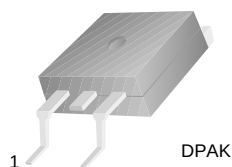


FJD3305H1

NPN Silicon Transistor

High Voltage Switch Mode Application

- Fast Speed Switching
- Wide Safe Operating Area
- Suitable for Electronic Ballast Application



1. Base 2. Collector 3. Emitter

Absolute Maximum Ratings * $T_C=25^{\circ}\text{C}$ 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)	4	A
I_{CP}	Collector Current (Pulse)	8	A
I_B	Base Current	2	A
P_C	Collector Dissipation, $T_a = 25^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}$	1.1 50	W W
T_J	Junction Temperature	150	$^{\circ}\text{C}$
T_{STG}	Storage Temperature	-65 ~ 150	$^{\circ}\text{C}$

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Thermal Characteristics $T_a=25^{\circ}\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	110	$^{\circ}\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.0	$^{\circ}\text{C/W}$

* Device mounted on minimum pad size

Ordering Information

Part Number	Marking	Package	Packing Method	Remarks
FJD3305H1TM	J3305H1	D-PAK	Tape & Reel	

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

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
BV_{CBO}	Collector-Base Breakdown 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	μA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			1	μA
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		28 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	$V_{CC} = 125\text{V}, I_C = 2\text{A}$ $I_{B1} = -I_{B2} = 0.4\text{A}$ $R_L = 62.5\Omega$			0.8	μs
t_{STG}	Storage Time				4.0	μs
t_F	Fall Time				0.9	μs

