



# BC846-AU,BC847-AU,BC848-AU,BC849-AU,BC850-AU SERIES

## NPN GENERAL PURPOSE TRANSISTORS

**VOLTAGE** 30/45/65 Volt **POWER** 330 mWatt

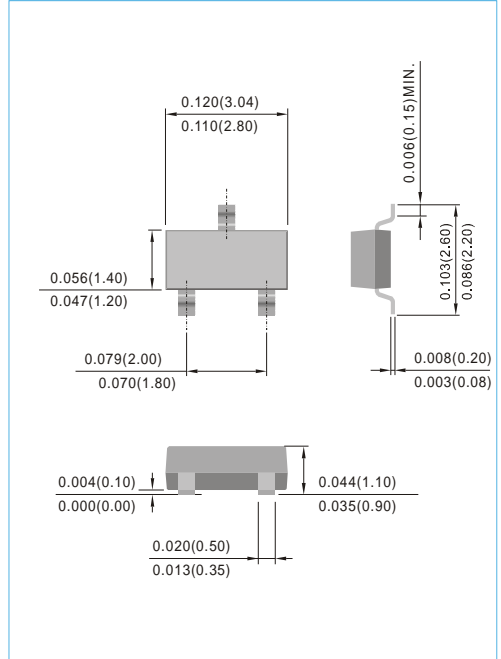
**SOT-23** Unit : inch(mm)

### FEATURES

- General purpose amplifier applications
- NPN epitaxial silicon, planar design
- Collector current IC = 100mA
- Acquire quality system certificate : TS16949
- AEC-Q101 qualified
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Green molding compound as per IEC61249 Std. . (Halogen Free)

### MECHANICAL DATA

- Case: SOT-23, Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.0003 ounces, 0.0084 grams



|                 |               |               |               |               |
|-----------------|---------------|---------------|---------------|---------------|
| Device Marking: |               |               |               |               |
| BC846A-AU=46A   | BC847A-AU=47A | BC848A-AU=48A |               |               |
| BC846B-AU=46B   | BC847B-AU=47B | BC848B-AU=48B | BC849B-AU=49B | BC850B-AU=50B |
|                 | BC847C-AU=47C | BC848C-AU=48C | BC849C-AU=49C | BC850C-AU=50C |

### ABSOLUTE RATINGS

| Parameter                      | Symbol   | Value          | Units |
|--------------------------------|--|----------------|-------|
| Collector - Emitter Voltage    | BC846-AU<br>BC847-AU,BC850-AU<br>BC848-AU,BC849-AU | 65<br>45<br>30 | V     |
| Collector - Base Voltage       | BC846-AU<br>BC847-AU,BC850-AU<br>BC848-AU,BC849-AU | 80<br>50<br>30 | V     |
| Emitter - Base Voltage         | BC846-AU<br>BC847-AU,BC850-AU<br>BC848-AU,BC849-AU | 6<br>6<br>5    | V     |
| Collector Current - Continuous | IC   | 100            | mA    |

### THERMAL CHARACTERISTICS

| Parameter  | Symbol  | Value      | Units |
|--|---------|------------|-------|
| Max Power Dissipation (Note 1)                               | PTOT    | 330        | mW    |
| Thermal Resistance , Junction to Ambient                     | RθJA    | 375        | °C/W  |
| Operating Junction Temperature and Storage Temperature Range | TJ,TSTG | -55 to 150 | °C    |

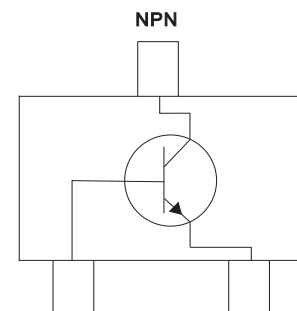
Note 1: Transistor mounted on FR-4 board 8 cm<sup>2</sup>.



