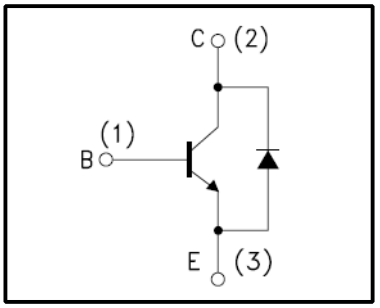
SBR13003D

High Voltage Fast-Switching NPN Power Transistor

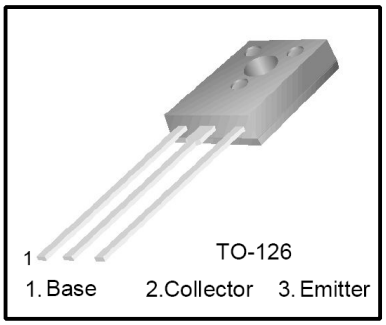


Features

- Very High Switching Speed
- High Voltage Capability
- Wide Reverse Bias SOA
- Built-in freewheeling diode

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		1.5	A
I_{CP}	Collector pulse Current		3.0	A
I_B	Base Current		0.75	A
I_{BM}	Base Peak Current	t_P = 5ms	1.5	A
P_C	Total Dissipation at Tc = 25℃		40	W
	Total Dissipation at Ta = 25℃		1.2	
T_J	Operation Junction Temperature		- 40 ~ 150	℃
T_{STG}	Storage Temperature		- 40 ~ 150	℃

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta Jc}$	Thermal Resistance Junction to Case	3.12	℃/W
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	89	℃/W

Electrical Characteristics (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Test Conditions	Value			Units
			Min	Typ	Max	
BV_{CBO}	Collector-Base Breakdown Voltage	Ic=0.5mA,Ie=0	700			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	Ic=10mA,Ib=0	400	-	-	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	Ic=200mA,Ib=100mA	-	-	1.6	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	Ic=200mA,Ib=100mA	-	-	1.2	V
I_{CBO}	Collector-Base Cutoff Current	Vcb=550V,Ie=0mA	-	-	10	μA
I_{CEO}	Collector-Emitter Cutoff Current	Vce=400V,Ib=0mA	-	-	20	μA
I_{EBO}	Emitter- Base Cutoff Current	Veb=9V,Ic=0mA	-	-	20	μA
h_{FE}	DC Current Gain	Vce=20V,Ic=20mA Vce=5V, Ic=1mA	10 9	- -	40 -	
ts tf	Storage Time Fall Time	V_{CC}=250V I_C=5 I_B I_{B1}=- I_{B2}=0.04A	- -	- -	3 0.8	μs

Note:

