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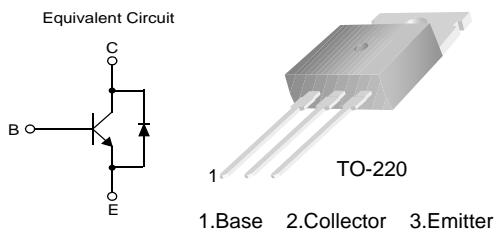
NPN Silicon Transistor

July 2008



High Voltage High Speed Power Switch Application

- Wide Safe Operating Area
- Built-in Free Wheeling diode Suitable for Electronic Ballast Application
- Suitable for Electronic Ballast Application
- Small Variance in Storage Time



Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	700	V
V_{CEO}	Collector-Emitter Voltage	400	V
V_{EBO}	Emitter-Base Voltage	12	V
I_C	Collector Current (DC)	4	A
I_{CP}	* Collector Current (Pulse)	8	A
I_B	Base Current (DC)	2	A
I_{BP}	* Base Current (Pulse)	4	A
P_C	Collector Dissipation ($T_C=25^\circ\text{C}$)	70	W
T_{STG}	Storage Temperature	- 65 ~ 150	°C

* Pulse Test Pulse Width = 5ms, Duty Cycle $\geq 1.0\%$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
BV_{CBO}	Collector-Base Breakdown Voltage	$I_C = 1\text{mA}$, $I_E = 0$	700			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	$I_C = 5\text{mA}$, $I_B = 0$	400			V
BV_{EBO}	Emitter-Base Breakdown Voltage	$I_E = 1\text{mA}$, $I_C = 0$	12			V
I_{CES}	Collector Cut-off Current	$V_{CE} = 700\text{V}$, $V_{EB} = 0$			100	mA
I_{CEO}	Collector Cut-off Current	$V_{CE} = 400\text{V}$, $I_B = 0$			250	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 12\text{V}$, $I_C = 0$			100	mA

