

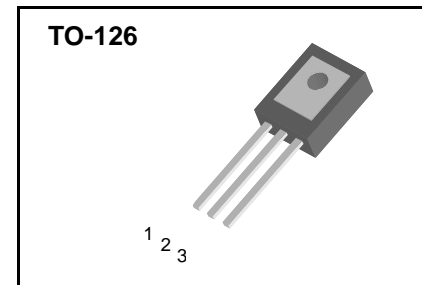
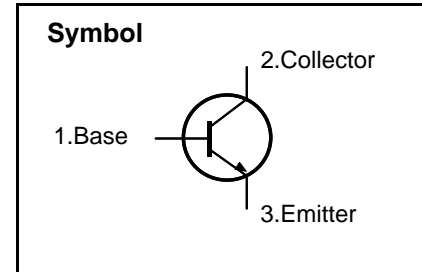
High Voltage Fast-Switching NPN Power Transistor

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

General Description

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



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

SBR13003A

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

Symbol	Parameter	Condition	Min	Typ	Max	Units
I_{CEV}	Collector Cut-off Current ($V_{BE} = -1.5V$)	$V_{CE} = 700V$ $V_{CE} = 700V$ $T_C = 100\text{ }^\circ\text{C}$	-	-	1.0 5.0	mA
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage ($I_B = 0$)	$I_C = 10\text{ mA}$	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	$I_C = 1.0A$ $V_{CC} = 125V$ $I_{B1} = 0.2A$ $I_{B2} = -0.2A$ $T_P = 25\mu s$	-	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	$V_{CC} = 15V$ $I_C = 1.0A$ $I_{B1} = 0.2A$ $I_{B2} = -0.5A$ $L = 0.35mH$ $V_{clamp} = 300V$ $T_C = 100\text{ }^\circ\text{C}$	-	2.4 0.15	5.0 0.4	μs

Notes :

