

RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

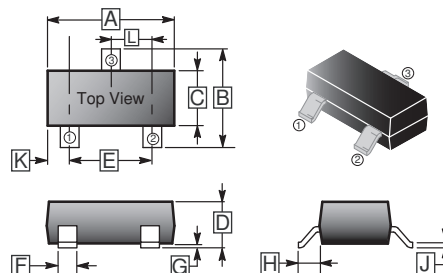
FEATURES

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

CLASSIFICATION OF h_{FE}

Product-Rank	BC846AS	BC846BS	-
	BC847AS	BC847BS	BC847CS
	BC848AS	BC848BS	BC848CS
Range	110~220	200~450	420~800

SOT-23



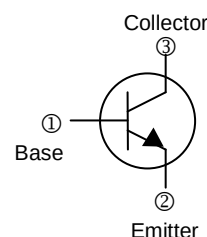
MARKING

Product-Rank	BC846AS	BC846BS	-
Marking	1A	1B	-
Product-Rank	BC847AS	BC847BS	BC847CS
Marking	1E	1F	1G
Product-Rank	BC848AS	BC848BS	BC848CS
Marking	1J	1K	1L

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.80	3.04	G	0.09	0.18
B	2.10	2.55	H	0.45	0.60
C	1.20	1.40	J	0.08	0.177
D	0.89	1.15	K	0.6	REF.
E	1.78	2.04	L	0.89	1.02
F	0.30	0.50			

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7' inch



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER		SYMBOL	RATINGS	UNIT
Collector to Base Voltage	BC846	V_{CBO}	80	V
	BC847		50	
	BC848		30	
Collector to Emitter Voltage	BC846	V_{CEO}	65	V
	BC847		45	
	BC848		30	
Emitter to Base Voltage	BC846	V_{EBO}	6	V
	BC847		6	
	BC848		5	
Collector Current - Continuous		I_C	0.1	A
Total Device Dissipation	FR-5 Board, $T_A=25^\circ\text{C}$ ¹	P_D	225	mW
	Derate Above 25°C		1.8	mW / $^\circ\text{C}$
Thermal Resistance, Junction to Ambient ¹		$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation	FR-5 Board, $T_A=25^\circ\text{C}$ ²	P_D	300	mW
	Derate Above 25°C		2.4	mW / $^\circ\text{C}$
Thermal Resistance, Junction to Ambient ²		$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction, Storage Temperature		T_J, T_{STG}	-55 ~ 150	$^\circ\text{C}$

Note:

1. FR-5 = $1.0 \times 0.75 \times 0.062$ in
2. Alumina = $0.4 \times 0.3 \times 0.024$ in. 99.5% alumina.

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

PARAMETER		SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector to Base Breakdown Voltage	BC846	V _{CBO}	80	-	-	V	I _C = 10μA
	BC847		50				
	BC848		30				
Collector–Emitter Breakdown Voltage	BC846	V _{(BR)CES}	80	-	-	V	I _C = 10μA, V _{EB} = 0
	BC847		50				
	BC848		30				
Collector to Emitter Breakdown Voltage	BC846	V _{CEO}	65	-	-	V	I _C = 10 mA
	BC847		45				
	BC848		30				
Emitter to Base Breakdown Voltage	BC846	V _{EBO}	6	-	-	V	I _E = 1 μA
	BC847		6				
	BC848		5				
Collector Cutoff Current		I _{CBO}	-	-	15	nA	V _{CB} = 30 V
			-	-	5	μA	V _{CB} = 30 V, T _A = 150°C
ON CHARACTERISTICS							
Collector to Emitter Saturation Voltage		V _{CE(sat)}	-	-	0.25	V	I _C = 10mA, I _B = 0.5 mA
			-	-	0.6		I _C = 100mA, I _B = 5 mA
Base to Emitter Saturation Voltage		V _{BE(sat)}	-	0.7	-	V	I _C = 10mA, I _B = 0.5 mA
			-	0.9	-		I _C = 100mA, I _B = 5 mA
Base to Emitter Voltage		V _{BE(on)}	580	660	700	mV	V _{CE} = 5 V, I _C = 2 mA
			-	-	770		V _{CE} = 5 V, I _C = 10 mA
DC Current Gain	BC846AS,BC847AS,BC848AS	h _{FE}	110	180	220		V _{CE} = 5V, I _C = 2mA
	BC846BS,BC847BS,BC848BS		200	290	450		
	BC847CS,BC848CS		420	520	800		
SMALL–SIGNAL CHARACTERISTICS							
Transition Frequency		f _T	100	-	-	MHz	V _{CE} = 5 V, I _C = 10 mA, f = 100MHz
Collector Output Capacitance		C _{Ob}	-	-	4.5	pF	V _{CB} = 10 V, f=1MHz
Noise Figure		NF	-	-	10	dB	V _{CE} = 5 V, I _C = 0.2 mA, f= 1KHz, R _S = 2KΩ, BW= 200Hz

