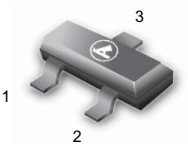
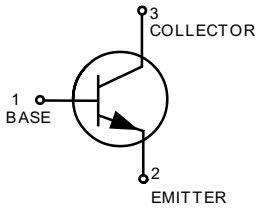
General Purpose Transistors
NPN Silicon

LBC846ALT1G
S-LBC846ALT1G
Series

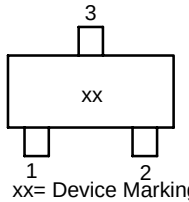
- Moisture Sensitivity Level: 1
- ESD Rating – Human Body Model: >4000 V
  – Machine Model: >400 V
- We declare that the material of product compliance with RoHS requirements.
- S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.



SOT–23



MARKING DIAGRAM



xx= Device Marking
(See Table Below)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage LBC846 LBC847, LBC850 LBC848, LBC849	V_{CEO}	 65 45 30	Vdc
Collector–Base Voltage LBC846 LBC847, LBC850 LBC848, LBC849	V_{CBO}	 80 50 30	Vdc
Emitter–Base Voltage LBC846 LBC847, LBC850 LBC848, LBC849	V_{EBO}	 6.0 6.0 5.0	Vdc
Collector Current – Continuous	I_C	100	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR–5 Board (Note 1.) T_A = 25°C Derate above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 1.)	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate (Note 2.) T_A = 25°C Derate above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 2.)	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	–55 to +150	°C

1. FR–5 = 1.0 x 0.75 x 0.062 in
2. Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Package	Shipping
LBC846ALT1G S-LBC846ALT1G	1A	SOT-23	3000/Tape&Reel
LBC846ALT3G S-LBC846ALT3G	1A	SOT-23	10000/Tape&Reel
LBC846BLT1G S-LBC846BLT1G	1B	SOT-23	3000/Tape&Reel
LBC846BLT3G S-LBC846BLT3G	1B	SOT-23	10000/Tape&Reel
LBC847ALT1G S-LBC847ALT1G	1E	SOT-23	3000/Tape&Reel
LBC847ALT3G S-LBC847ALT3G	1E	SOT-23	10000/Tape&Reel
LBC847BLT1G S-LBC847BLT1G	1F	SOT-23	3000/Tape&Reel
LBC847BLT3G S-LBC847BLT3G	1F	SOT-23	10000/Tape&Reel
LBC847CLT1G S-LBC847CLT1G	1G	SOT-23	3000/Tape&Reel
LBC847CLT3G S-LBC847CLT3G	1G	SOT-23	10000/Tape&Reel
LBC848ALT1G S-LBC848ALT1G	1J	SOT-23	3000/Tape&Reel
LBC848ALT3G S-LBC848ALT3G	1J	SOT-23	10000/Tape&Reel
LBC848BLT1G S-LBC848BLT1G	1K	SOT-23	3000/Tape&Reel
LBC848BLT3G S-LBC848BLT3G	1K	SOT-23	10000/Tape&Reel
LBC848CLT1G S-LBC848CLT1G	1L	SOT-23	3000/Tape&Reel
LBC848CLT3G S-LBC848CLT3G	1L	SOT-23	10000/Tape&Reel
LBC849BLT1G S-LBC849BLT1G	2B	SOT-23	3000/Tape&Reel
LBC849BLT3G S-LBC849BLT3G	2B	SOT-23	10000/Tape&Reel
LBC849CLT1G S-LBC849CLT1G	2C	SOT-23	3000/Tape&Reel
LBC849CLT3G S-LBC849CLT3G	2C	SOT-23	10000/Tape&Reel
LBC850BLT1G S-LBC850BLT1G	2E	SOT-23	3000/Tape&Reel
LBC850BLT3G S-LBC850BLT3G	2E	SOT-23	10000/Tape&Reel
LBC850CLT1G S-LBC850CLT1G	2G	SOT-23	3000/Tape&Reel
LBC850CLT3G S-LBC850CLT3G	2G	SOT-23	10000/Tape&Reel

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I_C = 10 mA)	LBC846A,B LBC847A,B,C, LBC850B,C LBC848A,B,C, LBC849B,C	$V_{(BR)CEO}$	65 45 30	– – –	– – –	V
Collector–Emitter Breakdown Voltage (I_C = 10 μA, V_{EB} = 0)	LBC846A,B LBC847A,B,C, LBC850B,C LBC848A,B,C, LBC849B,C	$V_{(BR)CES}$	80 50 30	– – –	– – –	V
Collector–Base Breakdown Voltage (I_C = 10 μA)	LBC846A,B LBC847A,B,C, LBC850B,C LBC848A,B,C, LBC849B,C	$V_{(BR)CBO}$	80 50 30	– – –	– – –	V
Emitter–Base Breakdown Voltage (I_E = 1.0 μA)	LBC846A,B LBC847A,B,C, LBC850B,C LBC848A,B,C, LBC849B,C	$V_{(BR)EBO}$	6.0 6.0 5.0	– – –	– – –	V
Collector Cutoff Current (V_{CB} = 30 V)	(V_{CB} = 30 V, T_A = 150°C)	I_{CBO}	– –	– –	15 5.0	nA μA
ON CHARACTERISTICS						
DC Current Gain (I_C = 2.0 mA, V_{CE} = 5.0 V)	LBC846A, LBC847A, LBC848A LBC846B, LBC847B, LBC848B, LBC849B, LBC850B LBC847C, LBC848C, LBC849C, LBC850C	h_{FE}	 110 200 420	 180 290 520	 220 450 800	–
Collector–Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA) (I_C = 100 mA, I_B = 5.0 mA)		$V_{CE(sat)}$	– –	– –	0.25 0.6	V
Base–Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA) (I_C = 100 mA, I_B = 5.0 mA)		$V_{BE(sat)}$	– –	0.7 0.9	– –	V
Base–Emitter Voltage (I_C = 2.0 mA, V_{CE} = 5.0 V) (I_C = 10 mA, V_{CE} = 5.0 V)		$V_{BE(on)}$	580 –	660 –	700 770	mV
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)	 LBC846A,B, LBC847A,B,C, LBC848A,B,C LBC849B,C, LBC850B,C	NF	 – –	 – –	 10 4.0	dB

