

### 描述 / Descriptions

TO-263 塑封封装电压调整器。Voltage Regulator in a TO-263 Plastic Package.

### 特征 / Features

三端稳压调整器，输出电流超过 1.5A,稳压输出电压在 1.2 ~ 37V 之间可调。

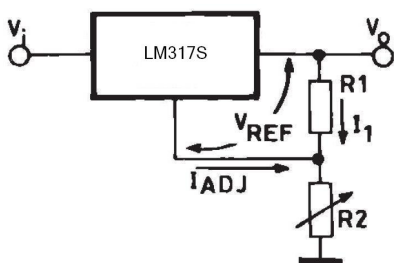
3-Terminal regulators ,output current in excess of 1.5 A, output voltage adjustable over a 1.2-37V.

### 用途 / Applications

电压调整器。

Voltage Regulator.

### 内部等效电路 / 应用电路      Equivalent Circuit or Application Circuit



### 引脚排列 / Pinning



PIN1 : ADJ      PIN 2 , 4 : OUT      PIN 3 : IN

### 印章代码 / Marking

见印章说明。 See marking instructions.

极限参数 / Absolute Maximum Ratings(Ta=25°C)

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Input voltage	$V_{i-o}$	40	V
Output current	$I_o$	Internally Limited	
Operating virtual Junction temperature	$T_J$	0~125	°C
Power Dissipation	$P_{tot}$	Internally Limited	
Storage temperature range	$T_{stg}$	-55~150	°C

电性能参数 / Electrical Characteristics(Ta=25°C)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Output voltage	$V_o$	$T_J=25^\circ\text{C}$		0.01	0.04	%/V
		$I_o=5\text{mA to }1\text{A}$ $V_i=-20\text{V to }-7\text{V}$		0.02	0.07	%/V
Load Regulation	$\Delta V_o$	$V_o \leq 5\text{V}$ $I_o=10\text{mA to }I_{o\text{MAX}}$ $T_J=25^\circ\text{C}$		5	25	mV
		$V_o \leq 5\text{V}$ $I_o=10\text{mA to }I_{o\text{MAX}}$		20	70	mV
		$V_o \geq 5\text{V}$ $I_o=10\text{mA to }I_{o\text{MAX}}$ $T_J=25^\circ\text{C}$		0.1	0.5	%
		$V_o \geq 5\text{V}$ $I_o=10\text{mA to }I_{o\text{MAX}}$		0.3	1.5	%
Adjustable Pin Current	$I_{ADJ}$			50	100	$\mu\text{A}$
Adjustable Pin Current Change	$\Delta I_{ADJ}$	$V_i-V_o=2.5\text{to }40\text{V}$ $I_o=10\text{mA to }I_{o\text{MAX}}$		0.2	5.0	$\mu\text{A}$
Reference Voltage	$V_{REF}$	$V_i-V_o=2.5\text{to }40\text{V}$ $I_o=10\text{mA to }I_{o\text{MAX}}$ $P_D \leq P_{MAX}$	1.2	1.25	1.3	V
Line Regulation	$\frac{\Delta V_o}{V_o}$			1		%
Minimum Load Current for Regulation	$I_{o(\text{min})}$	$V_i-V_o=40\text{V}$		3.5	10	mA
Maximum Output Current	$I_{o(\text{max})}$	$V_i-V_o \leq 15\text{V}$ $P_D < P_{MAX}$	1.5	2.2		A
		$V_i-V_o=40\text{V}$ $T_J=25^\circ\text{C}$ $P_D < P_{MAX}$		0.4		A
RMS Noise vs. %of VOUT	$e_N$	$B=10\text{Hz to }10\text{KHz}$ $T_J=25^\circ\text{C}$		0.003		%
Ripple Rejection	SVR	$T_J=25^\circ\text{C}$ $C_{ADJ}=0$ $f=120\text{Hz}$		65		dB
		$T_J=25^\circ\text{C}$ $C_{ADJ}=10\mu\text{F}$ $f=120\text{Hz}$	66	80		dB

