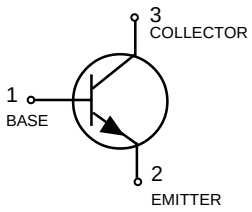
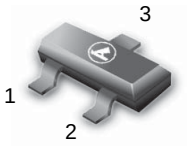
VHF/UHF Transistors



LMBTH10QLT1



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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, (1) T_A = 25°C Derate above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate, (2) T_A = 25°C Derate above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature	T_J , T_{stg}	–55 to +150	°C

DEVICE MARKING

LMBTH10QLT1 = 3EQ

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} = 25Vdc , I_E = 0)	I_{CBO}	—	—	100	nAdc
Emitter Cutoff Current (V_{EB} = 2.0Vdc , I_C = 0)	I_{EBO}	—	—	100	nAdc

1. FR–5 = 1.0 x 0.75 x 0.062 in.
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I_C = 4.0 mAdc, V_{CE} = 10 Vdc)	h_{FE}	120	—	—	–
Collector–Emitter Saturation Voltage (I_C = 4.0mAdc, I_B = 0.4 mAdc)	$V_{CE(sat)}$	—	—	0.5	Vdc
Base–Emitter On Voltage (I_C = 4.0mAdc, V_{CE} = 10Vdc)	V_{BE}	—	—	0.95	Vdc
SMALL–SIGNAL CHARACTERISTICS					
Current Gain–Bandwidth Product (V_{CE} = 10 Vdc, I_C = 4.0mAdc, f = 100MHz)	f_T	650	—	—	MHz
Collector –Base Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	C_{cb}	—	—	0.7	pF
Collector –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 = 4.0mAdc,V_{CB}=10 Vdc, f = 31.8 MHz)	rb' C_C	—	—	9.0	ps

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TYPICAL CHARACTERISTICS

COMMON–BASE y PARAMETERS versus FREQUENCY

(V_{CB} = 10 Vdc, I C = 4.0 mAdc, T_A = 25°C)

