

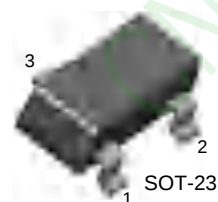


ON Semiconductor®

BC846 / BC847 / BC848 / BC850 NPN Epitaxial Silicon Transistor

Features

- Switching and Amplifier Applications
- Suitable for Automatic Insertion in Thick and Thin-film Circuits
- Low Noise: BC850
- Complement to BC856, BC857, BC858, BC859, and BC860



1. Base 2. Emitter 3. Collector

Ordering Information⁽¹⁾

Part Number	Marking	Package	Packing Method
BC846AMTF	8AA	SOT-23 3L	Tape and Reel
BC846BMTF	8AB	SOT-23 3L	Tape and Reel
BC846CMTF	8AC	SOT-23 3L	Tape and Reel
BC847AMTF	8BA	SOT-23 3L	Tape and Reel
BC847BMTF	8BB	SOT-23 3L	Tape and Reel
BC847CMTF	8BC	SOT-23 3L	Tape and Reel
BC848BMTF	8CB	SOT-23 3L	Tape and Reel
BC848CMTF	8CC	SOT-23 3L	Tape and Reel
BC850AMTF	8EA	SOT-23 3L	Tape and Reel
BC850CMTF	8EC	SOT-23 3L	Tape and Reel

Note:

1. Affix "-A,-B,-C" means h_{FE} classification. Affix "-M" means SOT-23 package. Affix "-TF" means the tape and reel type packing.

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	BC846	V
		BC847 / BC850	
		BC848	
V_{CEO}	Collector-Emitter Voltage	BC846	V
		BC847 / BC850	
		BC848	
V_{EBO}	Emitter-Base Voltage	BC846 / BC847	V
		BC848 / BC850	
I_C	Collector Current (DC)	100	mA
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-65 to +150	$^\circ\text{C}$

Thermal Characteristics⁽²⁾

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter	Value	Unit
P_D	Power Dissipation	310	mW
	Derate Above 25°C	2.48	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	403	$^\circ\text{C/W}$

Note:

2. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

Electrical Characteristics⁽³⁾Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

Symbol	Parameter		Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-Off Current		$V_{CB} = 30\text{ V}, I_E = 0$			15	nA
h_{FE}	DC Current Gain		$V_{CE} = 5\text{ V}, I_C = 2\text{ mA}$	110		800	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage		$I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$		90	250	mV
			$I_C = 100\text{ mA}, I_B = 5\text{ mA}$		200	600	
$V_{BE(sat)}$	Collector-Base Saturation Voltage		$I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$		700		mV
			$I_C = 100\text{ mA}, I_B = 5\text{ mA}$		900		
$V_{BE(on)}$	Base-Emitter On Voltage		$V_{CE} = 5\text{ V}, I_C = 2\text{ mA}$	580	660	700	mV
			$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$			720	
f_T	Current Gain Bandwidth Product		$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}, f = 100\text{ MHz}$		300		MHz
C_{ob}	Output Capacitance		$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$		3.5	6.0	pF
C_{ib}	Input Capacitance		$V_{EB} = 0.5\text{ V}, I_C = 0, f = 1\text{ MHz}$		9		pF
NF	Noise Figure	BC846 / BC847 / BC848	$V_{CE} = 5\text{ V}, I_C = 200\text{ }\mu\text{A}, R_G = 2\text{ k}\Omega, f = 1\text{ kHz}$		2.0	10.0	dB
		BC850			1.2	4.0	
		BC850	$V_{CE} = 5\text{ V}, I_C = 200\text{ }\mu\text{A}, R_G = 2\text{ k}\Omega, f = 30\text{ to }15000\text{ Hz}$		1.4	3.0	

Note:3. Pulse test: pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$ **h_{FE} Classification**

