



BC847BS

NPN GENERAL PURPOSE DUAL TRANSIS-

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|----------------|-----------------|--------------|-------------------|
| VOLTAGE | 45 Volts | POWER | 150 mWatts |
|----------------|-----------------|--------------|-------------------|

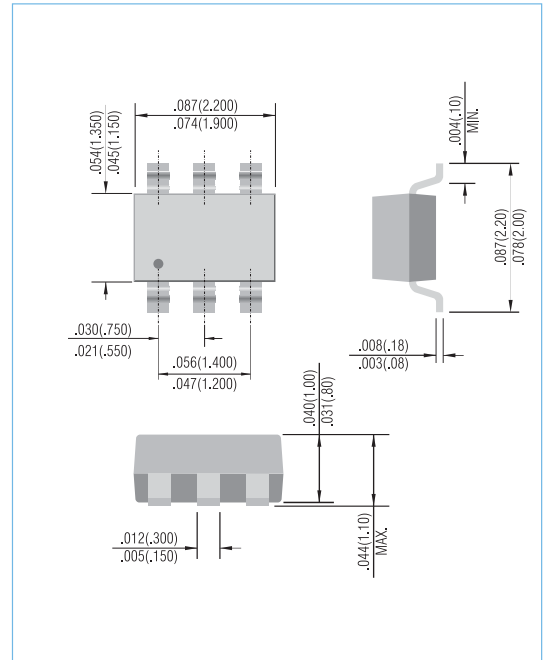
| | |
|----------------|-------------------|
| SOT-363 | Unit: inch (mm) |
|----------------|-------------------|

FEATURES

- General purpose amplifier applications
- PNP epitaxial silicon, planar design
- In compliance with EU RoHS 2002/95/EC directives

MECHANICAL DATA

- Case: SOT-363, Plastic
- Terminals: Solderable per MIL-STD-750, Method 2026
- Approx. Weight: 0.008 gram
- Marking : 47S



ABSOLUTE MAXIMUM RATINGS

| PARAMETER | Symbol | Value | Units |
|--------------------------------|-----------|-------|-------|
| Collector - Emitter Voltage | V_{CE0} | 45 | V |
| Collector - Base Voltage | V_{CB0} | 50 | V |
| Emitter - Base Voltage | V_{EB0} | 6.0 | V |
| Collector Current - Continuous | I_C | 100 | mA |

THERMAL CHARACTERISTICS

| PARAMETER | Symbol | Value | Units |
|--|-----------------|-------------------|--------------------------------|
| Total Device Dissipation Per Device FR-5 Board (Note 1) $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 300 150 3.0 | mW mW/ $^\circ\text{C}$ |
| Thermal Resistance , Junction to Ambient | $R_{\theta JA}$ | 328 | $^\circ\text{C/W}$ |
| Junction Temperature | T_J | -55 to 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{STG} | -55 to 150 | $^\circ\text{C}$ |

Note 1: FR-5 board 1.0 x 0.75 x 0.062 in.



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

| PARAMETER | Symbol | Test Condition | MIN. | TYP. | MAX. | Unit |
|--|---------------|---|------------|----------|-------------|----------|
| OFF CHARACTERISTICS | | | | | | |
| 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 | $V_{(BR)EBO}$ | $I_E=10\mu\text{A}$ | 6.0 | - | - | V |
| Collector Cutoff Current | I_{CBO} | $V_{CB}=30\text{V},$ $V_{CB}=30\text{V}, T_A=150^{\circ}\text{C}$ | - | - | 15 5.0 | nA uA |
| ON CHARACTERISTICS | | | | | | |
| DC Current Gain | h_{FE} | $I_C=2.0\text{mA}, V_{CE}=5\text{V}$ | 200 | - | 450 | - |
| Collector - Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C=10\text{mA}, I_B=0.5\text{mA}$ $I_C=100\text{mA}, I_B=5.0\text{mA}$ | - | - | 0.25 0.6 | V |
| Base - Emitter Saturation Voltage | $V_{BE(SAT)}$ | $I_C=10\text{mA}, I_B=0.5\text{mA}$ $I_C=100\text{mA}, I_B=5.0\text{mA}$ | 0.6 0.8 | - | 0.9 1.0 | V |
| Base - Emitter Voltage | $V_{CE(ON)}$ | $I_C=2\text{mA}, V_{CE}=5.0\text{V}$ $I_C=10\text{mA}, V_{CE}=5.0\text{V}$ | 580 - | 660 - | 700 770 | mV |
| SMALL-SIGNAL CHARACTERISTICS | | | | | | |
| Current-Gain-Bandwidth Product | f_T | $I_C=10\text{mA}, V_{CE}=5.0\text{Vdc}, f=100\text{MHz}$ | 100 | - | - | MHz |
| Output Capacitance | C_{obo} | $V_{CB}=10\text{V}, f=1.0\text{MHz}$ | - | - | 4.5 | pF |
| Noise Figure | NF | $I_C=0.2\text{mA}, V_{CE}=5.0\text{Vdc},$ $R_S=2.0\text{k}\Omega, f=1.0\text{kHz},$ $BW=200\text{Hz}$ | - | - | 10 | dB |

