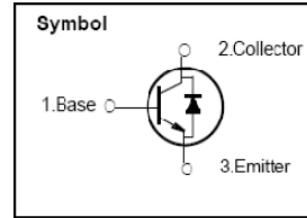


## High Voltage Fast-Switching NPN Power Transistor

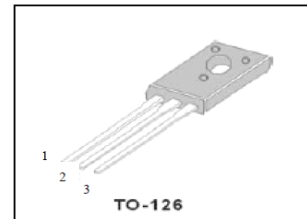
### Features

- ◆ 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
$V_{CBO}$	Collector-Base Voltage	$V_{BE}=0$	600	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		2	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
	Total Dissipation at $T_a = 25^{\circ}C$		1.2	
$T_J$	Operation Junction emperature		- 40 ~ 150	$^{\circ}C$
$T_{STG}$	Storage Temperature		- 40 ~ 150	$^{\circ}C$

### Thermal Characteristics

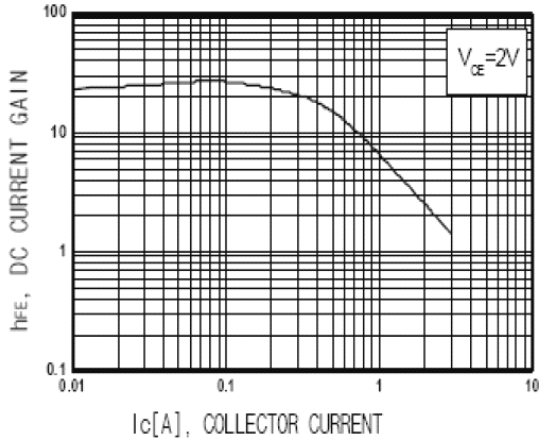
Symbol	Parameter	Value	Units
$R_{QJC}$	Thermal Resistance, Junction-to-Case	3.12	$^{\circ}C/W$
$R_{QJA}$	Thermal Resistance, Junction-to-Ambient	89	$^{\circ}C/W$

**Electrical Characteristics (Tc = 25°C)**

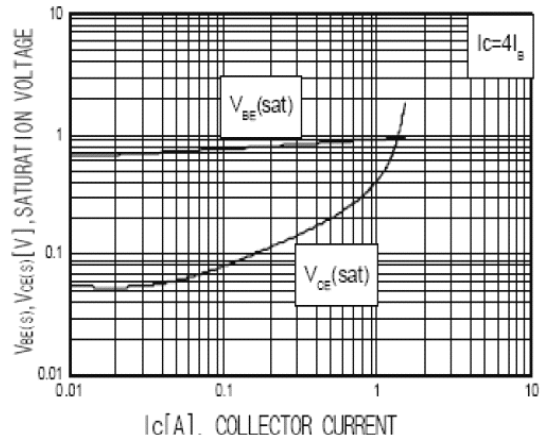
Symbol	Parameter	Test Conditions	Value			Units
			Min	Typ	Max	
BV <sub>CBO</sub>	Collector-Base Breakdown Voltage	I <sub>c</sub> =0.5mA, I <sub>e</sub> =0	600			V
BV <sub>CEO</sub>	Collector-Emitter Breakdown Voltage	I <sub>c</sub> =10mA, I <sub>b</sub> =0	400	-	-	V
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>c</sub> =200mA, I <sub>b</sub> =100mA	-	-	1.6	V
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>c</sub> =200mA, I <sub>b</sub> =100mA	-	-	1.2	V
I <sub>CBO</sub>	Collector-Base Cutoff Current	V <sub>cb</sub> =550V, I <sub>e</sub> =0mA	-	-	10	μA
I <sub>CEO</sub>	Collector-Emitter Cutoff Current	V <sub>ce</sub> =400V, I <sub>b</sub> =0mA	-	-	20	μA
I <sub>EBO</sub>	Emitter- Base Cutoff Current	V <sub>eb</sub> =9V, I <sub>c</sub> =0mA	-	-	20	μA
h <sub>FE</sub>	DC Current Gain	V <sub>ce</sub> =20V, I <sub>c</sub> =20mA V <sub>ce</sub> =5V, I <sub>c</sub> =1mA	10 9	- -	40 -	
t <sub>s</sub>	Storage Time	V <sub>cc</sub> =250V	-	-	3	μs
t <sub>f</sub>	Fall Time	I <sub>c</sub> =5 I <sub>B</sub> I <sub>B1</sub> =- I <sub>B2</sub> =0.04A	-	-	0.8	