Classification	A	B	C
h_{FE}	110 ~ 220	200 ~ 450	420 ~ 800

Typical Performance Characteristics

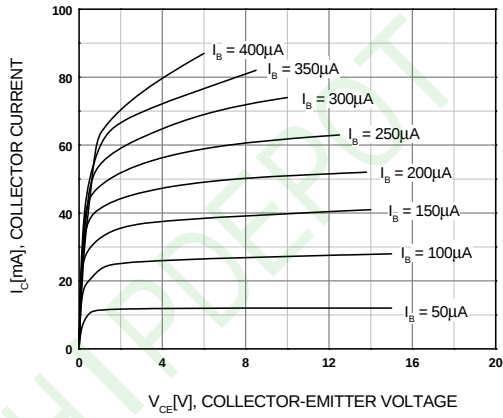


Figure 1. Static Characteristic

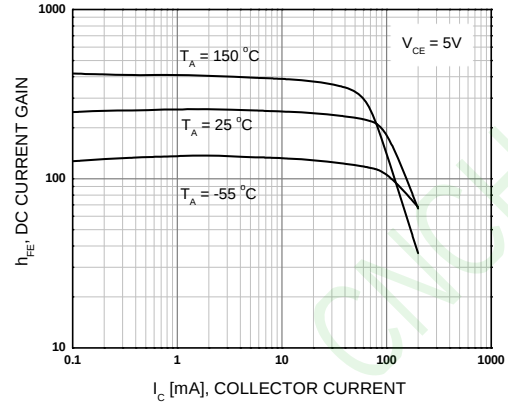


Figure 2. DC Current Gain

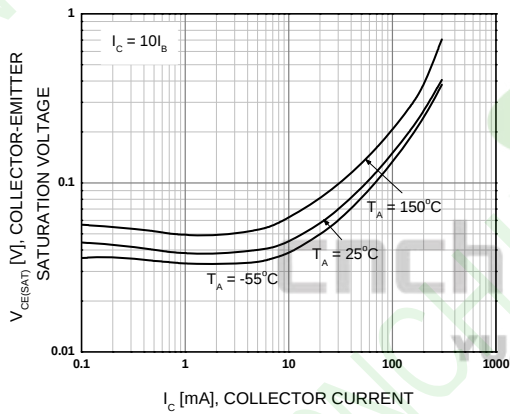


Figure 3. Collector-Emitter Saturation Voltage

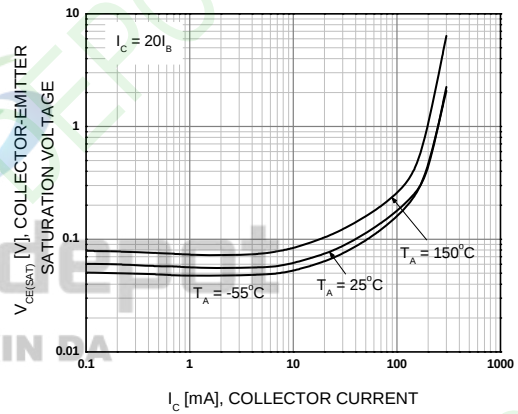


Figure 4. Collector-Emitter Saturation Voltage

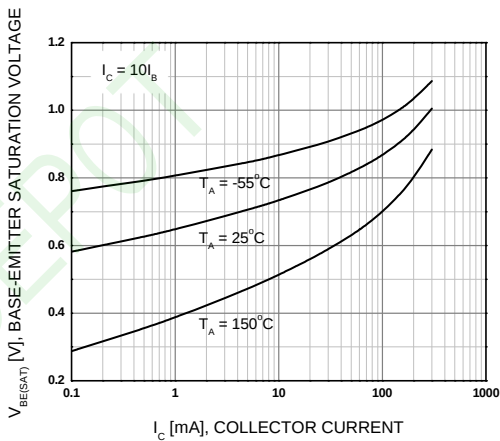


Figure 5. Base-Emitter Saturation Voltage

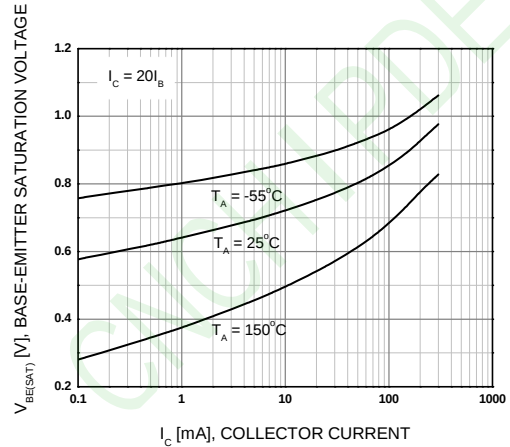


Figure 6. Base-Emitter Saturation Voltage

Typical Performance Characteristics (Continued)

