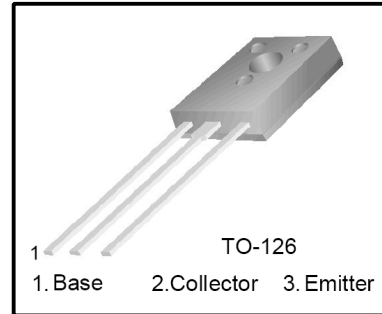


***High Voltage Fast-Switching NPN Power Transistor***
**Features**

- ◆ Very High Switching Speed
- ◆ High Voltage Capability
- ◆ Wide Reverse Bias SOA
- ◆ Built-in freewheeling 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               | $V_{BE} = 0$    | 350        | V          |
| $V_{CEO}$ | Collector-Emitter Voltage               | $I_B = 0$       | 200        | V          |
| $V_{EBO}$ | Emitter-Base Voltage                    | $I_C = 0$       | 7.0        | 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 $T_c = 25^\circ C$ |                 | 40         | W          |
| $T_J$     | Operation Junction Temperature          |                 | 150        | $^\circ C$ |
| $T_{STG}$ | Storage Temperature                     |                 | - 40 ~ 150 | $^\circ C$ |

**Thermal Characteristics**

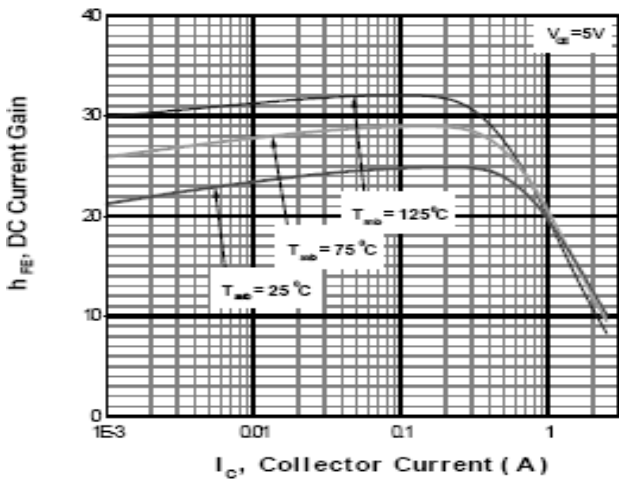
| Symbol          | Parameter                              | Value | Units        |
|-----------------|--|-------|--------------|
| $R_{\theta Jc}$ | Thermal Resistance Junction to Case    | 3.12  | $^\circ C/W$ |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 89    | $^\circ C/W$ |

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

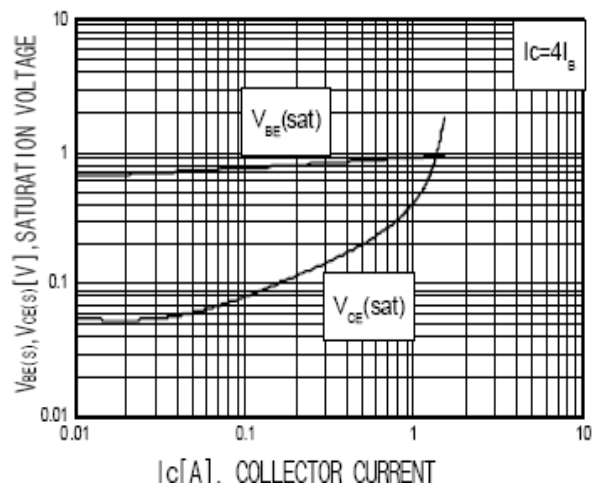
| Symbol        | Parameter                            | Test Conditions   | Value  |        |         | Units         |
|---------------|--------------------------------------|---|--------|--------|---------|---------------|
|               |                                      |   | Min    | Typ    | Max     |               |
| $BV_{CBO}$    | Collector-Base Breakdown Voltage     | $I_c=1\text{mA}, I_e=0$   | 350    |        |         | V             |
| $BV_{CEO}$    | Collector-Emitter Breakdown Voltage  | $I_c=5\text{mA}, I_b=0$   | 200    | -      | -       | V             |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_c=500\text{mA}, I_b=100\text{mA}$  | -      | -      | 0.8     | V             |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage      | $I_c=200\text{mA}, I_b=100\text{mA}$  | -      | -      | 1.0     | V             |
| $I_{CBO}$     | Collector-Base Cutoff Current        | $V_{cb}=350\text{V}, I_e=0\text{mA}$  | -      | -      | 100     | $\mu\text{A}$ |
| $I_{CEO}$     | Collector-Emitter Cutoff Current     | $V_{ce}=200\text{V}, I_b=0\text{mA}$  | -      | -      | 50      | $\mu\text{A}$ |
| $I_{EBO}$     | Emitter- Base Cutoff Current         | $V_{eb}=7\text{V}, I_c=0\text{mA}$  | -      | -      | 20      | $\mu\text{A}$ |
| $h_{FE}$      | DC Current Gain                      | $V_{ce}=20\text{V}, I_c=20\text{mA}$<br>$V_{ce}=5\text{V}, I_c=1.5\text{A}$ | 8<br>5 | -<br>- | 40<br>- |               |
| $t_s$         | Storage Time                         | $V_{CC}=250\text{V}$  | -      | -      | 3       | $\mu\text{s}$ |
| $t_f$         | Fall Time                            | $I_c=5 I_B$<br>$I_{B1}=- I_{B2}=0.04\text{A}$                               | -      | -      | 0.8     |               |

