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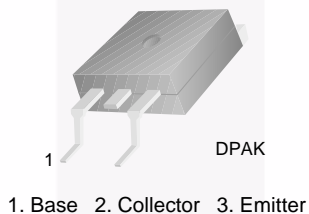
April 2012

# FJD3305H1

## NPN Silicon Transistor

### Features

- High Voltage Switch Mode Application
- Fast Speed Switching
- Wide Safe Operating Area
- Suitable for Electronic Ballast Application
- Wave Soldering



### 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 to 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	

FJD3305H1 — NPN Silicon Transistor

**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	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			1	$\mu\text{A}$
$h_{FE1}$ $h_{FE2}$	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	$V_{CC} = 125\text{V}, I_C = 2\text{A}$			0.8	$\mu\text{s}$
$t_{STG}$	Storage Time	$I_{B1} = -I_{B2} = 0.4\text{A}$			4.0	$\mu\text{s}$
$t_F$	Fall Time	$R_L = 62.5\Omega$			0.9	$\mu\text{s}$

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

## Typical Performance Characteristics

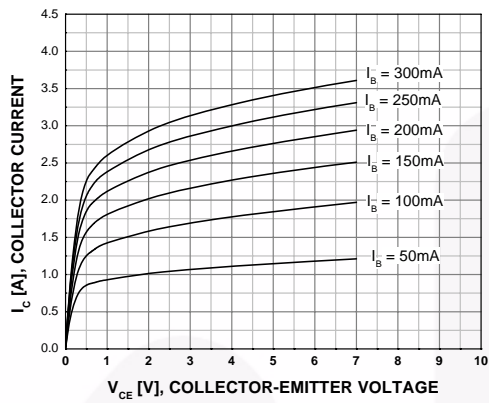


Figure 1. Static Characteristic

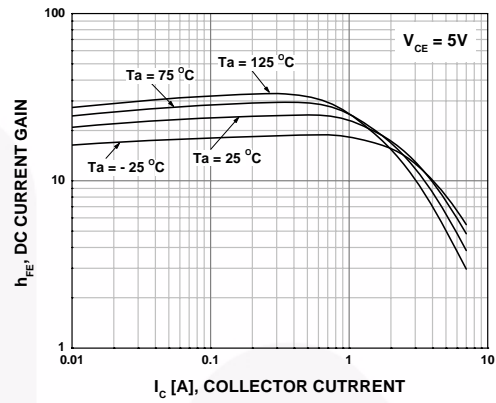


Figure 2. DC Current Gain

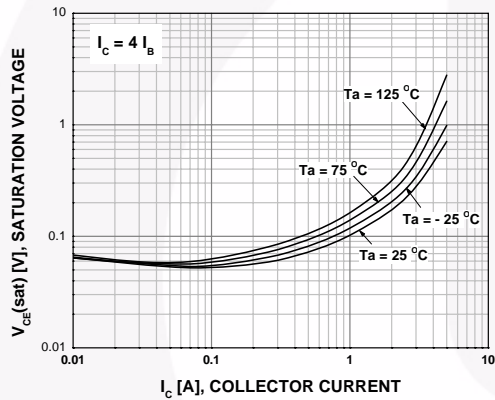


Figure 3. Collector- Emitter Saturation Voltage

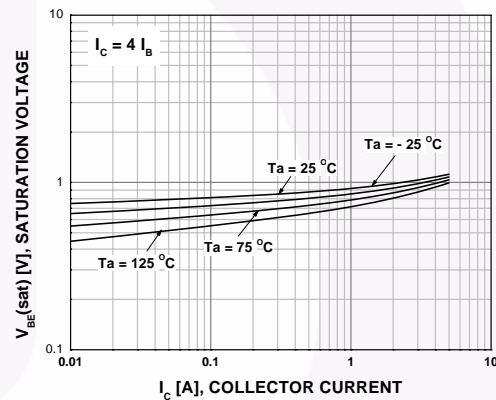


Figure 4. Base - Emitter Saturation Voltage

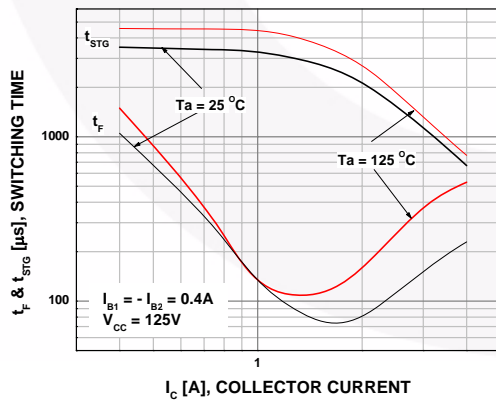


Figure 5. Switching Time

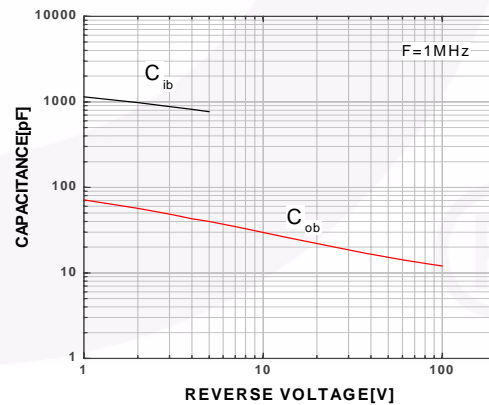


Figure 6. Capacitance

## Typical Performance Characteristics (Continued)

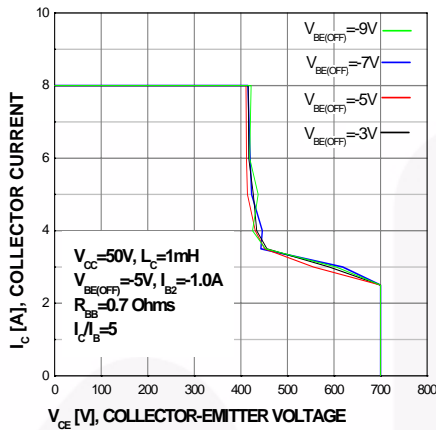