LBC846A, LBC847A, LBC848A

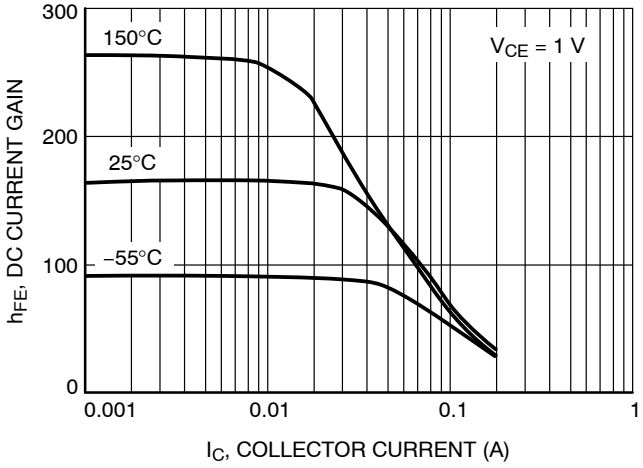


Figure 1. DC Current Gain vs. Collector Current

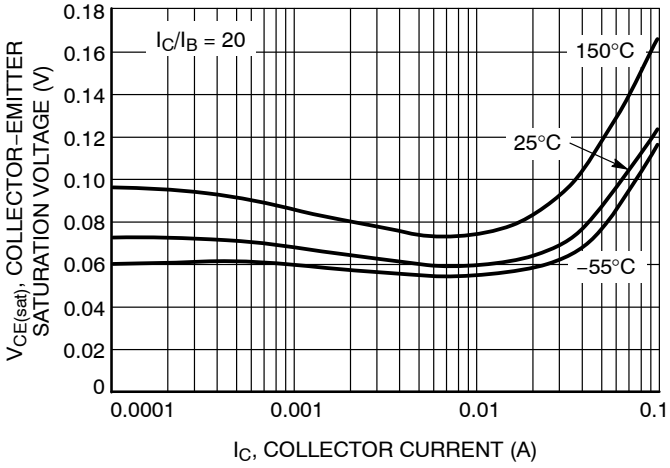


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

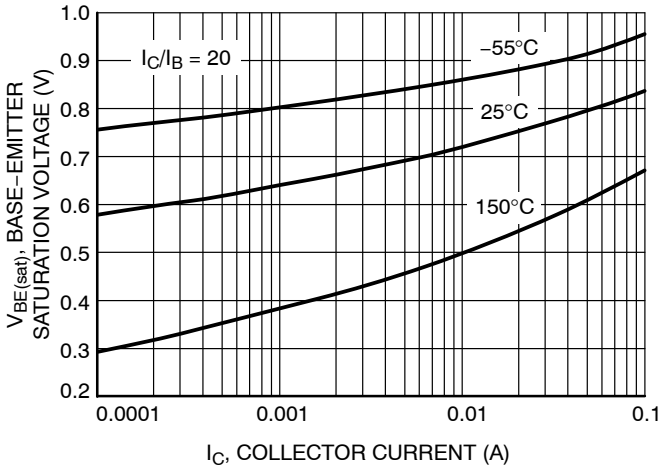


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

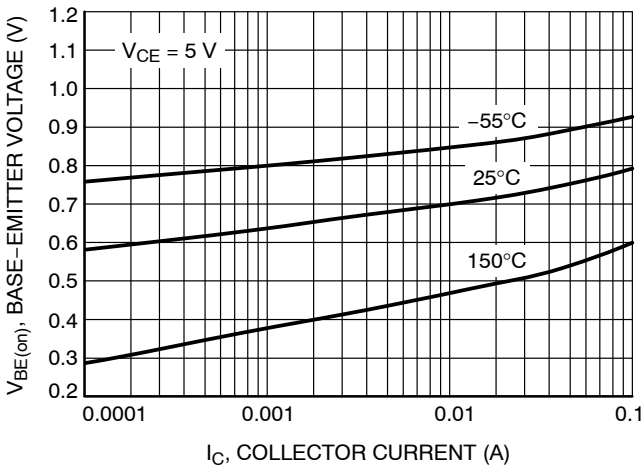


Figure 4. Base Emitter Voltage vs. Collector Current

LBC846A, LBC847A, LBC848A

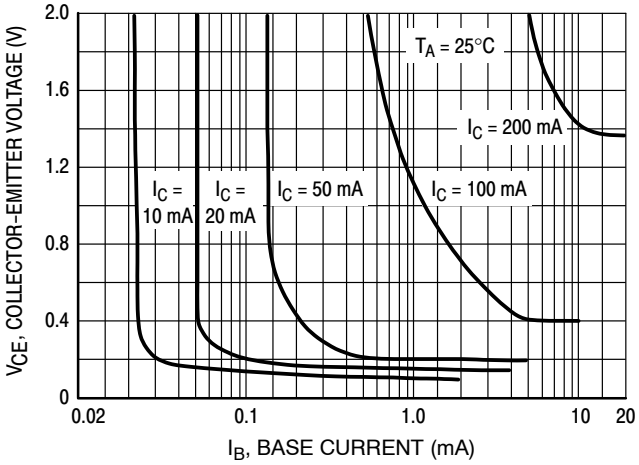


Figure 5. Collector Saturation Region