Pulse Test : Pulse width 300, Duty cycle 2%

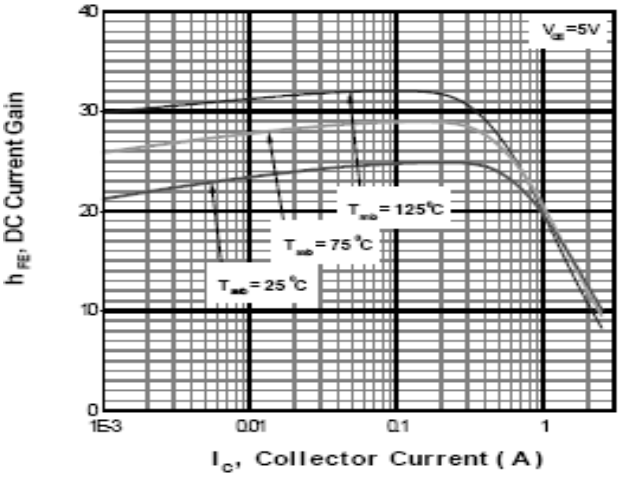


Fig. 1 DC Current Gain

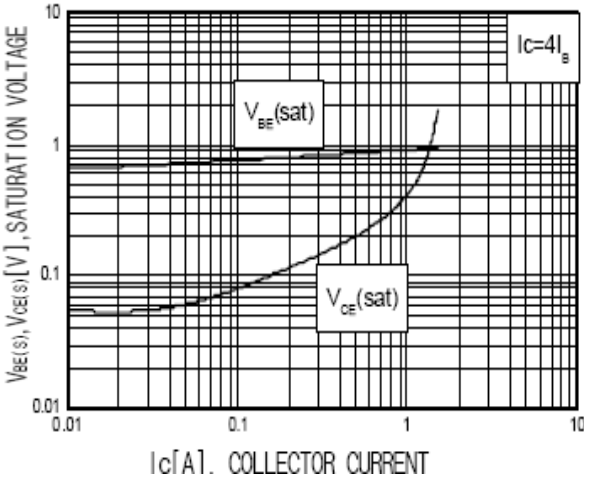


Fig. 2 Saturation Voltage

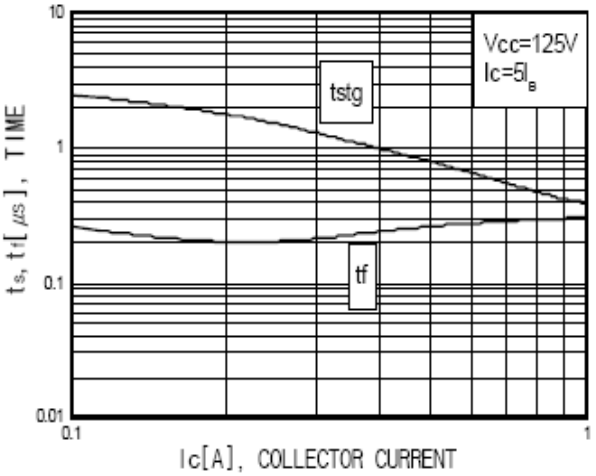


Fig. 3 Switching Time

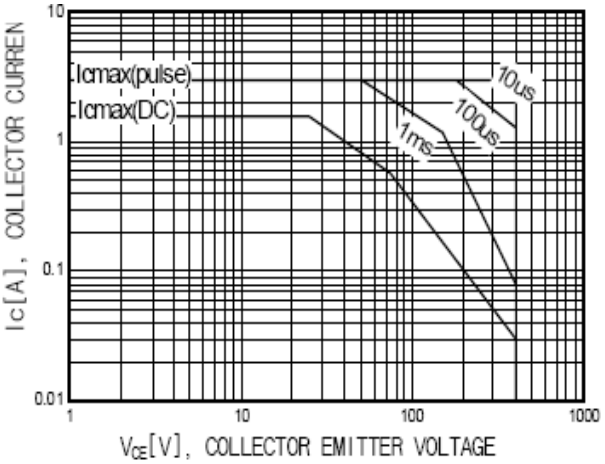


Fig. 4 Safe Operation Area

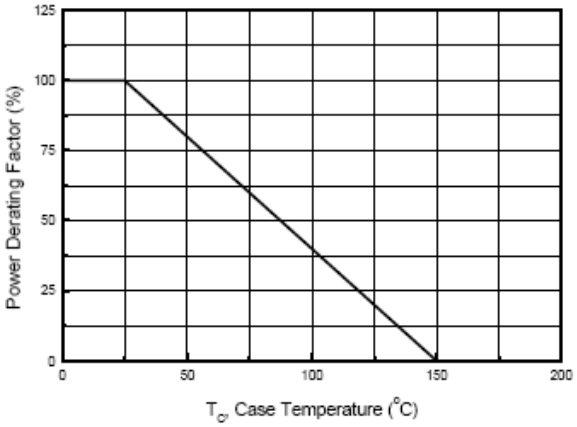
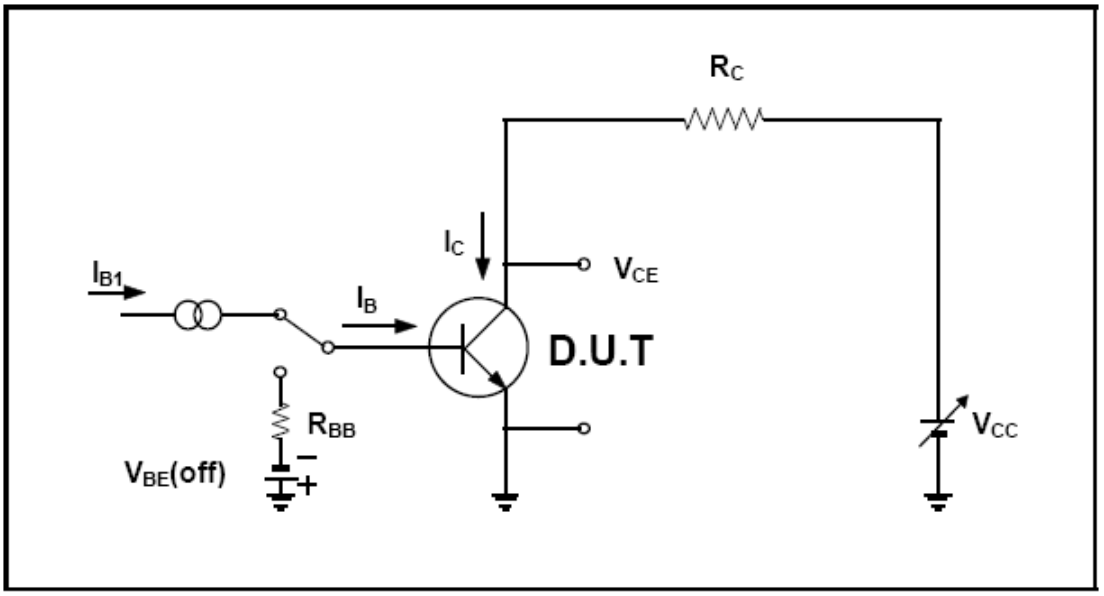
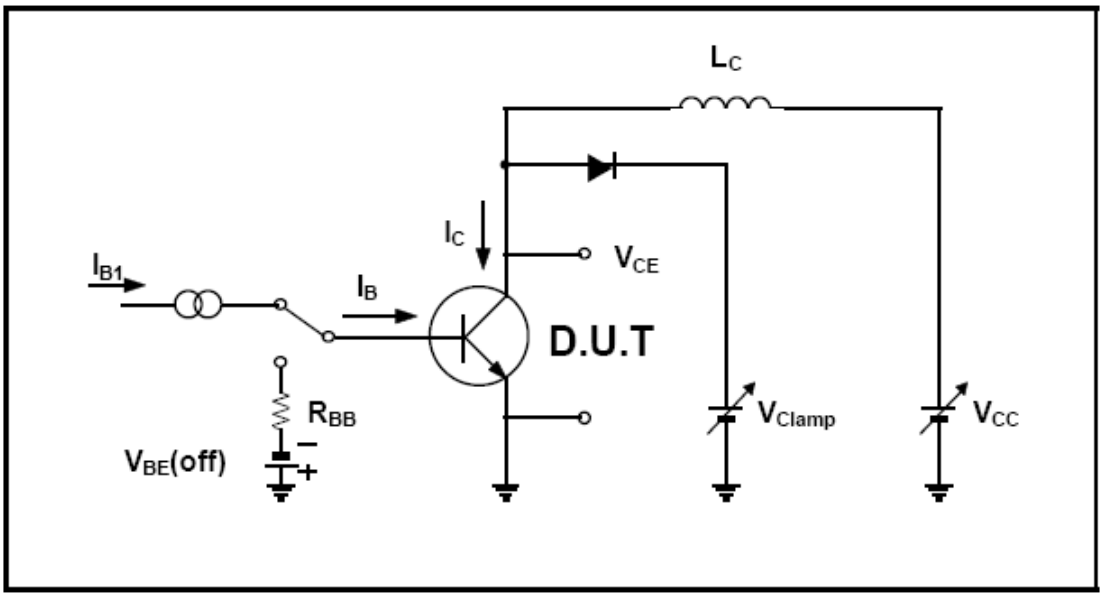


Fig.5 Power Derating

Resistive Load Switching Test Circuit



Inductive Load Switching & RBSOA Test Circuit



TO-126 Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	7.5		7.9	0.295		0.311
B	10.8		11.2	0.425		0.441
C	14.2		14.7	0.559		0.579
D	2.7		2.9	0.106		0.114
E		3.8			0.150	
F		2.5			0.098	
G	1.2		1.5	0.047		0.059
H		2.3			0.091	
I		4.6			0.181	
J	0.48		0.62	0.019		0.024
K	0.7		0.86	0.028		0.034
L		1.4			0.055	
ϕ		3.2			0.126