

*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                     |                 | 1.5     | A          |
| $I_{CP}$  | Collector pulse Current               |                 | 3.0     | A          |
| $I_B$     | Base Current                          |                 | 0.75    | A          |
| $I_{BM}$  | Base Peak Current                     | $t_p=5ms$       | 1.5     | A          |
| $P_C$     | Total Dissipation at $T_c=25^\circ C$ |                 | 18      | 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**

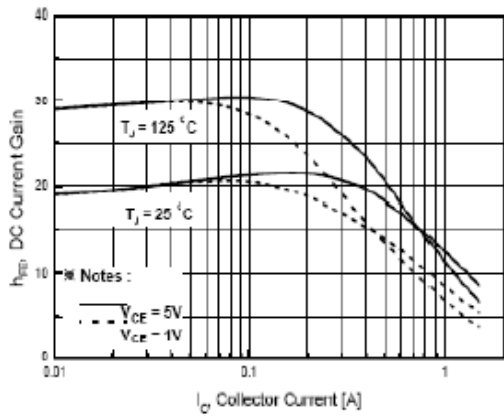
| Symbol    | Parameter                              | value | Units        |
|-----------|--|-------|--------------|
| $R_{QJA}$ | Thermal Resistance Junction to Ambient | 13.6  | $^\circ C/W$ |

## Electrical Characteristics(Tc=25°C unless otherwise noted)

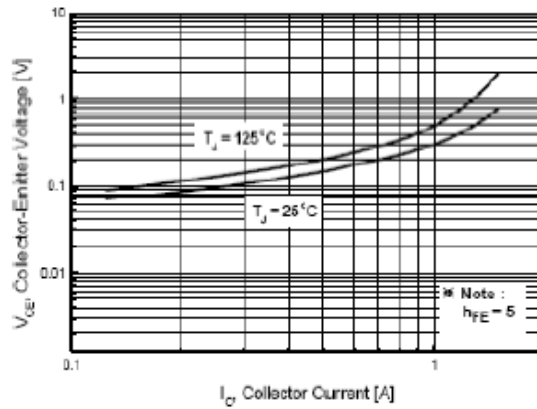
| Symbol                | Parameter   | Test Conditions  | Value   |        |                   | Units |
|-----------------------|---|--|---------|--------|-------------------|-------|
|                       |   |  | Min     | Typ    | Max               |       |
| V <sub>CEO(sus)</sub> | Collector-Emitter Breakdown Voltage                       | I <sub>c</sub> =10mA, I <sub>b</sub> =0  | 400     | -      | -                 | V     |
| V <sub>CE(sat)</sub>  | Collector-Emitter Saturation Voltage                      | I <sub>c</sub> =0.5A, I <sub>b</sub> =0.1A<br>I <sub>c</sub> =1.0A, I <sub>b</sub> =0.25A<br>I <sub>c</sub> =1.5A, I <sub>b</sub> =0.5A                  | -       | -      | 0.3<br>0.5<br>1.0 | V     |
| V <sub>BE(sat)</sub>  | Base -Emitter Saturation voltage                          | I <sub>c</sub> =0.5A, I <sub>b</sub> =0.1A<br>I <sub>c</sub> =1.0A, I <sub>b</sub> =0.25A  | -       | -      | 1.0<br>1.2        | V     |
| I <sub>CBO</sub>      | Collector Base Cutoff Current<br>(V <sub>be</sub> =-1.5v) | V <sub>cb</sub> =700V<br>V <sub>cb</sub> =700V, T <sub>c</sub> =100°C  | -       | -      | 1.0<br>5.0        | mA    |
| hFE                   | DC Current Gain   | V <sub>ce</sub> =2V, I <sub>c</sub> =0.5A<br>V <sub>ce</sub> =2V, I <sub>c</sub> =1.0A   | 10<br>5 | -<br>- | 30<br>25          |       |
| ton                   | Resistive Load<br>Turn-on Time                            | V <sub>CC</sub> =125V, I <sub>c</sub> =1A<br>I <sub>B1</sub> =0.2A, I <sub>B2</sub> =-0.5A<br>T <sub>p</sub> =25μs                                       | -       | 0.25   | 1.0               | μs    |
| ts                    | Storage time  |  | -       | 1.32   | 3.0               |       |
| tf                    | Fall Time   |  | -       | 0.23   | 0.4               |       |
| ts                    | Inductive Load<br>Storage Time                            | V <sub>CC</sub> =15V, I <sub>c</sub> =1A<br>I <sub>B1</sub> =0.2A, I <sub>B2</sub> =-0.5A<br>L=0.35mH, V <sub>clamp</sub> =300V                          | -       | 1.2    | 4.0               | μs    |
| tf                    | Fall Time   |  | -       | 0.12   | 0.3               |       |
| ts                    | Inductive Load<br>Storage Time                            | V <sub>CC</sub> =15V, I <sub>c</sub> =1A<br>I <sub>B1</sub> =0.2A, I <sub>B2</sub> =-0.5A<br>L=0.35mH, V <sub>clamp</sub> =300V<br>T <sub>c</sub> =100°C | -       | 1.8    | 5.0               | μs    |
| tf                    | Fall Time   |  | -       | 0.16   | 0.4               |       |

