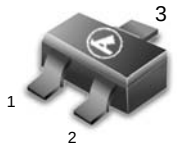
General Purpose Transistors

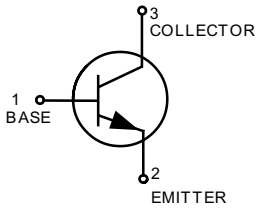
NPN Silicon

LBC846AWT1G Series

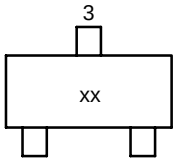
- Moisture Sensitivity Level: 1
- ESD Rating – Human Body Model: >4000 V
  – Machine Model: >400 V
- We declare that the material of product compliance with RoHS requirements.



SOT–323 /SC–70



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	150 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient (Note 1.)	$R_{\theta JA}$	833	°C/W
Junction and Storage Temperature Range	T_J, T_{stg}	–55 to +150	°C

LBC846AWT1G Series

DEVICE MARKING AND ORDERING INFORMATION

Device	Marking	Package	Shipping
LBC846AWT1G	1A	SC-70	3000/Tape&Reel
LBC846AWT3G	1A	SC-70	10000/Tape&Reel
LBC846BWT1G	1B	SC-70	3000/Tape&Reel
LBC846BWT3G	1B	SC-70	10000/Tape&Reel
LBC847AWT1G	1E	SC-70	3000/Tape&Reel
LBC847AWT3G	1E	SC-70	10000/Tape&Reel
LBC847BWT1G	1F	SC-70	3000/Tape&Reel
LBC847BWT3G	1F	SC-70	10000/Tape&Reel
LBC847CWT1G	1G	SC-70	3000/Tape&Reel
LBC847CWT3G	1G	SC-70	10000/Tape&Reel
LBC848AWT1G	1J	SC-70	3000/Tape&Reel
LBC848AWT3G	1J	SC-70	10000/Tape&Reel
LBC848BWT1G	1K	SC-70	3000/Tape&Reel
LBC848BWT3G	1K	SC-70	10000/Tape&Reel
LBC848CWT1G	1L	SC-70	3000/Tape&Reel
LBC848CWT3G	1L	SC-70	10000/Tape&Reel
LBC849BWT1G	2B	SC-70	3000/Tape&Reel
LBC849BWT3G	2B	SC-70	10000/Tape&Reel
LBC849CWT1G	2C	SC-70	3000/Tape&Reel
LBC849CWT3G	2C	SC-70	10000/Tape&Reel
LBC850BWT1G	2F	SC-70	3000/Tape&Reel
LBC850BWT3G	2F	SC-70	10000/Tape&Reel
LBC850CWT1G	2G	SC-70	3000/Tape&Reel
LBC850CWT3G	2G	SC-70	10000/Tape&Reel

LBC846AWT1G Series

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 = 10 μA, V_{CE} = 5.0 V)	LBC846A, LBC847A, LBC848A LBC846B, LBC847B, LBC848B LBC847C, LBC848C	h_{FE}	– – –	90 150 270	– – –	–
(I_C = 2.0 mA, V_{CE} = 5.0 V)	LBC846A, LBC847A, LBC848A LBC846B, LBC847B, LBC848B, LBC849B, LBC850B LBC847C, LBC848C, LBC849C, LBC850C		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