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

Typical Performance Characteristics

Figure 1. Static Characteristic

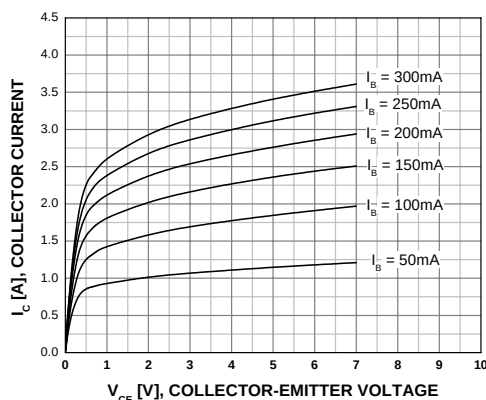


Figure 2. DC Current Gain

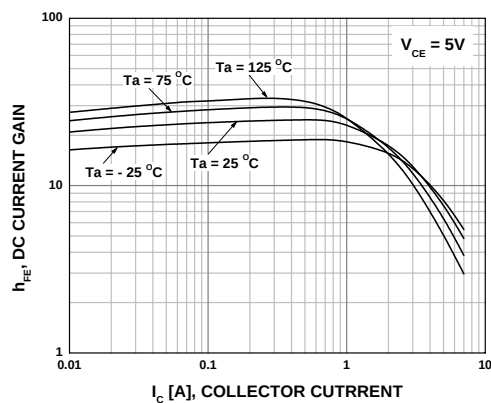


Figure 3. Collector- Emitter Saturation Voltage

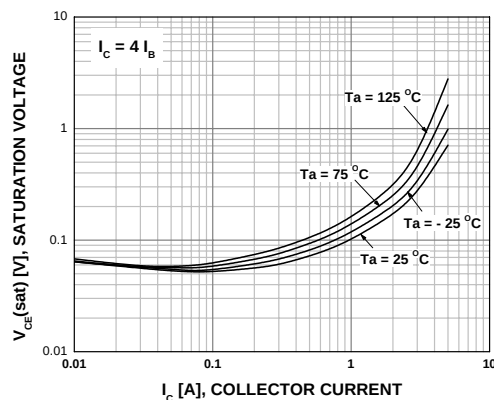


Figure 4. Base - Emitter Saturation Voltage

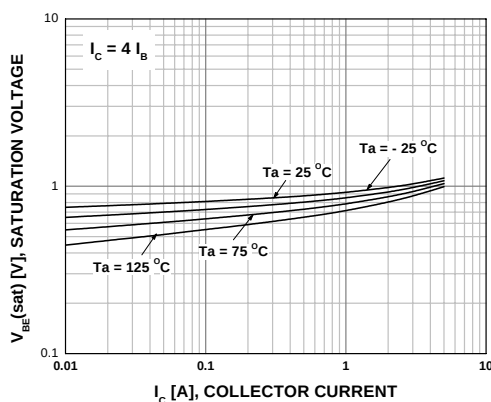


Figure 5. Switching Time

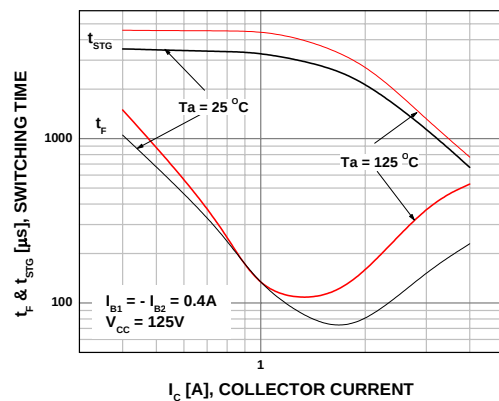


Figure 6. Capacitance

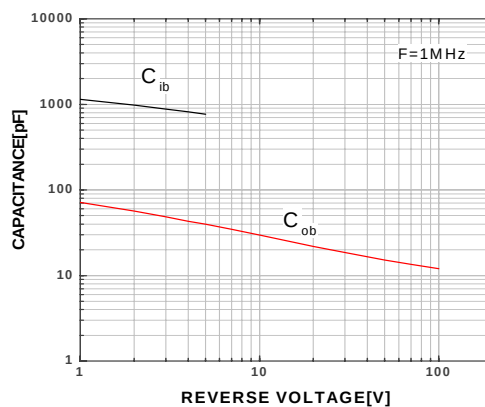


Figure 7. Reverse Biased Safe Operating Area

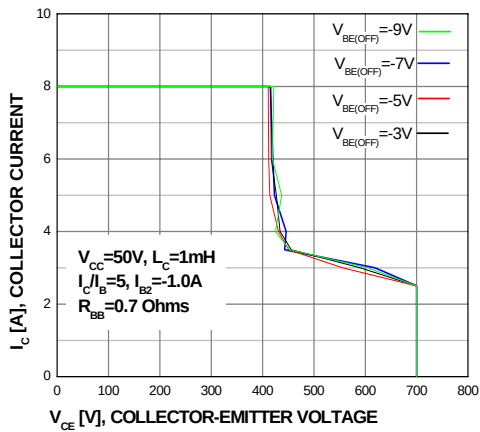


Figure 8. RBSOA Collector- Emitter Saturation Voltage

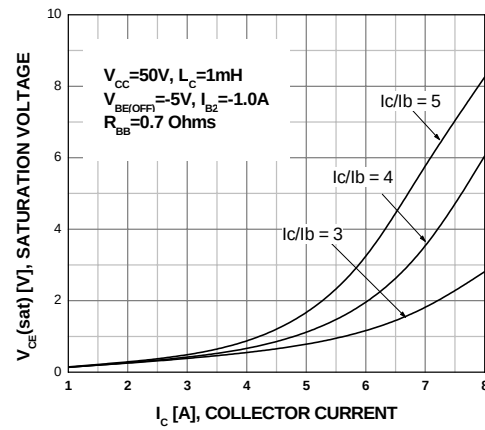


Figure 9. RBSOA Turn-on Pulse Width vs Collector Current

