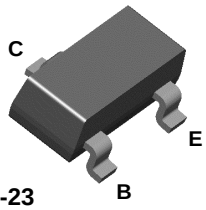
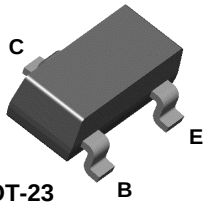
FAIRCHILD
SEMICONDUCTOR TM

BC846A
BC846B



SOT-23
Mark: 1A. / 1B.

BC847A
BC847B
BC847C



SOT-23
Mark: 1E. / 1F. / 1G.

NPN General Purpose Amplifier

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

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter		Value	Units
V_{CEO}	Collector-Emitter Voltage	**BC846 series**	65	V
		BC847 series	45	V
V_{CES}	Collector-Base Voltage	**BC846 series**	80	V
		BC847 series	50	V
V_{EBO}	Emitter-Base Voltage		6.0	V
I_C	Collector Current - Continuous		100	mA
T_J, T_{stg}	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_D	Total Device Dissipation	325	mW
	Derate above 25°C	2.8	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

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

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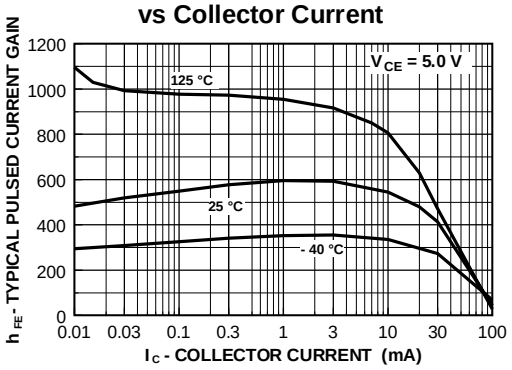
NPN General Purpose Amplifier
(continued)

Electrical Characteristics
TA = 25°C unless otherwise noted

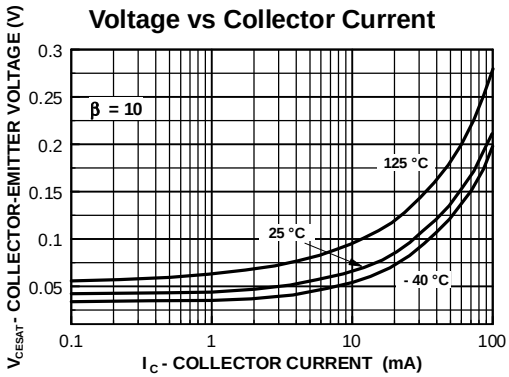
Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	I_C = 10 mA, I_B = 0 **846A / B** **847A / B**	65 45		V
$V_{(BR)CES}$	Collector-Base Breakdown Voltage	I_C = 10 µA, I_E = 0 **846A / B** **847A / B**	80 50		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 µA, I_C = 0	6.0		V
I_{CBO}	Collector-Cutoff Current	V_{CB} = 30 V V_{CB} = 30 V, T_A = 150°C		15 5.0	nA µA
ON CHARACTERISTICS					
h_{FE}	DC Current Gain	I_C = 2.0 mA, V_{CE} = 5.0 V **846A / 847A** **846B / 847B** **847C**	 110 200 420	 220 450 800	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 10 mA, I_B = 0.5 mA I_C = 100 mA, I_B = 5.0 mA		0.25 0.6	V V
$V_{BE(on)}$	Base-Emitter On Voltage	I_C = 2.0 mA, V_{CE} = 5.0 V I_C = 10 mA, V_{CE} = 5.0 V	0.58	0.70 0.77	V V
SMALL SIGNAL CHARACTERISTICS					
f_T	Current Gain - Bandwidth Product	I_C = 10 mA, V_{CE} = 5.0, f = 100 MHz	100		MHz
C_{obo}	Output Capacitance	V_{CB} = 10 V, f = 1.0 MHz		4.5	pF
NF	Noise Figure	I_C = 0.2 mA, V_{CE} = 5.0, R_S = 2.0 kΩ, f = 1.0 kHz, BW = 200 Hz		10	dB

Typical Characteristics

Typical Pulsed Current Gain vs Collector Current



Collector-Emitter Saturation Voltage vs Collector Current



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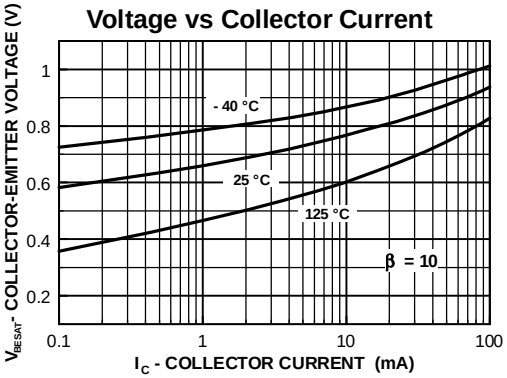
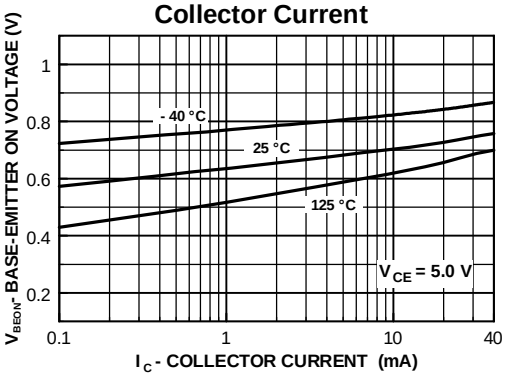
Typical Characteristics

