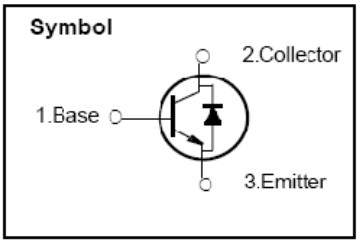
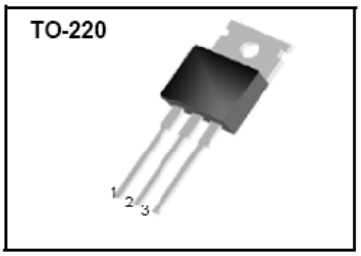
*High Voltage Fast-Switching NPN Power Transistor*

## Features

- Very High Switching Speed
- Minimum Lot-to-Lot $h_{FE}$ Variation
- Wide Reverse Bias SOA
- Built-in free wheeling diode




## General Description

This Device is designed for high voltage, High speed switching characteristics required such as lighting system, switching mode power supply.

### Absolute Maximum Ratings

| Symbol | Parameter | Test Conditions | Value | Units |
|---|---|---|---|---|
| $V_{CES}$ | Collector-Emitter Voltage | $V_{BE}$ = 0 | **700** | V |
| $V_{CEO}$ | Collector-Emitter Voltage | $I_B$ = 0 | 400 | V |
| $V_{EBO}$ | Emitter-Base Voltage | $I_C$ = 0 | 9.0 | V |
| $I_C$ | Collector Current | | 8.0 | A |
| $I_{CP}$ | Collector pulse Current | | 16 | A |
| $I_B$ | Base Current | | 4.0 | A |
| $I_{BM}$ | Base Peak Current | $t_P$ = 5ms | 8.0 | A |
| $P_C$ | Total Dissipation at TC = 25℃ | | 80 | W |
| $T_J$ | Operation Junction Temperature | | - 40 ~ 150 | ℃ |
| $T_{STG}$ | Storage Temperature | | - 40 ~ 150 | ℃ |

### Thermal Characteristics

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $R_{\theta JC}$ | Thermal Resistance Junction to Case | 1.67 | ℃/W |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 62.5 | ℃/W |

## Electrical Characteristics ($T_C$=25℃ unless otherwise noted)

| Symbol | Parameter | Test Conditions | Value | | | Units |
|---|---|---|---|---|---|---|
| | | | Min | Typ | Max | |
| $I_{CEV}$ | Colletor Cut-off Current<br>( VBE = -1.5V ) | $V_{CE}$ = 700V<br>$V_{CE}$ = 700V ,$T_C$ = 100℃ | -<br>- | -<br>- | 1.0<br>5.0 | mA |
| $V_{CEO(SUS)}$ | Collector-Emitter Sustaining Voltage | IB = 0, IC = 10mA | 400 | - | - | V |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$ =2.0A, $I_B$ = 0.4A<br>$I_C$ = 5.0A, $I_B$ = 1.0A<br>$I_C$ = 8.0A, $I_B$ = 2.0A | - | - | 0.6<br>1.5<br>3.0 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C$ =2.0A, $I_B$ = 0.4A<br>$I_C$ = 5.0A, $I_B$ = 1.0A | - | - | 1.2<br>1.6 | V |
| $h_{FE}$ | DC Current Gain | $I_C$ = 2.0A, VCE = 5V<br>IC = 5.0A, VCE = 5V | 10<br>10 | | 40<br>30 | |
| ts<br>tf | Storage Time<br>Fall Time | $I_C$ = 5.0A, $V_{CC}$ = 125V<br>$I_{B1}$ = 1.0A, $I_{B2}$ = -1.0A<br>$T_P$ = 25us | - | - | 3.6<br>1.6 | μS |
| $f_T$ | Current Gain Bandwidth Product | $I_C$=0.5A ,$V_{CE}$=10V | 4 | - | - | MHz |
| $V_F$ | Diode Forward Voltage | $I_F$=2A | - | - | 2.5 | V |
| $C_{OB}$ | Output Capacitance | $I_C$=0.5A ,$V_{CE}$=10V | - | 6.5 | | pF |

