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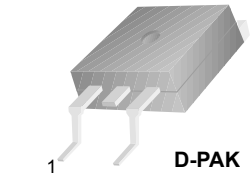
Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

July 2010

FJD5304D
High Voltage Fast Switching Transistor

Features

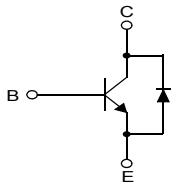
- Built-in Free Wheeling Diode
- Wide Safe Operating Area
- Small Variance in Storage Time
- Suitable for Electronic Ballast Application



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

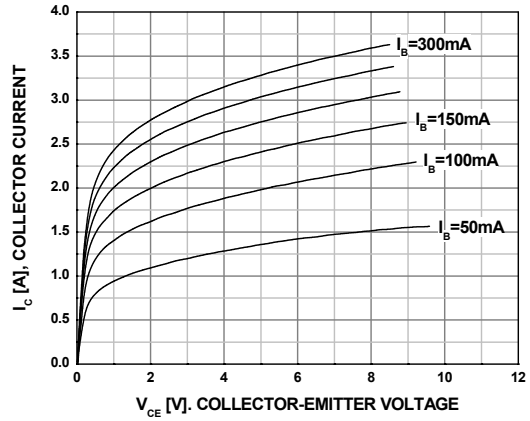


Figure 2. DC Current Gain

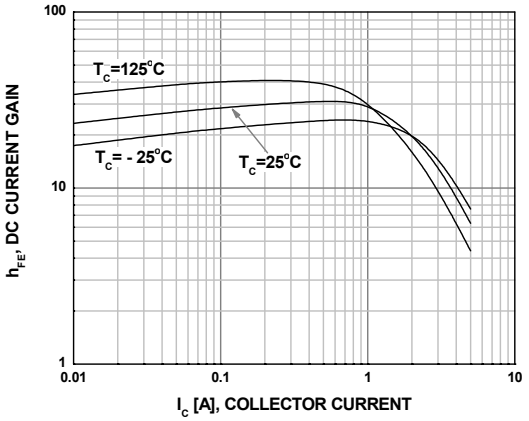