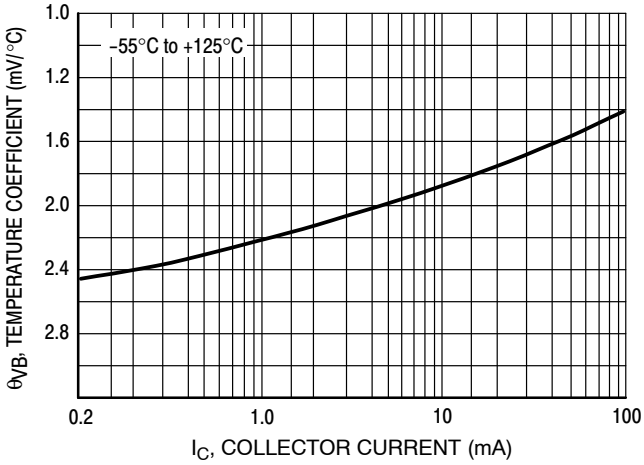


Figure 6. Base–Emitter Temperature Coefficient

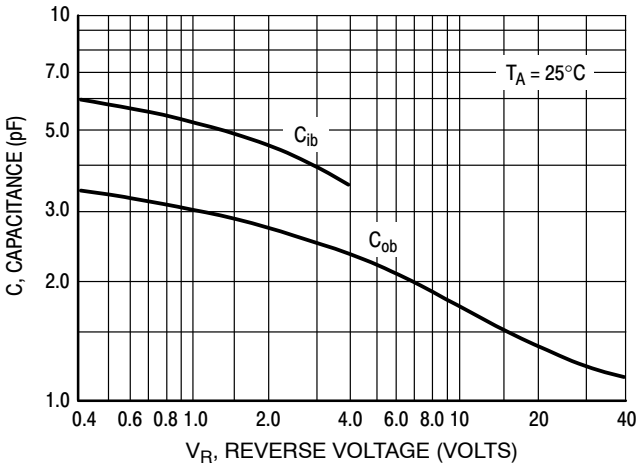


Figure 7. Capacitances

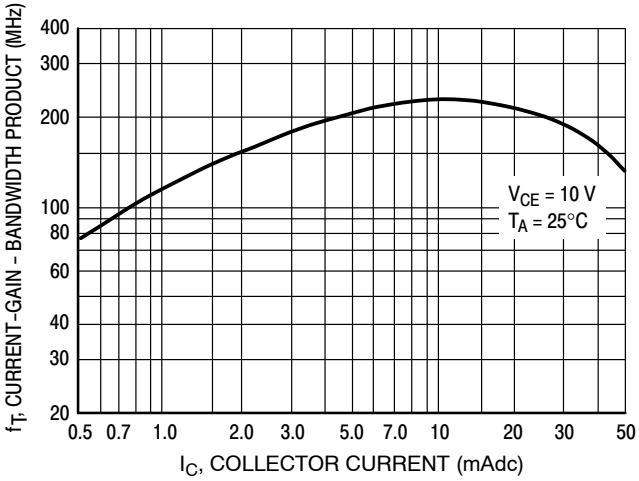


Figure 8. Current–Gain – Bandwidth Product

LBC846B

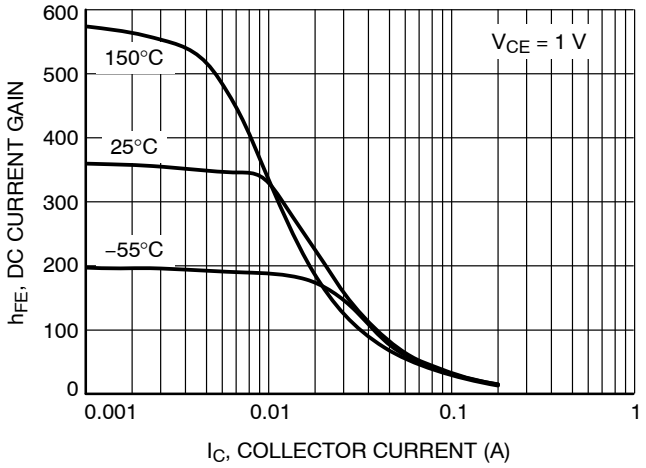


Figure 9. DC Current Gain vs. Collector Current

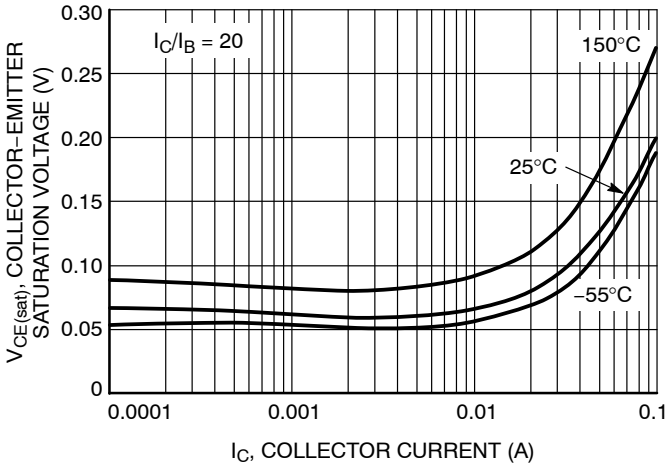


Figure 10. Collector Emitter Saturation Voltage vs. Collector Current

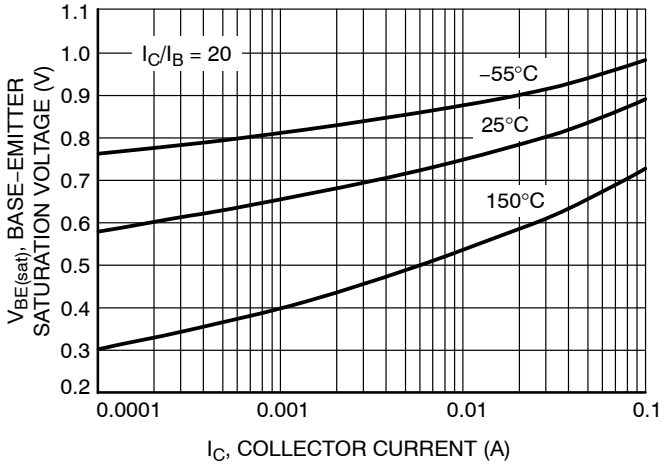


Figure 11. Base Emitter Saturation Voltage vs. Collector Current

