

## Features

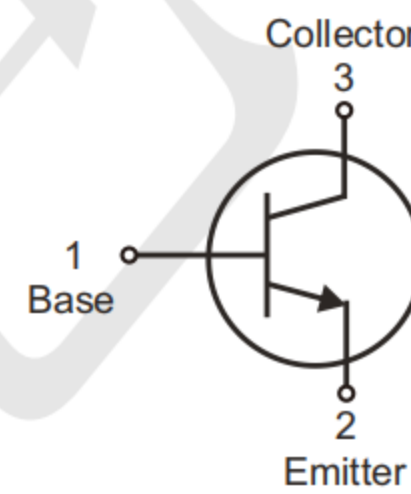
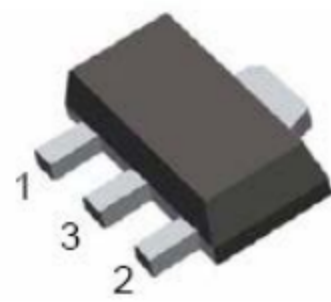
- For AF driver and output stages
- High collector current
- Low collector-emitter saturation voltage
- Complementary types: TPBCX51/TPBCX52/TPBCX53.

## Ordering Information

- Shipping Qty:1000 /7inch Tape& Reel

## Circuit Diagram

SOT-89



## Absolute Maximum Ratings (Tamb=25°C unless otherwise specified)

| Symbol          | Parameter                                       | Value       | Unit               |
|-----------------|-------------------------------------------------|-------------|--------------------|
| $V_{CBO}$       | Collector-Base Voltage                          | 60          | V                  |
| $V_{CEO}$       | Collector-Emitter Voltage                       | 60          | V                  |
| $V_{EBO}$       | Emitter-Base Voltage                            | 5           | V                  |
| $I_C$           | DC Collector Current                            | 1           | A                  |
| $I_{CM}$        | Peak Collector Current                          | 1.5         | A                  |
| $I_B$           | Base current                                    | 100         | mA                 |
| $I_{BM}$        | Peak base current                               | 200         | mA                 |
| $P_{tot}$       | Total power dissipation $T_S=130^\circ\text{C}$ | 500         | mW                 |
| $T_j, T_{stg}$  | Junction and Storage Temperature                | -65 to +150 | $^\circ\text{C}$   |
| $R_{\theta JA}$ | Thermal resistance junction to ambient air      | 75          | $^\circ\text{C/W}$ |
| $R_{\theta JC}$ | Junction-case thermal resistance                | 35          | $^\circ\text{C/W}$ |

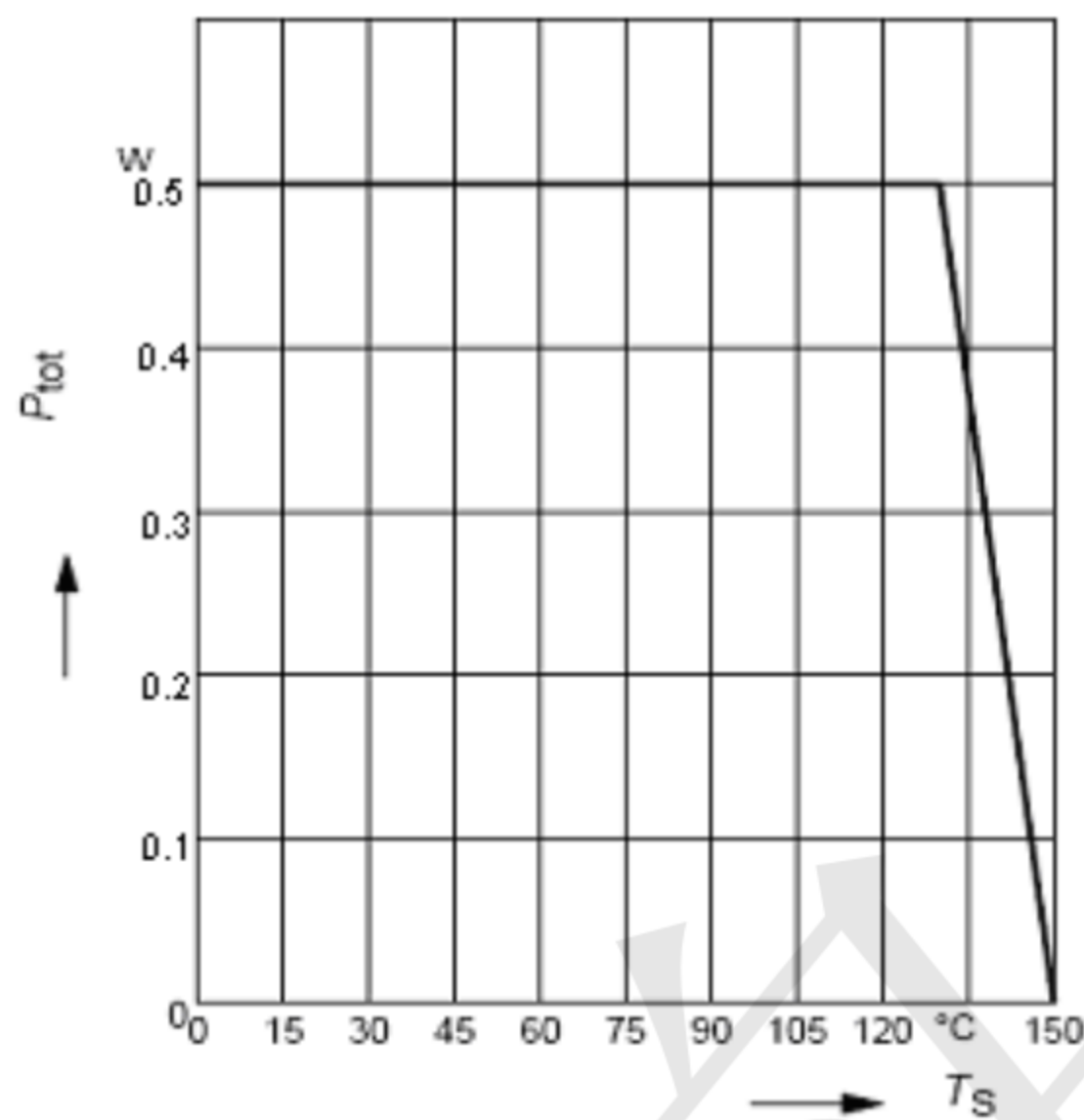
**Electrical Characteristics** (TA=25°C unless otherwise specified)