Figure 3. Collector-Emitter Saturation Voltage

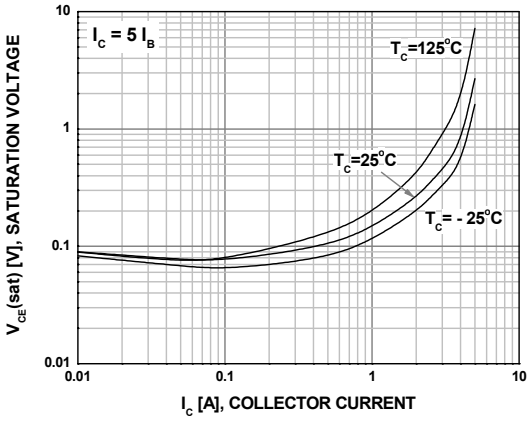


Figure 4. Base-Emitter Saturation Voltage

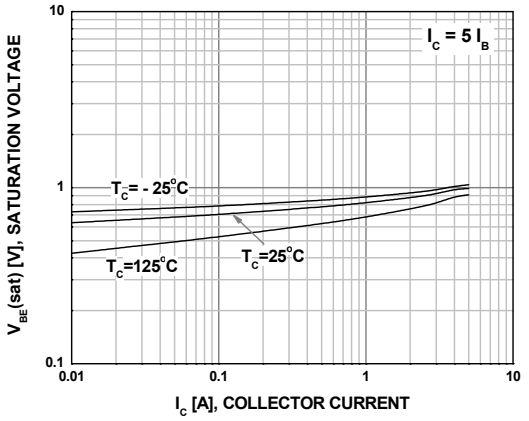


Figure 5. Resistive Load Switching Time

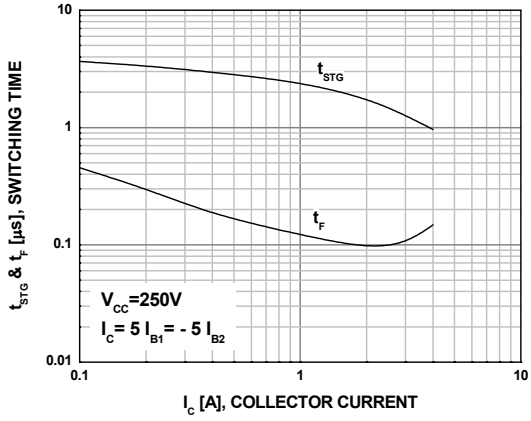
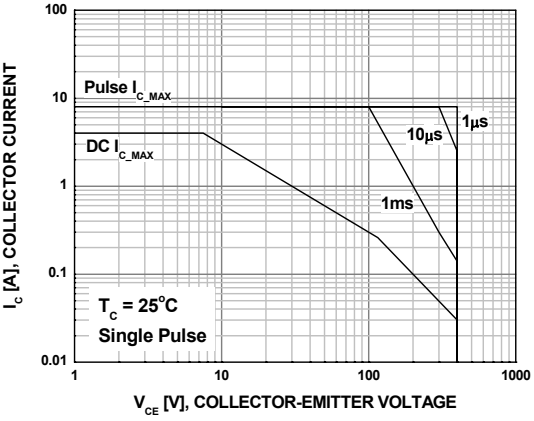


Figure 6. Forward Biased Safe Operating Area



Typical Performance Characteristics (Continued)

Figure 7. Reverse Biased Safe Operating Area

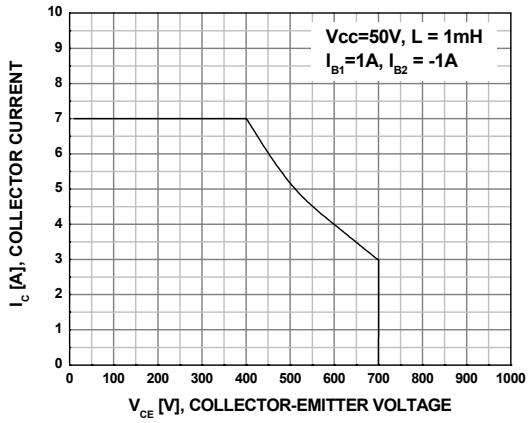
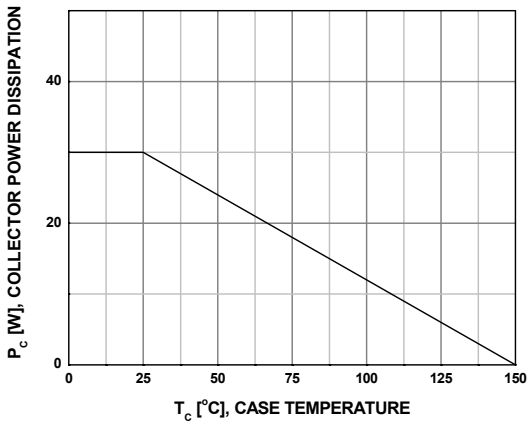
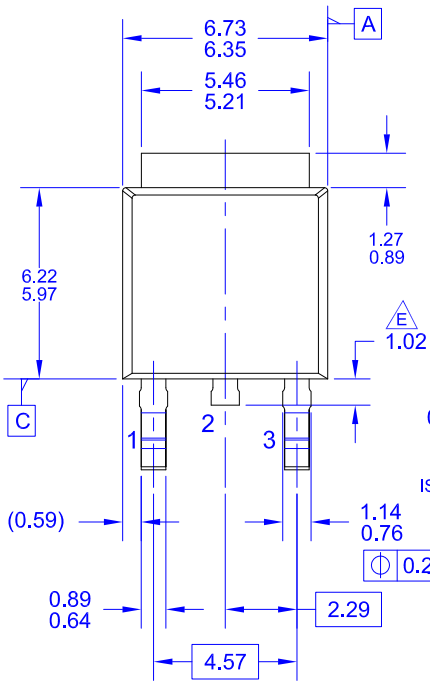
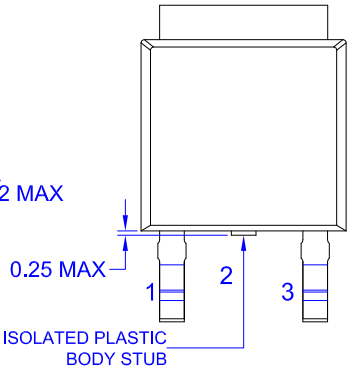


