



BC847AT, BT, CT

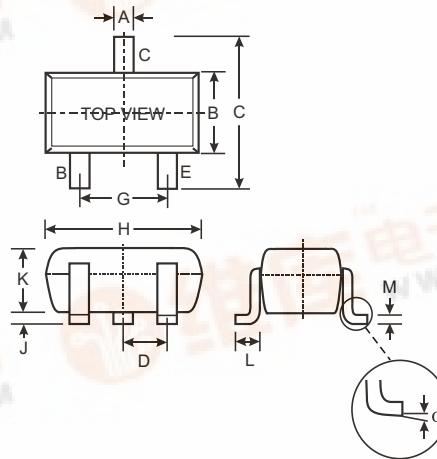
NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

Epitaxial Die Construction
Complementary PNP Type Available (BC857AT,BT,CT)
Ultra-Small Surface Mount Package
Lead Free/RoHS Compliant (Note 2)

Mechanical Data

Case: SOT-523
Case Material - Molded Plastic. UL Flammability Classification Rating 94V-0
Moisture Sensitivity: Level 1 per J-STD-020C
Terminals: Solderable per MIL-STD-202, Method 208
Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
Terminal Connections: See Diagram
Marking Code: See Table Below & Diagram on Page 2
Ordering Information: See Page 2
Date Code Information: See Page 2
Weight: 0.002 grams (approximate)



SOT-523			
Dim	Min	Max	Typ
A	0.15	0.30	0.22
B	0.75	0.85	0.80
C	1.45	1.75	1.60
D			0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
J	0.00	0.10	0.05
K	0.60	0.80	0.75
L	0.10	0.30	0.22
M	0.10	0.20	0.12
N	0.45	0.65	0.50
	0	8	
All Dimensions in mm			

Type	Marking
BC847AT	1E
BC847BT	1F
BC847CT	1M

Maximum Ratings @ $T_A = 25^\circ\text{C}$ 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}	6.0	V
Collector Current	I_C	100	mA
Power Dissipation (Note 1)	P_d	150	mW
Thermal Resistance, Junction to Ambient (Note 1)	R_{JA}	833	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
- Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 - No purposefully added lead.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

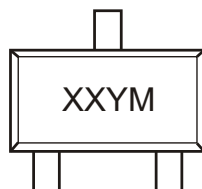
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
DC Current Gain (Note 3)						
Current Gain A	h_{FE}	—	—	—	—	$V_{CE} = 5.0\text{V}$, $I_C = 2.0\text{mA}$
B		—	150	—		
C		—	270	—		
Current Gain A		110	—	220		
B		200	290	450		
C		420	520	800		
Collector-Emitter Saturation Voltage (Note 3)	$V_{CE(SAT)}$	—	—	250 600	mV	$I_C = 10\text{mA}$, $I_B = 0.5\text{mA}$ $I_C = 100\text{mA}$, $I_B = 5.0\text{mA}$
Base-Emitter Saturation Voltage (Note 3)	$V_{BE(SAT)}$	—	700 900	—	mV	$I_C = 10\text{mA}$, $I_B = 0.5\text{mA}$ $I_C = 100\text{mA}$, $I_B = 5.0\text{mA}$
Base-Emitter Voltage (Note 3)	V_{BE}	580 —	660 —	700 770	mV	$V_{CE} = 5.0\text{V}$, $I_C = 2.0\text{mA}$ $V_{CE} = 5.0\text{V}$, $I_C = 10\text{mA}$
Collector-Emitter Cutoff Current (Note 3)	I_{CBO} I_{CBO}	—	—	15 5.0	nA μA	$V_{CB} = 30\text{V}$ $V_{CB} = 30\text{V}$, $T_A = 150^\circ\text{C}$
Gain Bandwidth Product	f_T	100	—	—	MHz	$V_{CE} = 5.0\text{V}$, $I_C = 10\text{mA}$, $f = 100\text{MHz}$
Output Capacitance	C_{OBO}	—	—	4.5	pF	$V_{CB} = 10\text{V}$, $f = 1.0\text{MHz}$
Noise Figure	BC847BT BC847CT	NF	—	10 4.0	dB	$V_{CE} = 5\text{V}$, $R_S = 2.0\text{k}$ $f = 1.0\text{kHz}$, $BW = 200\text{Hz}$

Notes: 3. Short duration pulse test used to minimize self-heating effect.

