



# BC847BS-AU

## NPN GENERAL PURPOSE DUAL TRANSISTOR

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

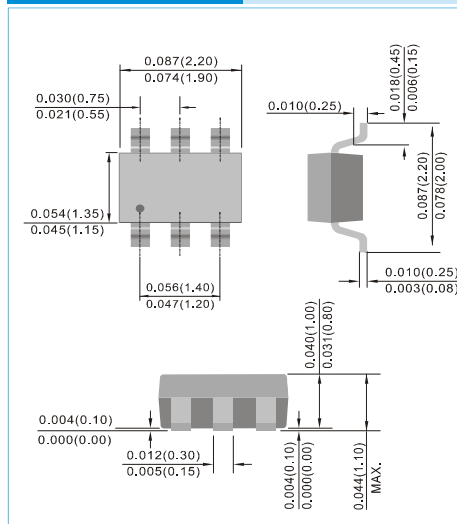
**SOT-363** Unit : inch(mm)

### 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 Per Device FR-5 Board (Note 1) $T_A=25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300 150 3	mW mW 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

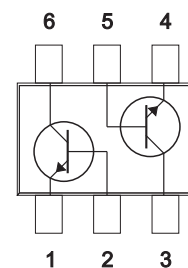
Note : 1.FR-5 board 1 x 0.75 x 0.062 in.  
2.Mounted on a FR4 PCB, single-sided copper, mini pad.



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### 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	$I_{CBO}$	$V_{CB}=30\text{V},$ $V_{CB}=30\text{V}, T_A=150^\circ\text{C}$	-	-	15 5	nA $\mu\text{A}$
<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	$V_{CE(SAT)}$	$I_C=10\text{mA}, I_B=0.5\text{mA}$ $I_C=100\text{mA}, I_B=5\text{mA}$	-	-	0.25 0.6	V
Base - Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=10\text{mA}, I_B=0.5\text{mA}$ $I_C=100\text{mA}, I_B=5\text{mA}$	0.6 0.8	-	0.9 1	V
Base - Emitter Voltage	$V_{BE(ON)}$	$I_C=2\text{mA}, V_{CE}=5\text{V}$ $I_C=10\text{mA}, V_{CE}=5\text{V}$	580 -	660 -	700 770	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	$I_C=0.2\text{mA}, V_{CE}=5\text{Vdc},$ $R_s=2\text{k}\Omega, f=1.0\text{kHz},$ $\text{BW}=200\text{Hz}$	-	-	10	dB



**Fig.54**



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## ELECTRICAL CHARACTERISTICS CURVE

