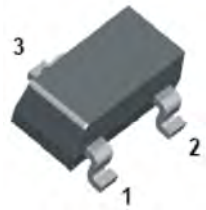
BC847BLD

SMALL SIGNAL NPN TRANSISTOR WITH CONTROLLED BASE-EMITTER VOLTAGE

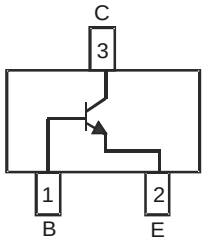
Please click here to visit our online spice models database.

Features

- Low Deviation in Base-Emitter Voltage
- Surface Mount Package
- Ideally Suited for Automated Assembly Processes
- **Lead Free by Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**



SOT-23



Schematic & Pin Configuration

Mechanical Data

- Case: SOT-23
- Case material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminal Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.008 grams (approximate)

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	45	V
Emitter-Base Voltage	V_{EBO}	6	V
Output Current - Continuous (Note 3)	I_C	200	mA
Peak Collector Current	I_{CM}	200	mA
Peak Emitter Current	I_{EM}	200	mA
Power Dissipation (Note 3)	P_d	300	mW
Power Deration	P_{der}	2.4	mW/°C

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient Air (Note 3)	$R_{\theta JA}$	417	°C/W
Operating and Storage Junction Temperature Range	T_j, T_{STG}	-55 to +150	°C

Notes:
1. No purposefully added lead.
2. Diode's Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on page 4 or on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.

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Electrical Characteristics: NPN Transistor @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50	—	—	V	I_C = 10μA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	45	—	—	V	I_C = 1.0mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6	—	—	V	I_E = 10μA, I_C = 0
Collector Cutoff Current	I_{CEX}	—	—	15	nA	V_{CE} = 50V, $V_{EB(OFF)}$ = 3.0V
Base Cutoff Current (I_{BEX})	I_{BL}	—	—	15	nA	V_{CE} = 40V, $V_{EB(OFF)}$ = 3.0V
Collector-Base Cut Off Current	I_{CBO}	—	—	15	nA	V_{CB} = 40V, I_E = 0
				5	μA	V_{CB} = 30V, T_A = 150°C
Collector-Emitter Cut Off Current, $I_{O(OFF)}$	I_{CEO}	—	—	50	nA	V_{CE} = 40V, I_B = 0
Emitter-Base Cut Off Current	I_{EBO}	—	—	50	nA	V_{EB} = 5V, I_C = 0
ON CHARACTERISTICS (Note 4)						
DC Current Gain	h_{fe}	180	—	—	—	V_{CE} = 5V, I_C = 100μA
		150	—	—	—	V_{CE} = 5V, I_C = 500μA
		220	—	—	—	V_{CE} = 5V, I_C = 1mA
		220	—	—	—	V_{CE} = 5V, I_C = 2mA
		150	—	—	—	V_{CE} = 5V, I_C = 5mA
		150	—	—	—	V_{CE} = 5V, I_C = 10mA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	0.09	0.18	V	I_C = 10mA, I_B = 0.5mA
		—	0.2	0.4	V	I_C = 100mA, I_B = 5mA
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	647	657	667	mV	V_{CE} = 5V, I_C = 2mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	0.8	V	I_C = 10mA, I_B = 0.5mA
		—	—	0.9	V	I_C = 100mA, I_B = 5mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{OBO}	—	3	—	pF	V_{CB} = 5.0V, f = 1.0 MHz, I_E = 0
Input Impedance	h_{ie}	—	4.5	—	KΩ	V_{CE} = 5.0V, I_C = 2mA, f = 1.0KHz
Voltage Feedback Ratio	h_{re}	—	2	—	x 10E-4	
Small Signal Current Gain	h_{fe}	—	200	—	—	
Output Admittance	h_{oe}	—	30	—	μS	
Current Gain-Bandwidth Product	f_T	100	—	—	MHz	V_{CE} = 20V, I_C = 10 mA, f = 100 MHz
Noise Figure	NF	—	—	10	dB	V_{CE} = 5V, I_C = 100μA, R_S = 1KΩ, f = 1kHz

Notes: 4. Short duration pulse test used to minimize self-heating effect.

