

**BCX54,BCX55,BCX56**  
NPN TRANSISTOR



**VOLTAGE**

45~80.0 Volts

**CURRENT**

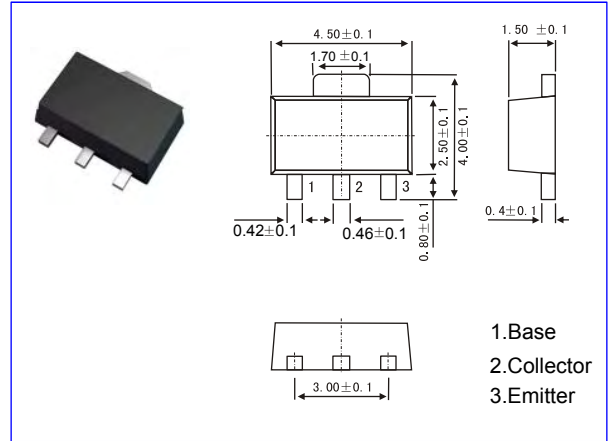
1.0 Amperes

**SOT-89**

Unit:Inch(mm)

**FEATURES**

- High current (max. 1 A).
- Low voltage (max. 80 V).



**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS (TA=25°C(UNLESS OTHERWISE NOTED))**

■ Absolute Maximum Ratings Ta = 25°C

| Parameter  | Symbol               | Rating           | Unit |   |
|--|----------------------|------------------|------|---|
| Collector-base voltage                           | BCX54                | V <sub>CB0</sub> | 45   | V |
|  | BCX55                |                  | 60   | V |
|  | BCX56                |                  | 100  | V |
| Collector-emitter voltage                        | BCX54                | V <sub>CEO</sub> | 45   | V |
|  | BCX55                |                  | 60   | V |
|  | BCX56                |                  | 80   | V |
| Emitter-base voltage                             | V <sub>EBO</sub>     | 5                | V    |   |
| Collector current                                | I <sub>c</sub>       | 1                | A    |   |
| Peak collector current                           | I <sub>CM</sub>      | 1.5              | A    |   |
| Peak base current                                | I <sub>BM</sub>      | 0.2              | A    |   |
| Total power dissipation                          | P <sub>tot</sub>     | 1.3              | W    |   |
| Storage temperature                              | T <sub>stg</sub>     | -65 to +150      | °C   |   |
| Junction temperature                             | T <sub>j</sub>       | 150              | °C   |   |
| Operating ambient temperature                    | T <sub>amb</sub>     | -65 to +150      | °C   |   |
| Thermal resistance from junction to ambient      | R <sub>th(j-a)</sub> | 94               | K/W  |   |
| Thermal resistance from junction to solder point | R <sub>th(j-s)</sub> | 14               | K/W  |   |

## BCX54,BCX55,BCX56 NPN TRANSISTOR



■ Electrical Characteristics Ta = 25°C

| Parameter  | Symbol                  | Testconditions   | Min | Typ | Max | Unit |
|--|-------------------------|--|-----|-----|-----|------|
| Collector cutoff current   | IcBO                    | V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0                         |     |     | 100 | nA   |
|  |                         | V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0; T <sub>j</sub> = 125°C |     |     | 10  | uA   |
| Emitter cutoff current   | I <sub>EBO</sub>        | V <sub>EB</sub> = 5 V, I <sub>C</sub> = 0                          |     |     | 100 | nA   |
| DC current gain  | h <sub>FE</sub>         | I <sub>C</sub> = 5 mA; V <sub>CE</sub> = 2 V                       | 63  |     |     |      |
|  |                         | I <sub>C</sub> = 150 mA; V <sub>CE</sub> = 2 V                     | 63  |     | 250 |      |
|  |                         | I <sub>C</sub> = 500 mA; V <sub>CE</sub> = 2 V                     | 40  |     |     |      |
| DC current gain BCX54-10,BCX55-10,BCX56-10<br>BCX54-16,BCX55-16,BCX56-16 | h <sub>FE</sub>         | I <sub>C</sub> = 150 mA; V <sub>CE</sub> = 2 V                     | 63  |     | 160 |      |
|  |                         | I <sub>C</sub> = 150 mA; V <sub>CE</sub> = 2 V                     | 100 |     | 250 |      |
| Collector-emitter saturation voltage                                     | V <sub>CE(sat)</sub>    | I <sub>C</sub> = 500 mA; I <sub>B</sub> = 50 mA                    |     |     | 0.5 | V    |
| Base to emitter voltage  | V <sub>BE</sub>         | I <sub>C</sub> = 500 mA; V <sub>CE</sub> = 2 V                     |     |     | 1   | V    |
| Transition frequency   | f <sub>T</sub>          | I <sub>C</sub> = 10 mA; V <sub>CE</sub> = 5 V; f = 100 MHz         |     | 130 |     | MHz  |
| DC current gain ratio of the complementary pairs                         | $\frac{h_{FE}}{h_{FE}}$ | I <sub>C</sub>   = 150 mA;   V <sub>CE</sub>   = 2V                |     | 1.3 | 1.6 |      |
|  | $\frac{h_{FE}}{h_{FE}}$ |  |     |     |     |      |

