September 2014

FJPF13009
NPN Silicon Transistor

Features

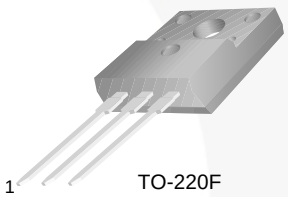
- High-Voltage Capability
- High Switching Speed

Applications

- Electronic Ballast
- Switching Regulator
- Motor Control
- Switched Mode Power Supply

Description

The FJPF13009 is a 700 V, 12 A NPN silicon epitaxial planar transistor. The FJPF13009 is available with multiple h_{FE} bin classes for ease of design use. The FJPF13009 is designed for high speed switching applications which utilizes the industry standard TO-220F package offering flexibility in design and excellent power dissipation.



TO-220F

1.Base 2.Collector 3.Emitter

Ordering Information

Part Number(1)	Top Mark	Package	Packing Method
FJPF13009H1TU	J13009-1	TO-220F 3L	Rail
FJPF13009H2TU	J13009-2	TO-220F 3L	Rail

Notes:

1. The affix “-H1, H2” means the h_{FE} classification. The suffix “-TU” means the tube packing method.

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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	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)	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. Fairchild Semiconductor should be consulted on application involving pulsed or low-duty-cycle operations.

Electrical Characteristics

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

Symbol	Parameter	Conditions	Min.	Typ.	Max	Unit
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_{FE1}	DC Current Gain(3)	V_{CE} = 5 V, I_C = 5 A	8		40	
h_{FE2}		V_{CE} = 5 V, I_C = 8 A	6		30	
V_{CE}(sat)	Collector-Emitter Saturation Voltage(3)	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(3)	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%

h_{FE} Classification

Classification	H1	H2
h_{FE1}	8 ~ 17	15 ~ 28

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Typical Performance Characteristics

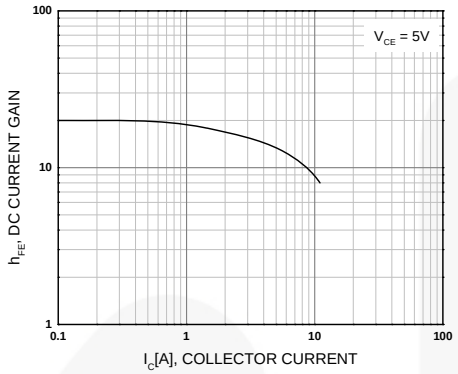


Figure 1. DC Current Gain

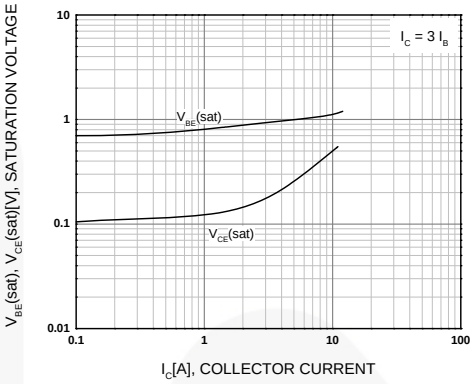


Figure 2. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

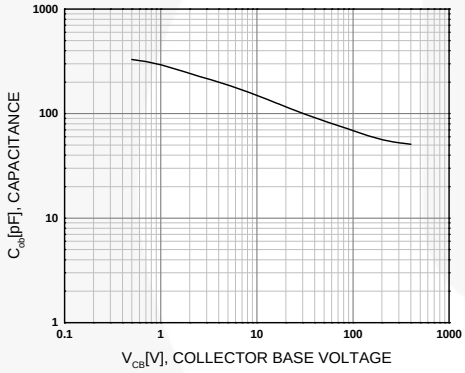


Figure 3. Collector Output Capacitance

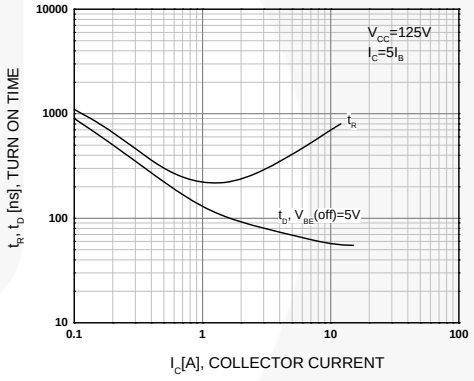


Figure 4. Turn-On Time

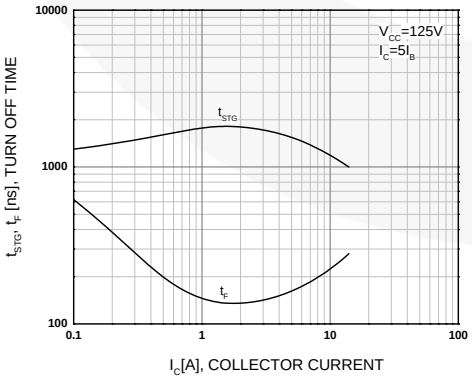


Figure 5. Turn-Off Time

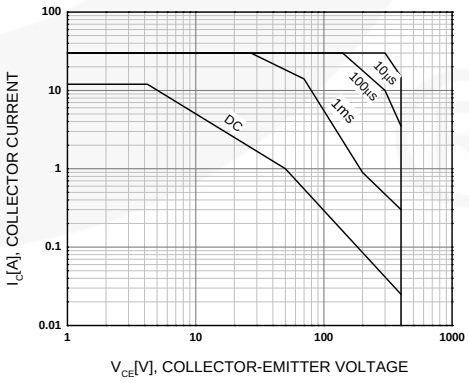


Figure 6. Forward Bias Safe Operating Area

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Typical Performance Characteristics (Continued)

