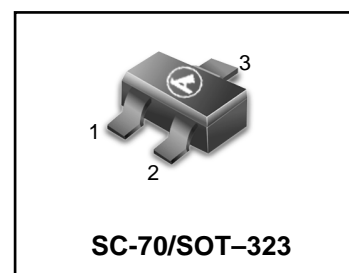


VHF/UHF Transistors

Features

- We declare that the material of product compliance with RoHS requirements.
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

LMBTH10WT1G
S-LMBTH10WT1G

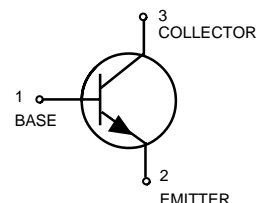


ORDERING INFORMATION

| Device | Marking | Shipping |
|------------------------------|---------|-----------------|
| LMBTH10WT1G S-LMBTH10WT1G | 3E | 3000/Tape&Reel |
| LMBTH10WT3G S-LMBTH10WT3G | 3E | 10000/Tape&Reel |

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 |
| Collector Current | I_C | 50 | mA |



THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--|-----------------|-----------|--------------------|
| Total Device Dissipation FR- 5 Board (1) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 150 | mW |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 833 | $^\circ\text{C/W}$ |
| Total Device Dissipation Alumina Substrate, (2) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 200 | mW |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 625 | $^\circ\text{C/W}$ |
| Junction and Storage Temperature | T_J, T_{stg} | -55to+150 | $^\circ\text{C}$ |

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

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 |

LMBTH10WT1G , S-LMBTH10WT1G
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

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

DC CHARACTERISTICS

| | | | | | |
|---|---------------|----|---|------|-----|
| DC Current Gain ($I_C = 4.0\text{ mA}$, $V_{CE} = 10\text{ Vdc}$) | h_{FE} | 60 | — | 270 | — |
| Collector–Emitter Saturation Voltage ($I_C = 4.0\text{ mA}$, $I_B = 0.4\text{ mA}$) | $V_{CE(sat)}$ | — | — | 0.5 | Vdc |
| Base–Emitter On Voltage ($I_C = 4.0\text{ mA}$, $V_{CE} = 10\text{ Vdc}$) | V_{BE} | — | — | 0.95 | Vdc |

SMALL–SIGNAL CHARACTERISTICS

| | | | | | |
|---|------------|-----|------|-----|-----|
| Current Gain–Bandwidth Product ($V_{CE} = 10\text{ Vdc}$, $I_C = 4.0\text{ mA}$, $f = 100\text{ MHz}$) | 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_{fb} | — | 0.65 | — | pF |
| Collector Base Time Constant ($I_C = 4.0\text{ mA}$, $V_{CB} = 10\text{ Vdc}$, $f = 31.8\text{ MHz}$) | $r_b' C_C$ | — | — | 9.0 | ps |

