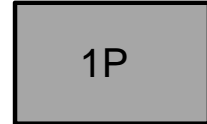
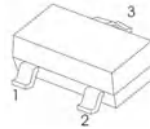




## FEATURES

- Epitaxial planar die construction
- Complementary PNP Type available (MMBT2907A)

### SOT-23



- 1.BASE  
2.EMITTER  
3.COLLECTOR

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

| Parameter  | Symbol         | Value    | Unit |
|--|----------------|----------|------|
| Collector–Base Voltage                           | $V_{CBO}$      | 75       | V    |
| Collector–Emitter Voltage                        | $V_{CEO}$      | 40       | V    |
| Emitter–Base Voltage                             | $V_{EBO}$      | 6        | V    |
| Collector Current — Continuous                   | $I_C$          | 600      | mA   |
| Collector Power Dissipation                      | $P_C$          | 300      | mW   |
| Thermal Resistance From Junction To Ambient      | $R_{thJA}$     | 417      | °C/W |
| Operation Junction and Storage Temperature Range | $T_J, T_{stg}$ | -55~+150 | °C   |

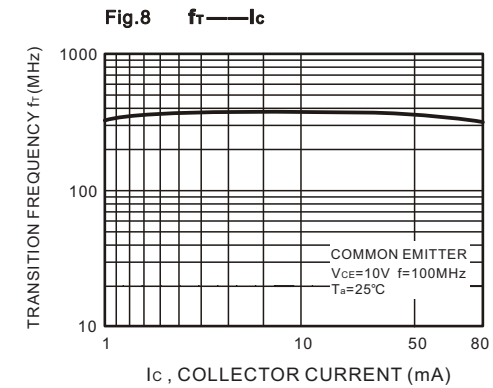
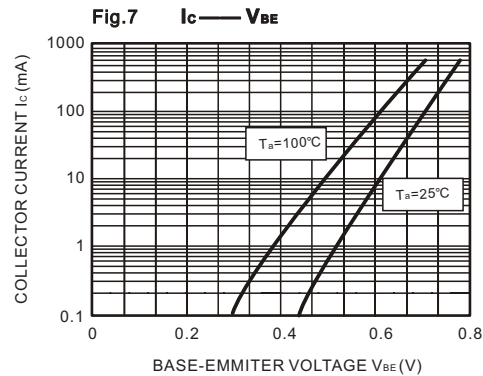
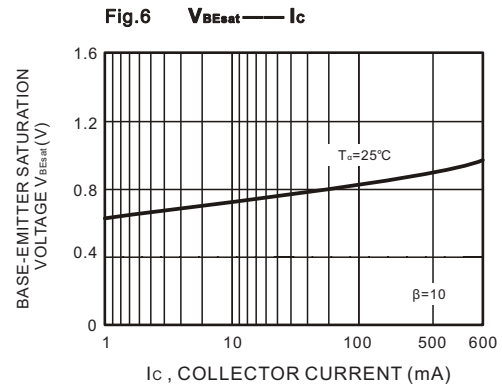
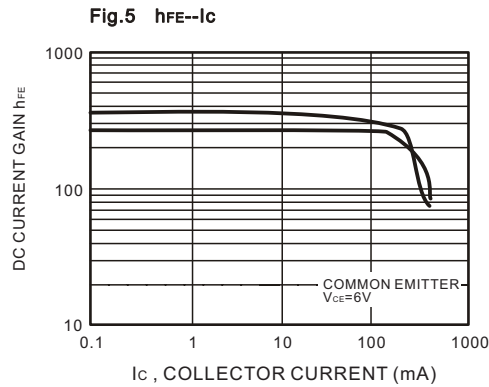
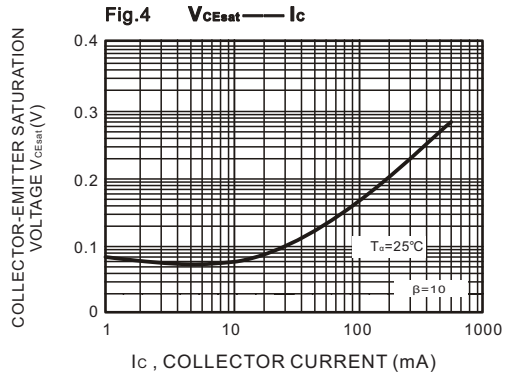
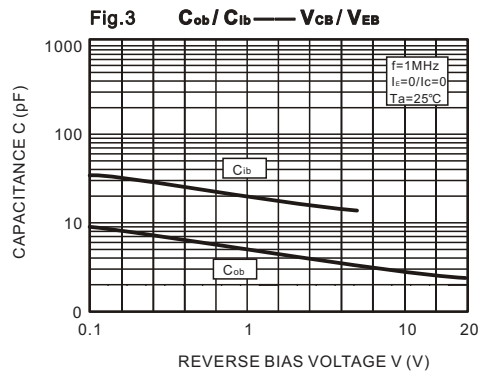
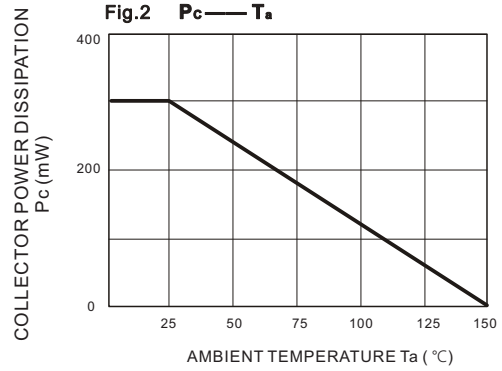
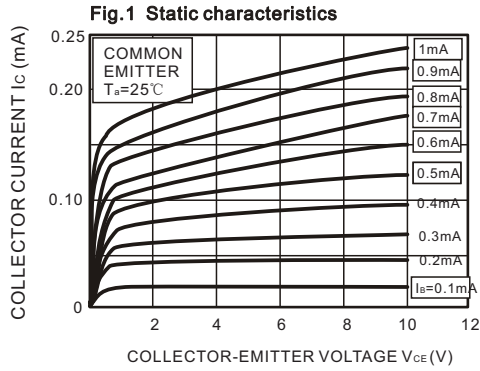
### CLASSIFICATION OF $h_{FE}$

