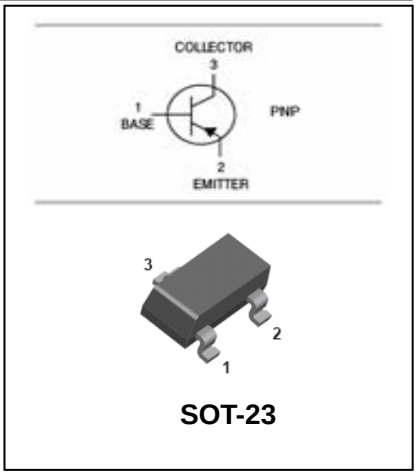
# Silicon Epitaxial Planar Transistor **2SB709A**

## FEATURES

- High forward current transfer ratio $h_{FE}$.
- Mini type package, allowing downsizing of the equipment and automatic insertion through the tape packing and the magazine packing.

Lead-free




**SOT-23**

## APPLICATIONS

- For general amplification complementary to 2SD601A

## ORDERING INFORMATION

| Type No. | Marking | Package Code |
|---|---|---|
| 2SB709A | BQ1,BR1,BS1 | SOT-23 |

## MAXIMUM RATING @ Ta=25℃ unless otherwise specified

| **Symbol** | **Parameter** | **Value** | **Units** |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | -45 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | -45 | V |
| $V_{EBO}$ | Emitter-Base Voltage | -7 | V |
| $I_{CP}$ | Peak collector Current | -200 | mA |
| $I_C$ | Collector Current | -100 | mA |
| $P_C$ | Collector Dissipation | 200 | mW |
| $T_j, T_{stg}$ | Junction and Storage Temperature | -55~150 | ℃ |

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## ELECTRICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

| **Parameter** | **Symbol** | **Test conditions** | **MIN** | **TYP** | **MAX** | **UNIT** |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C$=-10μA,$I_E$=0 | -45 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C$=-2mA,$I_B$=0 | -45 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E$=-10μA,$I_C$=0 | -7 | | | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$=-20V,$I_E$=0 | | | -0.1 | μA |
| Collector cut-off current | $I_{CEO}$ | $V_{EB}$=-10V,$I_C$=0 | | | -100 | μA |
| DC current gain | $h_{FE}$ | $V_{CE}$=-10V,$I_C$=-2mA | 160 | | 460 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$=-100mA, $I_B$=-10mA | | -0.3 | -0.5 | V |
| Transition frequency | $f_T$ | $V_{CB}$=-10V, $I_E$=-1mA f=200MHz | | 80 | | MHz |
| Collector output capacitance | $C_{ob}$ | $V_{CB}$=-10V,$I_E$=0,f=1MHz | | 2.7 | | pF |

CLASSIFICATION OF $h_{FE(1)}$

| Range | 160-260 | 210-340 | 290-460 |
|---|---|---|---|
| Marking | BQ1 | BR1 | BS1 |

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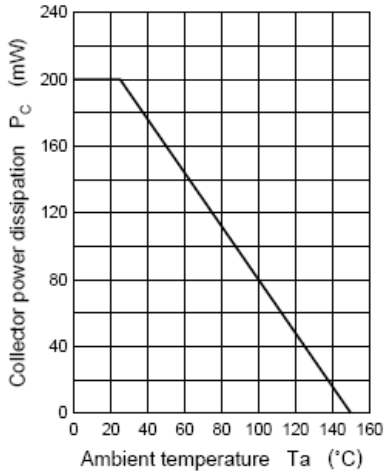
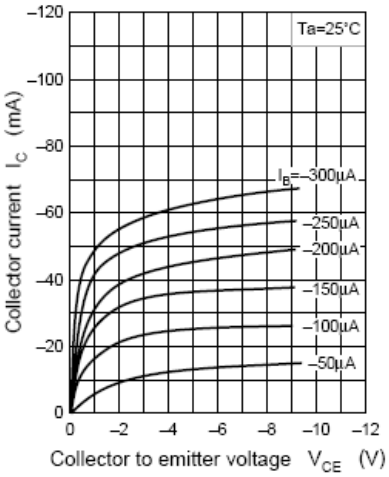
## TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

