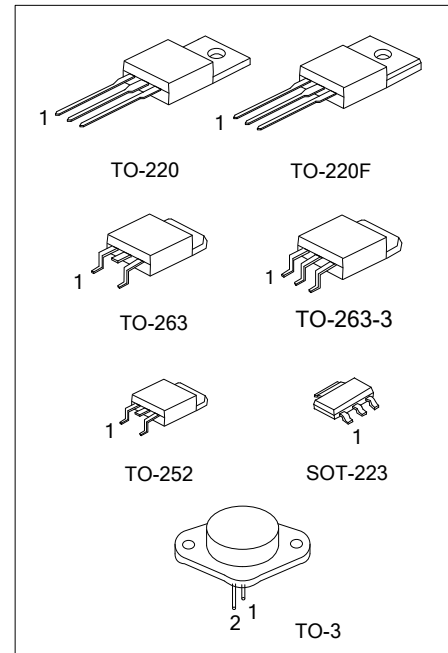


**LM317****LINEAR INTEGRATED CIRCUIT****HIGH CURRENT 1.3V TO 37V
ADJUSTABLE VOLTAGE
REGULATOR****DESCRIPTION**

The UTC **LM317** is an adjustable 3-terminal positive voltage regulator, designed to supply 1A of output current with voltage adjustable from 1.3V ~ 37V.

FEATURES

- *Output voltage adjustable from 1.3V ~ 37V
- *Output current in excess of 1A
- *Internal short circuit protection.
- *Internal over temperature protection.
- *Output transistor safe area compensation

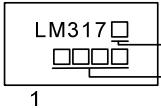
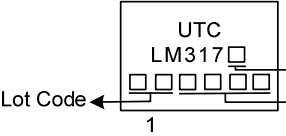
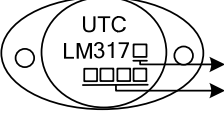
**ORDERING INFORMATION**

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
LM317K-AA3-R	LM317G-AA3-R	SOT-223	ADJ	O	I	Tape Reel
LM317K-TA3-T	LM317G-TA3-T	TO-220	ADJ	O	I	Tube
LM317K-TF3-T	LM317G-TF3-T	TO-220F	ADJ	O	I	Tube
LM317K-TN3-R	LM317G-TN3-R	TO-252	ADJ	O	I	Tape Reel
LM317K-TQ2-R	LM317G-TQ2-R	TO-263	ADJ	O	I	Tape Reel
LM317K-TQ2-T	LM317G-TQ2-T	TO-263	ADJ	O	I	Tube
LM317K-TQ3-R	LM317G-TQ3-R	TO-263-3	ADJ	O	I	Tape Reel
LM317K-TQ3-T	LM317G-TQ3-T	TO-263-3	ADJ	O	I	Tube
LM317K-T30-Y	LM317G-T30-Y	TO-3	I	ADJ	O	Tray

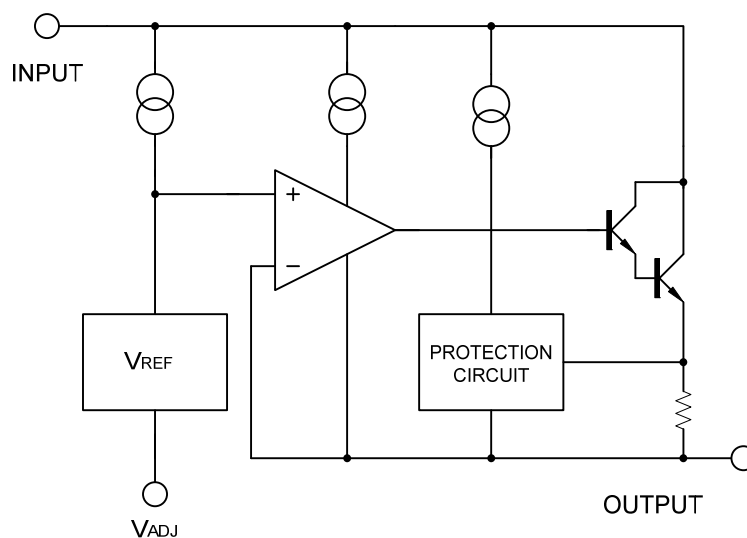
Note: 1. Pin Assignment: I: V_{IN} O: V_{OUT}
2. Pin 3 on TO-3 is case

LM317K-AA3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel, T: Tube, Y: Tray (2) AA3: SOT-223, TA3: TO-220, TF3: TO-220F, TN3: TO-252, TQ2: TO-263, TQ3: TO-263-3 T30: TO-3 (3) G: Halogen Free, K: Lead Free
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MARKING INFORMATION

