

BRMMBT3904Q

Rev.A Jun.-2022

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

低电压，低电流，符合 AEC-Q101 标准高可靠性要求，无卤产品。

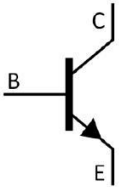
Low current, Low voltage, Qualified to AEC-Q101 Standards for High Reliability, HF Product.

用途 / Applications

用于普通放大及开关，满足汽车应用的严格要求。

General purpose amplifier and switching, Meet the stringent requirements of automotive applications.

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 | Q1A |

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

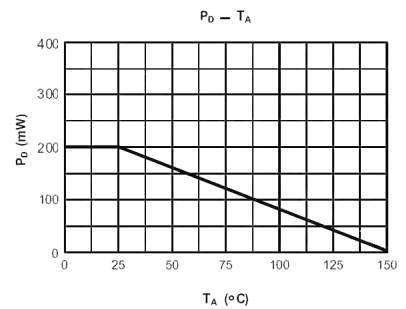
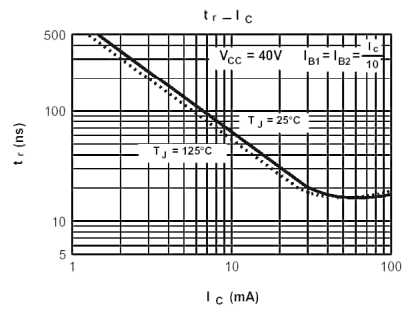
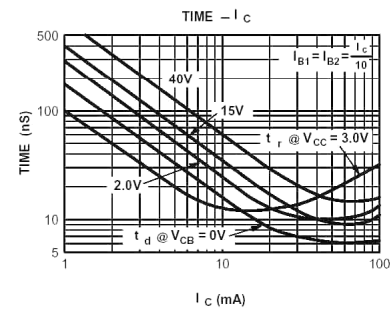
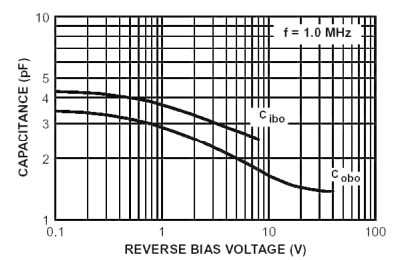
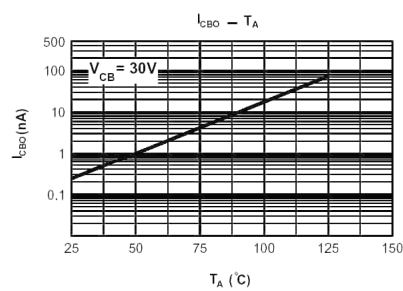
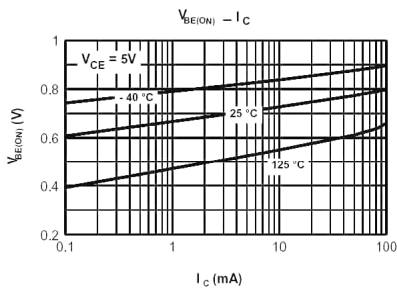
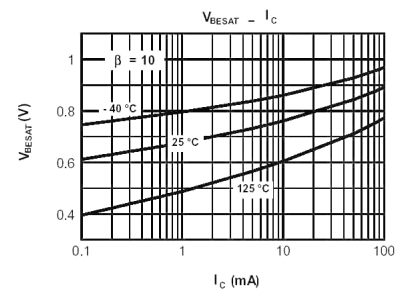
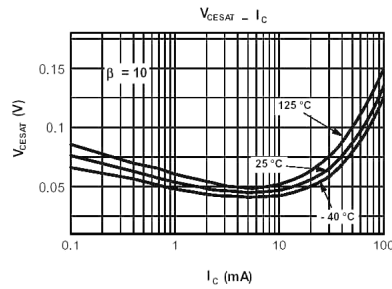
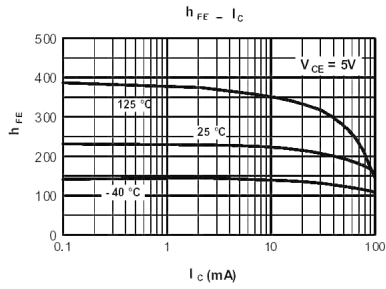
| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit |
|------------------------------|--------------|--------------|------------|
| Collector to Base Voltage | V_{CBO} | 60 | V |
| Collector to Emitter Voltage | V_{CEO} | 40 | V |
| Emitter to Base Voltage | V_{EBO} | 6.0 | V |
| Collector Current | I_C | 200 | mA |
| Collector Power Dissipation | P_C | 200 | mW |
| | * P_C | 350 | mW |
| Junction Temperature | T_j | 150 | °C |
| Storage Temperature Range | T_{stg} | -55~150 | °C |

