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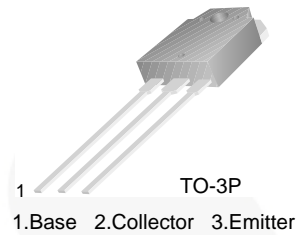
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# FJA13009

## High-Voltage Switch Mode Application

### Features

- High-Speed Switching
- Suitable for Switching Regulator and Motor Control



### Ordering Information

Part Number	Marking	Package	Packing Method
FJA13009TU	J13009	TO-3P	Rail

### Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_C = 25^\circ\text{C}$  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)	12	A
$I_{CP}$	Collector Current (Pulse)	24	A
$I_B$	Base Current	6	A
$P_D$	Total Device Dissipation ( $T_C = 25^\circ\text{C}$ )	130	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 to +150	$^\circ\text{C}$

**Electrical Characteristics<sup>(1)</sup>**Values are at  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 10 \text{ mA}, I_B = 0$	400			V
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 7 \text{ V}, I_C = 0$			1	mA
$h_{FE}$	DC Current Gain	$V_{CE} = 5 \text{ V}, I_C = 5 \text{ A}$	8		40	
		$V_{CE} = 5 \text{ V}, I_C = 8 \text{ A}$	6		30	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 5 \text{ A}, I_B = 1 \text{ A}$			1.0	V
		$I_C = 8 \text{ A}, I_B = 1.6 \text{ A}$			1.5	
		$I_C = 12 \text{ A}, I_B = 3 \text{ A}$			3.0	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 5 \text{ A}, I_B = 1 \text{ A}$			1.2	V
		$I_C = 8 \text{ A}, I_B = 1.6 \text{ A}$			1.6	
$C_{ob}$	Output Capacitance	$V_{CB} = 10 \text{ V}, f = 0.1 \text{ MHz}$		180		pF
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10 \text{ V}, I_C = 0.5 \text{ A}$	4			MHz
$t_{ON}$	Turn-On Time	$V_{CC} = 125 \text{ V}, I_C = 8 \text{ A}$			1.1	$\mu\text{s}$
$t_{STG}$	Storage Time	$I_{B1} = - I_{B2} = 1.6 \text{ A}$			3.0	
$t_F$	Fall Time	$R_L = 15.6 \Omega$			0.7	

**Note:**

1. Pulse test: pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

## Typical Performance Characteristics

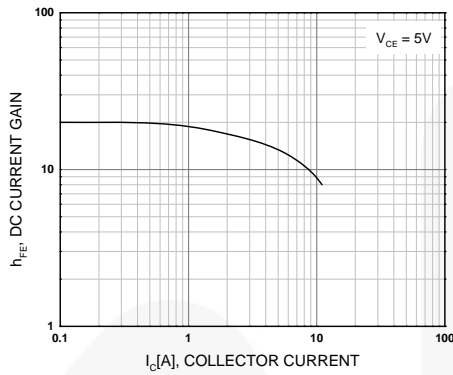


Figure 1. DC Current Gain

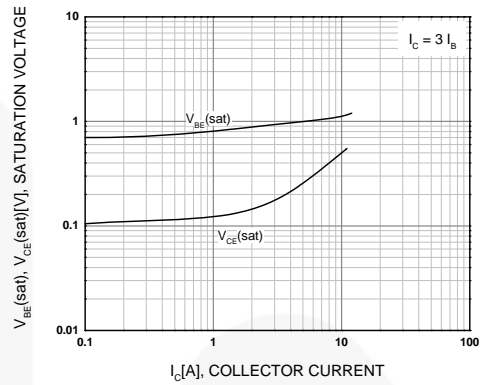


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

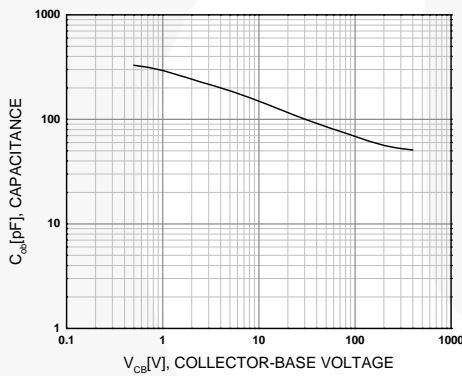


Figure 3. Collector Output Capacitance

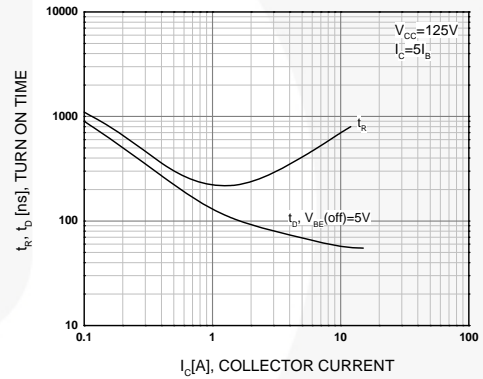


Figure 4. Turn-On Time

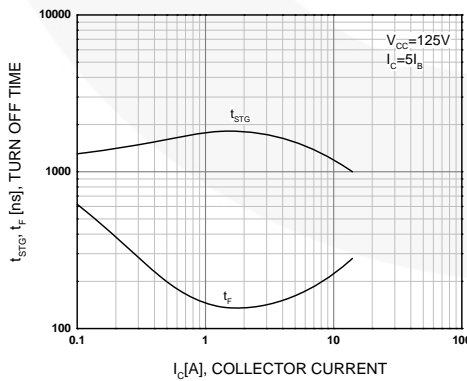


Figure 5. Turn-Off Time

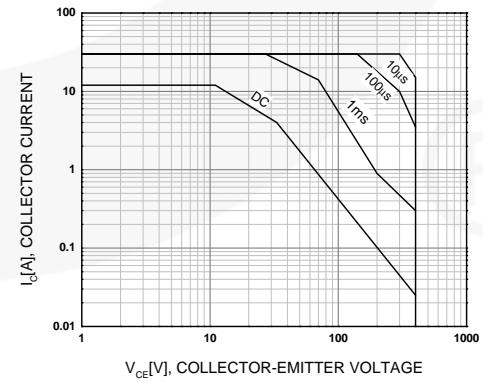


Figure 6. Forward Bias Safe Operating Area

Typical Performance Characteristics (continued)

