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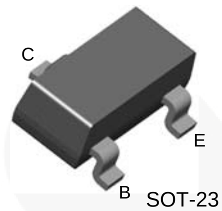
FAIRCHILD

November 2014

MMBT5401
PNP Epitaxial Silicon Transistor

Features

- PNP General-Purpose Amplifier
- This device is designed as a general-purpose amplifier and switch for applications requiring high voltage.



Ordering Information

Part Number	Marking	Package	Packing Method
MMBT5401	2L	SOT-23 3L	Tape and Reel, 3000 pcs, 7 inch Reel
MMBT5401_D87Z	2L	SOT-23 3L	Tape and Reel, 10000 pcs, 13 inch Reel

Absolute Maximum Ratings(1),(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_A = 25°C unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	-150	V
V_{CBO}	Collector-Base Voltage	-160	V
V_{EBO}	Emitter-Base Voltage	-5.0	V
I_C	Collector Current - Continuous	-600	mA
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Notes:

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

Thermal Characteristics[3]

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

Symbol	Parameter	Max.	Unit
P_D	Total Device Dissipation	350	mW
	Derate Above 25°C	2.8	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	357	°C/W

Note:
3. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (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.	Max.	Unit
BV_{CEO}	Collector-Emitter Breakdown Voltage[4]	I_C = -1.0 mA, I_B = 0	-150		V
BV_{CBO}	Collector-Base Breakdown Voltage	I_C = -100 µA, I_E = 0	-160		V
BV_{EBO}	Emitter-Base Breakdown Voltage	I_E = -10 µA, I_C = 0	-5.0		V
I_{CBO}	Collector Cut-Off Current	V_{CB} = -120 V, I_E = 0		-50	nA
		V_{CB} = -120 V, I_E = 0, T_A = 100°C		-50	µA
I_{EBO}	Emitter Cut-Off Current	V_{EB} = -3.0 V, I_C = 0		-50	nA
h_{FE}	DC Current Gain[4]	I_C = -0.1 mA, V_{CE} = -5.0 V	50		
		I_C = -10 mA, V_{CE} = -5.0 V	60	240	
		I_C = -50 mA, V_{CE} = -5.0 V	50		
$V_{CE}(sat)$	Collector-Emitter Saturation Voltage[4]	I_C = -10 mA, I_B = -1.0 mA		-0.2	V
		I_C = -50 mA, I_B = -5.0 mA		-0.5	
$V_{BE}(sat)$	Base-Emitter Saturation Voltage[4]	I_C = -10 mA, I_B = -1.0 mA		-1.0	V
		I_C = -50 mA, I_B = -5.0 mA		-1.0	
f_T	Current Gain Bandwidth Product	I_C = -10 mA, V_{CE} = -10 V, f = 100 MHz	100	300	MHz
C_{ob}	Output Capacitance	V_{CB} = -10 V, I_E = 0, f = 1 MHz		6.0	pF
N_F	Noise Figure	I_C = -250 µA, V_{CE} = -5.0 V, R_S = 1.0 kΩ, f = 10 Hz to 15.7 kHz		8.0	dB

