

### 描述 / Descriptions

TO-220 塑封封装电压调整器。Voltage Regulator in a TO-220 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。

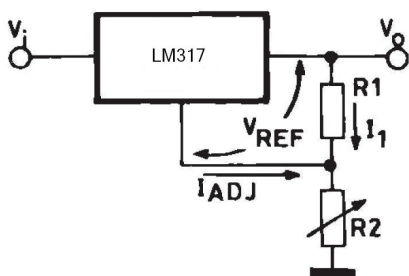
3-Terminal regulators ,output current in excess of 1.5 A, output voltage adjustable over a 1.2-37V.

### 用途 / Applications

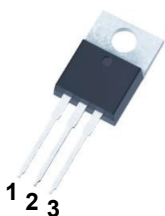
电压调整器。

Voltage Regulator.

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



### 引脚排列 / Pinning



PIN 1 : ADJ      PIN 2 : OUT      PIN 3 : IN

### 印章代码 / Marking

见印章说明。See Marking Instructions

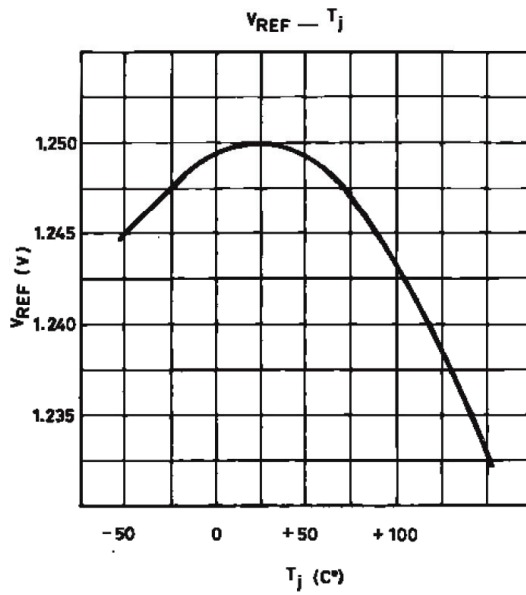
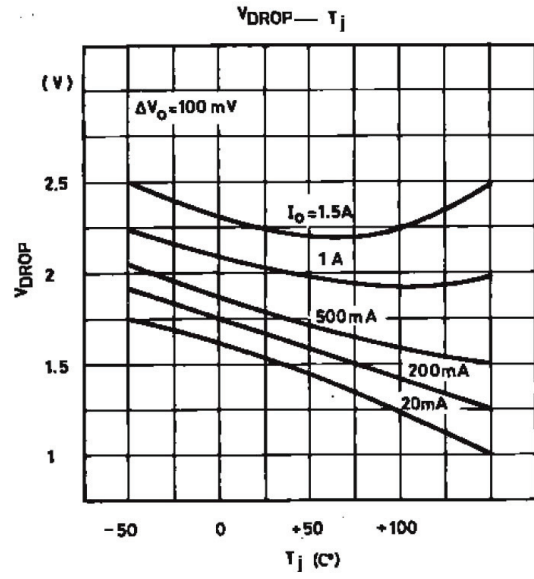
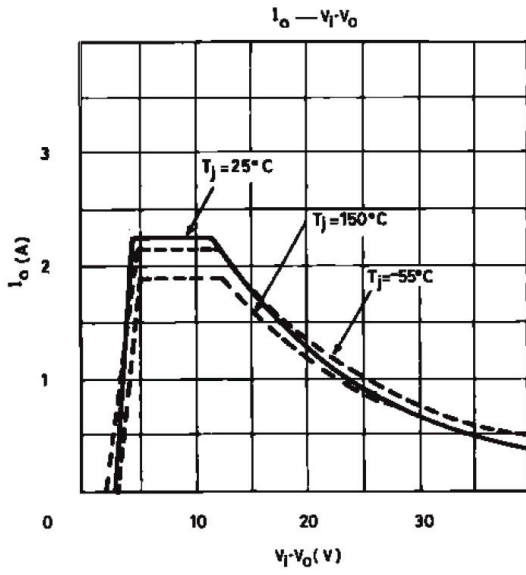
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Input - Output Voltage Difference	$V_{i-o}$	40	V
Output Current	$I_o$	Internally Limited	A
Operating Junction Temperature Range	$T_J$	0~125	°C
Power Dissipation	$P_{tot}$	Internally Limited	W
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
Line regulation	$\Delta V_o$	$V_i-V_o=3to40V$ $T_J=25^\circ C$		0.01	0.04	%/V
		$V_i-V_o=3to40V$		0.02	0.07	%/V
Load Regulation	$\Delta V_o$	$V_o \leq 5V$ $I_o=10mA$ $T_J=25^\circ C$		5	25	mV
		$V_o \leq 5V$ $I_o=10mA$		20	70	mV
		$V_o \geq 5V$ $I_o=10mA$ $T_J=25^\circ C$		0.1	0.5	%
		$V_o \geq 5V$ $I_o=10mA$		0.3	1.5	%
Adjustable Pin Current	$I_{ADJ}$			50	100	$\mu A$
Adjustable Pin Current Change	$\Delta I_{ADJ}$	$V_i-V_o=2.5to40V$ $I_o=10mA$		0.2	5	$\mu A$
Reference Voltage	$V_{REF}$	$V_i-V_o=2.5to40V$ $I_o=10mA$ $P_D \leq P_{MAX}$	1.2	1.25	1.3	V
Line Regulation	$\frac{\Delta V_o}{V_o}$			1		%
Minimum Load Current for Regulation	$I_{o(min)}$	$V_i-V_o=40V$		3.5	10	mA
Maximum Output Current	$I_{o(max)}$	$V_i-V_o \leq 15V$ $P_D < P_{MAX}$	1.5	2.2		A
		$V_i-V_o=40V$ $P_D < P_{MAX}$ $T_J=25^\circ C$		0.4		A
RMS Noise vs. %of VOUT	$e_N$	$B=10Hz$ to $10KHz$ $T_J=25^\circ C$		0.003		%
Ripple Rejection	SVR	$T_J=25^\circ C$ $f=120Hz$ $C_{ADJ}=0$ $C_{ADJ}=10\mu F$		65		dB
			66	80		dB

