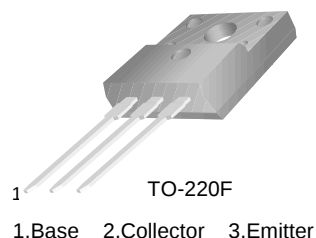


BUT11F/11AF

High Voltage Power Switching Applications



NPN Silicon Transistor

Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage : BUT11F : BUT11AF	850	V
		1000	V
V_{CEO}	Collector-Emitter Voltage : BUT11F : BUT11AF	400	V
		450	V
V_{EBO}	Emitter-Base Voltage	9	V
I_C	Collector Current (DC)	5	A
I_{CP}	*Collector Current (Pulse)	10	A
I_B	Base Current (DC)	2	A
I_{BP}	*Base Current (Pulse)	4	A
P_C	Collector Dissipation ($T_C=25^\circ\text{C}$)	40	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$

Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{CEO(SUS)}$	* Collector-Emitter Sustaining Voltage : BUT11F : BUT11AF	$I_C = 100\text{mA}$, $I_B = 0$	400			V
			450			V
I_{CES}	Collector Cut-off Current : BUT11F : BUT11AF	$V_{CE} = 850\text{V}$, $V_{BE} = 0$ $V_{CE} = 1000\text{V}$, $V_{BE} = 0$			1	mA
					1	mA
I_{EBO}	Emitter Cut-off Current	$V_{BE} = 9\text{V}$, $I_C = 0$			10	mA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage : BUT11F : BUT11AF	$I_C = 3\text{A}$, $I_B = 0.6\text{A}$ $I_C = 2.5\text{A}$, $I_B = 0.5\text{A}$			1.5	V
					1.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage : BUT11F : BUT11AF	$I_C = 3\text{A}$, $I_B = 0.6\text{A}$ $I_C = 2.5\text{A}$, $I_B = 0.5\text{A}$			1.3	V
					1.3	V
t_{ON}	Turn On Time	$V_{CC} = 250\text{V}$, $I_C = 2.5\text{A}$ $I_{B1} = -I_{B2} = 0.5\text{A}$ $R_L = 100\Omega$			1	μs
t_{STG}	Storage Time				4	μs
t_F	Fall Time				0.8	μs

* Pulsed: pulsed duration = 300 μs , duty cycle = 1.5%

Thermal Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3.125	$^\circ\text{C/W}$

