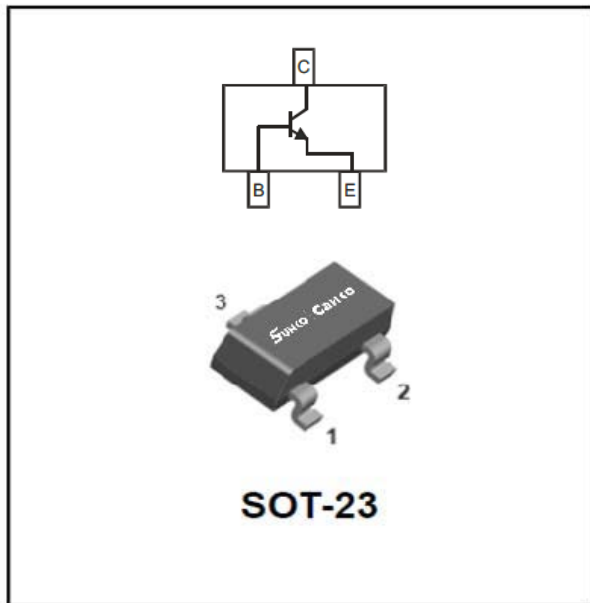


## NPN General Purpose Amplifier



### Features

- Low collector-emitter saturation voltage
- High current capability
- Improved device reliability due to reduced heat generation
- Epoxy meets UL94 V0 flammability rating
- Halogen free available upon request by adding suffix "HF"
- Moisture Sensitivity Level 1
- Marking: ZE

### Applications

- Supply line switching circuits
- Battery management
- DC-DC convertor
- Strobe flash
- Motor and lamp driver

### ■ Maximum Ratings (Ta=25°C)

| Item                                        | Symbol          | Unit | Conditions            | Value       |
|---------------------------------------------|-----------------|------|-----------------------|-------------|
| Collector-Emitter Voltage                   | $V_{CE0}$       | V    | $I_C=1mA, I_B=0$      | 40          |
| Collector-Base Voltage                      | $V_{CB0}$       | V    | $I_C=100\mu A, I_E=0$ | 40          |
| Emitter-Base Voltage                        | $V_{EB0}$       | V    | $I_E=100\mu A, I_C=0$ | 5           |
| Collector Current                           | $I_C$           | A    |                       | 2           |
| Collector Power Dissipation                 | $P_C$           | mW   |                       | 300         |
| Thermal Resistance From Junction To Ambient | $R_{\theta JA}$ | °C/W |                       | 417         |
| Operation Junction Temperature              | $T_j$           | °C   |                       | 150         |
| Storage Temperature                         | $T_{stg}$       | °C   |                       | -55 to +150 |

