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FAIRCHILD SEMICONDUCTOR®

November 2013

FJV3113R
NPN Epitaxial Silicon Transistor with Bias Resistor

Features

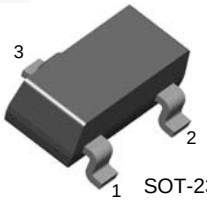
- 100 mA Output Current Capability
- Built-in Bias Resistor (R_1 = 2.2 kΩ, R_2 = 47 kΩ)

Application

- Switching, Interface, and Driver Circuits
- Inverters
- Digital Applications in Industrial Segments

Description

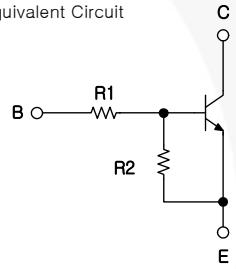
Transistors with built-in resistors can be excellent space- and cost-saving solutions by reducing component count and simplifying circuit design.



SOT-23

1. Base 2. Emitter 3. Collector

Equivalent Circuit



Ordering Information

Part Number	Top Mark	Package	Packing Method
FJV3113RMTF	R33	SOT-23 3L	Tape and Reel

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_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	50	V
V_{CEO}	Collector-Emitter Voltage	50	V
V_{EBO}	Emitter-Base Voltage	10	V
I_C	Collector Current	100	mA
T_J	Junction Temperature	150	°C
T_{STG}	Storage Temperature	-55 to 150	°C

Thermal Characteristics[1]

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

Symbol	Parameter	Value	Unit
P_D	Power Dissipation	200	mW
	Derate Above T_A = 25°C	1.60	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	625	°C/W

Note:

1. FR-4 76 x 114 x 0.6T mm^3 (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = 10 μA, I_E = 0	50			V
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_C = 100 μA, I_B = 0	50			V
I_{CBO}	Collector Cut-Off Current	V_{CB} = 40 V, I_E = 0			0.1	μA
h_{FE}	DC Current Gain	V_{CE} = 5 V, I_C = 5 mA	68			
V_{CE}(sat)	Collector-Emitter Saturation Voltage	I_C = 10 mA, I_B = 0.5 mA			0.3	V
f_T	Current Gain Bandwidth Product	V_{CE} = 10 V, I_C = 5 mA		250		MHz
C_{ob}	Output Capacitance	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz		3.7		pF
V_I(off)	Input-Off Voltage	V_{CE} = 5 V, I_C = 100 μA			0.5	V
V_I(on)	Input-On Voltage	V_{CE} = 0.2 V, I_C = 5 mA	1.1			V
R_1	Input Resistor		1.5	2.2	2.9	kΩ
R_1/R_2	Resistor Ratio		0.042	0.047	0.052	

