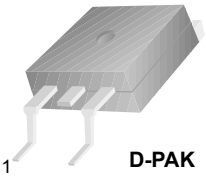
FAIRCHILD SEMICONDUCTOR®

July 2010

FJD5304D
High Voltage Fast Switching Transistor

Features

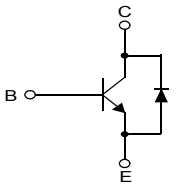
- Built-in Free Wheeling Diode
- Wide Safe Operating Area
- Small Variance in Storage Time
- Suitable for Electronic Ballast Application



D-PAK

1. Base 2. Collector 3. Emitter

Equivalent Circuit



Absolute Maximum Ratings 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		12	V
I_C	Collector Current (DC)		4	A
I_{CP}	* Collector Current (Pulse)		8	A
I_B	Base Current (DC)		2	A
I_{BP}	* Base Current (Pulse)		4	A
P_C	Collector Dissipation	T_c = 25°C T_a = 25°C	30 1.25	W W
T_J	Junction Temperature		150	°C
T_{STG}	Storage Temperature		-55 to 150	°C

* Pulse Test: PW = 300μs, Duty Cycle = 2% Pulsed

Thermal Characteristics T_a = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
$R_{\theta ja}$	Thermal Resistance Junction-Ambient **	99	°C/W

** Device mounted on minimum pad size.

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
J5304D	FJD5304DTM	D-PAK	13” Dia	-	2500
J5304D	FJD5304DTF	D-PAK	13” Dia	-	2000

Electrical Characteristics T_a = 25°C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 1mA, I_E = 0	700			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C = 5mA, I_B = 0	400			V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = 1mA, I_C = 0	12			V
I_{CES}	Collector Cut-off Current	V_{CB} = 700V, I_E = 0			100	μA
I_{CEO}	Collector Cut-off Current	V_{CB} = 400V, I_B = 0			250	μA
I_{EBO}	Emitter Cut-off Current	V_{EB} = 12V, I_C = 0			1	mA
h_{FE}	DC Current Gain	V_{CE} = 5V, I_C = 10mA V_{CE} = 5V, I_C = 2.0A	10 8		 40	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 0.5A, I_B = 0.1A			0.7	V
		I_C = 1.0A, I_B = 0.2A			1.0	V
		I_C = 2.5A, I_B = 0.5A			1.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 0.5A, I_B = 0.1A			1.1	V
		I_C = 1.0A, I_B = 0.2A			1.2	V
		I_C = 2.5A, I_B = 0.5A			1.3	V
t_{STG}	Storage Time	V_{CLAMP}=200V, I_C=2.0A, I_{B1}=0.4A, V_{BE}(off)=-5V, L=200μH		0.6		μs
t_F	Fall Time			0.1		μs
t_{STG}	Storage Time	V_{CC}=250V, I_C=2.0A, I_{B1}=0.4A, I_{B2}=-0.4A, T_P=30μs			2.9	μs
t_F	Fall Time			0.2		μs
V_F	Diode Forward Voltage	I_F = 2A			2.5	V

