BCP56-16Q

SOT-223 NPN Bipolar Transistor
SOT-223 NPN 双极型三极管

1. Description 描述

This NPN medium-power Bipolar Junction Transistor (BJT) is suitable for automotive applications.
这款 NPN 型中功率双极结型晶体管（BJT）适用于汽车电子应用领域。

2. Features 特性

Feature 特性	Description 描述
Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压	$BV_{CEO} > 80V$
Continuous Collector Current 连续集电极电流	$I_C = 1\text{A}$
Low Saturation Voltage 低饱和电压	$V_{CE(SAT)} < 500mV @ 0.5A$
Applications 应用	• Automotive Applications 汽车应用 • Medium Power Switching or Amplification Applications 中功率开关或放大应用 • AF Drivers and Output Stages AF 驱动器与输出级
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、无锑，“绿色”器件[2]
Automotive Compliance 汽车合规	AEC-Q101 qualified. 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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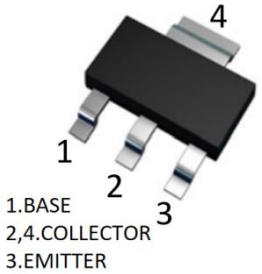
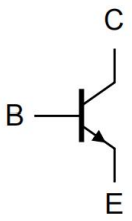
3. Mechanical Data 封装数据

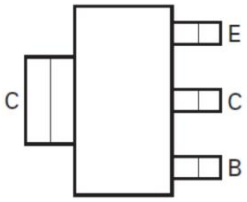
Feature 特性	Description 描述
Package 封装	SOT-223
Moisture Sensitivity Level 湿敏感度等级	J-STD-020 MSL1
Material 材料	Molded Plastic, “Green” Molding Compound; UL Flammability Classification Rating 94V-0. 模塑塑料封装，“绿色”成型复合材料；UL 可燃性等级 94V-0。
Dimensions 尺寸	$2.3mm$ pitch; $6.5mm \times 3.5mm \times 1.65mm$ body 相邻引脚中心距为 $2.3mm$，封装本体（不含引脚）尺寸为 $6.5mm \times 3.5mm \times 1.65mm$
Terminals Compliance 引脚合规	4 terminals, Tin Plated Leads; with an increased heatsink; Solderable per MILSTD-202, Method 208 e3 4 个镀锡引脚；带增强散热片；可焊性符合 MIL-STD-202 方法 208 的规定 e3
Weight 重量	0.112 grams (Approximate) 约 0.112 克
Polarity 极性	See Diagrams Below 极性见下图



SOT-223 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
BCP56-16Q	Automotive	SOT-223	13	12	2500