| Parameter                            | Symbol        | Test conditions                          | MIN | MAX | UNIT    |
|--------------------------------------|---------------|------------------------------------------|-----|-----|---------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=100\mu A$ $I_B=0$                   | 60  |     | V       |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=10mA$ $I_B=0$                       | 60  |     | V       |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=10\mu A$ $I_C=0$                    | 5   |     | V       |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=30V$ $I_E=0$                     |     | 100 | nA      |
|                                      |               | $V_{CB}=30V$ $I_E=0$ , $T_A=150^\circ C$ |     | 20  | $\mu A$ |
| DC current gain                      | $h_{FE}$      | $V_{CE}=2V$ $I_C=5mA$                    | 25  |     |         |
|                                      |               | $V_{CE}=2V$ $I_C=150mA$                  | 40  | 250 |         |
|                                      |               | $V_{CE}=2V$ $I_C=150mA$ -10              | 63  | 160 |         |
|                                      |               | -16                                      | 100 | 250 |         |
|                                      |               | $V_{CE}=2V$ $I_C=500mA$                  | 25  |     |         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=500mA$ $I_B=50mA$                   |     | 0.5 | V       |
| Base-emitter voltage                 | $V_{BE}$      | $I_C=500mA$ , $V_{CE}=2V$                |     | 1   | V       |
| Transition frequency                 | $f_T$         | $V_{CE}=10V$ , $I_C=50mA$ ,<br>$f=20MHz$ | 100 |     | MHz     |



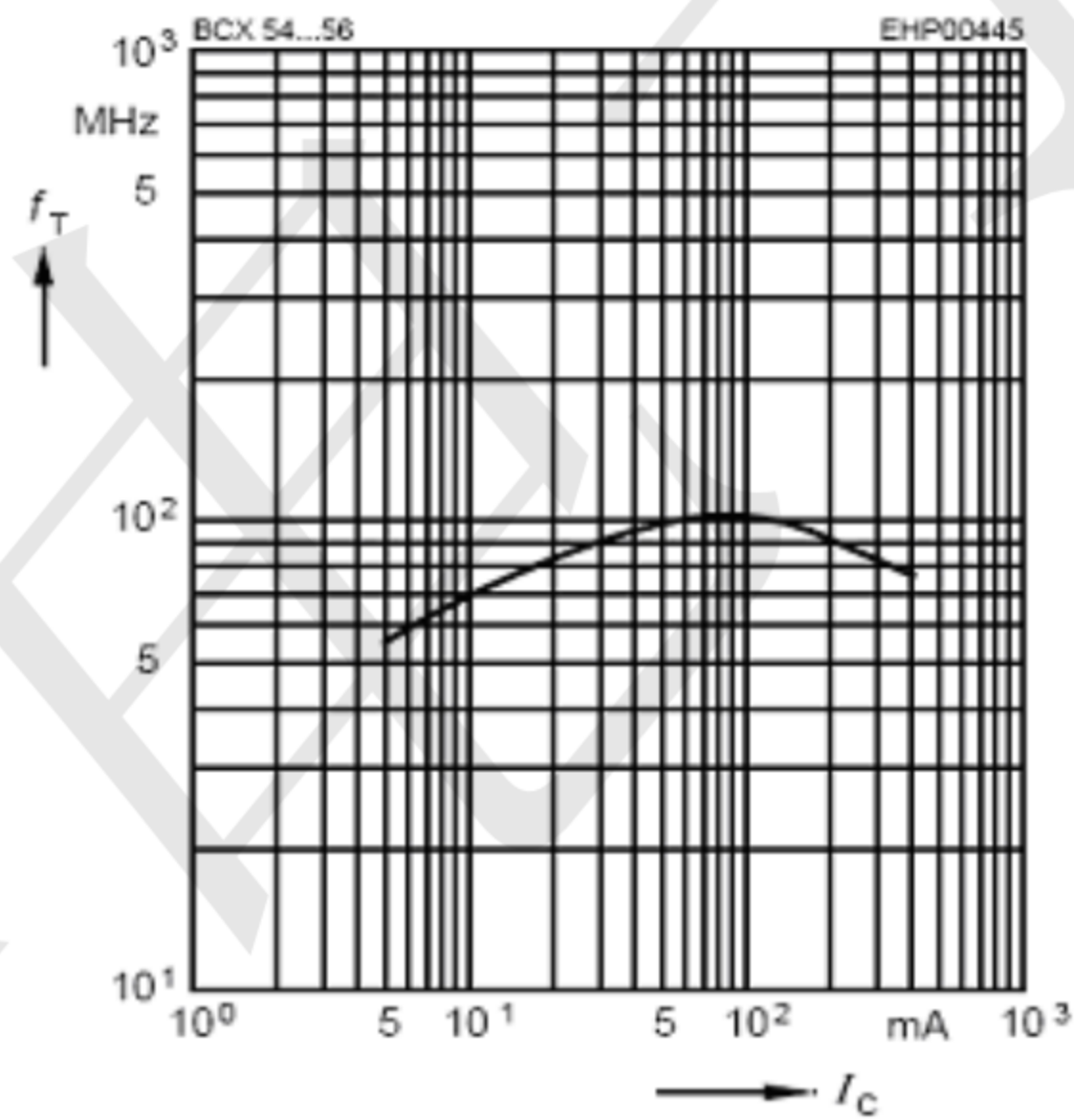
**Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)**

