



Micro Commercial Components



Micro Commercial Components  
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# BC846AW/BW BC847AW/BW/CW BC848AW/BW/CW

## Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Low current (max. 100mA)
- Low voltage (max. 65V)
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

## Maximum Ratings

- Operating temperature : -65°C to +150°C
- Storage temperature : -65°C to +150°C
- Thermal resistance from junction to ambient\*: 625K/W
- Marking: BC846AW---1A ; BC846BW---1B  
BC847AW---1E ; BC847BW---1F ; BC847CW---1G  
BC848AW---1JS/1J ; BC848BW---1KS/1K ; BC848CW---1LS/1L

## Electrical Characteristics @ 25°C Unless Otherwise Specified

| Symbol | Parameter | Min | Max | Units |
|--------|-----------|-----|-----|-------|
|--------|-----------|-----|-----|-------|

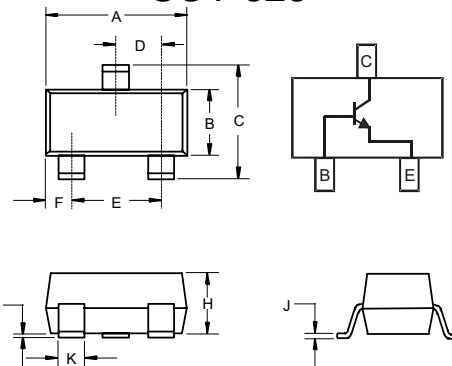
### OFF CHARACTERISTICS

|               |  |     |     |      |
|---------------|--|-----|-----|------|
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage<br>( $I_C=10\mu A_{dc}$ , $I_E=0$ ) |     |     | Vdc  |
|               | BC846AW/BW   | --- | 80  |      |
|               | BC847AW/BW/CW  | --- | 50  |      |
|               | BC848AW/BW/CW  | --- | 30  |      |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage<br>( $I_C=10mA_{dc}$ , $I_B=0$ ) |     |     | Vdc  |
|               | BC846AW/BW   | --- | 65  |      |
|               | BC847AW/BW/CW  | --- | 45  |      |
|               | BC848AW/BW/CW  | --- | 30  |      |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage<br>( $I_E=1\mu A_{dc}$ , $I_C=0$ )    |     |     | Vdc  |
|               | BC846AW/BW, BC847AW/BW/CW  | --- | 6   |      |
|               | BC848AW/BW/CW  | --- | 5   |      |
|               |  |     |     |      |
| $I_C$         | Collector Current (DC)   | --- | 100 | mAdc |
| $I_{CM}$      | Peak Collector Current   | --- | 200 | mAdc |
| $I_{BM}$      | Peak Base Current  | --- | 200 | mAdc |

\* Transistor mounted on an FR4 printed-circuit board

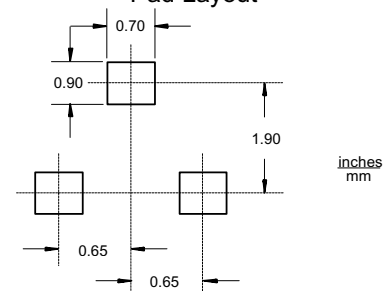
## NPN General Purpose Transistors

### SOT-323



| DIM | DIMENSIONS   |      |             |      | NOTE |
|-----|--------------|------|-------------|------|------|
|     | INCHES       |      | MM          |      |      |
|     | MIN          | MAX  | MIN         | MAX  |      |
| A   | .071         | .087 | 1.80        | 2.20 |      |
| B   | .045         | .053 | 1.15        | 1.35 |      |
| C   | .079         | .087 | 2.00        | 2.20 |      |
| D   | .026 Nominal |      | 0.65Nominal |      |      |
| E   | .047         | .055 | 1.20        | 1.40 |      |
| F   | .012         | .016 | .30         | .40  |      |
| G   | .000         | .004 | .000        | .100 |      |
| H   | .035         | .039 | .90         | 1.00 |      |
| J   | .004         | .010 | .100        | .250 |      |
| K   | .012         | .016 | .30         | .40  |      |