5. Marking Information 丝印信息

Part Number	Marking Code
BCP56-16Q	BCP 5616

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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}	100	V
Collector-Emitter Voltage 集电极-发射极电压	V_{CEO}	80	V
Emitter-Base Voltage 发射极-基极电压	V_{EBO}	5	V
Collector Current 集电极电流	I_C	1	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	1.5	W
Thermal Resistance From Junction To Ambient 结到环境的热阻	$R_{\theta JA}$	94	℃/W
Junction Temperature 结温	T_J	-65 ~ +150	℃
Storage Temperature 储藏温度	T_{stg}	-65 ~ +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	3A	4000	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}	100	-	-	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}	80	-	-	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-Base Cut-Off Current 集电极-基极漏电流	I_{CBO}	-	-	100	nA	$V_{CB} = 30V,\ I_E = 0$
Emitter-Base Cut-Off Current 发射极-基极漏电流	I_{EBO}	-	-	20	nA	$V_{EB} = 4V,\ I_C = 0$
DC Current Gain 直流电流增益[3]	h_{FE}	25	-	-	-	$V_{CE} = 2V$, $I_C = 5mA$
DC Current Gain 直流电流增益[3]	h_{FE}	100	-	250	-	$V_{CE} = 2V$, $I_C = 150mA$
DC Current Gain 直流电流增益[3]	h_{FE}	25	-	-	-	$V_{CE} = 2V$, $I_C = 500mA$
Collector-Emitter Saturation Voltage 集电极-发射极饱和压降[3]	$V_{CE(sat)}$	-	-	0.5	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	V	$V_{CE} = 2V$, $I_C = 500mA$
Transition Frequency 特征频率	f_T	100	-	-	MHz	$V_{CE} = 10V$, $I_C = 50\text{mA}$, $f = 100MHz$
Out Capacitance 输出电容	C_{ob}	-	-	25	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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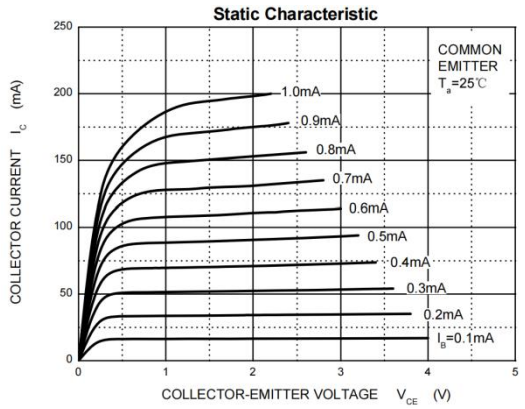
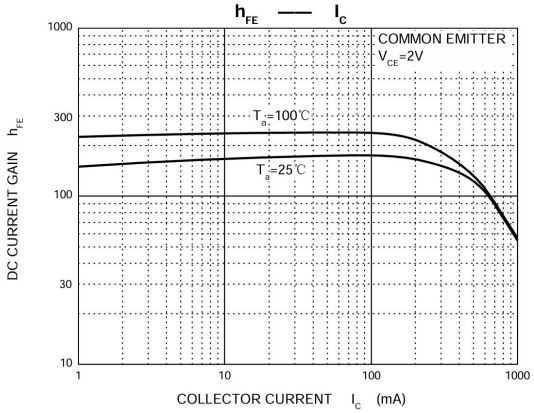
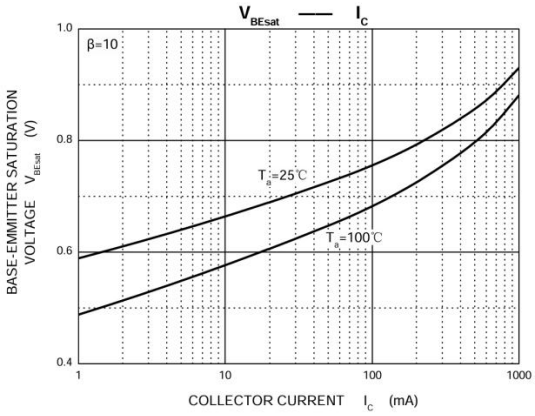
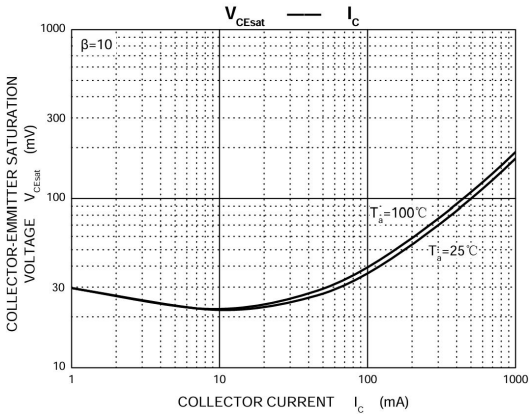
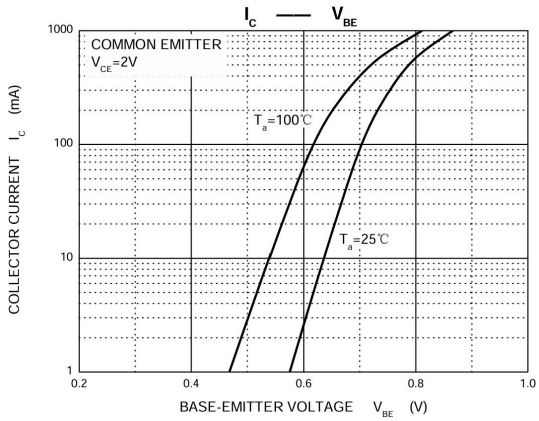
10. Typical Electrical Characteristics Curve 典型电特性曲线

