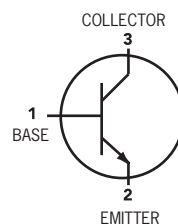


NPN Silicon VHF/UHF Transistor

(Pb) Lead(Pb)-Free



MAXIMUM RATINGS (Ta=25 °C)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	25	V _{dc}
Collector-Base Voltage	V _{CBO}	30	V _{dc}
Emitter-Base Voltage	V _{EBO}	3.0	V _{dc}
Collector Current - Continuous	I _C	50	mA _{dc}

THERMAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Total Device Dissipation FR-5 Board ⁽¹⁾ T _A = 25 °C	P _D	225	mW
Derate above 25 °C		1.8	mW/°C
Thermal Resistance, Junction Ambient	R _{θJA}	556	°C/W
Junction and Storage, Temperature	T _J , T _{stg}	-55 to +150	°C

Device Marking

MMBTH10=3EM

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
Collector-Emitter Breakdown Voltage (I _C = 1.0 mA _{dc} , I _B =0)	V _{(BR)CEO}	25	-	V _{dc}
Collector-Base Breakdown Voltage (I _C = 100 μA _{dc} , I _E =0)	V _{(BR)CBO}	30	-	V _{dc}
Emitter-Base Breakdown Voltage (I _E = 10 μA _{dc} , I _C =0)	V _{(BR)EBO}	3.0	-	V _{dc}
Collector Cutoff Current (V _{CB} = 25V _{dc} , I _E =0)	I _{CBO}	-	100	nA _{dc}
Emitter Cutoff Current (V _{EB} = 2.0 V _{dc} , I _C =0)	I _{EBO}	-	100	nA _{dc}

1. FR-5=1.0 × 0.75 × 0.062 in

MMBTH10



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

Characteristics	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

DC Current Gain ($I_C=4.0\text{ mA dc}$, $V_{CE}=10\text{ Vdc}$)	h_{FE}	60	-	-	-
Collector-Emitter Saturation Voltage ($I_C=4.0\text{ mA dc}$, $I_B=0.4\text{ mA dc}$)	$V_{CE(sat)}$	-	-	0.5	Vdc
Base-Emitter On Voltage ($I_C=4.0\text{ mA dc}$, $V_{CE}=10\text{ V}$)	$V_{BE(on)}$	-	-	0.95	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C=4.0\text{ mA dc}$, $V_{CE}=10\text{ Vdc}$, $f=100\text{ MHz}$)	f_T	650	-	-	MHz
Collector-Base Capacitance ($V_{CB}=10\text{ Vdc}$, $I_E=0$, $f=1.0\text{ MHz}$)	C_{cb}	-	-	0.7	pF
Common-Base Feedback Capacitance ($V_{CB}=10\text{ Vdc}$, $I_E=0$, $f=1.0\text{ MHz}$)	C_{rb}	-	-	0.65	pF
Collector Base Time Constant ($I_C=4.0\text{ mA dc}$, $V_{CB}=10\text{ Vdc}$, $f=31.8\text{ MHz}$)	$r_b'C_c$	-	-	9.0	ps

