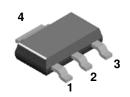


June 2007

# BSP51

# **NPN Darlington Transistor**

This device is designed for applications requiring extremly high current gain at collector currents to 500mA. Sourced from process 03.



1. Base 2. Collector 3. Emitter

## Absolute Maximum Ratings ${}^{\star}T_a = 25^{\circ}C$ unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CES</sub>	Collector-Emitter Voltage	80	V
V <sub>CBO</sub>	Collector-Base Voltage	90	V
V <sub>EBO</sub>	Emitter-Base Voltage	5.0	V
I <sub>C</sub>	Collector Current (Continuous)	500	mA
T <sub>J,</sub> T <sub>STG</sub>	Junction Temperature, Storage Temperature	-55 ~ +150	°C

<sup>\*</sup> These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Symbol

# Electrical Characteristics \* T<sub>a</sub> = 25°C unless otherwise noted **Parameter**

Off Characteristics					
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	Ic = 100 μA, IE = 0	90		V
V <sub>(BR)EBO</sub>	Emitter-Base Breakdown Voltage	$IE = 10 \mu A, Ic = 0$	5.0		V
Ices	Collector Cutoff Current	VCE = 80 V, IBE = 0		10	μΑ
<b>І</b> ЕВО	Emitter Cutoff Current	VEB = 4.0 V, Ic = 0		10	μΑ

**Test Condition** 

MIN

MAX

Units

## On Characteristics

hfE	DC Current Gain	Ic = 150 mA, VcE = 10 V Ic = 500 mA, VcE = 10 V	1000 2000		
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage *	Ic = 500 mA, I <sub>B</sub> = 0.5 mA		1.3	V
V <sub>BE</sub> (sat)	Base-Emitter Saturation Voltage *	Ic = 500 mA, I <sub>B</sub> = 0.5 mA		1.9	V

<sup>\*</sup> Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

<sup>1)</sup> These ratings are based on a maximum junction temperature of 150 degrees C.

<sup>2)</sup> These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

# Thermal Characteristics ${}^{\star}T_a = 25^{\circ}C$ unless otherwise noted

Symbol	Characteristic	Max	Units
PD	Total Device Dissipation	1000	mW
	Derate above 25°	8.0	mW/°C
R $\Theta$ JA	Thermal Resistance, Junction to Ambient	125	°C/W

<sup>\*</sup>Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06".





UniFET™

 $VCX^{TM}$ 

Wire™

### **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.

 $OCX^{TM}$ SILENT SWITCHER® ACEx<sup>™</sup> FACT Quiet Series™ ActiveArray™ OCXPro™ GlobalOptoisolator™ SMART START™ OPTOLOGIC® Bottomless™ GTO™ SPM™ OPTOPLANAR™ HiSeC™ Build it Now™ Stealth™ I<sup>2</sup>C™ PACMAN™ SuperFET™ CoolFET™ **РОР**<sup>ТМ</sup> i-Lo<sup>TM</sup>  $CROSSVOLT^{TM}$ SuperSOT™-3 Power247™ SuperSOT™-6 DOME™ ImpliedDisconnect™  $\mathsf{EcoSPARK}^{\mathsf{TM}}$ PowerEdge™ IntelliMAX™ SuperSOT™-8 E<sup>2</sup>CMOS™ PowerSaver™ ISOPLANAR™ SyncFET™ PowerTrench®  $\mathsf{TCM}^\mathsf{TM}$ EnSigna™ LittleFET™ QFET® FACT<sup>®</sup>  $\mathsf{MICROCOUPLER}^{\mathsf{TM}}$ TinyBoost™ FAST<sup>®</sup> QS<sup>TM</sup> TinyBuck™ MicroFET™ FASTr™ MicroPak™ QT Optoelectronics™ TinyPWM™ FPS™ Quiet Series™ MICROWIRE™ TinyPower™ RapidConfigure™ FRFET™ MSX<sup>TM</sup> TinyLogic<sup>®</sup> RapidConnect™  $MSXPro^{TM}$ TINYOPTO™ Across the board. Around the world.™ սSerDes™ TruTranslation™ ScalarPump™ The Power Franchise® UHC®

**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, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

## LIFE SUPPORT POLICY

Programmable Active Droop™

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. I23