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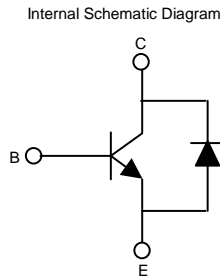
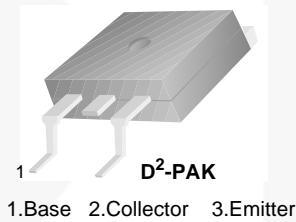
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# FJB3307D

## High-Voltage Fast-Switching NPN Power Transistor

### Features

- Built-in Diode between Collector and Emitter
- Suitable for Electronic Ballast and Switch-Mode Power Supplies



### Ordering Information

Part Number	Marking	Package	Packing Method
FJB3307DTM	J3307D	D <sup>2</sup> -PAK	Tape and Reel

### Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  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	9	V
$I_C$	Collector Current (DC)	8	A
$I_{CP}^{(1)}$	Collector Current (Pulse)	16	A
$I_B$	Base Current (DC)	4	A
$I_{BP}^{(1)}$	Base Current (Pulse)	8	A
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	-55 to 150	$^\circ\text{C}$

**Note:**

1. Pulse test: pulse width = 300 $\mu\text{s}$ , duty cycle = 2% pulsed.

### Thermal Characteristics

Symbol	Parameter	Value	Units	
P <sub>D</sub>	Total Device Dissipation	T <sub>A</sub> = 25°C	1.72	W
		T <sub>C</sub> = 25°C	80	W
R <sub>θja</sub>	Thermal Resistance, Junction to Ambient	72.5	°C/W	
R <sub>θjc</sub>	Thermal Resistance, Junction to Case	1.56	°C/W	

### Electrical Characteristics<sup>(2)</sup>

Values are at T<sub>A</sub> = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV <sub>CB0</sub>	Collector-Base Breakdown Voltage	I <sub>C</sub> = 500 μA, I <sub>E</sub> = 0	700			V
BV <sub>CEO</sub>	Collector-Emitter Breakdown Voltage	I <sub>C</sub> = 5 mA, I <sub>B</sub> = 0	400			V
BV <sub>EBO</sub>	Emitter-Base Breakdown Voltage	I <sub>E</sub> = 500 μA, I <sub>C</sub> = 0	9			V
I <sub>EBO</sub>	Emitter Cut-Off Current	V <sub>EB</sub> = 9 V, I <sub>C</sub> = 0			1	mA
h <sub>FE1</sub>	DC Current Gain	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 A	8		40	
h <sub>FE2</sub>		V <sub>CE</sub> = 5 V, I <sub>C</sub> = 5 A	5		30	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = 2 A, I <sub>B</sub> = 0.4 A			1	V
		I <sub>C</sub> = 5 A, I <sub>B</sub> = 1 A			2	V
		I <sub>C</sub> = 5 A, I <sub>B</sub> = 1 A, T <sub>A</sub> = 100°C			3	V
		I <sub>C</sub> = 8 A, I <sub>B</sub> = 2 A			3	V
V <sub>BE(sat)</sub>	Base-Emitter Saturation Voltage	I <sub>C</sub> = 2 A, I <sub>B</sub> = 0.4 A			1.2	V
		I <sub>C</sub> = 5 A, I <sub>B</sub> = 1 A			1.6	V
		I <sub>C</sub> = 5 A, I <sub>B</sub> = 1 A, T <sub>A</sub> = 100°C			2.0	V
V <sub>F</sub>	Diode Forward Voltage	I <sub>C</sub> = 3 A			2.5	V
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz		60		pF
t <sub>STG</sub>	Storage Time	V <sub>CC</sub> = 125 V, I <sub>C</sub> = 5 A,			3.0	μs
t <sub>F</sub>	Fall Time	I <sub>B1</sub> = -I <sub>B2</sub> = 1 A, R <sub>L</sub> = 50 Ω			0.7	μs
t <sub>STG</sub>	Storage Time	V <sub>CC</sub> = 30 V, I <sub>C</sub> = 5 A, L = 200 μH			2.3	μs
t <sub>F</sub>	Fall Time	I <sub>B1</sub> = 1 A, R <sub>BB</sub> = 0 Ω, V <sub>BE(OFF)</sub> = -5 V, V <sub>CLAMP</sub> = 250 V			150	ns

