



# BC847BS-AU

## NPN GENERAL PURPOSE DUAL TRANSISTOR

**VOLTAGE** 45 Volt **POWER** 150 mWatt

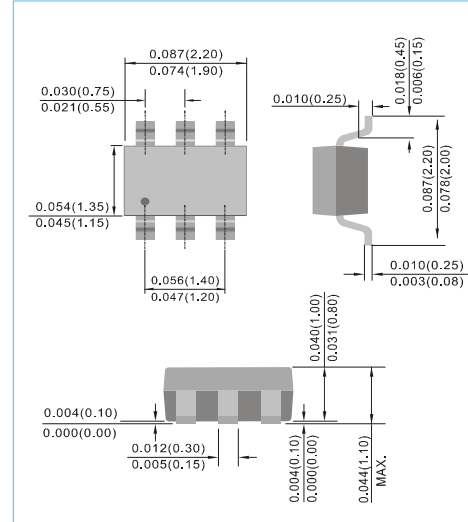
**SOT-363** Unit : inch(mm)

### FEATURES

- General purpose amplifier applications
- NPN epitaxial silicon, planar design
- 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-363, Plastic
- Terminals : Solderable per MIL-STD-750, Method 2026
- Approx. Weight : 0.0002 ounces, 0.006 grams
- Marking : 47S



### ABSOLUTE MAXIMUM RATINGS

| Parameter                      | Symbol    | Value | Units |
|--------------------------------|-----------|-------|-------|
| Collector - Emitter Voltage    | $V_{CE0}$ | 45    | V     |
| Collector - Base Voltage       | $V_{CBO}$ | 50    | V     |
| Emitter - Base Voltage         | $V_{EBO}$ | 6     | V     |
| Collector Current - Continuous | $I_c$     | 100   | mA    |

### THERMAL CHARACTERISTICS

| Parameter  | Symbol          | Value           | Units             |
|--|-----------------|-----------------|-------------------|
| Total Device Dissipation<br>Per Device FR-5 Board (Note 1) $T_A=25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$           | 300<br>150<br>3 | mW<br>mW<br>mW/°C |
| Thermal Resistance , Junction to Ambient (Note 2)  | $R_{\theta JA}$ | 550             | °C/W              |
| Junction Temperature   | $T_J$           | -55 to 150      | °C                |
| Storage Temperature  | $T_{STG}$       | -55 to 150      | °C                |

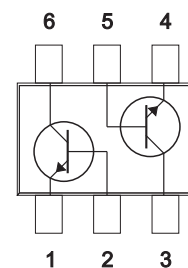
Note : 1.FR-5 board 1 x 0.75 x 0.062 in.  
2.Mounted on a FR4 PCB, single-sided copper, mini pad.