CHARACTERISTIC CURVES (BC846AS, BC847AS, BC848AS)

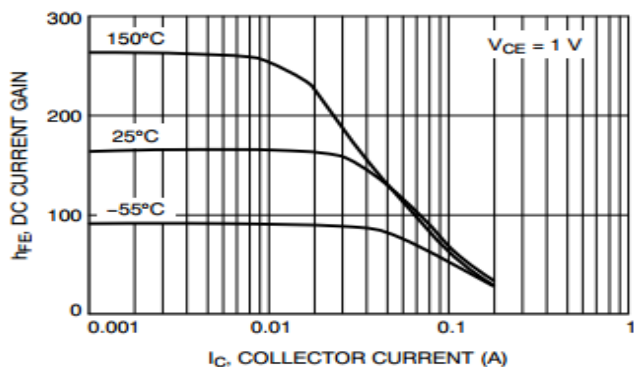


Figure 1. DC Current Gain vs. Collector Current

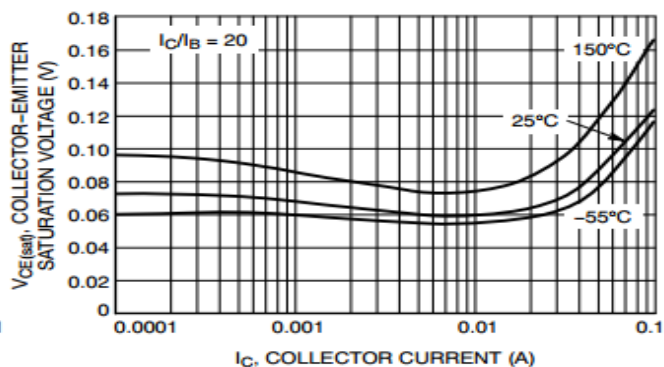


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

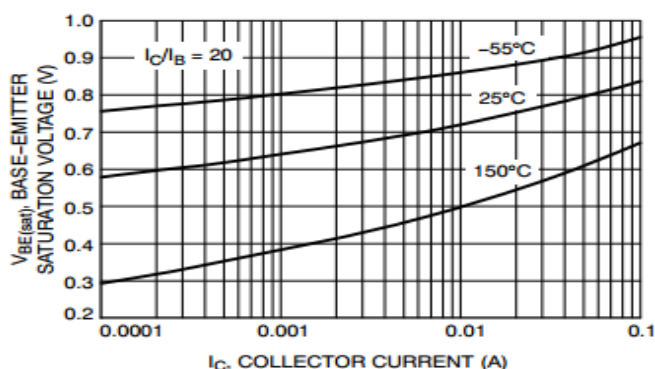


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

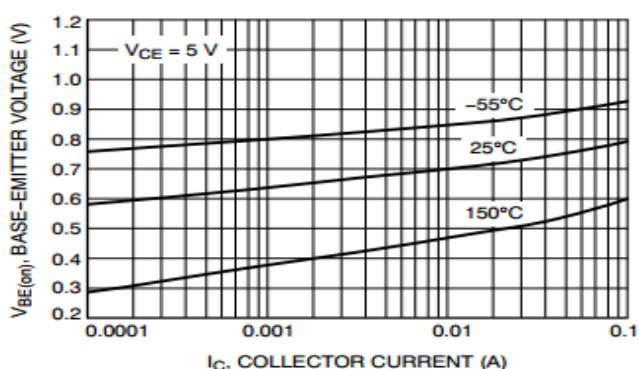


