

SULM317

Adjustable Voltage Regulator

RoHS Compliant Product
A suffix of "-C" specifies halogen free

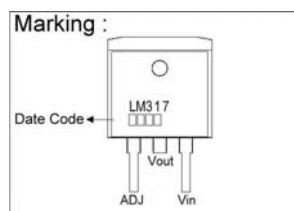
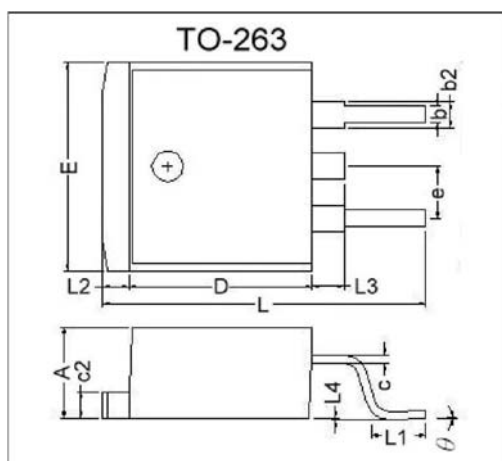
DESCRIPTION

The SULM317 is an adjustable 3-terminal positive voltage regulator, designed to supply more than 1.5A of output current with voltage adjustable from 1.3 to 37V.

FEATURES

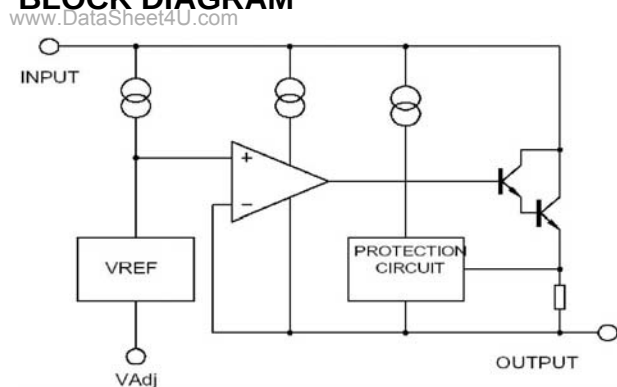
- Output current up to 1.5A.
- Output voltage adjustable from 1.3V to 37V.
- Internal short circuit protection.
- Internal over temperature protection.
- Safe-Area compensation for output transistor.

PACKAGE DIMENSIONS



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.80	c2	1.25	1.45
b	0.76	1.00	b2	1.17	1.47
L4	0.00	0.30	D	8.6	9.0
c	0.36	0.5	e	2.54 REF.	
L3	1.50 REF.		L	14.6	15.8
L1	2.29	2.79	θ	0°	8°
E	9.80	10.4	L2	1.27 REF.	

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS at Ta = 25°C

Parameter	Symbol	Ratings	Unit
Input-Output Voltage Difference	$V_i - V_o$	40	V
Load Temperature	T_{LEAD}	230	°C
Power Dissipation	P_D	Internal limited	
Operating, Storage Temperature Range	T_{OPR}, T_{STG}	0~125, -65 ~ 150	°C

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ELECTRICAL CHARACTERISTICS

($V_I - V_O = 5V$, $0^\circ C < T_J < 125^\circ C$, $I_O = 500mA$, $I_{MAX} = 1.5A$, $P_{MAX} = 20W$, unless otherwise specified)

