

描述 / Descriptions

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

特征 / Features

饱和压降低，开关速度快，耗散功耗大。

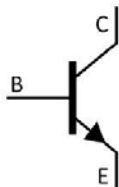
Low collector-to-emitter saturation voltage, high-speed switching, high allowable power dissipation.

用途 / Applications

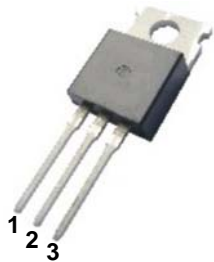
直流-直流转换，继电器驱动，闪光灯驱动，电机驱动。

DC-DC converter, relay drivers, lamp drivers motor drivers.

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.

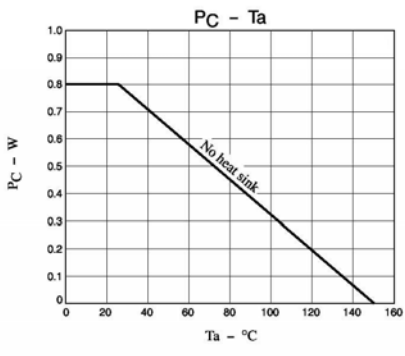
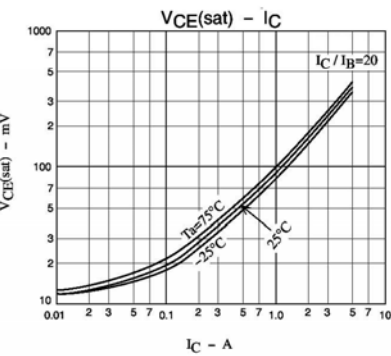
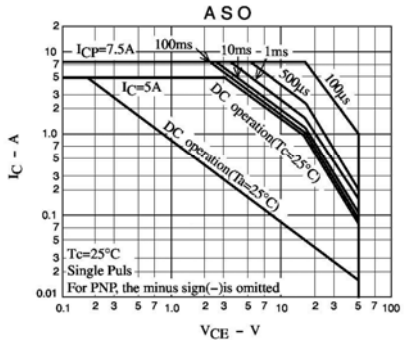
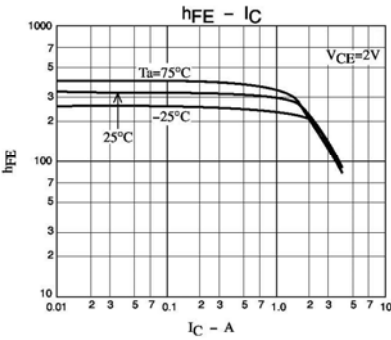
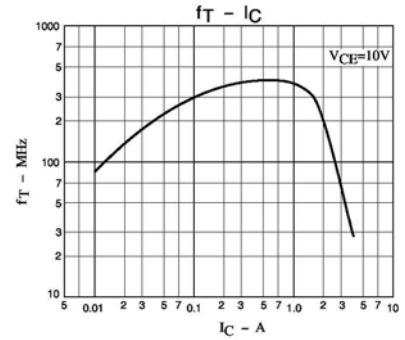
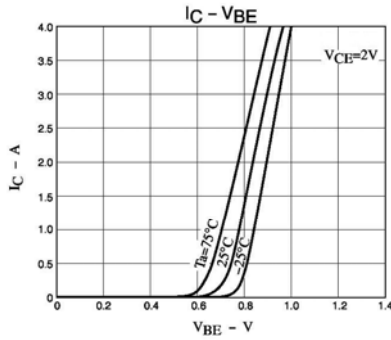
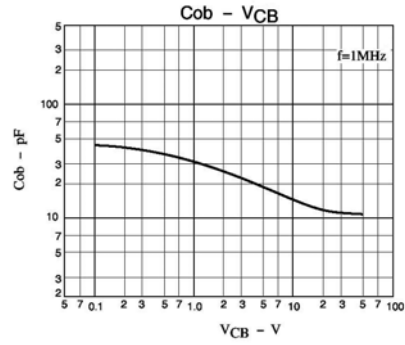
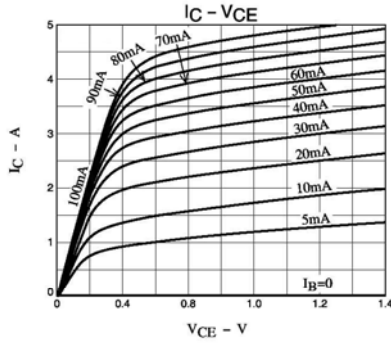
极限参数 / Absolute Maximum Ratings(Ta=25°C)

| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit |
|--------------------------------|-----------------------------|--------------|------------|
| Collector to Base Voltage | V_{CBO} | 80 | V |
| Collector to Emitter Voltage | V_{CEO} | 50 | V |
| Collector to Emitter Voltage | V_{CES} | 80 | V |
| Emitter to Base Voltage | V_{EBO} | 6.0 | V |
| Collector Current - Continuous | I_C | 5.0 | A |
| Peak Collector Current | I_{CP} | 7.5 | A |
| Base Current - Continuous | I_B | 1.2 | A |
| Collector Power Dissipation | P_C | 2 | W |
| | $P_C(T_C=25^\circ\text{C})$ | 15 | 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} | $I_C=0.01\text{mA}$ $I_E=0$ | 80 | | | V |
| Collector to Emitter Breakdown Voltage | V_{CES} | $I_C=0.1\text{mA}$ $R_{BE}=0$ | 80 | | | V |
| Collector to Emitter Breakdown Voltage | V_{CEO} | $I_C=1.0\text{mA}$ $R_{BE}=\infty$ | 50 | | | V |
| Emitter to Base Breakdown Voltage | V_{EBO} | $I_C=0.01\text{mA}$ $I_C=0$ | 6.0 | | | V |
| Collector Cut-Off Current | I_{CBO} | $V_{CB}=40\text{V}$ $I_E=0$ | | | 1.0 | μA |
| Emitter Cut-Off Current | I_{EBO} | $V_{EB}=4.0\text{V}$ $I_C=0$ | | | 1.0 | μA |
| DC Current Gain | h_{FE} | $V_{CE}=2.0\text{V}$ $I_C=0.5\text{A}$ | 200 | | 560 | |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)(1)}$ | $I_C=1.0\text{A}$ $I_B=0.05\text{A}$ | | 0.09 | 0.135 | V |
| | $V_{CE(sat)(2)}$ | $I_C=2.0\text{A}$ $I_B=0.1\text{A}$ | | 0.16 | 0.24 | V |
| Base to Emitter Saturation Voltage | $V_{BE(sat)}$ | $V_{CE}=2.0\text{V}$ $I_C=0.1\text{A}$ | | 0.89 | 1.2 | V |
| Transition Frequency | f_T | $V_{CE}=10\text{V}$ $I_C=0.5\text{A}$ | | 400 | | MHz |
| Collector output capacitance | C_{ob} | $V_{CB}=10\text{V}$ $f=1.0\text{MHz}$ | | 15 | | pF |
| Turn-On Time | t_{on} | $V_{CC}=25\text{V}$ $10I_{B1}=-10I_{B2}=I_C=1\text{A}$ | | 35 | | ns |
| Storage Time | t_{stg} | | | 300 | | |
| Fall Time | t_f | | | 20 | | |

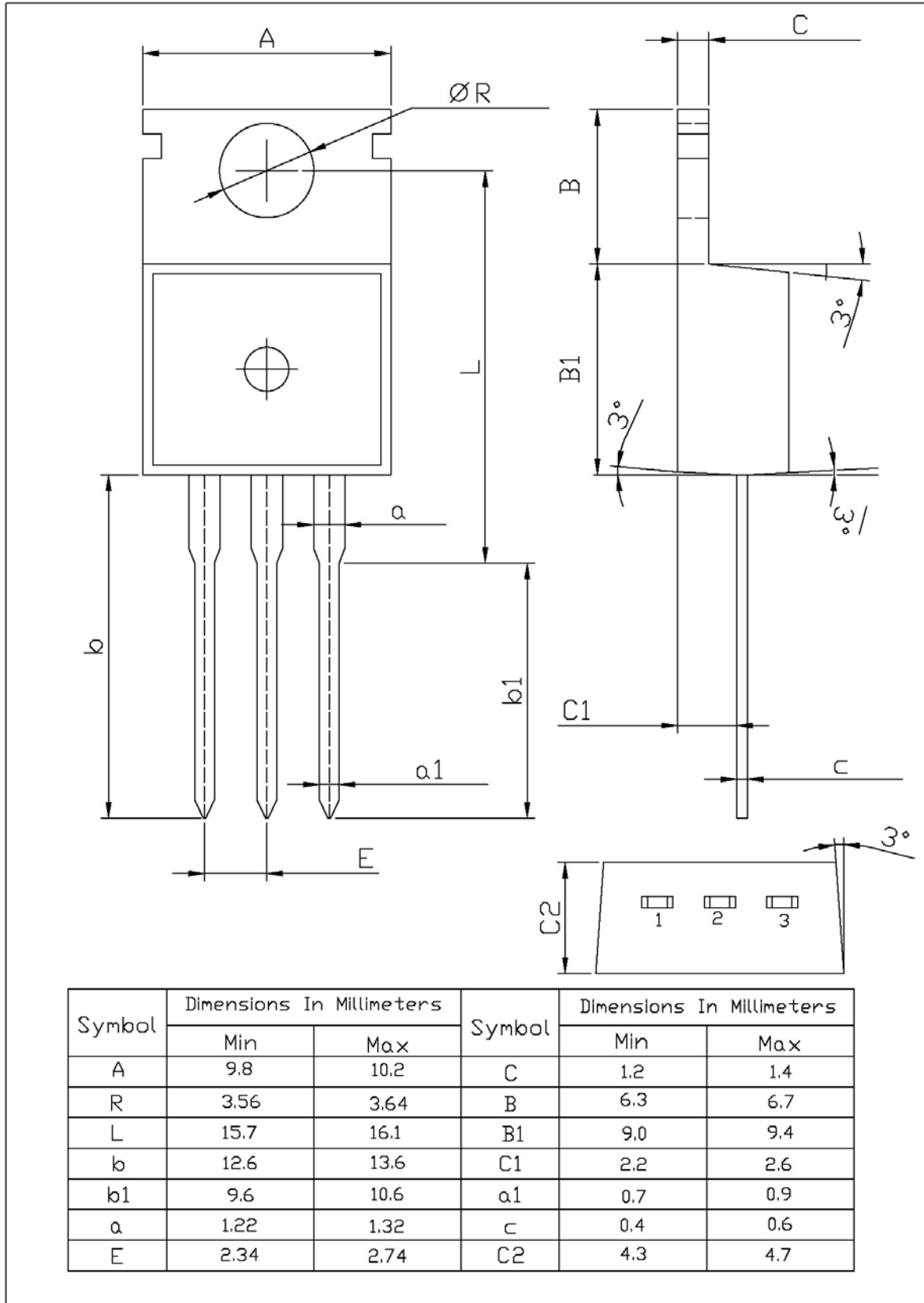
电参数曲线图 / Electrical Characteristic Curve



