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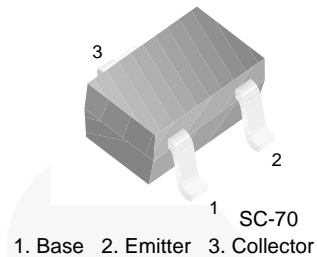
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# FJX3904

## NPN Epitaxial Silicon Transistor

### Feature

- General-Purpose Transistor



### Package Marking and Ordering Information

Device Item	Device Marking	Package	Packing Method	Qty (pcs)
FJX3904TF	S1A	SC-70	TAPE & REEL	3,000 units

### Absolute Maximum Ratings<sup>(1)</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	Units
$V_{CBO}$	Collector-Base Voltage	60	V
$V_{CES}$	Collector-Emitter Voltage	40	V
$V_{EBO}$	Emitter-Base Voltage	6	V
$I_C$	Collector Current	200	mA
$P_C$	Collector Power Dissipation	350	mW
$T_{STG}^{(2)}$	Storage Temperature	-55 to 150	$^\circ\text{C}$

#### Notes:

1. These ratings are limiting values above which the serviceability of the diode may be impaired.
2. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .  
These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low duty cycle operations.

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

Symbol	Parameter	Value	Unit
$P_D$	Derate above $25^\circ\text{C}$	2.8	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Air	357	$^\circ\text{C}/\text{W}$

#### Note:

3. PCB board size: FR-4 76 x 114 x 0.6 T mm<sup>3</sup> (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

### Electrical Characteristics<sup>(4)</sup>

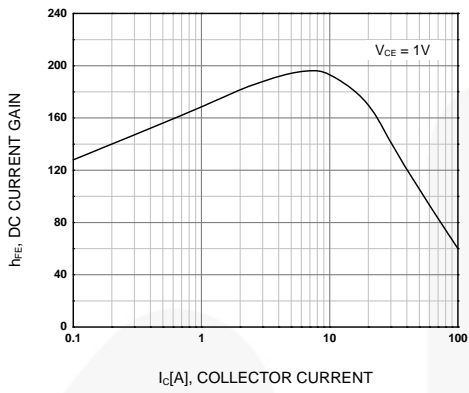
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Test Conditions	Min.	Max.	Units
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\ \mu\text{A}, I_E = 0$	60		V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 1\ \text{mA}, I_B = 0$	40		V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\ \mu\text{A}, I_C = 0$	6		V
$I_{CEX}$	Collector Cut-Off Current	$V_{CE} = 30\ \text{V}, V_{EB} = 3\ \text{V}$		50	nA
$h_{FE}$	DC Current Gain	$V_{CE} = 1\ \text{V}, I_C = 0.1\ \text{mA}$	40		
		$V_{CE} = 1\ \text{V}, I_C = 1\ \text{mA}$	70		
		$V_{CE} = 1\ \text{V}, I_C = 10\ \text{mA}$	100	300	
		$V_{CE} = 1\ \text{V}, I_C = 50\ \text{mA}$	60		
		$V_{CE} = 1\ \text{V}, I_C = 100\ \text{mA}$	30		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10\ \text{mA}, I_B = 1\ \text{mA}$		0.2	V
		$I_C = 50\ \text{mA}, I_B = 5\ \text{mA}$		0.3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10\ \text{mA}, I_B = 1\ \text{mA}$	0.65	0.85	V
		$I_C = 50\ \text{mA}, I_B = 5\ \text{mA}$		0.95	V
$C_{ob}$	Output Capacitance	$V_{CB} = 5\ \text{V}, I_E = 0, f = 1\ \text{MHz}$		4	pF
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 20\ \text{V}, I_C = 10\ \text{mA}$	300		MHz
NF	Noise Figure	$I_C = 100\ \mu\text{A}, V_{CE} = 5\ \text{V},$ $R_S = 1\ \text{k}\Omega,$ $f = 10\ \text{Hz to } 15.7\ \text{kHz}$		5	dB
$t_{ON}$	Turn-On Time	$V_{CC} = 3\ \text{V}, V_{BE} = 0.5\ \text{V},$ $I_C = 10\ \text{mA}, I_{B1} = 1\ \text{mA}$		70	ns
$t_{OFF}$	Turn-Off Time	$V_{CC} = 3\ \text{V}, I_C = 10\ \text{mA},$ $I_{B1} = I_{B2} = 1\ \text{mA}$		250	ns

