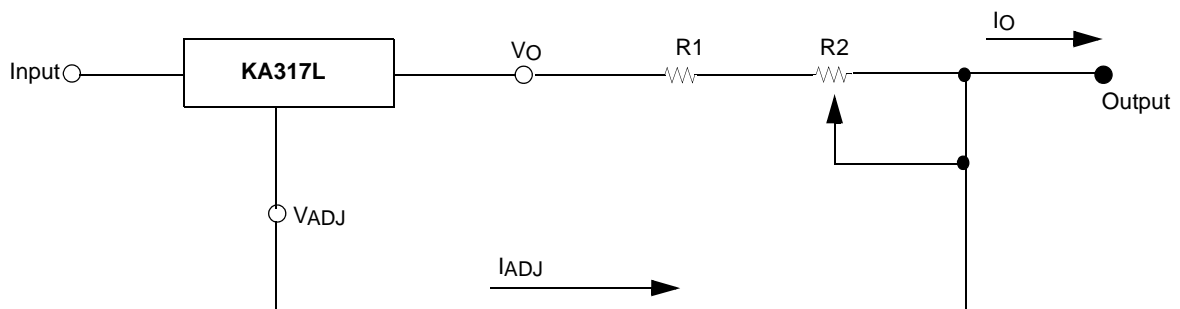


Figure 3. Current Regulator

$$I_{O\text{MAX}} = \left( \frac{V_{\text{REF}}}{R1} \right) + I_{\text{ADJ}} \cong \frac{1.25\text{V}}{R1}$$

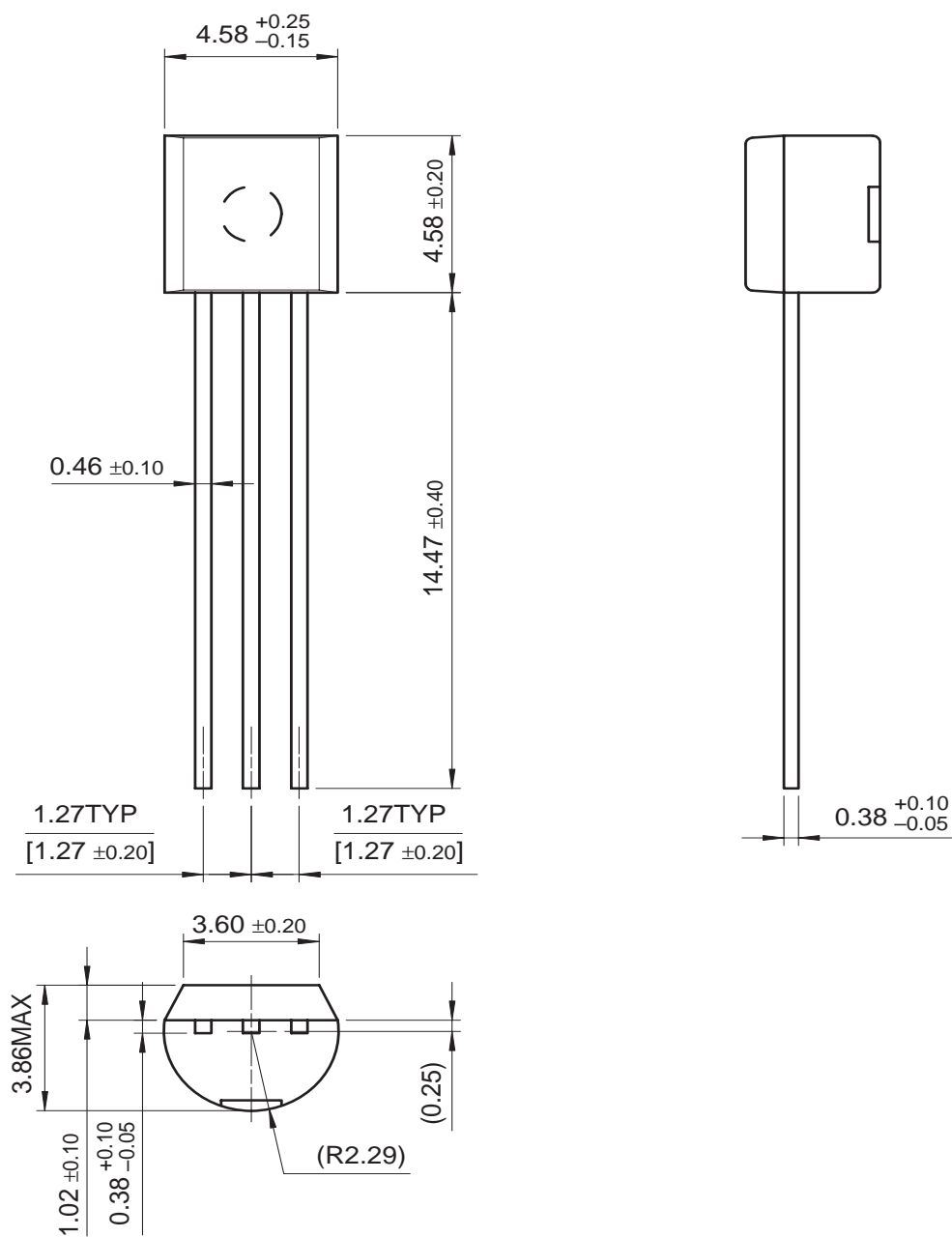
$$I_{O\text{MAX}} = \left( \frac{V_{\text{REF}}}{R1 + R2} \right) + I_{\text{ADJ}} \cong \frac{1.25\text{V}}{R1 + R2}$$

$$5\text{mA} < I_O < 500\text{mA}$$

Mechanical Dimensions

Package

TO-92



## Ordering Information

Product Number	Package	Operating Temperature
KA317LZ	TO-92	0°C to +125°C

### DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

### LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.