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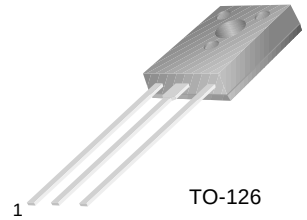
Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

# FJE3303
## High Voltage Fast-Switching NPN Power Transistor

- High Voltage Capability
- High Switching Speed
- Suitable for Electronic Ballast and Switching Regulator




TO-126

1. Emitter 2.Collector 3.Base

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

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 700 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 400 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 9 | V |
| $I_C$ | Collector Current (DC) | 1.5 | A |
| $I_{CP}$ | Collector Current (Pulse) * | 3 | A |
| $I_B$ | Base Current (DC) | 0.75 | A |
| $I_{BP}$ | Base Current (Pulse) * | 1.5 | A |
| $P_C$ | Collector Dissipation ($T_C$ = 25°C) | 20 | W |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | -65 ~ 150 | °C |

* Pulse Test: Pulse Width = 5ms, Duty Cycle ≤ 10%

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

| Symbol | Parameter | Conditions | Min. | Typ. | Max | Units |
|---|---|---|---|---|---|---|
| $BV_{CBO}$ | Collector-Base Breakdwon Voltage | $I_C$ = 500μA, $I_E$ = 0 | 700 | | | V |
| $BV_{CEO}$ | Collector-Emitter Breakdown Voltage | $I_C$ = 5mA, $I_B$ = 0 | 400 | | | V |
| $BV_{EBO}$ | Emitter-Base Breakdown Voltage | $I_E$ = 500μA, $I_C$ = 0 | 9 | | | V |
| $I_{CBO}$ | Collector Cut-off Current | $V_{CB}$ = 700V, $I_E$ = 0 | | | 10 | μA |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{EB}$ = 9V, $I_C$ = 0 | | | 10 | μA |
| $h_{FE1}$<br>$h_{FE2}$ | DC Current Gain * | $V_{CE}$ = 2V, $I_C$ = 0.5A<br>$V_{CE}$ = 2V, $I_C$ = 1.0A | 8<br>5 | | 21 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$ = 0.5A, $I_B$ = 0.1A<br>$I_C$ = 1.0A, $I_B$ = 0.25A<br>$I_C$ = 1.5A, $I_B$ = 0.5A | | | 0.5<br>1.0<br>3.0 | V<br>V<br>V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C$ = 0.5A, $I_B$ = 0.1A<br>$I_C$ = 1.0A, $I_B$ = 0.25A | | | 1.0<br>1.2 | V<br>V |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$ = 10V, $I_C$ = 0.1A | 4 | | | MHz |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = 10V, f = 0.1MHz | | 21 | | pF |
| $t_{ON}$ | Turn On Time | $V_{CC}$ = 125V, $I_C$ = 1A<br>$I_{B1}$ = 0.2A, $I_{B2}$ = -0.2A<br>$R_L$ = 125Ω | | | 1.1 | μs |
| $t_{STG}$ | Storge Time | | | | 4.0 | μs |
| $t_F$ | Fall Time | | | | 0.7 | μs |

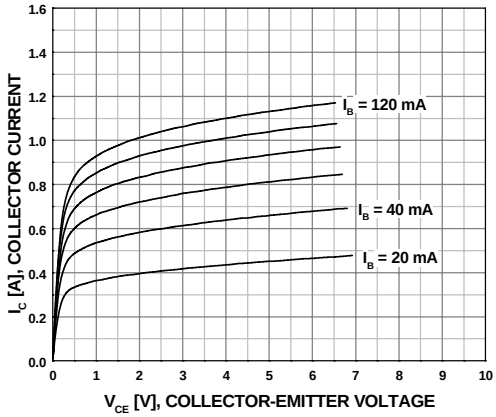
* Pulse Test: PW ≤ 300μs, Duty Cycle ≤ 2%

## $h_{FE}$ Classification

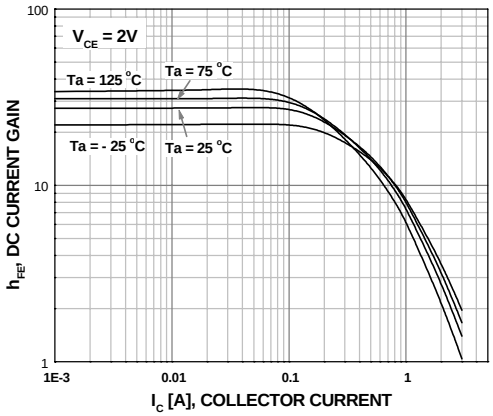
| Classification | H1 | H2 |
|---|---|---|
| $h_{FE1}$ | 8 ~ 16 | 14 ~ 21 |