**Note:**

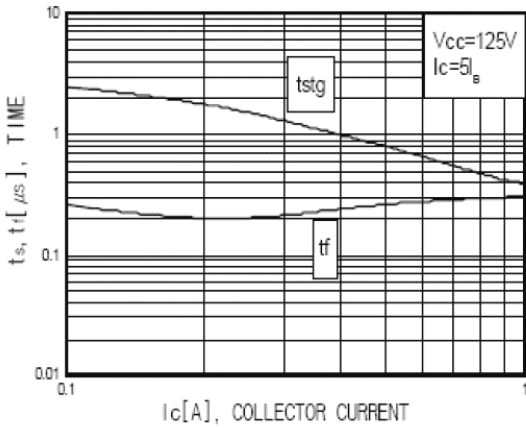
Pulse Test : Pulse width 300, Duty cycle 2%



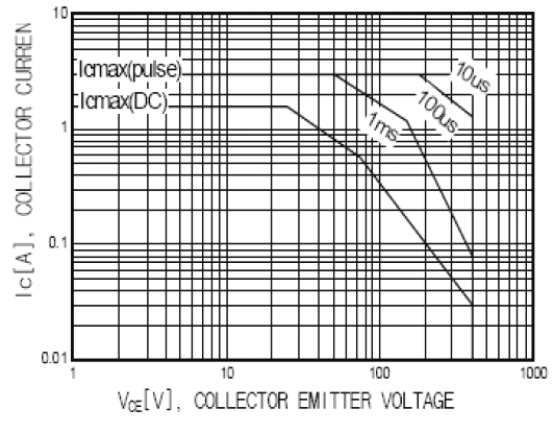
**Fig. 1 DC Current Gain**



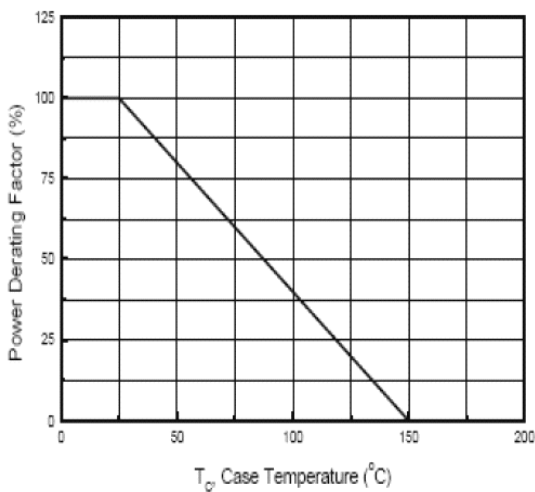
**Fig. 2 Saturation Voltage**



**Fig. 3 Switching Time**

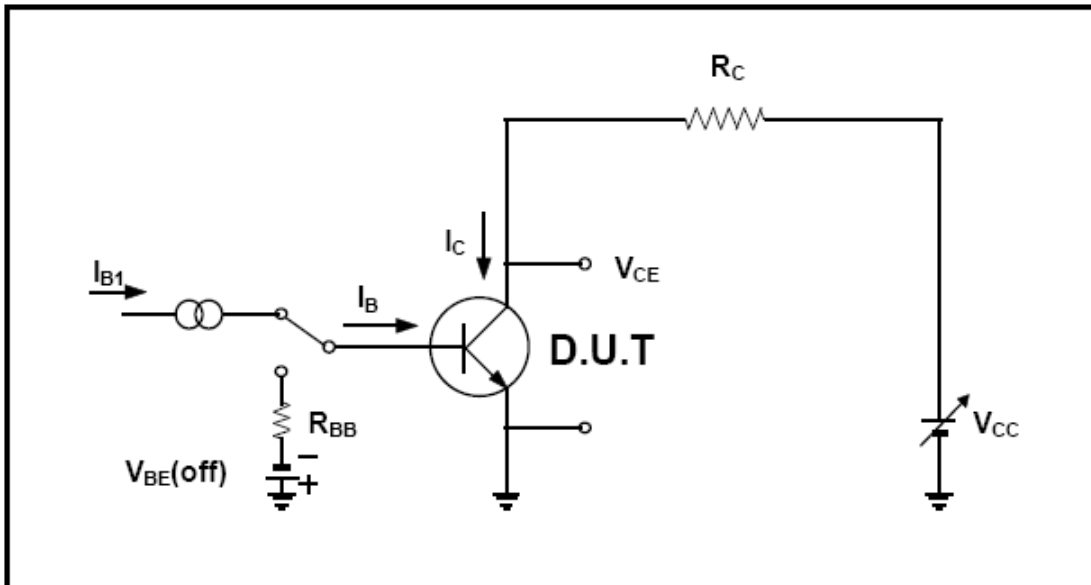


**Fig. 4 Safe Operation Area**

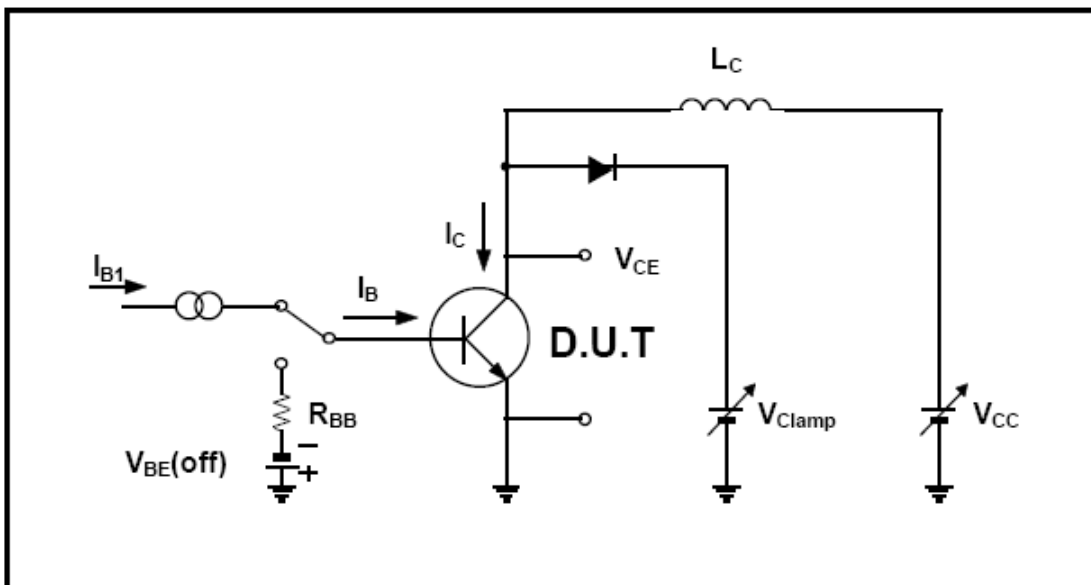


**Fig.5 Power Derating**

**Resistive Load Switching Test Circuit**



**Inductive Load Switching & RBSOA Test Circuit**



**TO-126 Package Dimension**

Dim	mm			Inch		
	Min	Typ	Max	Min	Typ	Max
A	7.5		7.9	0.295		0.311
B	10.8		11.2	0.425		0.441
C	14.2		14.7	0.559		0.579
D	2.7		2.9	0.106		0.114
E		3.8			0.150	
F		2.5			0.098	
G	1.2		1.5	0.047		0.059
H		2.3			0.091	
I		4.6			0.181	
J	0.48		0.62	0.019		0.024
K	0.7		0.86	0.028		0.034
L		1.4			0.055	
Φ		3.2			0.126	

