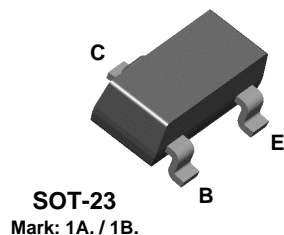
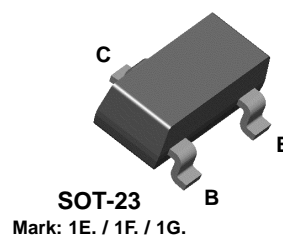


**BC846A  
BC846B**



**BC847A  
BC847B  
BC847C**



## NPN General Purpose Amplifier

This device is designed for low noise, high gain, general purpose amplifier applications at collector currents from 1.0  $\mu$ A to 50 mA.  
Sourced from Process 07.

### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage <b>BC846 series</b>	65	V
	<b>BC847 series</b>	45	V
V <sub>CES</sub>	Collector-Base Voltage <b>BC846 series</b>	80	V
	<b>BC847 series</b>	50	V
V <sub>EBO</sub>	Emitter-Base Voltage	6.0	V
I <sub>C</sub>	Collector Current - Continuous	100	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°C

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

#### NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

### Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		*BC846 / BC847	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	325 2.8	mW mW/°C
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	357	°C/W

\* Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

# NPN General Purpose Amplifier

(continued)

BC846A / BC846B / BC847A / BC847B / BC847C

## Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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### OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 10 \text{ mA}$ , $I_B = 0$	<b>846A / B</b> <b>847A / B</b>	65 45	V
$V_{(BR)CES}$	Collector-Base Breakdown Voltage	$I_C = 10 \text{ }\mu\text{A}$ , $I_E = 0$	<b>846A / B</b> <b>847A / B</b>	80 50	V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ }\mu\text{A}$ , $I_C = 0$		6.0	V
$I_{CBO}$	Collector-Cutoff Current	$V_{CB} = 30 \text{ V}$ $V_{CB} = 30 \text{ V}$ , $T_A = 150^\circ\text{C}$		15 5.0	nA $\mu\text{A}$

### ON CHARACTERISTICS

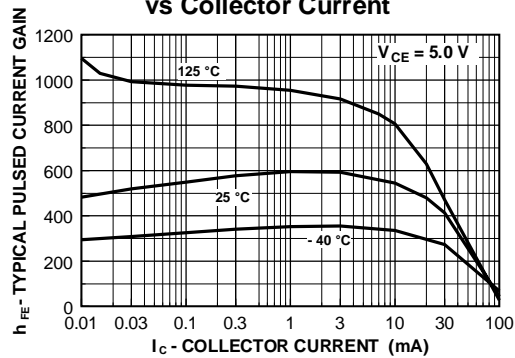
$h_{FE}$	DC Current Gain	$I_C = 2.0 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ <b>846A / 847A</b> <b>846B / 847B</b> <b>847C</b>	110 200 420	220 450 800	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}$ , $I_B = 0.5 \text{ mA}$ $I_C = 100 \text{ mA}$ , $I_B = 5.0 \text{ mA}$		0.25 0.6	V V
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = 2.0 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ $I_C = 10 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$	0.58	0.70 0.77	V V

### SMALL SIGNAL CHARACTERISTICS

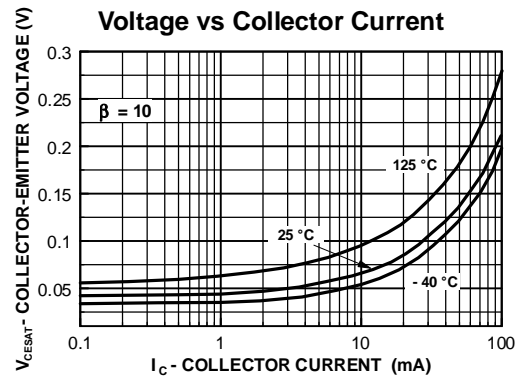
$f_T$	Current Gain - Bandwidth Product	$I_C = 10 \text{ mA}$ , $V_{CE} = 5.0$ , $f = 100 \text{ MHz}$	100		MHz
$C_{obo}$	Output Capacitance	$V_{CB} = 10 \text{ V}$ , $f = 1.0 \text{ MHz}$		4.5	pF
NF	Noise Figure	$I_C = 0.2 \text{ mA}$ , $V_{CE} = 5.0$ , $R_S = 2.0 \text{ k}\Omega$ , $f = 1.0 \text{ kHz}$ , $BW = 200 \text{ Hz}$		10	dB

