

# General Purpose Transistors

## NPN Silicon

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Pb– Free Package May be Available. The G.Suffix Denotes a Pb– Free Lead Finish

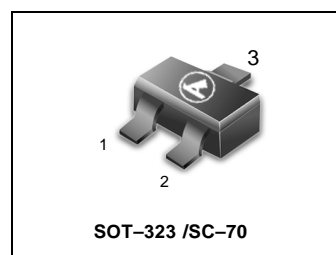
### ORDERING INFORMATION (Pb– Free)

Device	Package	Shipping
LBC846AWT1G,BWT1G	SOT-323	3000/Tape & Reel
LBC847AWT1G,BWT1G,CWT1G	SOT-323	3000/Tape & Reel
LBC848AWT1G,BWT1G,CWT1G	SOT-323	3000/Tape & Reel

### MAXIMUM RATINGS

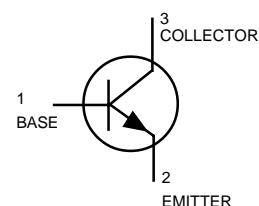
Rating	Symbol	BC846	BC847	BC848	Unit
Collector–Emitter Voltage	$V_{CEO}$	65	45	30	V
Collector–Base Voltage	$V_{CBO}$	80	50	30	V
Emitter–Base Voltage	$V_{EBO}$	6.0	6.0	5.0	V
Collector Current — Continuous	$I_C$	100	100	100	mAdc

LBC846AWT1,BWT1  
LBC847AWT1,BWT1  
CWT1  
LBC848AWT1,BWT1  
CWT1



### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR–5 Board, (1) $T_A = 25^\circ\text{C}$	$P_D$	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	$^\circ\text{C}/\text{W}$
Total Device Dissipation	$P_D$	2.4	mW/ $^\circ\text{C}$
Junction and Storage Temperature	$T_J, T_{stg}$	–55 to +150	$^\circ\text{C}$



### DEVICE MARKING

LBC846AWT1 = 1A; LBC846BWT1 = 1B; LBC847AWT1 = 1E; LBC847BWT1 = 1F;  
LBC847CWT1 = 1G; LBC848AWT1 = 1J; LBC848BWT1 = 1K; LBC848CWT1 = 1L

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage ( $I_C = 10\text{ mA}$ )	LBC846 Series	65	—	—	v
	LBC847 Series	45	—	—	
	LBC848 Series	30	—	—	
Collector–Emitter Breakdown Voltage ( $I_C = 10\ \mu\text{A}, V_{EB} = 0$ )	LBC846 Series	80	—	—	v
	LBC847 Series	50	—	—	
	LBC848 Series	30	—	—	
Collector–Base Breakdown Voltage ( $I_C = 10\ \mu\text{A}$ )	LBC846 Series	80	—	—	v
	LBC847 Series	50	—	—	
	LBC848 Series	30	—	—	
Emitter–Base Breakdown Voltage ( $I_E = 1.0\ \mu\text{A}$ )	LBC846 Series	6.0	—	—	v
	LBC847 Series	6.0	—	—	
	LBC848 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	$\mu\text{A}$

1.FR–5=1.0 x 0.75 x 0.062in

LBC846AWT1,BWT1 LBC847AWT1,BWT1 CWT1 LBC848AWT1,BWT1,CWT1

ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V)	h <sub>FE</sub>	—	90	—	—
LBC846A, LBC847A, LBC848A		—	150	—	—
LBC846B, LBC847B, LBC848B LBC847C, LBC848C		—	270	—	—
(I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 5.0 V)	h <sub>FE</sub>	110	180	220	—
LBC846A, LBC847A, LBC848A		200	290	450	—
LBC846B, LBC847B, LBC848B LBC847C, LBC848C		420	520	800	—
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0.5 mA) (I <sub>C</sub> = 100 mA, I <sub>B</sub> = 5.0 mA)	V <sub>CE(sat)</sub>	—	—	0.25 0.6	V
Base–Emitter Saturation Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0.5 mA) (I <sub>C</sub> = 100 mA, I <sub>B</sub> = 5.0 mA)	V <sub>BE(sat)</sub>	—	0.7 0.9	—	V
Base–Emitter Voltage (I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 5.0 V) (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 V)	V <sub>BE(on)</sub>	580	660	700 770	mV