内部等效电路 / Equivalent Circuit

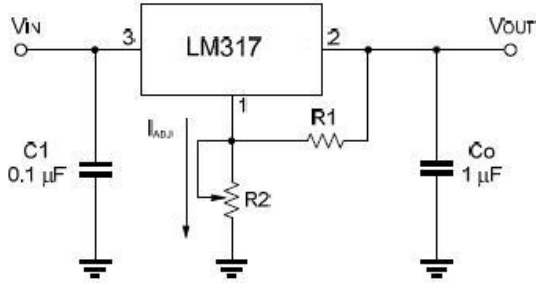


Fig.1 Programmable voltage regulator

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

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

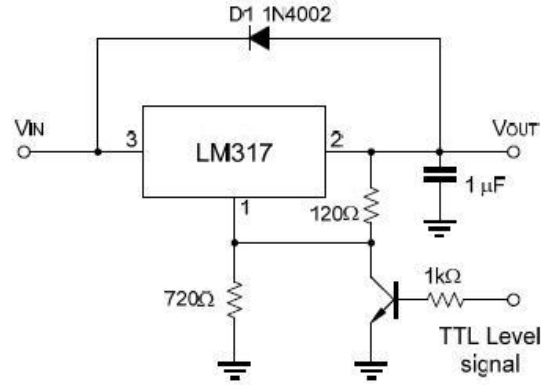


Fig.2 Regulator with On-off control

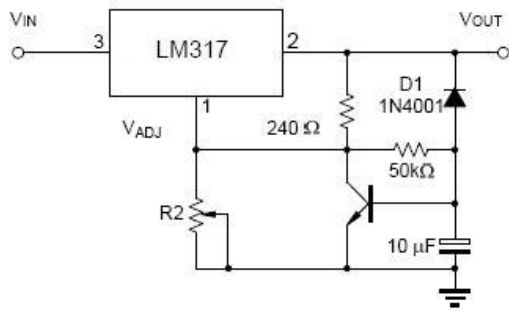
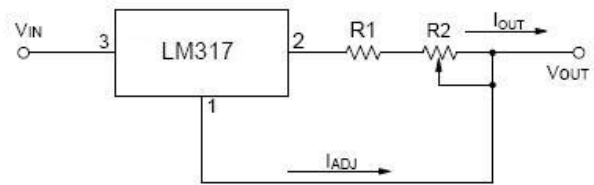


