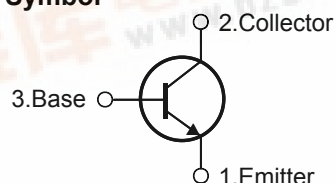
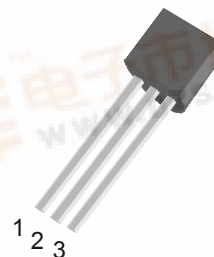


High Voltage Fast-Switching NPN Power Transistor**Features**

- Very High Switching Speed (Typical 120ns@1.0A)
- Minimum Lot-to-Lot hFE Variation
- Low VCE(sat) (Typical 230mV@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.

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 ($I_C = 0$)	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 $T_C = 25^\circ\text{C}$	1.1	W
T_{STG}	Storage Temperature	- 65 ~ 150	$^\circ\text{C}$
T_J	Max. Operating Junction Temperature	150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	113.6	$^\circ\text{C/W}$

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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	$I_C = 1.0A$ $V_{CC} = 125V$ $I_{B1} = 0.2A$ $I_{B2} = -0.2A$ $T_P = 25\mu s$	-	0.25 1.32 0.23	1.0 3.0 0.4	μs
t_s t_f	Inductive Load Storage Time Fall Time	$V_{CC} = 15V$ $I_C = 1.0A$ $I_{B1} = 0.2A$ $I_{B2} = -0.5A$ $L = 0.35mH$ $V_{clamp} = 300V$	-	1.2 0.12	4.0 0.3	μs
t_s t_f	Inductive Load Storage Time Fall Time	$V_{CC} = 15V$ $I_C = 1.0A$ $I_{B1} = 0.2A$ $I_{B2} = -0.5A$ $L = 0.35mH$ $V_{clamp} = 300V$ $T_C = 100\text{ }^{\circ}\text{C}$	-	1.8 0.16	5.0 0.4	μs

※ Notes :

