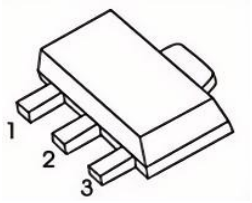
# TRANSISTOR (NPN)

| Parameter | Value | Unit |
|---|---|---|
| $V_{CBO}$ | 45,60,100 | V |
| $I_C$ | 1.0 | A |

1. BASE
2. COLLECTOR
3. EMITTER




SOT-89

## Features

- PNP Complements to BCX51,BCX52,BCX53
- Low Voltage
- High Current

## Applications

- Medium Power General Purposes
- Driver Stages of Audio Amplifiers

| Device Code | | |
|---|---|---|
| BA=BCX54 | BC=BCX54-10 | BD=BCX54-16 |
| BE=BCX55 | BG=BCX55-10 | BM=BCX55-16 |
| BH=BCX56 | BK=BCX56-10 | BL=BCX56-16 |

## Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | BCX54 | 45 | V |
| | | BCX55 | 60 | |
| | | BCX56 | 100 | |
| $V_{CEO}$ | Collector-Emitter Voltage | BCX54 | 45 | V |
| | | BCX55 | 60 | |
| | | BCX56 | 80 | |
| $V_{EBO}$ | Emitter-Base Voltage | | 5 | V |
| $I_C$ | Collector Current | | 1 | A |
| $P_C$ | Collector Power Dissipation | | 500 | mW |
| $R_{\theta JA}$ | Thermal Resistance From Junction To Ambient | | 250 | ℃/W |
| $T_J$ | Junction Temperature | | 150 | ℃ |
| $T_{STG}$ | Storage Temperature | | -55~+150 | ℃ |

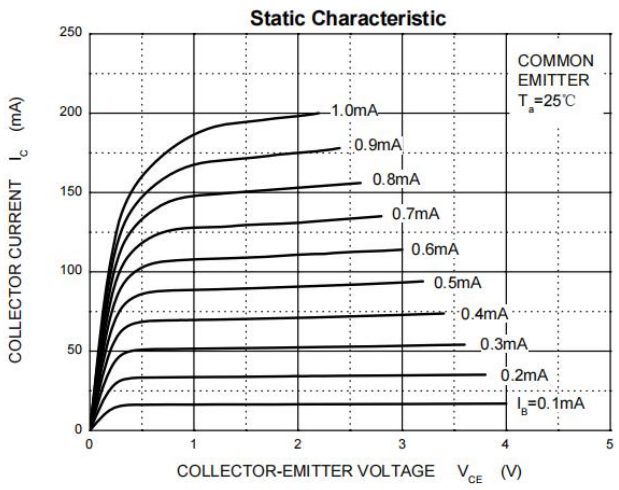
## Electrical Characteristics (Ta=25℃ unless otherwise noted)

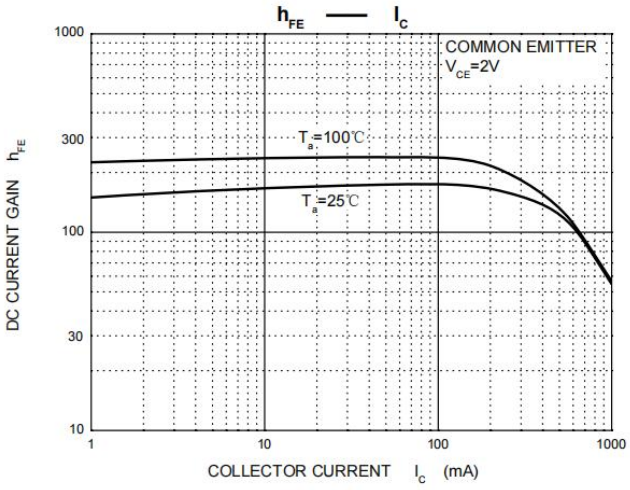
| Parameter | Symbol | Test conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C$=100μA,$I_E$=0 | BCX54 | 45 | | | V |
| | | | BCX55 | 60 | | | |
| | | | BCX56 | 100 | | | |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C$=1mA,$I_B$=0 | BCX54 | 45 | | | V |
| | | | BCX55 | 60 | | | |
| | | | BCX56 | 80 | | | |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E$=10μA, $I_C$=0 | | 5 | | | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$=30V, $I_E$=0 | | | | 0.1 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$=5V, $I_C$=0 | | | | 0.1 | μA |
| DC current gain | $h_{FE(1)}$ | $V_{CE}$=2V, $I_C$=5mA | | 40 | | | |
| | $h_{FE(2)}$ | $V_{CE}$=2V, $I_C$=150mA | | 63 | | 250 | |
| | $h_{FE(3)}$ | $V_{CE}$=2V, $I_C$=0.5A | | 25 | | | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$=0.5A, $I_B$=50mA | | | | 0.5 | V |
| Base -emitter voltage | $V_{BE}$ | $V_{CE}$=2V, $I_C$=0.5A | | | | 1 | V |
| Transition frequency | $f_T$ | $V_{CE}$=5V,$I_C$=10mA, f=100MHz | | | 130 | | MHz |

