BCX56-16Q

SOT-89 NPN Bipolar Transistor
SOT-89 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

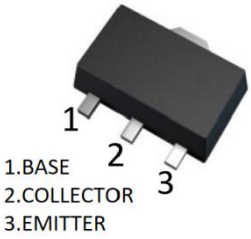
Feature 特性	Description 描述
Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压	$BV_{CEO} > 80V$
Continuous Collector Current 连续集电极电流	$I_C = 1A$
Peak Pulse Current 峰值脉冲电流	$I_{CM} = 2A$
Complementary PNP Types 互补 PNP 类型	BCX53-16Q
Applications 应用	• Automotive Applications 汽车应用 • Medium Power Switching or Amplification 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）。

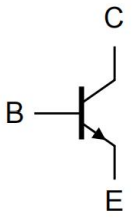
[2] Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
无卤素和无锑的“绿色”产品指溴含量<900ppm，氯含量<900ppm（溴+氯总含量<1500ppm）和锑化合物含量<1000ppm。

3. Mechanical Data 封装数据

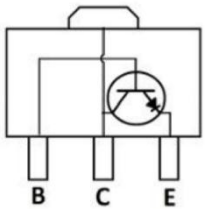
Feature 特性	Description 描述
Package 封装	SOT-89
Moisture Sensitivity Level 湿敏感度等级	J-STD-020 MSL1
Material 材料	Molded Plastic, “Green” Molding Compound; UL Flammability Classification Rating 94V-0. 模塑塑料封装，“绿色”成型复合材料；UL 可燃性等级 94V-0。
Dimensions 尺寸	$1.5mm$ pitch; $4.5mm \times 2.5mm \times 1.5mm$ body 相邻引脚中心距为 $1.5mm$，封装本体（不含引脚）尺寸为 $4.5mm \times 2.5mm \times 1.5mm$
Terminals Compliance 引脚合规	3 terminals, Tin Plated Leads; exposed die pad for good heat transfer; Solderable per MILSTD-202, Method 208e3 3 个镀锡引脚；外露散热焊盘以增强热传导；可焊性符合 MIL-STD-202 方法 208 的规定e3
Weight 重量	0.055 grams (Approximate) 约 0.055 克
Polarity 极性	See Diagrams Below 极性见下图



SOT-89 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
BCX56-16Q	Automotive	SOT-89	7	12	1000

5. Marking Information 丝印信息

Part Number	Marking Code
BCX56-16Q	BL

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
Peak Pulse Collector Current(single pulse,$t_P \leq 1ms$) 峰值脉冲集电极电流（单脉冲,$t_P \leq 1ms$)	I_{CM}	2	A
Peak Pulse Base Current(single pulse,$t_P \leq 1ms$) 峰值脉冲基极电流（单脉冲,$t_P \leq 1ms$）	I_{BM}	200	mA

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	500	mW
Thermal Resistance From Junction To Ambient 结到环境的热阻	$R_{\theta JA}$	250	℃/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

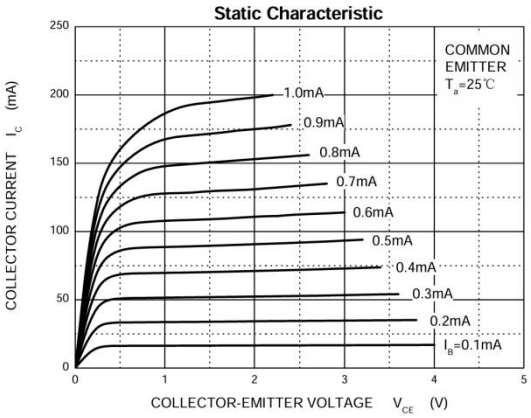
Characteristic 特性	JEDEC Class JEDEC 等级	Value 值	Unit 单位
Electrostatic Discharge-Human Body Model（ESD HBM） 人体放电模型	3A	4000	V
Electrostatic Discharge-Machine Model（ESD MM） 带电器件模型	C	400	V

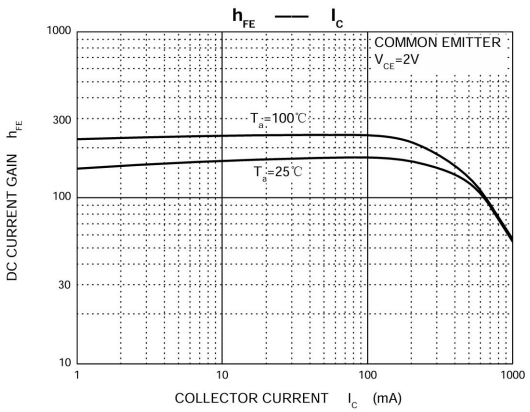
9. Electrical Characteristics(T_a =+ 25℃) 电特性

