MMBTH10LT1, MMBTH10-4LT1

Preferred Devices

VHF/UHF Transistor

NPN Silicon

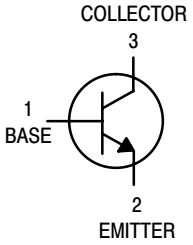
- Device Marking: 3EM

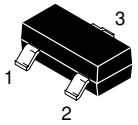
ON Semiconductor®

http://onsemi.com

Features

- Pb−Free Package May be Available. The G−Suffix Denotes a Pb−Free Lead Finish





CASE 318
SOT−23
STYLE 6

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	25	Vdc
Collector-Base Voltage	V_{CBO}	30	Vdc
Emitter-Base Voltage	V_{EBO}	3.0	Vdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR−5 Board (Note 4) T_A = 25°C Derate above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate (Note 5) T_A = 25°C Derate above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

4. FR−5 = 1.0 x 0.75 x 0.062 in.
5. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina

ORDERING INFORMATION

Device	Package	Shipping†
MMBTH10LT1	SOT−23	3000/Tape & Reel
MMBTH10LT1G	SOT−23 (Pb−Free)	3000/Tape & Reel
MMBTH10−4LT1	SOT−23	3000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

Preferred devices are recommended choices for future use and best overall value.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector−Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)		$V_{(BR)CEO}$	25	–	–	Vdc
Collector−Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)		$V_{(BR)CBO}$	30	–	–	Vdc
Emitter−Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	3.0	–	–	Vdc
Collector Cutoff Current (V_{CB} = 25 Vdc, I_E = 0)		I_{CBO}	–	–	100	nAdc
Emitter Cutoff Current (V_{EB} = 2.0 Vdc, I_C = 0)		I_{EBO}	–	–	100	nAdc
ON CHARACTERISTICS						
DC Current Gain (I_C = 4.0 mAdc, V_{CE} = 10 Vdc)	MMBTH10LT1 MMBTH10−4LT1	h_{FE}	 60 120	 – –	 – 240	–
Collector−Emitter Saturation Voltage (I_C = 4.0 mAdc, I_B = 0.4 mAdc)		$V_{CE(sat)}$	–	–	0.5	Vdc
Base−Emitter On Voltage (I_C = 4.0 mAdc, V_{CE} = 10 Vdc)		V_{BE}	–	–	0.95	Vdc
SMALL−SIGNAL CHARACTERISTICS						
Current−Gain − Bandwidth Product (I_C = 4.0 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	MMBTH10LT1 MMBTH10−4LT1	f_T	 650 800	 – –	 – –	MHz
Collector−Base Capacitance (V_{CB}= 10 Vdc, I_E = 0, f = 1.0 MHz)		C_{cb}	–	–	0.7	pF
Common−Base Feedback Capacitance (V_{CB}= 10 Vdc, I_E = 0, f = 1.0 MHz)		C_{rb}	–	–	0.65	pF
Collector Base Time Constant (I_C= 4.0 mAdc, V_{CB} = 10 Vdc, f = 31.8 MHz)		$rb'C_c$	–	–	9.0	ps

TYPICAL CHARACTERISTICS

COMMON−BASE y PARAMETERS versus FREQUENCY
(V_{CB} = 10 Vdc, I_C = 4.0 mAdc, T_A = 25°C)