LMBTH10WT1G , S-LMBTH10WT1G

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

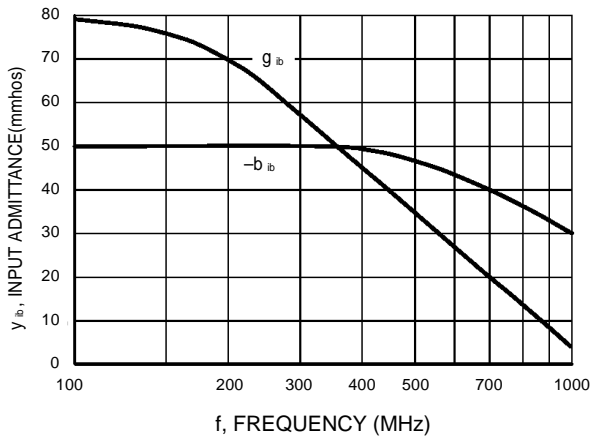


Figure 1. Rectangular Form

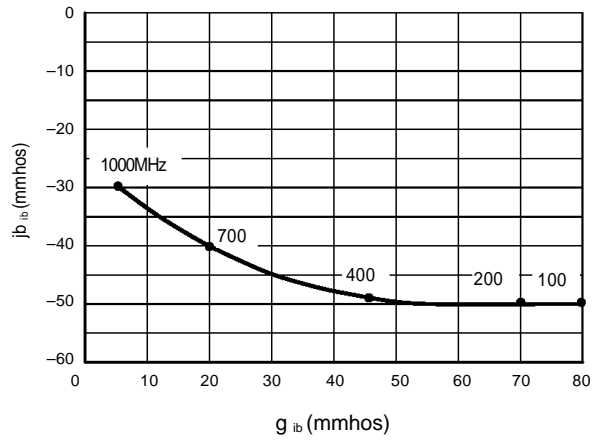


Figure 2. Polar Form

y_{fb} , FORWARD TRANSFER ADMITTANCE

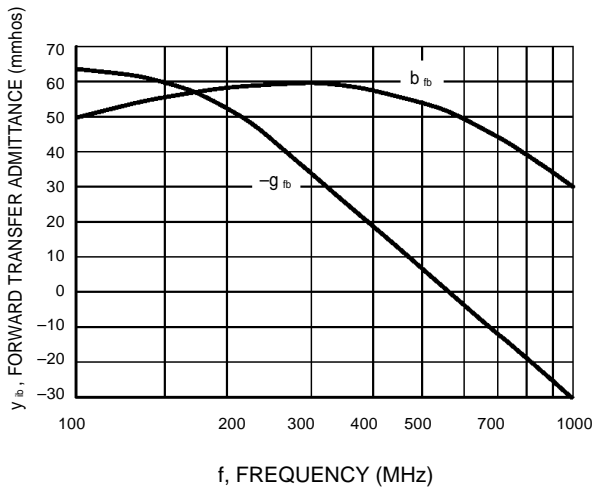


Figure 3. Rectangular Form

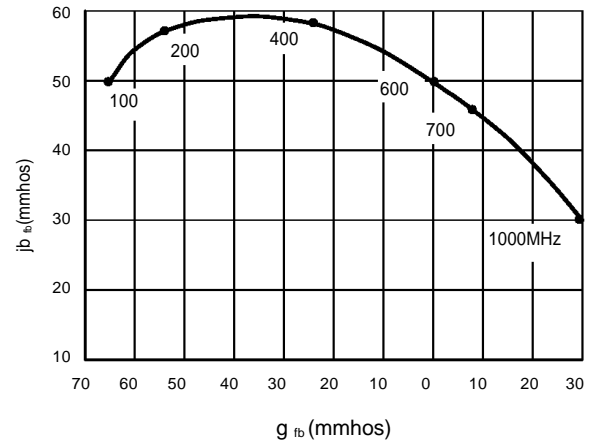


Figure 4. Polar Form