Figure 4. Base Emitter Voltage vs. Collector Current

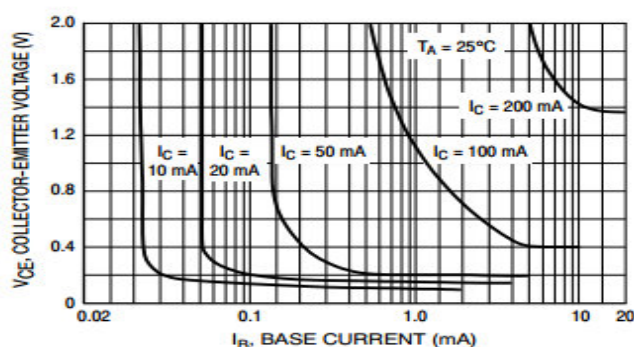


Figure 5. Collector Saturation Region

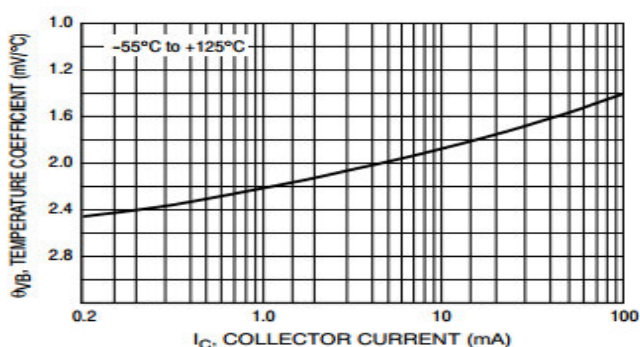


Figure 6. Base-Emitter Temperature Coefficient

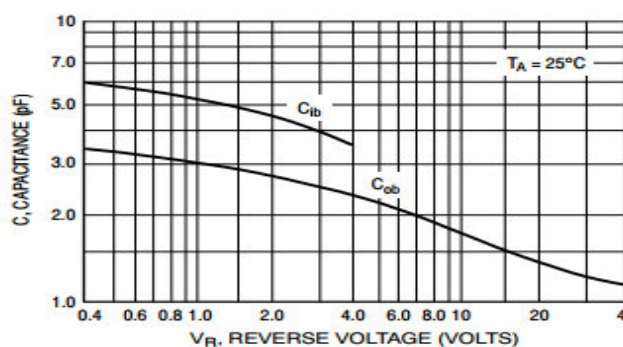


Figure 7. Capacitances

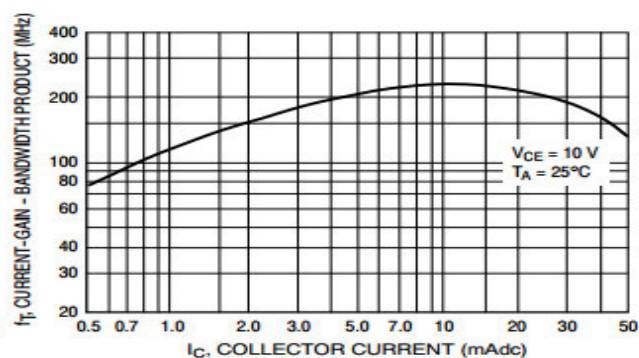


Figure 8. Current-Gain - Bandwidth Product

CHARACTERISTIC CURVES (BC846BS)

