

BC846BM3T5G

General Purpose Transistor

NPN Silicon

- Moisture Sensitivity Level: 1
- ESD Rating: Human Body Model: >4000 V
Machine Model: >400 V
- This is a Pb-Free Device

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--------------------------------|-----------|-------|------|
| Collector-Emitter Voltage | V_{CEO} | 65 | Vdc |
| Collector-Base Voltage | V_{CBO} | 80 | Vdc |
| Emitter-Base Voltage | V_{EBO} | 6.0 | Vdc |
| Collector Current - Continuous | I_C | 100 | mAdc |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|----------------|---------------------------|
| Total Device Dissipation FR-5 Board (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 265 | mW |
| | | 2.1 | mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction to Ambient (Note 1) | $R_{\theta JA}$ | 470 | $^\circ\text{C}/\text{W}$ |
| Total Device Dissipation Alumina Substrate (Note 2) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 640 | mW |
| | | 5.1 | mW/ $^\circ\text{C}$ |
| Thermal Resistance, Junction to Ambient (Note 2) | $R_{\theta JA}$ | 195 | $^\circ\text{C}/\text{W}$ |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

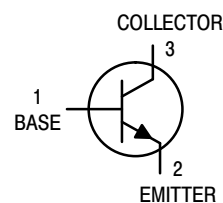
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

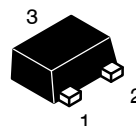


ON Semiconductor®

<http://onsemi.com>



MARKING DIAGRAM



SOT-723
CASE 631AA
STYLE 1



1B = Specific Device Code
M = Date Code

ORDERING INFORMATION

| Device | Package | Shipping† |
|-------------|----------------------|------------------|
| BC846BM3T5G | SOT-723 (Pb-Free) | 8000/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.

BC846BM3T5G

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

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

OFF CHARACTERISTICS

| | | | | | |
|---|----------------------|-----|---|-----------|----------|
| Collector – Emitter Breakdown Voltage (I _C = 10 mA) | V _{(BR)CEO} | 65 | – | – | V |
| Collector – Emitter Breakdown Voltage (I _C = 10 μA, V _{EB} = 0) | V _{(BR)CES} | 80 | – | – | V |
| Collector – Base Breakdown Voltage (I _C = 10 μA) | V _{(BR)CBO} | 80 | – | – | V |
| Emitter – Base Breakdown Voltage (I _E = 1.0 μA) | V _{(BR)EBO} | 6.0 | – | – | V |
| Collector Cutoff Current (V _{CB} = 30 V) (V _{CB} = 30 V, T _A = 150°C) | I _{CBO} | – | – | 15 5.0 | nA μA |

ON CHARACTERISTICS

| | | | | | |
|--|----------------------|-----------------|-----------------|-------------------|----|
| DC Current Gain (I _C = 10 μA, V _{CE} = 5.0 V) (I _C = 2.0 mA, V _{CE} = 5.0 V) | h _{FE} | – 200 | 150 290 | – 450 | – |
| Collector – Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA) (I _C = 100 mA, I _B = 5.0 mA) | V _{CE(sat)} | – – | – – | 0.25 0.6 | V |
| Base – Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA) (I _C = 100 mA, I _B = 5.0 mA) | V _{BE(sat)} | – – | 0.7 0.9 | – – | V |
| Base – Emitter Voltage (I _C = 1.0 mA, V _{CE} = 5.0 V) (I _C = 2.0 mA, V _{CE} = 5.0 V) (I _C = 10 mA, V _{CE} = 5.0 V) | V _{BE(on)} | 550 580 – | 645 660 – | 700 700 770 | mV |

SMALL-SIGNAL CHARACTERISTICS

| | | | | | |
|---|------------------|-----|---|-----|-----|
| Current – Gain – Bandwidth Product (I _C = 10 mA, V _{CE} = 5.0 Vdc, f = 100 MHz) | f _T | 100 | – | – | MHz |
| Output Capacitance (V _{CB} = 10 V, f = 1.0 MHz) | C _{obo} | – | – | 4.5 | pF |
| Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 Vdc, R _S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz) | NF | – | – | 10 | dB |

