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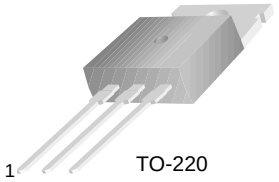
# KSC2333

## High Speed Switching Application

- Low Collector Saturation Voltage
- Specified of Reverse Biased SOA With Inductive Load




TO-220

1.Base 2.Collector 3.Emitter

## NPN Epitaxial Silicon Transistor

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

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 500 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 400 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 7 | V |
| $I_C$ | Collector Current (DC) | 2 | A |
| $I_{CP}$ | *Collector Current (Pulse) | 4 | A |
| $I_B$ | Base Current (DC) | 1 | A |
| $P_C$ | Collector Dissipation ($T_C$=25°C) | 15 | W |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | - 55 ~ 150 | °C |

*PW≤350µs, Duty Cycle≤10%

### Electrical Characteristics TC=25°C unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|---|---|---|---|---|---|
| $V_{CEO}$(sus) | Collector-Emitter Sustaining Voltage | $I_C$ = 0.5A, $I_B$ =0.1A, L = 1mH | 400 | | V |
| $V_{CEX}$(sus)1 | Collector-Emitter Sustaining Voltage | $I_C$ = 0.5A, $I_{B1}$ = -$I_{B2}$ = 0.1A<br>$T_C$ = 125°C, L = 180µH, clamped | 450 | | V |
| $V_{CEX}$(sus)2 | Collector-Emitter Sustaining Voltage | $I_C$ = 1A, $I_{B1}$ = 0.2A, -$I_{B2}$ =0.2A<br>$T_C$= 125°C, L = 180µH, clamped | 400 | | V |
| $I_{CBO}$ | Collector Cut-off Current | $V_{CB}$ = 400V, $I_E$ = 0 | | 10 | µA |
| $I_{CER}$ | Collector Cut-off Current | $V_{CE}$ = 400V, $R_{BE}$ =51Ω, $T_C$ = 125°C | | 1 | mA |
| $I_{CEX1}$ | Collector Cut-off Current | $V_{CE}$ = 400V, $V_{BE}$(off) = -5V | | 10 | µA |
| $I_{CEX2}$ | Collector Cut-off Current | $V_{CE}$ = 400V, $V_{BE}$(off) = -5V @<br>$T_C$ = 125°C | | 1 | mA |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{EB}$ = 5V, $I_C$ = 0 | | 10 | µA |
| $h_{FE1}$<br>$h_{FE2}$ | * DC Current Gain | $V_{CE}$ = 5V, $I_C$ = 0.1A<br>$V_{CE}$ = 5V, $I_C$ = 0.5A | 20<br>10 | 80 | |
| $V_{CE}$(sat) | * Collector-Emitter Saturation Voltage | $I_C$ = 0.5A, $I_B$ = 0.1A | | 1 | V |
| $V_{BE}$(sat) | * Base-Emitter Saturation Voltage | $I_C$ = 0.5A, $I_B$ = 0.1A | | 1.2 | V |
| $t_{ON}$ | Turn ON Time | $V_{CC}$ = 150V, $I_C$ = 0.5A<br>$I_{B1}$ = - $I_{B2}$ = 0.1A<br>$R_L$ = 300Ω | | 1 | µs |
| $t_{STG}$ | Storage Time | | | 2.5 | µs |
| $t_F$ | Fall Time | | | 1 | µs |

* Pulse Test: PW≤350µs, Duty Cycle≤2%Pulsed

### $h_{FE}$ Classification

| Classification | R | O | Y |
|---|---|---|---|
| $h_{FE1}$ | 20 ~ 40 | 30 ~ 60 | 40 ~ 80 |

