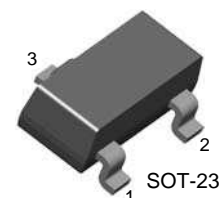


# BC846 - BC850

## NPN Epitaxial Silicon Transistor

### Features

- Switching and Amplifier Applications
- Suitable for automatic insertion in thick and thin-film circuits
- Low Noise: BC849, BC850
- Complement to BC856 ... BC860



1. Base 2. Emitter 3. Collector

### Absolute Maximum Ratings\* $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage : BC846	80	V
	: BC847/850	50	V
	: BC848/849	30	V
$V_{CEO}$	Collector-Emitter Voltage : BC846	65	V
	: BC847/850	45	V
	: BC848/849	30	V
$V_{EBO}$	Emitter-Base Voltage : BC846/847	6	V
	: BC848/849/850	5	V
$I_C$	Collector Current (DC)	100	mA
$P_C$	Collector Power Dissipation	310	mW
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	-65 to 150	$^\circ\text{C}$

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

### Electrical Characteristics\* $T_a = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
$I_{CBO}$	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	
$V_{CE}(\text{sat})$	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	mV
$V_{BE}(\text{sat})$	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		mV
$V_{BE}(\text{on})$	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	mV
$f_T$	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	pF
$C_{ib}$	Input Capacitance	$V_{EB}=0.5\text{V}, I_C=0, f=1\text{MHz}$		9		pF
NF	Noise Figure	$V_{CE}=5\text{V}, I_C=200\mu\text{A}$ $R_G=2\text{K}\Omega, f=1\text{KHz}$		2	10	dB
				1.2	4	dB
	: BC849	$V_{CE}=5\text{V}, I_C=200\mu\text{A}$ $R_G=2\text{K}\Omega, f=30\sim 15000\text{Hz}$		1.4	4	dB
				1.4	3	dB

\* Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

**h<sub>FE</sub> Classification**

Classification	A	B	C
h <sub>FE</sub>	110 ~ 220	200 ~ 450	420 ~ 800

**Ordering Information**

Device(note1)	Device Marking	Package	Packing Method	Qty(pcs)	Pin Difinitions
BC846AMTF	8AA	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC846BMTF	8AB	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC846CMTF	8AC	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC847AMTF	8BA	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC847BMTF	8BB	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC847CMTF	8BC	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC848AMTF	8CA	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC848BMTF	8CB	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC848CMTF	8CC	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC849AMTF	8DA	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC849BMTF	8DB	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC849CMTF	8DC	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC850AMTF	8EA	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC850BMTF	8EB	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector
BC850CMTF	8EC	SOT-23	Tape & Reel	3000	1.Base 2.Emitter 3.Collector

**Note1** : Affix "-A,-B,-C" means h<sub>FE</sub> classification.

Affix "-M" means SOT-23 package.

Affix "-TF" means the tape & reel type packing.

