

General Purpose Transistors NPN Silicon

BC846AWT1G,BWT1G BC847AWT1G,BWT1G CWT1G

BC848AWT1G,BWT1G CWT1G

S-BC846AWT1G,BWT1G S-BC847AWT1G,BWT1G CWT1G

S-BC848AWT1G,BWT1G CWT1G



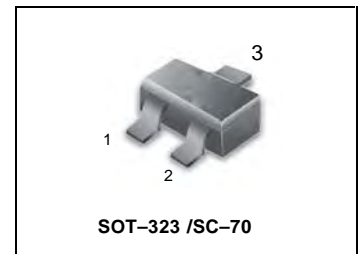
We declare that the material of product compliance with RoHS requirements.
S- Prefix for Automotive and Other Applications Requiring Unique Site
and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

ORDERING INFORMATION (Pb-Free)

Device	Package	Shipping
BC846AWT1G S-BC846AWT1G	SC-70	3000/Tape&Reel
BC846AWT3G S-BC846AWT3G	SC-70	10000/Tape&Reel

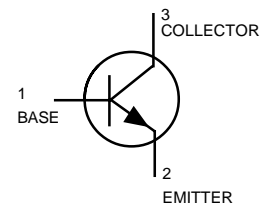
MAXIMUM RATINGS

Rating	Symbol	BC846	BC847	BC848	Unit
Collector-Emitter Voltage	V_{CEO}	65	45	30	V
Collector-Base Voltage	V_{CBO}	80	50	30	V
Emitter-Base Voltage	V_{EBO}	6.0	6.0	5.0	V
Collector Current — Continuous	I_C	100	100	100	mAdc



THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation	P_D	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	°C/W
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	°C



DEVICE MARKING

BC846AWT1G = 1A; BC846BWT1G = 1B; BC847AWT1G = 1E; BC847BWT1G = 1F;
BC847CWT1G = 1G; BC848AWT1G = 1J; BC848BWT1G = 1K; BC848CWT1G = 1L;

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$)	BC846 Series	65	—	—	v
	BC847 Series	$V_{(BR)CEO}$	45	—	
	BC848 Series	30	—	—	
Collector-Emitter Breakdown Voltage ($I_C = 10\ \mu\text{A}, V_{EB} = 0$)	BC846 Series	80	—	—	v
	BC847 Series	$V_{(BR)CES}$	50	—	
	BC848 Series	30	—	—	
Collector-Base Breakdown Voltage ($I_C = 10\ \mu\text{A}$)	BC846 Series	80	—	—	v
	BC847 Series	$V_{(BR)CBO}$	50	—	
	BC848 Series	30	—	—	
Emitter-Base Breakdown Voltage ($I_E = 1.0\ \mu\text{A}$)	BC846 Series	6.0	—	—	v
	BC847 Series	$V_{(BR)EBO}$	6.0	—	
	BC848 Series	5.0	—	—	
Collector Cutoff Current ($V_{CB} = 30\text{ V}$) ($V_{CB} = 30\text{ V}, T_A = 150^\circ\text{C}$)	I_{CBO}	—	—	15	nA
		—	—	5.0	μA

1.FR-5=1.0 x 0.75 x 0.062in

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S-BC846AWT1G, BWT1G S-BC847AWT1G, BWT1G CWT1G

S-BC848AWT1G, BWT1G CWT1G



ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I _C = 2.0 mA, V _{CE} = 5.0 V)	h _{FE}				
LBC846A, LBC847A, LBC848A		110	180	220	
LBC846B, LBC847B, LBC848B		200	290	450	
LBC847C, LBC848C		420	520	800	
Collector-Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA)	V _{CE(sat)}	—	—	0.25	V
(I _C = 100 mA, I _B = 5.0 mA)		—	—	0.6	
Base-Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA)	V _{BE(sat)}	—	0.7	—	V
(I _C = 100 mA, I _B = 5.0 mA)		—	0.9	—	
Base-Emitter Voltage (I _C = 2.0 mA, V _{CE} = 5.0 V)	V _{BE(on)}	580	660	700	mV
(I _C = 10 mA, V _{CE} = 5.0 V)		—	—	770	

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product (I _C = 10 mA, V _{CE} = 5.0 Vdc, f = 100 MHz)	f _T	100	—	—	MHz
Output Capacitance (V _{CB} = 10 V, f = 1.0 MHz)	C _{obo}	—	—	4.5	pF
Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 Vdc, R _S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)	NF	—	—	10	dB
		—	—	4.0	

