

### 描述 / Descriptions

TO-92LM 塑封封装 NPN 半导体三极管。Silicon NPN transistor in a TO-92LM Plastic Package.

### 特征 / Features

饱和压降  $V_{CE(sat)}$  小,  $h_{FE}$  高且线性极好。

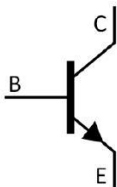
Low saturation voltage, excellent  $h_{FE}$  linearity and high  $h_{FE}$ .

### 用途 / Applications

用于 3 瓦音频放大输出, 电压调节器, 电源转换和继电器驱动。

Output stage of 3 watts audio amplifier, voltage regulator, DC-DC converter and relay driver.

### 内部等效电路 / Equivalent Circuit



### 引脚排列 / Pinning



PIN 1 : Base      PIN 2 : Collector      PIN 3 : Emitter

### 放大及印章代码 / $h_{FE}$ Classifications & Marking

| $h_{FE}$ Classifications Symbol | R      | Q       | P       | E       |
|---------------------------------|--------|---------|---------|---------|
| $h_{FE}$ Range                  | 60~120 | 100~200 | 160~320 | 200~400 |

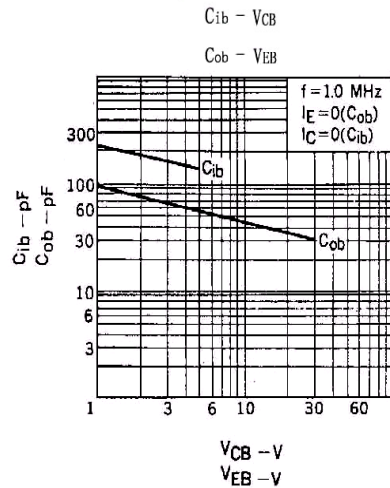
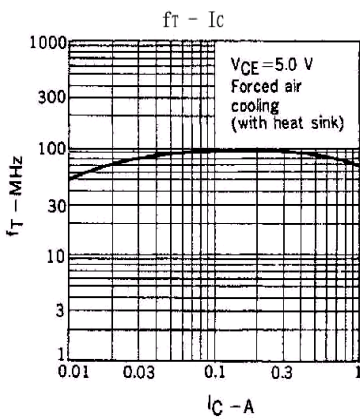
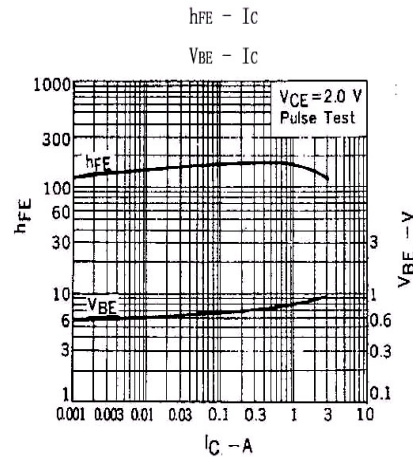
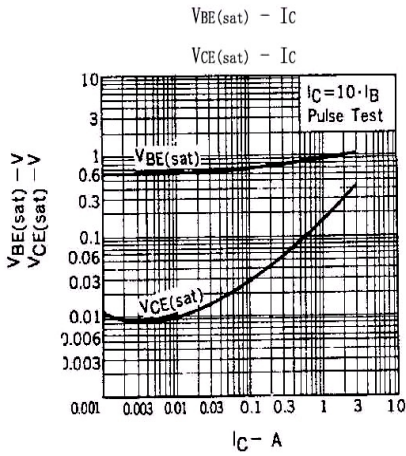
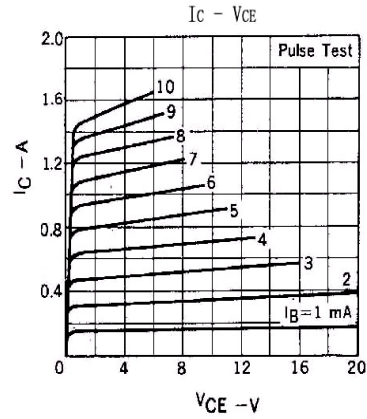
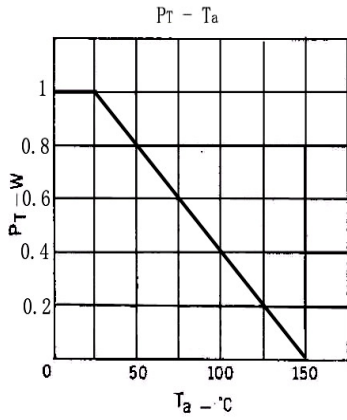
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