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### ELECTRICAL CHARACTERISTICS

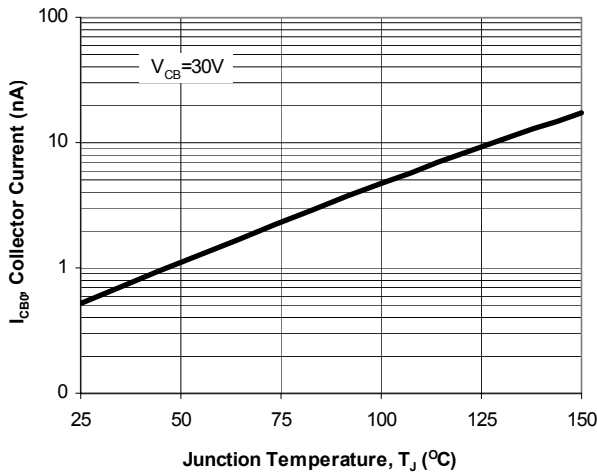
| Parameter                              | Symbol        | Test Condition  | MIN.              | TYP.              | MAX.              | Units         |
|--|---------------|---|-------------------|-------------------|-------------------|---------------|
| Collector - Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=10mA, I_B=0$   | 65<br>45<br>30    | -                 | -                 | V             |
| Collector - Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=10\mu A, I_E=0$  | 80<br>50<br>30    | -                 | -                 | V             |
| Emitter - Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=10\mu A, I_C=0$  | 6<br>6<br>5       | -                 | -                 | V             |
| Emitter-Base Cutoff Current            | $I_{EBO}$     | $V_{EB}=5$  | -                 | -                 | 100               | nA            |
| Collector-Base Cutoff Current          | $I_{CBO}$     | $V_{CB}=30V, I_E=0$<br>$V_{CB}=30V, I_E=0, T_J=150^\circ C$ | -                 | -                 | 15<br>5           | nA<br>$\mu A$ |
| DC Current Gain                        | $h_{FE}$      | $I_C=10\mu A, V_{CE}=5V$                                    | -                 | 90<br>150<br>270  | -                 | -             |
| DC Current Gain                        | $h_{FE}$      | $I_C=2mA, V_{CE}=5V$  | 110<br>200<br>420 | 180<br>290<br>520 | 220<br>450<br>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                 | $V_{BE(ON)}$  | $I_C=2mA, V_{CE}=5V$<br>$I_C=10mA, V_{CE}=5V$               | 0.58<br>-         | 0.66<br>-         | 0.70<br>0.77      | V             |
| Collector - Base Capacitance           | $C_{CBO}$     | $V_{CB}=10V, I_E=0, f=1MHz$                                 | -                 | -                 | 4.5               | pF            |



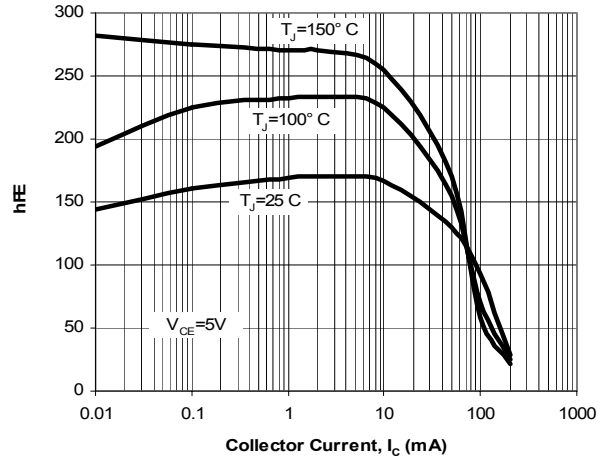


# BC846-AU, BC847-AU, BC848-AU, BC849-AU, BC850-AU SERIES

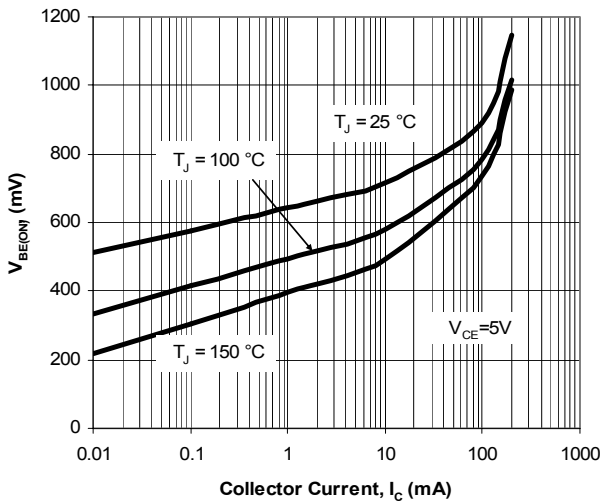
## ELECTRICAL CHARACTERISTICS CURVE (BC846A-AU, BC847A-AU, BC848A-AU)



