

## 200mW, PNP Small Signal Transistor

### FEATURES

- AEC-Q101 qualified
- General-purpose transistors
- Ideal for automated placement
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

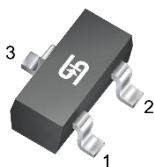
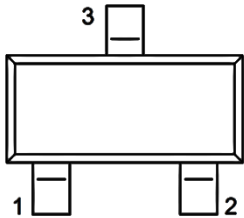
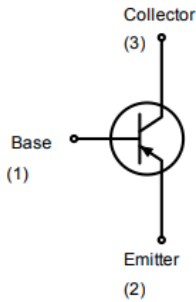
### APPLICATIONS

- General switching and amplification

### MECHANICAL DATA

- Case: SOT-23
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Weight: 8.00mg (approximately)



| PACKAGE: SOT-23                                                                     | PIN CONFIGURATION                                                                   | CIRCUIT DIAGRAM                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)

| PARAMETER                        |                  | SYMBOL           | VALUE       | UNIT |
|----------------------------------|------------------|------------------|-------------|------|
| Power dissipation <sup>(1)</sup> |                  | P <sub>D</sub>   | 200         | mW   |
| Collector-base voltage           | BC856BH          | V <sub>CBO</sub> | -80         | V    |
|                                  | BC857BH, BC857CH |                  | -50         |      |
| Collector-emitter voltage        | BC856BH          | V <sub>CEO</sub> | -65         | V    |
|                                  | BC857BH, BC857CH |                  | -45         |      |
| Emitter-base voltage             |                  | V <sub>EBO</sub> | -5          | V    |
| Collector current                |                  | I <sub>C</sub>   | -100        | mA   |
| Junction temperature             |                  | T <sub>J</sub>   | -55 to +150 | °C   |
| Storage temperature              |                  | T <sub>STG</sub> | -55 to +150 | °C   |

#### Note:

1. Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint

**THERMAL PERFORMANCE**

| PARAMETER                                             | SYMBOL          | TYP | UNIT |
|-------------------------------------------------------|-----------------|-----|------|
| Junction-to-ambient thermal resistance <sup>(1)</sup> | $R_{\theta JA}$ | 625 | °C/W |

**Thermal Performance Note:**

1. Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint

**ELECTRICAL SPECIFICATIONS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| PARAMETER                            | CONDITIONS                                                         |                  | SYMBOL        | MIN | TYP | MAX   | UNIT          |
|--------------------------------------|--------------------------------------------------------------------|------------------|---------------|-----|-----|-------|---------------|
| Collector-base breakdown voltage     | $I_C = -10\mu\text{A}$ , $I_E = 0\text{A}$                         | BC856BH          | $V_{(BR)CBO}$ | -80 | -   | -     | V             |
|                                      |                                                                    | BC857BH, BC857CH |               | -50 | -   | -     |               |
| Collector-emitter breakdown voltage  | $I_C = -10\text{mA}$ , $I_B = 0\text{A}$                           | BC856BH          | $V_{(BR)CEO}$ | -65 | -   | -     | V             |
|                                      |                                                                    | BC857BH, BC857CH |               | -45 | -   | -     |               |
| Emitter-base breakdown voltage       | $I_E = -1\mu\text{A}$ , $I_C = 0\text{A}$                          |                  | $V_{(BR)EBO}$ | -5  | -   | -     | V             |
| Collector-base cut-off current       | $V_{CB} = -70\text{V}$ , $I_E = 0\text{A}$                         | BC856BH          | $I_{CBO}$     | -   | -   | -0.1  | $\mu\text{A}$ |
|                                      | $V_{CB} = -45\text{V}$ , $I_E = 0\text{A}$                         | BC857BH, BC857CH |               |     |     |       |               |
| Emitter-base cut-off current         | $V_{EB} = -5\text{V}$ , $I_C = 0\text{A}$                          |                  | $I_{EBO}$     | -   | -   | -0.1  | $\mu\text{A}$ |
| DC current gain                      | $V_{CE} = -5\text{V}$ , $I_C = -2\text{mA}$                        | BC856BH, BC857BH | $h_{FE}$      | 220 | -   | 475   | -             |
|                                      |                                                                    | BC857CH          |               | 420 | -   | 800   |               |
| Collector-emitter saturation voltage | $I_C = -100\text{mA}$ , $I_B = -5\text{mA}$                        |                  | $V_{CE(sat)}$ | -   | -   | -0.65 | V             |
| Base-emitter saturation voltage      | $I_C = -100\text{mA}$ , $I_B = -5\text{mA}$                        |                  | $V_{BE(sat)}$ | -   | -   | -1.1  | V             |
| Transition frequency                 | $V_{CE} = -5\text{V}$ , $I_C = -10\text{mA}$ , $f = 100\text{MHz}$ |                  | $f_T$         | 100 | -   | -     | MHz           |
| Output capacitance                   | $V_{CB} = -10\text{V}$ , $I_E = 0\text{A}$ , $f = 1\text{MHz}$     |                  | $C_{obo}$     | -   | -   | 4.5   | pF            |

