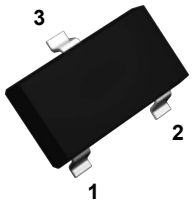
GOOD-ARK
SEMICONDUCTOR

# BC846xW/BC847xW/BC848xW
# NPN Transistors

## Features

- Low current leakage
- Small surface mount package
- For high-speed switching applications
- Ideal for automatic insertion

1. BASE
2. EMITTER
3. COLLECTOR




**SOT-323**

## Maximum Ratings ($T_A$=25°C unless otherwise specified)

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Collector-Base Voltage | BC846xW | $V_{CBO}$ | 80 | V |
| | BC847xW | | 50 | |
| | BC848xW | | 30 | |
| Collector-Emitter Voltage | BC846xW | $V_{CEO}$ | 65 | V |
| | BC847xW | | 45 | |
| | BC848xW | | 30 | |
| Emitter-Base Voltage | BC846xW | $V_{EBO}$ | 6 | V |
| | BC847xW | | 6 | |
| | BC848xW | | 5 | |
| Collector Current-Continuous | | $I_C$ | 0.1 | A |
| Collector Power Dissipation | | $P_C$ | 150 | mW |
| Thermal Resistance From Junction to Ambient | | $R_{\theta JA}$ | 833 | °C/W |
| Junction Temperature | | $T_J$ | -55 to +150 | °C |
| Storage Temperature | | $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics ($T_A$=25°C unless otherwise specified)

| Parameter | | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | BC846xW | $V_{CBO}$ | $I_C$=10μA, $I_E$=0 | 80 | - | - | V |
| | BC847xW | | | 50 | | | |
| | BC848xW | | | 30 | | | |
| Collector-Emitter Breakdown Voltage | BC846xW | $V_{CEO}$ | $I_C$=10mA, $I_B$=0 | 65 | - | - | V |
| | BC847xW | | | 45 | | | |
| | BC848xW | | | 30 | | | |
| Emitter-Base Breakdown Voltage | BC846xW | $V_{EBO}$ | $I_E$=1μA, $I_C$=0 | 6 | - | - | V |
| | BC847xW | | | 6 | | | |
| | BC848xW | | | 5 | | | |
| Collector Cutoff Current | | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0 | - | - | 15 | nA |
| DC Current Gain | BC846AW, BC847AW, BC848AW | $h_{FE}$ | $V_{CE}$=5V, $I_C$=10μA | - | 90 | - | - |
| | BC846BW, BC847BW, BC848BW | | | - | 150 | - | |
| | BC847CW, BC848CW | | | - | 270 | - | |
| | BC846AW, BC847AW, BC848AW | | $V_{CE}$=5V, $I_C$=2mA | 110 | - | 220 | |
| | BC846BW, BC847BW, BC848BW | | | 200 | - | 450 | |
| | BC847CW, BC848CW | | | 420 | - | 800 | |
| Collector-Emitter Saturation Voltage | | $V_{CE(sat)}$ | $I_C$=10mA, $I_B$=0.5mA<br>$I_C$=100mA, $I_B$= 5mA | - | | 0.25<br>0.6 | V |
| Base-Emitter Saturation Voltage | | $V_{BE(sat)}$ | $I_C$=10mA, $I_B$=0.5mA<br>$I_C$=100mA, $I_B$=5mA | - | 0.7<br>0.9 | - | V |
| Base-Emitter Voltage | | $V_{BE(on)}$ | $V_{CE}$=5V, $I_C$=2mA<br>$V_{CE}$=5V, $I_C$=10mA | 580<br>- | 660<br>- | 700<br>770 | mV |
| Transition Frequency | | $f_T$ | $V_{CE}$=5V, $I_C$=10mA<br>F=100MHz | 100 | - | - | MHz |
| Collector Output Capacitance | | $C_{ob}$ | $V_{CB}$=10V, F=1MHz | - | - | 4.5 | pF |
| Noise Figure | BC846AW, BC847AW, BC848AW | $N_F$ | $V_{CE}$=5V, $I_c$=0.2mA | - | - | 10 | dB |
| | BC846BW, BC847BW, BC848BW | | F=1kHz, $R_S$=2kΩ | - | - | 10 | |
| | BC847BW, BC848BW | | BW=200Hz | - | - | 4 | |