*在 7×5×0.6mm 陶瓷板上 *When mounted on a 7×5×0.6mm ceramic board

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} | $I_C=10\mu A$ $I_E=0$ | 60 | | | V |
| Collector to Emitter Breakdown Voltage | V_{CEO} | $I_C=1.0mA$ $I_B=0$ | 40 | | | V |
| Emitter to Base Breakdown Voltage | V_{EBO} | $I_E=10\mu A$ $I_C=0$ | 6.0 | | | V |
| Collector Cut-Off Current | I_{CBO} | $V_{CB}=30V$ $I_E=0$ | | | 0.05 | μA |
| Emitter Cut-Off Current | I_{EBO} | $V_{EB}=3.0V$ $I_C=0$ | | | 0.05 | μA |
| DC Current Gain | $h_{FE(1)}$ | $V_{CE}=1.0V$ $I_C=10mA$ | 100 | | 300 | |
| | $h_{FE(2)}$ | $V_{CE}=1.0V$ $I_C=100mA$ | 30 | | | |
| | $h_{FE(3)}$ | $V_{CE}=1.0V$ $I_C=50mA$ | 60 | | | |
| | $h_{FE(4)}$ | $V_{CE}=1.0V$ $I_C=1.0mA$ | 70 | | | |
| | $h_{FE(5)}$ | $V_{CE}=1.0V$ $I_C=0.1mA$ | 40 | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)(1)}$ | $I_C=10mA$ $I_B=1.0mA$ | | | 0.2 | V |
| | $V_{CE(sat)(2)}$ | $I_C=50mA$ $I_B=5.0mA$ | | | 0.3 | V |
| Base-Emitter Saturation Voltage | $V_{BE(sat)(1)}$ | $I_C=10mA$ $I_B=1.0mA$ | 0.65 | | 0.85 | V |
| | $V_{BE(sat)(2)}$ | $I_C=50mA$ $I_B=5.0mA$ | | | 0.95 | V |
| Transition Frequency | f_T | $V_{CE}=20V$ $I_C=10mA$ $f=100MHz$ | 300 | | | MHz |
| Output Capacitance | C_{ob} | $V_{CB}=5.0V$ $f=1.0MHz$ | | | 4.0 | pF |
| Storage Time | t_{stg} | $V_{CC}=3.0V$ $I_C=10mA$ $I_{B1}=-I_{B2}=1.0mA$ | | | 200 | ns |
| Fall Time | t_f | $V_{CC}=3.0V$ $I_C=10mA$ $I_{B1}=-I_{B2}=1.0mA$ | | | 50 | ns |
| Delay Time | t_d | $V_{CC}=3.0V$ $V_{BE}=0.5V$ $I_C=10mA$ $I_{B1}=1.0mA$ | | | 35 | ns |
| Rise Time | t_r | $V_{CC}=3.0V$ $V_{BE}=0.5V$ $I_C=10mA$ $I_{B1}=1.0mA$ | | | 35 | ns |
| Input Capacitance | C_{ib} | $V_{EB}=0.5V$ $f=1.0MHz$ | | | 8.0 | pF |

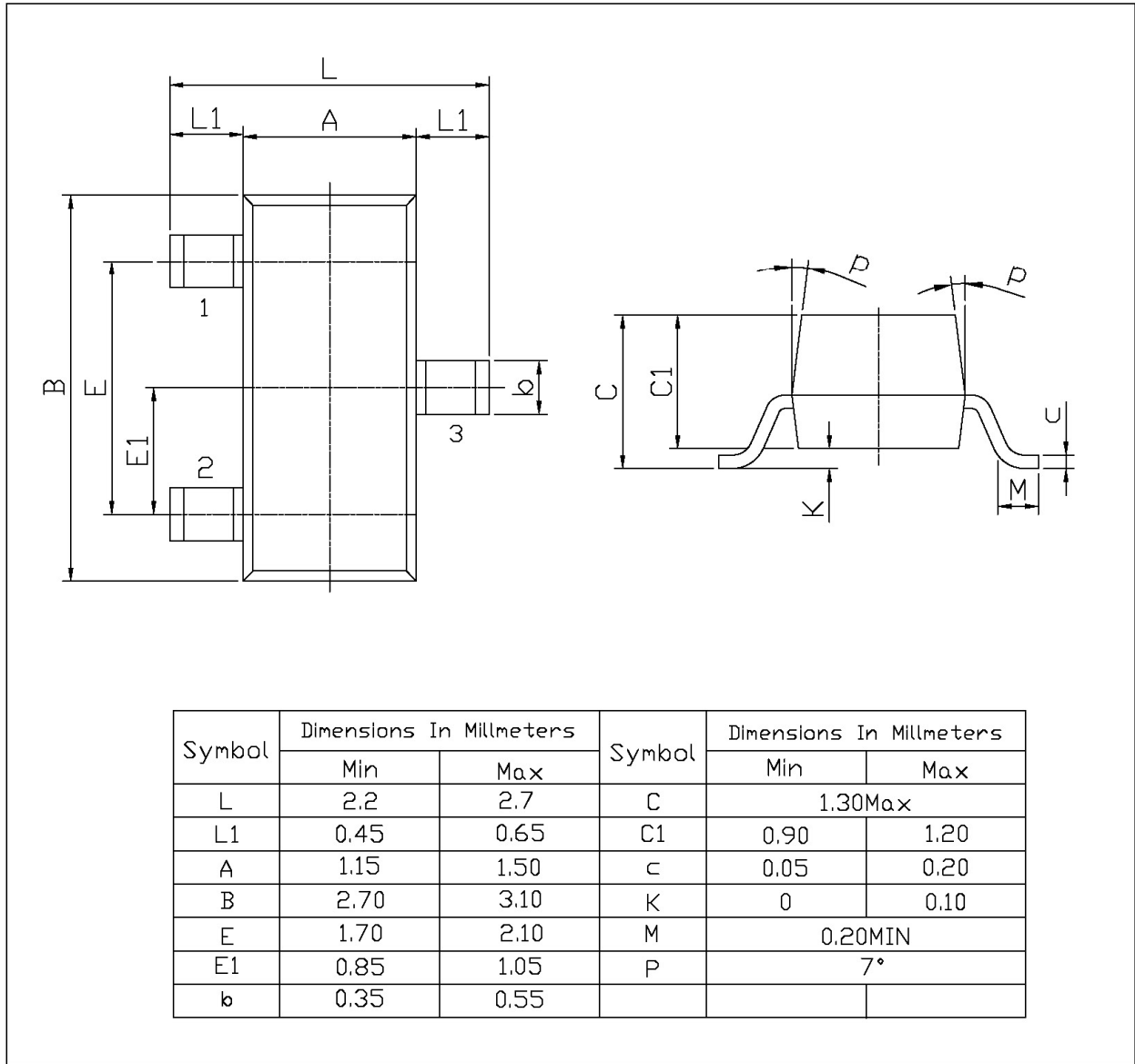
电参数曲线图 / Electrical Characteristic Curve