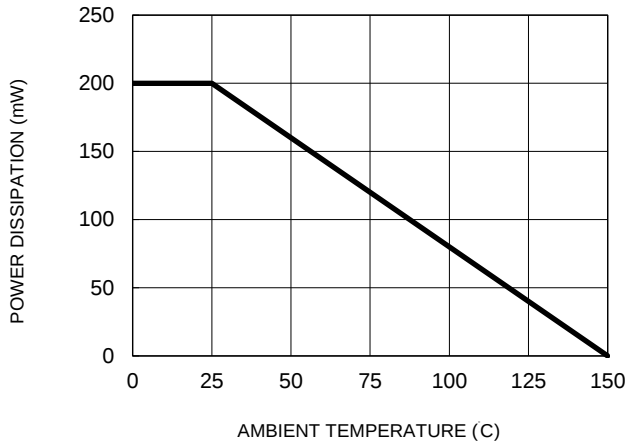
**ORDERING AND MARKING INFORMATION**

| ORDERING CODE | PACKAGE | PACKING                | DEVICE MARKING |
|---------------|---------|------------------------|----------------|
| BC856BH RFG   | SOT-23  | 3,000 / 7" Tape & Reel | <u>3</u> B     |
| BC857BH RFG   | SOT-23  | 3,000 / 7" Tape & Reel | <u>3</u> F     |
| BC857CH RFG   | SOT-23  | 3,000 / 7" Tape & Reel | <u>3</u> G     |

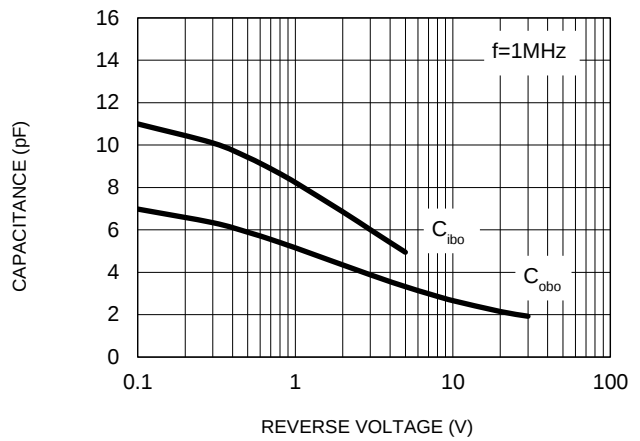
## CHARACTERISTICS CURVES

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

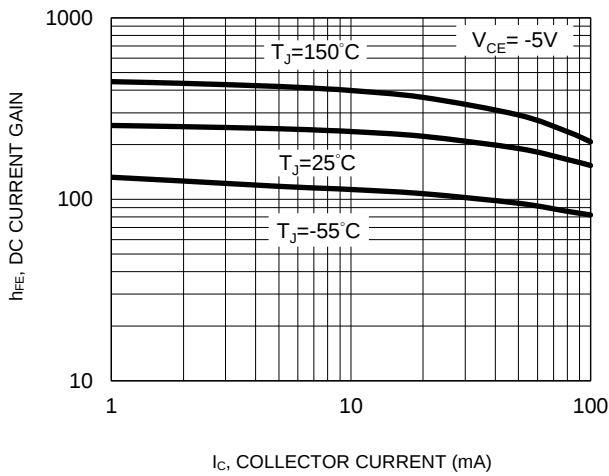
**Fig.1 Power Dissipation Curve**



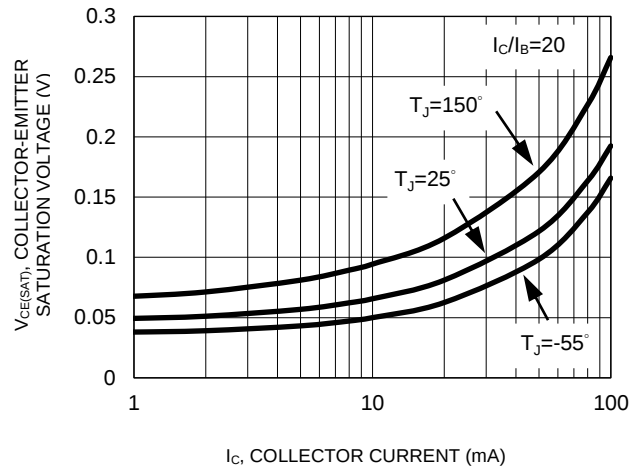
**Fig.2 Typical Capacitance Characteristics**



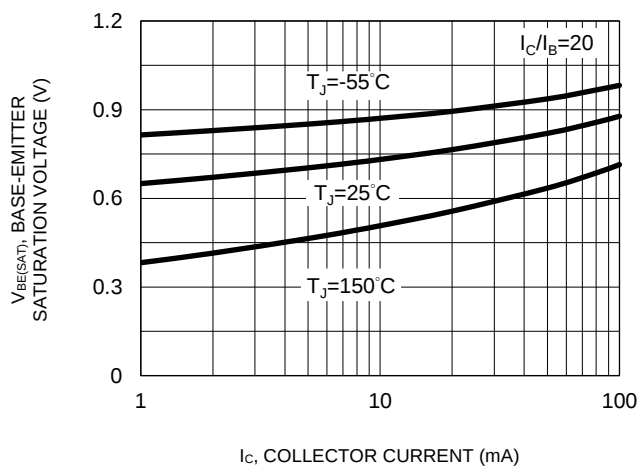
**Fig.3 DC Current Gain vs. Collector Current**



