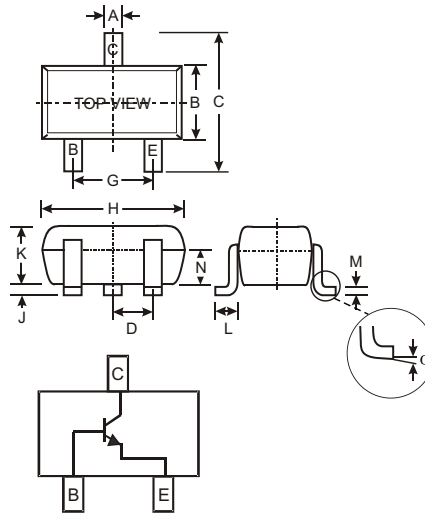


Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (MMBT2907AT)
- Ultra-Small Surface Mount Package

Mechanical Data

- Case: SOT-523, Molded Plastic
- Case material - UL Flammability Rating 94V-0
- Moisture sensitivity: Level 1 per J-STD-020A
- Terminals: Solderable per MIL-STD-202, Method 208
- Terminal Connections: See Diagram
- Marking (See Page 2): 1P
- Ordering & Date Code Information, See Page 2
- Weight: 0.002 grams (approx.)



| SOT-523 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.15 | 0.30 | 0.22 |
| B | 0.75 | 0.85 | 0.80 |
| C | 1.45 | 1.75 | 1.60 |
| D | — | — | 0.50 |
| G | 0.90 | 1.10 | 1.00 |
| H | 1.50 | 1.70 | 1.60 |
| J | 0.00 | 0.10 | 0.05 |
| K | 0.60 | 0.80 | 0.75 |
| L | 0.10 | 0.30 | 0.22 |
| M | 0.10 | 0.20 | 0.12 |
| N | 0.45 | 0.65 | 0.50 |
| α | 0° | 8° | — |
| All Dimensions in mm | | | |

Maximum Ratings @ T_A = 25°C unless otherwise specified

| Characteristic | Symbol | MMBT2222AT | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Base Voltage | V _{CBO} | 75 | V |
| Collector-Emitter Voltage | V _{CEO} | 40 | V |
| Emitter-Base Voltage | V _{EBO} | 6.0 | V |
| Collector Current - Continuous | I _C | 600 | mA |
| Power Dissipation (Note 1) | P _d | 150 | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | R _{θJA} | 833 | °C/W |
| Operating and Storage and Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

Notes: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

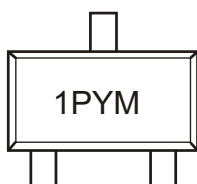
| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|---------------|----------|------------|------------------|--|
| OFF CHARACTERISTICS (Note 2) | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 75 | — | V | $I_C = 10\mu\text{A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 40 | — | V | $I_C = 10\text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 6.0 | — | V | $I_E = 10\mu\text{A}, I_C = 0$ |
| Collector Cutoff Current | I_{CEX} | — | 10 | nA | $V_{CE} = 60\text{V}, V_{EB(OFF)} = 3.0\text{V}$ |
| Base Cutoff Current | I_{BL} | — | 20 | nA | $V_{CE} = 60\text{V}, V_{EB(OFF)} = 3.0\text{V}$ |
| ON CHARACTERISTICS (Note 2) | | | | | |
| DC Current Gain | h_{FE} | 35 | — | — | $I_C = 100\mu\text{A}, V_{CE} = 10\text{V}$ $I_C = 1.0\text{mA}, V_{CE} = 10\text{V}$ $I_C = 10\text{mA}, V_{CE} = 10\text{V}$ $I_C = 150\text{mA}, V_{CE} = 10\text{V}$ $I_C = 500\text{mA}, V_{CE} = 10\text{V}$ |
| | | 50 | — | | |
| | | 75 | — | | |
| | | 100 | — | | |
| | | 40 | — | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | — | 0.3 1.0 | V | $I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$ |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | 0.6 — | 1.2 2.0 | V | $I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C_{obo} | — | 8 | pF | $V_{CB} = 10\text{V}, f = 1.0\text{MHz}, I_E = 0$ |
| Input Capacitance | C_{ibo} | — | 30 | pF | $V_{EB} = 0.5\text{V}, f = 1.0\text{MHz}, I_C = 0$ |
| Current Gain-Bandwidth Product | f_T | 300 | — | MHz | $V_{CE} = 20\text{V}, I_C = 20\text{mA}, f = 100\text{MHz}$ |
| Input Impedance | h_{ie} | 0.25 | 1.25 | k Ω | $V_{CE} = 10\text{Vdc}, I_C = 10\text{mAdc}, f = 1.0\text{kHz}$ |
| Voltage Feedback Ratio | h_{re} | — | 4.0 | $\times 10^{-4}$ | $V_{CE} = 10\text{Vdc}, I_C = 10\text{mAdc}, f = 1.0\text{kHz}$ |
| Small-Signal Current Gain | h_{fe} | 75 | 375 | — | $V_{CE} = 10\text{Vdc}, I_C = 10\text{mAdc}, f = 1.0\text{kHz}$ |
| Output Admittance | h_{oe} | 25 | 200 | μS | $V_{CE} = 10\text{Vdc}, I_C = 10\text{mAdc}, f = 1.0\text{kHz}$ |
| Noise Figure | NF | — | 4.0 | dB | $V_{CE} = 10\text{Vdc}, I_C = 100\mu\text{Adc}, R_S = 1.0\text{k ohms}, f = 1.0\text{kHz}$ |
| SWITCHING CHARACTERISTICS | | | | | |
| Delay Time | t_d | — | 10 | ns | $V_{CC} = 30\text{V}, I_C = 150\text{mA}, V_{BE(off)} = -0.5\text{V}, I_{B1} = 15\text{mA}$ |
| Rise Time | t_r | — | 25 | ns | |
| Storage Time | t_s | — | 225 | ns | $V_{CC} = 30\text{V}, I_C = 150\text{mA}, I_{B1} = I_{B2} = 15\text{mA}$ |
| Fall Time | t_f | — | 60 | ns | |

Ordering Information (Note 3)

| Device | Packaging | Shipping |
|--------------|-----------|------------------|
| MMBT2222AT-7 | SOT-523 | 3000/Tape & Reel |

- Notes: 2. Short duration test pulse used to minimize self-heating effect.
3. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



1P = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: N = 2002)
M = Month (ex: 9 = September)

Date Code Key

| Year | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|-------|------|------|-------|------|------|------|------|------|------|------|------|------|
| Code | J | K | L | M | N | P | R | S | T | U | V | W |
| Month | Jan | Feb | March | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

