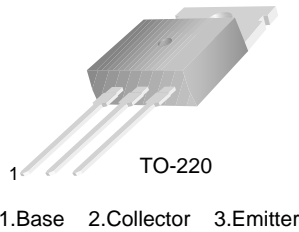


# FJP13009

## High Voltage Fast-Switching NPN Power Transistor

- High Voltage Capability
- High Switching Speed
- Suitable for Electronic Ballast and Switching Mode Power Supply



### Absolute Maximum Ratings\* $T_C = 25^\circ\text{C}$ unless otherwise noted (notes\_1)

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	700	V
$V_{CEO}$	Collector-Emitter Voltage	400	V
$V_{EBO}$	Emitter-Base Voltage	9	V
$I_C$	Collector Current (DC)	12	A
$I_{CP}$	Collector Current (Pulse)	24	A
$I_B$	Base Current	6	A
$P_C$	Collector Dissipation ( $T_C = 25^\circ\text{C}$ )	100	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-65 ~ 150	$^\circ\text{C}$

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### NOTES\_1:

- 1) These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Package Marking and Ordering Information

Device Item (notes_2)	Device Marking	Package	Packing Method	Qty(pcs)
FJP13009	J13009	TO-220	Bulk	1,200
FJP13009H2TU	J130092	TO-220	TUBE	1,000
FJP13009TU	J13009	TO-220	TUBE	1,000

#### Notes\_2 :

- 1) The Affix "-H2" means the hFE classification.
- 2) The Suffix "-TU" means the Tube packing method, which can be on fairchildsemi website at <http://www.fairchildsemi.com/packaging>.

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

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 10\text{mA}, I_B = 0$	400			V
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			1	mA
$h_{FE}$	* DC Current Gain	$V_{CE} = 5\text{V}, I_C = 5\text{A}$ ( $h_{FE1}$ ) $V_{CE} = 5\text{V}, I_C = 8\text{A}$	8 6		40 30	
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = 5\text{A}, I_B = 1\text{A}$ $I_C = 8\text{A}, I_B = 1.6\text{A}$ $I_C = 12\text{A}, I_B = 3\text{A}$			1 1.5 3	V V V
$V_{BE(sat)}$	* Base-Emitter Saturation Voltage	$I_C = 5\text{A}, I_B = 1\text{A}$ $I_C = 8\text{A}, I_B = 1.6\text{A}$			1.2 1.6	V V
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{V}, f = 0.1\text{MHz}$		180		pF
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}$	4			MHz
$t_{ON}$	Turn On Time	$V_{CC} = 125\text{V}, I_C = 8\text{A}$			1.1	$\mu\text{s}$
$t_{STG}$	Storage Time	$I_{B1} = -I_{B2} = 1.6\text{A}, R_L = 15,6\Omega$			3	$\mu\text{s}$
$t_F$	Fall Time				0.7	$\mu\text{s}$

