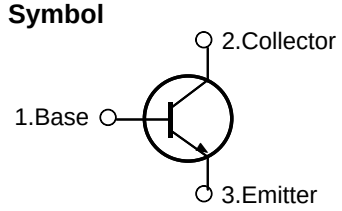
High Voltage Fast-Switching NPN Power Transistor

Features

- ◆ Very High Switching Speed (Typical 120ns@1.0A)
- ◆ Minimum Lot-to-Lot h_{FE} Variation
- ◆ Low $V_{CE(sat)}$ (Typical 200mV@1.0A/0.25A)
- ◆ Wide Reverse Bias S.O.A

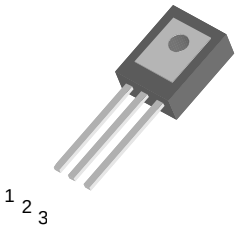
Symbol



General Description

This devices is designed for high voltage, high speed switching characteristic required such as lighting system, switching regulator, inverter and deflection circuit.

TO-126



Absolute Maximum Ratings

Symbol	Parameter	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_{CM}	Collector Peak Current (t_P < 5 ms)	3.0	A
I_B	Base Current	0.75	A
I_{BM}	Base Peak Current (t_P < 5 ms)	1.5	A
P_C	Total Dissipation at T_C = 25 °C	40	W
T_{STG}	Storage Temperature	- 65 ~ 150	°C
T_J	Max. Operating Junction Temperature	150	°C

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.12	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	89	°C/W

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

Symbol	Parameter	Condition	Min	Typ	Max	Units
I_{CEV}	Collector Cut-off Current (V_{BE} = - 1.5V)	V_{CE} = 700V V_{CE} = 700V T_C = 100 °C	-	-	1.0 5.0	mA
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 10 mA	400	-	-	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 0.5A I_B = 0.1A I_C = 1.0A I_B = 0.25A I_C = 1.5A I_B = 0.5A	-	-	0.3 0.5 1.0	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 0.5A I_B = 0.1A I_C = 1.0A I_B = 0.25A	-	-	1.0 1.2	V
h_{FE}	DC Current Gain	I_C = 0.5A V_{CE} = 2V I_C = 1.0A V_{CE} = 2V	10 5	-	30 25	
t_{on} t_s t_f	**Resistive Load** Turn-On Time Storage Time Fall Time	I_C = 1.0A V_{CC} = 125V I_{B1} = 0.2A I_{B2} = - 0.2A T_P = 25μs	-	0.2 1.5 0.15	1.0 3.0 0.4	μs
t_s t_f	**Inductive Load** Storage Time Fall Time	V_{CC} = 15V I_C = 1.0A I_{B1} = 0.2A I_{B2} = -0.5A L = 0.35mH V_{clamp} = 300V	-	2.0 0.12	4.0 0.3	μs
t_s t_f	**Inductive Load** Storage Time Fall Time	V_{CC} = 15V I_C = 1.0A I_{B1} = 0.2A I_{B2} = -0.5A L = 0.35mH V_{clamp} = 300V T_C = 100 °C	-	2.4 0.15	5.0 0.4	μs

※ Notes :

Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

SBR13003A-1 Hfe 13-20(Ic = 0.5A V_{CE} = 2V)

SBR13003A-2 Hfe 18-26(Ic = 0.5A V_{CE} = 2V)