**Note:**

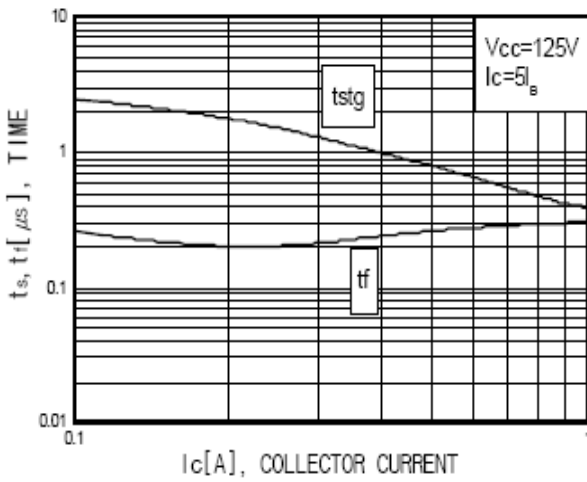
Pulse Test : Pulse width 300, Duty cycle 2%



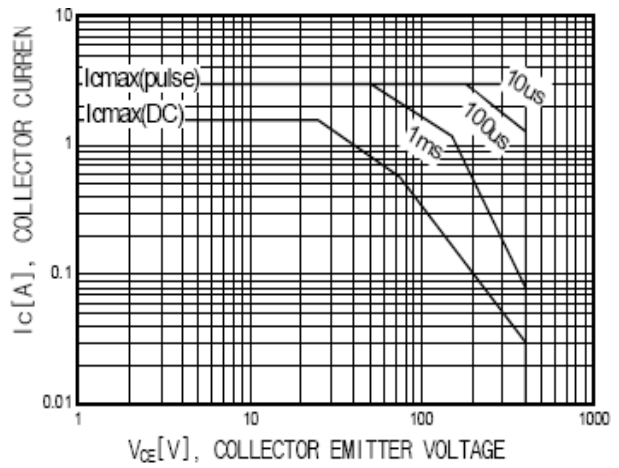
**Fig. 1 DC Current Gain**



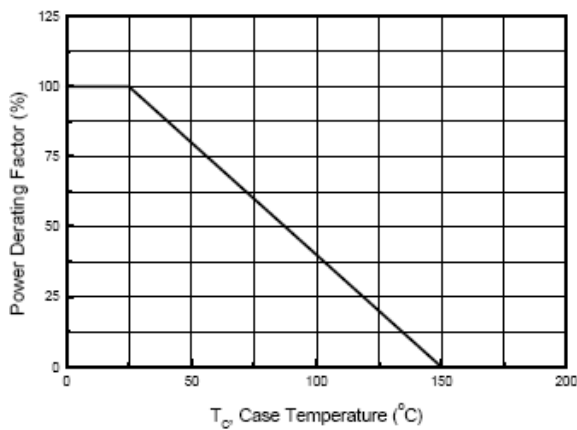
**Fig. 2 Saturation Voltage**



**Fig. 3 Switching Time**

