



3-Terminal 1.5A Adjustable Regulator

DESCRIPTION

LM317 series of adjustable 3-terminal positive voltage regulators is capable of supply in excess of 1.5A over a 1.2V to 37V output range. They are exceptionally easy to use, and require only two external resistors to set the output voltage. Further, both line and load regulation are better than standard fixed regulators.

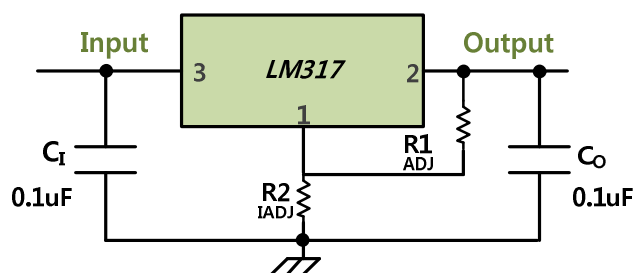
FEATURES

- Output current in excess of 1.5A
- Pb-Free Packages are available
- Internal Thermal shutdown and SOA protection
- Output voltage offered in 4% Tolerance
- High ESD Level (HBM>8000V, MM>800V)

TYPICAL APPLICATION

The input voltage must remain typically 2.0V above the output voltage even during the low point on the ripple voltage.

- * C_I is required if regulator is located an appreciable Distance from power filter.
- * C_O improves transient response.
Values of $\leq 0.1 \mu F$ could cause instability.



$$V_o = (1 + R_2/R_1) * 1.25 + I_{ADJ} * R_2$$



Maximum Ratings (T_A=25 °C, unless otherwise noted)

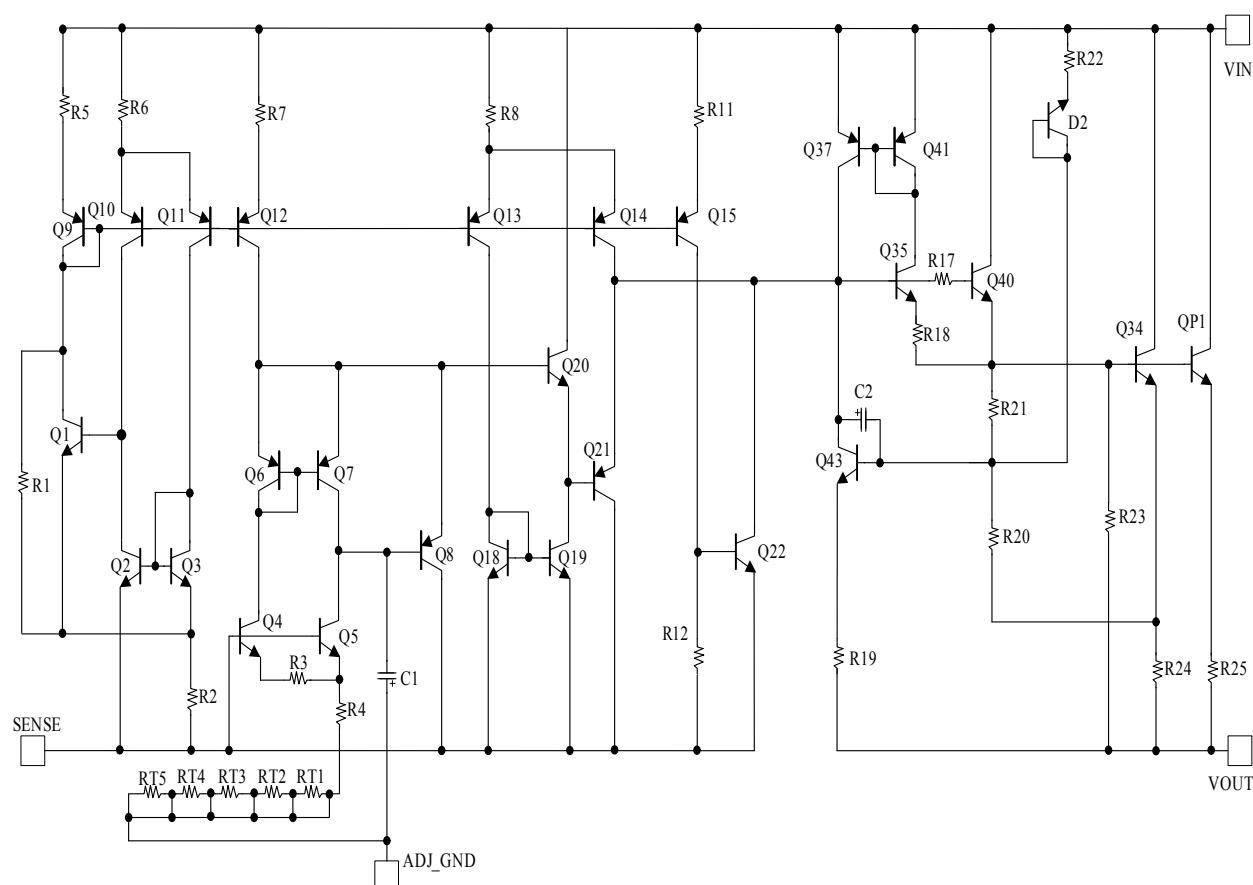
Rating	Symbol	Value	Unit
Input-Output Voltage Differential	V _{IN} - V _O	40	V
Power Dissipation	P _D	Internally Limited	W
Storage Junction Temperature	T _{STG}	-55 ~ 150	°C
Operating Junction Temperature	T _J	-30 ~ 125	°C
Temperature Coefficient of Output Voltage	ΔV _O / ΔT	± 0.02	% / °C