BC846A, BC847A, BC848A

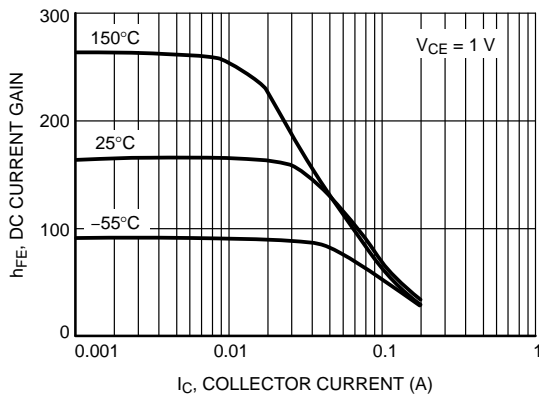


Figure 1. DC Current Gain vs. Collector Current

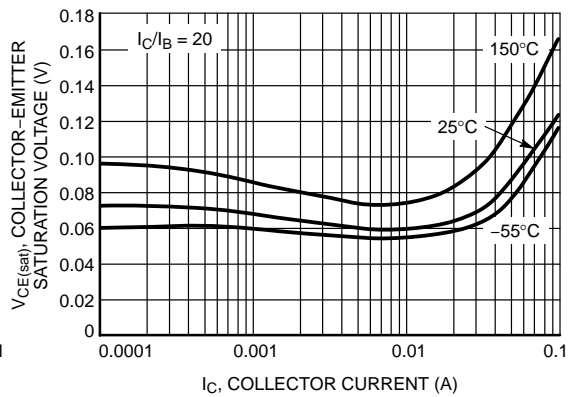


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

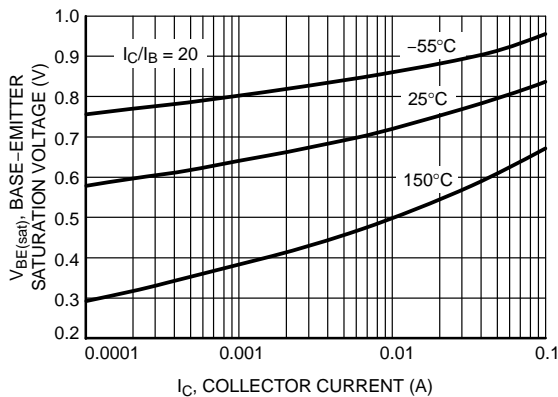


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

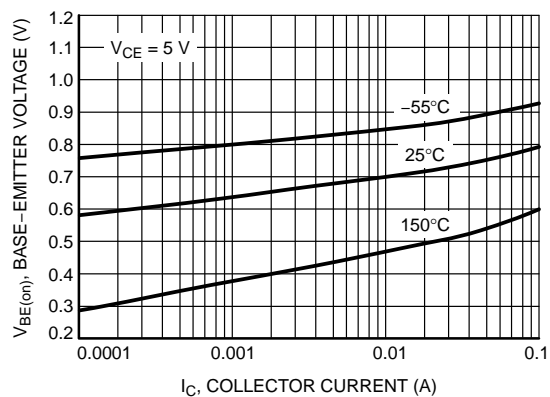


Figure 4. Base Emitter Voltage vs. Collector Current

General Purpose Transistors NPN Silicon

BC846AWT1G, BWT1G

BC847AWT1G, BWT1G CWT1G

BC848AWT1G, BWT1G CWT1G

S-LBC846AWT1G, BWT1G

S-BC847AWT1G, BWT1G CWT1G

S-BC848AWT1G, BWT1G CWT1G



BC846A, BC847A, BC848A

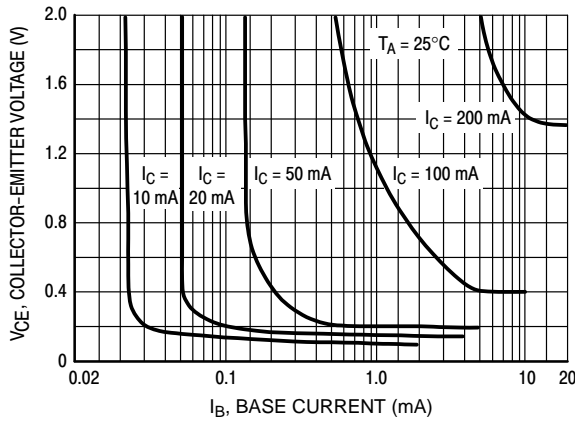


