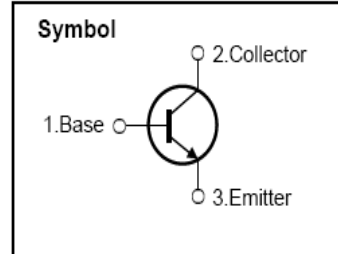


High Voltage Fast-Switching NPN Power Transistor

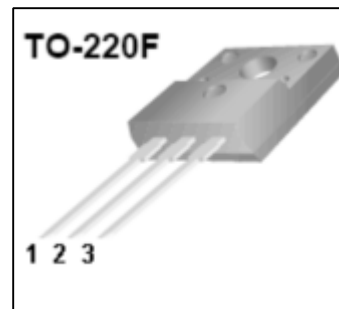
Features

- ◆ Very High Switching Speed
- ◆ High Voltage Capability
- ◆ Wide Reverse Bias SOA



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 | | 12* | A |
| I_{CP} | Collector pulse Current | | 25 | A |
| I_B | Base Current | | 6.0 | A |
| I_{BM} | Base Peak Current | $t_p = 5ms$ | 12 | A |
| P_C | Total Dissipation at $T_c = 25^\circ C$ | | 50 | W |
| | Total Dissipation at $T_a = 25^\circ C$ | | 2.2 | |
| T_J | Operation Junction Temperature | | -40 ~ 150 | $^\circ C$ |
| T_{STG} | Storage Temperature | | -40 ~ 150 | $^\circ C$ |

T_c : Case temperature (good cooling)

T_a : Ambient temperature (without heat sink)

Thermal Characteristics

| Symbol | Parameter | Value | Units |
|-----------------|----------------------------------------|-------|--------------|
| $R_{\theta Jc}$ | Thermal Resistance Junction to Case | 2.50 | $^\circ C/W$ |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 62.5 | $^\circ C/W$ |

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

| Symbol | Parameter | Test Conditions | Value | | | Units |
|----------------|--------------------------------------|---------------------------------------------------------------|-------|-----|-----|---------------|
| | | | Min | Typ | Max | |
| $V_{CEO(sus)}$ | Collector-Emitter Breakdown Voltage | $I_c=10\text{mA}, I_b=0$ | 400 | - | - | V |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_c=5.0\text{A}, I_b=1.0\text{A}$ | - | - | 1.0 | V |
| | | $I_c=8.0\text{A}, I_b=1.6\text{A}$ | - | - | 1.5 | |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_c=12\text{A}, I_b=3.0\text{A}$ | - | - | 3.0 | V |
| | | $I_c=8.0\text{A}, I_b=1.6\text{A}$ $T_c=100^\circ\text{C}$ | - | - | 2.0 | |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_c=5.0\text{A}, I_b=1.0\text{A}$ | - | - | 1.2 | V |
| | | $I_c=8.0\text{A}, I_b=1.6\text{A}$ | - | - | 1.6 | |
| I_{EBO} | Emitter-Base Cutoff Current | $V_{eb}=9\text{V}, I_c=0\text{V}$ | - | - | 10 | μA |
| | | $V_{ce}=5\text{V}, I_c=5.0\text{A}$ | 10 | - | 40 | |
| h_{FE} | DC Current Gain | $V_{ce}=5\text{V}, I_c=8.0\text{A}$ | 6 | - | 30 | |
| | | $V_{cc}=5.0\text{V}, I_c=0.5\text{A}$ (UI9600) | 4 | - | 10 | |
| t_s | Storage Time | $V_{cc}=5.0\text{V}, I_c=0.5\text{A}$ (UI9600) | 4 | - | 10 | μs |
| t_f | Fall Time | | | | | |
| f_T | Current Gain Band with Prouct | $V_{ce}=10\text{V}, I_c=0.5\text{A}$ | 4 | | | MHz |

Note:

Pulse Test : Pulse width 300, Duty cycle 2%

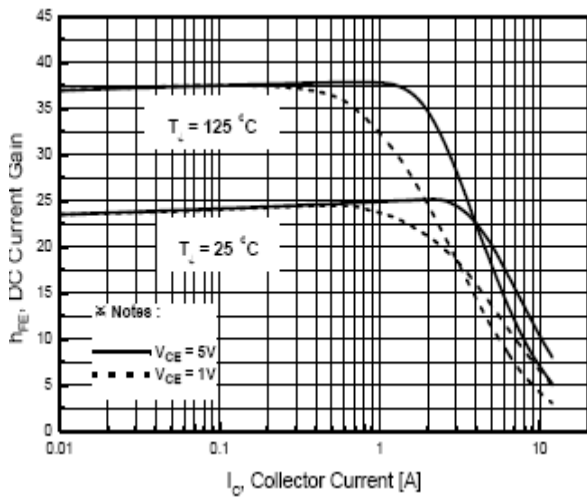


Fig. 1 DC Current Gain

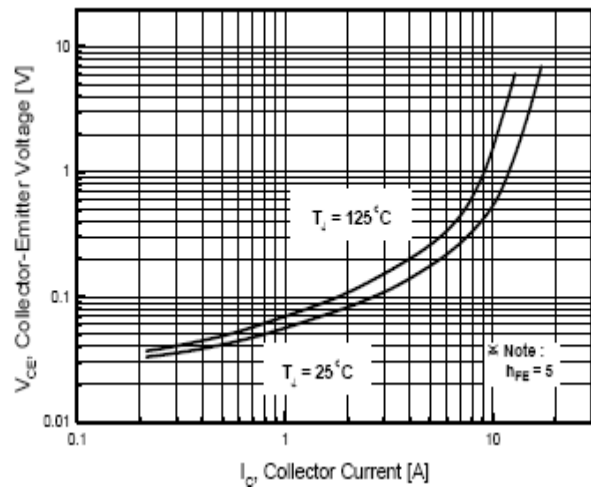


Fig. 2 Collector-Emitter Saturation Voltage

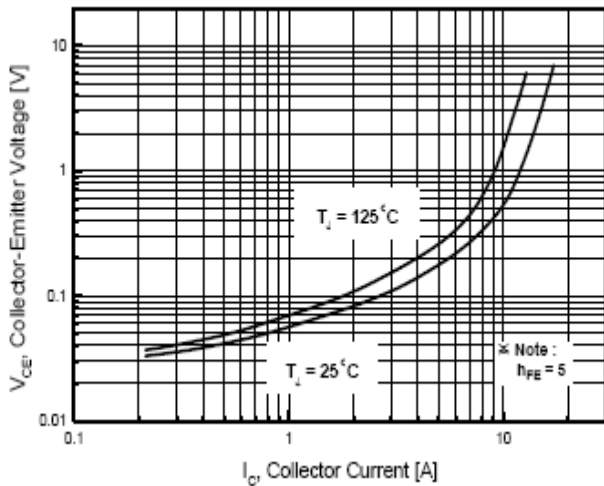


Fig. 3 Base-Emitter Saturation Voltage

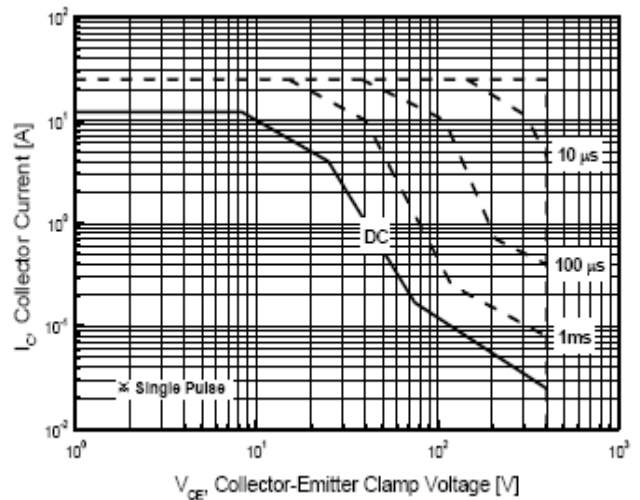


Fig. 4 Safe Operation Area