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 Vdc, f = 100 MHz)	f <sub>T</sub>	100	—	—	MHz
Output Capacitance (V <sub>CB</sub> = 10 V, f = 1.0 MHz)	C <sub>obo</sub>	—	—	4.5	pF
Noise Figure (I <sub>C</sub> = 0.2 mA, V <sub>CE</sub> = 5.0 Vdc, R <sub>S</sub> = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz)	NF	—	—	10 4.0	dB
					LBC846A, LBC847A, LBC848A LBC846B, LBC847B, LBC848B LBC847C, LBC848C

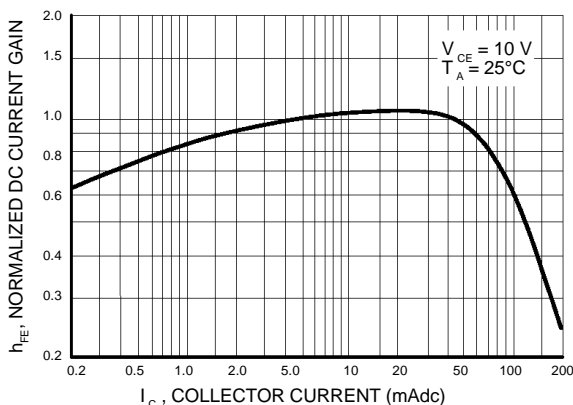


Figure 1. Normalized DC Current Gain

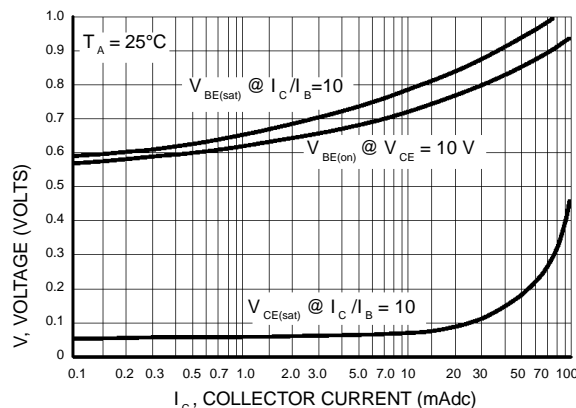


Figure 2. "Saturation" and "On" Voltages