LBC846AWT1G Series

LBC847, LBC848, LBC849, LBC850

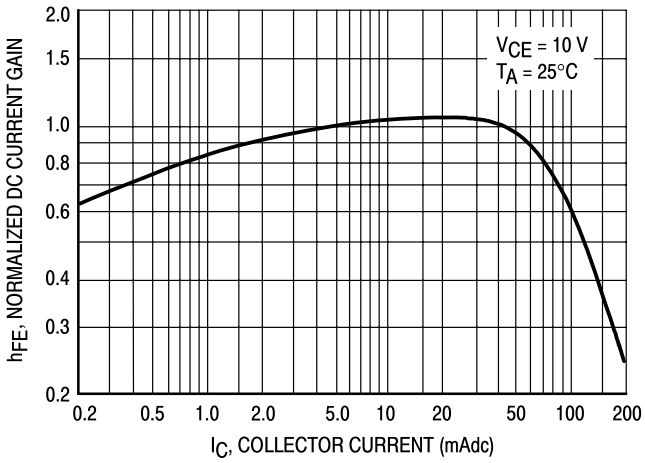


Figure 1. Normalized DC Current Gain

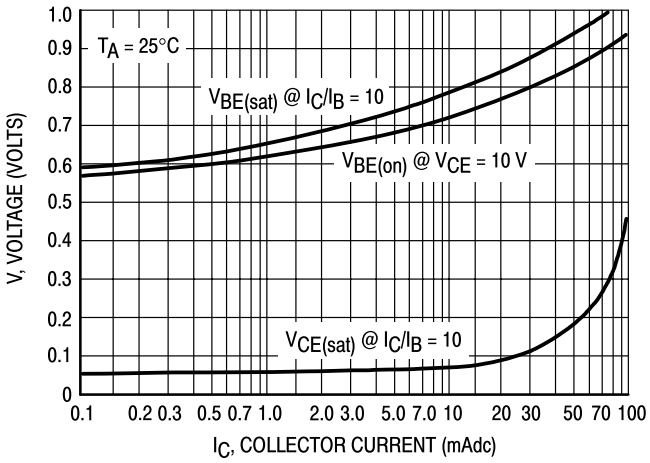


Figure 2. “Saturation” and “On” Voltages

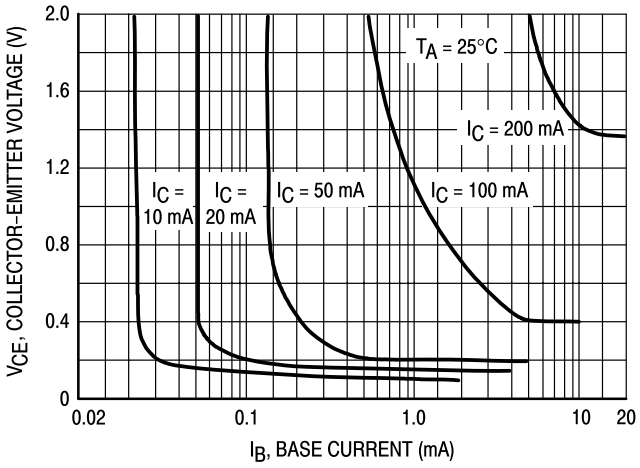


Figure 3. Collector Saturation Region

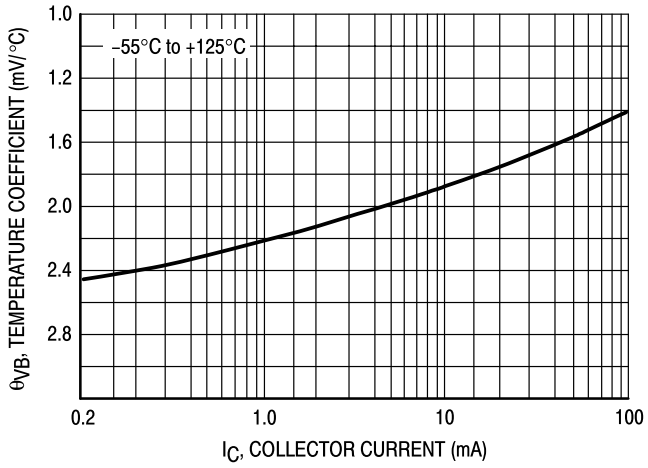


Figure 4. Base–Emitter Temperature Coefficient

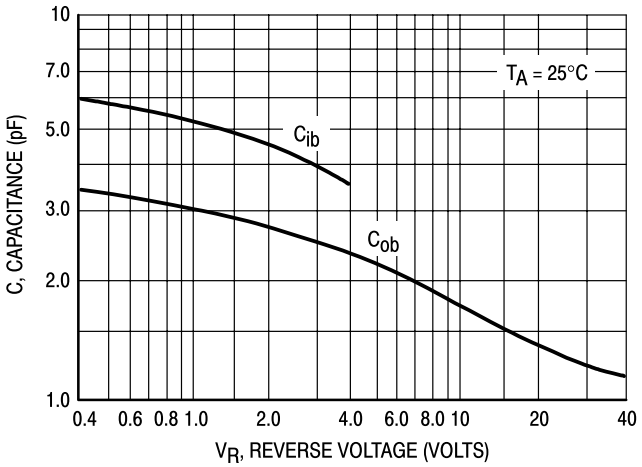


Figure 5. Capacitances

