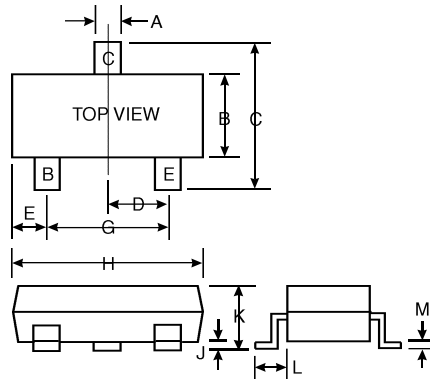


Features

Epitaxial Planar Die Construction
 Complementary PNP Type Available
 (MMBT3906)
 Ideal for Medium Power Amplification and
 Switching

Mechanical Data

Case: SOT-23, Molded Plastic
 Terminals: Solderable per MIL-STD-202,
 Method 208
 Terminal Connections: See Diagram
 Marking: K1N, R1A, 1AM
 Weight: 0.008 grams (approx.)



| SOT-23 | | |
|----------------------|-------|-------|
| Dim | Min | Max |
| A | 0.37 | 0.51 |
| B | 1.19 | 1.40 |
| C | 2.10 | 2.50 |
| D | 0.89 | 1.05 |
| E | 0.45 | 0.61 |
| G | 1.78 | 2.05 |
| H | 2.65 | 3.05 |
| J | 0.013 | 0.15 |
| K | 0.89 | 1.10 |
| L | 0.45 | 0.61 |
| M | 0.076 | 0.178 |
| All Dimensions in mm | | |

Maximum Ratings @ T_A = 25 C unless otherwise specified

| Characteristic | Symbol | MMBT3904 | Unit |
|--|-----------------------------------|-------------|------|
| Collector-Base Voltage | V _{CBO} | 60 | V |
| Collector-Emitter Voltage | V _{CEO} | 40 | V |
| Emitter-Base Voltage | V _{EBO} | 6.0 | V |
| Collector Current - Continuous (Note 1) | I _C | 200 | mA |
| Power Dissipation (Note 1) | P _d | 350 | mW |
| Thermal Resistance, Junction to Ambient (Note 1) | R _{JA} | 357 | K/W |
| Operating and Storage and Temperature Range | T _J , T _{STG} | -55 to +150 | C |

Notes: 1. Valid provided that terminals are kept at ambient temperature.
 2. Pulse test: Pulse width 300 s, duty cycle 2%.

Electrical Characteristics @ T_A = 25 °C unless otherwise specified

| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|----------------------|-----------------------------|--------------|--------------------|--|
| OFF CHARACTERISTICS (Note 2) | | | | | |
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | 60 | | V | I _C = 10 A, I _E = 0 |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | 40 | | V | I _C = 1.0mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | V _{(BR)EBO} | 5.0 | | V | I _E = 10 A, I _C = 0 |
| Collector Cutoff Current | I _{CEX} | | 50 | nA | V _{CE} = 30V, V _{EB(OFF)} = 3.0V |
| Base Cutoff Current | I _{BL} | | 50 | nA | V _{CE} = 30V, V _{EB(OFF)} = 3.0V |
| ON CHARACTERISTICS (Note 2) | | | | | |
| DC Current Gain | h _{FE} | 40 70 100 60 30 | 300 | | I _C = 100μA, V _{CE} = 1.0V I _C = 1.0mA, V _{CE} = 1.0V I _C = 10mA, V _{CE} = 1.0V I _C = 50mA, V _{CE} = 1.0V I _C = 100mA, V _{CE} = 1.0V |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | | 0.20 0.30 | V | I _C = 10mA, I _B = 1.0mA I _C = 50mA, I _B = 5.0mA |
| Base- Emitter Saturation Voltage | V _{BE(SAT)} | 0.65 | 0.85 0.95 | V | I _C = 10mA, I _B = 1.0mA I _C = 50mA, I _B = 5.0mA |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C _{obo} | | 4.0 | pF | V _{CB} = 5.0V, f = 1.0MHz, I _E = 0 |
| Input Capacitance | C _{ibo} | | 8.0 | pF | V _{EB} = 0.5V, f = 1.0MHz, I _C = 0 |
| Input Impedance | h _{ie} | 1.0 | 10 | k | V _{CE} = 10V, I _C = 1.0mA, f = 1.0kHz |
| Voltage Feedback Ratio | h _{re} | 0.5 | 8.0 | x 10 ⁻⁴ | |
| Small Signal Current Gain | h _{fe} | 100 | 400 | | |
| Output Admittance | h _{oe} | 1.0 | 40 | S | |
| Current Gain-Bandwidth Product | f _T | 300 | | MHz | |
| Noise Figure | NF | | 5.0 | dB | V _{CE} = 5.0V, I _C = 100 A, R _S = 1.0k f = 1.0kHz |
| SWITCHING CHARACTERISTICS | | | | | |
| Delay Time | t _d | | 35 | ns | V _{CC} = 3.0V, I _C = 10mA, V _{BE(off)} = - 0.5V, I _{B1} = 1.0mA |
| Rise Time | t _r | | 35 | ns | |
| Storage Time | t _s | | 200 | ns | V _{CC} = 3.0V, I _C = 10mA, I _{B1} = I _{B2} = 1.0mA |
| Fall Time | t _f | | 50 | ns | |

- Notes: 1. Valid provided that terminals are kept at ambient temperature.
2. Pulse test: Pulse width 300 s, duty cycle 2%.