

High Voltage Fast-Switching NPN Power Transistor

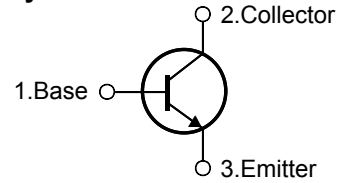
Features

- 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

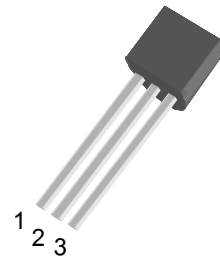
General Description

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

Symbol



TO-92



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	$I_C = 50mA$ $I_B = 10mA$ $I_C = 100mA$ $I_B = 20mA$	-	-	0.3 0.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 50mA$ $I_B = 10mA$	-	-	1	V
h_{FE}	DC Current Gain	$I_C = 50mA$ $V_{CE} = 10V$ $I_C = 100mA$ $V_{CE} = 10V$	10 10	-	30	
t_{on} t_s t_f	Resistive Load Turn-On Time Storage Time Fall Time	$I_C = 100mA$ $V_{CC} = 125V$ $I_{B1} = 20mA$ $I_{B2} = -20mA$ $T_P = 25\mu s$	-	0.2 1.5 0.15	1.0 3.0 0.4	μs
t_s t_f	Inductive Load Storage Time Fall Time	$V_{CC} = 15V$ $I_C = 100mA$ $I_{B1} = 20mA$ $I_{B2} = -50mA$ $L = 0.35mH$ $V_{clamp} = 300V$	-	2.0 0.12	4.0 0.3	μs
t_s t_f	Inductive Load Storage Time Fall Time	$V_{CC} = 15V$ $I_C = 100mA$ $I_{B1} = 20mA$ $I_{B2} = -50mA$ $L = 0.35mH$ $V_{clamp} = 300V$ $T_C = 100\text{ }^{\circ}\text{C}$	-	2.4 0.15	5.0 0.4	μs

※ Notes :

