

## 描述 / Descriptions

SOT-89 塑封封装 NPN 半导体三极管。Silicon NPN transistor in a SOT-89 Plastic Package.

## 特征 / Features

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

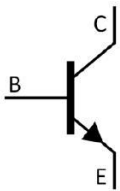
Low saturation voltage, excellent  $h_{FE}$  linearity and high  $h_{FE}$ . HF Product.

## 用途 / Applications

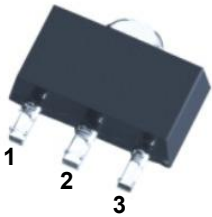
用于 3 瓦音频放大输出, 电压调节器, 电源转换和继电器驱动。

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



PIN1 : Base      PIN 2 : Collector      PIN 3 : Emitter

## 印章代码 / Marking

| $h_{FE}$ Classifications<br>Symbol | R           | Q           | P           | E           |
|------------------------------------|-------------|-------------|-------------|-------------|
| $h_{FE}$ Range                     | 60~120      | 100~200     | 160~320     | 200~400     |
| Marking                            | H82R *<br>* | H82Q *<br>* | H82P *<br>* | H82E *<br>* |

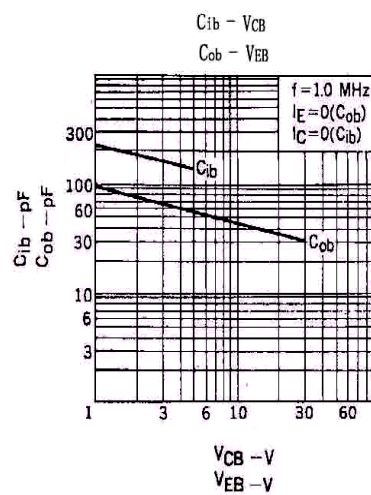
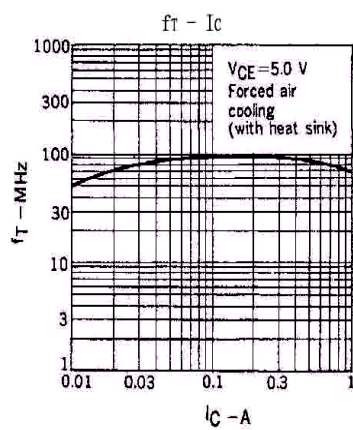
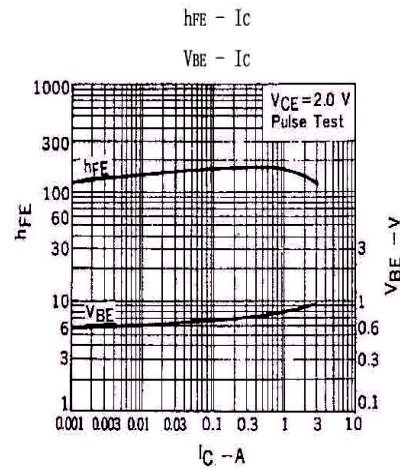
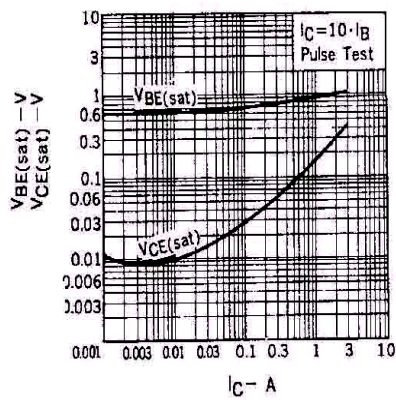
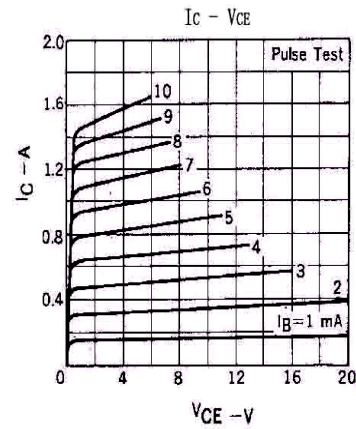
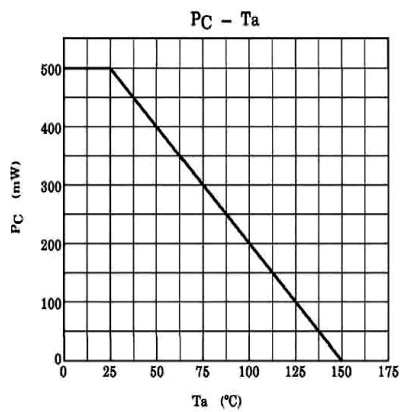
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

