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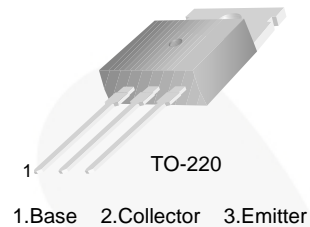


November 2014

# FJP13007 High Voltage Fast-Switching NPN Power Transistor

## Features

- High Voltage High Speed Power Switch Application
- High Voltage Capability
- High Switching Speed
- Suitable for Electronic Ballast and Switching Mode Power Supply



## Ordering Information

Part Number	Top Mark	Package	Packing Method
FJP13007TU	J13007	TO-220 3L (Dual Gauge)	Rail
FJP13007H1TU	J13007-1	TO-220 3L (Single Gauge)	Rail
FJP13007H1TU_F080	J13007-1	TO-220 3L (Dual Gauge)	Rail
FJP13007H2TU	J13007-2	TO-220 3L (Dual Gauge)	Rail
FJP13007H2TU_F080	J13007-2	TO-220 3L (Dual Gauge)	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	Unit
$V_{CBO}$	Collector-Base Voltage	700	V
$V_{CEO}$	Collector-Emitter Voltage	400	V
$V_{EBO}$	Emitter-Base Voltage	9	V
$I_C$	Collector Current (DC)	8	A
$I_{CP}$	Collector Current (Pulse)	16	A
$I_B$	Base Current (DC)	4	A
$P_C$	Collector Dissipation ( $T_C = 25^\circ\text{C}$ )	80	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-65 to 150	$^\circ\text{C}$

FJP13007 — High Voltage Fast-Switching NPN Power Transistor

## Electrical Characteristics

Values are at  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 10\text{ mA}, I_B = 0$	400			V
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 9\text{ V}, I_C = 0$			1	mA
$h_{FE1}$	DC Current Gain <sup>(1)</sup>	$V_{CE} = 5\text{ V}, I_C = 2\text{ A}$	8		60	
$h_{FE2}$	DC Current Gain <sup>(1)</sup>	$V_{CE} = 5\text{ V}, I_C = 5\text{ A}$	5		30	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 2\text{ A}, I_B = 0.4\text{ A}$			1.0	V
		$I_C = 5\text{ A}, I_B = 1\text{ A}$			2.0	
		$I_C = 8\text{ A}, I_B = 2\text{ A}$			3.0	
$V_{BE(sat)}$	Collector-Base Saturation Voltage	$I_C = 2\text{ A}, I_B = 0.4\text{ A}$			1.2	V
		$I_C = 5\text{ A}, I_B = 1\text{ A}$			1.6	
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{ V}, I_C = 0.5\text{ A}$	4			MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{ V}, f = 0.1\text{ MHz}$		110		pF
$t_{ON}$	Turn-On Time	$V_{CC} = 125\text{ V}, I_C = 5\text{ A},$ $I_{B1} = -I_{B2} = 1\text{ A},$ $R_L = 25\ \Omega$			1.6	$\mu\text{s}$
$t_{STG}$	Storage Time				3.0	$\mu\text{s}$
$t_F$	Fall Time				0.7	$\mu\text{s}$

