

## GCLM317L

### 100mA ADJUSTABLE VOLTAGE REGULATOR

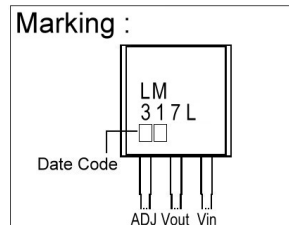
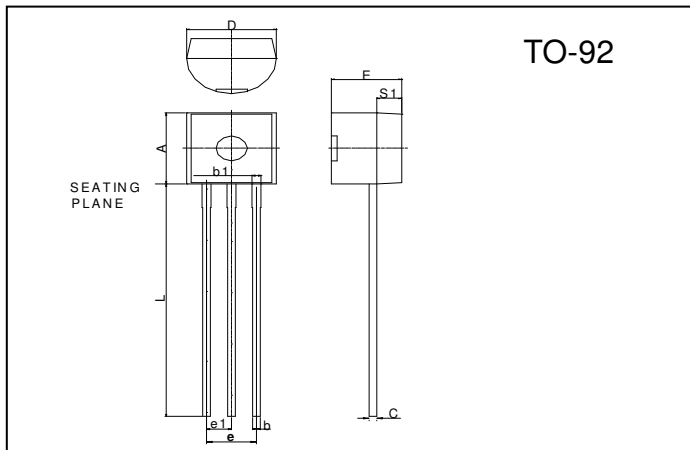
#### Description

The GCLM317L is a monolithic integral circuit, designed for use as positive adjustable voltage regulator. It is designed to supply unit 100mA of load current with an output voltage adjustable over a 1.25V to 37V range.

#### Features

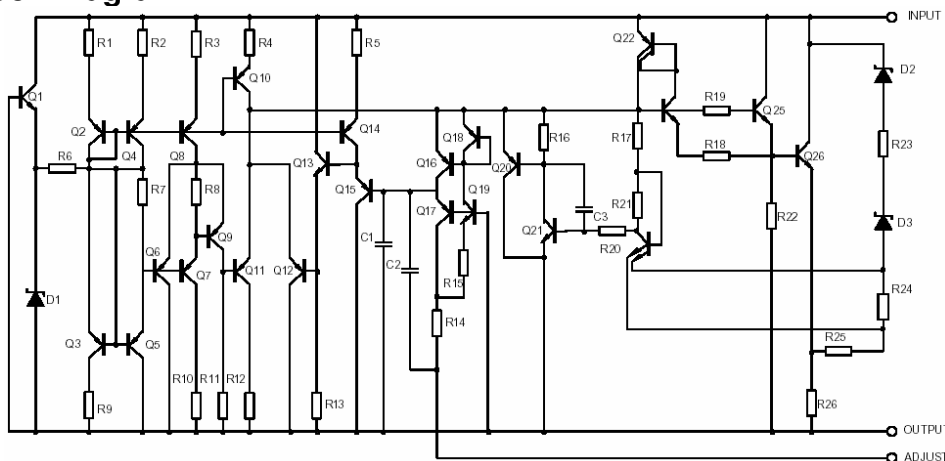
- Output voltage adjustable from 1.25V to 37V
- Output current in excess of 100mA
- Thermal overload protection
- Short circuit protection
- Output transistor save area compensation
- Floating operation for high voltage applications

#### Package Dimensions

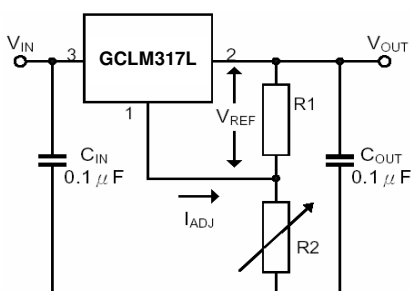


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.45	4.7	D	4.44	4.7
S1	1.02	-	E	3.30	3.81
b	0.36	0.51	L	12.70	-
b1	0.36	0.76	e1	1.150	1.390
C	0.36	0.51	e	2.42	2.66

#### Block Diagram



#### Test Circuit



## Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Ratings	Unit
Input-Output Voltage Difference	V <sub>IN</sub> - V <sub>OUT</sub>	40	V
Power Dissipation	P <sub>D</sub>	625	mW
Junction Temperature	T <sub>J</sub>	+125	°C
Operating Junction Temperature	T <sub>OPR</sub>	0 ~ +70	°C
Storage Temperature Range	T <sub>STR</sub>	-40 ~ +150	°C

Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

Note 2. The device is guaranteed to meet performance specification within 0°C ~ 70°C operating temperature range and assured by design from -20°C ~ 85°C.

