

45 V, 0.5 A, General Purpose NPN Transistor

BC817-40W

onsemi's BC817-40W is a General Purpose NPN Transistor that is housed in the SC-70/SOT-323 package.

Features

- NSV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- This Device is Pb-Free, Halogen Free/BFR Free and is RoHS Compliant

MAXIMUM RATINGS (T_A = 25°C)

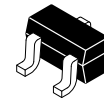
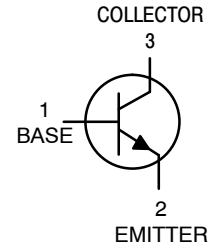
| Rating | Symbol | Value | Unit |
|--------------------------------|------------------|-------|------------------|
| Collector – Emitter Voltage | V _{CEO} | 45 | V |
| Collector – Base Voltage | V _{CBO} | 50 | V |
| Emitter – Base Voltage | V _{EBO} | 5.0 | V |
| Collector Current – Continuous | I _C | 500 | mA _{dc} |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|--|-----------------------------------|-------------|------|
| Total Device Dissipation (Note 1) | P _D | 460 | mW |
| Thermal Resistance, Junction-to-Ambient (Note 1) | R _{θJA} | 272 | °C/W |
| Junction and Storage Temperature Range | T _J , T _{stg} | -55 to +150 | °C |

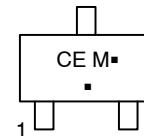
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. FR-4 Board, 1 oz. Cu, 100 mm²



**SC-70
CASE 419
STYLE 3**

MARKING DIAGRAM



CE = Specific Device Code
 M = Date Code
 ■ = Pb-Free Package

(Note: Microdot may be in either location)

*Date Code orientation and/or overbar may vary depending upon manufacturing location.

ORDERING INFORMATION†

| Device | Package | Shipping |
|-----------------|-----------------|--------------------|
| BC817-40WT1G | SC-70 (Pb-Free) | 3000 / Tape & Reel |
| NSVBC817-40WT1G | SC-70 (Pb-Free) | 3000 / Tape & Reel |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

BC817-40W

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|---------------|-----------|--------|------------|---------------------|
| OFF CHARACTERISTICS | | | | | |
| Collector - Emitter Breakdown Voltage ($I_C = 10\text{ mA}$) | $V_{(VR)CEO}$ | 45 | - | - | V |
| Collector - Emitter Breakdown Voltage ($V_{EB} = 0\text{ V}$, $I_C = 10\text{ }\mu\text{A}$) | $V_{(VR)CES}$ | 50 | - | - | V |
| Emitter - Base Breakdown Voltage ($I_E = 1.0\text{ }\mu\text{A}$) | $V_{(VR)EBO}$ | 5.0 | - | - | V |
| Collector Cutoff Current ($V_{CB} = 20\text{ V}$) ($V_{CB} = 20\text{ V}$, $T_A = 150^\circ\text{C}$) | I_{CBO} | - | - | 100 5.0 | nA μA |
| ON CHARACTERISTICS | | | | | |
| DC Current Gain (Note 2) ($I_C = 100\text{ mA}$, $V_{CE} = 1.0\text{ V}$) ($I_C = 500\text{ mA}$, $V_{CE} = 1.0\text{ V}$) | h_{FE} | 250 40 | - - | 600 - | - |
| Collector - Emitter Saturation Voltage (Note 2) ($I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$) | $V_{CE(sat)}$ | - | - | 0.7 | V |
| Base - Emitter On Voltage (Note 2) ($I_C = 500\text{ mA}$, $V_{CE} = 1.0\text{ V}$) | $V_{BE(on)}$ | - | - | 1.2 | V |
| SMALL-SIGNAL CHARACTERISTICS | | | | | |
| Current - Gain - Bandwidth Product ($I_C = 10\text{ mA}$, $V_{CE} = 5.0\text{ V}$, $f = 100\text{ MHz}$) | f_T | 100 | - | - | MHz |
| Output Capacitance ($V_{CB} = 10\text{ V}$, $f = 1.0\text{ MHz}$) | C_{obo} | - | 10 | - | pF |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Pulse Condition: Pulse Width = 300 μsec , Duty Cycle $\leq 2\%$