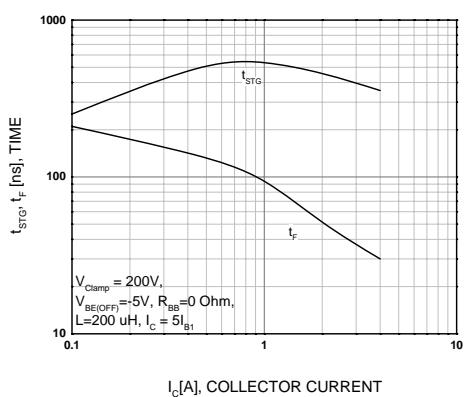
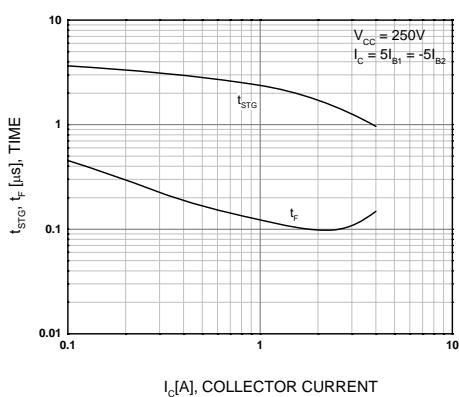
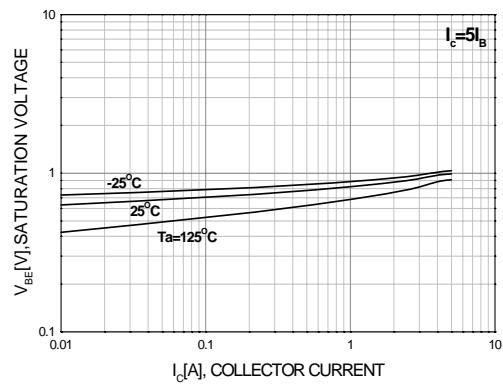
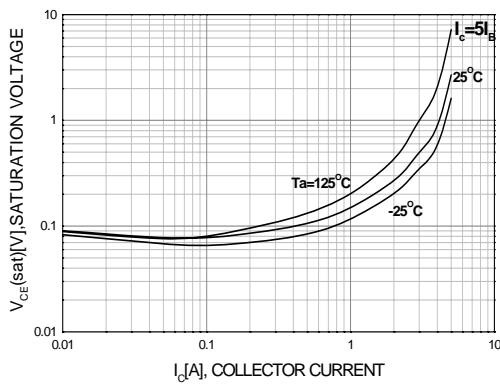
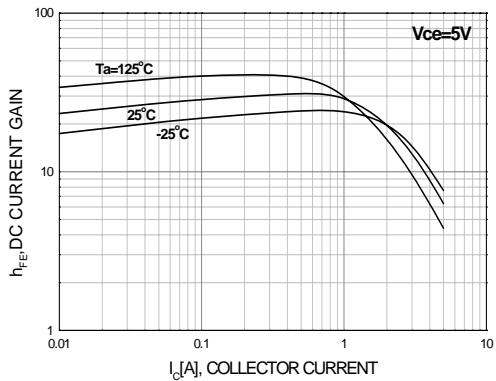
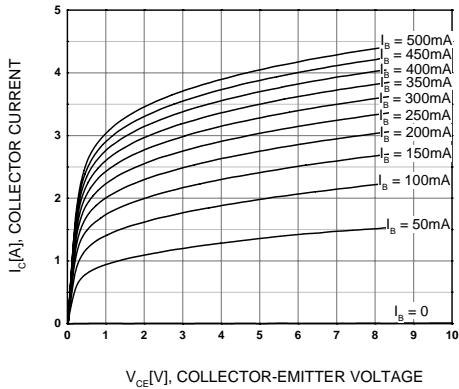
h_{FE}	DC Current Gain	$V_{CE} = 5V, I_C = 10mA$ $V_{CE} = 5V, I_C = 2A$	10	8	40	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 0.5A, I_B = 0.1A$ $I_C = 1A, I_B = 0.2A$ $I_C = 2.5A, I_B = 0.5A$			0.7 1.0 1.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 0.5A, I_B = 0.1A$ $I_C = 1A, I_B = 0.2A$ $I_C = 2.5A, I_B = 0.5A$			1.1 1.2 1.3	V
V_f	Internal Diode Forward Voltage Drop	$I_F = 2A$			2.5	V
Inductive Load Switching ($V_{CC} = 200V$)						
t_{stg}	Storage Time	$I_C = 2A, I_{B1} = 0.4A$ $V_{BE(off)} = -5V, L = 200\mu H$		0.6		μs
t_f	Fall Time			0.1		
Resistive Load Switching ($V_{CC} = 250V$)						
t_{stg}	Storage Time	$I_C = 2A, I_{B1} = I_{B2} = 0.4A$ $T_P = 30\mu s$			2.9	μs
t_f	Fall Time			0.2		

* Pulse test: $PW \leq 300\mu s$, Duty cycle $\leq 2\%$

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.78	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	$^{\circ}C/W$

Typical Characteristics



Typical Characteristics (Continued)

