

NPN HIGH FREQUENCY TRANSISTOR

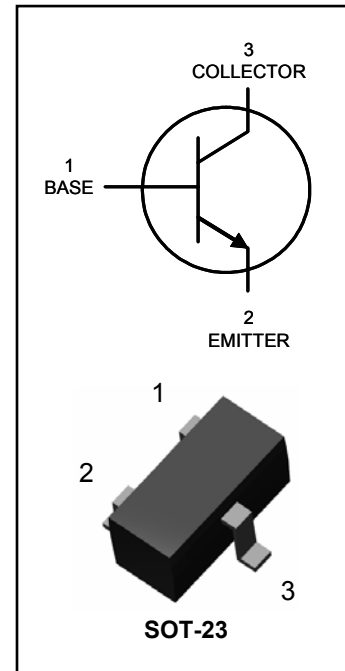
This device is designed for VHF/UHF amplifier applications and high output VHF oscillators.

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	$^\circ\text{C}/\text{W}$

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

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise noted)

OFF CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typical	Max	Units
Collector-Emitter Breakdown Voltage	$V_{(BR)CE0}$	$I_C = 1.0\text{ mA}, I_B = 0$	25	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CB0}$	$I_C = 100\text{ }\mu\text{A}, I_E = 0$	30	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EB0}$	$I_E = 10\text{ }\mu\text{A}, I_C = 0$	3.0	-	-	V
Collector Cutoff Current	I_{CB0}	$V_{CB} = 25\text{ V}, I_E = 0$	-	-	100	nA
Emitter Cutoff Current	I_{EB0}	$V_{EB} = 2.0\text{ V}, I_C = 0$	-	-	100	nA

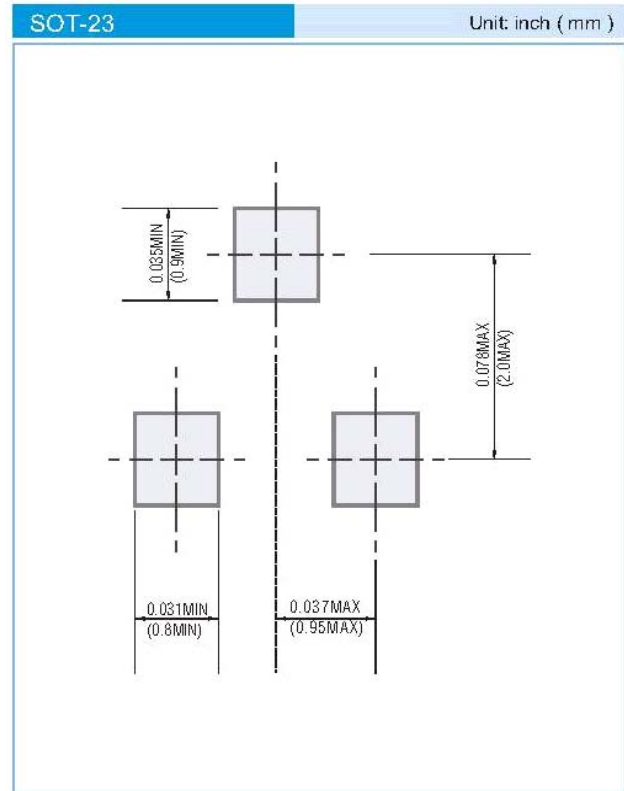
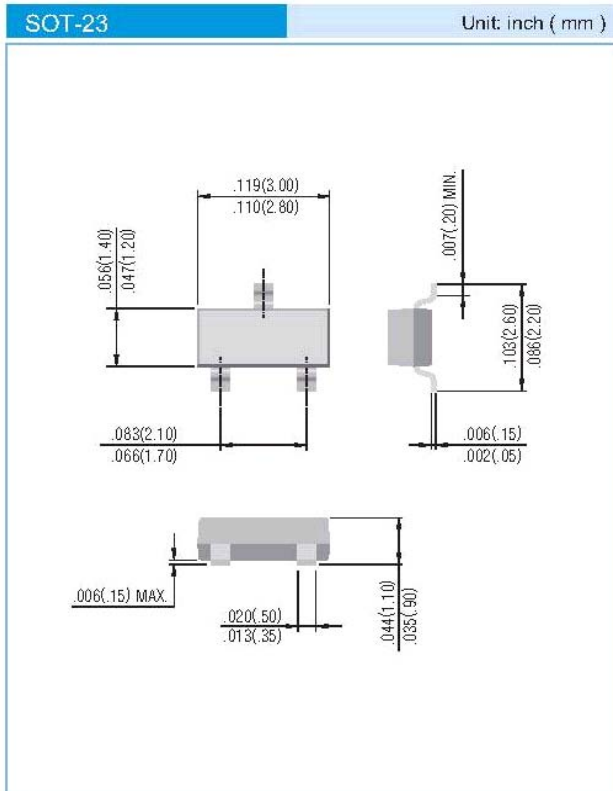
ON CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typical	Max	Units
DC Current Gain	h_{FE}	$I_C = 4.0\text{ mA}, V_{CE} = 10\text{ V}$	60	180	-	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 4.0\text{ mA}, I_B = 0.4\text{ mA}$	-	-	0.5	V
Base-Emitter On Voltage	V_{BE}	$I_C = 4.0\text{ mA}, V_{CE} = 10\text{ V}$	-	-	0.95	V

SMALL-SIGNAL CHARACTERISTICS

Parameter	Symbol	Conditions	Min	Typical	Max	Units
Current Gain - Bandwidth Product	f_T	$I_C = 4.0\text{ mA}, V_{CE} = 10\text{ V}$ $f = 1.0\text{ MHz}$	650	-	-	MHz
Collector-Base Capacitance	C_{cb}	$V_{CB} = 10\text{ V}, I_E = 0$ $f = 1.0\text{ MHz}$	-	-	0.7	pF
Common-Base Feedback Capacitance	C_{rb}	$V_{CB} = 10\text{ V}, I_E = 0$ $f = 1.0\text{ MHz}$	-	-	0.65	pF
Collector-Base Time Constant	$r_b'C_c$	$I_C = 4.0\text{ mA}, V_{CB} = 10\text{ V}$ $f = 31.8\text{ MHz}$	-	-	9.0	ps

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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