Stresses exceeding Maximum ratings may damage the device. Maximum ratings are stress ratings.

Functional operation above the recommended operating conditions is not implied.

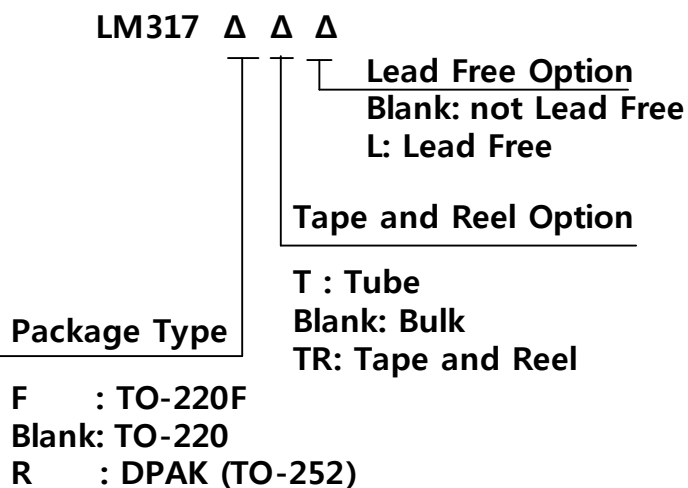
Extended exposure to stresses the above the recommended operating conditions may affect device reliability.

Representative Schematic of LM317

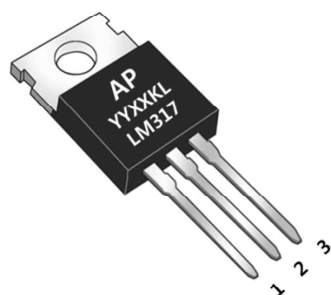




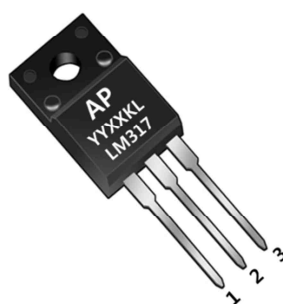
Ordering Information



Package Outline



TO-220



TO-220F



TO-252

PIN INFO.

