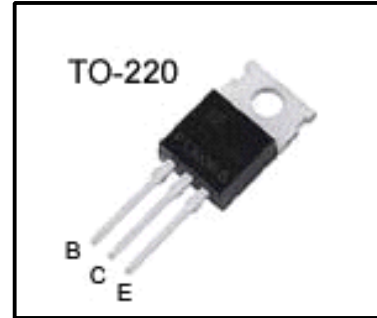


High Voltage Fast-Switching NPN Power Transistor

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 °C		100	W
	Total Dissipation at T _a *=25 °C		2.2	
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	1.25	°C/W
R _{θJA}	Thermal Resistance Junction to Ambient	40	°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	$I_c=5.0\text{A}, I_b=1.0\text{A}$	–	–	0.5	V
		$I_c=8.0\text{A}, I_b=1.6\text{A}$	–	–	1.0	
$V_{CE(sat)}$	Collector –Emitter Saturation Voltage	$I_c=12\text{A}, I_b=3.0\text{A}$	–	–	1.5	V
		$I_c=8.0\text{A}, I_b=1.6\text{A}$ $T_c=100^\circ\text{C}$	–	–	2.0	
$V_{BE(sat)}$	Base –Emitter Saturation Voltage	$I_c=5.0\text{A}, I_b=1.0\text{A}$	–	–	1.2	V
		$I_c=8.0\text{A}, I_b=1.6\text{A}$	–	–	1.6	
$V_{BE(sat)}$	Base –Emitter Saturation Voltage	$I_c=8.0\text{A}, I_b=1.6\text{A}$ $T_c=100^\circ\text{C}$	–	–	1.5	V
I_{CBO}	Collector –Base Cutoff Current ($V_{be}=-1.5\text{V}$)	$V_{cb}=700\text{V}$ $V_{cb}=700\text{V}, T_c=100^\circ\text{C}$	–	–	1.0 5.0	mA
h_{FE}	DC Current Gain	$V_{ce}=5\text{V}, I_c=5.0\text{A}$ $V_{ce}=5\text{V}, I_c=8.0\text{A}$	10 6	– –	40 40	
t_s t_f	Resistive Load Storage time Fall Time	$V_{CC}=125\text{V}, I_c=6.0\text{A}$ $I_{B1}=1.6\text{A}, I_{B2}=-1.6\text{A}$ $T_P=25\mu\text{s}$	–	1.5 0.17	3.0 0.4	μs
	Inductive Load Storage Time Fall Time	$V_{CC}=15\text{V}, I_c=5\text{A}$ $I_{B1}=1.6\text{A}, V_{be(off)}=5\text{V}$ $L=0.35\text{mH}, V_{clamp}=300\text{V}$ V	– –	0.8 0.04	2.0 0.1	μs
t_s t_f	Inductive Load Storage Time Fall Time	$V_{CC}=15\text{V}, I_c=1\text{A}$ $I_{B1}=0.4\text{A}, V_{be(off)}=5\text{V}$ $L=0.2\text{mH}, V_{clamp}=300\text{V}$ $T_c=100^\circ\text{C}$	– –	0.8 0.05	2.5 0.15	μs

Note:

