

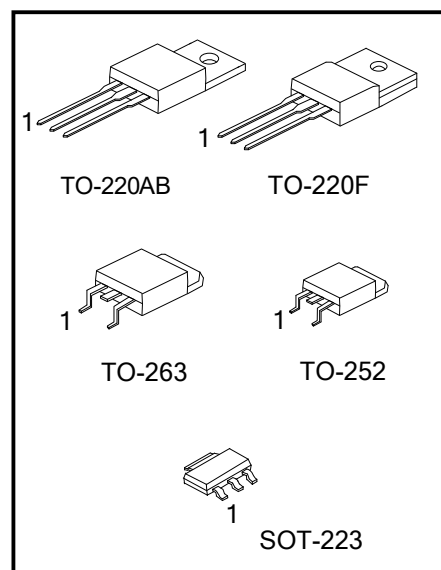
**MEDIUM CURRENT 1.2V TO
37V ADJUSTABLE VOLTAGE
REGULATOR**

DESCRIPTION

The LM317A is an adjustable 3-terminal positive voltage regulator, designed to supply 1.5A of output current with voltage adjustable from 1.2V ~ 37V.

FEATURES

- Output voltage adjustable from 1.2V ~ 37V
- Output current in excess of 1.5A
- Internal thermal overload protection
- Internal short circuit current limiting
- Output transistor safe area compensation



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
LM317A-MSI	LM317AG-MSI	SOT-223	ADJ	O	I	Tape Reel
LM317A-AT	LM317AG-AT	TO-220AB	ADJ	O	I	Tube
LM317A-AF	LM317AG-AF	TO-220F	ADJ	O	I	Tube
LM317A-AD	LM317AG-AD	TO-252	ADJ	O	I	Tape Reel
LM317A-AS	LM317AG-AS-R	TO-263	ADJ	O	I	Tape Reel

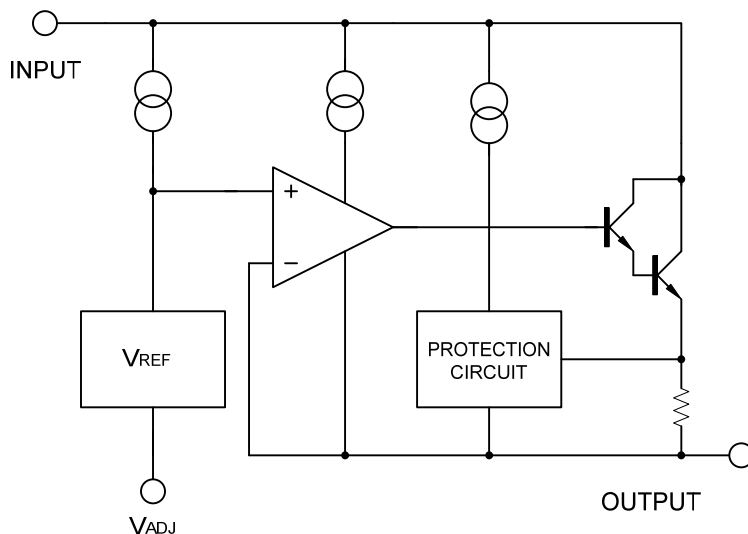
Note: Pin Assignment: I: V_{IN} O: V_{OUT}

LM317A-MSI-R (1) Packing Type (2) Package Type	(1) R: Tape Reel (2) MSI: SOT-223, AT: TO-220AB, AF: TO-220F AD: TO-252, AS: TO-263 (3) G: Halogen Free
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MARKING

SOT-223	TO-220AB / TO-220F / TO-252 / TO-263
LM317A G: Halogen Free Data Code 1	LM317A G: Halogen Free Data Code Lot Code 1

LINEAR INTEGRATED CIRCUIT
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input-Output Voltage Differential	$V_{IN}-V_{OUT}$	40	V
Power Dissipation	P_D	Internally limited	
Junction Temperature	T_J	+125	°C
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

THERMAL DATA

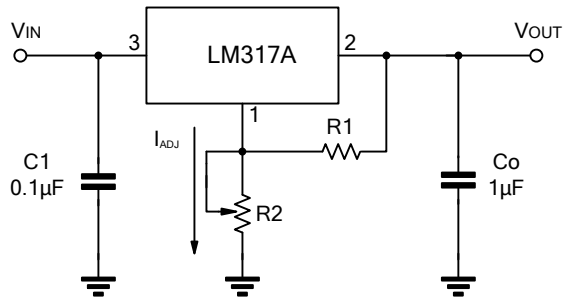
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	140	°C/W
	TO-220AB/TO-220F		50	°C/W
	TO-252		103	°C/W
	TO-263		62.5	°C/W
Junction to Case	SOT-223	θ_{JC}	23.5	°C/W
	TO-220AB/TO-263		5	°C/W
	TO-220F		8	°C/W
	TO-252		12	°C/W

