

# UTC LM317L LINEAR INTEGRATED CIRCUIT

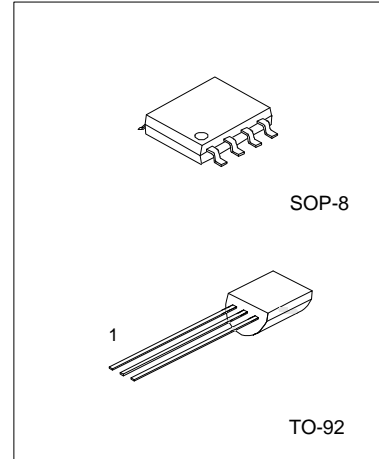
## LOW CURRENT 1.25V TO 37V ADJUSTABLE VOLTAGE REGULATOR

### DESCRIPTION

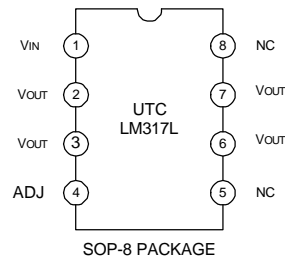
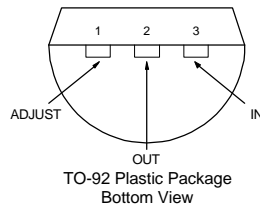
The UTC LM317L is a monolithic integrated circuit, designed for use as positive adjustable voltage regulator. It is designed to supply until 100mA of load current with an output voltage adjustable over a 1.25V to 37V range.

### FEATURES

- \*Output voltage range: 1.25V to 37V
- \*Output current in excess of 100mA
- \*Line regulation typ. 0.01%
- \*Load regulation typ. 0.1%
- \*Thermal overload protection
- \*Short circuit protection
- \*Output transistor safe area compensation
- \*Floating operation for high voltage applications



