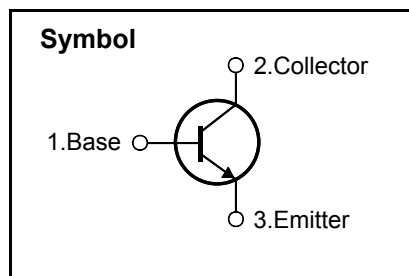


**High Voltage Fast-Switching NPN Power Transistor**

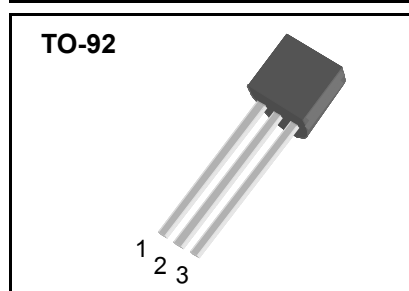
**Features**

- Very High Switching Speed (Typical 120ns@100mA)
- Minimum Lot-to-Lot hFE Variation
- Low VCE(sat) (Typical 120mV@100mA/20mA)
- 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 ( $I_C = 0$ )	8.0	V
$I_C$	Collector Current	0.2	A
$I_{CM}$	Collector Peak Current ( $t_p < 5$ ms )	0.4	A
$I_B$	Base Current	0.1	A
$I_{BM}$	Base Peak Current ( $t_p < 5$ ms )	0.2	A
$P_C$	Total Dissipation at $T_A = 25$ °C	750	mW
$T_{STG}$	Storage Temperature	- 65 ~ 150	°C
$T_J$	Max. Operating Junction Temperature	150	°C

**Thermal Characteristics**

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	166	°C/W

# SBN13001

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

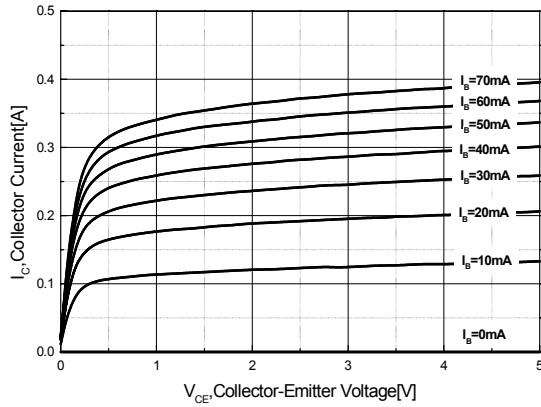
Symbol	Parameter	Condition	Min	Typ	Max	Units
$I_{CEV}$	Collector Cut-off Current ( $V_{BE} = -1.5V$ )	$V_{CE} = 650V$ $V_{CE} = 650V$ $T_C = 100\text{ }^\circ\text{C}$	-	-	1.0 5.0	mA
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage ( $I_B = 0$ )	$I_C = 1\text{ mA}$	400	-	-	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 50\text{mA}$ $I_B = 10\text{mA}$ $I_C = 100\text{mA}$ $I_B = 20\text{mA}$	-	-	0.3 0.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 50\text{mA}$ $I_B = 10\text{mA}$	-	-	1	V
$h_{FE}$	DC Current Gain	$I_C = 50\text{mA}$ $V_{CE} = 10V$ $I_C = 100\text{mA}$ $V_{CE} = 10V$	10 10	-	30	
$t_{on}$ $t_s$ $t_f$	<b>Resistive Load</b> Turn-On Time Storage Time Fall Time	$I_C = 100\text{mA}$ $V_{CC} = 125V$ $I_{B1} = 20\text{mA}$ $I_{B2} = -20\text{mA}$ $T_P = 25\mu s$	-	0.2 1.5 0.15	1.0 3.0 0.4	$\mu s$
$t_s$ $t_f$	<b>Inductive Load</b> Storage Time Fall Time	$V_{CC} = 15V$ $I_C = 100\text{mA}$ $I_{B1} = 20\text{mA}$ $I_{B2} = -50\text{mA}$ $L = 0.35\text{mH}$ $V_{clamp} = 300V$	-	2.0 0.12	4.0 0.3	$\mu s$
$t_s$ $t_f$	<b>Inductive Load</b> Storage Time Fall Time	$V_{CC} = 15V$ $I_C = 100\text{mA}$ $I_{B1} = 20\text{mA}$ $I_{B2} = -50\text{mA}$ $L = 0.35\text{mH}$ $V_{clamp} = 300V$ $T_C = 100\text{ }^\circ\text{C}$	-	2.4 0.15	5.0 0.4	$\mu s$

※ Notes :

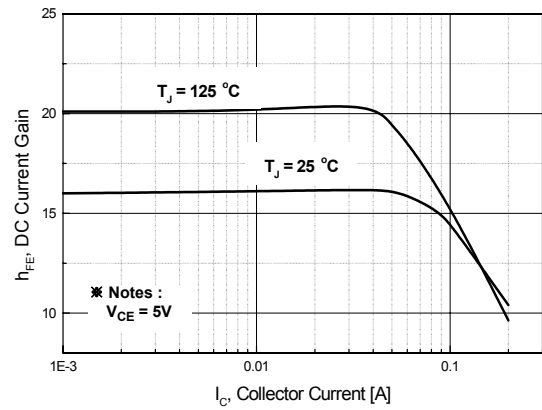
Pulse Test : Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$



