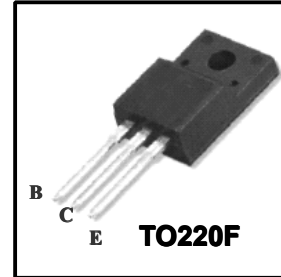


*High Voltage Fast-Switching NPN Power Transistor*

**Features**

- ◆ Very High Switching Speed
- ◆ High Voltage Capability
- ◆ Wide Reverse Bias SOA
- ◆ Isolation Voltage (  $V_{ISO} = 4000V AC$  )



**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 $T_c = 25^\circ C$		40	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**

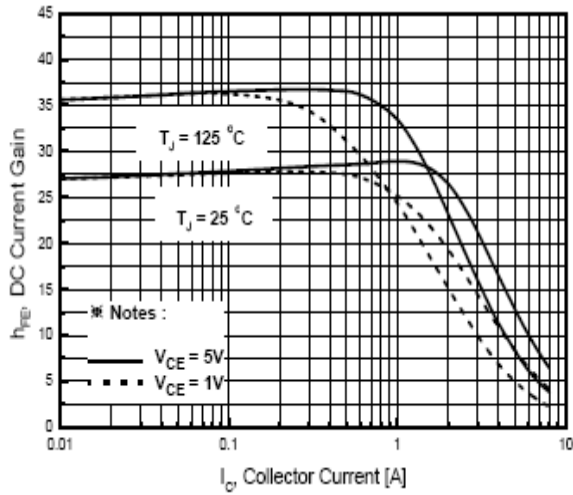
Symbol	Parameter	Value	Units
$R_{\theta Jc}$	Thermal Resistance Junction to Case	3.13	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62.5	$^\circ C/W$

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

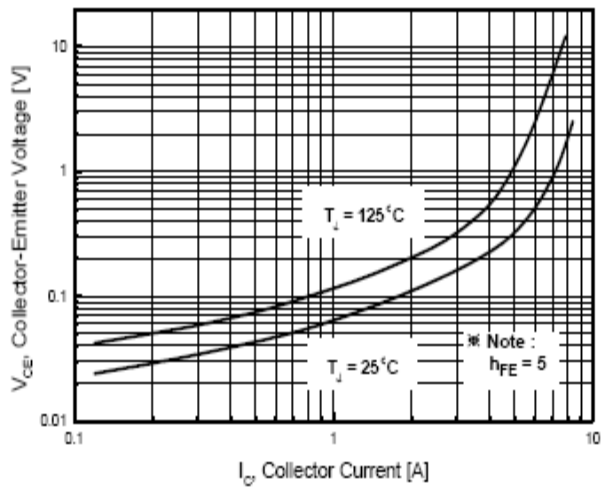
Symbol	Parameter	Test Conditions	Value			Units
			Min	Typ	Max	
V <sub>CEO(sus)</sub>	Collector-Emitter Breakdown Voltage	I <sub>c</sub> =10mA, I <sub>b</sub> =0	400	-	-	V
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>c</sub> =2.0A, I <sub>b</sub> =0.4A	-	-	1.0	V
		I <sub>c</sub> =5.0A, I <sub>b</sub> =1.0A	-	-	2.0	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>c</sub> =8.0A, I <sub>b</sub> =2.0A	-	-	3.0	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	
I <sub>EBO</sub>	Emitter -Base Cutoff Current	V <sub>eb</sub> =9V	-	-	1.0	mA
h <sub>FE</sub>	DC Current Gain	V <sub>ce</sub> =5V, I <sub>c</sub> =2.0A	10	-	40	
		V <sub>ce</sub> =5V, I <sub>c</sub> =5.0A	5	-	40	
f <sub>T</sub>	Current Gain Bandwidth Product	V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.5A	4			MHz
ton	Turn on Time	V <sub>CC</sub> =125V, I <sub>c</sub> =5A	-	-	1.6	μs
ts	Storage Time	I <sub>B1</sub> =I <sub>B2</sub> =-1.0A	-	-	3.0	
tf	Fall Time	R <sub>L</sub> =50Ω	-	-	0.7	

