钍地半导体
Tudi Semiconductor

Product Specification

TUDI-LM217LD13TR

Low current 1.2 to 37 V adjustable voltage regulators

网址 www.sztdbdt.com

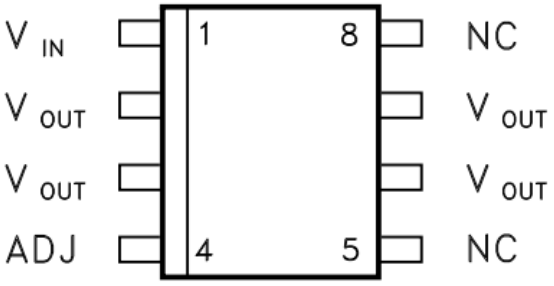
用芯智造·卓越品质

semiconductor device manufacturer

- Design
- research and development
- production
- and sales

Features

- Outuput voltage range: 1.2 to 37 V
- Outuput current in excess of 100 mA
- Output current up to 100 mA
- Line regulation typ. 0.01%
- Load regulation typ. 0.1%
- Thermal overload protection
- Short-circuit protection
- Output transition safe area compensation
- Floating operation for high voltage applications



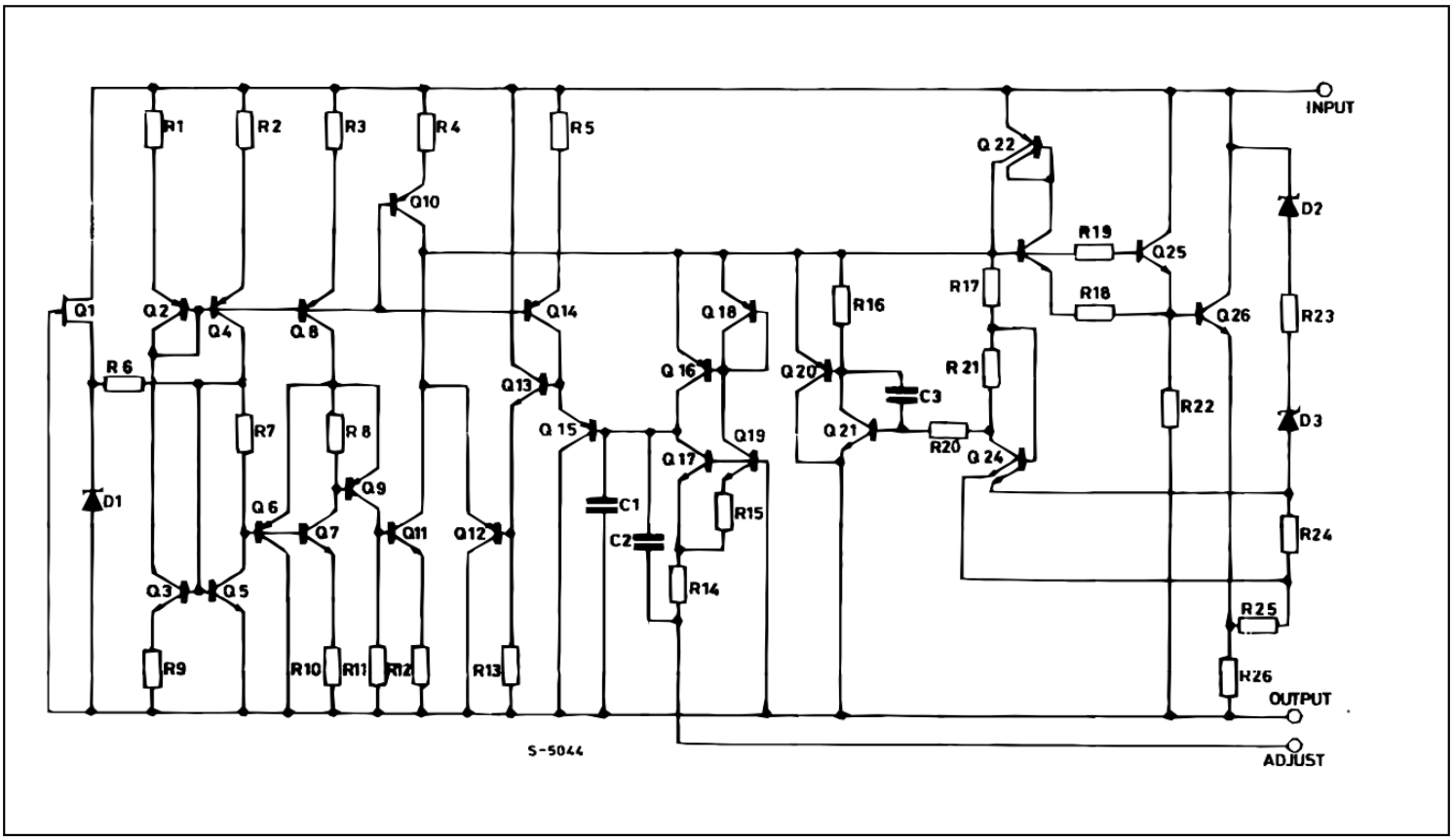
SOP-8

Description

The LM217L/LM317L are monolithic integrated circuits in SO-8 and TO-92 packages intended for use as positive adjustable voltage regulators. They are designed to supply up to 100 mA of load current with an output voltage adjustable over a 1.2 to 37 V range.The nominal output voltage is selected by means of only a resistive divider, making the device exceptionally easy to use and eliminating the stocking of many fixed regulators