### Suggested Solder Pad Layout



**ON CHARACTERISTICS**

| Symbol               | Parameter   | Min | Typ | Max | Units |
|----------------------|---|-----|-----|-----|-------|
| I <sub>CBO</sub>     | Collector-base Cut-off Current<br>(I <sub>CE</sub> =0, V <sub>CB</sub> =30Vdc)<br>(I <sub>CE</sub> =0, V <sub>CB</sub> =30Vdc, T <sub>F</sub> =150°C) | --- | --- | 15  | nA    |
|                      |   | --- | --- | 5   | μA    |
| I <sub>CEO</sub>     | Emitter-base Cut-off Current<br>(I <sub>C</sub> =0, V <sub>EB</sub> =5Vdc)  | --- | --- | 100 | nA    |
| V <sub>CE(sat)</sub> | Collector-Emitter Saturation Voltage<br>(I <sub>C</sub> =10mAdc, I <sub>B</sub> =0.5mAdc)<br>(I <sub>C</sub> =100mAdc, I <sub>B</sub> =5mAdc*)        | --- | 90  | 250 | mVdc  |
|                      |   | --- | 200 | 600 | mVdc  |
| V <sub>BE(sat)</sub> | Base-Emitter Saturation Voltage<br>(I <sub>C</sub> =10mAdc, I <sub>B</sub> =0.5mAdc)<br>(I <sub>C</sub> =100mAdc, I <sub>B</sub> =5mAdc*)             | --- | 700 | --- | mVdc  |
|                      |   | --- | 900 | --- | mVdc  |
| h <sub>FE</sub>      | DC Current Gain (I <sub>C</sub> =10μA; V <sub>CE</sub> =5V)<br>BC846AW; BC847AW; BC848AW<br>BC846BW; BC847BW; BC848BW<br>BC847CW; BC848CW             | --- | 90  | --- |       |
|                      |   | --- | 150 | --- |       |
|                      | DC Current Gain (I <sub>C</sub> =2mA; V <sub>CE</sub> =5V)<br><br>BC846AW; BC847AW; BC848AW<br>BC846BW; BC847BW; BC848BW<br>BC847CW; BC848CW          | --- | 270 | --- |       |
|                      |   | 110 | 180 | 220 |       |
| V <sub>BE</sub>      | Base-emitter Voltage<br>(I <sub>C</sub> =2mAdc, V <sub>CE</sub> =5V)<br>(I <sub>C</sub> =10mAdc, V <sub>CE</sub> =5V)                                 | 580 | 660 | 700 | mVdc  |
|                      |   | --- | --- | 770 | mVdc  |
| C <sub>C</sub>       | Collector Capacitance (V <sub>CB</sub> =10V; I <sub>E</sub> =I <sub>B</sub> =0; f=1MHz)   | --- | --- | 4.5 | pF    |
| f <sub>T</sub>       | Transition Frequency (V <sub>CE</sub> =5V; I <sub>C</sub> =10mA; f=100MHz)  | 100 | --- | --- | MHz   |
| F                    | Noise Figure (V <sub>CE</sub> =5V; I <sub>C</sub> =200μA; f=1KHz; B=200Hz; R <sub>S</sub> =2KΩ)   | --- | --- | 10  | dB    |

