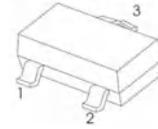




FEATURES

- Epitaxial planar die construction
- Complementary NPN Type available (MMBT2222A)

SOT-23



- 1.BASE
- 2.EMITTER
- 3.COLLECTOR

Marking

| Type number | Marking code |
|-------------|--------------|
| MMBT2907A | 2F |

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

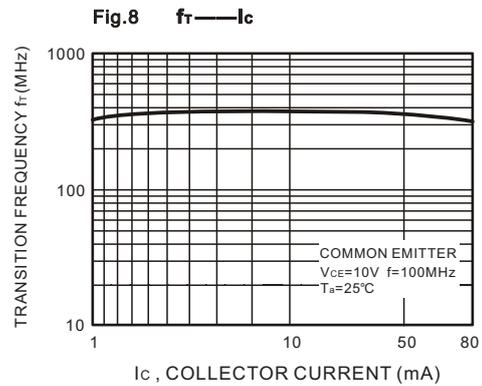
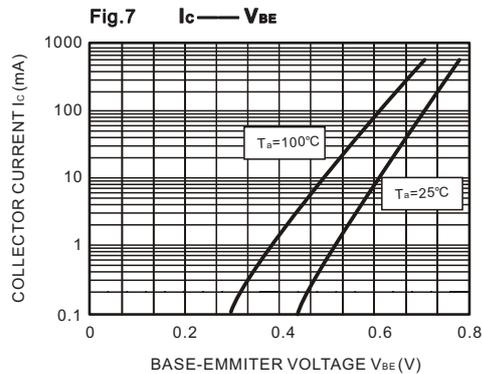
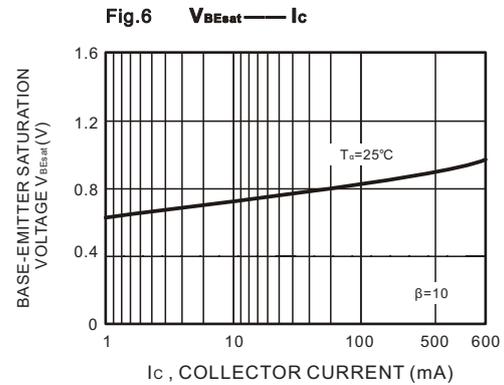
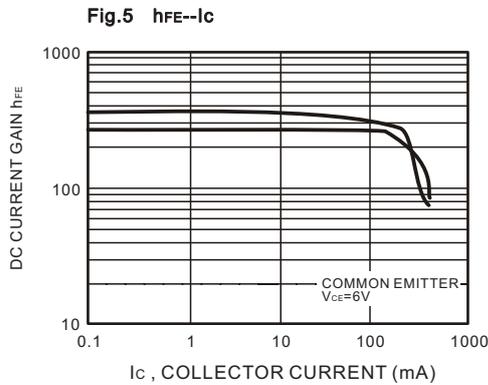
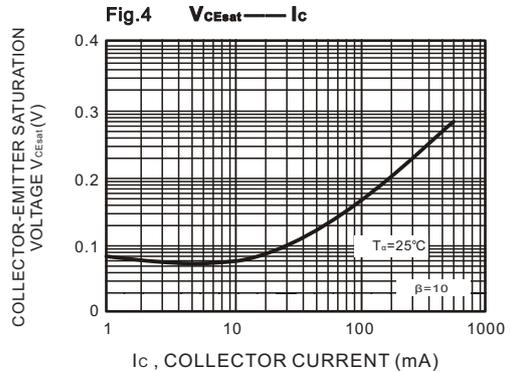
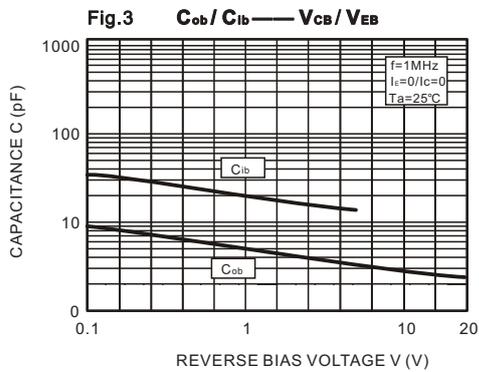
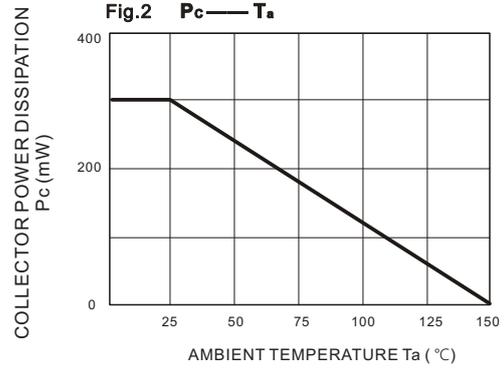
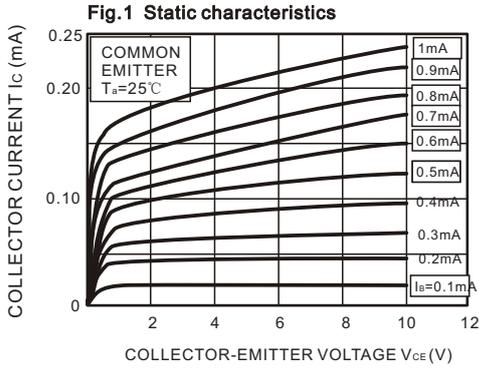
MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|--------------------------------------------------|----------------|----------|------|
| Collector–Base Voltage | V_{CBO} | -60 | V |
| Collector–Emitter Voltage | V_{CEO} | -60 | V |
| Emitter–Base Voltage | V_{EBO} | -5 | V |
| Collector Current — Continuous | I_C | -600 | mA |
| Total Device Dissipation | P_D | 250 | mW |
| Thermal Resistance From Junction To Ambient | R_{thJA} | 500 | °C/W |
| Operation Junction and Storage Temperature Range | T_J, T_{stg} | -55~+150 | °C |

