



# BC847AQ/BQ/CQ

## SOT-23 NPN Bipolar Transistor

## SOT-23 NPN 双极型三极管

### 1. Description 描述

This Bipolar Junction Transistor (BJT) is suitable for use in automotive applications.  
这种双极结晶体管 (BJT) 适用于汽车应用。

### 2. Features 特性

Feature 特性	Description 描述
Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压	$BV_{CEO} > 45V$
Continuous Collector Current 连续集电极电流	$I_C = 0.1A$
Peak Pulse Current 峰值脉冲电流	$I_{CM} = 0.2A$
Applications 应用	For Switching and AF Amplifier 开关和 AF 放大器应用
Environmental Compliance 环保合规	Totally Lead-Free & Fully RoHS Compliant. 完全无铅和符合 RoHS 标准 <sup>[1]</sup> Halogen and Antimony Free, "Green" Device. 无卤素和无锑, "绿色"器件 <sup>[2]</sup>
Automotive Compliance 汽车合规	Qualified according to AEC-Q101 and recommended for use in automotive applications. 通过了 AEC-Q101 认证, 推荐用于汽车电子应用场景。

[1] No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.

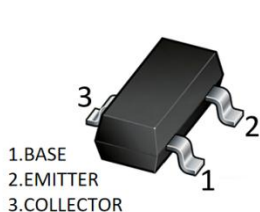
无铅, 完全符合欧盟标准 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) 和 2015/863/EU (RoHS 3)。

[2] Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

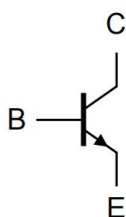
无卤素和无锑的“绿色”产品指溴含量<900ppm, 氯含量<900ppm (溴+氯总含量<1500ppm) 和锑化合物含量<1000ppm。

### 3. Mechanical Data 封装数据

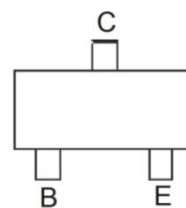
Feature 特性	Description 描述
Package 封装	SOT-23
Moisture Sensitivity Level 湿敏感度等级	J-STD-020 MSL1
Material 材料	Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0. 模塑塑料封装, "绿色" 成型复合材料; UL 可燃性等级 94V-0.
Dimensions 尺寸	1.9mm pitch; 2.9mm × 1.3mm × 1.0mm body 相邻引脚中心距为 1.9mm, 封装本体 (不含引脚) 尺寸为 2.9mm × 1.3mm × 1.0mm
Terminals Compliance 引脚合规	3 terminals, Tin Plated Leads, Solderable per MILSTD-202, Method 208 <sup>Ⓔ</sup> 3 个镀锡引脚, 可焊性符合 MIL-STD-202 标准中 208 方法 e3 条款的要求
Weight 重量	0.008 grams (Approximate) 约 0.008 克
Polarity 极性	See Diagrams Below 极性见下图



SOT-23 Top View



Device Symbol



Top View Pin-Out

### 4. Ordering Information 订购信息

Part Number	Compliance	Package	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
BC847AQ	Automotive	SOT-23	7	8	3000
BC847BQ	Automotive	SOT-23	7	8	3000
BC847CQ	Automotive	SOT-23	7	8	3000

### 5. Marking Information 丝印信息

Part Number	Marking Code
BC847AQ	1E
BC847BQ	1F
BC847CQ	1G



## 6. Absolute Maximum Ratings( $T_a = + 25^{\circ}\text{C}$ ) 绝对最大额定值

Characteristic 特性	Symbol 符号	Value 值	Unit 单位
Collector-Base Voltage 集电极-基极电压	$V_{CBO}$	50	V
Collector-Emitter Voltage 集电极-发射极电压	$V_{CEO}$	45	V
Emitter-Base Voltage 发射极-基极电压	$V_{EBO}$	6	V
Collector Current 集电极电流	$I_C$	0.1	A
Peak Pulse Collector Current(single pulse) 峰值脉冲集电极电流 (单脉冲)	$I_{CM}$	0.2	A
Peak Pulse Emitter Current(single pulse) 峰值脉冲基极电流 (单脉冲)	$I_{EM}$	0.2	A