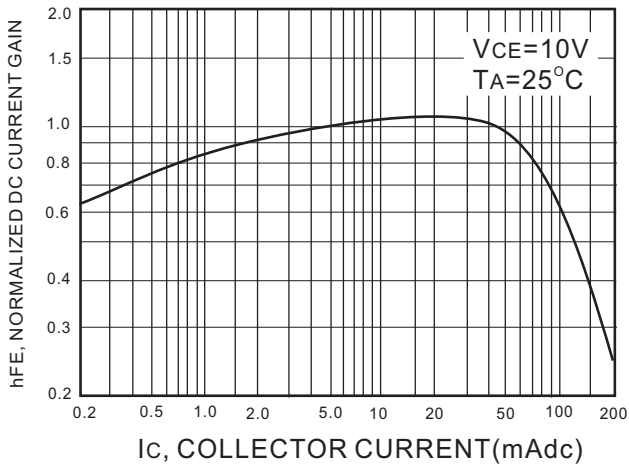


Figure 1. Normalized DC Current Gain

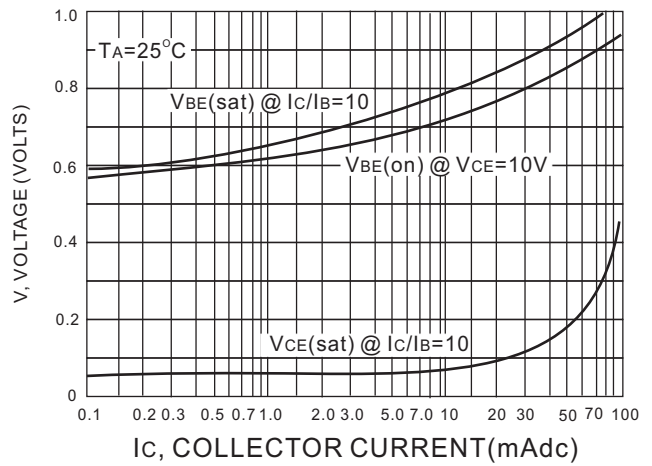


Figure 2. "Saturation" and "On" Voltages

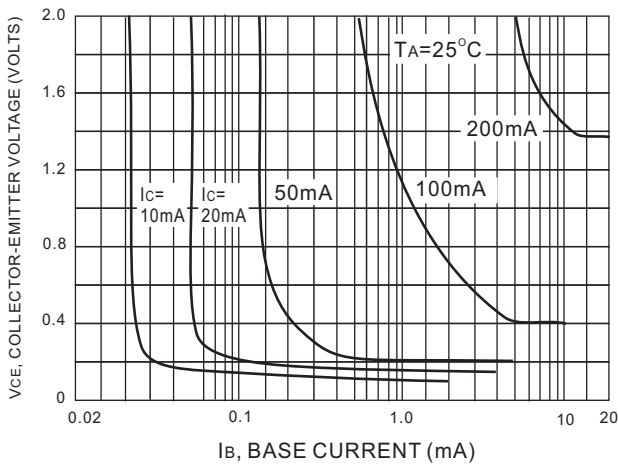


Figure 3. Collector Saturation Region

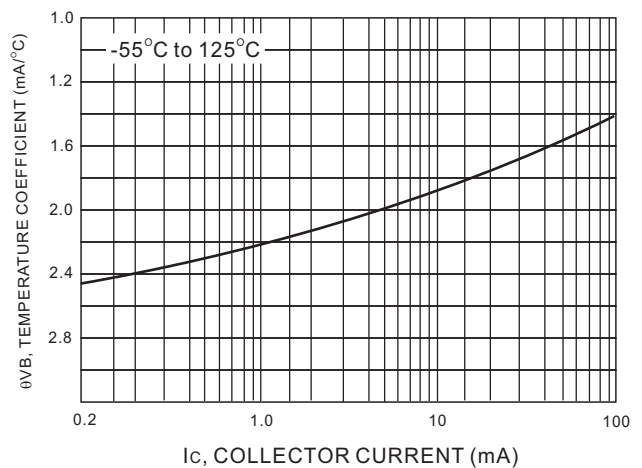


Figure 4. Base-Emitter Temperature Coefficient

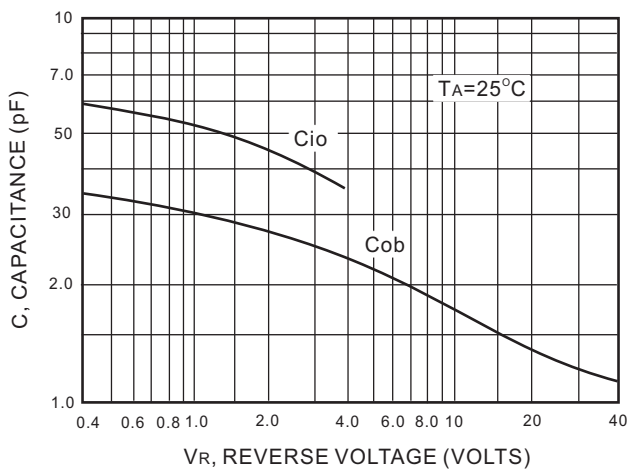


Figure 5. Capacitance

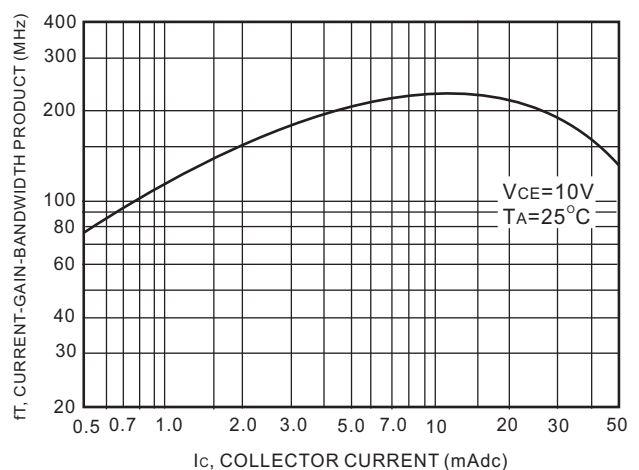


Figure 6. Current-Gain-Bandwidth Product



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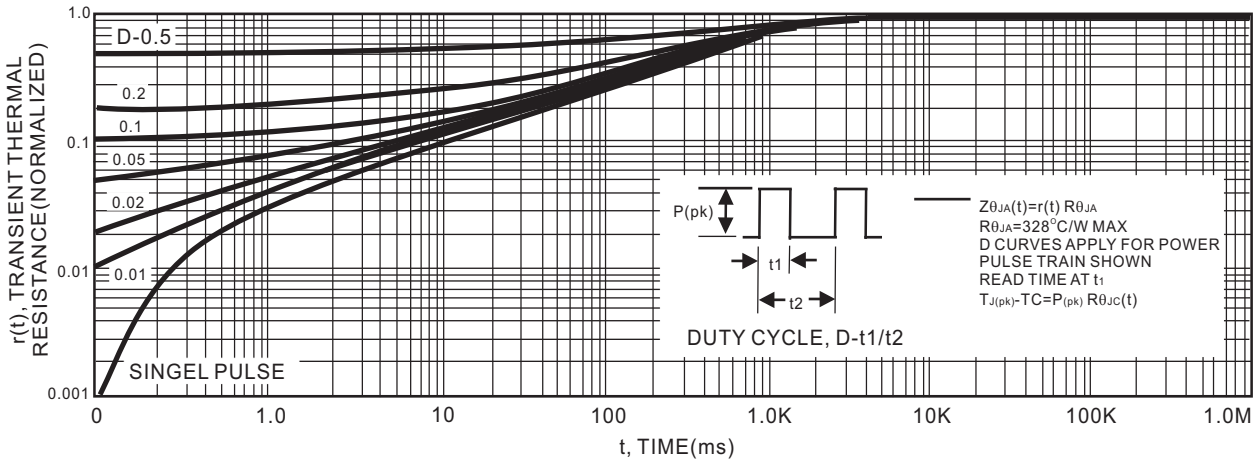


