Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

BC846ALT1 Series

BC846, BC847 and BC848 are Preferred Devices

General Purpose Transistors

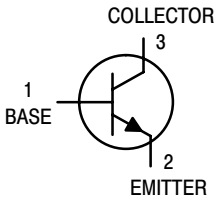
NPN Silicon

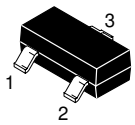
ON Semiconductor®

http://onsemi.com

Features

- Pb−Free Packages are Available
- Moisture Sensitivity Level: 1
- ESD Rating − Human Body Model: >4000 V
  − Machine Model: >400 V





SOT−23
CASE 318
STYLE 6

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC846 BC847, BC850 BC848, BC849	V_{CEO}	 65 45 30	Vdc
Collector−Base Voltage BC846 BC847, BC850 BC848, BC849	V_{CBO}	 80 50 30	Vdc
Emitter−Base Voltage BC846 BC847, BC850 BC848, BC849	V_{EBO}	 6.0 6.0 5.0	Vdc
Collector Current − Continuous	I_C	100	mAdc

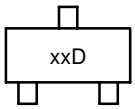
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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 × 0.75 × 0.062 in.
2. Alumina = 0.4 × 0.3 × 0.024 in 99.5% alumina.

MARKING DIAGRAM



xx = Specific Device Code
D = Date Code

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

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)	BC846A,B	$V_{(BR)CEO}$	65	–	–	V
	BC847A,B,C, BC850B,C		45	–	–	
	BC848A,B,C, BC849B,C		30	–	–	
Collector – Emitter Breakdown Voltage (I_C = 10 μA, V_{EB} = 0)	BC846A,B	$V_{(BR)CES}$	80	–	–	V
	BC847A,B,C BC850B,C		50	–	–	
	BC848A,B,C, BC849B,C		30	–	–	
Collector – Base Breakdown Voltage (I_C = 10 μA)	BC846A,B	$V_{(BR)CBO}$	80	–	–	V
	BC847A,B,C, BC850B,C		50	–	–	
	BC848A,B,C, BC849B,C		30	–	–	
Emitter – Base Breakdown Voltage (I_E = 1.0 μA)	BC846A,B	$V_{(BR)EBO}$	6.0	–	–	V
	BC847A,B,C, BC850B,C		6.0	–	–	
	BC848A,B,C, BC849B,C		5.0	–	–	
Collector Cutoff Current (V_{CB} = 30 V)		I_{CBO}	–	–	15	nA
(V_{CB} = 30 V, T_A = 150°C)			–	–	5.0	μA
ON CHARACTERISTICS						
DC Current Gain (I_C = 10 μA, V_{CE} = 5.0 V)	BC846A, BC847A, BC848A	h_{FE}	–	90	–	–
	BC846B, BC847B, BC848B		–	150	–	
	BC847C, BC848C		–	270	–	
(I_C = 2.0 mA, V_{CE} = 5.0 V)	BC846A, BC847A, BC848A		110	180	220	
	BC846B, BC847B, BC848B, BC849B, BC850B		200	290	450	
	BC847C, BC848C, BC849C, BC850C		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				dB
	BC846A,B, BC847A,B,C, BC848A,B,C		–	–	10	
	BC849B,C, BC850B,C		–	–	4.0	