## 7. Thermal Characteristics( $T_a = + 25^{\circ}\text{C}$ ) 热特性

Characteristic 特性	Symbol 符号	Value 值	Unit 单位
Collector Power Dissipation 集电极耗散功率	$P_C$	200	mW
Thermal Resistance From Junction To Ambient 结到环境的热阻	$R_{\theta JA}$	625	$^{\circ}\text{C}/\text{W}$
Junction Temperature 结温	$T_J$	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature 储藏温度	$T_{stg}$	-55 ~ +150	$^{\circ}\text{C}$

## 8. ESD Ratings ESD 评级

Characteristic 特性	JEDEC Class JEDEC 等级	Value 值	Unit 单位
Electrostatic Discharge-Human Body Model (ESD HBM) 人体放电模型	3A	4000	V
Electrostatic Discharge-Machine Model (ESD MM) 带电器件模型	C	400	V

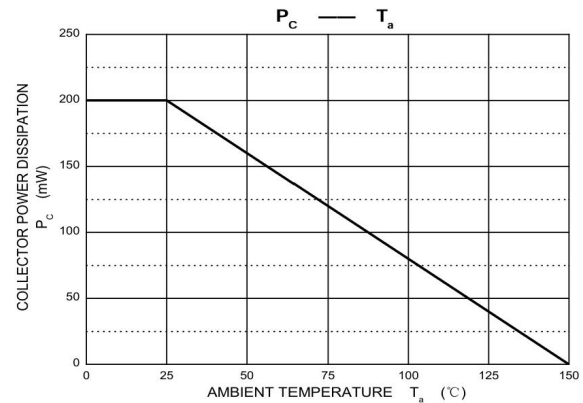
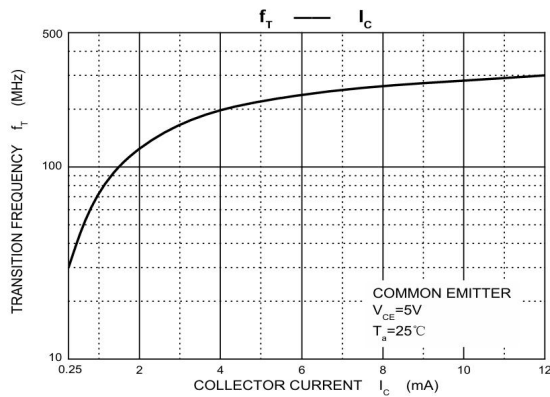
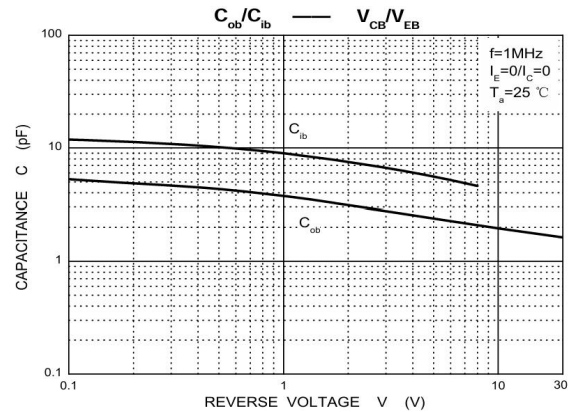
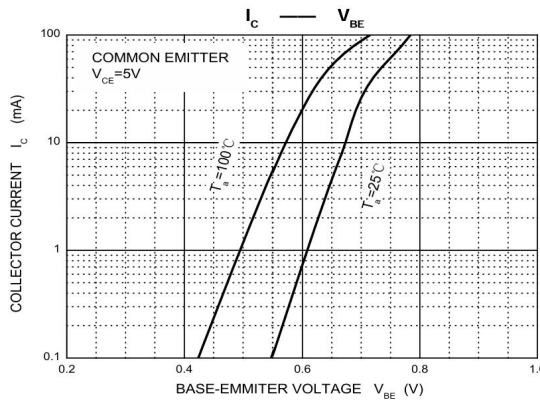
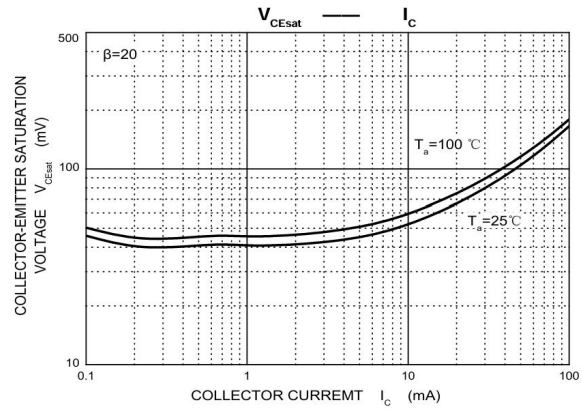
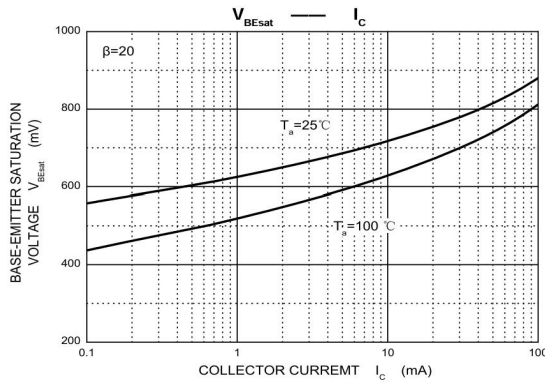
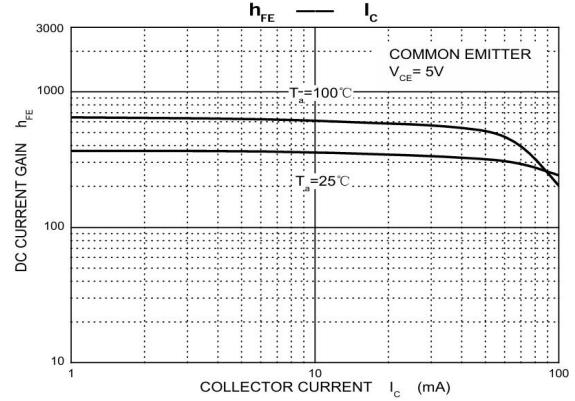
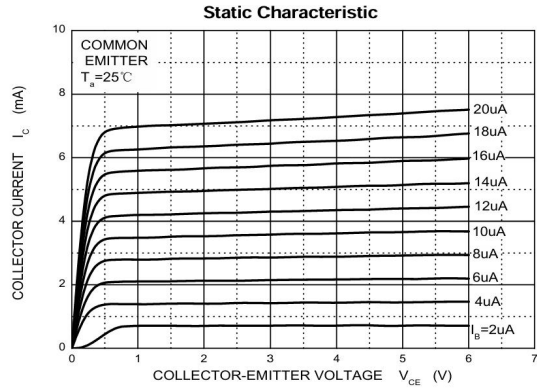
9. Electrical Characteristics( $T_a = +25^\circ\text{C}$ ) 电特性

