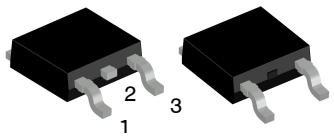
High Voltage Fast Switching Transistor

FJD5304D



1. Base
2. Collector
3. Emitter

DPAK3 6.10x6.54x2.29, 4.57P
CASE 369AS

Features

- Built-in Free Wheeling Diode
- Wide Safe Operating Area
- Small Variance in Storage Time
- Suitable for Electronic Ballast Application
- This is a Pb-Free Device

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C, unless otherwise noted)

Symbol	Parameter		Value	Unit
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) (Note 1)		8	A
I_B	Base Current (DC)		2	A
I_{BP}	Base Current (Pulse) (Note 1)		4	A
P_C	Total Device Dissipation	T_c = 25 °C	30	W
		T_a = 25 °C	1.25	W
T_J	Junction Temperature		150	°C
T_{STG}	Storage Junction Temperature Range		−55 to 150	°C

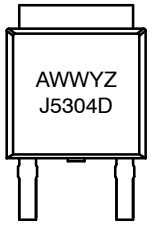
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
1. Pulse test: PW = 300 μs, Duty Cycle = 2% Pulsed

THERMAL CHARACTERISTICS (T_a = 25 °C, unless otherwise noted)

Symbol	Parameter	Value	Unit
$R_{\theta ja}$	Thermal Resistance Junction to Ambient (Note 2)	99	°C/W

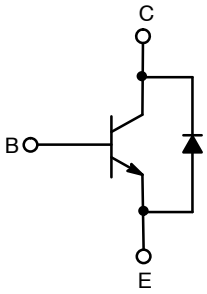
2. Device mounted on minimum pad side.

MARKING DIAGRAM



A = Assembly Location
WW = Work Week
Y = Year
Z = Lot Traceability
J5304D = Specific Device Code

EQUIVALENT CIRCUIT



ORDERING INFORMATION

Device	Package	Shipping†
FJD5304DTF	DPAK3	2000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

ELECTRICAL CHARACTERISTICS (T_a = 25 °C unless otherwise noted)

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

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL PERFORMANCE CHARACTERISTICS