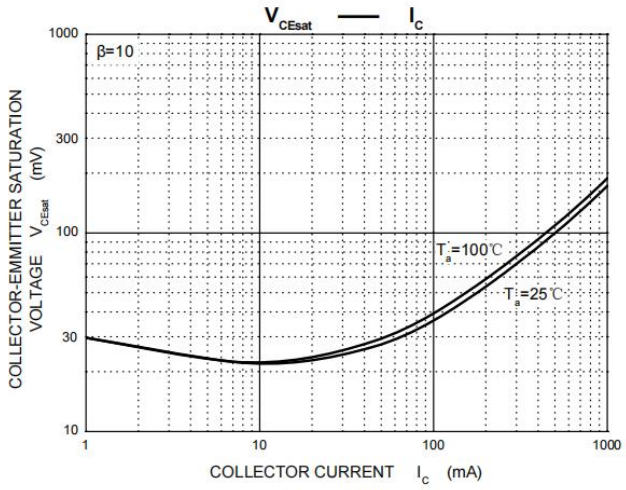
## CLASSIFICATION OF $h_{FE(2)}$

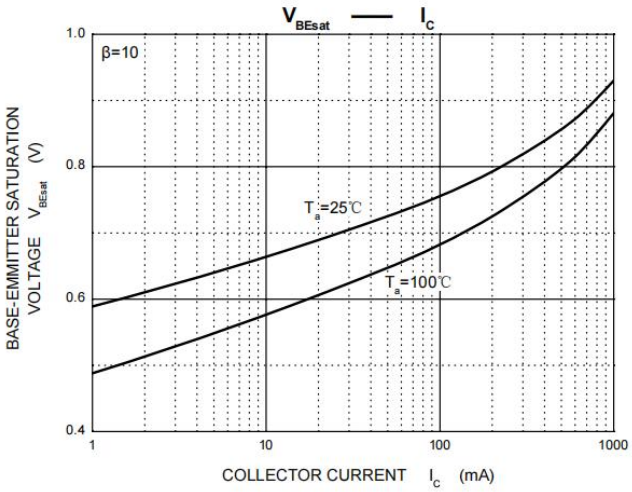
| Rank | BCX54<br>BCX55<br>BCX56 | BCX54-10<br>BCX55-10<br>BCX56-10 | BCX54-16<br>BCX55-16<br>BCX56-16 |
|---|---|---|---|
| Range | 63 -250 | 63 -160 | 100 -250 |