Ordering Information (Note 4)

Device	Packaging	Shipping
BC847AT-7-F	SOT-523	3000/Tape & Reel
BC847BT-7-F	SOT-523	3000/Tape & Reel
BC847CT-7-F	SOT-523	3000/Tape & Reel

Notes: 4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information


XX = Product Type Marking Code (See Page 1), e.g. 1E = BC847AT
 YM = Date Code Marking
 Y = Year (ex: N = 2002)
 M = Month (ex: 9 = September)

Date Code Key

Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	J	K	L	M	N	P	R	S	T	U	V	W	X	Y	Z

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

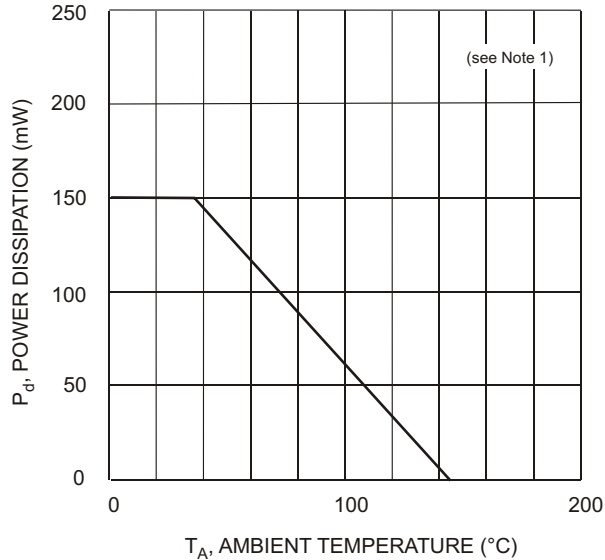


Fig. 1, Power Derating Curve

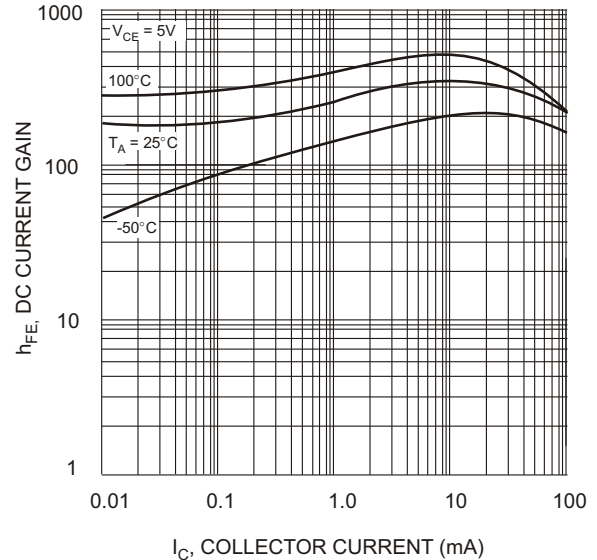


Fig. 2, DC Current Gain vs Collector Current

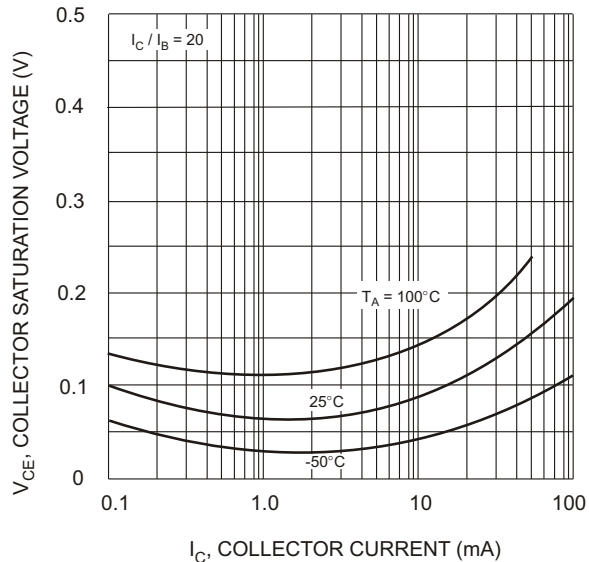


Fig. 3, Collector Saturation Voltage vs Collector Current

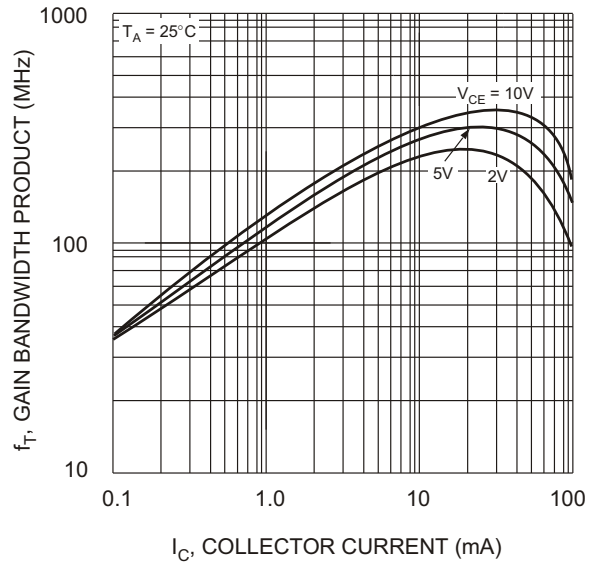


Fig. 4, Gain Bandwidth Product vs Collector Current

Notes: 1. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown 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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