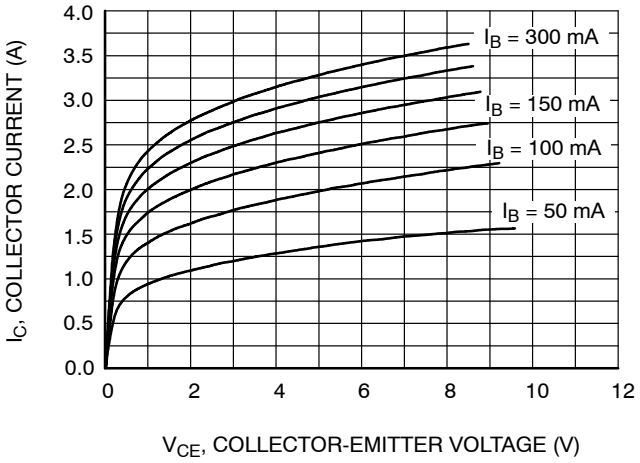


Figure 1. Static Characteristic

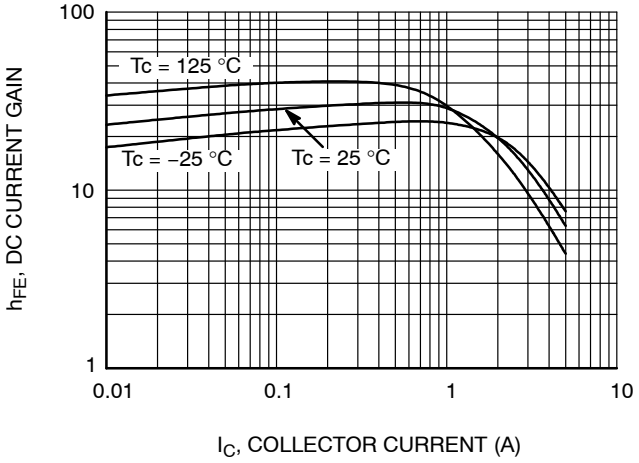


Figure 2. DC Current Gain

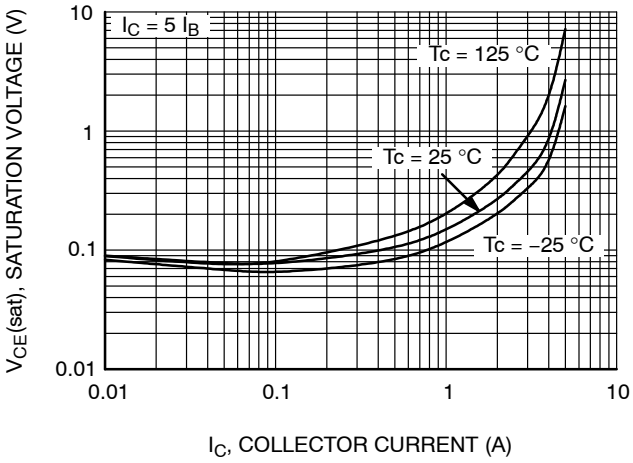


Figure 3. Collector-Emitter Saturation Voltage

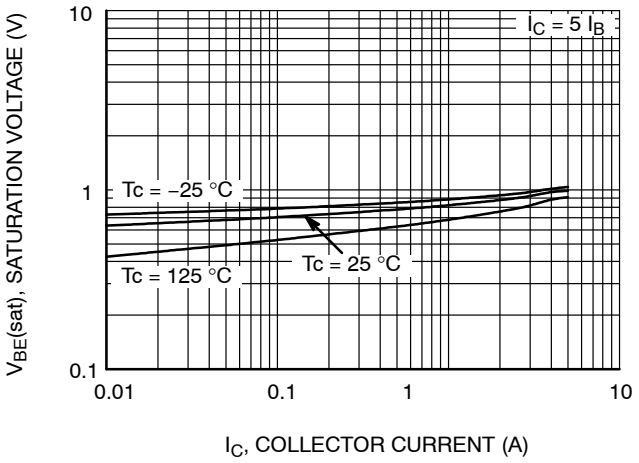


Figure 4. Base-Emitter Saturation Voltage

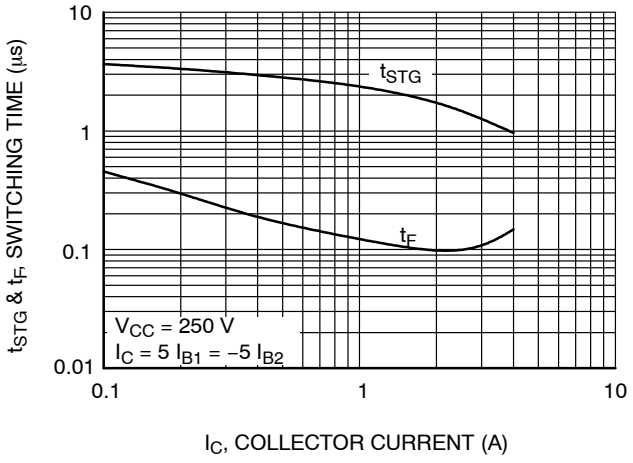


Figure 5. Resistive Load Switching Time

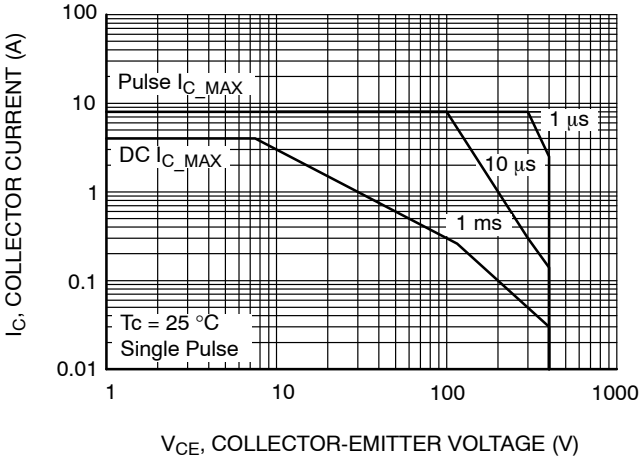


Figure 6. Forward Biased Safe Operating Area

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

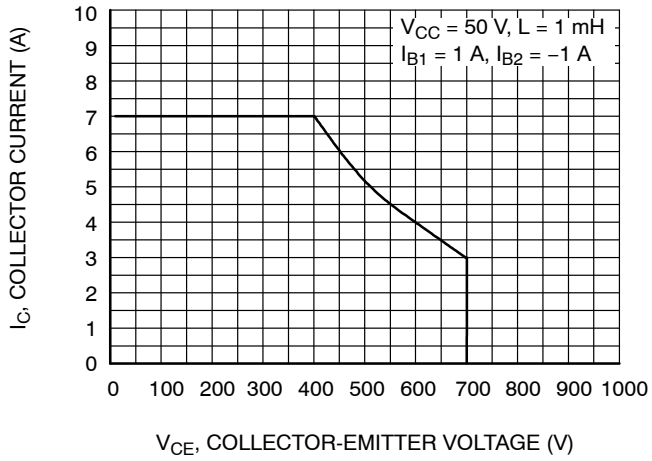


Figure 7. Reverse Biased Safe Operating Area

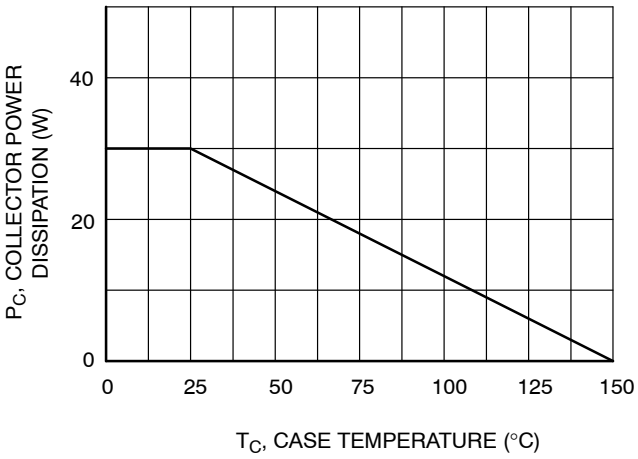
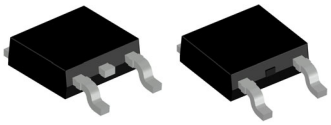
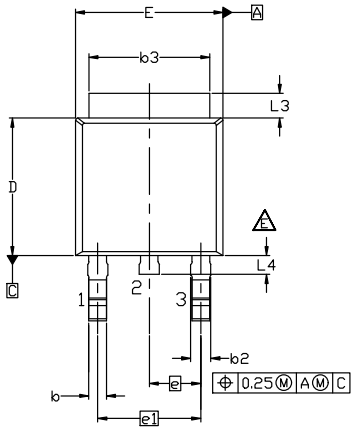


Figure 8. Power Derating Curve

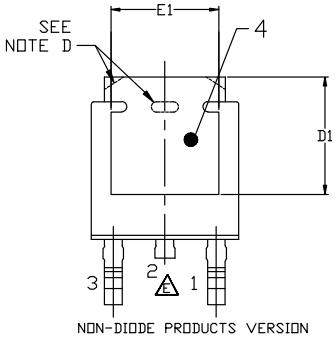


DPAK3 6.10x6.54x2.29, 4.57P
CASE 369AS
ISSUE B

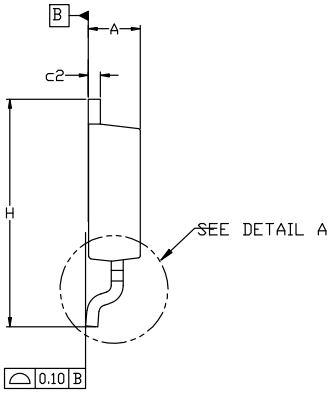
DATE 20 DEC 2023



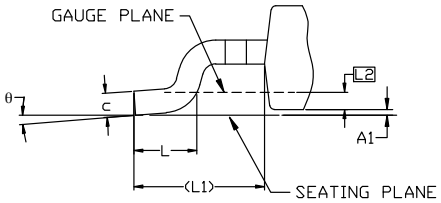
NON-DIODE PRODUCTS VERSION



NON-DIODE PRODUCTS VERSION

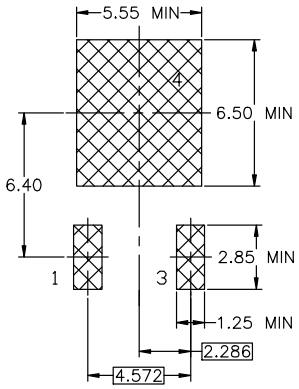


NOTES: UNLESS OTHERWISE SPECIFIED
A) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE F, VARIATION AA.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2018.
D) SUPPLIER DEPENDENT MOLD LOCKING HOLES OR CHAMFERED CORNERS OR EDGE PROTRUSION.
E) FOR DIODE PRODUCTS, L4 IS 0.25 MM MAX PLASTIC BODY STUB WITHOUT CENTER LEAD.
F) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
G) LAND PATTERN RECOMMENDATION IS BASED ON IPC7351A STD TO228P991X239-3N.



DETAIL A
(ROTATED -90°)
SCALE: 12X

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	2.18	2.29	2.39
A1	0.00	–	0.127
b	0.64	0.77	0.89
b2	0.76	0.95	1.14
b3	5.21	5.34	5.46
c	0.45	0.53	0.61
c2	0.45	0.52	0.58
D	5.97	6.10	6.22
D1	5.21	---	---
E	6.35	6.54	6.73
E1	4.32	---	---
e	2.286 BSC		
e1	4.572 BSC		
H	9.40	9.91	10.41
L	1.40	1.59	1.78
L1	2.90 REF		
L2	0.51 BSC		
L3	0.89	1.08	1.27
L4	---	---	1.02
θ	0°	---	10°



LAND PATTERN RECOMMENDATION

*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

GENERIC MARKING DIAGRAM*

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Assembly Lot Code

DOCUMENT NUMBER:	**98AON13810G**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.
DESCRIPTION:	**DPAK3 6.10x6.54x2.29, 4.57P**	**PAGE 1 OF 1**

ADDITIONAL INFORMATION

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