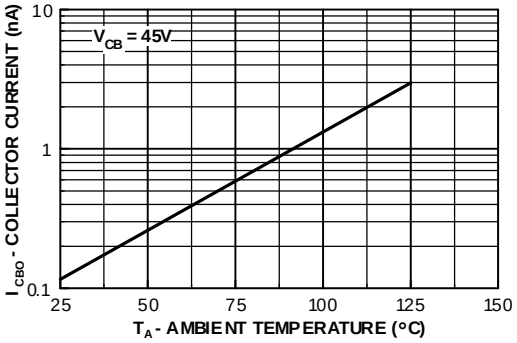
Base-Emitter Saturation Voltage vs Collector Current



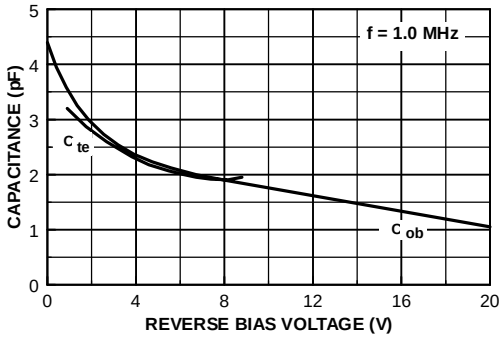
Base-Emitter ON Voltage vs Collector Current



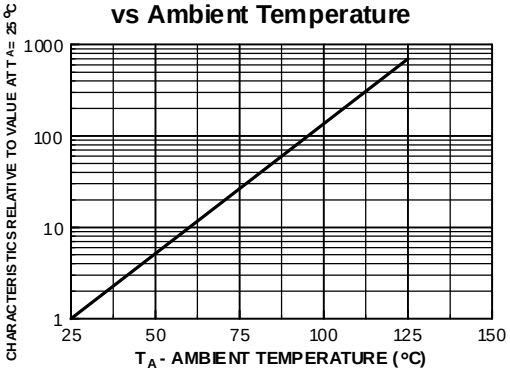
Collector-Cutoff Current vs Ambient Temperature



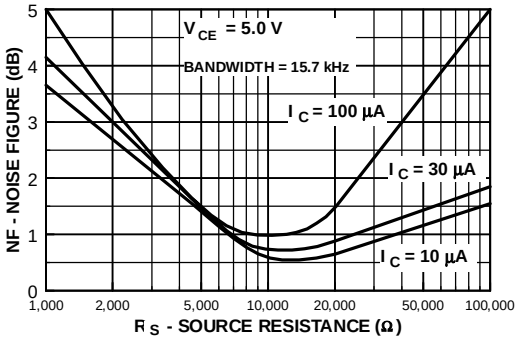
Input and Output Capacitance vs Reverse Bias Voltage



Normalized Collector-Cutoff Current vs Ambient Temperature



Wideband Noise Frequency vs Source Resistance



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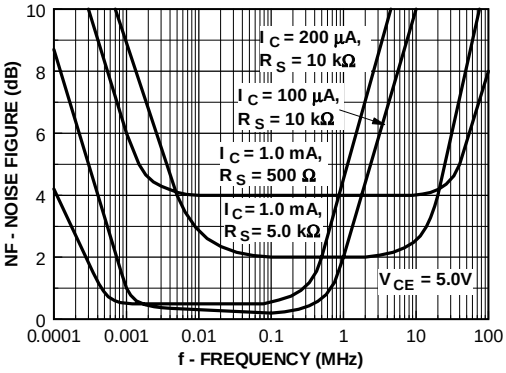
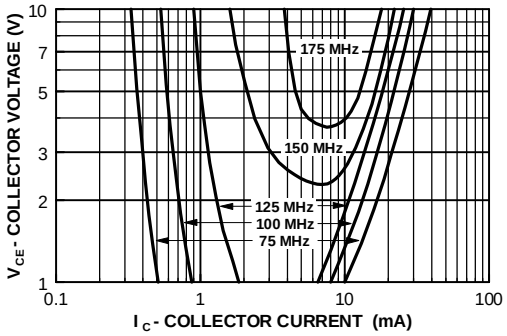
Typical Characteristics (continued)

