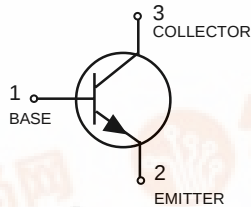
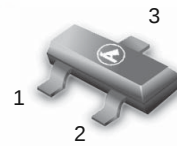




VHF/UHF Transistors


LMBTH10QLT1

SOT-23

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

DEVICE MARKING

LMBTH10QLT1 = 3EQ

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = 1.0 \text{ mAdc}$, $I_E = 0$)	$V_{(BR)CEO}$	25	—	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	30	—	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	3.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 25\text{Vdc}$, $I_E = 0$)	I_{CBO}	—	—	100	nAdc
Emitter Cutoff Current ($V_{EB} = 2.0\text{Vdc}$, $I_C = 0$)	I_{EBO}	—	—	100	nAdc

1. FR-5 = $1.0 \times 0.75 \times 0.062 \text{ in.}$

2. Alumina = $0.4 \times 0.3 \times 0.024 \text{ in.}$ 99.5% alumina.

LMBTH10QLT1
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

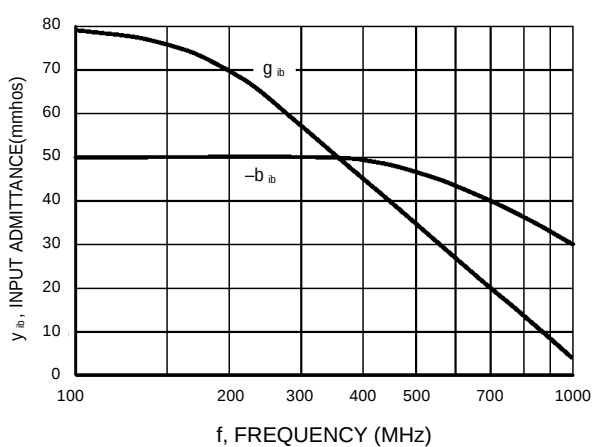
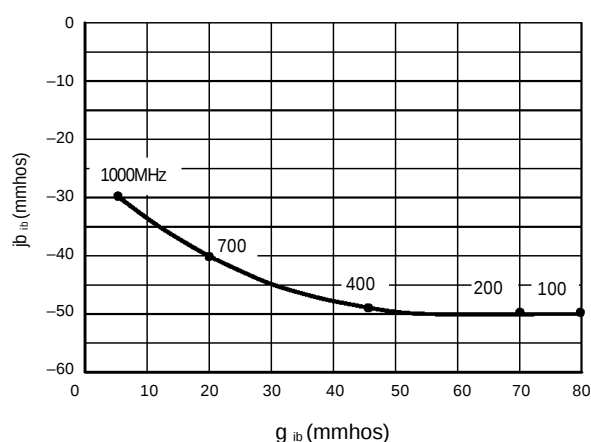
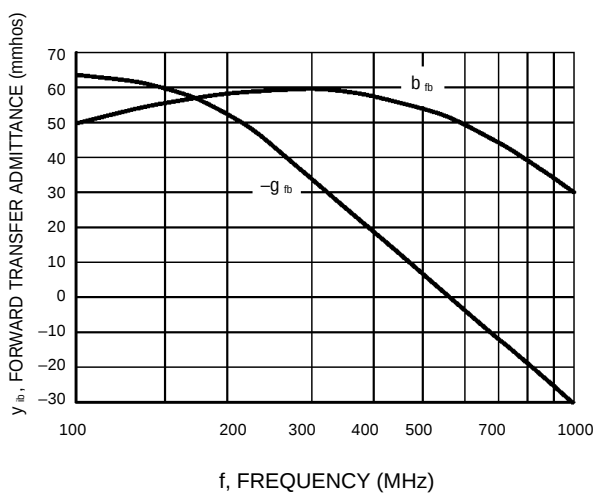
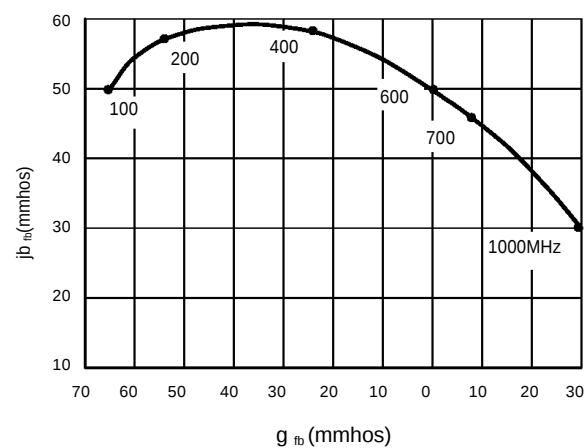
DC Current Gain ($I_C = 4.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	120	—	—	—
Collector–Emitter Saturation Voltage ($I_C = 4.0\text{ mAdc}$, $I_B = 0.4\text{ mAdc}$)	$V_{CE(sat)}$	—	—	0.5	Vdc
Base–Emitter On Voltage ($I_C = 4.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	V_{BE}	—	—	0.95	Vdc

SMALL–SIGNAL CHARACTERISTICS

Current Gain–Bandwidth Product ($V_{CE} = 10\text{ Vdc}$, $I_C = 4.0\text{ mAdc}$, $f = 100\text{ MHz}$)	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
Collector –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 ($I_C = 4.0\text{ mAdc}$, $V_{CB} = 10\text{ Vdc}$, $f = 31.8\text{ MHz}$)	$rb' C_C$	—	—	9.0	ps