1 Diagram

Figure 1. Schematic diagram

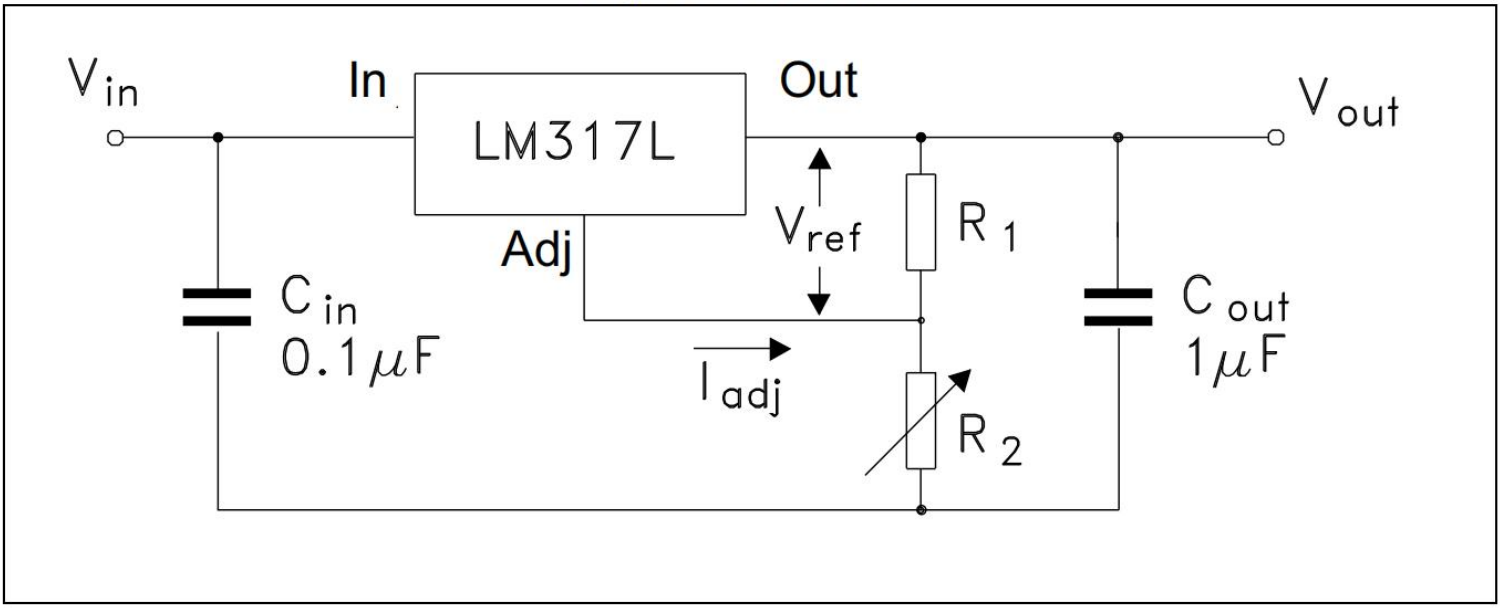


3 Maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_I-V_O	Input-output differential voltage		40	V
P_D	Power dissipation		Internally limited	mW
T_{OP}	Operating junction temperature range	for LM217L	-40 to 125	°C
		for LM317L	0 to 125	
T_{STG}	Storage temperature range		-55 to 150	°C

Figure 3. Test circuit



4 Electrical characteristics

(Refer to the test circuits, T_J = - 40 to 125°C, V_I - V_O = 5 V, I_O = 40 mA, unless otherwise specified)

Table 3. Electrical characteristics of LM217L

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
DV_O	Line regulation	V_I - V_O = 3 to 40 V, I_L 20 mA	T_J = 25°C		0.01	0.02	%/V
					0.02	0.05	
DV_O	Load regulation	$V_O \leq$ 5 V, I_O = 5 to 100 mA	T_J = 25°C		5	15	mV
					20	50	
		$V_O \geq$ 5 V, I_O = 5 to 100 mA	T_J = 25°C		0.1	0.3	%
					0.3	1	
I_{ADJ}	Adjustment pin current				50	100	µA
DI_{ADJ}	Adjustment pin current	V_I - V_O = 3 to 40 V, I_O = 5 to 100 mA P_d < 625 mW			0.2	5	µA
V_{REF}	Reference voltage	V_I - V_O = 3 to 40 V, I_O = 10 to 500 mA P_d < 625 mW		1.2	1.25	1.3	V
DV_O/V_O	Output voltage temperature stability				0.7		%
$I_{O(min)}$	Minimum load current	V_I - V_O = 40 V			3.5	5	mA
$I_{O(max)}$	Maximum output current	V_I - V_O = 3 to 13 V		100	200		mA
