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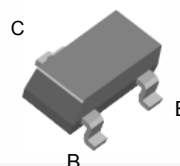


October 2014

FSB560 / FSB560A NPN Low-Saturation Transistor

Features

- These devices are designed with high-current gain and low-saturation voltage with collector currents up to 2 A continuous.



SuperSOT™-3 (SOT-23)

Ordering Information

| Part Number | Marking | Package | Packing Method |
|-------------|---------|---------|----------------|
| FSB560 | 560 | SSOT 3L | Tape and Reel |
| FSB560A | 560A | SSOT 3L | Tape and Reel |

Absolute Maximum Ratings^{(1),(2)}

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 | 60 | V |
| V_{CBO} | Collector-Base Voltage | 80 | V |
| V_{EBO} | Emitter-Base Voltage | 5 | V |
| I_C | Collector Current - Continuous | 2 | A |
| T_J, T_{STG} | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ\text{C}$ |

Notes:

1. These ratings are based on a maximum junction temperature of 150°C .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

Thermal Characteristics⁽³⁾

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

| Symbol | Parameter | Max. | Unit |
|-----------------|---|------|----------------------|
| P_D | Total Device Dissipation | 500 | mW |
| | Derate Above 25°C | 4 | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 250 | $^\circ\text{C/W}$ |

Note:

3. 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 | $I_C = 10\text{ mA}, I_B = 0$ | 60 | | V |
| BV_{CBO} | Collector-Base Breakdown Voltage | $I_C = 100\text{ }\mu\text{A}, I_E = 0$ | 80 | | V |
| BV_{EBO} | Emitter-Base Breakdown Voltage | $I_E = 100\text{ }\mu\text{A}, I_C = 0$ | 5 | | V |
| I_{CBO} | Collector Cut-Off Current | $V_{CB} = 30\text{ V}, I_E = 0$ | | 100 | nA |
| | | $V_{CB} = 30\text{ V}, I_E = 0, T_A = 100^\circ\text{C}$ | | 10 | μA |
| I_{EBO} | Emitter Cut-Off Current | $V_{EB} = 4\text{ V}, I_C = 0$ | | 100 | nA |
| h_{FE} | DC Current Gain ⁽⁴⁾ | $I_C = 100\text{ mA}, V_{CE} = 2\text{ V}$ | 70 | | |
| | | $I_C = 500\text{ mA}, V_{CE} = 2\text{ V}$ | 100 | 300 | |
| | | | 250 | 550 | |
| | | $I_C = 1\text{ A}, V_{CE} = 2\text{ V}$ | 80 | | |
| | | $I_C = 2\text{ A}, V_{CE} = 2\text{ V}$ | 40 | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage ⁽⁴⁾ | $I_C = 1\text{ A}, I_B = 100\text{ mA}$ | | 300 | mV |
| | | $I_C = 2\text{ A}, I_B = 200\text{ mA}$ | | 350 | |
| | | | | 300 | |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage ⁽⁴⁾ | $I_C = 1\text{ A}, I_B = 100\text{ mA}$ | | 1.25 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage ⁽⁴⁾ | $I_C = 1\text{ A}, V_{CE} = 2\text{ V}$ | | 1 | V |
| C_{obo} | Output Capacitance | $V_{CB} = 10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$ | | 30 | pF |
| f_T | Transition Frequency | $I_C = 100\text{ mA}, V_{CE} = 5\text{ V}, f = 100\text{ MHz}$ | 75 | | MHz |

Note:

4. Pulse test: pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2.0\%$

Typical Performance Characteristics

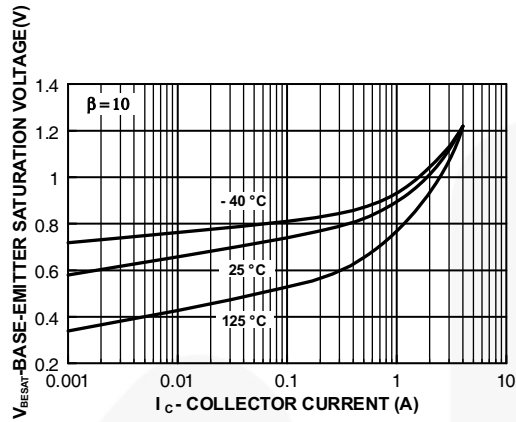


Figure 1. Base-Emitter Saturation Voltage vs. Collector Current

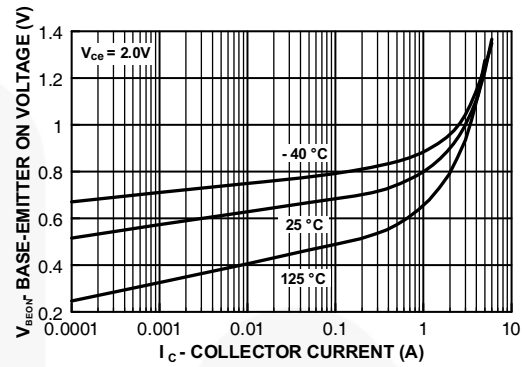


Figure 2. Base-Emitter On Voltage vs. Collector Current

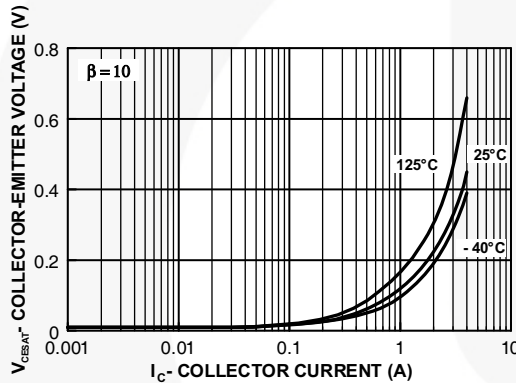


Figure 3. Collector-Emitter Saturation Voltage vs. Collector Current

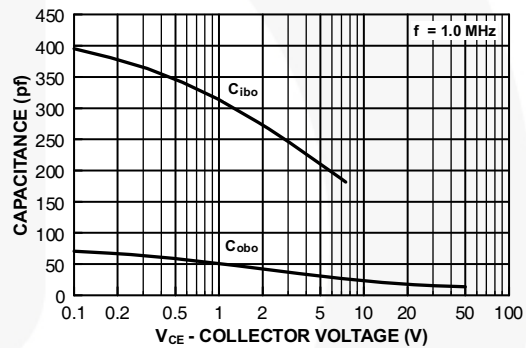


Figure 4. Input / Output Capacitance vs. Reverse Bias Voltage

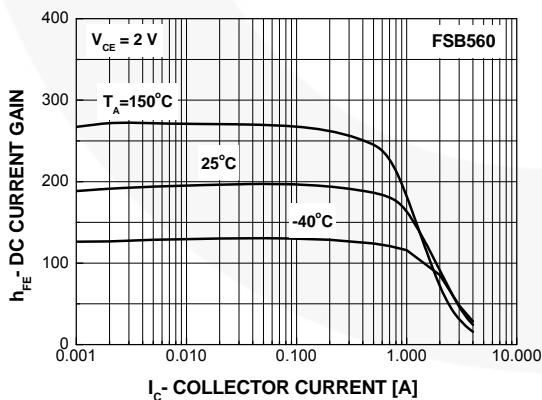


Figure 5. Current Gain vs. Collector Current

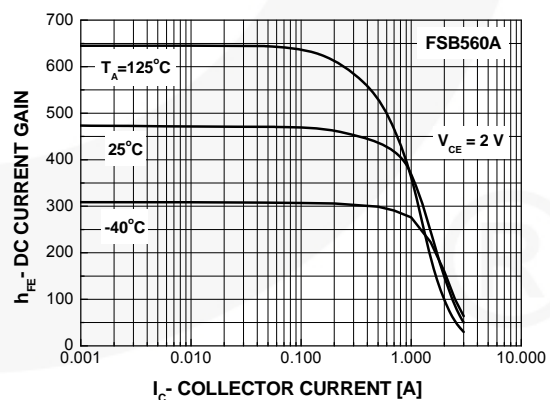


Figure 6. Current Gain vs. Collector Current

MA03BREVB



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