| 参数<br>Parameter              | 符号<br>Symbol | 数值<br>Rating | 单位<br>Unit |
|------------------------------|--------------|--------------|------------|
| Collector to Base Voltage    | $V_{CBO}$    | 40           | V          |
| Collector to Emitter Voltage | $V_{CEO}$    | 30           | V          |
| Emitter to Base Voltage      | $V_{EBO}$    | 5.0          | V          |
| Collector Current            | $I_C$        | 3.0          | A          |
| Collector Power Dissipation  | $P_C$        | 1.0          | W          |
| Junction Temperature         | $T_j$        | 150          | °C         |
| Storage Temperature Range    | $T_{stg}$    | -55~150      | °C         |

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

| 参数<br>Parameter                         | 符号<br>Symbol  | 测试条件<br>Test Conditions            | 最小值<br>Min | 典型值<br>Typ | 最大值<br>Max | 单位<br>Unit |
|-----------------------------------------|---------------|------------------------------------|------------|------------|------------|------------|
| Collector Cut-Off Current               | $I_{CBO}$     | $V_{CB}=30V$ $I_E=0$               |            |            | 1.0        | $\mu A$    |
| Emitter Cut-Off Current                 | $I_{EBO}$     | $V_{EB}=3.0V$ $I_C=0$              |            |            | 1.0        | $\mu A$    |
| DC Current Gain                         | $h_{FE(1)}$   | $V_{CE}=2.0V$ $I_C=1.0A$           | 60         | 160        | 400        |            |
|                                         | $h_{FE(2)}$   | $V_{CE}=2.0V$ $I_C=20mA$           | 30         | 150        |            |            |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=2.0A$ $I_B=0.2A$              |            | 0.3        | 0.5        | V          |
| Base to Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=2.0A$ $I_B=0.2A$              |            | 1.0        | 2.0        | V          |
| Transition Frequency                    | $f_T$         | $V_{CE}=5.0V$ $I_C=0.1A$           |            | 90         |            | MHz        |
| Collector Output Capacitance            | $C_{ob}$      | $V_{CB}=10V$ $I_E=0$<br>$f=1.0MHz$ |            | 45         |            | pF         |

