

RoHS Compliant Product

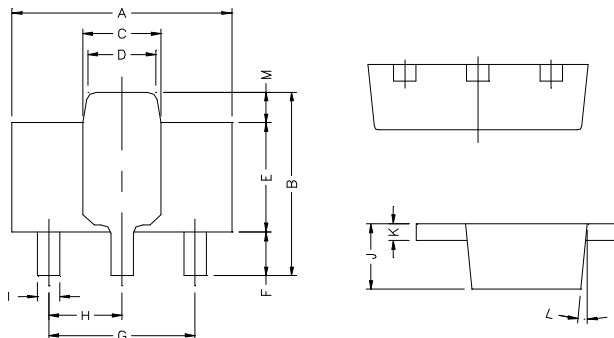
Description

The SMLM317L 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

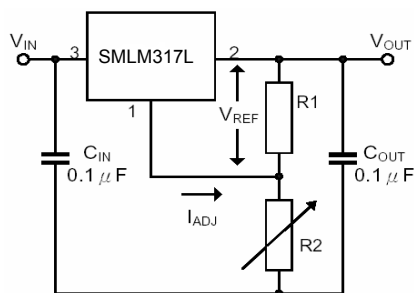
- * Thermal Overload Protection
- * Floating Operation For High Voltage Applications
- * Short Circuit Protection
- * Output Voltage Adjustable From 1.25V To 37V
- * Output Transistor Save Area Compensation
- * Output Current In Excess Of 100mA

SOT-89

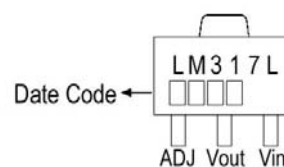


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.4	4.6	G	3.00	REF.
B	4.05	4.25	H	1.50	REF.
C	1.50	1.70	I	0.40	0.52
D	1.30	1.50	J	1.40	1.60
E	2.40	2.60	K	0.35	0.41
F	0.89	1.20	L	5° TYP.	
			M	0.70 REF.	

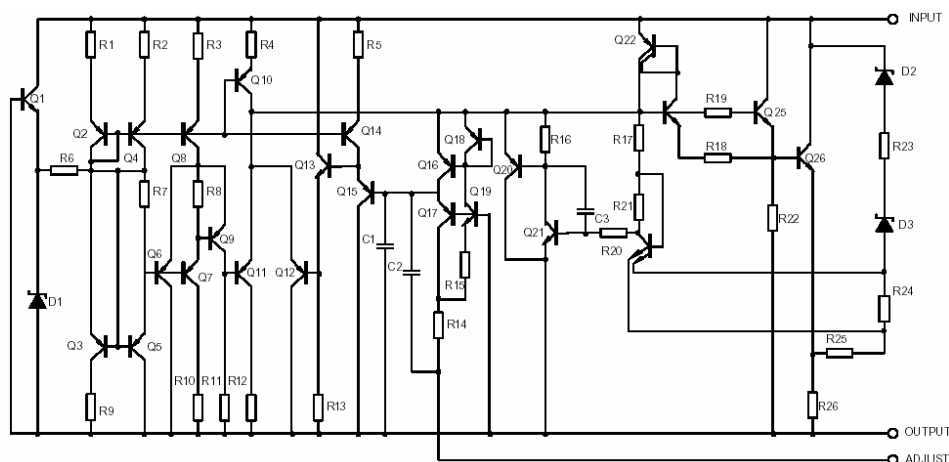
Test Circuit



Marking :



Block Diagram



Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Ratings	Unit
Input-Output Voltage Difference	V _{IN-VOUT}	40	V
Junction Temperature	T _J	+125	°C
Power Dissipation	P _D	625	mW
Storage Temperature Range	T _{STR}	0~+70	°C
Operating Junction Temperature	T _{OPR}	-40~+150	°C

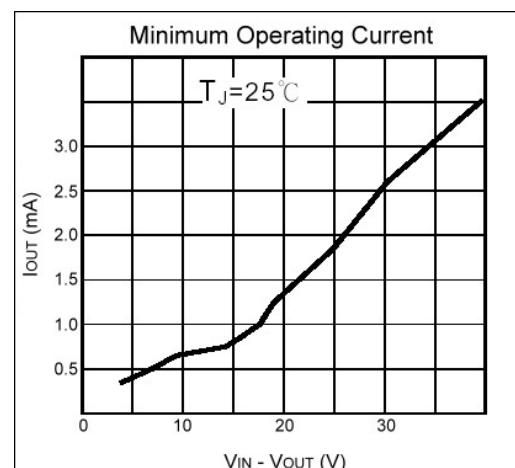
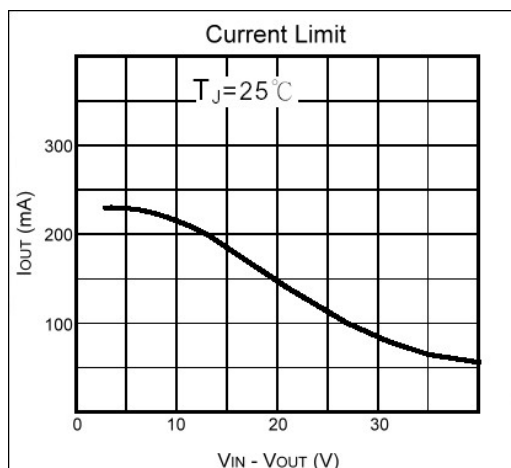
Note: 1. Absolute max. ratings are those values beyond which the device could be permanently damaged. Absolute max. ratings are stress ratings only and functional device operation is not implied.