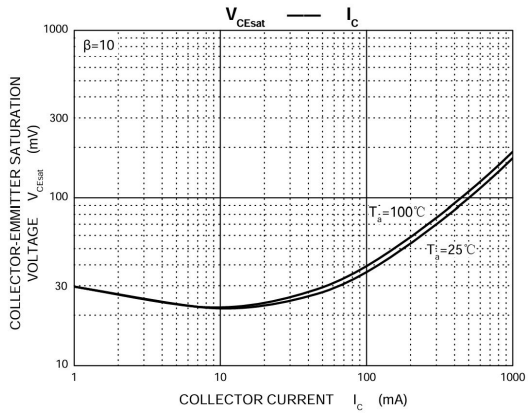
Characteristic 特性	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Conditions 条件
Collector-Base Breakdown Voltage 集电极-基极击穿电压	BV_{CBO}	100	-	-	V	$I_C = 100\mu A,\ I_E = 0$
Collector-Emitter Breakdown Voltage 集电极-发射极击穿电压[3]	BV_{CEO}	80	-	-	V	$I_C = 10mA,\ I_B = 0$
Emitter-Base Breakdown Voltage 发射极-基极击穿电压	BV_{EBO}	5	-	-	V	$I_E = 100\mu A,\ I_C = 0$
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}	-	-	100	nA	$V_{EB} = 5V,\ I_C = 0$
DC Current Gain 直流电流增益[3]	h_{FE}	40	-	-	-	$V_{CE} = 2V$, $I_C = 5mA$
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	$I_C = 500mA$, $I_B = 50mA$
Transition Frequency 特征频率	f_T	-	130	-	MHz	$V_{CE} = 5V$, $I_C = 10mA$
Out Capacitance 输出电容	C_{ob}	-	15	-	pF	$V_{CB} = 10V$,$I_E = 0$, $f = 1MHz$

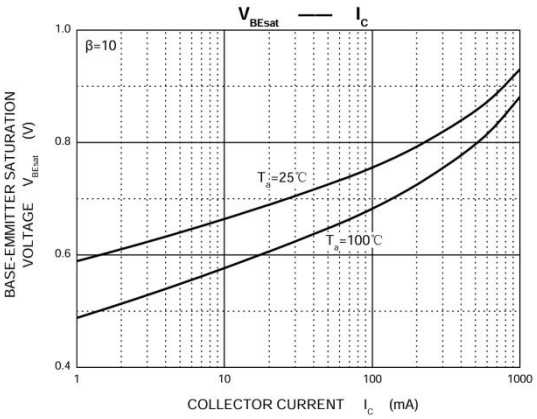
[3] pulsed; $t_p \leq 300\mu s$; $\delta \leq 0.02$. 测量时脉冲宽度≤ 300 μ s，占空比≤ 0.02。

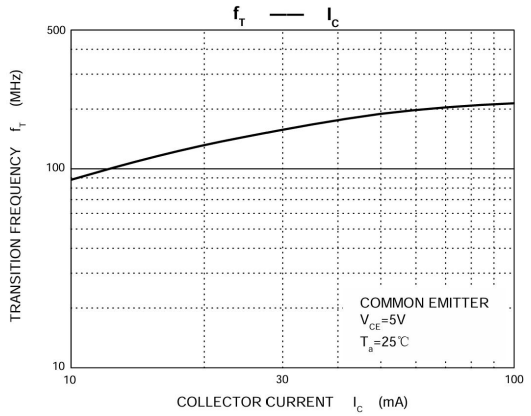
10. Typical Electrical Characteristics Curve 典型电特性曲线

