

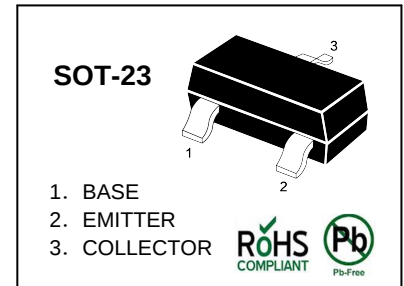
### TRANSISTOR (NPN)

#### FEATURES

Epitaxial planar die construction

Complementary PNP Type available(MMBT2907A)

MARKING: 1P



#### MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)

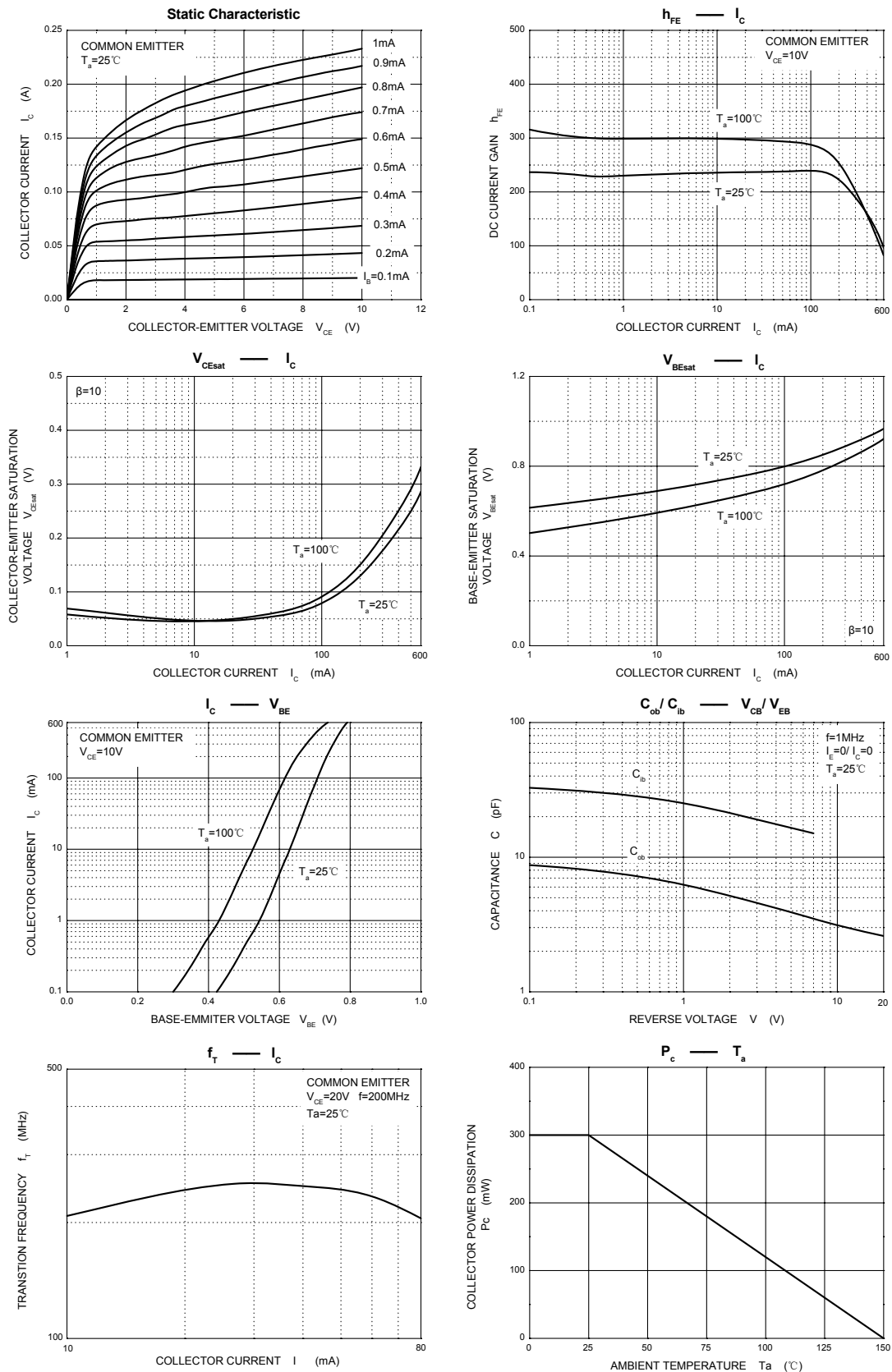
| Symbol           | Parameter                               | Value     | Units |
|------------------|-----------------------------------------|-----------|-------|
| V <sub>CBO</sub> | Collector-Base Voltage                  | 75        | V     |
| V <sub>CEO</sub> | Collector-Emitter Voltage               | 40        | V     |
| V <sub>EBO</sub> | Emitter-Base Voltage                    | 6         | V     |
| I <sub>C</sub>   | Collector Current -Continuous           | 600       | mA    |
| P <sub>C</sub>   | Collector Dissipation                   | 250       | mW    |
| R <sub>θJA</sub> | Thermal Resistance, Junction to Ambient | 500       | °C/W  |
| T <sub>J</sub>   | Junction Temperature                    | 150       | °C    |
| T <sub>stg</sub> | Storage Temperature                     | -55to+150 | °C    |

#### ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless otherwise specified)

| Parameter                            | Symbol                 | Test conditions                                                                                    | Min | Typ | Max        | Unit |
|--------------------------------------|------------------------|----------------------------------------------------------------------------------------------------|-----|-----|------------|------|
| Collector-base breakdown voltage     | V <sub>(BR)CBO</sub>   | I <sub>C</sub> = 10μA, I <sub>E</sub> =0                                                           | 75  |     |            | V    |
| Collector-emitter breakdown voltage  | V <sub>(BR)CEO</sub> * | I <sub>C</sub> = 10mA, I <sub>B</sub> =0                                                           | 40  |     |            | V    |
| Emitter-base breakdown voltage       | V <sub>(BR)EBO</sub>   | I <sub>E</sub> =10μA, I <sub>C</sub> =0                                                            | 6   |     |            | V    |
| Collector cut-off current            | I <sub>CBO</sub>       | V <sub>CB</sub> =60V, I <sub>E</sub> =0                                                            |     |     | 0.01       | μA   |
| Collector cut-off current            | I <sub>CEX</sub>       | V <sub>CE</sub> =30V, V <sub>BE(off)</sub> =3V                                                     |     |     | 0.01       | μA   |
| Emitter cut-off current              | I <sub>EBO</sub>       | V <sub>EB</sub> = 3V, I <sub>C</sub> =0                                                            |     |     | 0.1        | μA   |
| DC current gain                      | h <sub>FE(1)</sub> *   | V <sub>CE</sub> =10V, I <sub>C</sub> = 150mA                                                       | 100 |     | 300        |      |
|                                      | h <sub>FE(2)</sub>     | V <sub>CE</sub> =10V, I <sub>C</sub> = 0.1mA                                                       | 40  |     |            |      |
|                                      | h <sub>FE(3)</sub> *   | V <sub>CE</sub> =10V, I <sub>C</sub> = 500mA                                                       | 42  |     |            |      |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> * | I <sub>C</sub> =500 mA, I <sub>B</sub> = 50mA<br>I <sub>C</sub> =150 mA, I <sub>B</sub> =15mA      |     |     | 1<br>0.3   | V    |
| Base-emitter saturation voltage      | V <sub>BE(sat)</sub> * | I <sub>C</sub> =500 mA, I <sub>B</sub> = 50mA<br>I <sub>C</sub> =150 mA, I <sub>B</sub> =15mA      |     |     | 2.0<br>1.2 | V    |
| Transition frequency                 | f <sub>T</sub>         | V <sub>CE</sub> =20V, I <sub>C</sub> = 20mA,<br>f=100MHz                                           | 300 |     |            | MHz  |
| Delay time                           | t <sub>d</sub>         | V <sub>CC</sub> =30V, V <sub>BE(off)</sub> =-0.5V<br>I <sub>C</sub> =150mA, I <sub>B1</sub> = 15mA |     |     | 10         | nS   |
| Rise time                            | t <sub>r</sub>         |                                                                                                    |     |     | 25         | nS   |
| Storage time                         | t <sub>s</sub>         | V <sub>CC</sub> =30V, I <sub>C</sub> =150mA<br>I <sub>B1</sub> =-I <sub>B2</sub> =15mA             |     |     | 225        | nS   |
| Fall time                            | t <sub>f</sub>         |                                                                                                    |     |     | 60         | nS   |

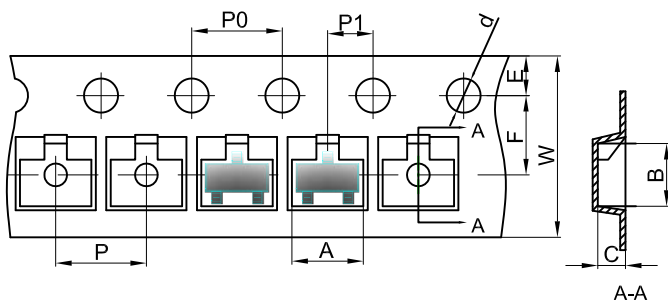
\*pulse test: Pulse Width ≤300μs, Duty Cycle≤ 2.0%.