Figure 5. Collector Saturation Region

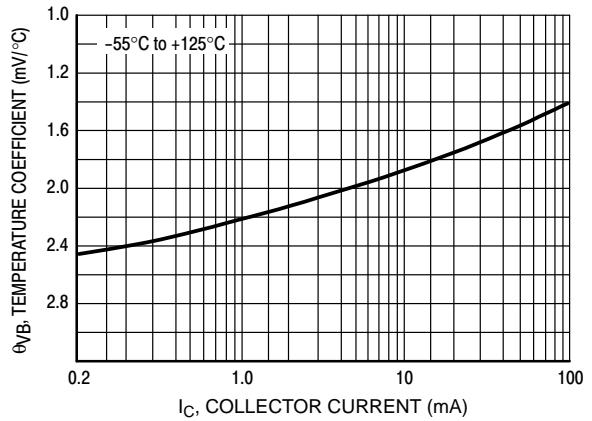


Figure 6. Base-Emitter Temperature Coefficient

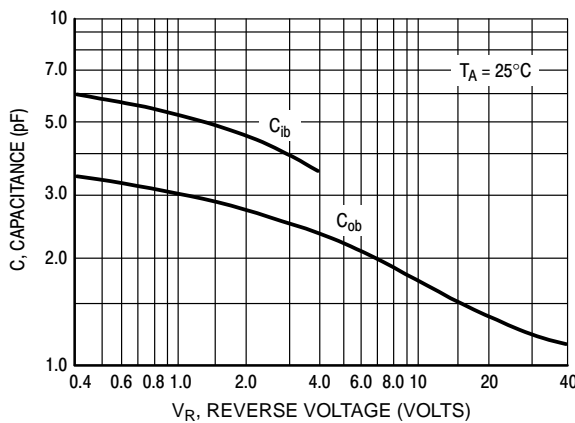


Figure 7. Capacitances

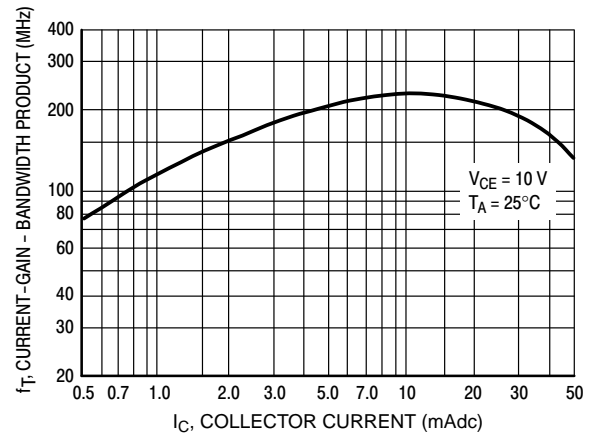


Figure 8. Current-Gain - Bandwidth Product

LBC846B

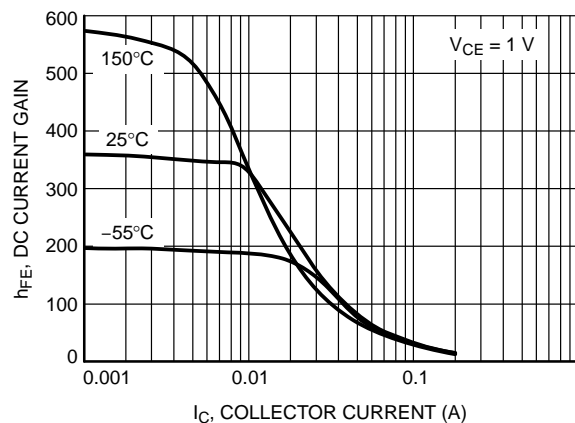


Figure 9. DC Current Gain vs. Collector Current

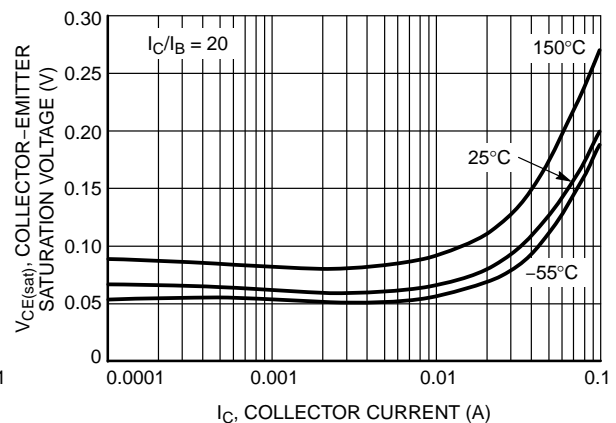


Figure 10. Collector Emitter Saturation Voltage vs. Collector Current

General Purpose Transistors NPN Silicon

BC846AWT1G, BWT1G
 BC847AWT1G, BWT1G CWT1G
 BC848AWT1G, BWT1G CWT1G
 S-BC846AWT1G, BWT1G
 S-BC847AWT1G, BWT1G CWT1G
 S-BC848AWT1G, BWT1G CWT1G



