

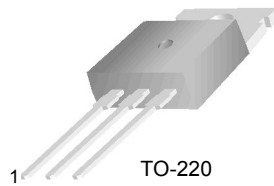


October 2008

# FJP3305

## High Voltage Fast-Switching NPN Power Transistor

- High Voltage Capability
- High Switching Speed
- Suitable for Electronic Ballast and Switching Regulator



1.Base 2.Collector 3.Emitter

### Absolute Maximum Ratings T<sub>C</sub> = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CB0</sub>	Collector-Base Voltage	700	V
V <sub>CEO</sub>	Collector-Emitter Voltage	400	V
V <sub>EBO</sub>	Emitter-Base Voltage	9	V
I <sub>C</sub>	Collector Current (DC)	4	A
I <sub>CP</sub>	Collector Current (Pulse)	8	A
I <sub>B</sub>	Base Current	2	A
P <sub>C</sub>	Collector Dissipation (T <sub>C</sub> = 25°C)	75	W
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>STG</sub>	Storage Temperature	-65 ~ 150	°C

FJP3305 — High Voltage Fast-Switching NPN Power Transistor

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

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
$BV_{CBO}$	Collector-Base Breakdwon Voltage	$I_C = 500\mu\text{A}, I_E = 0$	700			V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 5\text{mA}, I_B = 0$	400			V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 500\mu\text{A}, I_C = 0$	9			V
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = 700\text{V}, I_E = 0$			1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			1	$\mu\text{A}$
$h_{FE1}$ $h_{FE2}$	DC Current Gain *	$V_{CE} = 5\text{V}, I_C = 1\text{A}$ $V_{CE} = 5\text{V}, I_C = 2\text{A}$	19 8		35 40	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 1\text{A}, I_B = 0.2\text{A}$ $I_C = 2\text{A}, I_B = 0.5\text{A}$ $I_C = 4\text{A}, I_B = 1\text{A}$			0.5 0.6 1.0	V V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 1\text{A}, I_B = 0.2\text{A}$ $I_C = 2\text{A}, I_B = 0.5\text{A}$			1.2 1.6	V V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}$	4			MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		65		pF
$t_{ON}$	Turn On Time	$V_{CC} = 125\text{V}, I_C = 2\text{A}$			0.8	$\mu\text{s}$
$t_{STG}$	Storage Time	$I_{B1} = -I_{B2} = 0.4\text{A}$ $R_L = 62.5\Omega$			4.0	$\mu\text{s}$
$t_F$	Fall Time				0.9	$\mu\text{s}$

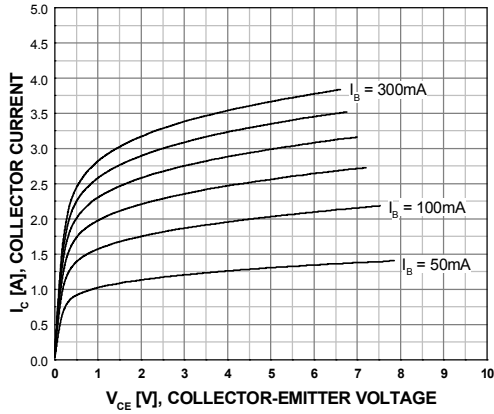
\* Pulse Test:  $PW \leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

**$h_{FE}$  Classification**

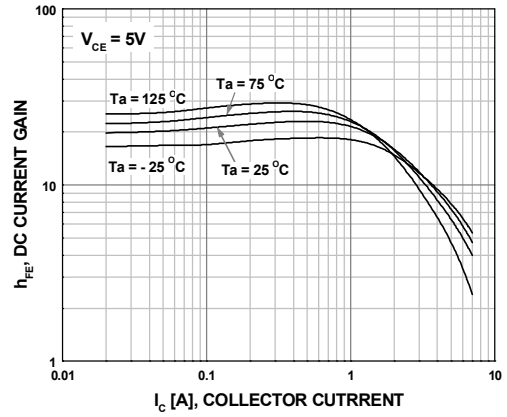
Classification	H1	H2
$h_{FE1}$	19 ~ 28	26 ~ 35

