



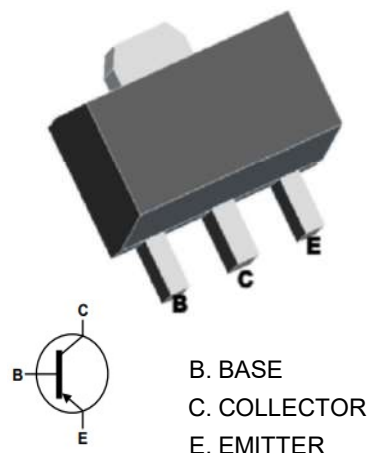
### 1. Features

- Low Voltage
- High Current
- Complementary types: BCX56
- Medium Power General Purposes
- Driver Stages of Audio Amplifiers

### 2. Mechanical Data

- Case:Molded Plastic,SOT-89 .
- Epoxy:UL 94V-0 rate flame retardant.
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Mounting Position : Any.

SOT-89



B. BASE  
C. COLLECTOR  
E. EMITTER

### 3. Maximum Ratings

Electrical Characteristics Rating at 25°C ambient temperature unless otherwise specified.

| Characteristic              | 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    |
| Collector Power Dissipation | $P_C$     | 0.5      | W    |
| Junction Temperature        | $T_J$     | -55~+150 | °C   |
| Storage Temperature         | $T_{stg}$ | -55~+150 | °C   |

### 4. Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Characteristics                       | Symbol        | Condition                                     | Min  | TYP | Max  | Unit |
|---------------------------------------|---------------|-----------------------------------------------|------|-----|------|------|
| Collector-base breakdown voltage      | $V_{(BR)CBO}$ | $I_C=-100\mu\text{A}$ , $I_E=0$               | -100 | -   | -    | V    |
| Collector-emitter breakdown voltage   | $V_{(BR)CEO}$ | $I_C=-1\text{mA}$ , $I_B=0$                   | -80  | -   | -    | V    |
| Emitter-base breakdown voltage        | $V_{(BR)EBO}$ | $I_E=-100\mu\text{A}$ , $I_C=0$               | -5   | -   | -    | V    |
| Collector cut-off current             | $I_{CBO}$     | $V_{CB}=-80\text{V}$ , $I_E=0$                | -    | -   | -100 | nA   |
| Emitter cut-off current               | $I_{EBO}$     | $V_{EB}=-4\text{V}$ , $I_C=0$                 | -    | -   | -100 | nA   |
| DC current gain*                      | $h_{FE}$      | $V_{CE}=-2\text{V}$ , $I_C=-5\text{mA}$       | 25   | -   | 250  | -    |
|                                       |               | $V_{CE}=-2\text{V}$ , $I_C=-150\text{mA}$     | 63   |     |      |      |
|                                       |               | $V_{CE}=-2\text{V}$ , $I_C=-500\text{mA}$     | 25   |     |      |      |
| Collector-emitter saturation voltage* | $V_{CE(sat)}$ | $I_C=-500\text{mA}$ , $I_B=-50\text{mA}$      | -    | -   | -0.5 | V    |
| Base-emitter On Voltage*              | $V_{BE(on)}$  | $V_{CE} = -2\text{V}$ , $I_C = -500\text{mA}$ | -    | -   | -1.0 | V    |

\*Pulse Test: Pulse Width  $\leq 300$  ms, Duty Cycles  $\leq 2.0\%$

#### hFE Classification

| Type    | BCX53  | BCX53-10 | BCX53-16 |
|---------|--------|----------|----------|
| Range   | 63-250 | 63-160   | 100-250  |
| Marking | AH     | AK       | AL       |