**Total power dissipation  $P_{\text{tot}} = f(T_S)$**



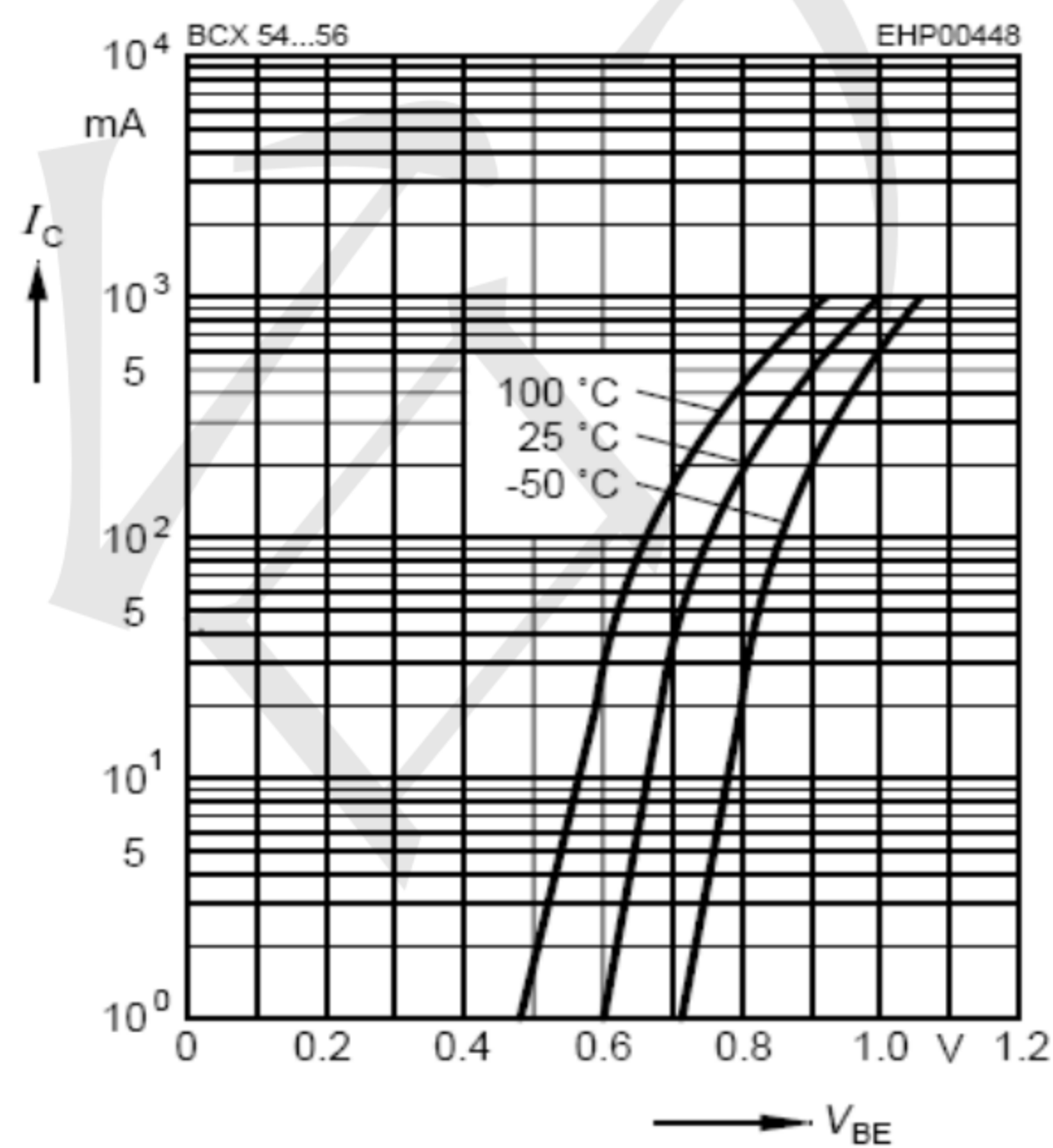
**Transition frequency  $f_T = f(I_C)$**