**Note:**

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

## $h_{FE}$ Classification

Classification	H1	H2
$h_{FE1}$	15 ~ 28	26 ~ 39

## Typical Performance Characteristics

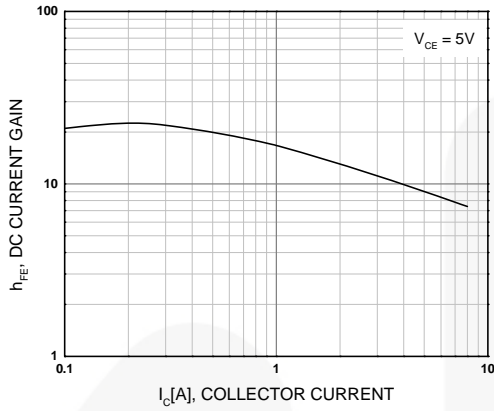


Figure 1. DC Current Gain

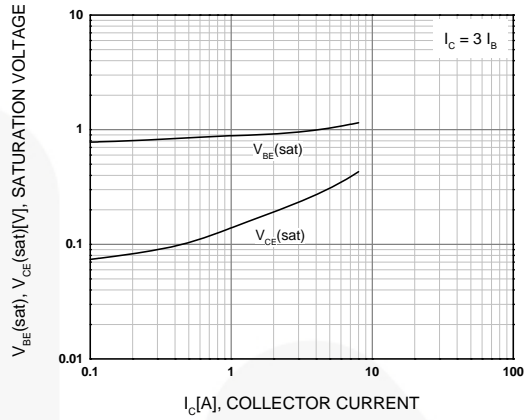


Figure 2. Saturation Voltage

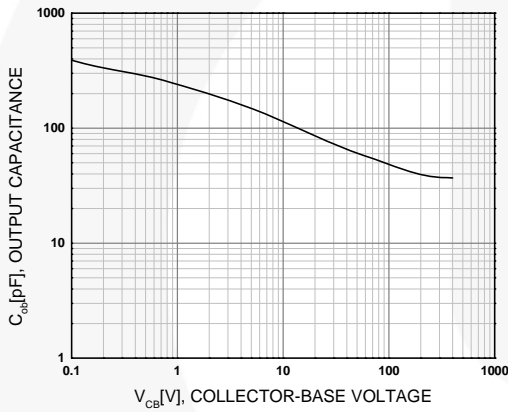


Figure 3. Collector Output Capacitance

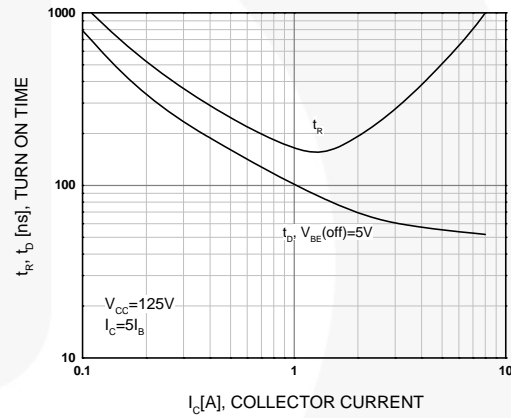


Figure 4. Turn-On Time

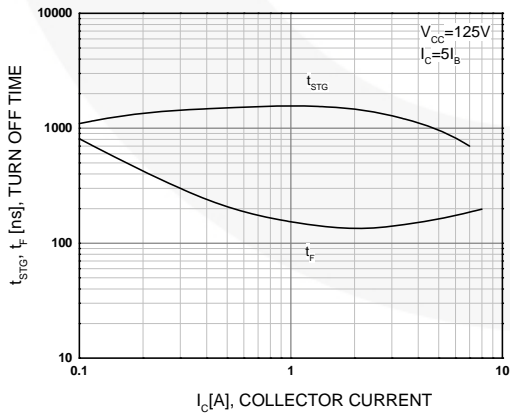


Figure 5. Turn-Off Time

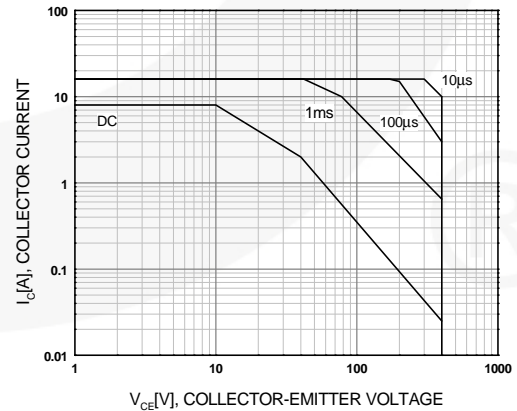
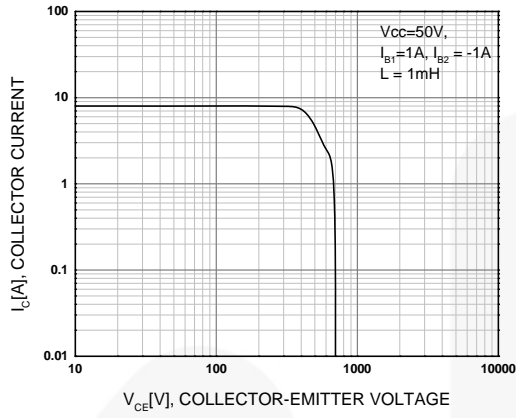
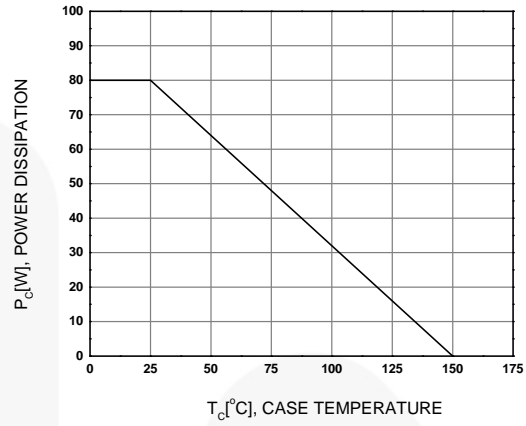


Figure 6. Forward Biased Safe Operating Area

**Typical Performance Characteristics** (Continued)



**Figure 7. Reverse Biased Safe Operating Area**



**Figure 8. Power Derating**



- NOTES:
- A) REFERENCE JEDEC, TO-220, VARIATION AB
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [ ].
  - D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
  - E) DOES NOT COMPLY JEDEC STANDARD VALUE.
  - F) "A1" DIMENSIONS AS BELOW:  
 SINGLE GAUGE = 0.51 - 0.61  
 DUAL GAUGE = 1.10 - 1.45
  - G) DRAWING FILE NAME: TO220B03REV9
  - H) PRESENCE IS SUPPLIER DEPENDENT
  - I) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

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