TYPICAL CHARACTERISTICS

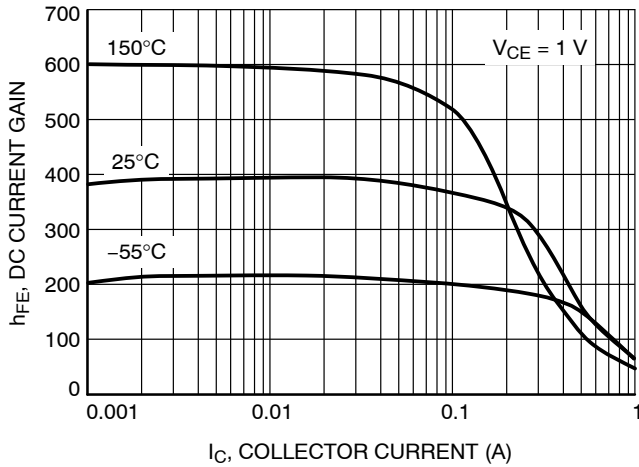


Figure 1. DC Current Gain vs. Collector Current

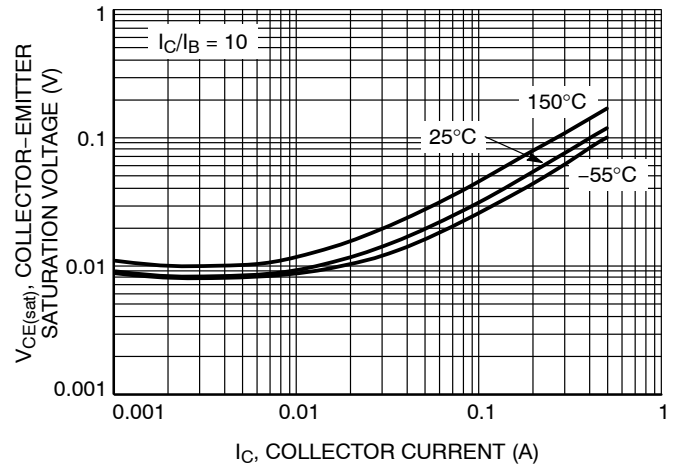


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

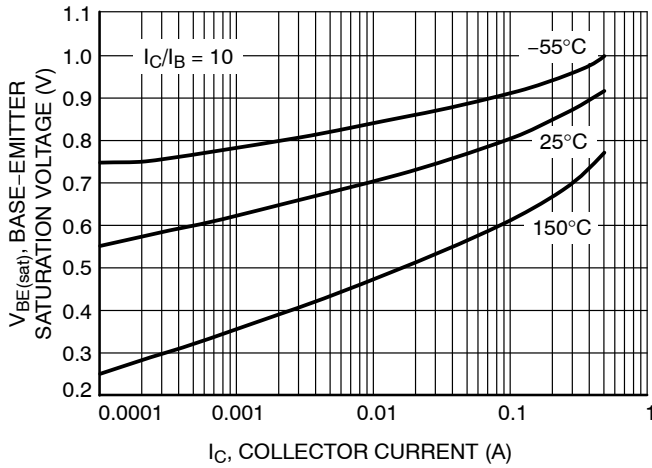


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

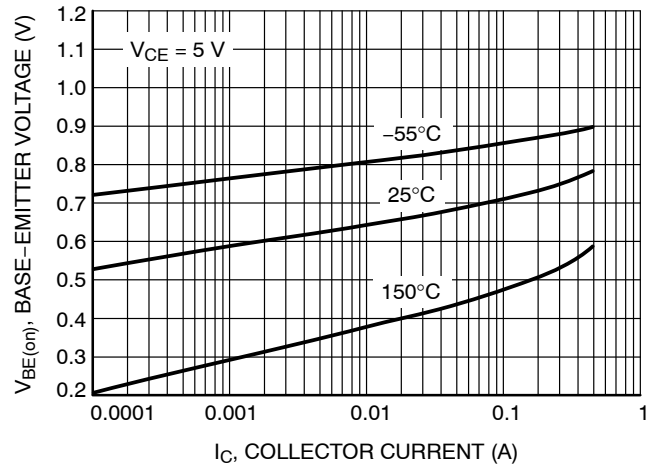


Figure 4. Base Emitter Voltage vs. Collector Current

