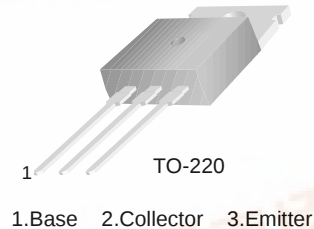




## KSC5338

### High Voltage Power Switch Switching Application

- High Speed Switching
- Wide SOA



### NPN Silicon Transistor

#### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

| Symbol    | Parameter                                        | Value      | Units            |
|-----------|--------------------------------------------------|------------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                           | 1000       | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                        | 450        | V                |
| $V_{EBO}$ | Emitter-Base Voltage                             | 9          | V                |
| $I_C$     | Collector Current (DC)                           | 5          | A                |
| $I_{CP}$  | Collector Current (Pulse)                        | 10         | A                |
| $I_B$     | Base Current (DC)                                | 2          | A                |
| $I_{BP}$  | Base Current (Pulse)                             | 4          | A                |
| $P_C$     | Collector Dissipation ( $T_C=25^\circ\text{C}$ ) | 100        | W                |
| $T_J$     | Junction Temperature                             | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                              | - 65 ~ 150 | $^\circ\text{C}$ |

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

| Symbol                 | Parameter                            | Test Condition                                                                   | Min.    | Typ. | Max.        | Units         |
|------------------------|--------------------------------------|----------------------------------------------------------------------------------|---------|------|-------------|---------------|
| $BV_{CBO}$             | Collector-Base Breakdown Voltage     | $I_C = 1\text{mA}, I_E = 0$                                                      | 1000    |      |             | V             |
| $BV_{CEO}$             | Collector-Emitter Breakdown Voltage  | $I_C = 5\text{mA}, I_B = 0$                                                      | 450     |      |             | V             |
| $BV_{EBO}$             | Emitter-Base Breakdown Voltage       | $I_C = 1\text{mA}, I_E = 0$                                                      | 9       |      |             | V             |
| $I_{CBO}$              | Collector Cut-off Current            | $V_{CB} = 800\text{V}, V_{BE} = 0$                                               |         |      | 10          | $\mu\text{A}$ |
| $I_{EBO}$              | Emitter Cut-off Current              | $V_{EB} = 9\text{V}, I_C = 0$                                                    |         |      | 10          | $\mu\text{A}$ |
| $h_{FE1}$<br>$h_{FE2}$ | * DC Current Gain                    | $V_{CE} = 5\text{V}, I_C = 0.5\text{A}$<br>$V_{CE} = 1\text{V}, I_C = 2\text{A}$ | 15<br>6 |      | 30          |               |
| $V_{CE(sat)}$          | Collector-Emitter Saturation Voltage | $I_C = 1\text{A}, I_B = 0.1\text{A}$<br>$I_C = 2\text{A}, I_B = 0.4\text{A}$     |         | 0.55 | 0.8<br>0.5  | V<br>V        |
| $V_{BE(sat)}$          | Base-Emitter Saturation Voltage      | $I_C = 1\text{A}, I_B = 0.1\text{A}$<br>$I_C = 2\text{A}, I_B = 0.4\text{A}$     |         |      | 1.1<br>1.25 | V<br>V        |
| $C_{ob}$               | Output Capacitance                   | $V_{CB} = 10\text{V}, f = 1\text{MHz}$                                           |         | 70   |             | pF            |
| $C_{ib}$               | Input Capacitance                    | $V_{EB} = 8\text{V}, I_C = 0, f = 1\text{MHz}$                                   |         | 1000 |             | pF            |
| $f_T$                  | Current Gain Bandwidth Product       | $V_{EB} = 6\text{V}, I_C = 0.1\text{A}$                                          |         | 14   |             | MHz           |
| $t_{ON}$               | Turn ON Time                         | $V_{CC} = 125\text{V}, I_C = 1\text{A}$                                          |         |      | 200         | ns            |
| $t_{STG}$              | Storage Time                         | $I_{B1} = 0.2\text{A}, I_{B2} = -0.2\text{A}$                                    |         |      | 2           | $\mu\text{s}$ |
| $t_F$                  | Fall Time                            | $R_L = 125\Omega$                                                                |         |      | 500         | ns            |