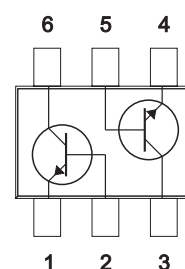


Fig.54



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ELECTRICAL CHARACTERISTICS CURVE

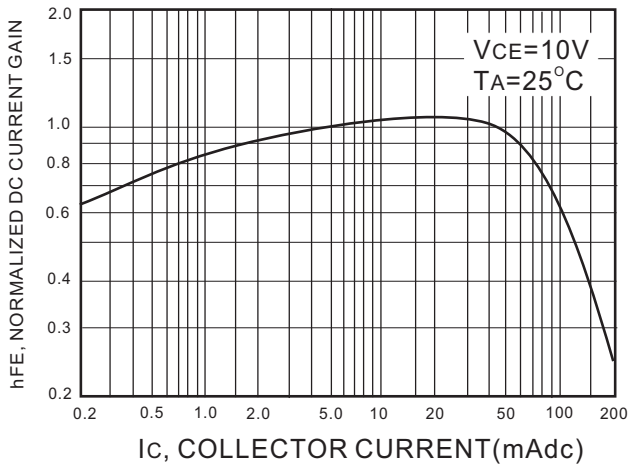


Figure 1. Normalized DC Current Gain

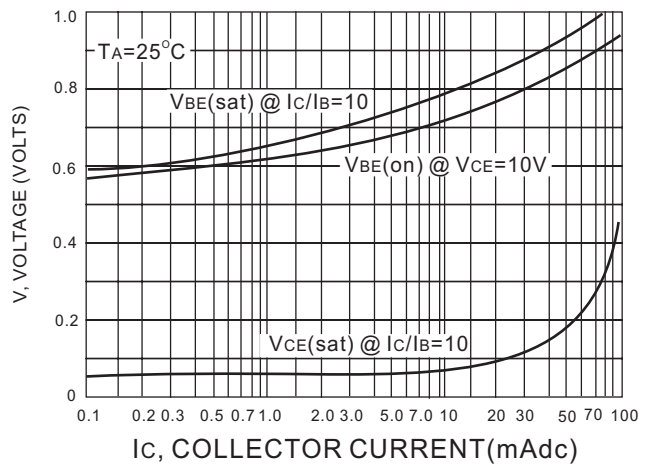


Figure 2. "Saturation" and "On" Voltages

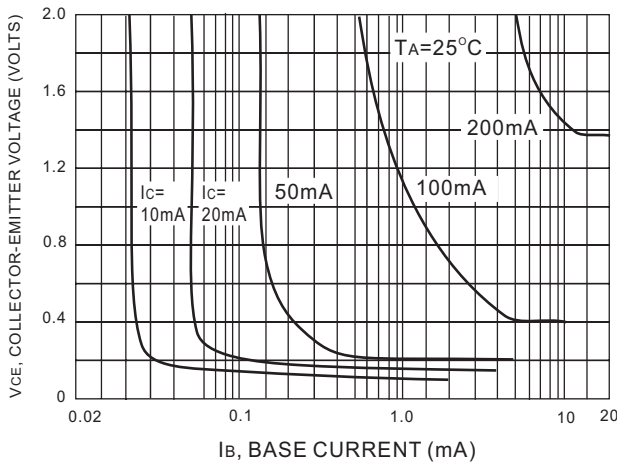