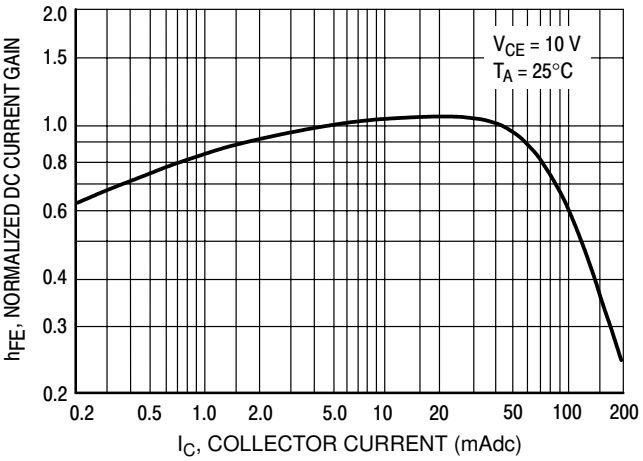


Figure 1. Normalized DC Current Gain

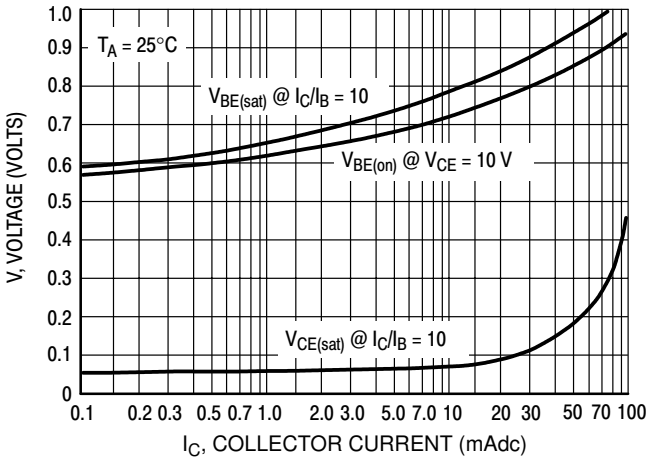


Figure 2. "Saturation" and "On" Voltages

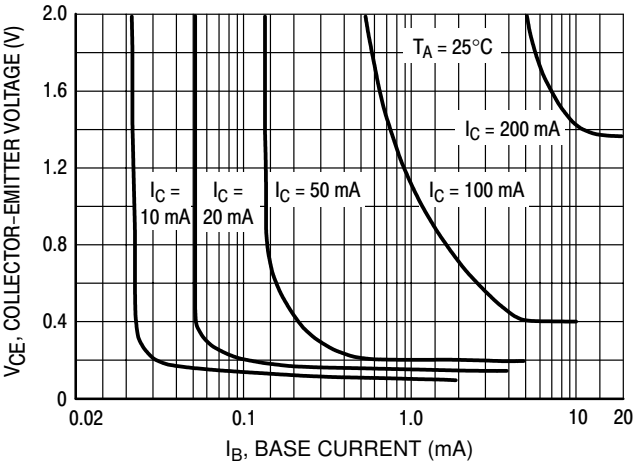


Figure 3. Collector Saturation Region

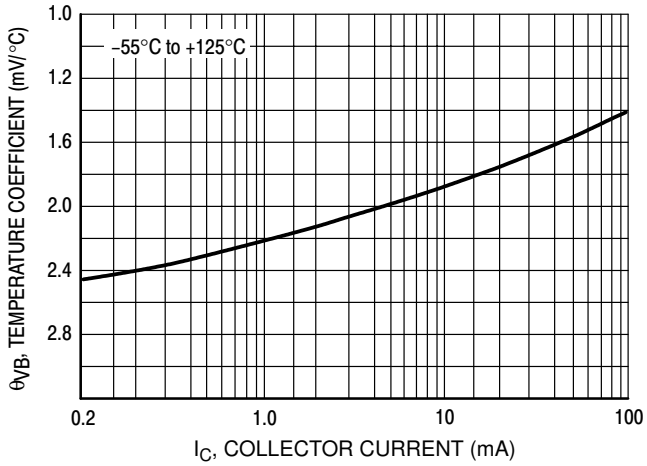


Figure 4. Base−Emitter Temperature Coefficient

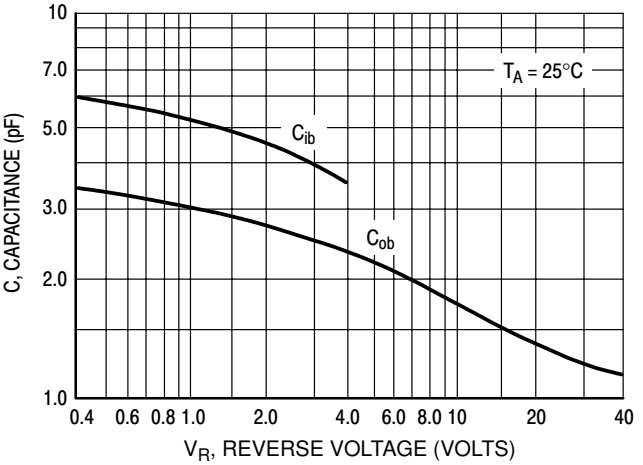


Figure 5. Capacitances

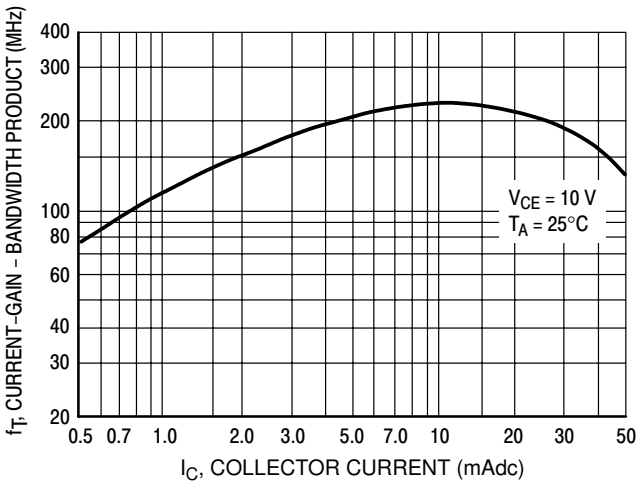


Figure 6. Current−Gain − Bandwidth Product

BC846

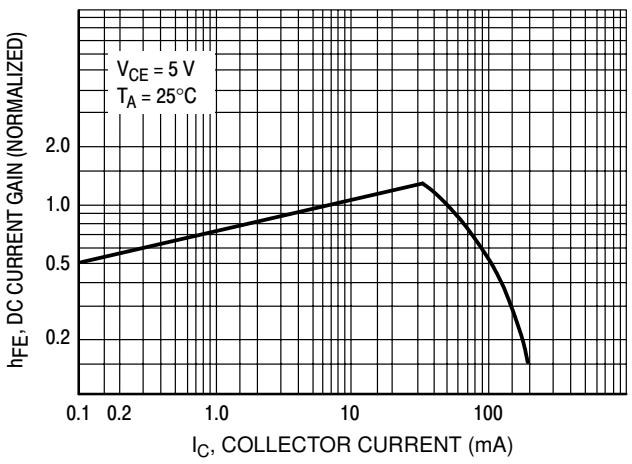


Figure 7. DC Current Gain

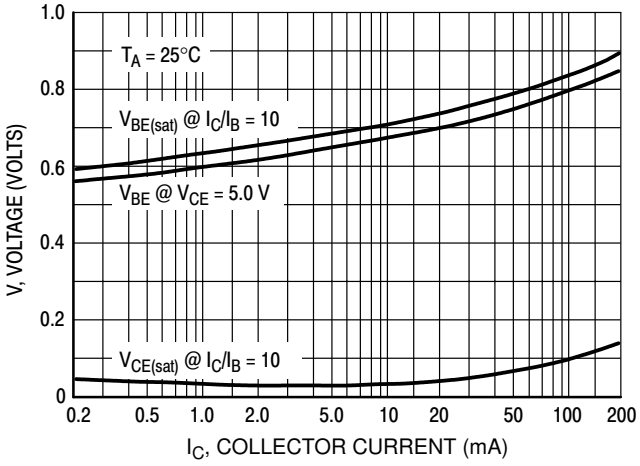


Figure 8. "On" Voltage

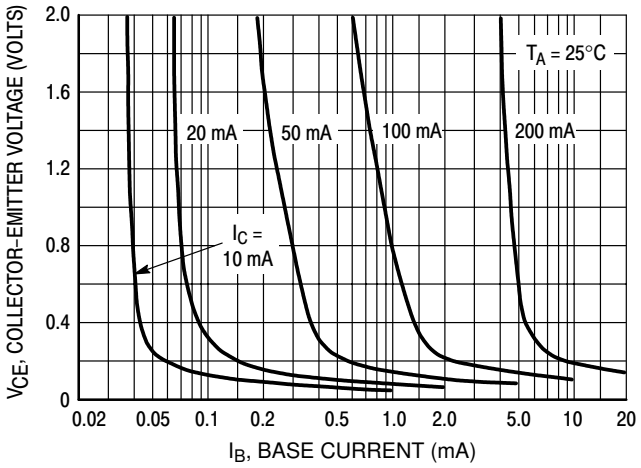