| 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-Continuous | $I_C$        | 3.0          | A          |
| Collector Power Dissipation  | $P_C$        | 500          | mW         |
| 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        | μA         |
| Emitter Base Cut-Off Current            | $I_{EBO}$     | $V_{EB}=3.0V$ $I_C=0$           |            |            | 1.0        | μA         |
| 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            | $C_{ob}$      | $V_{CB}=10V$ $f=1.0MHz$ $I_E=0$ |            | 45         |            | pF         |

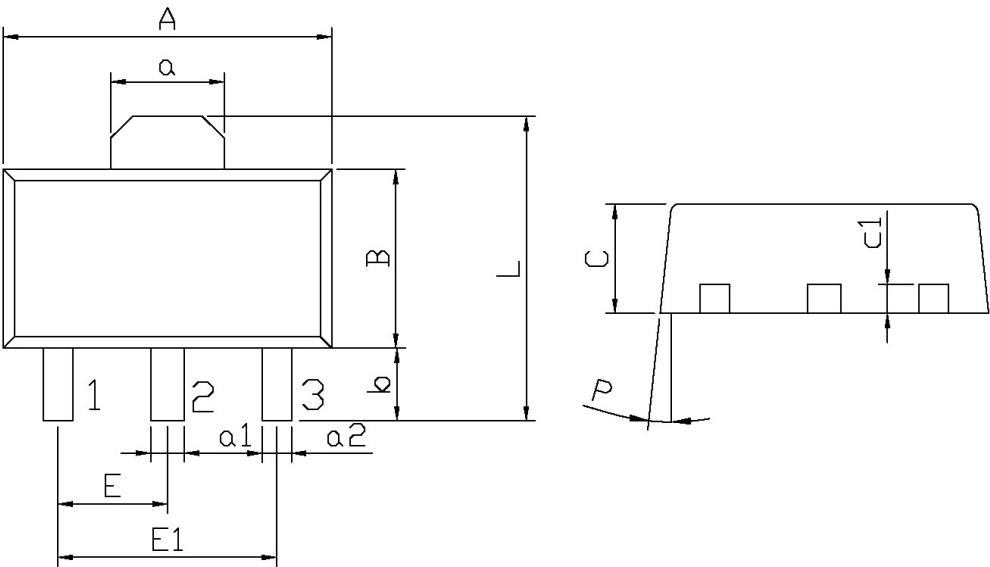
电参数曲线图 / Electrical Characteristic Curve



