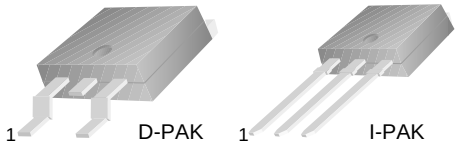
FAIRCHILD SEMICONDUCTOR®

February 2012

# MJD31/31C
# NPN Epitaxial Silicon Transistor

## Features

- General Purpose Amplifier
- Low Speed Switching Applications
- Load Formed for Surface Mount Application (No Suffix)
- Straight Lead (I-PAK, “- I” Suffix)
- Electrically Similar to Popular TIP31 and TIP31C




1.Base 2.Collector 3.Emitter

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

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage<br>: MJD31<br>: MJD31C | <br>40<br>100 | <br>V<br>V |
| $V_{CEO}$ | Collector-Emitter Voltage<br>: MJD31<br>: MJD31C | <br>40<br>100 | <br>V<br>V |
| $V_{EBO}$ | Emitter-Base Voltage | 5 | V |
| $I_C$ | Collector Current (DC) | 3 | A |
| $I_{CP}$ | Collector Current (Pulse) | 1 | A |
| $I_B$ | Base Current | 1 | A |
| $P_C$ | Collector Dissipation ($T_C$ = 25°C) | 15 | W |
| | Collector Dissipation ($T_a$ = 25°C) | 1.56 | W |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | - 65 to 150 | °C |

## Ordering Information

| Part Number | Marking | Package | Packing Method | Remarks |
|---|---|---|---|---|
| MJD31CTF | MJD31C | D-PAK | Tape & Reel | |
| MJD31CITU | MJD31C-I | I-PAK | Tube | |

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## Electrical Characteristics $T_a$ = 25°C unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|---|---|---|---|---|---|
| $V_{CEO}$(sus) | * Collector-Emitter Sustaining Voltage | | | | |
| | : MJD31 | $I_C$ = 30mA, $I_B$ = 0 | 40 | | V |
| | : MJD31C | $I_C$ = 30mA, $I_B$ = 0 | 100 | | V |
| $I_{CEO}$ | Collector Cut-off Current | | | | |
| | : MJD31 | $V_{CE}$ = 40V, $I_B$ = 0 | | 50 | μA |
| | : MJD31C | $V_{CE}$ = 60V, $I_B$ = 0 | | 50 | μA |
| $I_{CES}$ | Collector Cut-off Current | | | | |
| | : MJD31 | $V_{CE}$ = 40V, $V_{BE}$ = 0 | | 20 | μA |
| | : MJD31C | $V_{CE}$ = 100V, $V_{BE}$ = 0 | | 20 | μA |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{BE}$ = 5V, $I_C$ = 0 | | 1 | mA |
| $h_{FE}$ | * DC Current Gain | $V_{CE}$ = 4V, $I_C$ = 1A | 25 | | |
| | | $V_{CE}$ = 4V, $I_C$ = 3A | 10 | 50 | |
| $V_{CE}$(sat) | * Collector-Emitter Saturation Voltage | $I_C$ = 3A, $I_B$ = 375mA | | 1.2 | V |
| $V_{BE}$(on) | * Base-Emitter On Voltage | $V_{CE}$ = 4A, $I_C$ = 3A | | 1.8 | V |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$ = 10V, $I_C$ = 500mA | 3 | | MHz |

* Pulse Test: PW≤300μs, Duty Cycle≤2%

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## Typical Performance Characteristics

