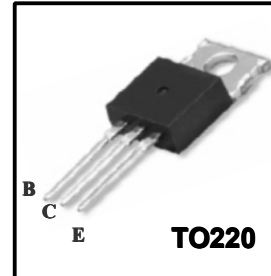


## High Voltage Fast-Switching NPN Power Transistor

### 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		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 $T_c = 25^\circ C$		80	W
	Total Dissipation at $T_a = 25^\circ C$		2.05	
$T_J$	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

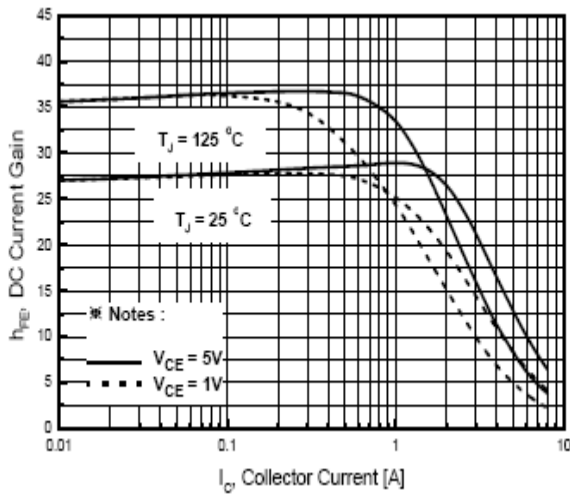
Symbol	Parameter	Value	Units
$R_{\theta Jc}$	Thermal Resistance Junction to Case	1.56	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62.5	$^\circ C/W$

## Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise noted)

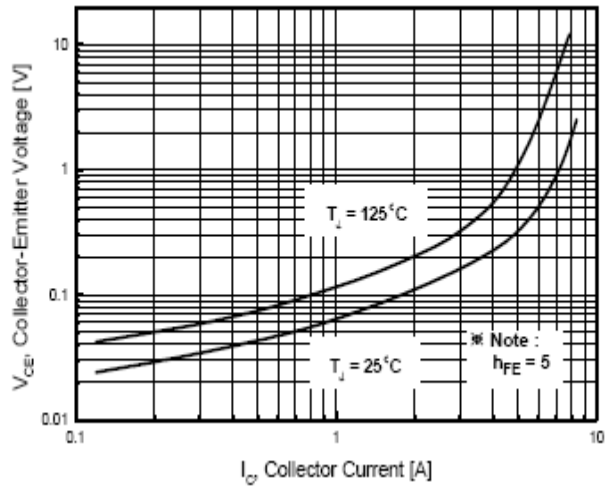
Symbol	Parameter	Test Conditions	Value			Units
			Min	Typ	Max	
V <sub>CEO(sus)</sub>	Collector-Emitter Breakdown Voltage	I <sub>c</sub> =10mA, I <sub>b</sub> =0	400	-	-	V
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>c</sub> =2.0A, I <sub>b</sub> =0.4A	-	-	1.0	V
		I <sub>c</sub> =5.0A, I <sub>b</sub> =1.0A	-	-	1.5	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>c</sub> =8.0A, I <sub>b</sub> =2.0A	-	-	2.0	V
		I <sub>c</sub> =5.0A, I <sub>b</sub> =1.0A T <sub>c</sub> =100°C	-	-	2.5	
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>c</sub> =2.0A, I <sub>b</sub> =0.4A	-	-	1.2	V
		I <sub>c</sub> =5.0A, I <sub>b</sub> =1.0A	-	-	1.6	
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>c</sub> =5.0A, I <sub>b</sub> =1.0A T <sub>c</sub> =100°C	-	-	1.5	V
I <sub>CBO</sub>	Collector-Base Cutoff Current (V <sub>be</sub> =-1.5V)	V <sub>cb</sub> =700V	-	-	1.0	mA
		V <sub>cb</sub> =700V, T <sub>c</sub> =100°C	-	-	5.0	
h <sub>FE</sub>	DC Current Gain	V <sub>ce</sub> =5V, I <sub>c</sub> =2.0A	8	-	40	
		V <sub>ce</sub> =5V, I <sub>c</sub> =5.0A	5	-	40	
t <sub>s</sub> t <sub>f</sub>	Resistive Load Storage Time Fall Time	V <sub>CC</sub> =125V, I <sub>c</sub> =5.0A I <sub>B1</sub> =1.0A, I <sub>B2</sub> =-1.0A T <sub>p</sub> =25μs	-	1.5	3.0	μs
				0.17	0.4	
t <sub>s</sub> t <sub>f</sub>	Inductive Load Storage Time Fall Time	V <sub>CC</sub> =15V, I <sub>c</sub> =5A I <sub>B1</sub> =1.0A, I <sub>B2</sub> =-2.5A L=0.35mH, V <sub>clamp</sub> =300V	-	0.8	2.0	μs
				0.06	0.12	
t <sub>s</sub> t <sub>f</sub>	Inductive Load Storage Time Fall Time	V <sub>CC</sub> =15V, I <sub>c</sub> =1A I <sub>B1</sub> =0.4A, I <sub>B2</sub> =-1.0A L=0.35mH, V <sub>clamp</sub> =300V T <sub>c</sub> =100°C	-	1.0	3.0	μs
				0.07	0.15	

