



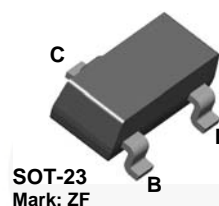
March 2014

# MMBT4126

## PNP General-Purpose Amplifier

### Description

This device is designed for general-purpose amplifier and switching applications at collector currents to 10  $\mu$ A as a switch and to 100 mA as an amplifier.



### Ordering Information

Part Number	Marking	Package	Packing Method
MMBT4126	ZF	SOT-23 3L	Tape and Reel

### Absolute Maximum Ratings<sup>(1),(2)</sup>

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  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	-25	V
$V_{CBO}$	Collector-Base Voltage	-25	V
$V_{EBO}$	Emitter-Base Voltage	-4	V
$I_C$	Collector Current - Continuous	-200	mA
$T_J, T_{STG}$	Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

#### Notes:

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

### Thermal Characteristics<sup>(3)</sup>

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

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

**Note:**

3. Device mounted on FR-4 PCB 1.6 inch X 1.6 inch X 0.06 inch.

### Electrical Characteristics

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

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = -1.0\text{ mA}, I_B = 0$	-25		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\text{ }\mu\text{A}, I_E = 0$	-25		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\text{ }\mu\text{A}, I_C = 0$	-4.0		V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = -20\text{ V}, I_E = 0$		-50	nA
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = -3.0\text{ V}, I_C = 0$		-50	nA
$h_{FE}$	DC Current Gain <sup>(4)</sup>	$I_C = -2.0\text{ mA}, V_{CE} = -1.0\text{ V}$	120	360	
		$I_C = -50\text{ mA}, V_{CE} = -1.0\text{ V}$	60		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage <sup>(4)</sup>	$I_C = -50\text{ mA}, I_B = -5.0\text{ mA}$		-0.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage <sup>(4)</sup>	$I_C = -50\text{ mA}, I_B = -5.0\text{ mA}$		-0.95	V
$f_T$	Current Gain - Bandwidth Product	$I_C = -10\text{ mA}, V_{CE} = -20\text{ V}, f = 100\text{ MHz}$	250		MHz
$C_{ib}$	Input Capacitance	$V_{EB} = -0.5\text{ V}, I_C = 0, f = 1.0\text{ MHz}$		10	pF
$C_{cb}$	Collector-Base Capacitance	$V_{CB} = -5.0\text{ V}, I_E = 0, f = 100\text{ kHz}$		4.5	pF
$h_{fe}$	Small-Signal Current Gain	$I_C = -2.0\text{ mA}, V_{CE} = -10\text{ V}, f = 1.0\text{ kHz}$	120	480	
NF	Noise Figure	$I_C = -100\text{ }\mu\text{A}, V_{CE} = -5.0\text{ V}, R_S = -1.0\text{ k}\Omega, f = 10\text{ Hz to }15.7\text{ kHz}$		4.0	dB

