



November 2014

FMBM5551 NPN General-Purpose Amplifier

Features

- This device has matched dies
- Sourced from process 16
- See MMBT5551 for characteristics

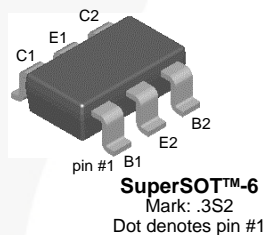


Figure 1. Device Package

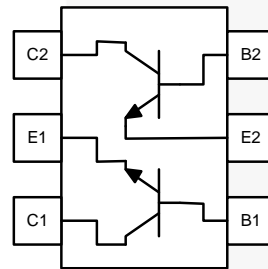


Figure 2. Internal Connection

Ordering Information

| Part Number | Top Mark | Package | Packing Method |
|-------------|----------|---------|----------------|
| FMBM5551 | 3S2 | SSOT 6L | Tape and Reel |

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|-----------|---------------------------|------------|------------------|
| V_{CEO} | Collector-Emitter Voltage | 160 | V |
| V_{CBO} | Collector-Base Voltage | 180 | V |
| V_{EBO} | Emitter-Base Voltage | 6 | V |
| I_C | Collector Current (DC) | 600 | mA |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics^{(1), (2)}

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|-----------------|--|-------|---------------------------|
| P_D | Power Dissipation ($T_C = 25^\circ\text{C}$) | 0.7 | W |
| | Derate Above 25°C | 5.6 | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 180 | $^\circ\text{C}/\text{W}$ |

Notes:

- P_D total, for both transistors. For each transistor, $P_D = 350$ mW.
- PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Max. | Unit |
|----------------------|--|---|------|------|---------------|
| BV_{CEO} | Collector-Emitter Breakdown Voltage | $I_C = 1$ mA, $I_B = 0$ | 160 | | V |
| BV_{CBO} | Collector-Base Breakdown Voltage | $I_C = 100$ μA , $I_E = 0$ | 180 | | V |
| BV_{EBO} | Emitter-Base Breakdown Voltage | $I_E = 10$ μA , $I_C = 0$ | 6 | | V |
| I_{CBO} | Collector Cut-Off Current | $V_{CB} = 120$ V, $I_E = 0$ | | 50 | nA |
| | | $V_{CB} = 120$ V, $I_E = 0$, $T_A = 100^\circ\text{C}$ | | 50 | μA |
| I_{EBO} | Emitter Cut-Off Current | $V_{EB} = 4$ V, $I_C = 0$ | | 50 | nA |
| h_{FE1} | DC Current Gain | $V_{CE} = 5$ V, $I_C = 1$ mA | 80 | | |
| DIVID1 | Variation Ratio of h_{FE1} Between Die 1 and Die 2 | $h_{FE1}(\text{Die1}) / h_{FE1}(\text{Die2})$ | 0.9 | 1.1 | |
| h_{FE2} | DC Current Gain | $V_{CE} = 5$ V, $I_C = 10$ mA | 80 | 250 | |
| DIVID2 | Variation Ratio of h_{FE2} Between Die 1 and Die 2 | $h_{FE2}(\text{Die1}) / h_{FE2}(\text{Die2})$ | 0.95 | 1.05 | |
| h_{FE3} | DC Current Gain | $V_{CE} = 5$ V, $I_C = 50$ mA | 30 | | |
| DIVID3 | Variation Ratio of h_{FE3} Between Die 1 and Die 2 | $h_{FE3}(\text{Die1}) / h_{FE3}(\text{Die2})$ | 0.9 | 1.1 | |
| $V_{CE}(\text{sat})$ | Collector-Emitter Saturation Voltage | $I_C = 10$ mA, $I_B = 1$ mA | | 0.15 | V |
| | | $I_C = 50$ mA, $I_B = 5$ mA | | 0.20 | |
| $V_{BE}(\text{sat})$ | Base-Emitter Saturation Voltage | $I_C = 10$ mA, $I_B = 1$ mA | | 1 | V |
| | | $I_C = 50$ mA, $I_B = 5$ mA | | 1 | |
| $V_{BE}(\text{on})$ | Base-Emitter On Voltage | $V_{CE} = 5$ V, $I_C = 10$ mA | | 1 | V |
| DEL | Difference of $V_{BE}(\text{on})$ Between Die1 and Die 2 | $V_{BE}(\text{on})(\text{Die1}) - V_{BE}(\text{on})(\text{Die2})$ | -8 | 8 | mV |
| C_{ob} | Output Capacitance | $V_{CB} = 10$ V, $I_E = 0$, $f = 1$ MHz | | 6 | pF |
| C_{ib} | Input Capacitance | $V_{EB} = 0.5$ V, $I_C = 0$, $f = 1$ MHz | | 20 | pF |
| f_T | Current Gain Bandwidth Product | $V_{CE} = 10$ V, $I_C = 10$ mA, $f = 100$ MHz | 100 | 300 | MHz |
| NF | Noise Figure | $V_{CE} = 5$ V, $I_C = 200$ μA , $f = 1$ MHz, $R_S = 20$ k Ω , $B = 200$ Hz | | 8 | dB |
| h_{fe} | Small Signal Current Gain | $V_{CE} = 10$ V, $I_C = 1.0$ mA, $f = 10$ kHz | 50 | 250 | |