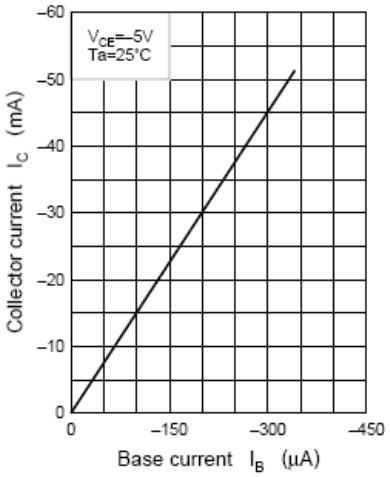
$P_C$ — Ta



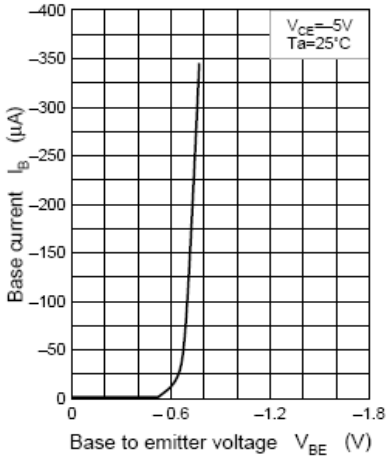

$I_C$ — $V_{CE}$



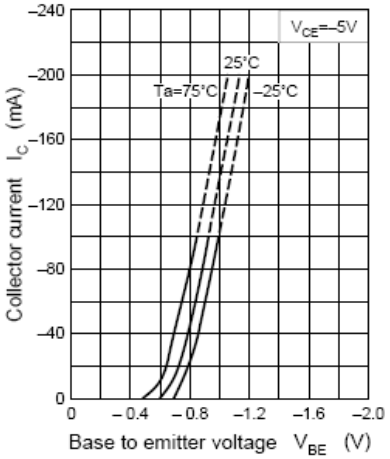

$I_C$ — $I_B$



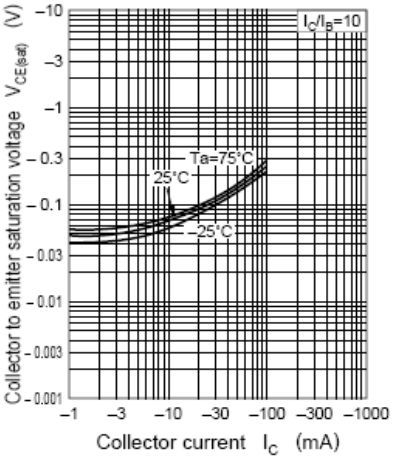

$I_B$ — $V_{BE}$



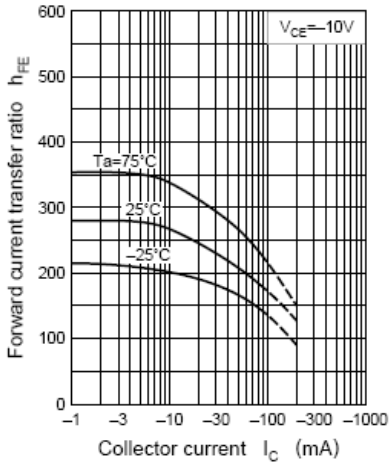

$I_C$ — $V_{BE}$



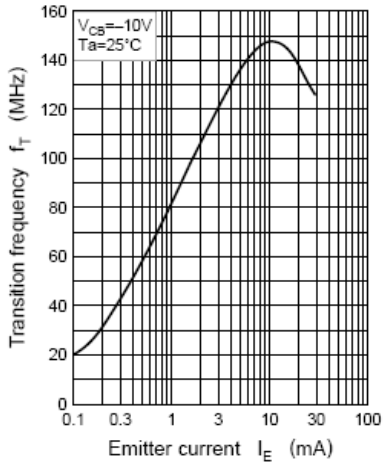

$V_{CE(sat)}$ — $I_C$



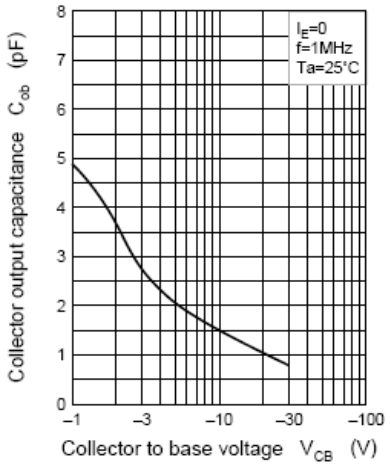

$h_{FE}$ — $I_C$




$f_T$ — $I_E$




$C_{ob}$ — $V_{CB}$



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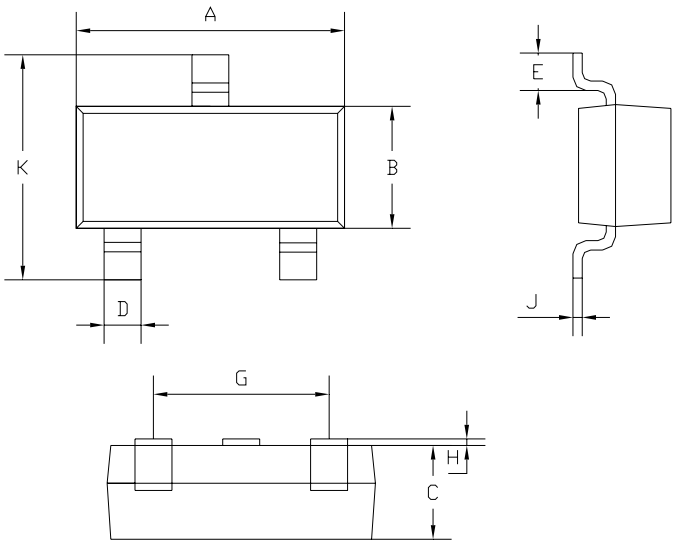
