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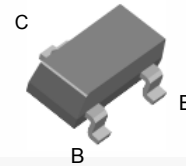
September 2015

FSB619

NPN Low-Saturation Transistor

Features

- This device is designed with high-current gain and low-saturation voltage with collector currents up to 3 A continuous.



SuperSOT™-3 (SOT-23)

Ordering Information

| Part Number | Marking | Package | Packing Method |
|-------------|---------|---------|----------------|
| FSB619 | 619 | 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 | 50 | V |
| V_{CBO} | Collector-Base Voltage | 50 | 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

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

| Symbol | Parameter | Max. | Unit |
|-----------------|---|------|---------------------------|
| P_D | Total Device Dissipation ⁽³⁾ | 500 | mW |
| | Derate Above 25°C | 4 | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 250 | $^\circ\text{C}/\text{W}$ |

Note:

3. Device mounted on FR-4 PCB 4.5" X 5"; mounting pad 0.02 in² of 2oz copper.

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 | $I_C = 10\text{ mA}, I_B = 0$ | 50 | | V |
| BV_{CBO} | Collector-Base Breakdown Voltage | $I_C = 100\ \mu\text{A}, I_E = 0$ | 50 | | V |
| BV_{EBO} | Emitter-Base Breakdown Voltage | $I_E = 100\ \mu\text{A}, I_C = 0$ | 5 | | V |
| I_{CBO} | Collector Cut-Off Current | $V_{CB} = 40\text{ V}, I_E = 0$ | | 100 | nA |
| I_{EBO} | Emitter Cut-Off Current | $V_{EB} = 4\text{ V}, I_C = 0$ | | 100 | nA |
| I_{CES} | Collector Emitter Cut-Off Current | $V_{CES} = 40\text{ V}$ | | 100 | nA |
| h_{FE} | DC Current Gain ⁽⁴⁾ | $I_C = 10\text{ mA}, V_{CE} = 2\text{ V}$ | 200 | | |
| | | $I_C = 200\text{ mA}, V_{CE} = 2\text{ V}$ | 300 | | |
| | | $I_C = 1\text{ A}, V_{CE} = 2\text{ V}$ | 200 | | |
| | | $I_C = 2\text{ A}, V_{CE} = 2\text{ V}$ | 100 | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage ⁽⁴⁾ | $I_C = 100\text{ mA}, I_B = 10\text{ mA}$ | | 20 | mV |
| | | $I_C = 1\text{ A}, I_B = 10\text{ mA}$ | | 235 | |
| | | $I_C = 2\text{ A}, I_B = 50\text{ mA}$ | | 320 | |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage ⁽⁴⁾ | $I_C = 2\text{ A}, I_B = 50\text{ mA}$ | | 1 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage ⁽⁴⁾ | $I_C = 2\text{ A}, V_{CE} = 2\text{ V}$ | | 1 | V |
| C_{obo} | Output Capacitance | $V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$ | | 30 | pF |
| f_T | Transition Frequency | $I_C = 50\text{ mA}, V_{CE} = 10\text{ V}, f = 100\text{ MHz}$ | 100 | | |

Note:

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

Typical Performance Characteristics

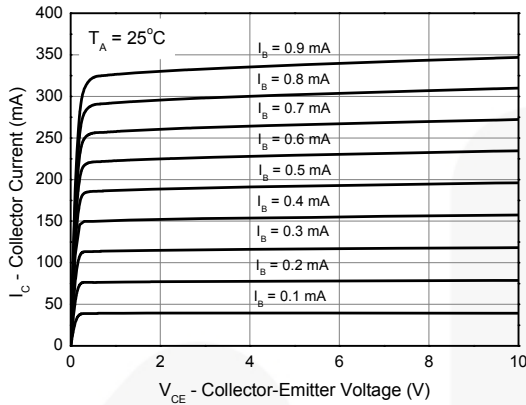


Figure 1. Static Characteristics

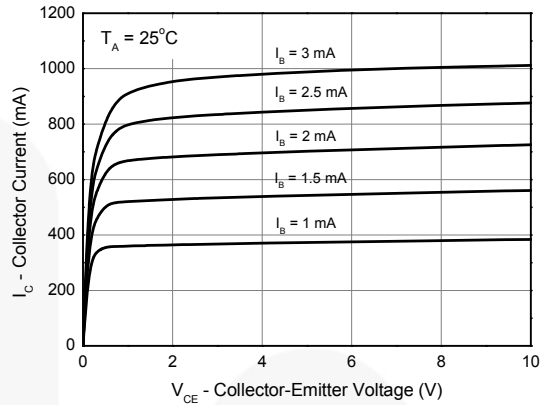


Figure 2. Static Characteristics

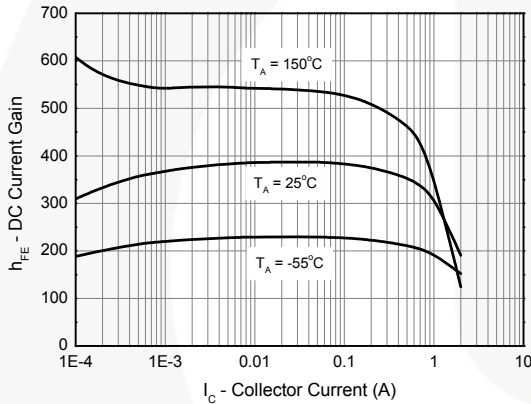


Figure 3. DC Current Gain vs. Collector Current

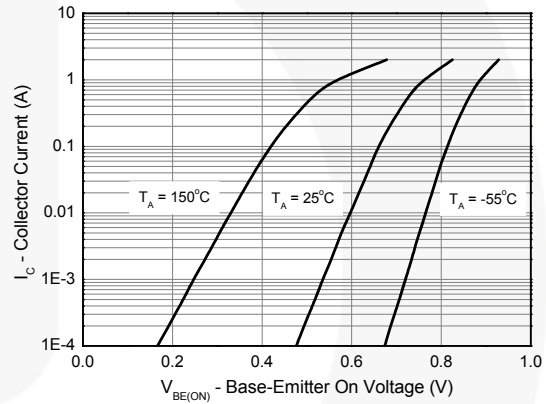


Figure 4. Base-Emitter On Voltage vs. Collector Current

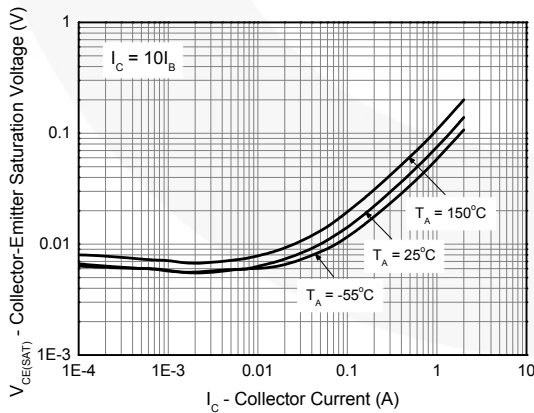


Figure 5. Collector-Emitter Saturation Voltage vs. Collector Current

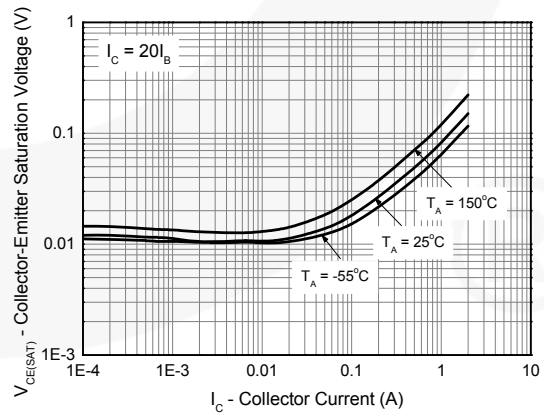


Figure 6. Collector-Emitter Saturation Voltage vs. Collector Current

Typical Performance Characteristics (Continued)