## Typical Characteristic Curves

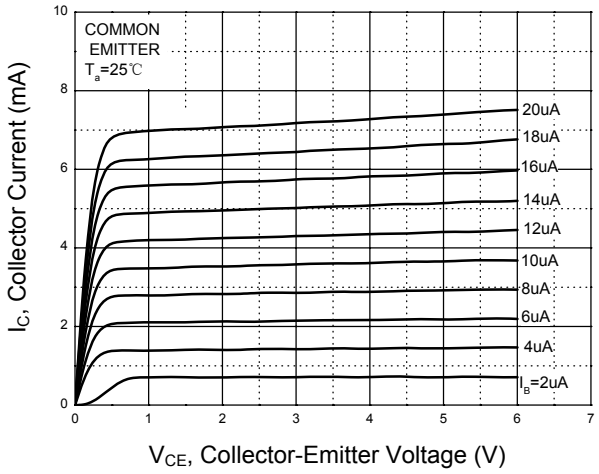



**Figure 1. Static Characteristic**

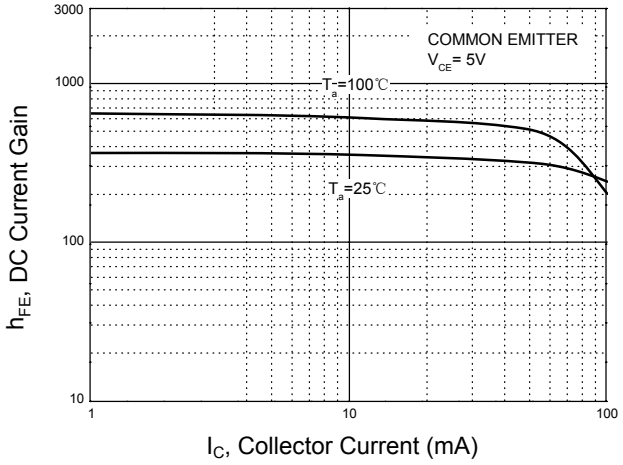



**Figure 2. $h_{FE}$ — $I_C$**

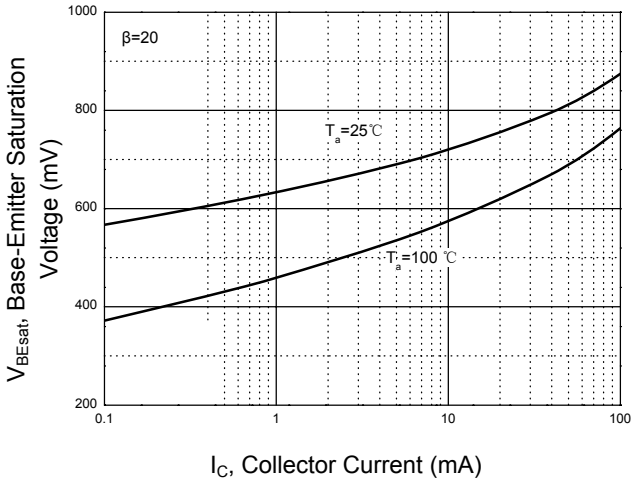



**Figure 3. $V_{BE(sat)}$ — $I_C$**

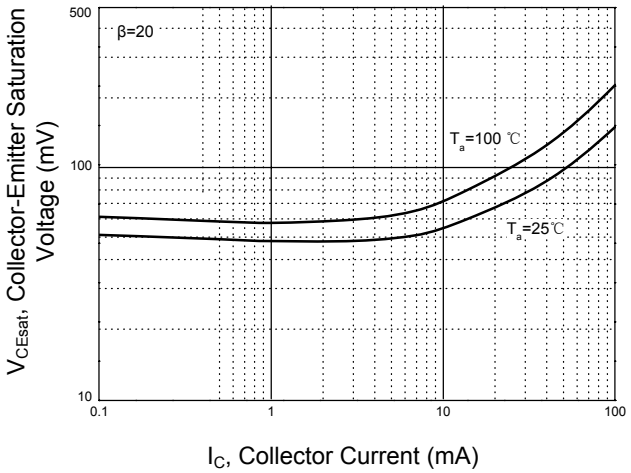



**Figure 4. $V_{CE(sat)}$ — $I_C$**

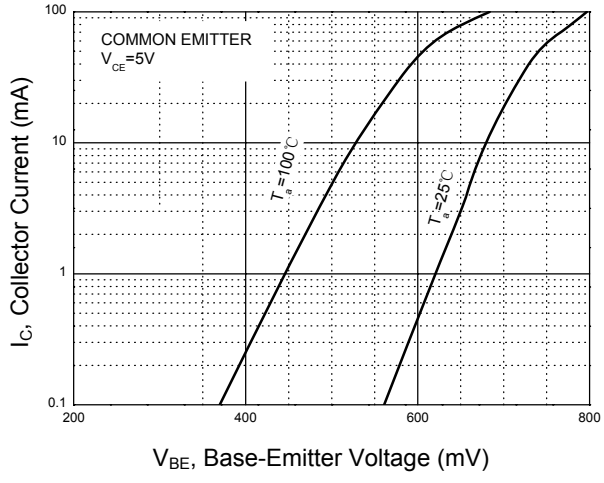



**Figure 5. $I_C$ — $V_{BE}$**

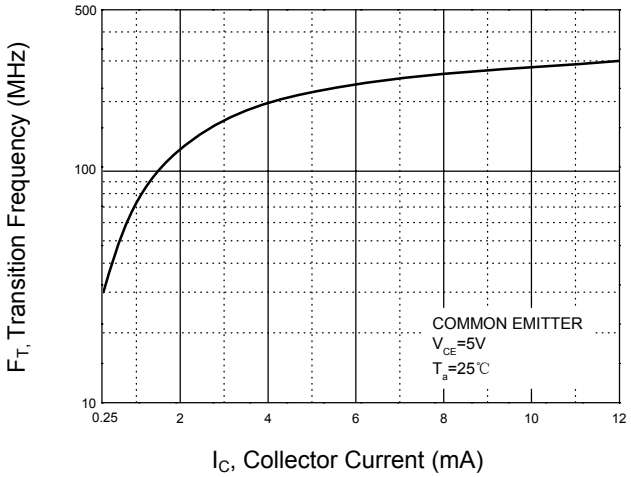



**Figure 6. $F_T$ — $I_C$**

## Typical Characteristic Curves

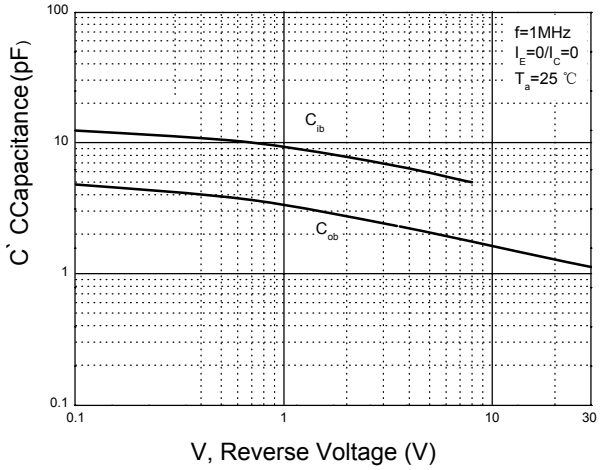



**Figure 7. $C_{ob}/C_{ib}$ — $V_{CB}/V_{EB}$**

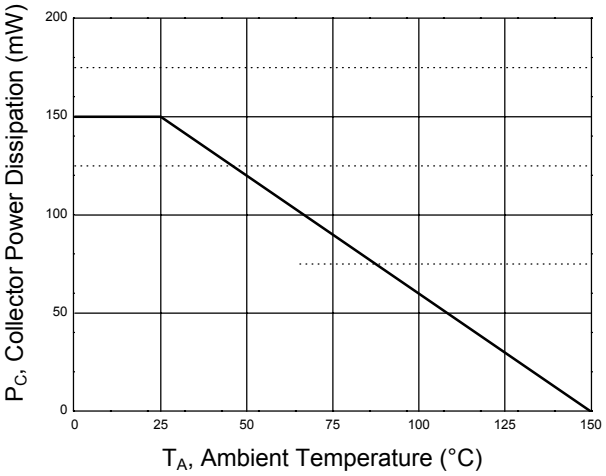
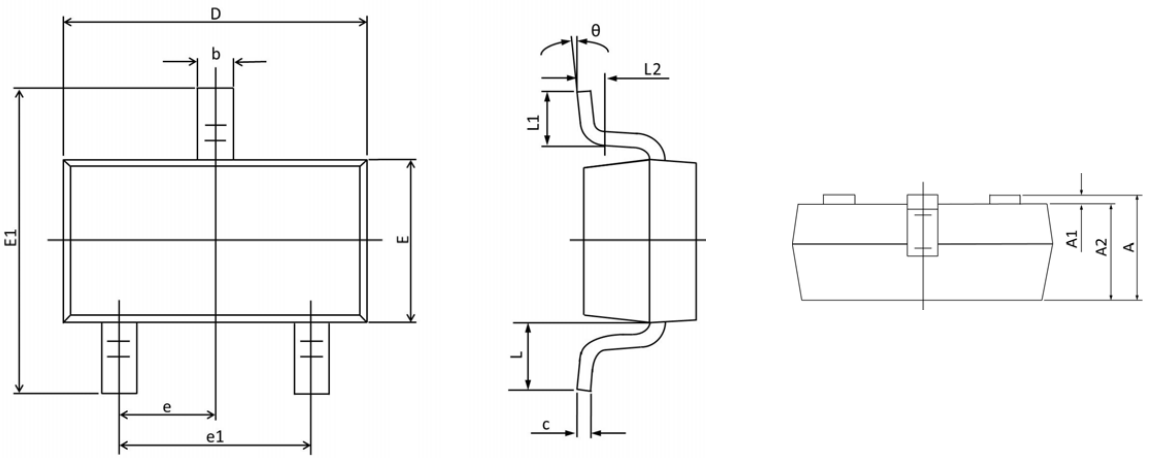


