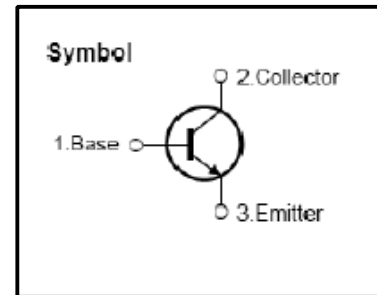


## High Voltage Fast-Switching NPN Power Transistor

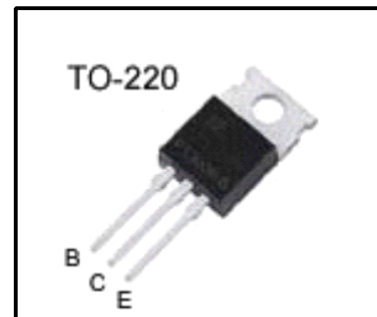
### Features

- 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 $T_C^*=25^{\circ}C$ |                 | 100     | 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

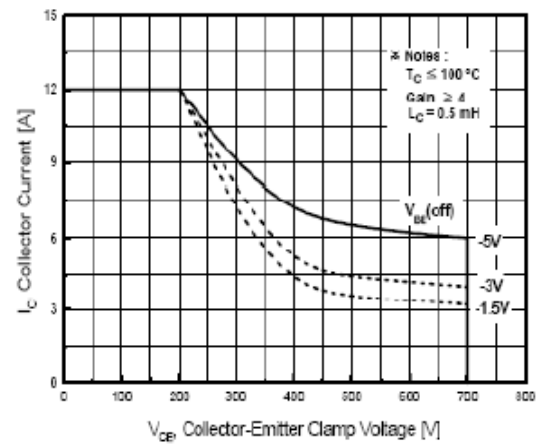
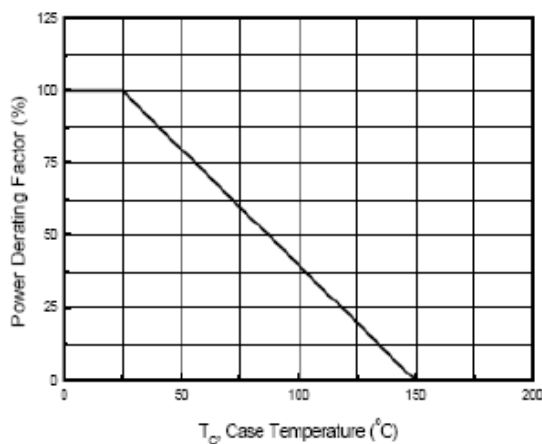
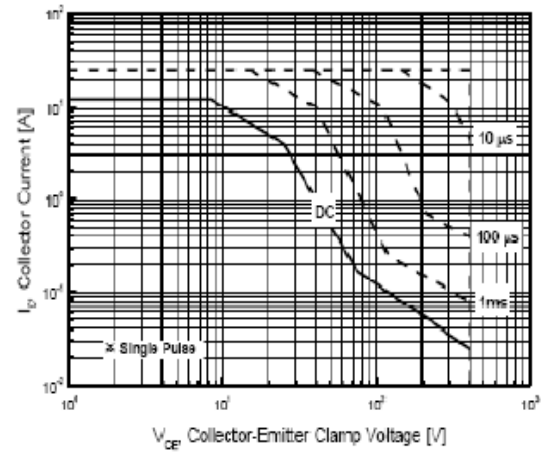
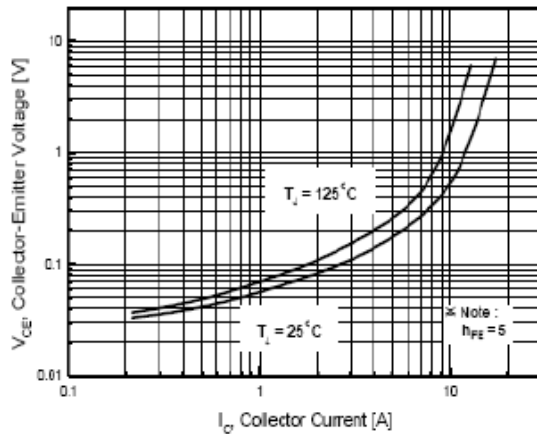
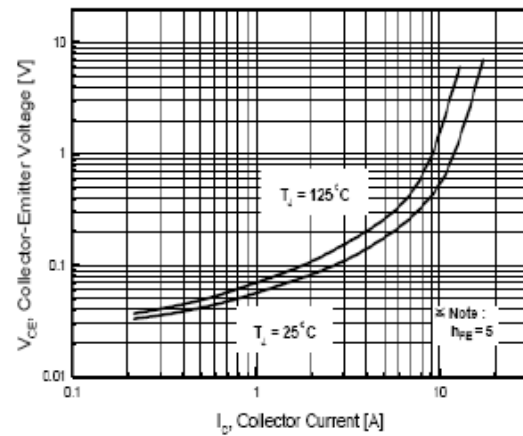
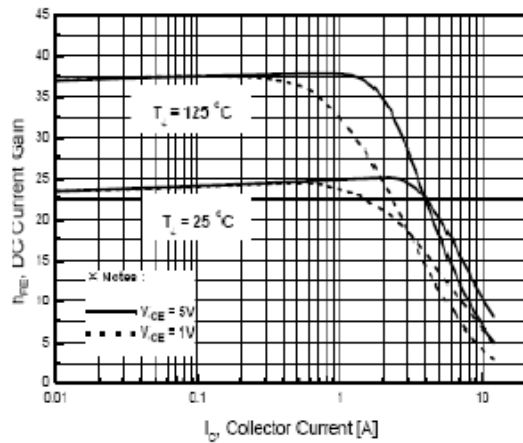
| Symbol          | Parameter                              | Value | Units         |
|-----------------|----------------------------------------|-------|---------------|
| $R_{\theta JC}$ | Thermal Resistance Junction to Case    | 1.25  | $^{\circ}C/W$ |
| $R_{\theta JA}$ | Thermal Resistance Junction to Ambient | 40    | $^{\circ}C/W$ |