**Note:**

2. Pulse test: pw = 300 μs, duty cycle = 2%.

### h<sub>FE</sub> Classification

Classification	H1	H2
h <sub>FE1</sub>	15 ~ 28	26 ~ 39

## Typical Performance Characteristics

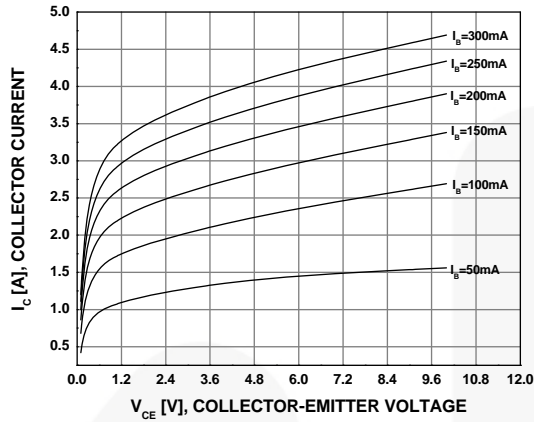


Figure 1. Static Characteristic

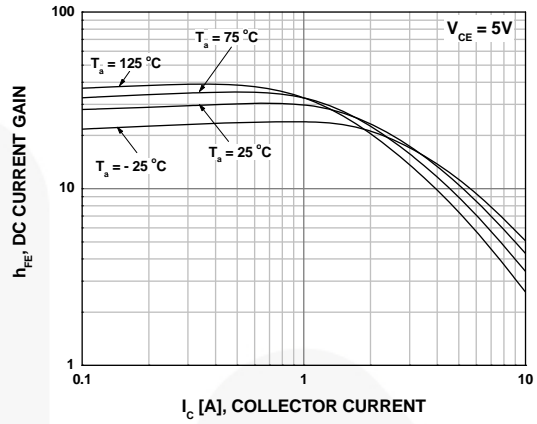


Figure 2. DC Current Gain

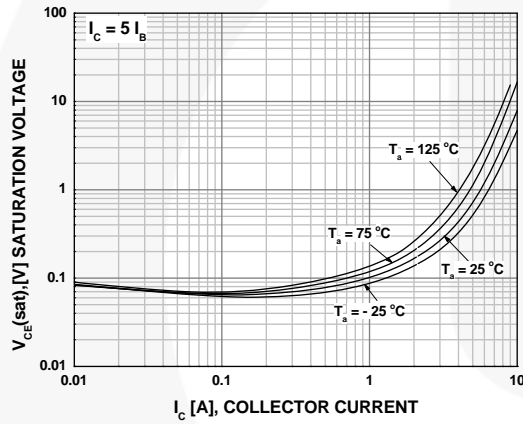


Figure 3. Collector-Emitter Saturation Voltage

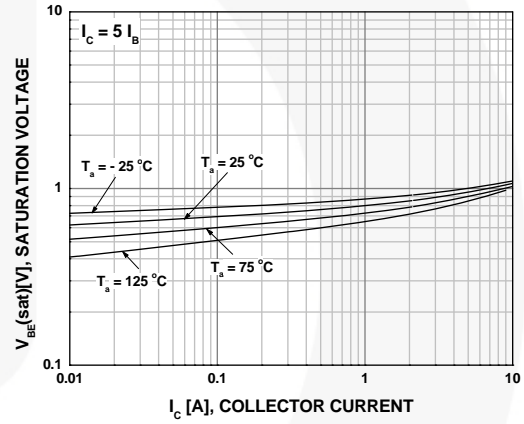


Figure 4. Base-Emitter Saturation Voltage