LMBTH10WT1G , S-LMBTH10WT1G

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

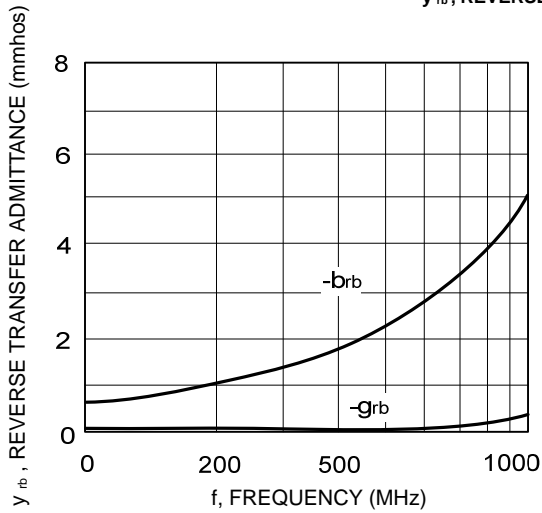


Figure 5. Rectangular Form

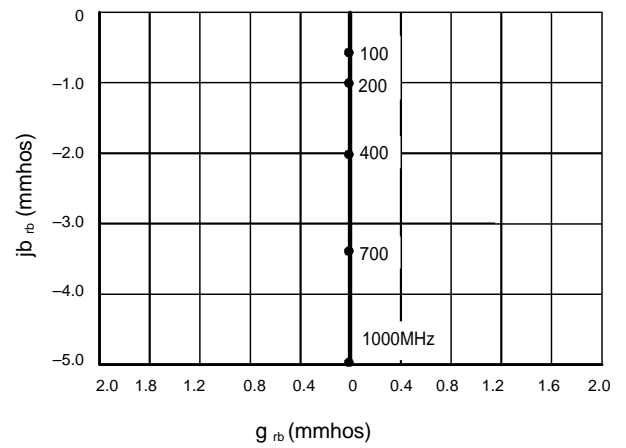


Figure 6. Polar Form

y_{ob} , OUTPUT ADMITTANCE

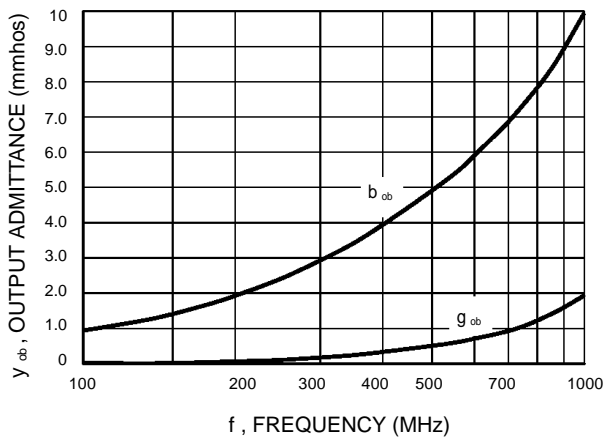


Figure 7. Rectangular Form

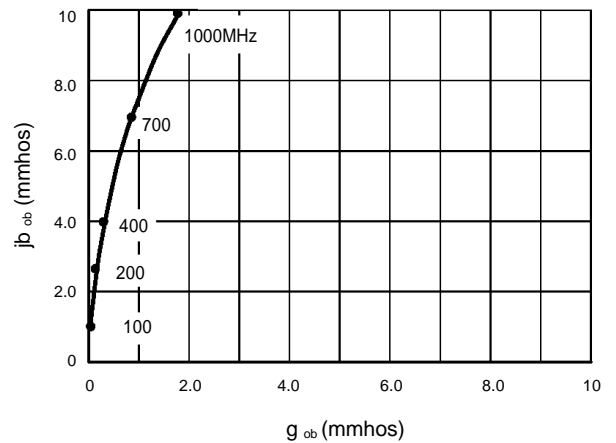
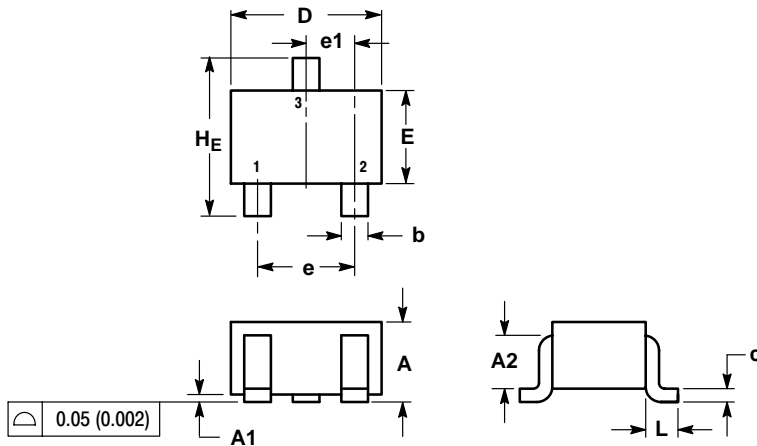