		V_I - V_O = 40 V			50		
eN	Output noise voltage	B = 10 Hz to 10 KHz, T_J = 25°C			0.003		%
SVR	Supply voltage rejection (1)	T_J = 25°C f = 120 Hz	C_{ADJ} = 0		65		dB
			C_{ADJ} = 10 µF	66	80		

1. C_{ADJ} is connected between adjust pin and ground.

(Refer to the test circuits, T_J = 0 to 125°C, V_I - V_O = 5 V, I_O = 40 mA, unless otherwise specified)

Table 4. Electrical characteristics of LM317L

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
DV_O	Line regulation	V_I - V_O = 3 to 40 V, I_L < 20 mA	T_J = 25°C		0.01	0.04	%/V
					0.02	0.07	
DV_O	Load regulation	$V_O \leq$ 5 V, I_O = 5 to 100 mA	T_J = 25°C		5	25	mV
					20	70	
		$V_O \geq$ 5 V, I_O = 5 to 100 mA	T_J = 25°C		0.1	0.5	%
					0.3	1.5	
I_{ADJ}	Adjustment pin current				50	100	µA
DI_{ADJ}	Adjustment pin current	V_I - V_O = 3 to 40 V, I_O = 5 to 100 mA P_d < 625 mW			0.2	5	µA
V_{REF}	Reference voltage	V_I - V_O = 3 to 40 V, I_O = 5 to 100 mA P_d < 625 mW		1.2	1.25	1.3	V
DV_O/V_O	Output voltage temperature stability				0.7		%
$I_{O(min)}$	Minimum load current	V_I - V_O = 40 V			3.5	5	mA
$I_{O(max)}$	Maximum output current	V_I - V_O = 3 to 13 V		100	200		mA
		V_I - V_O = 40 V			50		
eN	Output noise voltage	B = 10 Hz to 10 KHz, T_J = 25°C			0.003		%
SVR	Supply voltage rejection (1)	T_J = 25°C f = 120 Hz	C_{ADJ} = 0		65		dB
			C_{ADJ} = 10 µF	66	80		