## Typical Performance Characteristics

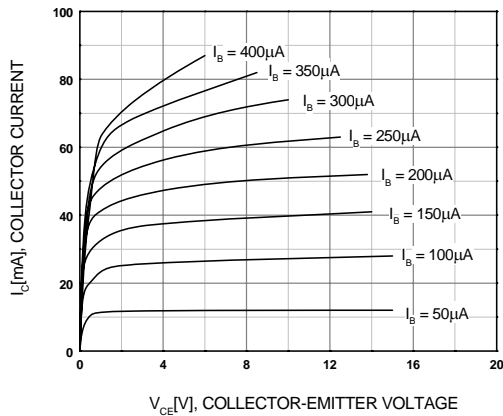


Figure 1. Static Characteristic

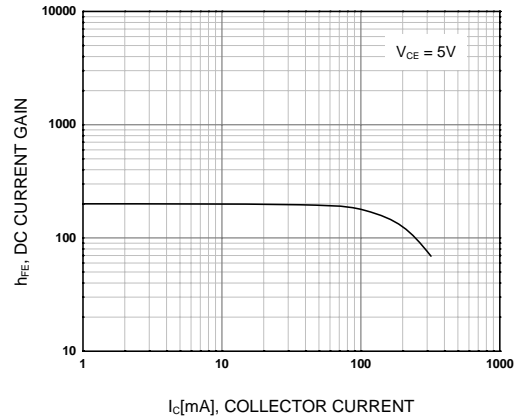


Figure 2. DC current Gain

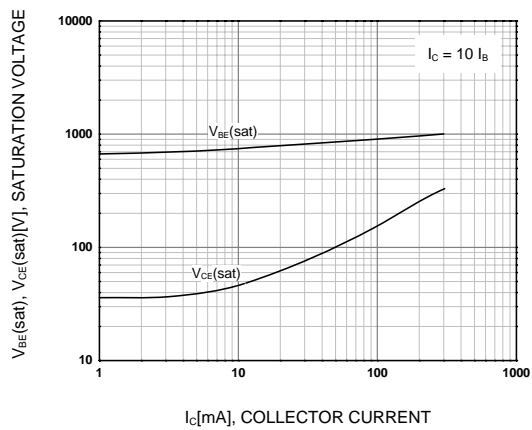


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

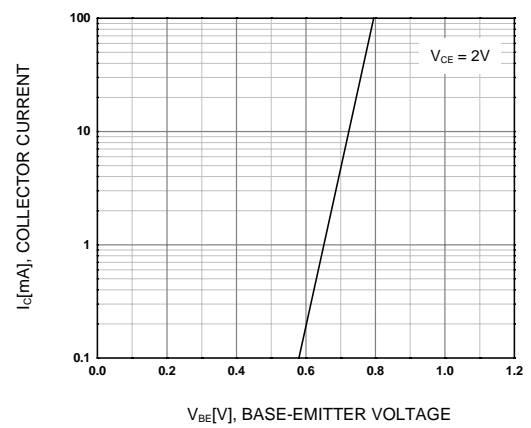


Figure 4. Base-Emitter On Voltage

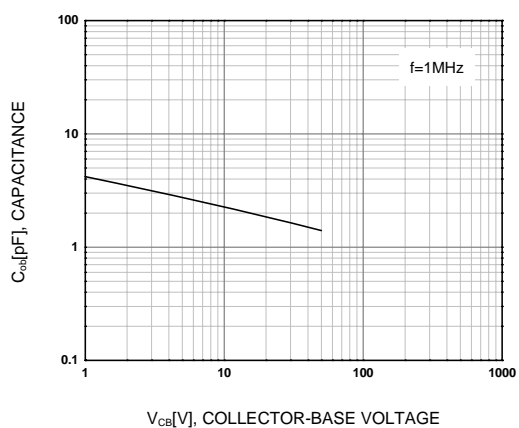


Figure 5. Collector Output Capacitance

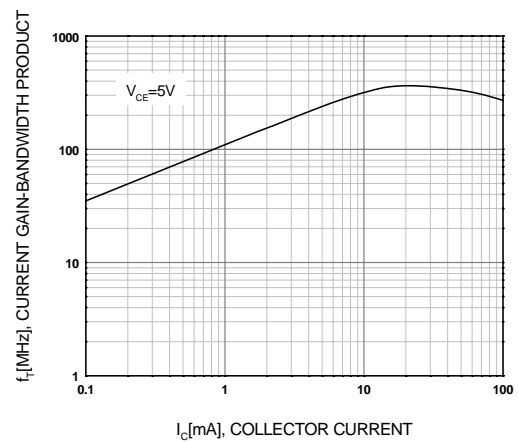
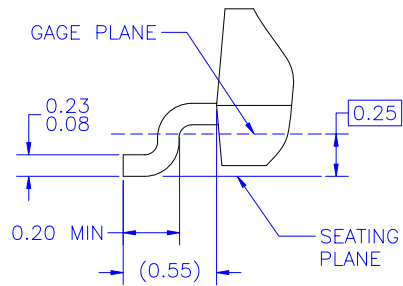
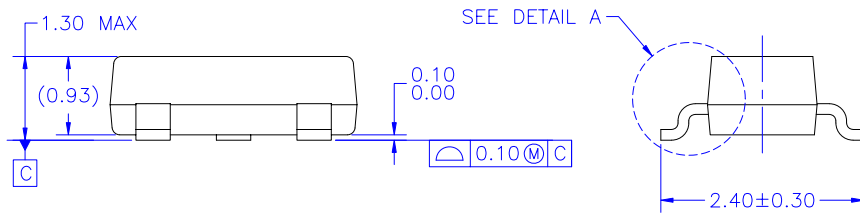
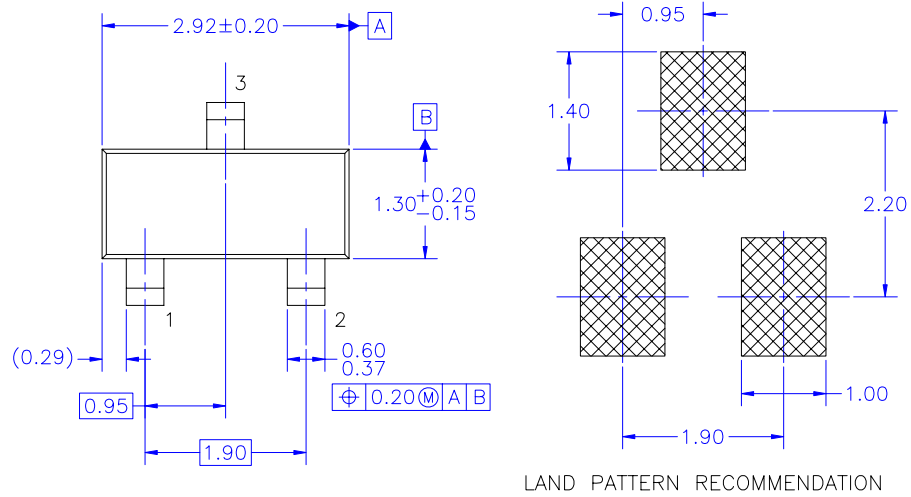


Figure 6. Current Gain Bandwidth Product

# Physical Dimensions

## SOT-23



DETAIL A  
SCALE: 2X

NOTES: UNLESS OTHERWISE SPECIFIED






- A) REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE H.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS ARE INCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M - 1994.
- E) DRAWING FILE NAME: MA03DREV9

Dimensions in Millimeters



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CTL™	IntelliMAX™	RapidConfigure™	TinyLogic®
Current Transfer Logic™	ISOPLANAR™	 ™	TINYOPTO™
DEUXPEED®	MegaBuck™	Saving our world, 1mW/W/kW at a time™	TinyPower™
Dual Cool™	MICROCOUPLER™	SignalWise™	TinyPWM™
EcoSPARK®	MicroFET™	SmartMax™	TinyWire™
EfficientMax™	MicroPak™	SMART START™	TriFault Detect™
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Fairchild®	MotionMax™	SuperFET®	 SerDes™
Fairchild Semiconductor®	Motion-SPM™	SuperSOT™.3	UHC®
FACT Quiet Series™	mWSaver™	SuperSOT™.6	Ultra FRFET™
FACT®	OptoHiT™	SuperSOT™.8	UniFET™
FAST®	OPTOLOGIC®	SupreMOS®	VCX™
FastvCore™	OPTOPLANAR®	SyncFET™	VisualMax™
FETBench™	 ®	Sync-Lock™	XS™
FlashWriter®*	PDP SPM™	 SYSTEM GENERAL®*	
FPS™			

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