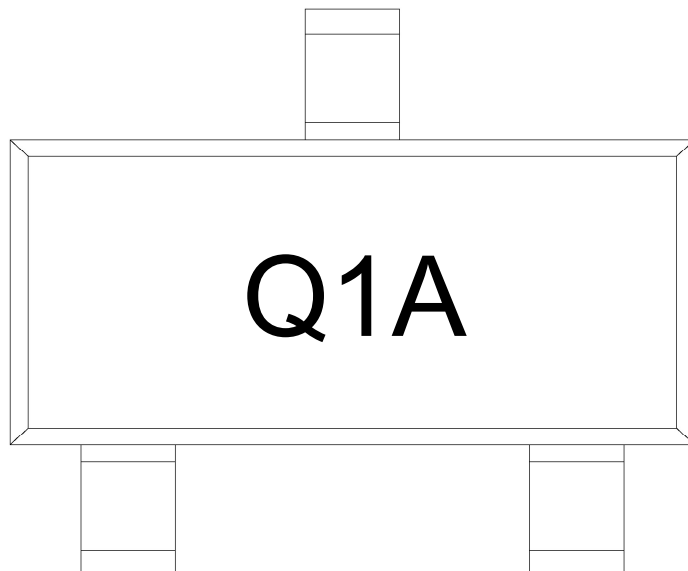
外形尺寸图 / Package Dimensions

SOT-23

单位: mm



印章说明 / Marking Instructions



说明：

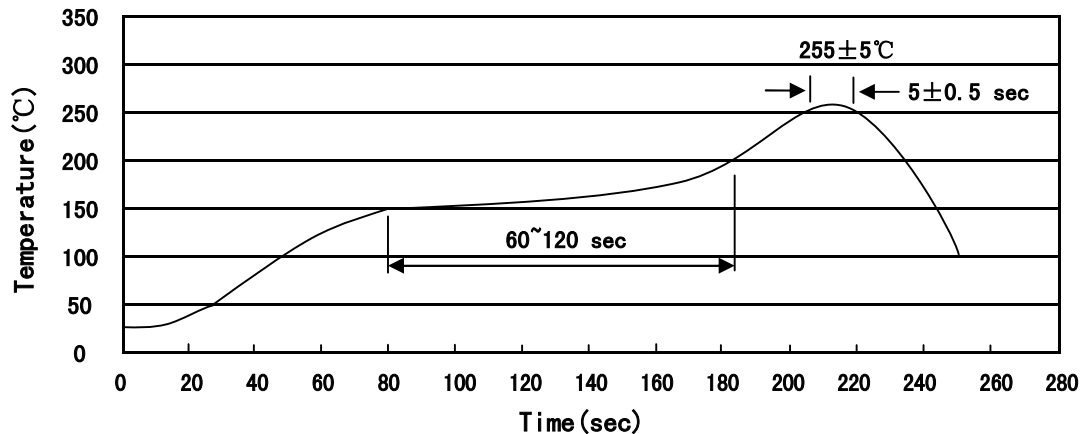
Q： 为汽车无卤产品标识

1A： 为型号代码

Note:

Q: Automobile halogen-free product Code

1A: 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 150~200°C，时间 60~120sec;
- 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:150~200°C, Time:60~120sec.
- 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：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