Figure 7. Thermal Response

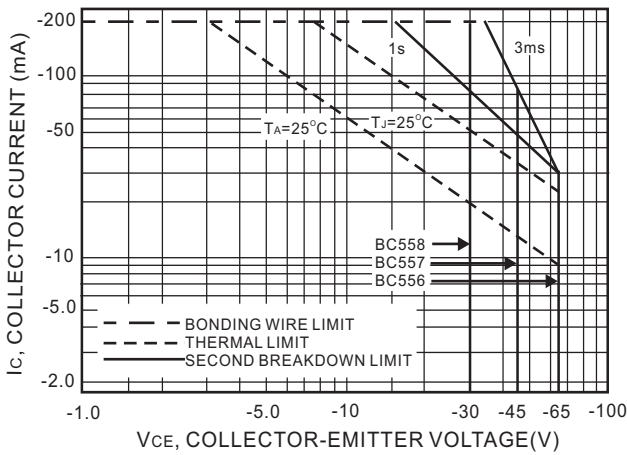


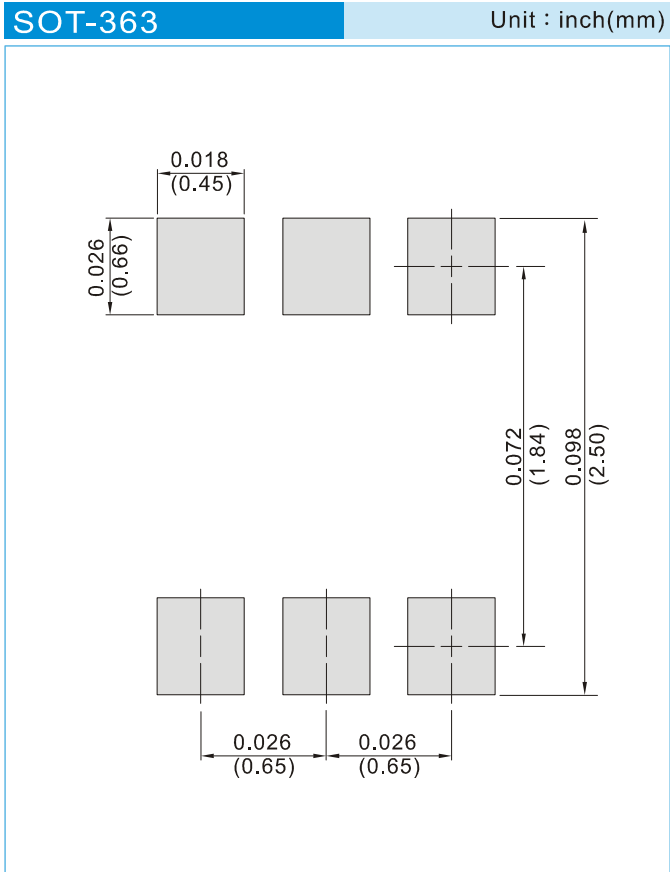
Figure 8. Active Region Safe Operating Area

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.



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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



## 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)	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			



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