Pulse Test : Pulse width $300\mu s$, Duty cycle 2%

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

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



Fig.1 DC CURRENT GAIN

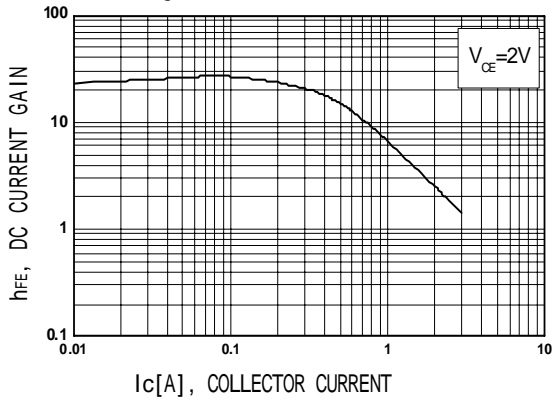


Fig. 2 SATURATION VOLTAGE

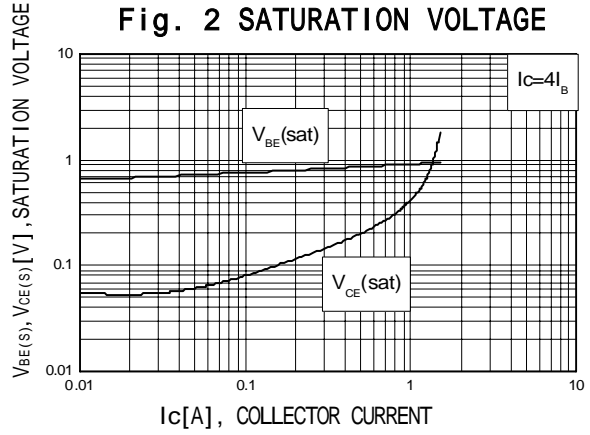


Fig.3. SWICING TIME

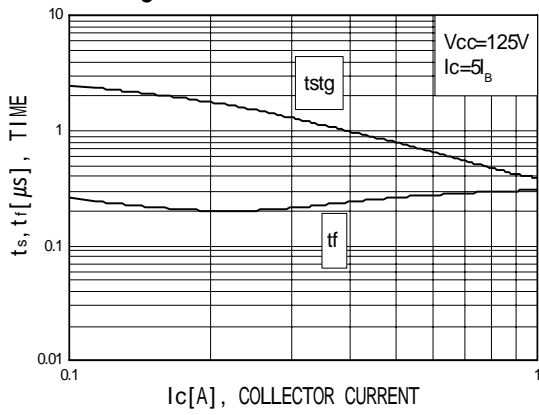


Fig. 4 SAFE OPERATING AREA

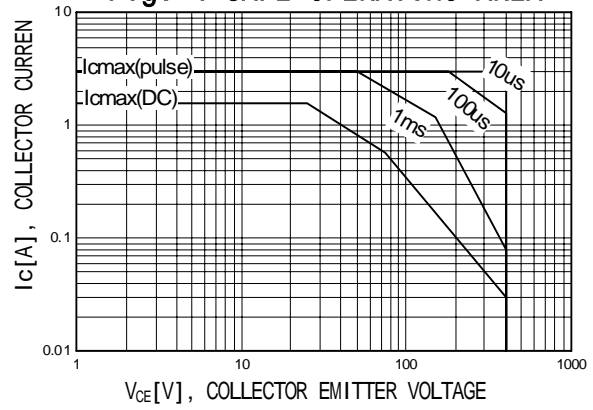
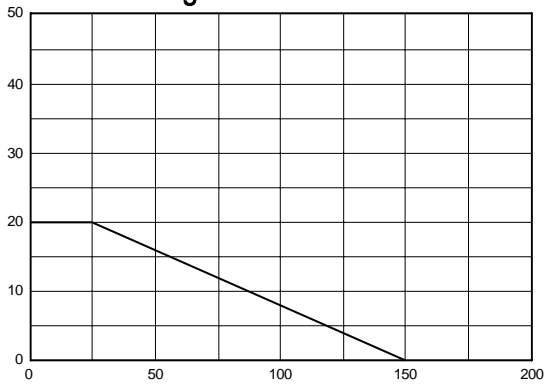
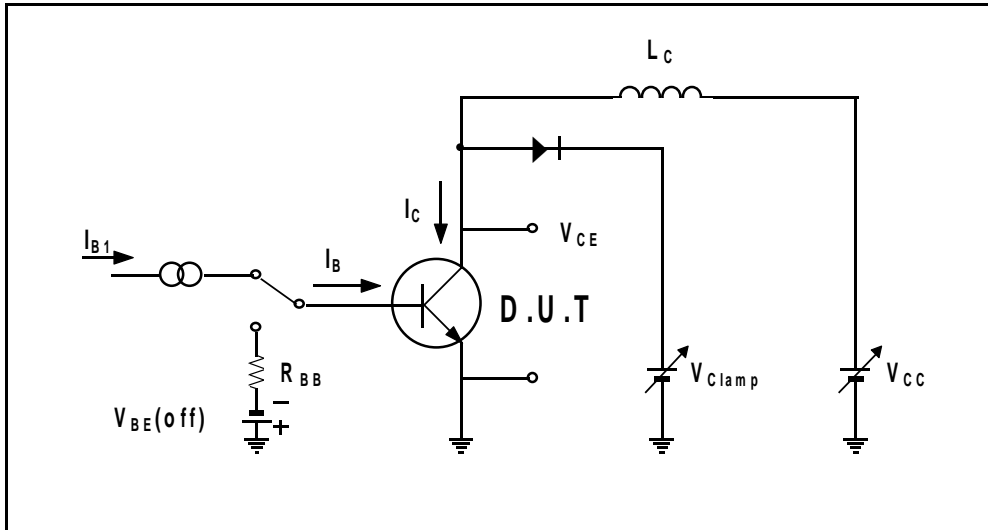


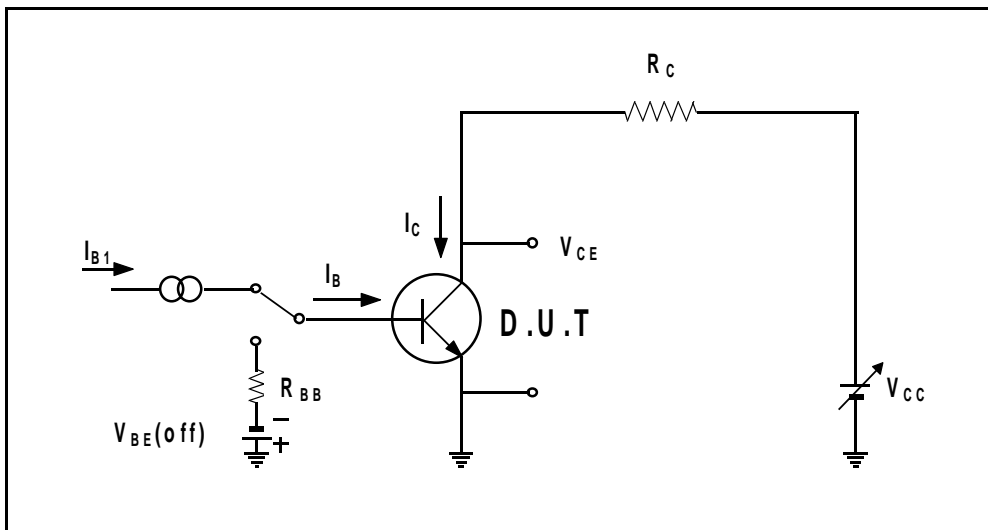
Fig. 5 POWER DERATING



Inductive Load Switching & RBSOA Test Circuit



Resistive Load Switching Test Circuit



SBR13003A

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	
		3.2			0.126	

