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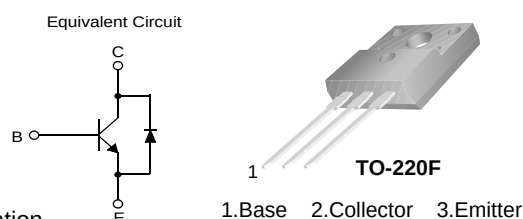
NPN Silicon Transistor

Features

- High Voltage High Speed Power Switch

Application

- Built-in Free-wheeling Diode makes efficient anti saturation operation
- Suitable for half bridge light ballast Applications
- No need to interest an h_{FE} value because of low variable storage-time spread even though corner spirit product
- Low base drive requirement



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

Symbol	Parameter	Value	Units
V_{CBO}	Collector Base Voltage	800	V
V_{CEO}	Collector Emitter Voltage	400	V
V_{EBO}	Emitter Base Voltage	12	V
I_C	Collector Current (DC)	5	A
I_{CP}	*Collector Current (Pulse)	10	A
I_B	Base Current (DC)	2	A
I_{BP}	*Base Current (Pulse)	4	A
P_C	Power Dissipation ($T_C=25^\circ\text{C}$)	40	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature range	-65 to +150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.125	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	69.5	$^\circ\text{C/W}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
BV_{CBO}	Collector-Base Breakdown Voltage	$I_C=1\text{mA}, I_E=0$	800	-	-	V
BV_{CEO}	Collector-Emitter Breakdown Voltage	$I_C=5\text{mA}, I_B=0$	400	-	-	V
BV_{EBO}	Emitter Cut-off Current	$I_E=1\text{mA}, I_C=0$	12	-	-	V
I_{CBO}	Collector Cut-off Current	$V_{CB}=500\text{V}, I_E=0$	-	-	10	μA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$	-	-	10	μA
h_{FE1} h_{FE2}	DC Current Gain	$V_{CE}=1\text{V}, I_C=0.8\text{A}$ $V_{CE}=1\text{V}, I_C=2\text{A}$	22 8	- -	- -	
$V_{CE}(\text{sat})$	Collector-Emitter Saturation Voltage	$I_C=0.8\text{A}, I_B=0.08\text{A}$ $I_C=2\text{A}, I_B=0.4\text{A}$	- -	- -	0.4 0.5	V V
$V_{BE}(\text{sat})$	Base-Emitter Saturation Voltage	$I_C=0.8\text{A}, I_B=0.08\text{A}$ $I_C=2\text{A}, I_B=0.4\text{A}$	- -	- -	1.0 1.0	V V
C_{ob}	Output Capacitance	$V_{CB} = 10\text{V}, f=1\text{MHz}$	-	-	75	pF
t_{ON}	Turn On Time	$V_{CC}=300\text{V}, I_C=2\text{A}$ $I_{B1} = 0.4\text{A}, I_{B2}=-1\text{A}$ $R_L = 150\Omega$	-	-	150	ns
t_{STG}	Storage Time		-	-	2	μs
t_F	Fall Time		-	-	0.2	μs
t_{STG}	Storage Time	$V_{CC}=15\text{V}, V_Z=300\text{V}$ $I_C = 2\text{A}, I_{B1} = 0.4\text{A}$ $I_{B2} = -0.4\text{A}, L_C=200\mu\text{H}$	-	-	2.25	μs
t_F	Fall Time		-	-	150	ns
V_F	Diode Forward Voltage	$I_F = 1\text{A}$ $I_F = 2\text{A}$	- -	- -	1.5 1.6	V V
t_{rr}	* Reverse recovery time ($di/dt = 10\text{A}/\mu\text{s}$)	$I_F = 0.4\text{A}$ $I_F = 1\text{A}$ $I_F = 2\text{A}$	- - -	800 1.4 1.9	- - -	ns μs μs

