

### 描述 / Descriptions

TO-220F 塑封封装 PNP 半导体三极管。Silicon PNP transistor in a TO-220F Plastic Package.

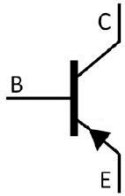
### 特征 / Features

$h_{FE}$  线性好,与 KTD2060 互补。  
Good Linearity of  $h_{FE}$ , complementary pair with KTD2060.

### 用途 / Applications

用于一般放大。  
General Purpose Application.

### 内部等效电路 / Equivalent Circuit



### 引脚排列 / Pinning



PIN1 : Base      PIN 2 : Collector      PIN 3 : Emitter

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

|                                    |       |        |         |
|------------------------------------|-------|--------|---------|
| $h_{FE}$ Classifications<br>Symbol | R     | O      | Y       |
| $h_{FE}$ Range                     | 40~80 | 70~140 | 120~240 |

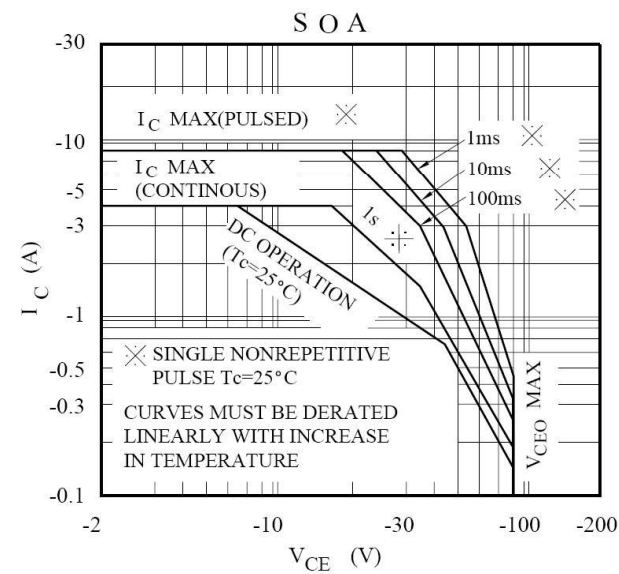
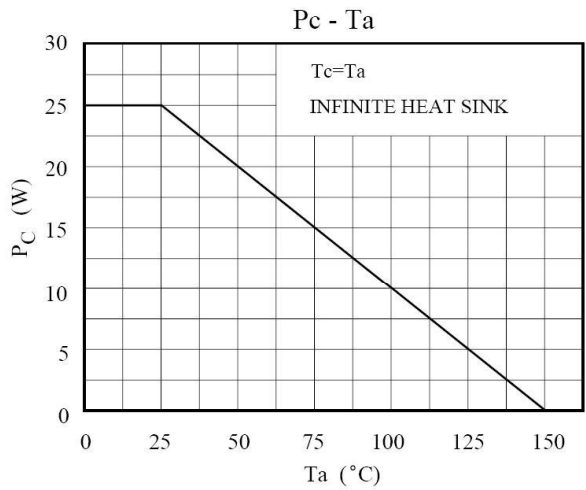
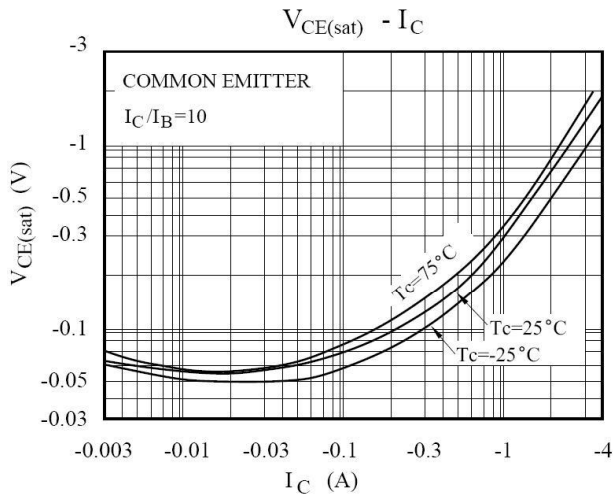
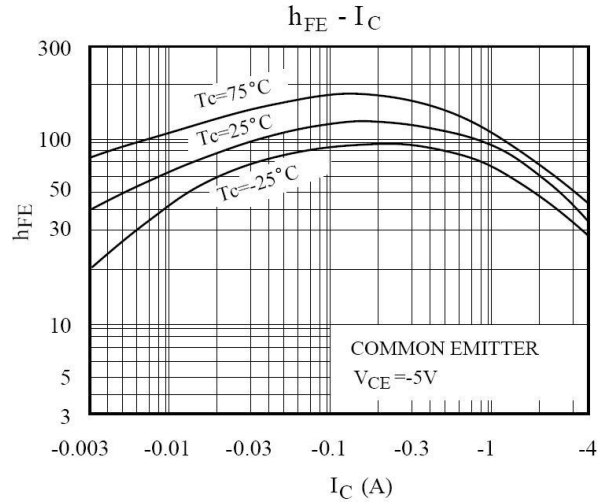
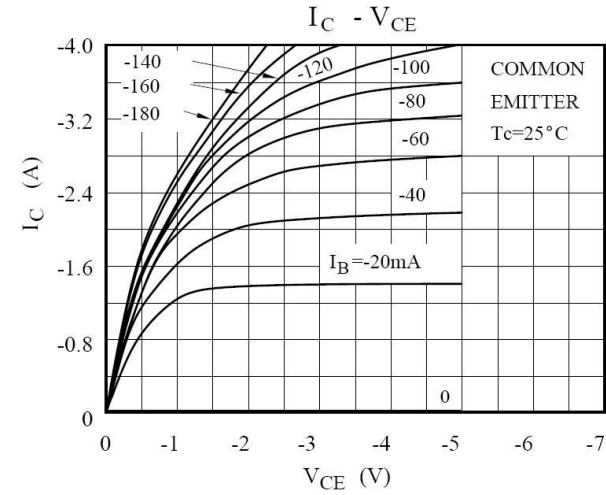
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