Pulse Test : Pulse Width300,Duty cycle 2%

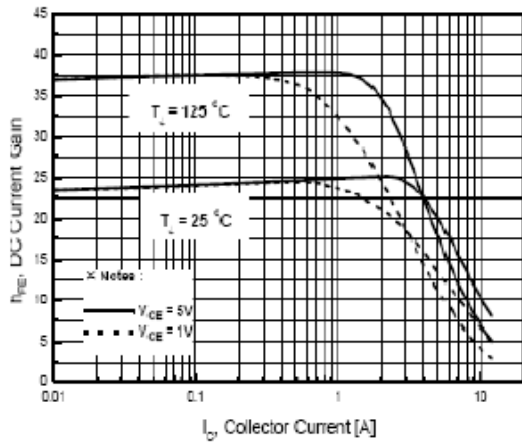


Fig.1 DC Current Gain

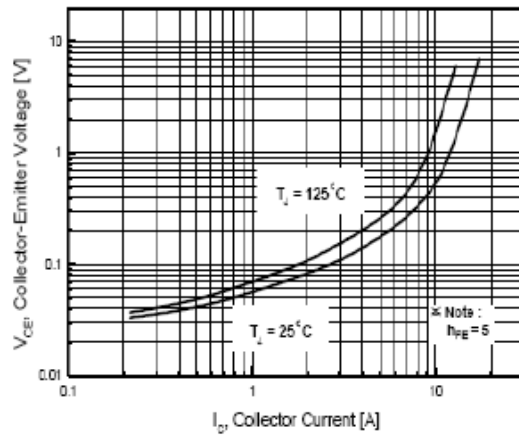


Fig.2 Collector-Emitter Saturation Voltage

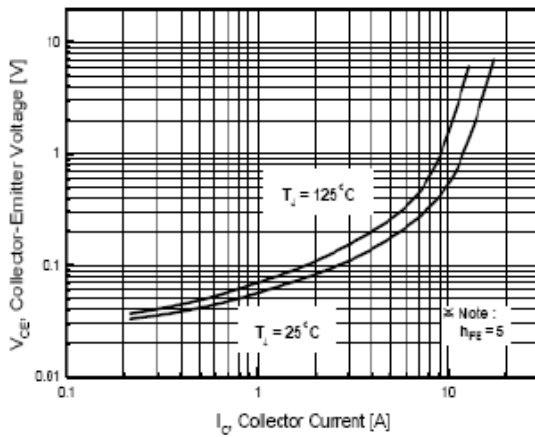


Fig.3 Base-Emitter Saturation Voltage

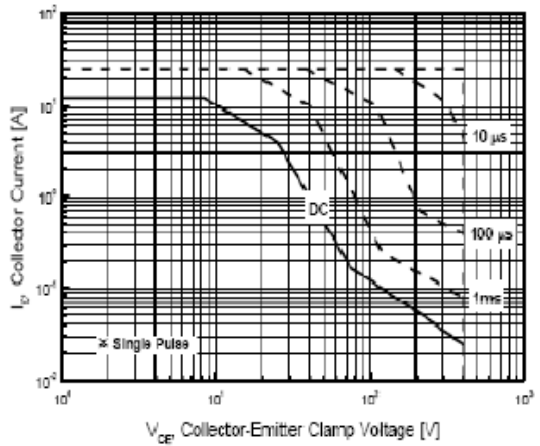


Fig.4 Safe Operation Area