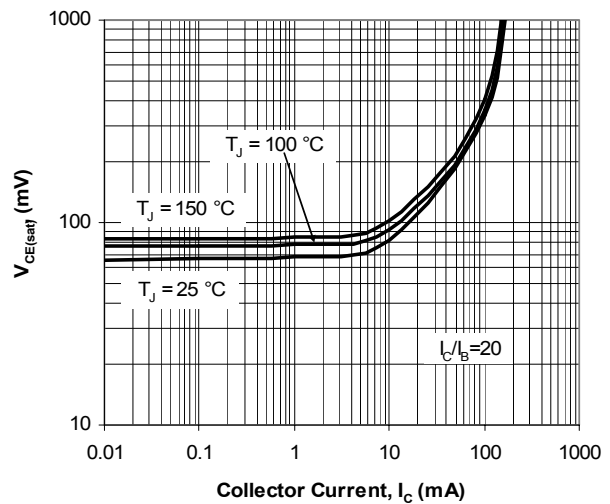
**Fig. 1. Typical  $I_{CB0}$  vs. Junction Temperature**



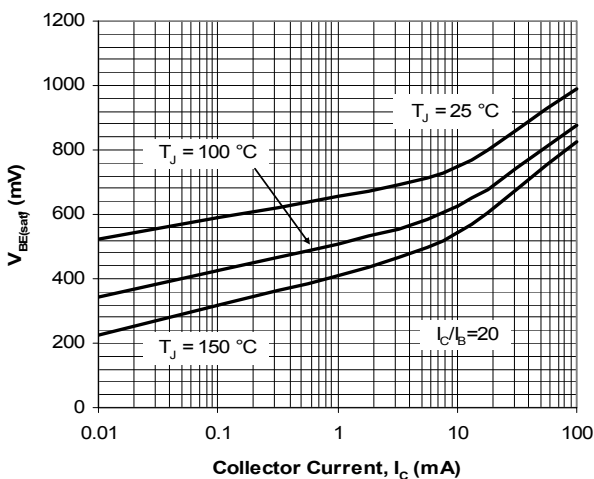
**Fig. 2. Typical  $h_{FE}$  vs. Collector Current**



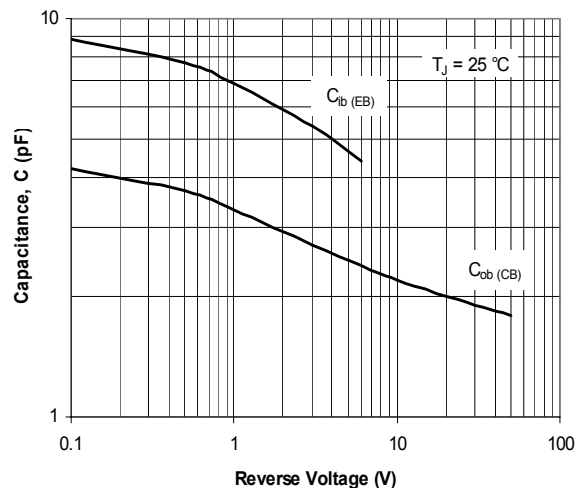
**Fig. 3. Typical  $V_{BE(ON)}$  vs. Collector Current**



