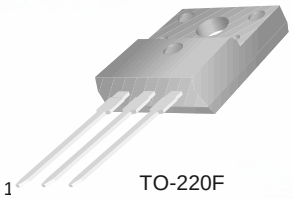
FAIRCHILD SEMICONDUCTOR TM

# KSE13009F

## High Voltage Switch Mode Application

- High Speed Switching
- Suitable for Switching Regulator and Motor Control



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TO-220F

1.Base 2.Collector 3.Emitter

## NPN Silicon Transistor

### 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) | 12 | A |
| $I_{CP}$ | Collector Current (Pulse) | 24 | A |
| $I_B$ | Base Current | 6 | A |
| $P_C$ | Collector Dissipation ($T_C$=25°C) | 50 | W |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | -65 ~ 150 | °C |

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

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $V_{CEO}$(sus) | Collector-Emitter Sustaining Voltage | $I_C$ = 10mA, $I_B$ = 0 | 400 | | | V |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{EB}$ = 7V, $I_C$ = 0 | | | 1 | mA |
| $h_{FE}$ | DC Current Gain | $V_{CE}$ = 5V, $I_C$ = 5A<br>$V_{CE}$ = 5V, $I_C$ = 8A | 8<br>6 | | 40<br>30 | |
| $V_{CE}$(sat) | Collector-Emitter Saturation Voltage | $I_C$ = 5A, $I_B$ = 1A<br>$I_C$ = 8A, $I_B$ = 1.6A<br>$I_C$ = 12A, $I_B$ = 3A | | | 1<br>1.5<br>3 | V<br>V<br>V |
| $V_{BE}$(sat) | Base-Emitter Saturation Voltage | $I_C$ = 5A, $I_B$ = 1A<br>$I_C$ = 8A, $I_B$ = 1.6A | | | 1.2<br>1.6 | V<br>V |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = 10V , f = 0.1MHz | | 180 | | pF |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$ = 10V, $I_C$ = 0.5A | 4 | | | MHz |
| $t_{ON}$ | Turn ON Time | $V_{CC}$ =125V, $I_C$ = 8A<br>$I_{B1}$ = - $I_{B2}$ = 1.6A<br>$R_L$ = 15,6Ω | | | 1.1 | µs |
| $t_{STG}$ | Storage Time | | | | 3 | µs |
| $t_F$ | Fall Time | | | | 0.7 | µs |