|         |         |         |
|---------|---------|---------|
| Rank    | L       | H       |
| Range   | 100-200 | 200-300 |
| Marking | 1P      |         |

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

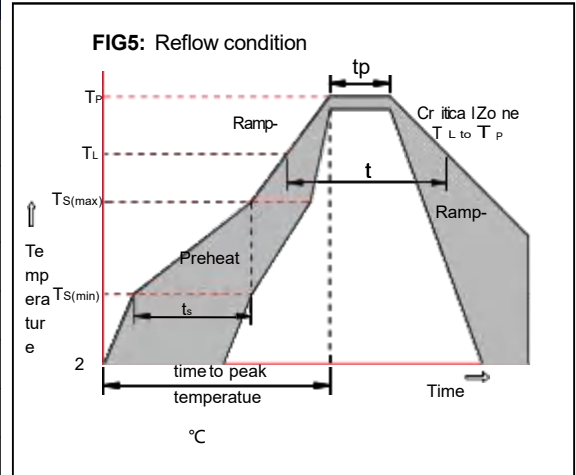
| Parameter                            | Symbol        | Test conditions   | Min | Typ | Max        | Unit    |
|--------------------------------------|---------------|---|-----|-----|------------|---------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C = 10\mu A, I_E = 0$  | 75  |     |            | V       |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C = 10\text{ mA}, I_B = 0$   | 40  |     |            | V       |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E = 10\mu A, I_C = 0$  | 6   |     |            | V       |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = 60V, I_E = 0$   |     |     | 0.01       | $\mu A$ |
| Collector cut-off current            | $I_{CEX}$     | $V_{CE} = 30V, V_{BE(off)} = 3V$  |     |     | 0.01       | $\mu A$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = 3V, I_C = 0$  |     |     | 0.1        | $\mu A$ |
| DC current gain                      | $h_{FE1}$     | $V_{CE} = 10V, I_C = 150\text{mA}$  | 100 |     | 300        |         |
|                                      | $h_{FE2}$     | $V_{CE} = 10V, I_C = 0.1\text{mA}$  | 40  |     |            |         |
|                                      | $h_{FE3}$     | $V_{CE} = 10V, I_C = 500\text{mA}$  | 42  |     |            |         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 500\text{mA}, I_B = 50\text{mA}$                                       |     |     | 1.0<br>0.3 | V       |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = 150\text{mA}, I_B = 15\text{mA}$                                       |     |     | 2.0<br>1.2 | V       |
| Transition frequency                 | $f_T$         | $V_{CE} = 20V, I_C = 20\text{mA}, f = 100\text{MHz}$                          | 300 |     |            | MHz     |
| Delay time                           | $t_d$         | $V_{CC} = 30V, V_{BE(off)} = -0.5V, I_C = 150\text{mA}, I_{B1} = 15\text{mA}$ |     |     | 10         | ns      |
| Rise time                            | $t_r$         |   |     |     | 25         | ns      |
| Storage time                         | $t_s$         | $V_{CC} = 30V, I_C = 150\text{mA}, I_{B1} = -I_{B2} = 15\text{mA}$            |     |     | 225        | ns      |
| Fall time                            | $t_f$         |   |     |     | 60         | ns      |