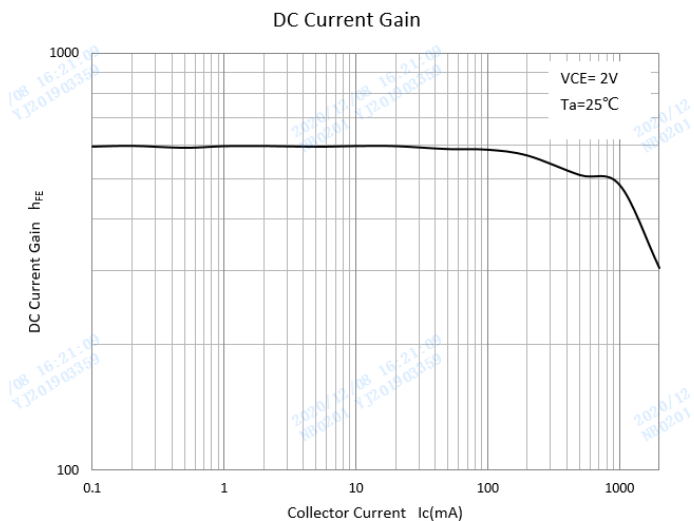
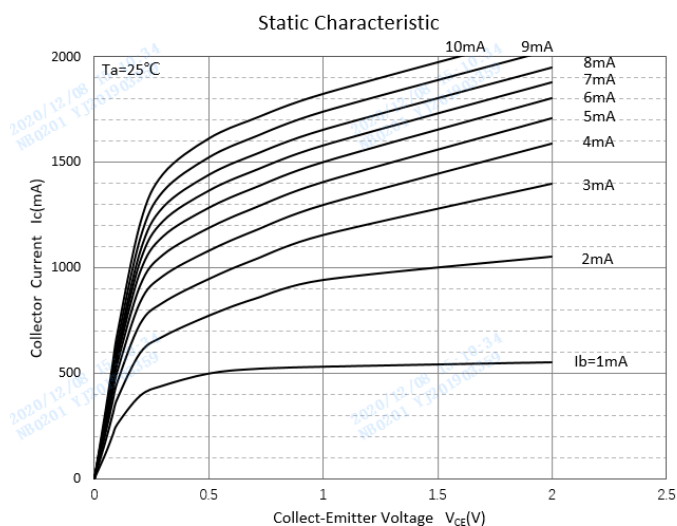
### ■ Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | UNIT WEIGHT(g)    | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|-------------------|----------------------|-------------------------|----------------------------|---------------|
| PBSS4240T     | F2           | Approximate 0.008 | 3000                 | 30000                   | 120000                     | 7" reel       |

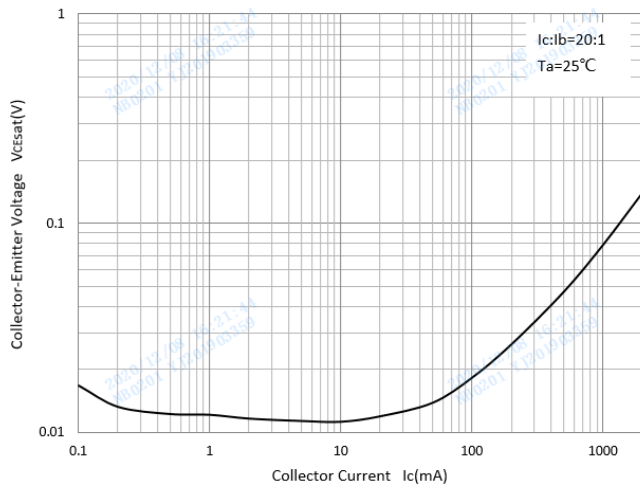
■ Electrical Characteristics (T<sub>a</sub>=25°C)