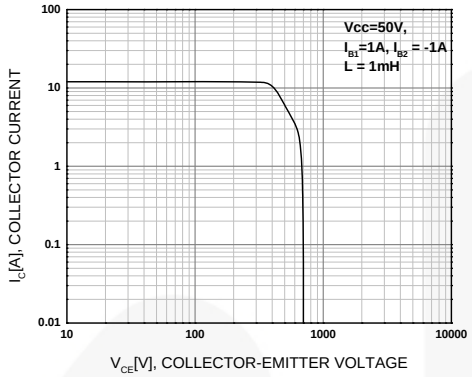


Figure 7. Reverse Bias Safe Operating Area

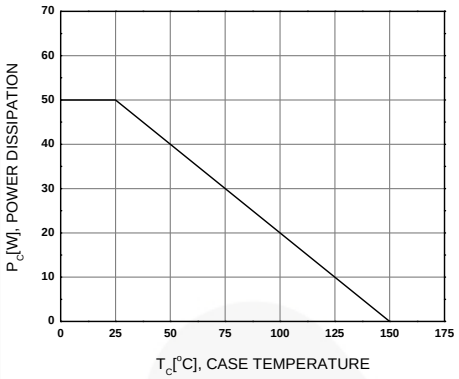
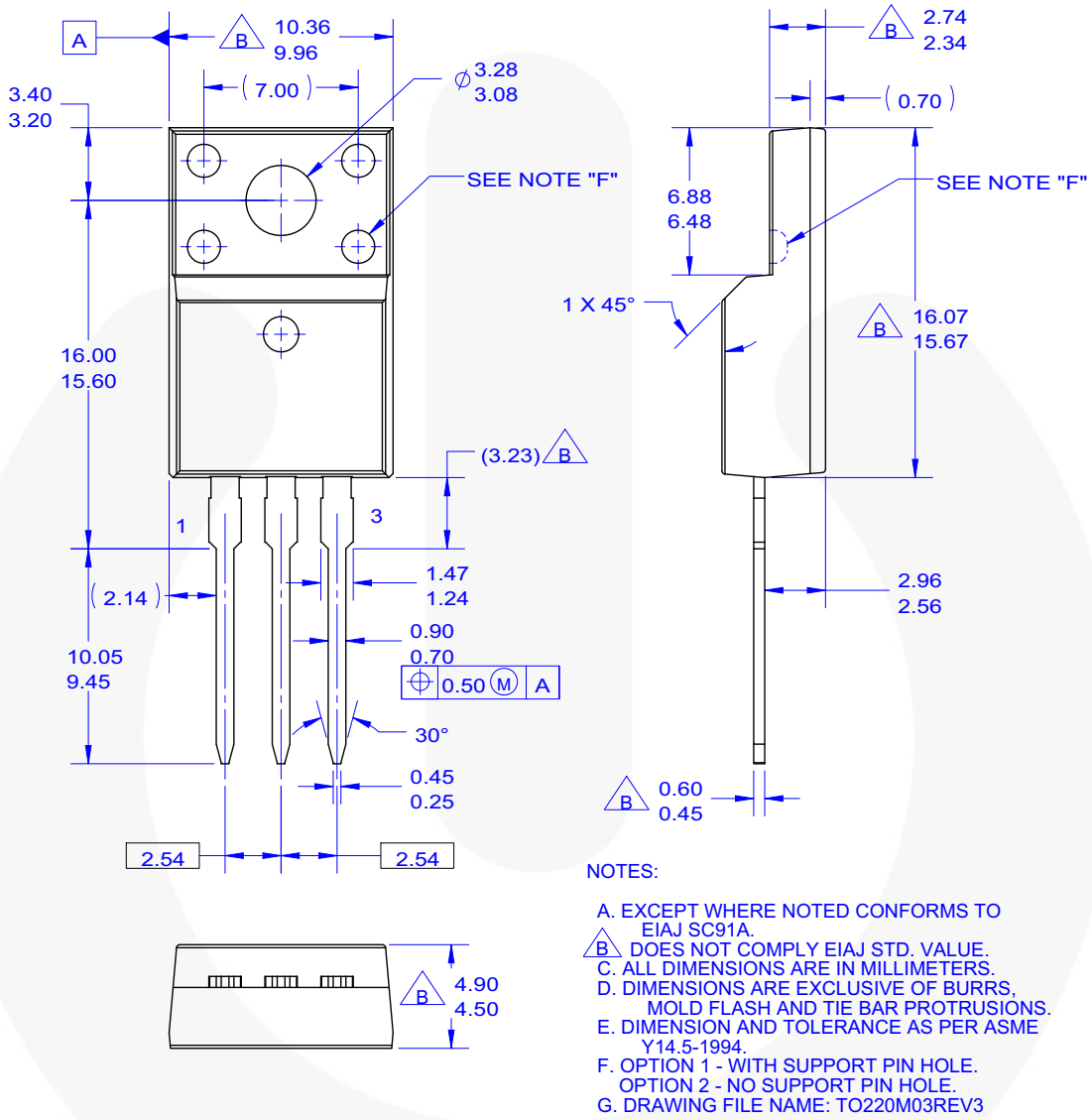


Figure 8. Power Derating

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Physical Dimensions



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

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