\* Pulse Test:  $PW \leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

**$h_{FE}$  Classification**

Classification	H1	H2
$h_{FE1}$	8 ~ 17	15 ~ 28

## Typical Performance Characteristics

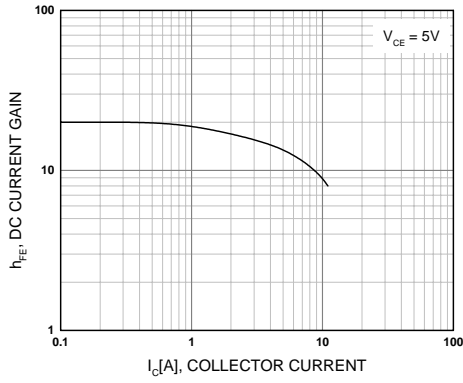


Figure 1. DC current Gain

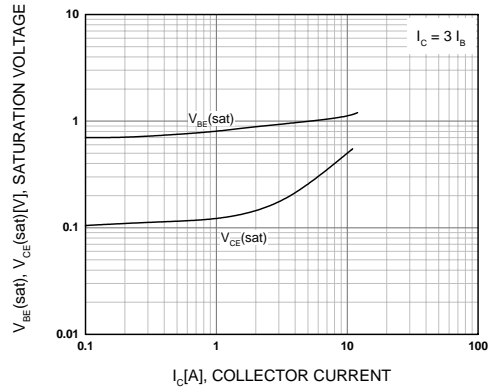


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emmitter Saturation Voltage

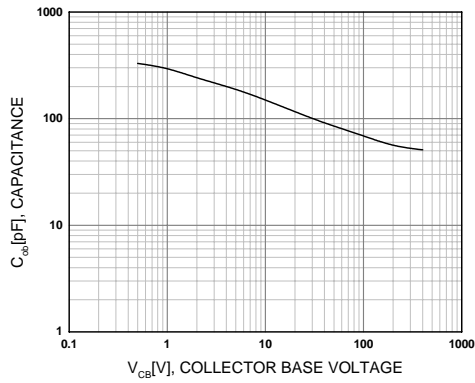


Figure 3. Collector Output Capacitance

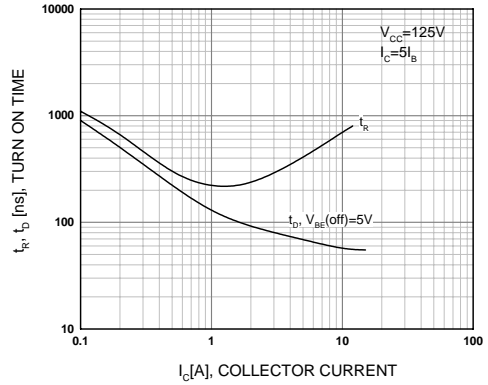


Figure 4. Turn On Time

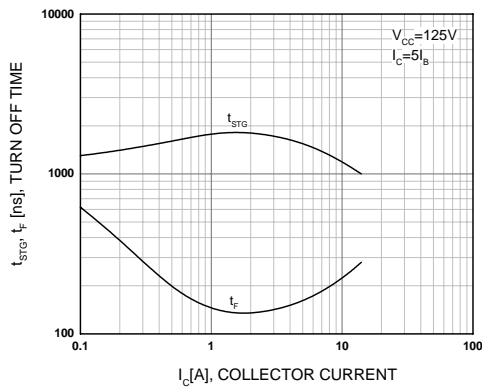


Figure 5. Turn Off Time

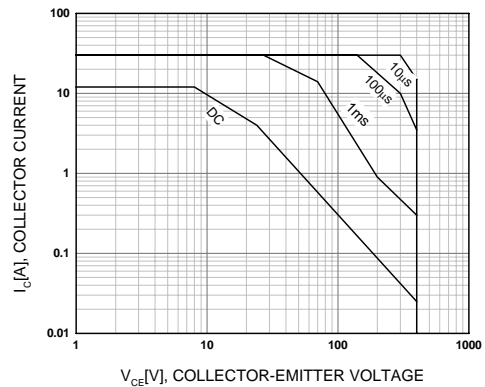
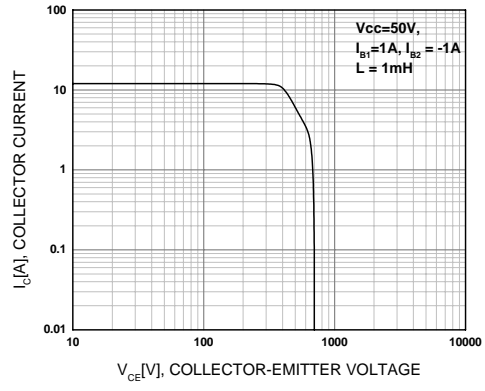
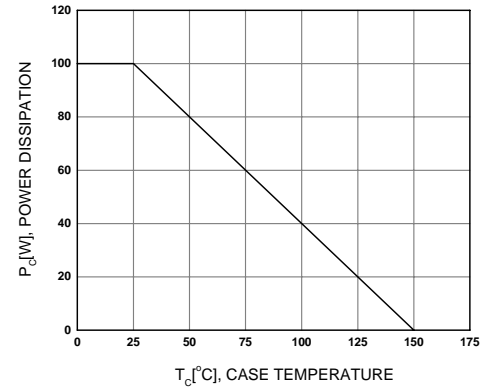


Figure 6. Forward Bias Safe Operating Area

**Typical Performance Characteristics** (Continued)



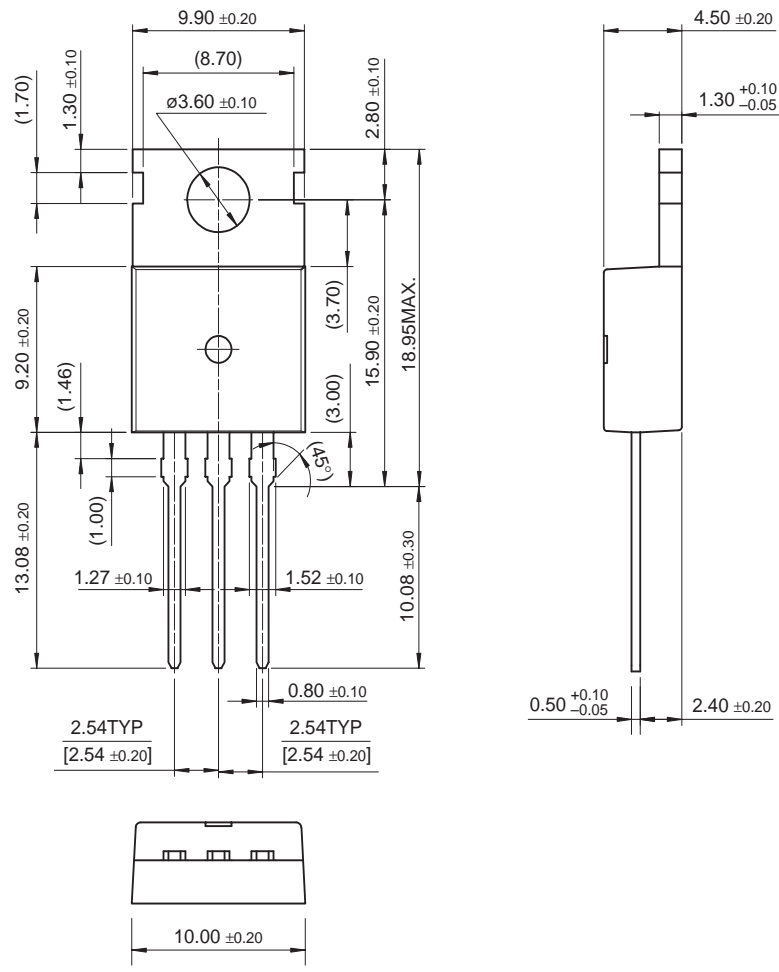
**Figure 7. Reverse Bias Safe Operating Area**



**Figure 8. Power Derating**

Mechanical Dimensions

TO-220




Dimensions in Millimeters



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Rev. I24



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