Typical Characteristics

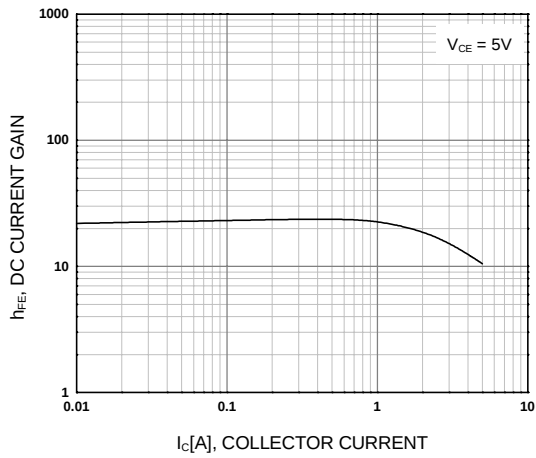


Figure 1. DC current Gain

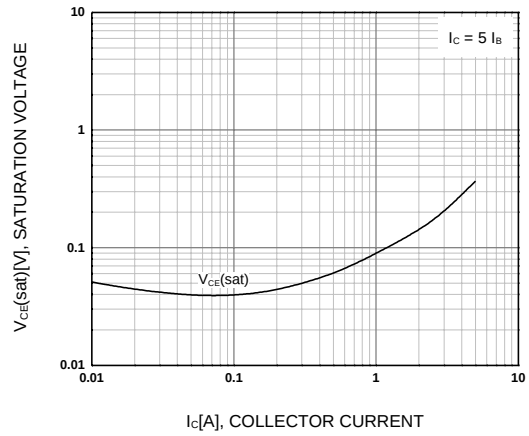


Figure 2. Collector-Emitter Saturation Voltage

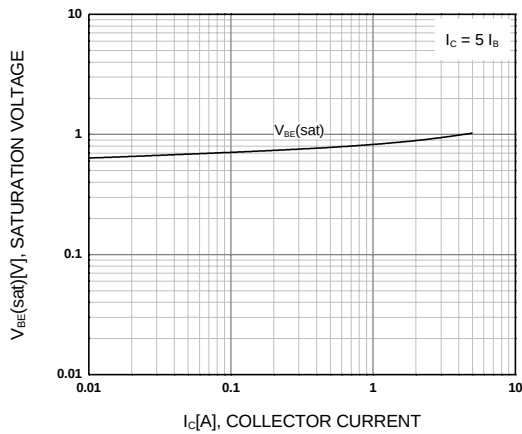


Figure 3. Base-Emitter Saturation Voltage

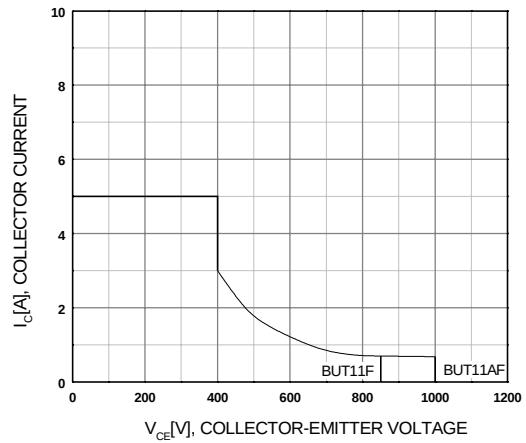


Figure 4. Reverse Biased Safe Operating Area

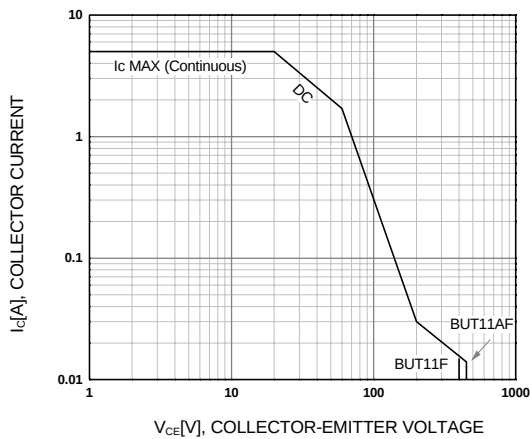


Figure 5. Safe Operating Area

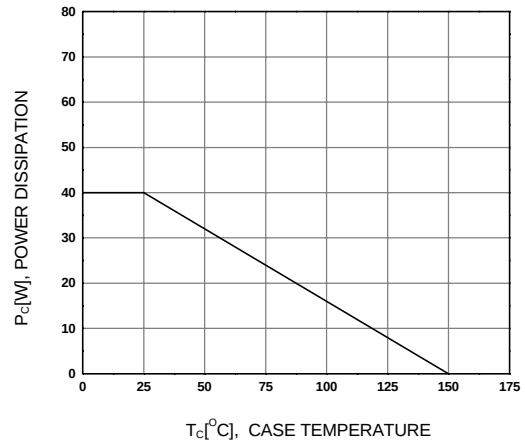
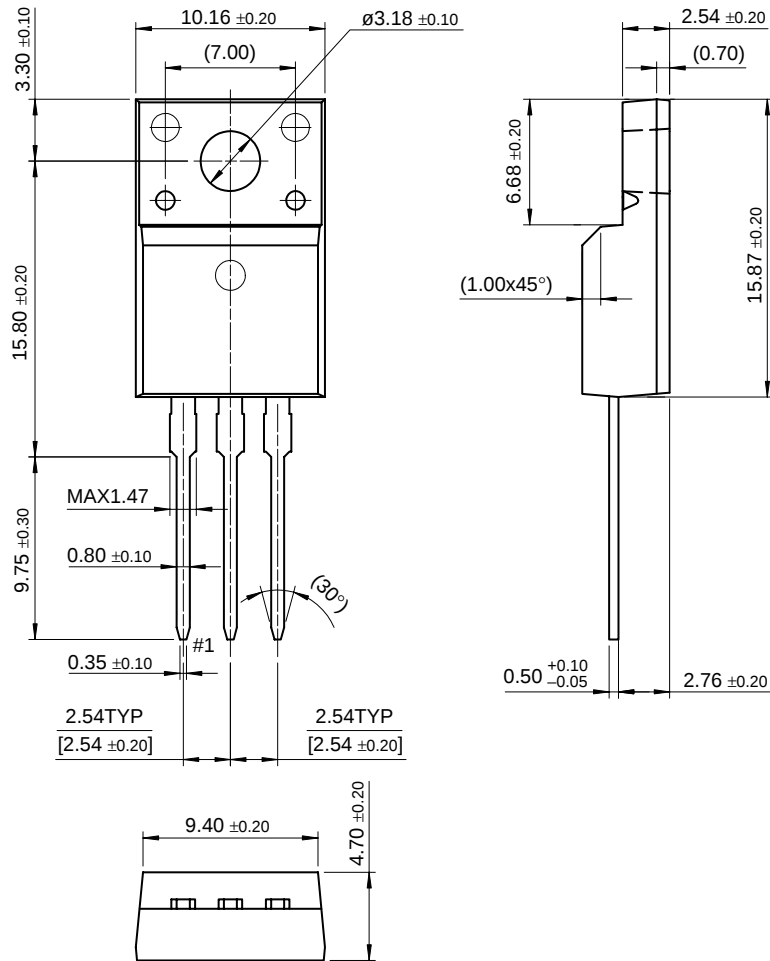


Figure 6. Power Derating

Package Dimensions

TO-220F



Dimensions in Millimeters

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.