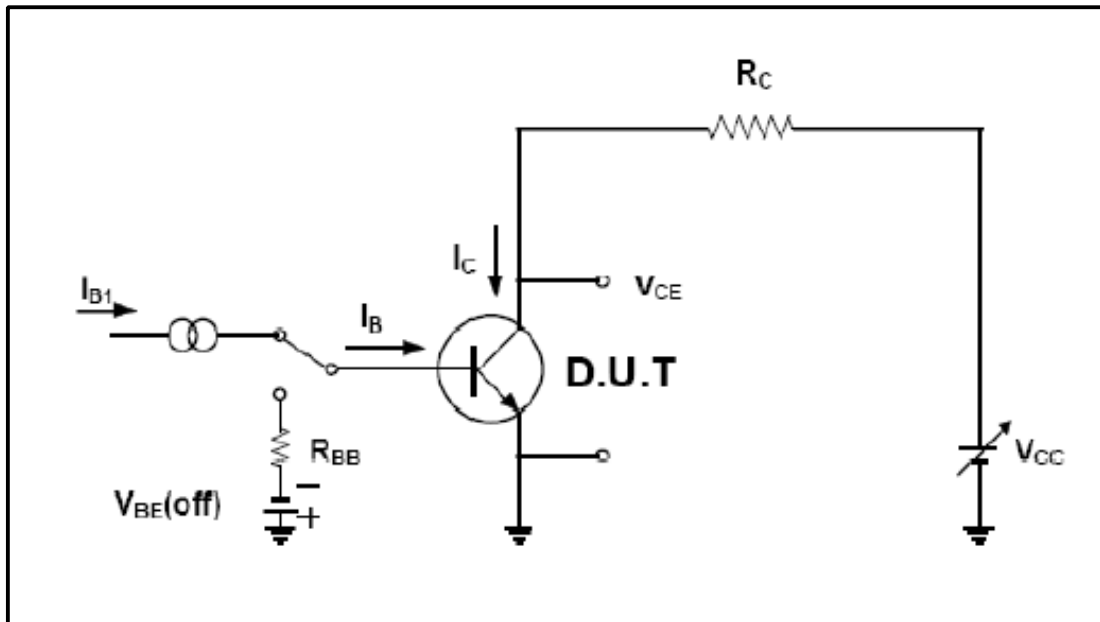
**Electrical Characteristics**(Tc=25℃ unless otherwise noted)