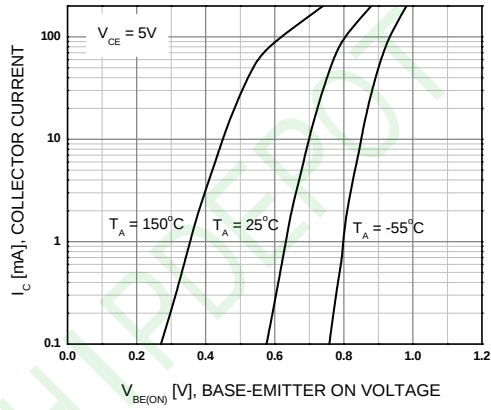


Figure 7. Base-Emitter On Voltage

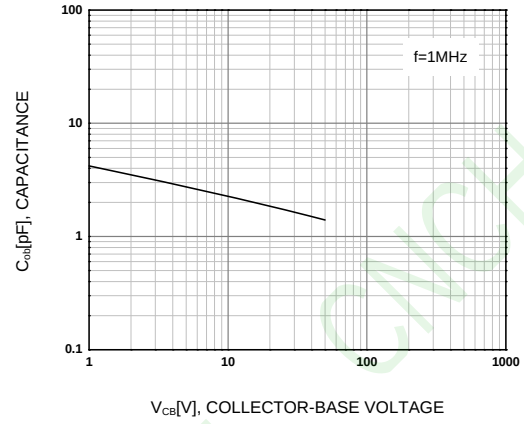


Figure 8. Collector Output Capacitance

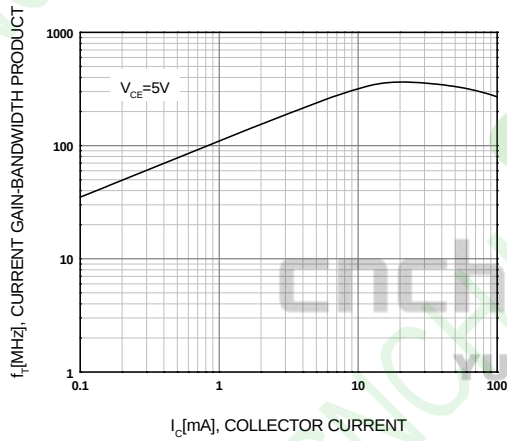


Figure 9. Current Gain Bandwidth Product



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Product Portfolio

Primary Category	Secondary Category	Series	Model	Package	Link
Diode	Rectifier Diode	1N4007	1N4007	SMA(DO-214AC)	https://www.cnchipdepot.com/p/fosan-1n4007-107172.html
Diode	Rectifier Diode	1N4007	1N4007	SOD-123FL	https://www.cnchipdepot.com/p/fosan-1n4007-107173.html
Diode	Switching Diode	BAW56	BAW56	SOT-23	https://www.cnchipdepot.com/p/fosan-baw56-107174.html
Diode	Switching Diode	BAW56	BAW56W-6AF	SOT-323	https://www.cnchipdepot.com/p/fosan-baw56w-6af-107175.html

Diode	Switching Diode	1N4148	1N4148WT	SOD-323	https://www.cnchipdepot.com/p/fosan-1n4148wt-107176.html
Diode	Schottky Diode	1N5819	1N4148WS	SOD-323	https://www.cnchipdepot.com/p/fosan-1n4148ws-107177.html
Diode	Schottky Diode	SS34	SS34	SMA(DO-214AC)	https://www.cnchipdepot.com/p/fosan-ss34-107178.html
Diode	Schottky Diode	SS54	SS34B	SMA(DO-214AC)	https://www.cnchipdepot.com/p/baocheng-ss34b-12183.html
Diode	Schottky Diode	SS14	SS34C	SMA(DO-214AC)	https://www.cnchipdepot.com/p/baocheng-ss34c-12188.html
Diode Fast Recovery / High Efficiency Diode		US1M	US1M	SMA	https://www.cnchipdepot.com/p/fosan-us1m-107198.html
Diode Fast Recovery / High Efficiency Diode		US1M	US1MA-AAF	SMA	https://www.cnchipdepot.com/p/fosan-us1ma-aaf-107179.html
Diode Fast Recovery / High Efficiency Diode		US1M	US1MF	SMAF	https://www.cnchipdepot.com/p/baocheng-us1mf-17709.html
Diode	Switching Diode	BAV99	BAV99	SOT-23	https://www.cnchipdepot.com/p/agertech-bav99-18862.html
Diode	Switching Diode	BAV99	BAV99-6AF	SOT-23	https://www.cnchipdepot.com/p/fosan-ss34-107178.html
Diode	Switching Diode	BAV99	BAV99W-6AF	SOT-23	https://www.cnchipdepot.com/p/fosan-bav99w-6af-107181.html
Diode	Schottky Diode	B5819W	B5819WS	SOD-123	https://www.cnchipdepot.com/p/am-b5819ws-12167.html
Diode	Schottky Diode	B5819W	B5819W		https://www.cnchipdepot.com/p/am-b5819w-12166.html
Transistor (BJT)	NPN BJT	S8050	S8050	SOT-23	https://www.cnchipdepot.com/p/am-s8050-1108.html

