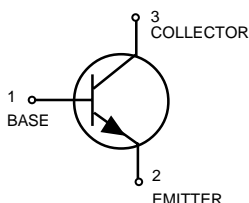
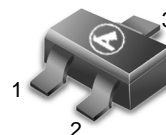


VHF/UHF Transistors



LMBTH10WT1



SC-70/SOT-323

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

LMBTH10WT1 = 3E

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

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 = $1.0 \times 0.75 \times 0.062$ in.

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

LMBTH10WT1
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

ON CHARACTERISTICS

| | | | | | |
|---|---------------|----|---|------|-----|
| DC Current Gain ($I_C = 4.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) | h_{FE} | 60 | — | 270 | — |
| 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 ($I_C = 4.0 \text{ mAdc}$, $V_{CB} = 10 \text{ Vdc}$, $f = 31.8 \text{ MHz}$) | $r_b' C_C$ | — | — | 9.0 | ps |

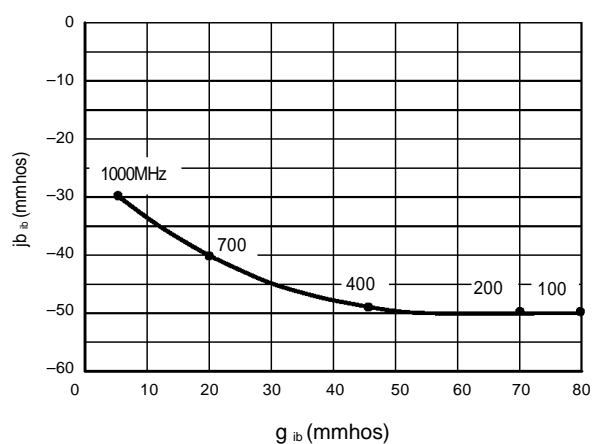
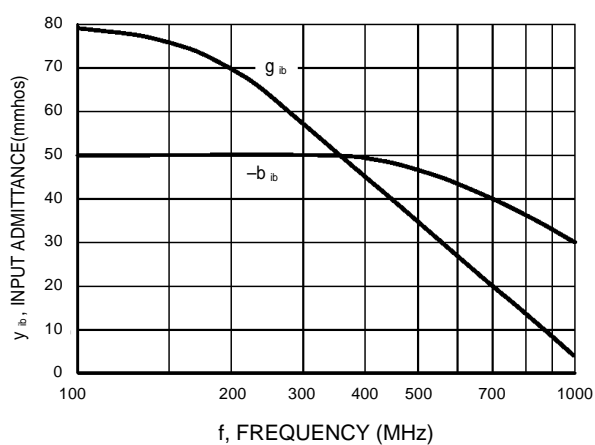
LMBTH10WT1

TYPICAL CHARACTERISTICS

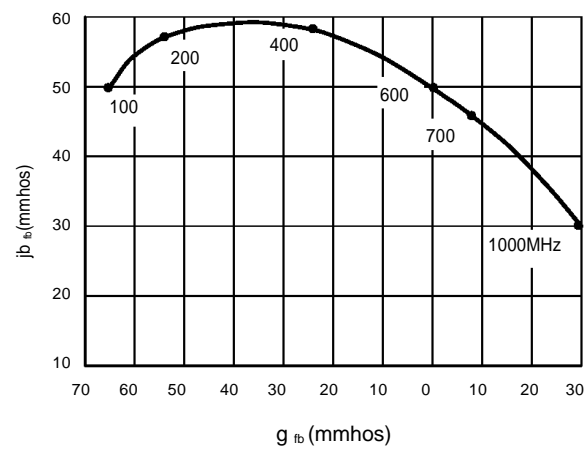
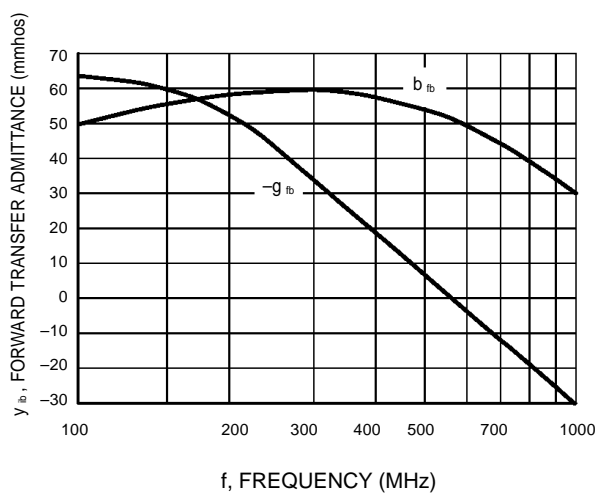
COMMON-BASE y PARAMETERS versus FREQUENCY