## Typical Characteristics



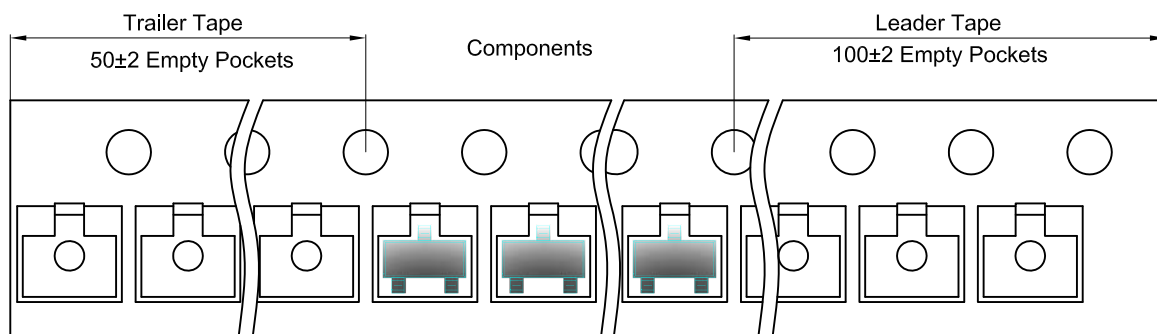
### SOT-23 Tape and Reel

#### SOT-23 Embossed Carrier Tape

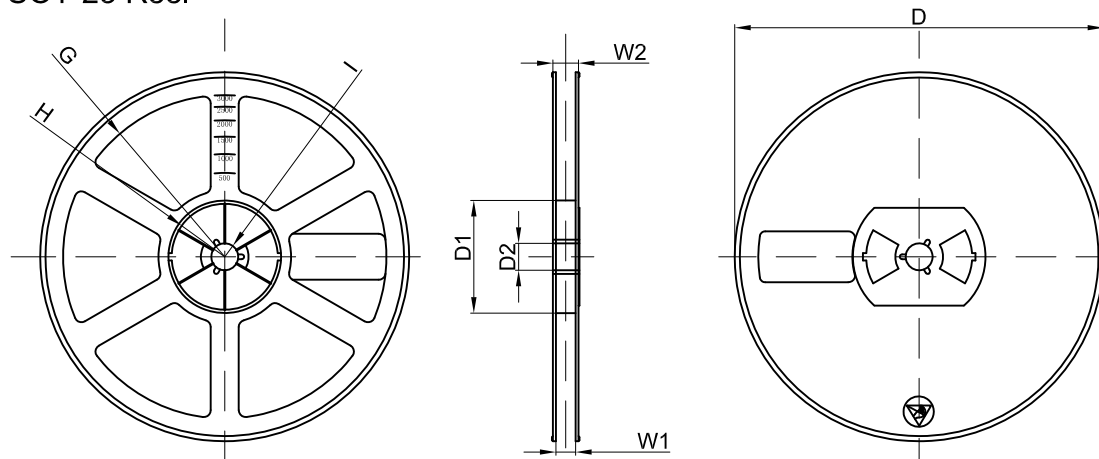


| Dimensions are in millimeter |      |      |      |       |      |      |      |      |      |      |
|------------------------------|------|------|------|-------|------|------|------|------|------|------|
| Pkg type                     | A    | B    | C    | d     | E    | F    | P0   | P    | P1   | W    |
| SOT-23                       | 3.15 | 2.77 | 1.22 | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

