

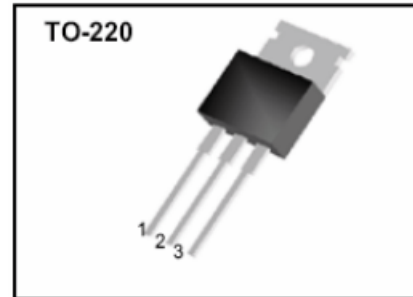
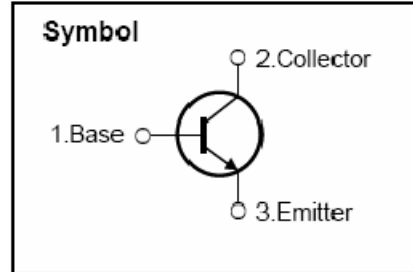
High Voltage Fast-Switching NPN Power Transistor

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°C		80	W
	Total Dissipation at T _a = 25°C		2.1	
T _J	Operation Junction Temperature		- 40 ~ 150	°C
T _{STG}	Storage Temperature		- 40 ~ 150	°C

T_c: Case temperature (good cooling)

T_a: Ambient temperature (without heat sink)

Thermal Characteristics

Symbol	Parameter	Value	Units
R _{θJc}	Thermal Resistance Junction to Case	1.56	°C/W
R _{θJA}	Thermal Resistance Junction to Ambient	62.5	°C/W

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

Symbol	Parameter	Test Conditions	Value			Units
			Min	Typ	Max	
$V_{CEO(sus)}$	Collector-Emitter Breakdown Voltage	$I_c=10\text{mA}, I_b=0$	400	-	-	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_c=2.0\text{A}, I_b=0.4\text{A}$	-	-	0.5	V
		$I_c=5.0\text{A}, I_b=1.0\text{A}$	-	-	1.0	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_c=8.0\text{A}, I_b=2.0\text{A}$	-	-	2.5	V
		$I_c=5.0\text{A}, I_b=1.0\text{A}$ $T_c=100^{\circ}\text{C}$	-	-	2.5	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_c=2.0\text{A}, I_b=0.4\text{A}$	-	-	1.2	V
		$I_c=5.0\text{A}, I_b=1.0\text{A}$	-	-	1.6	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_c=5.0\text{A}, I_b=1.0\text{A}$ $T_c=100^{\circ}\text{C}$	-	-	1.5	V
			-	-	1.5	
I_{CBO}	Collector-Base Cutoff Current ($V_{be}=-1.5\text{V}$)	$V_{cb}=700\text{V}$	-	-	1.0	mA
		$V_{cb}=700\text{V}, T_c=100^{\circ}\text{C}$	-	-	5.0	
h_{FE}	DC Current Gain	$V_{ce}=5\text{V}, I_c=2.0\text{A}$	10	-	40	
		$V_{ce}=5\text{V}, I_c=5.0\text{A}$	5	-	40	
t_s t_f	Resistive Load	$V_{CC}=125\text{V}, I_c=5.0\text{A}$ $I_{B1}=1.0\text{A}, I_{B2}=-1.0\text{A}$ $T_p=25\mu\text{s}$	-	1.5	3.0	μs
	Storage Time		0.17			
t_s t_f	Inductive Load	$V_{CC}=15\text{V}, I_c=5\text{A}$ $I_{B1}=1.0\text{A}, I_{B2}=-2.5\text{A}$ $L=0.35\text{mH}, V_{clamp}=300\text{V}$	-	0.8	2.0	μs
	Storage Time		0.06			
t_s t_f	Inductive Load	$V_{CC}=15\text{V}, I_c=1\text{A}, I_{B1}=0.4\text{A}, I_{B2}=-1.0\text{A}$ $L=0.35\text{mH}, V_{clamp}=300\text{V}$ $T_c=100^{\circ}\text{C}$	-	1.0	3.0	μs
	Storage Time		0.07			
t_s t_f	Inductive Load	$V_{CC}=15\text{V}, I_c=1\text{A}, I_{B1}=0.4\text{A}, I_{B2}=-1.0\text{A}$ $L=0.35\text{mH}, V_{clamp}=300\text{V}$ $T_c=100^{\circ}\text{C}$	-	1.0	3.0	μs
	Storage Time		0.07			
t_s t_f	Inductive Load	$V_{CC}=15\text{V}, I_c=1\text{A}, I_{B1}=0.4\text{A}, I_{B2}=-1.0\text{A}$ $L=0.35\text{mH}, V_{clamp}=300\text{V}$ $T_c=100^{\circ}\text{C}$	-	1.0	3.0	μs
	Storage Time		0.07			

Note:

Pulse Test : Pulse width 300, Duty cycle 2%

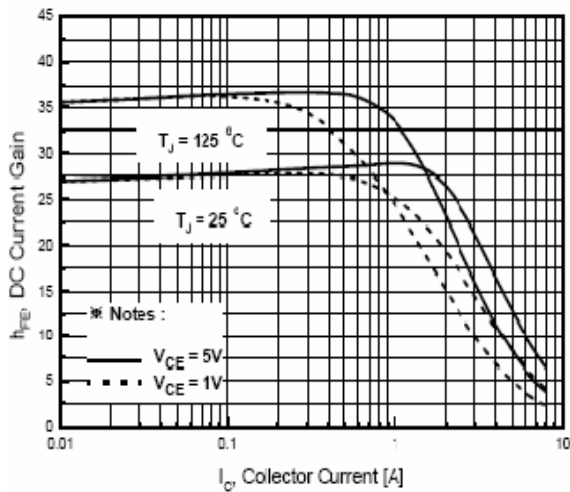


Fig. 1 DC Current Gain

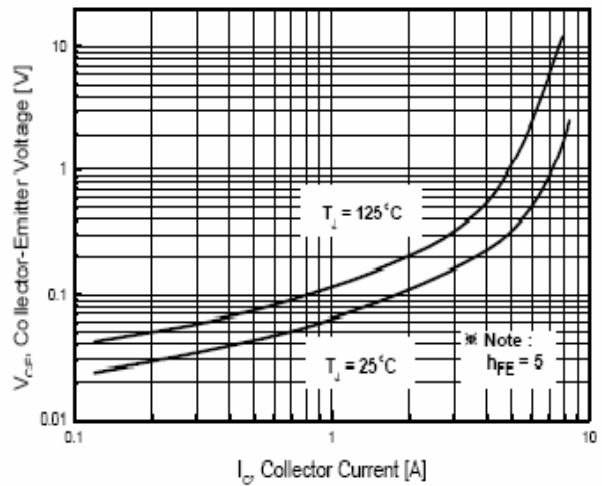


Fig. 2 Collector-Emmitter Saturation Voltage

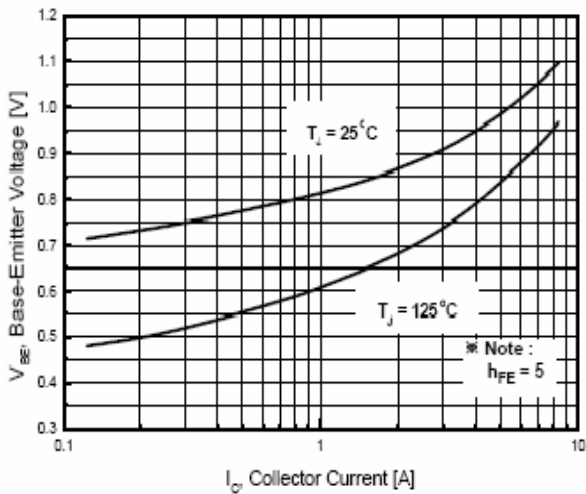


Fig. 3 Base-Emmitter Saturation Voltage

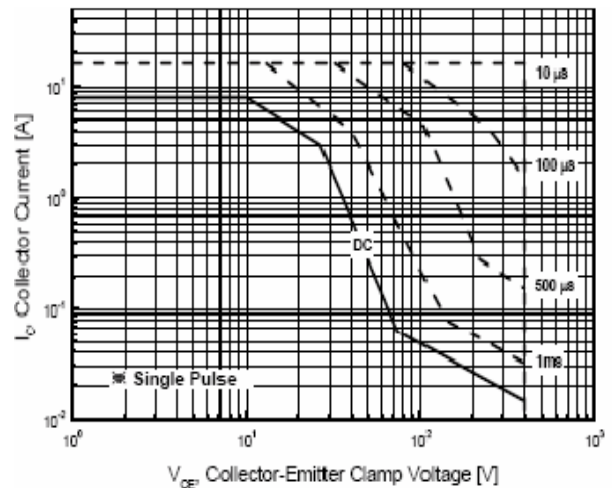


Fig. 4 Safe Operation Area

