



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
- Halogen free available upon request by adding suffix "-HF"

### 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 |
|--------|-----------|-----|-----|-------|
|--------|-----------|-----|-----|-------|

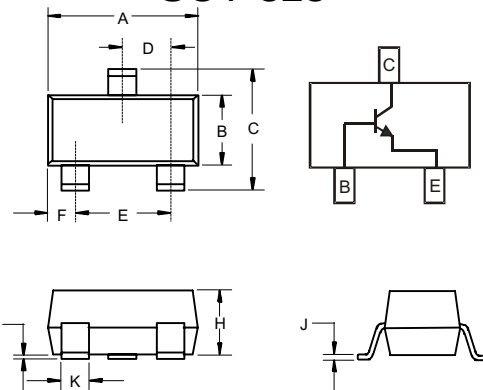
#### OFF CHARACTERISTICS

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

\* Transistor mounted on an FR4 printed-circuit board

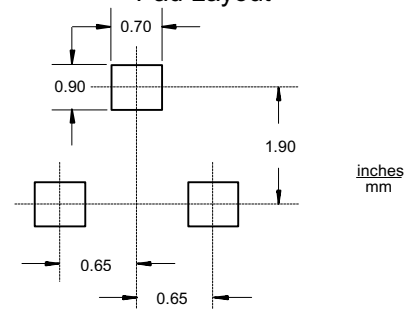
### NPN General Purpose Transistors

#### SOT-323



| DIMENSIONS |              |      |             |      |      |
|------------|--------------|------|-------------|------|------|
| DIM        | INCHES       |      | MM          |      | NOTE |
|            | MIN          | MAX  | MIN         | MAX  |      |
| A          | .071         | .087 | 1.80        | 2.20 |      |
| B          | .045         | .053 | 1.15        | 1.35 |      |
| C          | .083         | .096 | 2.10        | 2.45 |      |
| 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          | .006         | .016 | .15         | .40  |      |

#### Suggested Solder Pad Layout



# ON CHARACTERISTICS

| Symbol        | Parameter                                                                                                                                                                                                                                                          | Min        | Typ              | Max        | Units         |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|------------|---------------|
| $I_{CBO}$     | Collector-base Cut-off Current<br>( $I_{CE}=0$ , $V_{CB}=30V_{dc}$ )<br>( $I_{CE}=0$ , $V_{CB}=30V_{dc}$ , $T_J=150^{\circ}C$ )                                                                                                                                    | ---        | ---              | 15<br>5    | nA<br>$\mu A$ |
| $I_{CEO}$     | Emitter-base Cut-off Current<br>( $I_C=0$ , $V_{EB}=5V_{dc}$ )                                                                                                                                                                                                     | ---        | ---              | 100        | nA            |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage<br>( $I_C=10mA_{dc}$ , $I_B=0.5mA_{dc}$ )<br>( $I_C=100mA_{dc}$ , $I_B=5mA_{dc}^*$ )                                                                                                                                          | ---        | 90<br>200        | 250<br>600 | mVdc<br>mVdc  |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage<br>( $I_C=10mA_{dc}$ , $I_B=0.5mA_{dc}$ )<br>( $I_C=100mA_{dc}$ , $I_B=5mA_{dc}^*$ )                                                                                                                                               | ---        | 700<br>900       | ---        | mVdc<br>mVdc  |
| $h_{FE}$      | DC Current Gain ( $I_C=10\mu A$ ; $V_{CE}=5V$ )<br>BC846AW; BC847AW; BC848AW<br>BC846BW; BC847BW; BC848BW<br>BC847CW; BC848CW<br><br>DC Current Gain ( $I_C=2mA$ ; $V_{CE}=5V$ )<br><br>BC846AW; BC847AW; BC848AW<br>BC846BW; BC847BW; BC848BW<br>BC847CW; BC848CW | ---        | 90<br>150<br>270 | ---        |               |
| $V_{BE}$      | Base-emitter Voltage<br>( $I_C=2mA_{dc}$ , $V_{CE}=5V$ )<br>( $I_C=10mA_{dc}$ , $V_{CE}=5V$ )                                                                                                                                                                      | 580<br>--- | 660<br>---       | 700<br>770 | mVdc<br>mVdc  |
| $C_c$         | Collector Capacitance ( $V_{CB}=10V$ ; $I_E=I_B=0$ ; $f=1MHz$ )                                                                                                                                                                                                    | ---        | ---              | 4.5        | pF            |
| $f_T$         | Transition Frequency ( $V_{CE}=5V$ ; $I_C=10mA$ ; $f=100MHz$ )                                                                                                                                                                                                     | 100        | ---              | ---        | MHz           |
| $F$           | Noise Figure ( $V_{CE}=5V$ ; $I_C=200\mu A$ ; $f=1KHz$ ; $B=200Hz$ ; $R_S=2K\Omega$ )                                                                                                                                                                              | ---        | ---              | 10         | dB            |