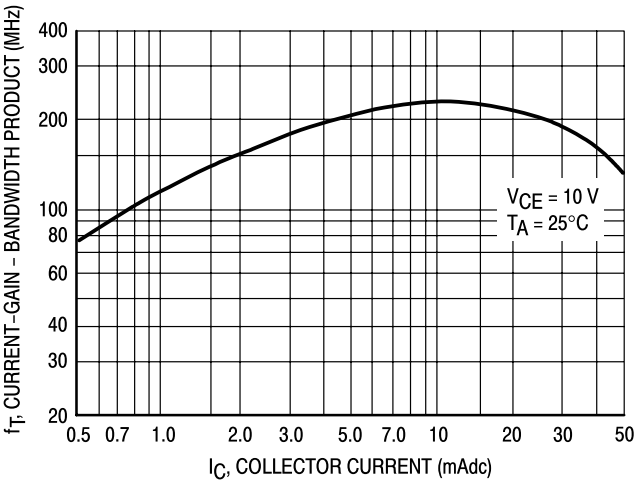


Figure 6. Current–Gain – Bandwidth Product

LBC846

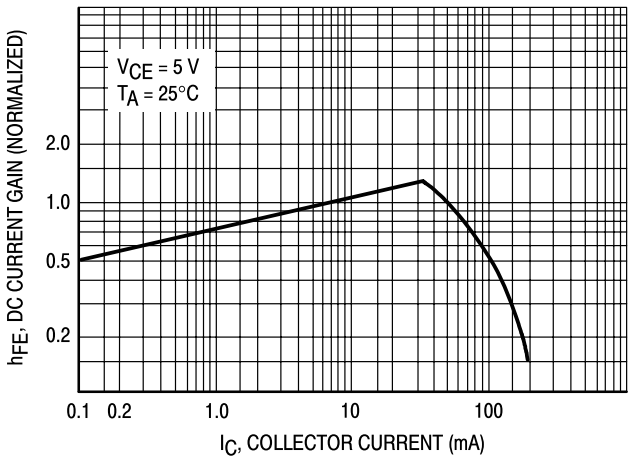


Figure 7. DC Current Gain

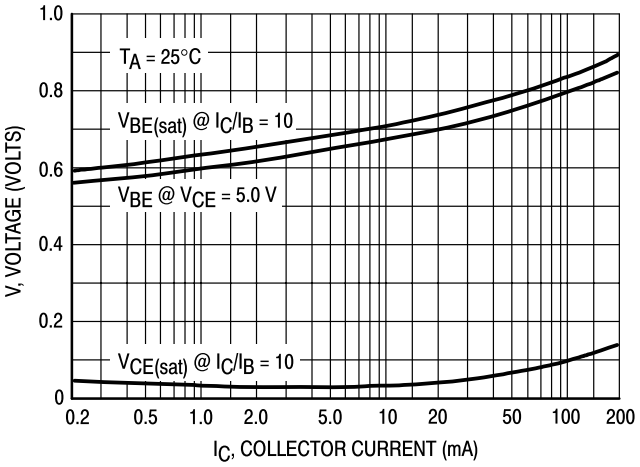


Figure 8. “On” Voltage

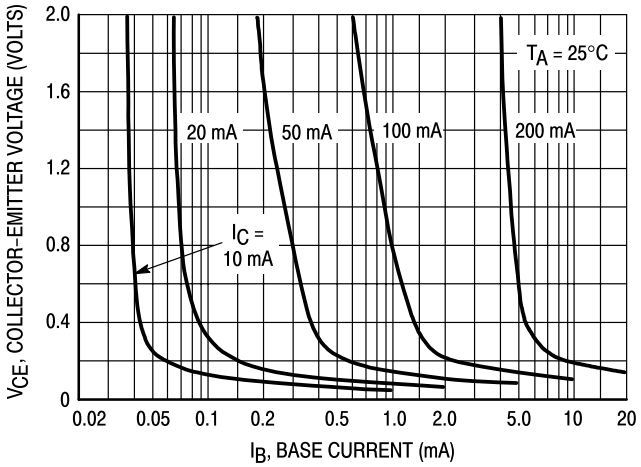


Figure 9. Collector Saturation Region

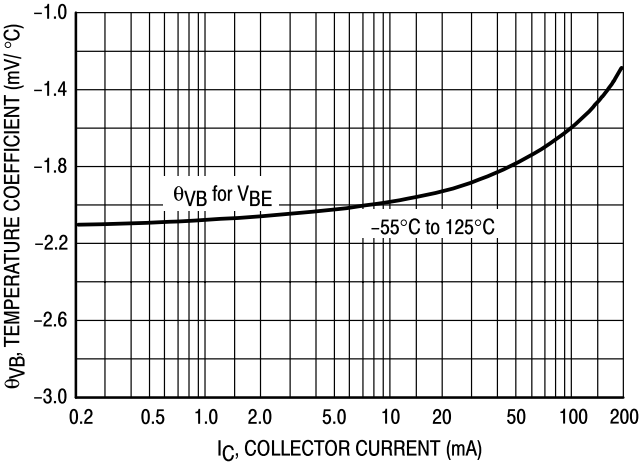


Figure 10. Base–Emitter Temperature Coefficient

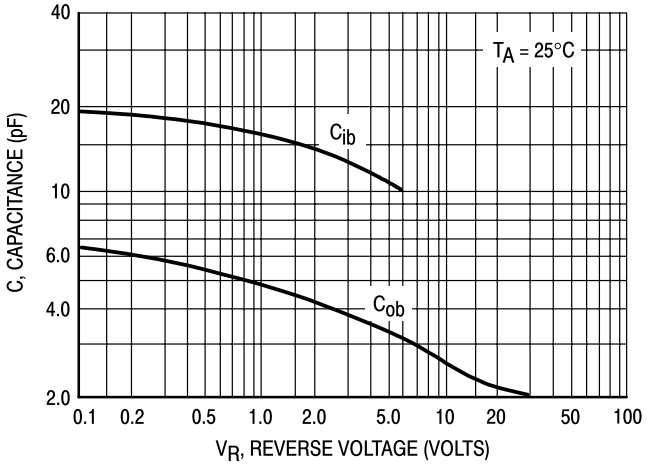


Figure 11. Capacitance

