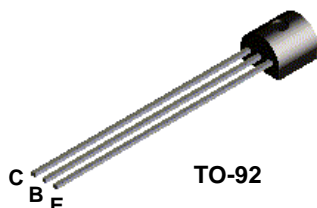


## 2N4125



### PNP General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents of 10  $\mu$ A to 100 mA.

#### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

| Symbol                            | Parameter  | Value       | Units |
|-----------------------------------|--|-------------|-------|
| V <sub>CEO</sub>                  | Collector-Emitter Voltage                        | 30          | V     |
| V <sub>CBO</sub>                  | Collector-Base Voltage                           | 30          | V     |
| V <sub>EBO</sub>                  | Emitter-Base Voltage                             | 4.0         | V     |
| I <sub>C</sub>                    | Collector Current - Continuous                   | 200         | mA    |
| T <sub>J</sub> , T <sub>stg</sub> | Operating and Storage Junction Temperature Range | -55 to +150 | °C    |

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

#### Thermal Characteristics

TA = 25°C unless otherwise noted

| Symbol           | Characteristic                                | Max    | Units |
|------------------|---|--------|-------|
|                  |   | 2N4125 |       |
| P <sub>D</sub>   | Total Device Dissipation<br>Derate above 25°C | 625    | mW    |
|                  |   | 5.0    | mW/°C |
| R <sub>θJC</sub> | Thermal Resistance, Junction to Case          | 83.3   | °C/W  |
| R <sub>θJA</sub> | Thermal Resistance, Junction to Ambient       | 200    | °C/W  |

# PNP General Purpose Amplifier

(continued)

2N4125

## Electrical Characteristics

TA = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Max | Units |
|--------|-----------|-----------------|-----|-----|-------|
|--------|-----------|-----------------|-----|-----|-------|

### OFF CHARACTERISTICS

|               |                                      |  |     |    |    |
|---------------|--------------------------------------|--|-----|----|----|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage* | $I_C = 1.0 \text{ mA}, I_B = 0$          | 30  |    | V  |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage     | $I_C = 10 \text{ } \mu\text{A}, I_E = 0$ | 30  |    | V  |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage       | $I_E = 10 \text{ } \mu\text{A}, I_C = 0$ | 4.0 |    | V  |
| $I_{CBO}$     | Collector-Cutoff Current             | $V_{CB} = 20 \text{ V}, I_E = 0$         |     | 50 | nA |
| $I_{EBO}$     | Emitter-Cutoff Current               | $V_{EB} = 3.0 \text{ V}, I_C = 0$        |     | 50 | nA |

### ON CHARACTERISTICS\*

|               |                                      |   |          |      |   |
|---------------|--------------------------------------|---|----------|------|---|
| $h_{FE}$      | DC Current Gain                      | $V_{CE} = 1.0 \text{ V}, I_C = 2.0 \text{ mA}$<br>$V_{CE} = 1.0 \text{ V}, I_C = 50 \text{ mA}$ | 50<br>25 | 150  |   |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$   |          | 0.4  | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage      | $I_C = 50 \text{ mA}, I_B = 5.0 \text{ mA}$   |          | 0.95 | V |

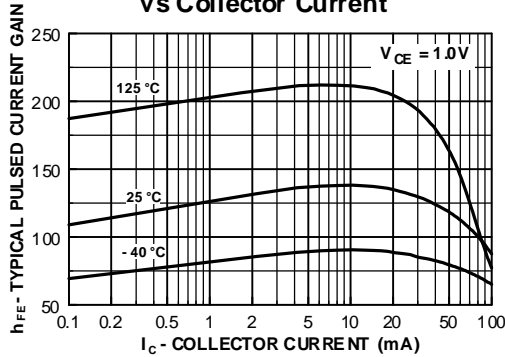
### SMALL SIGNAL CHARACTERISTICS

|          |                           |   |           |     |    |
|----------|---------------------------|---|-----------|-----|----|
| $C_{ob}$ | Output Capacitance        | $V_{CB} = 5.0 \text{ V}, f = 100 \text{ kHz}$   |           | 4.5 | pF |
| $C_{ib}$ | Input Capacitance         | $V_{BE} = 0.5 \text{ V}, f = 100 \text{ kHz}$   |           | 10  | pF |
| $h_{fe}$ | Small-Signal Current Gain | $I_C = 2.0 \text{ mA}, V_{CE} = 10 \text{ V},$<br>$f = 1.0 \text{ kHz}$<br>$I_C = 10 \text{ mA}, V_{CE} = 20 \text{ V},$<br>$f = 100 \text{ MHz}$ | 50<br>2.0 | 200 |    |
| NF       | Noise Figure              | $V_{CE} = 5.0 \text{ V}, I_C = 100 \text{ } \mu\text{A},$<br>$R_S = 1.0 \text{ k}\Omega,$<br>$f = 10 \text{ Hz to } 15.7 \text{ kHz},$            |           | 5.0 | dB |