RATING AND CHARACTERISTIC CURVES



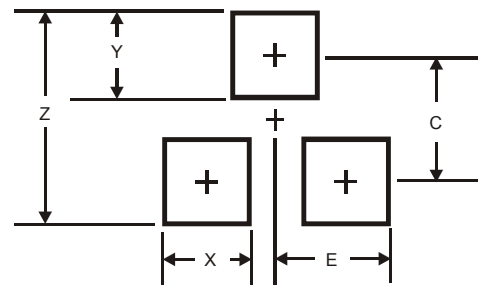
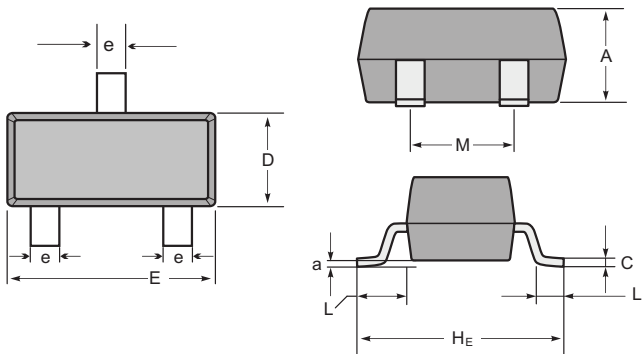
Soldering parameters

| Reflow Condition  |                                    | Pb-Free assembly<br>(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



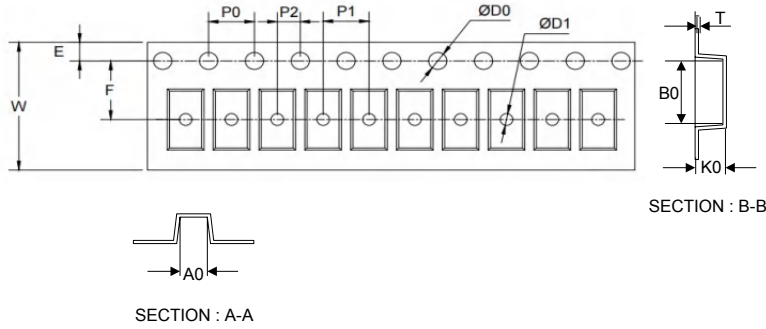
SOT-23 mechanical data

| UNIT | A   | C   | D    | E   | $H_e$ | 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      |
| D2     | 178.0±3.0      |
| D3     | 55Min.         |
| D4     | R24.0±3.0      |
| G      | R82.0±3.0      |
| I      | 13.0±2.0       |
| W1     | 11.0±3.0       |

7" Reel



Quantity: 3000PCS