1. ADJ PIN

2. OUTPUT PIN

3. INPUT PIN



Electrical characteristics

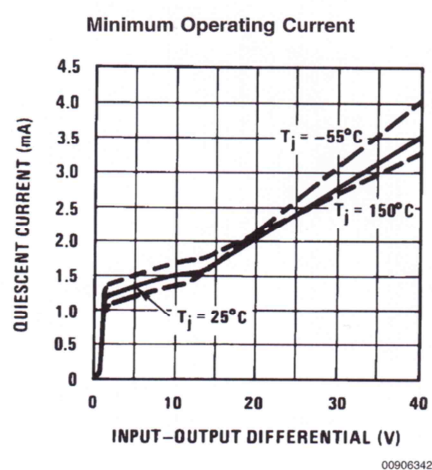
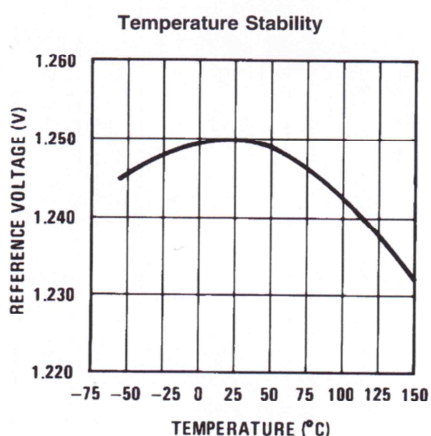
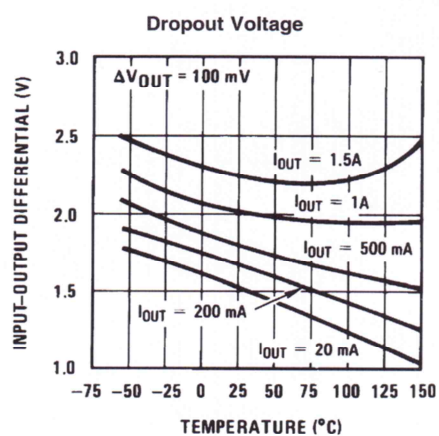
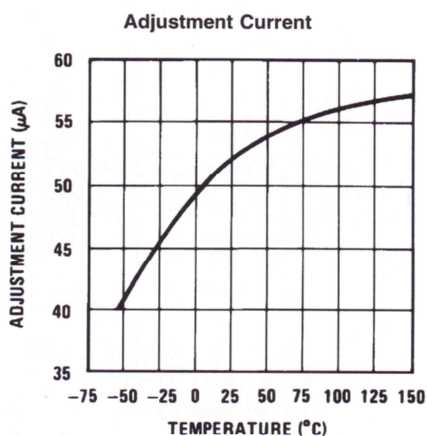
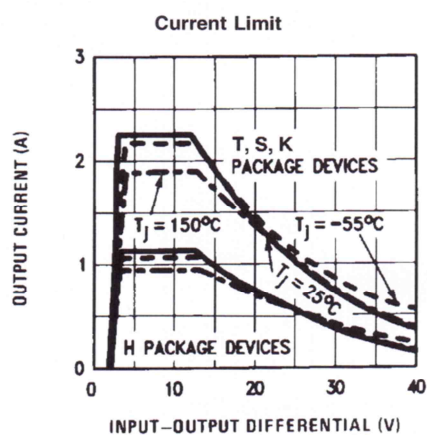
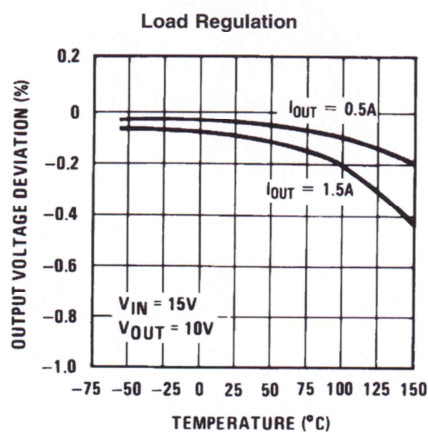
***Note 1** Line and Load regulation are specified at constant junction temperature. Changes of V_O due to heating effects must be taken into account separately. Pulse testing with low duty circle is used (P_{MAX}=20W)

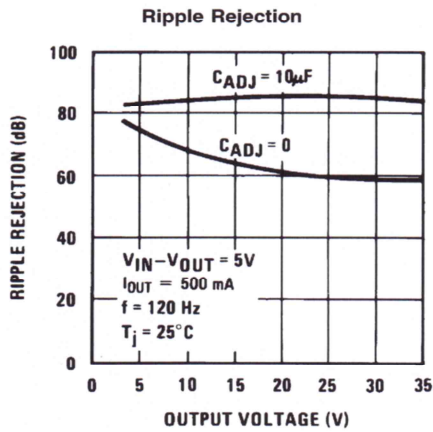
(T_J = 0 to 125 °C, V_{IN} - V_{OUT}=10V, I_O= 0.5A, I_{MAX} = 1.5A, P_DMAX = 20W, unless otherwise noted)