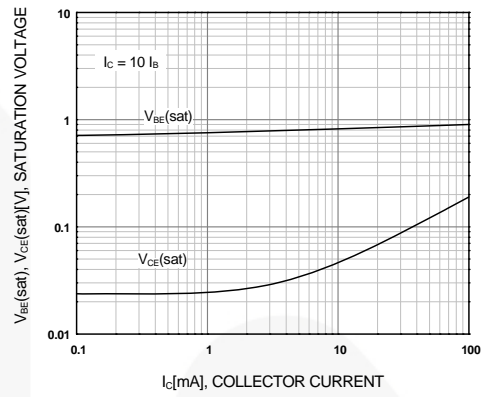
**Note:**

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

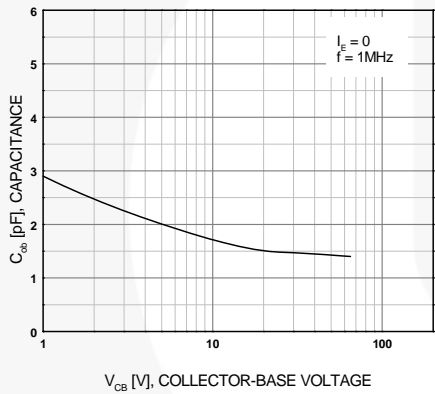
## Typical Performance Characteristics



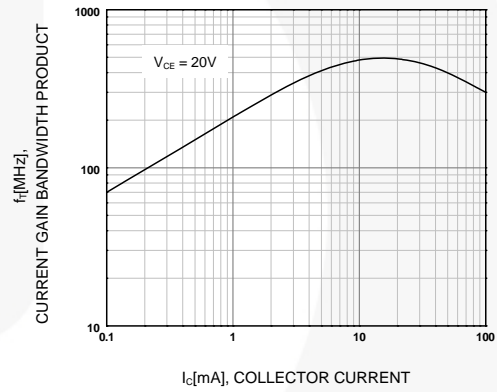
**Figure 1. DC Current Gain**



**Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage**



**Figure 3. Output Capacitance**



**Figure 4. Current Gain Bandwidth Product**

## Physical Dimensions

### SC-70 (SOT-323)

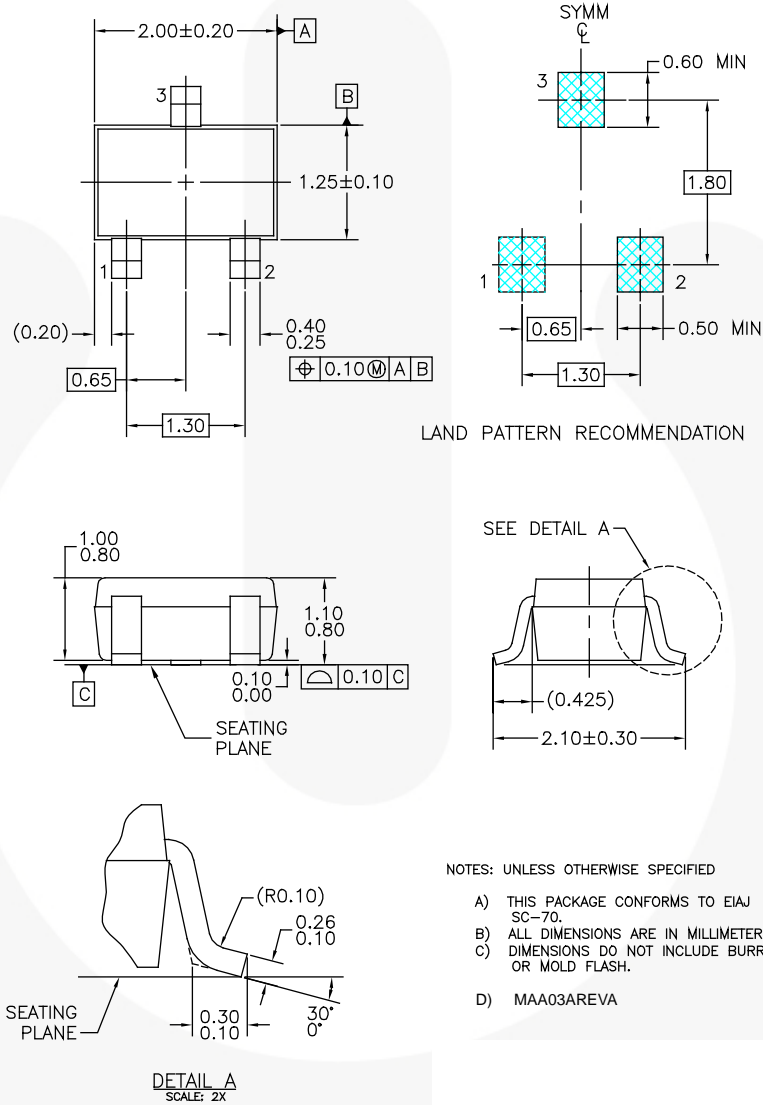


Figure 5. 3 LEAD, SC90, EIAJ SC-70, 1.25 MM WIDE (ACTIVE)

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