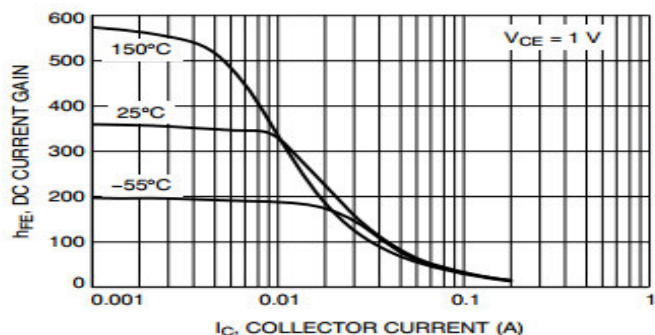


Figure 9. DC Current Gain vs. Collector Current

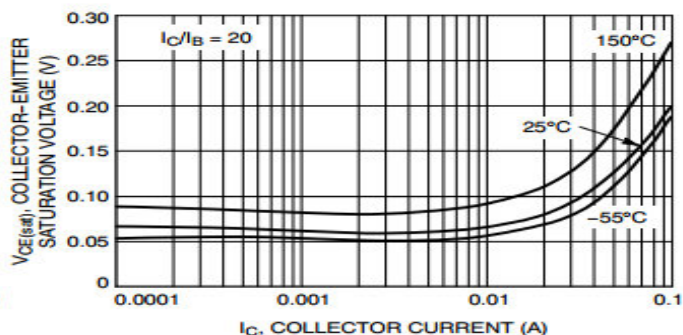


Figure 10. Collector Emitter Saturation Voltage vs. Collector Current

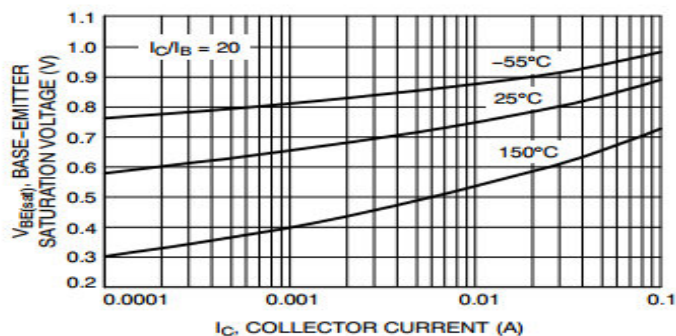


Figure 11. Base Emitter Saturation Voltage vs. Collector Current

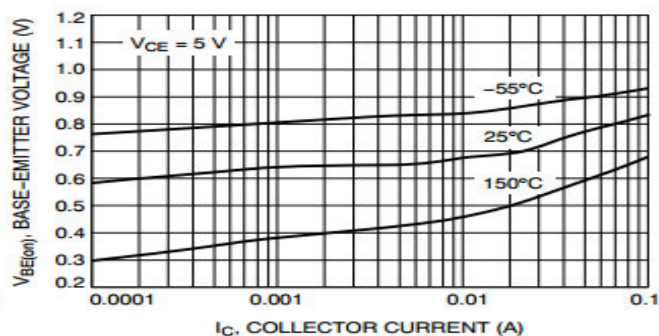


Figure 12. Base Emitter Voltage vs. Collector Current

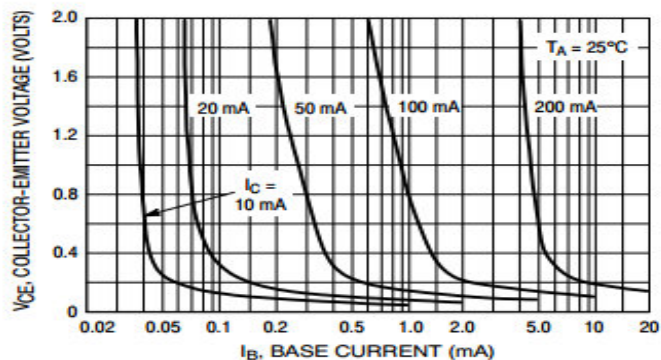


Figure 13. Collector Saturation Region

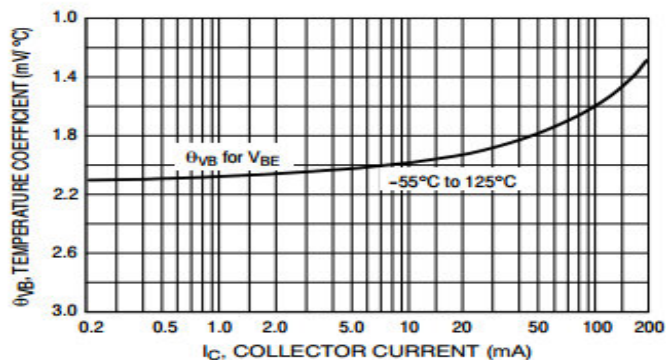


Figure 14. Base-Emitter Temperature Coefficient

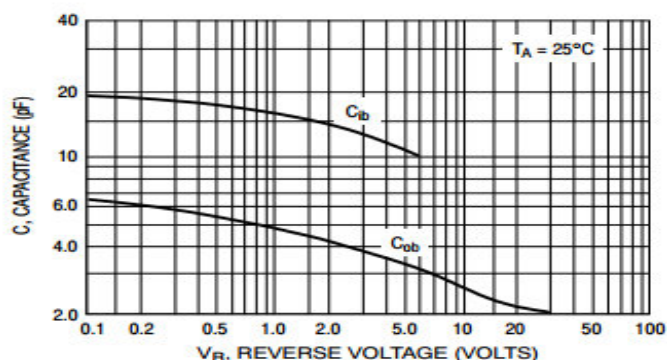


Figure 15. Capacitance

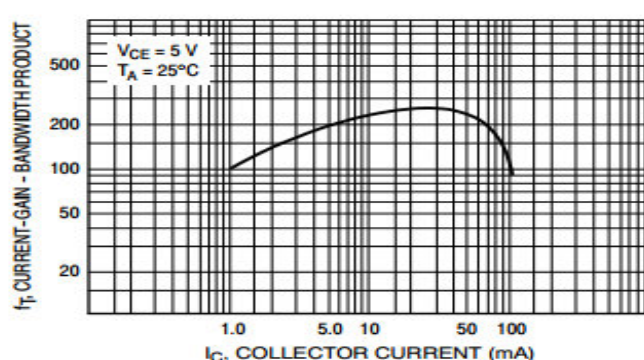


Figure 16. Current-Gain - Bandwidth Product

CHARACTERISTIC CURVES (BC847BS, BC848BS)

