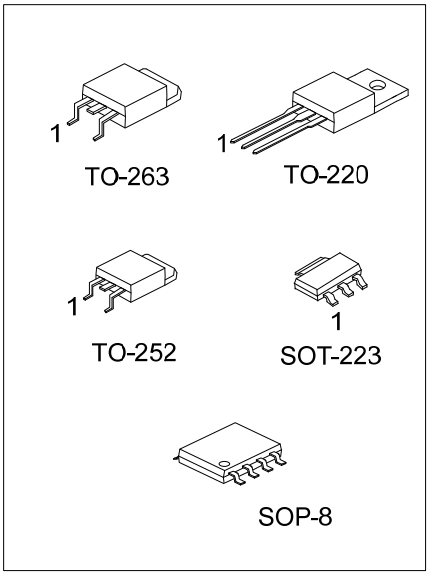
LM317M

LINEAR INTEGRATED CIRCUIT

MEDIUM CURRENT 1.2V TO 37V ADJUSTABLE VOLTAGE REGULATOR



■ DESCRIPTION

The UTC **LM317M** is an adjustable 3-terminal positive voltage regulator, designed to supply 500mA of output current with voltage adjustable from 1.2V ~ 37V.

■ FEATURES

*Output Voltage Adjustable From 1.2V ~ 37V
*Output Current In Excess of 500mA
*Internal Thermal Overload Protection
*Internal Short Circuit Current Limiting
*Output Transistor Safe Area Compensation

■ ORDERING INFORMATION

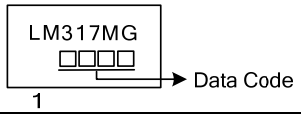
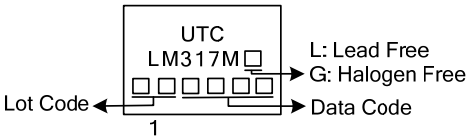
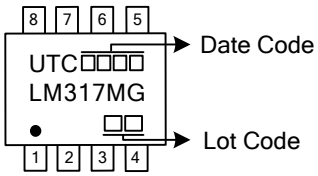
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
-	LM317MG-AA3-R	SOT-223	ADJ	O	I	-	-	-	-	-	Tape Reel
LM317ML-TA3-T	LM317MG-TA3-T	TO-220	ADJ	O	I	-	-	-	-	-	Tube
LM317ML-TN3-R	LM317MG-TN3-R	TO-252	ADJ	O	I	-	-	-	-	-	Tape Reel
LM317ML-TQ2-T	LM317MG-TQ2-T	TO-263	ADJ	O	I	-	-	-	-	-	Tube
LM317ML-TQ2-R	LM317MG-TQ2-R	TO-263	ADJ	O	I	-	-	-	-	-	Tape Reel
-	LM317MG-S08-R	SOP-8	I	O	O	ADJ	x	O	O	x	Tape Reel

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

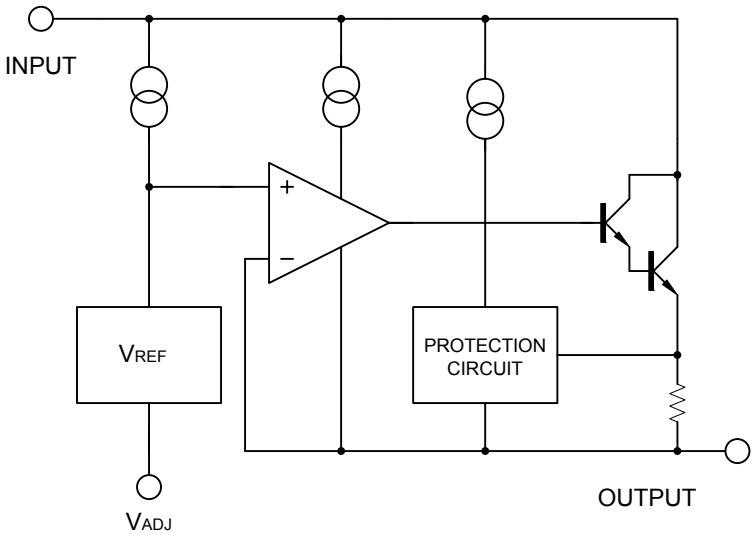
LM317MG-AA3-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel, T: Tube
(2) AA3: SOT-223, TA3: TO-220, TN3: TO-252, TQ2: TO-263, S08: SOP-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