Fig.3 Soft Start Application



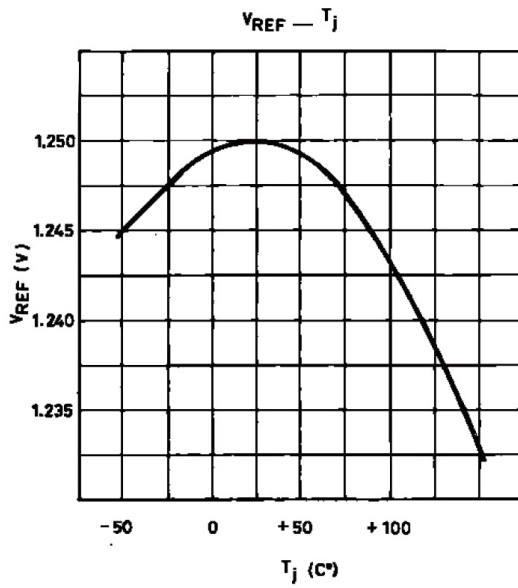
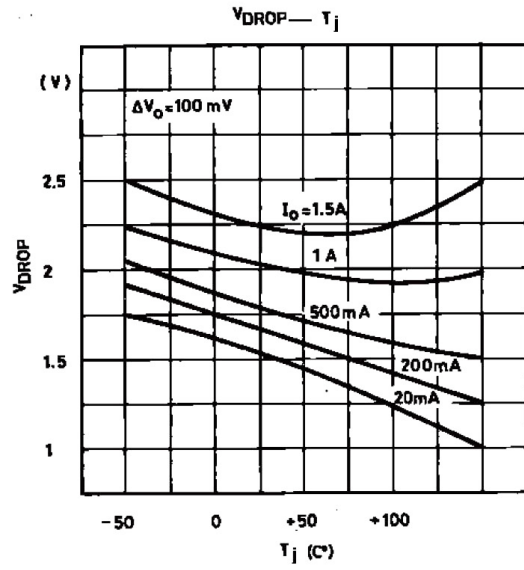
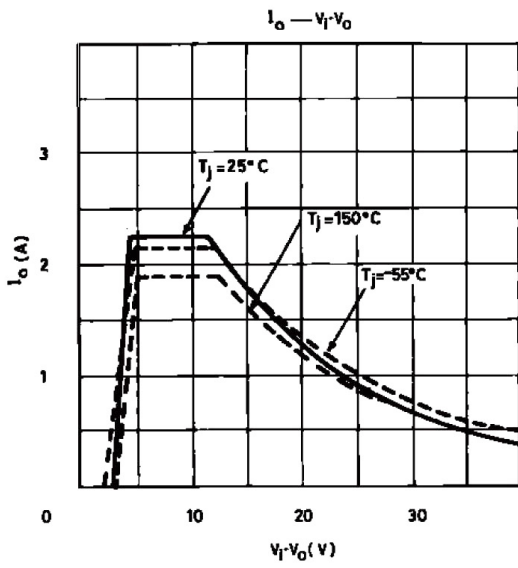
$$I_{O(MAX)} = \left( \frac{V_{REF}}{R1} \right) + I_{ADJ} = \frac{1.25V}{R1}$$

