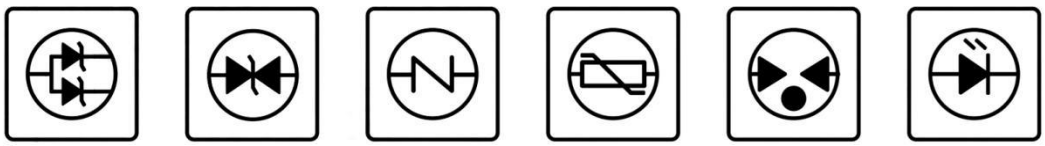
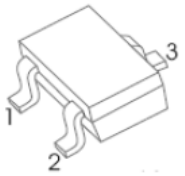
# MSKSEMI
SEMICONDUCTOR

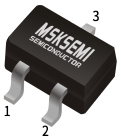



# Product data sheet

TRANSISTOR (NPN)

# BC846W/BC847W/BC848W




1. BASE
2. EMITTER
3. COLLECTOR

**SOT-323**

**FEATURES**

- Ideally suited for automatic insertion
- For Switching and AF Amplifier Applications

P/N MARK

| |
|---|
| **BC846AW=1A; BC846BW=1B;** |
| **BC847AW=1E; BC847BW=1F; BC847CW=1G;** |
| **BC848AW=1J; BC848BW=1K: BC848CW=1L** |

**MAXIMUM RATINGS ($T_a$=25℃ unless otherwise noted)**

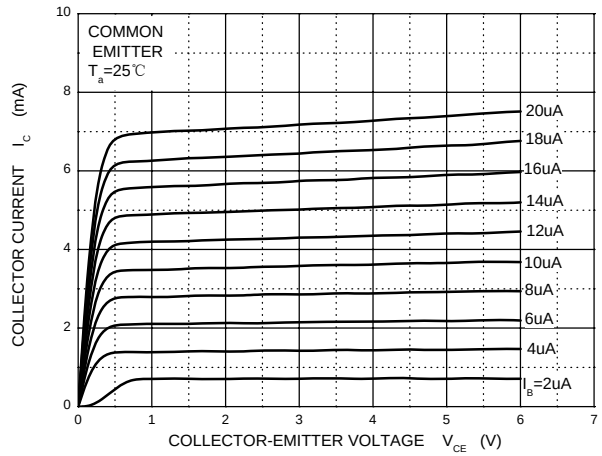
| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | BC846W | 80 | V |
| | | BC847W | 50 | |
| | | BC848W | 30 | |
| $V_{CEO}$ | Collector-Emitter Voltage | BC846W | 65 | V |
| | | BC847W | 45 | |
| | | BC848W | 30 | |
| $V_{EBO}$ | Emitter-Base Voltage | BC846W | 6 | V |
| | | BC847W | 6 | |
| | | BC848W | 5 | |
| $I_C$ | Collector Current –Continuous | | 0.1 | A |
| $P_C$ | Collector Power Dissipation | | 150 | mW |
| $R_{\Theta JA}$ | Thermal Resistance From Junction To Ambient | | 833 | ℃/W |
| $T_J$,$T_{stg}$ | Operation Junction and Storage Temperature Range | | -55-150 | ℃ |