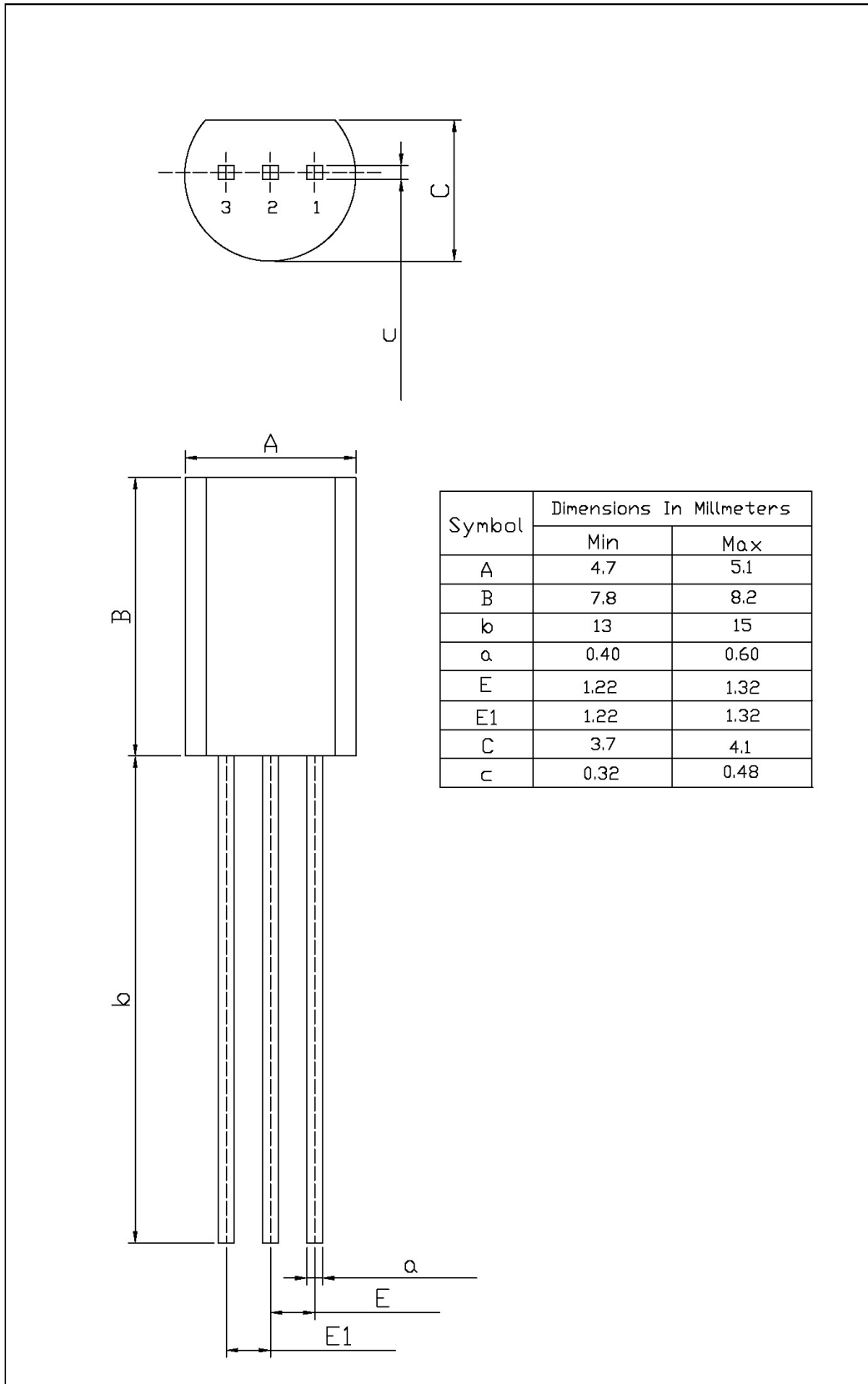
电参数曲线图 / Electrical Characteristic Curve



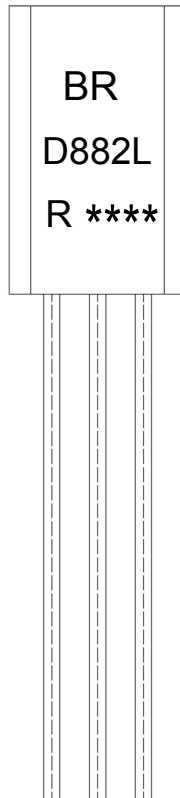
外形尺寸图 / Package Dimensions

T0-92LM

Unit: mm



印章说明 / Marking Instructions



说明：

BR: 为公司代码

D882L : 为型号代码

R: 为  $h_{FE}$  分档代码

\*\*\*\* : 为生产批号代码，随生产批号变化。

Note:

BR: Company Code.

D882L: Product Type.

R:  $h_{FE}$  Classifications Symbol

\*\*\*\*: 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<br>封装形式 | Units 包装数量       |                       |                        |                              |                        | Dimension 包装尺寸 (unit: mm3) |             |             |
|----------------------|------------------|-----------------------|------------------------|------------------------------|------------------------|----------------------------|-------------|-------------|
|                      | Units/Bag<br>只/袋 | Bags/Inner Box<br>袋/盒 | Units/Inner Box<br>只/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>只/箱 | Bag 袋                      | Inner Box 盒 | Outer Box 箱 |
| TO-92LM              | 1,000            | 8                     | 8,000                  | 5                            | 40,000                 | 135×190                    | 237×172×102 | 560×245×195 |

编带包装 / AMMO

| Package Type<br>封装形式 | Units 包装数量         |                        |                         |                              |                        | Dimension 包装尺寸 (unit: mm3) |                                  |
|----------------------|--------------------|------------------------|-------------------------|------------------------------|------------------------|----------------------------|----------------------------------|
|                      | Units/tape<br>只/纸带 | Tape/Inner Box<br>纸带/盒 | Rows/Inner Box<br>纸带层/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>只/箱 | Inner Box 盒                | Outer Box 箱                      |
| TO-92LM              | 2,500              | 1                      | 100                     | 10                           | 25,000                 | 328×230×42                 | 小箱 480×346×235<br>大箱 547×407×268 |

**使用说明 / Notices**