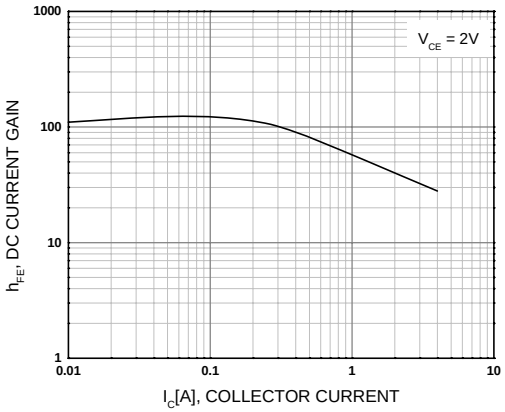



**Figure 1. DC current Gain**

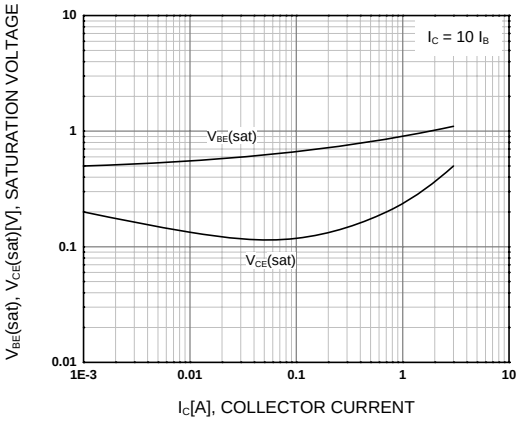



**Figure 2. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage**

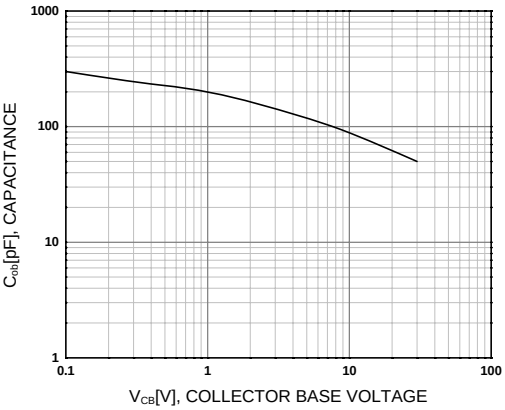



**Figure 3. Collector Capacitance**

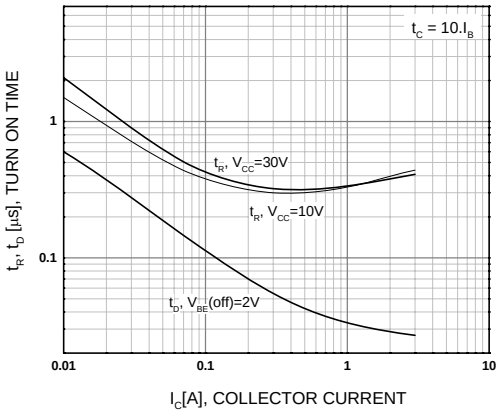



**Figure 4. Turn On Time**

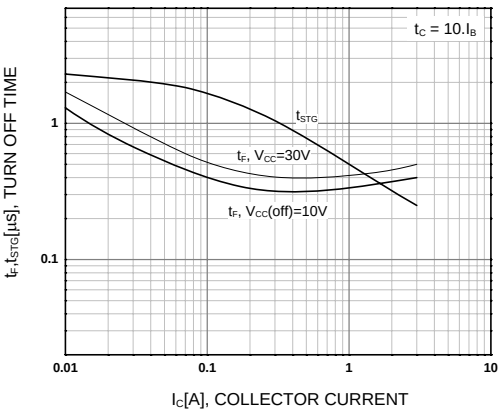



**Figure 5. Turn Off Time**

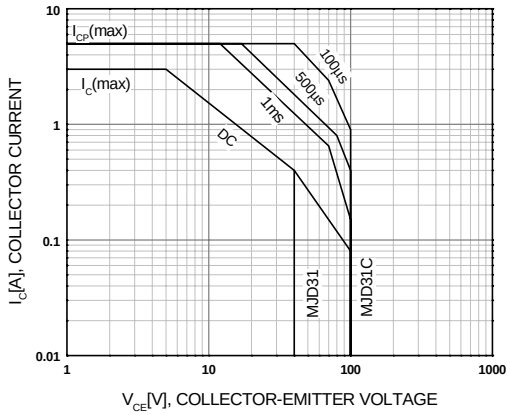



**Figure 6. Safe Operating**

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## Typical Performance Characteristics (Continued)

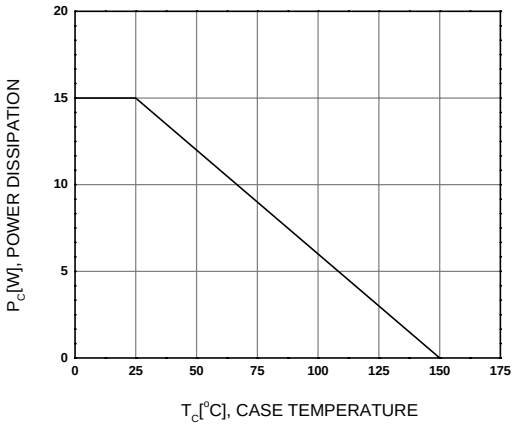
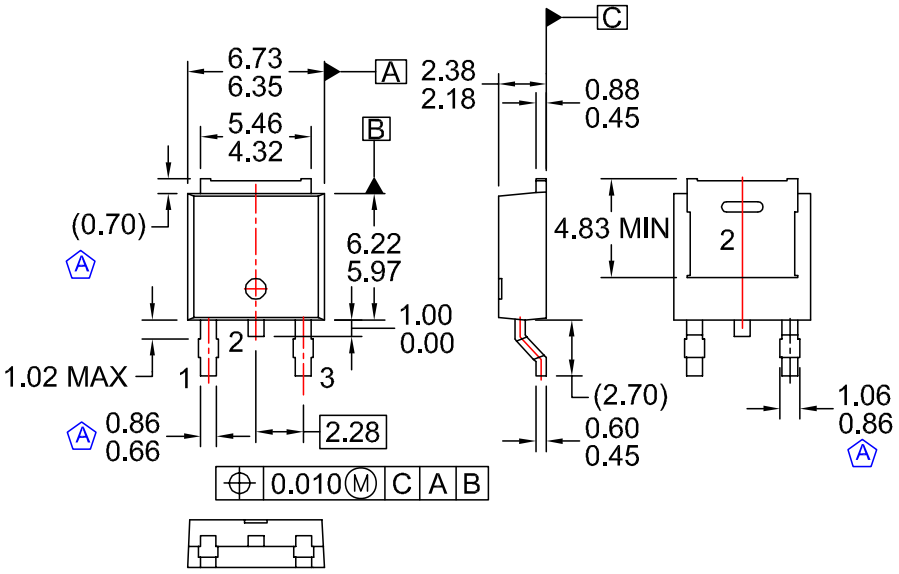



**Figure 7. Power Derating**

## Physical Dimensions

# D-PAK




NOTES: UNLESS OTHERWISE SPECIFIED

A) CONFORMS TO JEDEC TO-252 VARIATION AB EXCEPT WHERE NOTED

B) ALL DIMENSIONS ARE IN MILLIMETERS.

C) DRAWING CONFORMS TO ASME Y14.5M-1994

D) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

E) FORMERLY NAMED BD1733

F) DRAWING FILE NAME: MKT-TO252D03REV1

Dimensions in Millimeters

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