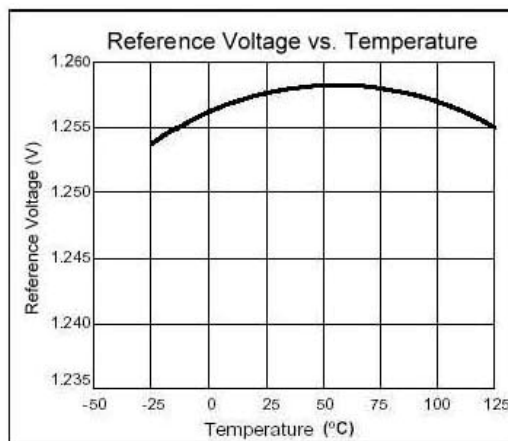
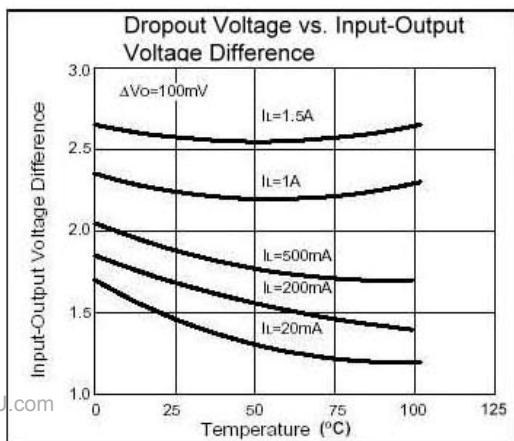
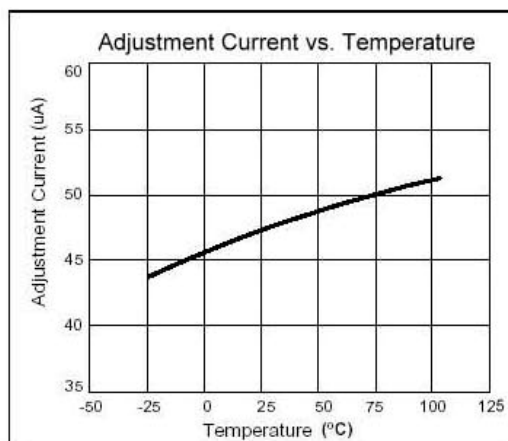
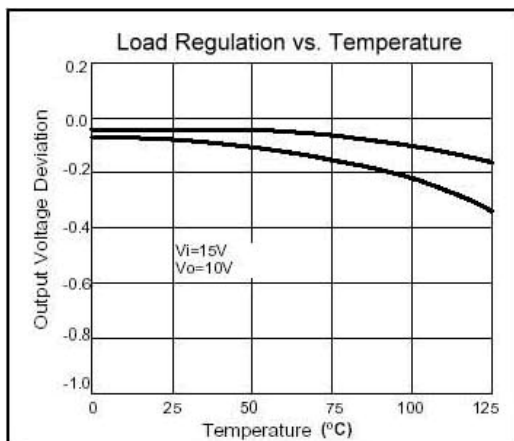
Parameter	Symbol	Test Conditions	Min.	Typ.	Max	Unit
Line Regulation	ΔV_O	$T_A = 25^\circ C$, $3V \leq V_I - V_O = 40V$	-	0.01	0.04	%V
		$T_A = 0-125^\circ C$, $3V \leq V_I - V_O \leq 40V$	-	0.02	0.07	%V
Load Regulation	ΔV_O	$T_A = 25^\circ C$				
		$V_O \leq 6V$	-	18	25	mV
		$10 mA \leq I_O \leq I_{MAX}$				
		$V_O \geq 5V$	-	0.4	0.5	%/V _O
		$10 mA \leq I_O \leq I_{MAX}$				
		$V_O \leq 5V$	-	40	70	mV
		$V_O \geq 6V$	-	0.8	1.5	%V _O
Adjustable Pin Current	I_{ADJ}		-	46	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	$2.5V \leq V_I - V_O \leq 40V$, $10 mA \leq I_O \leq I_{MAX}$, $P_D \leq P_{MAX}$	-	2.0	5	μA
Reference Voltage		$3V \leq V_I - V_O \leq 40V$, $10 mA \leq I_O \leq I_{MAX}$, $P_D \leq P_{MAX}$	1.225	1.25	1.275	V
Temperature Stability	STT		-	0.7	-	%/V _O
Minimum Load Current for Regulation	$I_{L(MIN)}$	$V_I - V_O = 40V$	-	3.5	10	mA
Maximum Output Current	$I_{O(MAX)}$	$V_I - V_O \leq 15V$, $P_D < P_{MAX}$	1.5	2.2	-	A
		$V_I - V_O = 40V$, $P_D < P_{MAX}$, $T_J = 25^\circ C$	0.15	0.4	-	
RMS Noise vs.% of Vout	eN	$T_A = 25^\circ C$, $10 Hz \leq f \leq 10 KHz$	-	0.003	0.01	%/V _O
Ripple Rejection	RR	$V_O = 10V$, $f = 120Hz$,	-	60	-	dB
		$V_O = 10V$, $f = 120Hz$, $C_{ADJ} = 10\mu F$	66	75	-	
Long-term Stability, $T_J = T_{HIGH}$	ST	$T_A = 25^\circ C$, 1000hr	-	0.3	1	%
Junction to Case Thermal Resistance	$R_{\theta JC}$		-	5	-	$^\circ C/W$