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

Fig 1. Static Characteristics

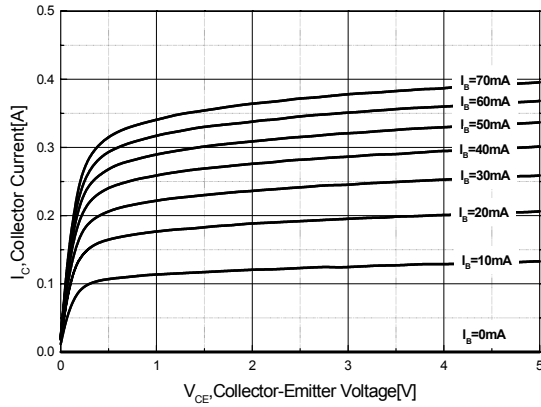


Fig 2. DC Current Gain

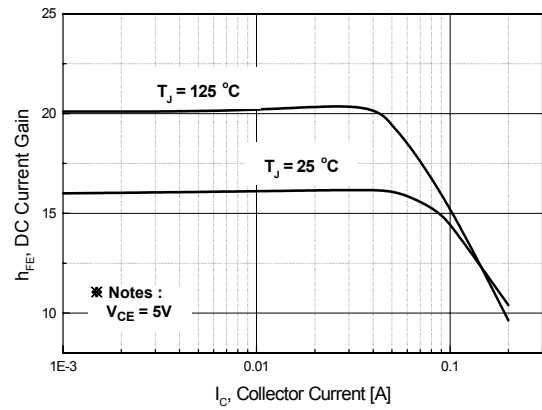


Fig 3. Collector-Emitter Saturation Voltage

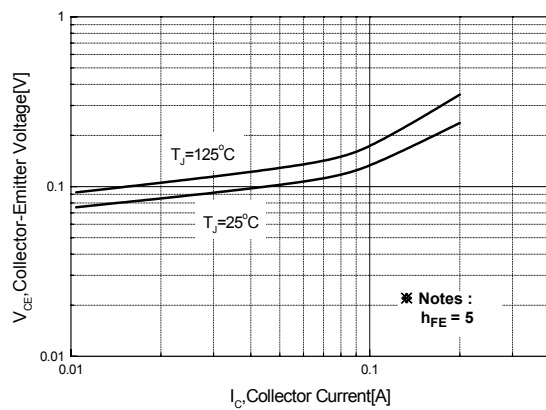


Fig 4. Base-Emitter Saturation Voltage

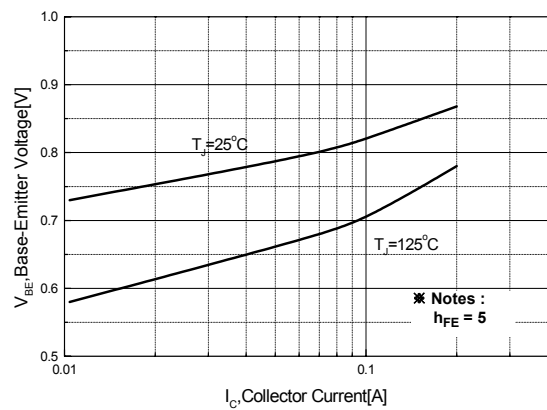


Fig 5. Safe Operation Areas

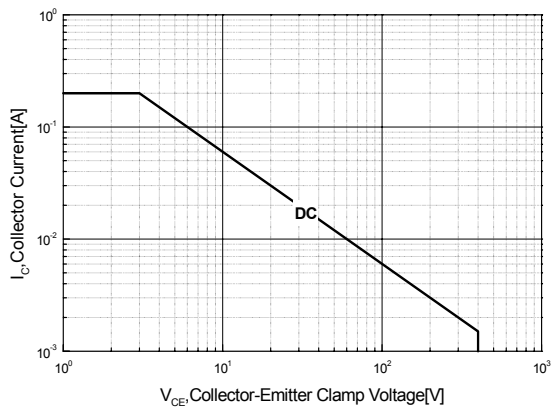
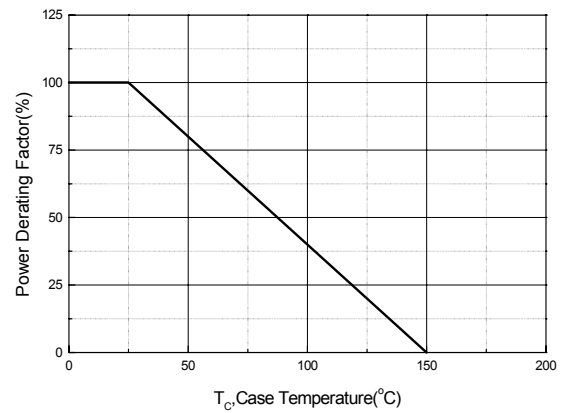
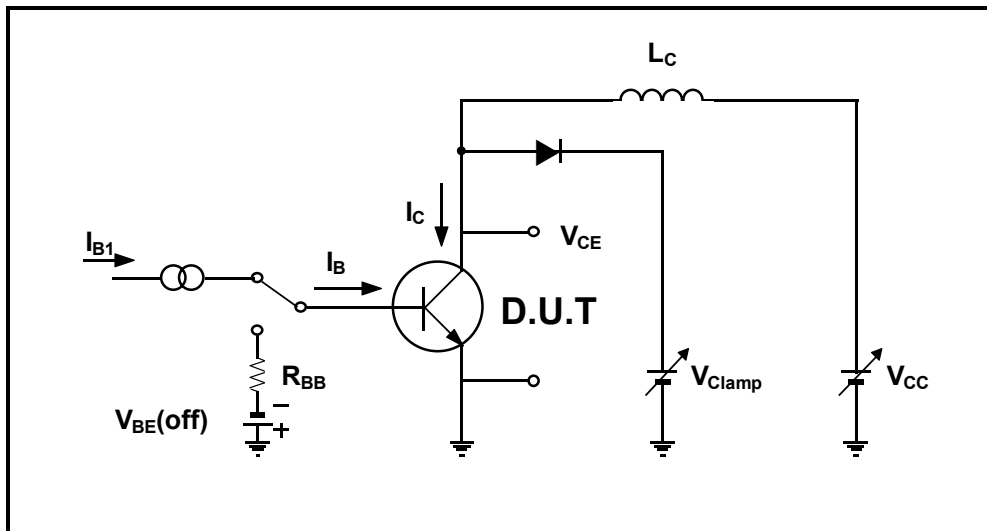


Fig 6. Power Derating Curve



Inductive Load Switching & RBSOA Test Circuit



Resistive Load Switching Test Circuit