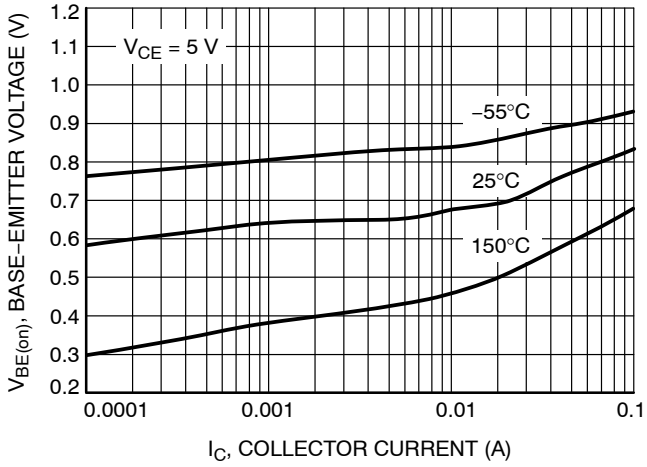


Figure 12. Base Emitter Voltage vs. Collector Current

LBC846B

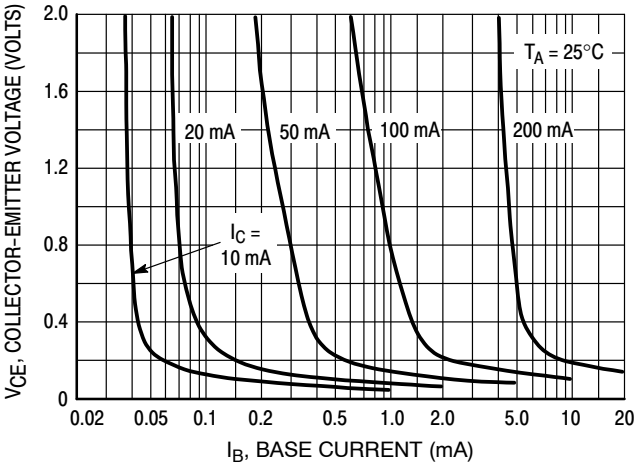


Figure 13. Collector Saturation Region

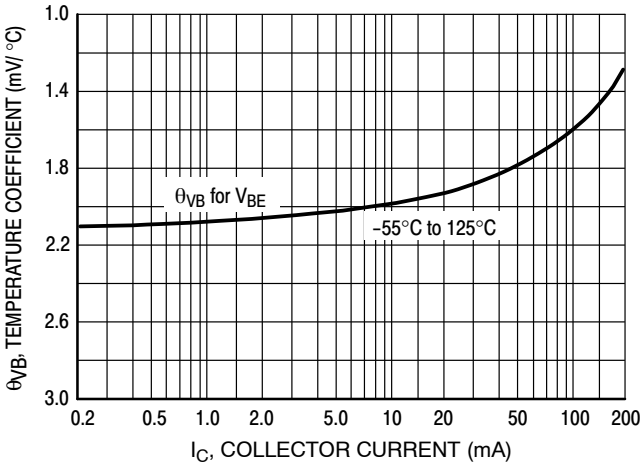


Figure 14. Base−Emitter Temperature Coefficient

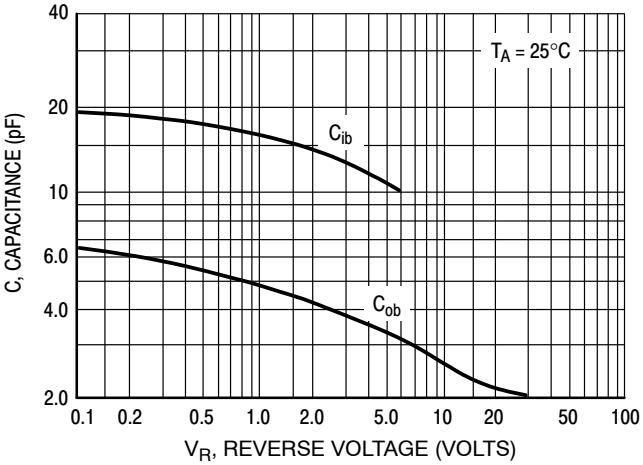


Figure 15. Capacitance

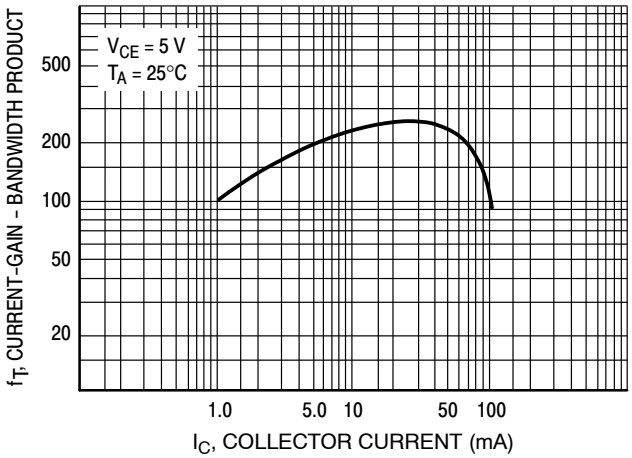


Figure 16. Current−Gain − Bandwidth Product

LBC847B, LBC848B, LBC849B, LBC850B

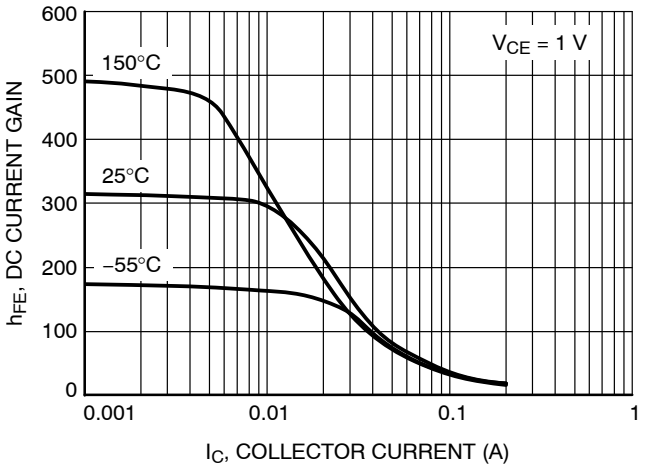


