

LM317M

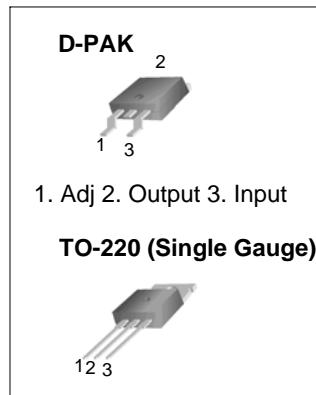
3-Terminal 0.5A Positive Adjustable Regulator

Features

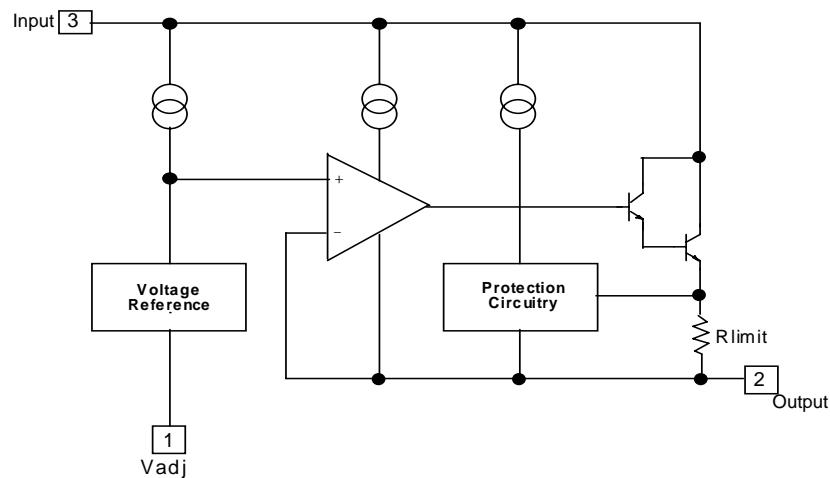
- Output Current in Excess of 0.5A
- Output Adjustable Between 1.2V and 37V
- Internal Thermal Overload Protection
- Internal Short Circuit Current Limiting
- Output Transistor Safe Area Compensation
- Floating Operation for High Voltage Applications

Description

The LM317M is a 3-terminal adjustable positive voltage regulator capable of supplying in excess of 500mA over an output voltage range of 1.2V to 37V. This voltage regulator is exceptionally easy to use and requires only two external resistors to set the output voltage.



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input-Output Voltage Differential	$V_I - V_O$	40	V
Power Dissipation	P_D	Internally Limited	W
Thermal Resistance Junction-Case (TO-220)	$R_{\theta JC}$	5	°C/W
Thermal Resistance Junction-Air (TO-220)	$R_{\theta JA}$	81	°C/W
Thermal Resistance Junction-Air (D-PAK (Note1,2))	$R_{\theta JA}$	100	°C/W
Operating Junction Temperature Range	T_J	0 ~ +125	°C
Storage Temperature Range	T_{STG}	-65 ~ +125	°C

Electrical Characteristics

($V_I - V_O = 5V$, $I_O = 0.1A$, $0°C \leq T_J \leq +125°C$, $P_{D MAX} = 7.5W$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Line Regulation (Note3)	R_{LINE}	$T_A = +25°C$, $3V \leq V_I - V_O \leq 40V$	-	0.01	0.04	%/V
		$3V \leq V_I - V_O \leq 40V$	-	0.02	0.07	
Load Regulation (Note3)	R_{LOAD}	$T_A = +25°C$, $10mA \leq I_O \leq 0.5A$ $V_O \leq 5V$ $V_O \geq 5V$	-	5 0.1	25 0.5	mV %/V _O
		$10mA \leq I_O \leq 0.5A$ $V_O \leq 5V$ $V_O \geq 5V$	-	20 0.3	70 1.5	mV %/V _O
Adjustment Pin Current	I_{ADJ}	-	-	50	100	uA
Adjustment Pin Current Change	ΔI_{ADJ}	$3V \leq V_I - V_O \leq 40V$ $10mA \leq I_O \leq 0.5A$, $P_D < P_{D MAX}$	-	0.2	5	uA
Reference Voltage	V_{REF}	$3V < V_I - V_O < 40V$ $10mA \leq I_O \leq 0.5A$, $P_D < P_{D MAX}$	1.20	1.25	1.30	V
Temperature Stability	S_{TT}	-	-	0.7	-	%/V _O
Minimum Load Current to Maintain Regulation	$I_L(MIN)$	$V_I - V_O = 40V$	-	3.5	10	mA
Maximum Output Current	$I_O(MAX)$	$V_I - V_O \leq 15V$, $P_D < P_{D MAX}$	0.5	0.9	-	
		$V_I - V_O = 40V$ $P_D < P_{D MAX}$, $T_A = +25°C$	0.15	0.25	-	A
RMS Noise, % of V _{OUT}	e_N	$T_A = +25°C$, $10Hz < f < 10kHz$	-	0.003	-	%/V _O
Ripple Rejection	RR	$V_O = 10V$, $f = 120Hz$ without CADJ $CADJ = 10\mu F$ (Note4)	66	65 80	-	dB
Long-Term Stability	ST	$T_J = +125°C$, 1000Hours	-	0.3	1	%/1000Hrs

Note:

- Thermal resistance test board
Size: 76.2mm * 114.3mm * 1.6mm(1SOP)
JEDEC standard: JESD51-3, JESD51-7
- Assume no ambient airflow.
- 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 cycle is used.
- CADJ, when used, is connected between the adjustment pin and ground.