电参数曲线图 / Electrical Characteristic Curve



内部电路图 / Internal circuit diagram

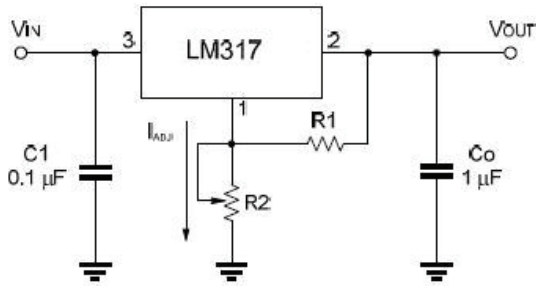


Fig.1 Programmable voltage regulator

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

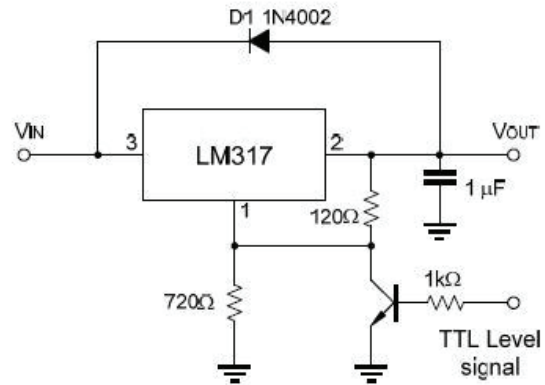


Fig.2 Regulator with On-off control

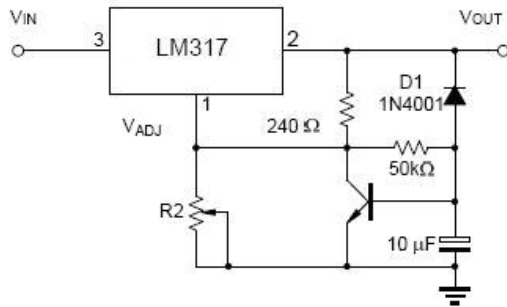
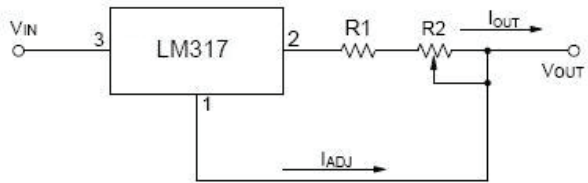