* Pulse Test : Pulse Width=5mS, Duty cycles $\leq 10\%$

Typical Performance Characteristics

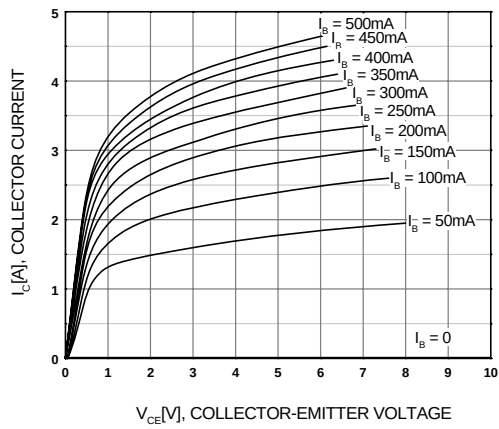


Figure 1. Static Characteristic

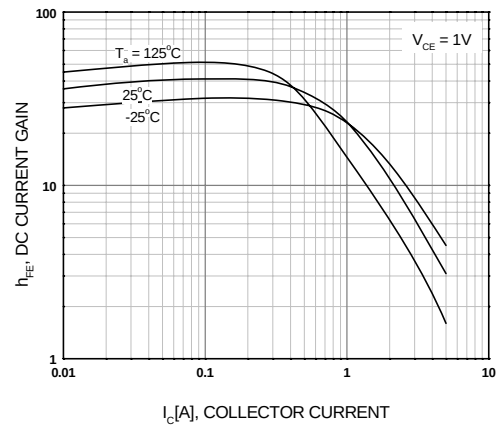


Figure 2. DC current Gain

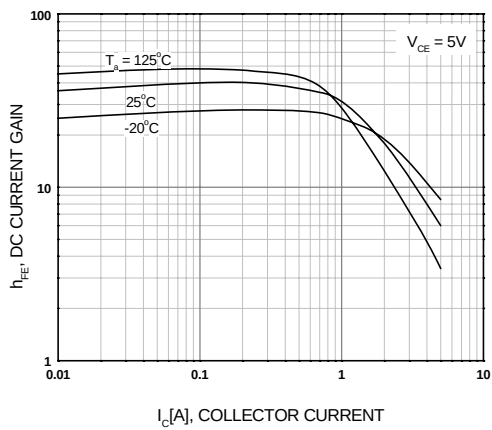


Figure 3. DC current Gain

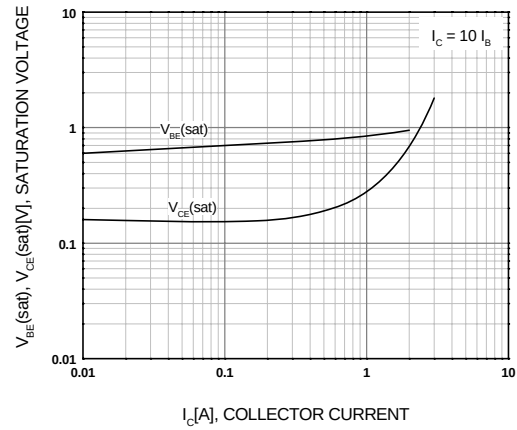


Figure 4. Collector-Emitter Saturation Voltage
Base-Emitter Saturation Voltage

