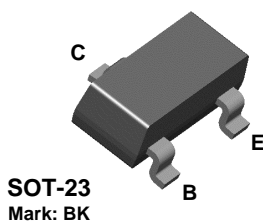


BCX71K



PNP General Purpose Amplifier

This device is designed for applications requiring extremely high current gain at collector currents to 300 mA. Sourced from Process 68.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|----------------|--|-------------|-------|
| V_{CEO} | Collector-Emitter Voltage | 45 | V |
| V_{CES} | Collector-Base Voltage | 45 | V |
| V_{EBO} | Emitter-Base Voltage | 5.0 | V |
| I_C | Collector Current - Continuous | 500 | mA |
| T_J, T_{stg} | 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.
- 3) All voltages (V) and currents (A) are negative polarity for PNP transistors.

Thermal Characteristics TA = 25°C unless otherwise noted

| Symbol | Characteristic | Max | Units |
|-----------------|---|---------|-------|
| | | *BCX71K | |
| P_D | Total Device Dissipation Derate above 25°C | 350 | mW |
| | | 2.8 | mW/°C |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 357 | °C/W |

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

PNP General Purpose Amplifier

(continued)

BCX71K

Electrical Characteristics

TA = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Max | Units |
|----------------------------|-------------------------------------|---|-----|----------|---------------------|
| OFF CHARACTERISTICS | | | | | |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | $I_C = 1.0 \text{ mA}, I_B = 0$ | 45 | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E = 10 \text{ } \mu\text{A}, I_C = 0$ | 5.0 | | V |
| I_{CES} | Collector-Cutoff Current | $V_{CB} = 45 \text{ V}, I_E = 0$ $V_{CB} = 45 \text{ V}, I_E = 0, T_A = 100^\circ\text{C}$ | | 20 20 | nA μA |

ON CHARACTERISTICS

| | | | | | |
|---------------|--------------------------------------|--|-------------------|--------------|---|
| h_{FE} | DC Current Gain | $I_C = 10 \text{ } \mu\text{A}, V_{CE} = 5.0 \text{ V}$ $I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$ $I_C = 50 \text{ mA}, V_{CE} = 1.0 \text{ V}$ | 100 380 110 | 630 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 10 \text{ mA}, I_B = 0.25 \text{ mA}$ $I_C = 50 \text{ mA}, I_B = 1.25 \text{ mA}$ | 0.06 0.12 | 0.25 0.55 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C = 10 \text{ mA}, I_B = 0.25 \text{ mA}$ $I_C = 50 \text{ mA}, I_B = 1.25 \text{ mA}$ | 0.6 0.68 | 0.85 1.05 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage | $I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$ | 0.6 | 0.75 | V |

SMALL SIGNAL CHARACTERISTICS

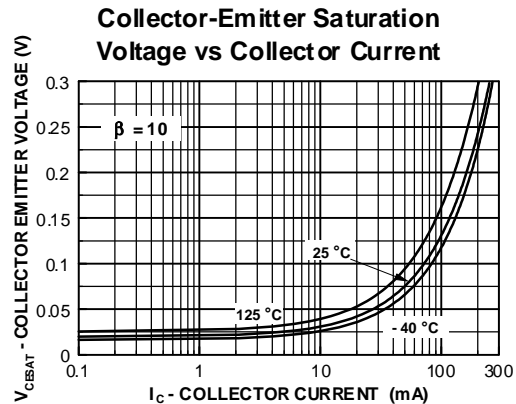
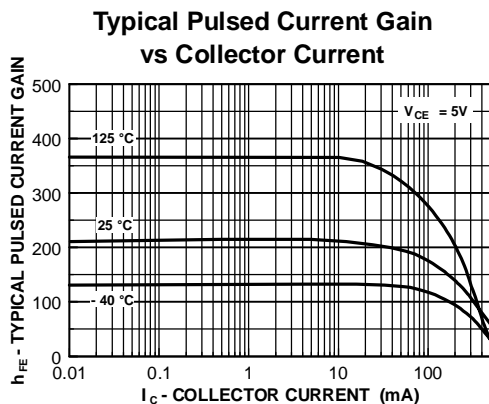
| | | | | | |
|-----------|--------------------|---|--|-----|----|
| C_{obo} | Output Capacitance | $V_{CE} = 10 \text{ V}, I_C = 0, f = 1.0 \text{ MHz}$ | | 6.0 | pF |
| NF | Noise Figure | $I_C = 0.2 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $R_S = 2.0 \text{ k}\Omega, f = 1.0 \text{ kHz},$ $BW = 200 \text{ Hz}$ | | 6.0 | dB |