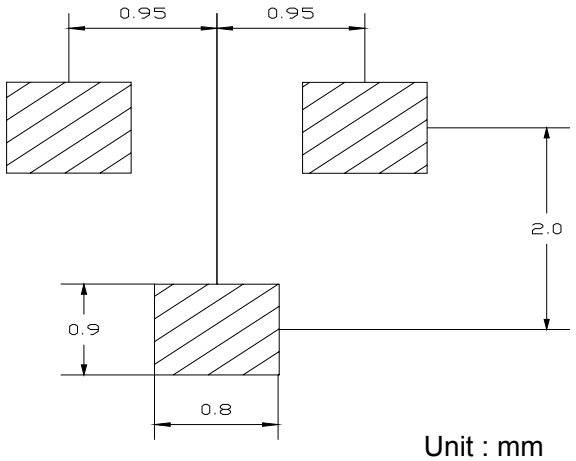
## PACKAGE OUTLINE

Plastic surface mounted package SOT-23




| SOT-23 | | |
|---|---|---|
| Dim | Min | Max |
| A | 2.85 | 2.95 |
| B | 1.25 | 1.35 |
| C | 1.0Typical | |
| D | 0.37 | 0.43 |
| E | 0.35 | 0.48 |
| G | 1.85 | 1.95 |
| H | 0.02 | 0.1 |
| J | 0.1Typical | |
| K | 2.35 | 2.45 |
| All Dimensions in mm | | |

## SOLDERING FOOTPRINT




Unit : mm

## PACKAGE INFORMATION

| Device | Package | Shipping |
|---|---|---|
| 2SB709A | SOT-23 | 3000/Tape&Reel |