TYPICAL CHARACTERISTICS

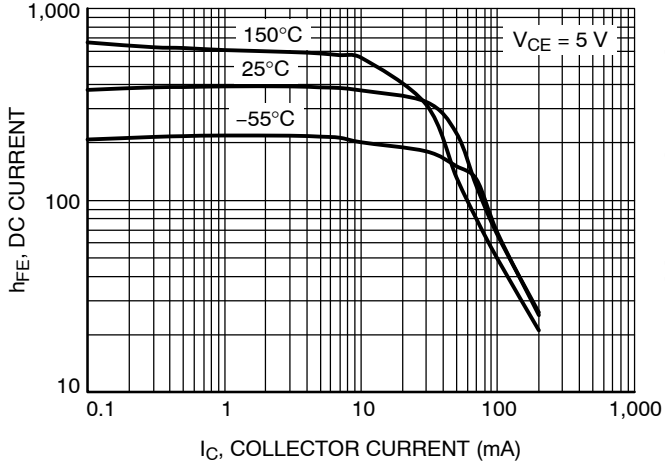


Figure 1. DC Current Gain

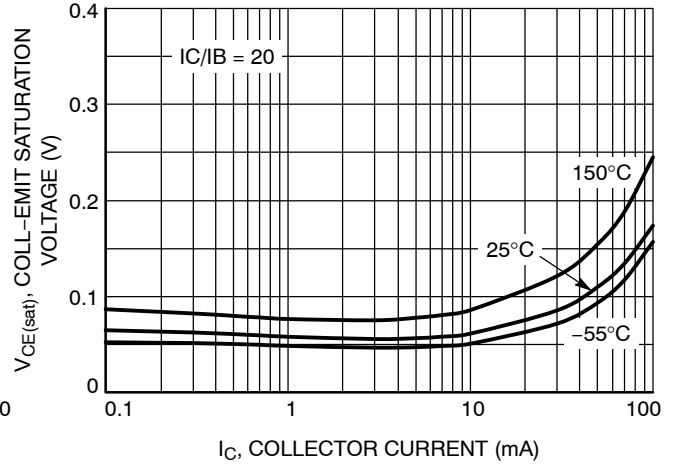


Figure 2. Collector-Emmit Saturation Voltage

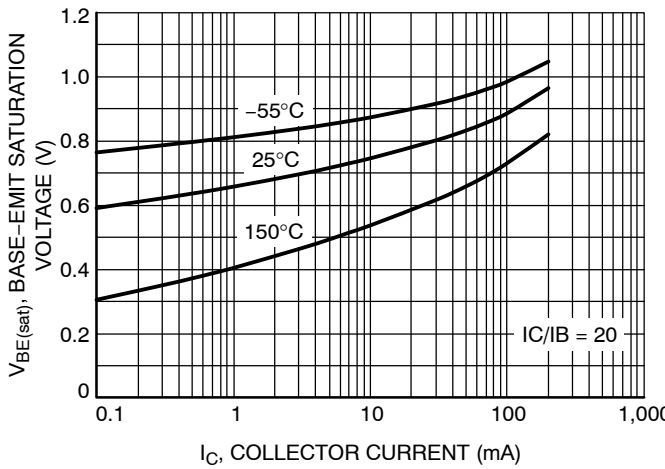


Figure 3. Base-Emmit Saturation Voltage

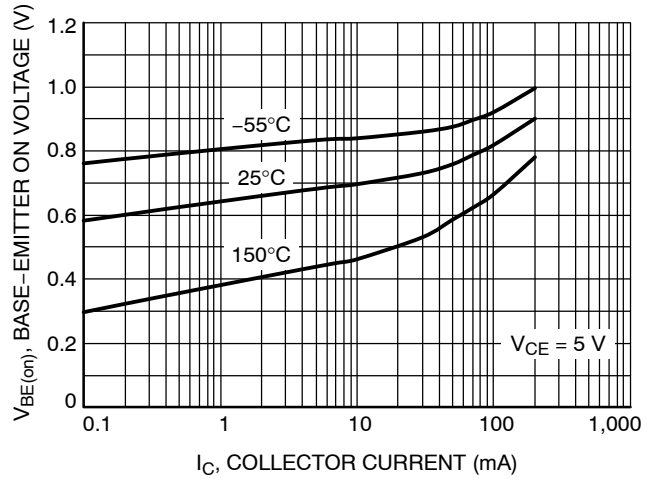


Figure 4. Base-Emmit "On" Voltage

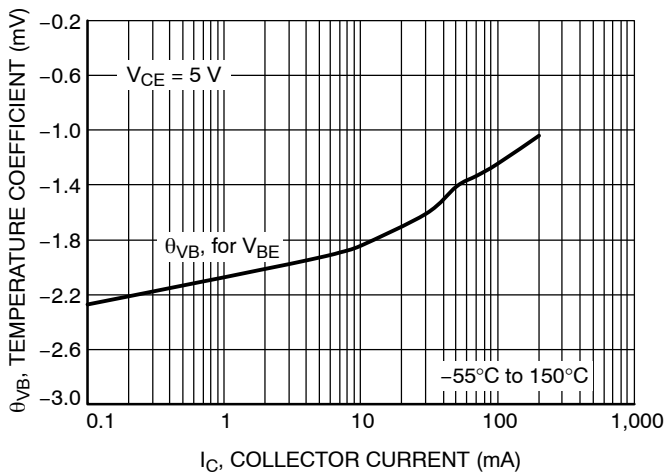


Figure 5. Base-Emmit Temperature Coefficient

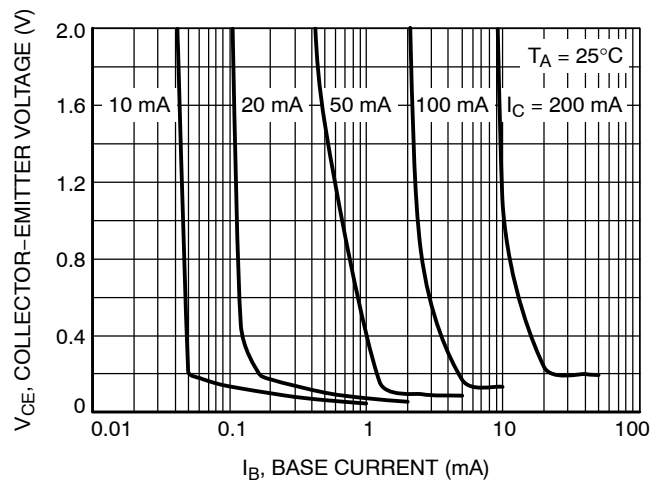