Characteristic 特性		Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Conditions 条件
Collector-Base Breakdown Voltage 集电极-基极击穿电压		$BV_{CBO}$	50	-	-	V	$I_C = 10\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压 <sup>[3]</sup>		$BV_{CEO}$	45	-	-	V	$I_C = 10\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage 发射极-基极击穿电压		$BV_{EBO}$	6	-	-	V	$I_E = 1\mu\text{A}, I_C = 0$
Collector Cutoff Current 集电极截止电流		$I_{CBO}$	-	-	15	nA	$V_{CB} = 30\text{V}$
			-	-	100	nA	$V_{CB} = 50\text{V}$
Collector-Emitter Cut-Off Current 集电极-发射极漏电流		$I_{CES}$	-	-	15	nA	$V_{CE} = 50\text{V}$
Emitter-Base Cut-Off Current 发射极-基极漏电流		$I_{EBO}$	-	-	100	nA	$V_{EB} = 5\text{V}$
DC Current Gain 直流电流增益 <sup>[3]</sup>	BC847AQ	$h_{FE}$	110	180	220	-	$V_{CE} = 5\text{V},$ $I_C = 2\text{mA}$
	BC847BQ		200	290	450		
	BC847CQ		420	520	800		
Collector-Emitter Saturation Voltage 集电极-发射极饱和压降 <sup>[3]</sup>		$V_{CE(sat)}$	-	-	0.25	V	$I_C = 10\text{mA},$ $I_B = 0.5\text{mA}$
			-	-	0.5	V	$I_C = 100\text{mA},$ $I_B = 5\text{mA}$
Base-Emitter Saturation Voltage 基极-发射极饱和电压 <sup>[3]</sup>		$V_{BE(sat)}$	-	-	1.1	V	$I_C = 100\text{mA},$ $I_B = 5\text{mA}$
Transition Frequency 特征频率		$f_T$	100	-	-	MHz	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$
Out Capacitance 输出电容		$C_{ob}$	-	4.5	-	pF	$V_{CB} = 10\text{V}, I_E = 0,$ $f = 1\text{MHz}$

