BC817-16Q/-25Q/-40Q

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	$I_C = 0.5\text{A}$
Complementary PNP Types 互补 PNP 类型	BC807-xxQ
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[1] Halogen and Antimony Free, "Green" Device. 无卤素和无锑，“绿色”器件[2]
Automotive Compliance 汽车合规	BC817-16Q/-25Q/-40Q suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified. 适用于需要特定变更控制的汽车应用，这些器件通过了 AEC-Q101 认证。

[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。

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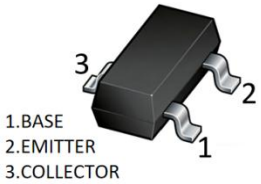
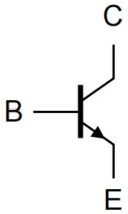
3. Mechanical Data 封装数据

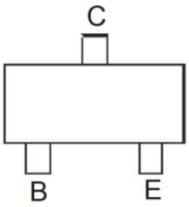
Feature 特性	Description 描述
Package 封装	SOT-23
Moisture Sensitivity Level 湿敏感度等级	J-STD-020 MSL1
Material 材料	Molded Plastic, “Green” Molding Compound; UL Flammability Classification Rating 94V-0. 模塑塑料封装，“绿色”成型复合材料；UL 可燃性等级 94V-0。
Dimensions 尺寸	$1.9mm$ pitch; $2.9mm \times 1.3mm \times 1.0mm$ body 相邻引脚中心距为 $1.9mm$，封装本体（不含引脚）尺寸为 $2.9mm \times 1.3mm \times 1.0mm$
Terminals Compliance 引脚合规	3 terminals, Tin Plated Leads, Solderable per MILSTD-202, Method 208 e3 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
BC817-16Q	Automotive	SOT-23	7	8	3000
BC817-25Q	Automotive	SOT-23	7	8	3000
BC817-40Q	Automotive	SOT-23	7	8	3000

5. Marking Information 丝印信息

Part Number	Marking Code
BC817-16Q	6A
BC817-25Q	6B
BC817-40Q	6C

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6. Absolute Maximum Ratings(T_a =+ 25℃) 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}	5	V
Collector Current 集电极电流	I_C	0.5	A

7. Thermal Characteristics(T_a =+ 25℃) 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	300	mW
Thermal Resistance From Junction To Ambient 结到环境的热阻	$R_{\theta JA}$	417	℃/W
Junction Temperature 结温	T_J	-55 ~ +150	℃
Storage Temperature 储藏温度	T_{stg}	-55 ~ +150	℃

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	3B	8000	V
Electrostatic Discharge-Machine Model（ESD MM） 带电器件模型	C	400	V

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9. Electrical Characteristics(T_a =+ 25℃) 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	$I_C = 100\mu A$, $I_E = 0$
Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压[3]		BV_{CEO}	45	-	-	V	$I_C = 10mA$, $I_B = 0$
Emitter-Base Breakdown Voltage 发射极-基极击穿电压		BV_{EBO}	5	-	-	V	$I_E = 10\mu A$, $I_C = 0$
Collector-Emitter Cut-Off Current 集电极-发射极漏电流		I_{CES}	-	-	100	nA	$V_{CE} = 45V$
Emitter-Base Cut-Off Current 发射极-基极漏电流		I_{EBO}	-	-	100	nA	$V_{EB} = 5V$
DC Current Gain 直流电流增益[3]	BC817-16Q BC817-25Q BC817-40Q	h_{FE}	100 160 250	-	250 400 600	-	$V_{CE} = 1V$, $I_C = 100mA$
DC Current Gain 直流电流增益[3]	BC817-16Q BC817-25Q BC817-40Q	h_{FE}	60 100 160	-	-	-	$V_{CE} = 1V$, $I_C = 300mA$
DC Current Gain 直流电流增益[3]		h_{FE}	40	-	-	-	$V_{CE} = 1V$, $I_C = 500mA$
Collector-Emitter Saturation Voltage 集电极-发射极饱和压降[3]		$V_{CE(sat)}$	-	-	0.7	V	$I_C = 500mA$, $I_B = 50mA$
Base-Emitter Saturation Voltage 基极-发射极饱和电压[3]		$V_{BE(sat)}$	-	-	1.2	V	$I_C = 500mA$, $I_B = 50mA$
Transition Frequency 特征频率		f_T	100	-	-	MHz	$V_{CE} = 5V, I_C = 10mA$
Out Capacitance 输出电容		C_{ob}	-	10	-	pF	$V_{CB} = 10V, I_E = 0$, $f = 1MHz$