\* Pulse test: t<sub>p</sub> ≅ 300μs; δ ≅ 0.02

Typical Characteristics

846AW,BW;BC847AW, BW, CW;BC848AW, BW, CW

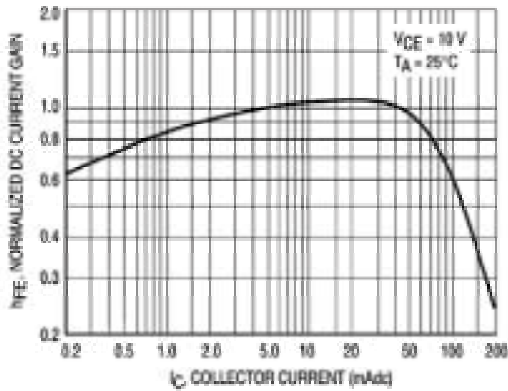


Figure 1. Normalized DC Current Gain

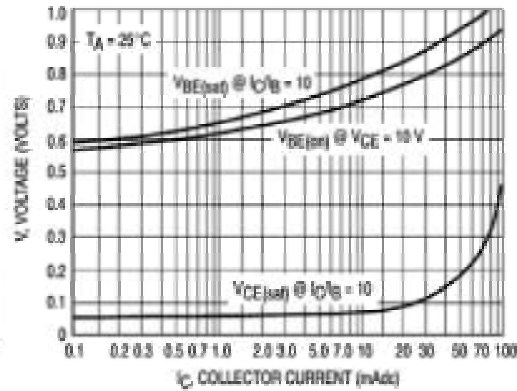


Figure 2. "Saturation" and "On" Voltages

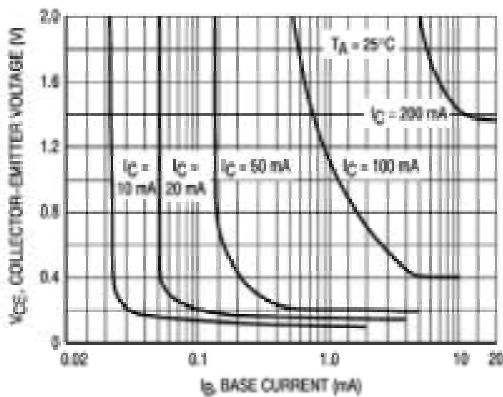


Figure 3. Collector Saturation Region

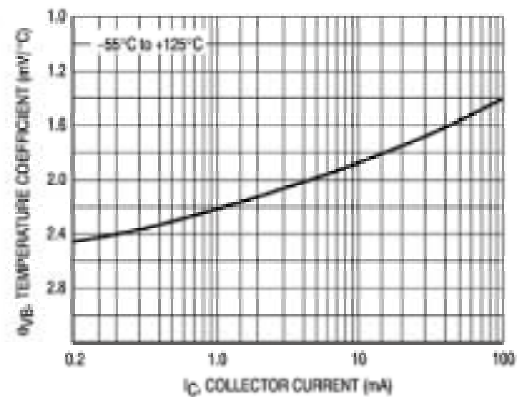


Figure 4. Base-Emitter Temperature Coefficient

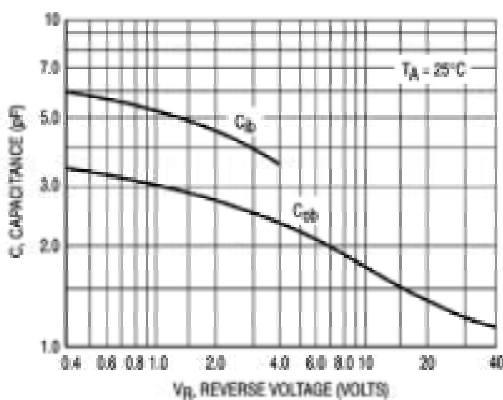


Figure 5. Capacitances

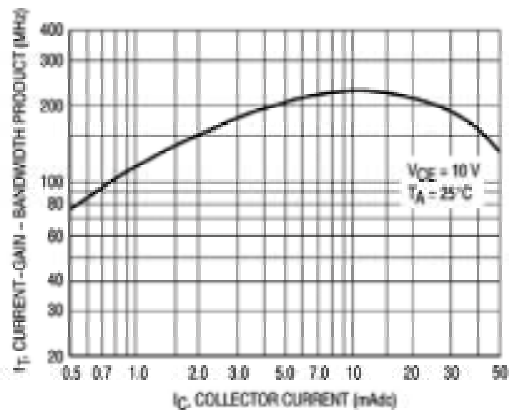


Figure 6. Current-Gain - Bandwidth Product

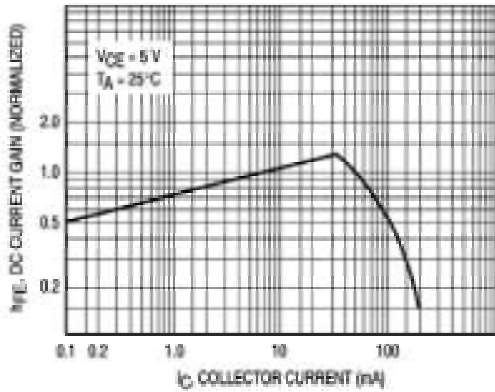


Figure 7. DC Current Gain