**Note:**

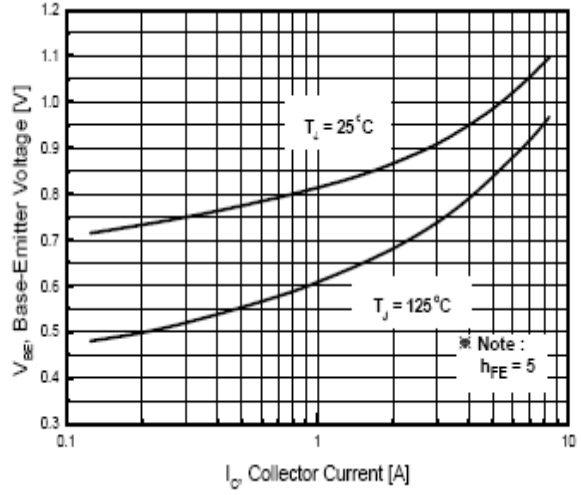
Pulse Test : Pulse width 300, Duty cycle 2%



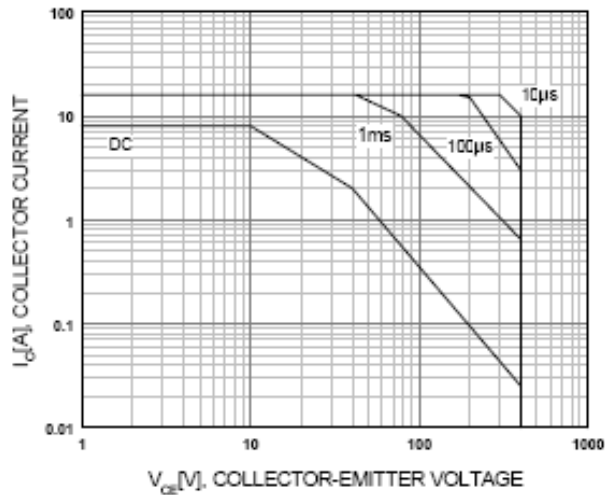
**Fig. 1 DC Current Gain**



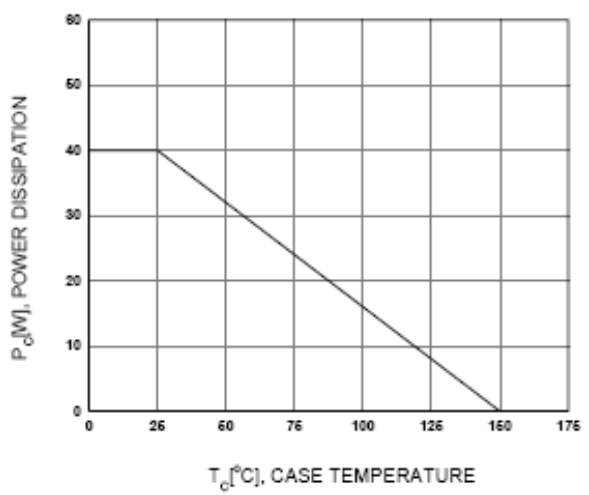
**Fig. 2 Collector-Emmitter Saturation Voltage**



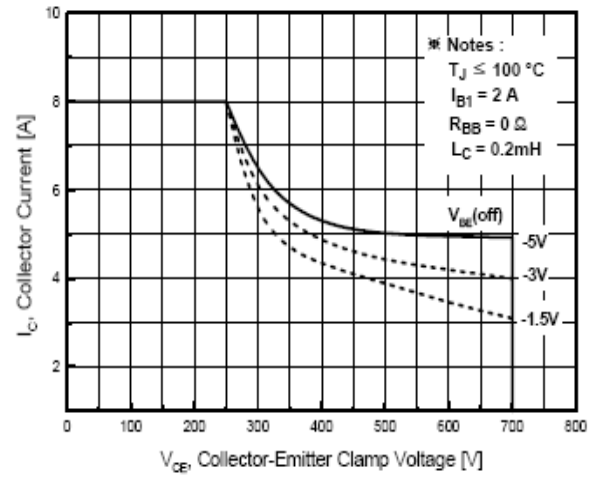
**Fig. 3 Base-Emmitter Saturation Voltage**



