FAIRCHILD SEMICONDUCTOR®

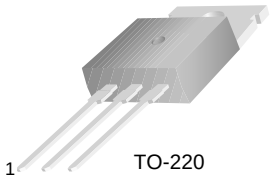
July 2013

FJPF13009

NPN Silicon Transistor

Features

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



TO-220

1.Base 2.Collector 3.Emitter

Ordering Information

Part Number[1]	Marking	Package	Packing Method
FJPF13009H1TU	J13009-1	TO-220F 3L	Rail
FJPF13009H2TU	J13009-2	TO-220F 3L	Rail

Note:

1. The Affix “-H2” means the hFE classification.
   The Suffix “-TU” means the tube packing method.

Absolute Maximum Ratings[2]

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°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°C)	50	W
T_J	Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-65 to +150	°C

Note:

2. These ratings are based on a maximum junction temperature of 150°C.
   These are steady state-limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Electrical Characteristics[3]

Values are at T_C = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
V_{CEO}(sus)	Collector-Emitter Sustaining Voltage	I_C = 10 mA, I_B = 0	400			V
I_{EBO}	Emitter Cut-Off Current	V_{EB} = 9 V, I_C = 0			1	mA
h_{FE}	DC Current Gain	V_{CE} = 5 V, I_C = 5 A (h_{FE1})	8		40	
		V_{CE} = 5 V, I_C = 8 A	6		30	
V_{CE}(sat)	Collector-Emitter Saturation Voltage	I_C = 5 A, I_B = 1 A			1.0	V
		I_C = 8 A, I_B = 1.6 A			1.5	
		I_C = 12 A, I_B = 3 A			3.0	
V_{BE} (sat)	Base-Emitter Saturation Voltage	I_C = 5 A, I_B = 1 A			1.2	V
		I_C = 8 A, I_B = 1.6 A			1.6	
C_{ob}	Output Capacitance	V_{CB} = 10 V, f = 0.1 MHz		180		pF
f_T	Current Gain Bandwidth Product	V_{CE} = 10 V, I_C = 0.5 A	4			MHz
t_{ON}	Turn-On Time	V_{CC} = 125 V, I_C = 8 A, I_{B1} = - I_{B2} = 1.6 A, R_L = 15.6 Ω			1.1	µs
t_{STG}	Storage Time				3.0	
t_F	Fall Time				0.7	

Note:

3. Pulse test: pulse width ≤ 300 µs, duty cycle ≤ 2%.

Typical Performance Characteristics

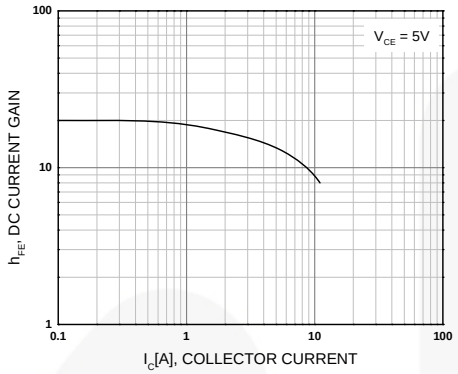


Figure 1. DC current Gain

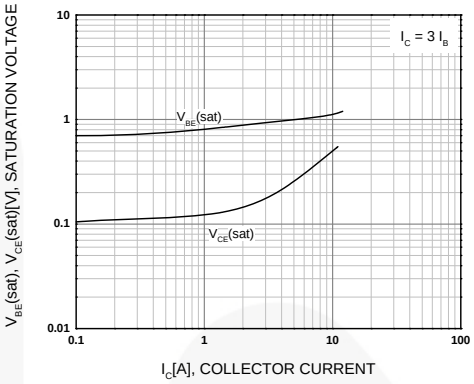


Figure 2. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

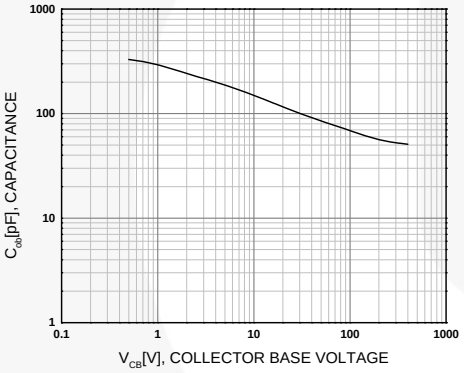


Figure 3. Collector Output Capacitance

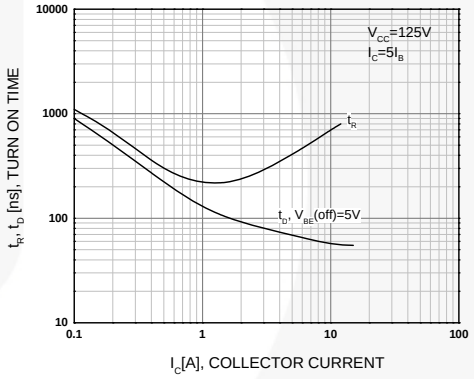


Figure 4. Turn-On Time

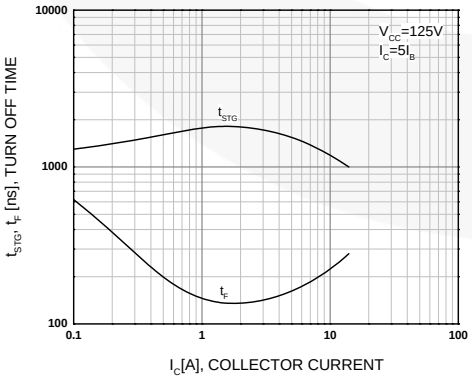


Figure 5. Turn-Off Time

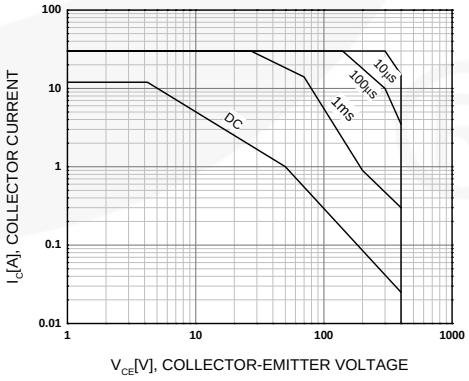


Figure 6. Forward Bias Safe Operating Area

Typical Performance Characteristics (continued)