LMBTH10QLT1
TYPICAL CHARACTERISTICS
COMMON-BASE y PARAMETERS versus FREQUENCY

($V_{CB} = 10 \text{ Vdc}$, $I_C = 4.0 \text{ mAdc}$, $T_A = 25^\circ\text{C}$)

 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

LMBTH10QLT1
TYPICAL CHARACTERISTICS
COMMON-BASE y PARAMETERS versus FREQUENCY

($V_{CB} = 10 \text{ Vdc}$, $I_C = 4.0 \text{ mA}$, $T_A = 25^\circ\text{C}$)

y_{rb} , REVERSE TRANSFER ADMITTANCE

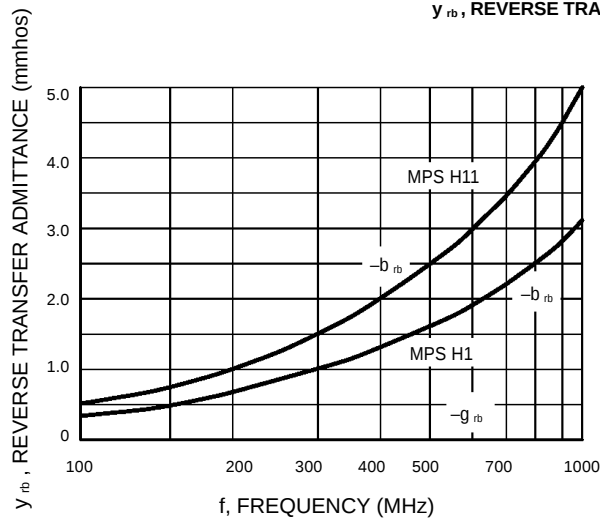


Figure 5. Rectangular Form

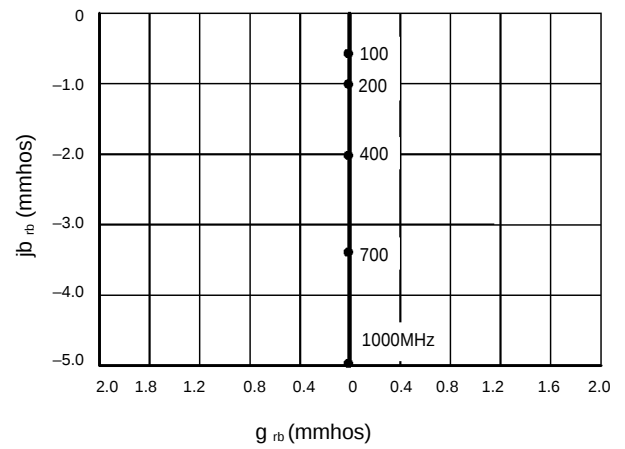


Figure 6. Polar Form

y_{ob} , OUTPUT ADMITTANCE

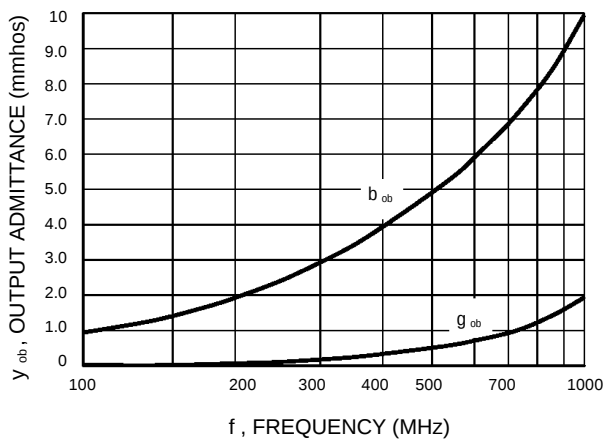


Figure 7. Rectangular Form

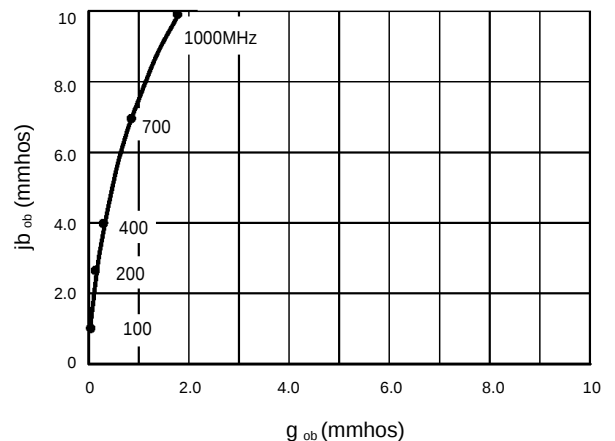
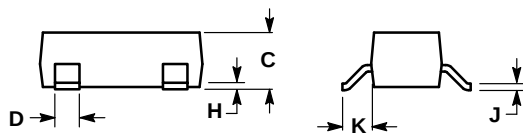
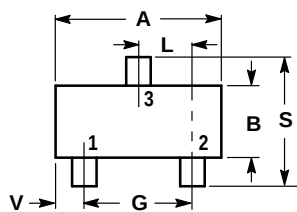


Figure 8. Polar Form

LMBTH10QLT1

SOT-23



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

