

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

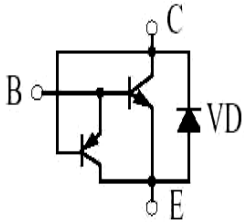
耐压高、稳定性好、N 沟道晶体管，一致性好、可靠性高，开关速度快。

NPN transistor, high voltage capability, low spread of dynamic parameters, minimum lot-to-lot spread for Reliable operation, very high switching speed.

用途 / Applications

用于电子荧光灯和低功率快速转换。

Electronic ballasts for fluorescent lighting, flyback and forward single transistor low power converters .

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

见印章说明。See Marking Instructions.

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

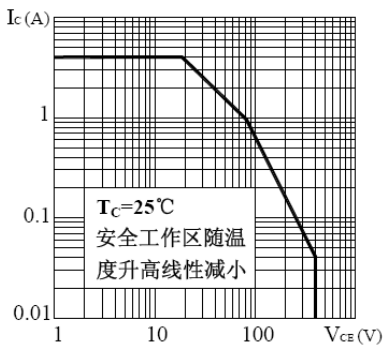
| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit |
|--------------------------------|-----------------------|--------------|------------|
| Collector to Base Voltage | V_{CBO} | 700 | V |
| Collector to Emitter Voltage | V_{CEO} | 400 | V |
| Emitter to Base Voltage | V_{EBO} | 9.0 | V |
| Collector Current - Continuous | I_C | 4.0 | A |
| Collector Power Dissipation | P_C | 2.0 | W |
| Collector Power Dissipation | $P_C(T_c=25^\circ C)$ | 75 | 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)

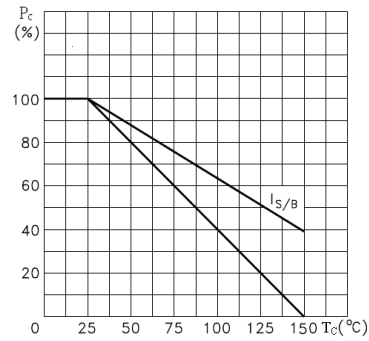
| 参数 Parameter | 符号 Symbol | 测试条件 Test Conditions | 最小值 Min | 典型值 Typ | 最大值 Max | 单位 Unit |
|-----------------------------------------|---------------|---------------------------------------|------------|------------|------------|------------|
| Collector to Base Breakdown Voltage | V_{CBO} | $I_C=1mA$ $I_E=0$ | 700 | | | V |
| Collector to Emitter Breakdown Voltage | V_{CEO} | $I_C=10mA$ $I_B=0$ | 400 | | | V |
| Emitter to Base Breakdown Voltage | V_{EBO} | $I_E=1mA$ $I_C=0$ | 9.0 | | | V |
| Emitter Base Cut-Off Current | I_{CBO} | $V_{CB}=700V$ $I_E=0$ | | | 0.1 | mA |
| Collector Cut-Off Current | I_{CEO} | $V_{CE}=400V$ $I_B=0$ | | | 0.1 | mA |
| Collector cut-off current | I_{EBO} | $V_{EB}=9.0V$ $I_C=0$ | | | 0.1 | mA |
| DC Current Gain | h_{FE} | $V_{CE}=5.0V$ $I_C=1.0A$ | 10 | | 40 | |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=2.0A$ $I_B=0.5A$ | | | 0.8 | V |
| Base to Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C=2.0A$ $I_B=0.5A$ | | | 1.2 | V |
| Transition Frequency | f_T | $V_{CE}=10V$ $I_C=0.5A$ $f=1.0MHz$ | 7.0 | | | MHz |
| Fall time | t_f | $V_{CE}=5V$ $I_C=0.5A$ (UI9600) | | | 0.8 | μs |
| Storage time | t_s | | | | 4.0 | μs |

电参数曲线图 / Electrical Characteristic Curve

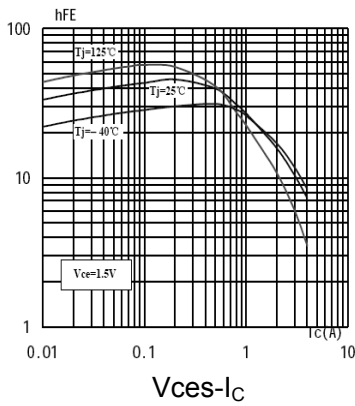
SOA(DC)