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

Fig 1. Static Characteristics

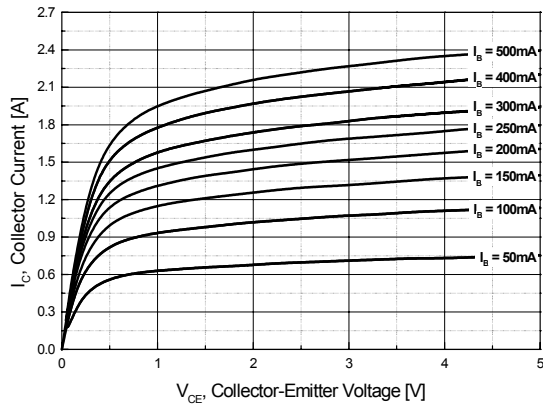


Fig 2. DC Current Gain

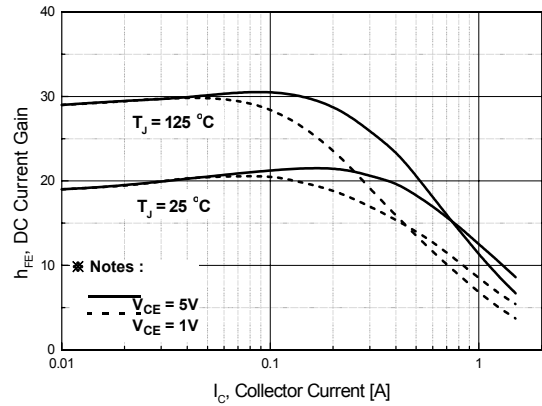


Fig 3. Collector-Emitter Saturation Voltage

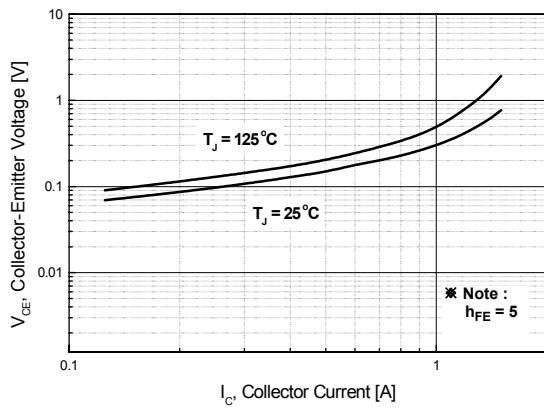


Fig 4. Base-Emitter Saturation Voltage

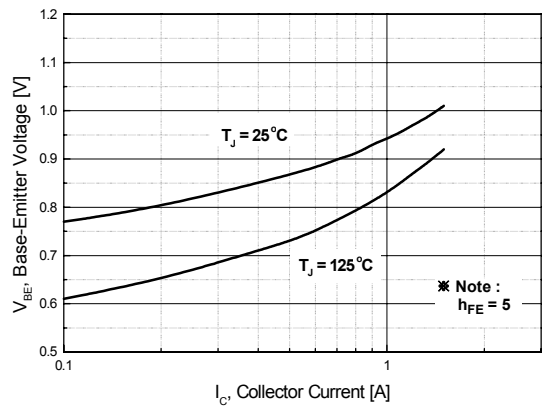


Fig 5. Resistive Load Fall Time

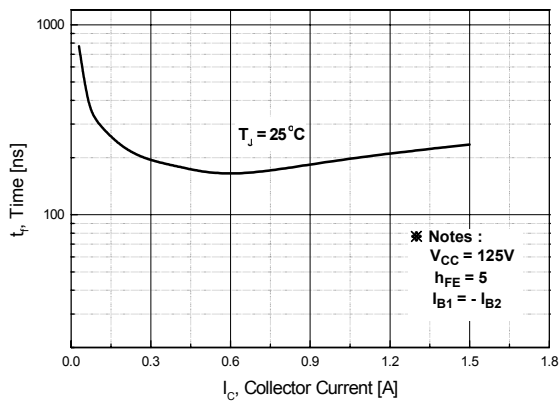
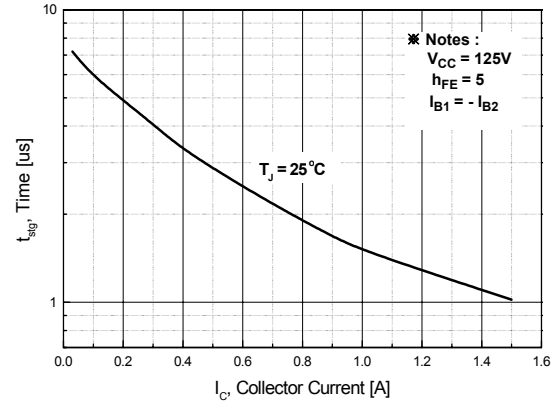