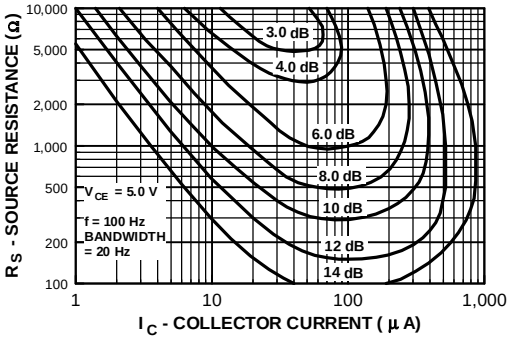
Noise Figure vs Frequency



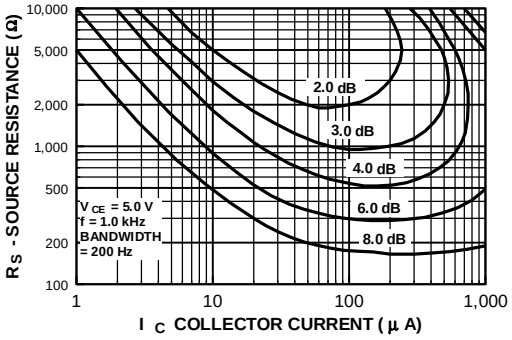
Contours of Constant Gain Bandwidth Product (f_T)



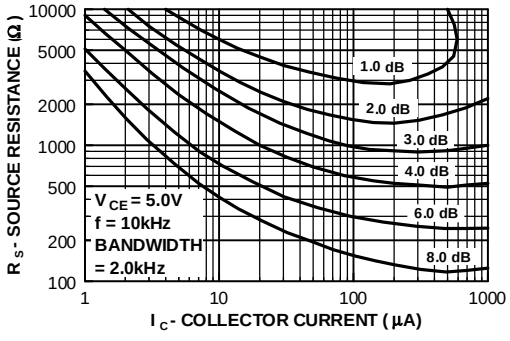
Contours of Constant Narrow Band Noise Figure



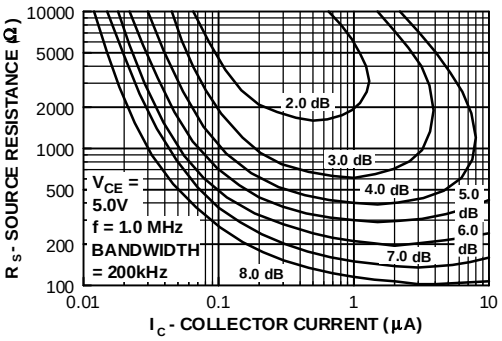
Contours of Constant Narrow Band Noise Figure



Contours of Constant Narrow Band Noise Figure



Contours of Constant Narrow Band Noise Figure



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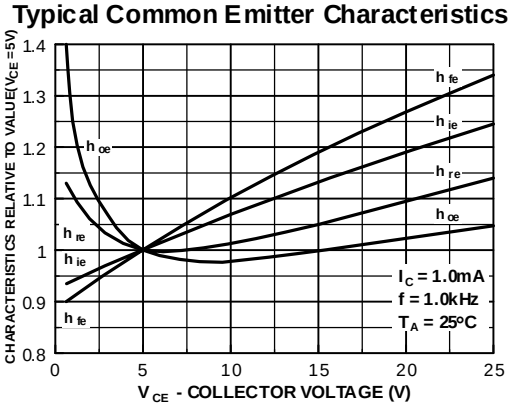
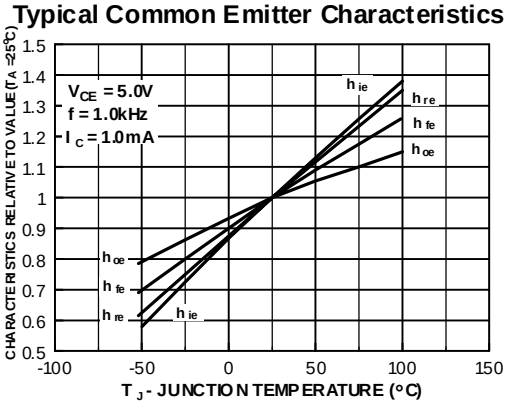
NPN General Purpose Amplifier
(continued)

Typical Common Emitter Characteristics (f = 1.0 kHz)

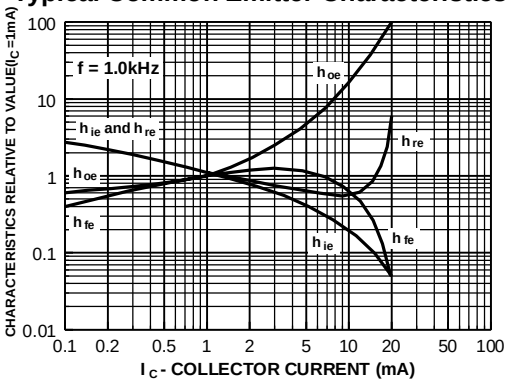
Typical Common Emitter Characteristics



Typical Common Emitter Characteristics



Typical Common Emitter Characteristics



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