| Item                                | Symbol                | Unit | Conditions                                            | Min | Max  |
|-------------------------------------|-----------------------|------|-------------------------------------------------------|-----|------|
| CollectorEmitter Voltage            | V <sub>CEO</sub>      | V    | I <sub>C</sub> =1mA, I <sub>B</sub> =0                | 40  |      |
| CollectorBase Voltage               | V <sub>CBO</sub>      | V    | I <sub>C</sub> =100uA, I <sub>E</sub> =0              | 40  |      |
| EmitterBase Voltage                 | V <sub>EBO</sub>      | V    | I <sub>E</sub> =100uA, I <sub>C</sub> =0              | 5   |      |
| Collectorbase Cutoff Current        | I <sub>CBO</sub>      | nA   | V <sub>CB</sub> =30V                                  |     | 100  |
| Baseemitter Cutoff Current          | I <sub>EB0</sub>      | nA   | V <sub>EB</sub> =4V                                   |     | 100  |
| DC Current Gain                     | h <sub>FE</sub>       |      | I <sub>C</sub> =100mA V <sub>CE</sub> =2V             | 350 |      |
|                                     |                       |      | I <sub>C</sub> =500mA V <sub>CE</sub> =2V             | 300 |      |
|                                     |                       |      | I <sub>C</sub> =1A V <sub>CE</sub> =2V                | 300 |      |
|                                     |                       |      | I <sub>C</sub> =2A V <sub>CE</sub> =2V                | 150 |      |
| CollectorEmitter Saturation Voltage | V <sub>CE(sat)1</sub> | mV   | I <sub>C</sub> =100mA I <sub>B</sub> =1mA             |     | 70   |
|                                     | V <sub>CE(sat)2</sub> | mV   | I <sub>C</sub> =500mA I <sub>B</sub> =50mA            |     | 100  |
|                                     | V <sub>CE(sat)3</sub> | mV   | I <sub>C</sub> =750mA I <sub>B</sub> =15mA            |     | 180  |
|                                     | V <sub>CE(sat)4</sub> | mV   | I <sub>C</sub> =1A I <sub>B</sub> =50mA               |     | 180  |
|                                     | V <sub>CE(sat)5</sub> | mV   | I <sub>C</sub> =2A I <sub>B</sub> =200mA              |     | 320  |
| Equivalent OnResistance             | R <sub>CE(sat)</sub>  | mΩ   | I <sub>C</sub> =500mA I <sub>B</sub> =50mA            |     | 200  |
| BaseEmitter Saturation Voltage      | V <sub>BE(sat)</sub>  | V    | I <sub>C</sub> =2A I <sub>B</sub> =200mA              |     | 1.1  |
| BaseEmitter TurnOn Voltage          | V <sub>BE(on)</sub>   | V    | I <sub>C</sub> =100mA V <sub>CE</sub> =2V             |     | 0.75 |
| Transition frequency                | f <sub>T</sub>        | MHz  | I <sub>C</sub> =100mA, V <sub>CE</sub> =10V, f=100MHz | 100 |      |
| Collector Capacitance               | Cob                   | pF   | V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz       |     | 20   |

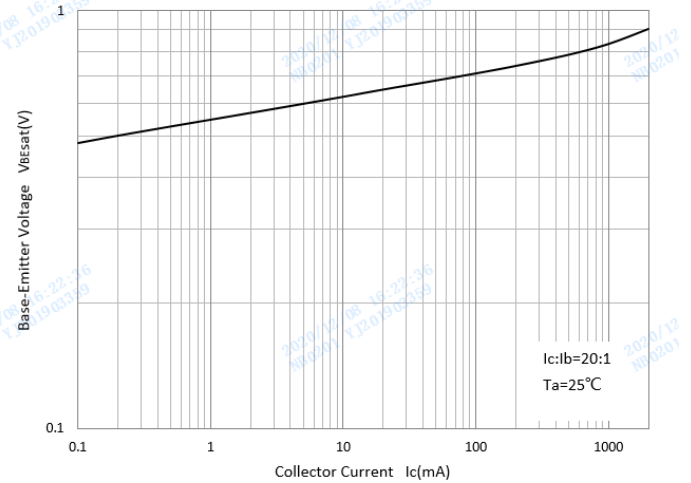
## ■ Characteristics(Typical)



