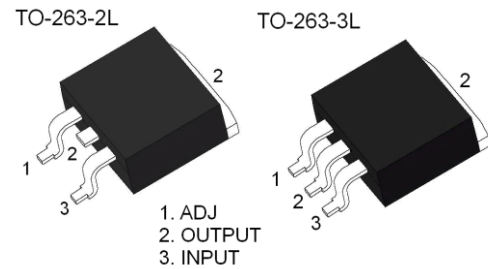


The LM317 are monolithic integrated circuit in TO-263 package sintended for use as positive adjustable voltage regulators.They are designed to supply more than 1.5A of load current with an output voltage adjustable over a 1.2 to 37V range.

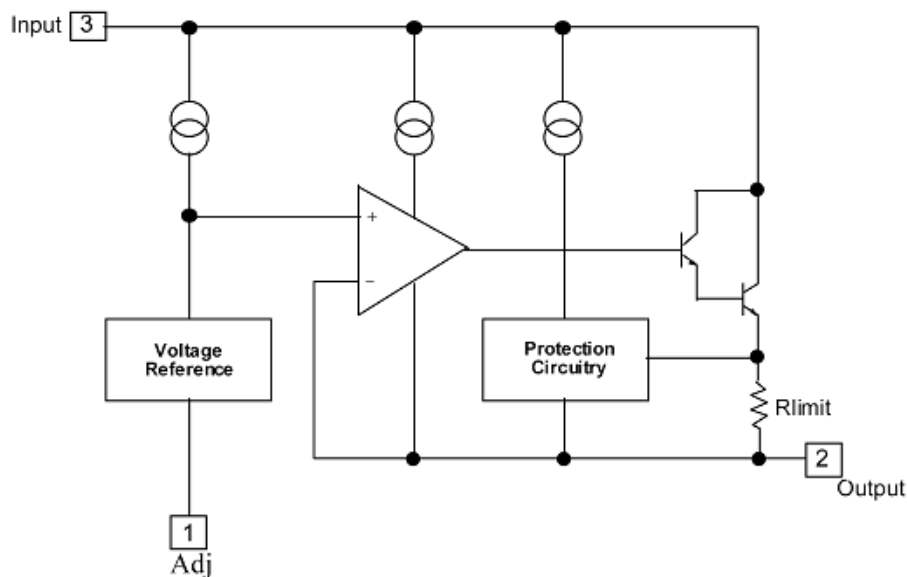
The nominal output voltage is selected by means of only a resistive divider, making the device exceptionally easy to use and eliminatingthestocking of many fixed regulators

Features

- Output Voltage Range : 1.2 to 37V
- Output Current in excess of 1.5A
- 0.1% Line and Load Regulation Voltages
- Floating Operation For High
- Complete Series of Protections:
Current Limiting, Thermal Shutdown and SOA Control



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input-output Differential Voltage	$V_i - V_o$	40	V
Power Dissipation	P_D	Intenrally Limited	W
Operating Junction Temperature	T_j	-40~+85	°C
Storage Temperature	T_{stg}	-60~+150	°C
Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T$	± 0.02	% / °C

Note 1: Absolute Maximum Ratings: are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.


Electrical Characteristics

 ($V_i - V_o = 5\text{ V}$, $I_o = 0.5\text{ A}$, $T_A = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions		Min	Typ	Max	Unit
Line Regulation (Note2)	$\Delta V_{\text{OUT}}/V_{\text{OUT}}$	$3\text{ V} \leq V_i - V_o \leq 40\text{ V}$, $T_A = 25^\circ\text{C}$			0.01	0.04	%V
		$3\text{ V} \leq V_i - V_o \leq 40\text{ V}$			0.002	0.07	
Load Regulation(Note2)	ΔV_{OUT}	$10\text{ mA} \leq I_o \leq 1.5\text{ A}$	$V_o < 5\text{ V}$		18	25	mV%/V
			$V_o \geq 5\text{ V}$		0.4	0.5	°
		$10\text{ mA} \leq I_o \leq 1.5\text{ A}$	$V_o < 5\text{ V}$		40	70	mV%/V
			$V_o \geq 5\text{ V}$		0.8	1.5	°
Adjustment Pin Current	I_{ADJ}	$T_j = 25^\circ\text{C}$			50	100	μA
Adjustment Pin Current	ΔI_{ADJ}	$3\text{ V} \leq V_i - V_o \leq 40\text{ V}$ $10\text{ mA} \leq I_o \leq 1.5\text{ A}$ $P_D \leq 20\text{ W}$			2.0	5.0	μA
Reference Voltage	V_{REF}	$3\text{ V} \leq V_i - V_o \leq 40\text{ V}$ $10\text{ mA} \leq I_o \leq 1.5\text{ A}$, $P_D \leq 20\text{ W}$		1.20	1.25	1.30	V
Minimum Load Current	$I_{\text{L(Min)}}$	$V_i - V_o = 40\text{ V}$			3.5	10	mA
Maximum Output Current	$I_{\text{O(Max)}}$	$V_i - V_o = 40$, $P_D \leq 20\text{ W}$		0.2	0.3		A
Maximum Load Current	eN	$10\text{ Hz} \leq f \leq 10\text{ kHz}$			0.003	0.01	% / V_o
RMS Noise,% of V_{OUT}	RR	$V_o = 10\text{ V}$, $f = 120\text{ Hz}$ (Note3)	C_{ADJ}		65		dB
			$C_{\text{ADJ}} = 10\mu\text{F}$	66	80		