ELECTRICAL CHARACTERISTICS (TA = 25°C unless otherwise noted.)

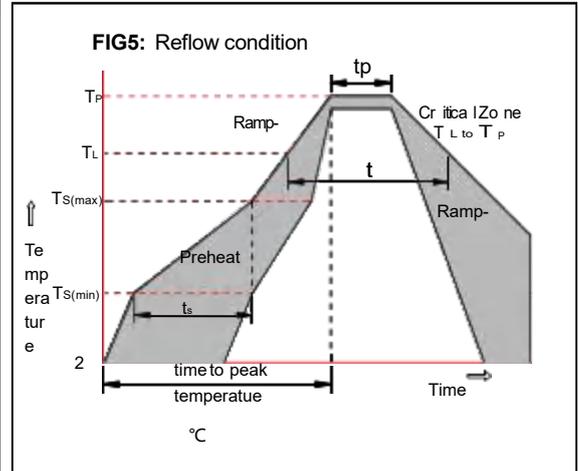
| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|------------------------------------------------------------|-----|-----|------|------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C = -10\mu A, I_E = 0$ | -60 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C = -10mA, I_B = 0$ | -60 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E = -10\mu A, I_C = 0$ | -5 | | | V |
| Collector cut-off current | I_{CBO} | $V_{CB} = -50V, I_E = 0$ | | | -20 | nA |
| Base cut-off current | I_{EBO} | $V_{EB} = -3V, I_C = 0$ | | | -10 | nA |
| Collector cut-off current | I_{CEX} | $V_{CE} = -30V, V_{BE} = -0.5V$ | | | -50 | nA |
| DC current gain | h_{FE1} | $V_{CE} = -10V, I_C = -150mA$ | 100 | | 300 | |
| | h_{FE2} | $V_{CE} = -10V, I_C = -0.1mA$ | 75 | | | |
| | h_{FE3} | $V_{CE} = -10V, I_C = -1mA$ | 100 | | | |
| | h_{FE4} | $V_{CE} = -10V, I_C = -10mA$ | 100 | | | |
| | h_{FE5} | $V_{CE} = -10V, I_C = -500mA$ | 50 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -150mA, I_B = -15mA$ | | | -0.4 | V |
| | $V_{CE(sat)}$ | $I_C = -500mA, I_B = -50mA$ | | | -1.6 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | $I_C = -150mA, I_B = -15mA$ | | | -1.3 | V |
| | $V_{BE(sat)}$ | $I_C = -500mA, I_B = -50mA$ | | | -2.6 | V |
| Transition frequency | f_T | $V_{CE} = -20V, I_C = -50mA, f = 100MHz$ | 200 | | | MHz |
| Delay time | t_d | $V_{CE} = -30V,$ $I_C = -150mA, I_{B1} = -15mA$ | | | 10 | ns |
| Rise time | t_r | | | | 25 | ns |
| Storage time | t_s | $V_{CE} = -6V, I_C = -150mA$ $I_{B1} = -I_{B2} = -15mA$ | | | 225 | ns |
| Fall time | t_f | | | | 60 | ns |

RATING AND CHARACTERISTIC CURVES



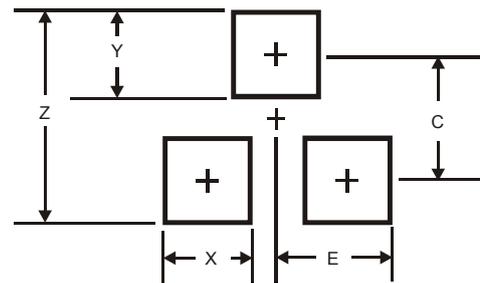
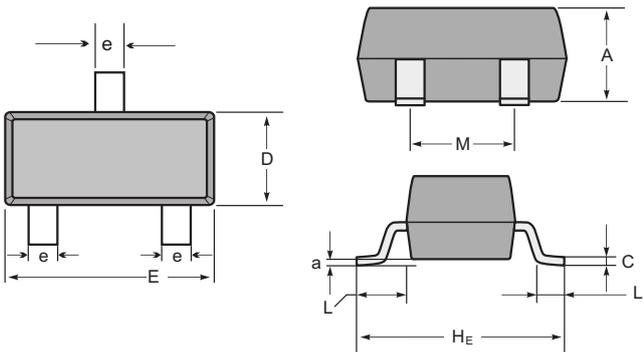
Soldering parameters