Figure 17. DC Current Gain vs. Collector Current

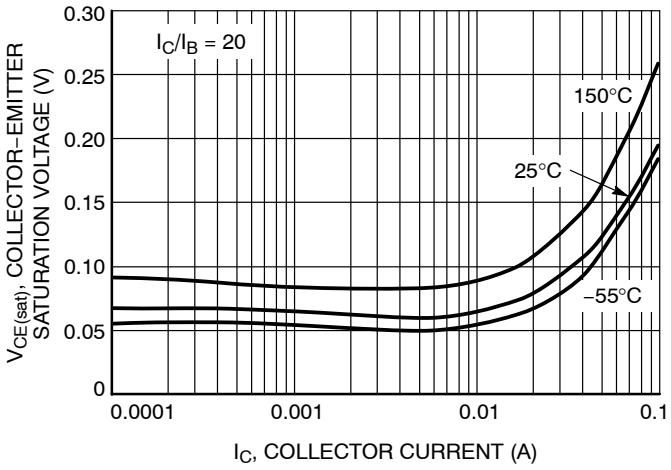


Figure 18. Collector Emitter Saturation Voltage vs. Collector Current

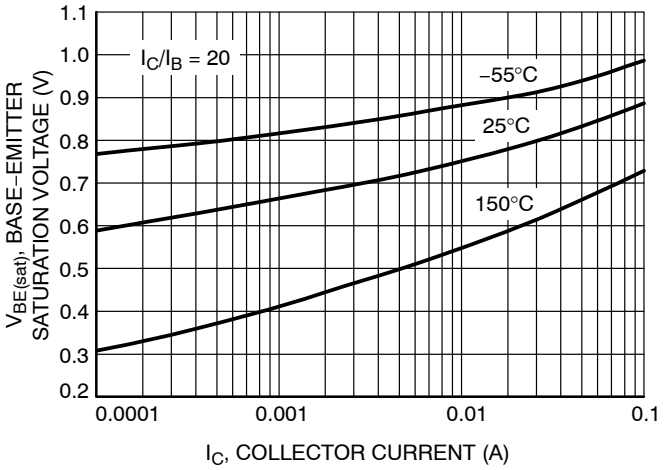


Figure 19. Base Emitter Saturation Voltage vs. Collector Current

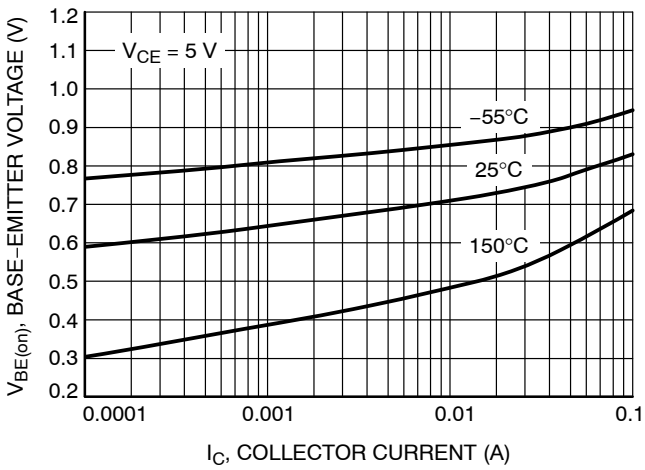


Figure 20. Base Emitter Voltage vs. Collector Current

LBC847B, LBC848B, LBC849B, LBC850B

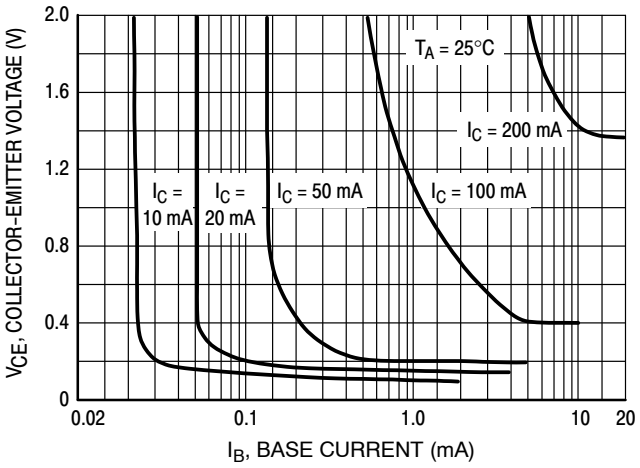


Figure 21. Collector Saturation Region

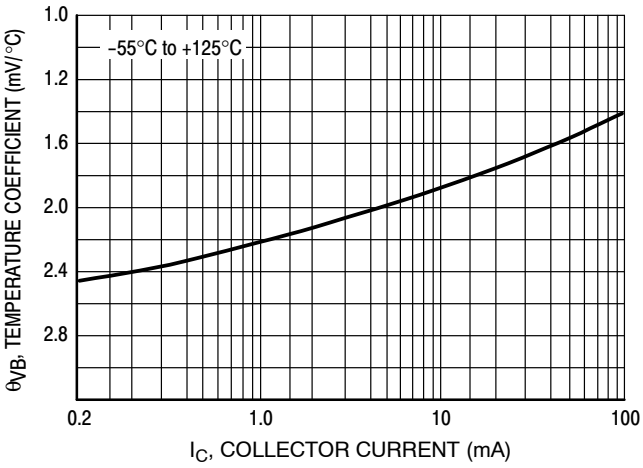