## Typical Performance Characteristics

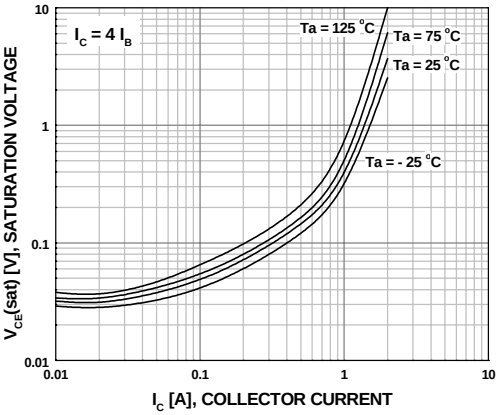
### Figure 1. Static Characteristic



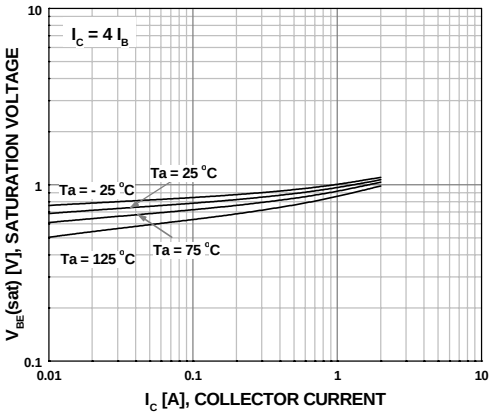

### Figure 2. DC Current Gain



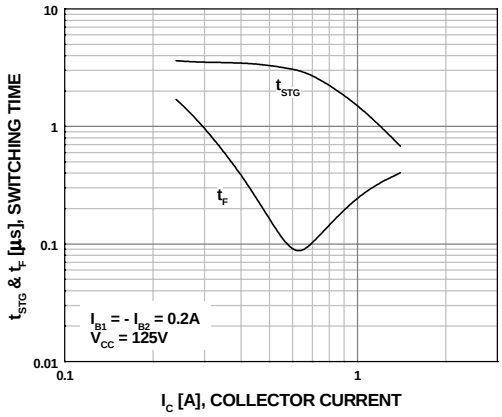

### Figure 3. Collector-Emitter Saturation Voltage



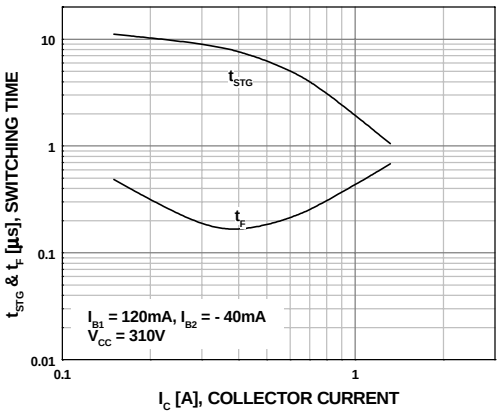

### Figure 4. Base-Emitter Saturation Voltage




### Figure 5. Resistive Load Switching Time




### Figure 6. Resistive Load Switching Time



## Typical Performance Characteristics (Continued)

**Figure 7. Forward Biased Safe Operating Area**

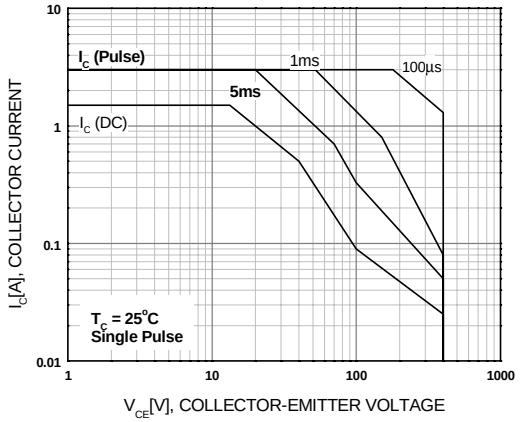



**Figure 8. Reverse Biased Safe Operating Area**

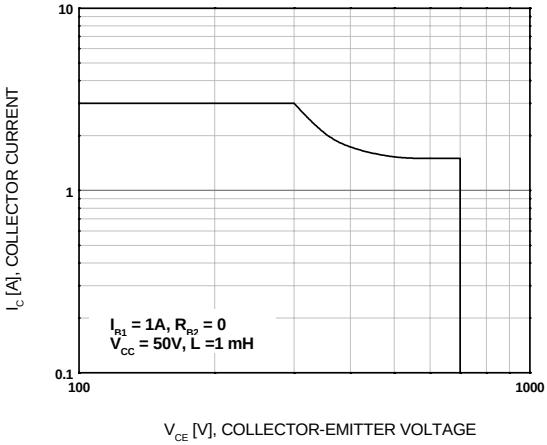