**Fig. 4. Typical  $V_{CE(SAT)}$  vs. Collector Current**



**Fig. 5. Typical  $V_{BE(SAT)}$  vs. Collector Current**

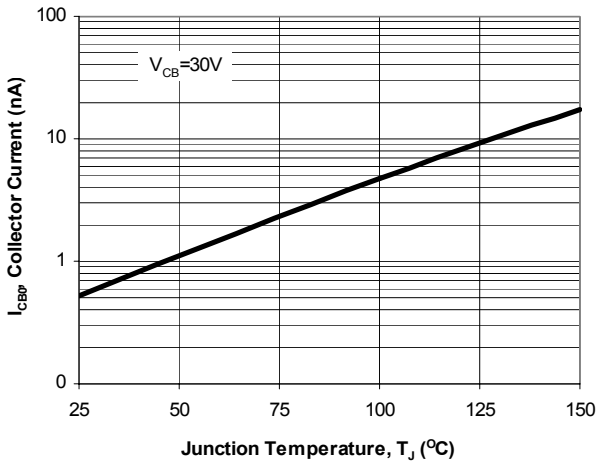


**Fig. 6. Typical Capacitances vs. Reverse Voltage**

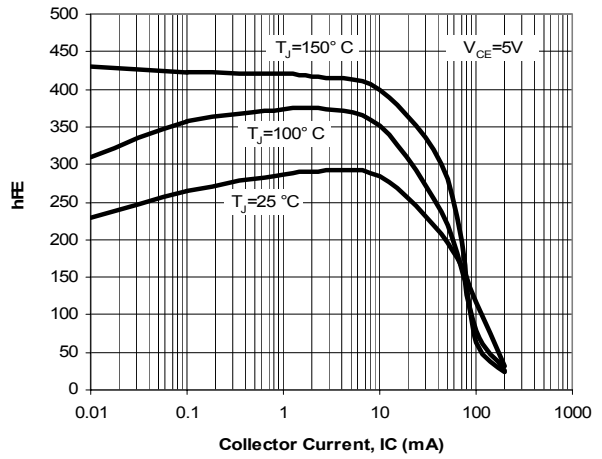


# BC846-AU, BC847-AU, BC848-AU, BC849-AU, BC850-AU SERIES

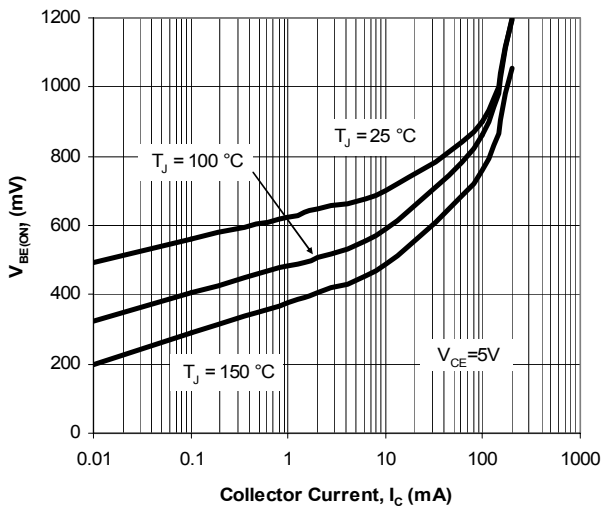
## ELECTRICAL CHARACTERISTICS CURVE (BC846B-AU, BC847B-AU, BC848B-AU, BC849B-AU, BC850B-AU)



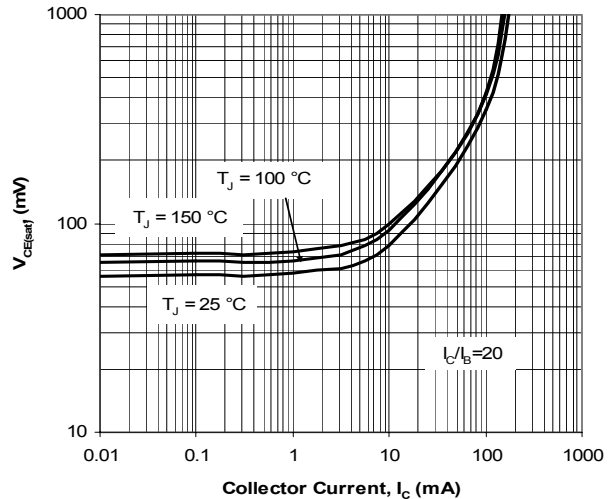
**Fig. 1. Typical  $I_{CBO}$  vs. Junction Temperature**