# Typical Characteristics

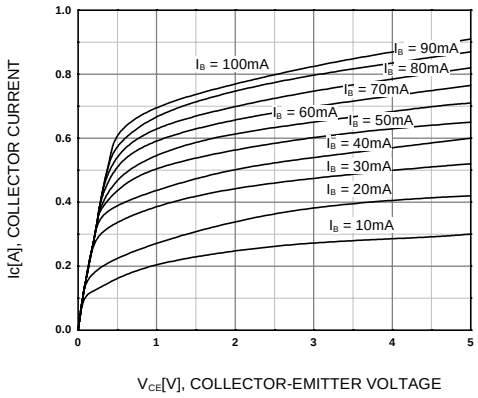



**Figure 1. Static Characteristic**

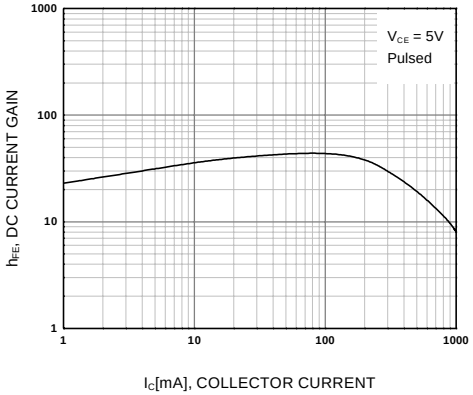



**Figure 2. DC current Gain**

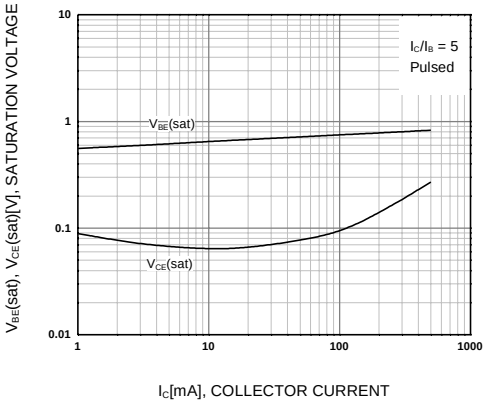



**Figure 3. Collector-Emitter Saturation Voltage Base-Emitter Saturation Voltage**

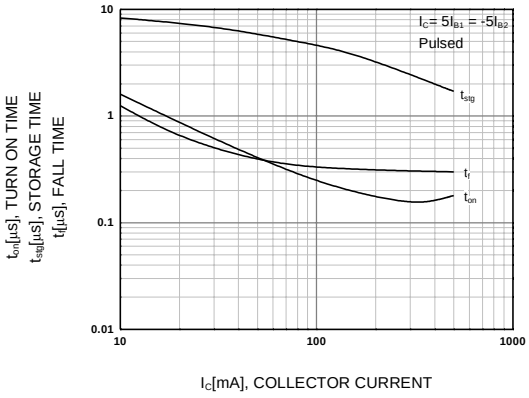



**Figure 4. Turn On, Storage and Fall Time vs Collector Current**

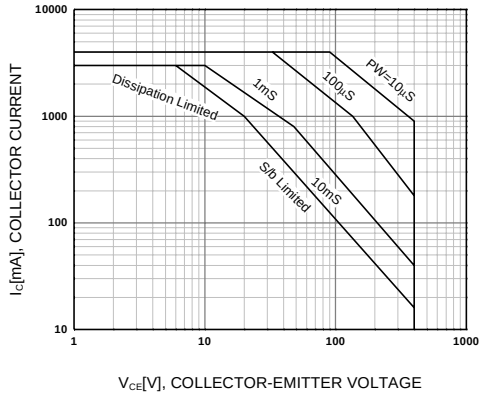



**Figure 5. Forward Bias Safe Operating Area**

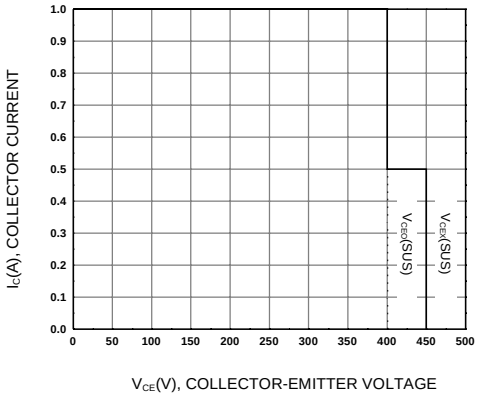



**Figure 6. Reverse Bias Safe Operating Area**

## Typical characteristics (Continued)

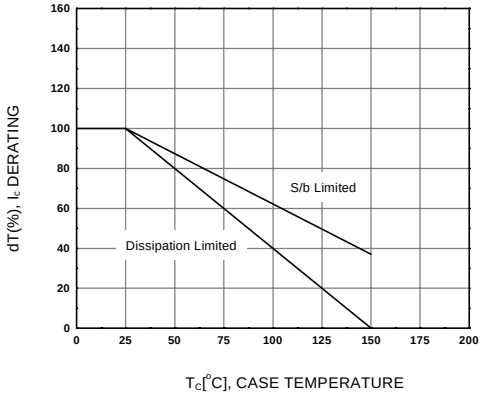