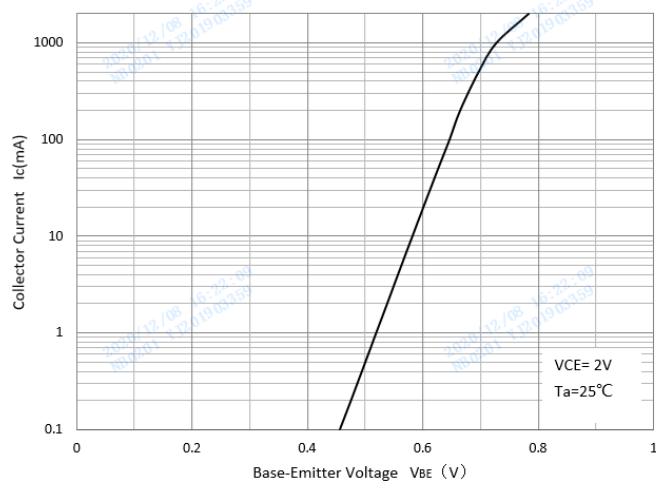
Collector-Emitter Saturation Voltage



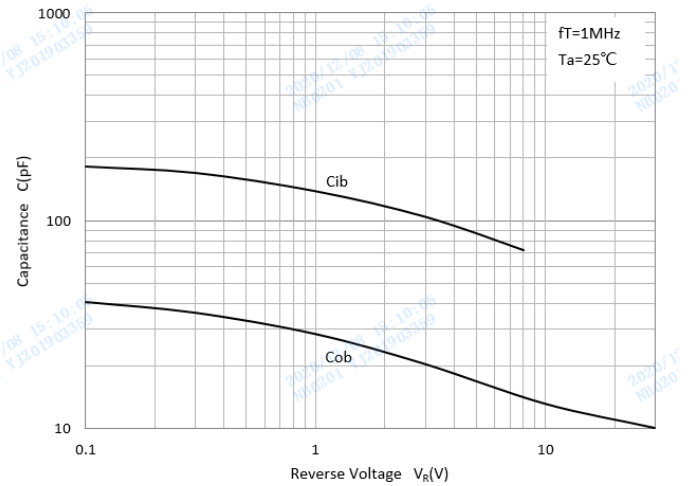
Base-Emitter Saturation Voltage



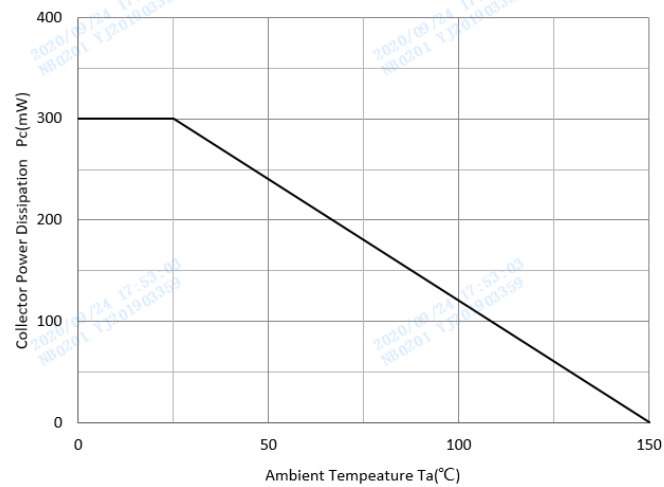
Base-Emitter On Voltage



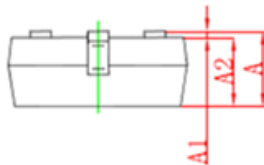
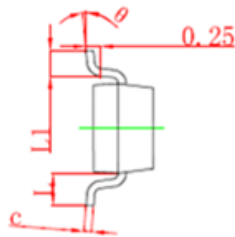
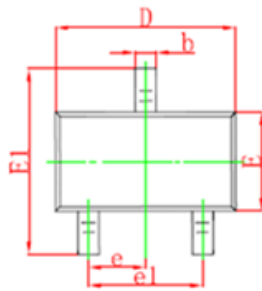
$C_{ob}/C_{ib}-V_{CB}/V_{EB}$



Collector Power Derating Curve

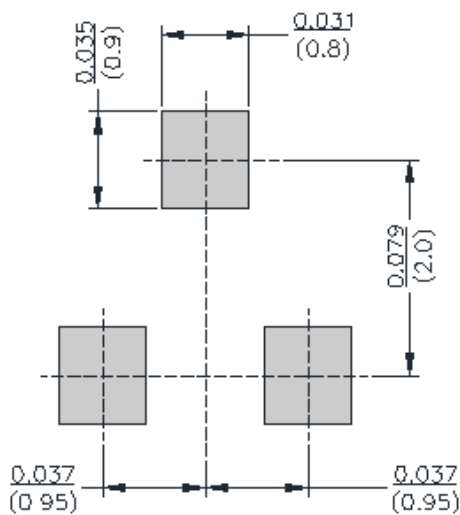


■SOT23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.100                     | 0.200 | 0.004                | 0.008 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950TYP                  |       | 0.037TYP             |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550REF                  |       | 0.022REF             |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

■SOT23 Soldering Footprint



## Disclaimer

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