## Typical Characteristics

**Typical Pulsed Current Gain vs Collector Current**



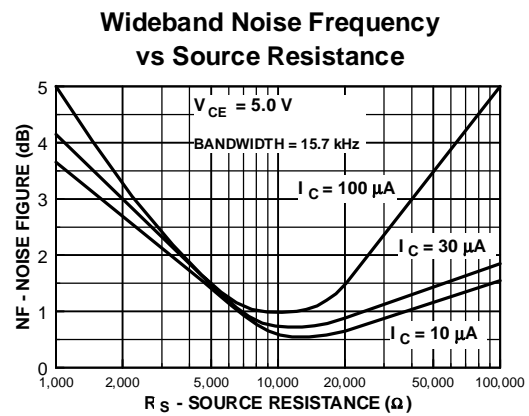
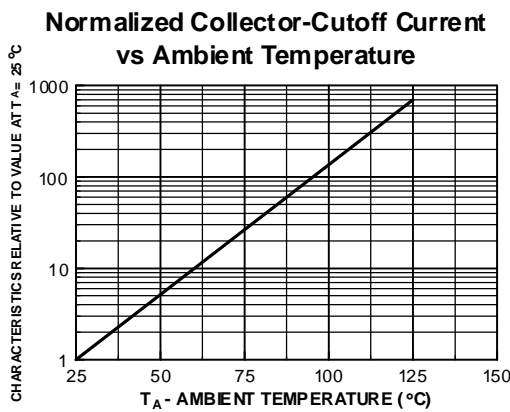
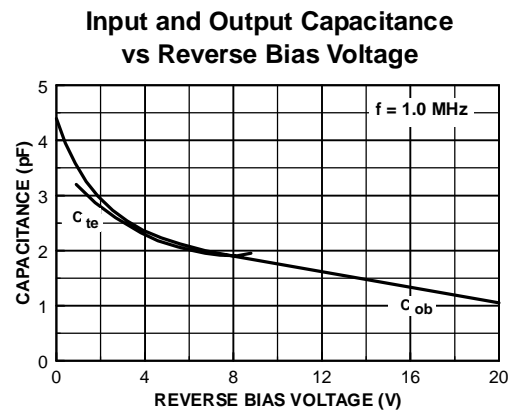
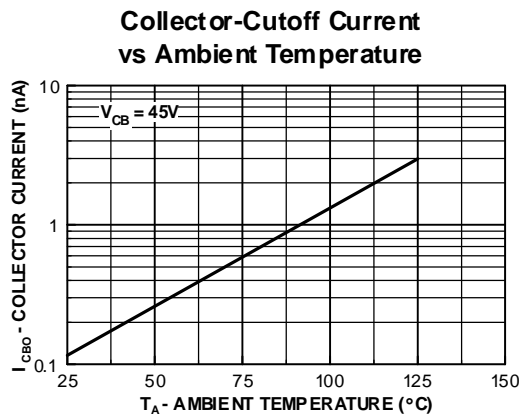
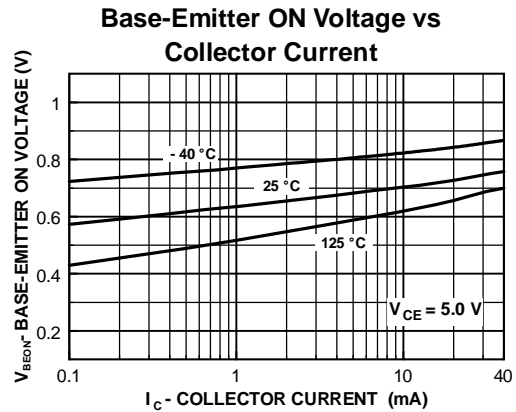
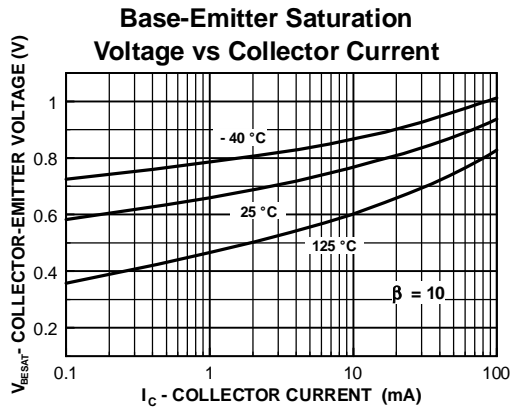
**Collector-Emitter Saturation Voltage vs Collector Current**



