

### 描述 / Descriptions

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

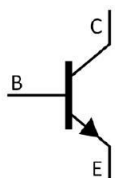
### 特征 / Features

饱和压降低，与 KTB1366 互补。  
Low saturation voltage, complementary to KTB1366.

### 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 Symbol | O      | Y       |
| $h_{FE}$ Range                  | 60~120 | 100~200 |

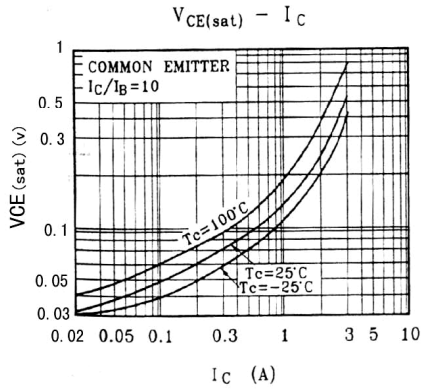
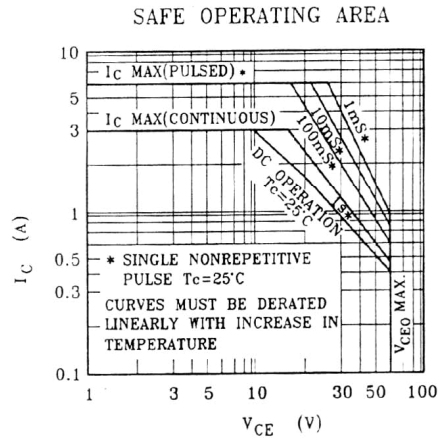
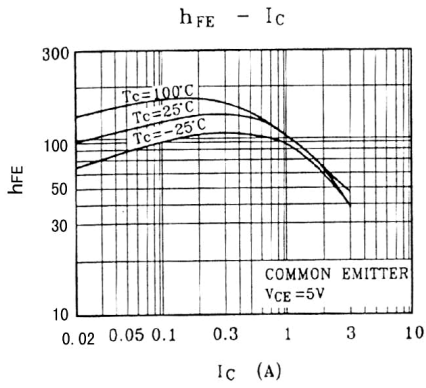
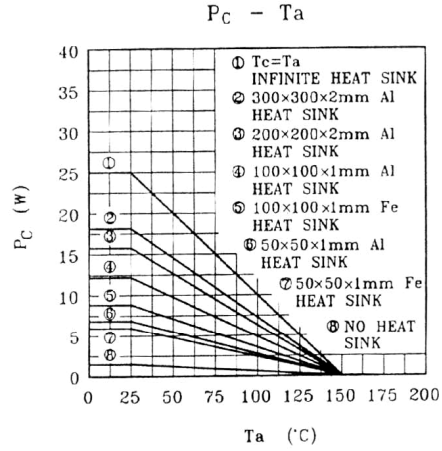
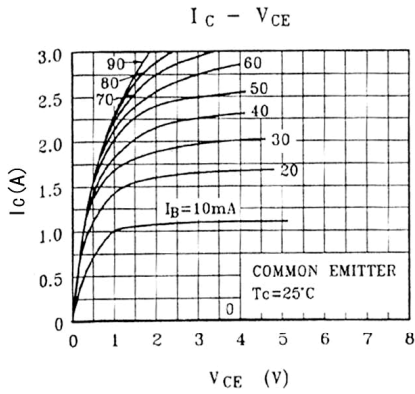
**极限参数 / Absolute Maximum Ratings(Ta=25°C)**