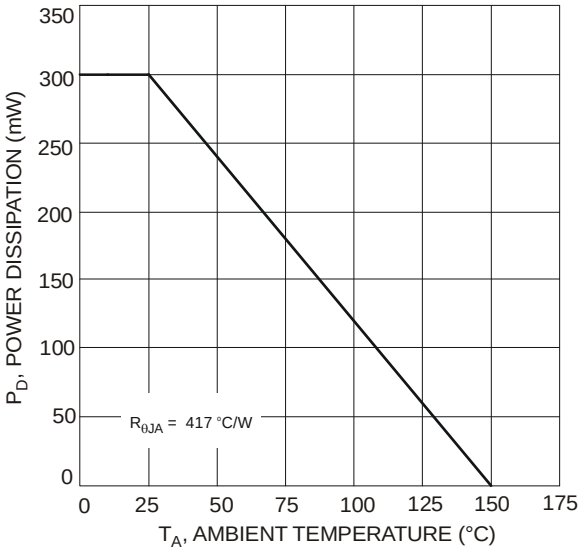

Fig. 1 Maximum Power Dissipation vs. Ambient Temperature

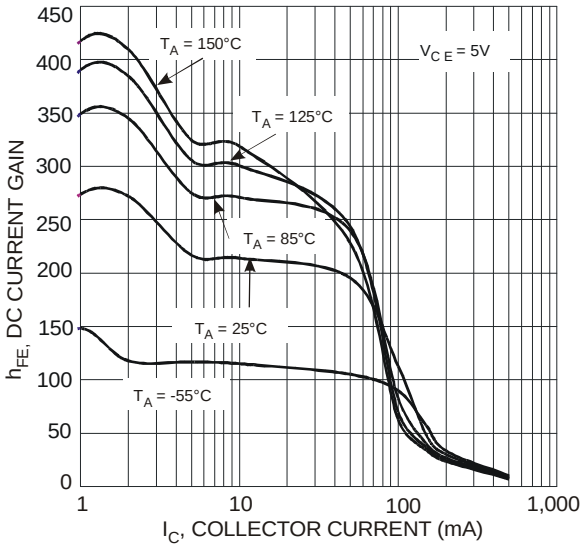

Fig. 2 Typical h_{FE} vs. I_C

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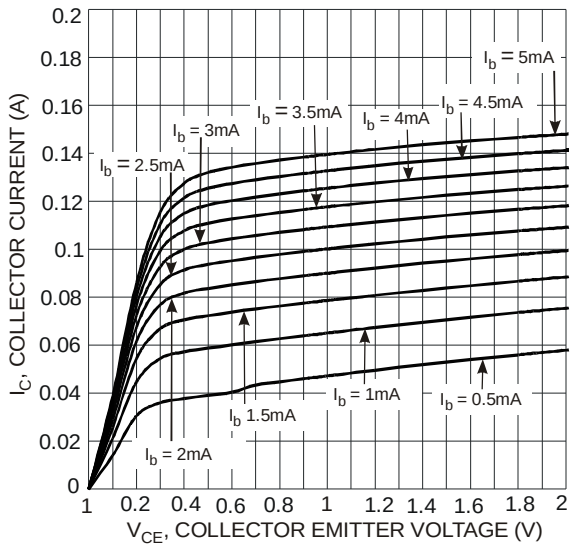