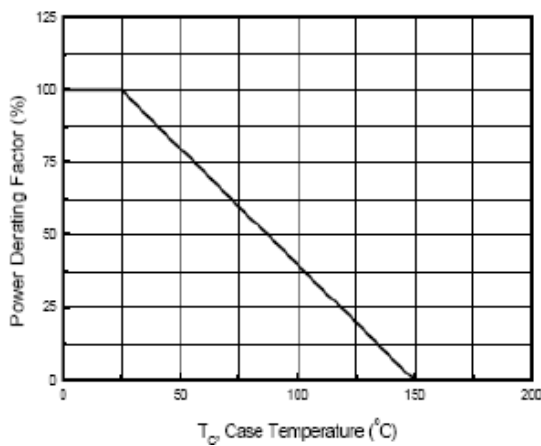


Fig.5 Power Derating

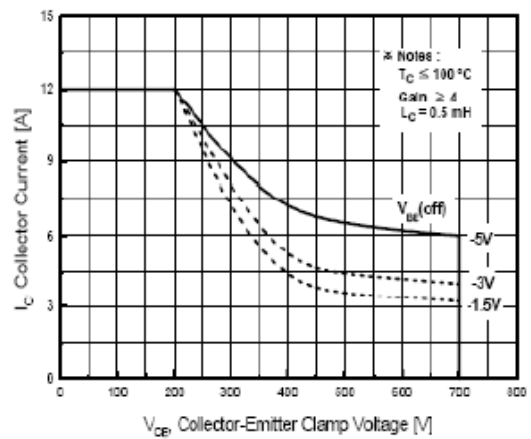
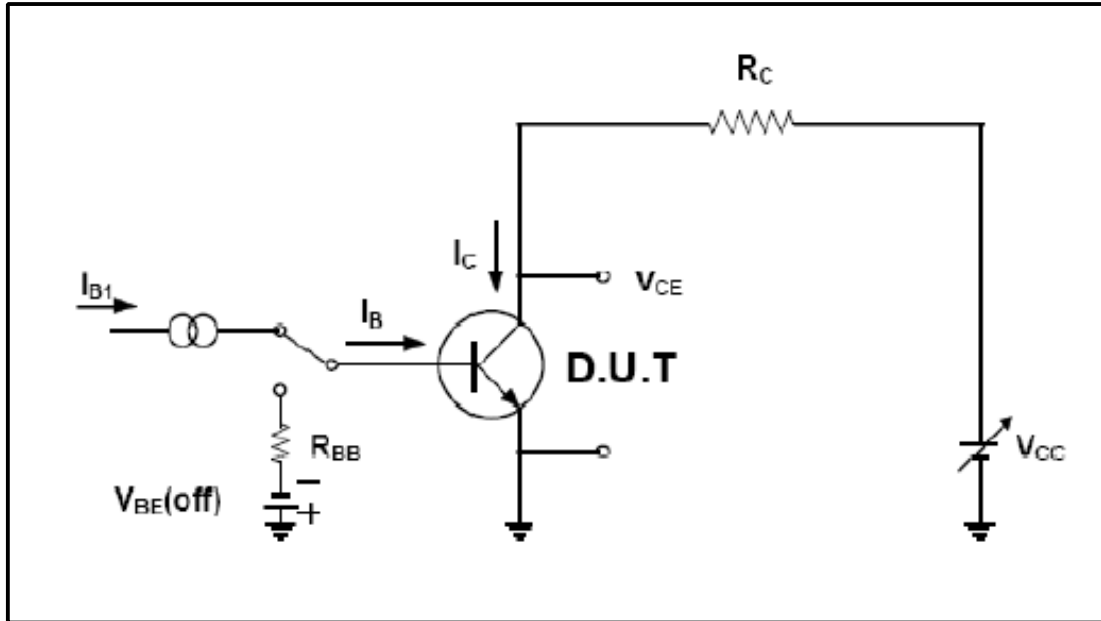
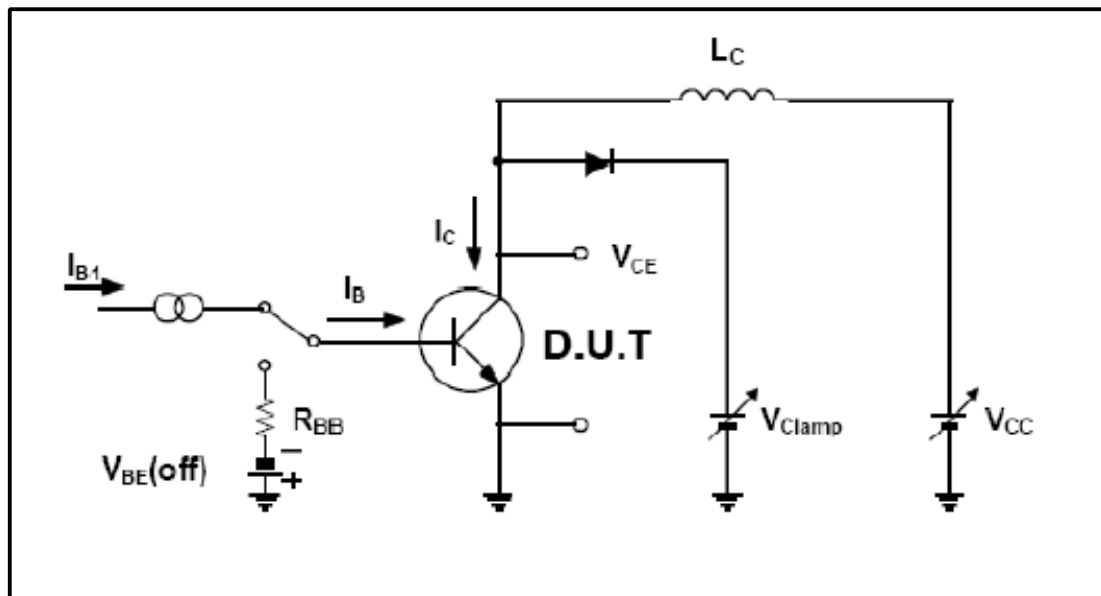


Fig.6 Reverse Biased Safe Operation Area



Resistive Load Switching Test Circuit



Inductive Load Switching & RBSOA Test Circuit