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

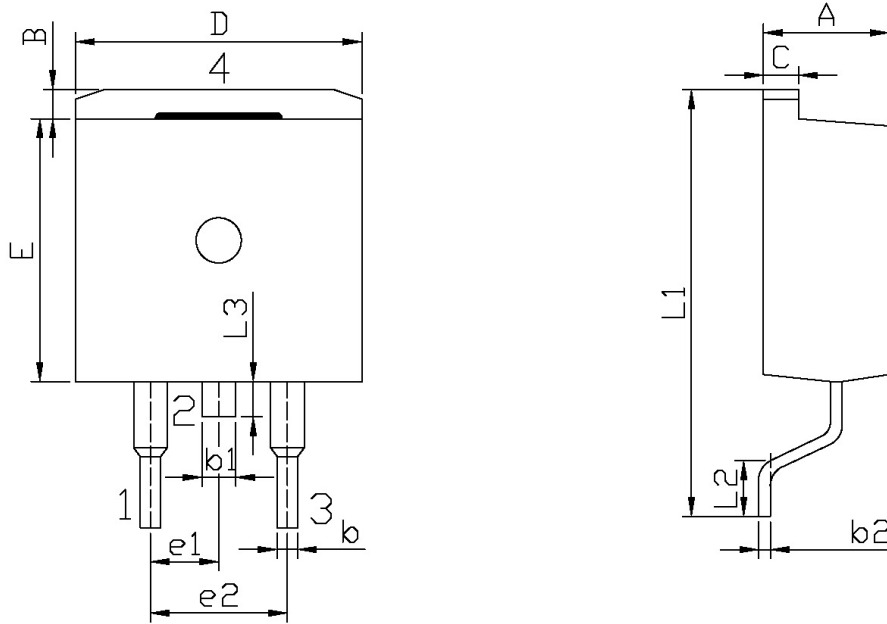
$$5mA < I_{OUT} < 100mA$$

Fig.4 Constant Current Application

电参数曲线图 / Electrical Characteristic Curve



外形尺寸图 / Package Dimensions

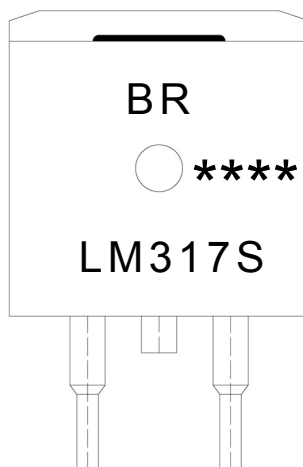


单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.30	4.70	E	9.00	9.40
B	1.00	1.40	e1	2.34	2.74
b	0.70	0.90	e2	4.88	5.28
b1	1.15	1.35	L1	15.00	16.00
b2	0.40	0.60	L2	2.24	2.84
C	1.20	1.40	L3	1.20	1.60
D	9.80	10.20			

TO-263

印章说明 / Marking Instructions



说明：

BR： 为公司代码

LM317S： 为产品型号

\*\*\*\*： 为生产批号代码，随生产批号变化。

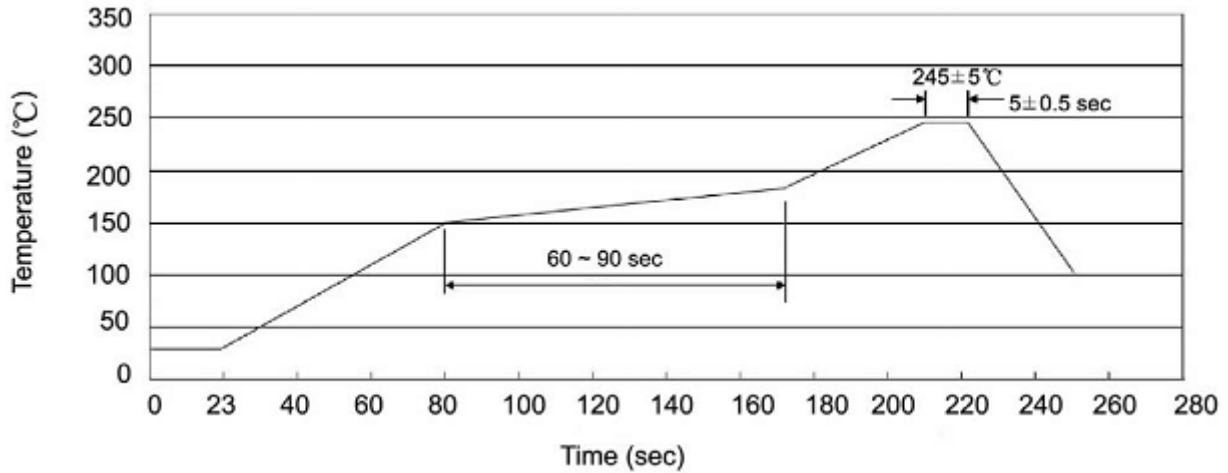
Note:

BR: Company Code.

LM317S: Product Type.

\*\*\*\*: Lot No. Code, code change with Lot No.

**回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)**



说明：

- 1、预热温度 25~150°C，时间 60~90sec;
- 2、峰值温度 245±5°C，时间持续为 5±0.5sec;
- 3、焊接制程冷却速度为 2~10°C/sec.

Note:

- 1.Preheating:25~150°C, Time:60~90sec.
- 2.Peak Temp.:245±5°C, Duration:5±0.5sec.
3. Cooling Speed: 2~10°C/sec.

**耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions**

温度：260±5°C

时间：10±1 sec.

Temp:260±5°C

Time:10±1 sec

**包装规格 / Packaging SPEC.**

卷盘包装 / REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
TO-263	800	1	800	5	4,000	13" ×24	360×360×50	385×257×392

套管包装 / TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm <sup>3</sup> )		
	Units/Tube 只/套管	Tubes/Inner Box 套管/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Tube 套管	Inner Box 盒	Outer Box 箱
TO-263	50	20	1,000	5	5,000	532×33×7.0	555×164×50	575×290×180

**使用说明 / Notices**