$V_{CE} = 10\text{V}$



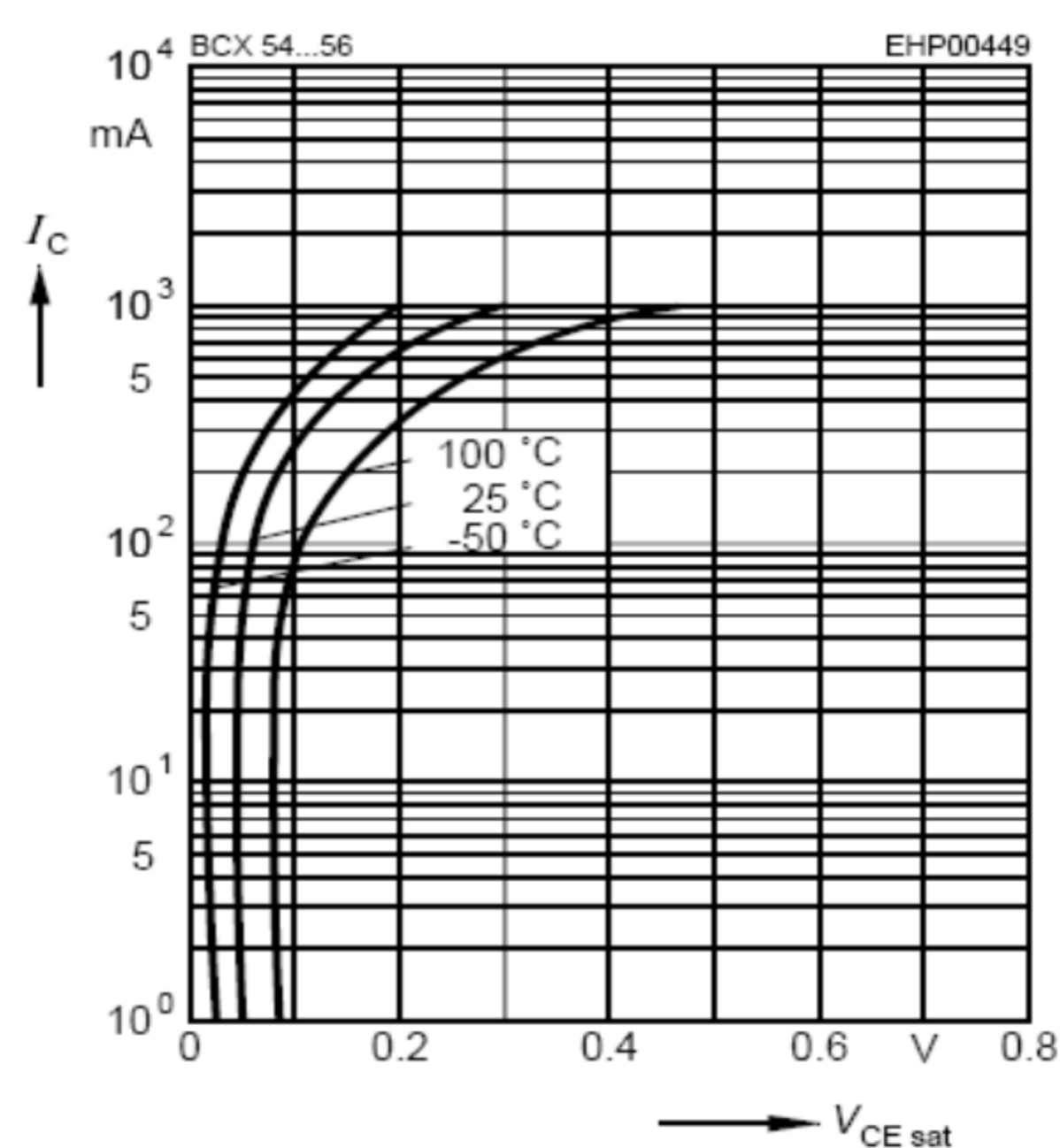
**Collector current  $I_C = f(V_{BE})$**