外形尺寸图 / Package Dimensions

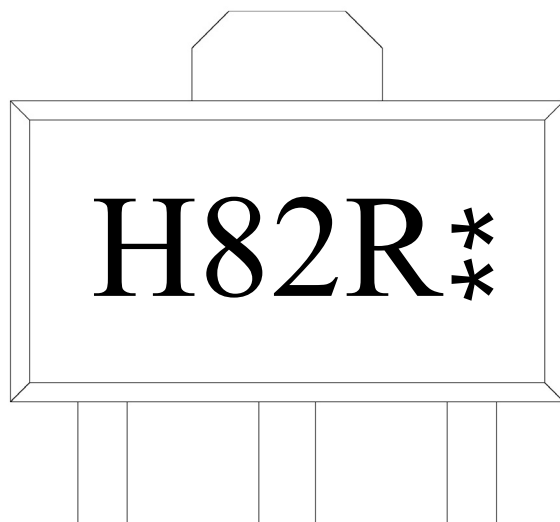
SOT-89

单位: mm



| Symbol | Dimensions In Millimeters |       | Symbol | Dimensions In Millimeters |      |
|--------|---------------------------|-------|--------|---------------------------|------|
|        | Min                       | Max   |        | Min                       | Max  |
| A      | 4.4                       | 4.7   | a1     | 0.36                      | 0.56 |
| B      | 2.35                      | 2.65  | a2     | 0.30                      | 0.50 |
| L      | 3.878                     | 4.478 | C      | 1.40                      | 1.70 |
| a      | 1.45                      | 1.65  | c1     | 0.35                      | 0.50 |
| E      | 1.40                      | 1.60  | P      | 6°                        |      |
| E1     | 2.80                      | 3.20  |        |                           |      |
| b      | 0.80                      | 1.20  |        |                           |      |

印章说明 / Marking Instructions



说明：

H： 为公司代码

82： 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:

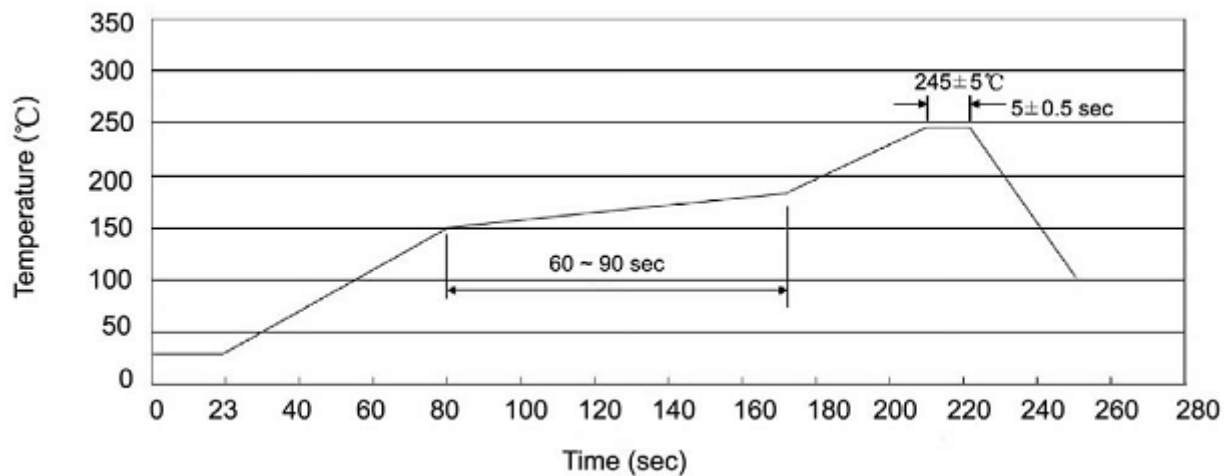
H: Company Code.

82: Product Type.

R:  $h_{FE}$  Classifications Symbol

\*\* : 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<br>封装形式 | Units 包装数量         |                         |                        |                              |                        | Dimension 包装尺寸 (unit: mm <sup>3</sup> ) |             |             |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|-----------------------------------------|-------------|-------------|
|                      | Units/Reel<br>只/卷盘 | Reels/Inner Box<br>卷盘/盒 | Units/Inner Box<br>只/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>只/箱 | Reel                                    | Inner Box 盒 | Outer Box 箱 |
| SOT-89               | 1,000              | 7                       | 7,000                  | 6                            | 42000                  | 7" ×12                                  | 180×120×180 | 390×385×205 |

### 使用说明 / Notices