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

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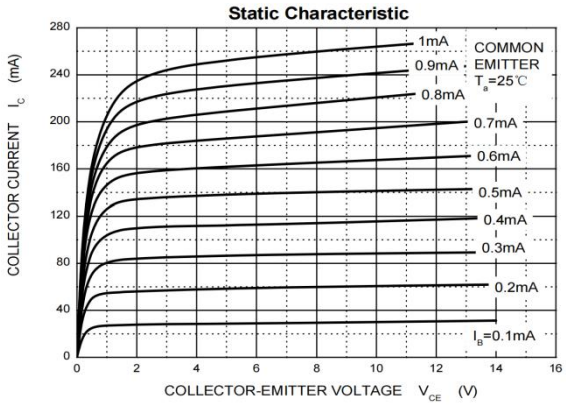
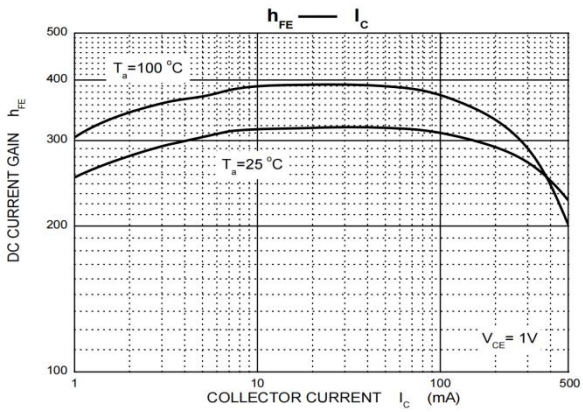
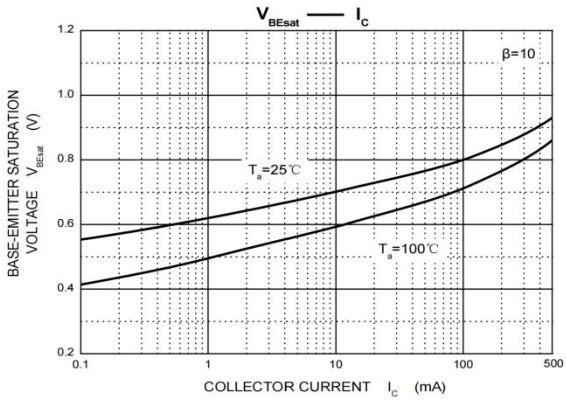
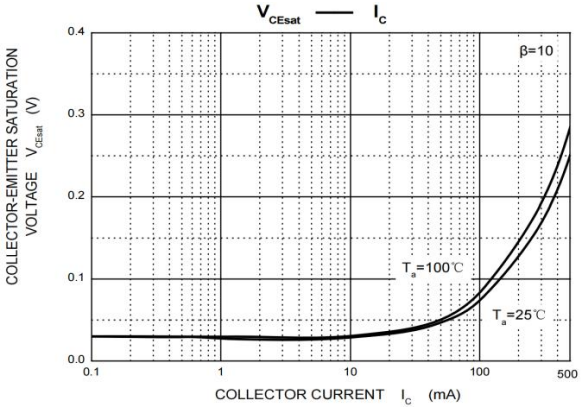
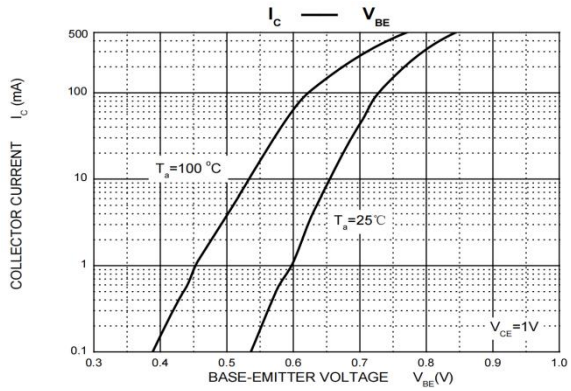
10. Typical Electrical Characteristics Curve 典型电特性曲线

