

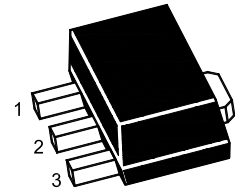
# BCX56U-AH

## NPN Silicon Epitaxial Planar Transistor

Medium Power Transistor

### Features

- AEC-Q101 Qualified
- Halogen and Antimony Free(HAF), RoHS compliant



1.Base 2.Collector 3.Emitter  
SOT-89 Plastic Package

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

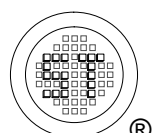
| Parameter                 | Symbol    | Value                                  | Unit             |
|---------------------------|-----------|----------------------------------------|------------------|
| Collector Base Voltage    | $V_{CBO}$ | 100                                    | V                |
| Collector Emitter Voltage | $V_{CEO}$ | 80                                     | V                |
| Emitter Base Voltage      | $V_{EBO}$ | 5                                      | V                |
| Collector Current         | $I_C$     | 1                                      | A                |
| Peak Collector Current    | $I_{CM}$  | 1.5                                    | A                |
| Total Power Dissipation   | $P_{tot}$ | 0.5 <sup>1)</sup><br>1.3 <sup>2)</sup> | W                |
| Junction Temperature      | $T_j$     | 150                                    | $^\circ\text{C}$ |
| Storage Temperature Range | $T_{stg}$ | - 65 to + 150                          | $^\circ\text{C}$ |

### Thermal Resistance Ratings

| Parameter                                   | Symbol          | Max.                                  | Unit               |
|---------------------------------------------|-----------------|---------------------------------------|--------------------|
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 250 <sup>1)</sup><br>96 <sup>2)</sup> | $^\circ\text{C/W}$ |

<sup>1)</sup> Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.

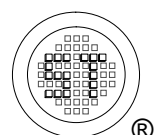
<sup>2)</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.



# BCX56U-AH

## Characteristics at $T_a = 25^\circ\text{C}$

| Parameter                                                              | Symbol        | Min. | Typ. | Max. | Unit |
|------------------------------------------------------------------------|---------------|------|------|------|------|
| DC Current Gain                                                        |               |      |      |      |      |
| at $V_{CE} = 2\text{ V}$ , $I_C = 5\text{ mA}$                         | $h_{FE}$      | 40   | -    | -    | -    |
| at $V_{CE} = 2\text{ V}$ , $I_C = 150\text{ mA}$                       | $h_{FE}$      | 63   | -    | 160  | -    |
| BCX56-10U                                                              | $h_{FE}$      | 100  | -    | 250  | -    |
| BCX56-16U                                                              | $h_{FE}$      | 25   | -    | -    | -    |
| at $V_{CE} = 2\text{ V}$ , $I_C = 500\text{ mA}$                       | $h_{FE}$      | 25   | -    | -    | -    |
| Collector Base Cutoff Current                                          |               |      |      |      |      |
| at $V_{CB} = 30\text{ V}$                                              | $I_{CBO}$     | -    | -    | 100  | nA   |
| Emitter Base Cutoff Current                                            |               |      |      |      |      |
| at $V_{EB} = 5\text{ V}$                                               | $I_{EBO}$     | -    | -    | 100  | nA   |
| Collector Base Breakdown Voltage                                       |               |      |      |      |      |
| at $I_C = 100\text{ }\mu\text{A}$                                      | $V_{(BR)CBO}$ | 100  | -    | -    | V    |
| Collector Emitter Breakdown Voltage                                    |               |      |      |      |      |
| at $I_C = 1\text{ mA}$                                                 | $V_{(BR)CEO}$ | 80   | -    | -    | V    |
| Emitter Base Breakdown Voltage                                         |               |      |      |      |      |
| at $I_E = 100\text{ }\mu\text{A}$                                      | $V_{(BR)EBO}$ | 5    | -    | -    | V    |
| Collector Emitter Saturation Voltage                                   |               |      |      |      |      |
| at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$                        | $V_{CE(sat)}$ | -    | -    | 0.5  | V    |
| Base Emitter Voltage                                                   |               |      |      |      |      |
| at $V_{CE} = 2\text{ V}$ , $I_C = 500\text{ mA}$                       | $V_{BE}$      | -    | -    | 1    | V    |
| Transition Frequency                                                   |               |      |      |      |      |
| at $V_{CE} = 5\text{ V}$ , $I_C = 50\text{ mA}$ , $f = 100\text{ MHz}$ | $f_T$         | 100  | -    | -    | MHz  |
| Collector Capacitance                                                  |               |      |      |      |      |
| at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                         | $C_c$         | -    | 6    | -    | pF   |



