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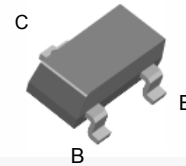
September 2015

# 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<sup>(1),(2)</sup>

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  $150^\circ\text{C}$ .
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 <sup>(3)</sup>	500	mW
	Derate Above $25^\circ\text{C}$	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 in<sup>2</sup> 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 <sup>(4)</sup>	$I_C = 10\text{ mA}, V_{CE} = 2\text{ V}$	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 <sup>(4)</sup>	$I_C = 100\text{ mA}, I_B = 10\text{ mA}$		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 <sup>(4)</sup>	$I_C = 2\text{ A}, I_B = 50\text{ mA}$		1	V
$V_{BE(on)}$	Base-Emitter On Voltage <sup>(4)</sup>	$I_C = 2\text{ A}, V_{CE} = 2\text{ V}$		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

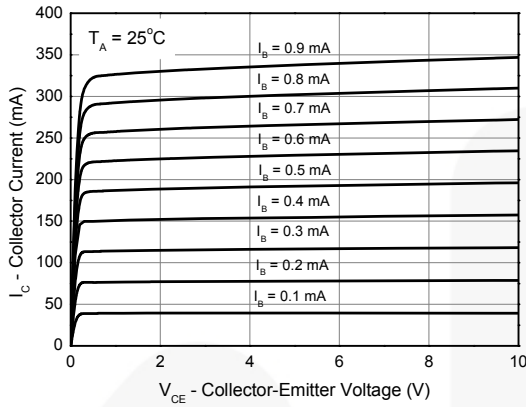


Figure 1. Static Characteristics