Figure 8. Power Derating Curve

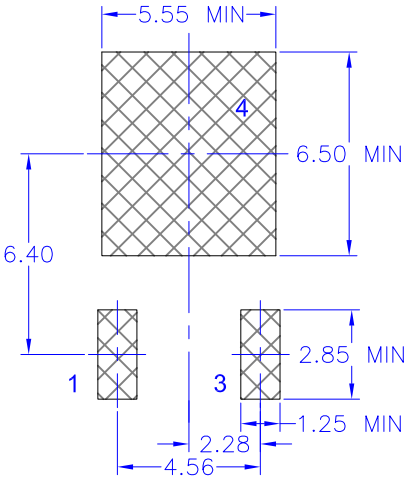




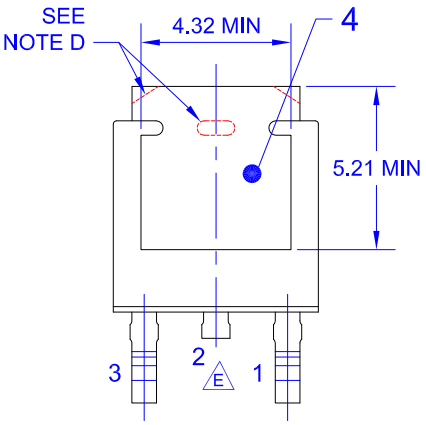
NON-DIODE PRODUCTS VERSION



DIODE PRODUCTS VERSION



LAND PATTERN RECOMMENDATION



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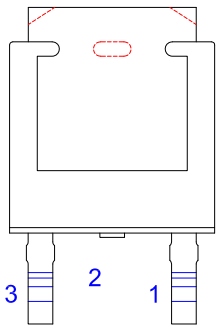
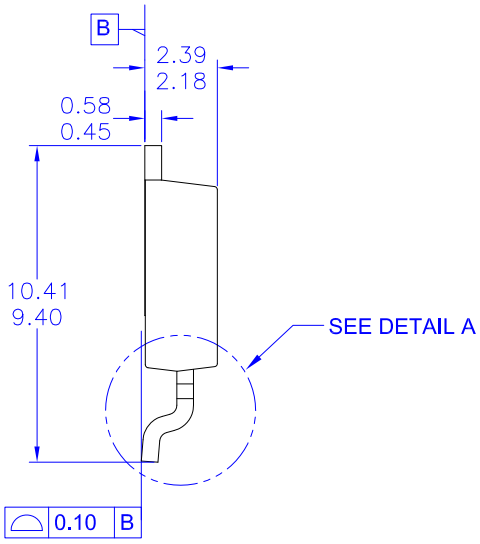
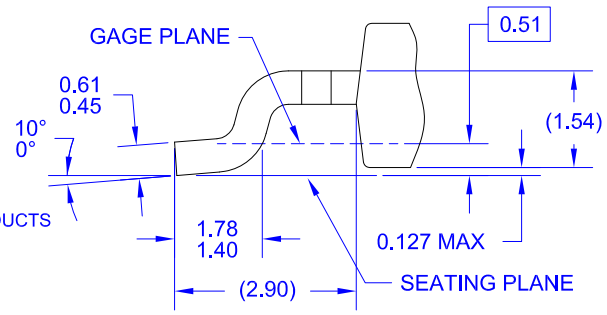


DIODE PRODUCTS VERSION



NOTES: UNLESS OTHERWISE SPECIFIED

A) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE C, VARIATION AA.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED CORNERS OR EDGE PROTRUSION.
E) TRIMMED METAL CENTER LEAD IS PRESENT ON FOR NON-DIODE PRODUCTS
F) DIMENSIONS ARE EXCLUSIVE OF BURS, MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.
H) DRAWING NUMBER AND REVISION: MKT-TO252A03REV11



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FAIRCHILD

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