Fig. 3 Typical I_C vs. V_{CE}

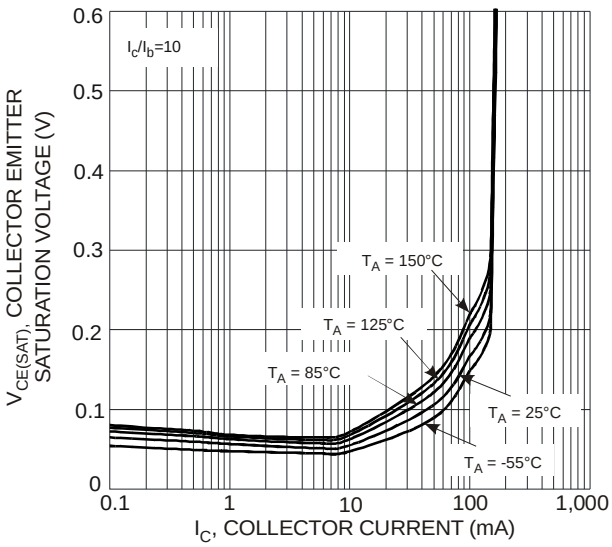


Fig. 4 Typical $V_{CE(SAT)}$ vs. I_C

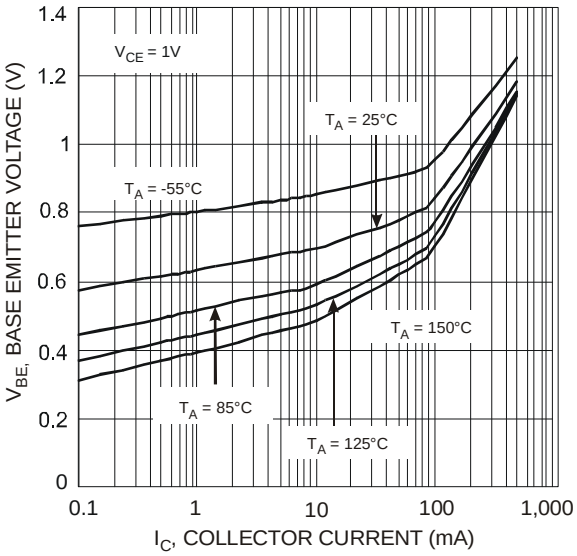


Fig. 5 Typical V_{BE} vs. I_C

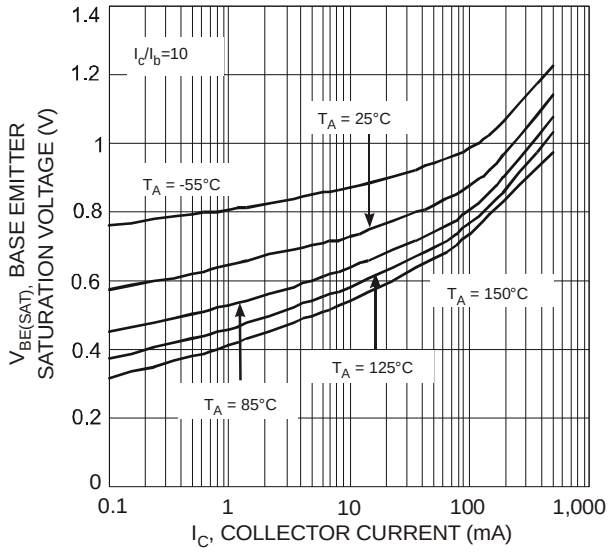


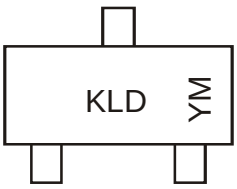
Fig. 6 Typical $V_{BE(SAT)}$ vs. I_C

Ordering Information (Note 5)

Device	Packaging	Shipping
BC847BLD-7	SOT-23	3000/Tape & Reel

Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



KLD = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: T = 2006
M = Month ex: 9 = September

Date Code Key

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Code	T	U	V	W	X	Y	Z	A	B	C

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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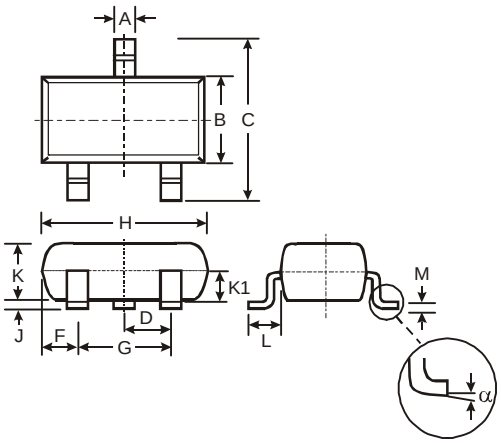
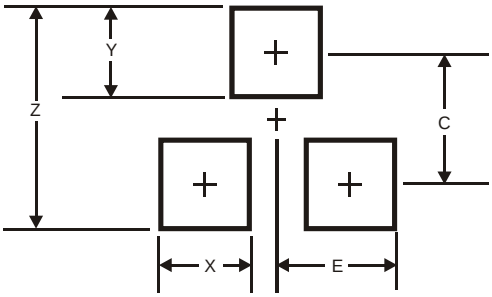
Mechanical Details



SOT-23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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