BC847AT, BT, CT

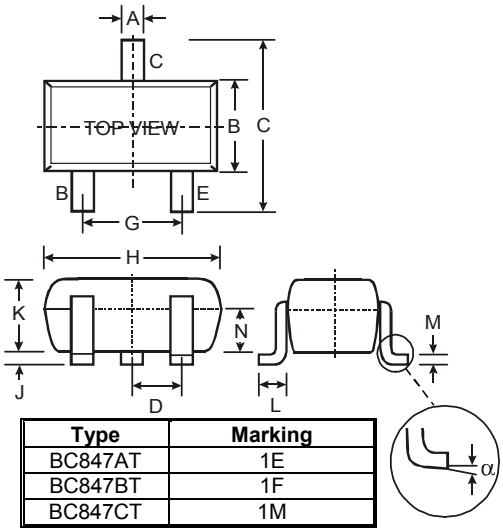
NPN SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Die Construction
- Complementary PNP Types Available (BC857AT,BT,CT)
- Ultra-Small Surface Mount Package
- **Lead Free/RoHS Compliant (Note 2)**
- **"Green" Device (Note 4 and 5)**

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
- Ordering Information: See Page 2
- Marking Information: See Page 2
- Weight: 0.002 grams (approximate)



Type	Marking
BC847AT	1E
BC847BT	1F
BC847CT	1M

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
α	0°	8°	—
All Dimensions in mm			

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}	6.0	V
Collector Current	I_C	100	mA
Power Dissipation (Note 1)	P_d	150	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

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

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.
2. No purposefully added lead.
3. Short duration pulse test used to minimize self-heating effect.
4. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
5. Product manufactured with Date Code UO (week 40, 2007) and newer are built with Green Molding Compound. Product manufactured prior to Date Code UO are built with Non-Green Molding Compound and may contain Halogens or Sb2O3 Fire Retardants.

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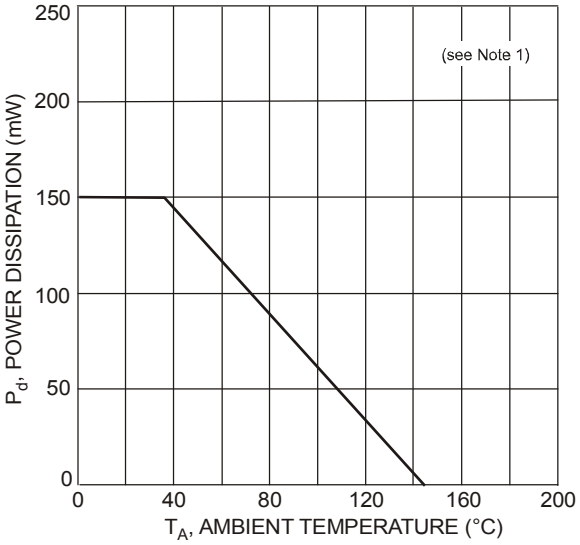


Fig. 1, Power Derating Curve

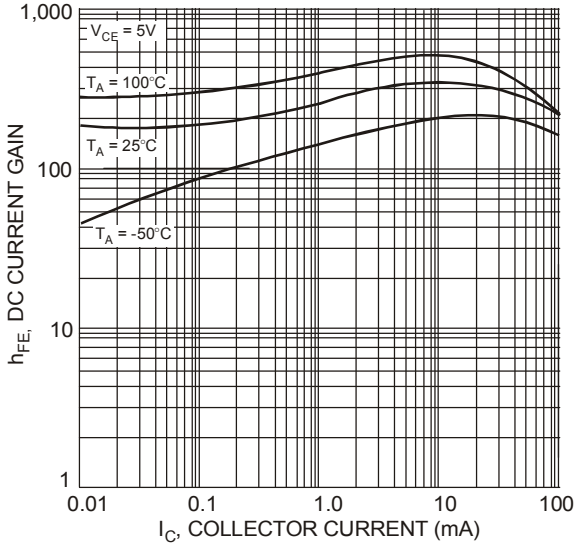


Fig. 2, DC Current Gain vs Collector Current

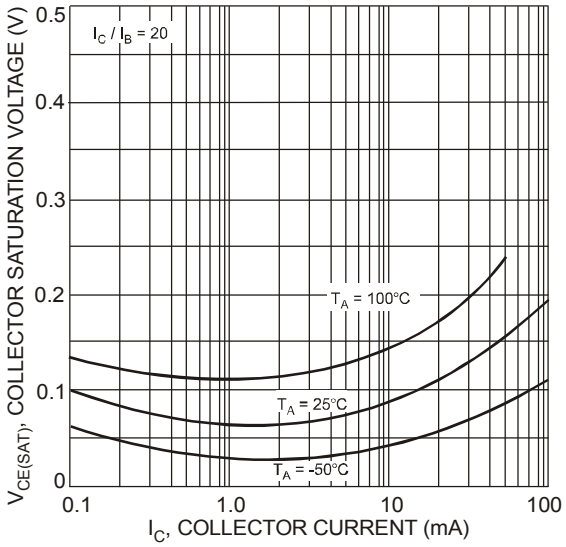


Fig. 3, Collector Saturation Voltage vs Collector Current

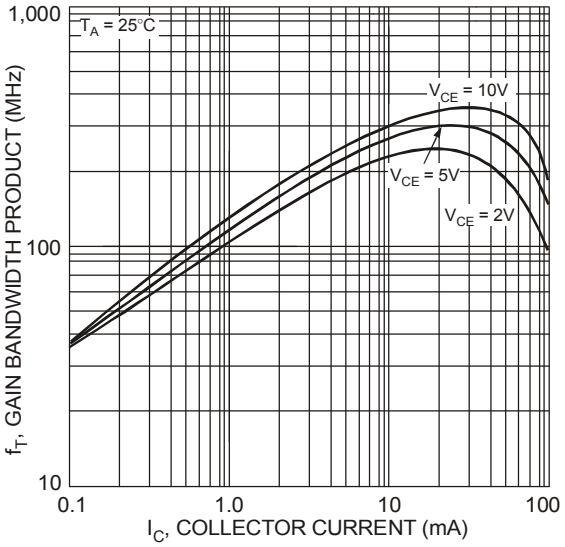


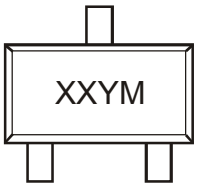
Fig. 4, Gain Bandwidth Product vs Collector Current

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	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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Authorized Distribution Brand :

Website :

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Contact Us :

- ## Address :

401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
Minhang District, Shanghai , China

- ## Sales :

Direct +86 (21) 6401-6692

Email amall@ameya360.com

QQ 800077892

Skype ameyasales1 ameyasales2

- ## Customer Service :

Email service@ameya360.com

- ## Partnership :

Tel +86 (21) 64016692-8333

Email mkt@ameya360.com