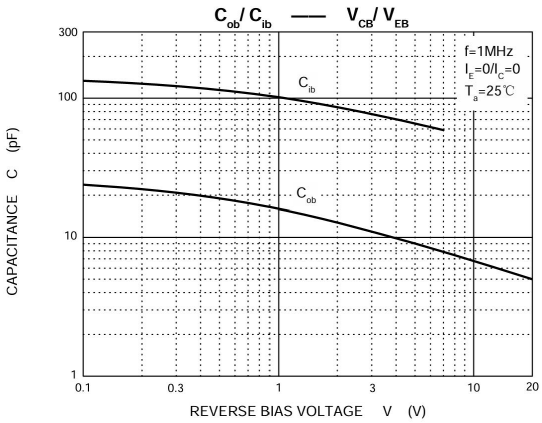


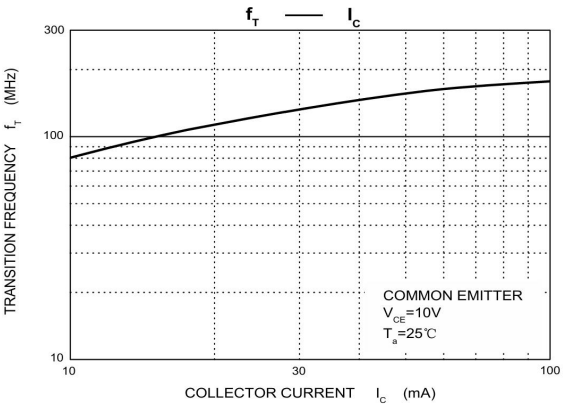


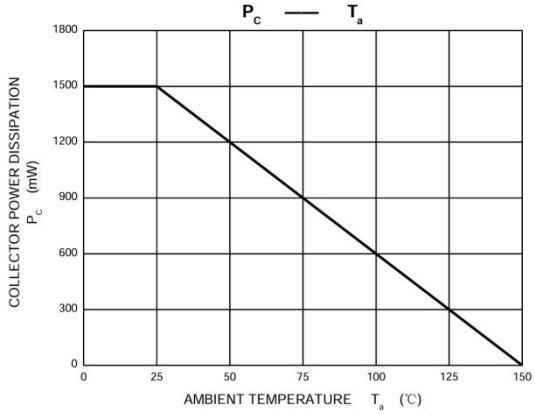












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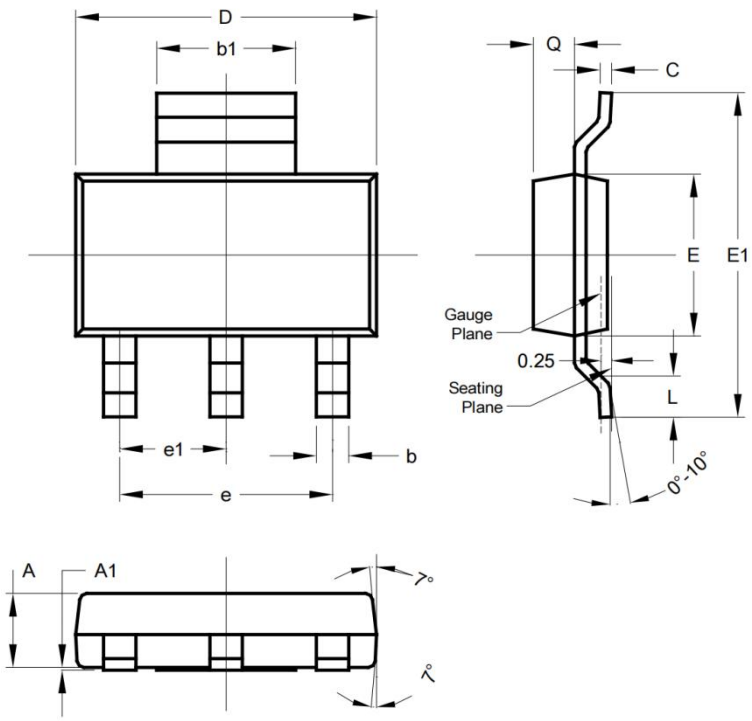
11. Package Outline Dimensions 封装外形尺寸

SOT-223



Symbol 符号	Millimeters 毫米	
	Min.最小值	Max.最大值
A	1.55	1.65
A1	0.01	0.15
b	0.60	0.80
b1	2.90	3.10
C	0.20	0.30
D	6.45	6.55
E	3.45	3.55
E1	6.90	7.10
e	4.40	4.80
e1	2.20	2.40
L	0.85	1.05
Q	0.84	0.94

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12. Suggested Pad Layout 推荐焊盘布局

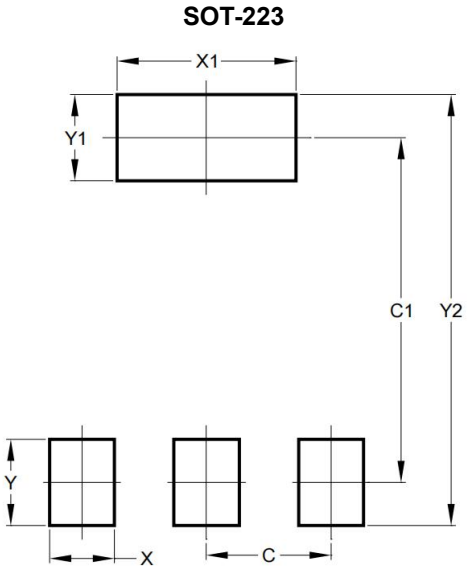

Fig. Soldering footprint for SOT-223

图 SOT-223 的引脚焊接

Dimensions 尺寸	Millimeters 毫米
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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Contents 目录

1. Description 描述 1
2. Features 特性 1
3. Mechanical Data 封装数据 2
4. Ordering Information 订购信息 2
5. Marking Information 丝印信息 2
6. Absolute Maximum Ratings(T_a =+ 25℃) 绝对最大额定值 3
7. Thermal Characteristics(T_a =+ 25℃) 热特性 3
8. ESD Ratings ESD 评级 3
9. Electrical Characteristics(T_a =+ 25℃) 电特性 4
10. Typical Electrical Characteristics Curve 典型电特性曲线 5
11. Package Outline Dimensions 封装外形尺寸 6
12. Suggested Pad Layout 推荐焊盘布局 7
Important Notice 重要通知 8

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