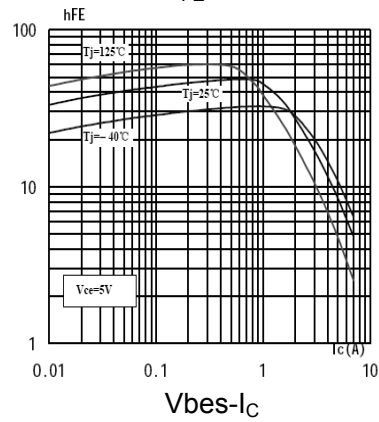
P_C-T_C



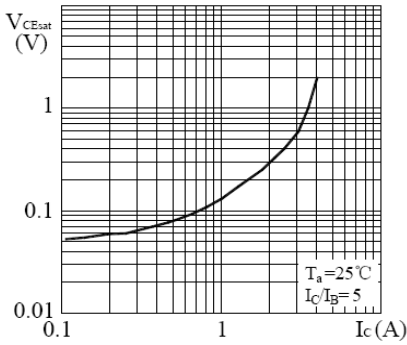
$h_{FE}-I_C$



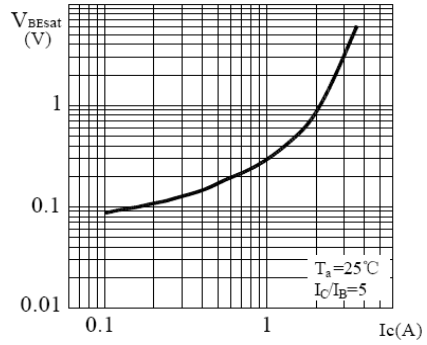
$h_{FE}-I_C$



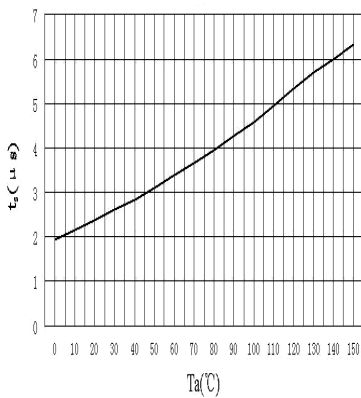
$V_{CEsat}-I_C$



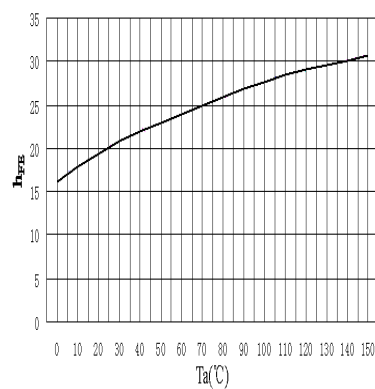
$V_{BEsat}-I_C$



t_s-T_a



$h_{FE}-T_a$



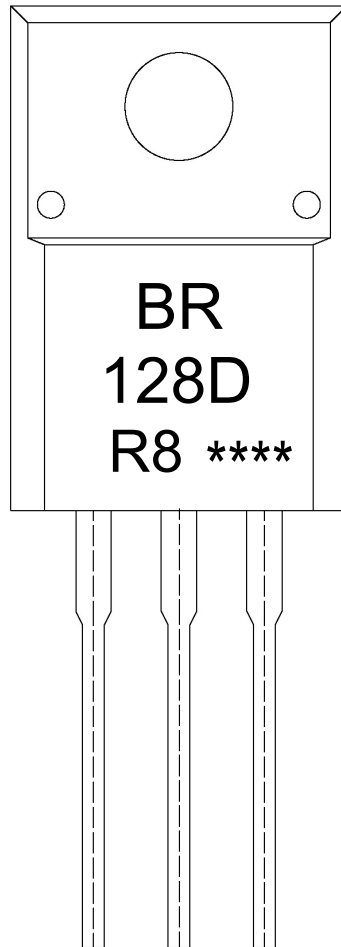
外形尺寸图 / Package Dimensions

TO-220F

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

128D： 为型号代码

R8： 为规格代码

****： 为生产批号代码，随生产批号变化。

Note:

BR: Company Code

128D: Product Type.

R8: Specification Code

****: 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: mm ³) | | |
|----------------------|------------------|-----------------------|------------------------|------------------------------|------------------------|-----------------------------------------|-------------|-------------|
| | 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: mm ³) | | |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|-----------------------------------------|-------------|-------------|
| | 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