* Pulse Test: PW≤300µs, Duty Cycle≤2%

# Typical Characteristics

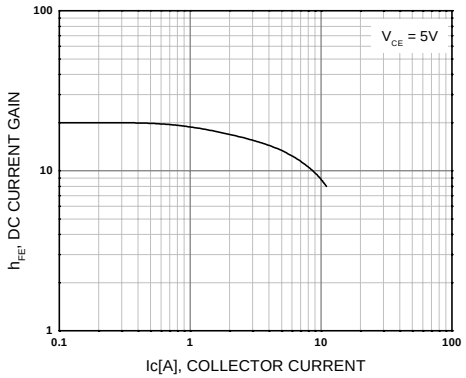



**Figure 1. DC current Gain**

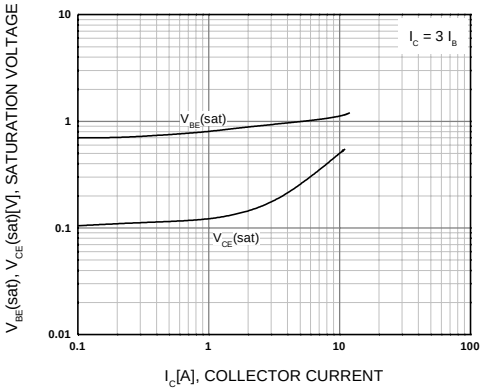



**Figure 2. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage**

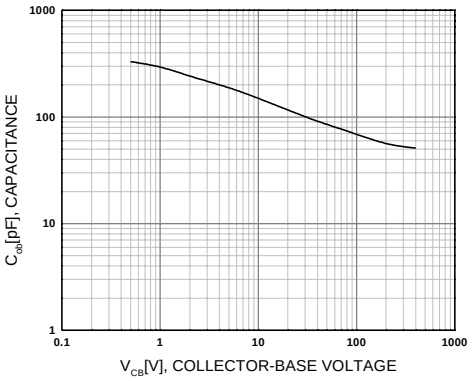



**Figure 3. Collector Output Capacitance**

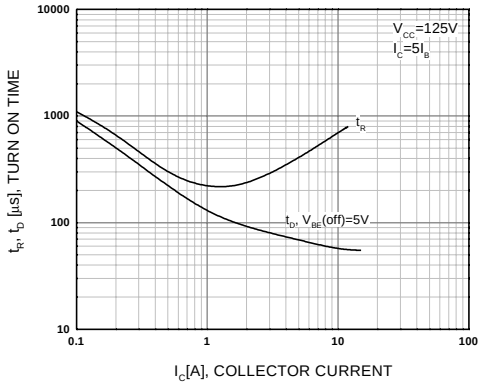



**Figure 4. Turn On Time**

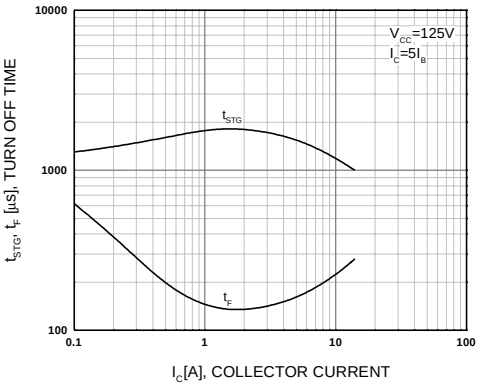



**Figure 5. Turn Off Time**

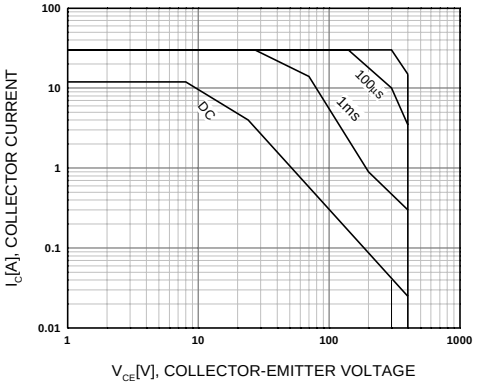



**Figure 6. Safe Operating Area**

## Typical Characteristics (Continued)

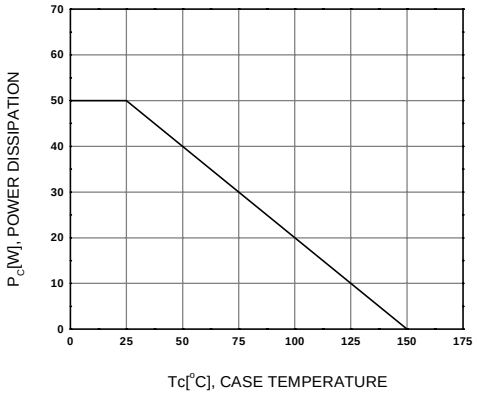
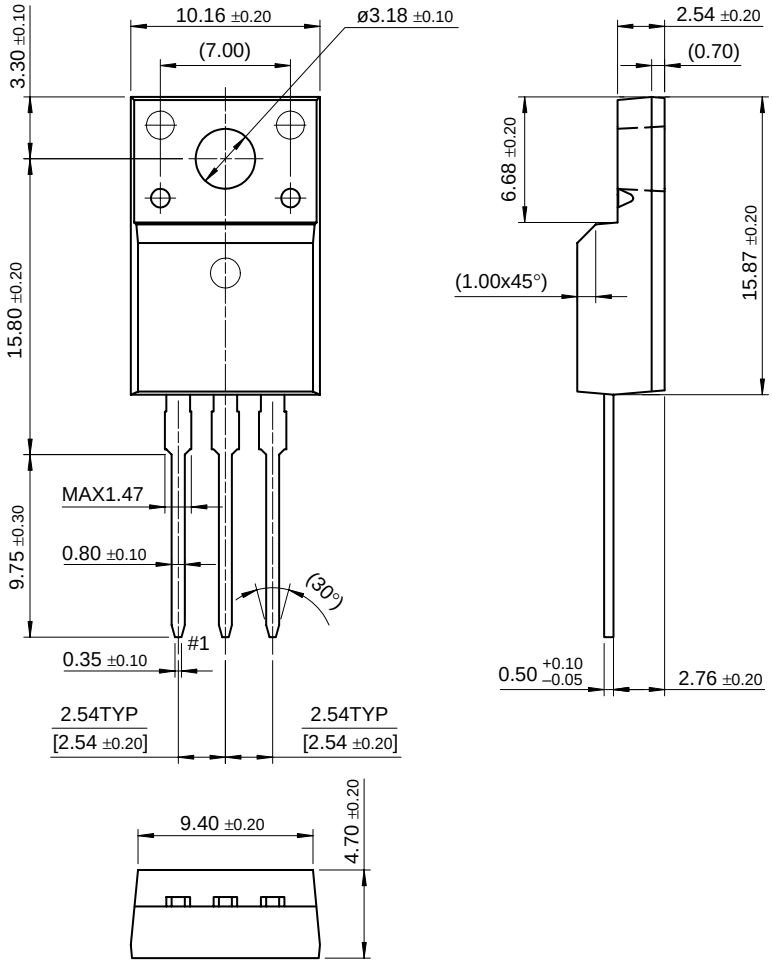



**Figure 1. DC current Gain**

## Package Demensions

TO-220F




Dimensions in Millimeters

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