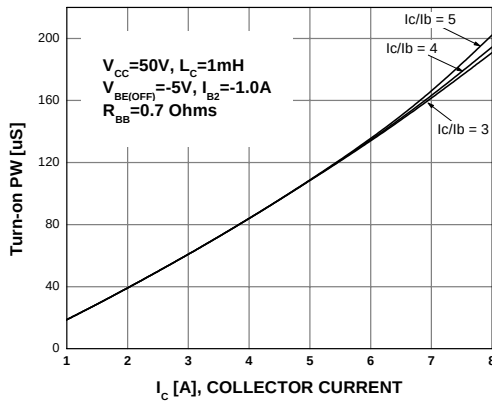


Figure 10. Power Derating

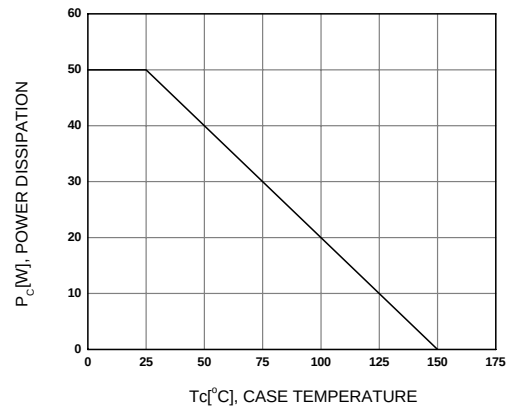
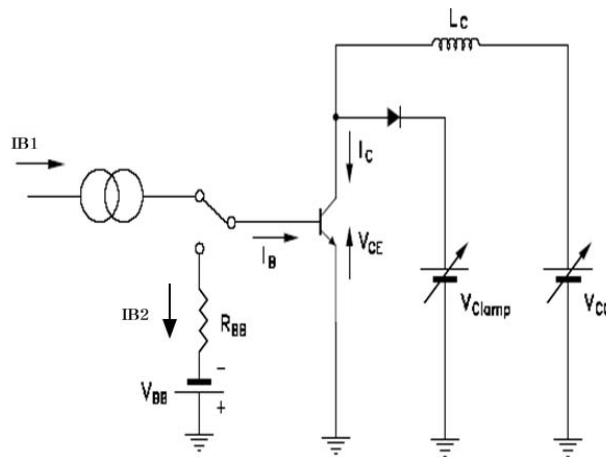
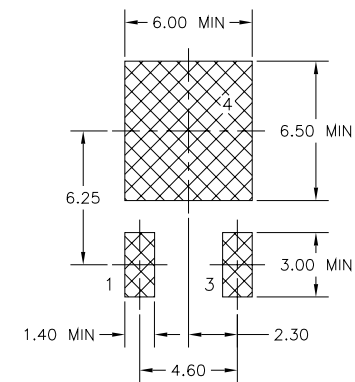
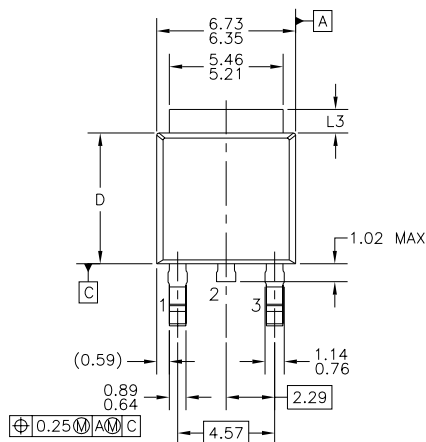


Figure 11. RBSOA Test Circuit

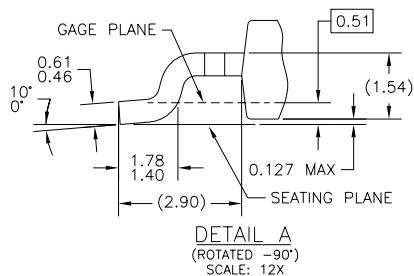
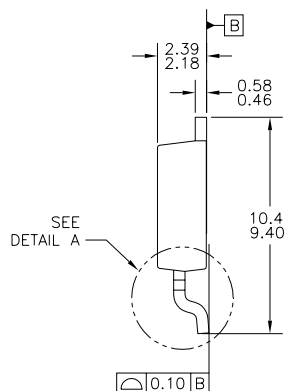
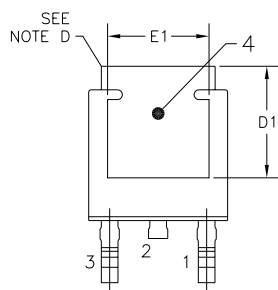


Mechanical Dimensions

D-PAK



LAND PATTERN RECOMMENDATION



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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2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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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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