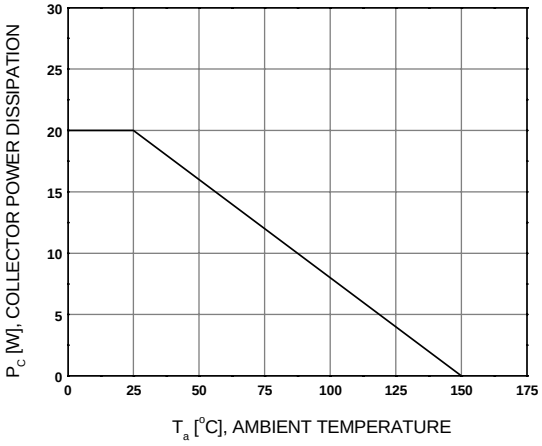
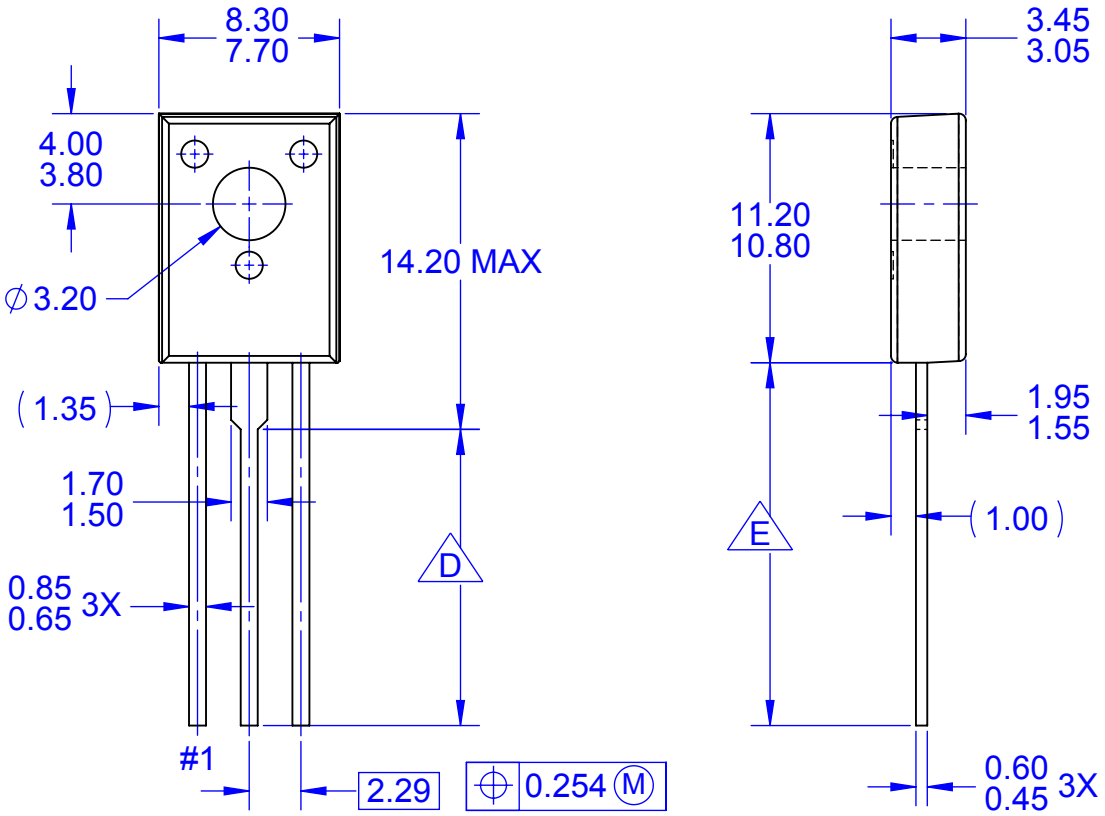
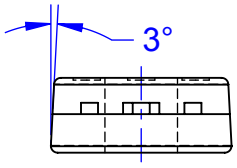



**Figure 9. Power Derating**






| PRODUCTION CODE | TERMINAL LENGTH "D" | TERMINAL LENGTH "E" |
|---|---|---|
| TSSTU | 3.45 - 4.05 | 6.45-7.45 |
| TSTU | 2.36 - 2.96 | 5.36-6.36 |
| NONE (STD LENGTH) | 12.76 - 13.36 | 15.76-16.76 |

NOTES:

A. NO INDUSTRY STANDARD APPLIES TO THIS PACKAGE
B. ALL DIMENSIONS ARE IN MILLIMETERS
C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR PROTRUSIONS

△D FOR TERMINAL LENGTH "D", REFER TO TABLE

△E FOR TERMINAL LENGTH "E", REFER TO TABLE

F. DRAWING FILENAME: MKT-TO126AArev2

FAIRCHILD ™

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