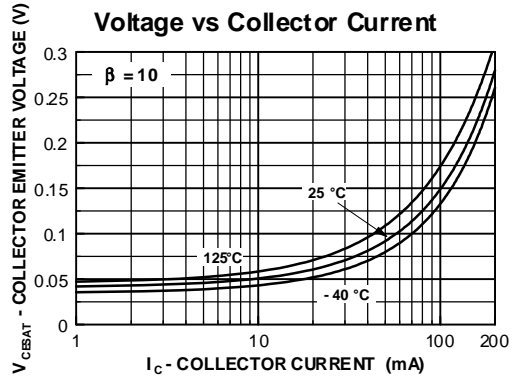
\* Pulse Test: Pulse Width  $\leq 300 \text{ } \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

Typical Characteristics

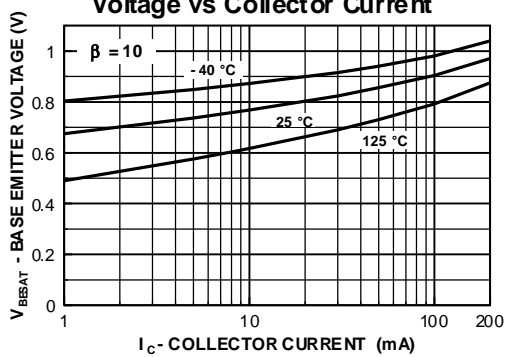
Typical Pulsed Current Gain vs Collector Current



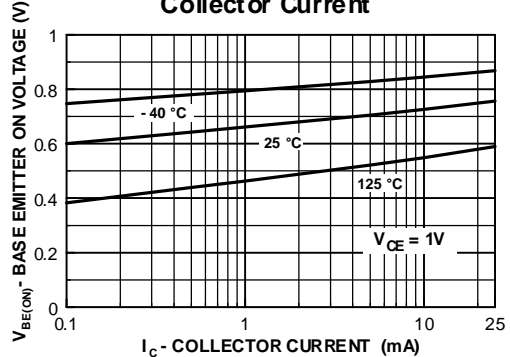
Collector-Emitter Saturation Voltage vs Collector Current



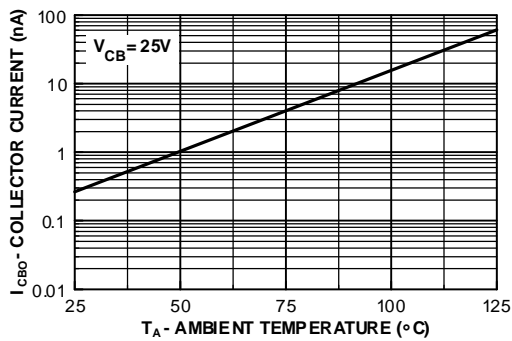
Base-Emitter Saturation Voltage vs Collector Current



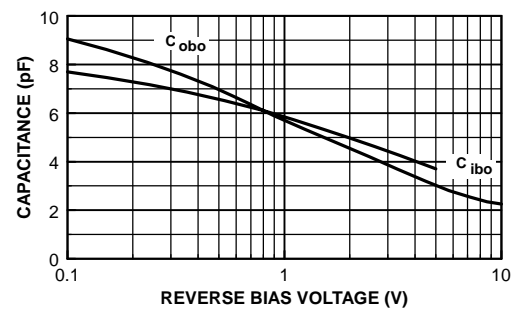
Base Emitter ON Voltage vs Collector Current



Collector-Cutoff Current vs Ambient Temperature

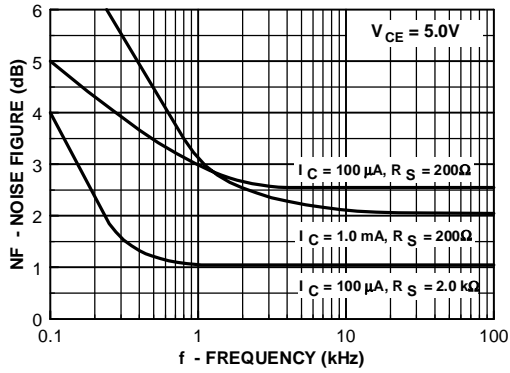


Common-Base Open Circuit Input and Output Capacitance vs Reverse Bias Voltage



Typical Characteristics (continued)