## ELECTRICAL CHARACTERISTICS ($T_a$=25℃ unless otherwise specified)

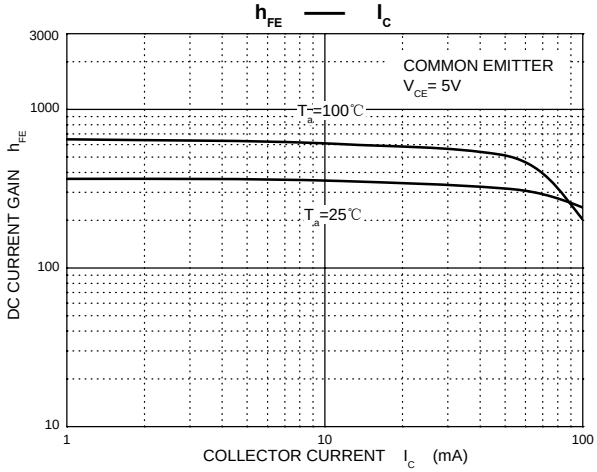
| Parameter | | Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | BC846W | $V_{CBO}$ | $I_C$= 10μA, $I_E$=0 | 80 | | | V |
| | BC847W | | | 50 | | | |
| | BC848W | | | 30 | | | |
| Collector-emitter breakdown voltage | BC846W | $V_{CEO}$ | $I_C$= 10mA, $I_B$=0 | 65 | | | V |
| | BC847W | | | 45 | | | |
| | BC848W | | | 30 | | | |
| Emitter-base breakdown voltage | BC846W | $V_{EBO}$ | $I_E$= 1 μA, $I_C$=0 | 6 | | | V |
| | BC847W | | | 6 | | | |
| | BC848W | | | 5 | | | |
| Collector Cutoff Current | | $I_{CBO}$ | $V_{CB}$=30V | | | 15 | nA |
| DC current gain | BC846AW,847AW,848AW | $h_{FE}$ | $V_{CE}$= 5V, $I_C$= 10μA | | 90 | | |
| | BC846BW,847BW,848BW | | | | 150 | | |
| | BC847CW,BC848CW | | | | 270 | | |
| | BC846AW,847AW,848AW | | $V_{CE}$= 5V, $I_C$= 2mA | 110 | | 220 | |
| | BC846BW,847BW,848BW | | | 200 | | 450 | |
| | BC847CW,BC848CW | | | 420 | | 800 | |
| Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_C$=10mA, $I_B$=0. 5mA | | | 0.25 | V |
| | | | $I_C$=100mA, $I_B$= 5mA | | | 0.6 | |
| Base-emitter saturation voltage | | $V_{BE(sat)}$ | $I_C$=10mA, $I_B$=0. 5mA | | 0.7 | | V |
| | | | $I_C$=100mA, $I_B$= 5mA | | 0.9 | | |
| Base-emitter voltage | | $V_{BE(on)}$ | $V_{CE}$= 5V, $I_C$= 2mA | 580 | 660 | 700 | mV |
| | | | $V_{CE}$= 5V, $I_C$= 10mA | | | 770 | |
| Transition frequency | | $f_T$ | $V_{CE}$= 5 V, $I_C$= 10mA f=100MHz | 100 | | | MHz |
| Collector output capacitance | | $C_{ob}$ | $V_{CB}$=10V,f=1MHz | | | 4.5 | pF |
| Noise figure | BC846AW,847AW,848AW | NF | $V_{CE}$=5V,$I_c$=0.2mA, f=1KHz,$R_S$=2KΩ BW=200Hz | | | 10 | dB |
| | BC846BW,847BW,848BW | | | | | 10 | |
| | BC847CW,BC848CW | | | | | 4 | |