Typical Performance Characteristics

Figure 1. Static Characteristic

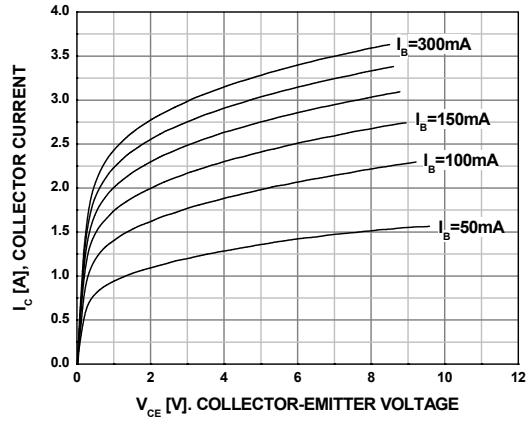


Figure 2. DC Current Gain

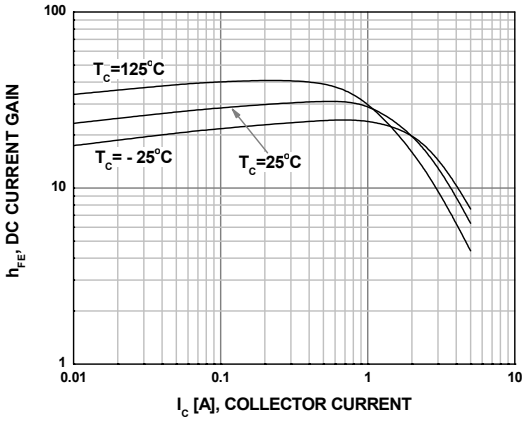


Figure 3. Collector-Emitter Saturation Voltage

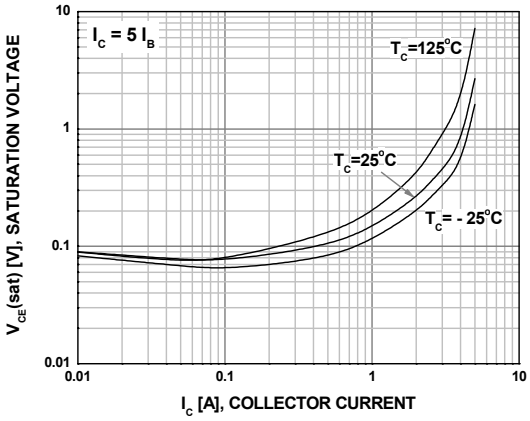


Figure 4. Base-Emitter Saturation Voltage

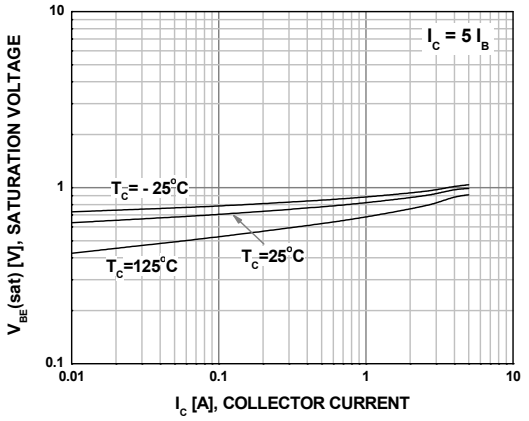


Figure 5. Resistive Load Switching Time

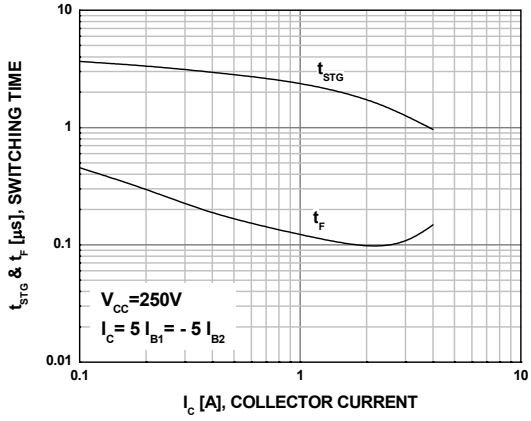
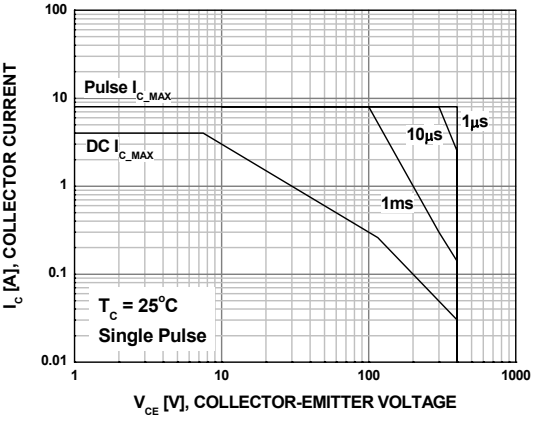


Figure 6. Forward Biased Safe Operating Area



Typical Performance Characteristics (Continued)

