Elektronische Bauelemente

SMLM317L

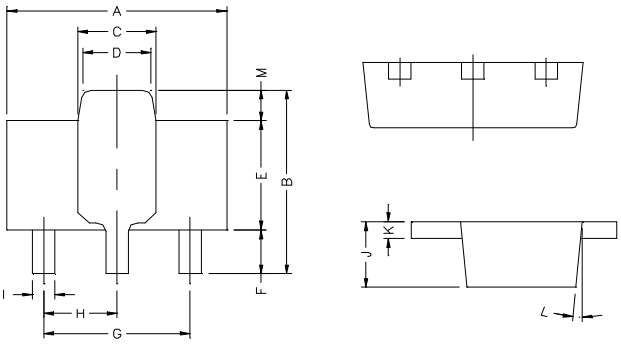
100mA Adjustable Voltage Regulator

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.

SOT-89

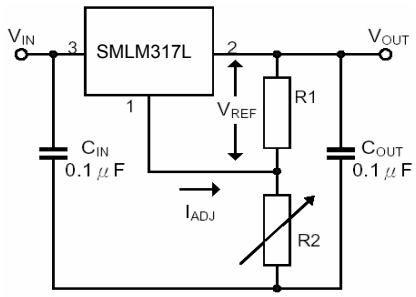


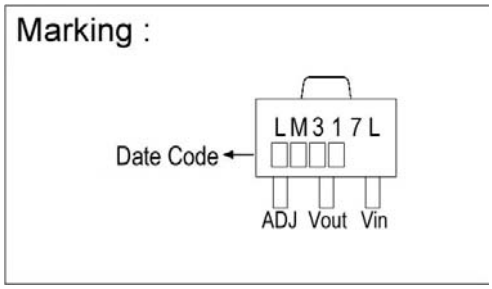
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.4	4.6	G	3.00 REF.	
B	4.05	4.25	H	1.50 REF.	
C	1.50	1.70	I	0.40	0.52
D	1.30	1.50	J	1.40	1.60
E	2.40	2.60	K	0.35	0.41
F	0.89	1.20	L	5° TYP.	
			M	0.70 REF.	

Features

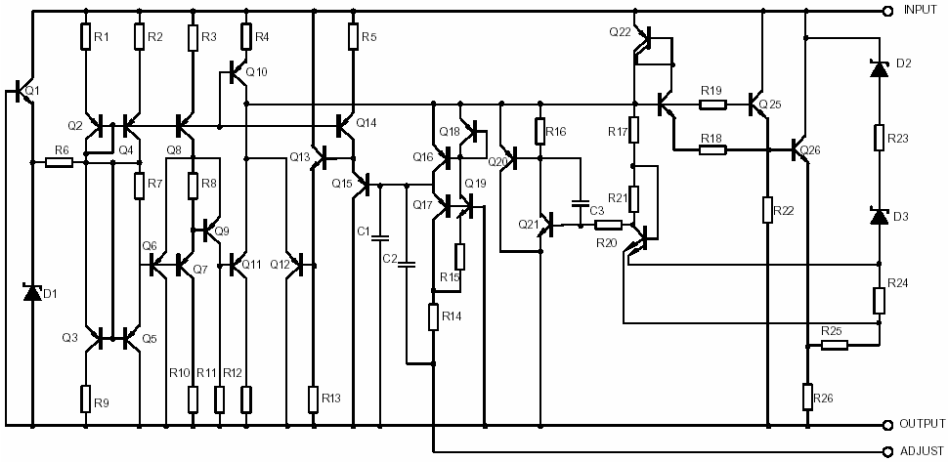
* Thermal Overload Protection
* Floating Operation For High Voltage Applications
* Short Circuit Protection
* Output Voltage Adjustable From 1.25V To 37V
* Output Transistor Save Area Compensation
* Output Current In Excess Of 100mA

Test Circuit





Block Diagram



Absolute Maximum Ratings at Ta=25°C

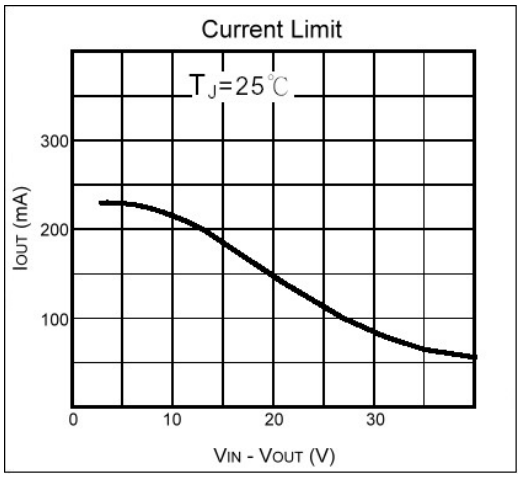
Parameter	Symbol	Ratings	Unit
Input-Output Voltage Difference	V_{IN}-V_{OUT}	40	V
Junction Temperature	T_J	+125	°C
Power Dissipation	P_D	625	mW
Storage Temperature Range	T_{STR}	0~+70	°C
Operating Juction Temperature	T_{OPR}	-40~+150	°C

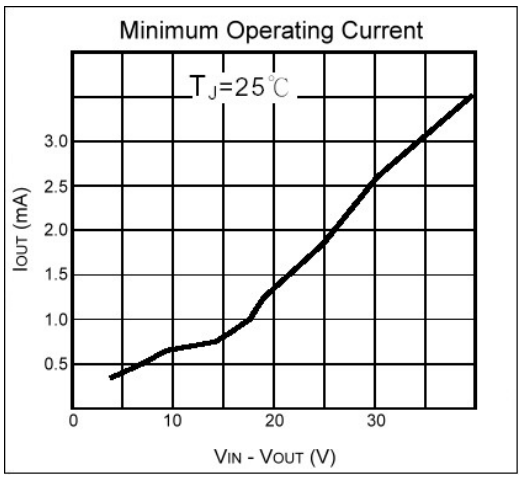
Note: 1. Absolute max. ratings are those values beyond witch the device could be permanently demaged. Absolute max. ratings are stress ratings only and functional device operation is not implied.
2. The device is guaranteed to meet performance specification within 0°C~70°C operating temperature range and assured by design from -20°C~85°C.