# BCX56U-AH

## Electrical Characteristics Curves

Fig. 1 Output Characteristics Curve

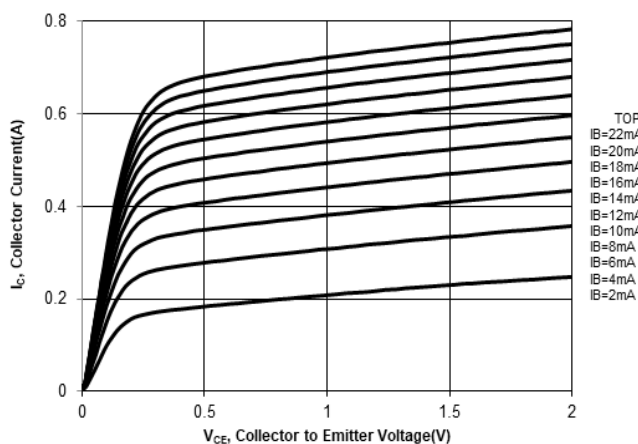


Fig. 2 Output Characteristics Curve

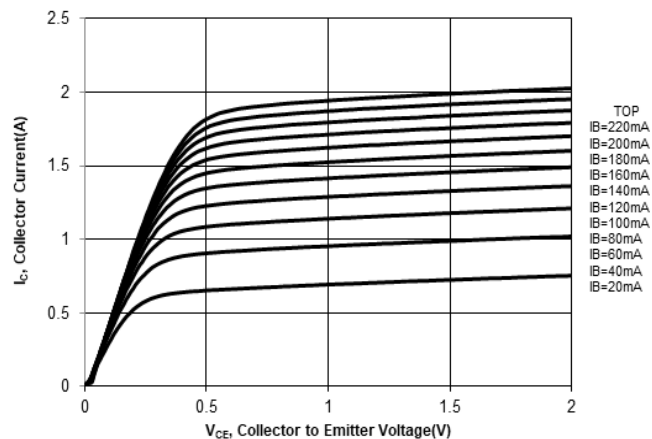


Fig. 3 Collector Current vs. Base to Emitter Voltage

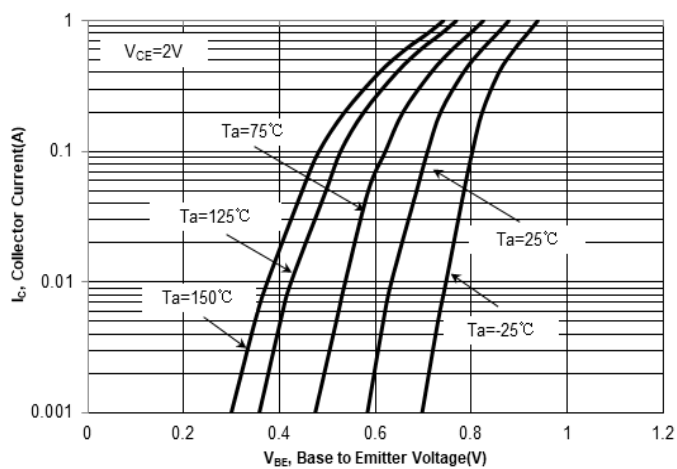
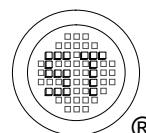
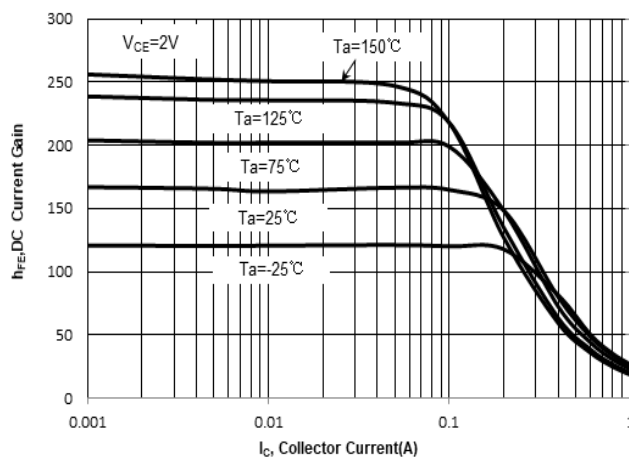