| 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> =5.0A, I <sub>b</sub> =1.0A<br>I <sub>c</sub> =8.0A, I <sub>b</sub> =1.6A<br>I <sub>c</sub> =12A, I <sub>b</sub> =3.0A                    | –      | –           | 0.5<br>2.0<br>2.5 | V     |
|                       |                                                            | I <sub>c</sub> =8.0A, I <sub>b</sub> =1.6A<br>T <sub>c</sub> =100℃                                                                                       | –      | –           | 2.0               | V     |
| V <sub>BE(sat)</sub>  | Base –Emitter Saturation Voltage                           | I <sub>c</sub> =5.0A, I <sub>b</sub> =1.0A<br>I <sub>c</sub> =8.0A, I <sub>b</sub> =1.6A                                                                 | –      | –           | 1.2<br>1.6        | V     |
|                       |                                                            | I <sub>c</sub> =8.0A, I <sub>b</sub> =1.6A<br>T <sub>c</sub> =100℃                                                                                       | –      | –           | 1.5               | 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℃                                                                                     | –      | –           | 1.0<br>5.0        | mA    |
| h <sub>FE</sub>       | DC Current Gain                                            | V <sub>ce</sub> =5V, I <sub>c</sub> =5.0A                                                                                                                | 8      | –           | 40                |       |
|                       |                                                            | V <sub>ce</sub> =5V, I <sub>c</sub> =8.0A                                                                                                                | 5      | –           | 40                |       |
| ts<br>tf              | Resistive Load<br>Storage time<br>Fall Time                | V <sub>CC</sub> =125V, I <sub>c</sub> =6.0A<br>I <sub>B1</sub> =1.6A, I <sub>B2</sub> =–1.6A<br>T <sub>P</sub> =25μs                                     |        | 1.5<br>0.17 | 3.0<br>0.4        | μs    |
| ts<br>tf              | Inductive Load<br>Storage Time<br>Fall Time                | V <sub>CC</sub> =15V, I <sub>c</sub> =5A<br>I <sub>B1</sub> =1.6A, V <sub>be(off)</sub> =5V<br>L=0.35mH, V <sub>clamp</sub> =300V                        | –<br>– | 0.8<br>0.04 | 2.0<br>0.1        | μs    |
|                       |                                                            | V <sub>CC</sub> =15V, I <sub>c</sub> =1A<br>I <sub>B1</sub> =0.4A, V <sub>be(off)</sub> =5V<br>L=0.2mH, V <sub>clamp</sub> =300V<br>T <sub>c</sub> =100℃ | –<br>– | 0.8<br>0.05 | 2.5<br>0.15       | μs    |

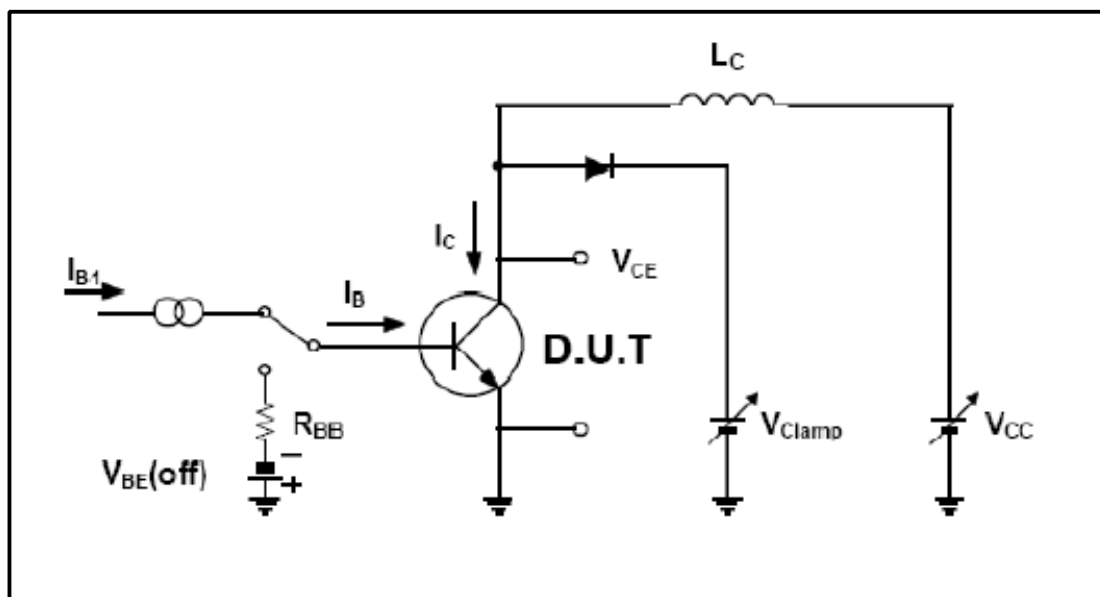
**Note:**

Pulse Test : Pulse Width300,Duty cycle 2%





**Resistive Load Switching Test Circuit**



**Inductive Load Switching & RBSOA Test Circuit**

**To-220 Package Dimension**

