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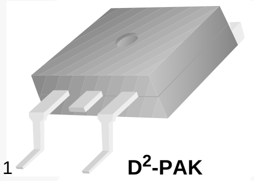
July 2013

FJB3307D

High-Voltage Fast-Switching NPN Power Transistor

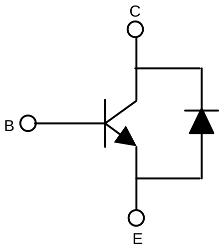
Features

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



1.Base 2.Collector 3.Emitter

Internal Schematic Diagram



Ordering Information

Part Number	Marking	Package	Packing Method
FJB3307DTM	J3307D	D^2-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°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	°C
T_{STG}	Storage Temperature	-55 to 150	°C

Note:

1. Pulse test: pulse width = 300µs, duty cycle = 2% pulsed.

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Thermal Characteristics

Symbol	Parameter		Value	Units
P_D	Total Device Dissipation	$T_A = 25°C$	1.72	W
		$T_C = 25°C$	80	W
$R_{\theta ja}$	Thermal Resistance, Junction to Ambient		72.5	°C/W
$R_{\theta jc}$	Thermal Resistance, Junction to Case		1.56	°C/W

Electrical Characteristics[2]

Values are at $T_A = 25°C$ unless otherwise noted**.**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV_{CBO}	Collector-Base Breakdown Voltage	$I_C = 500\ \mu A$, $I_E = 0$	700			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	$I_C = 5$ mA, $I_B = 0$	400			V
BV_{EBO}	Emitter-Base Breakdown Voltage	$I_E = 500\ \mu A$, $I_C = 0$	9			V
I_{EBO}	Emitter Cut-Off Current	$V_{EB} = 9$ V, $I_C = 0$			1	mA
h_{FE1}	DC Current Gain	$V_{CE} = 5$ V, $I_C = 2$ A	8		40	
h_{FE2}		$V_{CE} = 5$ V, $I_C = 5$ A	5		30	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 2$ A, $I_B = 0.4$ A			1	V
		$I_C = 5$ A, $I_B = 1$ A			2	V
		$I_C = 5$ A, $I_B = 1$ A, $T_A = 100°C$			3	V
		$I_C = 8$ A, $I_B = 2$ A			3	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 2$ A, $I_B = 0.4$ A			1.2	V
		$I_C = 5$ A, $I_B = 1$ A			1.6	V
		$I_C = 5$ A, $I_B = 1$ A, $T_A = 100°C$			2.0	V
V_F	Diode Forward Voltage	$I_C = 3$ A			2.5	V
C_{ob}	Output Capacitance	$V_{CB} = 10$ V, $I_E = 0$, f = 1 MHz		60		pF
t_{STG}	Storage Time	$V_{CC} = 125$ V, $I_C = 5$ A, $I_{B1} = -I_{B2} = 1$ A, $R_L = 50\ \Omega$			3.0	µs
t_F	Fall Time				0.7	µs
t_{STG}	Storage Time	$V_{CC} = 30$ V, $I_C = 5$ A, L=200 µH I_{B1}=1 A, $R_{BB} = 0\ \Omega$, $V_{BE(OFF)}$= -5 V, $V_{CLAMP} = 250$ V			2.3	µs
t_F	Fall Time				150	ns

Note:

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

h_{FE} Classification

Classification	H1	H2
h_{FE1}	15 ~ 28	26 ~ 39

Typical Performance Characteristics

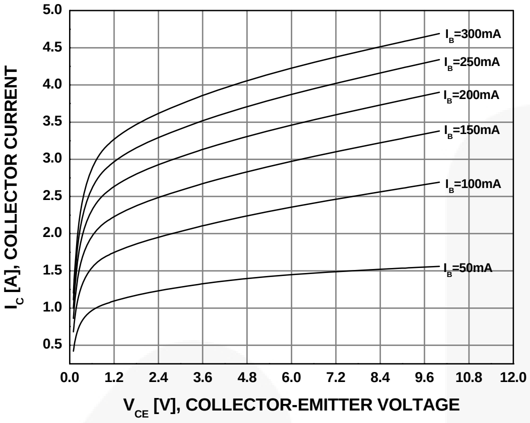


Figure 1. Static Characteristic

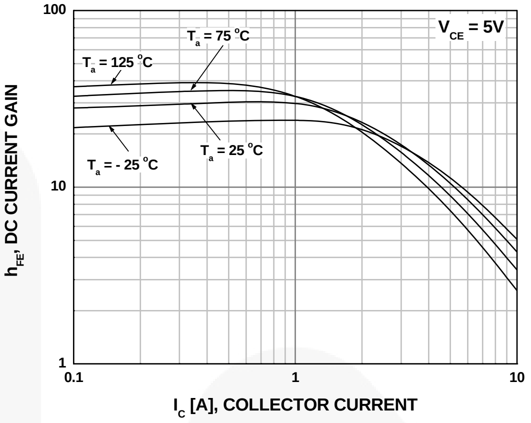


Figure 2. DC Current Gain

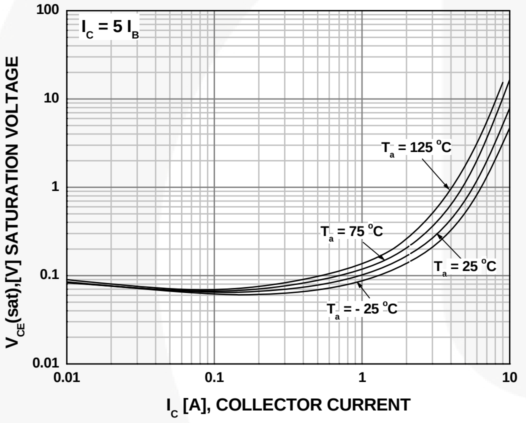


Figure 3. Collector-Emitter Saturation Voltage

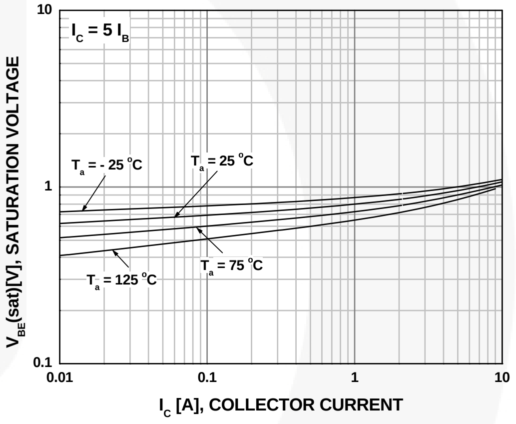


Figure 4. Base-Emitter Saturation Voltage

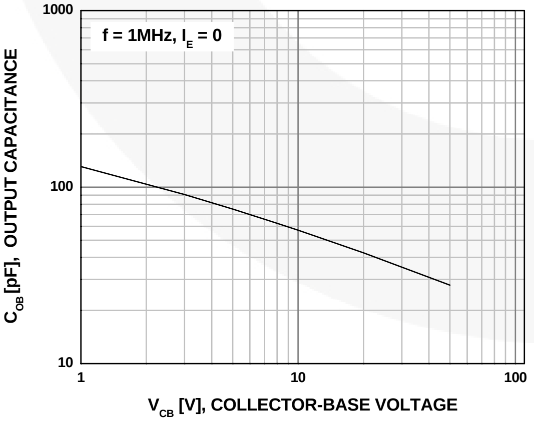


Figure 5. Collector Output Capacitance

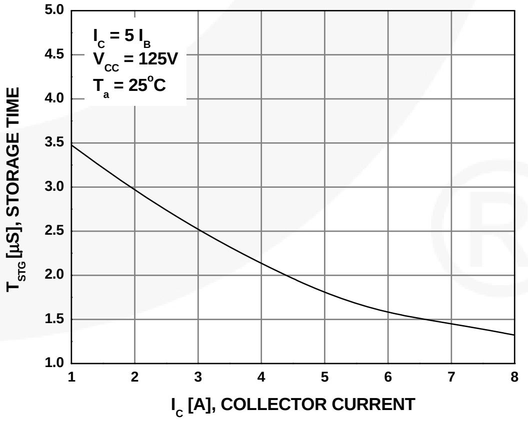


Figure 6. Storage Time (Resistive Load)

Typical Performance Characteristics (Continued)