**Figure 7. Derating Curve of Safe Operating Areas**

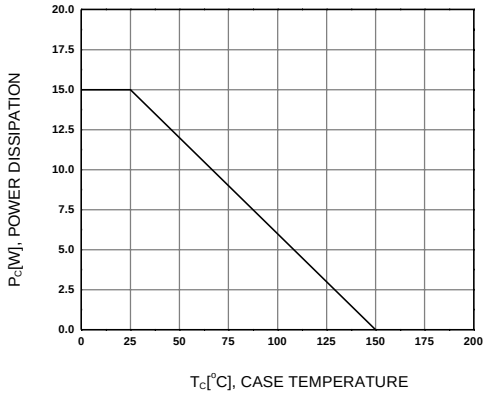
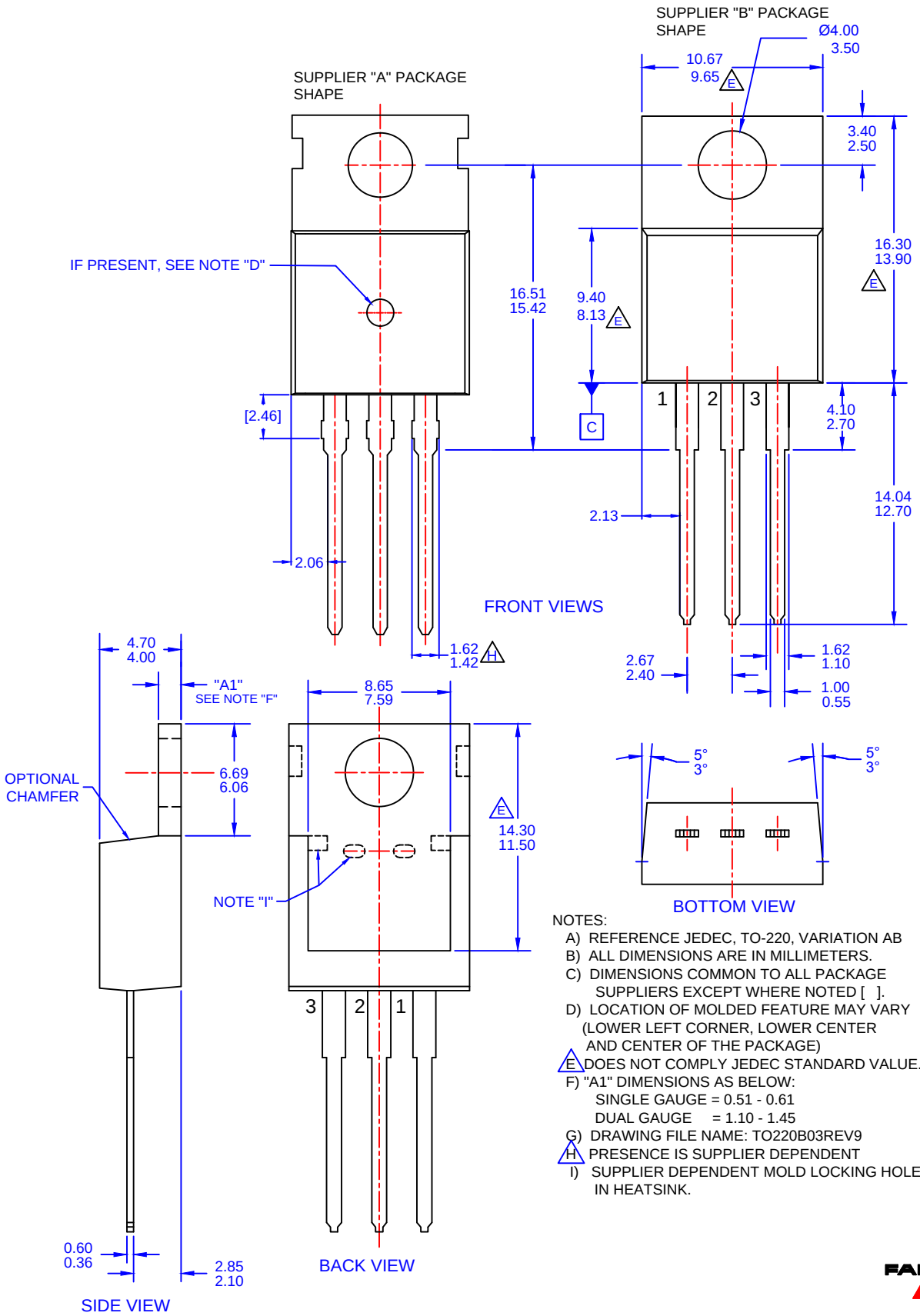



**Figure 8. Power Derating**




NOTES:

A) REFERENCE JEDEC, TO-220, VARIATION AB
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [ ].
D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
E DOES NOT COMPLY JEDEC STANDARD VALUE.
F) "A1" DIMENSIONS AS BELOW:
SINGLE GAUGE = 0.51 - 0.61
DUAL GAUGE = 1.10 - 1.45
G) DRAWING FILE NAME: TO220B03REV9
H PRESENCE IS SUPPLIER DEPENDENT
I) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

FAIRCHILD

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