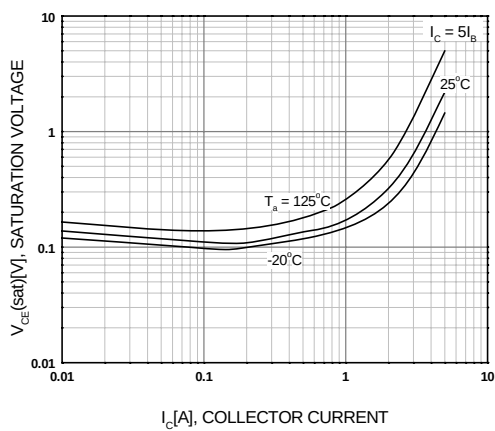


Figure 5. Collector-Emitter Saturation Voltage

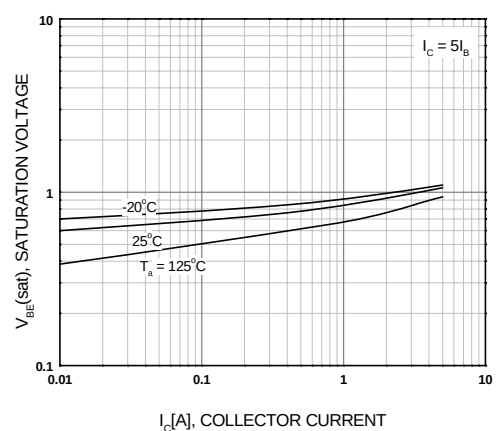


Figure 6. Base-Emitter Saturation Voltage

Typical Performance Characteristics

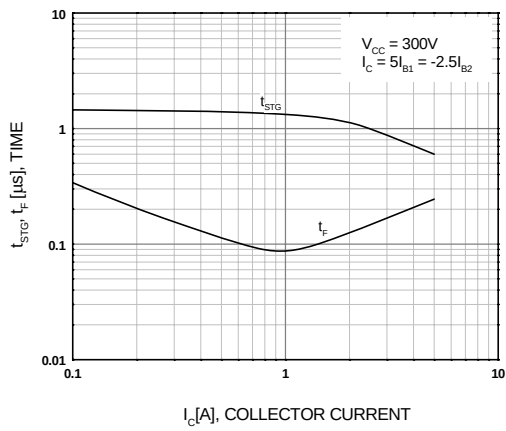


Figure 7. Switching Time

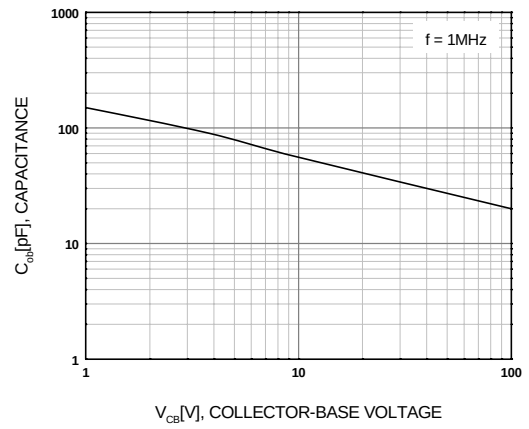


Figure 8. Collector Output Capacitance

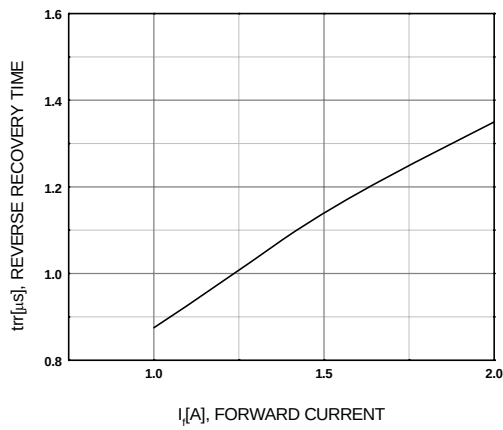