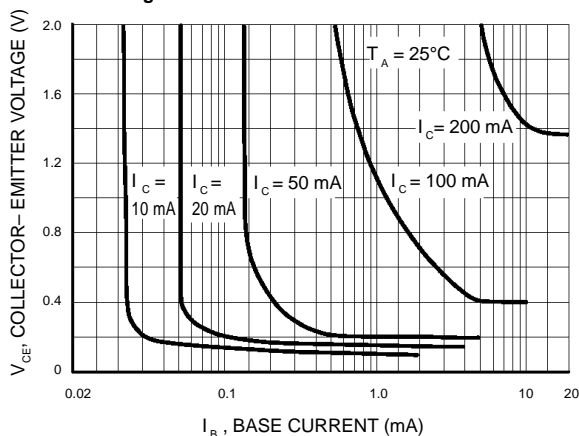


Figure 3. Collector Saturation Region

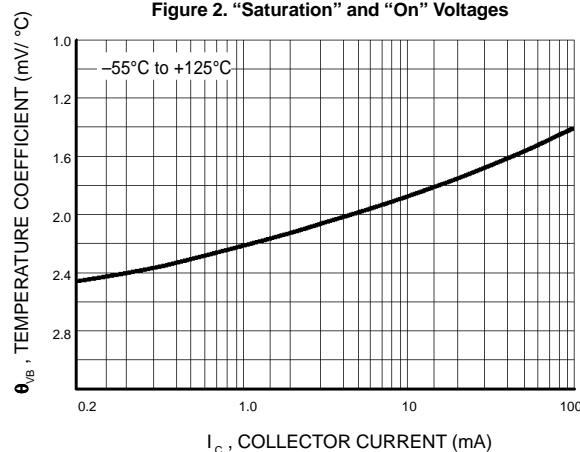


Figure 4. Base–Emitter Temperature Coefficient

LBC846AWT1, BWT1 LBC847AWT1, BWT1, CWT1 LBC848AWT1, BWT1, CWT1

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LBC847/LBC848

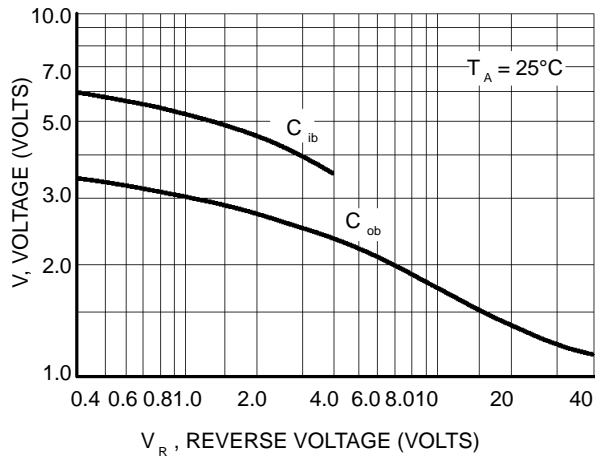


Figure 5. Capacitances

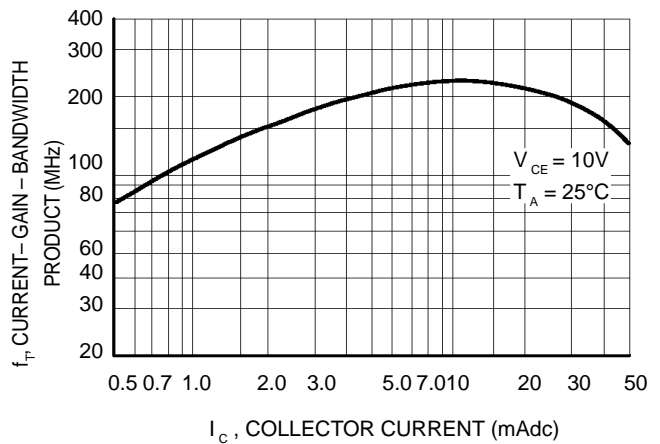


Figure 6. Current-Gain - Bandwidth Product

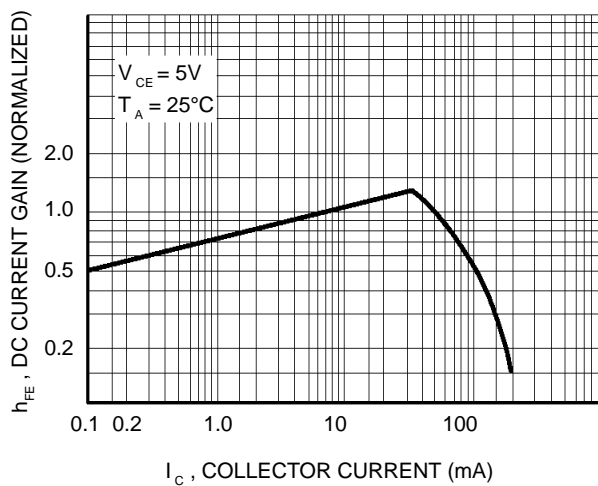


Figure 7. DC Current Gain

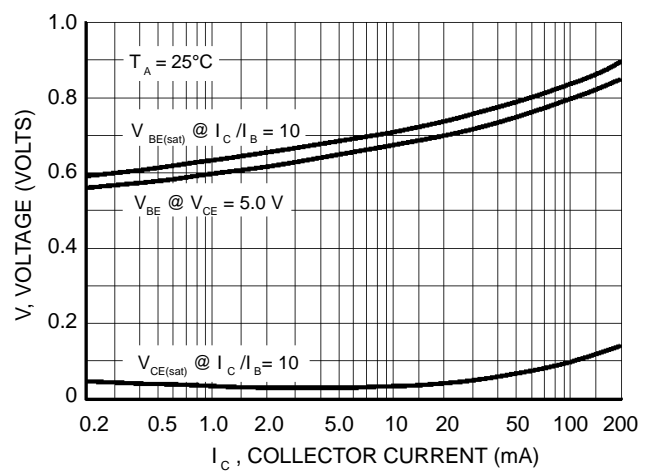