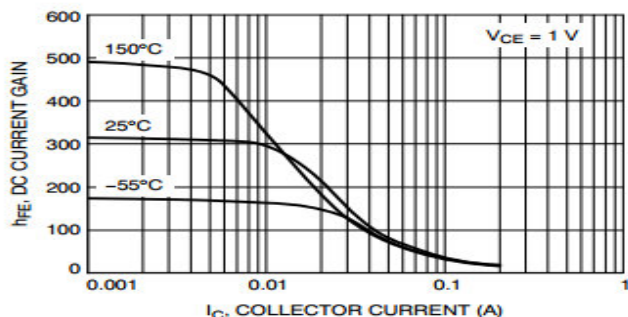


Figure 17. DC Current Gain vs. Collector Current

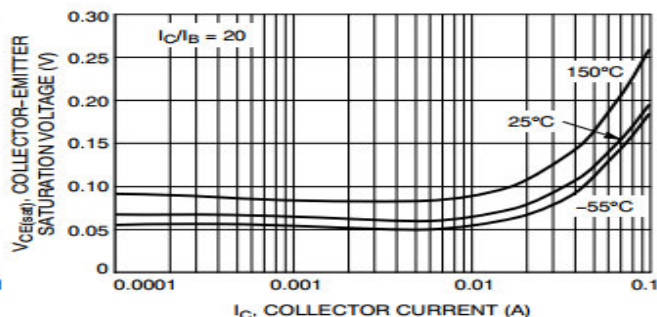


Figure 18. Collector Emitter Saturation Voltage vs. Collector Current

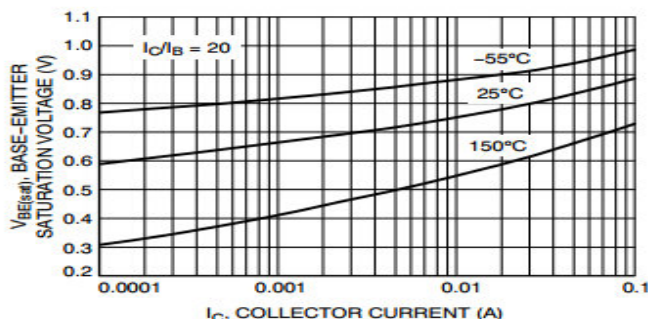


Figure 19. Base Emitter Saturation Voltage vs. Collector Current

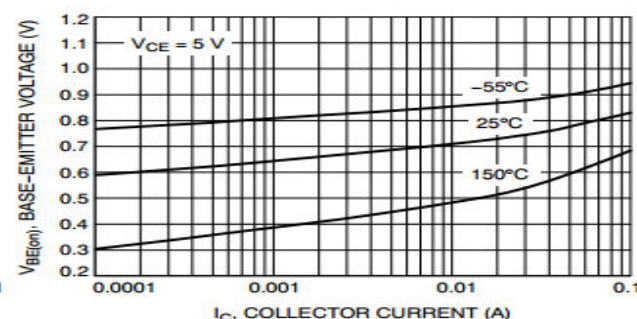


Figure 20. Base Emitter Voltage vs. Collector Current

