

## NPN HIGH FREQUENCY TRANSISTOR

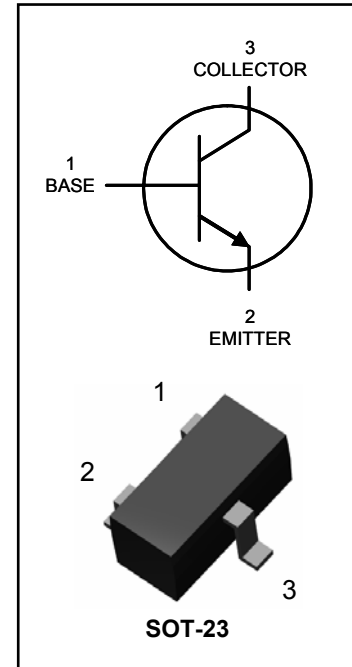
This device is designed for VHF/UHF amplifier applications and high output VHF oscillators.

### SPECIFICATION FEATURES

- Guaranteed Minimum Current Gain-Bandwidth Product of 650 MHz
- Collector Currents up to 50mA
- Industry Standard SOT-23 Package

### APPLICATIONS

- Low Noise VHF/UHF Amplifiers and Mixers
- Low Frequency Drift, High Output Oscillators



### MAXIMUM RATINGS $T_J = 25^\circ\text{C}$

Rating	Symbol	Value	Units
Collector-Emitter Voltage	$V_{CE0}$	25	V
Collector-Base Voltage	$V_{CB0}$	30	V
Emitter-Base Voltage	$V_{EB0}$	3.0	V
Collector Current - Continuous (Note 1)	$I_C$	50	mA
Power Dissipation (Note 1)	$P_D$	225	mW
Operating Temperature Range	$T_J$	-55 to 150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to 150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

CHARACTERISTIC	Symbol	Value	Units
Thermal Resistance - Junction to Ambient (Note 1)	$R_{th JA}$	556	$^\circ\text{C/W}$

Note 1: Device mounted on FR-5 board 1.0 x 0.75 x 0.062 in. with recommended minimum pad layout



# MMBTH10

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C, unless otherwise noted)

### OFF CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typical	Max	Units
Collector-Emitter Breakdown Voltage	V <sub>(BR)CE0</sub>	I <sub>C</sub> = 1.0 mA, I <sub>B</sub> = 0	25	-	-	V
Collector-Base Breakdown Voltage	V <sub>(BR)CB0</sub>	I <sub>C</sub> = 100 µA, I <sub>E</sub> = 0	30	-	-	V
Emitter-Base Breakdown Voltage	V <sub>(BR)EB0</sub>	I <sub>E</sub> = 10 µA, I <sub>C</sub> = 0	3.0	-	-	V
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> = 25 V, I <sub>E</sub> = 0	-	-	100	nA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> = 2.0 V, I <sub>C</sub> = 0	-	-	100	nA

### ON CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typical	Max	Units
DC Current Gain	h <sub>FE</sub>	I <sub>C</sub> = 4.0 mA, V <sub>CE</sub> = 10 V	60	180	-	-
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 4.0 mA, I <sub>B</sub> = 0.4 mA	-	-	0.5	V
Base-Emitter On Voltage	V <sub>BE</sub>	I <sub>C</sub> = 4.0 mA, V <sub>CE</sub> = 10 V	-	-	0.95	V

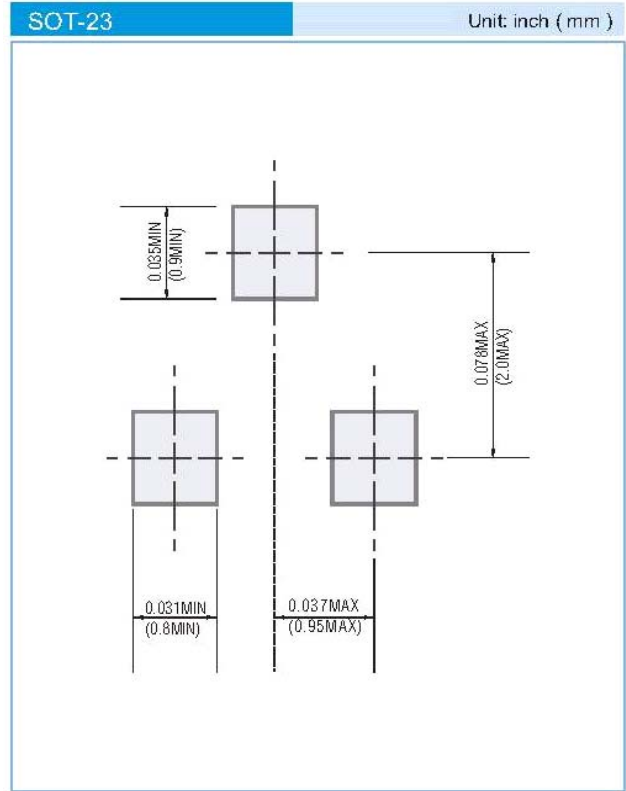
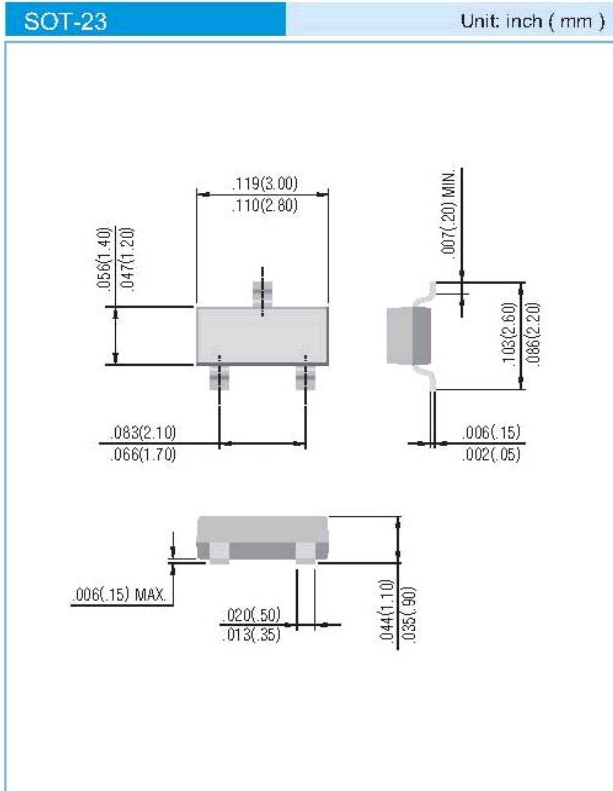
### SMALL-SIGNAL CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typical	Max	Units
Current Gain - Bandwidth Product	f <sub>T</sub>	I <sub>C</sub> = 4.0 mA, V <sub>CE</sub> = 10 V f = 1.0 MHz	650	-	-	MHz
Collector-Base Capacitance	C <sub>cb</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0 f = 1.0 MHz	-	-	0.7	pF
Common-Base Feedback Capacitance	C <sub>rb</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0 f = 1.0 MHz	-	-	0.65	pF
Collector-Base Time Constant	rb'C <sub>c</sub>	I <sub>C</sub> = 4.0 mA, V <sub>CB</sub> = 10 V f = 31.8 MHz	-	-	9.0	ps



# MMBTH10

## PACKAGE LAYOUT AND SUGGESTED PAD DIMENSIONS



## ORDERING INFORMATION

MMBTH10-T/R7 - 7 inch reel, 3K units per reel

MMBTH10-T/R13 - 13 inch reel, 12K units per reel

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