

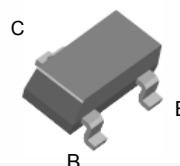


October 2014

## 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<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	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  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

**Thermal Characteristics<sup>(3)</sup>**

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 $25^\circ\text{C}$	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 <sub>CEO</sub>	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0	60		V	
BV <sub>CBO</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0	80		V	
BV <sub>EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> = 100 μA, I <sub>C</sub> = 0	5		V	
I <sub>CBO</sub>	Collector Cut-Off Current	V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0		100	nA	
		V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0, T <sub>A</sub> = 100°C		10	μA	
I <sub>EBO</sub>	Emitter Cut-Off Current	V <sub>EB</sub> = 4 V, I <sub>C</sub> = 0		100	nA	
h <sub>FE</sub>	DC Current Gain <sup>(4)</sup>	I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 2 V	70			
		I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 2 V	FSB560	100		300
			FSB560A	250		550
		I <sub>C</sub> = 1 A, V <sub>CE</sub> = 2 V	80			
		I <sub>C</sub> = 2 A, V <sub>CE</sub> = 2 V	40			
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage <sup>(4)</sup>	I <sub>C</sub> = 1 A, I <sub>B</sub> = 100 mA		300	mV	
		I <sub>C</sub> = 2 A, I <sub>B</sub> = 200 mA	FSB560			350
			FSB560A			300
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage <sup>(4)</sup>	I <sub>C</sub> = 1 A, I <sub>B</sub> = 100 mA		1.25	V	
V <sub>BE(on)</sub>	Base-Emitter On Voltage <sup>(4)</sup>	I <sub>C</sub> = 1 A, V <sub>CE</sub> = 2 V		1	V	
C <sub>obo</sub>	Output Capacitance	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1.0 MHz		30	pF	
f <sub>T</sub>	Transition Frequency	I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 5 V, f = 100 MHz	75		MHz	