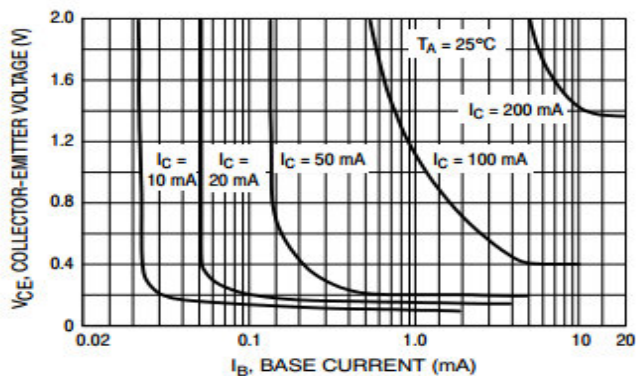


Figure 21. Collector Saturation Region

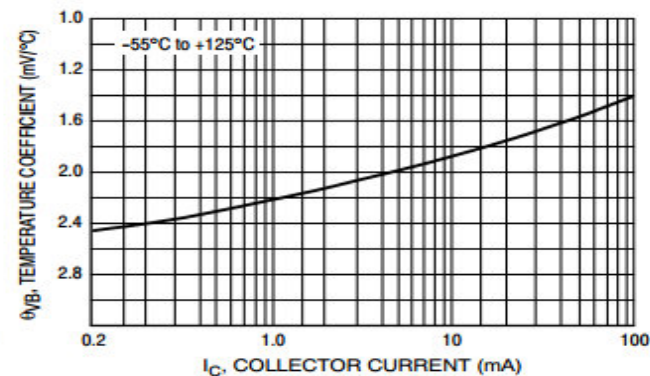


Figure 22. Base-Emitter Temperature Coefficient

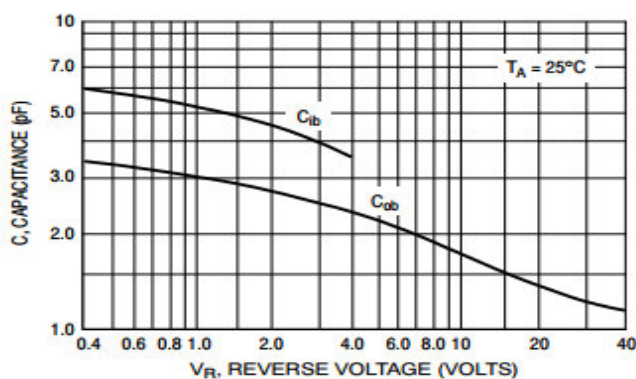


Figure 23. Capacitances

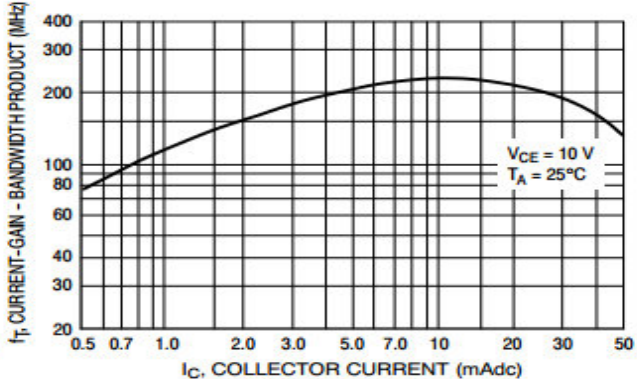


Figure 24. Current-Gain - Bandwidth Product

CHARACTERISTIC CURVES (BC847CS, BC848CS)

