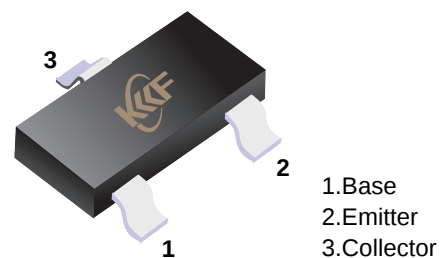


## 13001

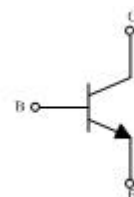
### ■ NPN Transistors

#### ■ Features

- Power switching applications



#### ■ Simplified outline(SOT-23)



#### ■ Absolute Maximum Ratings Ta = 25°C

| Symbol | Parameter                     | Value   | Units |
|--------|-------------------------------|---------|-------|
| VCBO   | Collector-Base Voltage        | 800     | V     |
| VCEO   | Collector-Emitter Voltage     | 500     | V     |
| VEBO   | Emitter-Base Voltage          | 9       | V     |
| IC     | Collector Current -Continuous | 0.2     | A     |
| PC     | Collector Power Dissipation   | 0.5     | W     |
| Tj     | Junction Temperature          | 150     | °C    |
| Tstg   | Storage Temperature           | -55-150 | °C    |

#### ■ Electrical Characteristics Ta = 25°C

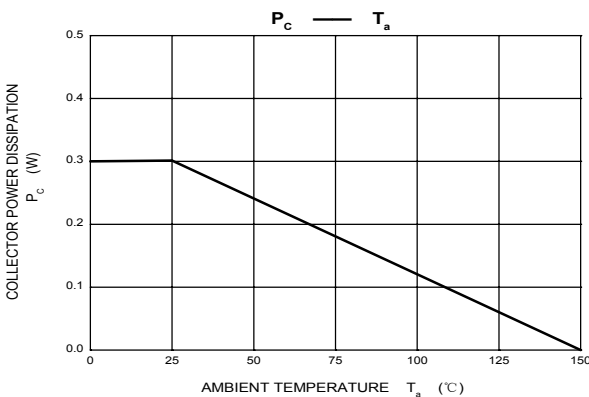
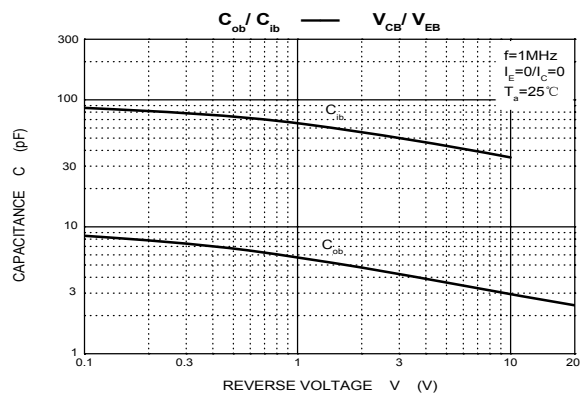
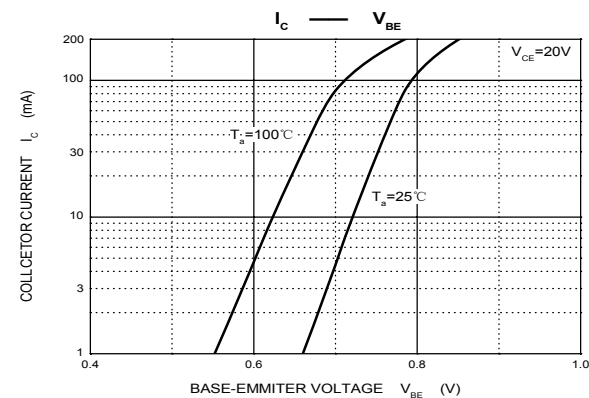
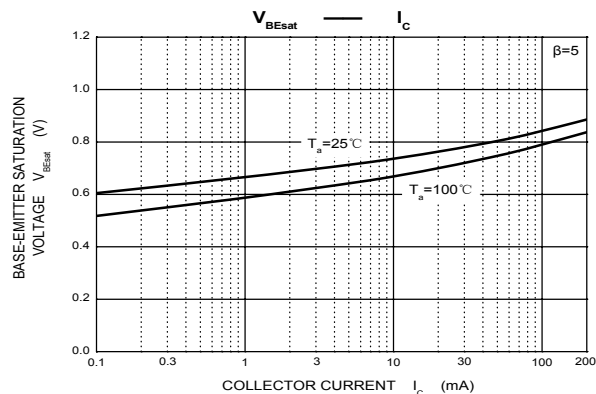
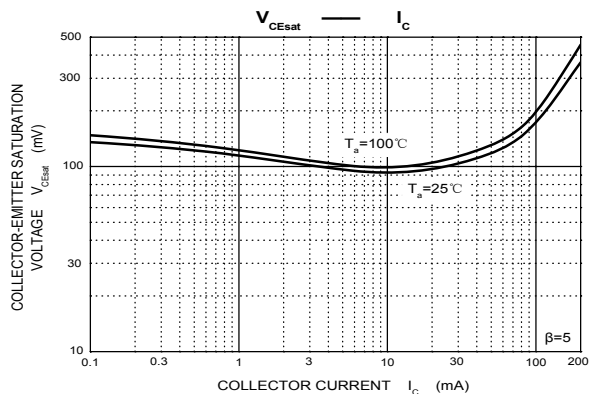
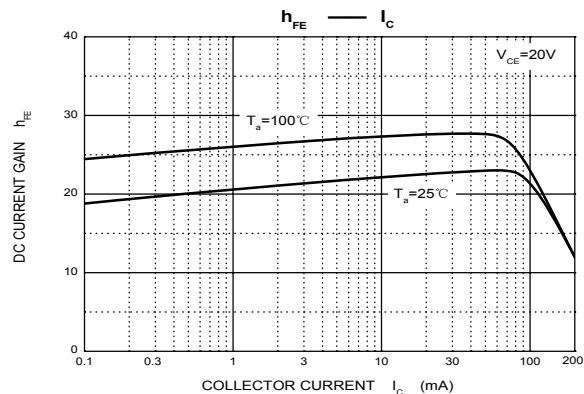
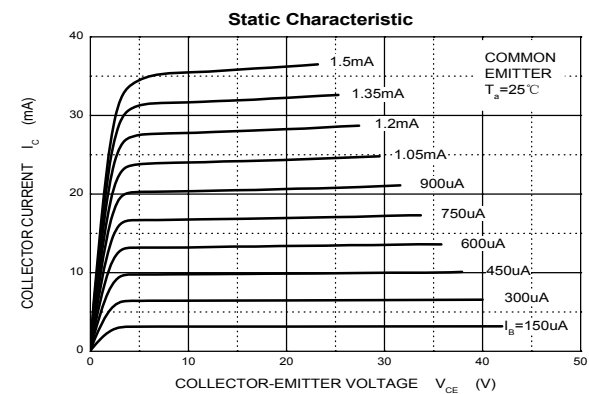