# NPN General Purpose Amplifier (continued)

BC846A / BC846B / BC847A / BC847B / BC847C

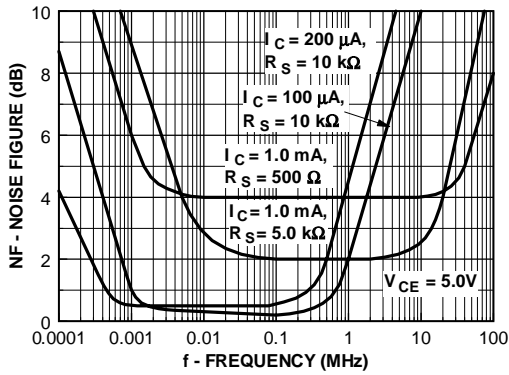
## Typical Characteristics



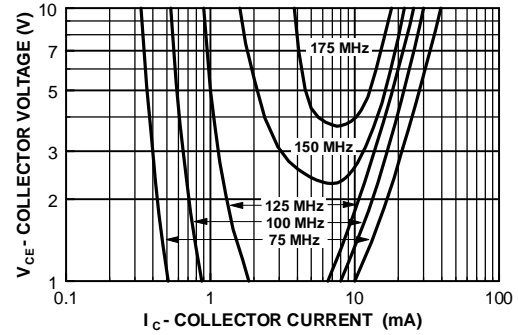
# NPN General Purpose Amplifier (continued)

## Typical Characteristics (continued)

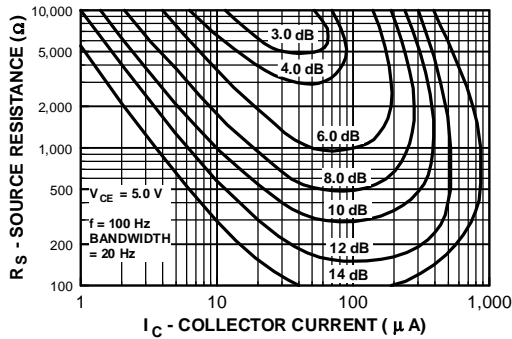
### Noise Figure vs Frequency



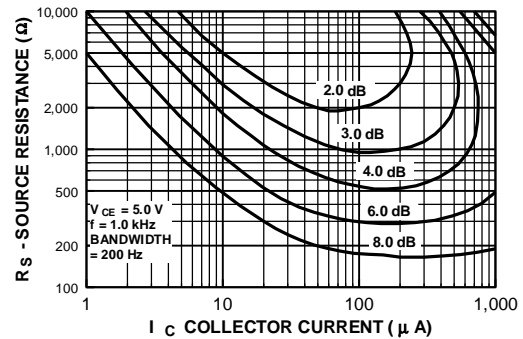
### Contours of Constant Gain Bandwidth Product ( $f_T$ )