y_{ib}, INPUT ADMITTANCE

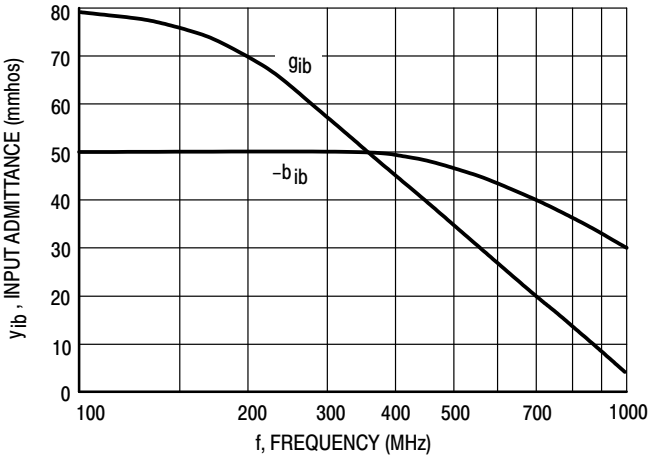


Figure 1. Rectangular Form

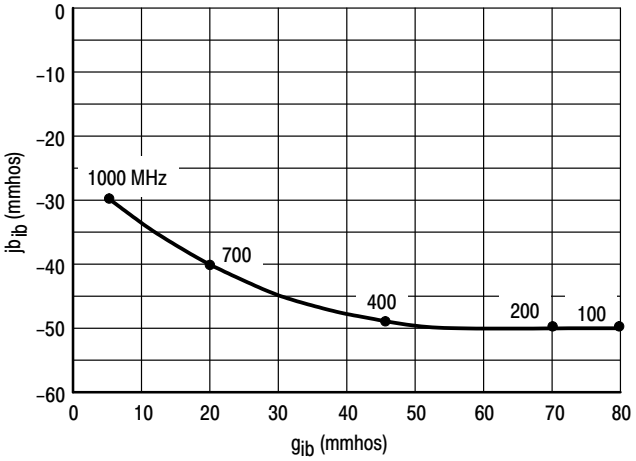


Figure 2. Polar Form

y_{fb}, FORWARD TRANSFER ADMITTANCE

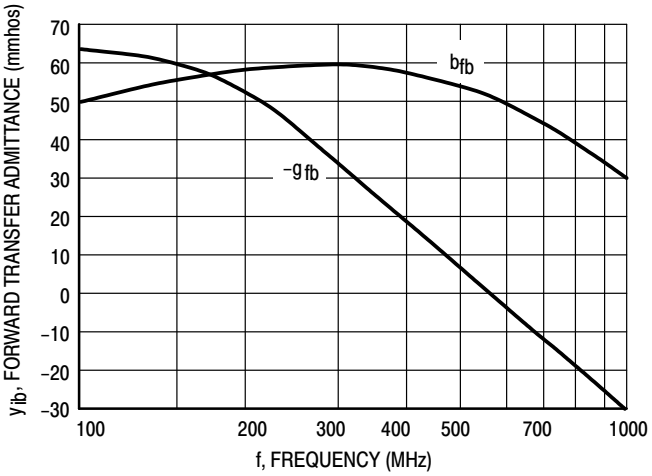


Figure 3. Rectangular Form

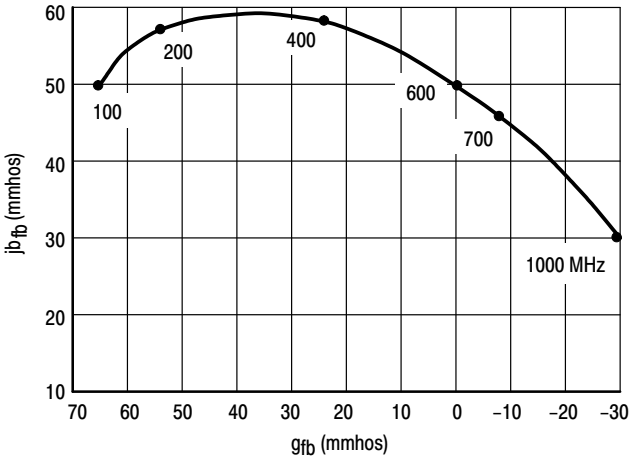


Figure 4. Polar Form

TYPICAL CHARACTERISTICS

COMMON−BASE y PARAMETERS versus FREQUENCY
(V_{CB} = 10 Vdc, I_C = 4.0 mAdc, T_A = 25°C)