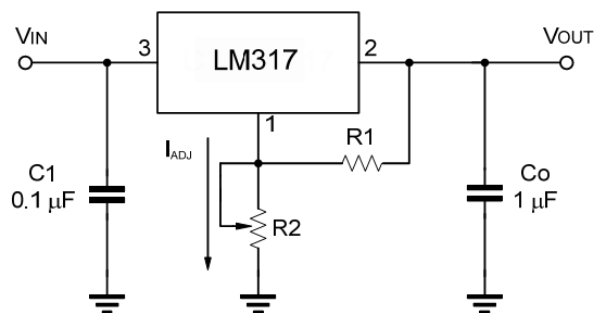
Note 2: Load and line regulation are specified at constant junction temperature. Change in V_o due to heating effects must be taken into account separately. Pulse testing with low duty is used. ($P_{\text{MAX}} = 20\text{ S}$)

Note 3: C_{ADJ} , when used, is connected between the adjustment pin and ground.

Thermal resistances

Parameter	Symbol	Conditions	Value	Unit
Junction to ambient	$R\theta_{\text{JA}}$		54	$^\circ\text{C/W}$
Junction to case	$R\theta_{\text{JC}}$		5	$^\circ\text{C/W}$

Application Circuits



$$V_{out} = 1.25 * (1 + R2/R1) + I_{ADJ} * R2$$

Fig.1 Programmable Voltage Regulator

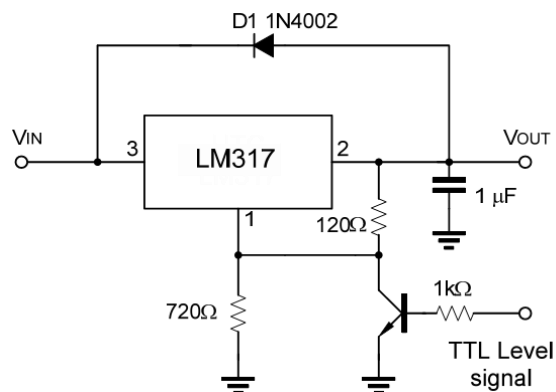


Fig.2 Regulator with ON-off control

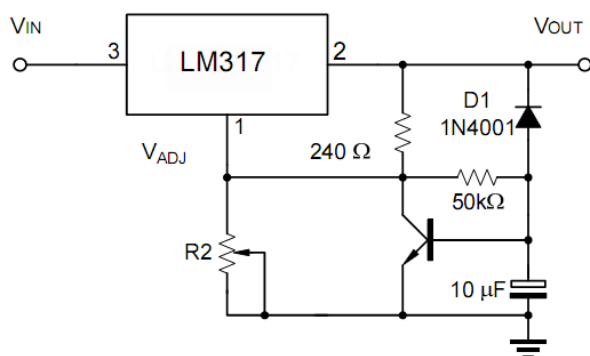


Fig.3 Soft Start Application

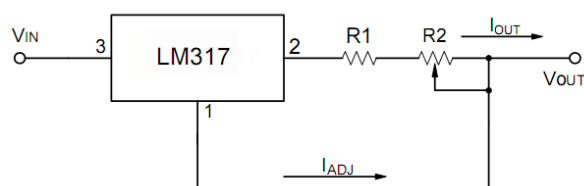


Fig.4. Constant Current Application

Typical Characteristics

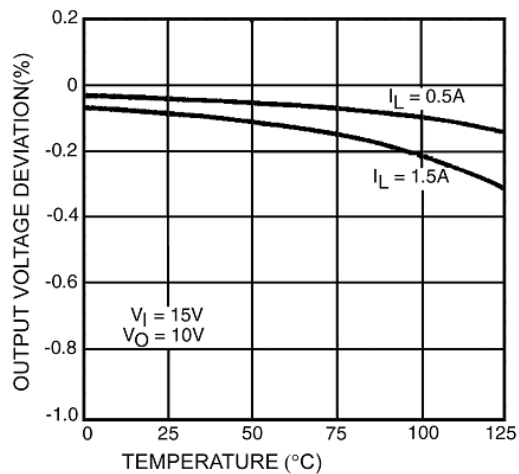


Fig.5. Load Regulation vs. temperature