Figure 7. Reverse Biased Safe Operating Area

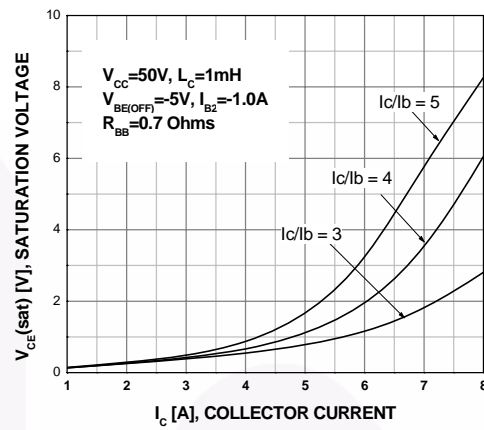


Figure 8. Collector- Emitter Saturation Voltage at RBSOA

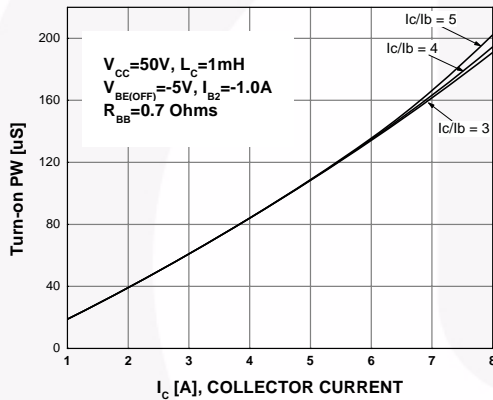


Figure 9. Input Pulse width vs Correct current at RBSOA

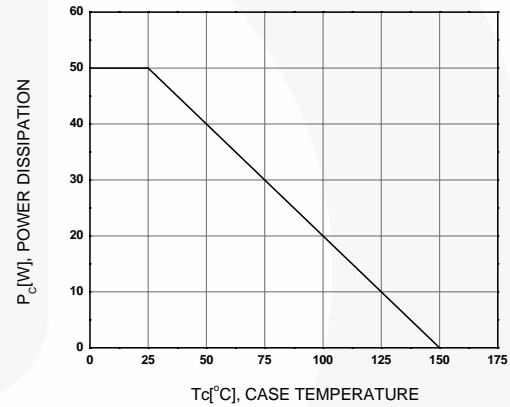


Figure 10. Power Derating

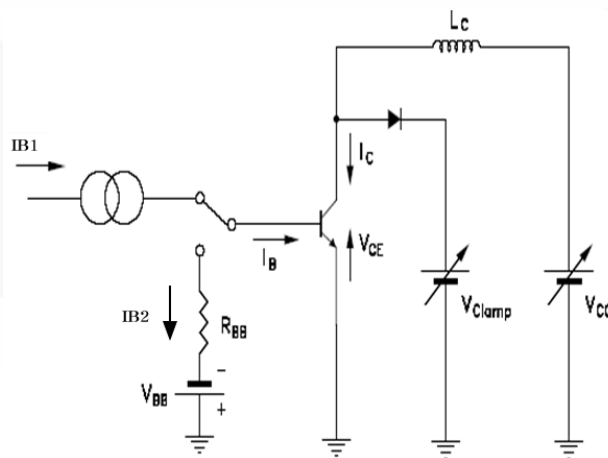
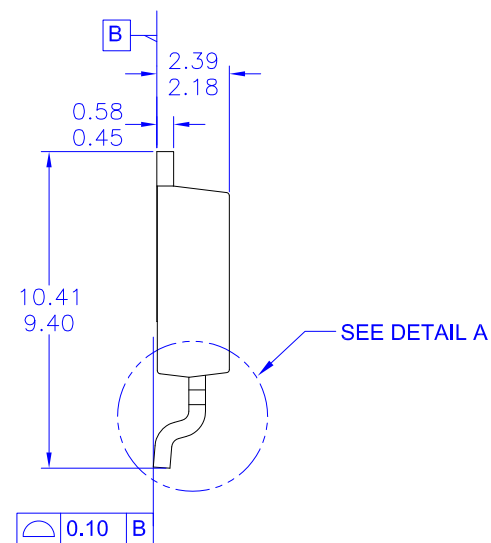
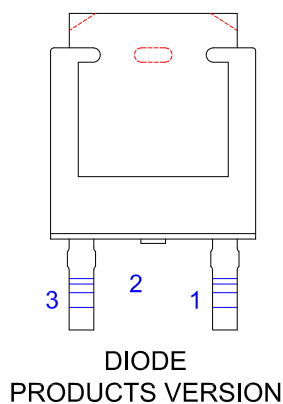
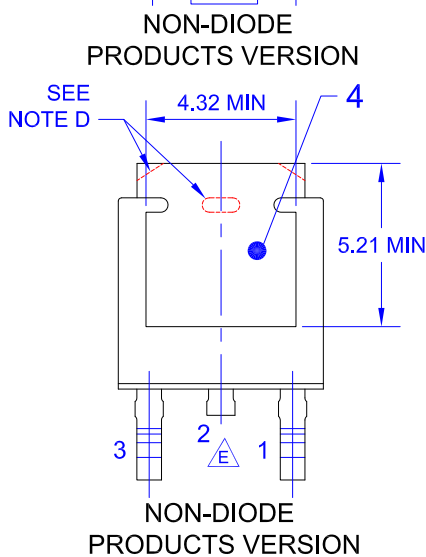
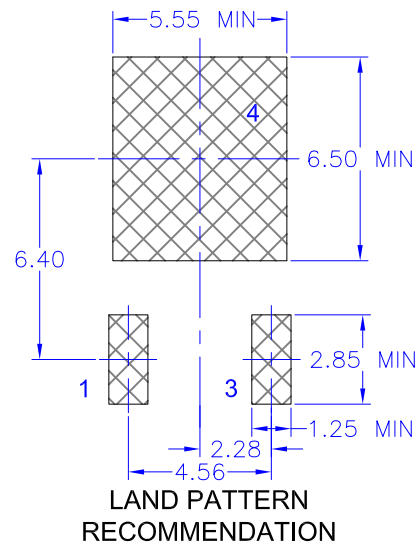
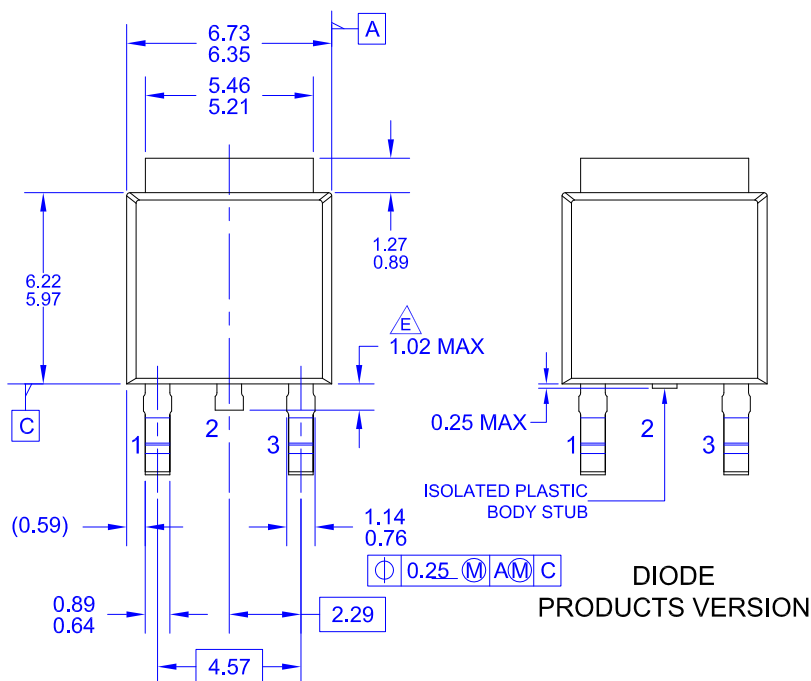
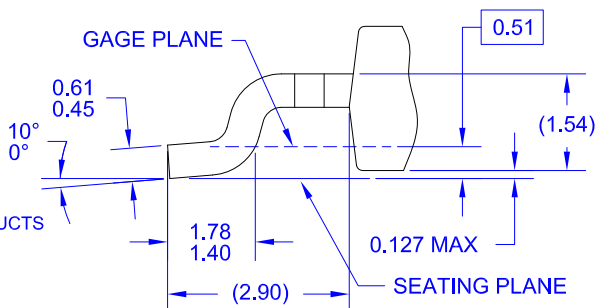


Figure 11. RBSOA Test Circuit



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



DETAIL A  
(ROTATED -90°)  
SCALE: 12X



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