Figure 9. Collector Saturation Region

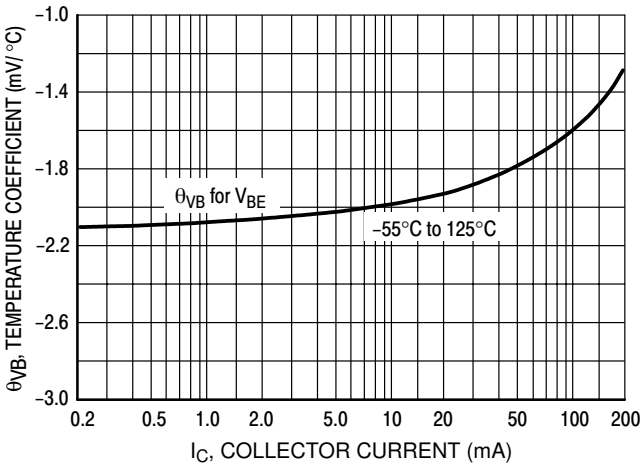


Figure 10. Base−Emitter Temperature Coefficient

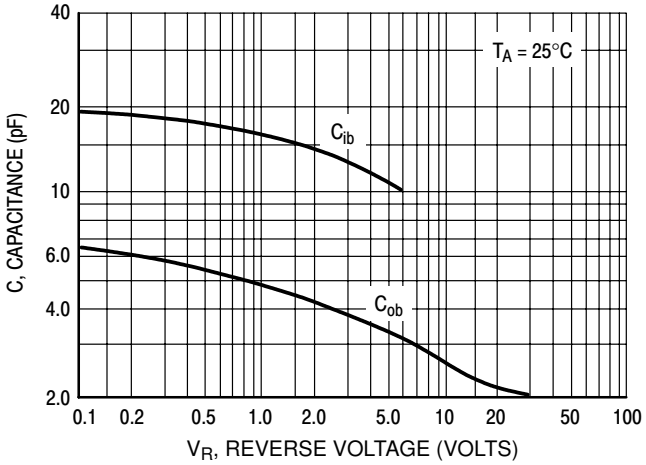


Figure 11. Capacitance

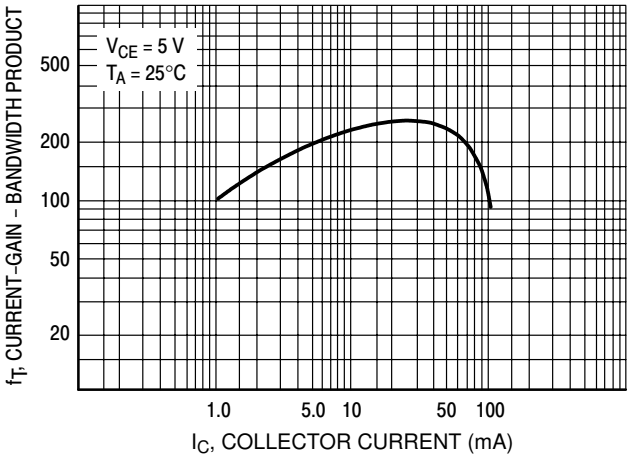


Figure 12. Current−Gain − Bandwidth Product

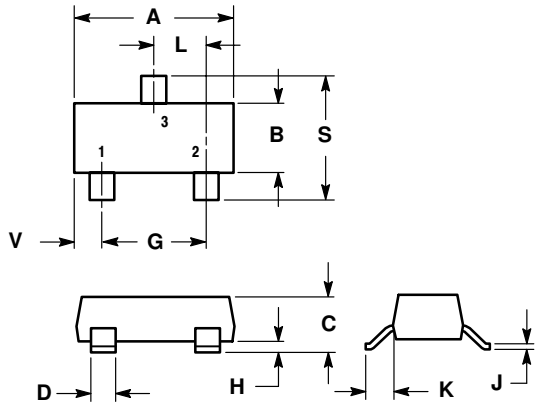
ORDERING INFORMATION

Device	Marking	Package	Shipping†
BC846ALT1	1A	SOT−23	3,000 / Tape & Reel
BC846ALT3	1A	SOT−23	10,000 / Tape & Reel
BC846BLT1	1B	SOT−23	3,000 / Tape & Reel
BC846BLT3	1B	SOT−23	10,000 / Tape & Reel
BC847ALT1	1E	SOT−23	3,000 / Tape & Reel
BC847ALT1G	1E	SOT−23 (Pb−Free)	
BC847BLT1	1F	SOT−23	3,000 / Tape & Reel
BC847CLT1	1G	SOT−23	3,000 / Tape & Reel