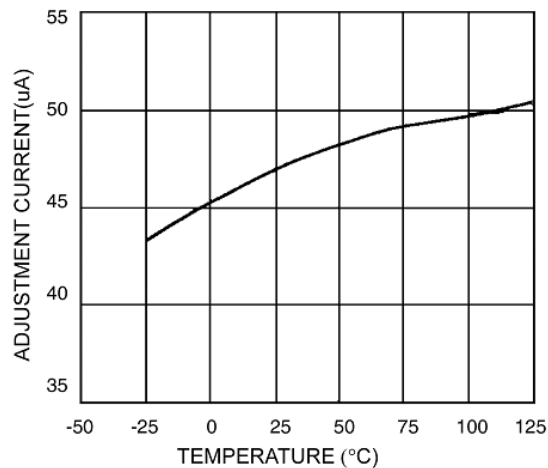


Fig.6. Adjustment Current vs. Temperature

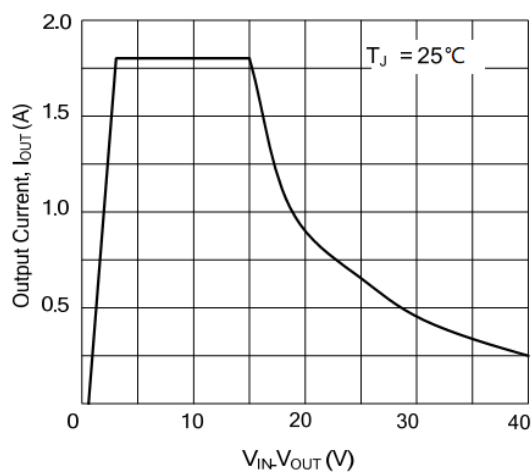


Fig.7. Current limit

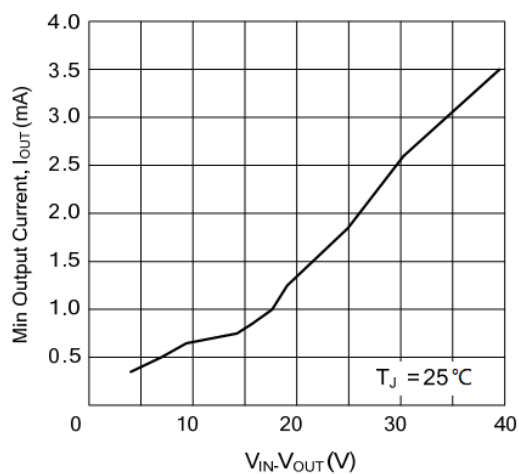


Fig.8. Minimum Operating Current

Package Dimensions

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
TO-263-2L				
A	4.30	4.70	0.169	0.185
A1	0.00	0.15	0.000	0.006
A2	4.30	4.55	0.169	0.179
B	1.10	1.50	0.043	0.059
b	0.70	0.90	0.028	0.035
b1	1.20	1.50	0.047	0.059
c	0.30	0.60	0.012	0.024
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
L	15.00	15.30	0.591	0.602
L1	5.20	5.40	0.205	0.213
L2	2.40	2.60	0.094	0.102
L3	1.60	1.80	0.063	0.071
TO-263-3L				
A	4.30	4.70	0.169	0.185
A1	0.00	0.15	0.000	0.006
A2	4.30	4.55	0.169	0.179
B	1.10	1.50	0.043	0.059
b	0.70	0.90	0.028	0.035
b1	1.20	1.50	0.047	0.059
c	0.30	0.60	0.012	0.024
c1	1.17	1.37	0.046	0.054
D	9.90	10.20	0.390	0.402
E	8.50	8.90	0.335	0.350
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
L	15.00	15.30	0.591	0.602
L1	5.20	5.40	0.205	0.213
L2	2.40	2.60	0.094	0.102