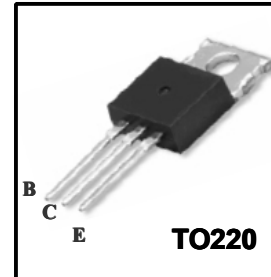


High Voltage Fast-Switching NPN Power Transistor

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 and inverters motor controls

Absolute Maximum Ratings

Symbol	Parameter	Test Conditions	Value	Units
V_{CES}	Collector-Emitter 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		12	A
I_{CP}	Collector pulse Current		24	A
I_B	Base Current		6.0	A
I_{BM}	Base Peak Current	$t_p = 5ms$	12	A
P_C	Total Dissipation at TC = 25°C		100	W
T_J	Operation Junction Temperature		150	°C
T_{STG}	Storage Temperature		- 65 ~ 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta Jc}$	Thermal Resistance Junction to Case	1.25	°C/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	40	°C/W

SBP13007-X

Electrical Characteristics (T_c=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Value			Units
			Min	Typ	Max	
V _{CEO(sus)}	Collector-Emitter Breakdown Voltage	I _c =10mA, I _b =0	400	-	-	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _c =5.0A, I _b =1.0A I _c =8.0A, I _b =1.6A I _c =12A, I _b =3.0A	-	-	1.0 1.5 3.0	V
V _{BE(sat)}	Base-Emitter Saturation Voltage	I _c =5.0A, I _b =1.0A I _c =8.0A, I _b =1.6A	-	-	1.2 1.6	V
I _{CBO}	Collector-Base Cutoff Current (V _{be} =-1.5V)	V _{cb} =600V	-	-	100	nA
h _{FE}	DC Current Gain	V _{ce} =5V, I _c =5.0A V _{ce} =5V, I _c =8.0A	8 6	- -	40 -	
t _s t _f	Resistive Load Storage Time Fall Time	V _{CC} =125V, I _c =6.0A I _{B1} =1.6A, I _{B2} =-1.6A T _p =25μs	-	1.5 0.17	3.0 0.4	μs
t _s t _f	Inductive Load Storage Time Fall Time	V _{CC} =15V, I _c =5A I _{B1} =1.6A, V _{be(off)} =5V L=0.35mH, V _{clamp} =300V	- -	0.8 0.04	2.0 0.1	μs
t _s t _f	Inductive Load Storage Time Fall Time	V _{CC} =15V, I _c =1A I _{B1} =0.4A, V _{be(off)} =5V L=0.2mH, V _{clamp} =300V T _c =100°C	- -	0.8 0.05	2.5 0.15	μs

Note:

Pulse Test : Pulse width 300, Duty cycle 2%

SBP13007-X

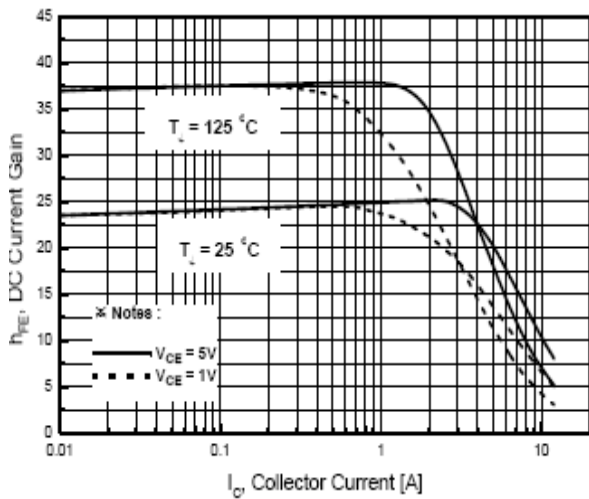


Fig. 1 DC Current Gain

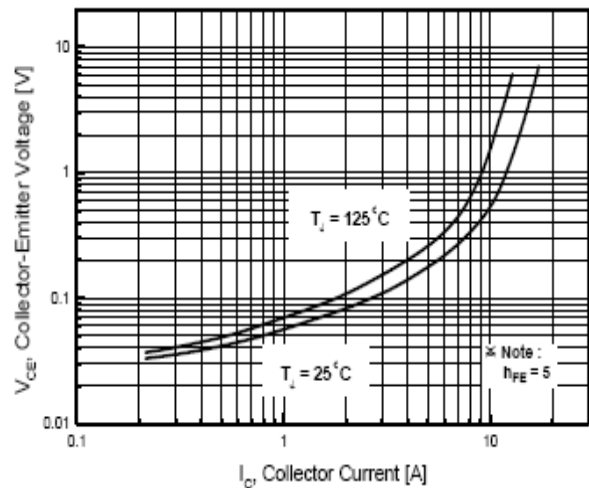


Fig. 2 Collector-Emitter Saturation Voltage

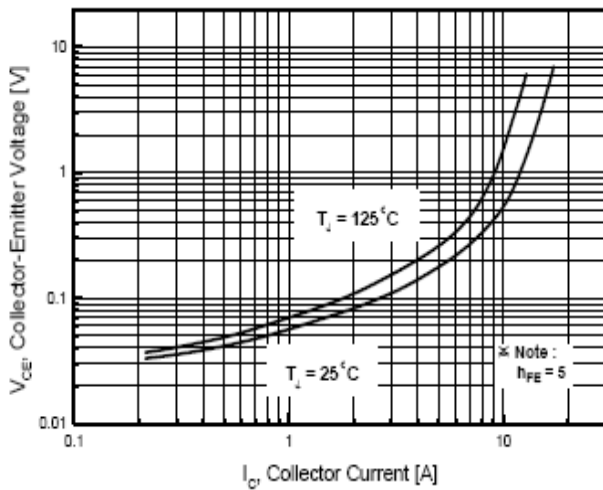


Fig. 3 Base-Emitter Saturation Voltage

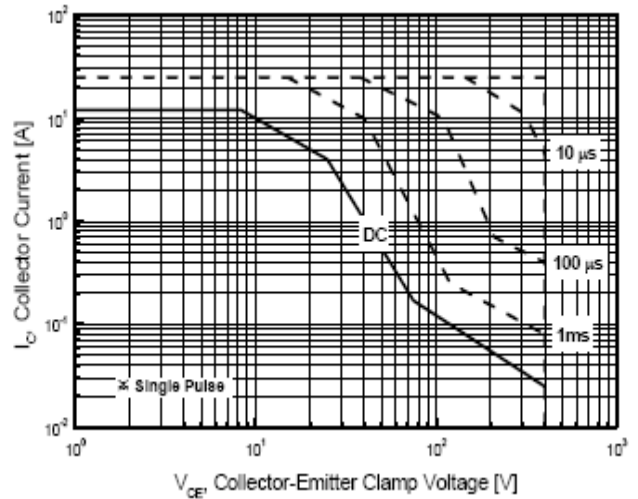


Fig. 4 Safe Operation Area