\* Pulse test:  $t_p \leq 300\mu s$ ;  $\delta \leq 0.02$

## Typical Characteristics

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

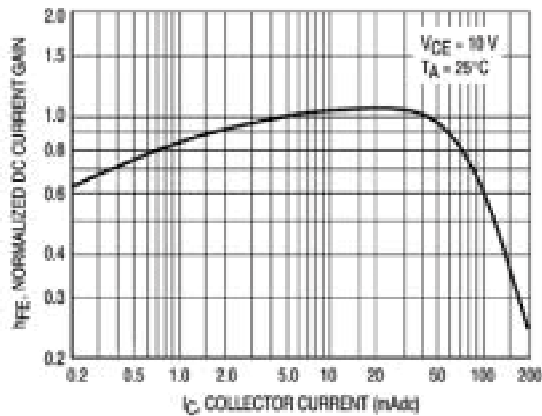


Figure 1. Normalized DC Current Gain

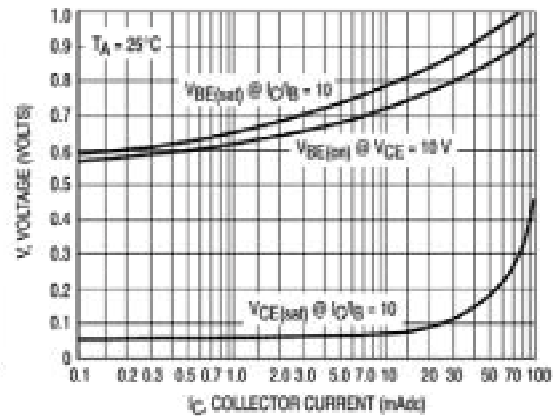


Figure 2. "Saturation" and "On" Voltages

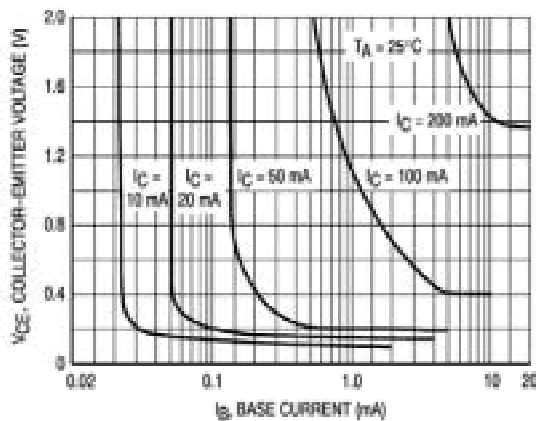


Figure 3. Collector Saturation Region

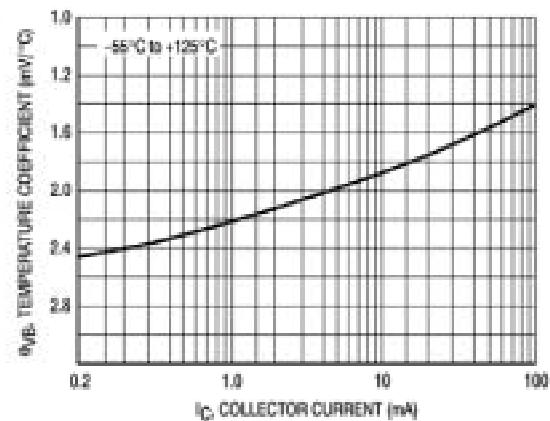


Figure 4. Base-Emitter Temperature Coefficient

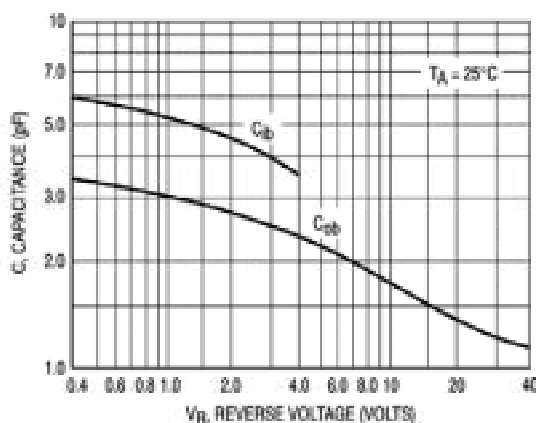


Figure 5. Capacitances

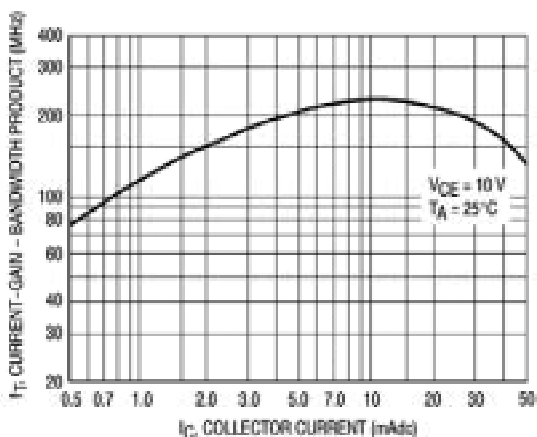


Figure 6. Current-Gain - Bandwidth Product