$V_{CE} = 2\text{V}$



**Collector-emitter saturation voltage**

$I_C = f(V_{CE\text{sat}}), h_{FE} = 10$



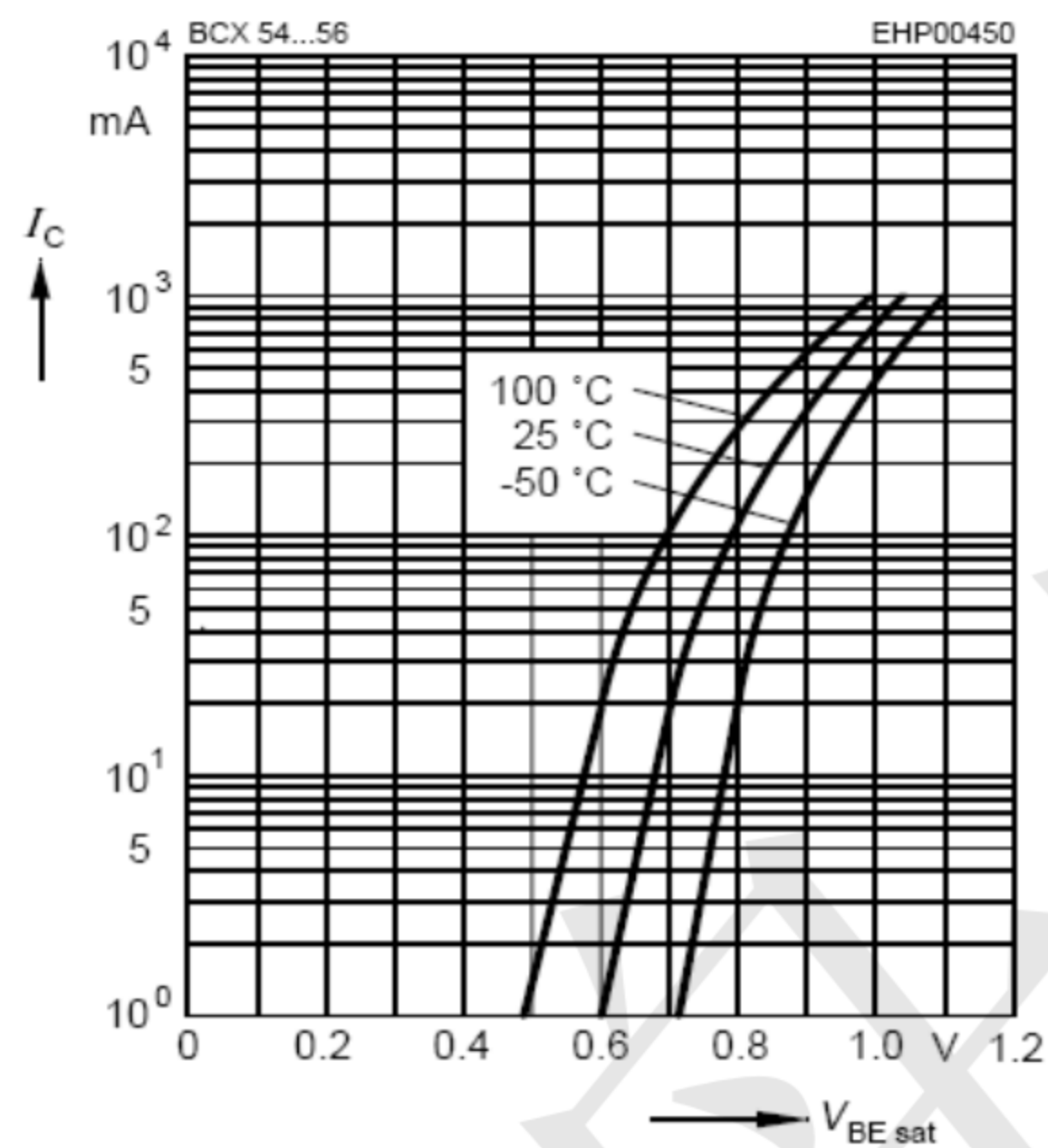




Typical Performance Characteristics ( $T_A=25^\circ\text{C}$  unless otherwise Specified)