ELECTRICAL CHARACTERISTICS

($V_{IN}-V_{OUT}=5V$, $I_{OUT}=0.5A$, $P_{MAX}=20W$, $T_a=25^{\circ}C$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Line Regulation	$\Delta V_{OUT}/V_{OUT}$	$3V \leq V_{IN}-V_{OUT} \leq 40V$, $I_{OUT}=100mA$		0.01	0.04	%/V
Load Regulation	ΔV_{OUT}	$10mA \leq I_{OUT} \leq 1.5A$, $V_{OUT} \leq 5V$		5	25	mV
		$V_{OUT} \geq 5V$		0.1	0.5	%
Adjustable Pin Current	I_{ADJ}			50	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	$3V \leq V_{IN}-V_{OUT} \leq 40V$, $10mA \leq I_{OUT} \leq 500mA$		0.2	5	μA
Reference Voltage	V_{REF}	$3V \leq V_{IN}-V_{OUT} \leq 40V$, $10mA \leq I_{OUT} \leq 1.5A$, $P_D < P_{MAX}$	1.20	1.25	1.30	V
Temperature Stability		$T_{MIN} \leq T_J \leq T_{MAX}$		0.7		%/ V_{OUT}
Minimum Load Current for Regulation	$I_{L(MIN)}$	$V_{IN}-V_{OUT}=40V$			4.5	mA
Maximum Output Current	$I_{O(MAX)}$	$V_{IN}-V_{OUT}=40V$, $P_D \leq P_{MAX}$	0.3	0.4		A
		$V_{IN}-V_{OUT}=15V$, $P_D < P_{MAX}$	1.5	2.2		A
RMS Noise vs. %of V_{OUT}	eN	$10Hz \leq f \leq 10KHz$		0.003		%/ V_{OUT}
Ripple Rejection	RR	$V_{OUT}=10V$, $f=120Hz$, $C_{ADJ}=0$		65		dB
		$C_{ADJ}=10\mu F$	66	80		dB

APPLICATION CIRCUITS



$$V_{OUT} = 1.25V \times (1 + R2/R1) + I_{ADJ} \times R2$$

C1 is required when regulator is located an appreciated distance from power supply. Co is needed to improve transient response.

Fig.1 Programmable voltage regulator

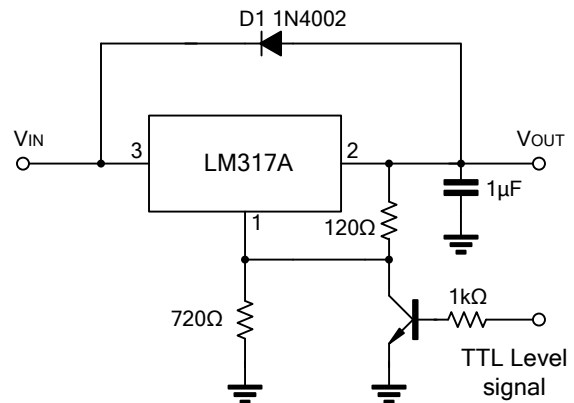


Fig.2 Regulator with On-off control

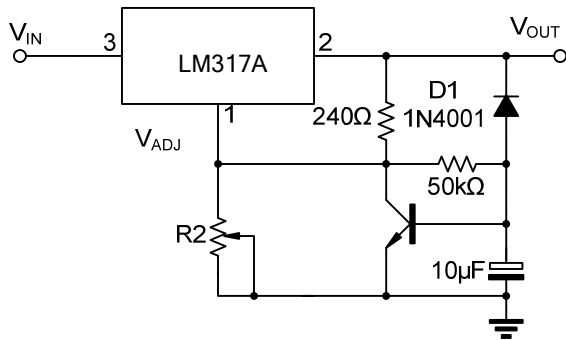
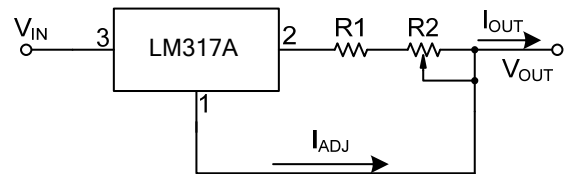


Fig.3 Soft Start Application



$$I_{O(MAX)} = \left(\frac{V_{REF}}{R1} \right) + I_{ADJ} = \frac{1.25V}{R1}$$

$$I_{O(MIN)} = \left(\frac{V_{REF}}{R1 + R2} \right) + I_{ADJ} = \frac{1.25V}{R1 + R2}$$

$$5mA < I_{OUT} < 100mA$$

Fig.4 Constant Current Application

TYPICAL CHARACTERISTICS