ACE ^x TM	FAST [®]	OPTOPLANAR TM	STAR*POWER TM
Bottomless TM	FAST ^r TM	PACMAN TM	Stealth TM
CoolFET TM	FRFET TM	POP TM	SuperSOT TM -3
CROSSVOLT TM	GlobalOptoisolator TM	Power247 TM	SuperSOT TM -6
DenseTrench TM	GTO TM	PowerTrench [®]	SuperSOT TM -8
DO TM	HiSeC TM	QFET TM	SyncFET TM
EcoSPARK TM	ISOPLANAR TM	QS TM	TruTranslation TM
E ² CMOS TM	LittleFET TM	QT Optoelectronics TM	TinyLogic TM
EnSigna TM	MicroFET TM	Quiet Series TM	UHC TM
FACT TM	MICROWIRE TM	SLIENT SWITCHER [®]	UltraFET [®]
FACT Quiet Series TM	OPTOLOGIC TM	SMART START TM	VCX TM

STAR*POWER is used under license

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.

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.

find products

[Home](#) >> [Find products](#) >>

[Products groups](#)

[Analog and Mixed](#)

[Signal](#)

[Discrete](#)

[Interface](#)

[Logic](#)

[Microcontrollers](#)

[Non-Volatile](#)

[Memory](#)

[Optoelectronics](#)

[Markets and](#)

[applications](#)

[New products](#)

[Product selection and](#)

[parametric search](#)

[Cross-reference](#)

[search](#)

BUT11F

NPN Silicon Transistor

Contents

[Applications](#) | [Product](#)
[status/pricing/package](#) | [Application notes](#)

Applications

High Voltage Power Switching

[back to top](#)

Product status/pricing/package

Product	Product status	Package type	Leads	Packing method
BUT11FTU	Full Production	TO-220F	3	RAIL

[back to top](#)

Application notes

[AN-7511: AN-7511 Insulated-Gate Transistors Simplify AC-Motor Speed](#)

[Control](#) (493 K) Jul 19, 2002

[AN-909: AN-909 Simple Interface for 68HC11 to Microwire 'Chip](#)

[Security' EEPROMs](#) (52 K) Jul 19, 2002

[back to top](#)

[Home](#) | [Find products](#) | [Technical information](#) | [Buy products](#) |

[Support](#) | [Company](#) | [Contact us](#) | [Site index](#) | [Privacy policy](#)

© Copyright 2002 Fairchild Semiconductor

Related Links

[Request samples](#)

[Dotted line](#)
[How to order products](#)

[Dotted line](#)
[Product Change Notices](#)
[\(PCNs\)](#)

[Dotted line](#)
[Support](#)

[Dotted line](#)
[Distributor and field sales](#)

[representatives](#)

[Dotted line](#)
[Quality and reliability](#)

[Dotted line](#)
[Design tools](#)

Datasheet
[Download this](#)
[datasheet](#)

PDF

[e-mail this datasheet](#)

[E-]

This page
[Print version](#)

[find products](#) [Home](#) >> [Find products](#) >>

- [Products groups](#)
- [Analog and Mixed](#)
- [Signal](#)
- [Discrete](#)
- [Interface](#)
- [Logic](#)
- [Microcontrollers](#)
- [Non-Volatile](#)
- [Memory](#)
- [Optoelectronics](#)
- [Markets and applications](#)
- [New products](#)
- [Product selection and parametric search](#)
- [Cross-reference search](#)

BUT11AF
NPN Silicon Transistor

Contents
[Applications](#) | [Product status/pricing/package](#)

Applications

High Voltage Power Switching

[back to top](#)

Product status/pricing/package

Datasheet
[Download this datasheet](#)

PDF

[e-mail this datasheet](#)

[E-

This page
[Print version](#)

Related Links

- [Request samples](#)
- [Dotted line](#)
- [How to order products](#)
- [Dotted line](#)
- [Product Change Notices \(PCNs\)](#)
- [Dotted line](#)
- [Support](#)
- [Dotted line](#)
- [Distributor and field sales representatives](#)
- [Dotted line](#)
- [Quality and reliability](#)
- [Dotted line](#)
- [Design tools](#)

technical information

buy products

technical support

my Fairchild

company

Product	Product status	Pricing*	Package type	Leads	Packing method
BUT11AFTU	Full Production	\$0.62	TO-220F	3	RAIL

* 1,000 piece Budgetary Pricing

[back to top](#)