Characteristic	Symbol	Condition	Min	Typ	Max	Unit
Line regulation (Note 1)	Regline	3.0V ≤ V _{IN} - V _O ≤ 40V, T _A =25°C			0.04	% / V
		3.0V ≤ V _{IN} - V _O ≤ 40V			0.07	
Load regulation (T _J =25°C) (Note 1)	Regload	10 mA ≤ I _O ≤ I _{MAX} , T _A =25°C V _O < 5V V _O ≥ 5V			25.0 0.5	mV %/V _O
		10 mA ≤ I _O ≤ I _{MAX} V _O < 5V V _O ≥ 5V			70.0 1.5	mV %/V _O
Adjustable print current	I _{ADJ}	T _J =25°C			100	uA
Adjustable pin current Change	Δ I _{ADJ}	3.0V ≤ V _{IN} - V _O ≤ 40V 10 mA ≤ I _O ≤ I _{MAX} , P _D ≤ P _D MAX			5.0	uA
Reference Voltage	V _{REF}	10 mA ≤ I _O ≤ I _{MAX} , P _D ≤ P _D MAX 3.0V ≤ V _{IN} - V _O ≤ 40V	1.20	1.25	1.30	V
Temperature Stability	ST _T				0.7	%/V _O
Minimum load current to maintain regulation		V _{IN} -V _O = 40V			12.0	mA
Maximum output current (T _A = 25°C)	I _O (MAX)	V _{IN} - V _O ≤ 15V, P _D ≤ P _D MAX V _{IN} - V _O ≤ 40V, P _D ≤ P _D MAX		2.2 0.3		A
RMS Noise, % of V _O	e _N	T _A =25°C, 10Hz ≤ f ≤ 10KHz			0.01	%/V _O
Ripple rejection	RR	V _O = 10V, f = 120 Hz C _{ADJ} = 0 uF C _{ADJ} = 10uF		60 75		dB
Long term stability T _J = T _{HIGH}	ST	T _J =25°C, 1,000 Hour		1.0		%