PACKAGE	MARKING
SOT-223	
TO-220 TO-252 TO-263	
SOP-8	

■ 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	W
Junction Temperature	T_J	+125	°C
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-40 ~ +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}	165	°C/W
	SOP-8		175	
	TO-220/TO-263		65	
	TO-252		112	
Junction to Case	SOT-223	θ_{JC}	24	°C/W
	SOP-8		27	
	TO-220/TO-263		5.5	
	TO-252		13	

■ ELECTRICAL CHARACTERISTICS

(V_{IN}-V_{OUT}=5V, I_{OUT}=0.1A, T_A=25°C, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Line Regulation	$\Delta V_{OUT}/V_{OUT}$	$3V \leqq V_{IN}$-$V_{OUT} \leqq 40V$			0.01	0.04	%/V
Load Regulation	ΔV_{OUT}	$10mA \leqq I_{OUT} \leqq 0.5A$	$V_{OUT} \leqq 5V$		5	25	mV
			$V_{OUT} \geqq 5V$		0.1	0.5	%
Adjustable Pin Current	I_{ADJ}				50	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	$3V \leqq V_{IN}$-$V_{OUT} \leqq 40V$, $10mA \leqq I_{OUT} \leqq 0.5A$, $P_D < 7.5W$			0.2	5	μA
Reference Voltage	V_{REF}	$3V \leqq V_{IN}$-$V_{OUT} \leqq 40V$, $10mA \leqq I_{OUT} \leqq 0.5A$, $P_D < 7.5W$		1.20	1.25	1.30	V
Temperature Stability		$T_{MIN} \leqq T_J \leqq T_{MAX}$			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, $P_D \leqq 7.5W$		0.1	0.2		A
RMS Noise vs. %of V_{OUT}	eN	$10H_Z \leqq f \leqq 10KH_Z$			0.003		%/V_{OUT}
Ripple Rejection	RR	V_{OUT}=10V,f=120H_Z	C_{ADJ}=0		65		dB
			C_{ADJ}=10μF	66	80		