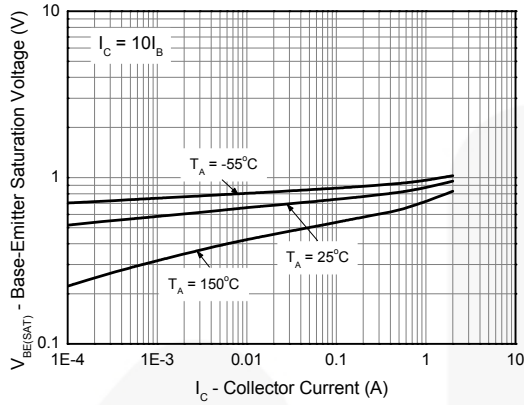


Figure 7. Base-Emitter Saturation Voltage vs. Collector Current

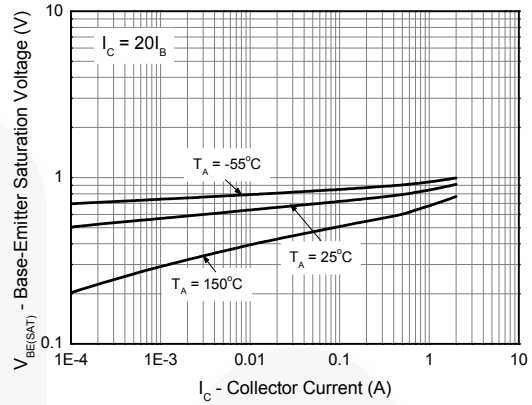


Figure 8. Base-Emitter Saturation Voltage vs. Collector Current

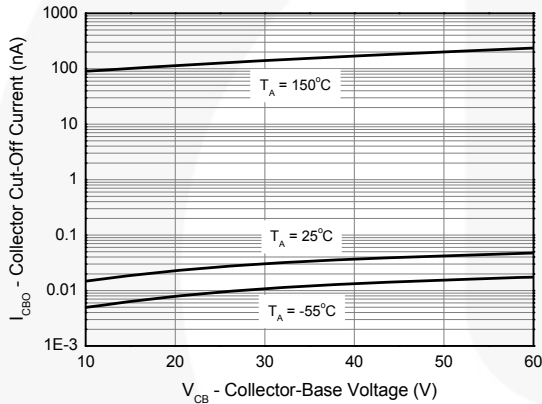


Figure 9. Collector Cut-Off Current vs. Collector-Base Voltage

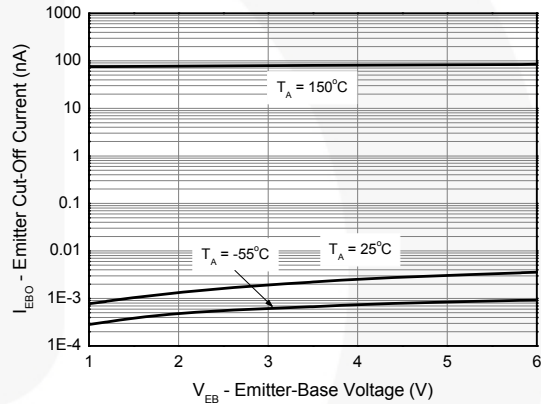


Figure 10. Emitter Cut-Off Current vs. Emitter-Base Voltage