## Typical Performance Characteristics

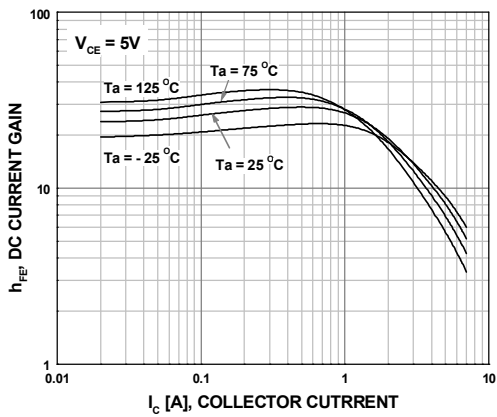
**Figure 1. Static Characteristic**



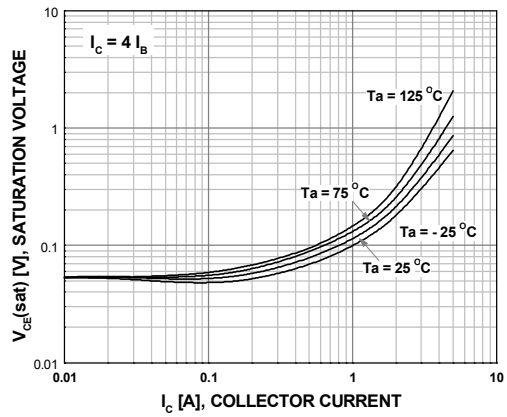
**Figure 2. DC Current Gain (R-Grade)**



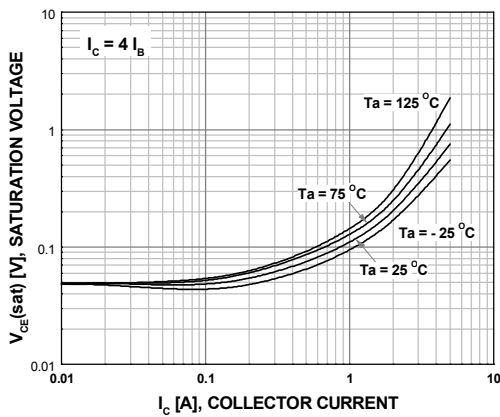
**Figure 3. DC Current Gain (O-Grade)**



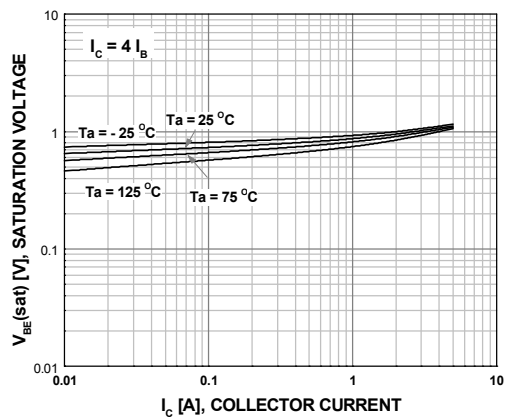
**Figure 4. Saturation Voltage (R-Grade)**