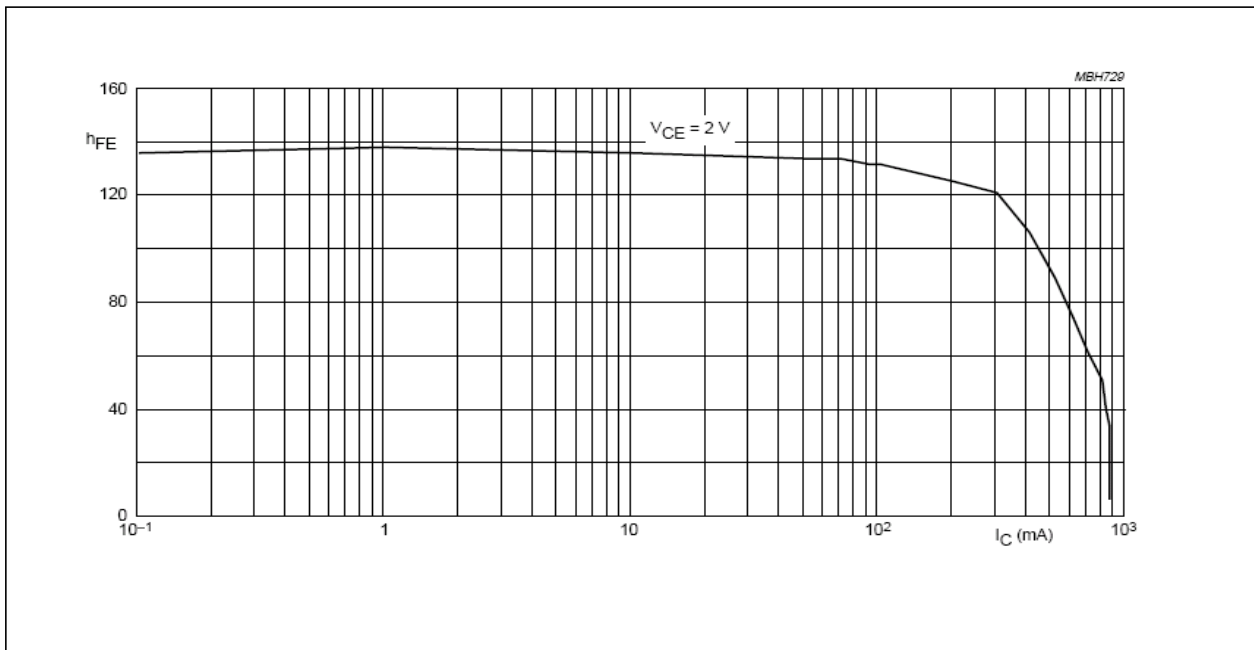
■ h<sub>FE</sub> Classification

| TYPE    | BCX54 | BCX54-10 | BCX54-16 |
|---------|-------|----------|----------|
| Marking | BA    | BC       | BD       |

| TYPE    | BCX55 | BCX55-10 | BCX55-16 |
|---------|-------|----------|----------|
| Marking | BE    | BG       | BM       |

| TYPE    | BCX56 | BCX56-10 | BCX56-16 |
|---------|-------|----------|----------|
| Marking | BH    | BK       | BL       |

■ Typical Characteristics



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**Thermal Characteristics** (Ratings at 25°C ambient temperature unless otherwise specified )

| Parameter                                | Symbol           | SOT-89 | Unit |
|--|------------------|--------|------|
| Typical thermal resistance <sup>1)</sup> | R <sub>θJA</sub> | 94     | K/W  |
|  | R <sub>θJS</sub> | 14     |      |

1.PCB Mounted with The Suggested PAD Size

**MOUNTING PAD LAYOUT**

SOT-89 Unit : inch(mm)

| Dimensions | Value (in mm) |
|------------|---------------|
| X          | 0.900         |
| X1         | 1.733         |
| X2         | 0.416         |
| Y          | 1.300         |
| Y1         | 4.600         |
| Y2         | 1.475         |
| Y3         | 0.950         |
| Y4         | 1.125         |
| C          | 1.500         |

**ORDER INFORMATION**

• Packing information

| Product code | Pack | Reel Size (mm) | Quantity (pcs/reel) | Box Size L×W×H (mm) | Quantity (reel/box) | Carton Size L×W×H (mm) | Quantity (box/carton) |
|--------------|------|----------------|---------------------|---------------------|---------------------|------------------------|-----------------------|
| SOT -89      | T/R  | Φ330           | 1000                | 340×340×40          | 2                   | 450×270×440            | 8                     |