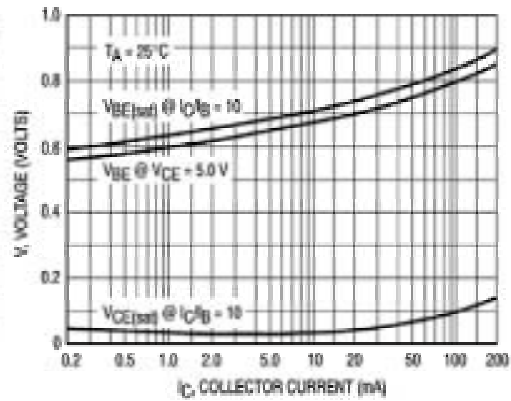


Figure 8. "On" Voltage

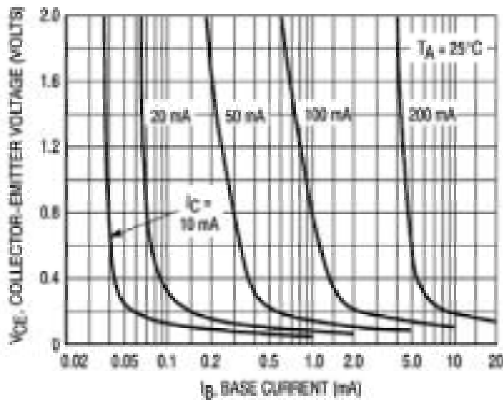


Figure 9. Collector Saturation Region

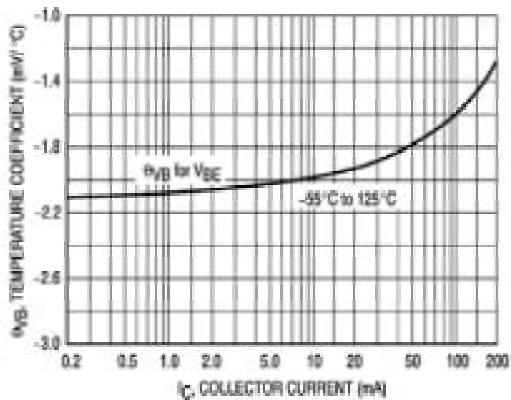


Figure 10. Base-Emitter Temperature Coefficient

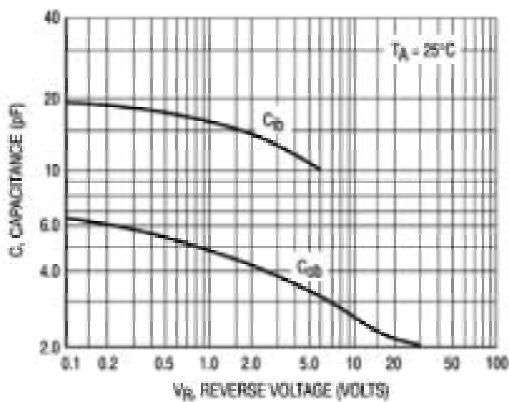


Figure 11. Capacitance

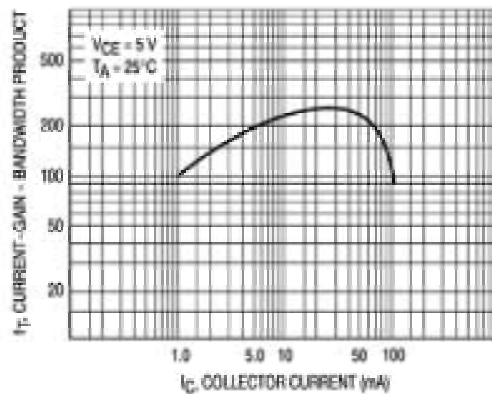


Figure 12. Current-Gain - Bandwidth Product



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### Ordering Information :

| Device         | Packing               |
|----------------|-----------------------|
| Part Number-TP | Tape&Reel; 3Kpcs/Reel |

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