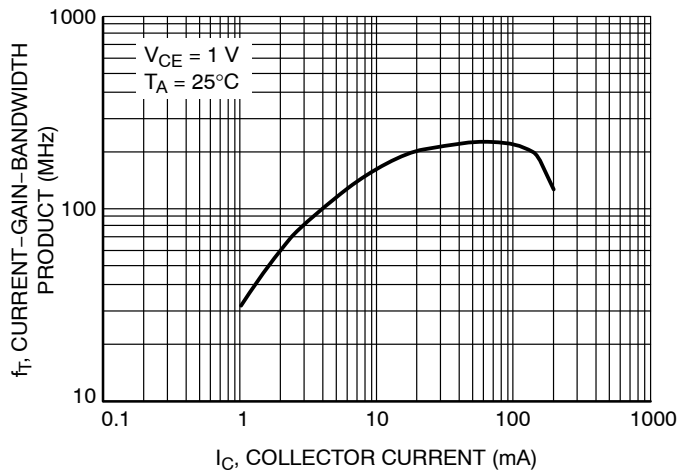


Figure 5. Current Gain Bandwidth Product vs. Collector Current

BC817-40W

TYPICAL CHARACTERISTICS

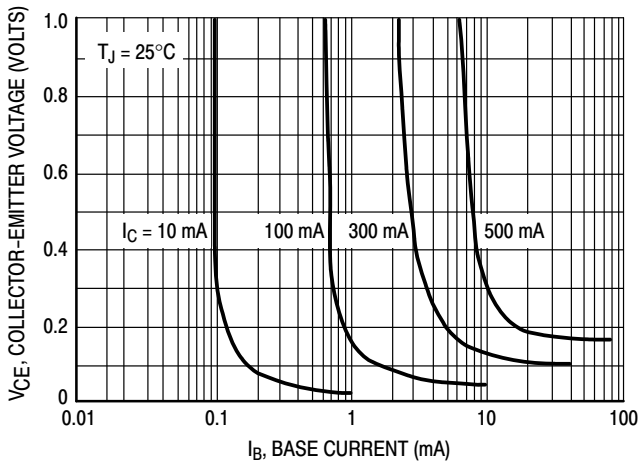


Figure 6. Saturation Region

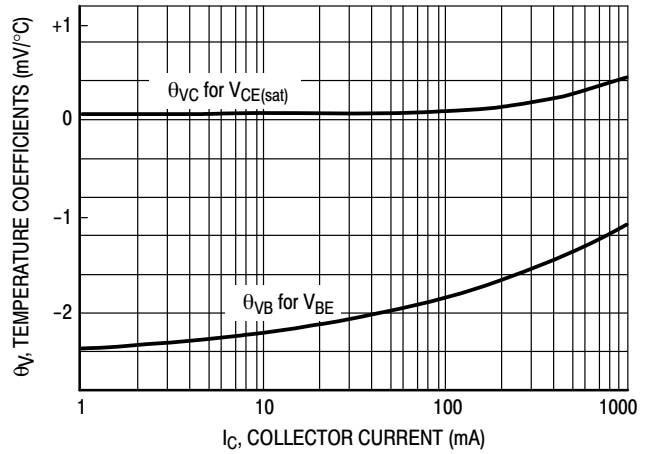


Figure 7. Temperature Coefficients

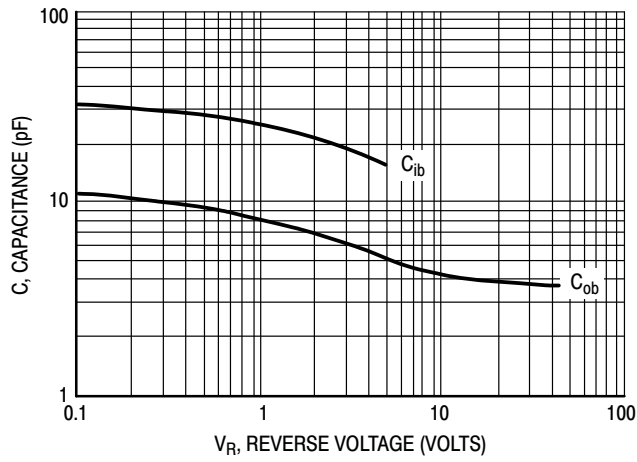


Figure 8. Capacitances

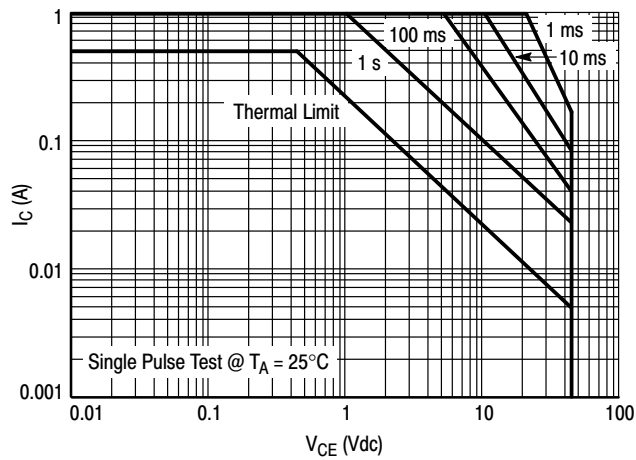
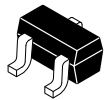


