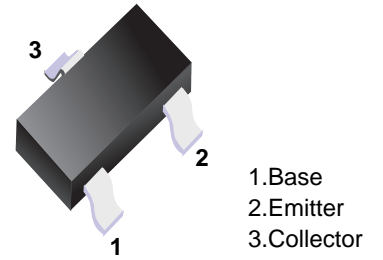


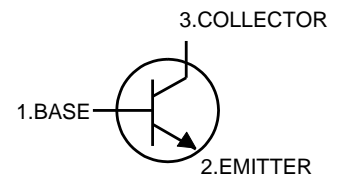
■ **NPN General Purpose Transistor**

■ **Features**

- General purpose transistor.



■ **Simplified outline(SOT-323)**



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

| Parameter | Symbol | Rating | Unit |
|---|------------------|-------------|------|
| Collector-emitter voltage | V _{CEO} | 40 | V |
| Collector-base voltage | V _{CBO} | 75 | V |
| Emitter-base voltage | V _{EB0} | 6.0 | V |
| Collector current | I _c | 600 | mA |
| Total Device Dissipation FR-5 Board | P _D | 150 | mW |
| Thermal Resistance, Junction-to-Ambient | R _{θJA} | 833 | °C/W |
| Junction temperature | T _j | 150 | °C |
| Storage temperature | T _{stg} | -55 to +150 | °C |