**Note:**

Pulse Test : Pulse width 300, Duty cycle 2%

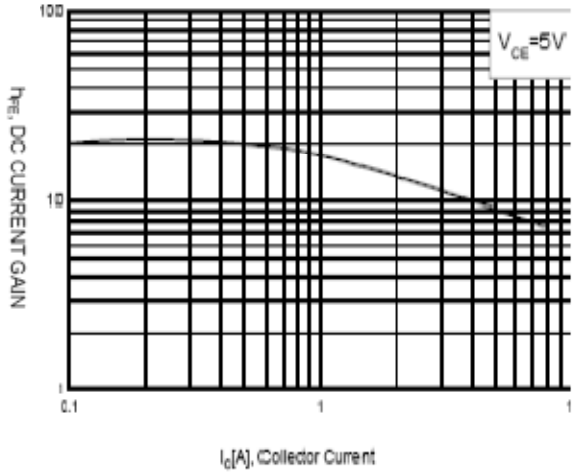



Fig. 1 DC Current Gain

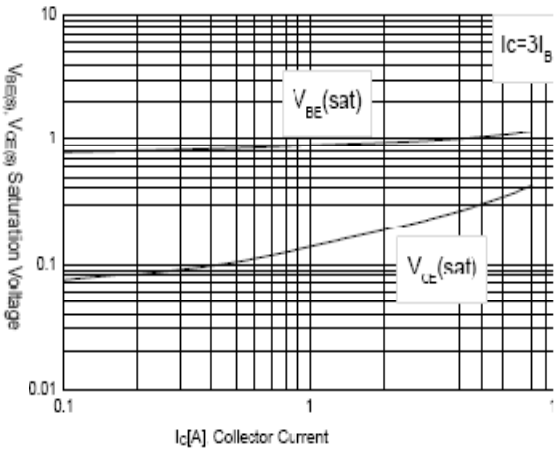



Fig. 2 Saturation Voltage

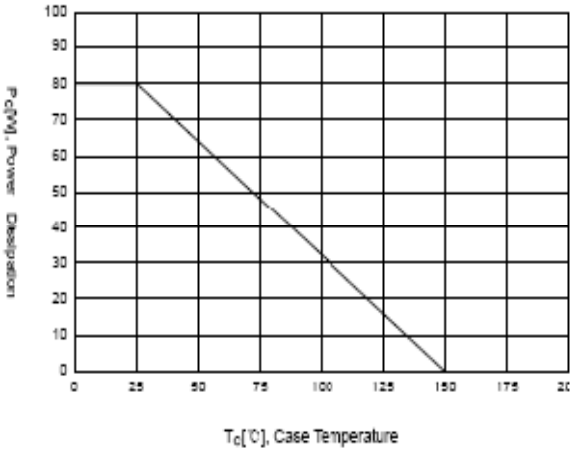



Fig. 3 Power Derating

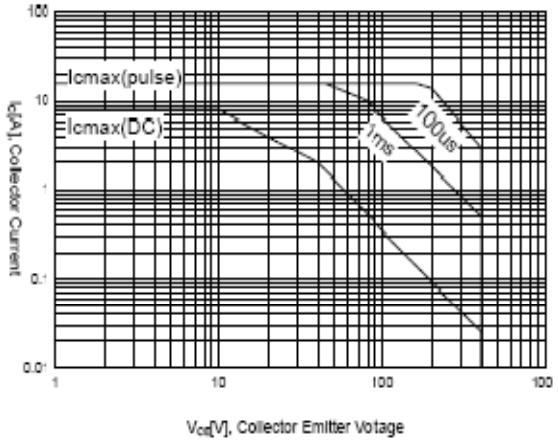



Fig. 4 Safe Operation Area

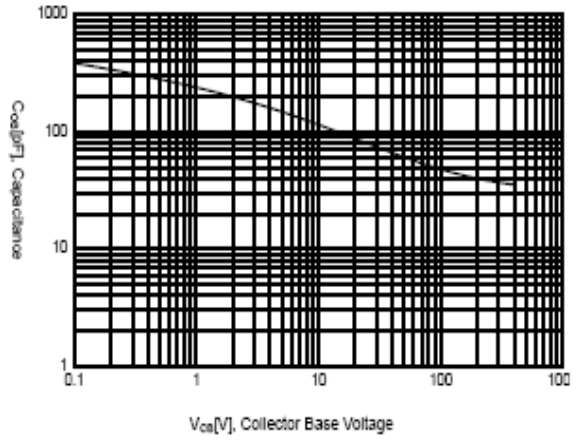



Fig. 5 Collect output capacitance

## TO-220 Package Dimension

Unit: mm