

## 200mW, NPN Small Signal Transistor

### FEATURES

- Low power loss, high efficiency
- Ideal for automated placement
- High surge current capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

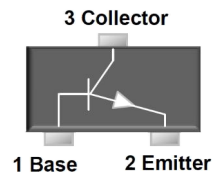
### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- On-board DC/DC converter

### MECHANICAL DATA

- Case: SOT-23
- Molding compound meets UL 94 V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1A whisker test
- Weight: 8mg (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$V_{CBO}$	30-80	V
$V_{CEO}$	30-65	V
$V_{EBO}$	5-6	V
$I_C$	0.1	A
$h_{FE}$	220-800	
Package	SOT-23	
Configuration	Single die	



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)				
PARAMETER		SYMBOL	VALUE	UNIT
Marking code on the device	BC846A		1A	
	BC846B		1B	
	BC847A		1E	
	BC847B		1F	
	BC847C		1G	
	BC848A		1J	
	BC848B		1K	
	BC848C		1L	
Power dissipation		$P_D$	200	mW

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)				
<b>PARAMETER</b>		<b>SYMBOL</b>	<b>VALUE</b>	<b>UNIT</b>
Collector-base voltage, emitter open	BC846	$V_{CBO}$	80	V
	BC847		50	
	BC848		30	
Collector-emitter voltage, base open	BC846	$V_{CEO}$	65	V
	BC847		45	
	BC848		30	
Emitter-base voltage, collector open	BC846	$V_{EBO}$	6	V
	BC847		6	
	BC848		5	
Collector current, dc		$I_C$	0.1	A
Junction temperature		$T_J$	-55 to +150	$^\circ\text{C}$
Storage temperature		$T_{STG}$	-55 to +150	$^\circ\text{C}$

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
<b>PARAMETER</b>	<b>CONDITIONS</b>		<b>SYMBOL</b>	<b>MIN</b>	<b>MAX</b>	<b>UNIT</b>
Collector cutoff current	$V_{CB} = 30\text{ V}, I_E = 0$		$I_{CBO}$	-	100	nA
Emitter cutoff current	$V_{EB} = 5\text{ V}, I_C = 0$		$I_{EBO}$	-	0.1	$\mu\text{A}$
Collector-base voltage	$I_C = 10\ \mu\text{A}, I_E = 0$	BC846	$V_{CBO}$	80	-	V
		BC847		50	-	
		BC848		30	-	
Collector-emitter voltage	$I_C = 10\text{ mA}, I_B = 0$	BC846	$V_{CEO}$	65	-	V
		BC847		45	-	
		BC848		30	-	
Emitter-base voltage	$I_E = 1\ \mu\text{A}, I_C = 0$	BC846	$V_{EBO}$	6	-	V
		BC847		6	-	
		BC848		5	-	
DC current gain	$V_{CE} = 5\text{ V}, I_C = 2\text{ mA}$	BC846A/BC847A/BC848A	$h_{FE}$	110	220	
		BC846B/BC847B/BC848B		200	450	
		BC847C/BC848C		420	800	

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)					
<b>PARAMETER</b>	<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>MIN</b>	<b>MAX</b>	<b>UNIT</b>
Collector-emitter saturation voltage	$I_C = 100\text{ mA}, I_B = 5\text{ mA}$	$V_{CE(sat)}$	-	0.5	V
Base-emitter saturation voltage	$I_C = 100\text{ mA}, I_B = 5\text{ mA}$	$V_{BE(sat)}$	-	1.1	V
Transition frequency	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}, f = 100\text{ MHz}$	$f_T$	100	-	MHz

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE</b> (Note1, 2)	<b>PACKAGE</b>	<b>PACKING</b>
BC84XX RF	SOT-23	3K / 7" Reel
BC84XX RFG	SOT-23	3K / 7" Reel
BC84XX R5	SOT-23	10K / 13" Reel
BC84XX R5G	SOT-23	10K / 13" Reel

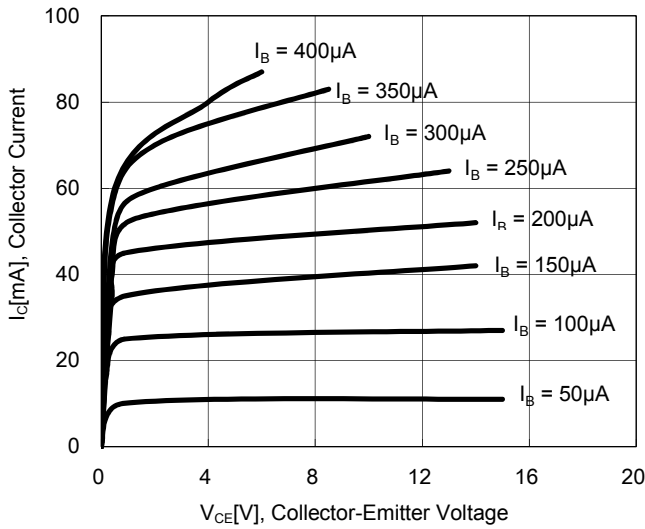
**Note:**

- "xx" is device code "6A" to "8C"
- "G" means green compound (halogen free)