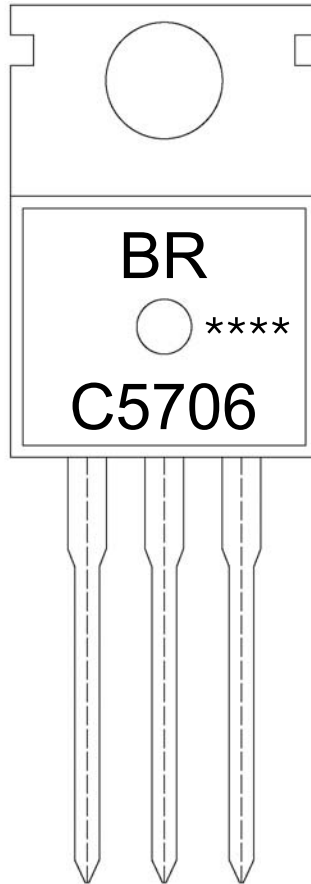
外形尺寸图 / Package Dimensions

T0-220

单位: mm



印章说明 / Marking Instructions



说明：

BR： 为公司代码

C5706： 为型号代码

****： 为生产批号代码，随生产批号变化。

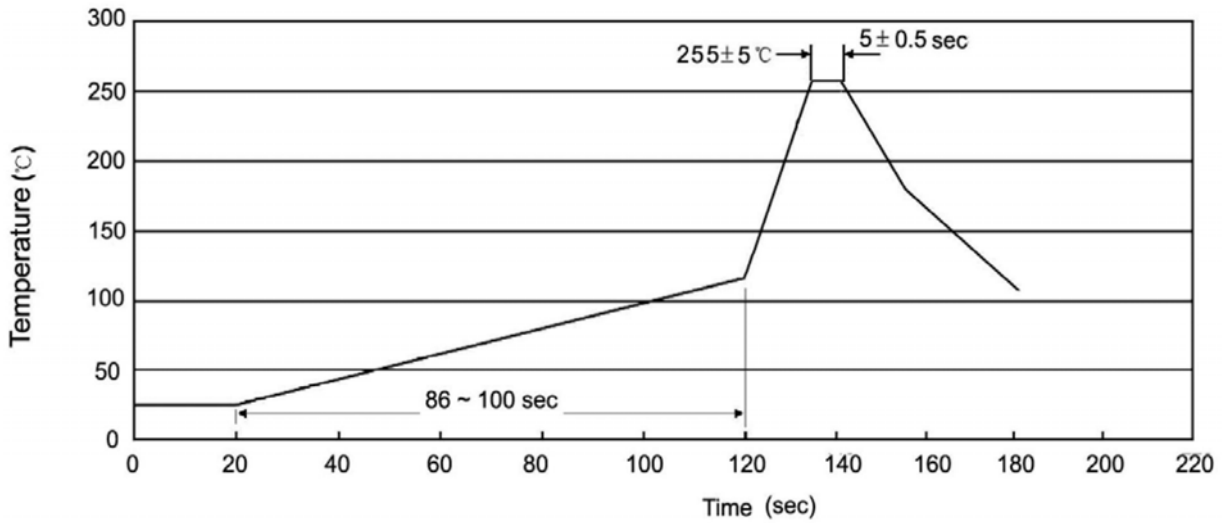
Note:

BR: Company Code

C5706: Product Type.

****: 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