BC846B

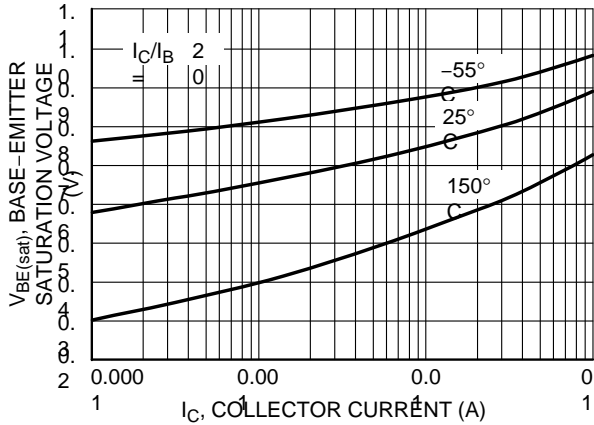


Figure 11. Base Emitter Saturation Voltage vs. Collector Current

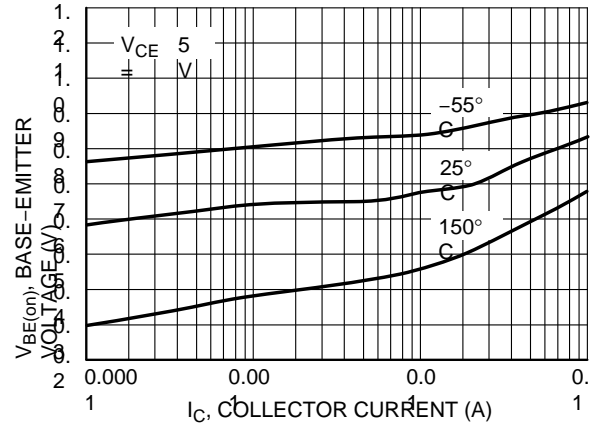


Figure 12. Base Emitter Voltage vs. Collector Current

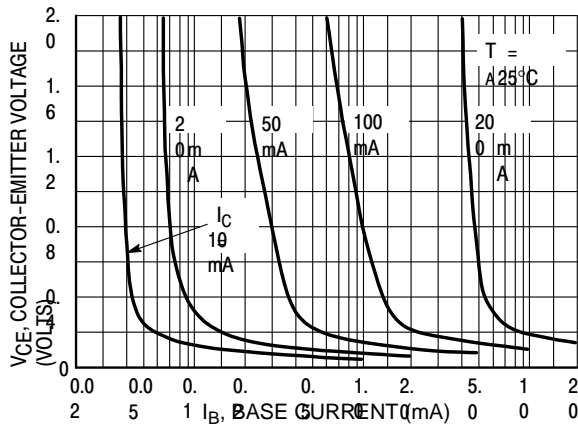


Figure 13. Collector Saturation

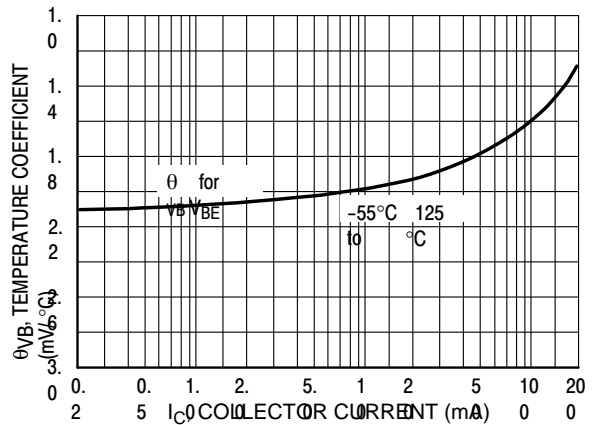


Figure 14. Base-Emitter Temperature Coefficient

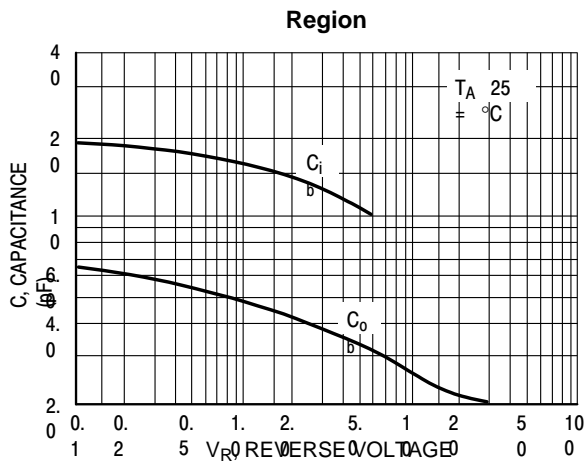


Figure 15. Capacitance

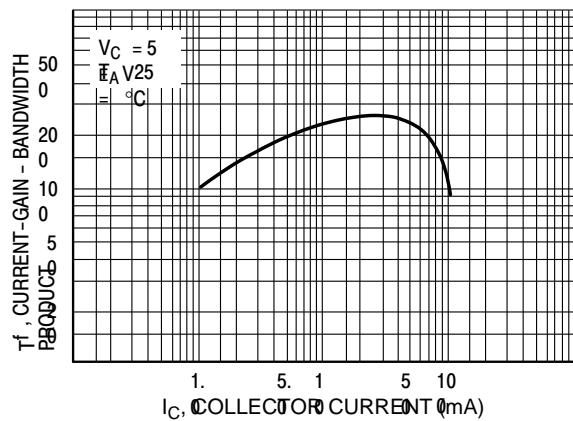


Figure 16. Current-Gain - Bandwidth Product

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BC846AWT1G, BWT1G
 BC847AWT1G, BWT1G CWT1G
 BC848AWT1G, BWT1G CWT1G
 S-BC846AWT1G, BWT1G
 S-BC847AWT1G, BWT1G CWT1G
 S-BC848AWT1G, BWT1G CWT1G