**Figure 5. Saturatin Voltage (O-Grade)**

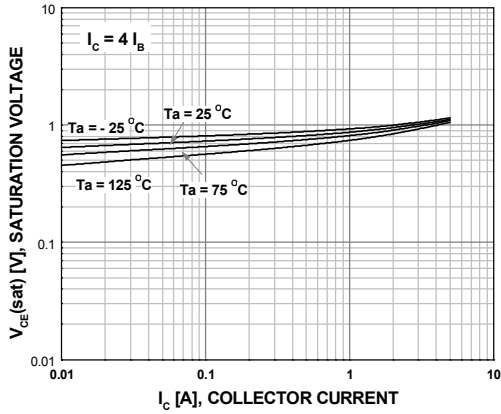


**Figure 6. Saturation Voltage (R-Grade)**

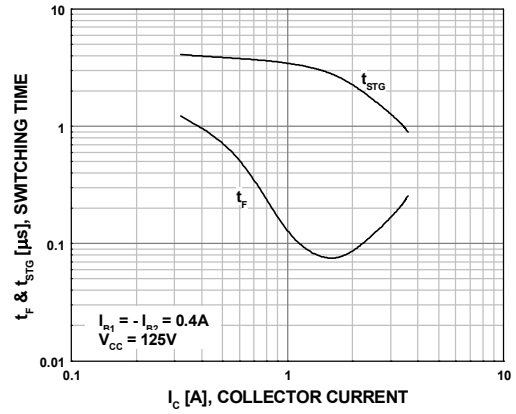


**Typical Performance Characteristics** (Continued)

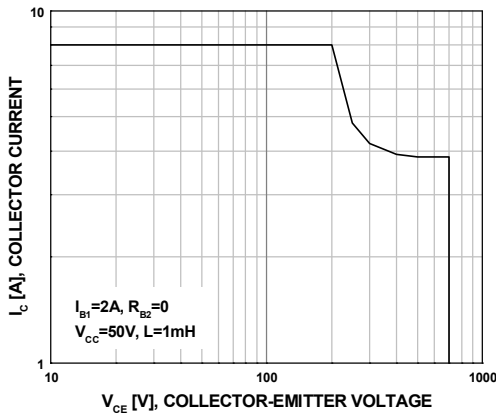
**Figure 7. Saturation Voltage (O-Grade)**



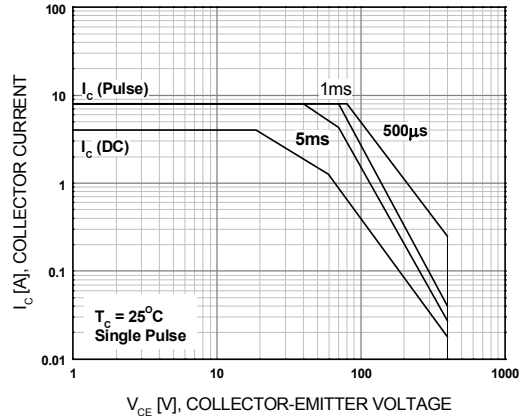
**Figure 8. Switching Time**



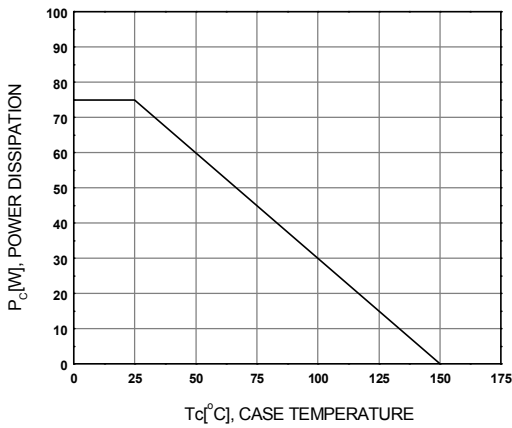
**Figure 9. Reverse Biased Safe Operating Area**