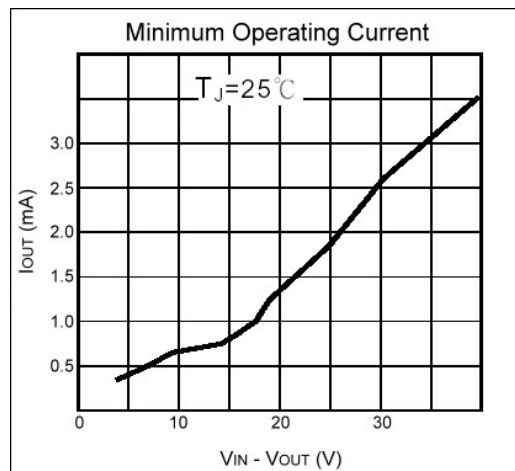
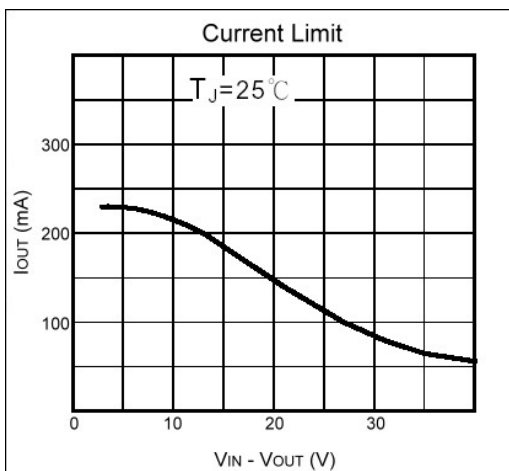
## Electrical Characteristics

(V<sub>IN</sub> - V<sub>OUT</sub>=5V, 0°C ≤ T<sub>J</sub> ≤ 125°C, I<sub>O</sub>=40mA, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	TYP	Max	Unit	
Line Regulation	REGLINE	V <sub>IN</sub> - V <sub>OUT</sub> =3~40V I <sub>O</sub> <20mA	T <sub>J</sub> =25°C	-	0.01	0.04	%/V
			0°C ≤ T <sub>J</sub> ≤ 125°C	-	0.02	0.07	%/V
Load Regulation	REGLOAD	I <sub>O</sub> =5~100mA V <sub>OUT</sub> ≤ 5V	T <sub>J</sub> =25°C	-	5	25	mV
			0°C ≤ T <sub>J</sub> ≤ 125°C	-	20	70	mV
		I <sub>O</sub> =5~100mA V <sub>OUT</sub> ≥ 5V	T <sub>J</sub> =25°C	-	0.1	0.5	%/V <sub>OUT</sub>
			0°C ≤ T <sub>J</sub> ≤ 125°C	-	0.3	1.5	%/V <sub>OUT</sub>
Adjustable Pin Current	I <sub>ADJ</sub>		-	50	100	μA	
Adjustable Pin Current Change	ΔI <sub>ADJ</sub>	V <sub>IN</sub> - V <sub>OUT</sub> =3~40V I <sub>O</sub> =5~100mA, P <sub>D</sub> < 625mW	-	0.2	5	μA	
Reference Voltage	V <sub>REF</sub>	V <sub>IN</sub> - V <sub>OUT</sub> =3~40V I <sub>O</sub> =5~100mA, P <sub>D</sub> < 625mW	1.2	1.25	1.3	V	
Output Voltage Temperature Stability	ΔV <sub>OUT</sub> /V <sub>OUT</sub>		-	0.7	-	%	
Minimum Load Current	I <sub>LOAD</sub> (Min)	V <sub>IN</sub> - V <sub>OUT</sub> =40V	-	3.5	5	mA	
Maximum Output Current	I <sub>OUT</sub> (Max)	V <sub>IN</sub> - V <sub>OUT</sub> =3~13V	100	200	-	mA	
		V <sub>IN</sub> - V <sub>OUT</sub> =40V	25	50	-	mA	
Output Noise Voltage (% of V <sub>OUT</sub> )	e <sub>N</sub>	f=10Hz ~ 10KHz, T <sub>J</sub> =25°C	-	0.003	-	%/V <sub>OUT</sub>	
Ripple Rejection	RR	T <sub>J</sub> =25°C, f=120Hz	C <sub>ADJ</sub> =0	-	65	-	dB
			C <sub>ADJ</sub> =10μF	66	80	-	dB

Note: C<sub>ADJ</sub> is connected between Adjust pin and Ground.