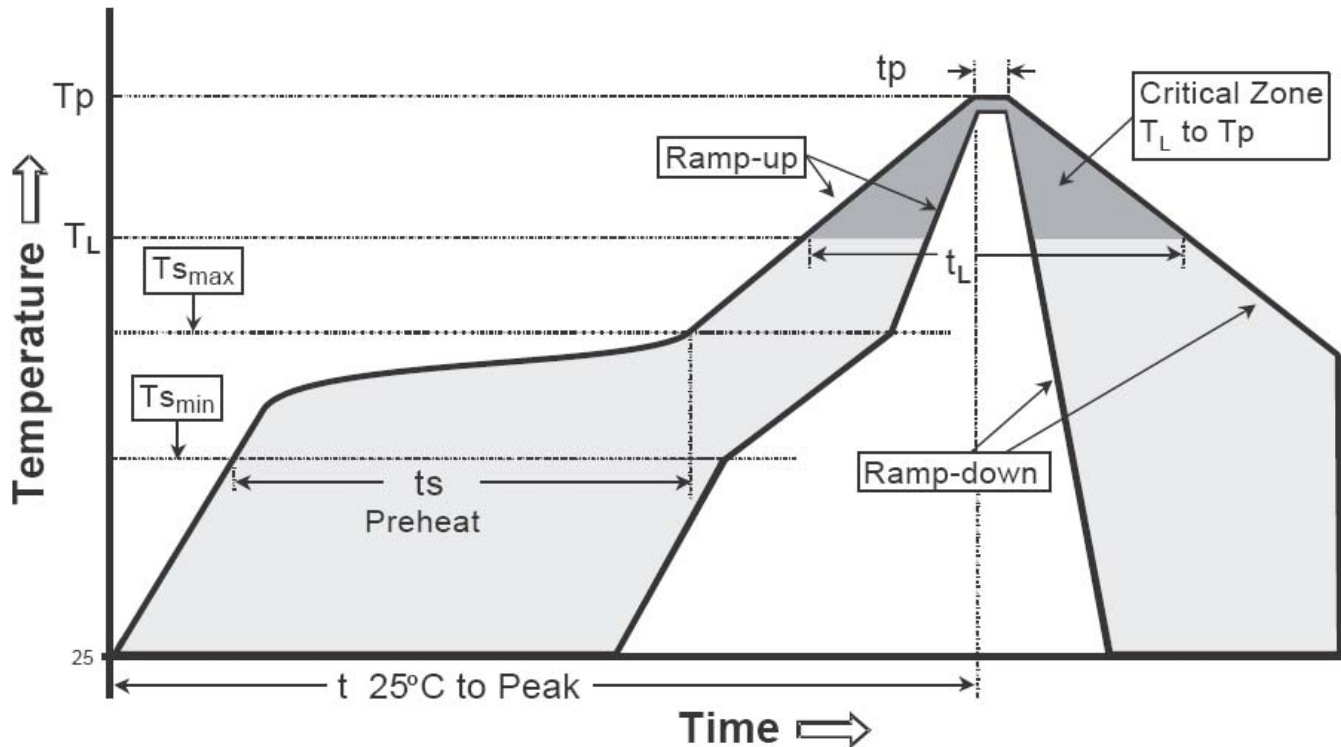
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**Recommended wave soldering condition**

|                 |                  |                 |
|-----------------|------------------|-----------------|
| Product         | Peak Temperature | Soldering Time  |
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

**Recommended temperature profile for IR reflow**



| Profile feature                                | Sn-Pb eutectic Assembly | Pb-free Assembly |
|--|-------------------------|------------------|
| Average ramp-up rate (Tsmax to Tp)             | 3°C/second max.         | 3°C/second max.  |
| Preheat  |                         |                  |
| -Temperature Min(Ts min)                       | 100°C                   | 150°C            |
| -Temperature Max(Ts max)                       | 150°C                   | 200°C            |
| -Time(ts min to ts max)                        | 60-120 seconds          | 60-180 seconds   |
| Time maintained above:                         |                         |                  |
| -Temperature (Tl)                              | 183°C                   | 217°C            |
| - Time (tL)                                    | 60-150 seconds          | 60-150 seconds   |
| Peak Temperature(TP)                           | 240 +0/-5 °C            | 260 +0/-5 °C     |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds           | 20-40 seconds    |
| Ramp down rate                                 | 6°C/second max.         | 6°C/second max.  |
| Time 25 °C to peak temperature                 | 6 minutes max.          | 8 minutes max.   |

Note : All temperatures refer to topside of the package, measured on the package body surface.

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