Note:
4. Pulse test: Pulse width ≤ 300 µs, duty cycle ≤ 2%

Typical Performance Characteristics

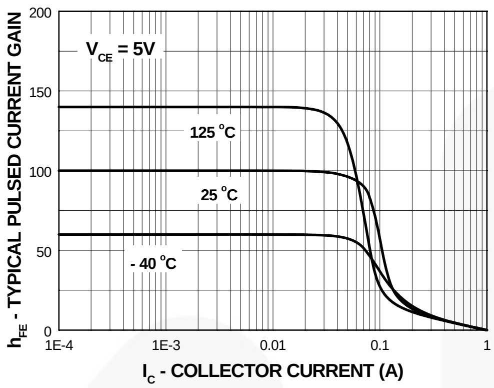


Figure 1. Typical Pulsed Current Gain vs. Collector Current

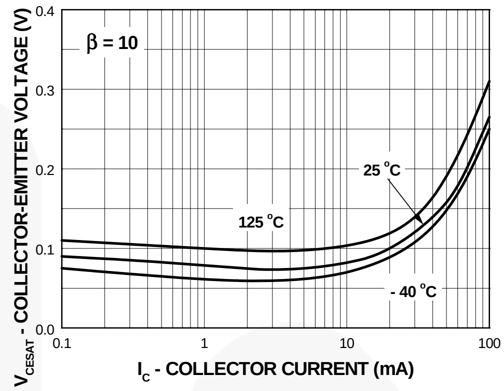


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

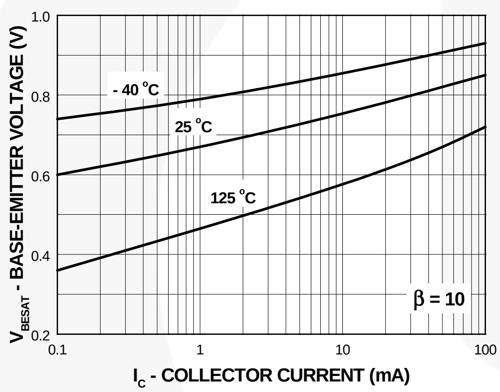


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

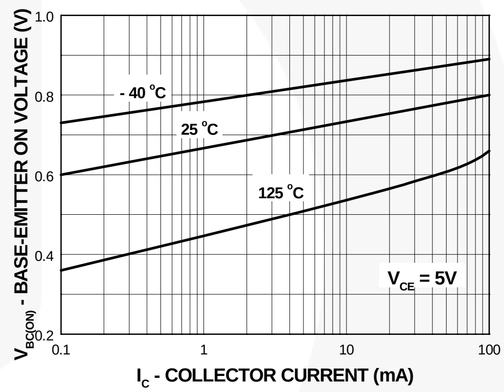


Figure 4. Base-Emitter On Voltage vs. Collector Current

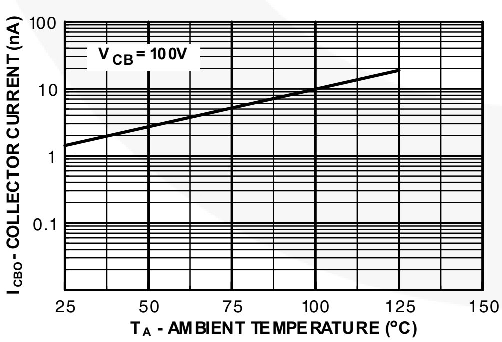


Figure 5. Collector-Cutoff Current vs. Ambient Temperature

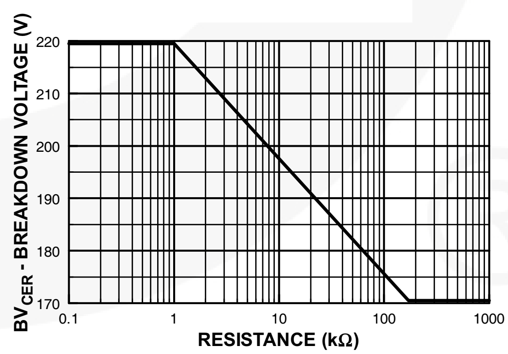


Figure 6. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

Typical Performance Characteristics (Continued)