[3] pulsed;  $t_p \leq 300\mu\text{s}$ ;  $\delta \leq 0.02$ . 测量时脉冲宽度 $\leq 300\mu\text{s}$ , 占空比 $\leq 0.02$ 。

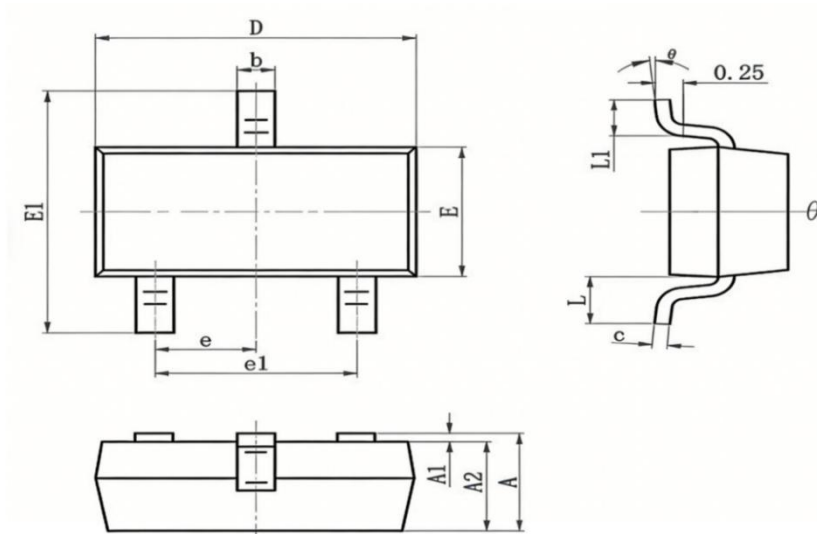


## 10. Typical Electrical Characteristics Curve 典型电特性曲线



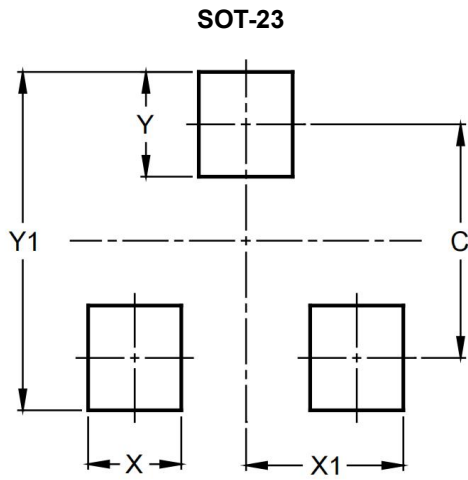
## 11. Package Outline Dimensions 封装外形尺寸

### SOT-23



Symbol 符号	Millimeters 毫米	
	Min.最小值	Max.最大值
A	0.900	1.150
A1	0	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.900	1.000
e1	1.800	2.000
L	0.500	0.600
L1	0.300	0.500
$\theta$	0°	8°

## 12. Suggested Pad Layout 推荐焊盘布局



Dimensions 尺寸	Millimeters 毫米
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

Fig. Soldering footprint for SOT-23

图 SOT-23 的引脚焊接



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