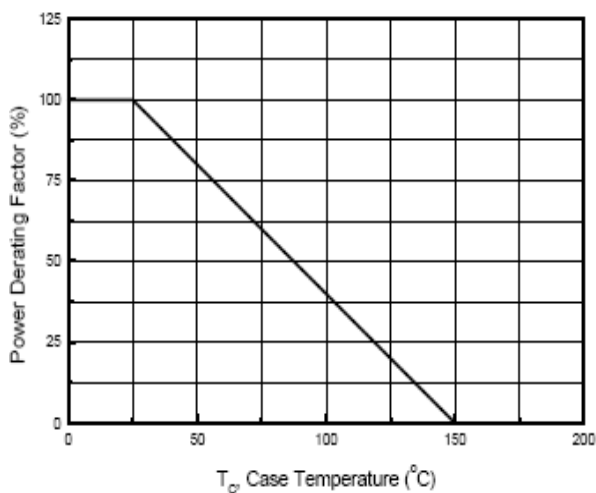


Fig. 5 Power Derating

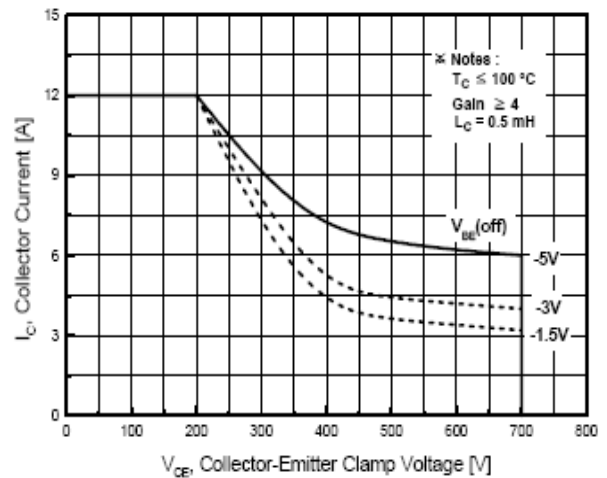
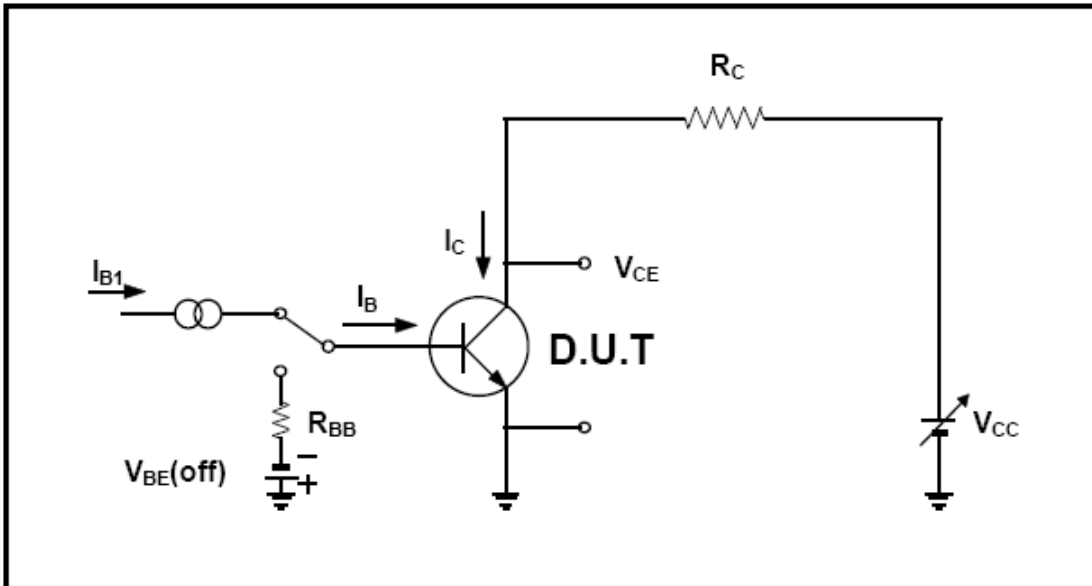
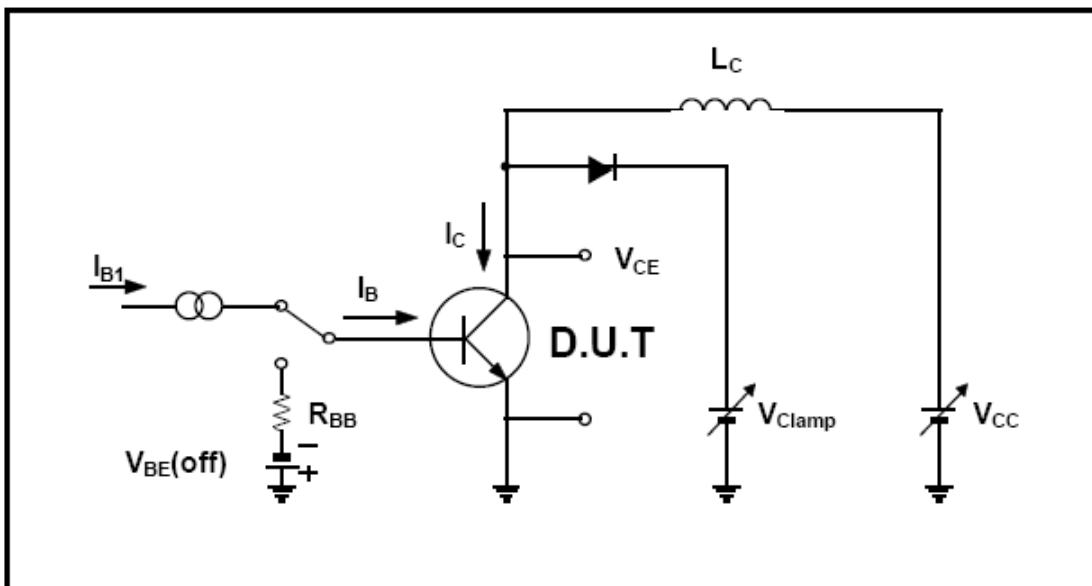


Fig. 6 Reverse Biased Safe Operation Area

Resistive Load Switching Test Circuit



Inductive Load Switching & RBSOA Test Circuit



TO-220F Package Dimension

Unit: mm