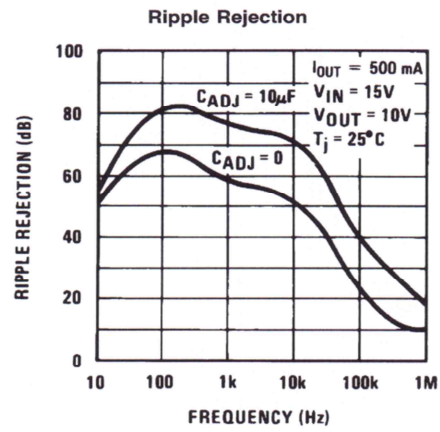


Typical Performance Characteristics

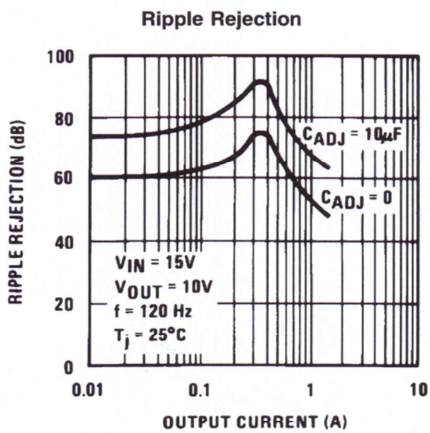




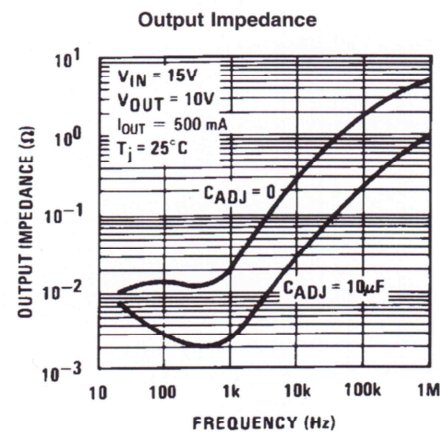
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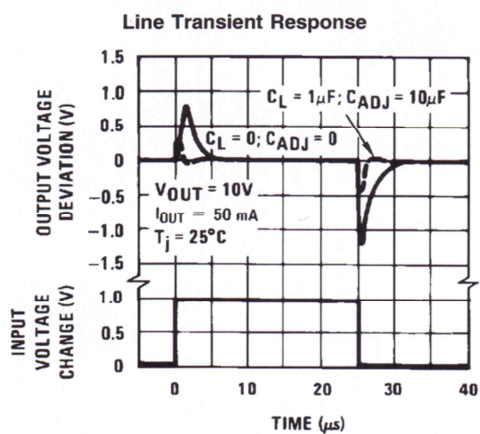
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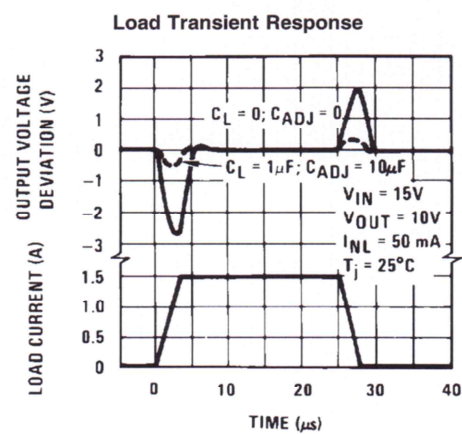
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Typical Applications

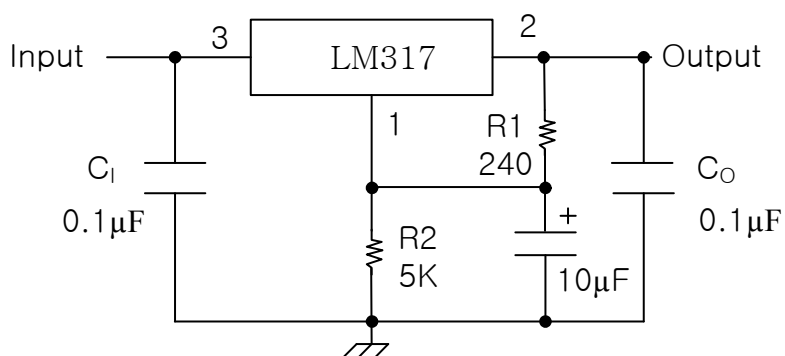


Figure 4-1 Adjustable Regulator with improved Ripple Rejection

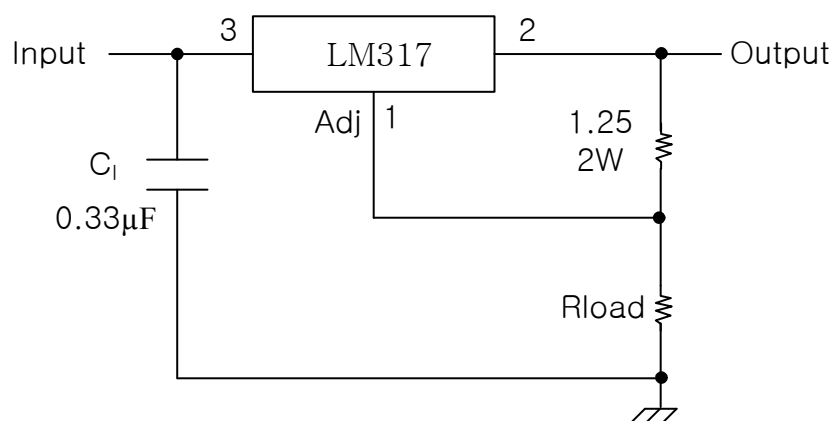
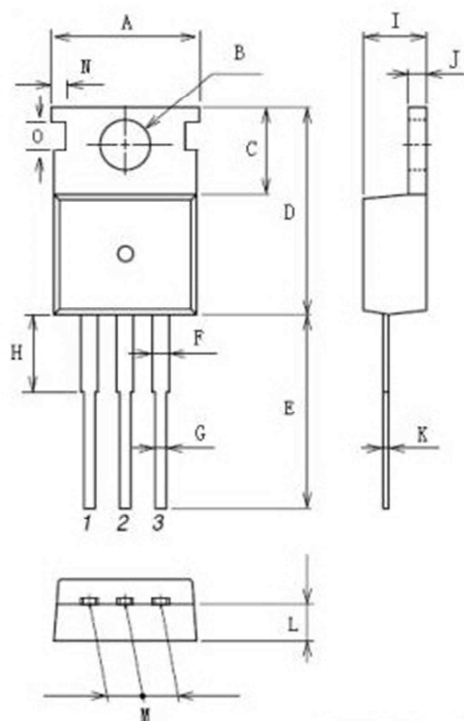