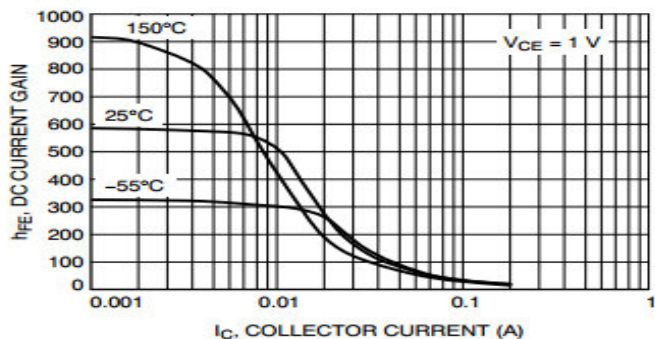


Figure 25. DC Current Gain vs. Collector Current

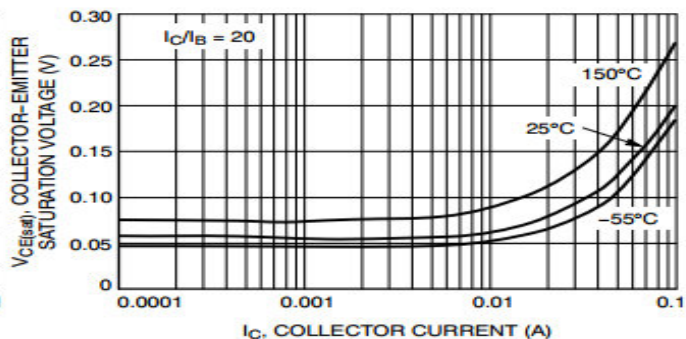


Figure 26. Collector-Emitter Saturation Voltage vs. Collector Current

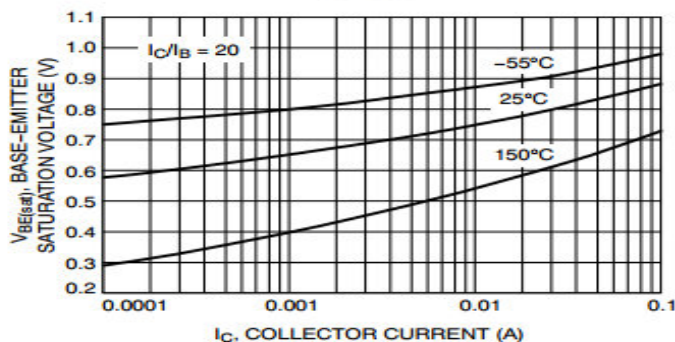


Figure 27. Base-Emitter Saturation Voltage vs. Collector Current

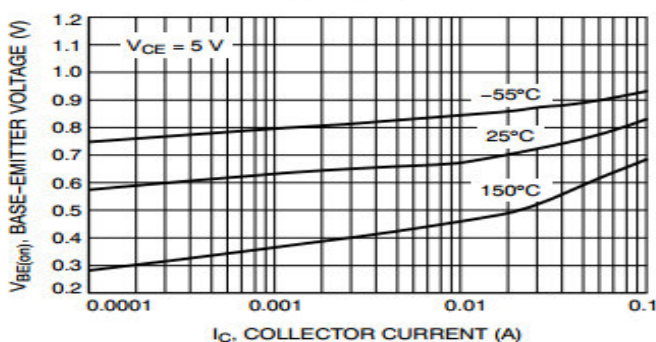


Figure 28. Base-Emitter Voltage vs. Collector Current

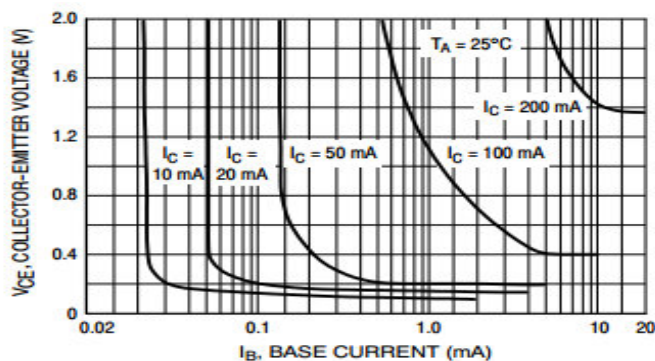


Figure 29. Collector Saturation Region

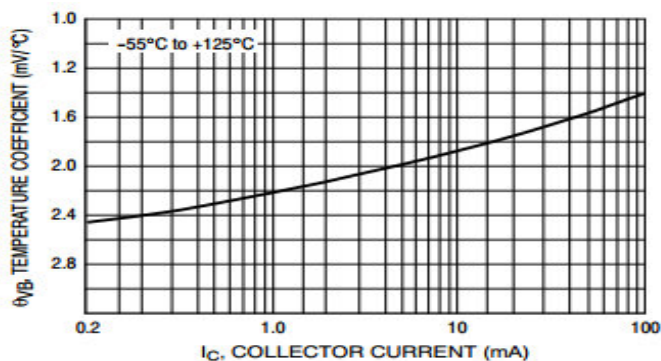


