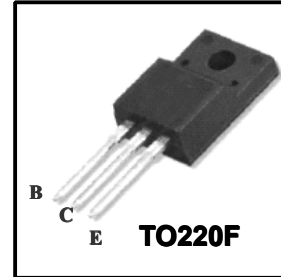


High Voltage Fast-Switching NPN Power Transistor

Features

- ◆ Very High Switching Speed
- ◆ High Voltage Capability
- ◆ Wide Reverse Bias SOA
- ◆ Isolation Voltage ($V_{ISO} = 4000V AC$)



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 $T_c = 25^\circ C$ | | 40 | W |
| T_J | Operation Junction Temperature | | - 40 ~ 150 | $^\circ C$ |
| T_{STG} | Storage Temperature | | - 40 ~ 150 | $^\circ C$ |

T_c : Case temperature (good cooling)

Thermal Characteristics

| Symbol | Parameter | Value | Units |
|-----------------|--|-------|--------------|
| $R_{\theta Jc}$ | Thermal Resistance Junction to Case | 3.13 | $^\circ C/W$ |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 62.5 | $^\circ C/W$ |

Electrical Characteristics (T_c=25°C unless otherwise noted)

| Symbol | Parameter | Test Conditions | Value | | | Units |
|-----------------------|---|--|---------|--------|-------------------|-------|
| | | | Min | Typ | Max | |
| V _{CEO(sus)} | Collector-Emitter Breakdown Voltage | I _c =10mA, I _b =0 | 400 | - | - | V |
| V _{CE(sat)} | Collector-Emitter Saturation Voltage | I _c =2.0A, I _b =0.4A I _c =5.0A, I _b =1.0A I _c =8.0A, I _b =2.0A | - | - | 1.0 2.0 3.0 | V |
| | | I _c =5.0A, I _b =1.0A T _c =100°C | - | - | 2.5 | V |
| V _{BE(sat)} | Base-Emitter Saturation Voltage | I _c =2.0A, I _b =0.4A I _c =5.0A, I _b =1.0A | - | - | 1.2 1.6 | V |
| | | I _c =5.0A, I _b =1.0A T _c =100°C | - | - | 1.5 | V |
| I _{CBO} | Collector-Base Cutoff Current (V _{be} =-1.5V) | V _{cb} =700V V _{cb} =700V, T _c =100°C | - | - | 1.0 5.0 | mA |
| I _{EBO} | Emitter -Base Cutoff Current | V _{eb} =9V | - | - | 1.0 | mA |
| h _{FE} | DC Current Gain | V _{ce} =5V, I _c =2.0A V _{ce} =5V, I _c =5.0A | 10 5 | - - | 40 40 | |
| | | | | | | |
| f _T | Current Gain Bandwidth Product | V _{CE} = 10V, I _C = 0.5A | 4 | | | MHz |
| ton | Turn on Time | V _{CC} =125V, I _c =5A I _{B1} =I _{B2} =-1.0A R _L =50Ω | - | - | 1.6 | μs |
| ts | Storage Time | | - | - | 3.0 | |
| tf | Fall Time | | - | - | 0.7 | |

Note:

Pulse Test : Pulse width 300, Duty cycle 2%

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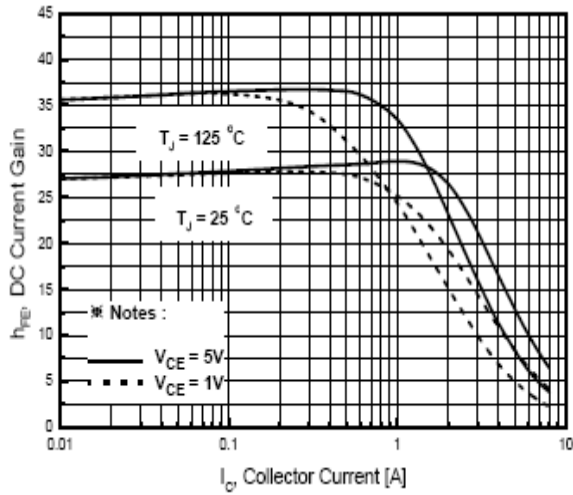