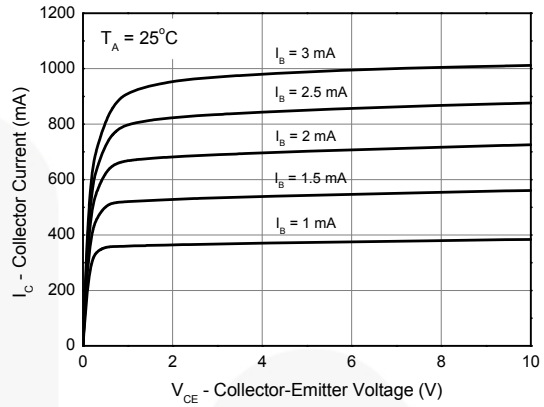


Figure 2. Static Characteristics

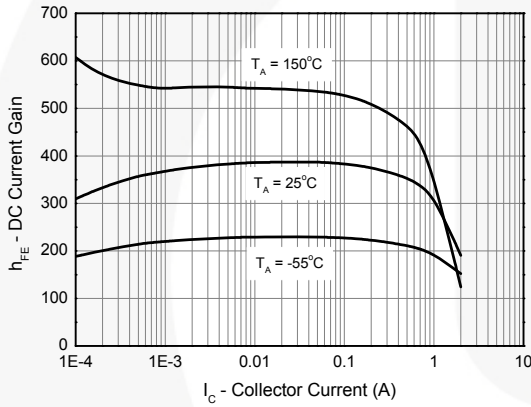


Figure 3. DC Current Gain vs. Collector Current

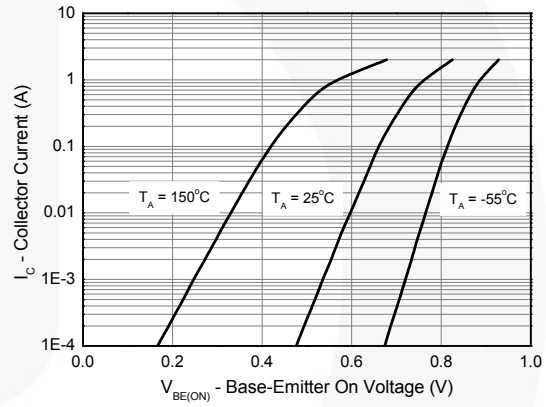


Figure 4. Base-Emitter On Voltage vs. Collector Current

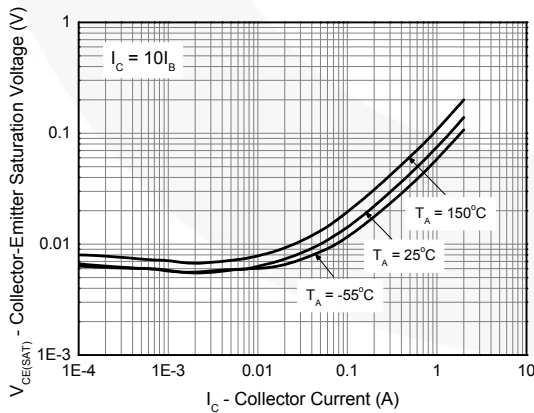


Figure 5. Collector-Emmitter Saturation Voltage vs. Collector Current

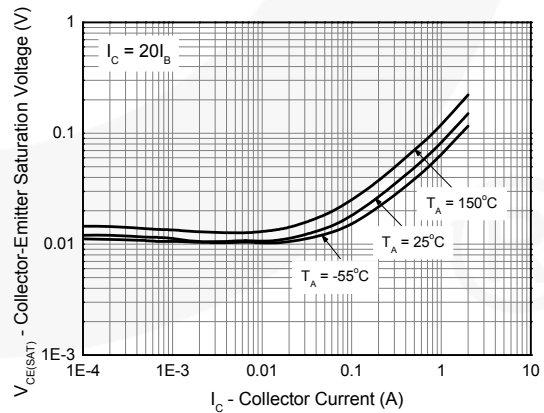
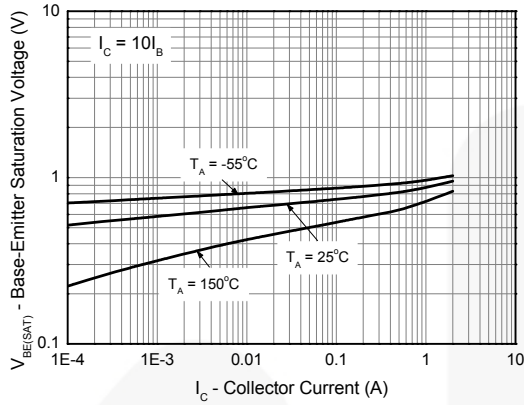
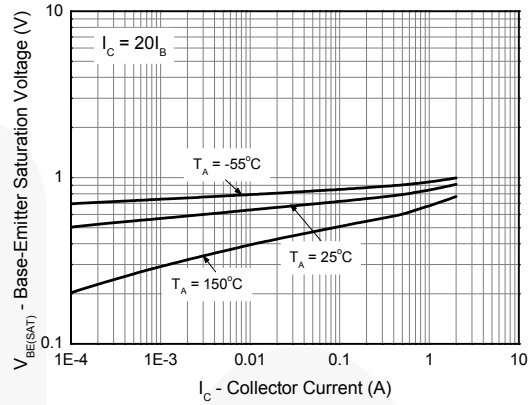


Figure 6. Collector-Emmitter Saturation Voltage vs. Collector Current

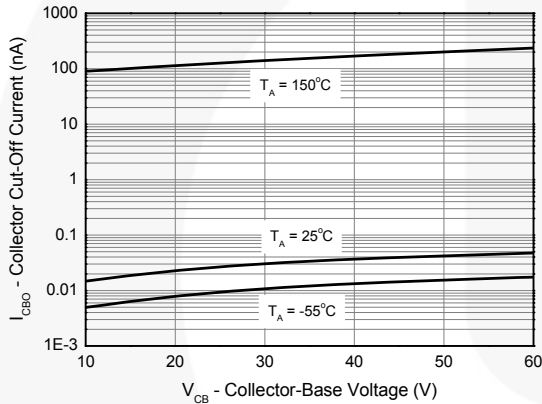
**Typical Performance Characteristics** (Continued)



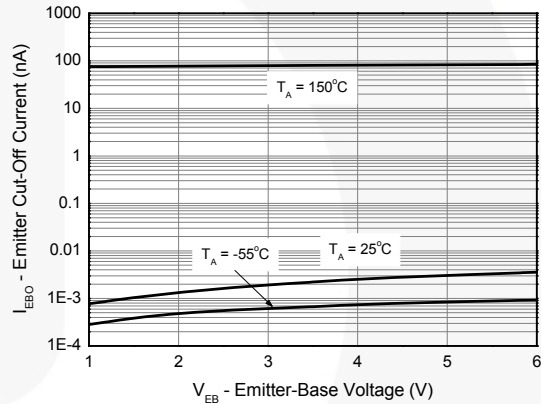
**Figure 7. Base-Emitter Saturation Voltage vs. Collector Current**



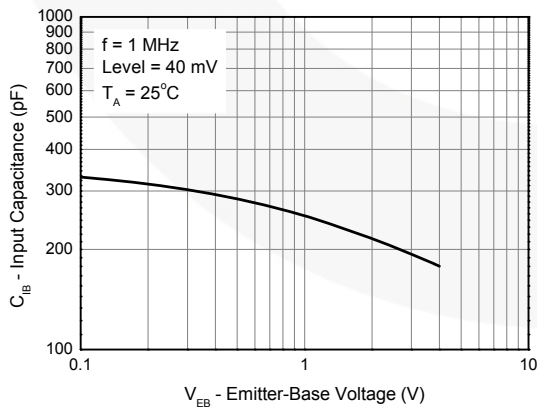
**Figure 8. Base-Emitter Saturation Voltage vs. Collector Current**



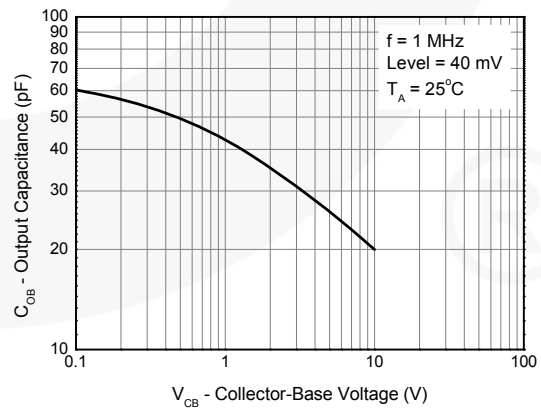
**Figure 9. Collector Cut-Off Current vs. Collector-Base Voltage**