Figure 6. Collector Saturation Region

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TYPICAL CHARACTERISTICS

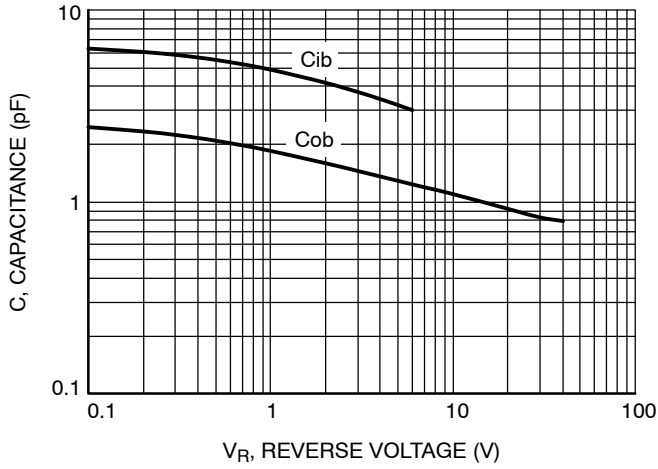


Figure 7. Capacitances

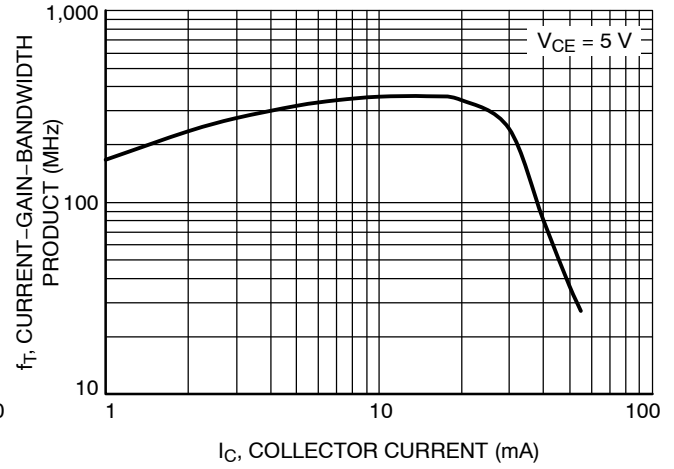
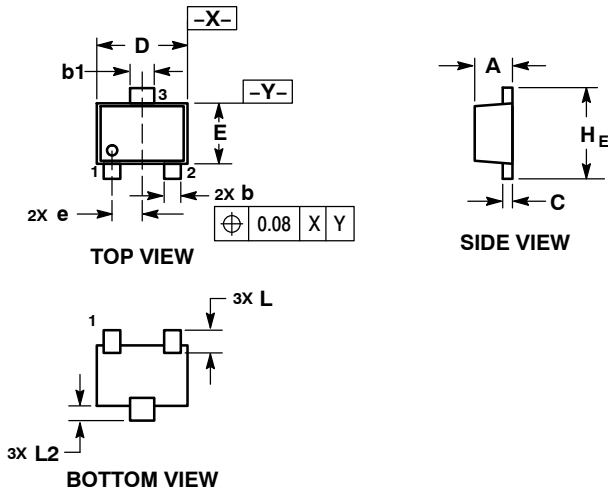


Figure 8. Current-Gain-Bandwidth Product

BC846BM3T5G

PACKAGE DIMENSIONS

SOT-723
CASE 631AA-01
ISSUE D



NOTES:

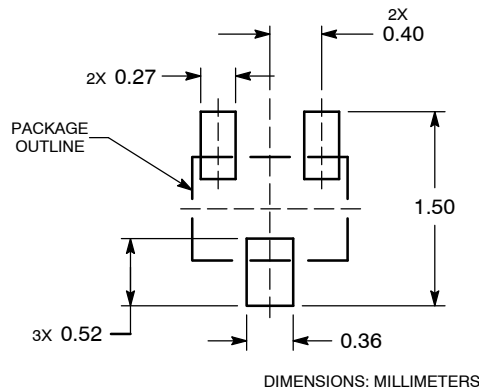
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

| DIM | MILLIMETERS | | |
|----------------|-------------|------|------|
| | MIN | NOM | MAX |
| A | 0.45 | 0.50 | 0.55 |
| b | 0.15 | 0.21 | 0.27 |
| b1 | 0.25 | 0.31 | 0.37 |
| C | 0.07 | 0.12 | 0.17 |
| D | 1.15 | 1.20 | 1.25 |
| E | 0.75 | 0.80 | 0.85 |
| e | 0.40 BSC | | |
| H _E | 1.15 | 1.20 | 1.25 |
| L | 0.29 REF | | |
| L2 | 0.15 | 0.20 | 0.25 |

STYLE 1:

1. BASE
2. EMITTER
3. COLLECTOR

RECOMMENDED SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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