### PIN CONFIGURATIONS

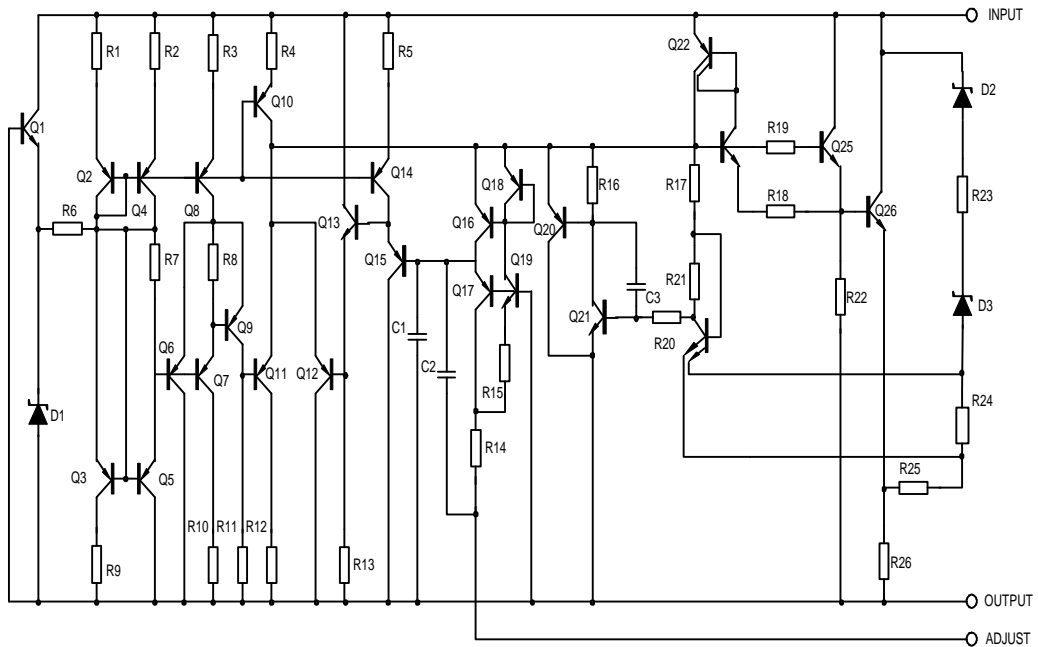


### ABSOLUTE MAXIMUM RATING

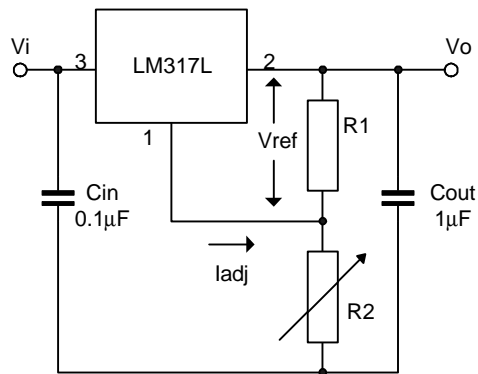
PARAMETER	SYMBOL	VALUE	UNIT
Input-Output Differential Voltage	$V_i - V_o$	40	V
Power Dissipation	$P_d$	Internally Limited	
Operating Junction Temperature Range	$T_{opr}$	0~125	°C
Storage Temperature Range	$T_{str}$	-55 ~ 150	°C

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## SCHEMATIC DIAGRAM



## TEST CIRCUIT

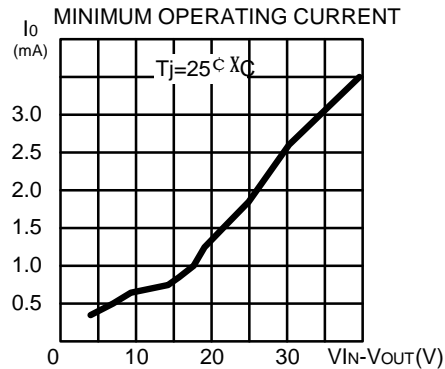
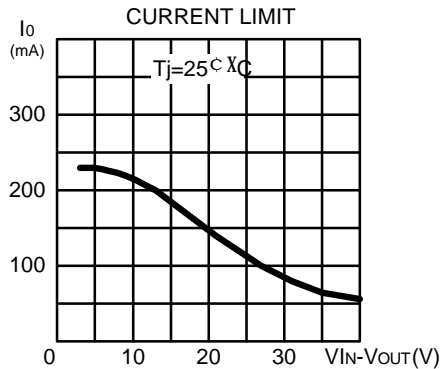


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ELECTRICAL CHARACTERISTICS ( $V_i-V_o=5V$ ,  $I_o=40mA$ ,  $0 \leq T_j \leq 125^\circ C$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Line Regulation	$\Delta V_o$	$V_i-V_o=3-40V$ $I_L < 20mA$	$T_j=25^\circ C$	0.01	0.04	%/V
				0.02	0.07	%/V
Load Regulation	$\Delta V_o$	$V_o \leq 5V$ $I_o=5-100mA$	$T_j=25^\circ C$	5	25	mV
				20	70	mV
		$V_o > 5V$ $I_o=5-100mA$	$T_j=25^\circ C$	0.1	0.5	%
Adjustment Pin Current	$I_{ADJ}$			0.3	1.5	%
Adjustment Pin Current	$\Delta I_{ADJ}$			50	100	$\mu A$
Adjustment Pin Current	$\Delta I_{ADJ}$	$V_i-V_o=3-40V$ $I_o=5-100mA$ , $P_d < 625 mW$		0.2	5	$\mu A$
Reference Voltage	$V_{REF}$	$V_i-V_o=3-40V$ $I_o=5-100 mA$ , $P_d < 625 mW$	1.2	1.25	1.3	V
Output Voltage Temperature Stability	$\Delta V_o/V_o$			0.7		%
Minimum Load Current	$I_o(\min)$	$V_i-V_o=40V$		3.5	5	mA
Maximum Output Current	$I_o(\max)$	$V_i-V_o=3-13V$	100	200		mA
		$V_i-V_o=40V$		50		
Output Noise Voltage (Percentage of $V_o$ )	eN	B=10Hz~10KHz $T_j=25^\circ C$		0.003		%
Supply Voltage Rejection(*)	SVR	$T_j=25^\circ C$ $f=120Hz$	$C_{ADJ}=0$	65		dB
			$C_{ADJ}=10\mu F$	66	80	dB

(\*)  $C_{ADJ}$  is connected between Adjust pin and Ground.