Electrical Characteristics (V_{IN}-V_{OUT}=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} -V_{OUT}=3~40V I_O<20mA	T_J=25℃	-	0.01	0.04	%/V
			0℃≤ T_J ≤ 125℃	-	0.02	0.07	%/V
Load Regulation	REG_{LOAD}	I_O=5~100mA V_{OUT} ≤ 5V	T_J=25℃	-	5	25	mV
			0℃≤ T_J ≤ 125℃	-	20	70	
		I_O=5~100mA V_{OUT} ≥ 5V	T_J=25℃	-	0.1	0.5	%/V_{OUT}
			0℃≤ T_J ≤ 125℃	-	0.3	1.5	
Adjustable Pin Current	I_{ADJ}			-	50	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	V_{IN} -V_{OUT}=3~40V I_O=5~100mA, P_D < 625mW		-	0.2	5	μA
Reference Voltage	V_{REF}	V_{IN} -V_{OUT}=3~40V I_O=5~100mA, P_D < 625mW		1.2	1.25	1.3	V
Output Voltage Temperature Stability	$\Delta V_{OUT}/V_{OUT}$			-	0.7	-	%
Minimum Load Current	$I_{LOAD(Min)}$	V_{IN} -V_{OUT}=40V		-	3.5	5	mA
Maximum Output Current	$I_{OUT(Max)}$	V_{IN} -V_{OUT}=3~13V		100	200	-	mA
		V_{IN} -V_{OUT}=40V		25	50		
Output Noise Voltage (% of V_{OUT})	eN	f=10Hz ~ 10KHz, T_J=25℃		-	0.003	-	%/V_{OUT}
Ripple Rejection	RR	T_J=25℃, f=120Hz	C_{ADJ}=0	-	65	-	dB
			C_{ADJ}=10uF	66	80	-	

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 charges. 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. Furthemore, 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.

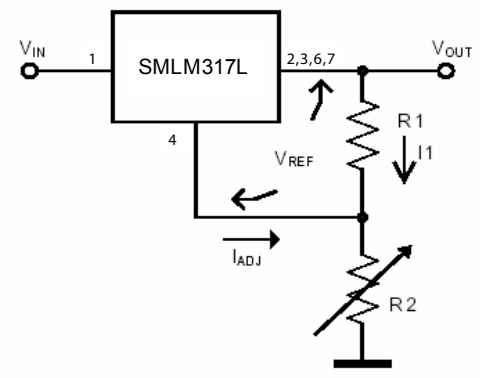


Fig 1. Basic Adjustable Regulator

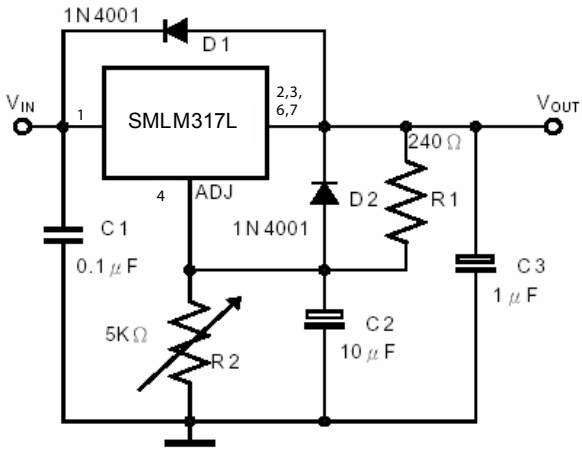


Fig 2. Voltage Regulator with Protection Diodes

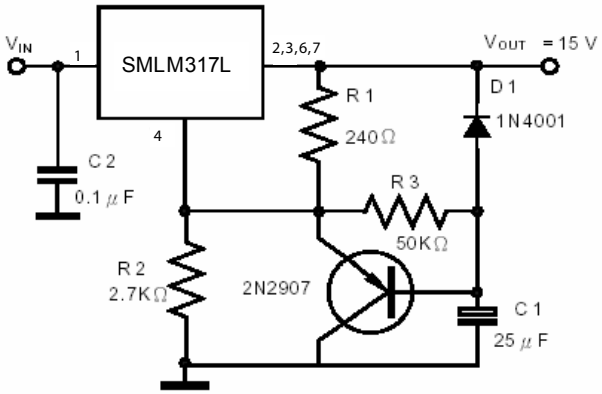


Fig 3. Slow Turn-On 15V Regulator

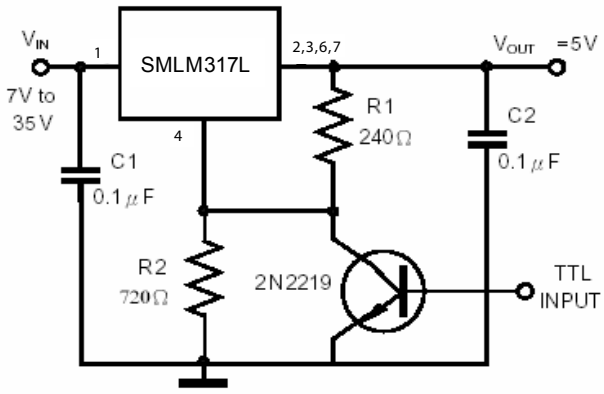


Fig 4. 5V Electronic Shut-Down Regulator