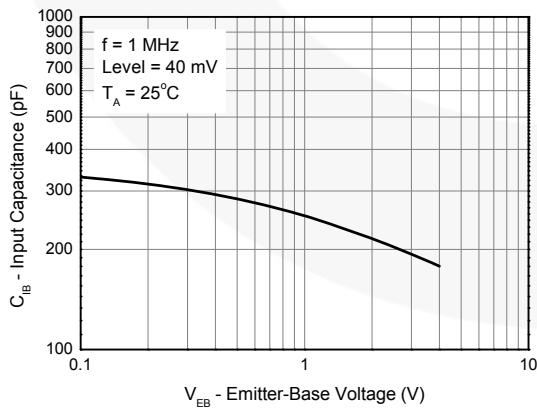


Figure 11. Typical Input Capacitance

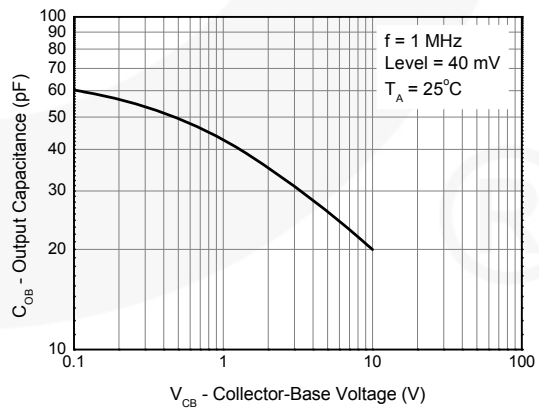
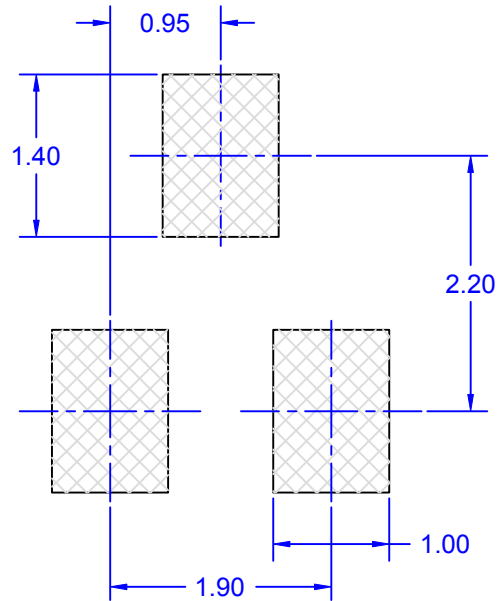
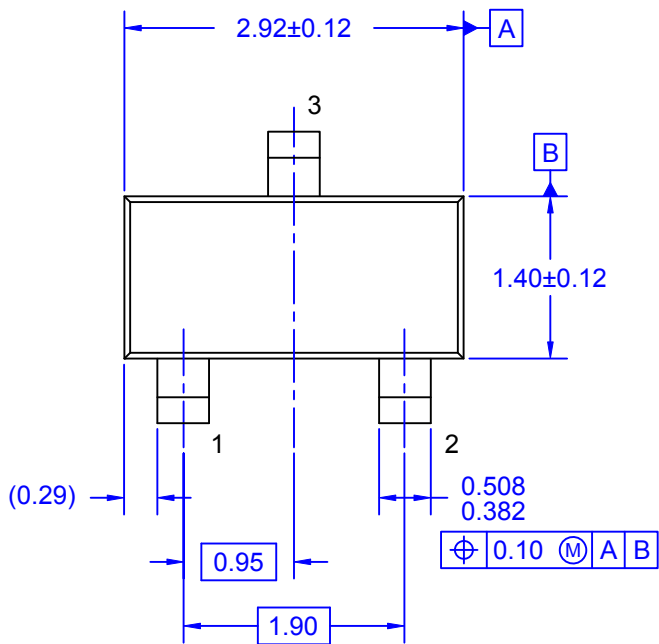
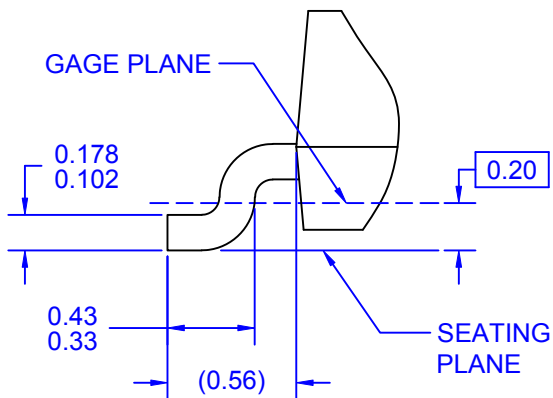
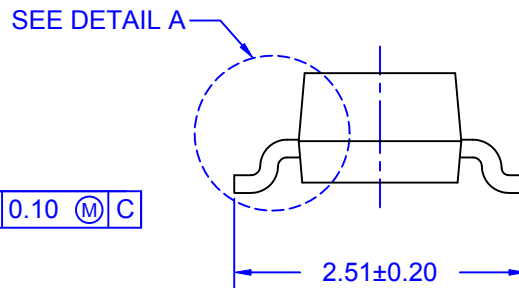
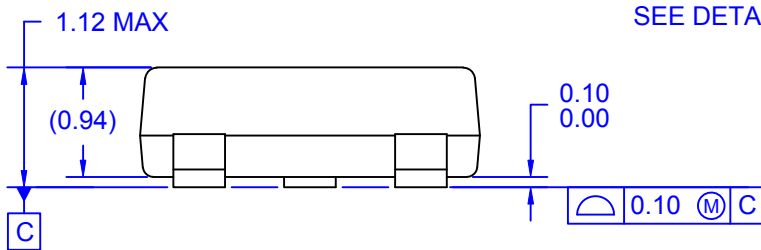


Figure 12. Typical Output Capacitance



LAND PATTERN RECOMMENDATION



DETAIL A

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