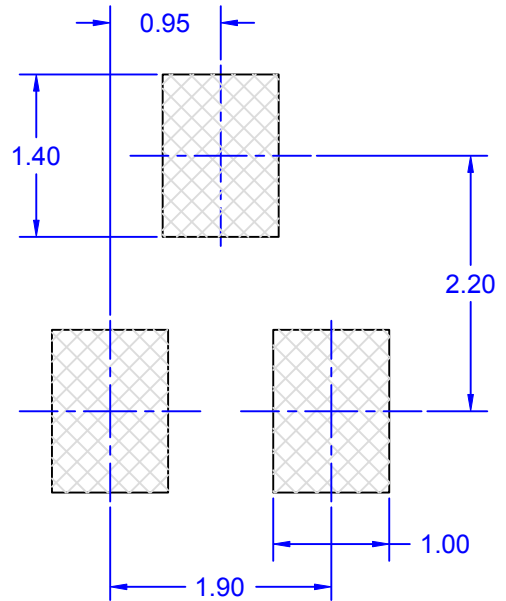
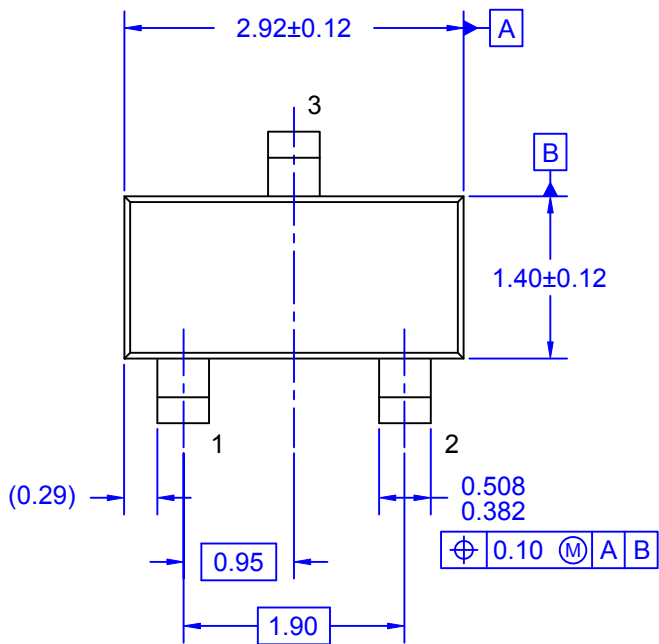
**Figure 10. Emitter Cut-Off Current vs. Emitter-Base Voltage**



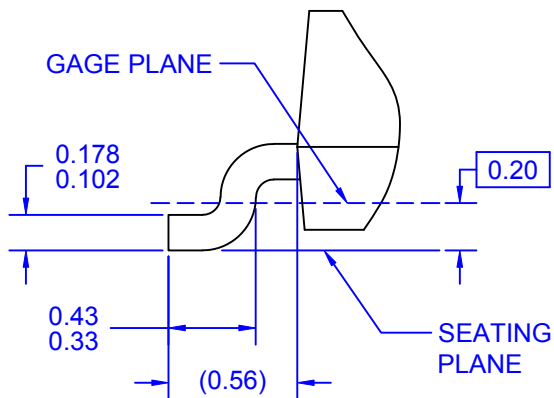
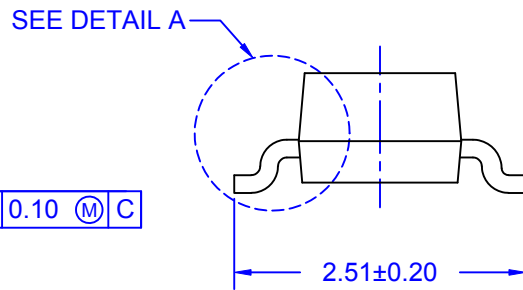
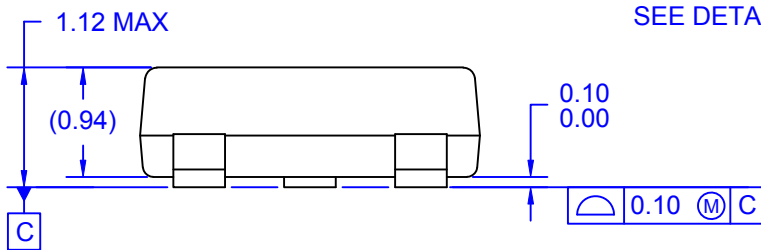
**Figure 11. Typical Input Capacitance**



**Figure 12. Typical Output Capacitance**



LAND PATTERN RECOMMENDATION



**DETAIL A**

SCALE: 50:1

NOTES: UNLESS OTHERWISE SPECIFIED

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- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 2009.
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