FAIRCHILD

SEMICONDUCTOR®

January 2007

FJX3904
NPN Epitaxial Silicon Transistor

- General Purpose Transistor

3

2

1   SOT-323
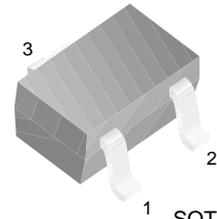
1. Base   2. Emitter   3. Collector

Absolute Maximum Ratings* T_a=25°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}	Storage Temperature	-55 ~ 150	°C

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.
NOTES:
1) These ratings are based on a maximum junction temperature of 150°C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Electrical Characteristics* T_a = 25°C unless otherwise noted

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

* Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2.0%

Package Marking and Ordering Information

Device Item (note)	Device Marking	Package	Packing Method	Qty(pcs)
FJX3904TF	S1A	SOT-323	TAPE & REEL	3,000

Note : The Suffix "-TF" means Tape& Reel packing method, which can be on fairchildsemi website at http://www.fairchildsemi.com/packaging

## Typical Performance Characteristics
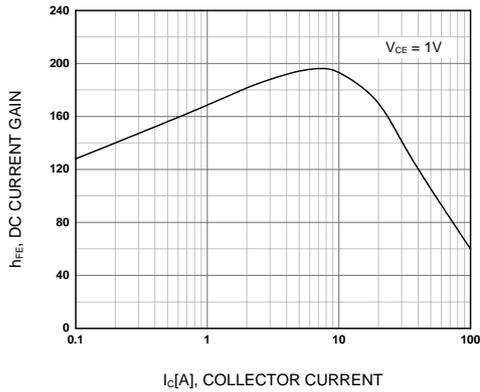
Figure 1. DC current Gain
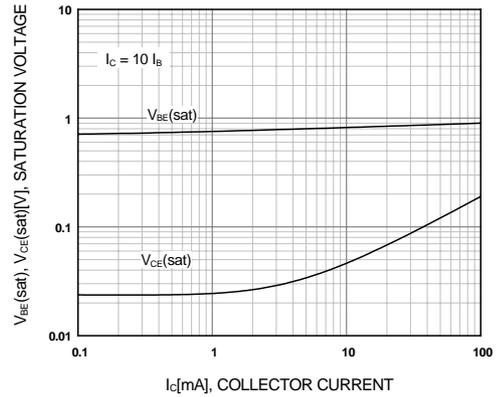
Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage
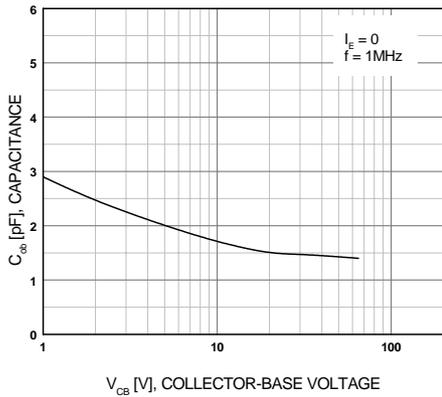
**Figure 3. Output Capacitance**
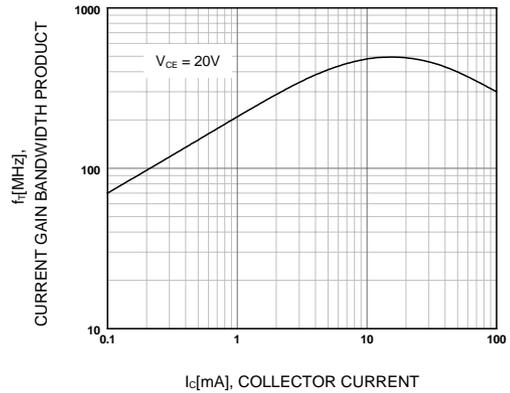
Figure 4. Current Gain Bandwidth Product

