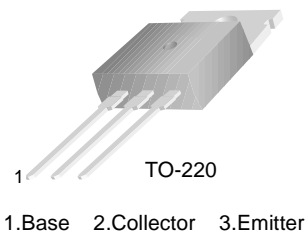


# KSC2335

## High Speed, High Voltage Switching

- Industrial Use



## NPN Epitaxial Silicon Transistor

### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ 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)                           | 7          | A                |
| $I_{CP}$  | *Collector Current (Pulse)                       | 15         | A                |
| $I_B$     | Base Current (DC)                                | 3.5        | A                |
| $P_C$     | Collector Dissipation ( $T_a=25^\circ\text{C}$ ) | 1.5        | W                |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 40         | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 55 ~ 150 | $^\circ\text{C}$ |

\*  $PW \leq 300\mu\text{s}$ , Duty Cycle  $\leq 10\%$

### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol                              | Parameter                              | Test Condition   | Min.           | Max.     | Units   |
|-------------------------------------|--|--|----------------|----------|---------|
| $V_{CEO(sus)}$                      | Collector-Emitter Sustaining Voltage   | $I_C = 3A, I_{B1} = 0.6A, L = 1mH$   | 400            |          | V       |
| $V_{CEX(sus)1}$                     | Collector-Emitter Sustaining Voltage   | $I_C = 3A, I_{B1} = -I_{B2} = 0.6A$<br>$V_{BE(off)} = -5V, L = 180\mu H, \text{Clamped}$     | 450            |          | V       |
| $V_{CEX(sus)2}$                     | Collector-Emitter Sustaining Voltage   | $I_C = 6A, I_{B1} = 2A, I_{B2} = -0.6A$<br>$V_{BE(off)} = -5V, L = 180\mu H, \text{Clamped}$ | 400            |          | V       |
| $I_{CBO}$                           | Collector Cut-off Current              | $V_{CB} = 400V, I_E = 0$   |                | 10       | $\mu A$ |
| $I_{CER}$                           | Collector Cut-off Current              | $V_{CE} = 400V, R_{BE} = 51\Omega @ T_C=125^\circ\text{C}$                                   |                | 1        | mA      |
| $I_{CEX1}$                          | Collector Cut-off Current              | $V_{CE} = 400V, V_{BE(off)} = -1.5V$   |                | 10       | $\mu A$ |
| $I_{CEX2}$                          | Collector Cut-off Current              | $V_{CE} = 400V, V_{BE(off)} = -1.5V @ T_C=125^\circ\text{C}$                                 |                | 1        | mA      |
| $I_{EBO}$                           | Emitter Cut-off Current                | $V_{EB} = 5V, I_C = 0$   |                | 10       | $\mu A$ |
| $h_{FE1}$<br>$h_{FE2}$<br>$h_{FE3}$ | * DC Current Gain                      | $V_{CE} = 5V, I_C = 0.1A$<br>$V_{CE} = 5V, I_C = 1A$<br>$V_{CE} = 5V, I_C = 3A$              | 20<br>20<br>10 | 80<br>80 |         |
| $V_{CE(sat)}$                       | * Collector-Emitter Saturation Voltage | $I_C = 3A, I_B = 0.6A$   |                | 1        | V       |
| $V_{BE(sat)}$                       | * Base-Emitter Saturation Voltage      | $I_C = 3A, I_B = 0.6A$   |                | 1.2      | V       |
| $t_{ON}$                            | Turn ON Time                           | $V_{CC} = 150V, I_C = 3A$<br>$I_{B1} = -I_{B2} = 0.6A$<br>$R_L = 50\Omega$                   |                | 1        | $\mu s$ |
| $t_{STG}$                           | Storage Time                           |  |                | 2.5      | $\mu s$ |
| $t_F$                               | Fall Time                              |  |                | 1        | $\mu s$ |

\* Pulse Test:  $PW \leq 350\mu\text{s}$ , Duty Cycle  $\leq 2\%$  Pulsed

## $h_{FE}$ Classification

| Classification | R       | O       | Y       |
|----------------|---------|---------|---------|
| $h_{FE2}$      | 20 ~ 40 | 30 ~ 60 | 40 ~ 80 |