Typical Performance Characteristics

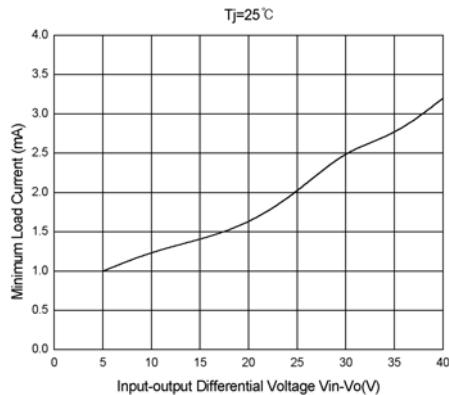


Figure 1. Minimum Load Current

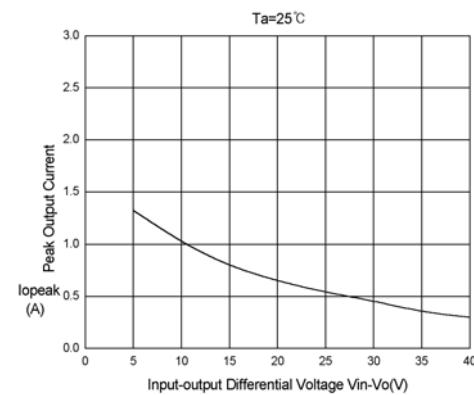


Figure 2. Peak Output Current vs. Input-Output Differential Voltage

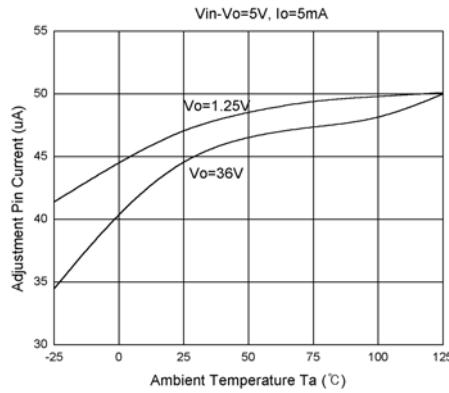


Figure 3. Adjustment Pin Current vs. Temperature

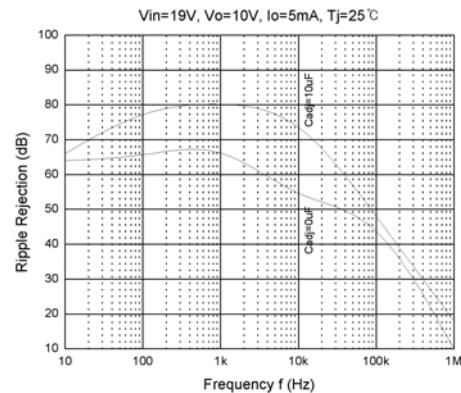


Figure 4. Ripple Rejection vs. Frequency

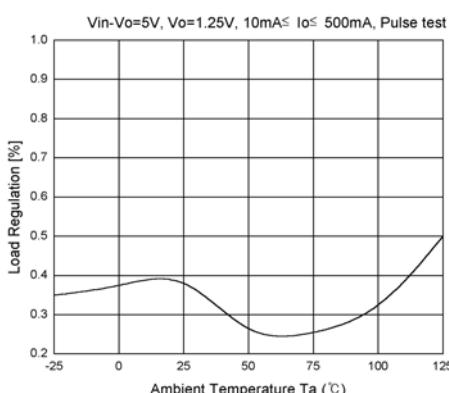


Figure 5. Load Regulation vs. Temperature

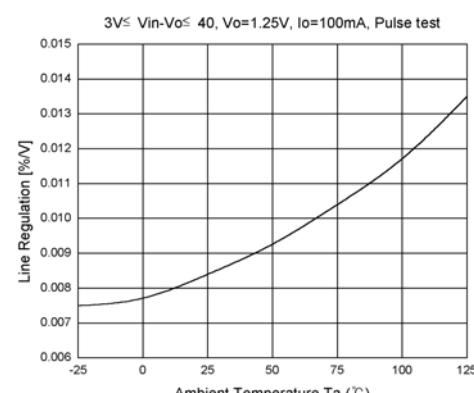


Figure 6. Line Regulation vs. Temperature

Ordering Information

Product Number	Package	Operating Temperature
LM317MDT	D-PAK	0 ~ 125°C
LM317MT	TO-220 (Single Gauge)	