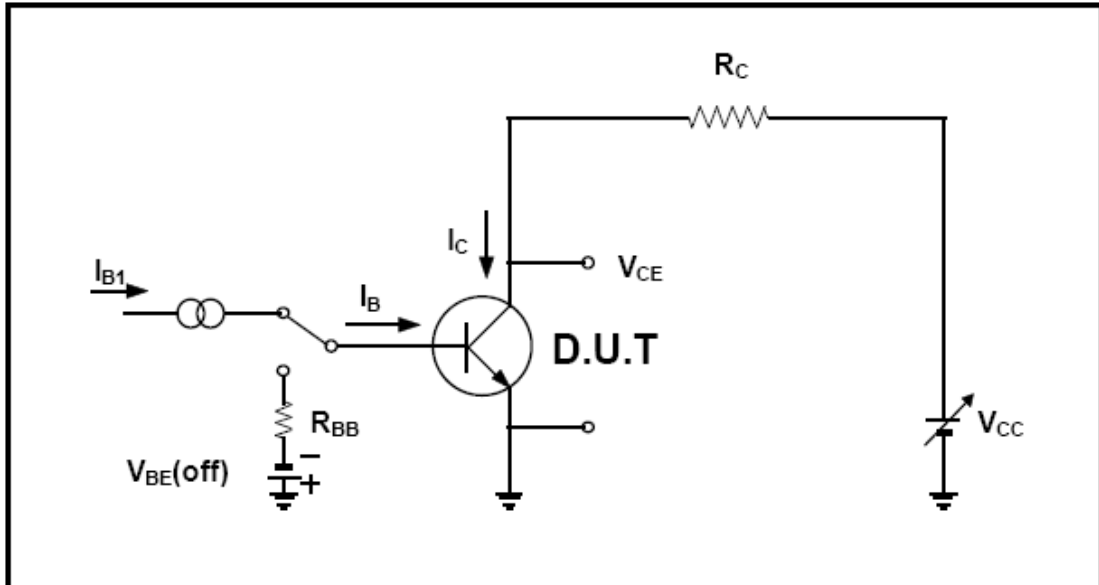


**Fig. 4 Safe Operation Area**

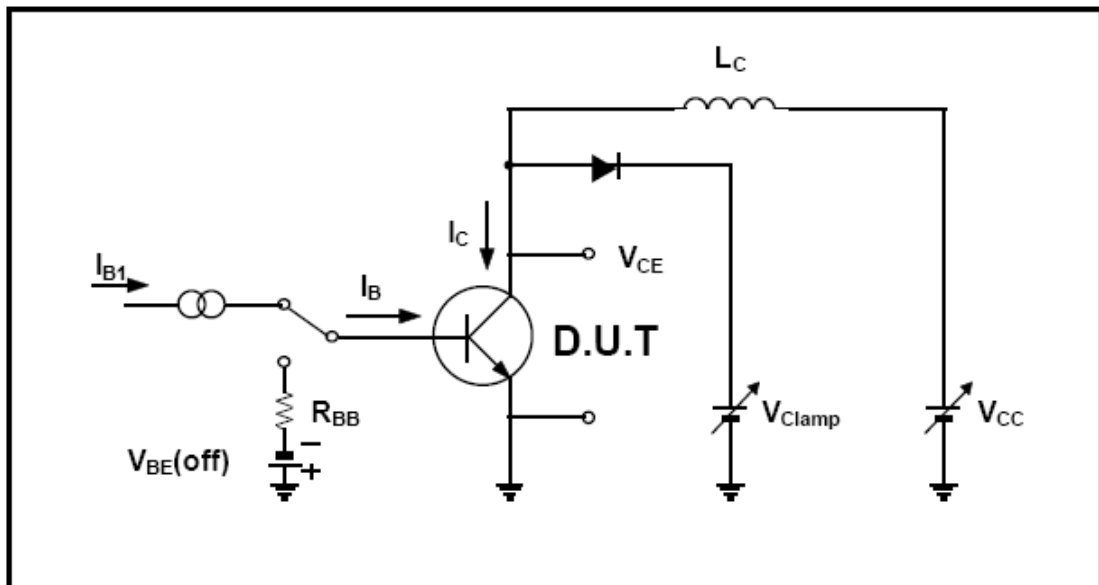


**Fig. 5 Power Derating**

## Resistive Load Switching Test Circuit



## Inductive Load Switching & RBSOA Test Circuit



**TO-126 Package Dimension**