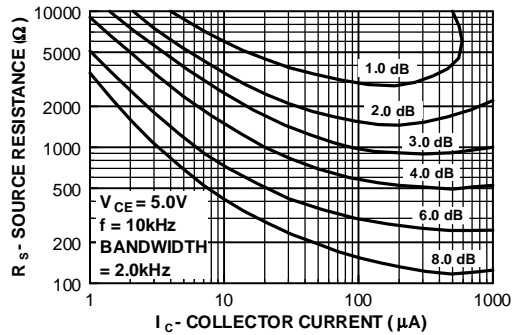
### Contours of Constant Narrow Band Noise Figure



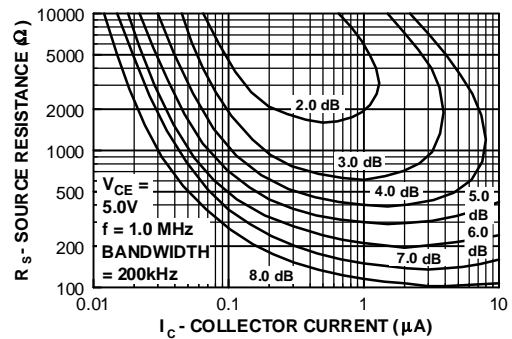
### Contours of Constant Narrow Band Noise Figure



### Contours of Constant Narrow Band Noise Figure



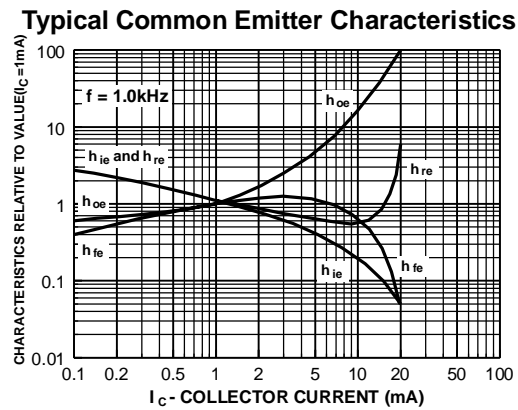
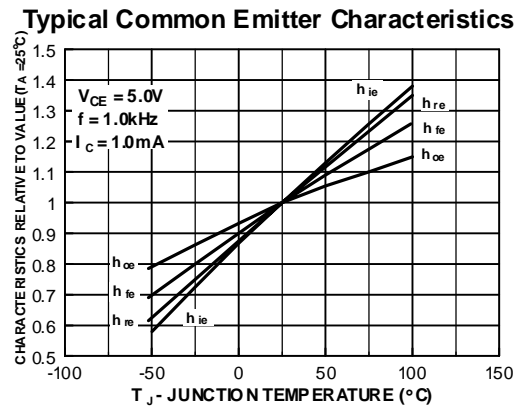
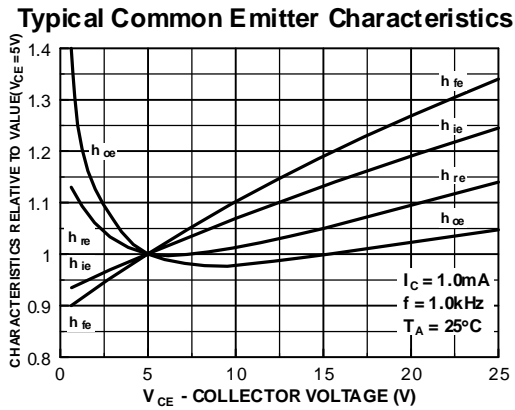
### Contours of Constant Narrow Band Noise Figure



BC846A / BC846B / BC847A / BC847B / BC847C

# NPN General Purpose Amplifier (continued)

## Typical Common Emitter Characteristics (f = 1.0 kHz)



BC846A / BC846B / BC847A / BC847B / BC847C

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