## BC847BS-AU

### ELECTRICAL CHARACTERISTICS ( $T_j=25^\circ\text{C}$ , unless otherwise noted)

| Parameter                              | Symbol        | Test Condition   | Min.       | Typ.     | Max.        | Unit                |
|--|---------------|--|------------|----------|-------------|---------------------|
| <b>OFF CHARACTERISTICS</b>             |               |  |            |          |             |                     |
| Collector - Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=10\text{mA}$  | 45         | -        | -           | V                   |
| Collector - Emitter Breakdown Voltage  | $V_{(BR)CES}$ | $I_C=10\mu\text{A}, V_{EB}=0$  | 50         | -        | -           | V                   |
| Collector - Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=10\mu\text{A}$  | 50         | -        | -           | V                   |
| Emitter - Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=1\mu\text{A}$   | 6          | -        | -           | V                   |
| Collector Cutoff Current               | $I_{CBO}$     | $V_{CB}=30\text{V},$<br>$V_{CB}=30\text{V}, T_A=150^\circ\text{C}$   | -          | -        | 15<br>5     | nA<br>$\mu\text{A}$ |
| <b>ON CHARACTERISTICS</b>              |               |  |            |          |             |                     |
| DC Current Gain                        | $h_{FE}$      | $I_C=2\text{mA}, V_{CE}=5\text{V}$   | 200        | -        | 450         | -                   |
| Collector - Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C=10\text{mA}, I_B=0.5\text{mA}$<br>$I_C=100\text{mA}, I_B=5\text{mA}$                                      | -          | -        | 0.25<br>0.6 | V                   |
| Base - Emitter Saturation Voltage      | $V_{BE(SAT)}$ | $I_C=10\text{mA}, I_B=0.5\text{mA}$<br>$I_C=100\text{mA}, I_B=5\text{mA}$                                      | 0.6<br>0.8 | -        | 0.9<br>1    | V                   |
| Base - Emitter Voltage                 | $V_{BE(ON)}$  | $I_C=2\text{mA}, V_{CE}=5\text{V}$<br>$I_C=10\text{mA}, V_{CE}=5\text{V}$                                      | 580<br>-   | 660<br>- | 700<br>770  | mV                  |
| <b>SMALL-SIGNAL CHARACTERISTICS</b>    |               |  |            |          |             |                     |
| Current-Gain-Bandwidth Product         | $f_T$         | $I_C=10\text{mA}, V_{CE}=5\text{Vdc}, f=100\text{MHz}$   | 100        | -        | -           | $\text{MHz}$        |
| Output Capacitance                     | $C_{obo}$     | $V_{CB}=10\text{V}, f=1\text{MHz}$   | -          | -        | 4.5         | pF                  |
| Noise Figure                           | NF            | $I_C=0.2\text{mA}, V_{CE}=5\text{Vdc},$<br>$R_s=2\text{k}\Omega, f=1.0\text{kHz},$<br>$\text{BW}=200\text{Hz}$ | -          | -        | 10          | dB                  |