## 5. Rating And Characteristic Curves

Fig.1 Static Characteristic

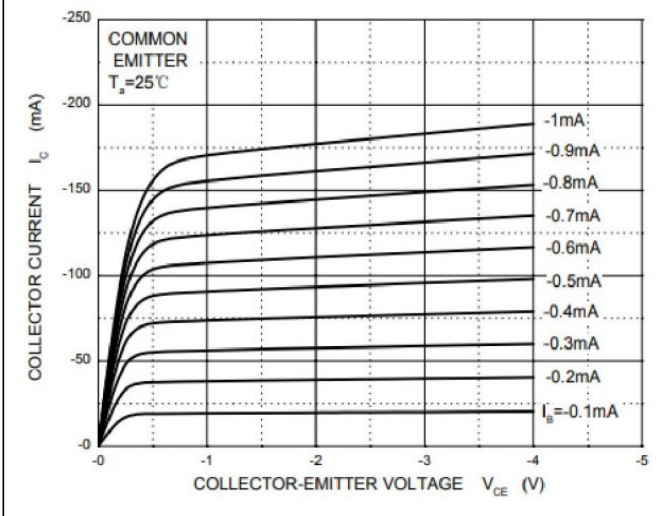


Fig.2 DC current Gain

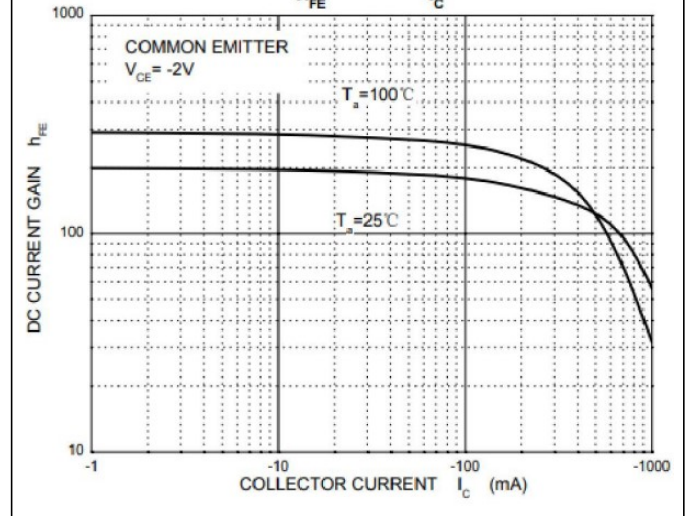


Fig.3 Collector-Emitter Saturation Voltage

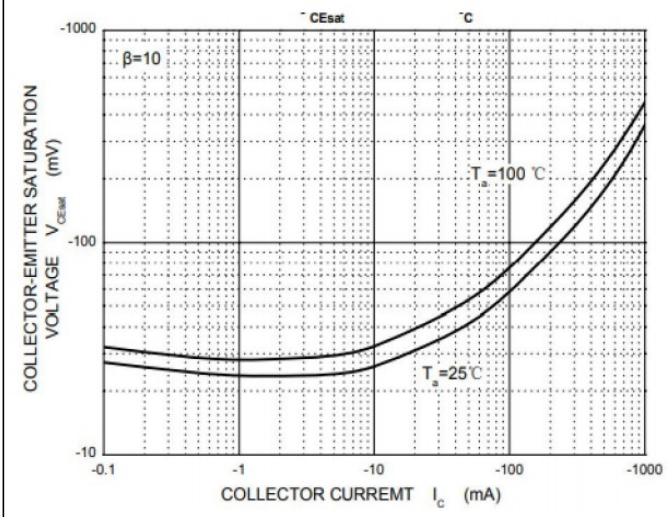