Figure 4-2 Constant Current Regulator ($V_I - V_O \geq 2.5\text{V}$)



Package Dimensions

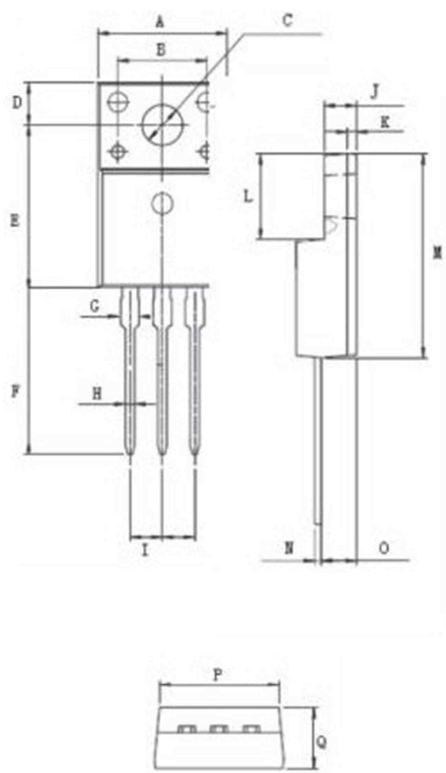
TO-220 Dual Gauge



Unit: mm

Item	Min	Max
A	9.85	10.15
B	3.60	3.70
C	6.35	6.55
D	15.55	15.95
E	12.85	13.15
F	1.17	1.37
G	0.70	0.90
H	2.30	2.70
I	4.40	4.60
J	1.20	1.40
K	0.40	0.60
L	2.23	2.53
M	4.98	5.18
N	0.55	0.75
O	1.62	1.82

TO-220F

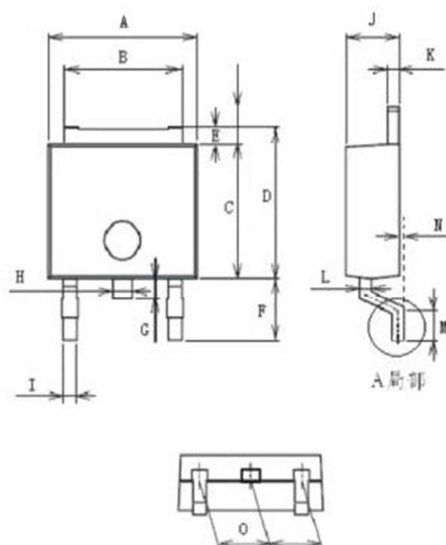


Unit: mm

Item	Min	Max
A	9.92	10.32
B	6.90	7.10
C	3.35	3.55
D	3.25	3.35
E	12.35	12.75
F	12.80	13.20
G	1.22	1.42
H	0.70	0.90
I	2.45Typical	
J	2.45	2.65
K	0.60	0.80
L	6.57	6.77
M	15.80	16.00
N	0.40	0.60
O	2.62	2.92
P	9.20	9.40
Q	4.62	4.80



TO-252



Unit: mm

Item	Min	Max
A	6.40	6.70
B	5.20	5.40
C	6.00	6.30
D	6.55	6.85
E	0.45	0.60
F	3.07	3.35
G	0.85	1.05
H	0.75	0.95
I	0.55	0.75
J	2.20	2.40
K	0.43	0.58
L	0.43	0.58
M	0.90	1.10
N	0.90	1.10
O	2.20	2.40

Revision History

REV. 02





No	Date	Contents
1	2015-01-30	Initial Brief Datasheet Release
2	2015-06-22	ESD Level Update



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