**Note:**

4. Pulse test: pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2.0\%$ .

## Typical Performance Characteristics

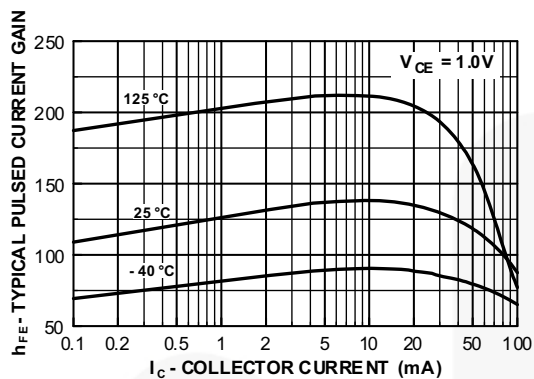


Figure 1. Typical Pulsed Current Gain vs. Collector Current

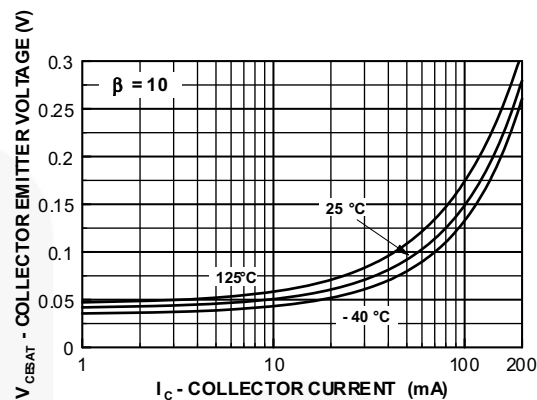


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

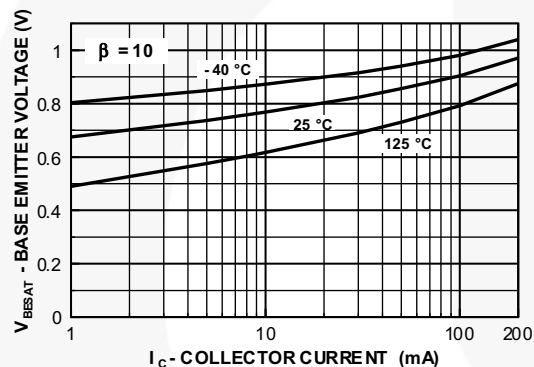


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

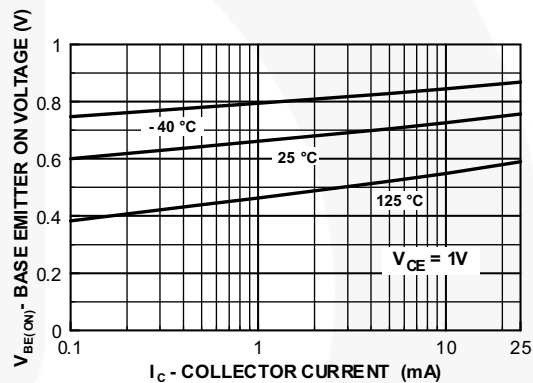


Figure 4. Base-Emitter On Voltage vs. Collector Current

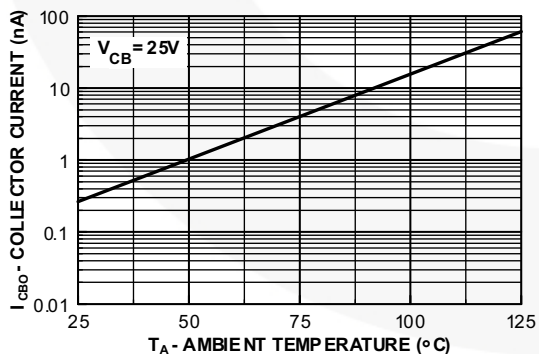


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

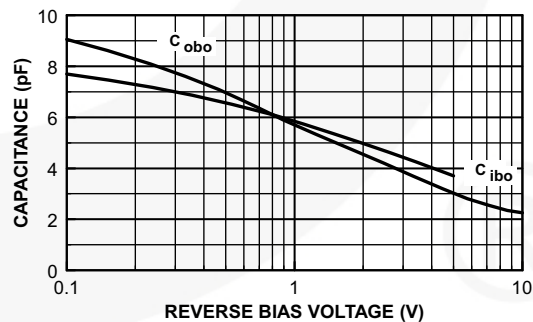


Figure 6. Common-Base Open-Circuit Input and Output Capacitance vs. Reverse-Bias Voltage

