

MMBT4401

Rev.B Dec.-2021

描述 / Descriptions

SOT-23 塑封封装 NPN 半导体三极管。Silicon NPN transistor in a SOT-23 Plastic Package.

特征 / Features

水分敏感等级：1，ESD 额定值：人体 4kV,机器 400V。无卤产品。

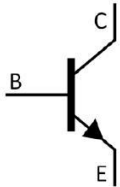
Moisture Sensitivity Level: 1, ESD Rating: Human Body Model; 4 kV, Machine Model; 400 V.HF Product.

用途 / Applications

用于 I_c 电流达 500mA 的中功率放大及开关电路。

Medium power amplifier and switch requiring collector currents up to 500 mA.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : Base PIN 2 : Emitter PIN 3 : Collector

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

| | |
|----------------|---------|
| h_{FE} Range | 100~300 |
| Marking | H2X |

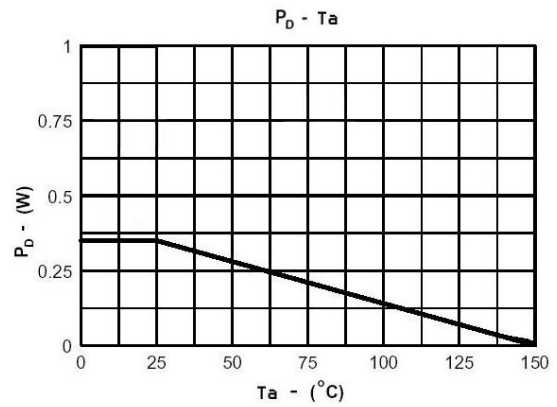
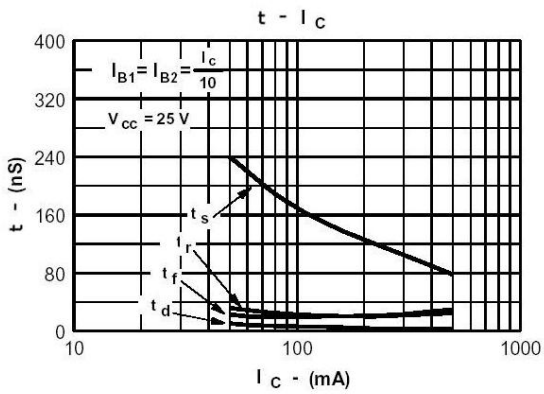
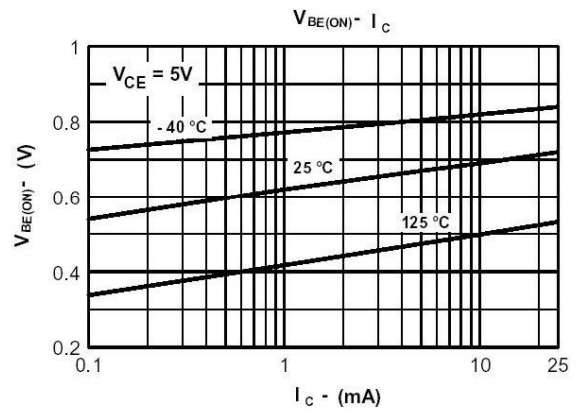
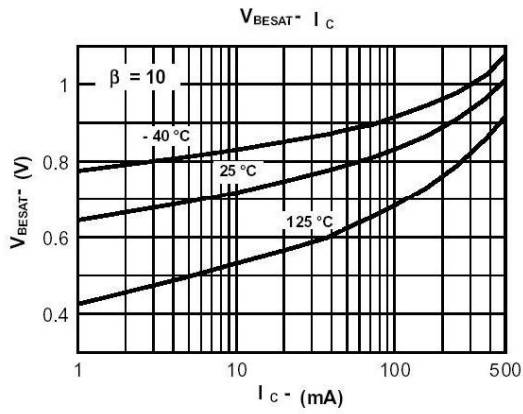
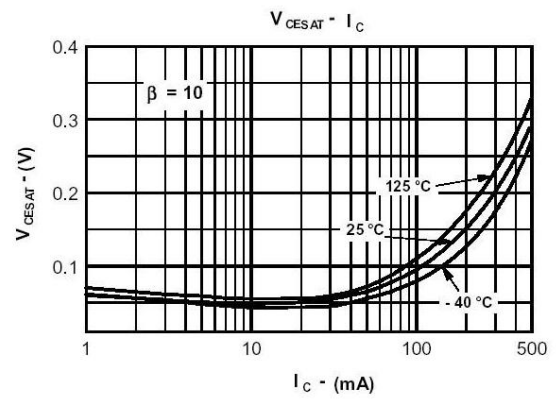
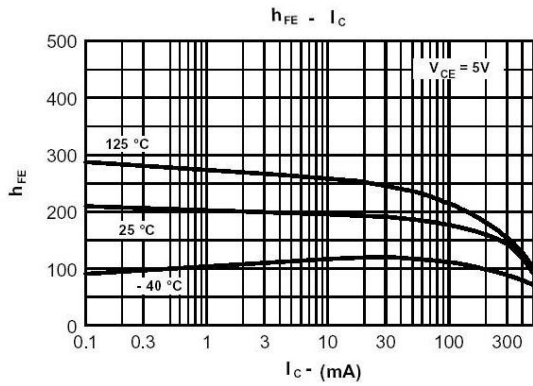
极限参数 / Absolute Maximum Ratings(Ta=25°C)

| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit |
|------------------------------|--------------|--------------|------------|
| Collector to Base Voltage | V_{CBO} | 60 | V |
| Collector to Emitter Voltage | V_{CEO} | 40 | V |
| Emitter to Base Voltage | V_{EBO} | 6.0 | V |
| Collector Current | I_C | 600 | mA |
| Collector Power Dissipation | P_C | 350 | 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 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 Emitter Breakdown Voltage | V_{CEO} | $I_C=1.0mA$ $I_B=0$ | 40 | | | V |
| Collector to Base Breakdown Voltage | V_{CBO} | $I_C=0.1mA$ $I_E=0$ | 60 | | | V |
| Emitter to Base Breakdown Voltage | V_{EBO} | $I_E=0.1mA$ $I_C=0$ | 6.0 | | | V |
| Collector Cut-Off Current | I_{CBO} | $V_{CB}=60V$ $I_E=0$ | | | 50 | nA |
| Emitter Cut-Off Current | I_{EBO} | $V_{EB}=6.0V$ $I_C=0$ | | | 50 | nA |
| DC Current Gain | $h_{FE(1)}$ | $V_{CE}=1.0V$ $I_C=150mA$ | 100 | | 300 | |
| | $h_{FE(2)}$ | $V_{CE}=2.0V$ $I_C=500mA$ | 40 | | | |
| | $h_{FE(3)}$ | $V_{CE}=1.0V$ $I_C=10mA$ | 80 | | | |
| | $h_{FE(4)}$ | $V_{CE}=1.0V$ $I_C=1.0mA$ | 40 | | | |
| | $h_{FE(5)}$ | $V_{CE}=1.0V$ $I_C=0.1mA$ | 20 | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)(1)}$ | $I_C=150mA$ $I_B=15mA$ | | | 0.4 | V |
| | $V_{CE(sat)(2)}$ | $I_C=500mA$ $I_B=50mA$ | | | 0.75 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)(1)}$ | $I_C=150mA$ $I_B=15mA$ | 0.75 | | 0.95 | V |
| | $V_{BE(sat)(2)}$ | $I_C=500mA$ $I_B=50mA$ | | | 1.2 | V |
| Transition Frequency | f_T | $V_{CE}=10V$ $I_C=20mA$ $f=100MHz$ | 250 | | | MHz |
| Delay Time | t_d | $V_{CC}=30V$ $I_C=150mA$ | | | 15 | ns |
| Rise Time | t_r | $I_{B1}=15mA$ | | | 20 | ns |
| Storage Time | t_s | $V_{CC}=30V$ $I_C=150mA$ | | | 225 | ns |
| Fall Time | t_f | $I_{B1}=-I_{B2}=15mA$ | | | 30 | ns |

