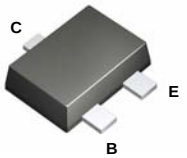
FAIRCHILD SEMICONDUCTOR®

July 2007

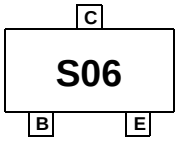
# FJY3006R
## NPN Epitaxial Silicon Transistor

### Features

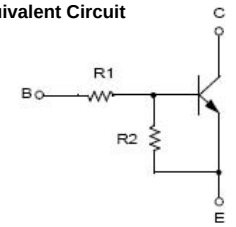
- Switching circuit, Inverter, Interface circuit, Driver Circuit
- Built in bias Resistor (R1=10KΩ, R2=47KΩ)
- Complement to FJY4006R




SOT − 523F




Equivalent Circuit




### Absolute Maximum Ratings * $T_a$ = 25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 50 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 50 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 10 | V |
| $I_C$ | Collector Current | 100 | mA |
| $T_{STG}$ | Storage Temperature Range | -55~150 | °C |
| $T_J$ | Junction Temperature | 150 | °C |
| $P_C$ | Collector Power Dissipation, by $R_{\theta JA}$ | 200 | mW |

* These ratings are limiting values above which the serviceability of any semiconductor device may by impaired.

### Thermal Characteristics* $T_a$=25°C unless otherwise noted

| Symbol | Parameter | Max | Units |
|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 600 | °C/W |

* Minimum land pad size.

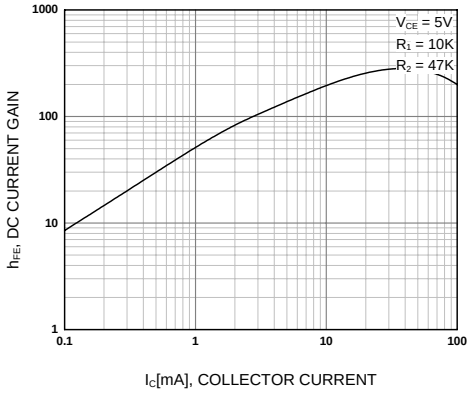
### Electrical Characteristics* $T_C$ = 25°C unless otherwise noted

| Symbol | Parameter | Test Condition | MIN | Typ | MAX | Units |
|---|---|---|---|---|---|---|
| $V_{(BR)CBO}$ | Collector-Emitter Breakdown Voltage | $I_C$ = 10 uA, $I_E$ = 0 | 50 | | | V |
| $V_{(BR)CEO}$ | Collector-Base Breakdown Voltage | $I_C$ = 100 uA, $I_B$ = 0 | 50 | | | V |
| $I_{CBO}$ | Collector-Cutoff Current | $V_{CB}$ = 40 V, $I_E$ = 0 | | | 0.1 | uA |
| $h_{FE}$ | DC Current Gain | $V_{CE}$ = 5 V, $I_C$ = 5 mA | 68 | | | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$ = 10 mA, $I_B$ = 0.5 mA | | | 0.3 | V |
| $f_T$ | Current Gain - Bandwidth Product | $V_{CE}$ = 10V, $I_C$ = 5 mA | | 250 | | MHz |
| $C_{cb}$ | Output Capacitance | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1.0 MHz | | 3.7 | | pF |
| $V_{I(off)}$ | Input Off Voltage | $V_{CE}$ = 5 V, $I_C$ = 100uA | 0.3 | | | V |
| $V_{I(on)}$ | Input On Voltage | $V_{CE}$ = 0.3V, $I_C$ = 1mA | | | 1.4 | V |
| $R_1$ | Input Resistor | | 7 | 10 | 13 | KΩ |
| $R_1/R_2$ | Resistor Ratio | | 0.19 | 0.21 | 0.24 | |