## Typical Performance Characteristics (Continued)

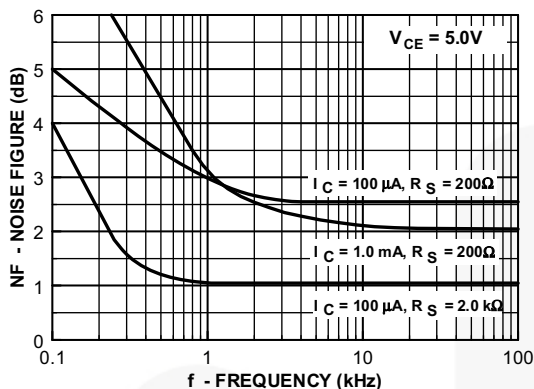


Figure 7. Noise Figure vs. Frequency

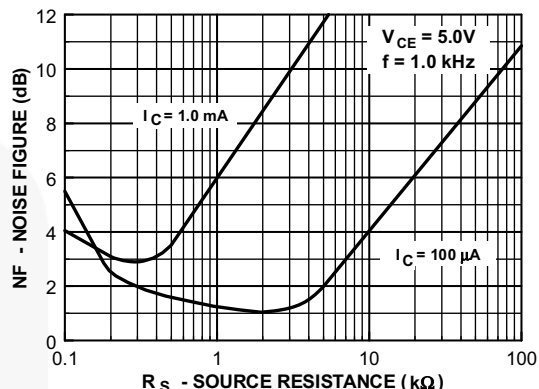


Figure 8. Noise Figure vs. Source Resistance

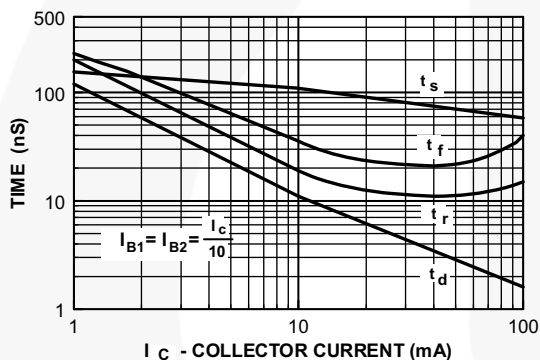


Figure 9. Switching Times vs. Collector Current

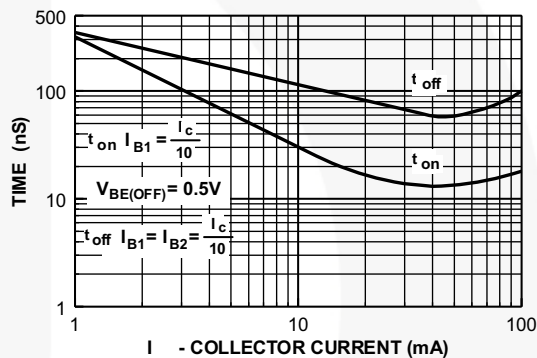


Figure 10. Turn-On and Turn-Off Times vs. Collector Current

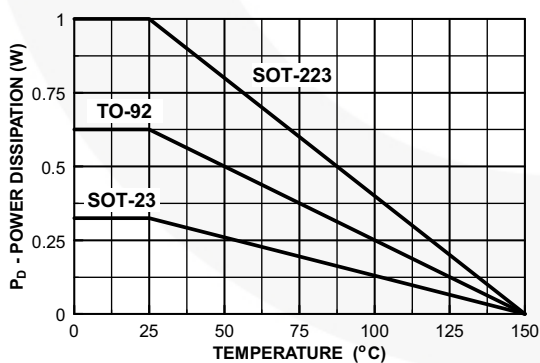


Figure 11. Power Dissipation vs. Ambient Temperature