## Typical Characteristics

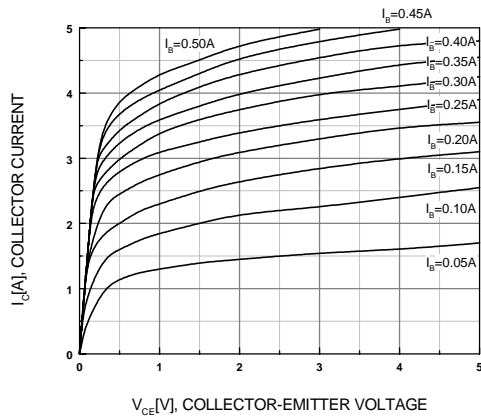


Figure 1. Static Characteristic

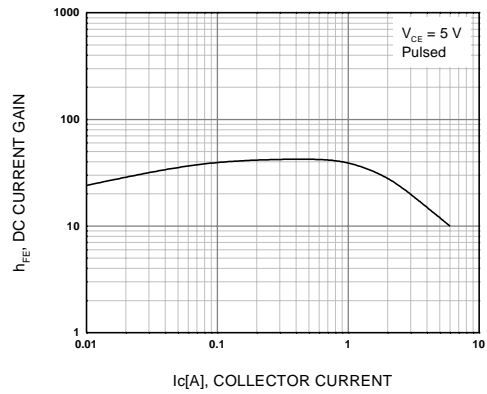


Figure 2. DC current Gain

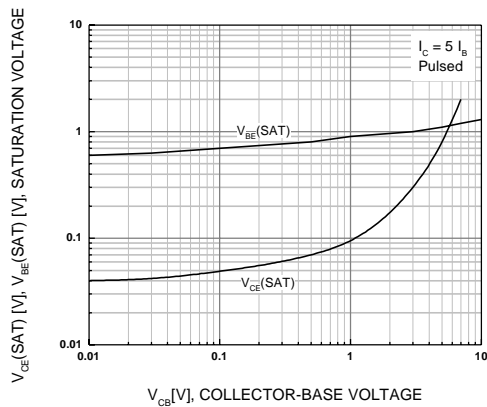


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

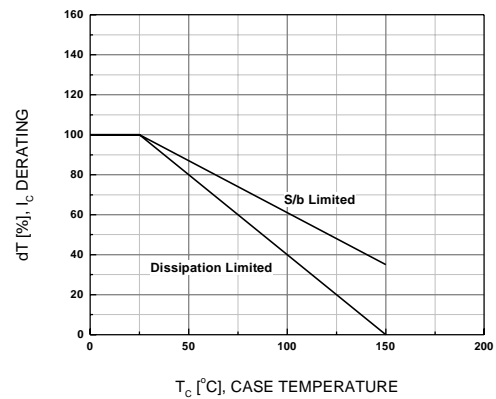


Figure 4. Derating Curve of Safe Operating Areas

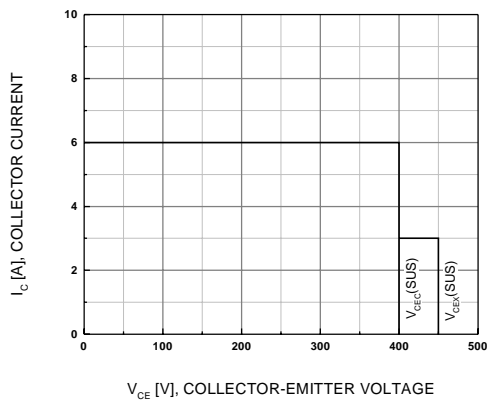


Figure 5. Reverse Bias Safe Operating Area

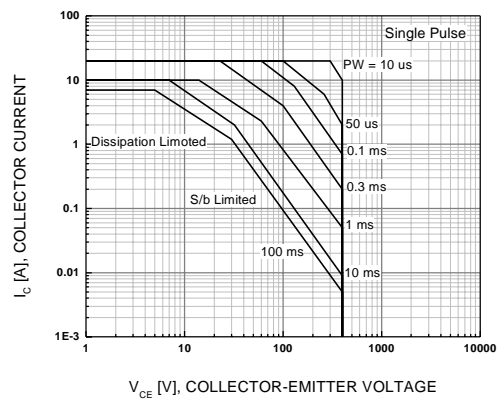
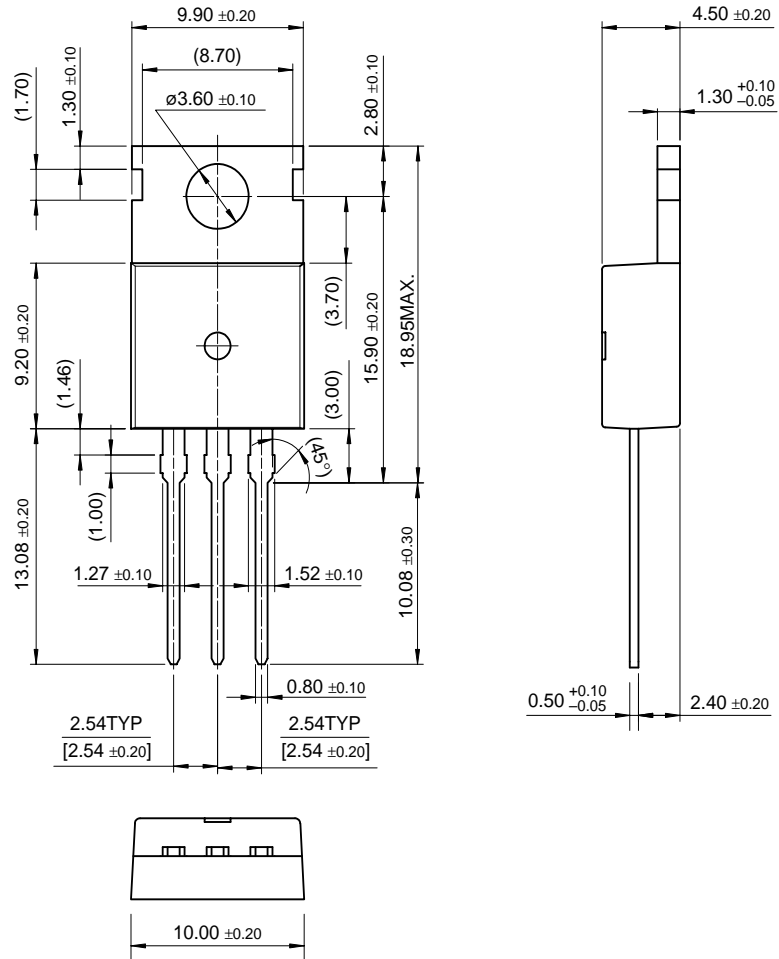


Figure 6. Forward Bias Safe Operating Area

# Package Dimensions

## TO-220



Dimensions in Millimeters

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