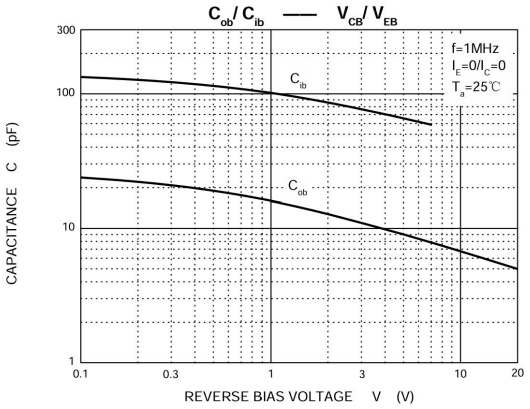


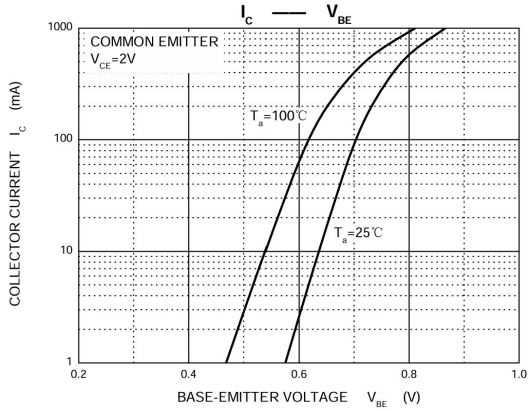


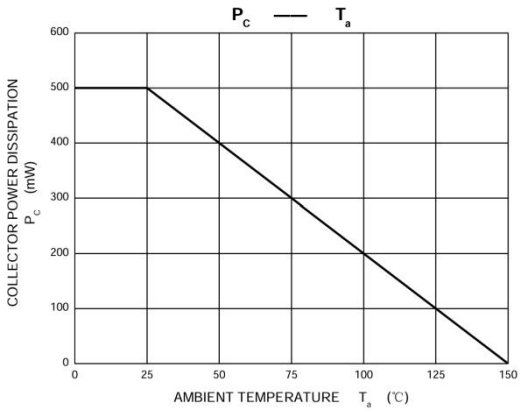






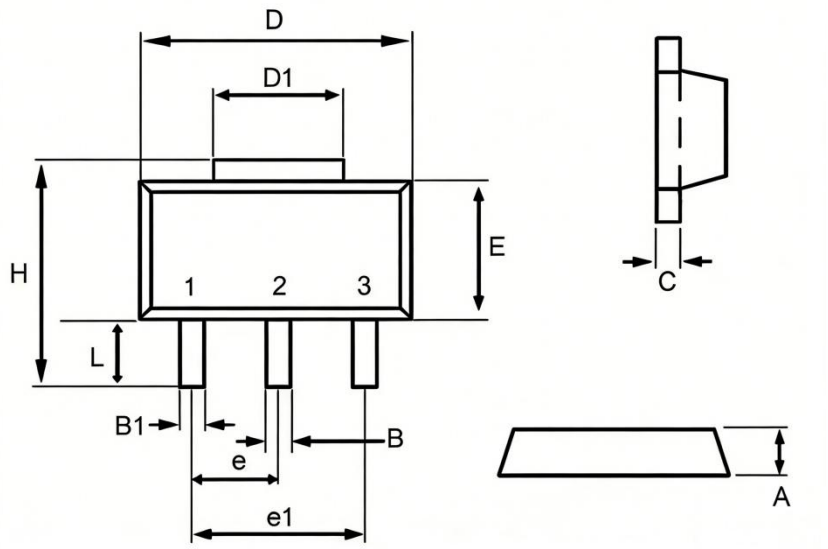






11. Package Outline Dimensions 封装外形尺寸

SOT-89



Symbol 符号	Millimeters 毫米	
	Min.最小值	Max.最大值
A	1.40	1.60
B	0.40	0.56
B1	0.35	0.48
C	0.35	0.44
D	4.40	4.60
D1	1.35	1.83
e	1.45	1.55
e1	2.95	3.05
E	2.29	2.60
H	3.75	4.25
L	0.80	1.20

12. Suggested Pad Layout 推荐焊盘布局

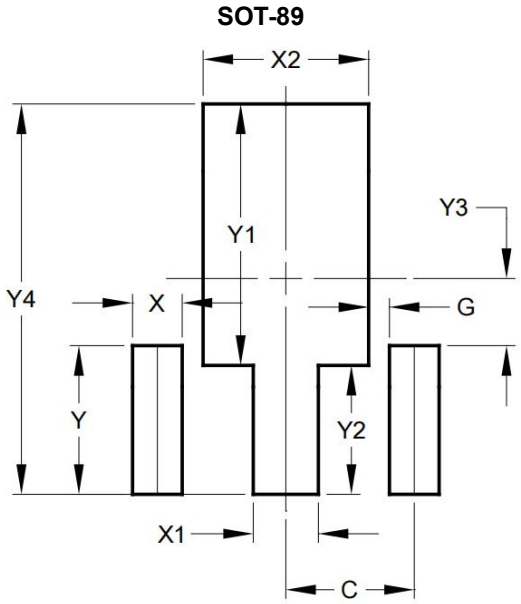


Fig. Soldering footprint for SOT-89

图 SOT-89 的引脚焊接

Dimensions 尺寸	Millimeters 毫米
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

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