Fig.3 Soft Start Application



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

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

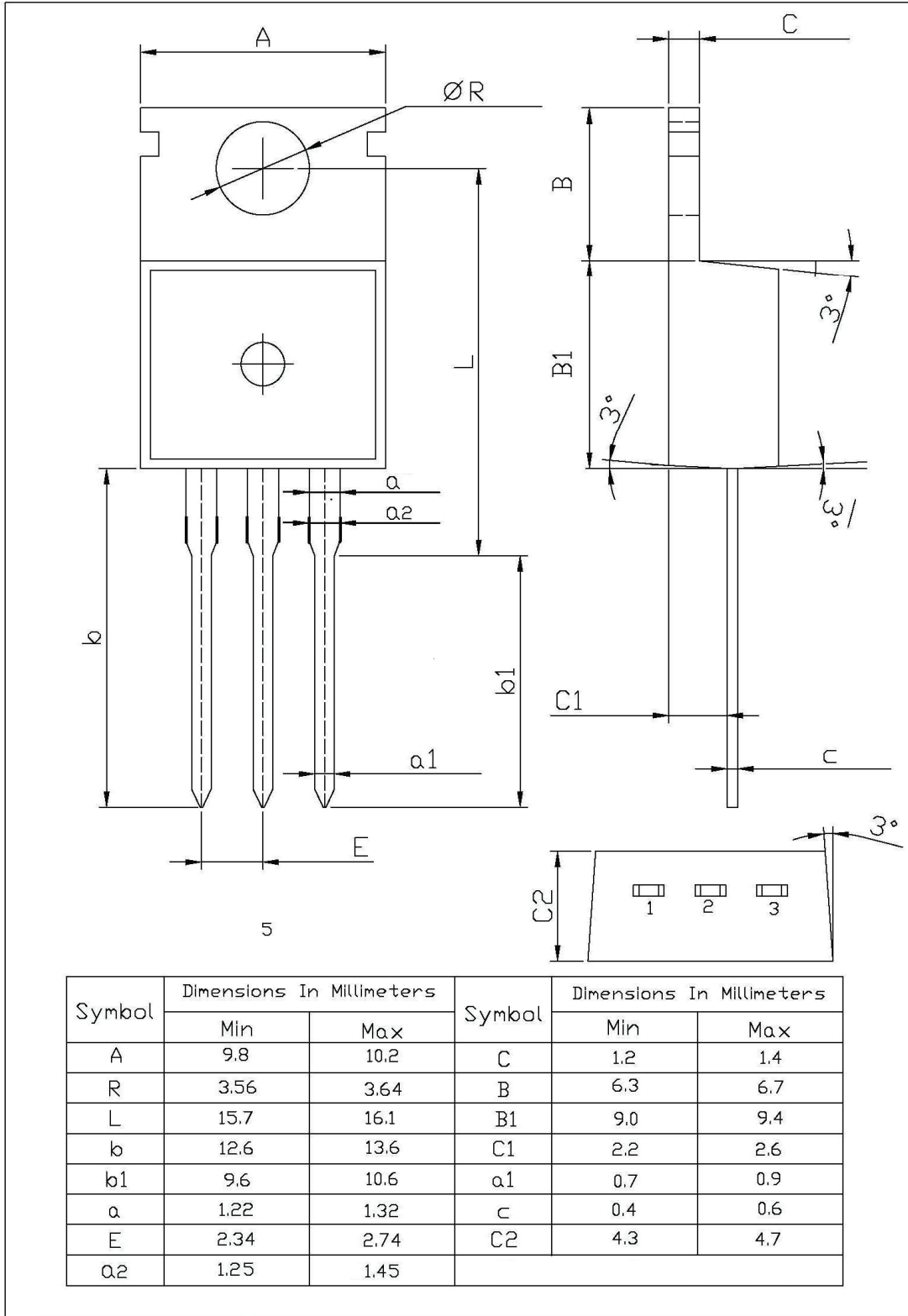
5mA < I<sub>OUT</sub> < 100mA

Fig.4 Constant Current Application

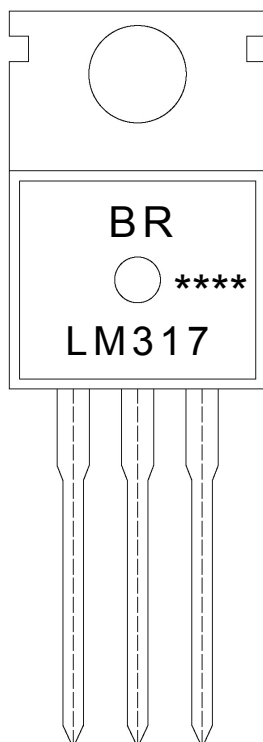
外形尺寸图 / Package Dimensions

TO-220

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

LM317： 为产品型号

\*\*\*\*： 为生产批号代码，随生产批号变化。

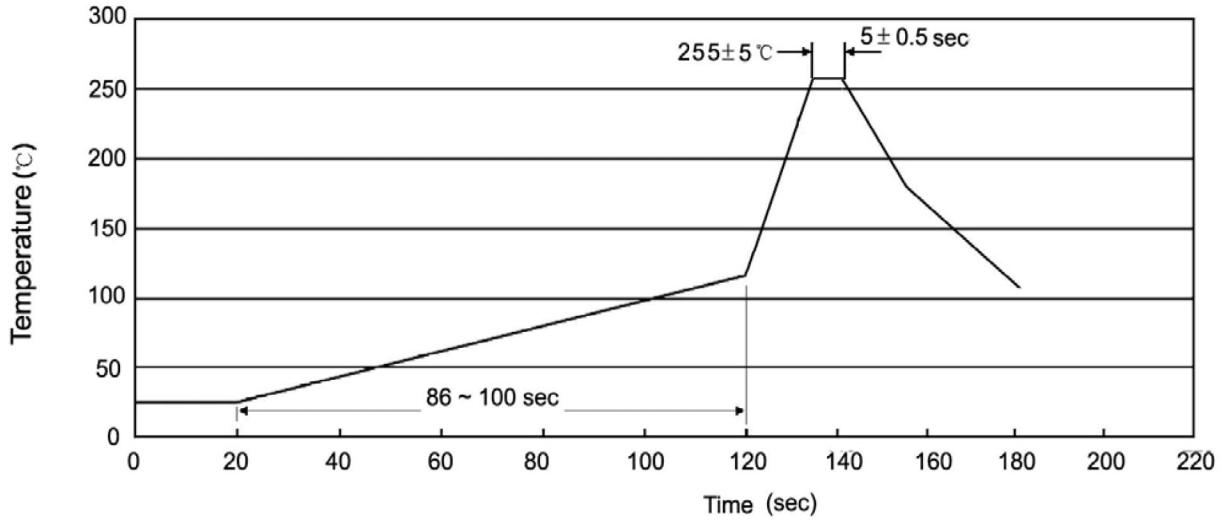
Note:

BR: Company Code.

LM317: Product Type.

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

**波峰焊温度曲线图(无铅) / Temperature Profile for Dip Soldering(Pb-Free)**



说明：

- 1、预热温度 25~150°C，时间 60~90sec;
- 2、峰值温度 255±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.:255±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：270±5°C      时间：10±1 sec.      Temp:270±5°C      Time:10±1 sec

**包装规格 / Packaging SPEC.**

散件包装 / BULK

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm3)		
	Units/Bag 只/袋	Bags/Inner Box 袋/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Bag 袋	Inner Box 盒	Outer Box 箱
TO-220/F	200	10	2,000	5	10,000	135×190	237×172×102	560×245×195

套管包装 / TUBE

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm3)		
	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-220/F	50	20	1,000	5	5,000	532×31.4×5.5	555×164×50	575×290×180

**使用说明 / Notices**