Note:

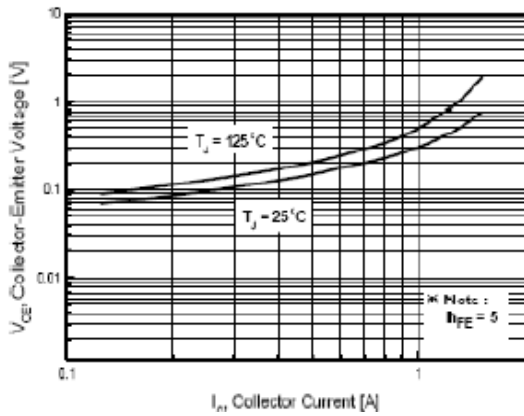
Pulse Test : Pulse width 300, Duty cycle 2%



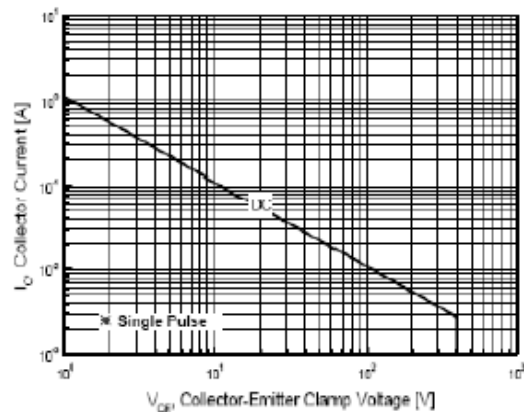
**Fig.1 DC Current Gain**



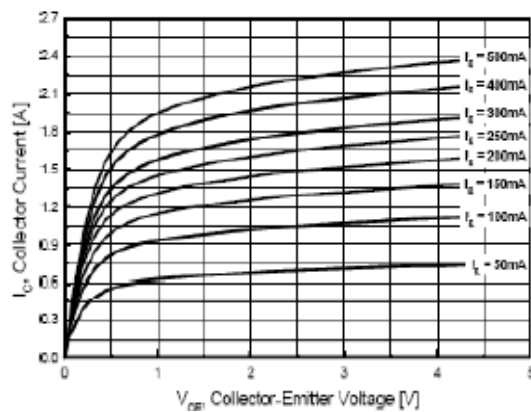
**Fig.2 Base-Emitter Saturation Voltage**



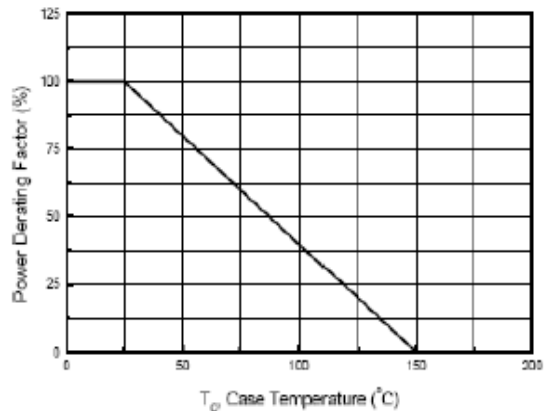
**Fig.3 Collector-Emitter Saturation Voltage**