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

# Typical Characteristics

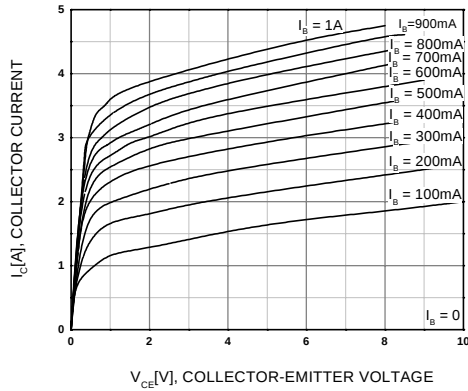


Figure 1. Static Characteristic

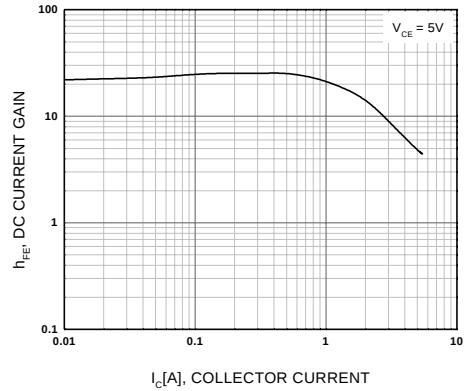


Figure 2. DC current Gain

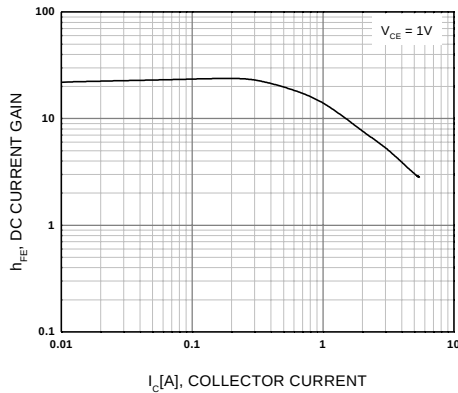


Figure 3. DC current Gain

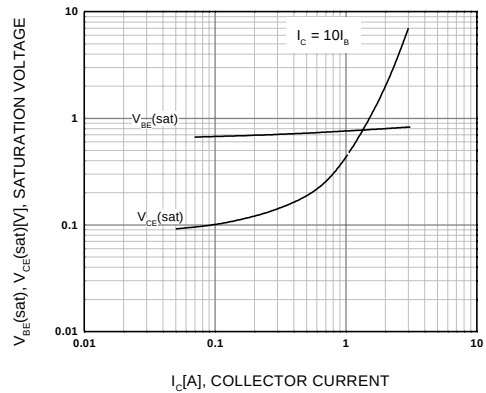


Figure 4. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

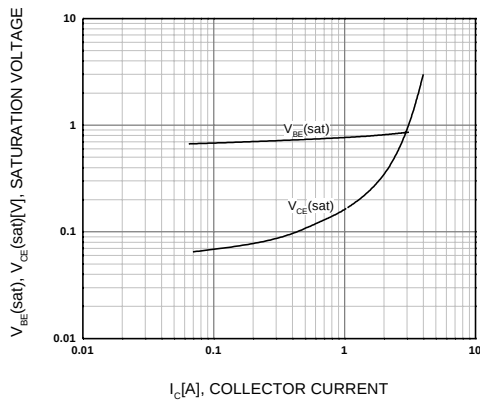


Figure 5. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

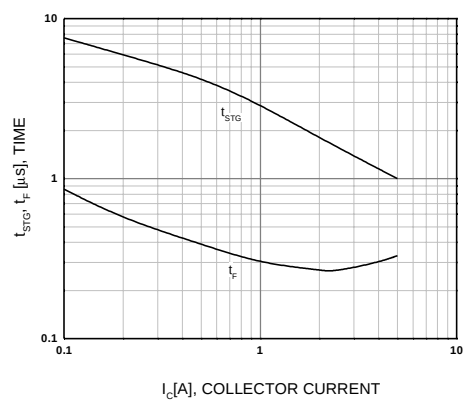


Figure 6. Switching Time

## Typical Characteristics (Continued)

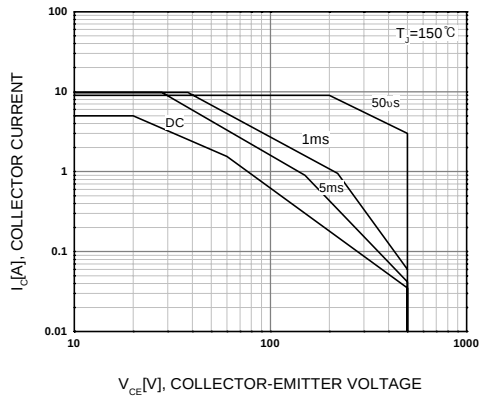


Figure 7. Safe Operating Area

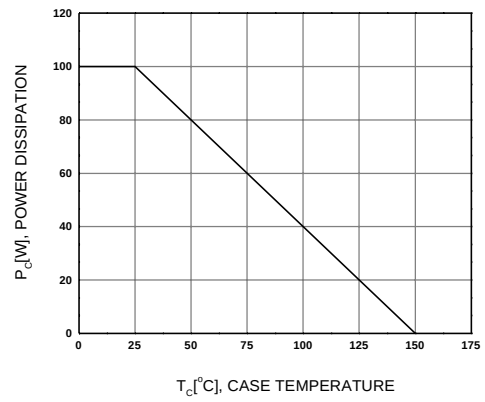


Figure 8. Power Derating



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