# Typical Characteristics

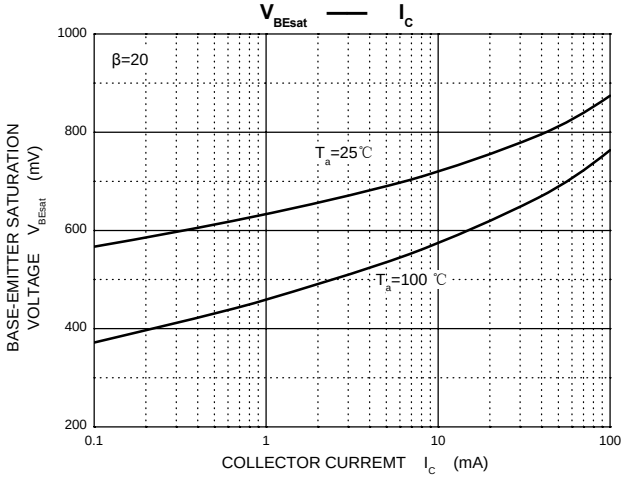
**Static Characteristic**



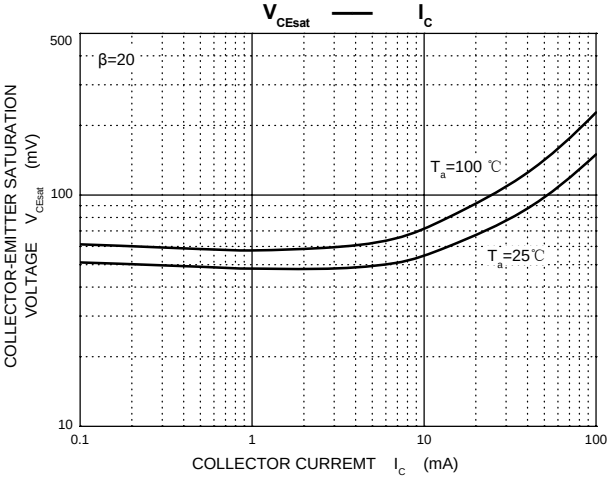

**$h_{FE}$ — $I_C$**



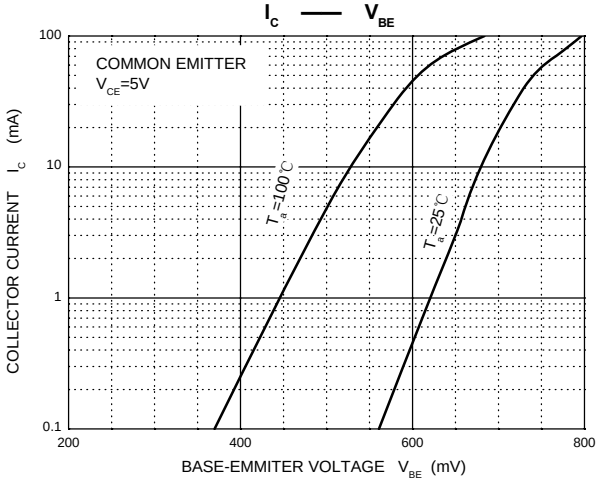

**$V_{BEsat}$ — $I_C$**



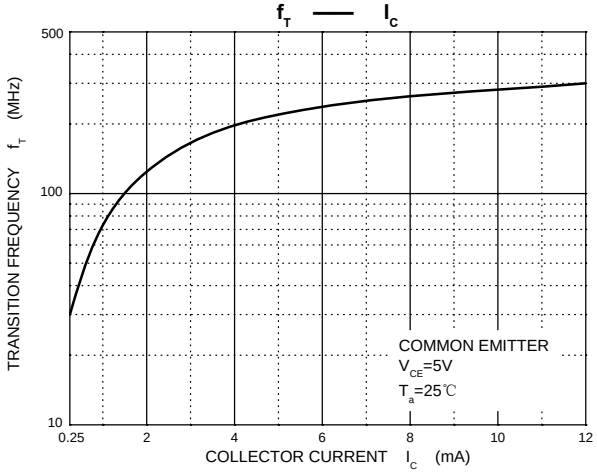

**$V_{CEsat}$ — $I_C$**



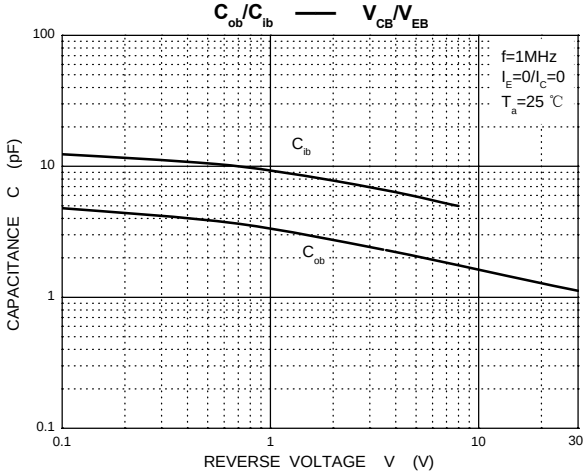

**$I_C$ — $V_{BE}$**



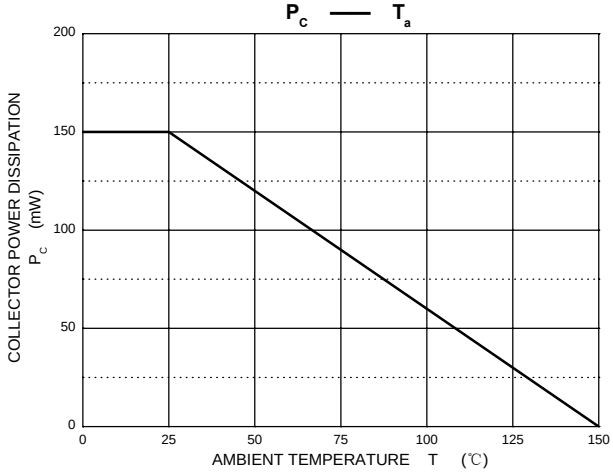

**$f_T$ — $I_C$**



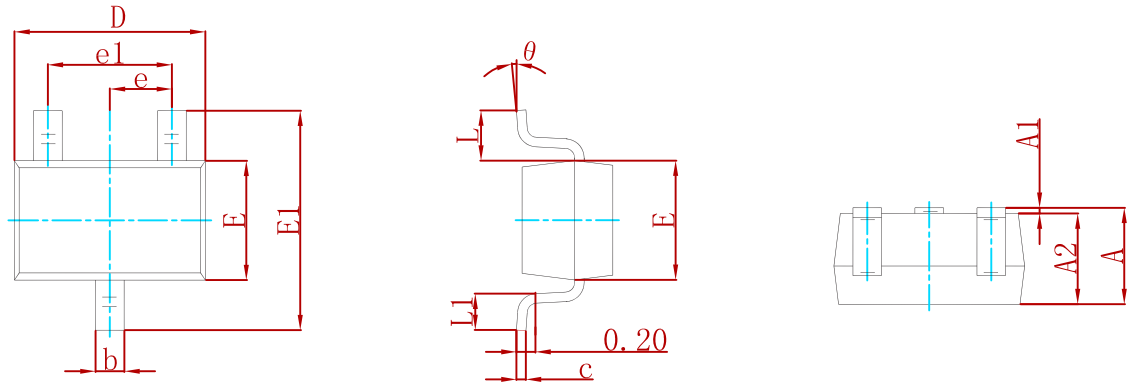

**$C_{ob}/C_{ib}$ — $V_{CB}/V_{EB}$**




**$P_C$ — $T_a$**

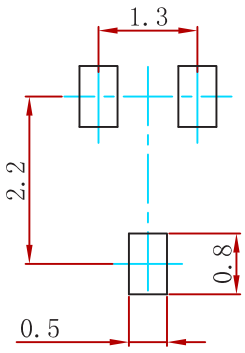


## PACKAGE MECHANICAL DATA




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.900 | 1.100 | 0.035 | 0.043 |
| 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 |
| θ | 0° | 8° | 0° | 8° |

## Suggested Pad Layout




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

## REEL SPECIFICATION

| P/N | PKG | QTY |
|---|---|---|
| BC846W/BC847W/BC848W | SOT-323 | 3000 |

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