BC847B, BC848B

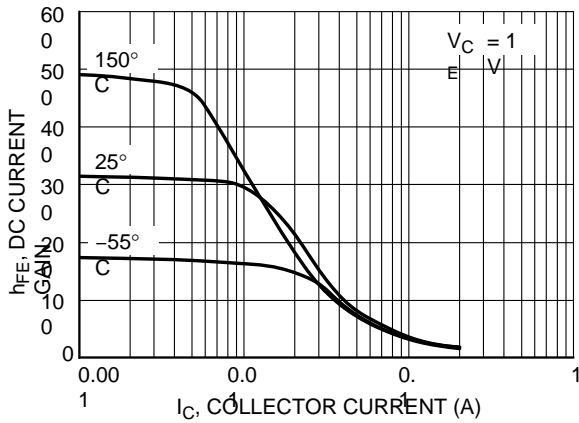


Figure 17. DC Current Gain vs. Collector Current

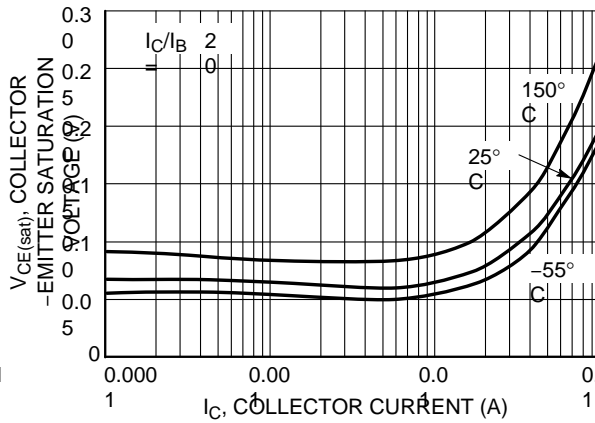


Figure 18. Collector Emitter Saturation Voltage vs. Collector Current

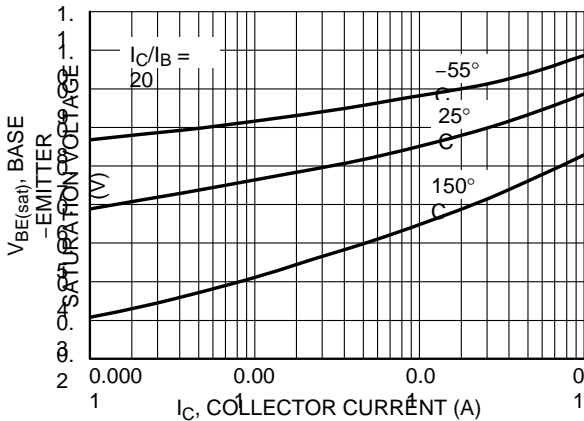


Figure 19. Base Emitter Saturation Voltage vs. Collector Current

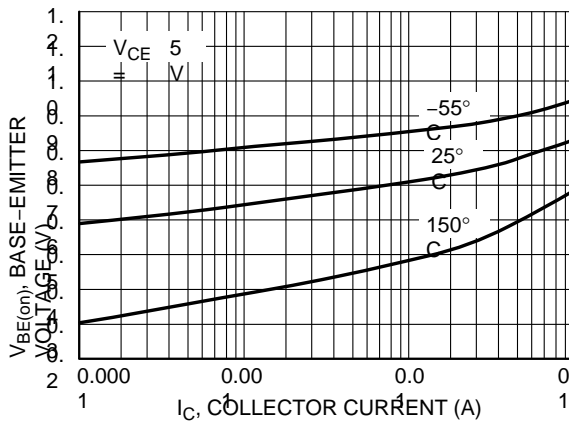


Figure 20. Base Emitter Voltage vs. Collector Current

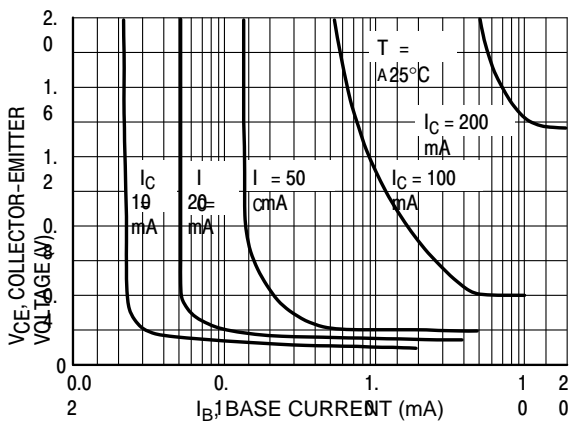


Figure 21. Collector Saturation Region

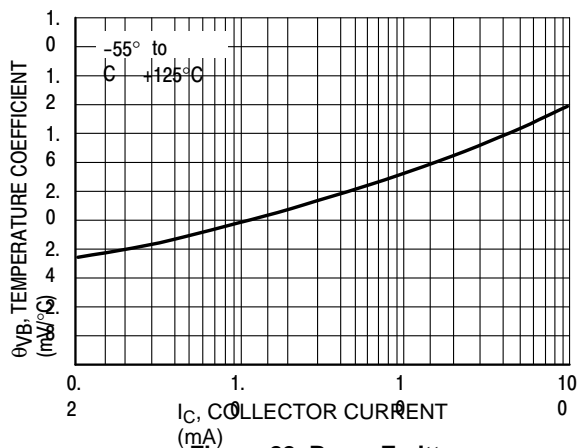


Figure 22. Base-Emitter Temperature Coefficient

General Purpose Transistors NPN Silicon

BC846AWT1G,BWT1G

BC847AWT1G,BWT1G CWT1G

BC848AWT1G,BWT1G CWT1G

S-BC846AWT1G,BWT1G

S-BC847AWT1G,BWT1G CWT1G

S-BC848AWT1G,BWT1G CWT1G