Figure 22. Base−Emitter Temperature Coefficient

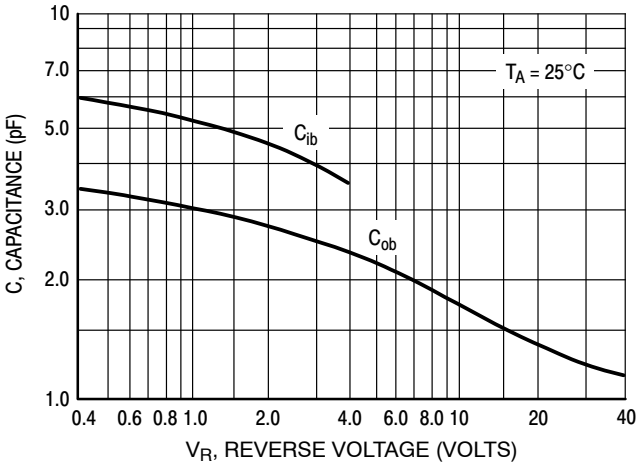


Figure 23. Capacitances

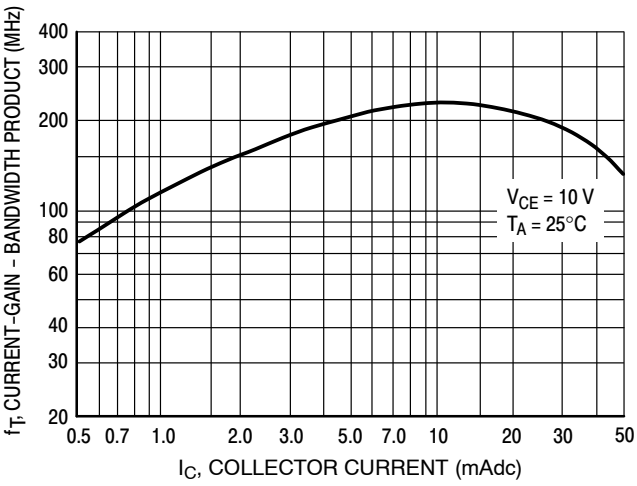


Figure 24. Current−Gain − Bandwidth Product

LBC847C, LBC848C, LBC849C, LBC850C

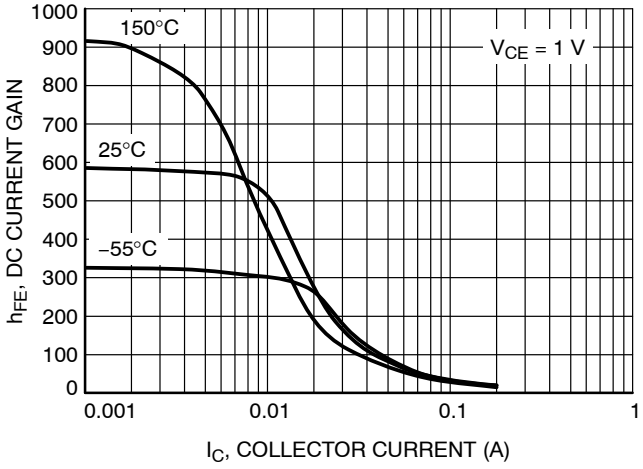


Figure 25. DC Current Gain vs. Collector Current

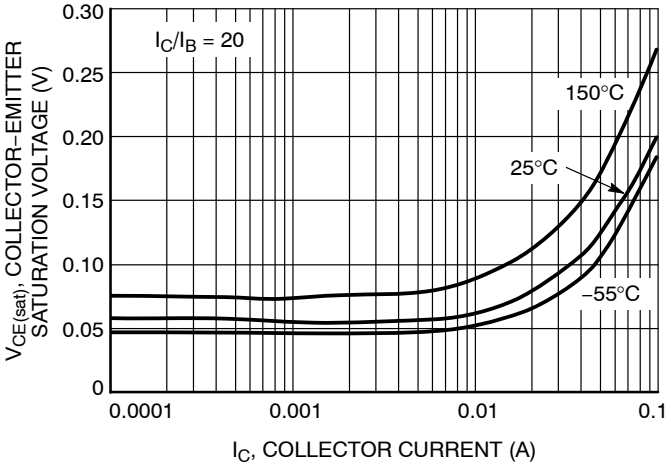


Figure 26. Collector Emitter Saturation Voltage vs. Collector Current

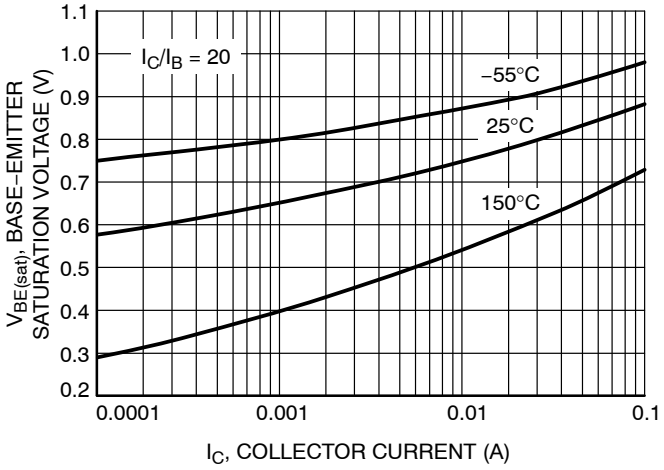