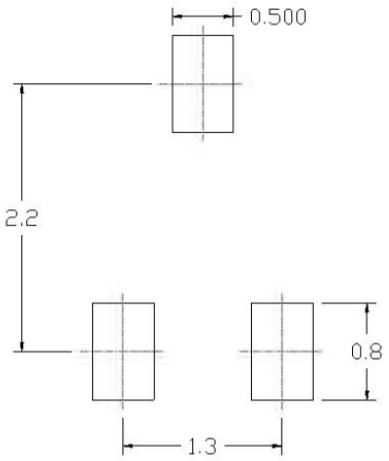

**Figure 8. $P_C$ — $T_A$**

## Package Outline Dimensions (SOT-323)




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.100 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.200 | 0.400 | 0.008 | 0.016 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.000 | 2.200 | 0.079 | 0.087 |
| E | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.650 TYP. | | 0.026 TYP. | |
| e1 | 1.200 | 1.400 | 0.047 | 0.055 |
| L | 0.525 REF. | | 0.021 REF. | |
| L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| L2 | 0.20 REF. | | 0.008 REF. | |
| θ | 0° | 8° | 0° | 8° |

## Recommended Pad Layout




Note:
1. Controlling dimension: in millimeters
2. General tolerance: ±0.05mm
3. The pad layout is for reference purposes only

## Order Information

| Device | Package | Marking | Packaging | SPQ |
|---|---|---|---|---|
| BC846AW | SOT-323 | 1A | Tape & Reel | 3,000pcs / 7" Reel |
| BC846BW | SOT-323 | 1B | Tape & Reel | 3,000pcs / 7" Reel |
| BC847AW | SOT-323 | 1E | Tape & Reel | 3,000pcs / 7" Reel |
| BC847BW | SOT-323 | 1F | Tape & Reel | 3,000pcs / 7" Reel |
| BC847CW | SOT-323 | 1G | Tape & Reel | 3,000pcs / 7" Reel |
| BC848AW | SOT-323 | 1J | Tape & Reel | 3,000pcs / 7" Reel |
| BC848BW | SOT-323 | 1K | Tape & Reel | 3,000pcs / 7" Reel |
| BC848CW | SOT-323 | 1L | Tape & Reel | 3,000pcs / 7" Reel |