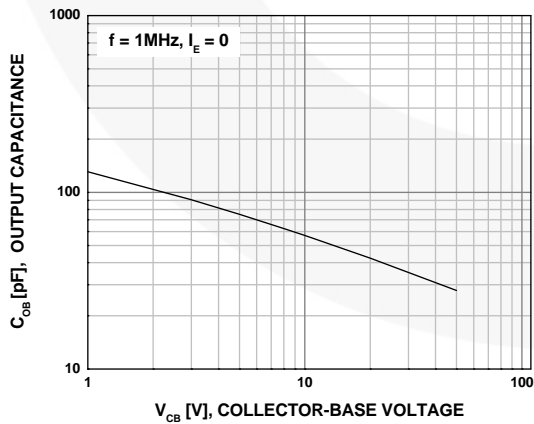


Figure 5. Collector Output Capacitance

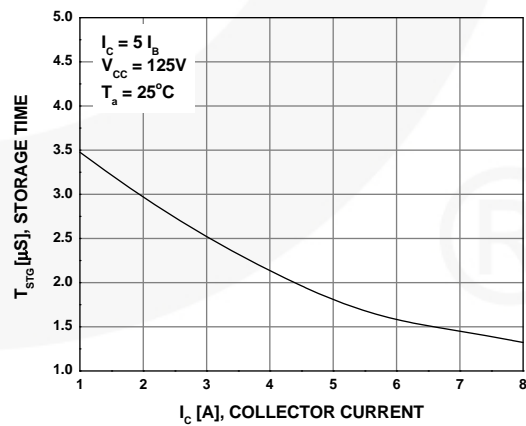
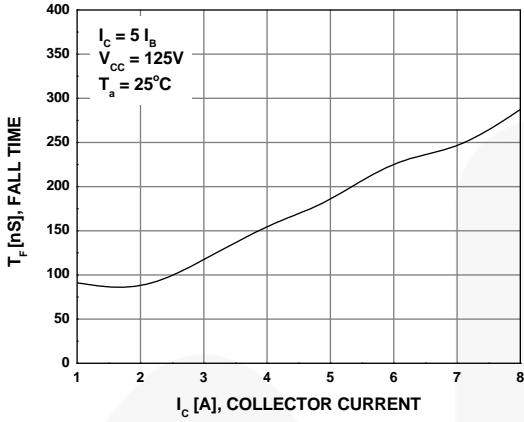
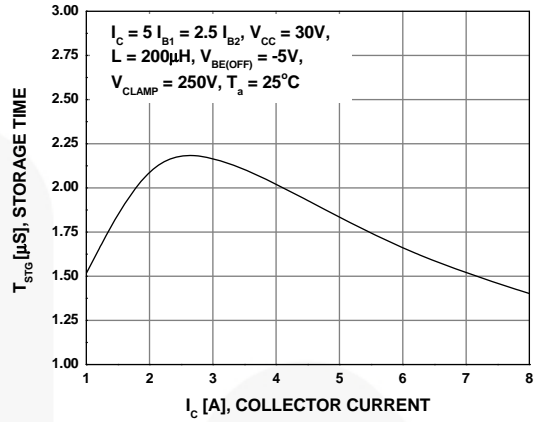


Figure 6. Storage Time (Resistive Load)

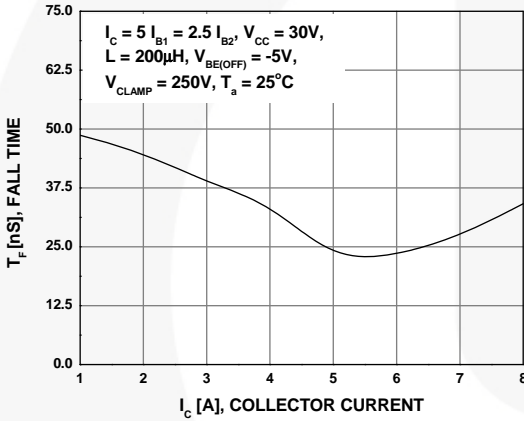
**Typical Performance Characteristics (Continued)**



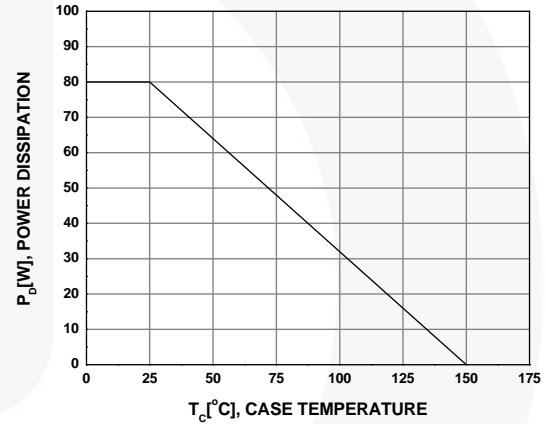
**Figure 7. Fall Time (Resistive Load)**



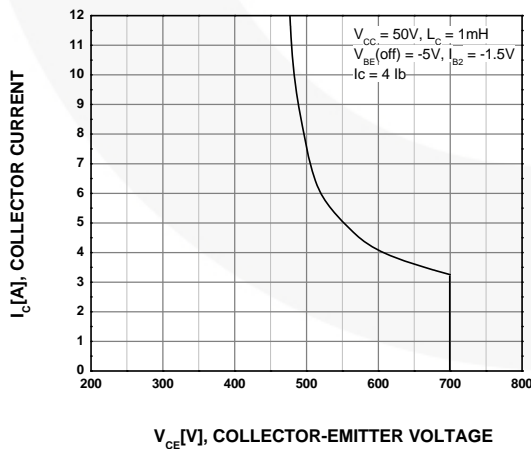
**Figure 8. Storage Time (Inductive Load)**