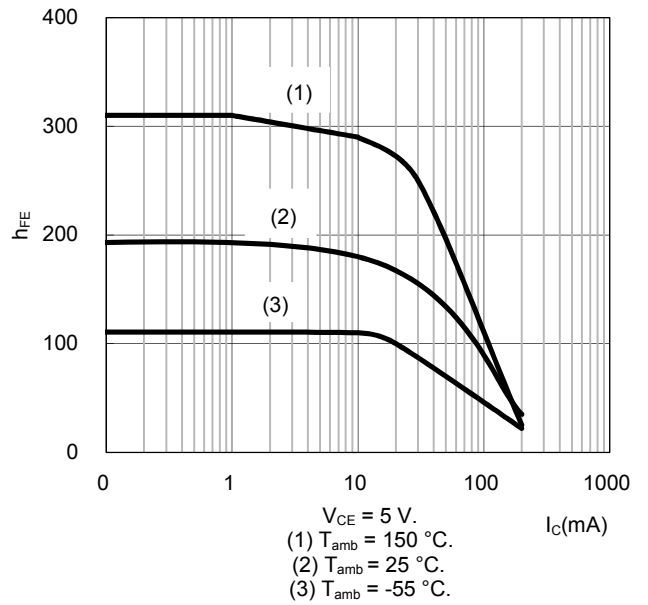
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