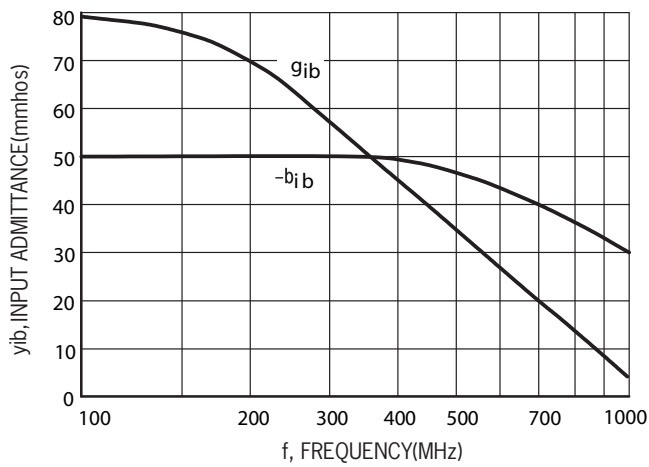


FIG.1 Rectangular Form

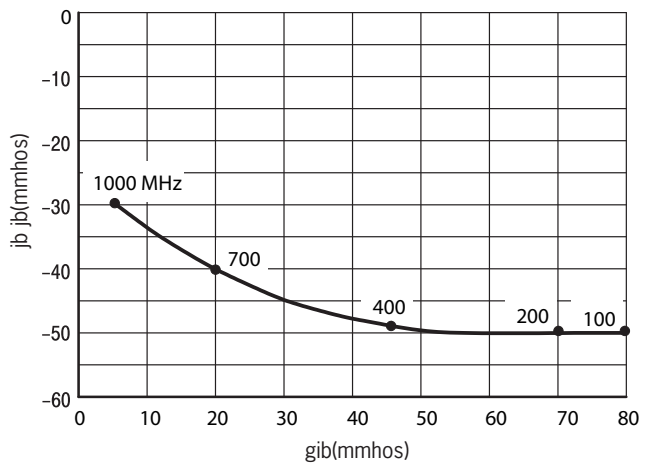


FIG.2 Polar Form

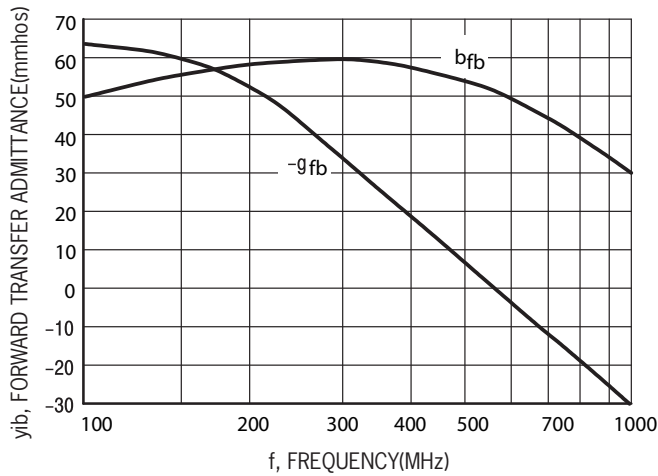


FIG.3 Rectangular Form

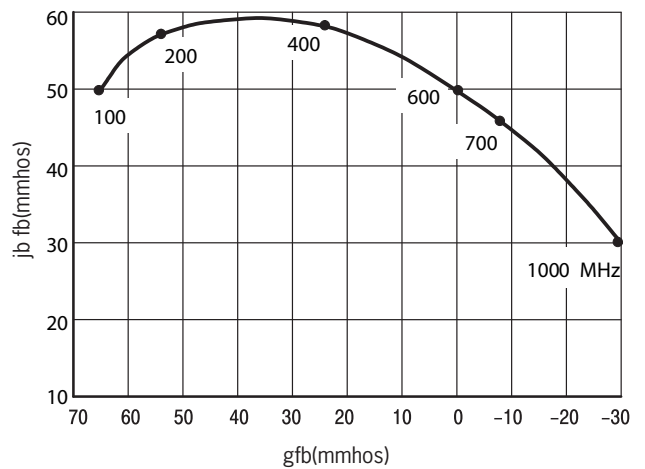


FIG.4 Polar Form

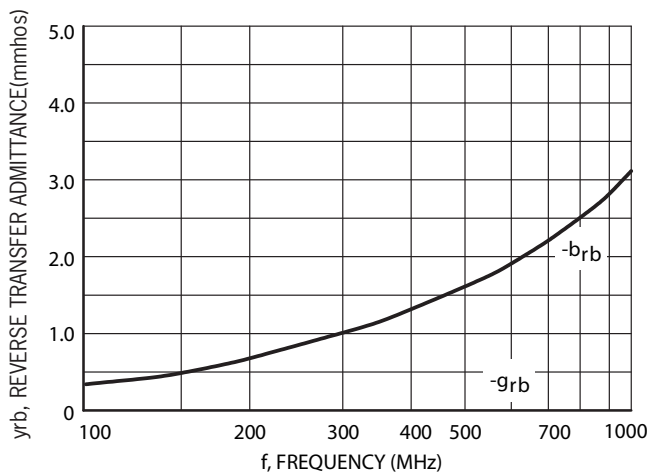


FIG.5 Rectangular Form