BC847B, BC848B

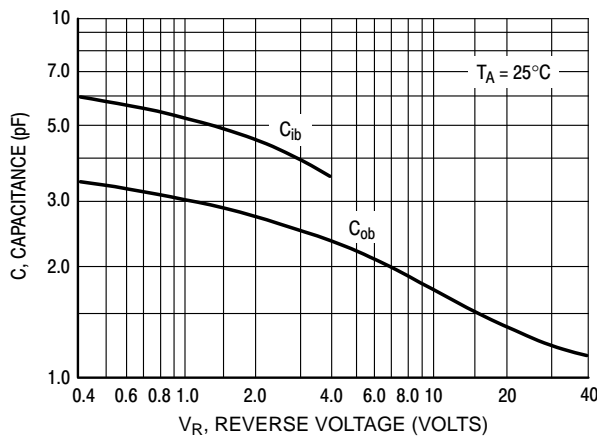


Figure 23. Capacitances

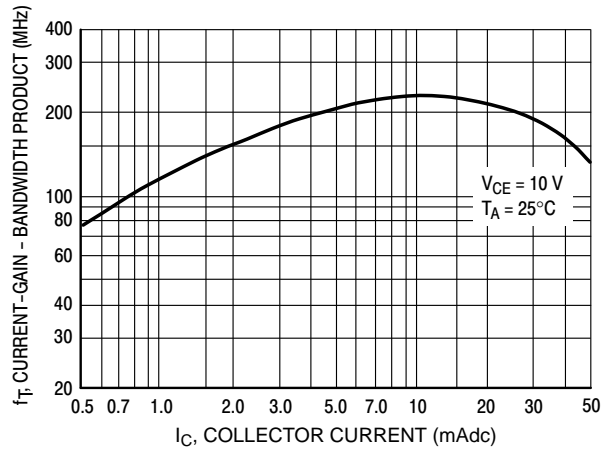


Figure 24. Current-Gain - Bandwidth Product

BC847C, BC848C

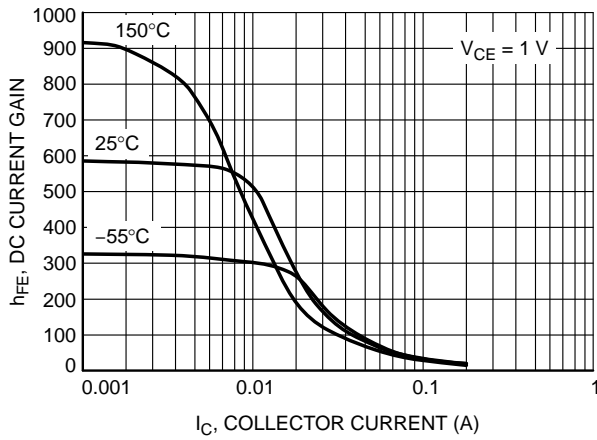


Figure 25. DC Current Gain vs. Collector Current

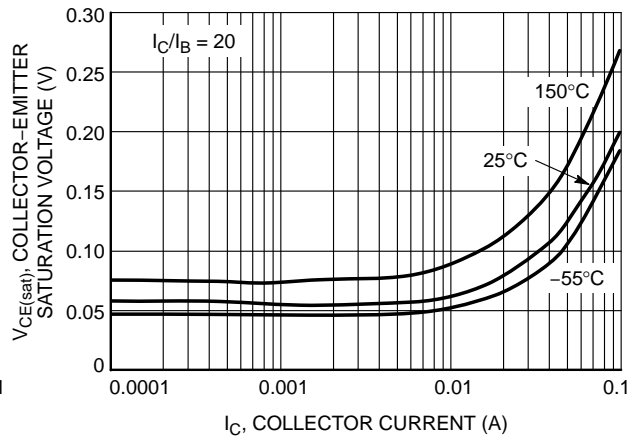


Figure 26. Collector Emitter Saturation Voltage vs. Collector Current

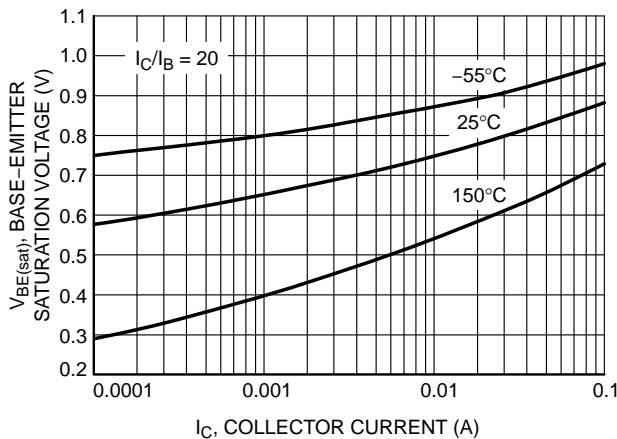


Figure 27. Base Emitter Saturation Voltage vs. Collector Current

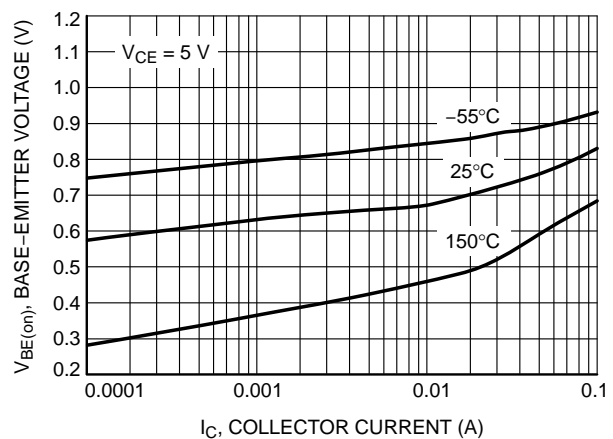


Figure 28. Base Emitter Voltage vs. Collector Current

General Purpose Transistors NPN Silicon
BC846AWT1G, BWT1G
BC847AWT1G, BWT1G CWT1G
BC848AWT1G, BWT1G CWT1G
S-BC846AWT1G, BWT1G
S-BC847AWT1G, BWT1G CWT1G
S-BC848AWT1G, BWT1G CWT1G