Transistor (BJT)	NPN BJT	S8050	S8050-6AF	SOT-23	https://www.cnchipdepot.com/p/fosan-s8050-6af-107182.html
Transistor (BJT)	NPN BJT	SS8050	SS8050	SOT-23	https://www.cnchipdepot.com/p/alj-longjing-micro-s8050-1087.html
Transistor (BJT)	NPN BJT	SS8050	SS8050S	SOT-23	https://www.cnchipdepot.com/p/fosan-ss8050s-2326.html
Transistor (BJT)	NPN BJT	MMBT5551	MMBT5551	SOT-23	https://www.cnchipdepot.com/p/agertech-mmbt5551-1003.html
Transistor (BJT)	NPN BJT	MMBT5551	MMBT5551S	SOT-23	https://www.cnchipdepot.com/p/fosan-mmbt5551s-2327.html
Transistor (BJT)	NPN BJT	MMBT5551	MMBT5551-6AF	SOT-23	https://www.cnchipdepot.com/p/fosan-mmbt5551-6af-107183.html
Transistor	MOSFET	7002	2N7002	SOT-23	https://www.cnchipdepot.com/p/fosan-2n7002-107184.html
Transistor	MOSFET	7002	2N7002K	SOT-23	https://www.cnchipdepot.com/p/alj-longjing-micro--2n7002k-5083.html
Transistor	MOSFET	7002	2N7002K-6AF	SOT-23	https://www.cnchipdepot.com/p/fosan-2n7002k-6af-107185.html
Transistor	MOSFET	7002	2N7002-6AF	SOT-23	https://www.cnchipdepot.com/p/fosan-2n7002-6af-107186.html
Transistor	MOSFET	BSS84	BSS84	SOT-23	https://www.cnchipdepot.com/p/fosan-bss84-107187.html
Transistor	MOSFET	BSS84	BSS84-6AF	SOT-363	https://www.cnchipdepot.com/p/fosan-bss84-6af-107188.html
Transistor (BJT)	NPN BJT	BC847	BC847A	SOT-23	https://www.cnchipdepot.com/p/alj-longjing-micro--bc847a-1052.html
Transistor (BJT)	NPN BJT	BC847	BC847B	SOT-23	https://www.cnchipdepot.com/p/alj-longjing-micro--bc847b-1056.html

Transistor (BJT)	NPN BJT	BC847	BC847C	SOT-23	https://www.cnchipdepot.com/p/alj-longjing-micro--bc847c-1055.html
Power IC	LDO	1117	LD1117-3.3	SOT223	https://www.cnchipdepot.com/p/hxy-mosfet-huaxuan-yang-electronics--ld1117-3-3-25490.html
Power IC	LDO	1117	LD1117-1.8	SOT223	https://www.cnchipdepot.com/p/hxy-mosfet-huaxuan-yang-electronics--ld1117-1-8-25429.html
Power IC	LDO	1117	LD1117-5.0	SOT223	https://www.cnchipdepot.com/p/hxy-mosfet-huaxuan-yang-electronics--ld1117-5-0-25444.html
Power IC	LDO	1117	LD1117-ADJ	SOT223	https://www.cnchipdepot.com/p/hxy-mosfet-huaxuan-yang-electronics--ld1117-adj-25427.html