

BRMMDT2227WS

Rev.D Oct.-2021

描述 / Descriptions

SOT-363 塑封封装双 NPN+PNP 半导体三极管。

Double silicon NPN and PNP transistor in a SOT-363 Plastic Package.

特征 / Features

理想的低功率放大和开关。无卤产品。

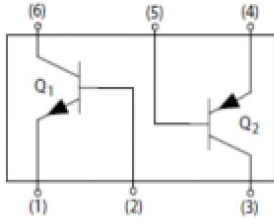
Ideal for Low Power Amplification and Switching.HF Product.

用途 / Applications

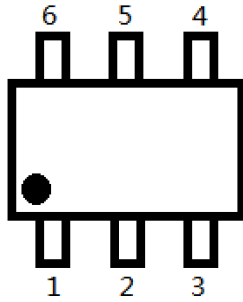
用于功率放大电路。

Power amplifier application.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



Pin 1: E2

Pin 2: B2

Pin 3: C1

Pin 4: E1

Pin 5: B1

Pin 6: C2

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

See Marking Instructions.

极限参数 / Maximum Ratings, Total Device @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit |
|---|-----------------|--------------|--------------------|
| Total Power Dissipation | P_d | 200 | mW |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 625 | $^\circ\text{C/W}$ |
| Operating and Storage and Temperature Range | T_j, T_{STG} | -55~150 | $^\circ\text{C}$ |

极限参数 / Absolute Maximum Ratings($T_a=25^\circ\text{C}$) (NPN , 2222A)

| 参数 Parameter | 符号 Symbol | 数值 Rating | 单位 Unit |
|------------------------------|--------------|--------------|------------|
| Collector to Base Voltage | V_{CBO} | 75 | V |
| Collector to Emitter Voltage | V_{CEO} | 40 | V |
| Emitter to Base Voltage | V_{EBO} | 6.0 | V |
| Collector Current | I_C | 600 | mA |

极限参数 / Absolute Maximum Ratings($T_a=25^\circ\text{C}$) (PNP , 2907A)

| 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} | -60 | V |
| Emitter to Base Voltage | V_{EBO} | -5.0 | V |
| Collector Current | I_C | -600 | mA |


电性能参数 / Electrical Characteristics(Ta=25°C) (NPN , 2222A)