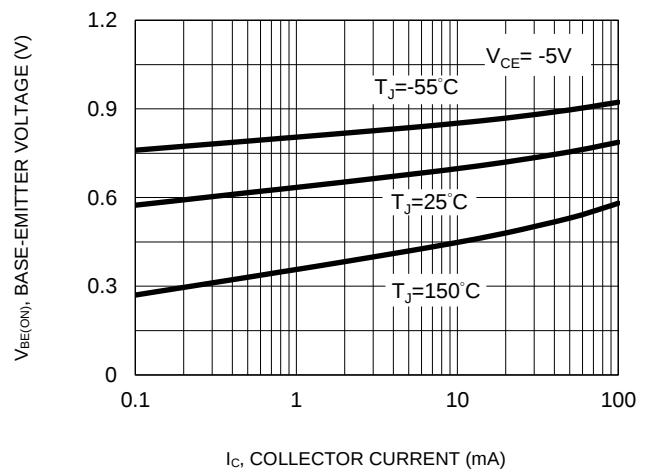
**Fig.4 Collector-Emitter Saturation Voltage vs. Collector Current**



**Fig.5 Base-Emitter Saturation Voltage vs. Collector Current**

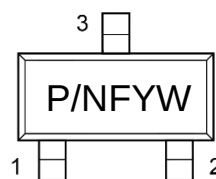
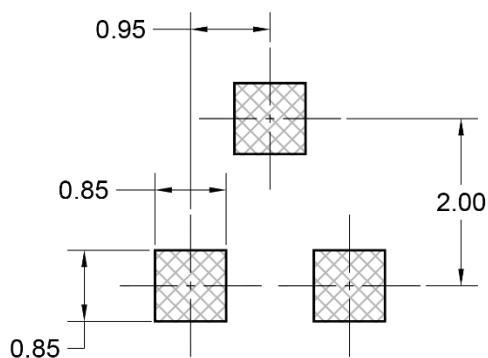
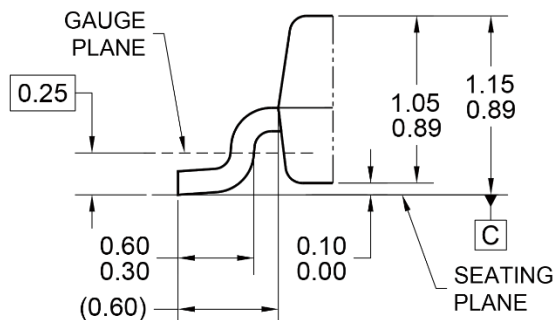
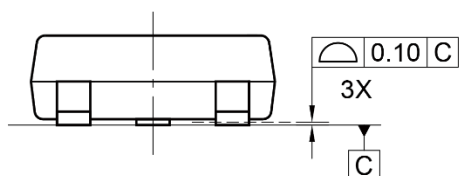
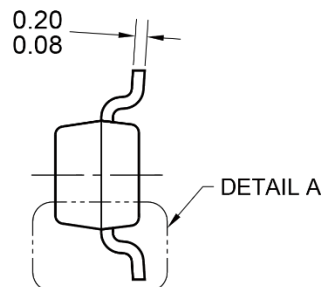
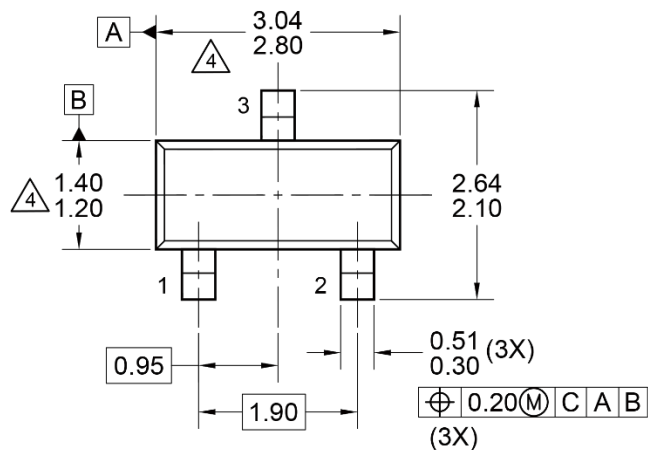


**Fig.6 Base-Emitter Voltage vs. Collector Current**



## PACKAGE OUTLINE DIMENSIONS

### SOT-23



#### NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-236, ISSUE H, VARIATION AA.

4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

5. DWG NO. REF: HQ2SD07-SOT23JEDEC-104 REV B.

P/N = Device marking  
F = Factory code  
Y = Year code  
W = Bi-Week code (A~Z)

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