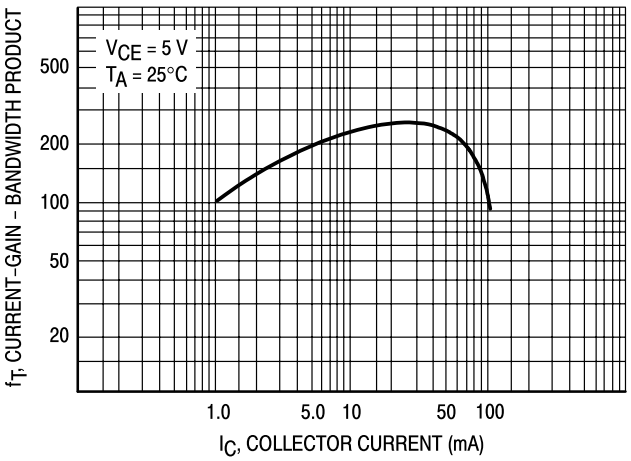
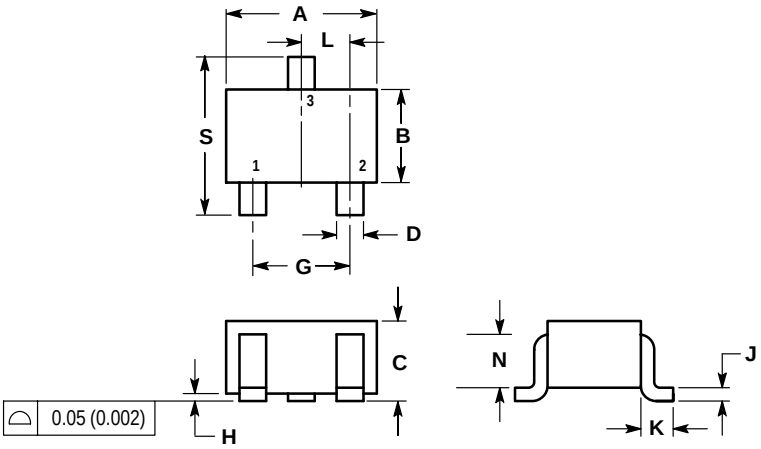


Figure 12. Current–Gain – Bandwidth Product

LBC846AWT1G Series

SC−70 / SOT−323



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.032	0.040	0.80	1.00
D	0.012	0.016	0.30	0.40
G	0.047	0.055	1.20	1.40
H	0.000	0.004	0.00	0.10
J	0.004	0.010	0.10	0.25
K	0.017 REF		0.425 REF	
L	0.026 BSC		0.650 BSC	
N	0.028 REF		0.700 REF	
S	0.079	0.095	2.00	2.40

PIN 1. BASE
2. EMITTER
3. COLLECTOR