| 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-Base Breakdown Voltage | V_{CBO} | $I_C = 10\mu A$ $I_E = 0$ | 75 | | | V | |
| Collector-Emitter Breakdown Voltage | V_{CEO} | $I_C = 10mA$ $I_B = 0$ | 40 | | | V | |
| Emitter-Base Breakdown Voltage | V_{EBO} | $I_E = 10\mu A$ $I_C = 0$ | 6.0 | | | V | |
| Collector Cut-Off Current | I_{CEX} | $V_{CE} = 60V$ $V_{EB(off)} = 3V$ | | | 10 | nA | |
| Collector Cut-Off Current | I_{CBO} | $V_{CB} = 60V$ $I_E = 0$ | | | 0.01 | μA | |
| | | $V_{CB} = 60V$ $I_E = 0$ $T_A = 125^\circ C$ | | | 10 | μA | |
| Emitter Cut-Off Current | I_{EBO} | $V_{EB} = 3.0V$ $I_C = 0$ | | | 10 | nA | |
| Base Cut-Off Current | I_{BL} | $V_{CE} = 60V$ $V_{EB(off)} = 3V$ | | | 20 | nA | |
| DC Current Gain | $h_{FE(1)}$ | $V_{CE} = 10V$ $I_C = 0.1mA$ | 35 | | | | |
| | $h_{FE(2)}$ | $V_{CE} = 10V$ $I_C = 1.0mA$ | 50 | | | | |
| | $h_{FE(3)}$ | $V_{CE} = 10V$ $I_C = 10mA$ | 75 | | | | |
| | $h_{FE(4)}$ | $V_{CE} = 10V$ $I_C = 10mA$ $T_A = -55^\circ C$ | 50 | | | | |
| | $h_{FE(5)}$ | $V_{CE} = 10V$ $I_C = 150mA$ | 100 | | 300 | | |
| | $h_{FE(6)}$ | $V_{CE} = 1.0V$ $I_C = 150mA$ | 35 | | | | |
| | $h_{FE(7)}$ | $V_{CE} = 10V$ $I_C = 500mA$ | 40 | | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)(1)}$ | $I_C = 150mA$ $I_B = 15mA$ | | | 0.3 | V | |
| | $V_{CE(sat)(2)}$ | $I_C = 500mA$ $I_B = 50mA$ | | | 1.0 | V | |
| Base-Emitter Saturation Voltage | $V_{BE(sat)(1)}$ | $I_C = 150mA$ $I_B = 15mA$ | 0.6 | | 1.2 | V | |
| | $V_{BE(sat)(2)}$ | $I_C = 500mA$ $I_B = 50mA$ | | | 2.0 | V | |
| Transition Frequency(Note 3) | f_T | $V_{CE} = 20V$ $I_C = 20mA$ $f = 100MHz$ | 300 | | | MHz | |
| Output Capacitance | C_{obo} | $V_{CB} = 10V$ $I_E = 0$ $f = 1.0MHz$ | | | 8.0 | pF | |
| Input Capacitance | C_{ibo} | $V_{EB} = 0.5V$ $I_C = 0$ $f = 1.0MHz$ | | | 25 | | |
| Noise Figure | NF | $I_C = 100\mu A$ $V_{CE} = 10V$ $R_S = 1.0k\Omega$ $f = 1.0kHz$ | | | 4.0 | dB | |
| Turn-on Time | t_d | $V_{CC} = 30V$ $I_C = 150mA$ $V_{BE(OFF)} = -0.5V$ $I_{B1} = 15mA$ | | | 10 | ns | |
| Storage Time | t_r | | | | 25 | ns | |
| | t_s | | $V_{CC} = 30V$ $I_C = 150mA$ | | | 225 | ns |
| Fall Time | t_f | | $I_{B1} = I_{B2} = 15mA$ | | | 60 | ns |


电性能参数 / Electrical Characteristics(Ta=25°C) (PNP , 2907A)

| 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 _{CB0} | I _C =-10μA I _E =0 | -60 | | | V |
| Collector to Emitter Breakdown Voltage | V _{CEO} | I _C =-10mA I _B =0 | -60 | | | V |
| Emitter to Base Breakdown Voltage | V _{EBO} | I _E =-10μA I _C =0 | -5.0 | | | V |
| Collector Cut-Off Current | I _{CB0} | V _{CB} =-50V I _E =0 | | | -0.01 | μA |
| | I _{CB0} | V _{CB} =-50V I _E =0 T _A =125°C | | | 10 | μA |
| Collector Cutoff Current | I _{CEX} | V _{CE} = -30V, V _{EB(OFF)} = -0.5V | | | -50 | nA |
| Base Cutoff Current | I _{BL} | V _{CE} = -30V, V _{EB(OFF)} = -0.5V | | | -50 | nA |
| DC Current Gain | h _{FE(1)} | V _{CE} =-10V I _C =-150mA* | 100 | | 300 | |
| | h _{FE(2)} | V _{CE} =-10V I _C =-500mA* | 50 | | | |
| | h _{FE(3)} | V _{CE} =-10V I _C =-10mA | 100 | | | |
| | h _{FE(4)} | V _{CE} =-10V I _C =-1.0mA | 100 | | | |
| | h _{FE(5)} | V _{CE} =-10V I _C =-0.1mA | 75 | | | |
| Collector-Emitter Saturation Voltage | V _{CE(sat) (1)} | I _C =-150mA I _B =-15 mA | | | -0.4 | V |
| | V _{CE(sat) (2)} | I _C =-500mA I _B =-50mA | | | -1.6 | V |
| Base-Emitter Saturation Voltage | V _{BE(sat) (1)} | I _C =-150mA I _B =-15 mA | | | -1.3 | V |
| | V _{BE(sat) (2)} | I _C =-500mA I _B =-50mA | | | -2.6 | V |
| Transition Frequency | f _T | V _{CE} =-20V I _C =-50mA f=100MHz | 200 | | | MHz |
| Output Capacitance | C _{obo} | V _{CB} =-10V I _E =0 f=1.0MHz | | | 8.0 | pF |
| Input Capacitance | C _{ibo} | V _{EB} =-2V I _C =0 f=1.0MHz | | | 30 | |
| Turn-On Time | t _{on} | | | | 45 | ns |
| Delay Time | t _d | V _{CC} =-30V I _C =-150mA | | | 10 | |
| Rise Time | t _r | I _{B1} =-15mA | | | 40 | |
| Storage Time | t _s | V _{CC} =-6V I _C =-150mA | | | 80 | |
| Fall Time | t _f | I _{B1} =I _{B1} =-15mA | | | 30 | |
| Turn-Off Time | t _{off} | | | | 100 | |