| 参数<br>Parameter                | 符号<br>Symbol                | 数值<br>Rating | 单位<br>Unit |
|--------------------------------|-----------------------------|--------------|------------|
| Collector to Base Voltage      | $V_{CBO}$                   | -80          | V          |
| Collector to Emitter Voltage   | $V_{CEO}$                   | -80          | V          |
| Emitter to Base Voltage        | $V_{EBO}$                   | -5           | V          |
| Collector Current - Continuous | $I_C$                       | -4           | A          |
| Base Current                   | $I_B$                       | -0.4         | A          |
| Collector Power Dissipation    | $P_C(T_c=25^\circ\text{C})$ | 25           | 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-Emitter Breakdown Voltage     | $V_{CEO}$     | $I_C=-50\text{mA}$ $I_B=0$                        | -80        |            |            | V             |
| Collector Cut-Off Current               | $I_{CBO}$     | $V_{CB}=-80\text{V}$ $I_E=0$                      |            |            | -30        | $\mu\text{A}$ |
| Emitter Cut-Off Current                 | $I_{EBO}$     | $V_{EB}=-5.0\text{V}$ $I_C=0$                     |            |            | -100       | $\mu\text{A}$ |
| DC Current Gain                         | $h_{FE(1)}$   | $V_{CE}=-5.0\text{V}$ $I_C=-0.5\text{A}$          | 40         |            | 240        |               |
|   | $h_{FE(2)}$   | $V_{CE}=-5.0\text{V}$ $I_C=-3.0\text{A}$          | 15         |            |            |               |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=-3.0\text{A}$ $I_B=-0.3\text{A}$             |            | -1.0       | -1.7       | V             |
| Base-Emitter Voltage                    | $V_{BE}$      | $V_{CE}=-5.0\text{V}$ $I_C=-3.0\text{A}$          |            | -1.0       | -1.5       | V             |
| Transition Frequency                    | $f_T$         | $I_C=-0.5\text{A}$ $V_{CE}=-5.0\text{V}$          |            | 9.0        |            | MHz           |
| Collector output capacitance            | $C_{ob}$      | $V_{CB}=-10\text{V}$ $I_E=0$<br>$f=1.0\text{MHz}$ |            | 130        |            | pF            |

**电参数曲线图 / Electrical Characteristic Curve**



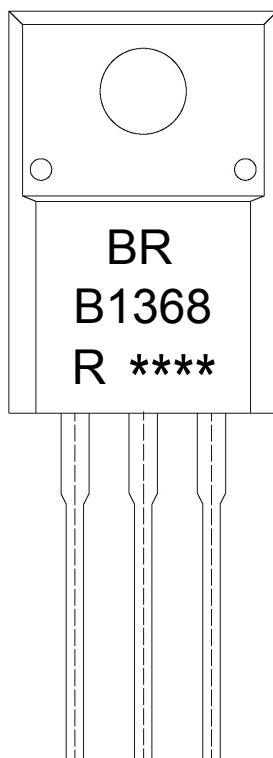
外形尺寸图 / Package Dimensions

TO-220F

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

B1368： 为型号代码

R： 为档次代码

\*\*\*\*： 为生产批号代码，随生产批号变化。

Note:

BR: Company Code.

B1368: 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-220F              | 200              | 10                    | 2,000                  | 5                            | 10,000                 | 135×190                    | 237×172×102 | 560×245×195 |

套管包装 / TUBE

| Package Type<br>封装形式 | Units 包装数量         |                         |                        |                              |                        | Dimension 包装尺寸 (unit: mm3) |             |             |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|----------------------------|-------------|-------------|
|                      | Units/Tube<br>只/套管 | Tubes/Inner Box<br>套管/盒 | Units/Inner Box<br>只/盒 | Inner Boxes/Outer Box<br>盒/箱 | Units/Outer Box<br>只/箱 | Tube 套管                    | Inner Box 盒 | Outer Box 箱 |
| TO-220F              | 50                 | 20                      | 1,000                  | 5                            | 5,000                  | 532×31.4×5.5               | 555×164×50  | 575×290×180 |

**使用说明 / Notices**