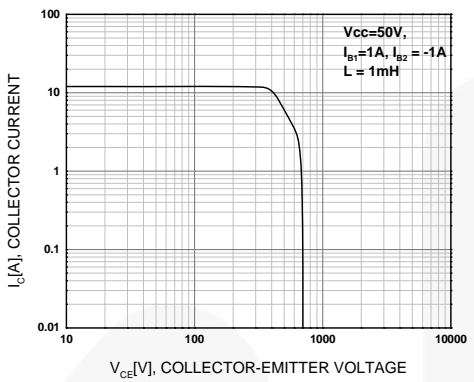


Figure 7. Reverse Bias Safe Operating Area

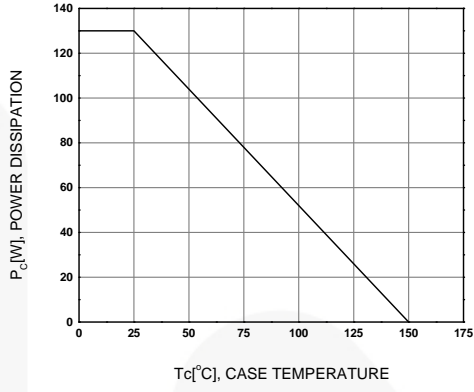
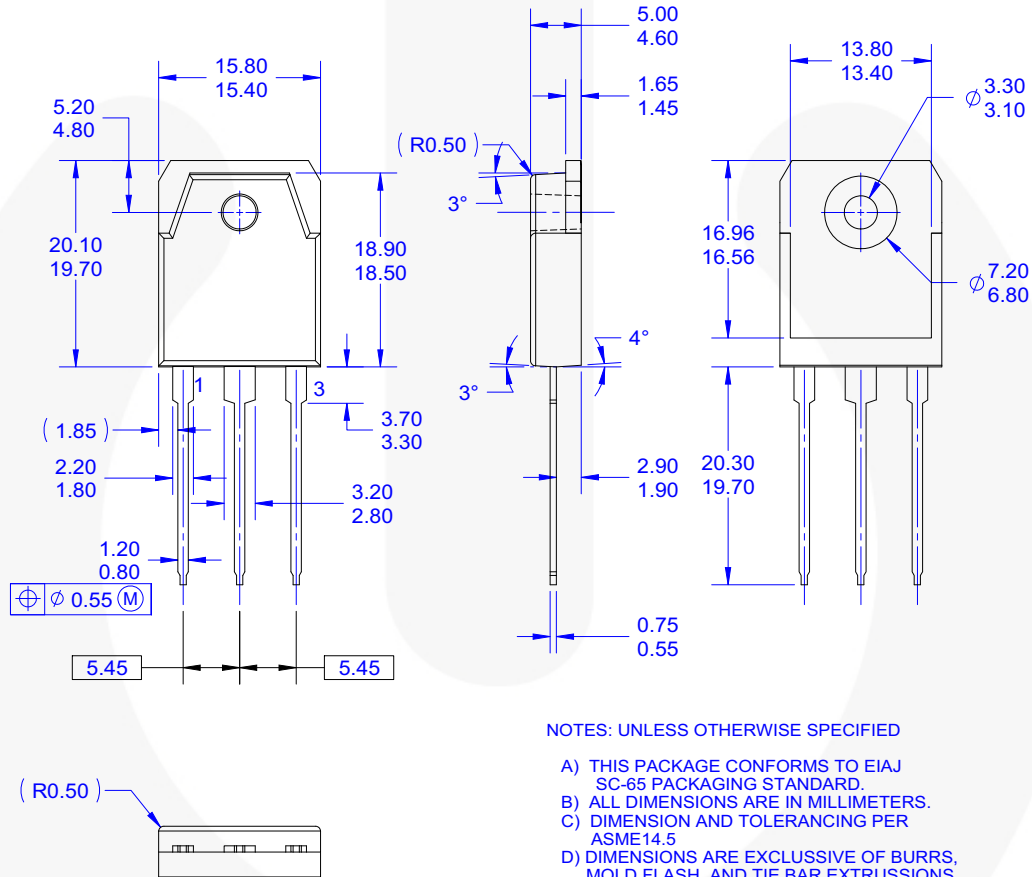


Figure 8. Power Derating



# Physical Dimensions

## TO-3P



NOTES: UNLESS OTHERWISE SPECIFIED

- A) THIS PACKAGE CONFORMS TO EIAJ SC-65 PACKAGING STANDARD.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSION AND TOLERANCING PER ASME14.5
- D) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
- E) THIS PACKAGE IS INTENDED ONLY FOR TO3PN.
- F) DRAWING FILE NAME: TO3P03AREV4.

**Figure 9. 3-LEAD, T03, PLASTIC, EIAJ SC-65 (ACTIVE)**

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| CorePLUS™   | Green FPS™                                     | QS™   | TinyLogic®  |
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