Figure 27. Base Emitter Saturation Voltage vs. Collector Current

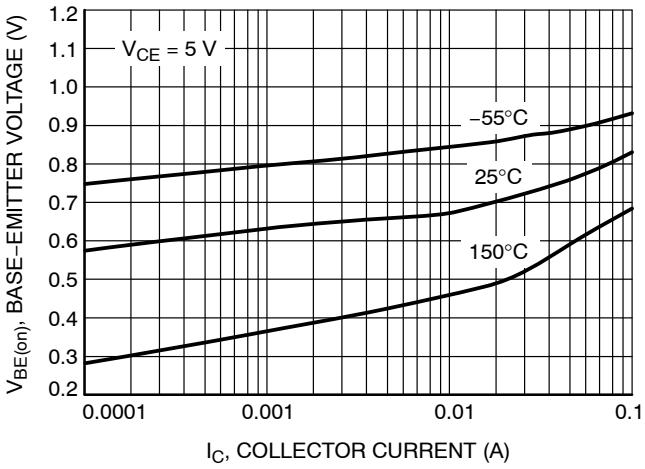


Figure 28. Base Emitter Voltage vs. Collector Current

LBC847C, LBC848C, LBC849C, LBC850C

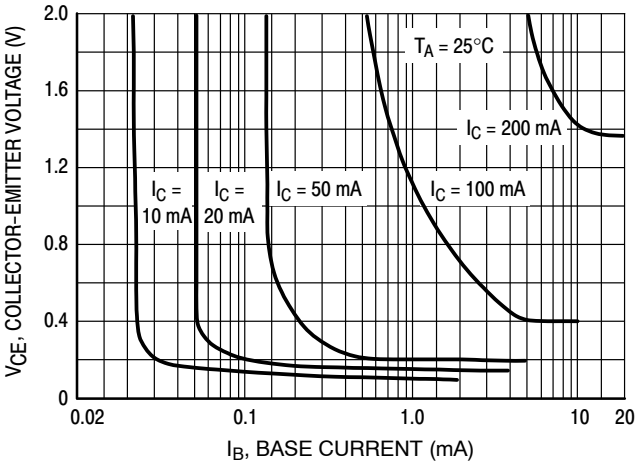


Figure 29. Collector Saturation Region

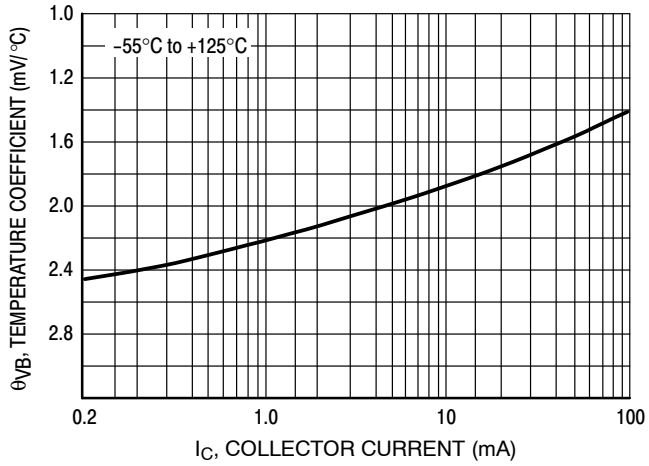


Figure 30. Base–Emitter Temperature Coefficient

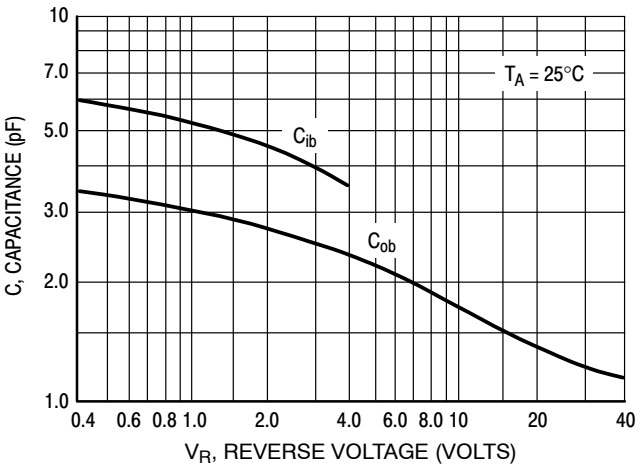


Figure 31. Capacitances

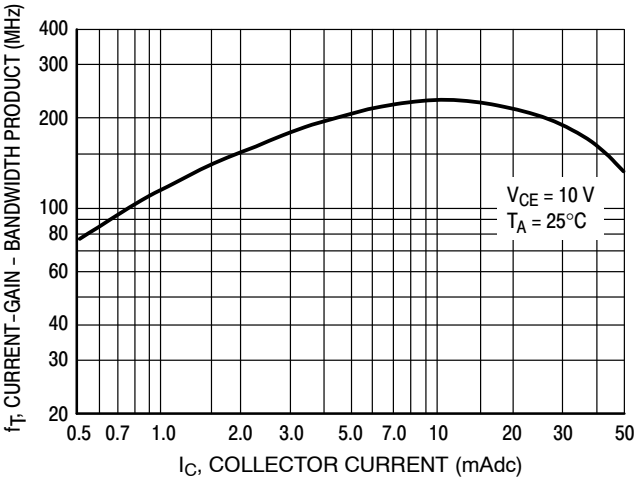


Figure 32. Current–Gain – Bandwidth Product