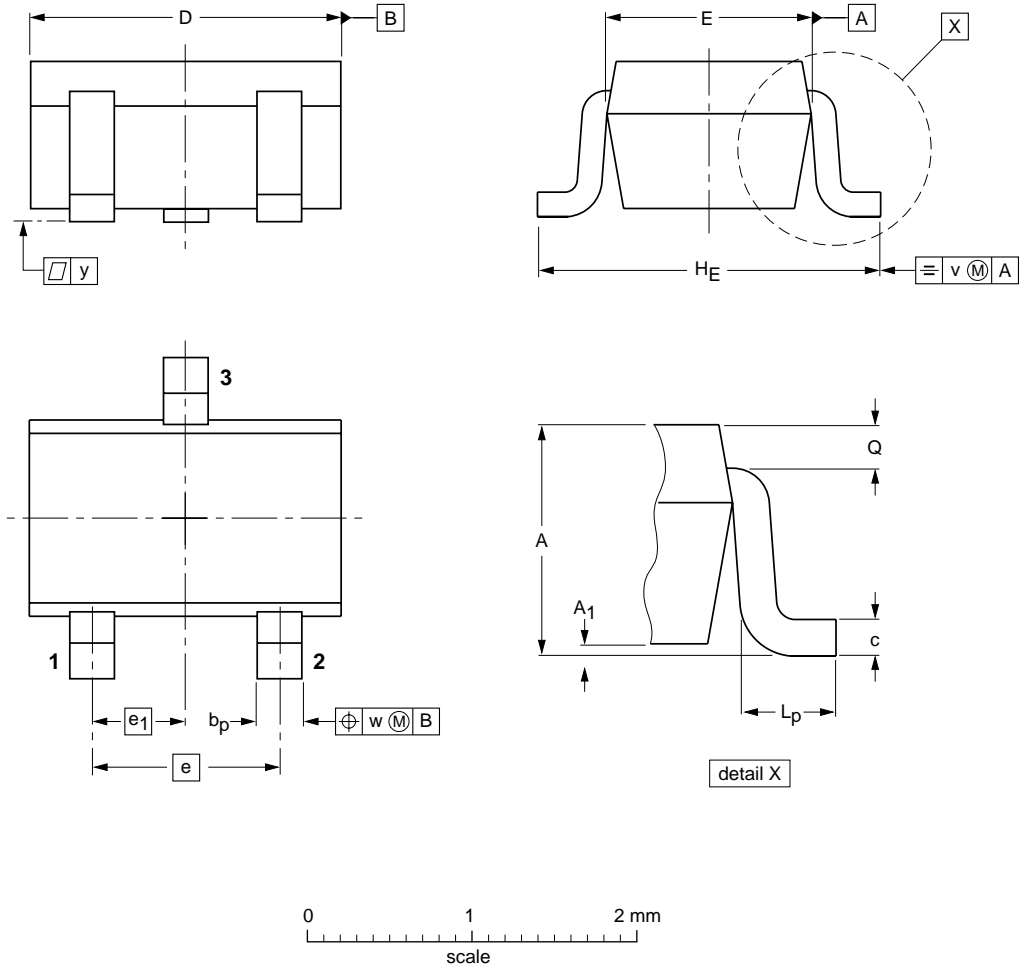
■ Electrical Characteristics Ta = 25°C

| Parameter | Symbol | Testconditons | Min | Typ | Max | Unit |
|--|---------------|--|------|-----|------|------------------|
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C = 1.0 \text{ mA}, I_B = 0$ | 40 | | | V |
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C = 10 \text{ }\mu\text{A}, I_E = 0$ | 75 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E = 10 \text{ }\mu\text{A}, I_C = 0$ | 6 | | | V |
| Base cutoff current | I_{BL} | $V_{CE} = 60 \text{ V}, V_{EB} = 3.0 \text{ V}$ | | | 20 | nA |
| Collector cutoff current | I_{CEX} | $V_{CE} = 60 \text{ V}, V_{EB} = 3.0 \text{ V}$ | | | 10 | nA |
| DC current gain * | h_{FE} | $I_C = 150 \text{ mA}, V_{CE} = 10 \text{ V}$ | 100 | | 300 | |
| Collector-emitter saturation voltage * | $V_{CE(sat)}$ | $I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$ | | | 0.3 | V |
| | | $I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$ | | | 1.0 | |
| Base-emitter saturation voltage * | $V_{BE(sat)}$ | $I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$ | 0.6 | | 1.2 | |
| | | $I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$ | | | 2.0 | |
| Current-gain-bandwidth product | f_T | $I_C = 20 \text{ mA}, V_{CE} = 20 \text{ V}, f = 100 \text{ MHz}$ | 300 | | | MHz |
| Output capacitance | C_{obo} | $V_{CB} = 10 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$ | | | 8.0 | pF |
| Input capacitance | C_{ibo} | $V_{EB} = 0.5 \text{ V}, I_C = 0, f = 1.0 \text{ MHz}$ | | | 30 | pF |
| Input impedance | h_{ie} | $V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 1.0 \text{ kHz}$ | 0.25 | | 1.25 | k Ω |
| Voltage feedback ratio | h_{re} | $V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 1.0 \text{ kHz}$ | | | 4.0 | $\times 10^{-4}$ |
| Small-signal current gain | h_{fe} | $V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 1.0 \text{ kHz}$ | 75 | | 375 | |
| Output admittance | h_{oe} | $V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}, f = 1.0 \text{ kHz}$ | 25 | | 200 | μmhos |
| Noise figure | NF | $V_{CE} = 10 \text{ V}, I_C = 100 \text{ }\mu\text{A}, R_s = 1.0 \text{ k}\Omega, f = 1.0 \text{ kHz}$ | | | 4.0 | dB |
| Delay time | t_d | $V_{CC} = 3.0 \text{ V}, V_{BE} = -0.5 \text{ V}, I_C = 150 \text{ mA}, I_{B1} = 15 \text{ mA}$ | | | 10 | ns |
| Rise time | t_r | | | | 25 | ns |
| Storage time | t_s | $V_{CC} = 30 \text{ V}, I_C = 150 \text{ mA}, I_{B1} = I_{B2} = 15 \text{ mA}$ | | | 225 | ns |
| Fall time | t_f | | | | 60 | ns |

* Pulse test: pulse width $\leq 300 \text{ }\mu\text{s}$, duty cycle $\leq 2.0\%$.

Package Outline

SOT-323



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₁ max | b _p | c | D | E | e | e ₁ | H _E | L _p | Q | v | w |
|------|------------|-----------------------|----------------|--------------|------------|--------------|-----|----------------|----------------|----------------|--------------|-----|-----|
| mm | 1.1 0.8 | 0.1 | 0.4 0.3 | 0.25 0.10 | 2.2 1.8 | 1.35 1.15 | 1.3 | 0.65 | 2.2 2.0 | 0.45 0.15 | 0.23 0.13 | 0.2 | 0.2 |

Summary of Packing Options

| Package | Package Description | Packing Quantity | Industry Standard |
|---------|---------------------|------------------|-------------------|
| SOT-323 | Tape/Reel, 7" reel | 3000 | EIA-481-1 |