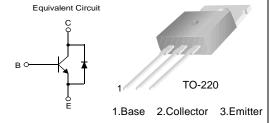


### **FJP5304D**

# **High Voltage High Speed Power Switch Application**

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



### **NPN Triple Diffused Planar Silicon Transistor**

### Absolute Maximum Ratings T<sub>C</sub>=25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CBO</sub>	Collector-Base Voltage	700	V
$V_{CEO}$	Collector-Emitter Voltage	400	V
V <sub>EBO</sub>	Emitter-Base Voltage	12	V
I <sub>C</sub>	Collector Current (DC)	4	Α
I <sub>CP</sub>	* Collector Current (Pulse)	8	Α
I <sub>B</sub>	Base Current (DC)	2	Α
I <sub>BP</sub>	* Base Current (Pulse)	4	Α
P <sub>C</sub>	Collector Dissipation (T <sub>C</sub> =25°C)	70	W
T <sub>STG</sub>	Storage Temperature	- 65 ~ 150	°C

<sup>\*</sup> Pulse Test Pulse Width = 5ms, Duty Cycle ≥ 1.0%

### Electrical Characteristics T<sub>C</sub>=25°C unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Тур.	Max.	Units
BV <sub>CBO</sub>	Collector-Base Breakdown Voltage	$I_{C} = 1 \text{mA}, I_{E} = 0$	700			V
BV <sub>CEO</sub>	Collector-Emitter Breakdown Voltage	$I_{C} = 5mA, I_{B} = 0$	400			V
BV <sub>EBO</sub>	Emitter-Base Breakdown Voltage	$I_E = 1 \text{mA}, I_C = 0$	12			V
I <sub>CES</sub>	Collector Cut-off Current	$V_{CE} = 700V, V_{EB} = 0$			100	mA
I <sub>CEO</sub>	Collector Cut-off Current	V <sub>CE</sub> = 400V, IB = 0			250	mA
I <sub>EBO</sub>	Emitter Cut-off Current	$V_{EB} = 12V, I_{C} = 0$			100	mA
h <sub>FE</sub>	DC Current Gain	$V_{CE} = 5V, I_{C} = 10mA$ $V_{CE} = 5V, I_{C} = 2A$	10 8		40	
V <sub>CE</sub> (sat)	Collector-Emitter Saturation Voltage	$I_C = 0.5A, I_B = 0.1A$ $I_C = 1A, I_B = 0.2A$ $I_C = 2.5A, I_B = 0.5A$		0.7 1.0 1.5	V	
V <sub>BE</sub> (sat)	Base-Emitter Saturation Voltage	$I_C = 0.5A, I_B = 0.1A$ $I_C = 1A, I_B = 0.2A$ $I_C = 2.5A, I_B = 0.5A$		1.1 1.2 1.3	V	
$V_{f}$	Internal Diode Forward Voltage Drop	I <sub>F</sub> = 2A			2.5	V

## $\textbf{Electrical Characteristics} \hspace{0.1cm} \text{(Continued)} \hspace{0.1cm} \textbf{T}_{\text{C}} = 25^{\circ} \textbf{C} \hspace{0.1cm} \text{unless otherwise noted}$

Symbol	Parameter	Test Condition	Min.	TYP.	Max.	Units	
Inductive Lo	Inductive Load Switching (V <sub>CC</sub> = 200V)						
t <sub>stg</sub>	Storage Time	$I_C = 2A, I_{B1} = 0.4A$		0.6		μs	
tf	Fall Time	$V_{BE}$ (off) = -5V, L = 200 $\mu$ H		0.1			
Resistive Lo	oad Switching (V <sub>CC</sub> = 250V)						
t <sub>stg</sub>	Storage Time	$I_C = 2A$ , $I_{B1} = I_{B2} = 0.4A$			2.9	μs	
tf	Fall Time	T <sub>P</sub> = 30μs		0.2			

<sup>\*</sup> Pulse test: PW≤300μs, Duty cycle≤2%

### **Thermal Characteristics**

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.78	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	°C/W

## **Typical Characteristics**

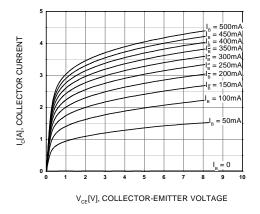


Figure 1. Static Characteristic

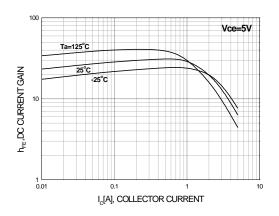


Figure 2. DC Current Gain

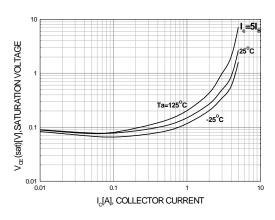


Figure 3. Collector-Emitter Saturation Voltage

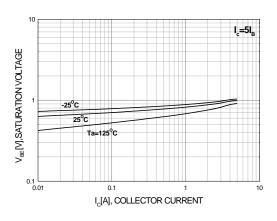


Figure 4. Base-Emitter Saturation Voltage

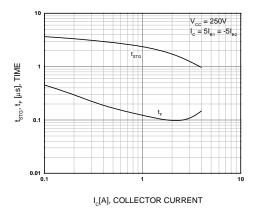


Figure 5. Resitive Load Switching Time

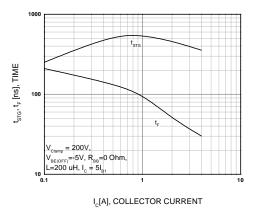


Figure 6. Inductive Load Switching Time

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## Typical Characteristics (Continued)

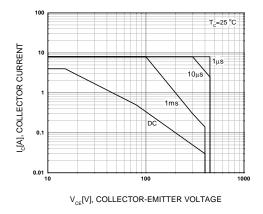


Figure 7. Forward Bias Safe Operating Area

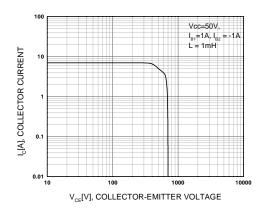


Figure 8. Reverse Bias Safe Operating Area

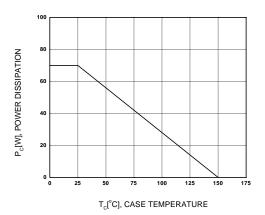
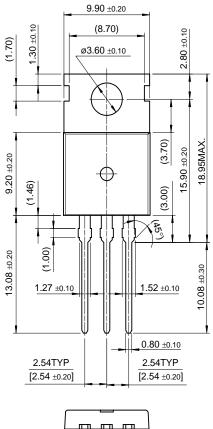


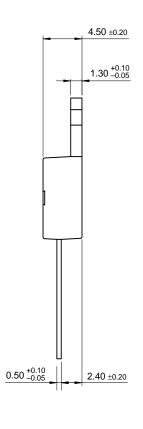
Figure 9. Power Derating

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## **Package Dimensions**

### TO-220





10.00 ±0.20

Dimensions in Millimeters

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E <sup>2</sup> CMOS™	HiSeC™	MSXPro™	Quiet Series™	TruTranslation™
EnSigna™	$I^2C^{TM}$	$OCX^{TM}$	RapidConfigure™	UHC™
Across the board.	Around the world.™	OCXPro™	RapidConnect™	UltraFET <sup>®</sup>
The Power Franchise™		OPTOLOGIC <sup>®</sup>	SILENT SWITCHER®	VCX™
Programmable Ad	ctive Droop™	OPTOPLANAR™	SMART START™	

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