**Note:**

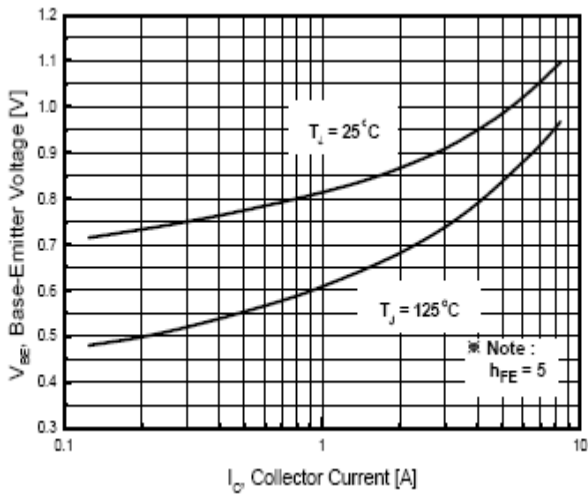
Pulse Test : Pulse width 300, Duty cycle 2%



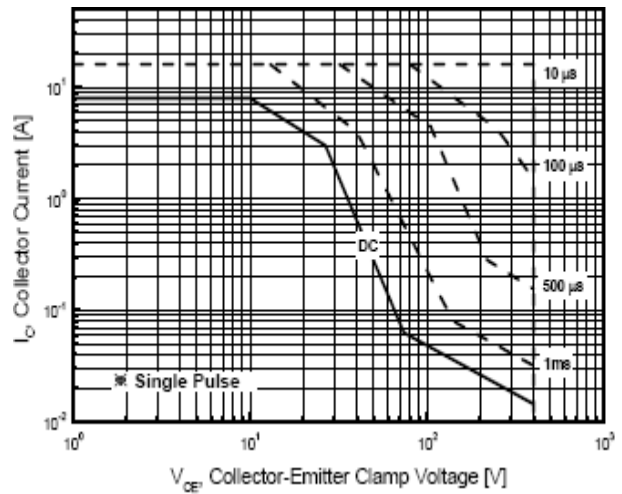
**Fig. 1 DC Current Gain**



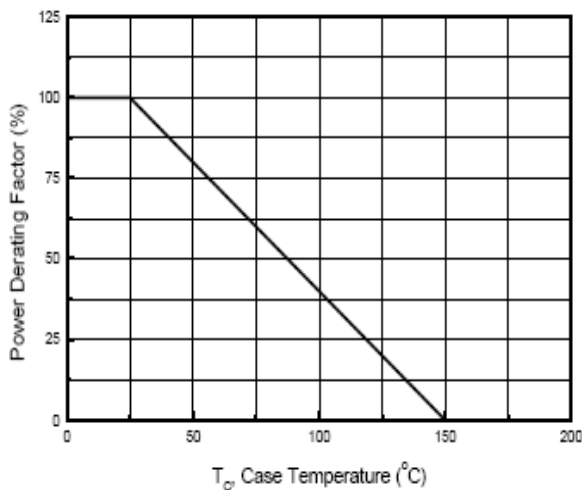
**Fig. 2 Collector-Emitter Saturation Voltage**