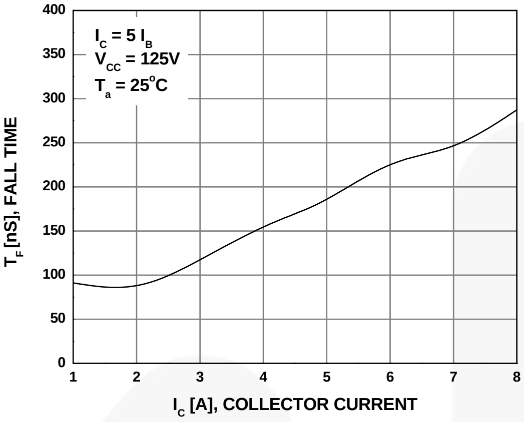


Figure 7. Fall Time (Resistive Load)

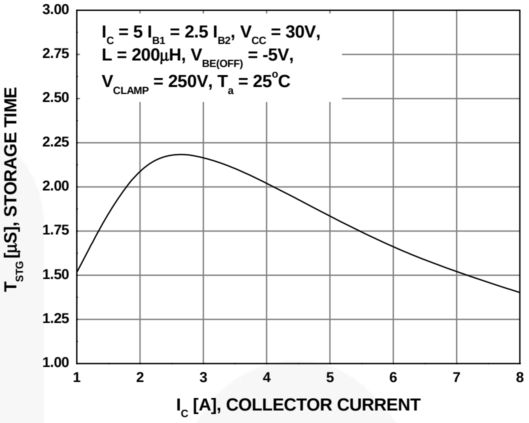


Figure 8. Storage Time (Inductive Load)

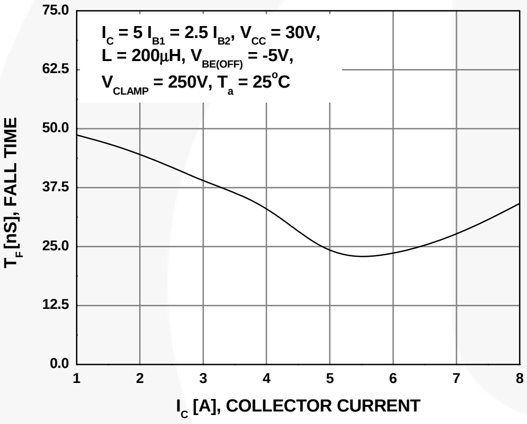


Figure 9. Fall Time (Inductive Load)

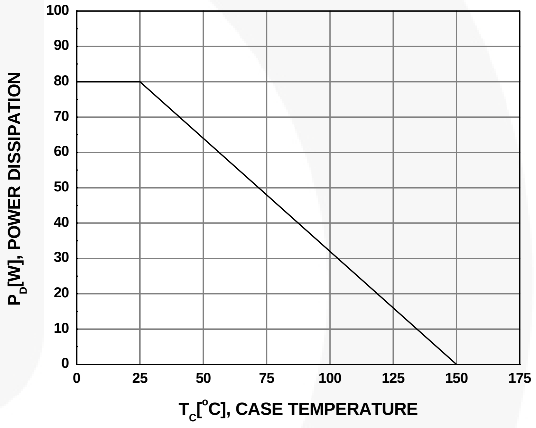


Figure 10. Power Derating

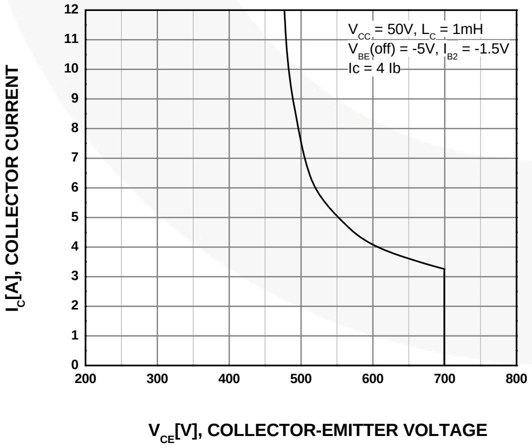


Figure 11. Reverse Bias Safe Operating Area

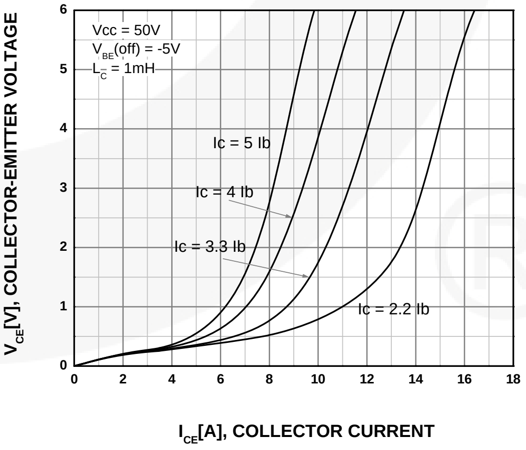


Figure 12. RBSOA Saturation

Typical Performance Characteristics (Continued)