Typical Performance Characteristics

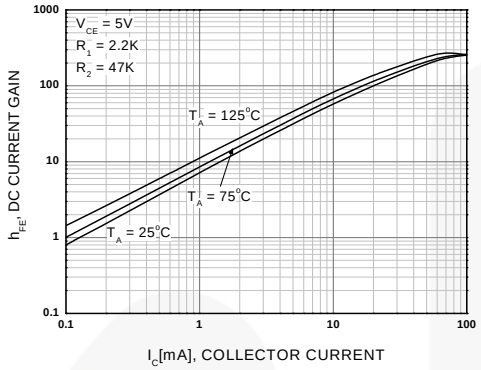


Figure 1. DC Current Gain

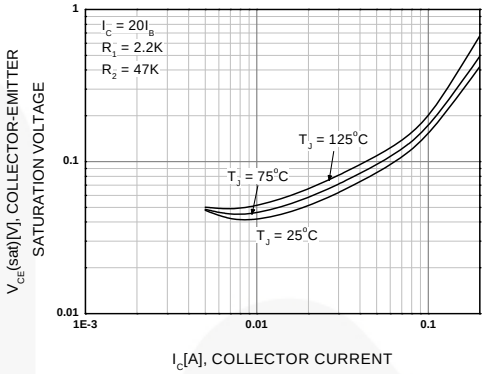


Figure 2. Collector-Emitter Saturation Voltage

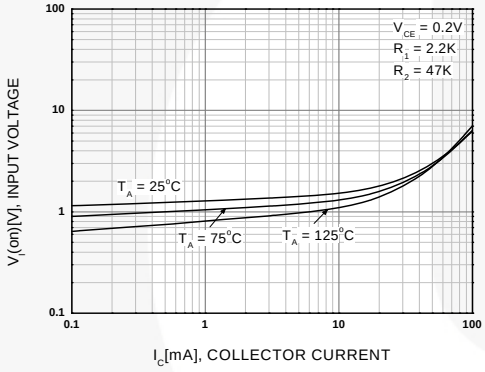


Figure 3. Input-On Voltage

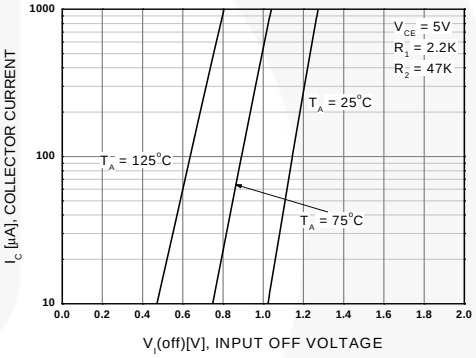


Figure 4. Input-Off Voltage

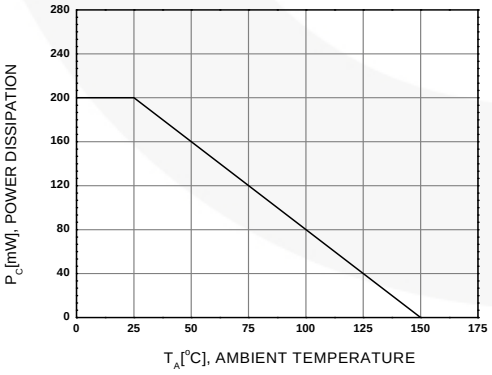


Figure 5. Power Derating

Physical Dimensions

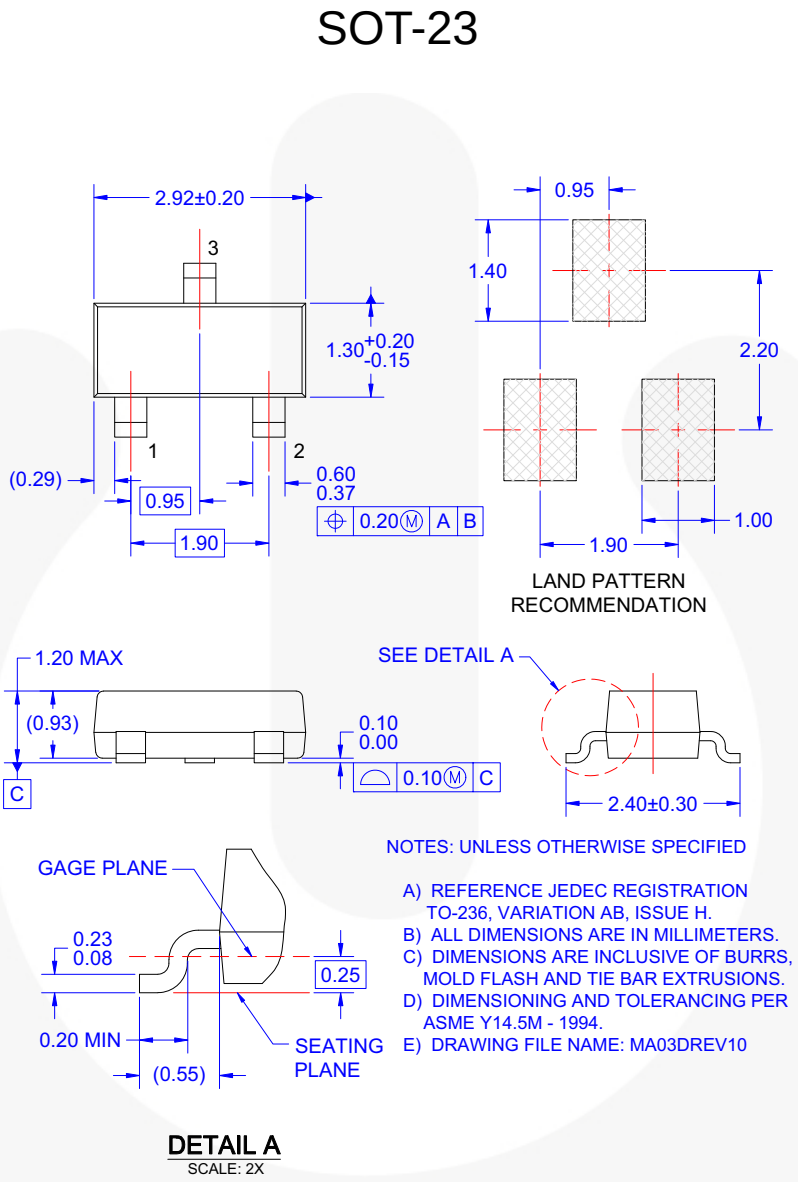


Figure 6. 3-LEAD, SOT-23, JEDEC TO-236, LOW PROFILE (ACTIVE)

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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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