*Note: Testing with low duty pulse should be used to avoid heating effect.

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CHARACTERISTIC CURVES



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APPLICATION CIRCUIT

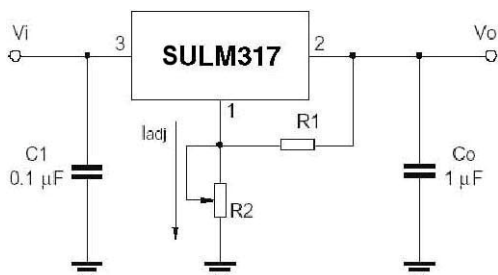


Fig. 1 Programmable voltage regulator
 $V_O = 1.25V \cdot (1 + R_2/R_1) + I_{ADJ} \cdot R_2$
 C1 is required when regulator is located an appreciated distance from power supply.
 Co is needed to improve transient response.

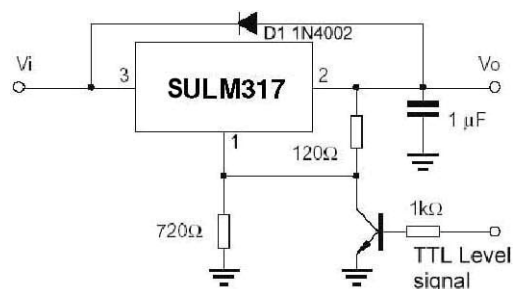


Fig. 2 Regulator with On-off control.

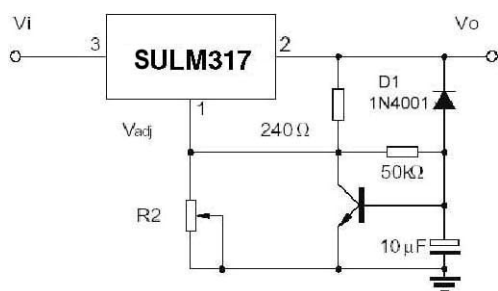
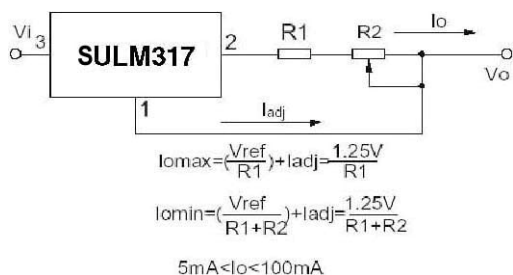


Fig. 3 Soft start application.



$$I_{\text{omax}} = \left(\frac{V_{\text{ref}}}{R_1} \right) + I_{\text{adj}} = \frac{1.25V}{R_1}$$

$$I_{\text{omin}} = \left(\frac{V_{\text{ref}}}{R_1 + R_2} \right) + I_{\text{adj}} = \frac{1.25V}{R_1 + R_2}$$

$$5\text{mA} < I_o < 100\text{mA}$$

Fig. 4 Constant current application.