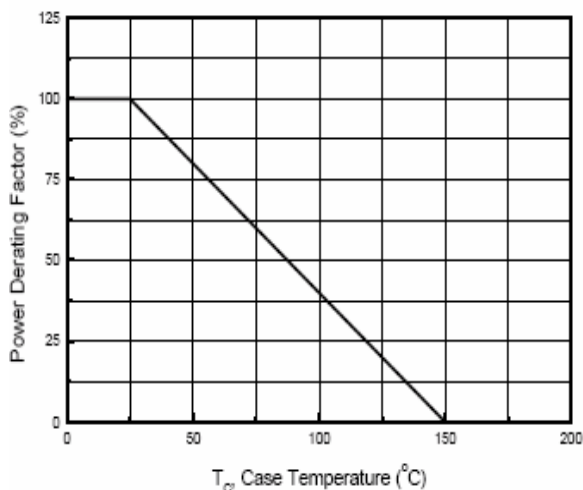


Fig.5 Power Derating

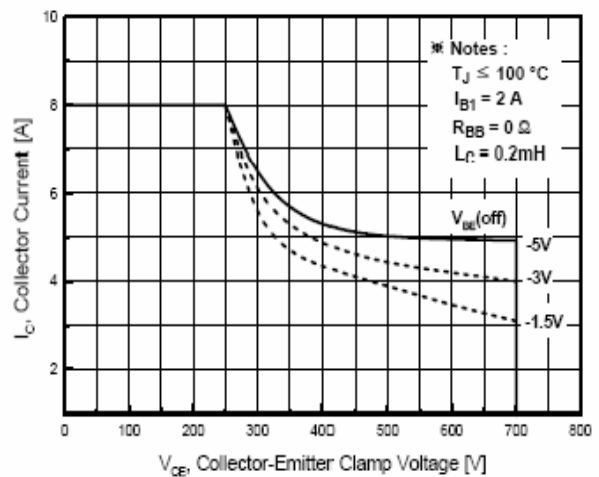
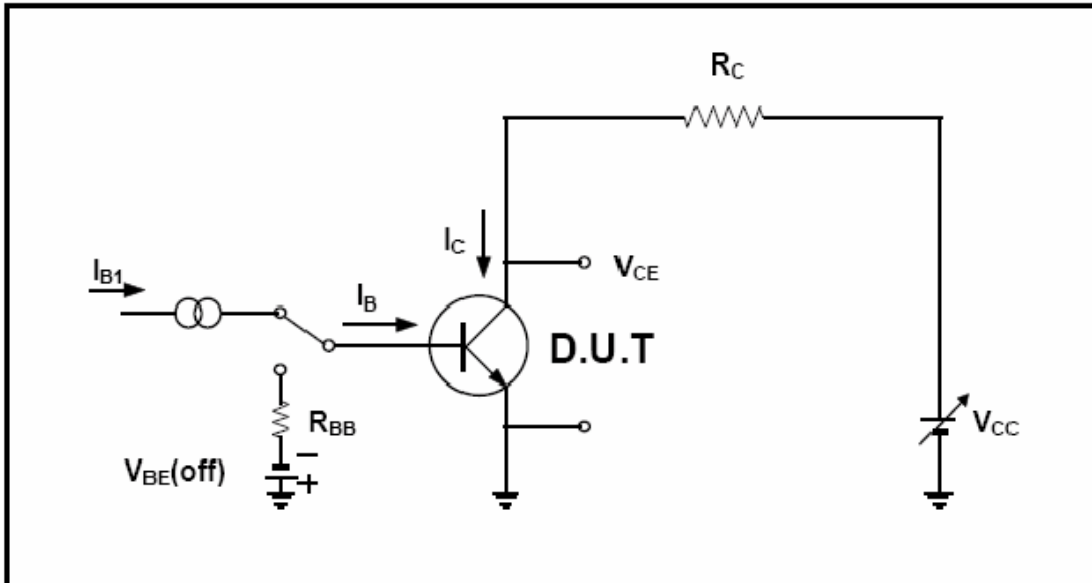
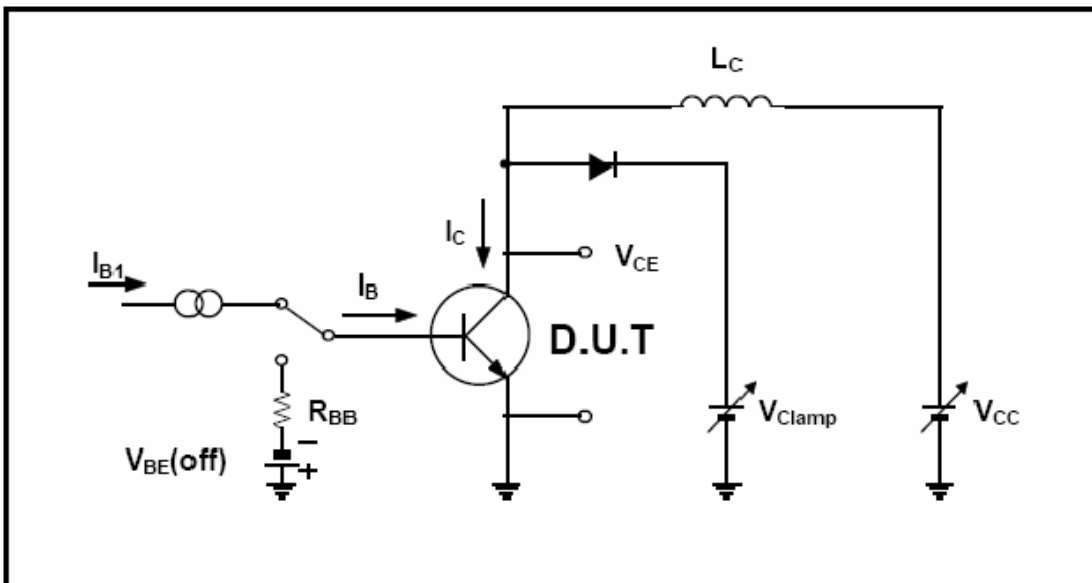


Fig.6 Reverse Biased Safe Operation Area

Resistive Load Switching Test Circuit



Inductive Load Switching & RBSOA Test Circuit



TO-220 Package Dimension