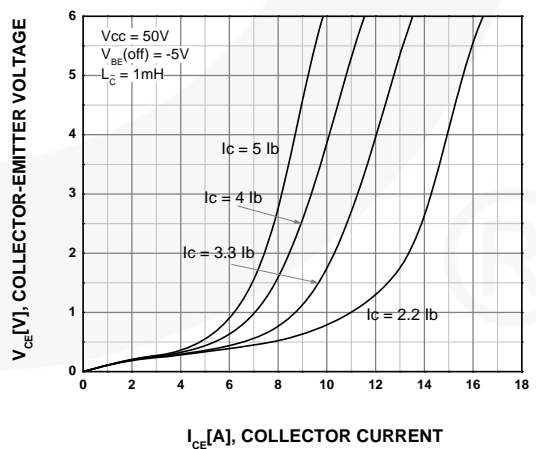
**Figure 9. Fall Time (Inductive Load)**



**Figure 10. Power Derating**



**Figure 11. Reverse Bias Safe Operating Area**



**Figure 12. RBSOA Saturation**

Typical Performance Characteristics (Continued)

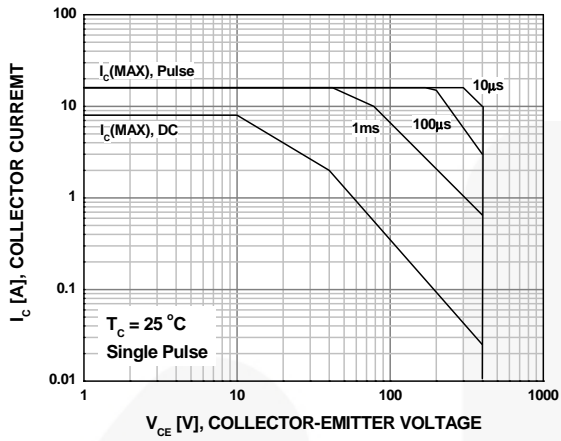
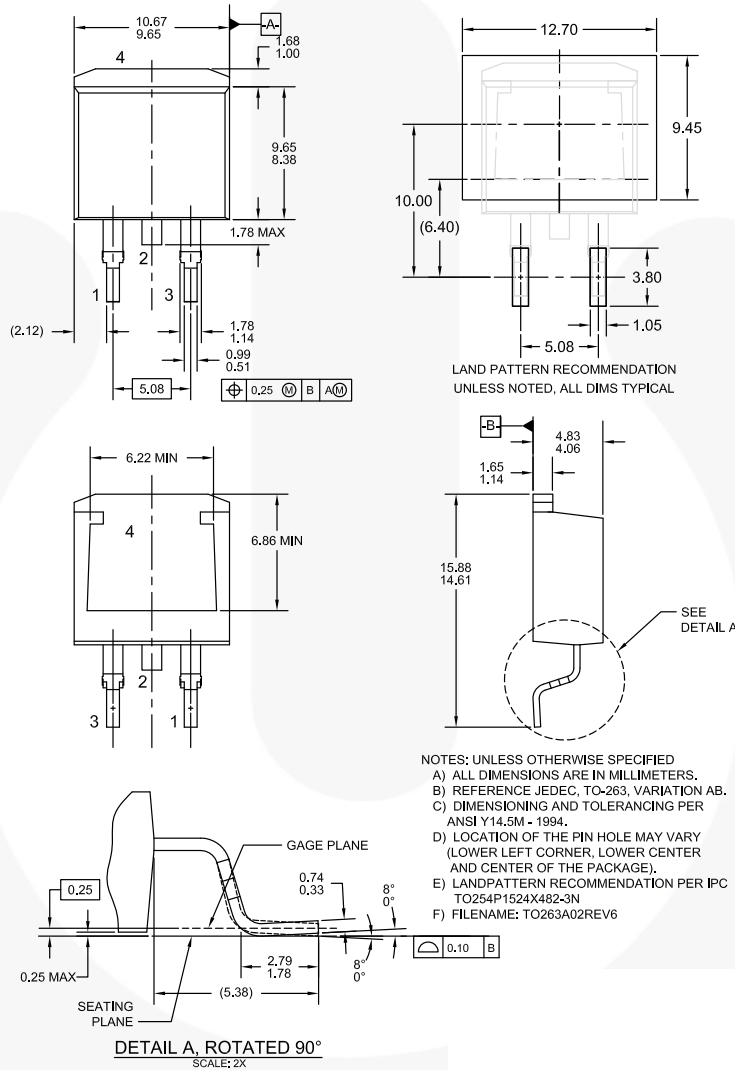


Figure 13. Forward Biased Safe Operating Area

## Physical Dimensions

### D<sup>2</sup>-PAK



**Figure 14. 2-LEAD, JEDEC TO263, VARIATION AB, SURFACE MOUNT (Active)**

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