



LM317A

LINEAR INTEGRATED CIRCUIT

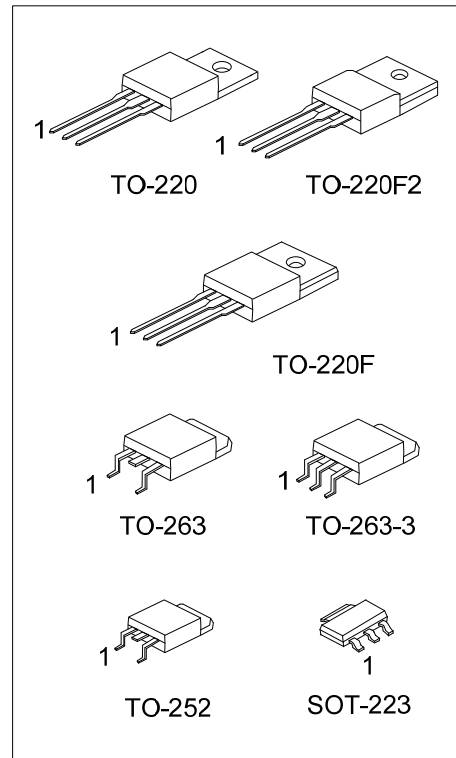
MEDIUM CURRENT 1.2V TO 37V ADJUSTABLE VOLTAGE REGULATOR

■ DESCRIPTION

The UTC **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



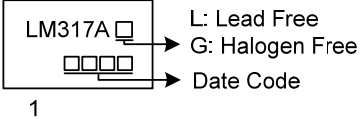
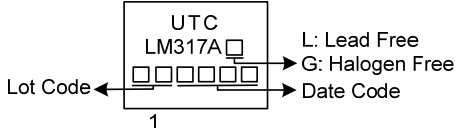
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
LM317AL-AA3-R	LM317AG-AA3-R	SOT-223	ADJ	O	I	Tape Reel
LM317AL-TA3-T	LM317AG-TA3-T	TO-220	ADJ	O	I	Tube
LM317AL-TF2-T	LM317AG-TF2-T	TO-220F2	ADJ	O	I	Tube
LM317AL-TF3-T	LM317AG-TF3-T	TO-220F	ADJ	O	I	Tube
LM317AL-TN3-R	LM317AG-TN3-R	TO-252	ADJ	O	I	Tape Reel
LM317AL-TQ2-R	LM317AG-TQ2-R	TO-263	ADJ	O	I	Tape Reel
LM317AL-TQ2-T	LM317AG-TQ2-T	TO-263	ADJ	O	I	Tube
LM317AL-TQ3-R	LM317AG-TQ3-R	TO-263-3	ADJ	O	I	Tape Reel
LM317AL-TQ3-T	LM317AG-TQ3-T	TO-263-3	ADJ	O	I	Tube

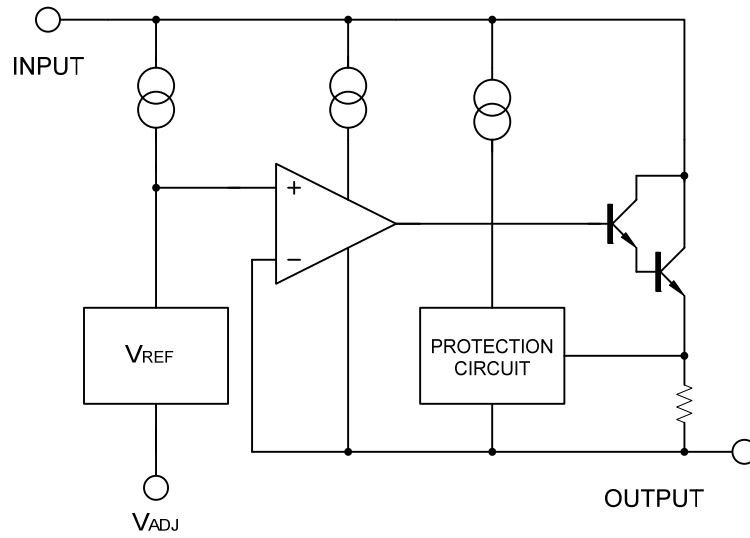
Note: Pin Assignment: I: V_{IN} O: V_{OUT}

<p>LM317AG-AA3-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel, T: Tube (2) AA3: SOT-223, TA3: TO-220, TF2: TO-220F2, TF3: TO-220F, TN3: TO-252, TQ2: TO-263, TQ3: TO-263-3 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING

SOT-223	TO-220 / TO-220F2 / TO-220F TO-252 / TO-263 / TO-263-3
 <p>LM317A □ □□□□ 1</p> <p>→ L: Lead Free → G: Halogen Free → Date Code</p>	 <p>UTC LM317A □ □□□□□□ 1</p> <p>← Lot Code → L: Lead Free → G: Halogen Free → Date Code</p>

■ 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	+150	°C
Operating Temperature	T_{OPR}	-40 ~ +125	°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

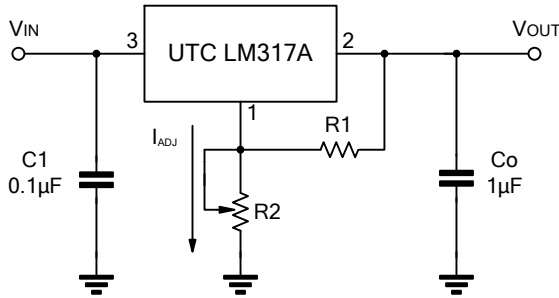
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	140	°C/W
	TO-220/TO-220F		50	°C/W
	TO-220F2			
	TO-252			
Junction to Case	TO-263/TO-263-3	θ_{JC}	62.5	°C/W
	SOT-223		23.5	°C/W
	TO-220/TO-220F		5	°C/W
	TO-263/TO-263-3			
TO-220F2	8	°C/W		
TO-252			12	°C/W