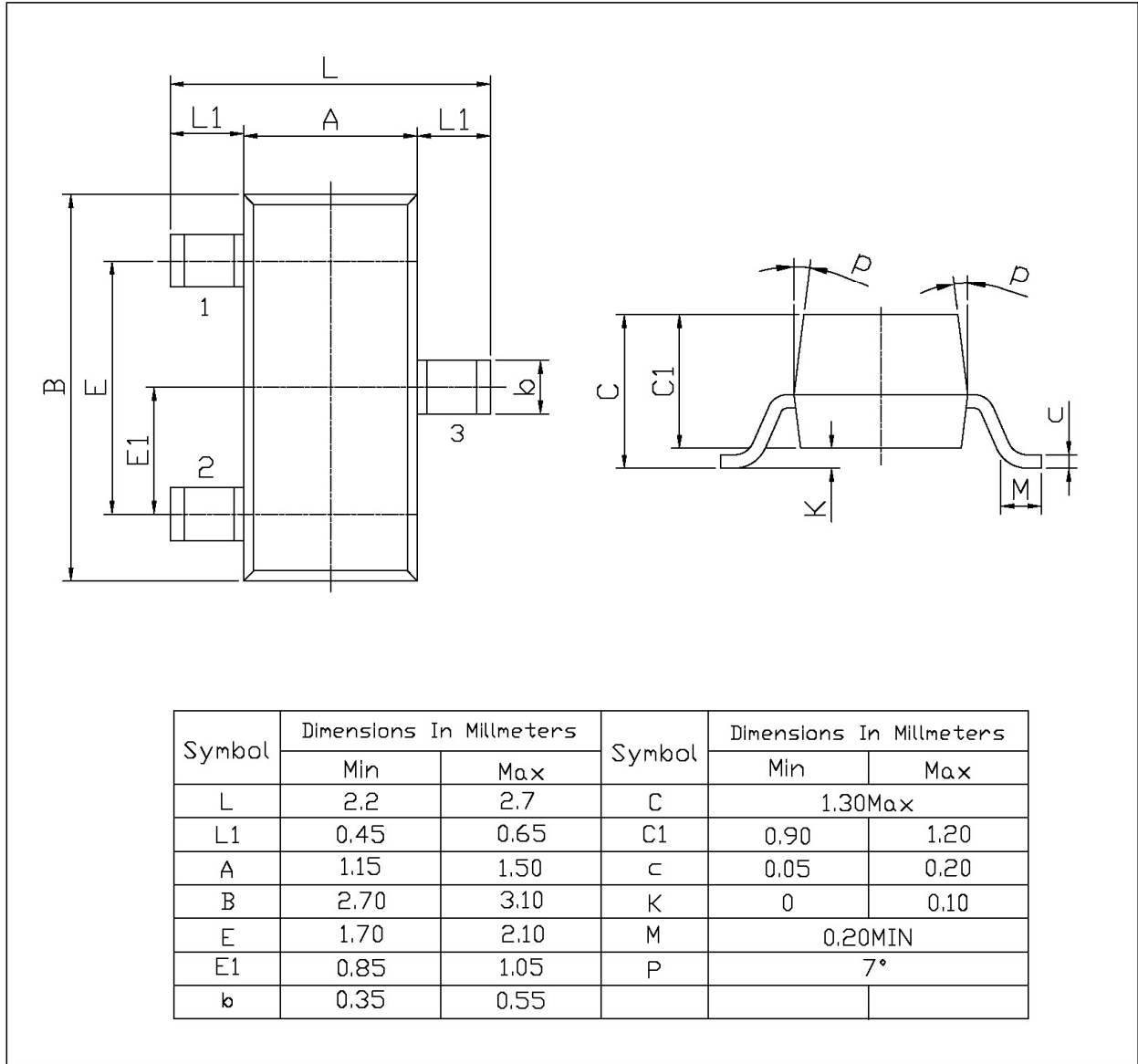
电参数曲线图 / Electrical Characteristic Curve