Figure 7. Reverse Biased Safe Operating Area

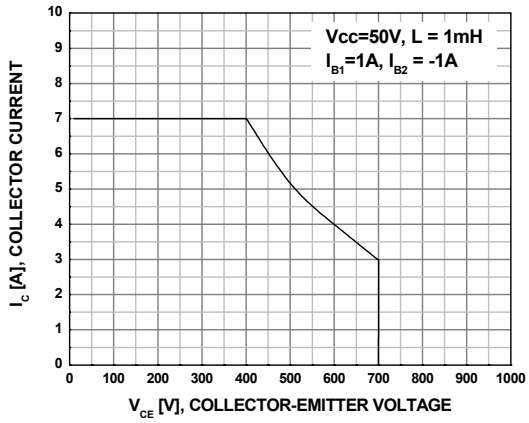
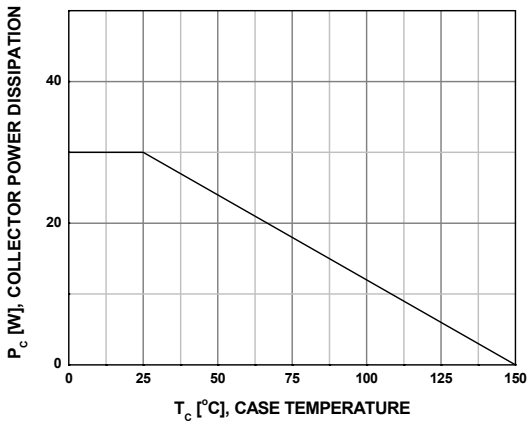
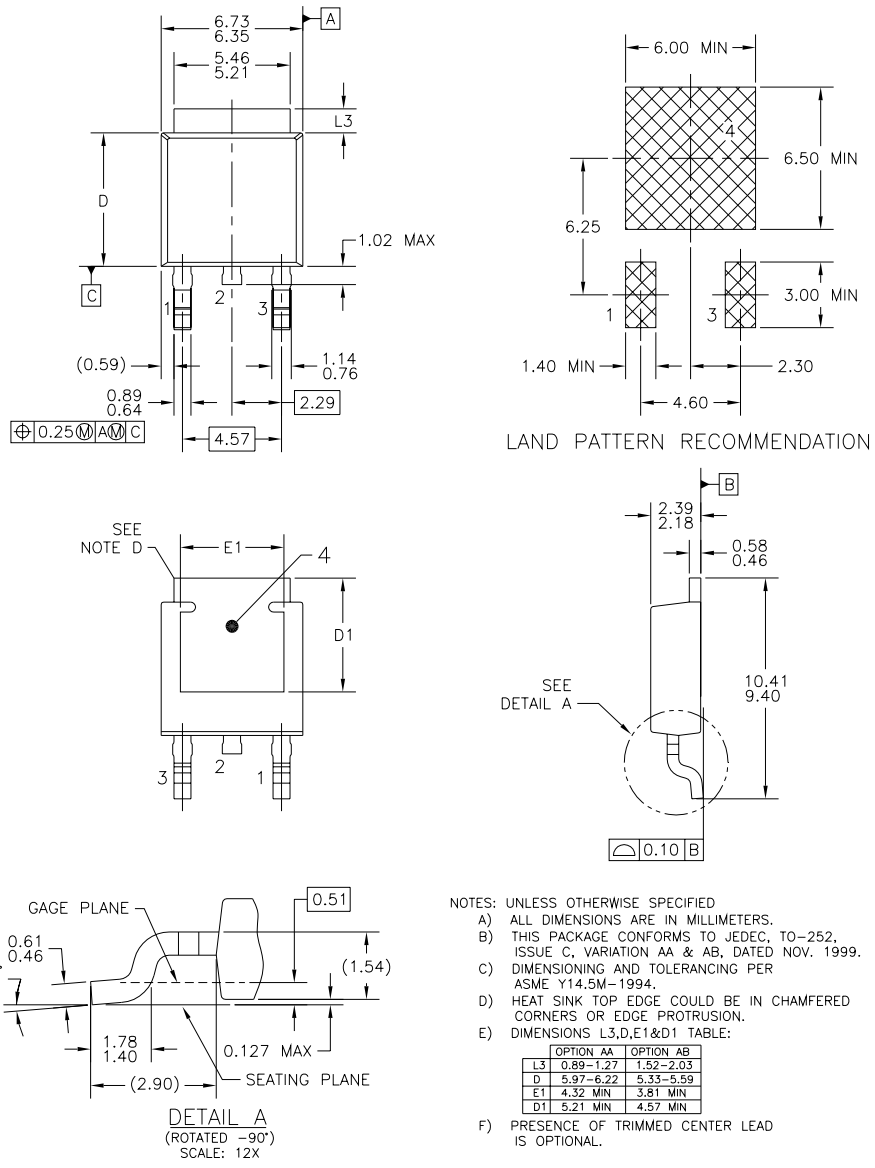


Figure 8. Power Derating Curve



Mechanical Dimensions

D-PAK



NOTES: UNLESS OTHERWISE SPECIFIED

A) ALL DIMENSIONS ARE IN MILLIMETERS.

B) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE C, VARIATION AA & AB, DATED NOV. 1999.

C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.

D) HEAT SINK TOP EDGE COULD BE IN CHAMFERED CORNERS OR EDGE PROTRUSION.

E) DIMENSIONS L3,D,E1&D1 TABLE:

	OPTION AA	OPTION AB
L3	0.89-1.27	1.52-2.03
D	5.97-6.22	5.33-5.59
E1	4.32 MIN	3.81 MIN
D1	5.21 MIN	4.57 MIN

F) PRESENCE OF TRIMMED CENTER LEAD IS OPTIONAL.

Dimensions in Millimeters

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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

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