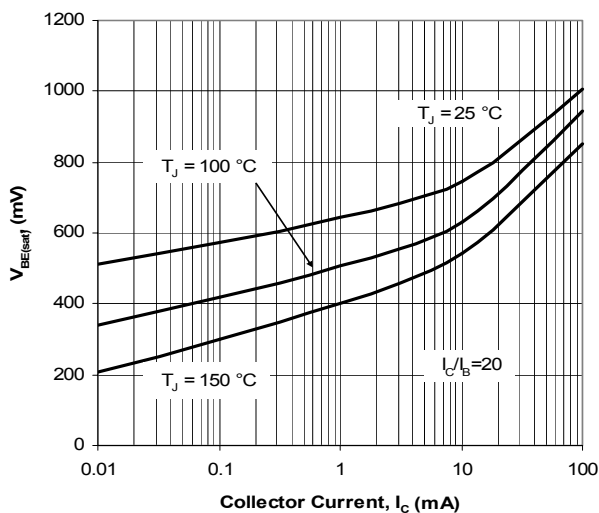
**Fig. 2. Typical  $h_{FE}$  vs. Collector Current**



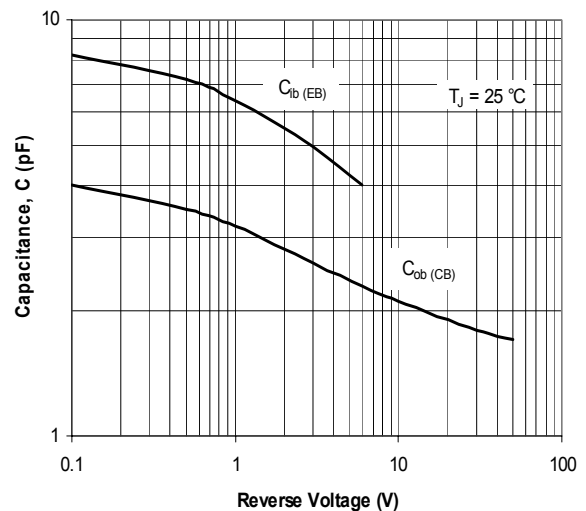
**Fig. 3. Typical  $V_{BE(ON)}$  vs. Collector Current**