Fig.4 Base-Emitter Saturation Voltage

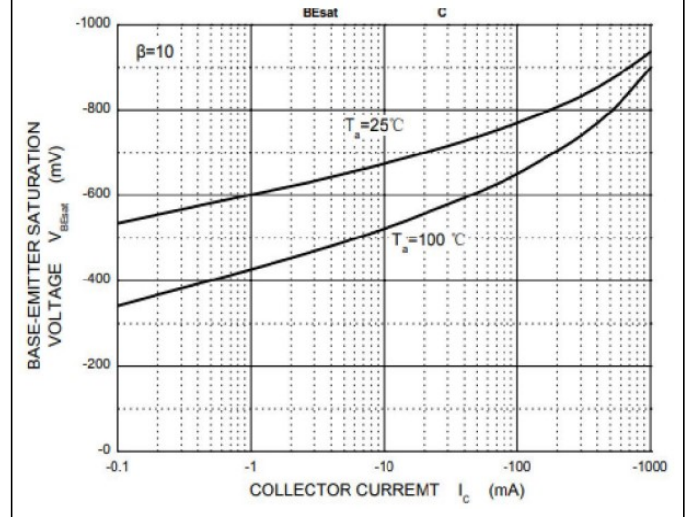


Fig.5 Current Gain Bandwidth Product

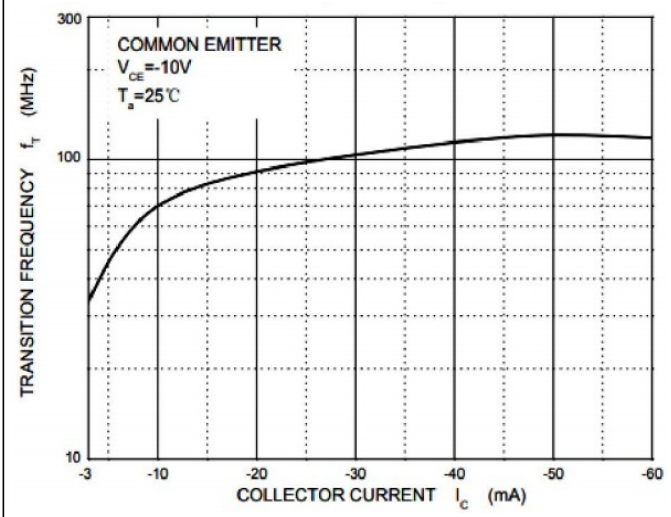
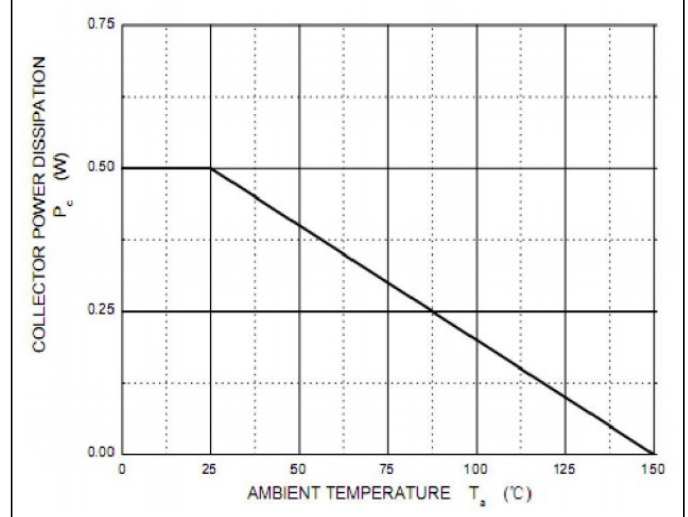
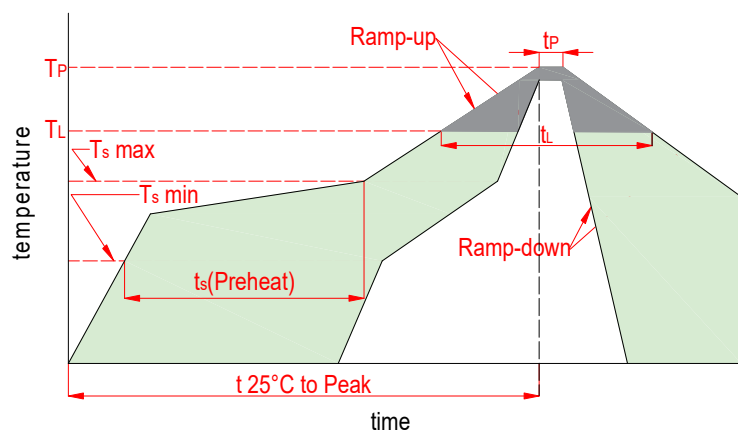