1. C_{ADJ} is connected between adjust pin and ground.

6 Application information

The LM317L provides an internal reference voltage of 1.25 V between the output and adjustments terminals. This is used to set a constant current flow across an external resistor divider (see *Figure 6.*), giving an output voltage V_O of:

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

The device was designed to minimize the term I_{ADJ} (100 µA max) and to maintain it very constant with line and load changes. Usually, the error term $I_{ADJ} \times R_2$ 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.

Since the LM317L is a floating regulator and "sees" only the input-to-output differential voltage, supplies of very high voltage with respect to ground can be regulated as regulator as the maximum input-to-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. In order to optimize the load regulation, the current set resistor R_1 (see *Figure 6.*) should be tied as close as possible to the regulator, while the ground terminal of R_2 should be near the ground of the load to provide remote ground sensing.

7 Application circuits

Figure 6. Basic adjustable regulator

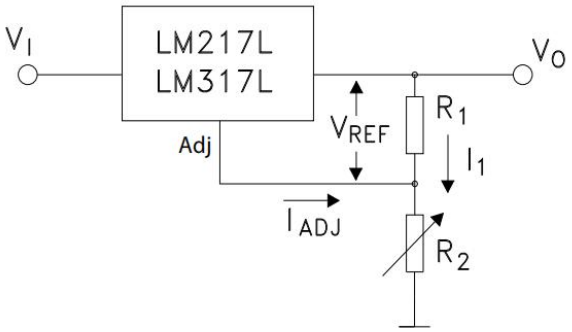


Figure 7. Voltage regulator with protection diodes

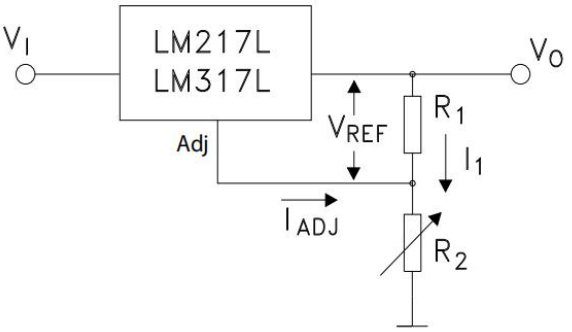


Figure 8. Slow turn-on 15 V regulator

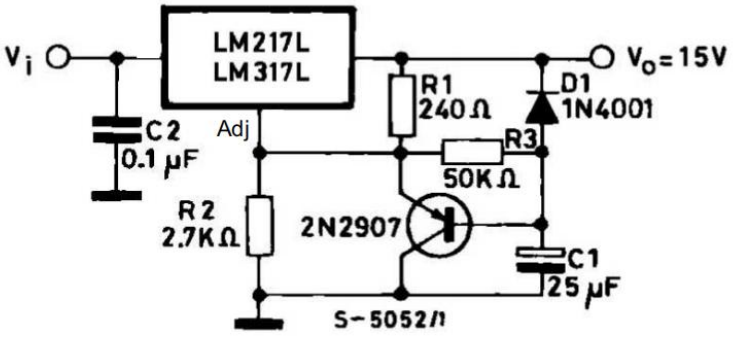
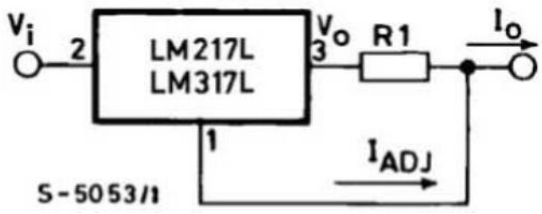