| 参数<br>Parameter                | 符号<br>Symbol          | 数值<br>Rating | 单位<br>Unit |
|--------------------------------|-----------------------|--------------|------------|
| Collector to Base Voltage      | $V_{CBO}$             | 60           | V          |
| Collector to Emitter Voltage   | $V_{CEO}$             | 60           | V          |
| Emitter to Base Voltage        | $V_{EBO}$             | 7.0          | V          |
| Collector Current - Continuous | $I_C$                 | 3.0          | A          |
| Base Current                   | $I_B$                 | 0.5          | A          |
| Collector Power Dissipation    | $P_C$                 | 2.0          | W          |
| Collector Power Dissipation    | $P_C(T_c=25^\circ C)$ | 25           | W          |
| Junction Temperature           | $T_j$                 | 150          | °C         |
| Storage Temperature Range      | $T_{sag}$             | -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     | $V_{CEO}$     | $I_C=50mA$ $I_B=0$                 | 60         |            |            | V          |
| Collector Cut-Off Current               | $I_{CBO}$     | $V_{CB}=60V$ $I_E=0$               |            |            | 100        | μA         |
| Emitter Cut-Off Current                 | $I_{EBO}$     | $V_{EB}=7.0V$ $I_C=0$              |            |            | 100        | μA         |
| DC Current Gain                         | $h_{FE}$      | $V_{CE}=5.0V$ $I_C=500mA$          | 60         |            | 200        |            |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=2.0A$ $I_B=200mA$             |            | 0.25       | 1.0        | V          |
| Base-Emitter Voltage                    | $V_{BE}$      | $V_{CE}=5.0V$ $I_C=500mA$          |            | 0.7        | 1.0        | V          |
| Transition Frequency                    | $f_T$         | $V_{CE}=5.0V$ $I_C=500mA$          |            | 3.0        |            | MHz        |
| Collector output capacitance            | $C_{ob}$      | $V_{CB}=10V$ $I_E=0$<br>$f=1.0MHz$ |            | 35         |            | pF         |
| Turn-On Time                            | $t_{on}$      | $I_{B1}=-I_{B2}=0.2A$              |            | 0.65       |            | μS         |
| Storage Time                            | $t_{stg}$     | $I_{B1}=-I_{B2}=0.2A$              |            | 1.3        |            | μS         |
| Fall Time                               | $t_f$         | $I_{B1}=-I_{B2}=0.2A$              |            | 0.65       |            | μS         |

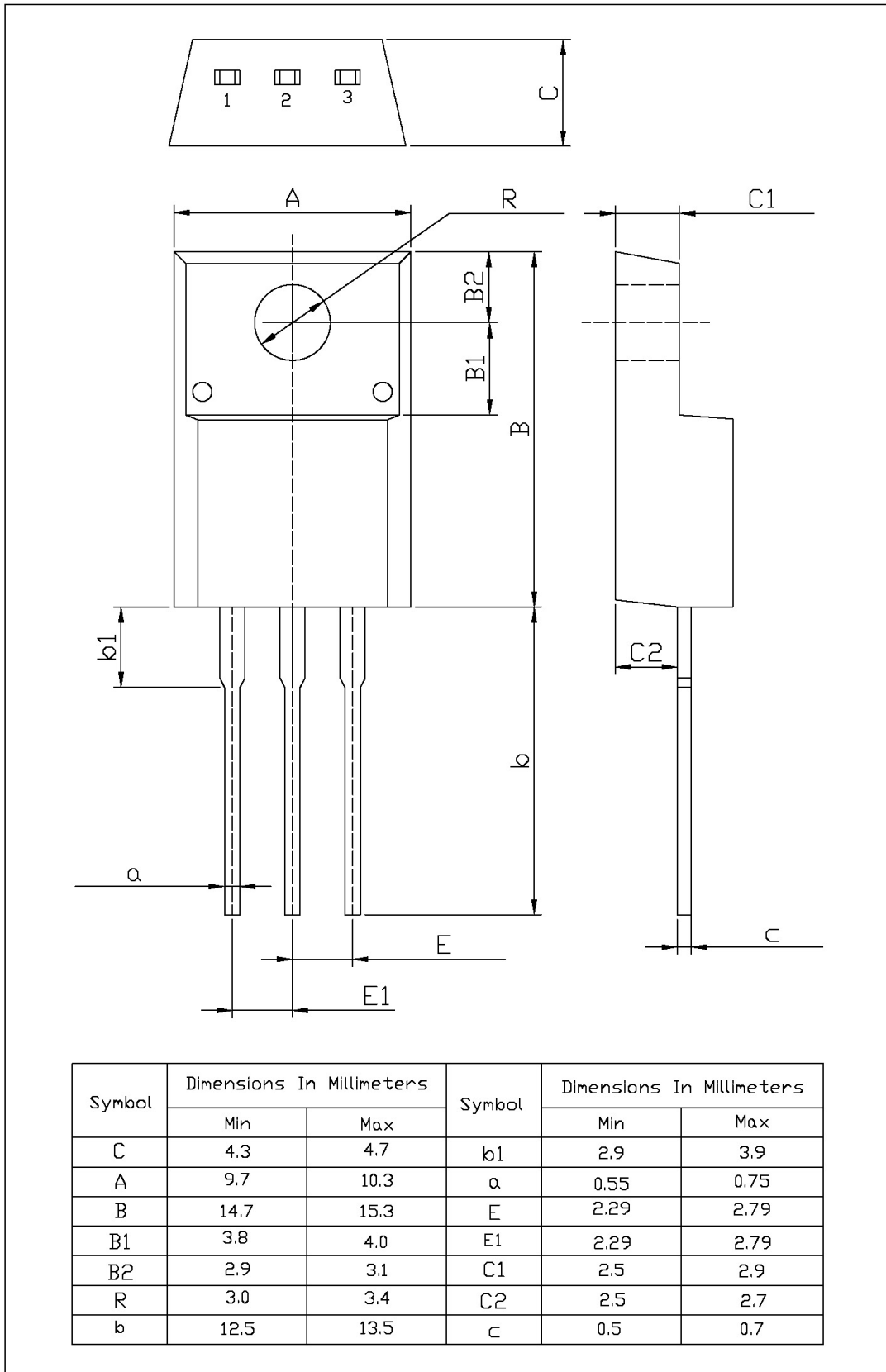
**电参数曲线图 / Electrical Characteristic Curve**