| Parameter                            | Symbol   | Test conditions    | MIN | TYP | MAX | UNIT |
|--------------------------------------|----------|--------------------|-----|-----|-----|------|
| Collector-base breakdown voltage     | V(BR)CBO | IC= 100μA, IE=0    | 800 |     |     | V    |
| Collector-emitter breakdown voltage  | V(BR)CEO | IC= 1mA, IB=0      | 500 |     |     | V    |
| Emitter-base breakdown voltage       | V(BR)EBO | IE=100μA, IC=0     | 9   |     |     | V    |
| Collector cut-off current            | ICBO     | VCB=600 V , IE=0   |     |     | 1   | μ A  |
| Collector cut-off current            | ICEO     | VCE=400V , IB=0    |     |     | 10  | μ A  |
| Emitter cut-off current              | IEBO     | VEB=9V , IC=0      |     |     | 1   | μ A  |
| DC current gain                      | hFE      | VCE=20V, IC= 20mA  | 8   |     |     |      |
| DC current gain                      | hFE      | VCE=5V, IC= 1mA    | 8   |     | 30  |      |
| Collector-emitter saturation voltage | VCE(sat) | IC=100mA, IB= 20mA |     |     | 0.5 | V    |
| Base-emitter saturation voltage      | VBE(sat) | IC=100mA, IB= 20mA |     |     | 1.2 | V    |