**Fig.54**



# BC847BS-AU

## ELECTRICAL CHARACTERISTICS CURVE

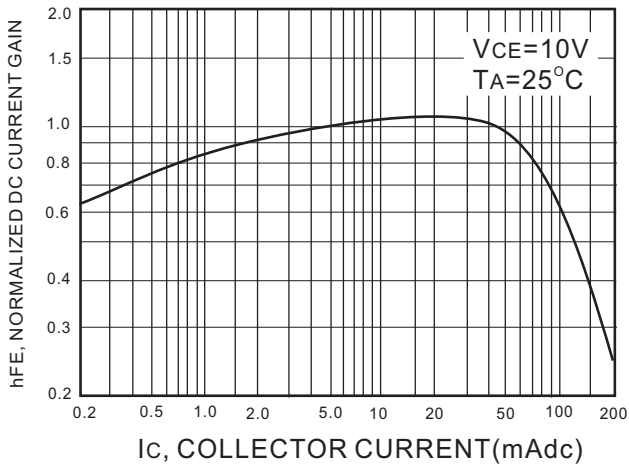


Figure 1. Normalized DC Current Gain

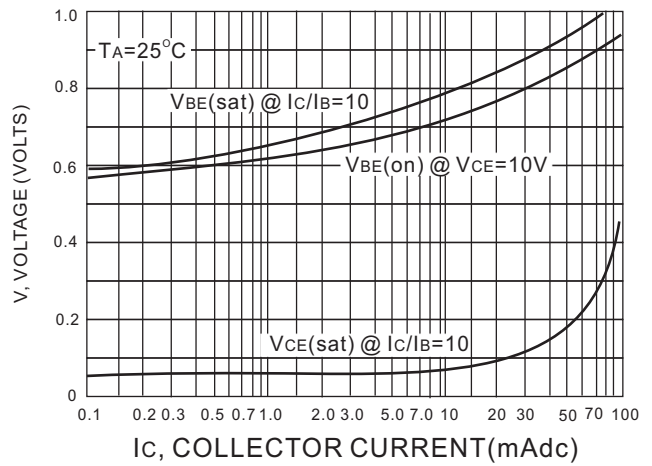


Figure 2. "Saturation" and "On" Voltages

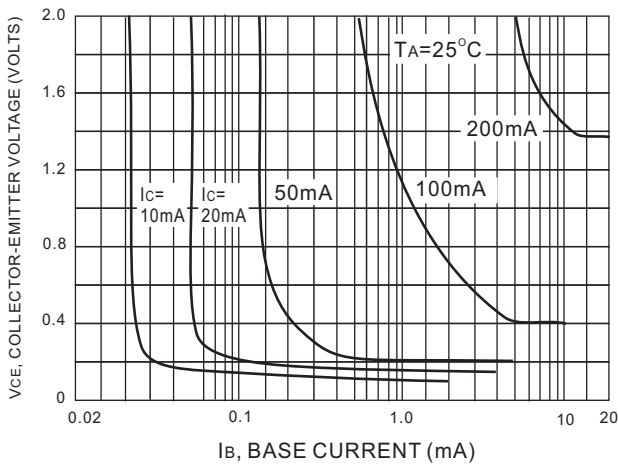


Figure 3. Collector Saturation Region

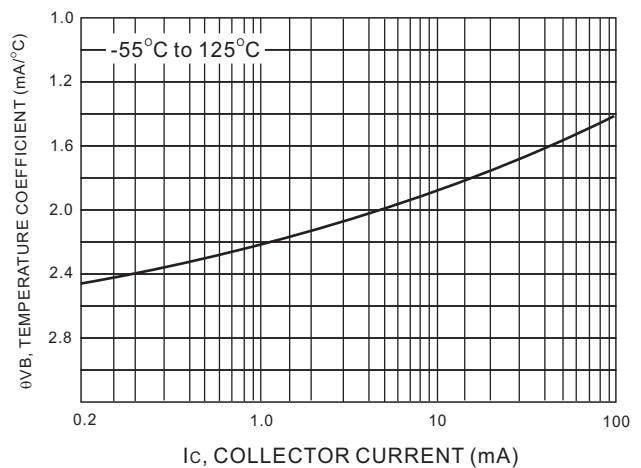


Figure 4. Base-Emitter Temperature Coefficient

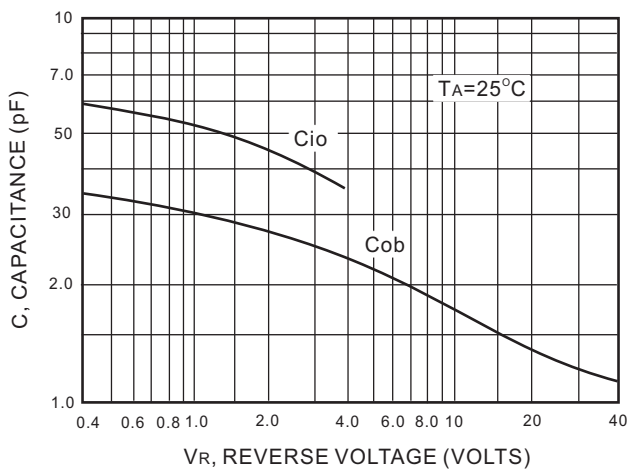


Figure 5. Capacitance

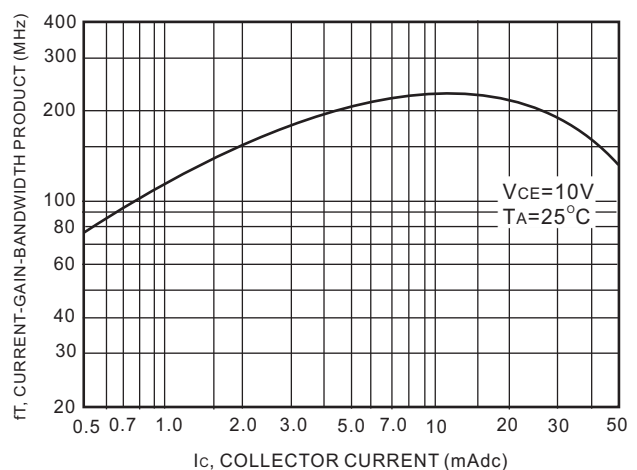


Figure 6. Current-Gain-Bandwidth Product



# BC847BS-AU

## ELECTRICAL CHARACTERISTICS CURVE

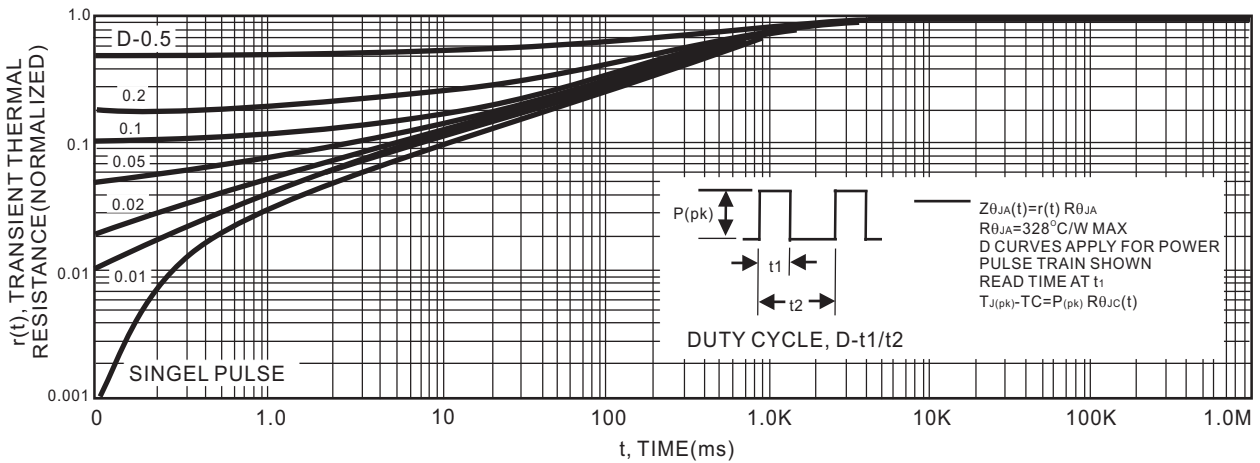


Figure 7. Thermal Response

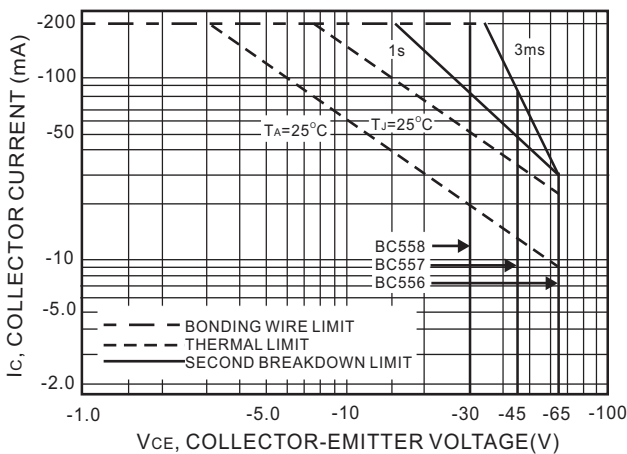


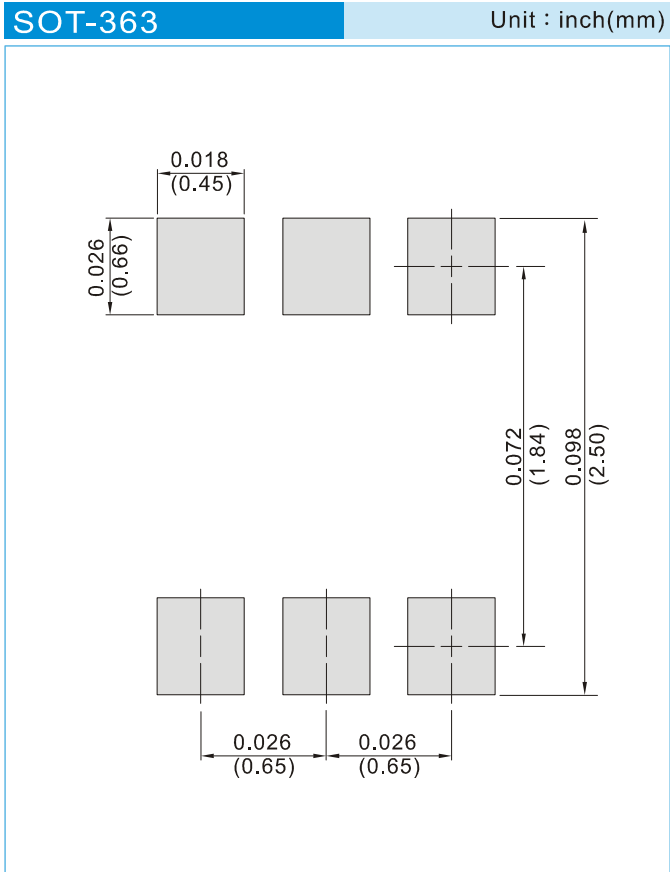
Figure 8. Active Region Safe Operating Area

The safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve. The data of Figure 26 is based upon  $T_{j(pk)} = 150^{\circ}\text{C}$ ;  $T_C$  or  $T_A$  is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided  $T_{j(pk)} < 150^{\circ}\text{C}$ .  $T_{j(pk)}$  may be calculated from the data in Figure 25. At high case or ambient temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by the secondary break-down.