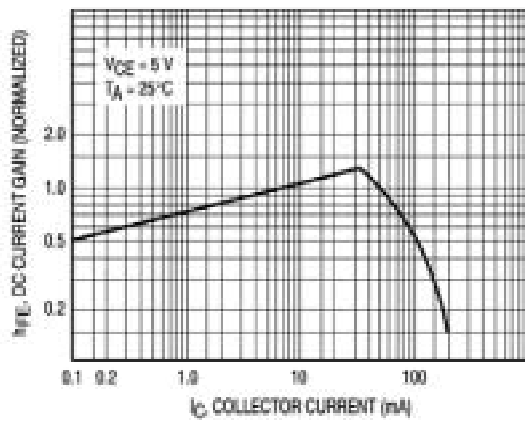


Figure 7. DC Current Gain

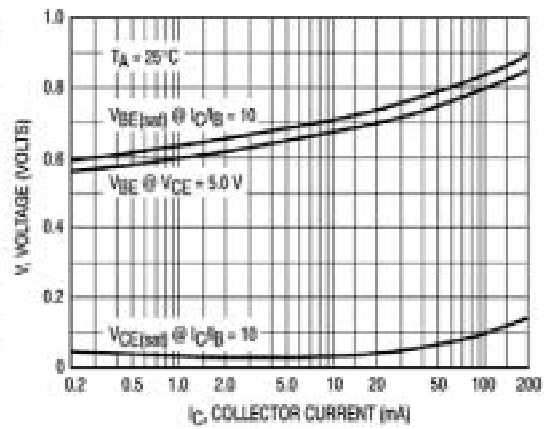


Figure 8. "On" Voltage

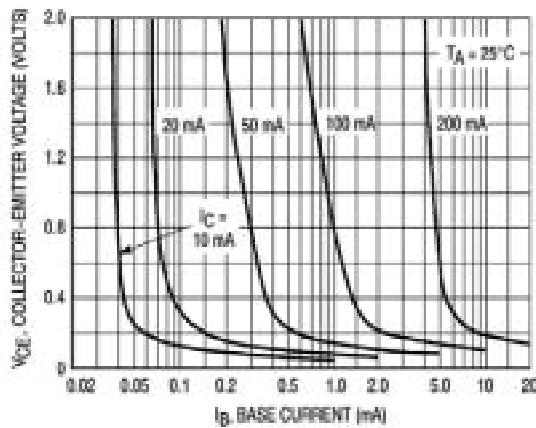


Figure 9. Collector Saturation Region

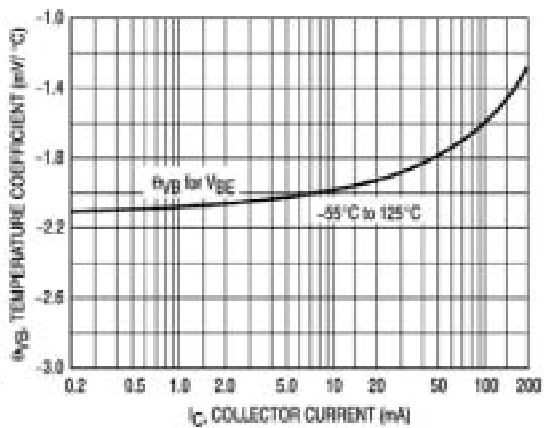


Figure 10. Base-Emitter Temperature Coefficient

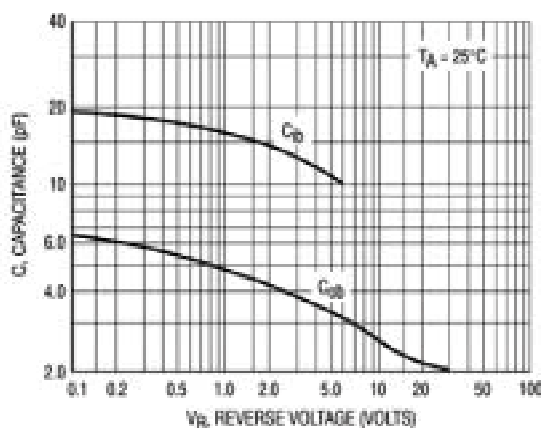


Figure 11. Capacitance

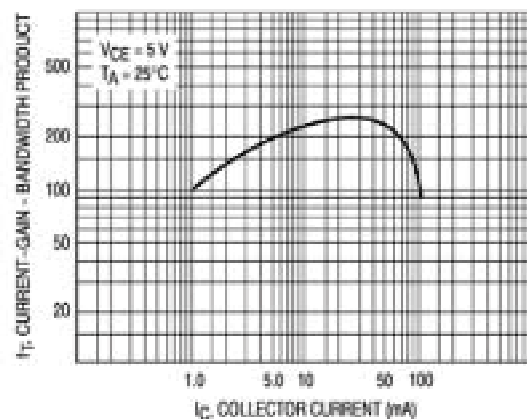


Figure 12. Current-Gain - Bandwidth Product

## Ordering Information :

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

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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