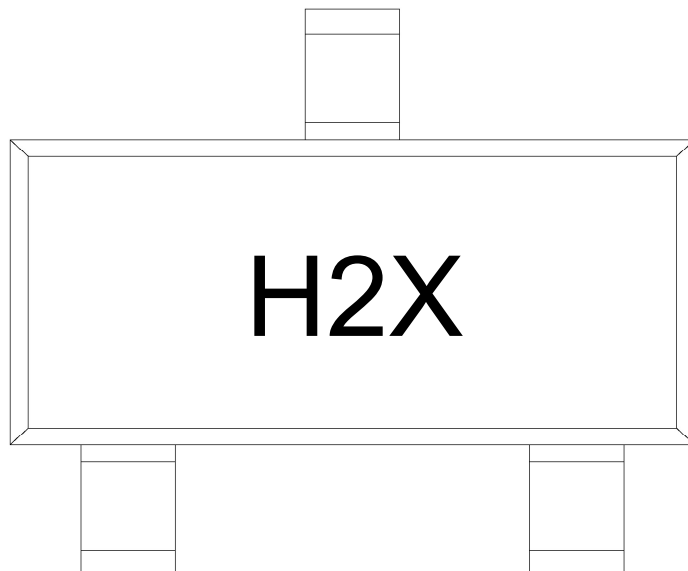
外形尺寸图 / Package Dimensions

SOT-23

单位: mm



印章说明 / Marking Instructions



说明：

H： 为公司代码

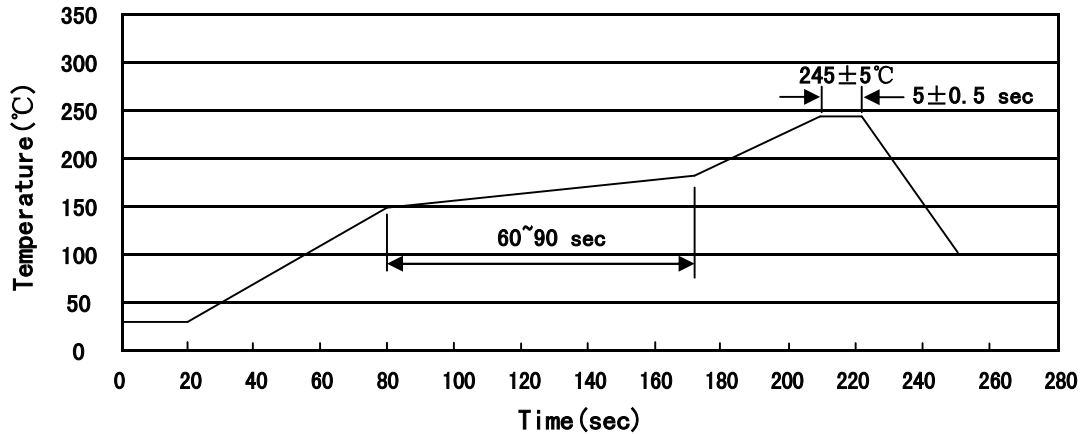
2X： 为型号代码

Note:

H： Company Code

2X： Product Type Code

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 150~180°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:150~180°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 封装形式 | Units 包装数量 | | | | | Dimension 包装尺寸 (unit: mm ³) | | |
|----------------------|--------------------|-------------------------|------------------------|------------------------------|------------------------|---|-------------|-------------|
| | Units/Reel 只/卷盘 | Reels/Inner Box 卷盘/盒 | Units/Inner Box 只/盒 | Inner Boxes/Outer Box 盒/箱 | Units/Outer Box 只/箱 | Reel | Inner Box 盒 | Outer Box 箱 |
| SOT-23 | 3,000 | 10 | 30,000 | 6 | 180,000 | 7" ×8 | 180×120×180 | 390×385×205 |

使用说明 / Notices