Typical Performance Characteristics

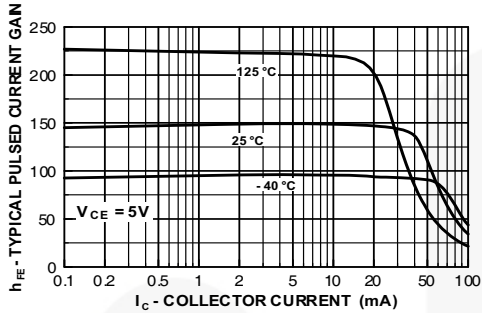


Figure 3. Typical Pulsed Current Gain vs. Collector Current

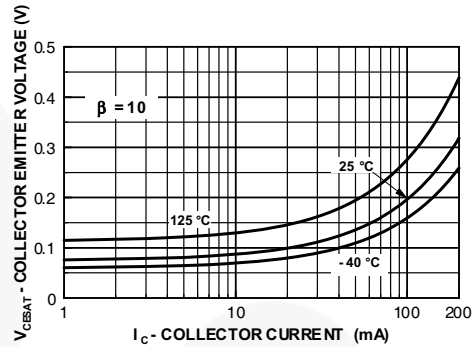


Figure 4. Collector-Emitter Saturation Voltage vs. Collector Current

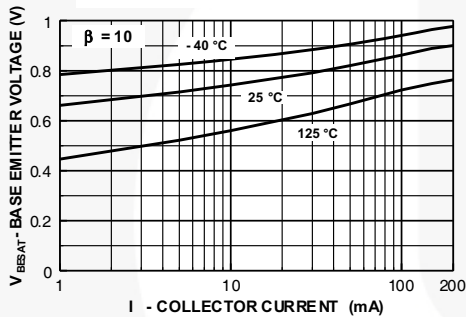


Figure 5. Base-Emitter Saturation Voltage vs. Collector Current

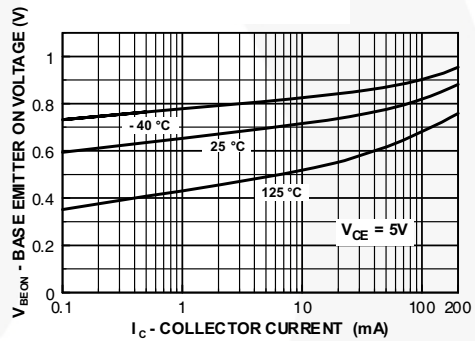


Figure 6. Base-Emitter On Voltage vs. Collector Current

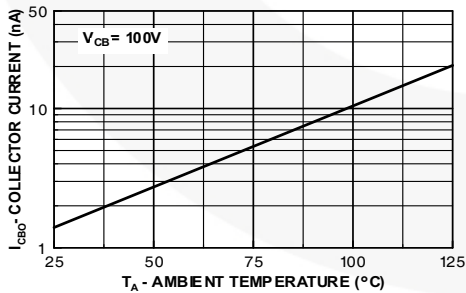


Figure 7. Collector Cut-Off Current vs. Ambient Temperature

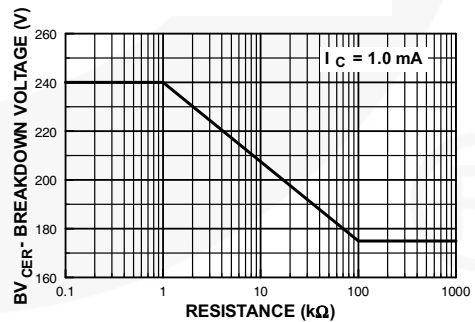


Figure 8. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

Typical Performance Characteristics (Continued)