Figure 9. Current regulator



$I_O=V_{REF}/R_1 + I_{ADJ} = 1.25V/R_1$

Figure 10. 5 V Electronic shut-down regulator

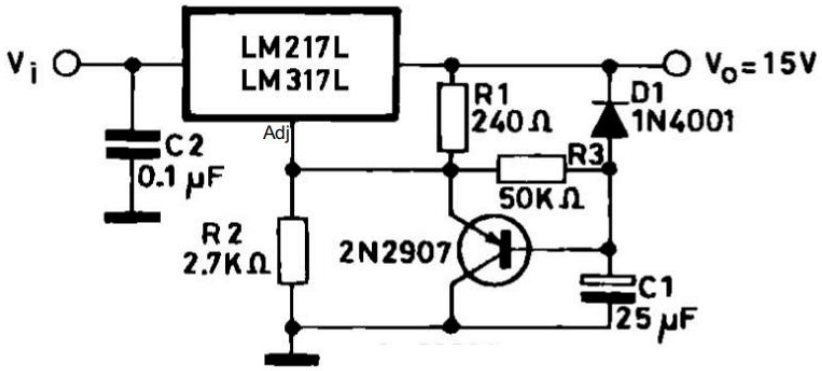
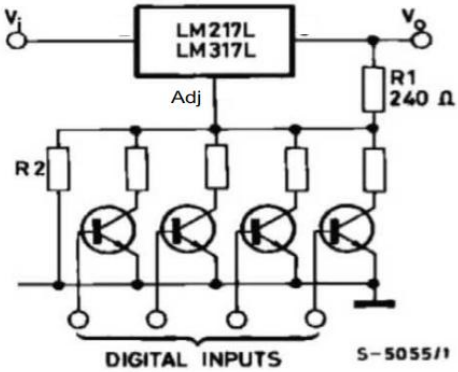


Figure 11. Digitally selected outputs

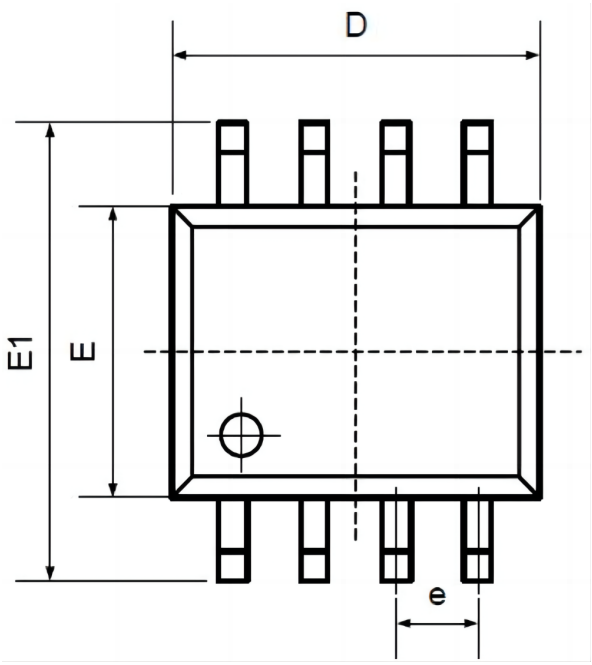


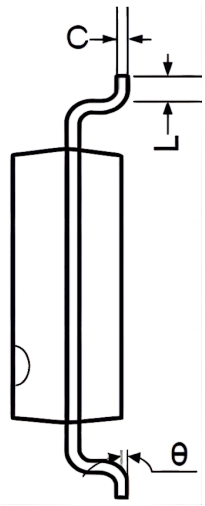
(R_2 = sets maximum V_O)

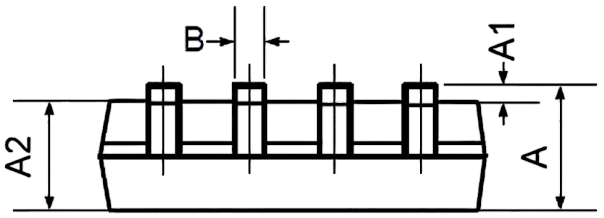
Order information

Order Number	Package	Package Quantity	Marking On The park
LM217LD13TR-TUDI	SOP8	Tape,Reel,2500	LM217LD13TR

Package SOP8







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
B	0.330	0.510	0.013	0.020
C	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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