BC847CLT1G	1G	SOT−23 (Pb−Free)	
BC847CLT3	1G	SOT−23	10,000 / Tape & Reel
BC847CLT3G	1G	SOT−23 (Pb−Free)	
BC848ALT1	1J	SOT−23	3,000 / Tape & Reel
BC848ALT1G	1J	SOT−23 (Pb−Free)	3,000 / Tape & Reel
BC848BLT1	1K	SOT−23	3,000 / Tape & Reel
BC848BLT3	1K	SOT−23	10,000 / Tape & Reel
BC848CLT1	1L	SOT−23	3,000 / Tape & Reel
BC848CLT1G	1L	SOT−23 (Pb−Free)	
BC849BLT1	2B	SOT−23	3,000 / Tape & Reel
BC849BLT3	2B	SOT−23	10,000 / Tape & Reel
BC849CLT1	2C	SOT−23	3,000 / Tape & Reel
BC849CLT1G	2C	SOT−23 (Pb−Free)	3,000 / Tape & Reel
BC850BLT1	2F	SOT−23	3,000 / Tape & Reel
BC850CLT1	2G	SOT−23	3,000 / Tape & Reel
BC850CLT1G	2G	SOT−23 (Pb−Free)	

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

PACKAGE DIMENSIONS

SOT−23 (TO−236)
CASE 318−09
ISSUE AI

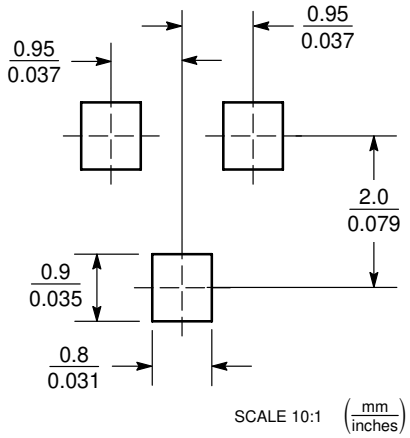


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. 318−01, −02, AND −06 OBSOLETE, NEW STANDARD 318−09.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0385	0.0498	0.99	1.26
D	0.0140	0.0200	0.36	0.50
G	0.0670	0.0826	1.70	2.10
H	0.0040	0.0098	0.10	0.25
J	0.0034	0.0070	0.085	0.177
K	0.0180	0.0236	0.45	0.60
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.0984	2.10	2.50
V	0.0177	0.0236	0.45	0.60

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

SOLDERING FOOTPRINT*



*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.

BC846ALT1/D