PACKAGE	MARKING
SOT-223	 K: Lead Free G: Halogen Free Data Code
TO-220 TO-220F TO-252 TO-263 TO-263-3	 UTC LM317 Lot Code K: Lead Free G: Halogen Free Data Code
TO-3	 UTC LM317 K: Lead Free G: Halogen Free Data Code

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Input - Output Voltage Difference	V _{IN} -V _{OUT}	40	V
Power Dissipation	P _D	Internal limited	
Junction Temperature	T _J	+125	°C
Operating Temperature	T _{OPR}	-40 ~ +85	°C
Storage Temperature	T _{STG}	-40 ~ +150	°C

Note:1. Absolute maximum ratings are stress ratings only and functional device operation is not implied. The device could be damaged beyond Absolute maximum ratings.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction-to-Ambient	TO-252	θ_{JA}	112	$^{\circ}\text{C/W}$
	TO-220/TO-220F		65	
	TO-263/TO-263-3		165	
	SOT-223		35	
	TO-3			
Junction-to-Case	TO-252	θ_{JC}	12	$^{\circ}\text{C/W}$
	TO-220/TO-263		5	
	TO-263-3		7.8	
	TO-220F		23	
	SOT-223		3	
	TO-3			

■ ELECTRICAL CHARACTERISTICS

(V_{IN}-V_{OUT}=5V, I_{OUT}=10mA, T_A=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Line Regulation	$\Delta V_{OUT}/V_{OUT}$	3V ≤ V _{IN} -V _{OUT} ≤ 40V		0.01	0.04	%/V
Load Regulation	ΔV_{OUT}	10mA ≤ I _{OUT} ≤ 1A		5	25	mV
		V _{OUT} ≤ 5V		0.1	0.5	%
Adjustable Pin Current	I _{ADJ}			50	100	μA
Adjustable Pin Current Change	ΔI _{ADJ}	3V ≤ V _{IN} -V _{OUT} ≤ 40V, 10mA ≤ I _{OUT} ≤ 1A, P _D ≤ 20W		0.2	5	μA
Reference Voltage	V _{REF}	3V ≤ V _{IN} -V _{OUT} ≤ 40V, 10mA ≤ I _{OUT} ≤ 1A, P _D ≤ 20W	1.20	1.25	1.30	V
Temperature Stability		T _{MIN} ≤ T _J ≤ T _{MAX}		0.7		%/V _{OUT}
Minimum Load Current for Regulation	I _{L(MIN)}	V _{IN} -V _{OUT} =40V		3.5	10	mA
Maximum Output Current	I _{O(MAX)}	V _{IN} -V _{OUT} =40V, P _D ≤ 20W	0.2	0.3		A
RMS Noise vs. % of V _{OUT}	eN	10Hz ≤ f ≤ 10KHz		0.003		%/V _{OUT}
Ripple Rejection	RR	V _{OUT} =10V, f=120Hz		65		dB
		C _{ADJ} =0		66	80	

Note: C_{ADJ} is connected between Adjust pin and Ground.

APPLICATION CIRCUITS

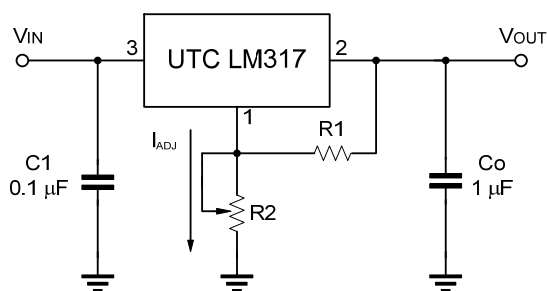


Fig.1 Programmable voltage regulator

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

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

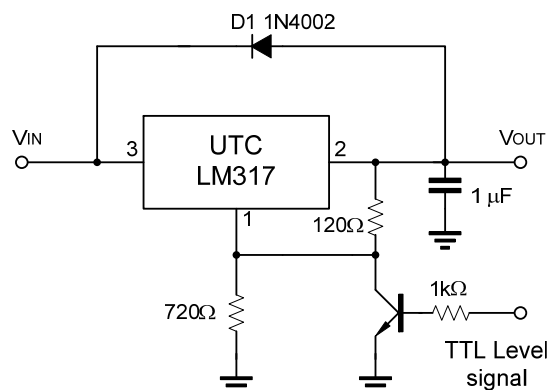


Fig.2 Regulator with On-off control

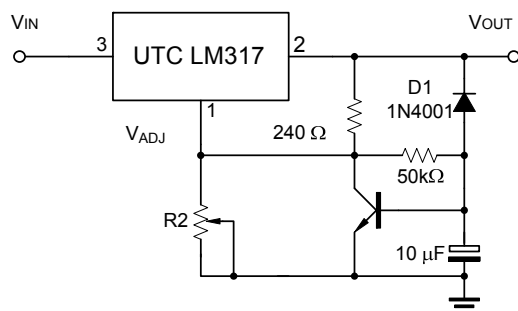
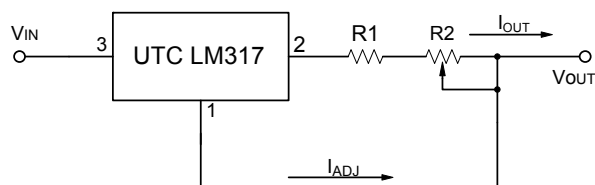


