



LM317Q

Preliminary

LINEAR INTEGRATED CIRCUIT

HIGH CURRENT 1.3V TO 37V ADJUSTABLE VOLTAGE REGULATOR

DESCRIPTION

The UTC **LM317Q** 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

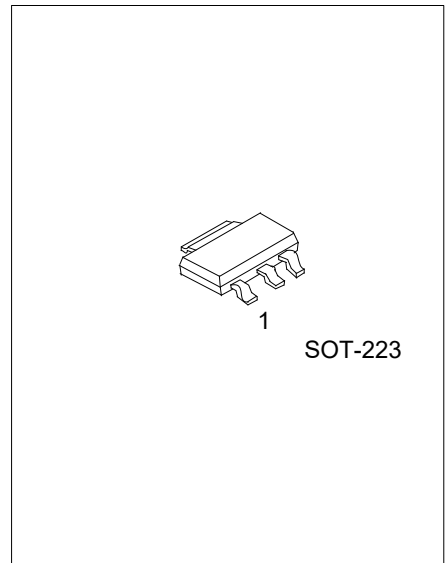
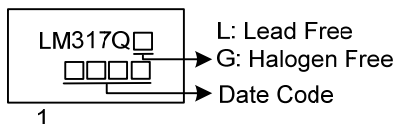
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
LM317QL-AA3-R	LM317QG-AA3-R	SOT-223	ADJ	O	I	Tape Reel

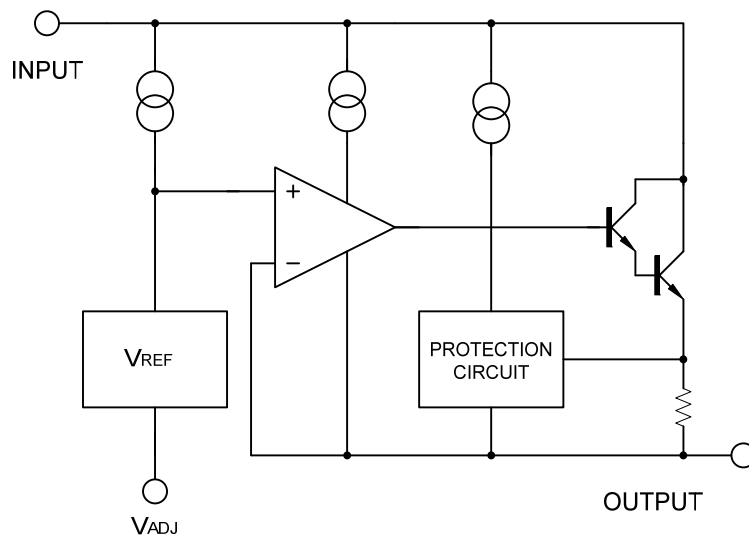
Note: Pin Assignment: I: V_{IN} O: V_{OUT}

<p>LM317QG-AA3-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel (2) AA3: SOT-223 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Input - Output Voltage Difference	$V_{IN}-V_{OUT}$	40	V
Power Dissipation	$P_{D\ max}$	0.606	W
Junction Temperature	T_J	+150	$^\circ\text{C}$
Operating Temperature	T_{OPR}	-40 ~ +125	$^\circ\text{C}$
Storage Temperature	T_{STG}	-40 ~ +150	$^\circ\text{C}$

Note: 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	θ_{JA}	165	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	23	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS

($V_{IN}-V_{OUT}=5\text{V}$, $I_{OUT}=10\text{mA}$, $T_A=25^\circ\text{C}$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Line Regulation	$\Delta V_{OUT}/V_{OUT}$	$3\text{V} \leq V_{IN}-V_{OUT} \leq 40\text{V}$		0.01	0.04	%/V
Load Regulation	ΔV_{OUT}	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$		5	25	mV
				0.1	0.5	%
Adjustable Pin Current	I_{ADJ}			50	100	μA
Adjustable Pin Current Change	ΔI_{ADJ}	$3\text{V} \leq V_{IN}-V_{OUT} \leq 40\text{V}$, $10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $P_D \leq P_{D\ max}$		0.2	5	μA
Reference Voltage	V_{REF}	$3\text{V} \leq V_{IN}-V_{OUT} \leq 40\text{V}$, $10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $P_D \leq P_{D\ max}$	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	$I_{L(MIN)}$	$V_{IN}-V_{OUT}=40\text{V}$		3.5	10	mA
Maximum Output Current	$I_{O(MAX)}$	$V_{IN}-V_{OUT}=40\text{V}$, $P_D \leq P_{D\ max}$	0.2	0.3		A
RMS Noise vs. % of V_{OUT}	eN	$10\text{Hz} \leq f \leq 10\text{KHz}$		0.003		%/ V_{OUT}
Ripple Rejection	RR	$V_{OUT}=10\text{V}$, $f=120\text{Hz}$		65		dB
			$C_{ADJ}=10\mu\text{F}$	66	80	

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

■ APPLICATION CIRCUITS

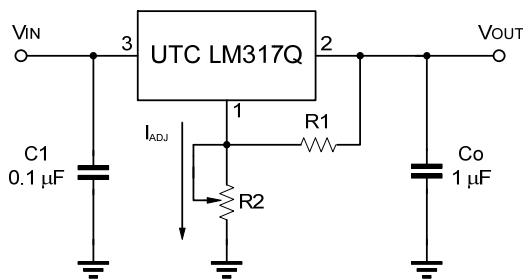


Fig.1 Programmable voltage regulator

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

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

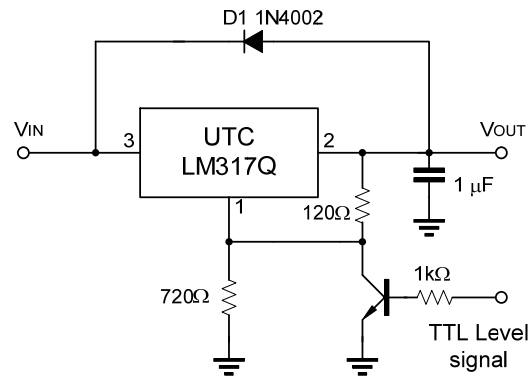


Fig.2 Regulator with On-off control

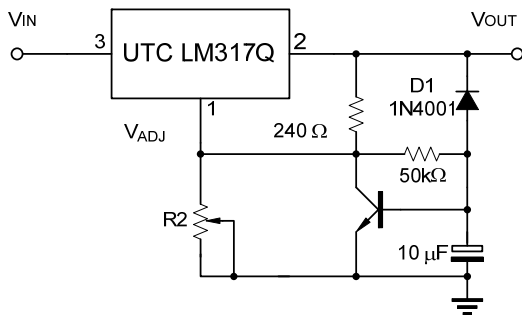
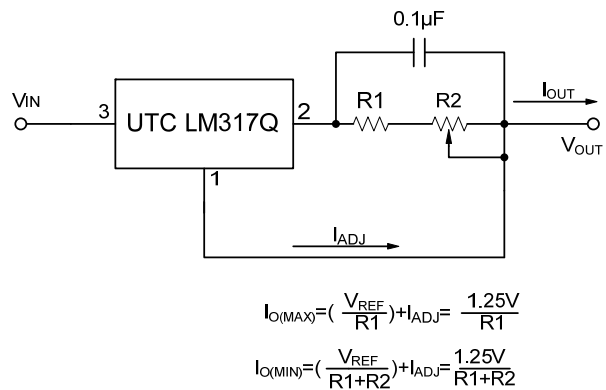


Fig.3 Soft Start Application



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

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

Fig.4 Constant Current Application

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