BC847C, BC848C

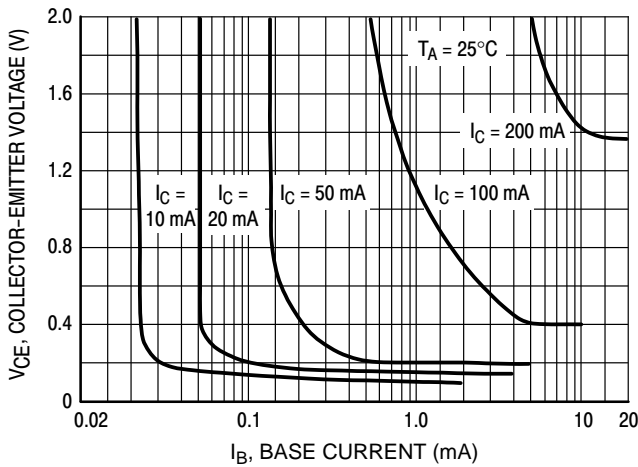


Figure 29. Collector Saturation Region

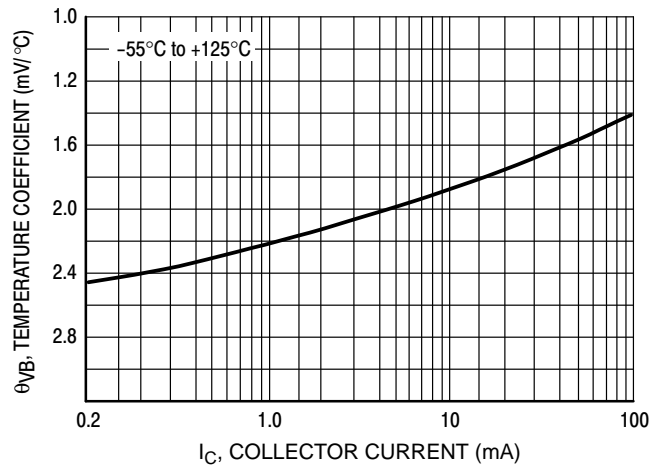


Figure 30. Base-Emitter Temperature Coefficient

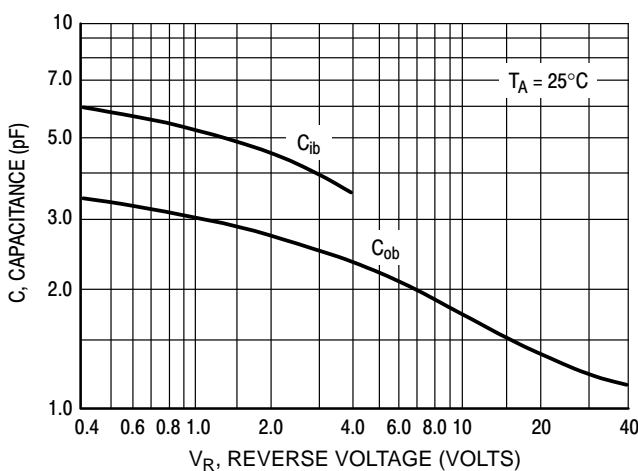


Figure 31. Capacitances

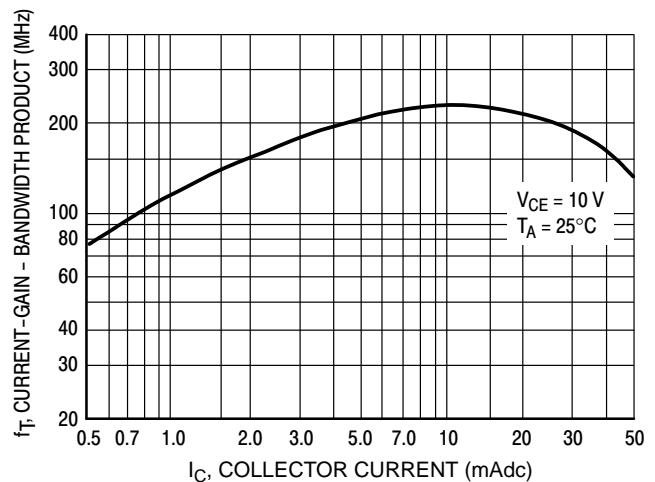


Figure 32. Current-Gain - Bandwidth Product

General Purpose Transistors NPN Silicon

BC846AWT1G,BWT1G

BC847AWT1G,BWT1G CWT1G

BC848AWT1G,BWT1G CWT1G

S-BC846AWT1G,BWT1G

S-BC847AWT1G,BWT1G CWT1G

S-BC848AWT1G,BWT1G CWT1G

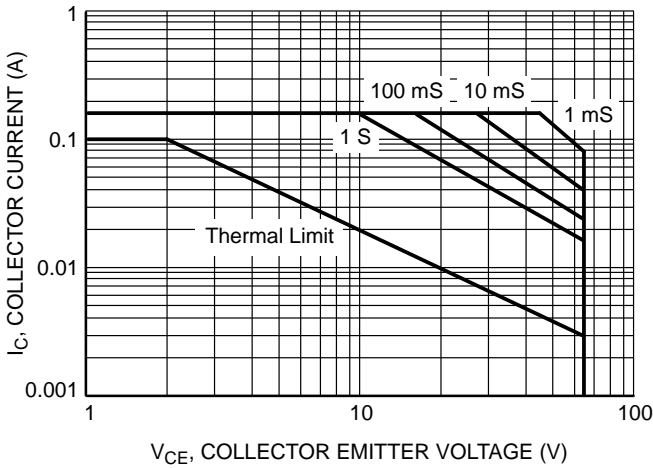


Figure 33. Safe Operating Area for LBC846A, LBC846B

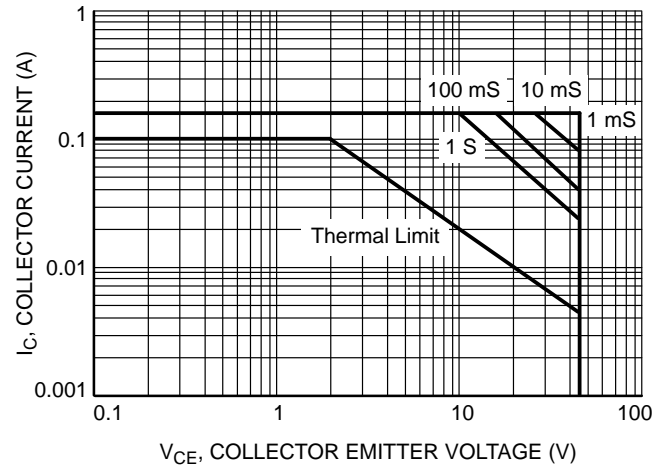


Figure 34. Safe Operating Area for LBC847A, LBC847B, LBC847C

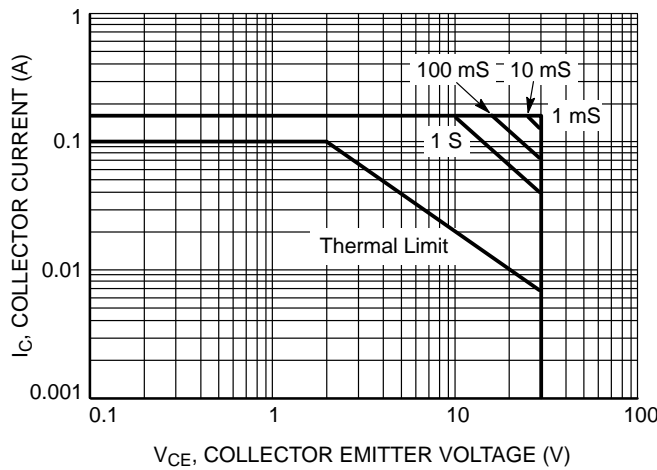


Figure 35. Safe Operating Area for LBC848A, LBC848B, LBC848C