**Fig. 4 Safe Operation Area**



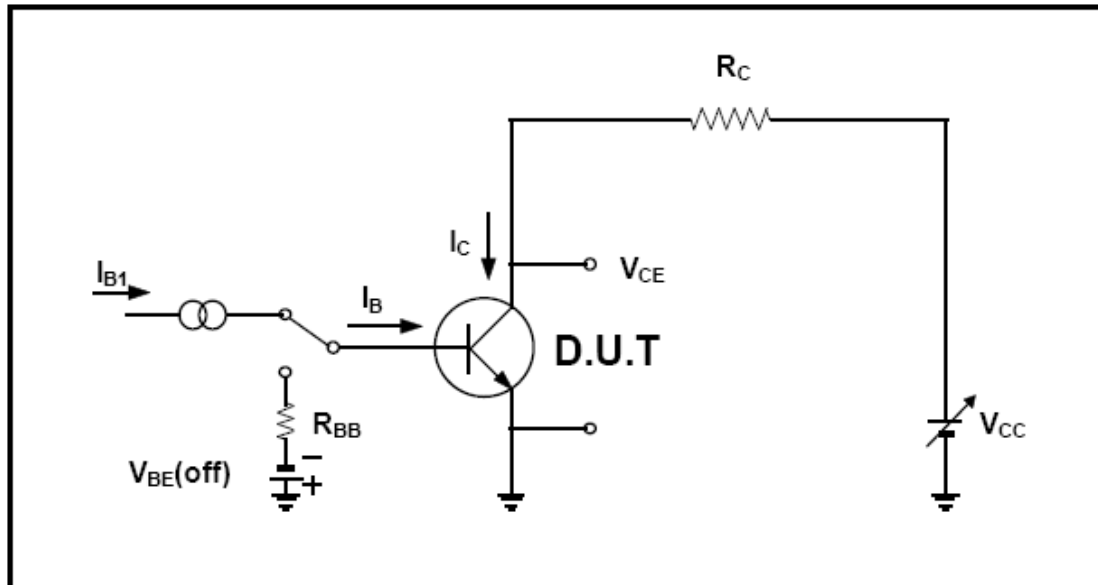
**Fig.5 Power Derating**



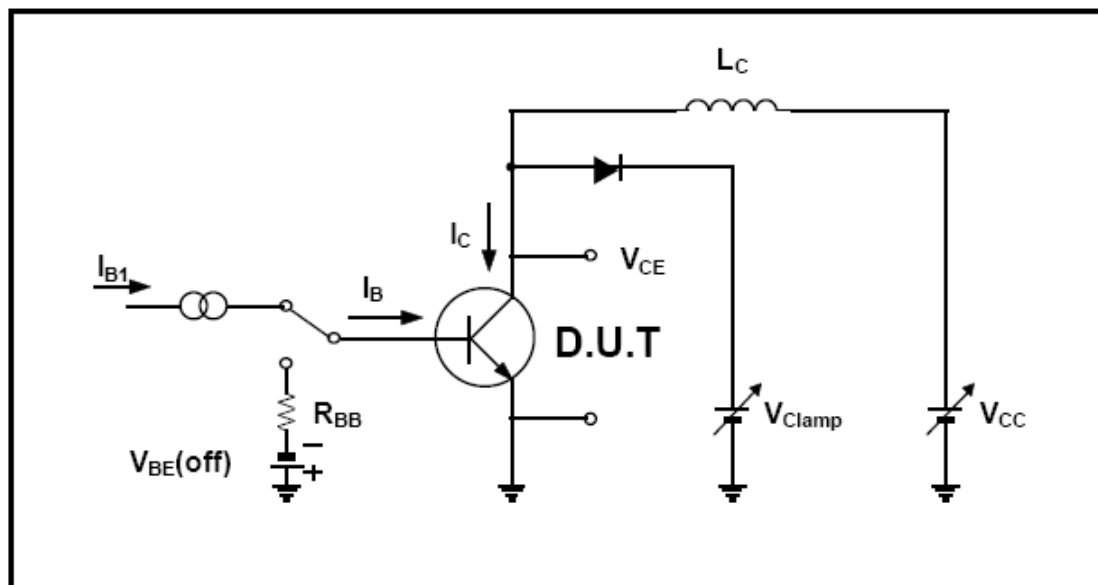
**Fig.6 Reverse Biased Safe Operation Area**



## Resistive Load Switching Test Circuit



## Inductive Load Switching & RBSOA Test Circuit



## TO-220F Package Dimension