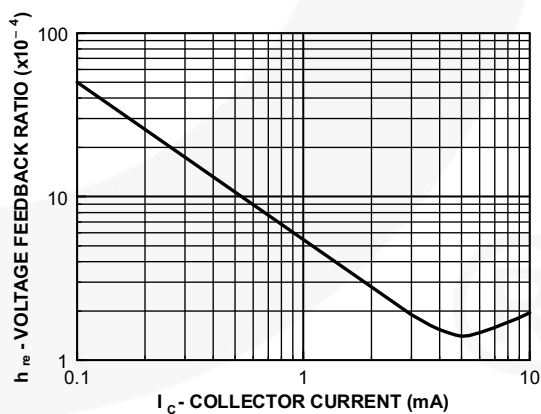


Figure 12. Voltage Feedback Ratio

## Typical Performance Characteristics (Continued)

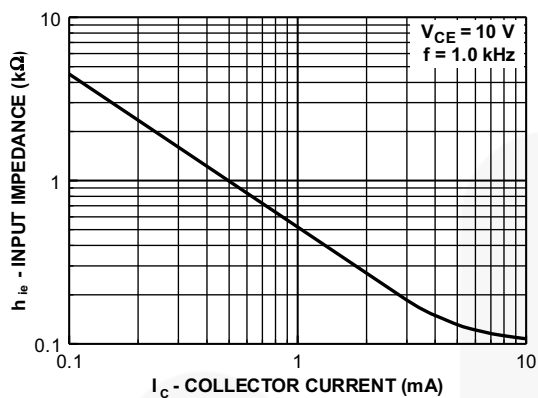


Figure 13. Input Impedance

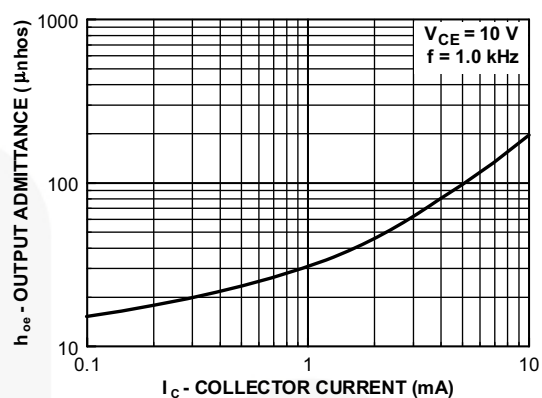


Figure 14. Output Admittance

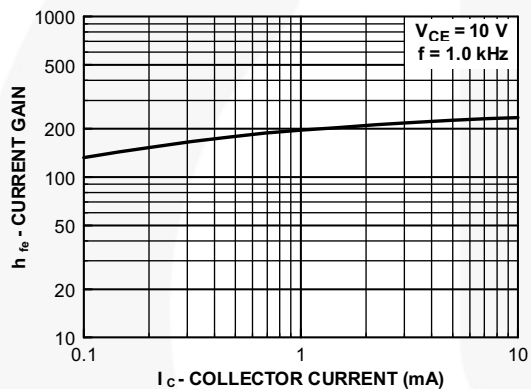


Figure 15. Current Gain

## Physical Dimensions

## SOT-23

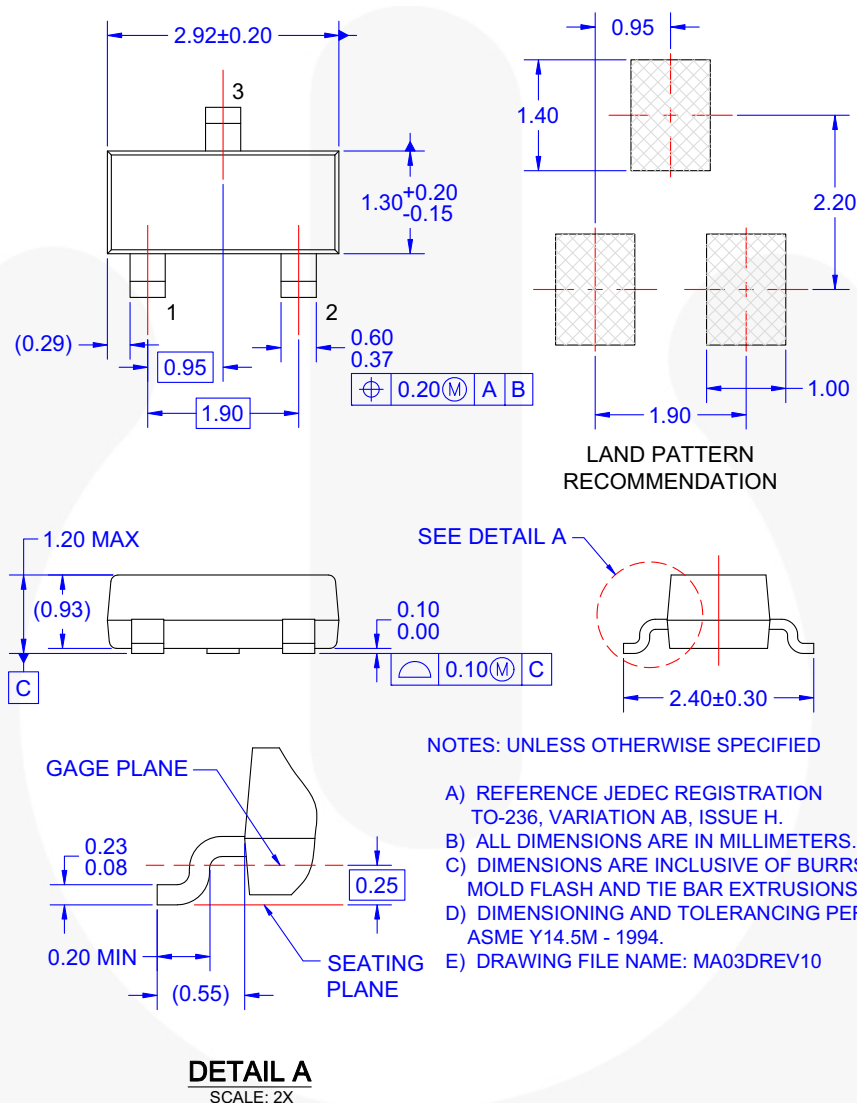


Figure 16. 3-LEAD, SOT23, JEDEC TO-236, LOW PROFILE (ACTIVE)

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