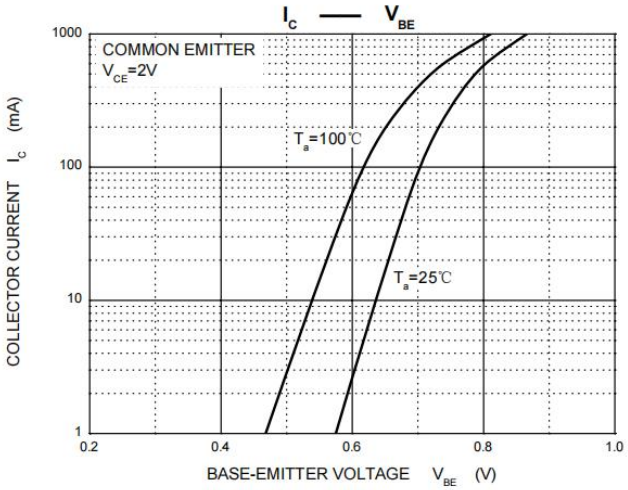
## Typical Characteristics

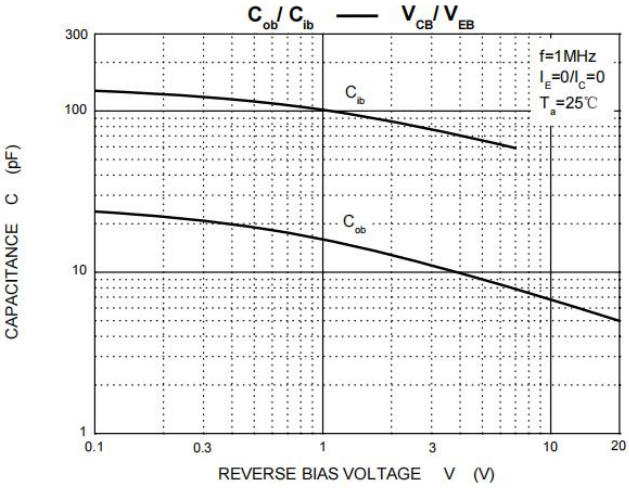


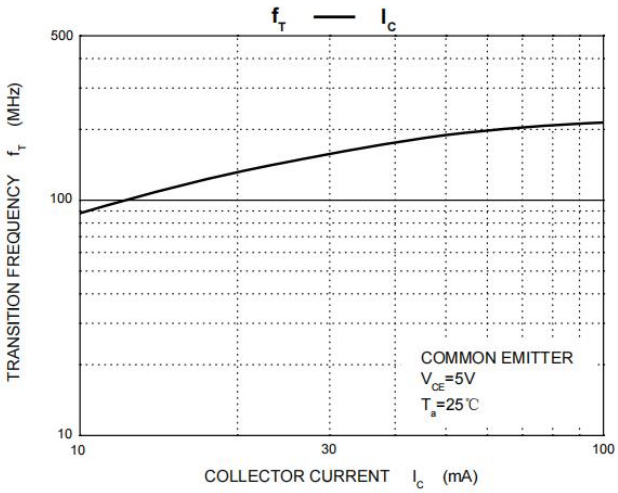



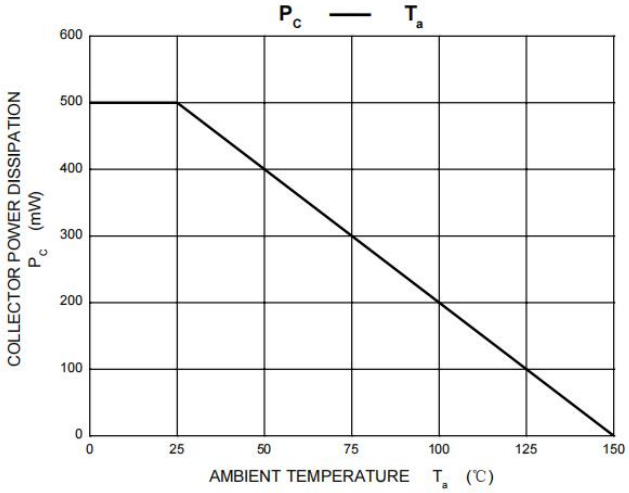

$V_{CEsat}$ — $I_C$
β=10
COLLECTOR-EMMITTER SATURATION VOLTAGE $V_{CEsat}$ (mV)
1000
300
100
30
10
$T_a$=100℃
$T_a$=25℃
1
10
100
1000
COLLECTOR CURRENT $I_C$ (mA)


$V_{BEsat}$ — $I_C$
β=10
BASE-EMMITTER SATURATION VOLTAGE $V_{BEsat}$ (V)
1.0
0.8
0.6
0.4
$T_a$=25℃
$T_a$=100℃
1
10
100
1000
COLLECTOR CURRENT $I_C$ (mA)


$I_C$ — $V_{BE}$
COMMON EMITTER
$V_{CE}$=2V
COLLECTOR CURRENT $I_C$ (mA)
1000
100
10
1
$T_a$=100℃
$T_a$=25℃
0.2
0.4
0.6
0.8
1.0
BASE-EMITTER VOLTAGE $V_{BE}$ (V)

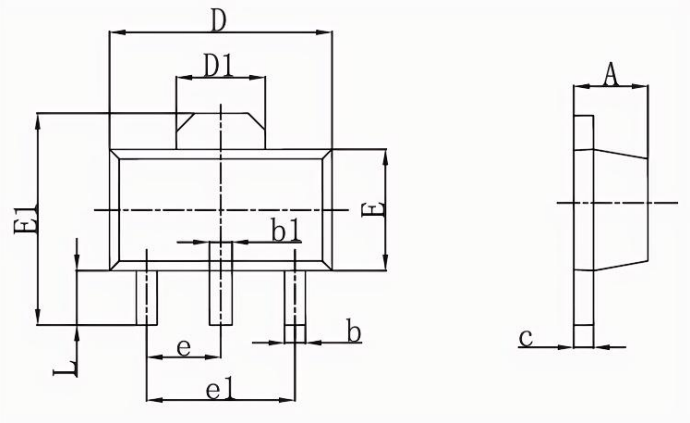

$C_{ob}$ / $C_{ib}$ — $V_{CB}$ / $V_{EB}$
f=1MHz
$I_E$=0/$I_C$=0
$T_a$=25℃
CAPACITANCE C (pF)
300
100
10
1
$C_{ib}$
$C_{ob}$
0.1
0.3
1
3
10
20
REVERSE BIAS VOLTAGE V (V)


$f_T$ — $I_C$
TRANSITION FREQUENCY $f_T$ (MHz)
500
100
10
COMMON EMITTER
$V_{CE}$=5V
$T_a$=25℃
10
30
100
COLLECTOR CURRENT $I_C$ (mA)


$P_C$ — $T_a$
COLLECTOR POWER DISSIPATION $P_C$ (mW)
600
500
400
300
200
100
0
0
25
50
75
100
125
150
AMBIENT TEMPERATURE $T_a$ (℃)

## Package Outline Dimensions

### SOT-89




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF. | | 0.061 REF. | |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 TYP. | | 0.060 TYP. | |
| e1 | 3.000 TYP. | | 0.118 TYP. | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |

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