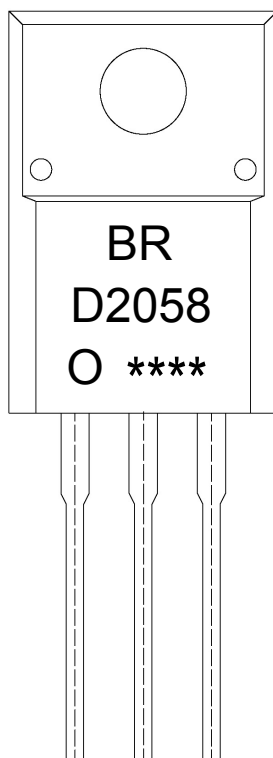
外形尺寸图 / Package Dimensions

T□-220F

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

D2058： 为型号代码

O： 为档次代码

\*\*\*\*： 为生产批号代码，随生产批号变化。

Note:

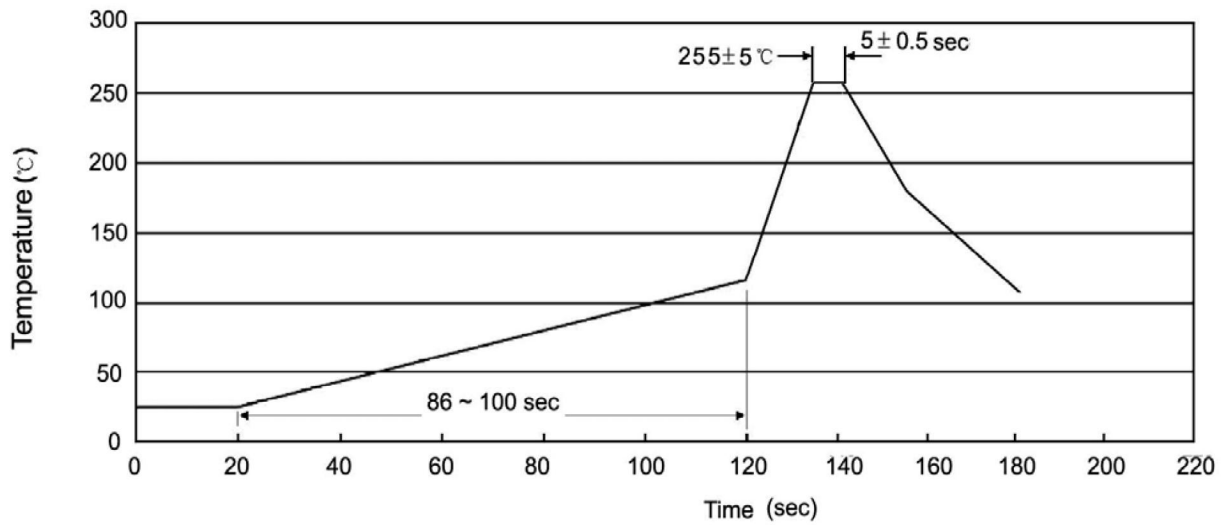
BR: Company Code.

D2058: Product Type.

O:  $h_{FE}$  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**