MMBT4209

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SOT-23   **B**

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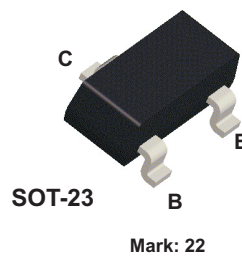
PNP General Purpose Amplifier

This device is designed as a general purpose amplifier and switch.
The useful dynamic range extends to 10 mA as a switch and to
850 MHz as an amplifier.

Absolute Maximum Ratings*   TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	15	V
V_{CBO}	Collector-Base Voltage	20	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current - Continuous	10	mA
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

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

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units

OFF CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Max	Units
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C = 10 mA, I_B = 0	15		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 10 µA, I_E	20		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 µA, I_C = 0	5.0		V

ON CHARACTERISTICS*

Symbol	Parameter	Test Conditions	Min	Max	Units
h_{FE}	DC Current Gain	I_C = 10 mA, V_{CE} = 1.0 V	50		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 1 mA, I_B = 100 mkA I_C = 5 mA, I_B = 0.5 mA		0.2 0.3	V V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 1 mA, I_B = 100 mkA I_C = 5 mA, I_B = 0.5 mA	0.65	0.85 0.95	V V

SMALL SIGNAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Max	Units
f_T	Current Gain - Bandwidth Product	I_C = 10 mA, V_{CE} = 20 V,	850		Mhz
C_{obo}	Output Capacitance	V_{CB} = 5.0 V, I_E = 0, f = 1.0 MHz		2.0	pF
C_{ibo}	Input Capacitance	V_{EB} = 0.5 V, I_C = 0, f = 1.0 MHz		3.0	pF

SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min	Max	Units
t_r	Rise Time	I_C = 10 mA, I_{B1} = 1.0 mA		35	ns
t_f	Fall Time	I_{B1} = I_{B2} = 1.0 mA		50	ns

Spice Model