**Note:**

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

## Typical Performance Characteristics

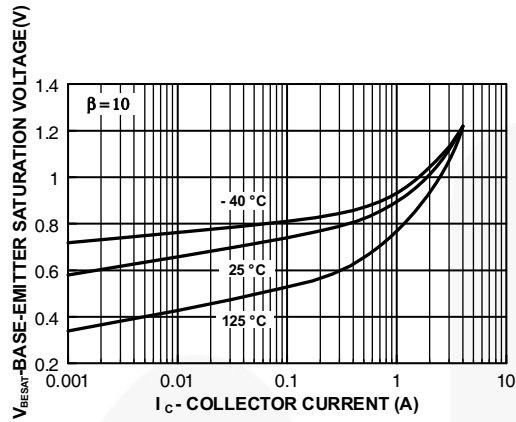


Figure 1. Base-Emitter Saturation Voltage vs. Collector Current

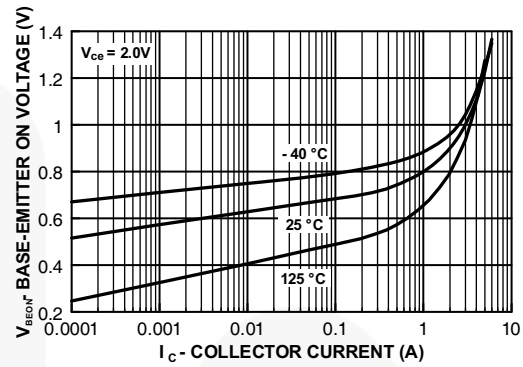


Figure 2. Base-Emitter On Voltage vs. Collector Current

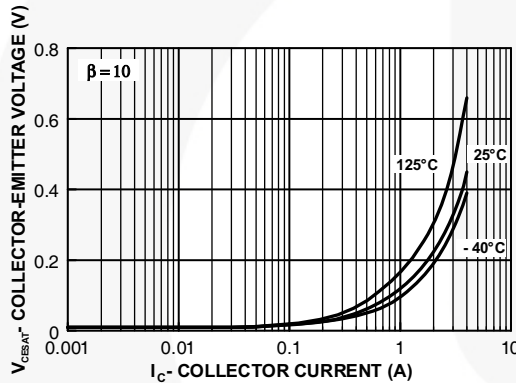


Figure 3. Collector-Emitter Saturation Voltage vs. Collector Current

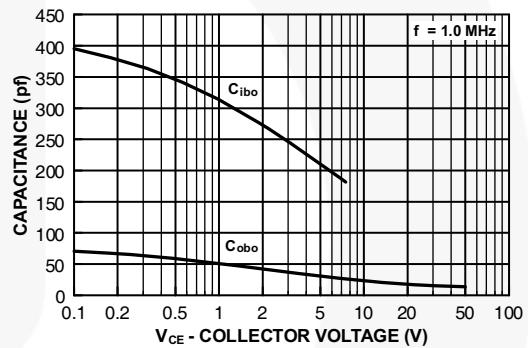


Figure 4. Input / Output Capacitance vs. Reverse Bias Voltage

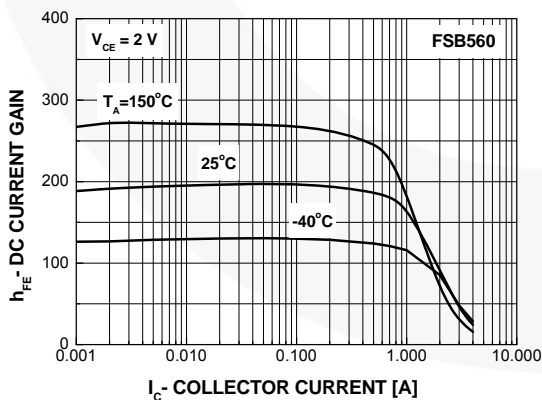


Figure 5. Current Gain vs. Collector Current

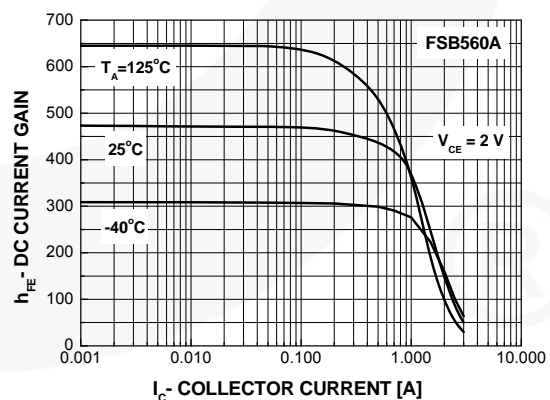
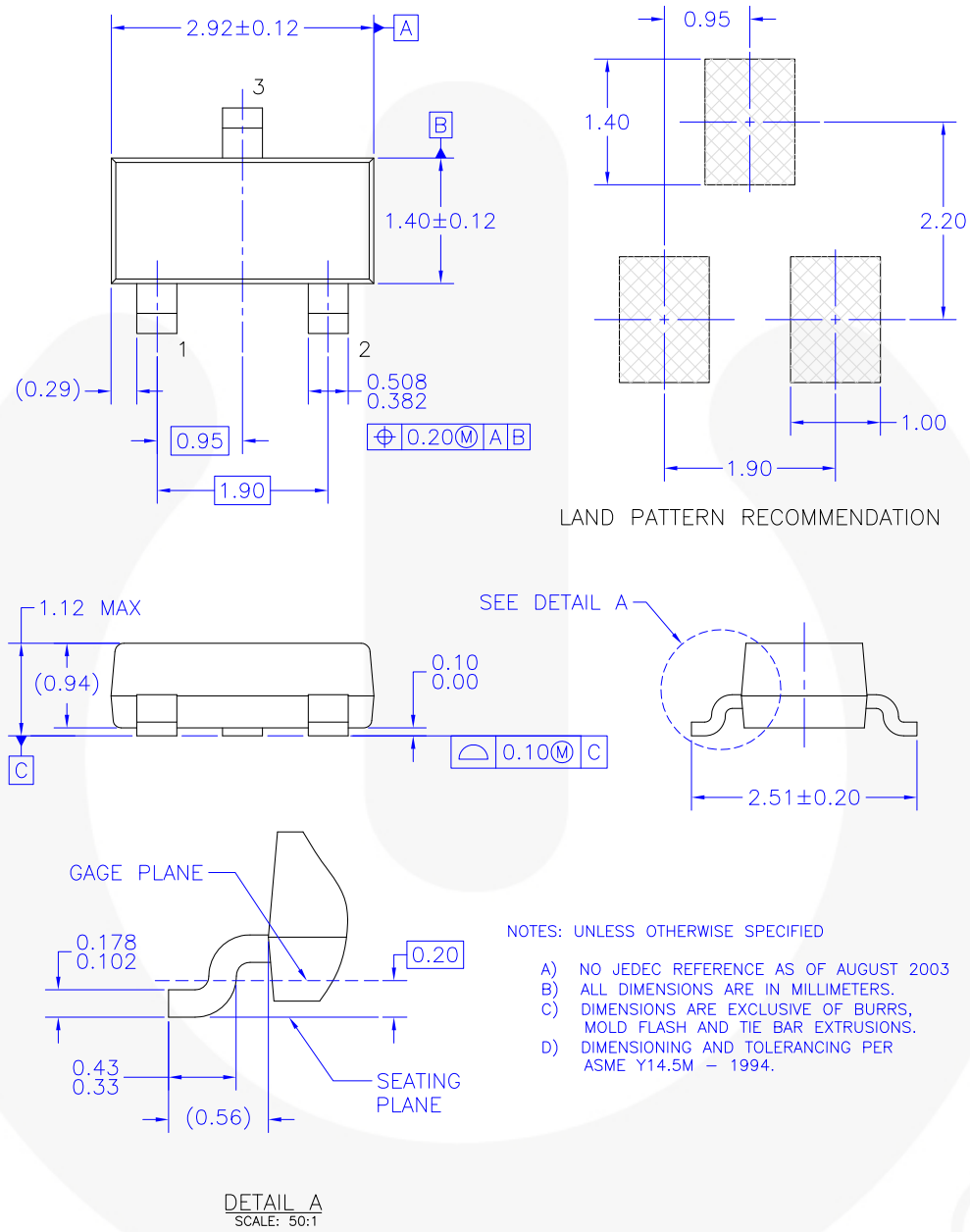


Figure 6. Current Gain vs. Collector Current

# Physical Dimensions



MA03BREV B

Figure 7. MOLDED PACKAGE, SUPERSOT, 3-LEAD



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