Figure 3. Collector Saturation Region

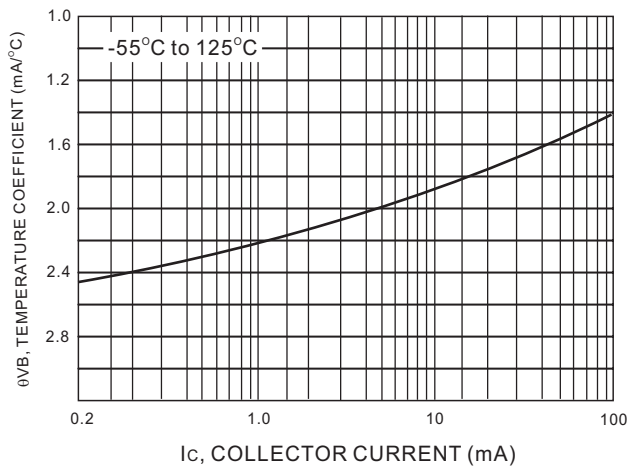


Figure 4. Base-Emitter Temperature Coefficient

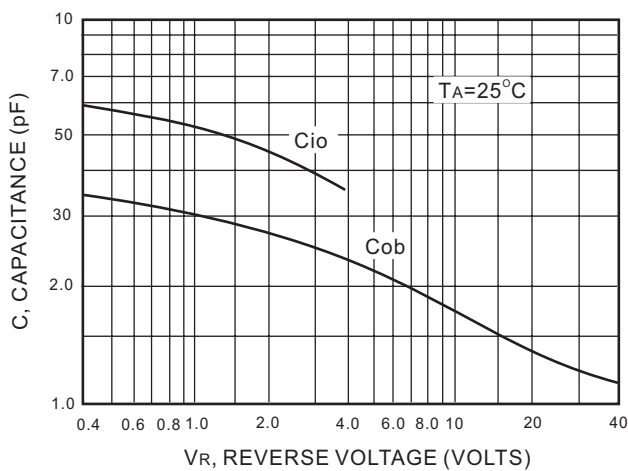


Figure 5. Capacitance

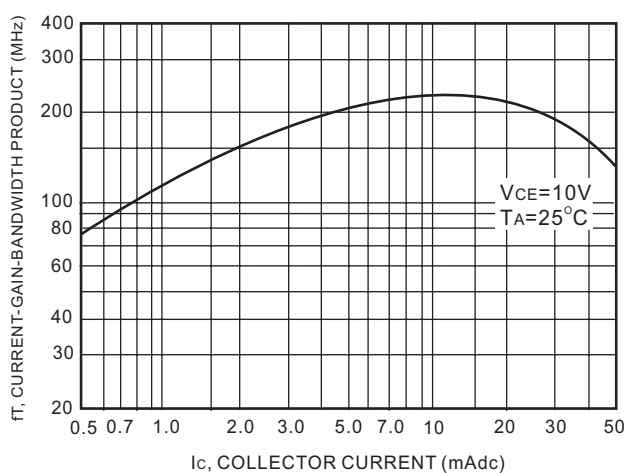


Figure 6. Current-Gain-Bandwidth Product



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ELECTRICAL CHARACTERISTICS CURVE