Figure 9. Reverse Recovery Time

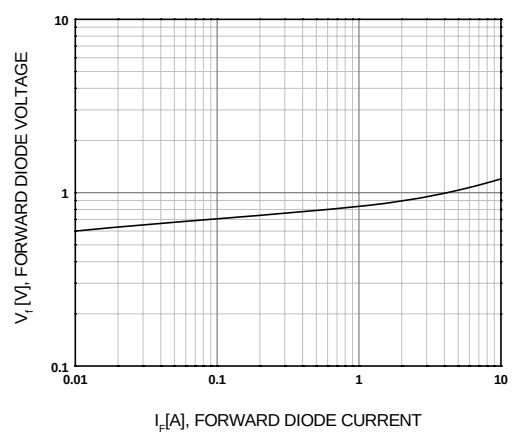


Figure 10. Forward Diode Voltage

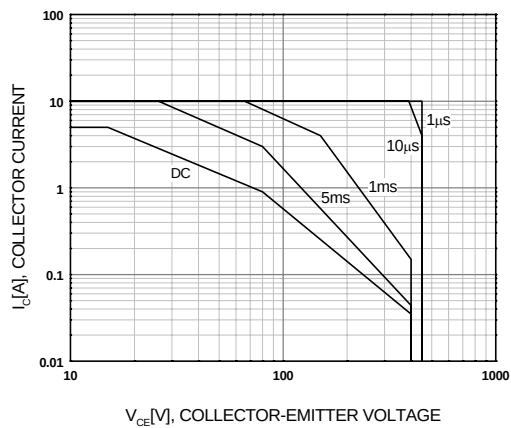


Figure 11. Safe Operating Area

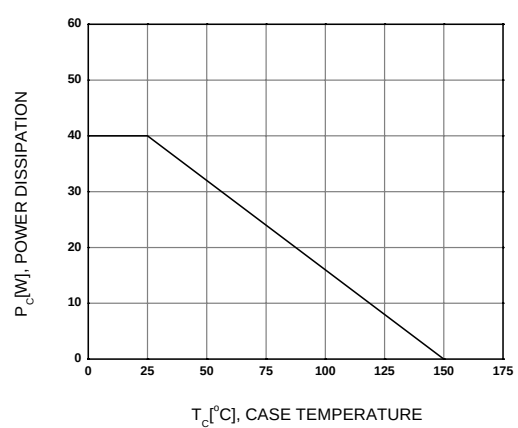
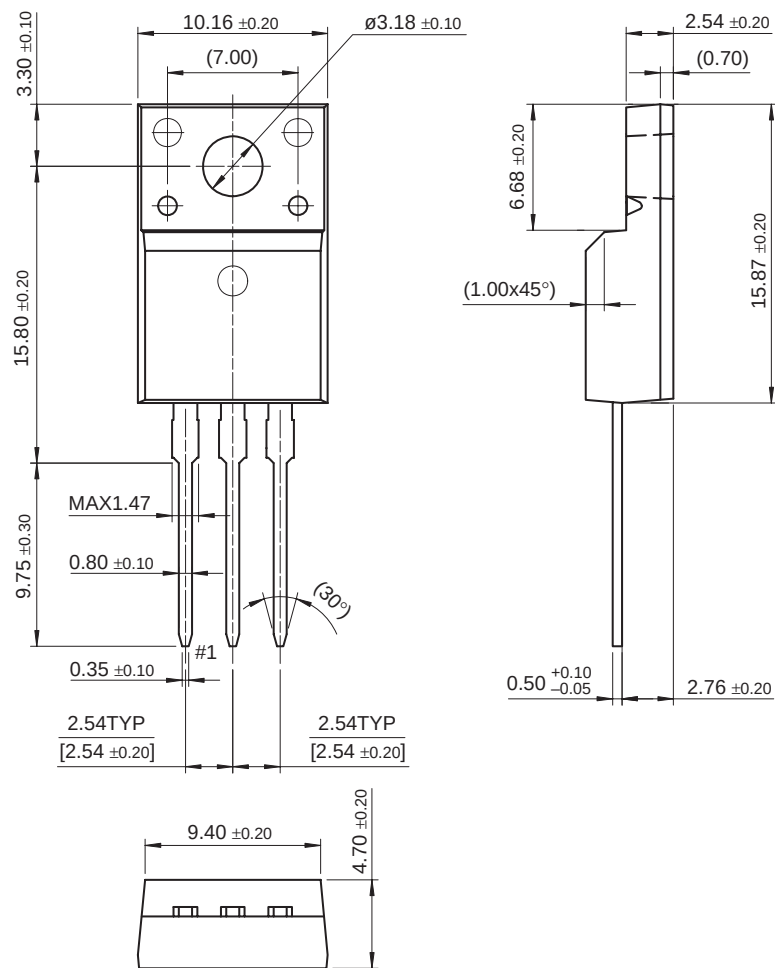


Figure 12. Power Derating

Physical Dimension

TO-220F



Dimensions in Millimeters



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