#### SOT-23 Tape Leader and Trailer

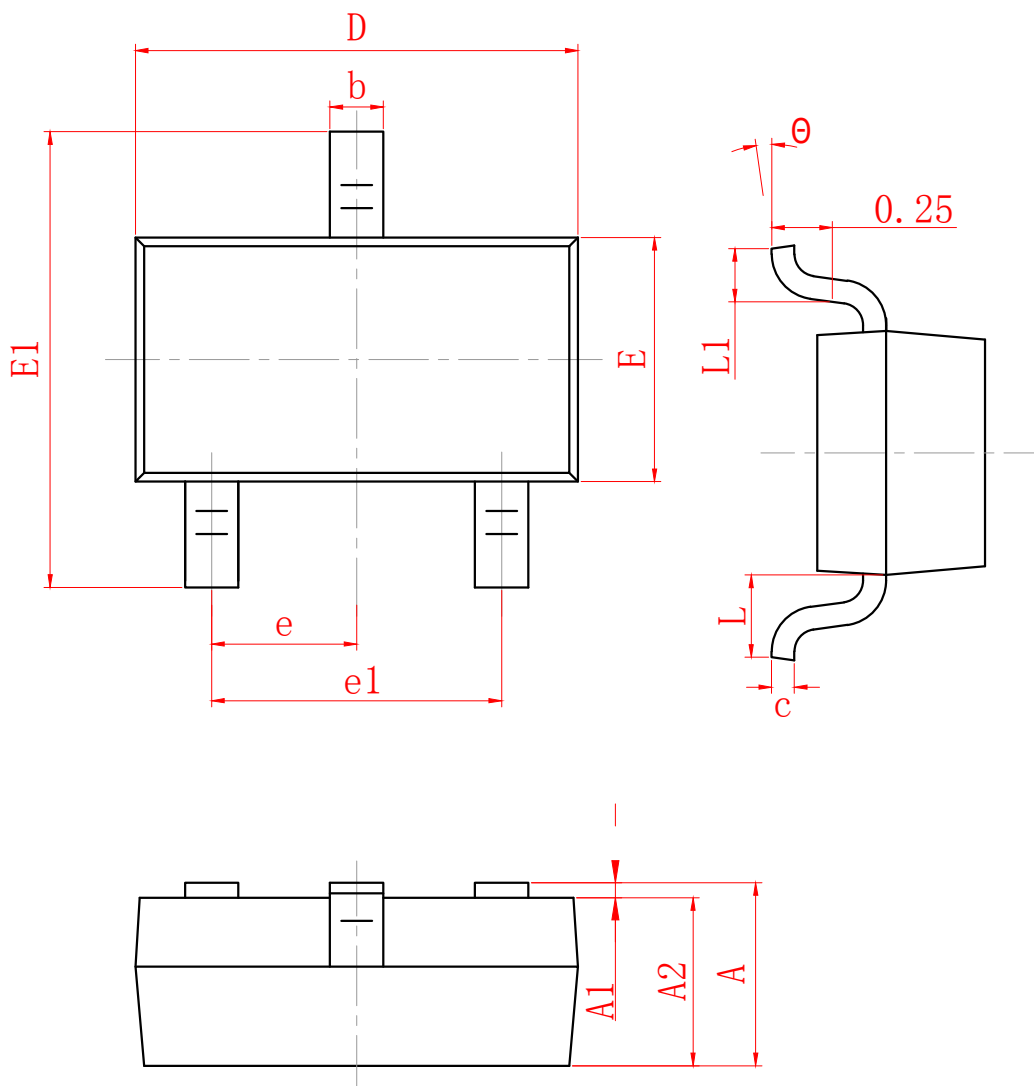


#### SOT-23 Reel



| Dimensions are in millimeter |         |       |       |        |        |       |      |       |
|------------------------------|---------|-------|-------|--------|--------|-------|------|-------|
| Reel Option                  | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
| 7"Dia                        | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |

| REEL     | Reel Size | Box        | Box Size(mm) | Carton      | Carton Size(mm) | G.W.(kg) |
|----------|-----------|------------|--------------|-------------|-----------------|----------|
| 3000 pcs | 7 inch    | 45,000 pcs | 203×203×195  | 180,000 pcs | 438×438×220     |          |



| SYMBOL   | MILLIMETER |       |
|----------|------------|-------|
|          | MIN        | MAX   |
| A        | 0.900      | 1.150 |
| A1       | 0.000      | 0.100 |
| A2       | 0.900      | 1.050 |
| b        | 0.300      | 0.500 |
| c        | 0.080      | 0.150 |
| D        | 2.800      | 3.000 |
| E        | 1.200      | 1.400 |
| E1       | 2.250      | 2.550 |
| e        | 0.950 TYP  |       |
| e1       | 1.800      | 2.000 |
| L        | 0.550 REF  |       |
| L1       | 0.300      | 0.500 |
| $\theta$ | 0°         | 8°    |

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