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

电参数曲线图 / Electrical Characteristic Curve

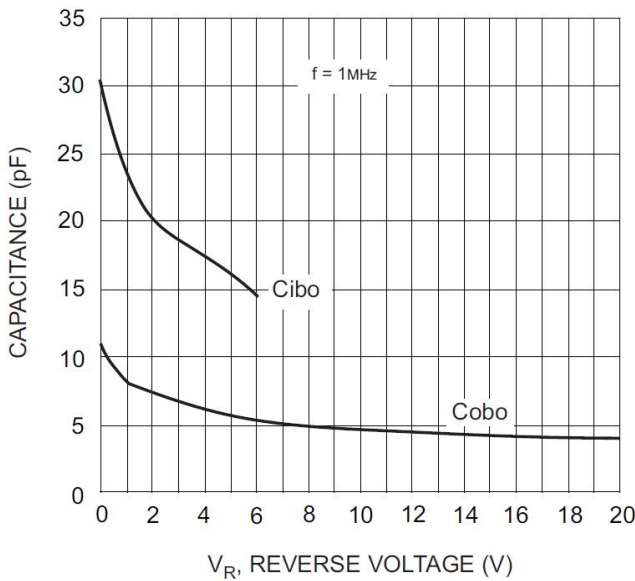


Fig. 1, Typical Capacitance Characteristics (2222A Type - NPN)

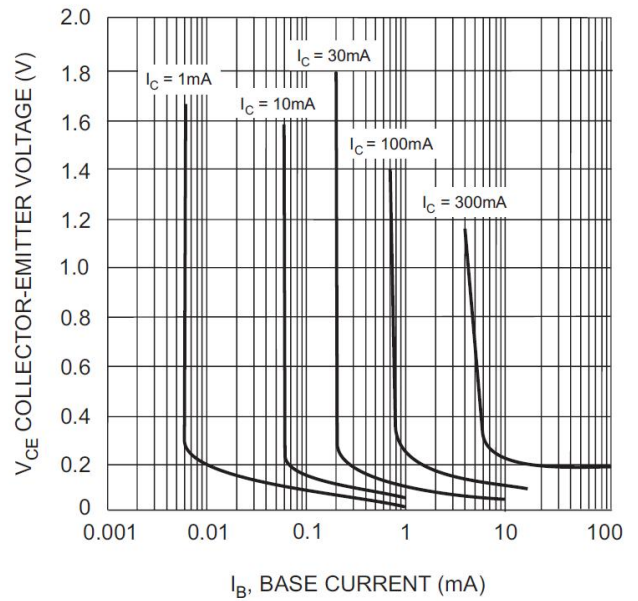


Fig. 2, Typical Collector Saturation Region (2222A Type - NPN)