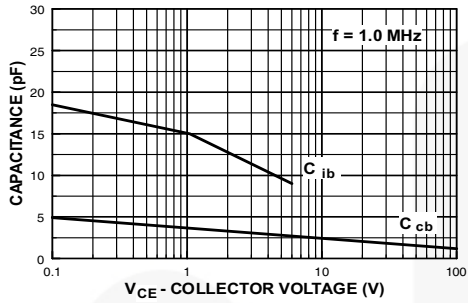


Figure 9. Input and Output Capacitance vs. Reverse Voltage

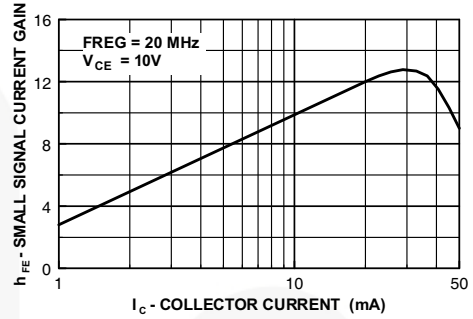


Figure 10. Small Signal Current Gain vs. Collector Current

Physical Dimensions

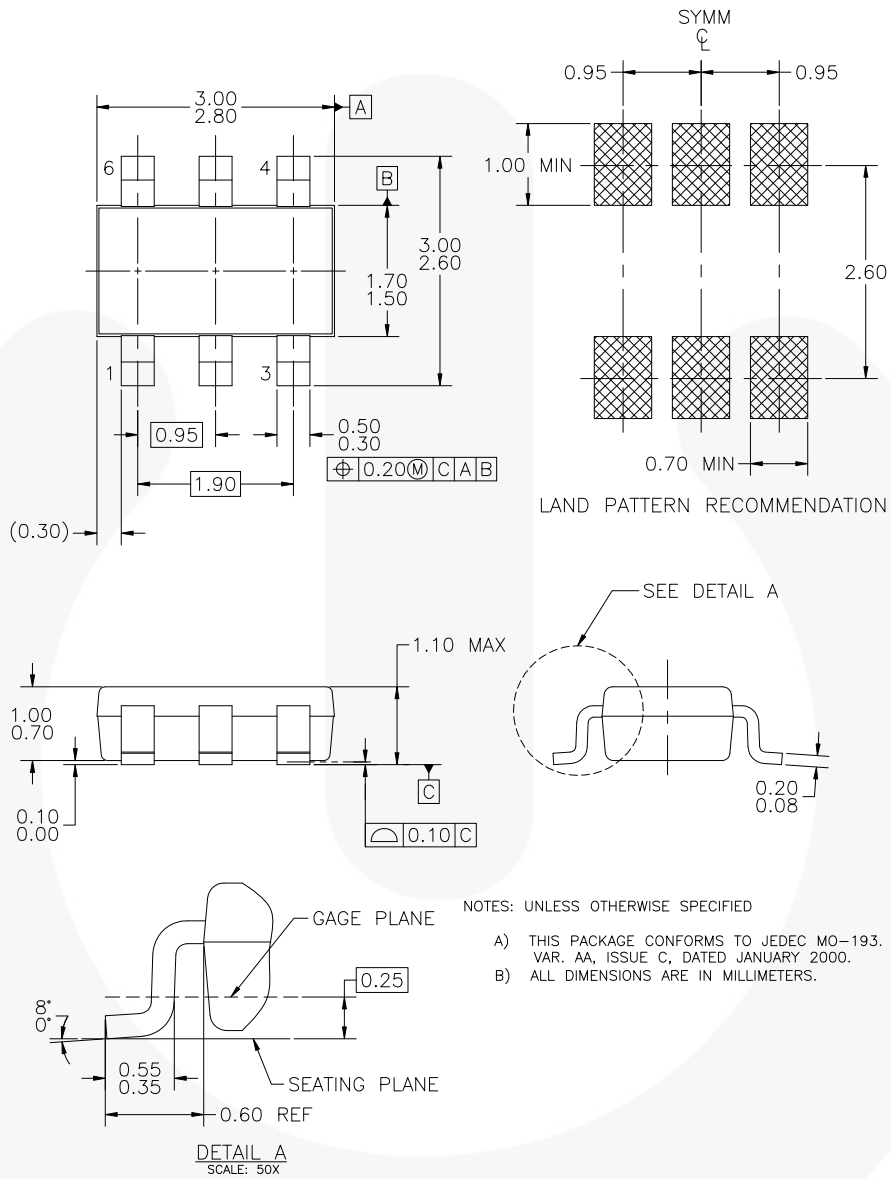


Figure 11. 6-LEAD, SUPERSOT6, JEDEC MO-193, 1.6 MM WIDE



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