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_{IN-VOUT}=5V, 0°C ≤ T_J ≤ 125°C, I_o=40mA, unless otherwise specified)

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

Characteristics Curve



Application Information and Circuits

The SMLM317L 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 min. 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 min. load current condition. If the load is insufficient, the output voltage will rise. The SMLM317L is a floating regulator, input-output differential voltage, supplies of very high voltage with respect to ground can be regulated as long as the max. 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.

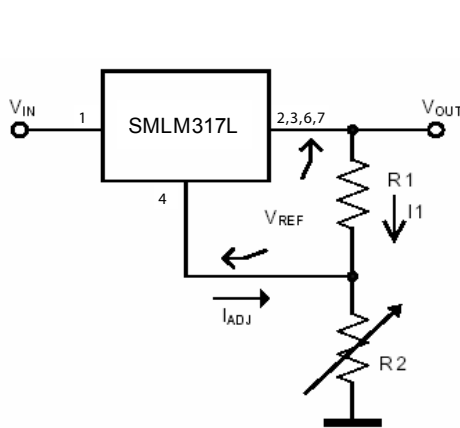


Fig 1. Basic Adjustable Regulator

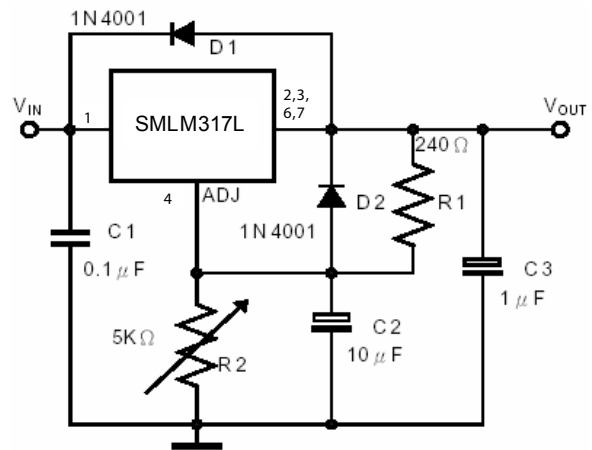


Fig 2. Voltage Regulator with Protection Diodes

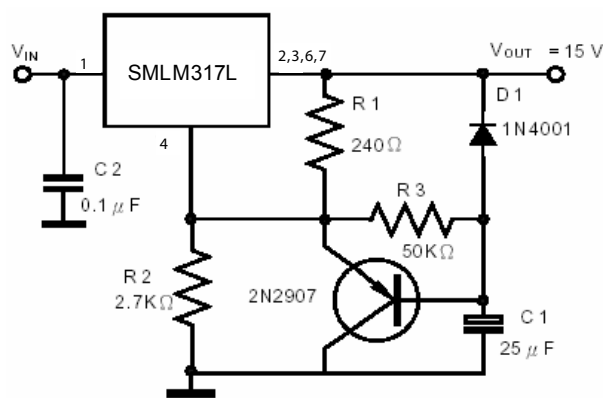


Fig 3. Slow Turn-On 15V Regulator

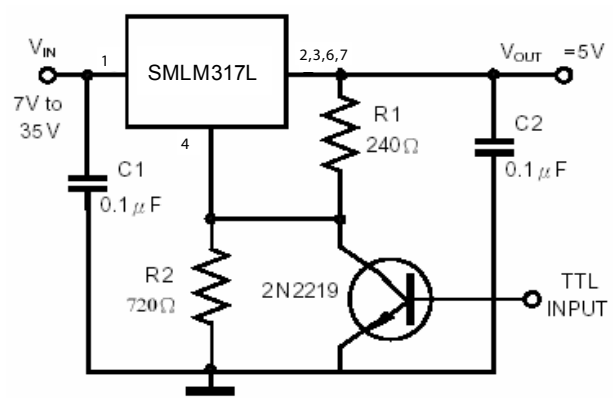


Fig 4. 5V Electronic Shut-Down Regulator