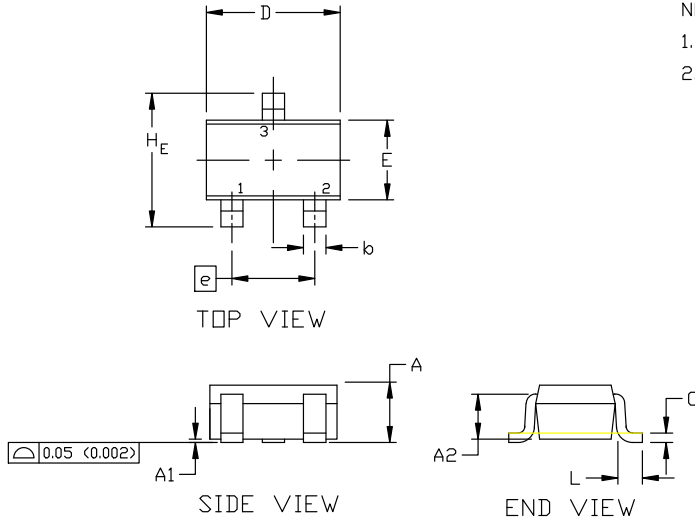
Figure 9. Safe Operating Area



SCALE 4:1

SC-70 (SOT-323)
CASE 419
ISSUE R

DATE 11 OCT 2022

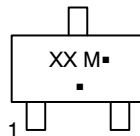


NOTES:

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

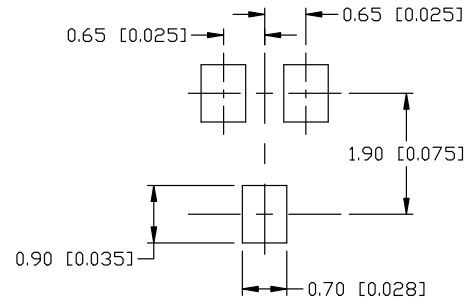
| DIM | MILLIMETERS | | | INCHES | | |
|----------------|-------------|------|------|-----------|-------|-------|
| | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. |
| A | 0.80 | 0.90 | 1.00 | 0.032 | 0.035 | 0.040 |
| A1 | 0.00 | 0.05 | 0.10 | 0.000 | 0.002 | 0.004 |
| A2 | 0.70 REF | | | 0.028 BSC | | |
| 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 | 2.00 | 2.20 | 0.071 | 0.080 | 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 | 0.20 | 0.38 | 0.56 | 0.008 | 0.015 | 0.022 |
| 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. Some products may not follow the Generic Marking.



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

SOLDERING FOOTPRINT

- | | | | | | |
|---|---|---|--|---|---|
| STYLE 1: CANCELLED | STYLE 2: PIN 1. ANODE 2. N.C. 3. CATHODE | STYLE 3: PIN 1. BASE 2. EMITTER 3. COLLECTOR | STYLE 4: PIN 1. CATHODE 2. CATHODE 3. ANODE | STYLE 5: PIN 1. ANODE 2. ANODE 3. CATHODE | |
| STYLE 6: PIN 1. EMITTER 2. BASE 3. COLLECTOR | STYLE 7: PIN 1. BASE 2. EMITTER 3. COLLECTOR | STYLE 8: PIN 1. GATE 2. SOURCE 3. DRAIN | STYLE 9: PIN 1. ANODE 2. CATHODE 3. CATHODE-ANODE | STYLE 10: PIN 1. CATHODE 2. ANODE 3. ANODE-CATHODE | STYLE 11: PIN 1. CATHODE 2. CATHODE 3. CATHODE |

| | | |
|------------------|-----------------|---|
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| DESCRIPTION: | SC-70 (SOT-323) | PAGE 1 OF 1 |

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