Fig. 1 DC Current Gain

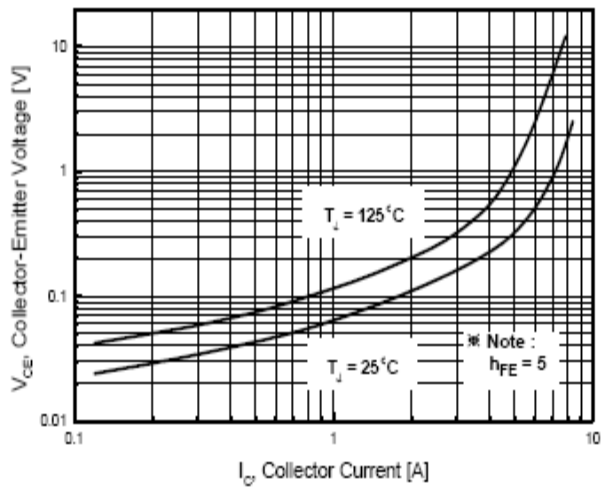


Fig. 2 Collector-Emitter Saturation Voltage

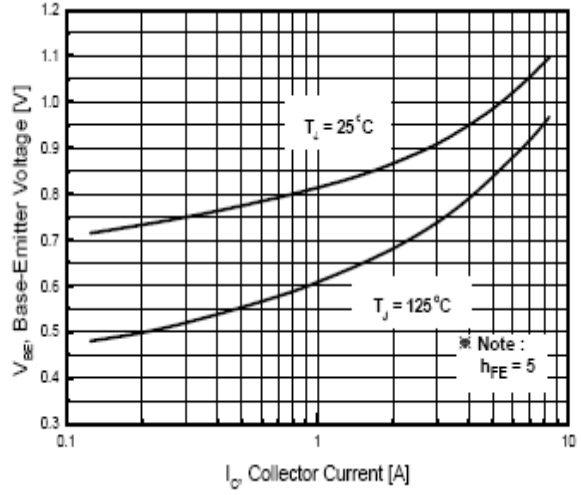


Fig. 3 Base-Emitter Saturation Voltage

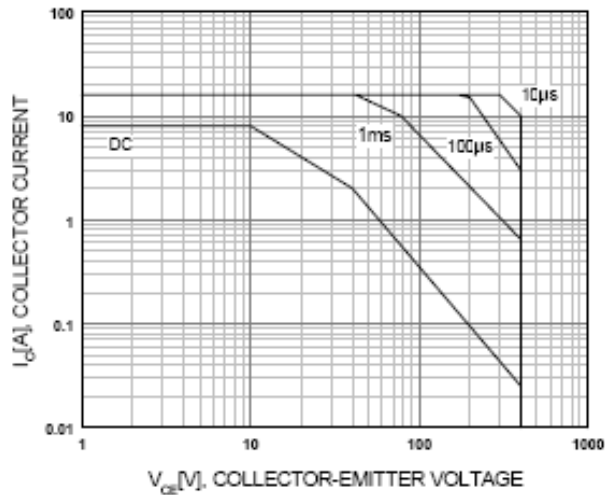


Fig. 4 Safe Operation Area

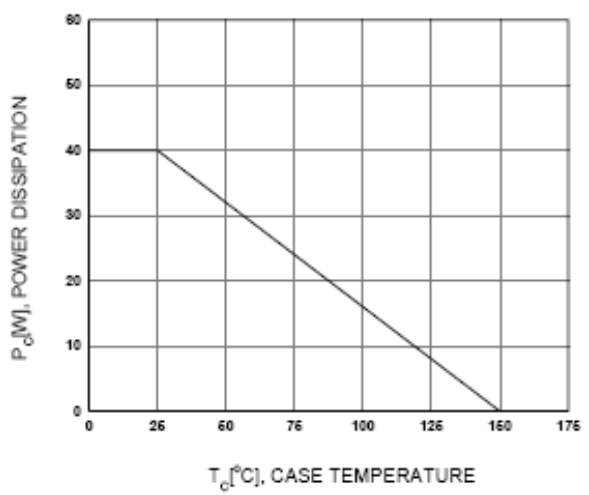