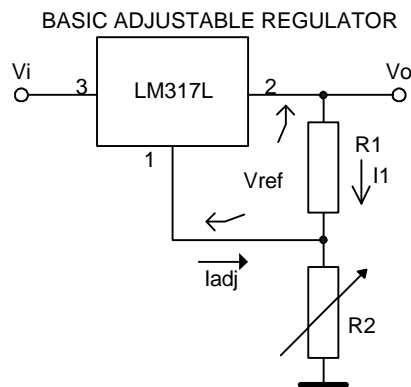
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## APPLICATION INFORMATION

The UTC LM317L provides an internal reference voltage of 1.25V between the output and adjustments terminals. This is used to set a constant current flow across an external resistor divider, giving an output voltage  $V_O$  of:

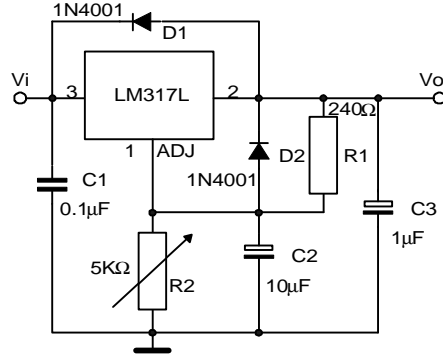
$$V_O = V_{REF} (1 + R_2/R_1) + I_{ADJ} R_2$$

The device is designed to minimize the term  $I_{ADJ}$  (100 $\mu$ A max) and to maintain it very constant with line and load changes. Usually, the error term  $I_{ADJ} R_2$  can be neglected. To obtain the previous requirement, all the regulator quiescent current is returned to the output terminal, imposing a minimum load current condition. If the load is insufficient, the output voltage will rise. The UTC LM317L is a floating regulator, input-output differential voltage, supplies of very high voltage with respect to ground can be regulated as long as the maximum input-output differential is not exceeded. Furthermore, programmable regulators are easily obtainable and, by connecting a fixed resistor between the adjustment and output, the device can be used as a precision current regulator.

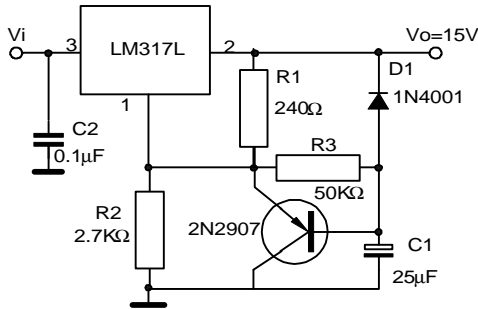


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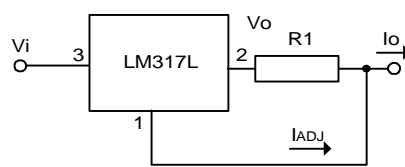
VOLTAGE REGULATOR WITH PROTECTION DIODES



SLOW TURN-ON 15V REGULATOR

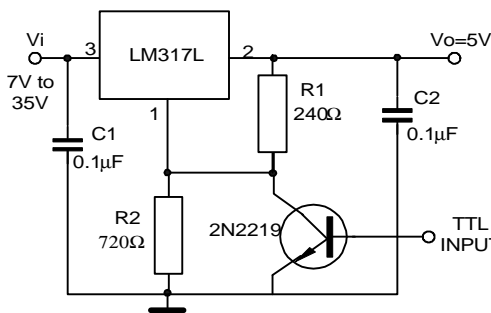


CURRENT REGULATOR

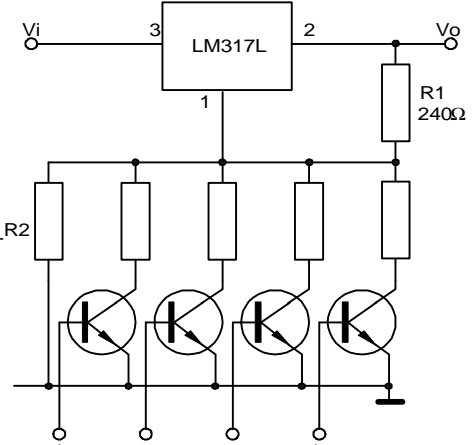


$$I_o = \frac{V_{ref}}{R_1} + I_{ADJ} \approx \frac{1.25V}{R_1}$$

5V ELECTRONIC SHUT-DOWN REGULATOR



DIGITALLY SELECTED OUTPUTS



DIGITAL INPUTS (R2 sets maximum Vo)