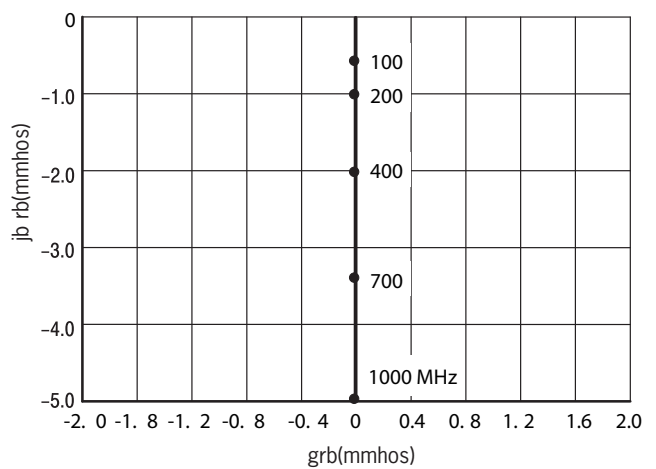


FIG.6 Polar Form

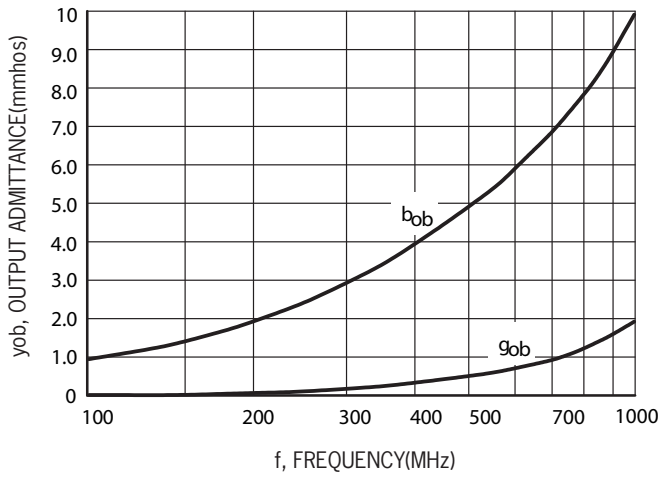


FIG.7 Rectangular Form

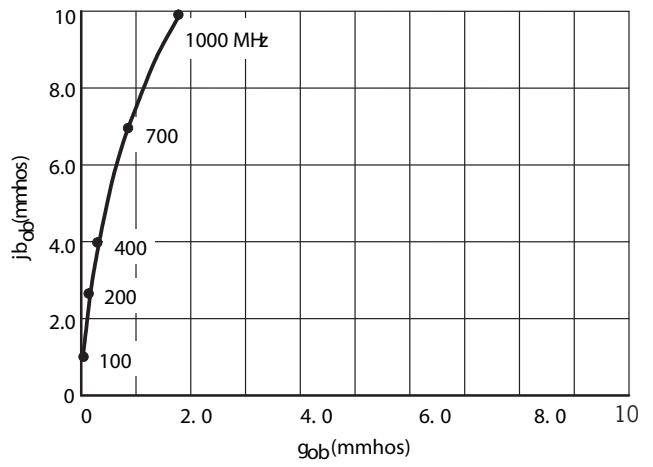
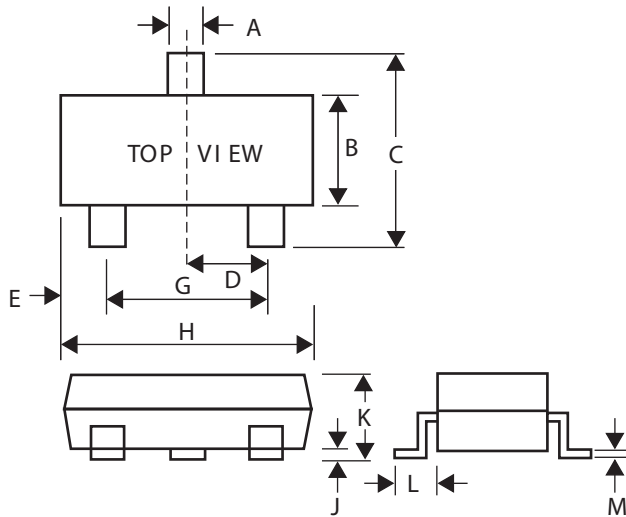


FIG.8 Polar Form

SOT-23 Package Outline Dimensions

Unit:mm



Dim	Min	Max
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25