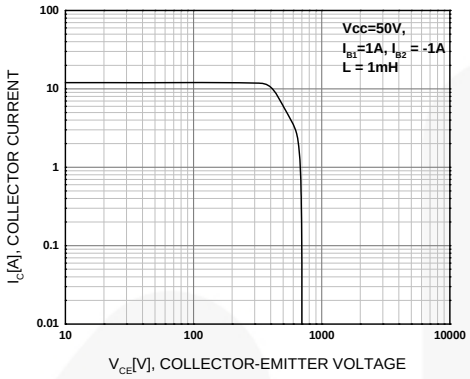


Figure 7. Reverse Bias Safe Operating Area

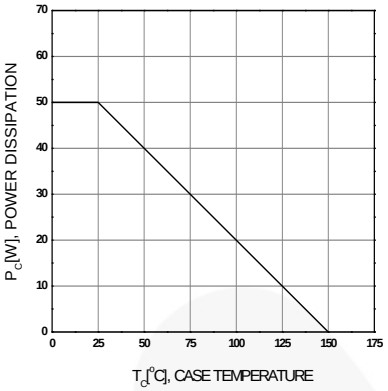
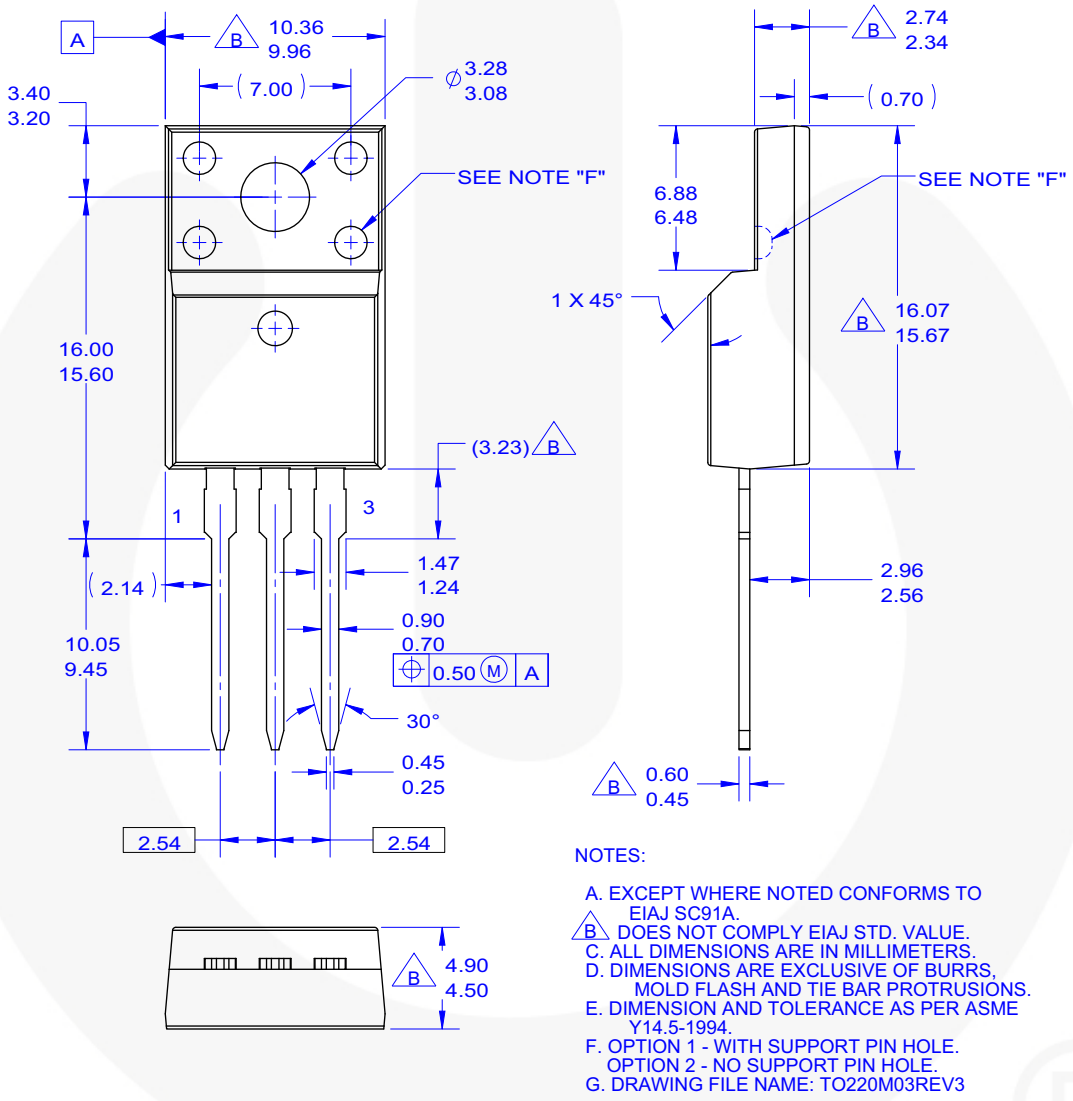


Figure 8. Power Derating

Physical Dimensions

TO-220F 3L



NOTES:

A. EXCEPT WHERE NOTED CONFORMS TO EIAJ SC91A.
B. DOES NOT COMPLY EIAJ STD. VALUE.
C. ALL DIMENSIONS ARE IN MILLIMETERS.
D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
E. DIMENSION AND TOLERANCE AS PER ASME Y14.5-1994.
F. OPTION 1 - WITH SUPPORT PIN HOLE.
OPTION 2 - NO SUPPORT PIN HOLE.
G. DRAWING FILE NAME: TO220M03REV3

Figure 9. TO220, MOLDED, 3-LEAD, FULL PACK, EIAJ SC91, STRAIGHT LEAD (ACTIVE)

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http://www.fairchildsemi.com/dwg/TO/TO220M03.pdf.
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