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

y_{ib} , INPUT ADMITTANCE



y_{fb} , FORWARD TRANSFER ADMITTANCE



LMBTH10WT1

TYPICAL CHARACTERISTICS

COMMON-BASE y PARAMETERS versus FREQUENCY

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

y_{rb} , REVERSE TRANSFER ADMITTANCE

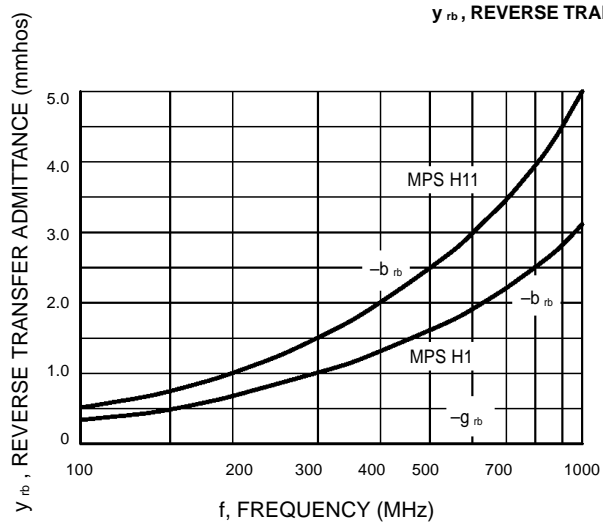


Figure 5. Rectangular Form

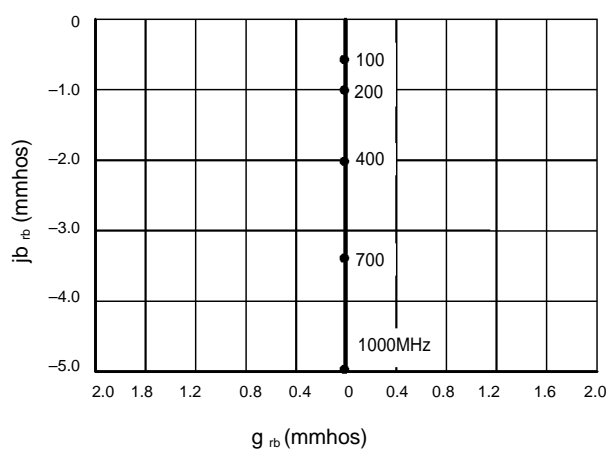


Figure 6. Polar Form

y_{ob} , OUTPUT ADMITTANCE

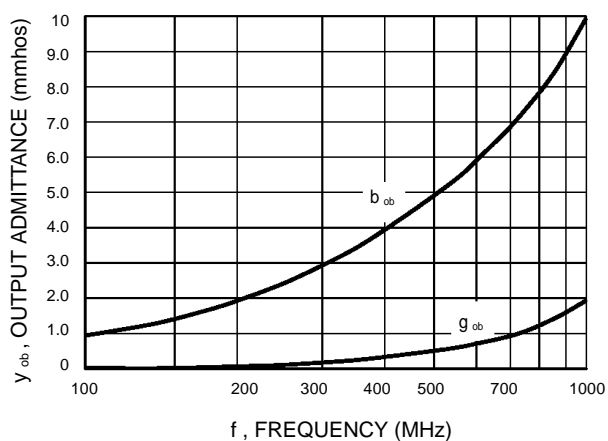


Figure 7. Rectangular Form

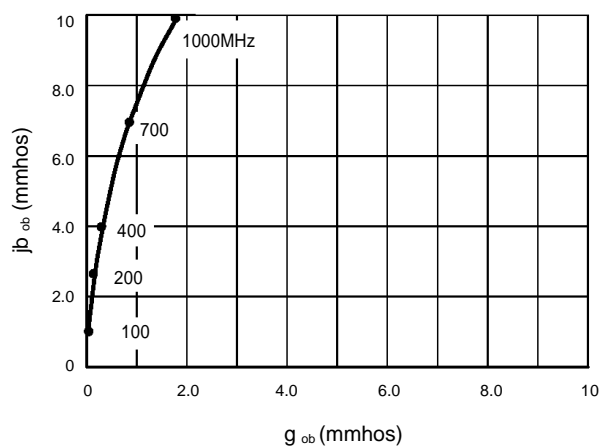


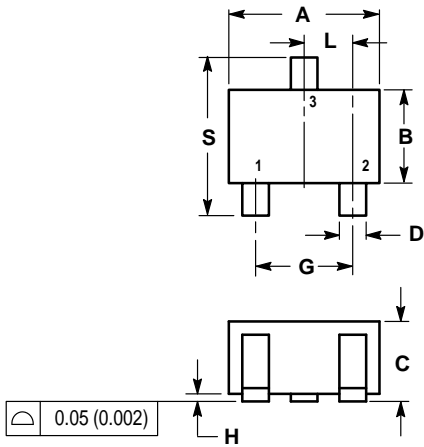
Figure 8. Polar Form

LMBTH10WT1

SC-70 / SOT-323

NOTES:

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



| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.071 | 0.087 | 1.80 | 2.20 |
| B | 0.045 | 0.053 | 1.15 | 1.35 |
| C | 0.032 | 0.040 | 0.80 | 1.00 |
| D | 0.012 | 0.016 | 0.30 | 0.40 |
| G | 0.047 | 0.055 | 1.20 | 1.40 |
| H | 0.000 | 0.004 | 0.00 | 0.10 |
| J | 0.004 | 0.010 | 0.10 | 0.25 |
| K | 0.017 REF | | 0.425 REF | |
| L | 0.026 BSC | | 0.650 BSC | |
| N | 0.028 REF | | 0.700 REF | |
| S | 0.079 | 0.095 | 2.00 | 2.40 |

- PIN 1. BASE
PIN 2. EMITTER
PIN 3. COLLECTOR