FJX3904 Rev. B

Mechanical Dimensions

SOT-323

2.00±0.20

1.25±0.10

2.10±0.10

1.00±0.10

0.275±0.100

3°

0.95±0.15

0.90 ±0.10

$0.05^{+0.05}_{-0.02}$

1.30±0.10

3°

$0.135^{+0.04}_{-0.01}$

0.10 Min
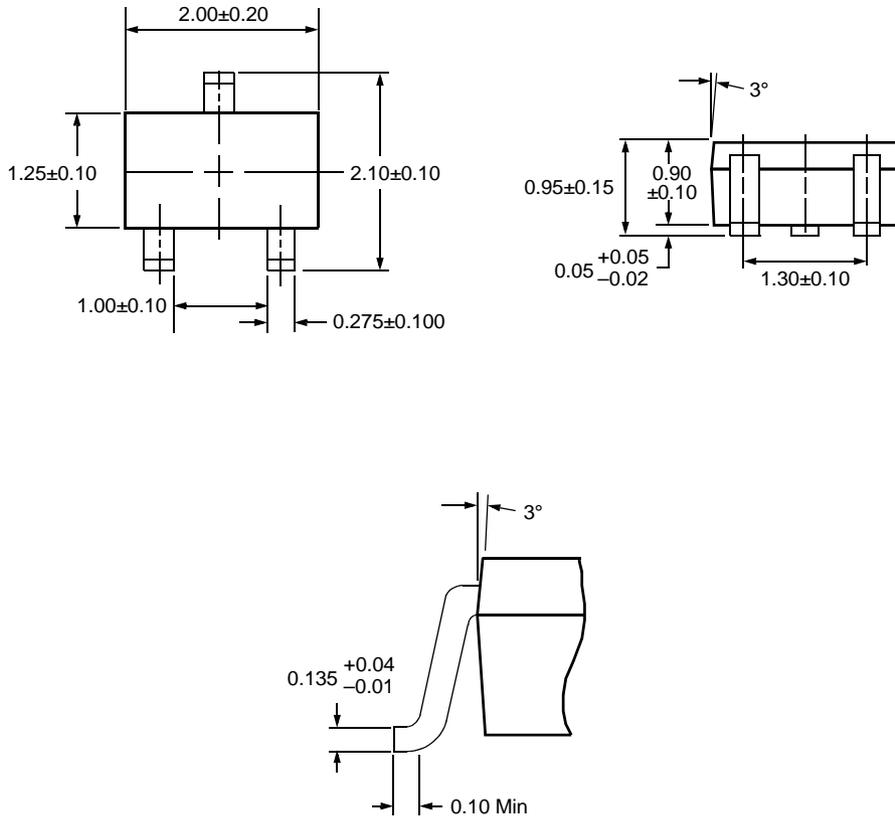
Dimensions in Millimeters

FJX3904 NPN Epitaxial Silicon Transistor

FAIRCHILD SEMICONDUCTOR TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACEx™	FACT Quiet Series™	OCX™	SILENT SWITCHER®	UniFET™
ActiveArray™	GlobalOptoisolator™	OCXPro™	SMART START™	VCX™
Bottomless™	GTO™	OPTOLOGIC®	SPM™	Wire™
Build it Now™	HiSeC™	OPTOPLANAR™	Stealth™	
CoolFET™	I²C™	PACMAN™	SuperFET™	
CROSSVOLT™	i-Lo™	POP™	SuperSOT™-3	
DOME™	ImpliedDisconnect™	Power247™	SuperSOT™-6	
EcoSPARK™	IntelliMAX™	PowerEdge™	SuperSOT™-8	
E²CMOS™	ISOPLANAR™	PowerSaver™	SyncFET™	
EnSigna™	LittleFET™	PowerTrench®	TCM™	
FACT®	MICROCOUPLER™	QFET®	TinyBoost™	
FAST®	MicroFET™	QS™	TinyBuck™	
FASTr™	MicroPak™	QT Optoelectronics™	TinyPWM™	
FPS™	MICROWIRE™	Quiet Series™	TinyPower™	
FRFET™	MSX™	RapidConfigure™	TinyLogic®	
	MSXPro™	RapidConnect™	TINYOPTO™	
Across the board. Around the world.™		μSerDes™	TruTranslation™	
The Power Franchise®		ScalarPump™	UHC®	
Programmable Active Droop™				

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN;NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPE-CIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, or (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.

Rev. I22