Fig.6 Power Derating



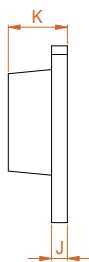
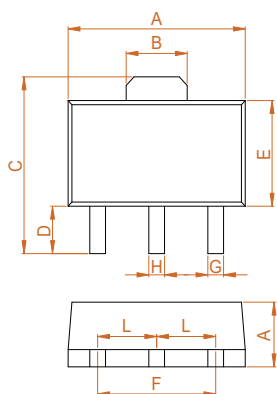


## 6. Soldering Parameters



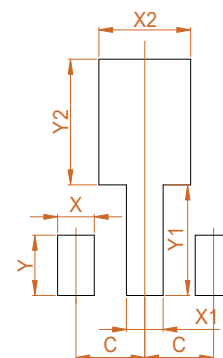
| Reflow Condition                                   |                           | Lead-free               |
|----------------------------------------------------|---------------------------|-------------------------|
| Pre Heat                                           | Temp. min( $T_s$ (min))   | 150°C                   |
|                                                    | Temp. max( $T_s$ (min))   | 200°C                   |
|                                                    | Time(min to max)( $t_s$ ) | 60~120s                 |
| Aver. ramp up rate(Liquidus Temp.)( $T_L$ )to peak |                           | 3°C/s max               |
| $T_s$ (max) to $T_L$ -Ramp-up Rate                 |                           | 3°C/s max               |
| Reflow                                             | Temp. ( $T_L$ )(Liquidus) | 217°C                   |
|                                                    | Temp. ( $t_L$ )(Liquidus) | 60~150s                 |
| Peak Temp. ( $T_P$ )                               |                           | 260 <sup>+0/-5</sup> °C |
| Time within actual peak Temp. ( $t_p$ )            |                           | 30s max                 |
| Ramp-down Rate                                     |                           | 6°C/s max               |
| Time 25°C to peak Tempe. ( $T_P$ )                 |                           | 8 minutes max           |
| Do not exceed                                      |                           | 260°C                   |

## 7. Dimensions

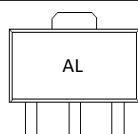
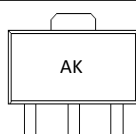
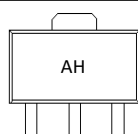


| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.169  | 0.185 | 4.300       | 4.700 |
| B          | 0.055  | 0.071 | 1.400       | 1.800 |
| C          | 0.154  | 0.167 | 3.900       | 4.250 |
| D          | 0.035  | 0.047 | 0.900       | 1.200 |
| E          | 0.091  | 0.106 | 2.300       | 2.700 |
| F          | 0.118  |       | 3.000       |       |
| G          | 0.013  | 0.024 | 0.320       | 0.600 |
| H          | 0.013  | 0.024 | 0.320       | 0.600 |
| J          | 0.013  | 0.020 | 0.340       | 0.500 |
| K          | 0.055  | 0.063 | 1.400       | 1.600 |
| L          | 0.059  |       | 1.500       |       |
| X          | 0.031  |       | 0.800       |       |
| Y          | 0.047  |       | 1.200       |       |
| X1         | 0.031  |       | 0.800       |       |
| Y1         | 0.087  |       | 2.200       |       |
| X2         | 0.079  |       | 2.000       |       |
| Y2         | 0.098  |       | 2.500       |       |
| C          | 0.059  |       | 1.500       |       |

Mounting PAD Layout



## 8. Part Marking System



## 9. Package Information

| Package | Part Number | Marking Code | Quantity(pcs) |
|---------|-------------|--------------|---------------|
| SOT-89  | BCX53       | AH           | 1000          |
| SOT-89  | BCX53-10    | AK           | 1000          |
| SOT-89  | BCX53-16    | AL           | 1000          |



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