**Fig. 4. Typical  $V_{CE(SAT)}$  vs. Collector Current**



**Fig. 5. Typical  $V_{BE(SAT)}$  vs. Collector Current**



**Fig. 6. Typical Capacitances vs. Reverse Voltage**



# BC846-AU, BC847-AU, BC848-AU, BC849-AU, BC850-AU SERIES

## ELECTRICAL CHARACTERISTICS CURVE (BC847C-AU, BC848C-AU, BC849C-AU, BC850C-AU)

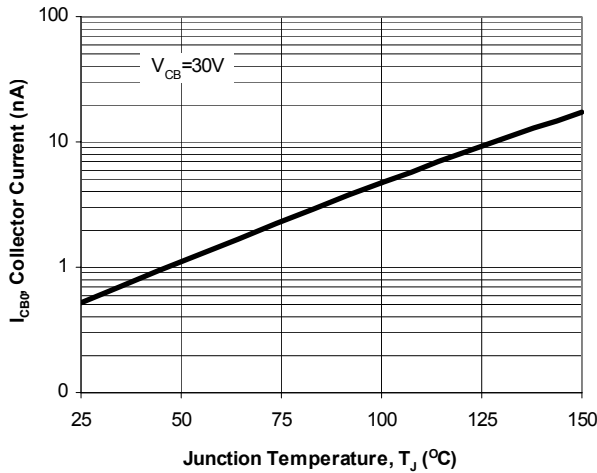


Fig. 1. Typical  $I_{CB0}$  vs. Junction Temperature

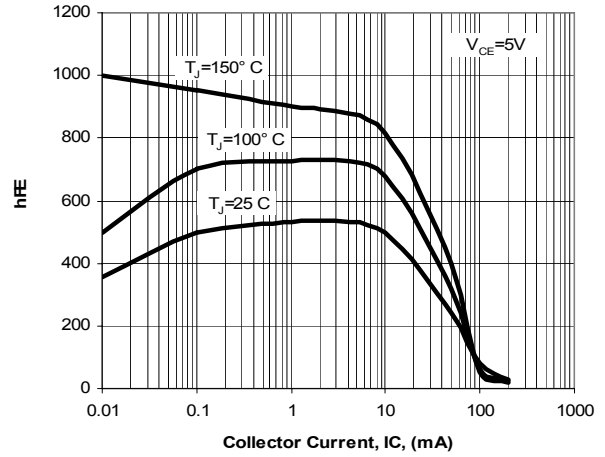


Fig. 2. Typical  $h_{FE}$  vs. Collector Current

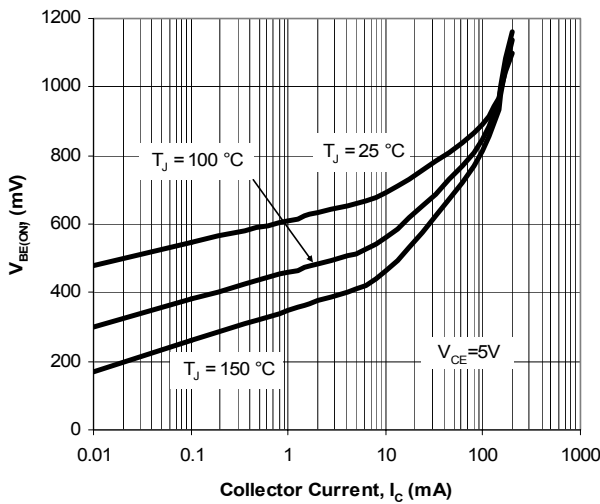


Fig. 3. Typical  $V_{BE(ON)}$  vs. Collector Current

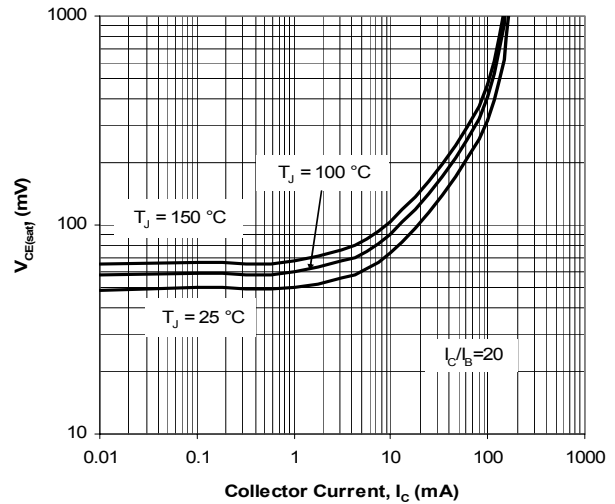


Fig. 4. Typical  $V_{CE(SAT)}$  vs. Collector Current

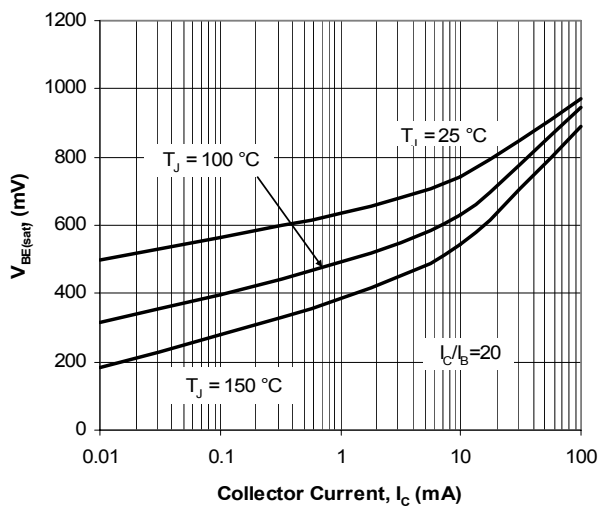


Fig. 5. Typical  $V_{BE(SAT)}$  vs. Collector Current

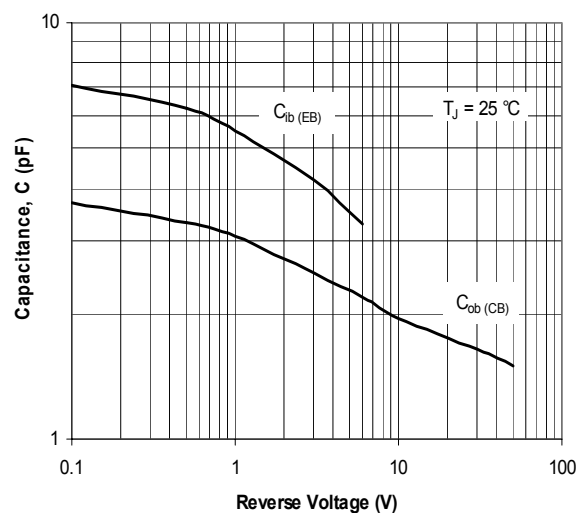


Fig. 6. Typical Capacitances vs. Reverse Voltage

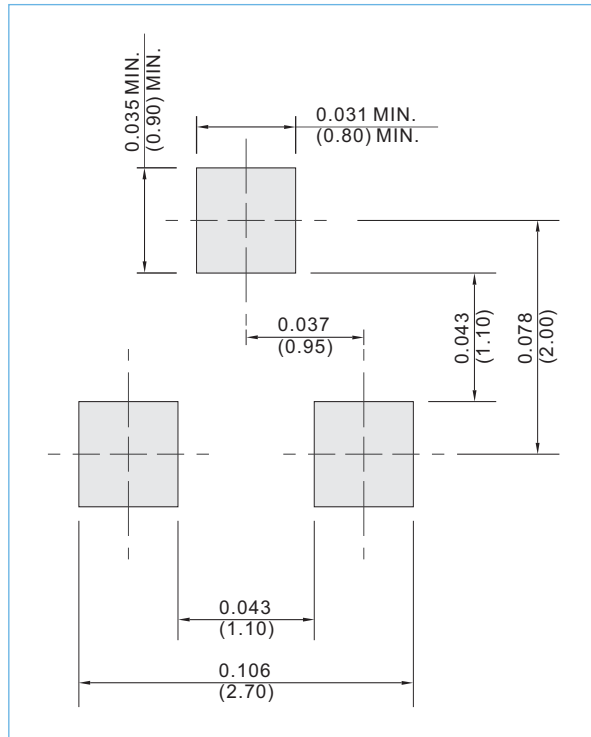


## BC846-AU,BC847-AU,BC848-AU,BC849-AU,BC850-AU SERIES

### MOUNTING PAD LAYOUT

SOT-23

Unit : inch(mm)



### ORDER INFORMATION

- Packing information
  - T/R - 12K per 13" plastic Reel
  - T/R - 3K per 7" plastic Reel



## BC846!5 I ,BC847!5 I ,BC848!5 I ,BC849!5 I ,BC850!5 I SERIES

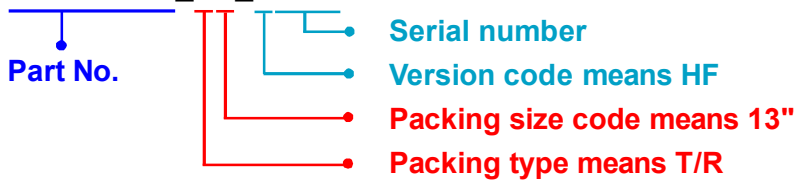
### Part No\_packing code\_Version

BC846-AU\_R1\_000A1

BC846-AU\_R2\_000A1

For example :

**RB500V-40\_R2\_00001**



| Packing Code <b>XX</b>               |                      |                                  |                      | Version Code <b>XXXXX</b> |                      |                                       |
|--------------------------------------|----------------------|----------------------------------|----------------------|---------------------------|----------------------|---------------------------------------|
| Packing type                         | 1 <sup>st</sup> Code | Packing size code                | 2 <sup>nd</sup> Code | HF or RoHS                | 1 <sup>st</sup> Code | 2 <sup>nd</sup> ~5 <sup>th</sup> Code |
| Tape and Ammunition Box (T/B)        | A                    | N/A                              | 0                    | HF                        | 0                    | serial number                         |
| Tape and Reel (T/R)                  | R                    | 7"                               | 1                    | RoHS                      | 1                    | serial number                         |
| Bulk Packing (B/P)                   | B                    | 13"                              | 2                    |                           |                      |                                       |
| Tube Packing (T/P)                   | T                    | 26mm                             | X                    |                           |                      |                                       |
| Tape and Reel (Right Oriented) (TRR) | S                    | 52mm                             | Y                    |                           |                      |                                       |
| Tape and Reel (Left Oriented) (TRL)  | L                    | PANASERT T/B CATHODE UP (PBCU)   | U                    |                           |                      |                                       |
| FORMING                              | F                    | PANASERT T/B CATHODE DOWN (PBCD) | D                    |                           |                      |                                       |



## BC846!5 I ,BC847!5 I ,BC848!5 I ,BC849!5 I ,BC850!5 I SERIES

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