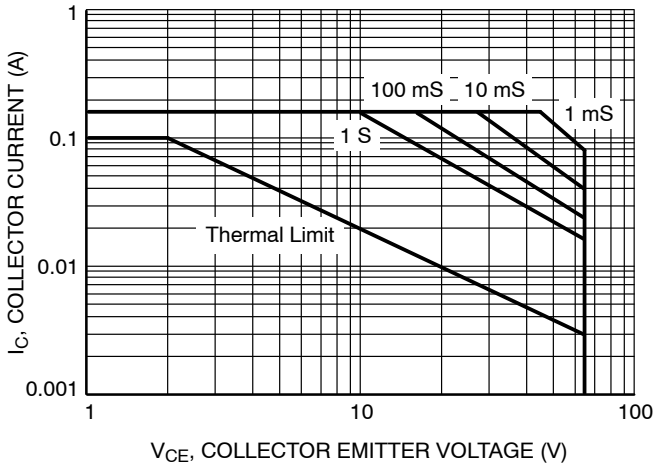


Figure 33. Safe Operating Area for LBC846A, LBC846B

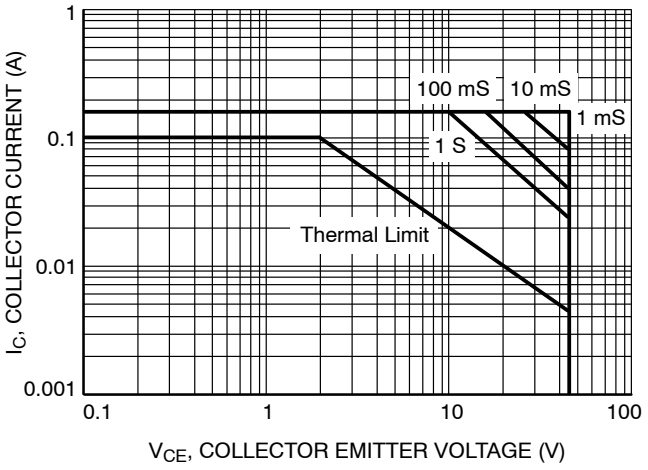


Figure 34. Safe Operating Area for LBC847A, LBC847B, LBC847C, LBC850B, LBC850C

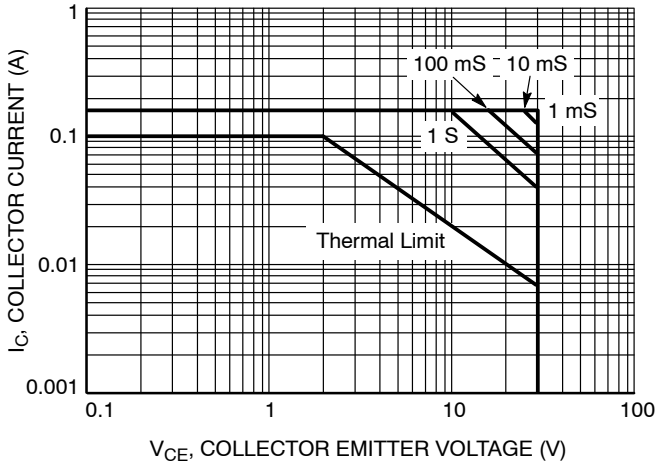
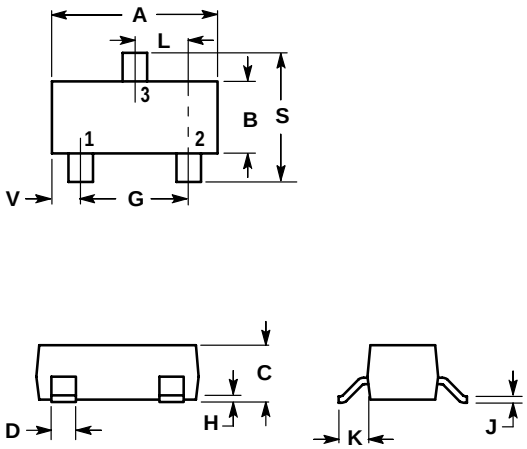


Figure 35. Safe Operating Area for LBC848A, LBC848B, LBC848C, LBC849B, LBC849C

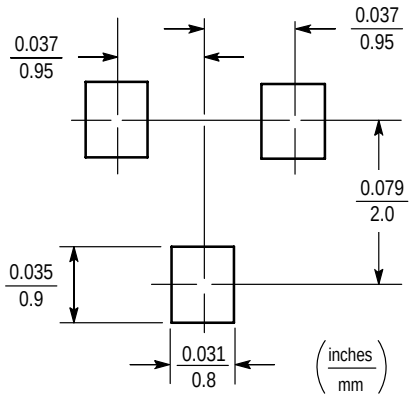
SOT-23



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60



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