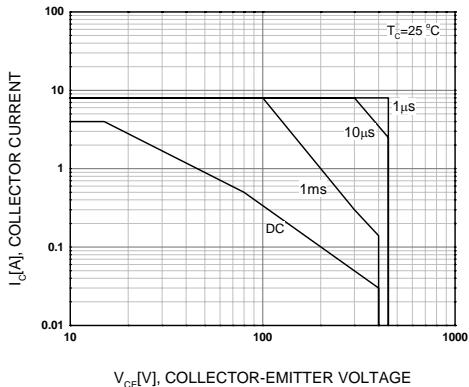


Figure 1. Forward Bias Safe Operating Area

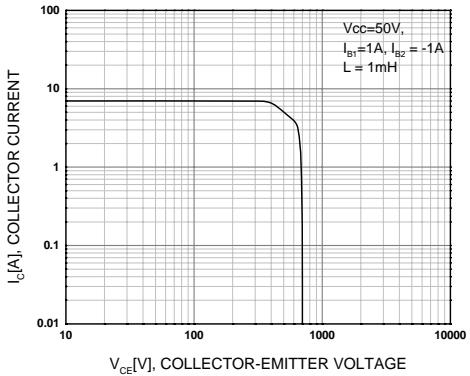


Figure 2. Reverse Bias Safe Operating Area

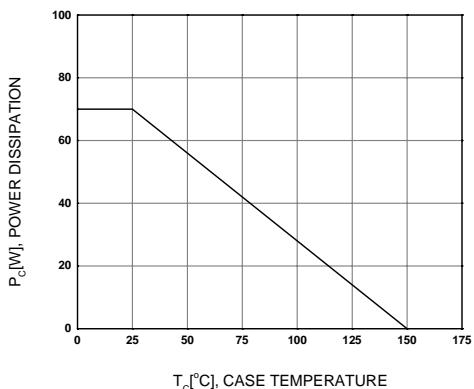
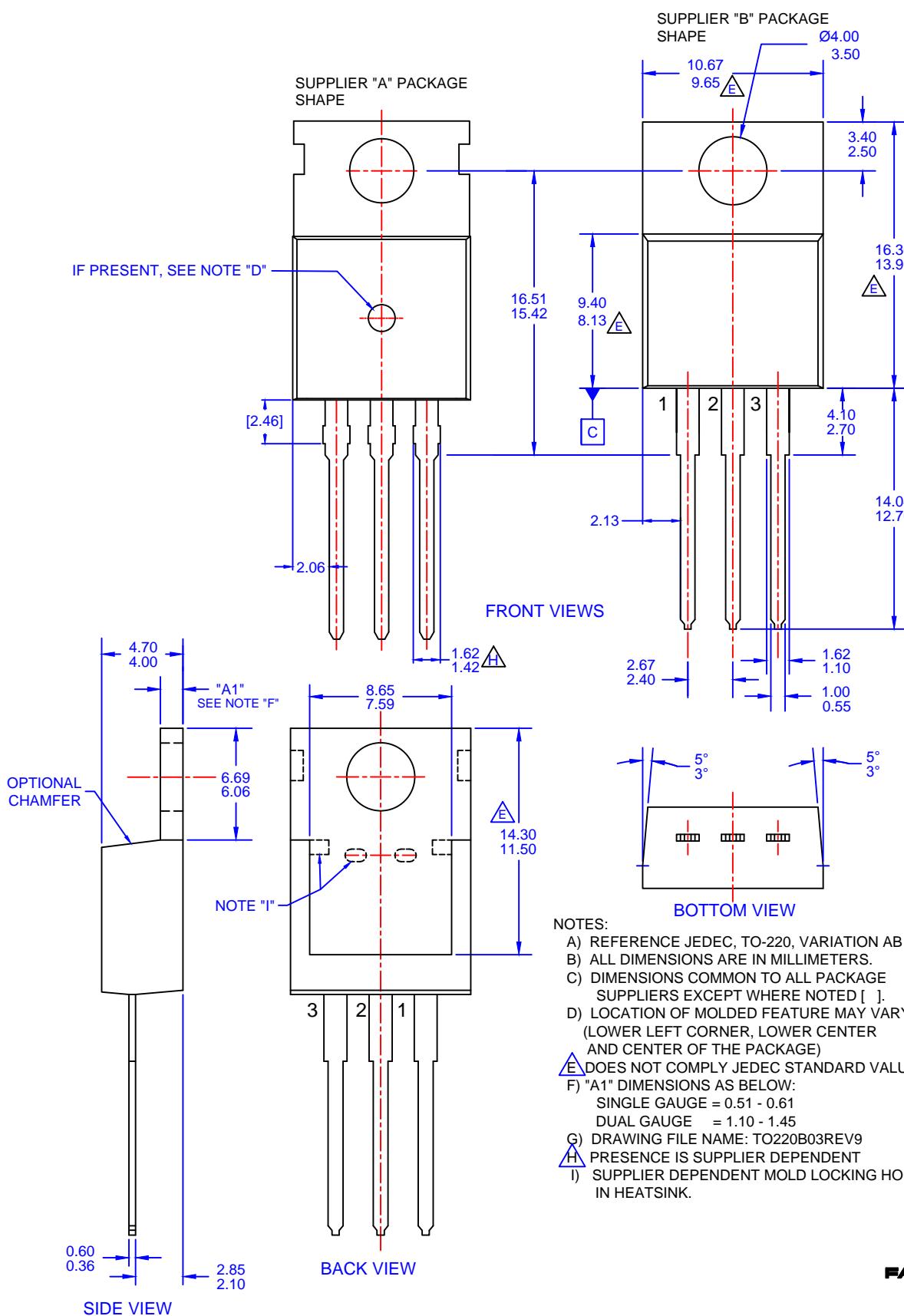


Figure 3. Power Derating



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