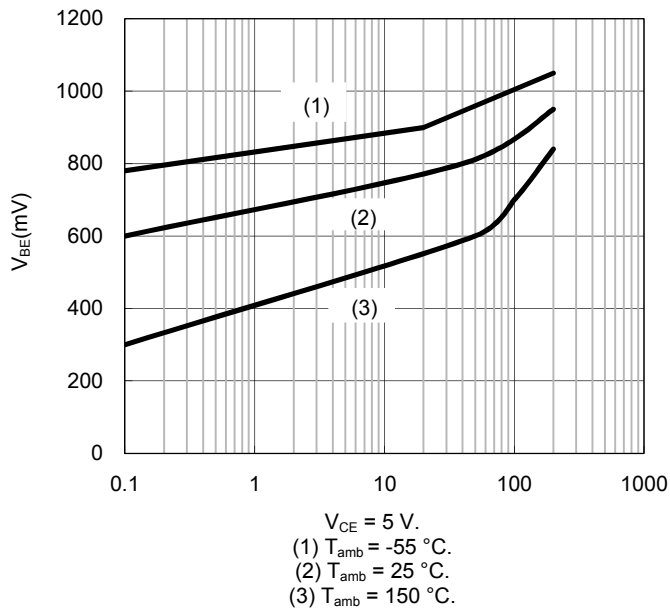
**Fig.1 Static Characteristic**



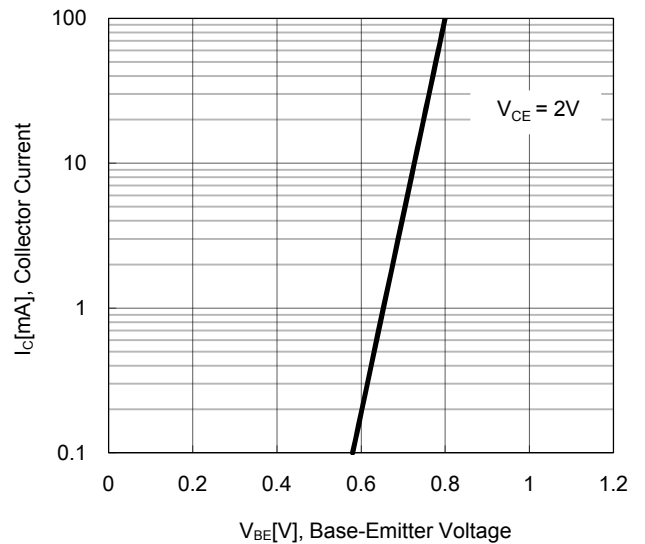
**Fig. 2 DC Current Gain**



**Fig.3 Base-Emitter Saturation Voltage**  
**Collector-Emitter Saturation Voltage**



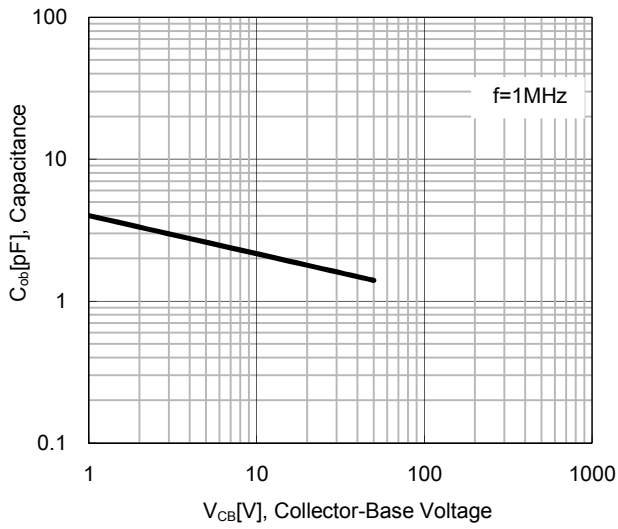
**Fig.4 Base-Emitter On Voltage**



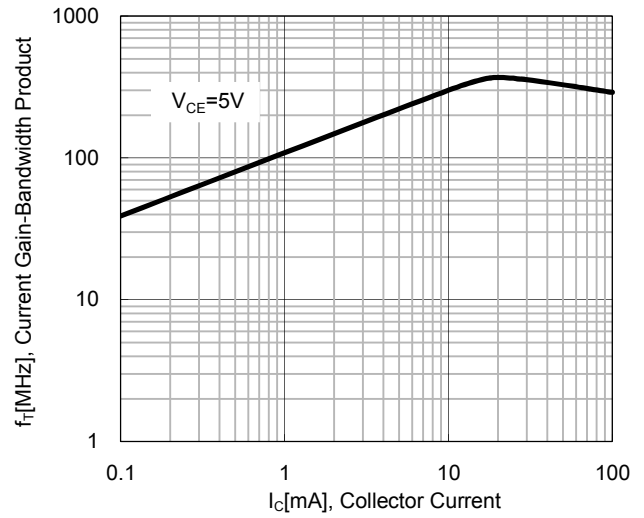
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.5 Collector Output Capacitance**

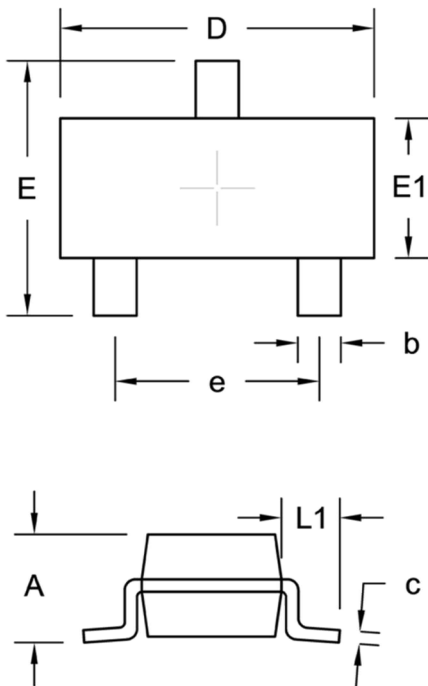


**Fig. 6 Current Gain Bandwidth Product**



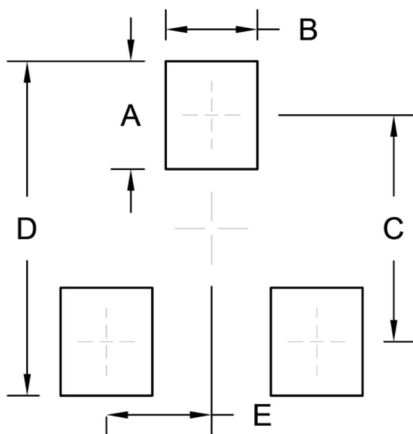
**PACKAGE OUTLINE DIMENSION**

SOT-23



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	0.89	1.12	0.035	0.044
b	0.30	0.50	0.012	0.020
c	0.08	0.20	0.003	0.008
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E1	1.20	1.40	0.047	0.055
e	1.90 BSC		0.075 BSC	
L1	0.54 REF.		0.021 REF.	

**SUGGESTED PAD LAYOUT**



Symbol	Unit (mm)	Unit (inch)
A	1.00	0.039
B	0.85	0.033
C	2.10	0.083
D	3.10	0.122
E	0.98	0.039

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