



LM317MD

Preliminary

LINEAR INTEGRATED CIRCUIT

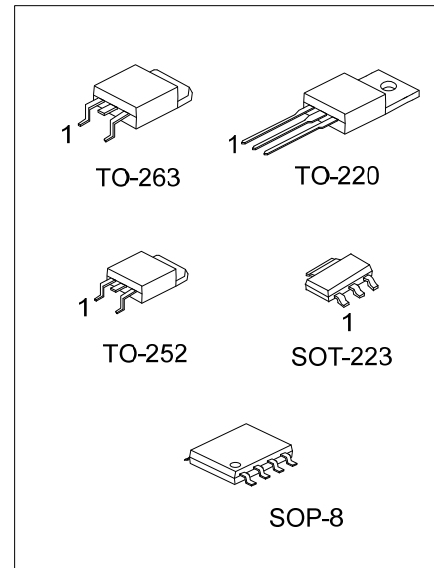
MEDIUM CURRENT 1.25V TO 37V ADJUSTABLE VOLTAGE REGULATOR

DESCRIPTION

The UTC **LM317MD** is an adjustable 3-terminal positive voltage regulator, designed to supply 500mA of output current with voltage adjustable from 1.25V ~ 37V.

FEATURES

- *Output Voltage Adjustable From 1.25V ~ 37V
- *Output Current In Excess of 500mA
- *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	
LM317MDL-AA3-R	LM317MDG-AA3-R	SOT-223	ADJ	O	I	-	-	-	-	-	Tape Reel
LM317MDL-TA3-T	LM317MDG-TA3-T	TO-220	ADJ	O	I	-	-	-	-	-	Tube
LM317MDL-TN3-R	LM317MDG-TN3-R	TO-252	ADJ	O	I	-	-	-	-	-	Tape Reel
LM317MDL-TQ2-T	LM317MDG-TQ2-T	TO-263	ADJ	O	I	-	-	-	-	-	Tube
LM317MDL-TQ2-R	LM317MDG-TQ2-R	TO-263	ADJ	O	I	-	-	-	-	-	Tape Reel
LM317MDL-S08-R	LM317MDG-S08-R	SOP-8	I	O	O	ADJ	x	O	O	x	Tape Reel

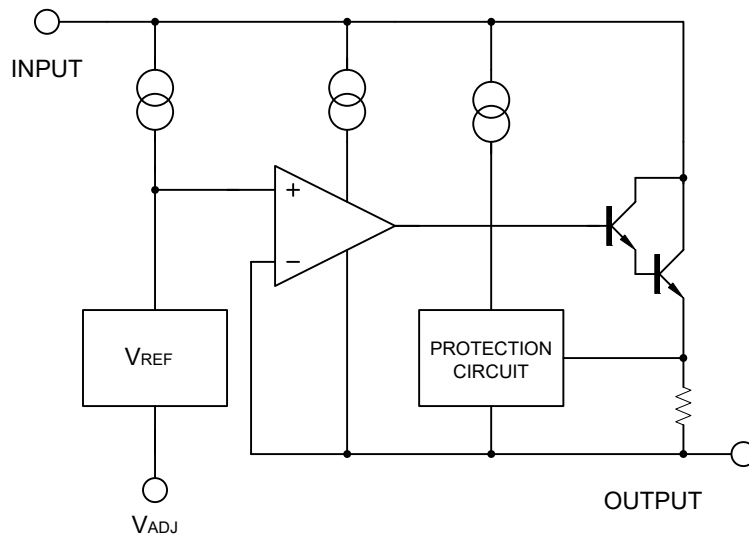
Note: Pin Assignment: I: V_{IN} O: V_{OUT} x: NC

<p>LM317MDG-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, TN3: TO-252, TQ2: TO-263, S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING

PACKAGE	MARKING
SOT-223	<p>L: Lead Free G: Halogen Free Date Code</p>
TO-220 TO-252 TO-263	<p>L: Lead Free G: Halogen Free Date Code Lot Code</p>
SOP-8	<p>Date Code L: Lead Free G: Halogen Free Lot 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	W
Junction Temperature	T_J	+150	°C
Operating Temperature	T_{OPR}	-40 ~ +125	°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	θ_{JA}	SOT-223	165	°C/W
		SOP-8	175	
		TO-220/TO-263	65	
		TO-252	112	
Junction to Case	θ_{JC}	SOT-223	24	°C/W
		SOP-8	27	
		TO-220/TO-263	5.5	
		TO-252	13	

■ ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Line Regulation	$\Delta V_{OUT}/V_{OUT}$	$3V \leq V_{IN}-V_{OUT} \leq 40V$		0.01	0.04	%/V	
Load Regulation	ΔV_{OUT}	$10mA \leq I_{OUT} \leq 0.5A$		$V_{OUT} \leq 5V$	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}	$3V \leq V_{IN}-V_{OUT} \leq 40V$, $10mA \leq I_{OUT} \leq 0.5A$, $P_D < 7.5W$		0.2	5	μA	
Reference Voltage	V_{REF}	$3V \leq V_{IN}-V_{OUT} \leq 40V$, $10mA \leq I_{OUT} \leq 0.5A$, $P_D < 7.5W$	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	$I_{L(MIN)}$	$V_{IN}-V_{OUT}=40V$		3.5	10	mA	
Maximum Output Current	$I_{O(MAX)}$	$V_{IN}-V_{OUT}=40V$, $P_D \leq 7.5W$	0.1	0.2		A	
Ripple Rejection	RR	$V_{OUT}=10V$, $f=120Hz$		$C_{ADJ}=0$	50		dB
				$C_{ADJ}=10\mu F$	60		dB

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

■ APPLICATION CIRCUITS (Capacitors recommended to use electrolytic capacitors.)

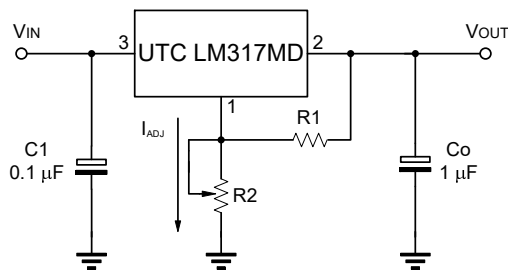


Fig.1 Programmable voltage regulator

$V_{OUT} = 1.25V * (1 + R2/R1) + I_{ADJ} * R2$
 C1 is required when regulator is located an appreciated distance from power supply. Co is needed to improve transient response.

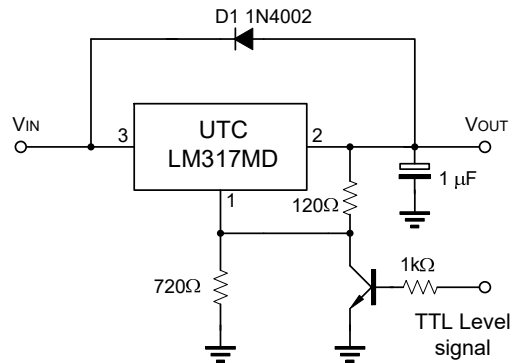


Fig.2 Regulator with On-off control

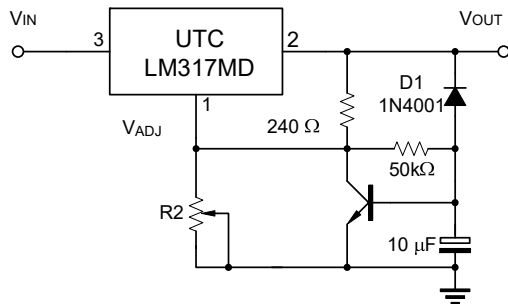
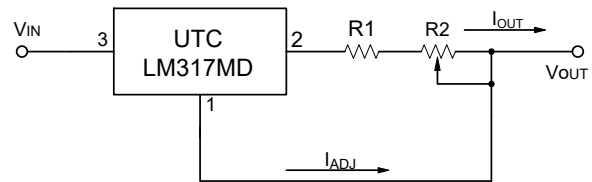


Fig.3 Soft Start Application



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

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

Fig.4 Constant Current Application

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