#### ■ Classification of hfe(1)

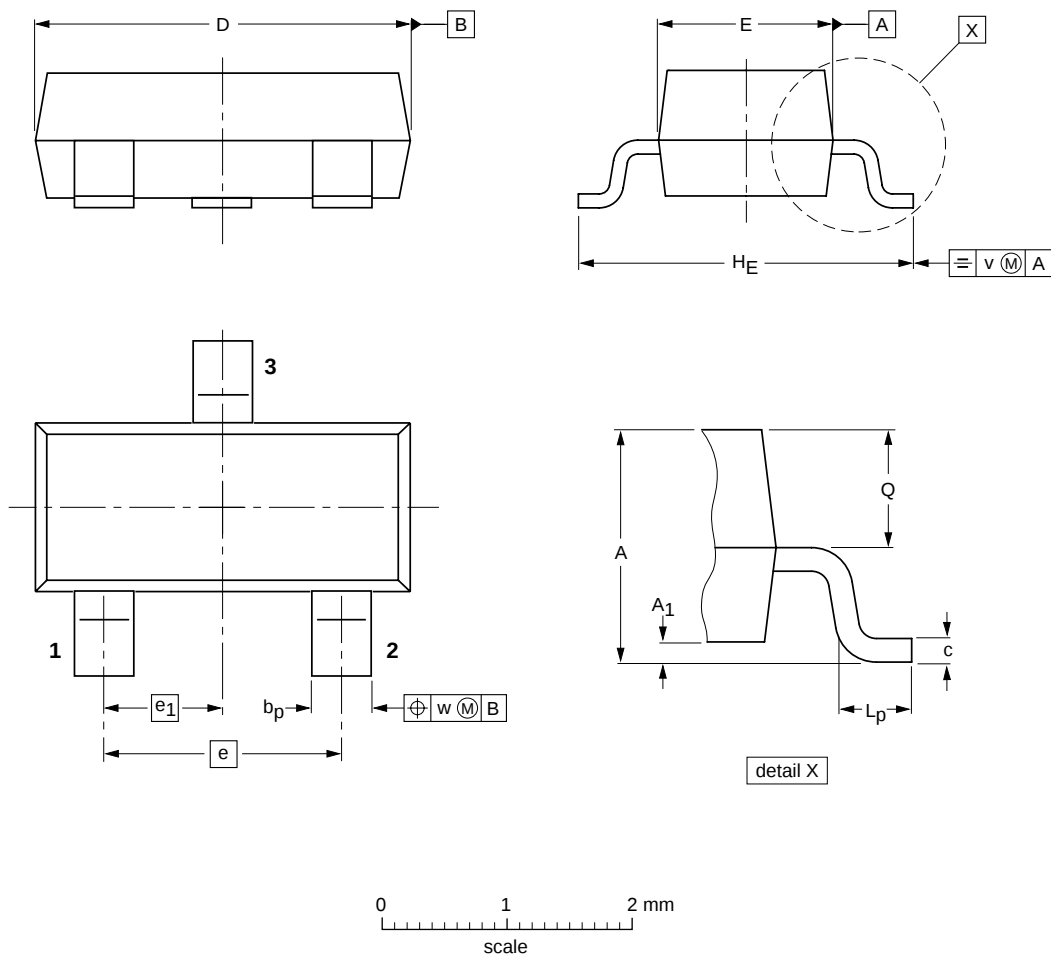
| Range | 8-15 | 15-20 | 20-25 | 25-30 |
|-------|------|-------|-------|-------|
|-------|------|-------|-------|-------|



■ Typical Characteristics



■ SOT-23



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1</sub><br>max. | b <sub>p</sub> | c            | D          | E          | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | Q            | v   | w   |
|------|------------|------------------------|----------------|--------------|------------|------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm   | 1.1<br>0.9 | 0.1                    | 0.48<br>0.38   | 0.15<br>0.09 | 3.0<br>2.8 | 1.4<br>1.2 | 1.9 | 0.95           | 2.5<br>2.1     | 0.45<br>0.15   | 0.55<br>0.45 | 0.2 | 0.1 |