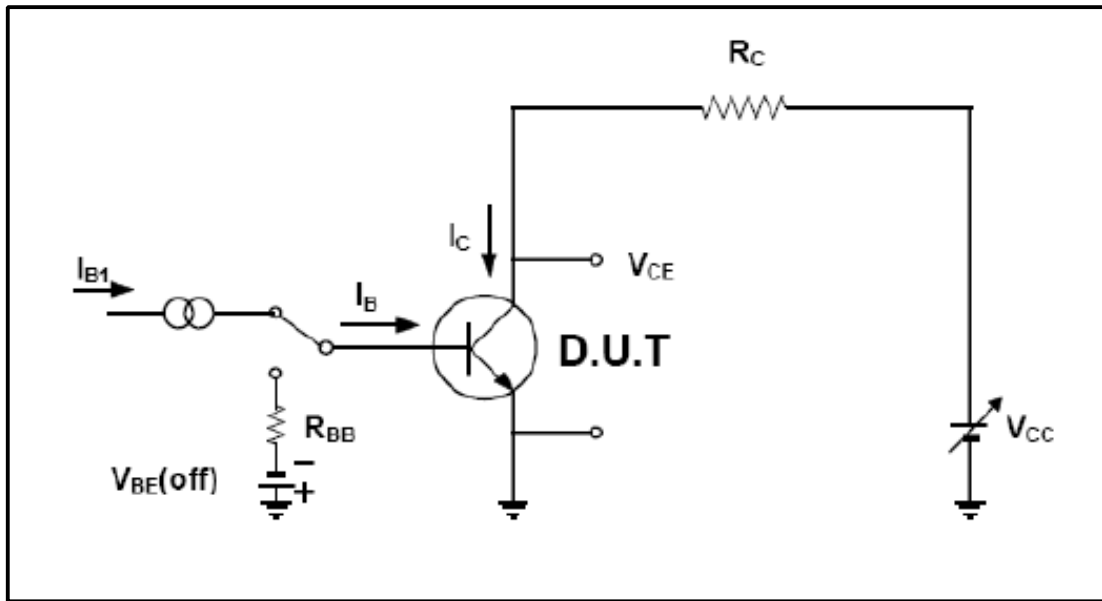
**Fig.4 Safe Operation Area**



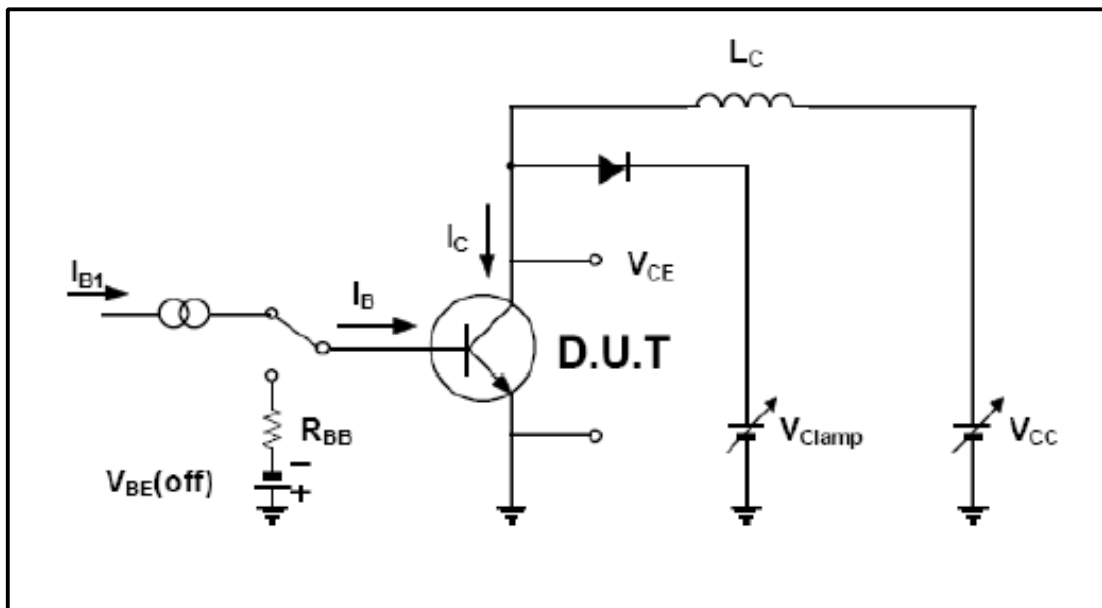
**Fig.5 Static Characteristics**



**Fig.6 Power Derating**



**Resistive Load Switching Test Circuit**



**Inductive Load Switching & RBSOA Test Circuit**

**To-92 Package Dimension**