General Purpose Transistors NPN Silicon

BC846AWT1G, BWT1G

BC847AWT1G, BWT1G CWT1G

BC848AWT1G, BWT1G CWT1G

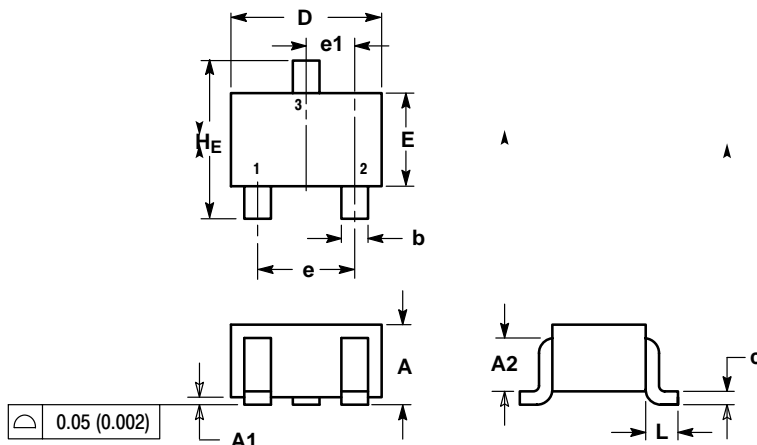
S-BC846AWT1G, BWT1G

S-BC847AWT1G, BWT1G CWT1G

S-BC848AWT1G, BWT1G CWT1G



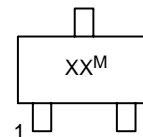
SC-70 / SOT-323



- NOTES:
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 - CONTROLLING DIMENSION: INCH.

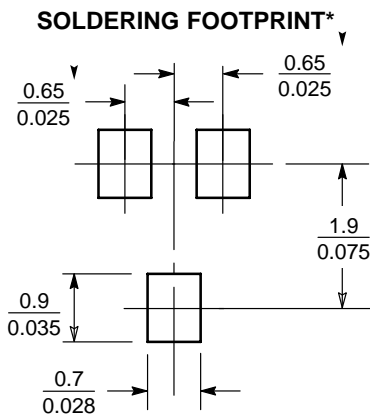
DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.7 REF			0.028 REF		
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.10	2.20	0.071	0.083	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1	0.65 BSC			0.026 BSC		
L	0.425 REF			0.017 REF		
HE	2.00	2.10	2.40	0.079	0.083	0.095

GENERIC MARKING DIAGRAM



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "■", may or may not be present.



SCALE 10:1 (mm/inches)