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

■ APPLICATION CIRCUITS

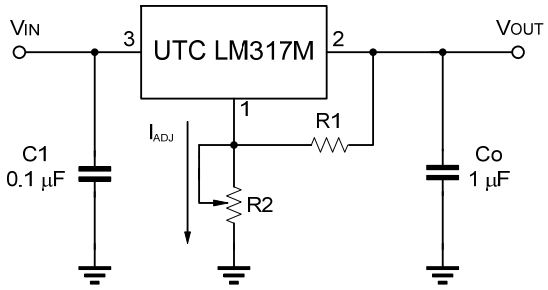


Fig.1 Programmable voltage regulator

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

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

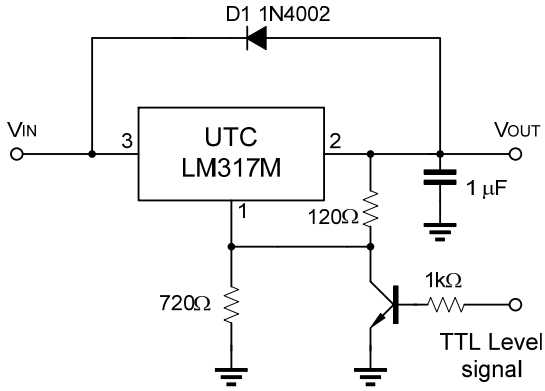


Fig.2 Regulator with On-off control

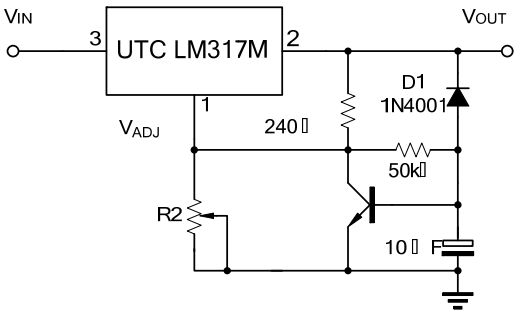


Fig.3 Soft Start Application

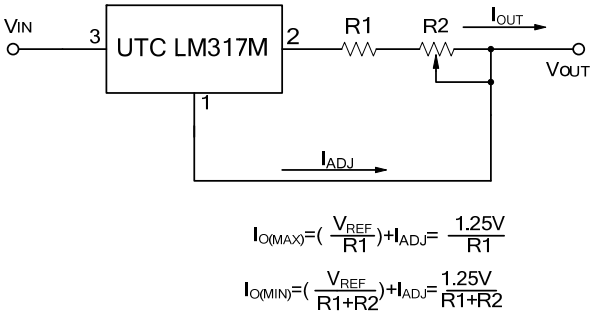
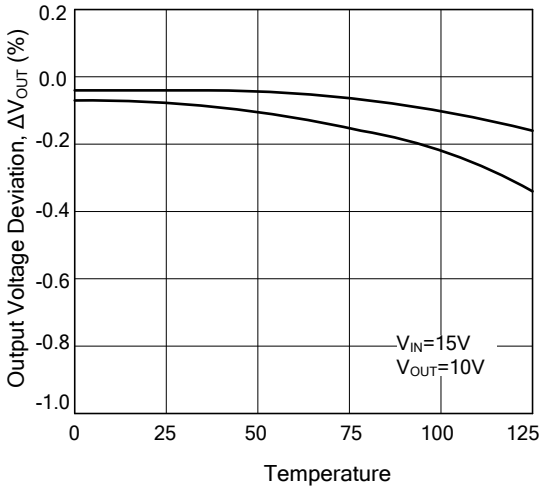


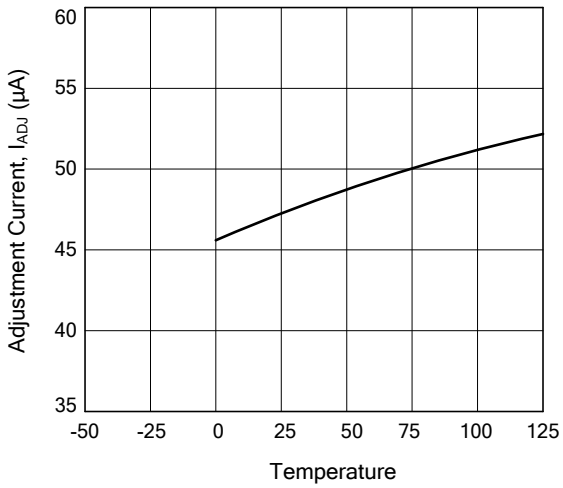
Fig.4 Constant Current Application

■ TYPICAL CHARACTERISTICS

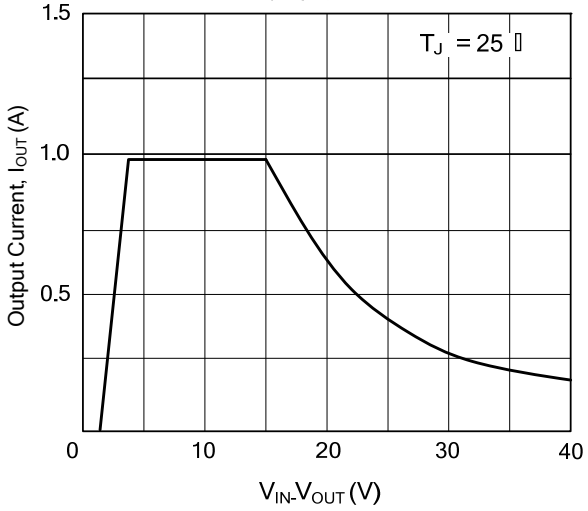
Load Regulation vs. temperature



Adjustment Current vs. Temperature



Current Limit



Minimum Operating Current