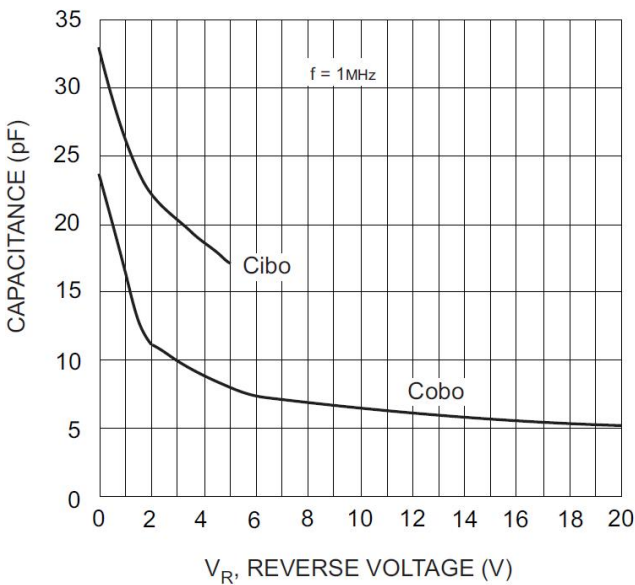


Fig. 3, Typical Capacitance Characteristics (2907A Type - PNP)

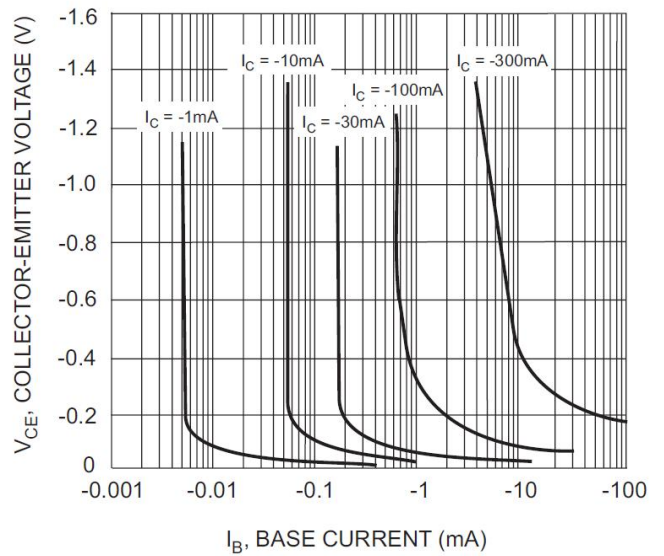
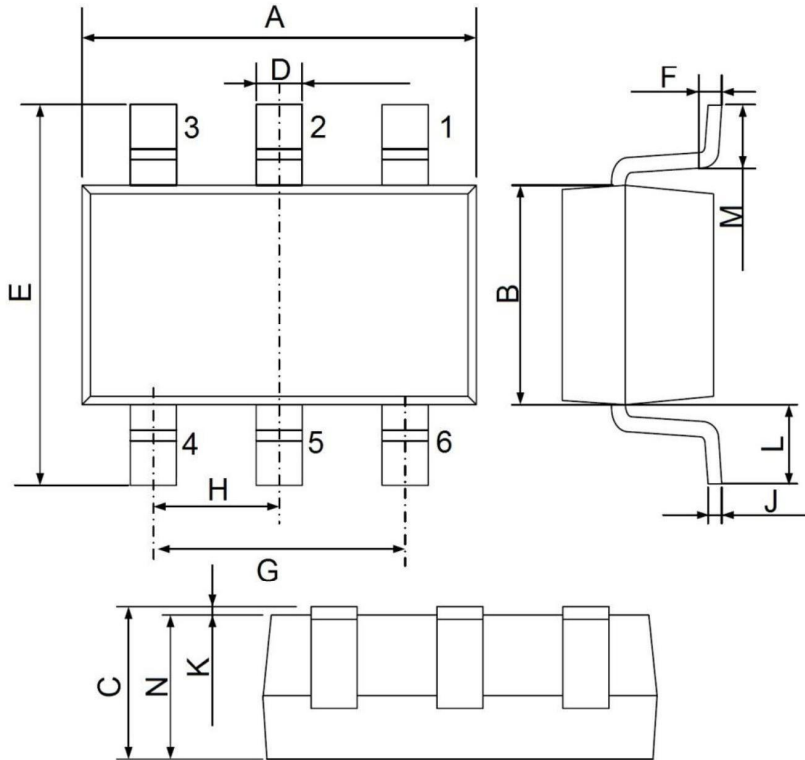