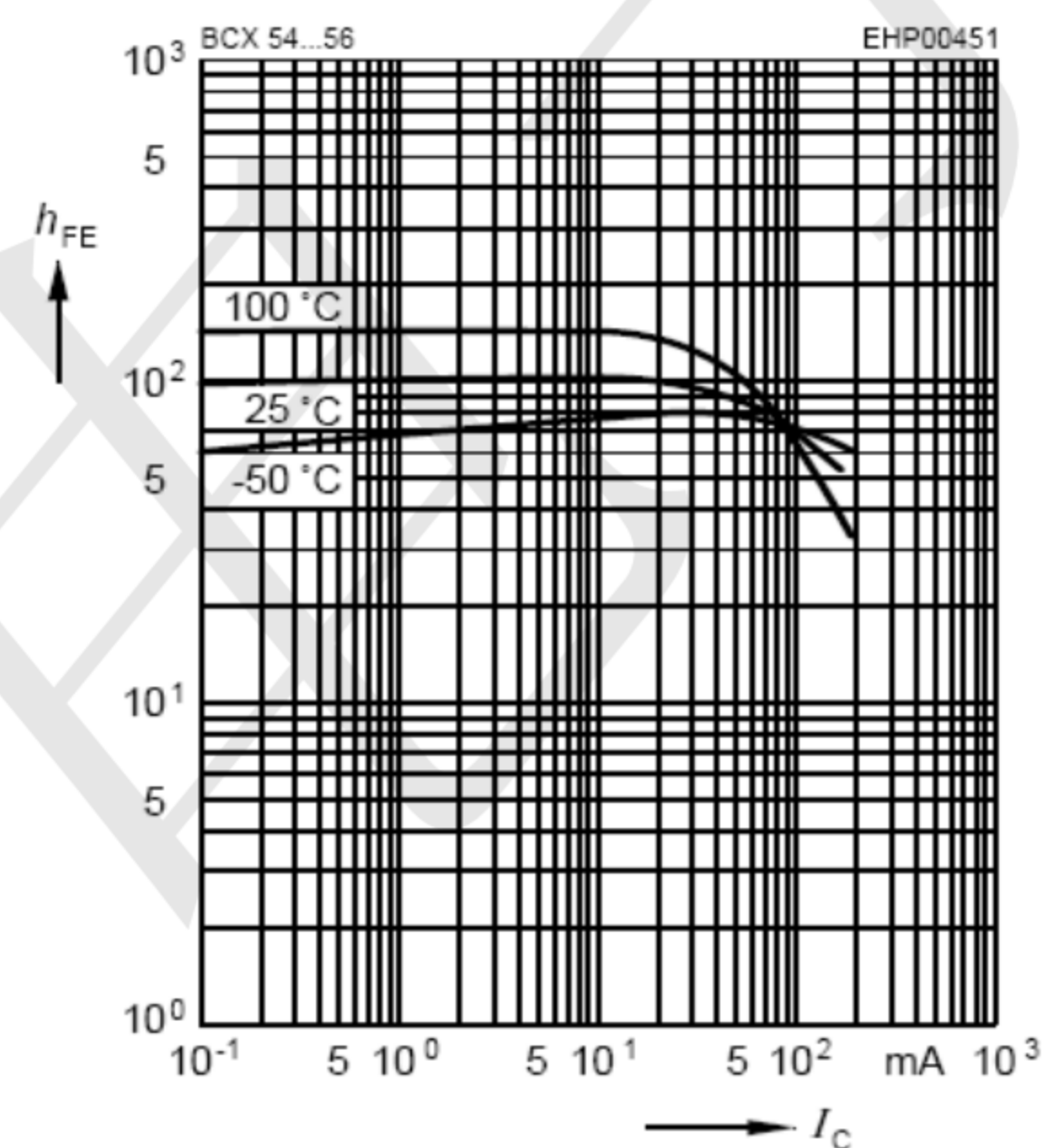
Base-emitter saturation voltage

$$I_C = f(V_{BE\text{sat}}), h_{FE} = 10$$



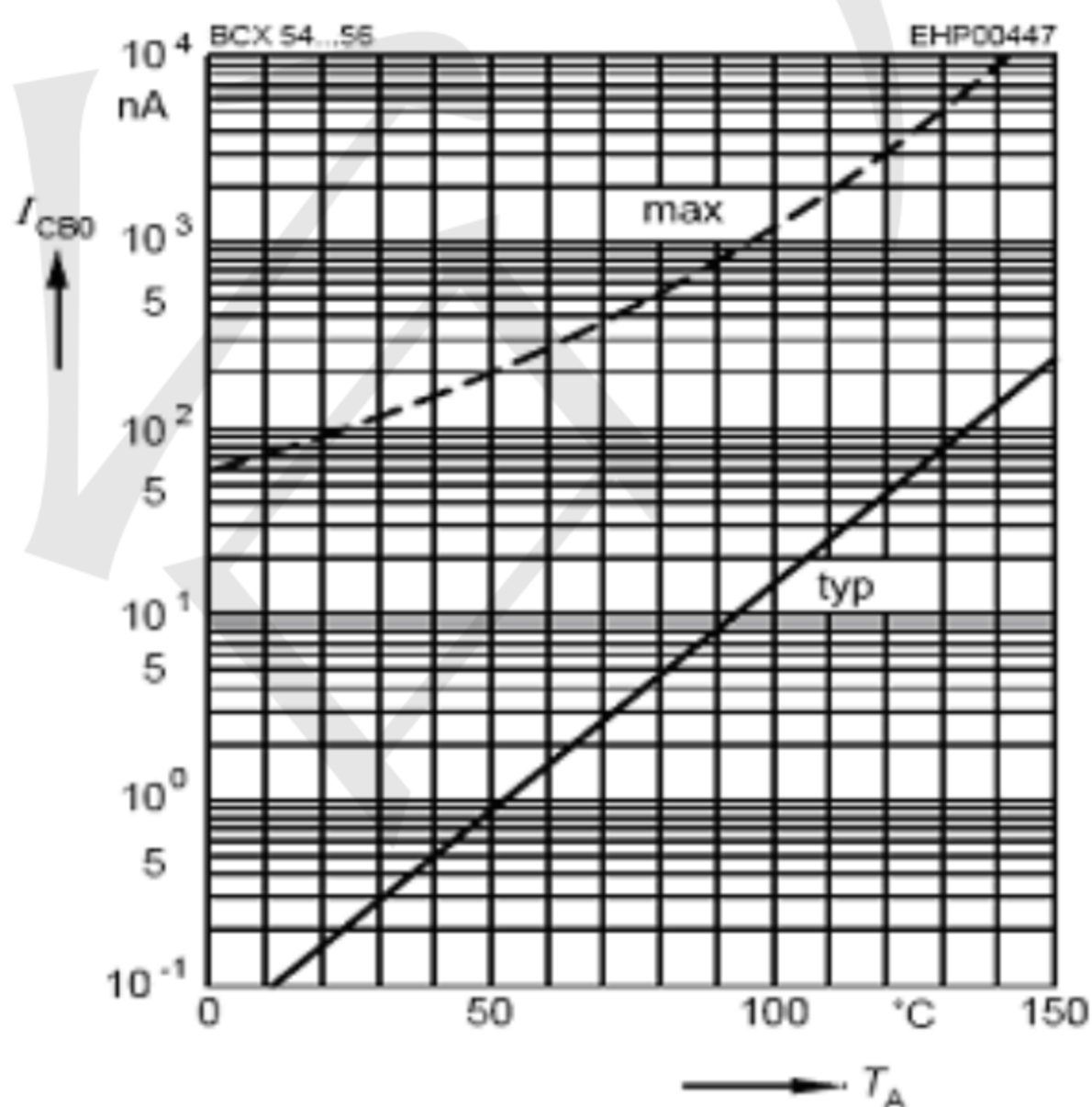
DC current gain  $h_{FE} = f(I_C)$

$$V_{CE} = 2V$$

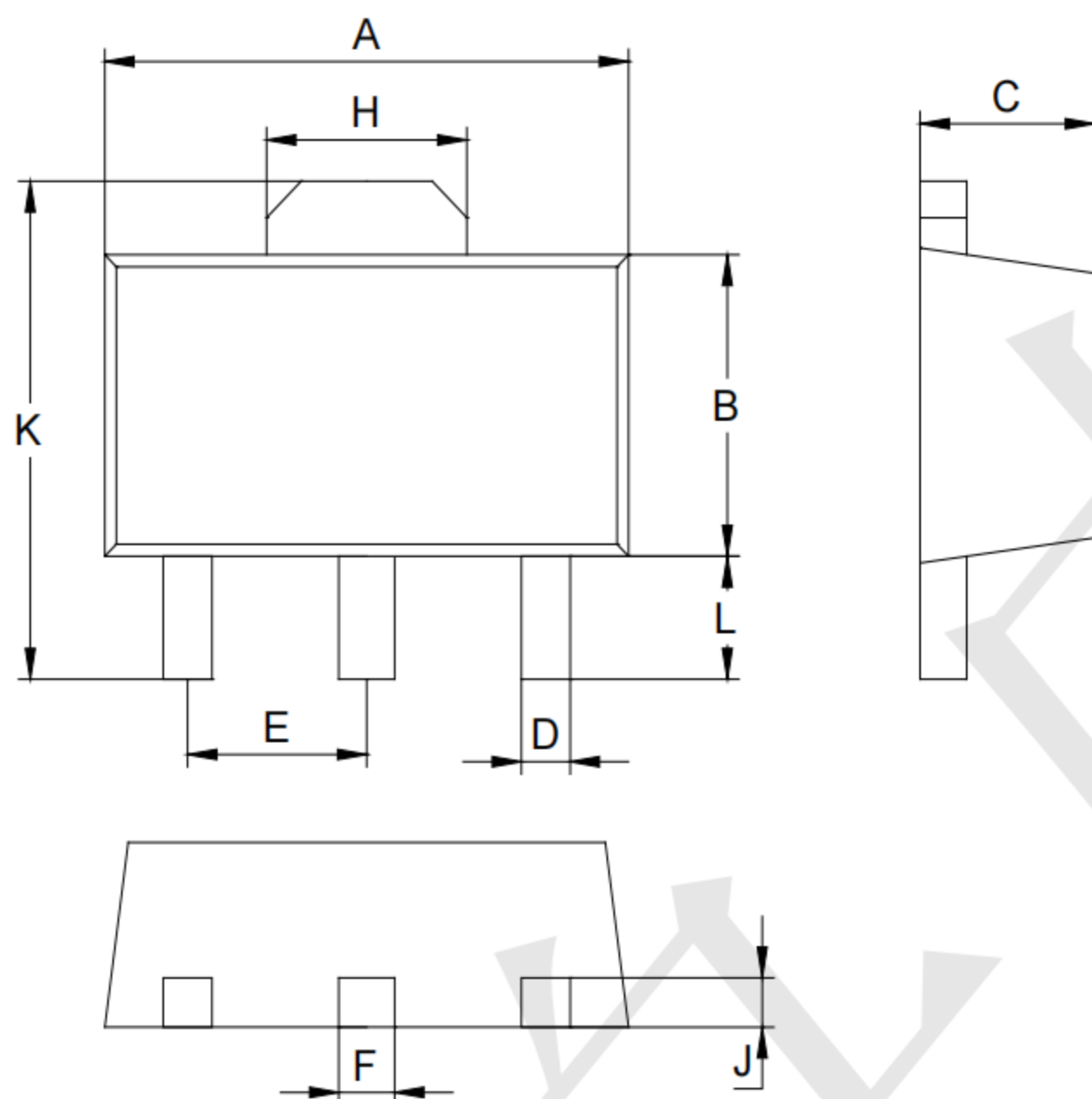


Collector cutoff current  $I_{CBO} = f(T_A)$