Fig. 4 DC Current Gain vs. Collector Current



## Electrical Characteristics Curves

Fig. 5  $V_{BESAT}$  vs. Collector Current

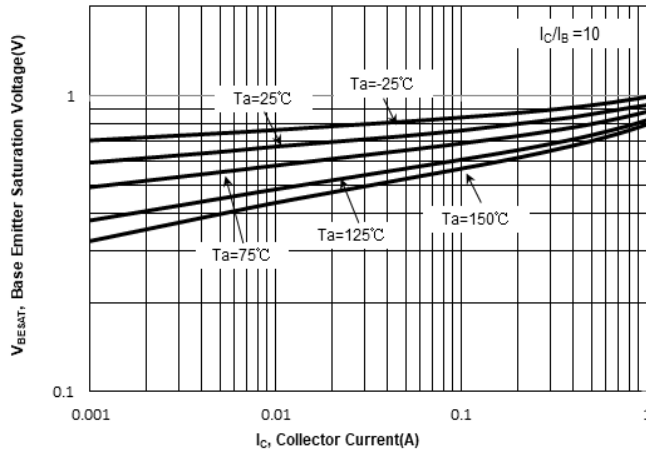


Fig. 6  $V_{CESAT}$  vs. Collector Current

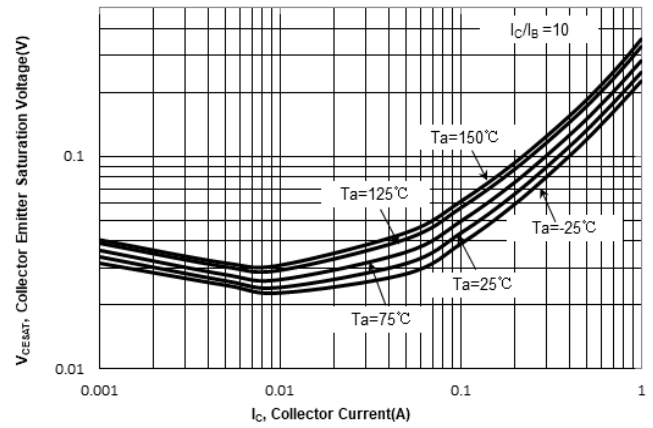


Fig. 7 Output Capacitance

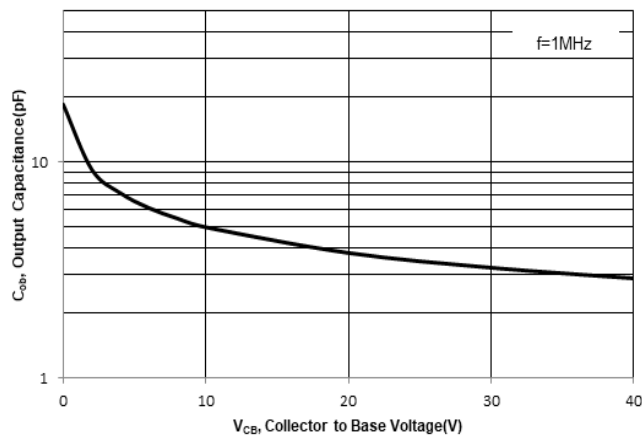
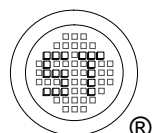
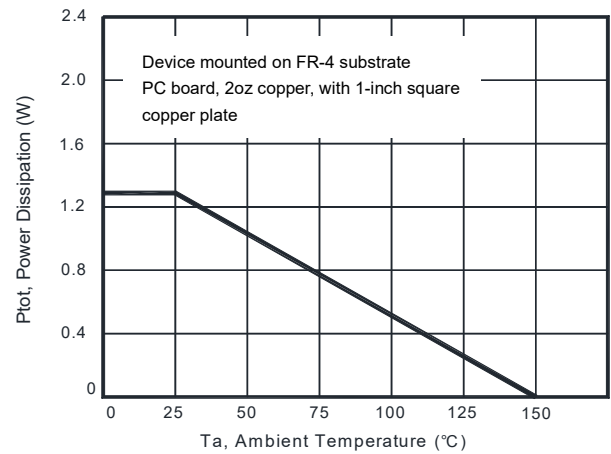


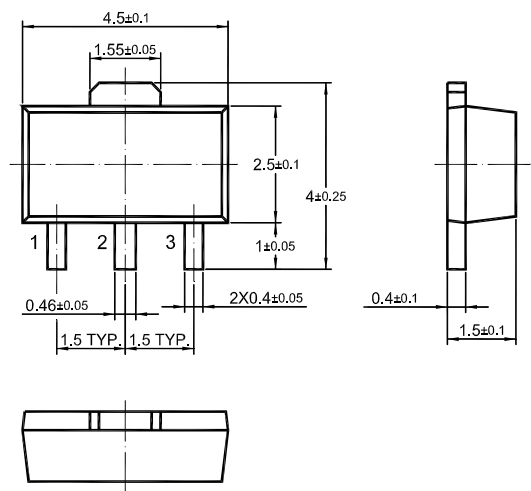
Fig. 8 Power Derating Curve



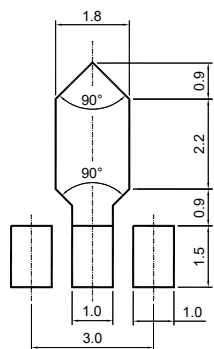
# BCX56U-AH

## Package Outline (Dimensions in mm)

SOT-89



## Recommended Soldering Footprint



## Packing information

| Package | Tape Width (mm) | Pitch   |               | Reel Size |      | Per Reel Packing Quantity |
|---------|-----------------|---------|---------------|-----------|------|---------------------------|
|         |                 | mm      | inch          | mm        | inch |                           |
| SOT-89  | 12              | 8 ± 0.1 | 0.315 ± 0.004 | 178       | 7    | 1,000                     |
|         |                 |         |               | 330       | 13   | 4,000                     |

## Marking information

" BCX56-\*\*U " = Part No. (" \*\* " = HFE grouping Code)

" • " = HAF (Halogen and Antimony Free)

"YM" = Date Code Marking

"Y" = Year

"M" = Month

Font type: Arial