| Reflow Condition | | Pb-Free assembly (see as below) |
|---------------------------------------------------------|-----------------------------------|------------------------------------|
| Pre Heat | -Temperature Min ($T_{s(min)}$) | +150°C |
| | -Temperature Max($T_{s(max)}$) | +200°C |
| | -Time (Min to Max) (ts) | 60-180 secs. |
| Average ramp up rate (Liquid us Temp (T_L) to peak) | | 3°C/sec. Max |
| $T_{s(max)}$ to T_L - Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature(T_L)(Liquid us) | +217°C |
| | -Temperature(t_L) | 60-150 secs. |
| Peak Temp (T_P) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t_p) | | 30 secs. Max |
| Ramp-down Rate | | 6°C/sec. Max |
| Time 25°C to Peak Temp (T_P) | | 8 min. Max |
| Do not exceed | | +260°C |



Package Dimensions & Suggested Pad Layout

SOT23

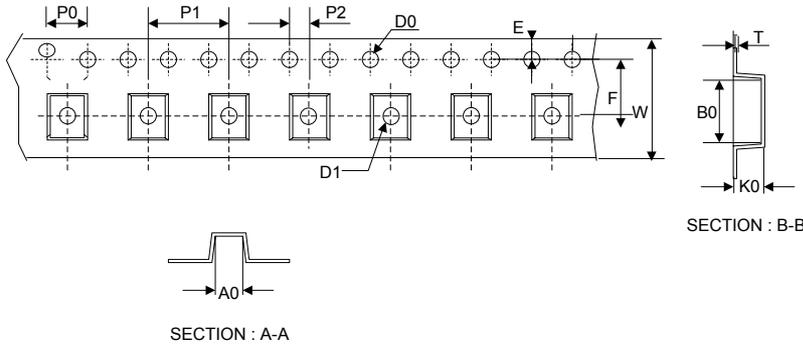
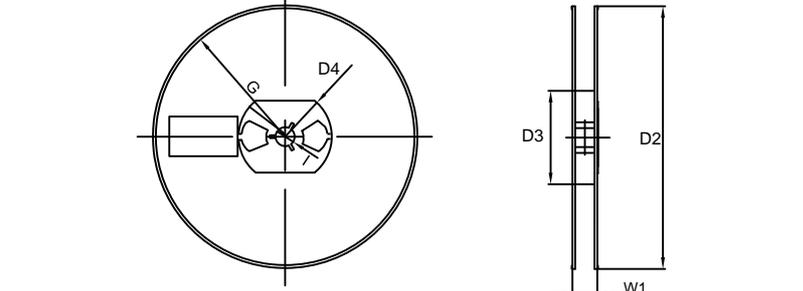


SOT-23 mechanical data

| UNIT | A | C | D | E | He | e | M | L | L ₁ | a | |
|------|-----|-----|------|-----|-----|-----|-----|------|----------------|------------|------|
| mm | max | 1.1 | 0.15 | 1.4 | 3.0 | 2.6 | 0.5 | 1.95 | 0.55 (ref) | 0.36 (ref) | 0.0 |
| | min | 0.9 | 0.08 | 1.2 | 2.8 | 2.2 | 0.3 | 1.7 | | | 0.15 |
| mil | max | 43 | 6 | 55 | 118 | 102 | 20 | 77 | 22 (ref) | 14 (ref) | 0.0 |
| | min | 35 | 3 | 47 | 110 | 87 | 12 | 67 | | | 6 |

| Dimensions | SOT23 |
|------------|-------|
| Z | 2.9 |
| X | 0.8 |
| Y | 0.9 |
| C | 2.0 |
| E | 1.35 |

Tape & reel specification

| Tape | Symbol | Dimension (mm) |
|-------------------------------------------------------------------------------------|-------------------|----------------|
|  | P0 | 4.00±0.10 |
| | P1 | 4.00±0.10 |
| | P2 | 2.00±0.10 |
| | D0 | 1.55±0.10 |
| | D1 | 1.05±0.10 |
| | E | 1.55±0.10 |
| | F | 3.60±0.10 |
| | W | 8.00±0.10 |
| | A0 | 3.80±0.20 |
| | B0 | 3.25±0.20 |
| | K0 | 1.45±0.10 |
| | T | 0.25±0.05 |
| | 7" Reel | D2 |
|  | D3 | 55Min. |
| | D4 | R24.0±3.0 |
| | G | R82.0±3.0 |
| | I | 13.0±2.0 |
| | W1 | 11.0±3.0 |
| | Quantity: 3000PCS | |