Fig.3 Soft Start Application



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

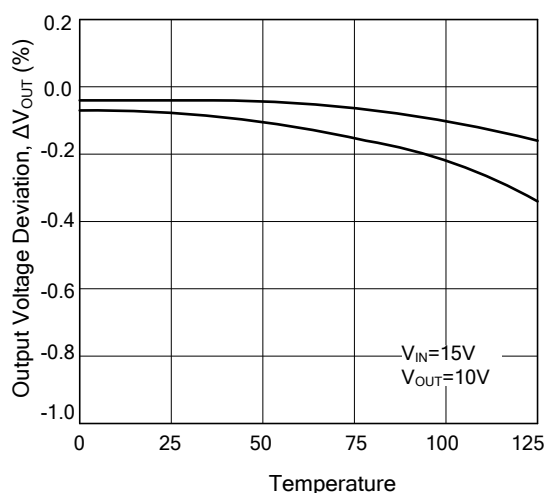
$$I_{O(MIN)} = \left(\frac{V_{REF}}{R1+R2} \right) + I_{ADJ} = \frac{1.25V}{R1+R2}$$

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

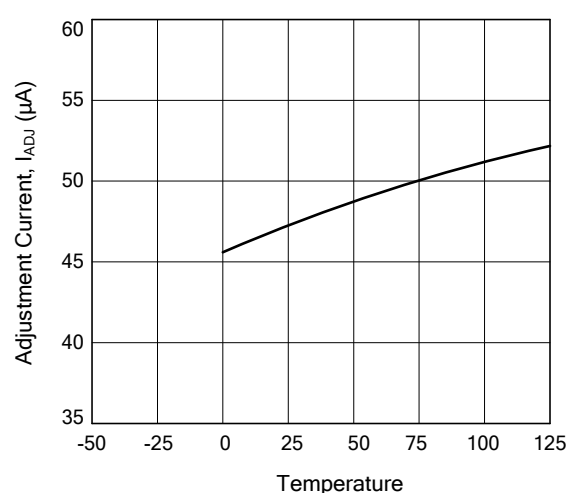
Fig.4 Constant Current Application

■ TYPICAL CHARACTERISTICS

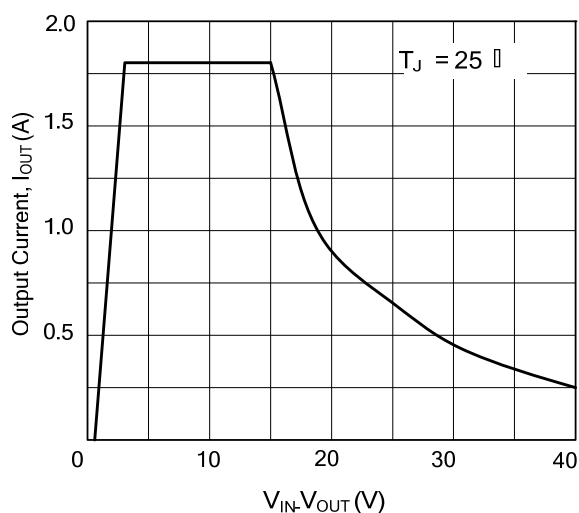
Load Regulation vs. temperature



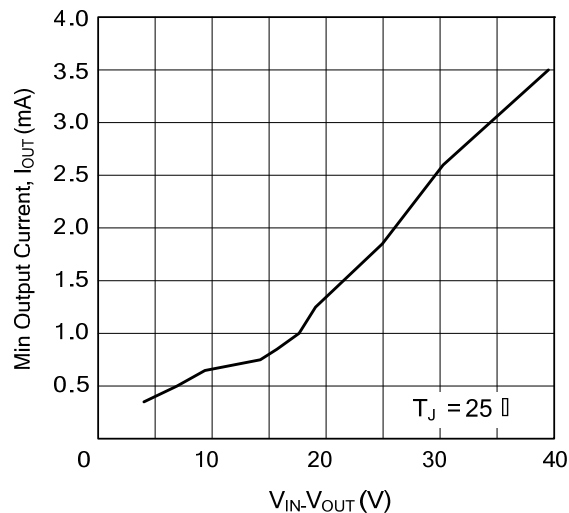
Adjustment Current vs. Temperature



Current Limit



Minimum Operating Current



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