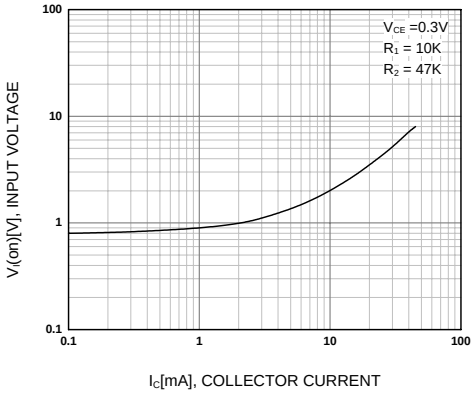
* Pulse Test: PW≤300μs, Duty Cycle≤2%

## Typical Performance Characteristics

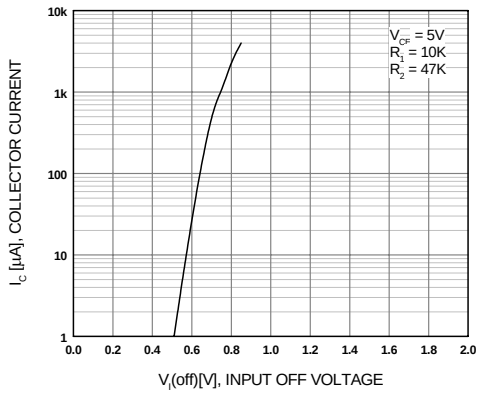
### Figure 1. DC current Gain



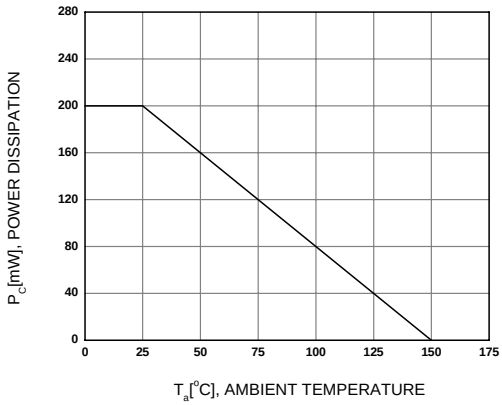

### Figure 2. Input On Voltage




### Figure 3. Input off Voltage

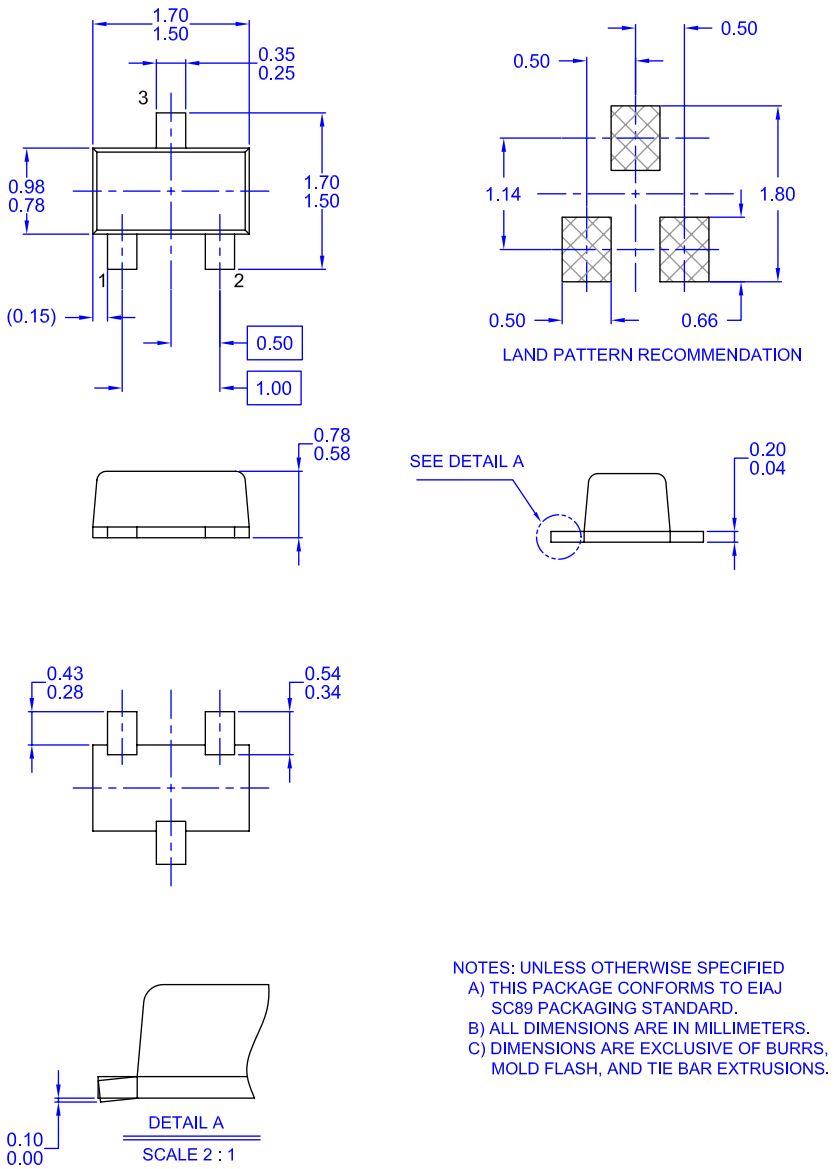



### Figure 4. Power Derating



## Package Dimensions

### SOT-523F




NOTES: UNLESS OTHERWISE SPECIFIED
A) THIS PACKAGE CONFORMS TO EIAJ SC89 PACKAGING STANDARD.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

Dimensions in Millimeters

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®
Across the board. Around the world.™
ActiveArray™
Bottomless™
Build it Now™
CoolFET™
*CROSSVOLT*™
CTL™
Current Transfer Logic™
DOME™
E²CMOS™
EcoSPARK®
EnSigna™
FACT Quiet Series™
FACT®
FAST®
FASTr™
FPS™
FRFET®
GlobalOptoisolator™
GTO™
HiSeC™
*i-Lo*™
ImpliedDisconnect™
IntelliMAX™
ISOPLANAR™
MICROCOUPLER™
MicroPak™
MICROWIRE™
Motion-SPM™
MSX™
MSXPro™
OCX™
OCXPro™
OPTOLOGIC®
OPTOPLANAR®
PACMAN™
PDP-SPM™
POP™
Power220®
Power247®
PowerEdge™
PowerSaver™
PowerTrench®
Programmable Active Droop™
QFET®
QS™
QT Optoelectronics™
Quiet Series™
RapidConfigure™
RapidConnect™
ScalarPump™
SMART START™
SPM®
STEALTH™
SuperFET™
SuperSOT™-3
SuperSOT™-6
SuperSOT™-8
SyncFET™
TCM™
The Power Franchise®
™
TinyBoost™
TinyBuck™
TinyLogic®
TINYOPTO™
TinyPower™
TinyWire™
TruTranslation™
μSerDes™
UHC®
UniFET™
VCX™
Wire™

## 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

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, and (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 a significant injury of the user.
2. A critical component in 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; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice 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 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. I25