Figure 8. "On" Voltage

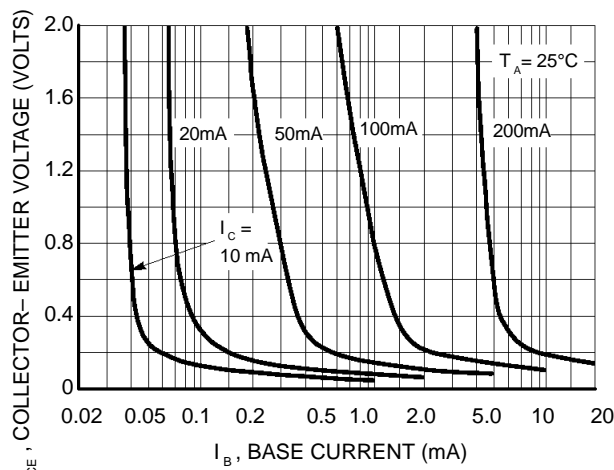


Figure 9. Collector Saturation Region

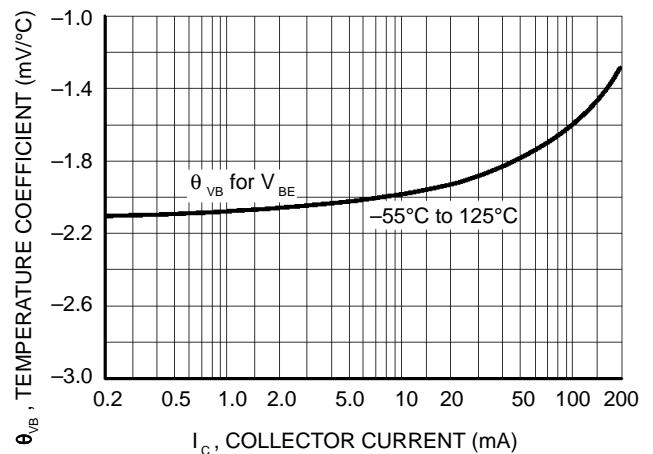


Figure 10. Base-Emitter Temperature Coefficient

LBC846AWT1, BWT1 LBC847AWT1, BWT1, CWT1 LBC848AWT1, BWT1, CWT1

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LBC846

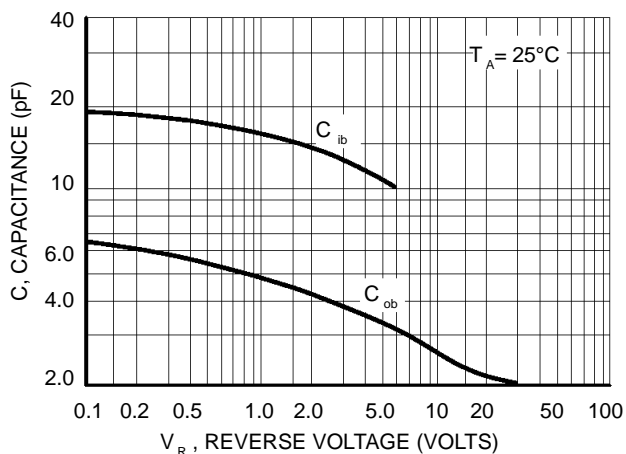


Figure 11. Capacitance

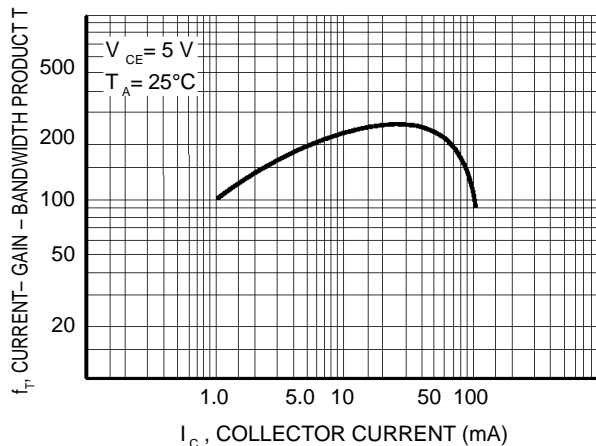
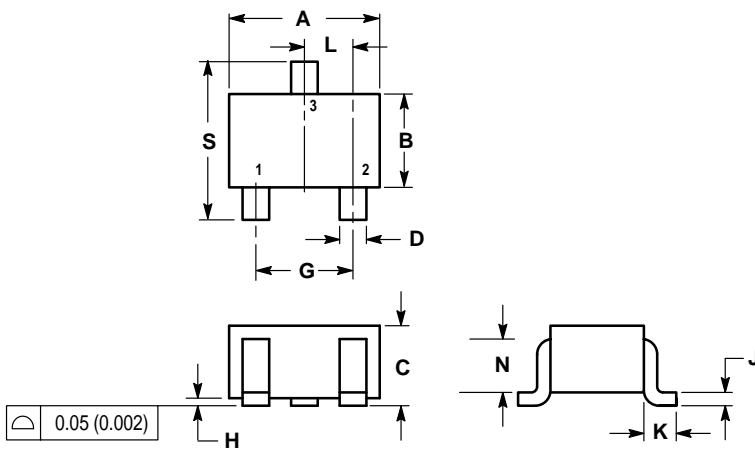


Figure 12. Current-Gain - Bandwidth Product

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