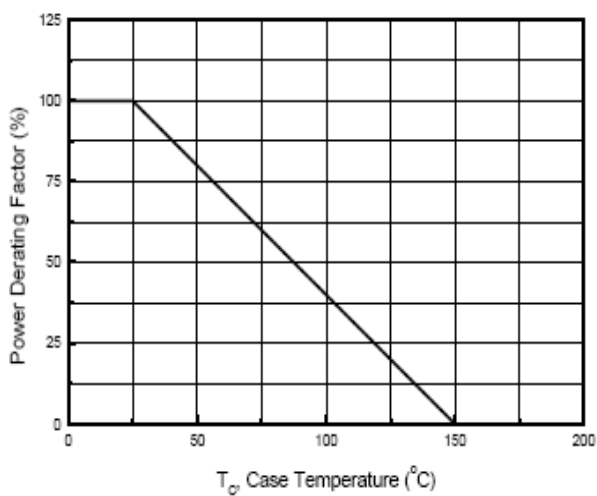


Fig.5 Power Derating

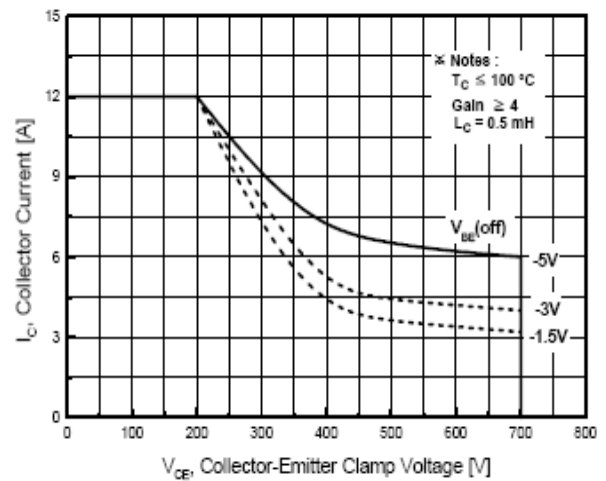
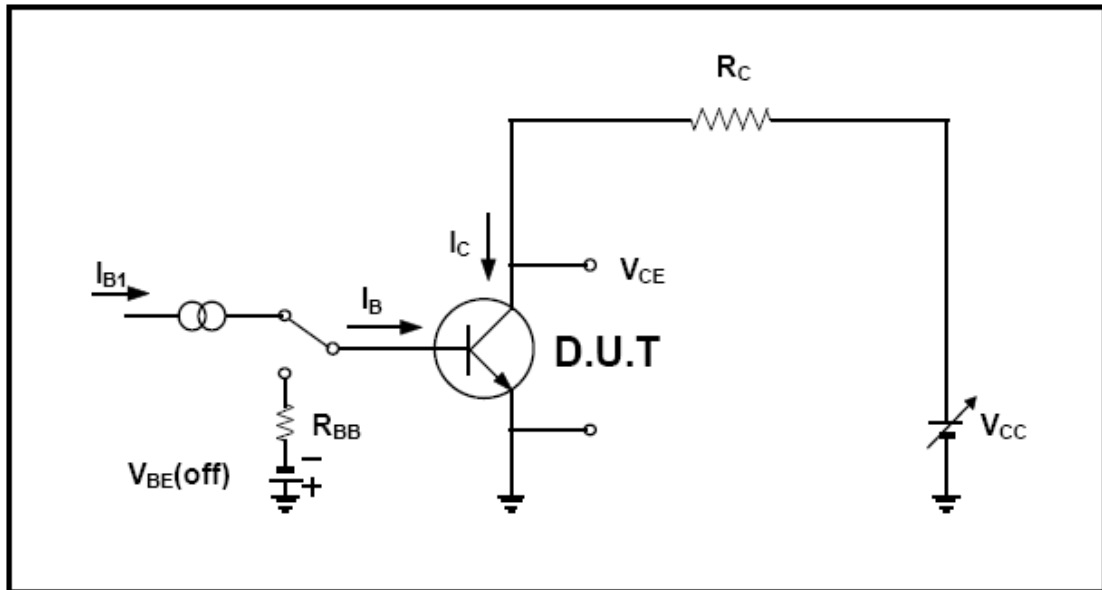


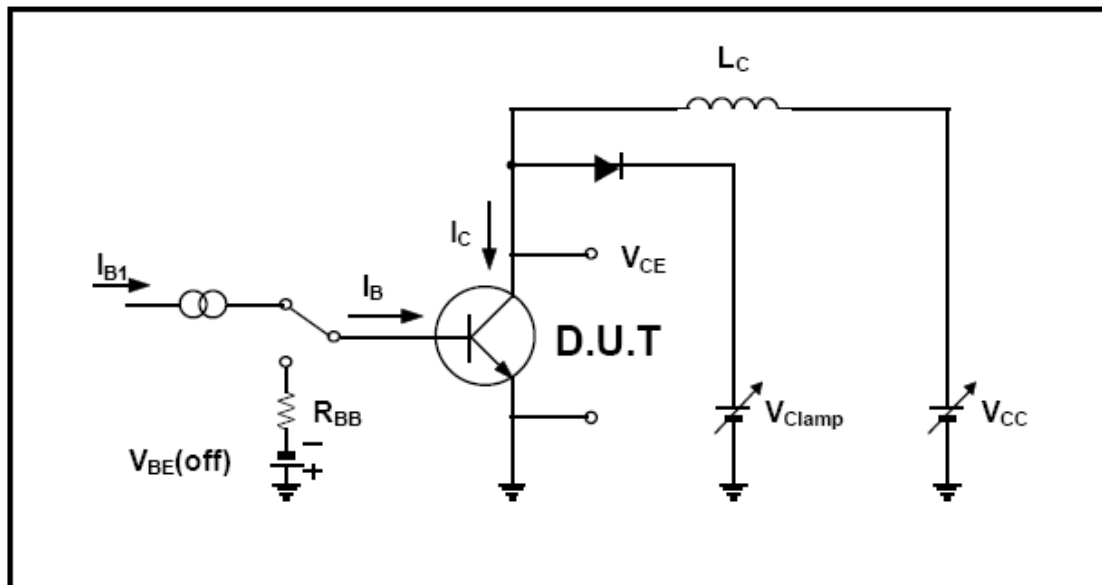
Fig.6 Reverse Biased Safe Operation Area



Resistive Load Switching Test Circuit



Inductive Load Switching & RBSOA Test Circuit



SBP13007-X

TO-220 Package Dimension