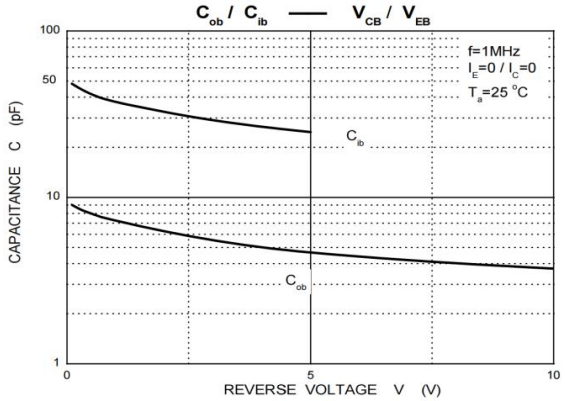


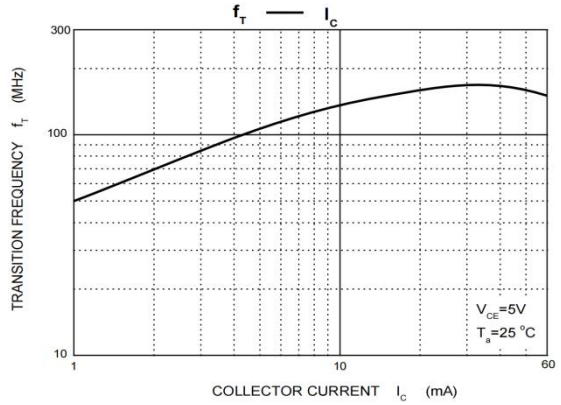


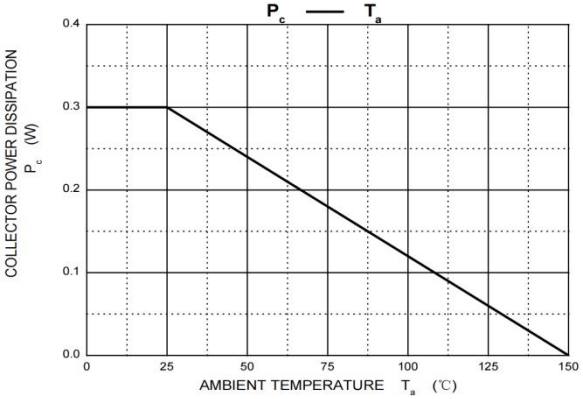












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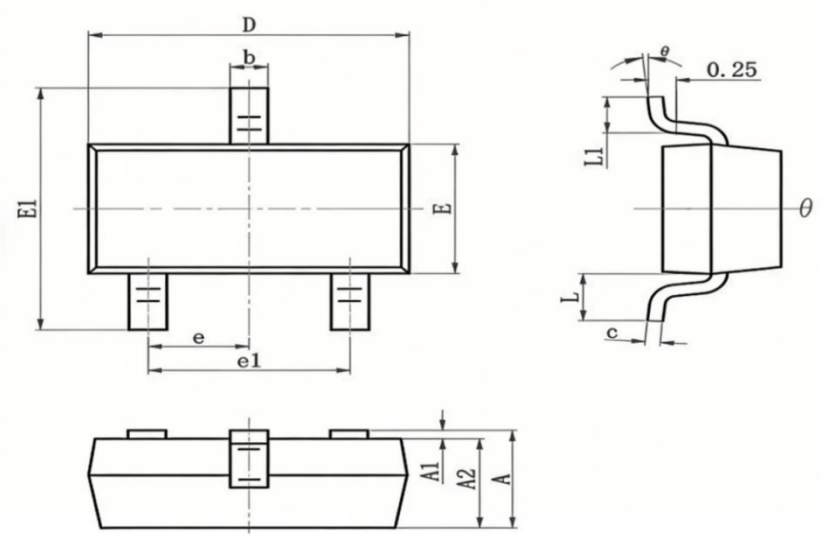
11. Package Outline Dimensions 封装外形尺寸

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
θ	0°	8°

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12. Suggested Pad Layout 推荐焊盘布局

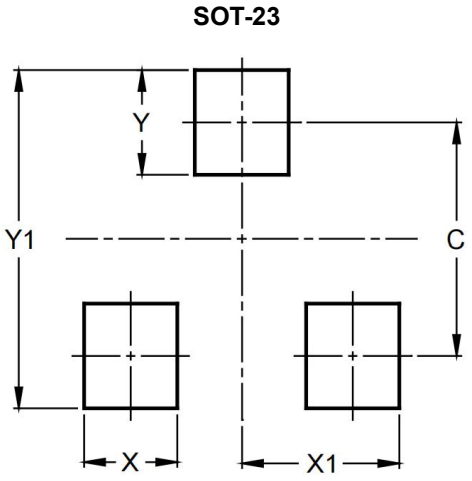

Fig. Soldering footprint for SOT-23

图 SOT-23 的引脚焊接

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

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