$$V_{CB} = 30V$$

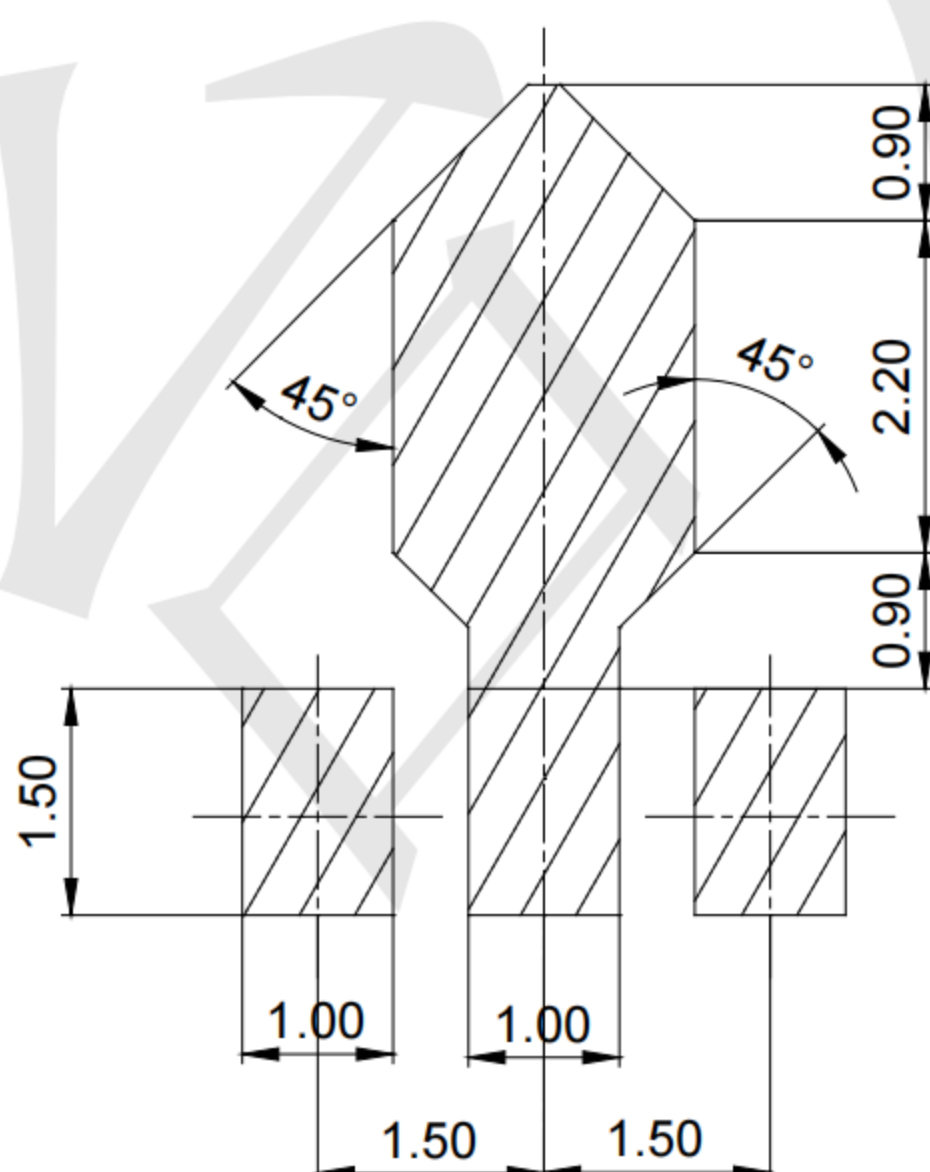


## Outline Drawing - SOT-89



| SOT-89               |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 4.30 | 4.70 |
| B                    | 2.25 | 2.65 |
| C                    | 1.30 | 1.70 |
| D                    | 0.30 | 0.50 |
| E                    | 1.40 | 1.60 |
| F                    | 0.38 | 0.58 |
| H                    | 1.60 | 1.80 |
| J                    | 0.30 | 0.50 |
| L                    | 0.90 | 1.10 |
| K                    | 3.95 | 4.35 |
| All Dimensions in mm |      |      |

## Land Pattern - SOT-89



Unit: mm