yib , INPUT ADMITTANCE

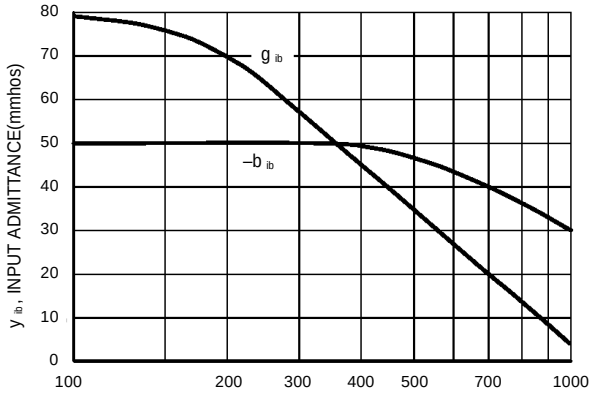

Figure 1. Rectangular Form

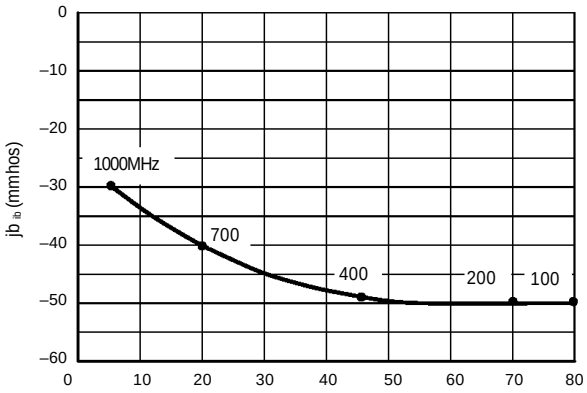

Figure 2. Polar Form

y fb , FORWARD TRANSFER ADMITTANCE

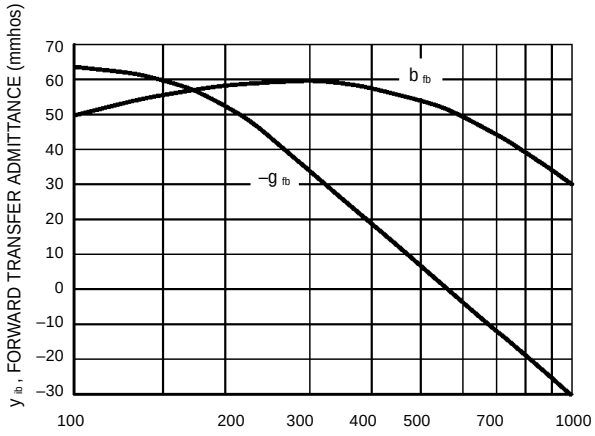

Figure 3. Rectangular Form

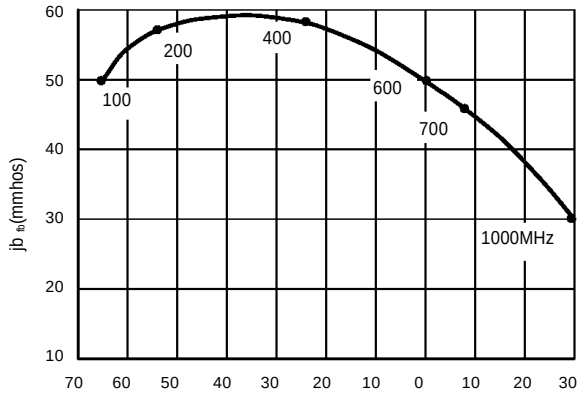

Figure 4. Polar Form

LMBTH10QLT1

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

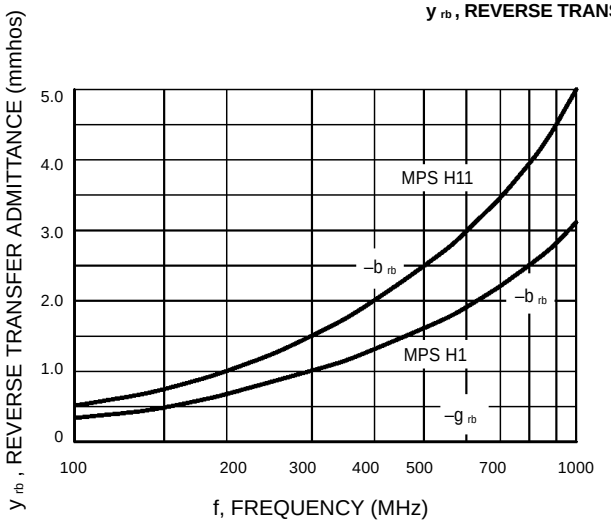

Figure 5. Rectangular Form

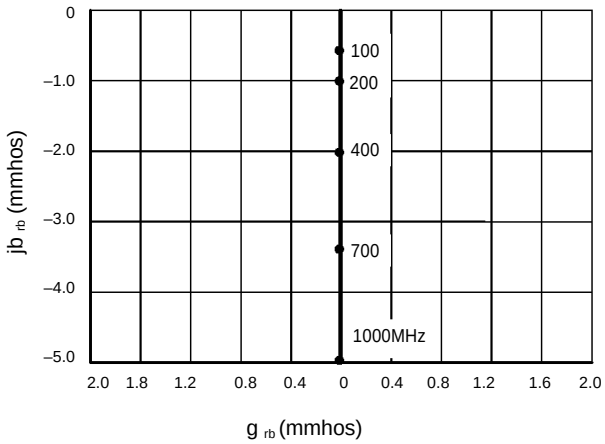

Figure 6. Polar Form

y_{ob}, OUTPUT ADMITTANCE

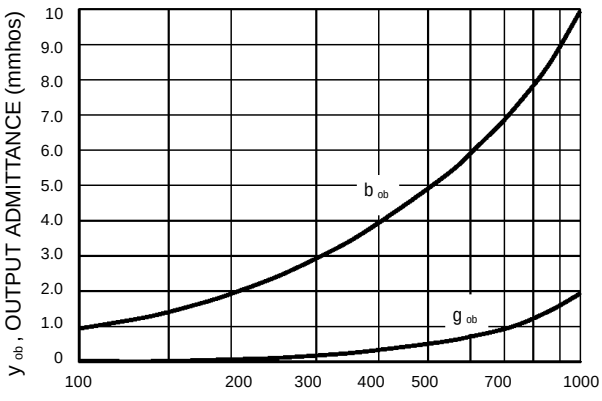

Figure 7. Rectangular Form

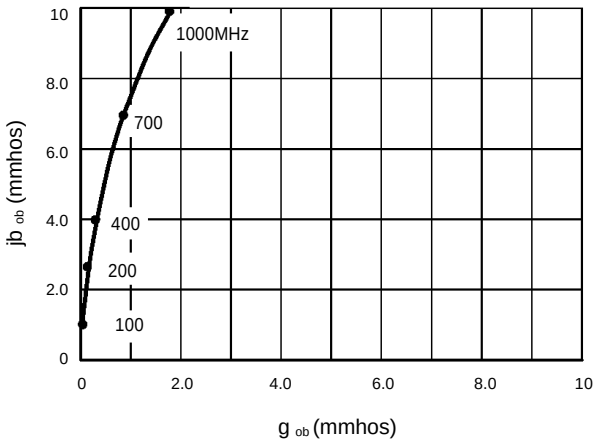

Figure 8. Polar Form

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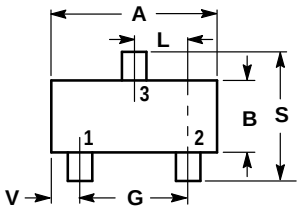

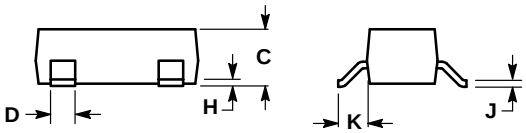

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

PIN 1. BASE
2. EMITTER
3. COLLECTOR