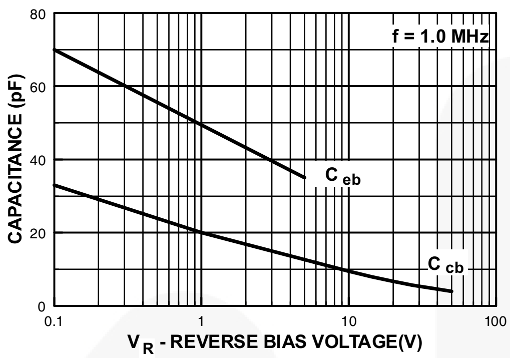


Figure 7. Input and Output Capacitance vs. Reverse Voltage

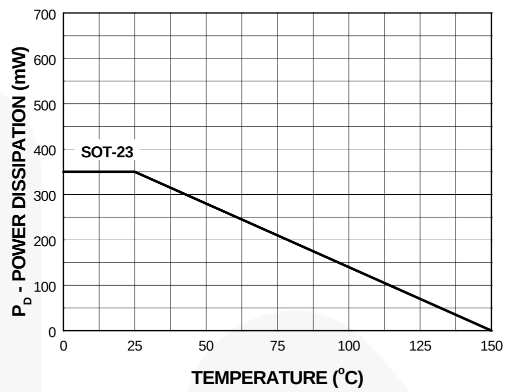


Figure 8. Power Dissipation vs. Ambient Temperature

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Physical Dimensions

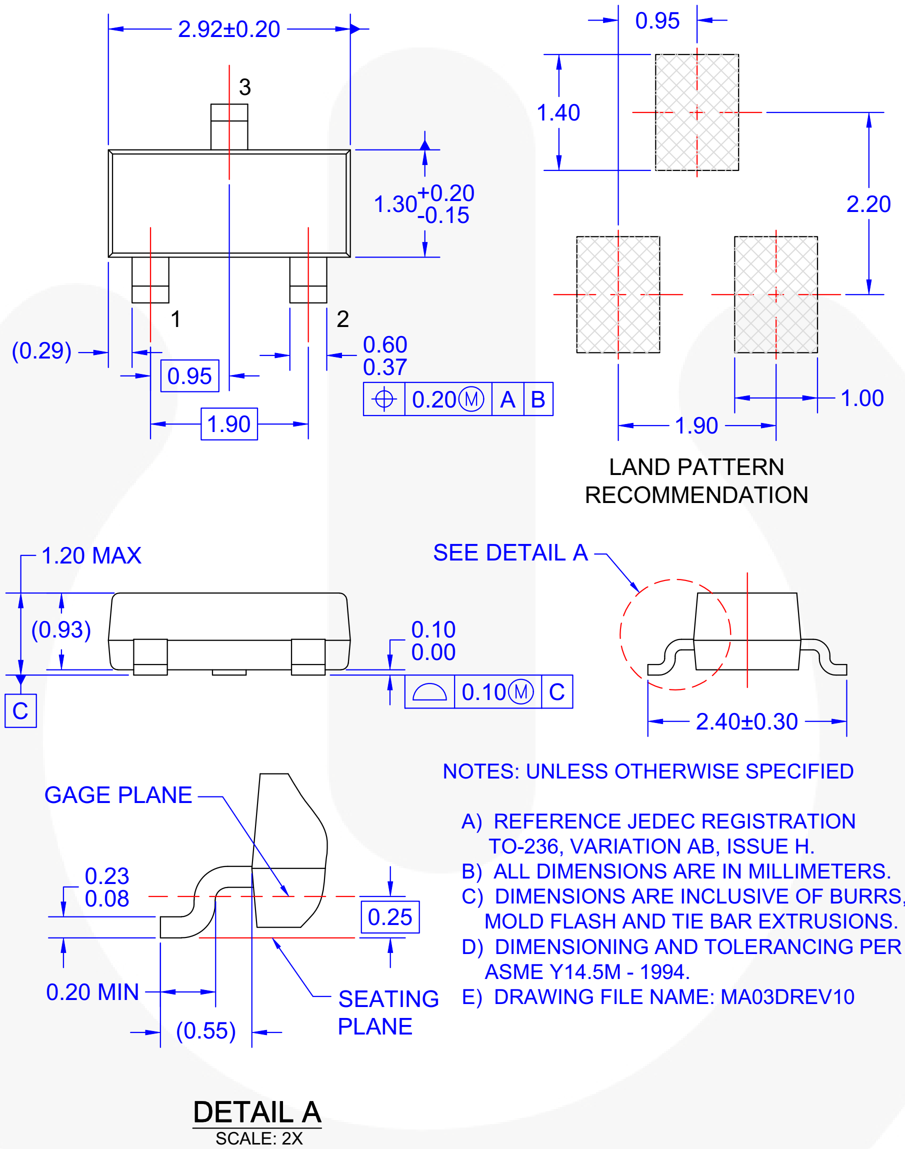

Figure 9. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE

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