Fig. 4, Typical Collector Saturation Region (2907A Type - PNP)

外形尺寸图 / Package Dimensions

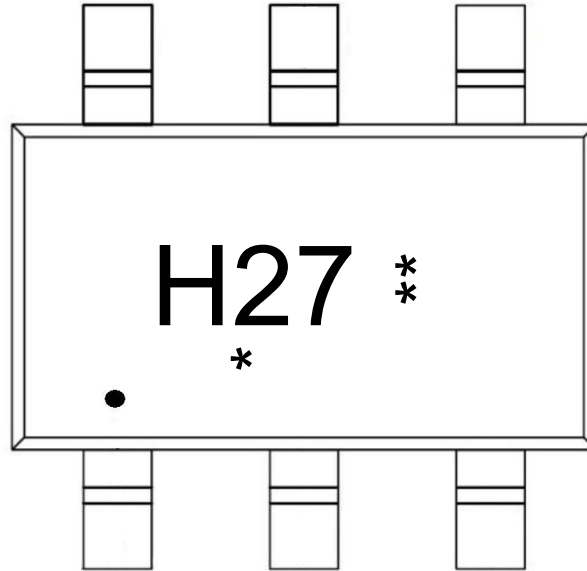
SOT-363-6L



UNIT: mm

| DIM | MIN | MAX |
|-----|------------|------|
| A | 2.00 | 2.20 |
| B | 1.15 | 1.35 |
| C | 0.90 | 1.10 |
| D | 0.15 | 0.35 |
| E | 1.95 | 2.25 |
| F | 0.20 Typ. | |
| G | 1.20 | 1.40 |
| H | 0.65 Typ. | |
| J | 0.08 | 0.15 |
| K | 0.00 | 0.10 |
| L | 0.525 Ref. | |
| M | 0.26 | 0.46 |
| N | 0.90 | 1.10 |

印章说明 / Marking Instructions



说明：

●： 为“1”脚

H27： 为型号代码

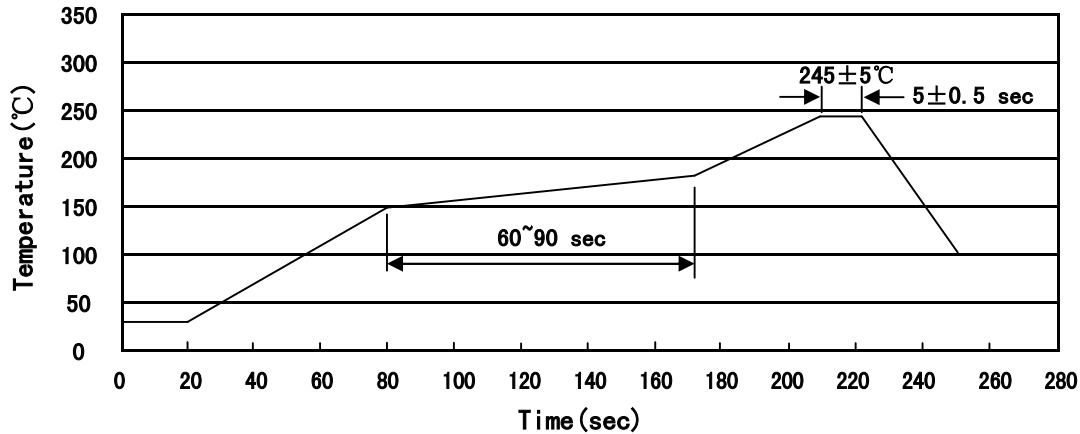
***： 为生产批号代码，随生产批号变化

Note:

●： “1” Pin

H27： Product Type Code

***： Lot No. Code, code change with Lot No.

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-363 | 3,000 | 10 | 30,000 | 6 | 180000 | 7" ×8 | 180×120×180 | 390×385×205 |

使用说明 / Notices