## Characteristics Curve

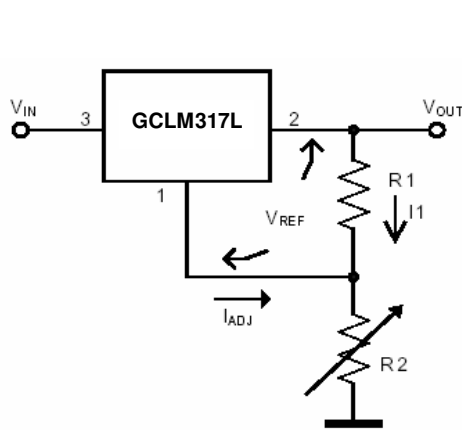


## Application Information and Circuits

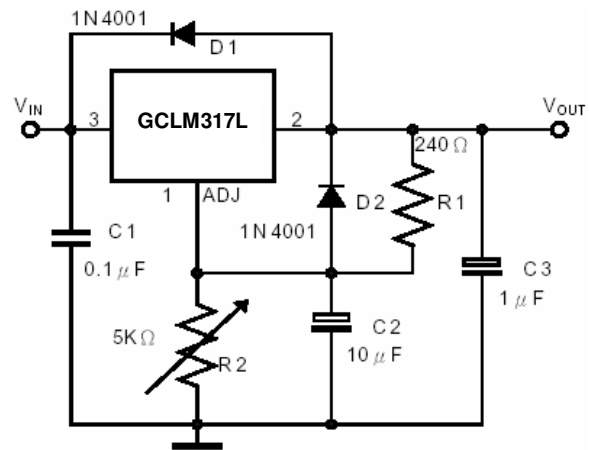
The GCLM317L provides an internal reference voltage of 1.25V between the output and adjustments terminals. This is used to set a constant current flow across an external resistor driver, giving an output voltage  $V_{OUT}$  of:

$$V_{OUT} = V_{REF} * (1 + R2 / R1) + I_{ADJ} * R2$$

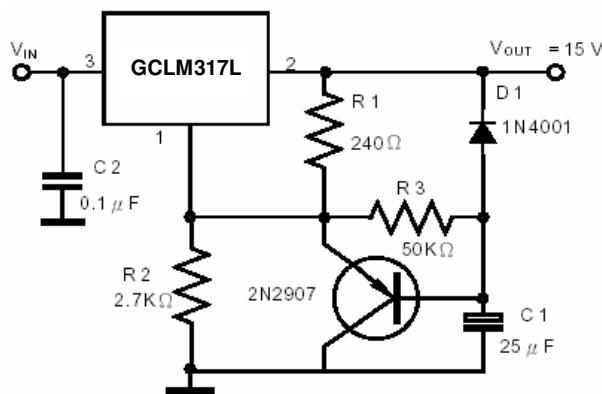
The device is designed to minimize the term  $I_{ADJ}$  (100uA max) and to maintain it very constant with line and load changes. Usually, the error term  $I_{ADJ} * R2$  can be neglected. To obtain the previous requirement, all the regulator quiescent current is returned to the output terminal, imposing a minimum load current condition. If the load is insufficient, the output voltage will rise. The GCLM317L is a floating regulator, input-output differential voltage, supplies of very high voltage with respect to ground can be regulated as long as the maximum input-output differential is not exceeded. Furthermore, programmable regulators are easily obtainable and, by connecting a fixed resistor between the adjustment and output, the device can be used as a precision current regulator.



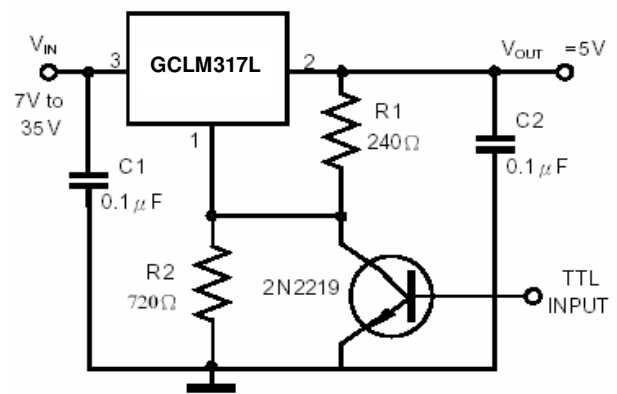
**Fig 1. Basic Adjustable Regulator**



**Fig 2. Voltage Regulator with Protection Diodes**



**Fig 3. Slow Turn-On 15V Regulator**



**Fig 4. 5V Electronic Shut-Down Regulator**

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