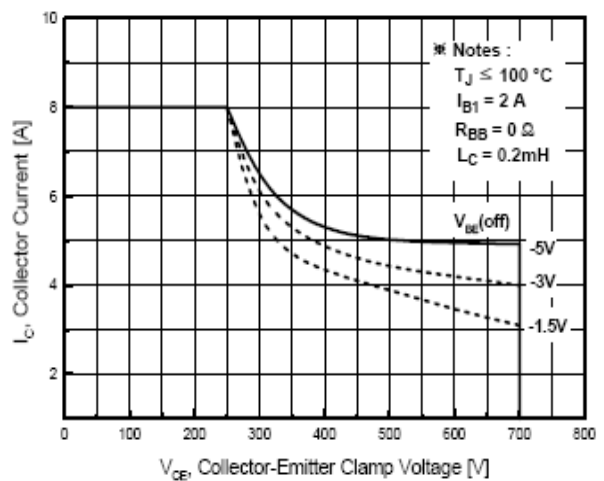
**Fig. 3 Base-Emitter Saturation Voltage**



**Fig. 4 Safe Operation Area**

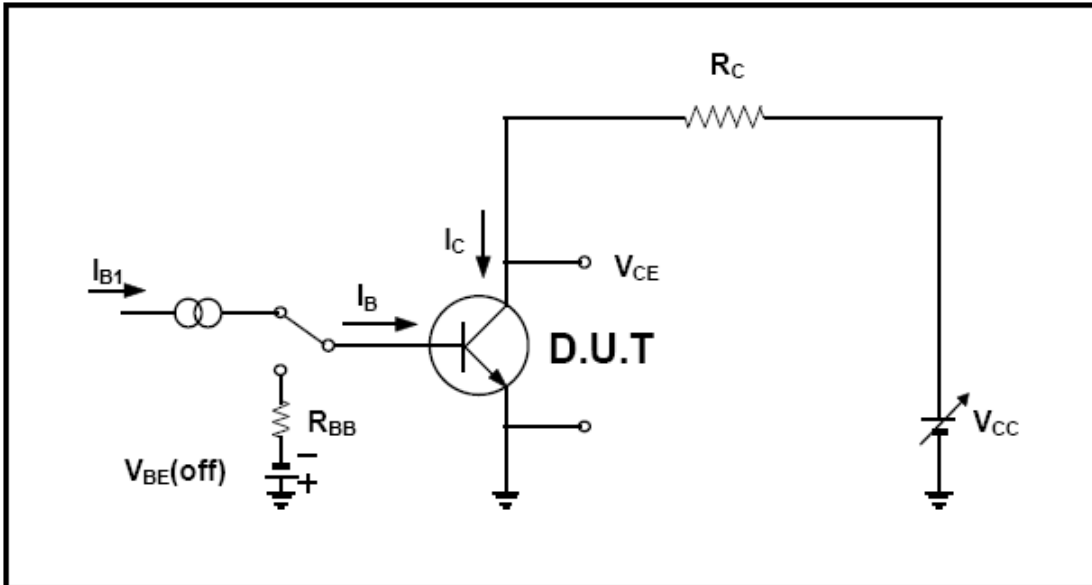


**Fig. 5 Power Derating**



**Fig. 6 Reverse Biased Safe Operation Area**

**Resistive Load Switching Test Circuit**



**Inductive Load Switching & RBSOA Test Circuit**