Fig.1 DC CURRENT GAIN

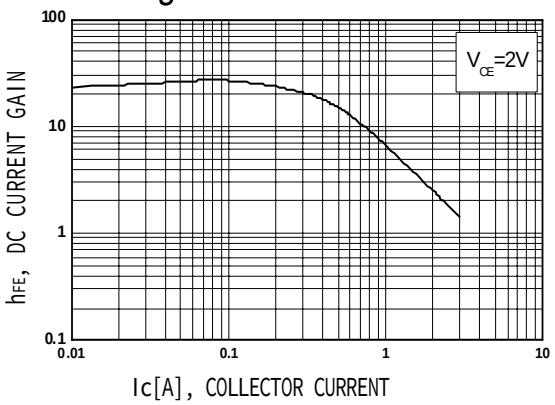


Fig. 2 SATURATION VOLTAGE

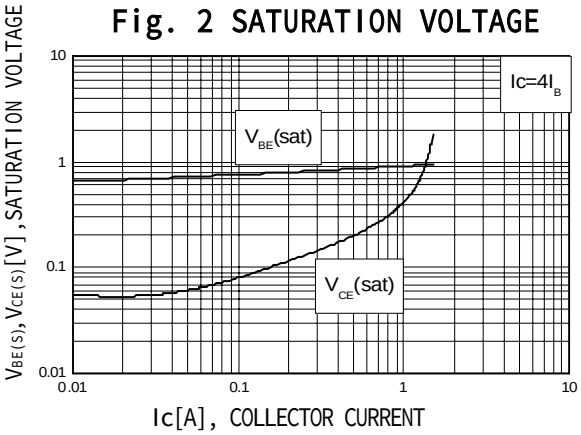


Fig.3. SWICHING TIME

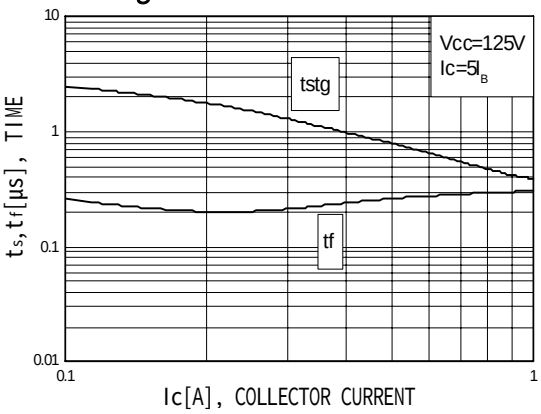


Fig. 4 SAFE OPERATING AREA

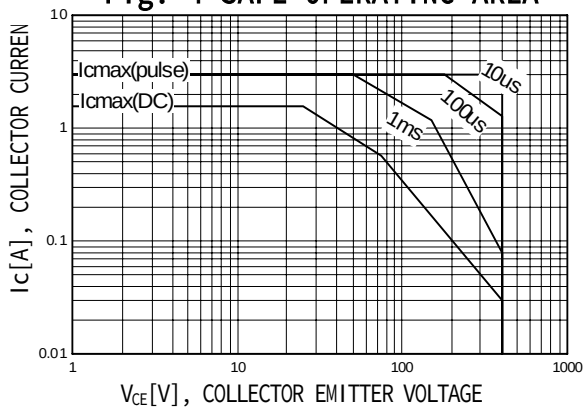
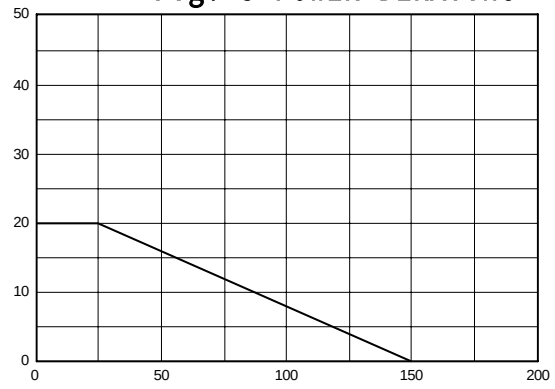
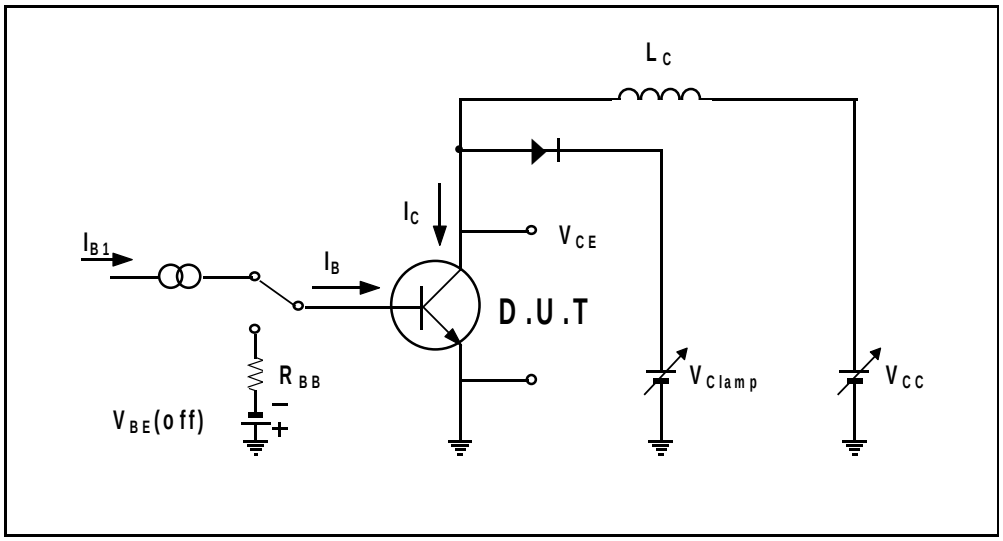


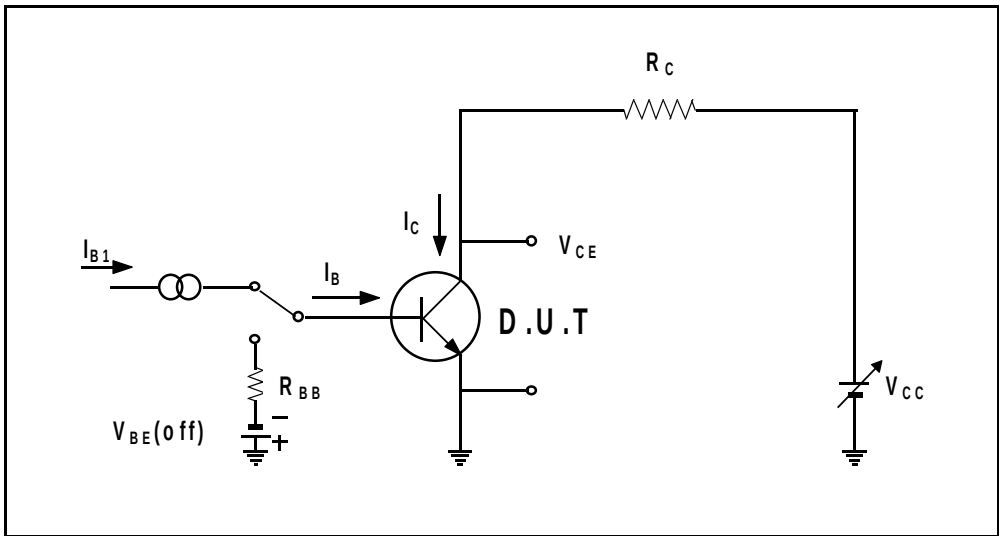
Fig. 5 POWER DERATING



Inductive Load Switching & RBSOA Test Circuit



Resistive Load Switching 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	