■ 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	

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

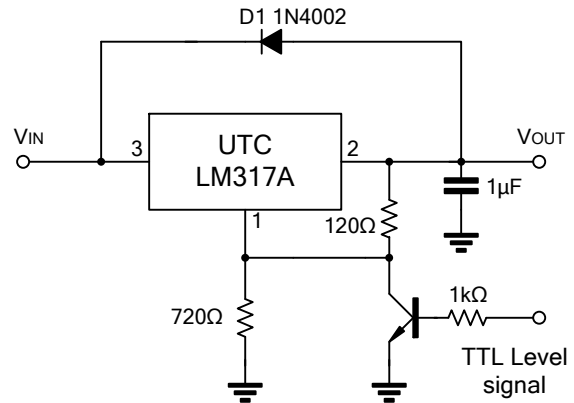


Fig.2 Regulator with On-off control

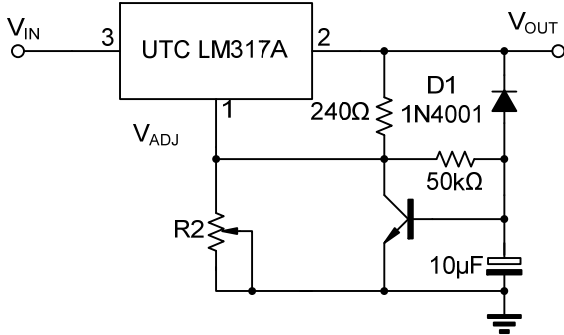
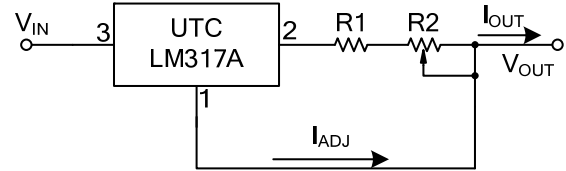


Fig.3 Soft Start Application

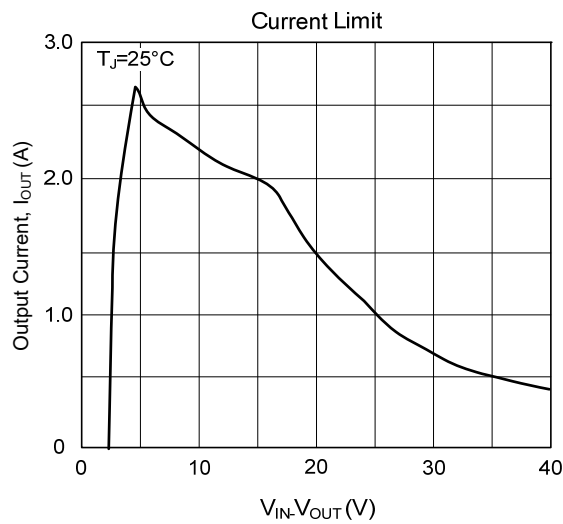
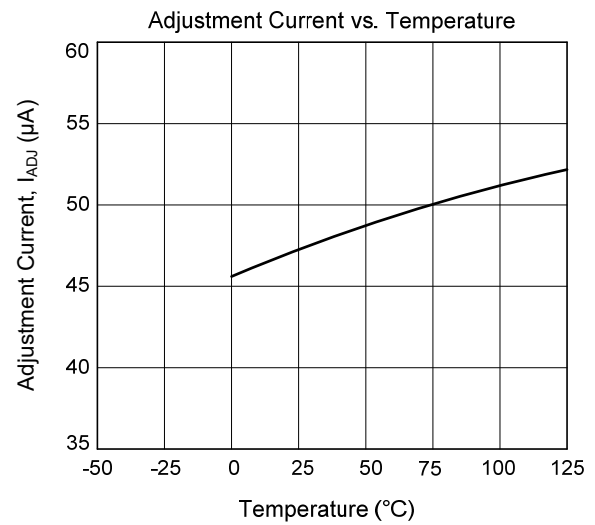
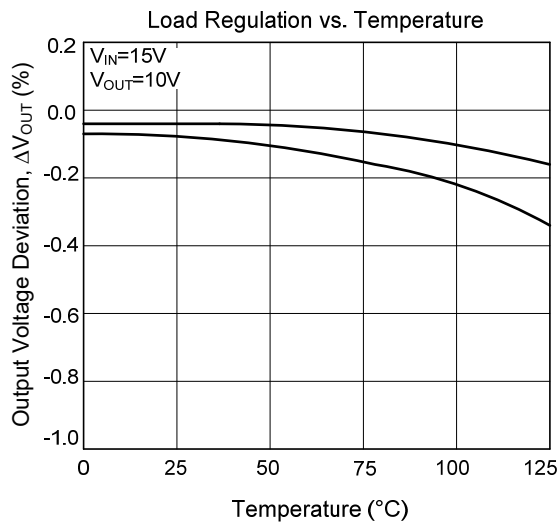


$$I_{O(MAX)} = \left(\frac{V_{REF}}{R1} \right) + I_{ADJ} = \frac{1.25V}{R1}$$

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

Fig.4 Constant Current Application

TYPICAL CHARACTERISTICS



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