Figure 30. Base-Emitter Temperature Coefficient

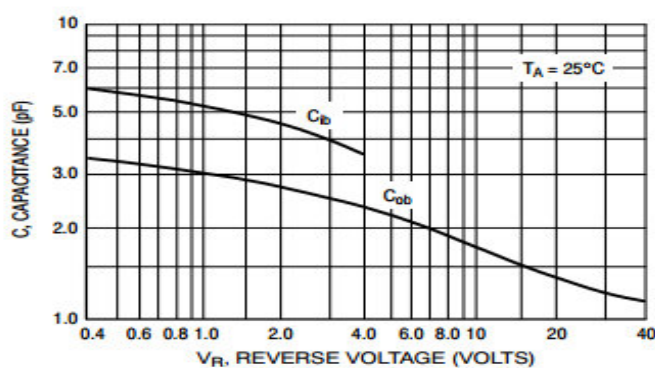


Figure 31. Capacitances

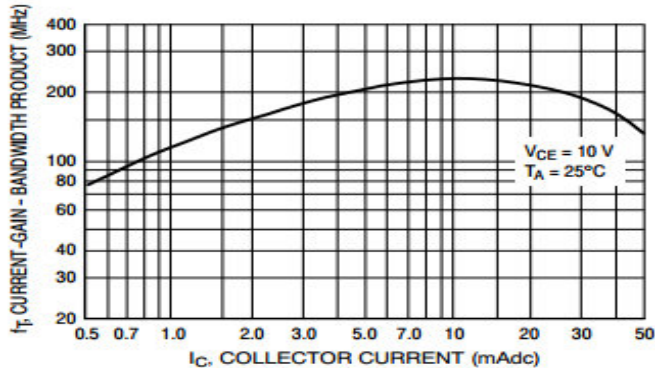
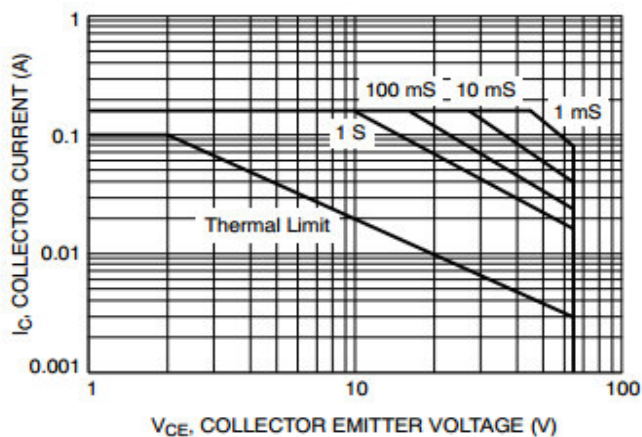
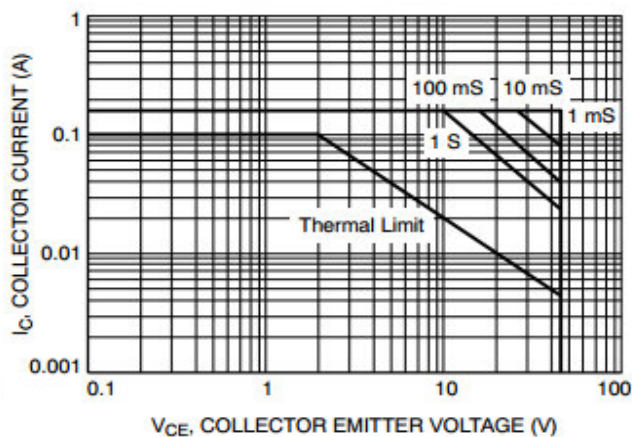


Figure 32. Current-Gain - Bandwidth Product

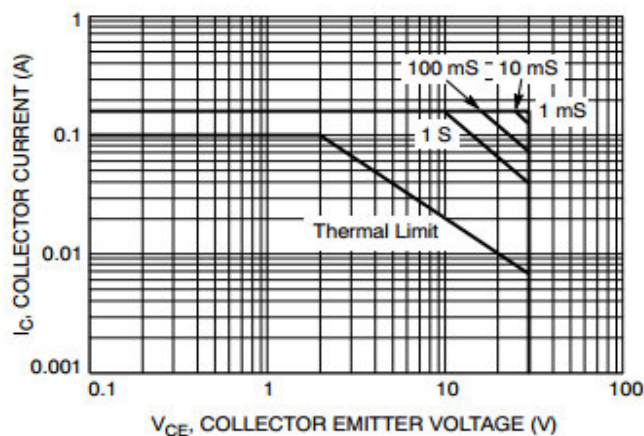
CHARACTERISTIC CURVES



**Figure 33. Safe Operating Area for
BC846AS, BC846BS**



**Figure 34. Safe Operating Area for
BC847AS, BC847BS, BC847CS**



**Figure 35. Safe Operating Area for
BC848AS, BC848BS, BC848CS**