# BC847BS-AU

## MOUNTING PAD LAYOUT



## ORDER INFORMATION

- Packing information  
T/R - 10K per 13" plastic Reel  
T/R - 3K per 7" plastic Reel



## BC847BS-AU

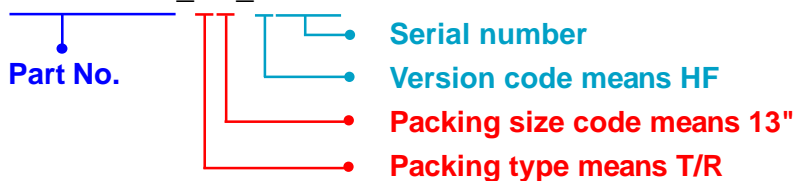
### Part No\_packing code\_Version

BC847BS-AU\_R1\_000A1

BC847BS-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)        | <b>A</b>             | N/A                              | <b>0</b>             | <b>HF</b>                 | <b>0</b>             | serial number                         |
| Tape and Reel (T/R)                  | <b>R</b>             | 7"                               | <b>1</b>             | <b>RoHS</b>               | <b>1</b>             | serial number                         |
| Bulk Packing (B/P)                   | <b>B</b>             | 13"                              | <b>2</b>             |                           |                      |                                       |
| Tube Packing (T/P)                   | <b>T</b>             | 26mm                             | <b>X</b>             |                           |                      |                                       |
| Tape and Reel (Right Oriented) (TRR) | <b>S</b>             | 52mm                             | <b>Y</b>             |                           |                      |                                       |
| Tape and Reel (Left Oriented) (TRL)  | <b>L</b>             | PANASERT T/B CATHODE UP (PBCU)   | <b>U</b>             |                           |                      |                                       |
| FORMING                              | <b>F</b>             | PANASERT T/B CATHODE DOWN (PBCD) | <b>D</b>             |                           |                      |                                       |



## BC847BS-AU

---

### Disclaimer

- Reproducing and modifying information of the document is prohibited without permission from Panjit International Inc..
- Panjit International Inc. reserves the rights to make changes of the content herein the document anytime without notification. Please refer to our website for the latest document.
- Panjit International Inc. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Panjit International Inc. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Panjit International Inc. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Panjit International Inc. for any damages resulting from such improper use or sale.
- Since Panjit uses lot number as the tracking base, please provide the lot number for tracking when complaining.