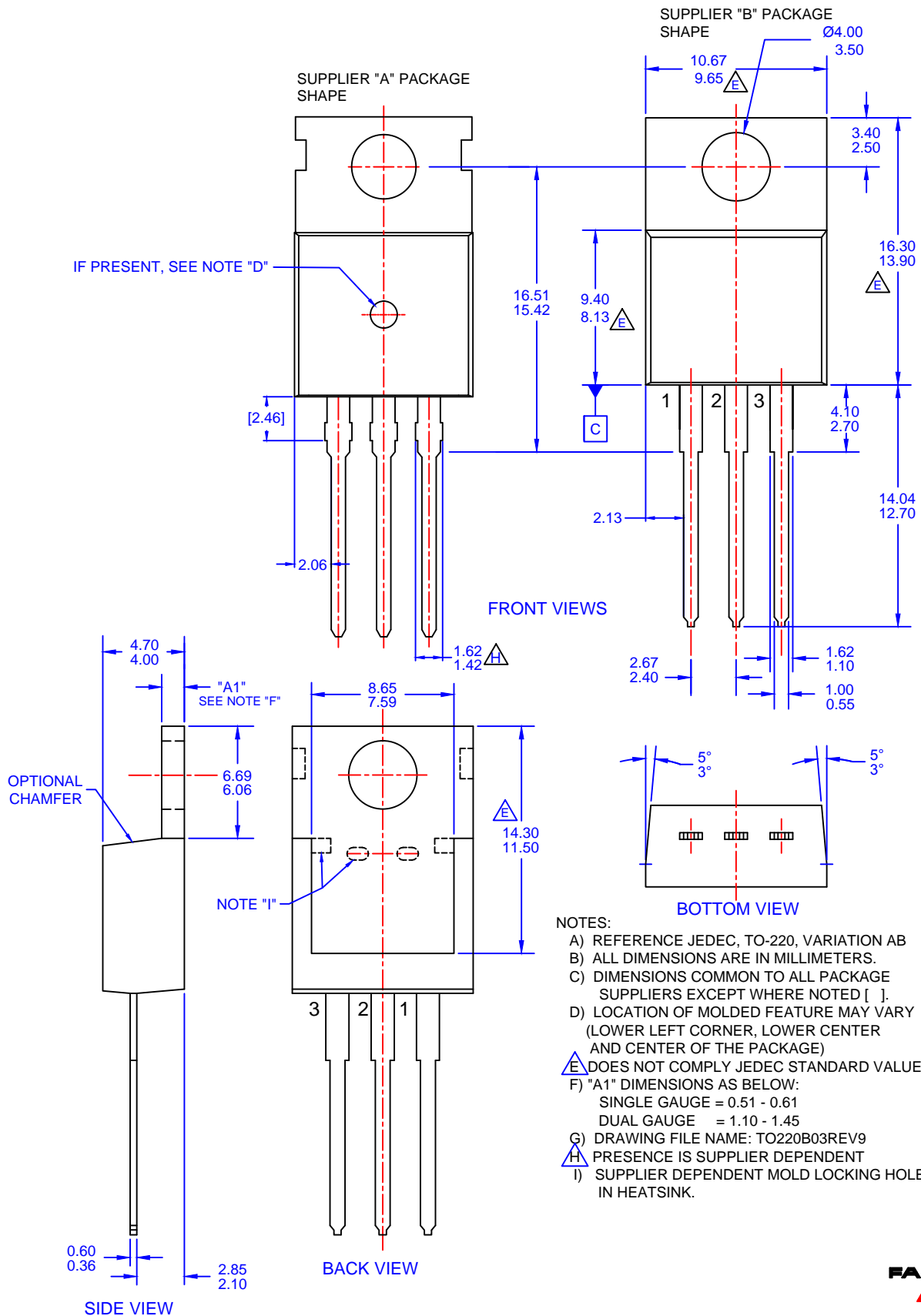


**Figure 10. Forward Biased Safe Operating Area**



**Figure 11. Power Derating**





- NOTES:
- A) REFERENCE JEDEC, TO-220, VARIATION AB
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [ ].
  - D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
  - E) DOES NOT COMPLY JEDEC STANDARD VALUE.
  - F) "A1" DIMENSIONS AS BELOW:  
 SINGLE GAUGE = 0.51 - 0.61  
 DUAL GAUGE = 1.10 - 1.45
  - G) DRAWING FILE NAME: TO220B03REV9
  - H) PRESENCE IS SUPPLIER DEPENDENT
  - I) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.



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