Fig 6. Resistive Load Storage Time



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Fig 7. Safe Operation Areas

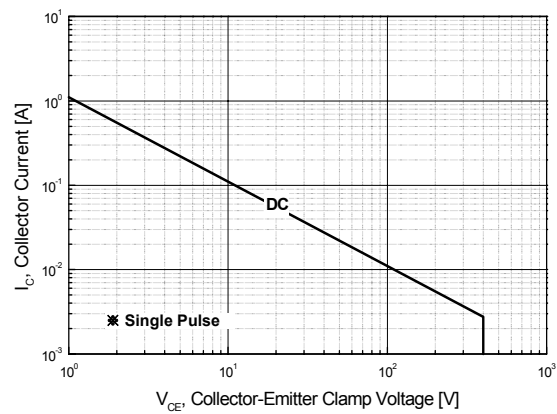
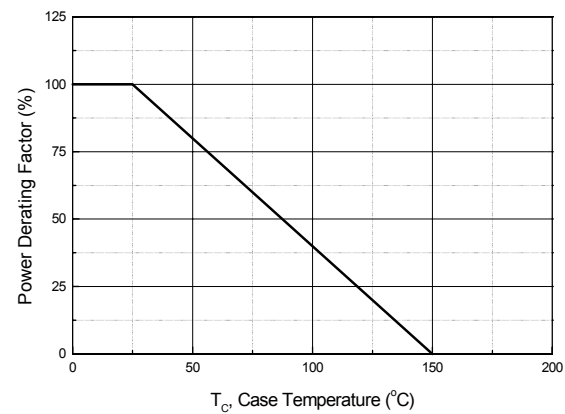
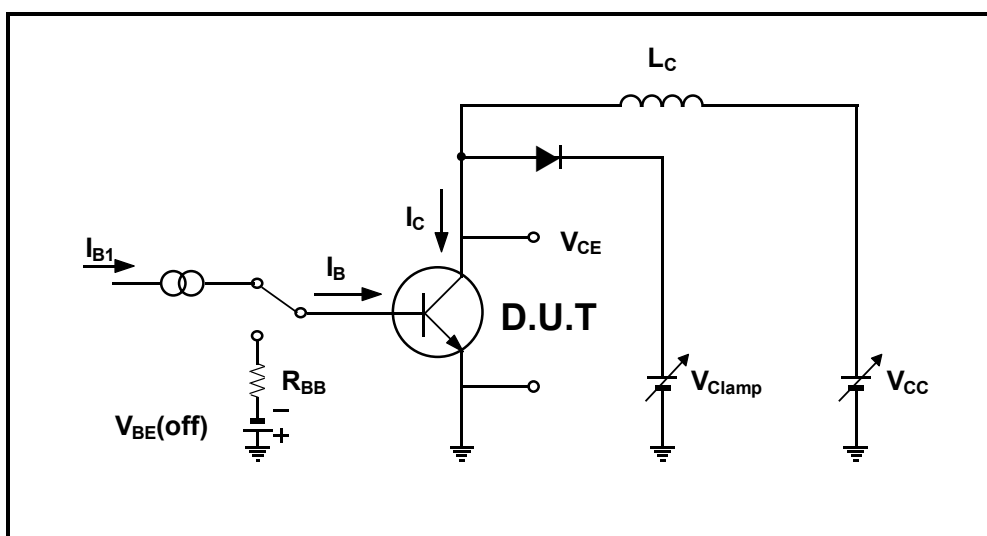


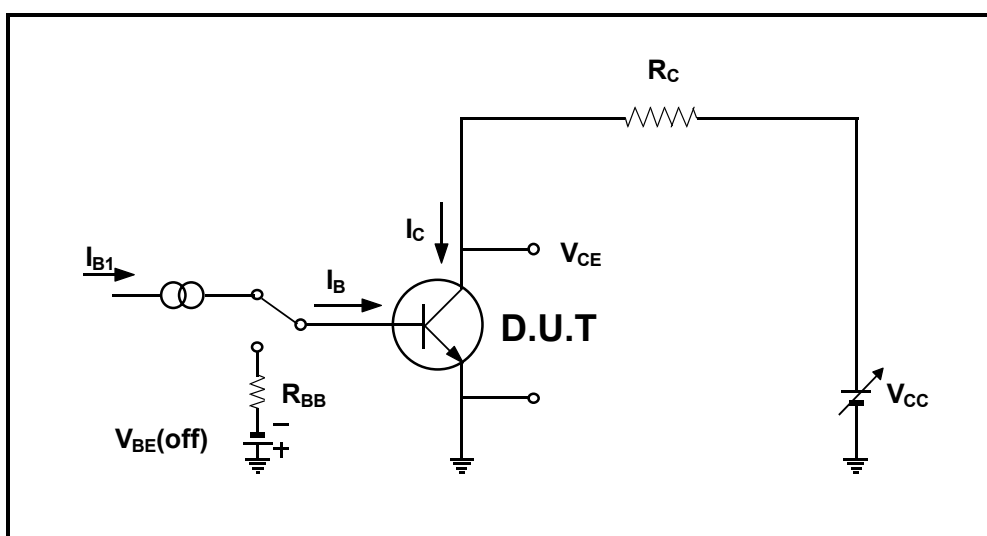
Fig 9. Power Derating Curve



Inductive Load Switching & RBSOA Test Circuit



Resistive Load Switching Test Circuit



SBN13003A

TO-92 Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		4.2			0.165	
B			3.7			0.146
C	4.43		4.83	0.174		0.190
D	14.07		14.87	0.554		0.585
E			0.4			0.016
F	4.43		4.83	0.174		0.190
G			0.45			0.017
H		2.54			0.100	
I		2.54			0.100	
J	0.33		0.48	0.013		0.019