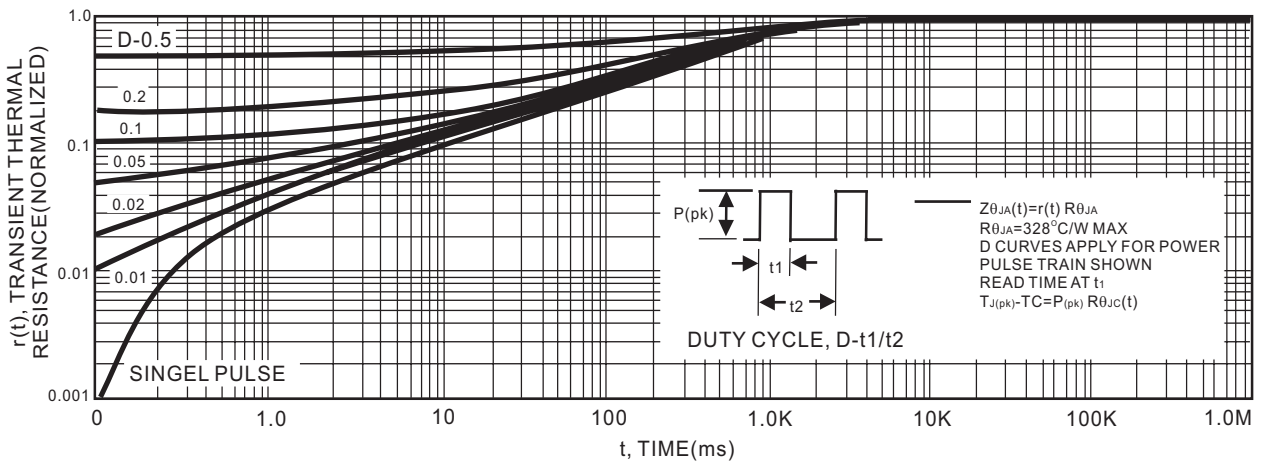


Figure 7. Thermal Response

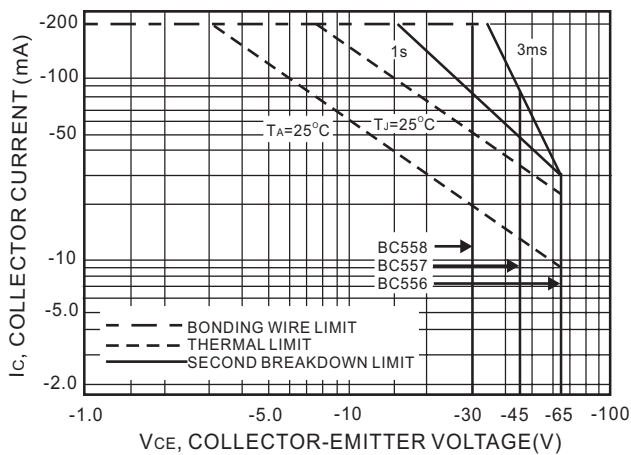


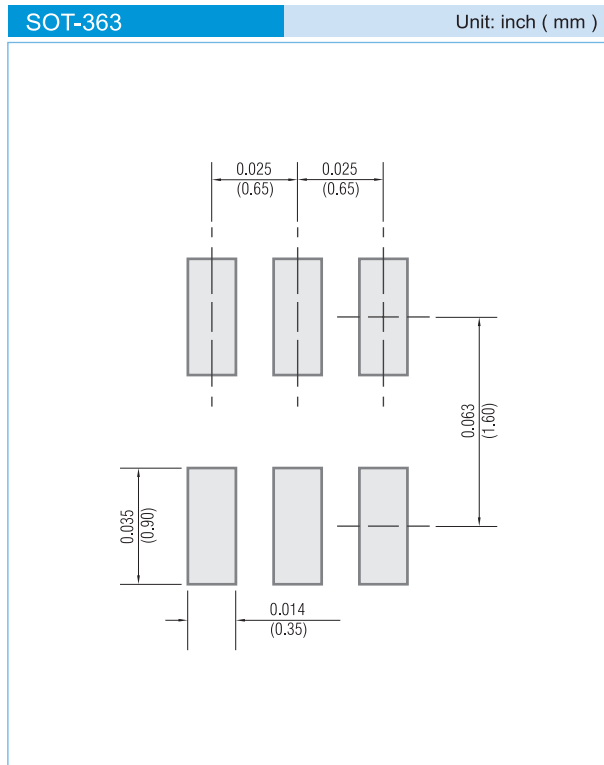
Figure 8. Active Region Safe Operating Area

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 $T_j(pk)=150^\circ C$; T_c or T_a is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_j(pk) < 150^\circ C$. $T_j(pk)$ 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.



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MOUNTING PAD LAYOUT



ORDER INFORMATION

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

LEGAL STATEMENT

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