y_{rb}, REVERSE TRANSFER ADMITTANCE

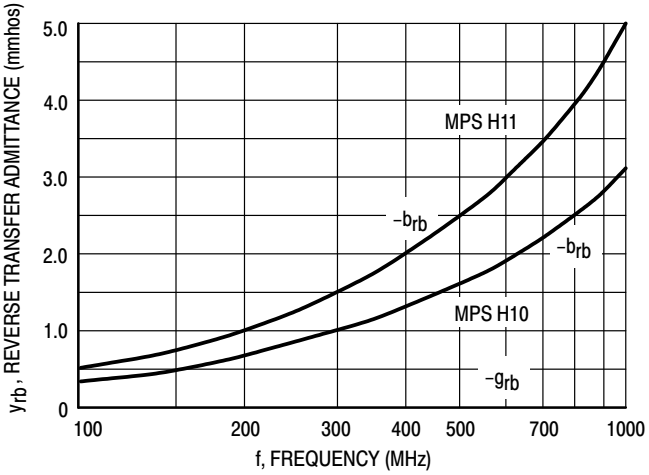


Figure 5. Rectangular Form

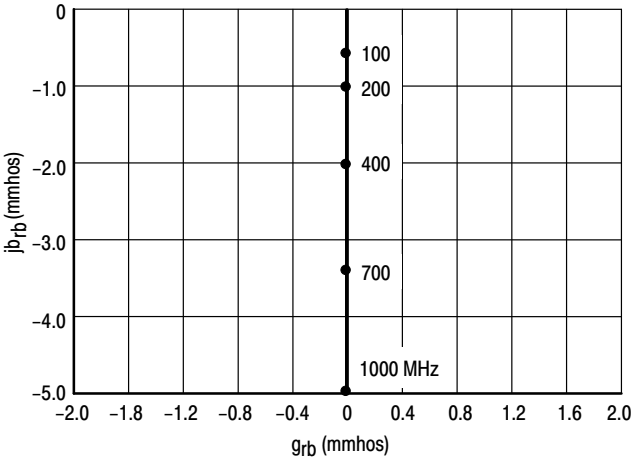


Figure 6. Polar Form

y_{ob}, OUTPUT ADMITTANCE

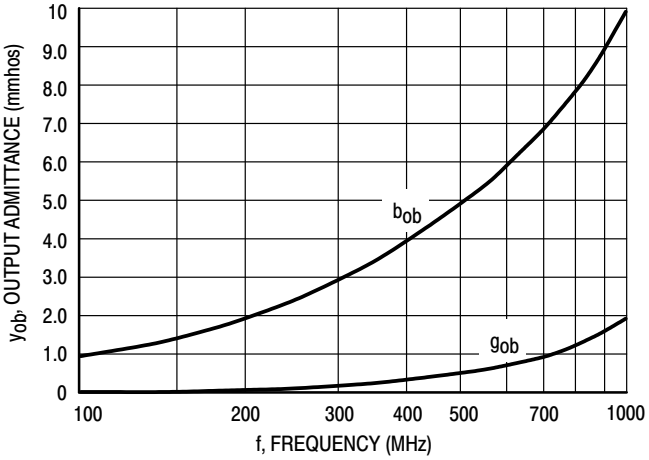


Figure 7. Rectangular Form

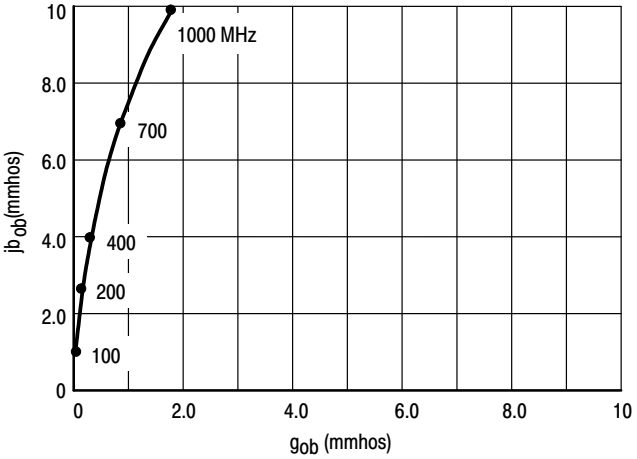


Figure 8. Polar Form