

LM317AHV

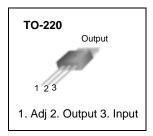
3-Terminal Positive Adjustable Regulator

Features

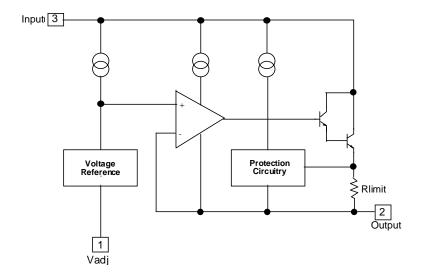
- Output Current in Excess of 1.5A
- Output Adjustable Between 1. 2V and 57V
- Internal Thermal Overload Protection
- · Internal Short Circuit Current Limiting
- Output Transistor Safe Area Compensation
- TO-220 Package

Description

This monolithic integrated circuit is an adjustable 3-terminal positive voltage regulator designed to supply more than 1.5A of load current with an output voltage adjustable over a 1.2 to 57V. It employs internal current limiting, thermal shut down and safe area compensation.



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input-Output Voltage Differential	V _I - V _O	60 V	
Lead Temperature	TLEAD	230	°C
Power Dissipation	PD	Internally limited	W
Operating Junction Temperature Range	Tj	0 ~ +125	°C
Storage Temperature Range	TSTG	-65 ~ +125	°C
Temperature Coefficient of Output Voltage	ΔVo/ΔΤ	±0.02	%/°C

Electrical Characteristics

(VI-VO=5V, IO= 0.5A, 0° C \leq TJ \leq + 125 $^{\circ}$ C, IMAX = 1.5A, PDMAX = 20W, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit
Line Regulation (Note1)	Rline	T _A = +25°C 3V ≤ V _I - V _O ≤ 60V	i	0.01	0.04	%/V
		$3V \le V_I - V_O \le 60V$	•	0.02	0.07	%/V
Load Regulation (Note1)	Rload	$T_A = +25^{\circ}C$, $10mA \le I_O \le I_{MAX}$ $V_O < 5V$ $V_O \ge 5V$	-	18 0.4	25 0.5	mV %/Vo
		$10mA \le I_O \le I_{MAX}$ $V_O < 5V$ $V_O \ge 5V$	ı	40 0.8	70 1.5	mV %/VO
Adjustable Pin Current	IADJ	-	•	46	100	μΑ
Adjustable Pin Current Change	Δladj	$3V \le V_I - V_O \le 60V$ $10mA \le I_O \le I_{MAX}$ $P_D \le P_{MAX}$	-	2.0	5	μΑ
Reference Voltage	VREF	$3V \le V_{IN} - V_O \le 60V$ $10mA \le I_O \le I_{MAX}$ $P_D \le P_{MAX}$	1.20	1.25	1.30	V
Temperature Stability	STT	-	-	0.7	-	%/Vo
Minimum Load Current to Maintain Regulation	IL(MIN)	VI - VO = 60V	-	3.5	12	mA
Maximum Output Current	IO(MAX)	V_I - $V_O \le 15V$, $P_D \le P_{MAX}$ V_I - $V_O \le 60V$, $P_D \le P_{MAX}$ $T_A = 25^{\circ}C$	1.0	2.2 0.3	-	А
RMS Noise, % of VOUT	eN	TA= +25°C, $10Hz \le f \le 10kHz$	-	0.003	0.01	%/Vo
Ripple Rejection	RR	$V_O = 10V$, $f = 120Hz$ without C _{ADJ} C _{ADJ} = $10\mu F$ (Note2)	66	60 75	1	dB
Long-Term Stability, TJ = THIGH	ST	T _A = +25°C for end point measurements, 1000HR	i	0.3	1	%
Thermal Resistance Junction to Case	R _θ JC	-	-	5	-	°C/W

Note:

^{1.} Load and line regulation are specified at constant junction temperature. Change in V_D due to heating effects must be taken into account separately. Pulse testing with low duty is used. (P_{MAX} = 20W)

^{2.} CADJ, when used, is connected between the adjustment pin and ground.

Typical Performance Characteristics

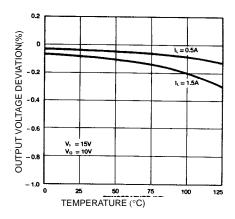


Figure 1. Load Regulation

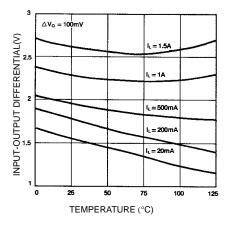


Figure 3. Dropout Voltage

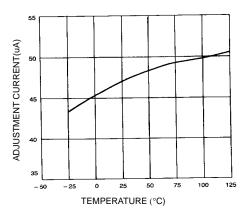


Figure 2. Adjustment Current

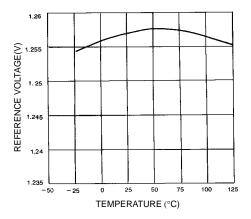
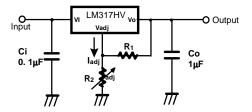


Figure 4. Reference Voltage

Typical Application



 $V_0 = 1.25V (1 + R_2/R_1) + I_{adj}R_2$

Figure 5. Programmable Regulator

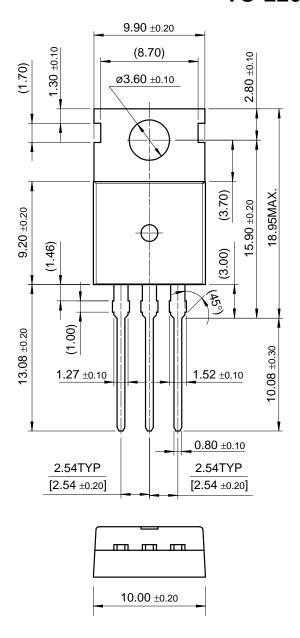
• C_i is required when regulator is located an appreciable distance from power supply filter. C_0 is not needed for stability, however, it does improve transient response. Since I_{ADJ} is controlled to less than $100\mu A$, the error associated with this term is negligible in most applications.

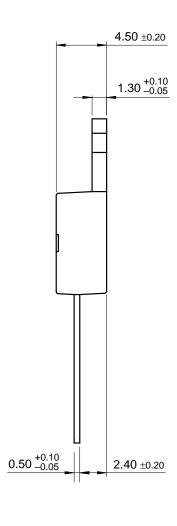
Mechanical Dimensions

Package

Dimensions in millimeters

TO-220





Ordering Information

Product Number	Package	Operating Temperature
LM317AHVT	TO-220	0°C to +125°C

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