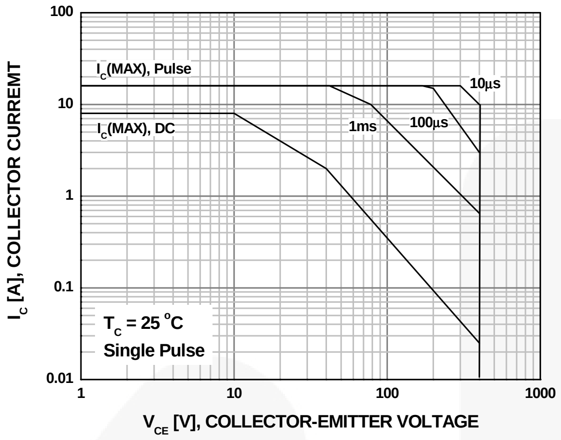
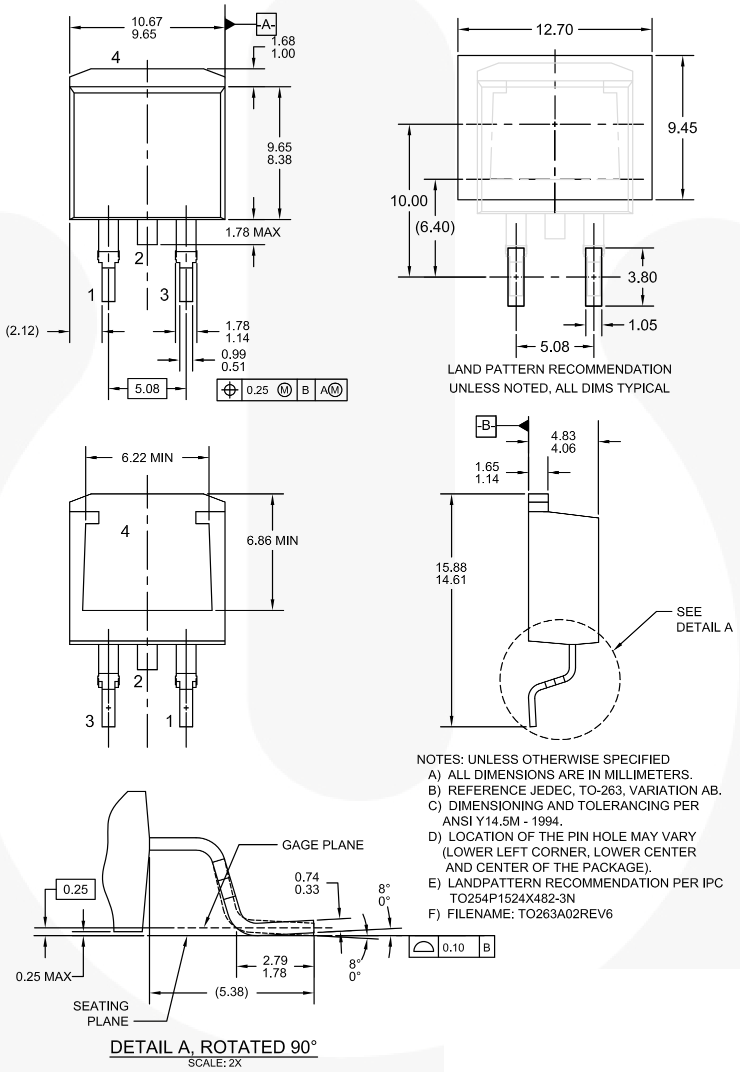


Figure 13. Forward Biased Safe Operating Area

Physical Dimensions

D^2-PAK



NOTES: UNLESS OTHERWISE SPECIFIED
A) ALL DIMENSIONS ARE IN MILLIMETERS.
B) REFERENCE JEDEC, TO-263, VARIATION AB.
C) DIMENSIONING AND TOLERANCING PER ANSI Y14.5M - 1994.
D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE).
E) LANDPATTERN RECOMMENDATION PER IPC TO254P1524X482-3N
F) FILENAME: TO263A02REV6

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

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