Fig.5 Power Derating

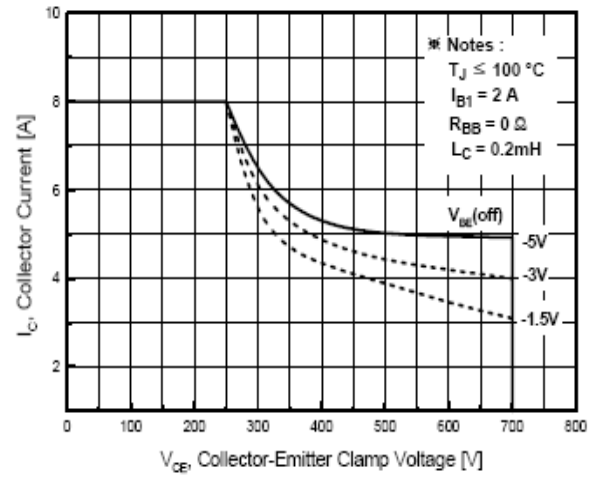
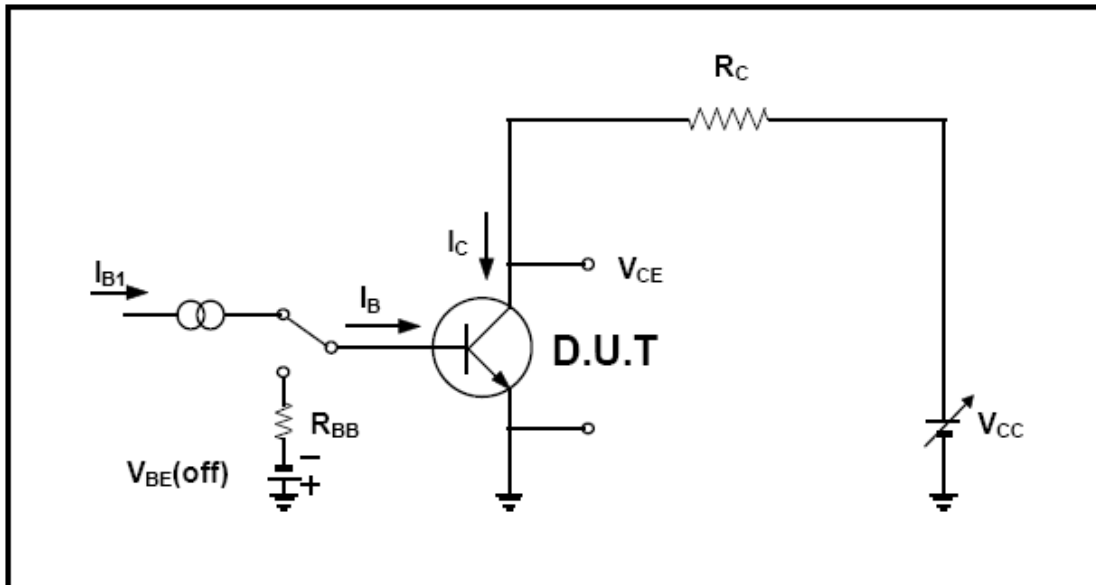


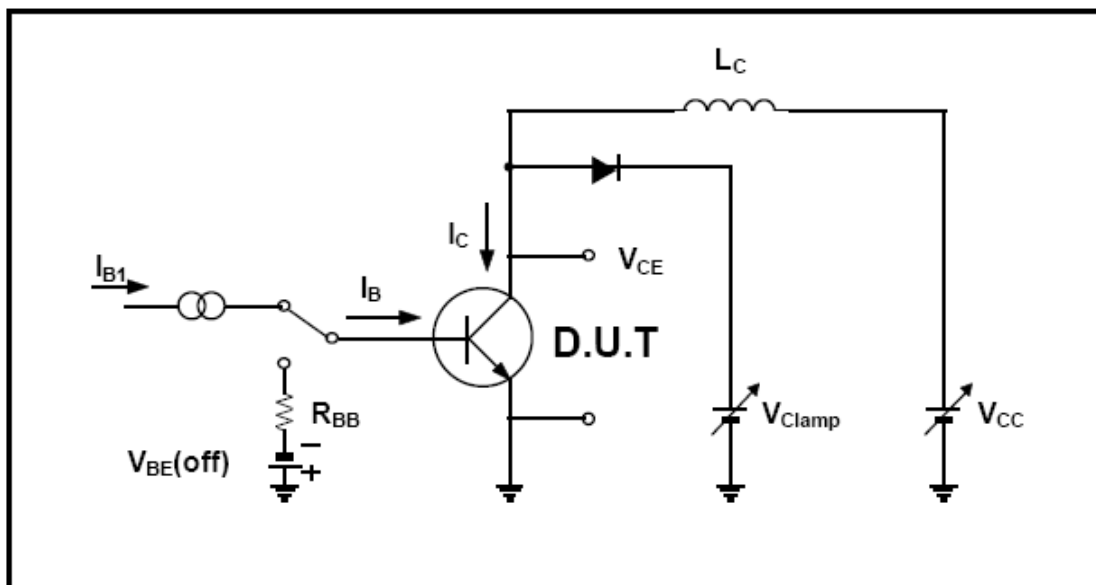
Fig.6 Reverse Biased Safe Operation Area



Resistive Load Switching Test Circuit



Inductive Load Switching & RBSOA Test Circuit



TO-220F Package Dimension