Figure 8. Polar Form

LMBTH10WT1G , S-LMBTH10WT1G

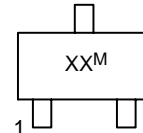
SC-70 / SOT-323



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

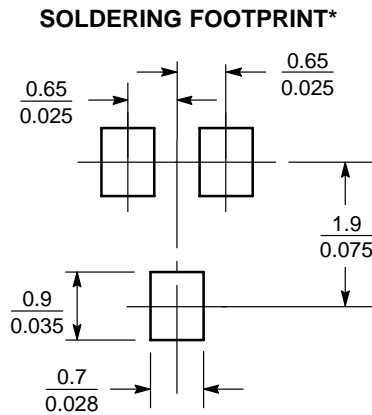
| DIM | MILLIMETERS | | | INCHES | | |
|----------------|-------------|------|------|-----------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.80 | 0.90 | 1.00 | 0.032 | 0.035 | 0.040 |
| A1 | 0.00 | 0.05 | 0.10 | 0.000 | 0.002 | 0.004 |
| A2 | 0.7 REF | | | 0.028 REF | | |
| b | 0.30 | 0.35 | 0.40 | 0.012 | 0.014 | 0.016 |
| c | 0.10 | 0.18 | 0.25 | 0.004 | 0.007 | 0.010 |
| D | 1.80 | 2.10 | 2.20 | 0.071 | 0.083 | 0.087 |
| E | 1.15 | 1.24 | 1.35 | 0.045 | 0.049 | 0.053 |
| e | 1.20 | 1.30 | 1.40 | 0.047 | 0.051 | 0.055 |
| e1 | 0.65 BSC | | | 0.026 BSC | | |
| L | 0.425 REF | | | 0.017 REF | | |
| H _E | 2.00 | 2.10 | 2.40 | 0.079 | 0.083 | 0.095 |

GENERIC MARKING DIAGRAM



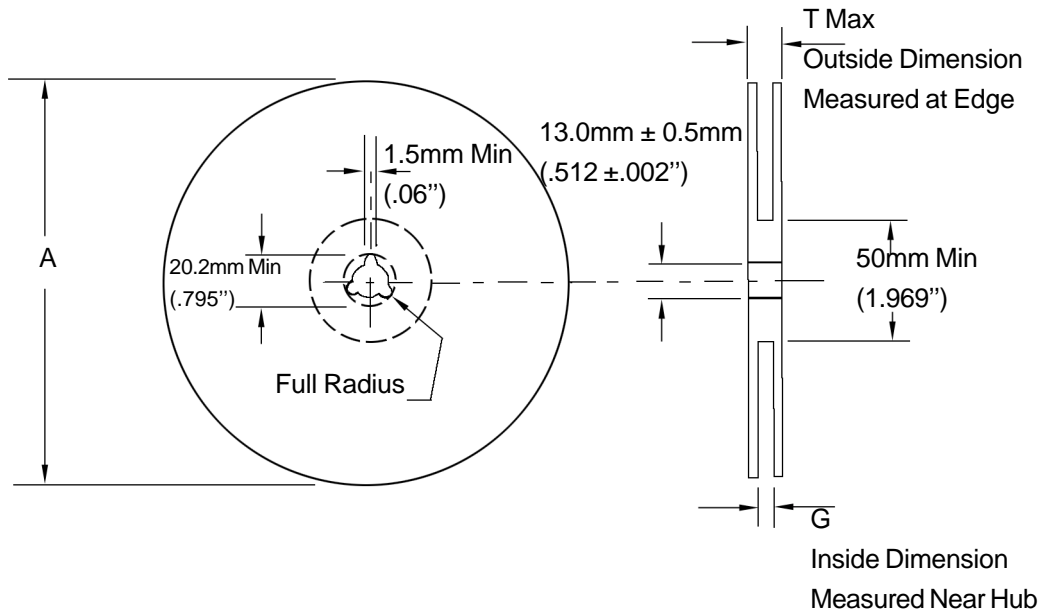
- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.



SCALE 10:1 (mm/inches)

EMBOSSED TAPE AND REEL DATA FOR DISCRETES



| Size | A Max | G | T Max |
|------|--------------------|--|------------------|
| 8 mm | 330mm (12.992") | 8.4mm+1.5mm, -0.0 (.33"+.059", -0.00) | 14.4mm (.56") |

Reel Dimensions

Metric Dimensions Govern — English are in parentheses for reference only

Storage Conditions

Temperature: 5 to 40 Deg.C (20 to 30 Deg. C is preferred)

Humidity: 30 to 80 RH (40 to 60 is preferred)

Recommended Period: One year after manufacturing

(This recommended period is for the soldering condition only. The characteristics and reliabilities of the products are not restricted to this limitation)

Shipment Specification