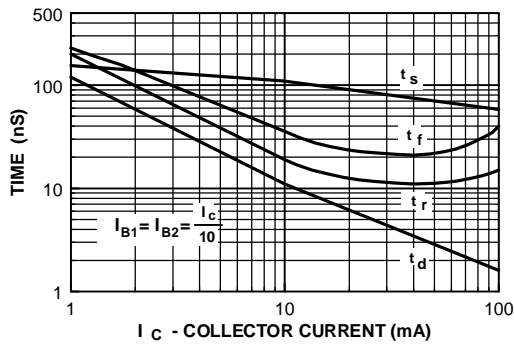
Noise Figure vs Frequency



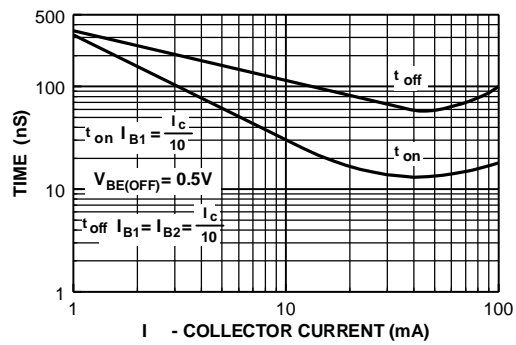
Noise Figure vs Source Resistance



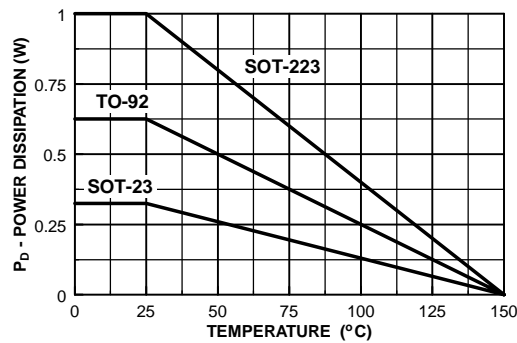
Switching Times vs Collector Current



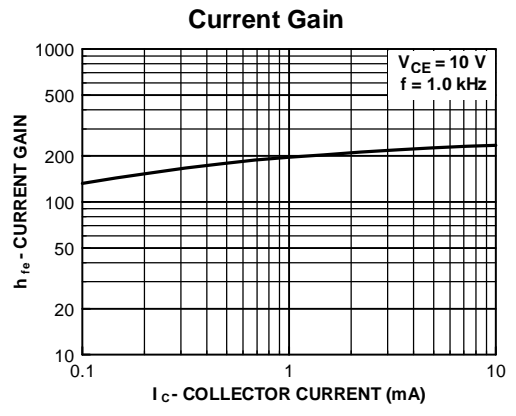
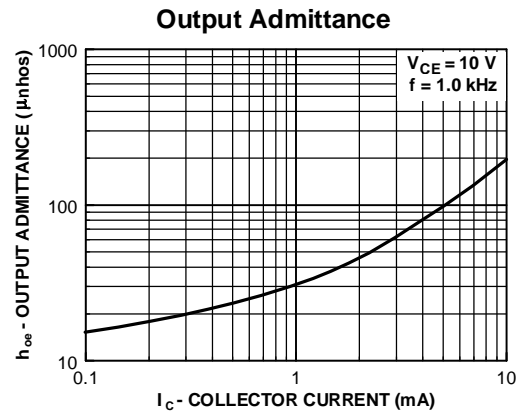
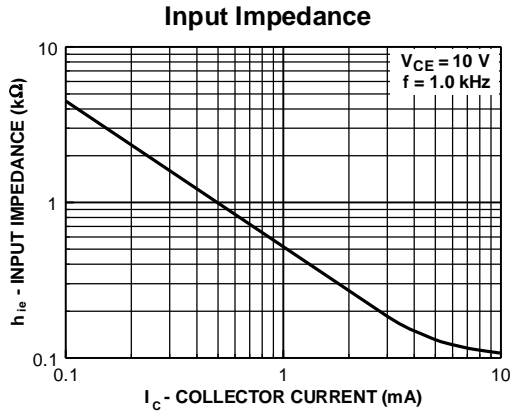
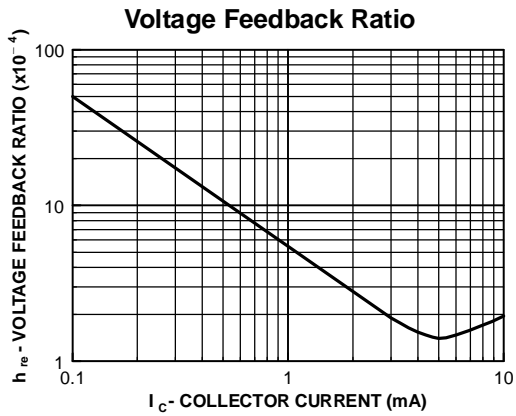
Turn On and Turn Off Times vs Collector Current



Power Dissipation vs Ambient Temperature



Typical Characteristics (continued)



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