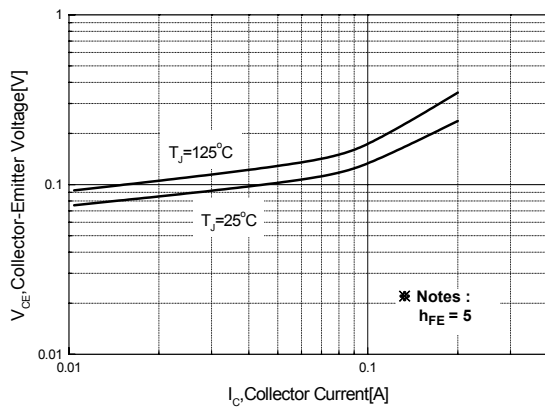
**Fig 1. Static Characteristics**



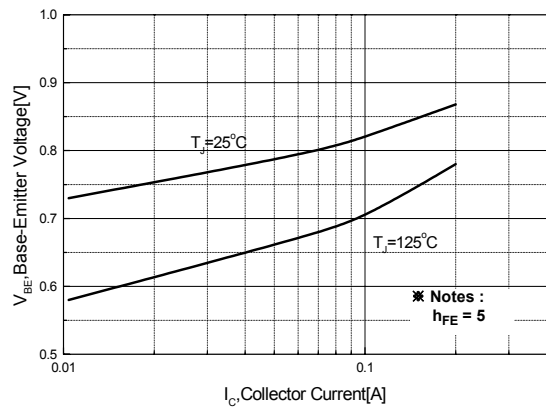
**Fig 2. DC Current Gain**



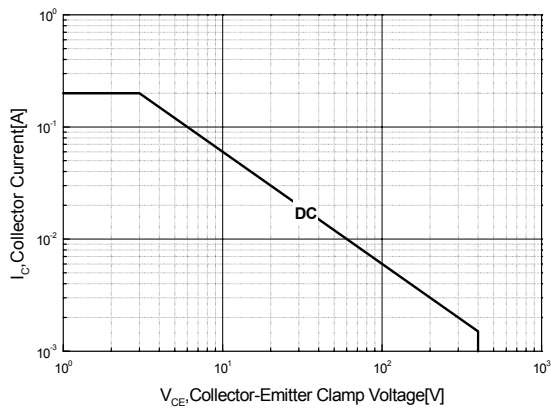
**Fig 3. Collector-Emitter Saturation Voltage**



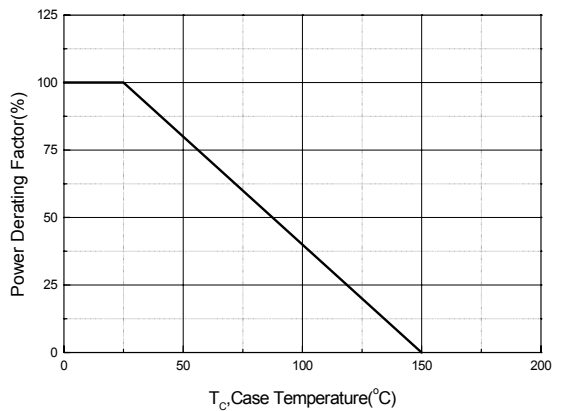
**Fig 4. Base-Emitter Saturation Voltage**



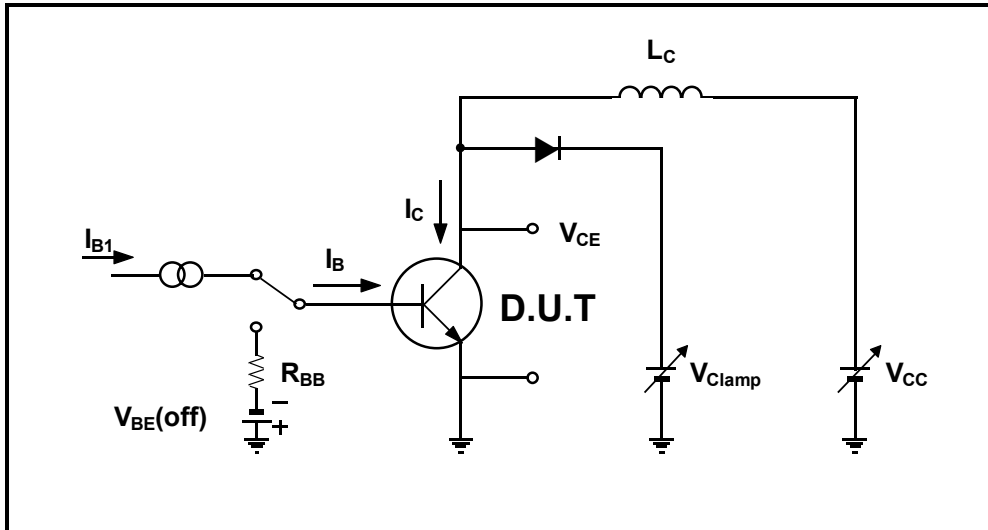
**Fig 5. Safe Operation Areas**



**Fig 6. Power Derating Curve**



## Inductive Load Switching & RBSOA Test Circuit



## Resistive Load Switching Test Circuit