SWITCHING CHARACTERISTICS

| | | | | | |
|-------------|---------------|--|--|-----|----|
| $t_{(on)}$ | Turn-On Time | $I_C = 10 \text{ mA}, I_{B1} = 1.0 \text{ mA}$ | | 150 | ns |
| $t_{(off)}$ | Turn-Off Time | $I_{B2} = 1.0 \text{ mA}, V_{BB} = 3.6 \text{ V},$ $R1 = R2 = 5.0 \text{ k}\Omega, R_L = 990 \text{ } \Omega$ | | 800 | ns |

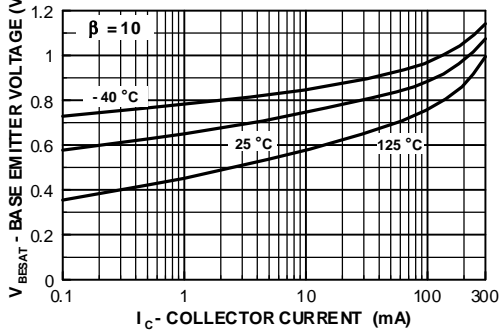
NOTE: All voltages (V) and currents (A) are negative polarity for PNP transistors.

Typical Characteristics

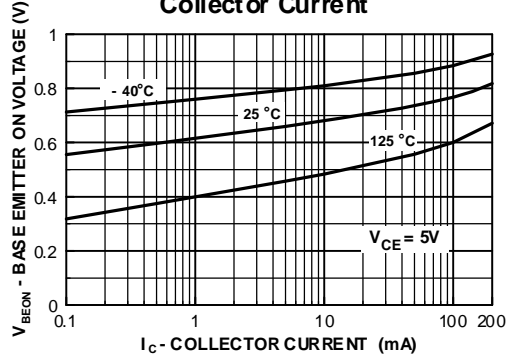


Typical Characteristics (continued)

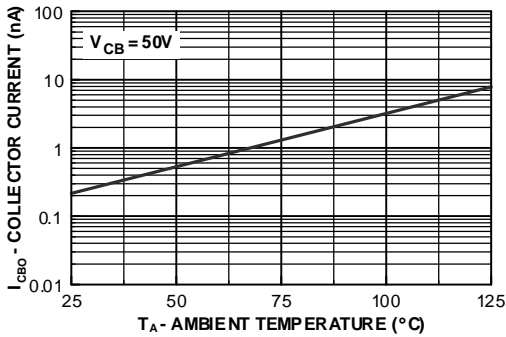
Base-Emitter Saturation Voltage vs Collector Current



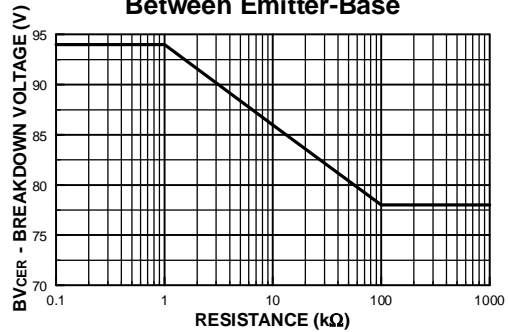
Base Emitter ON Voltage vs Collector Current



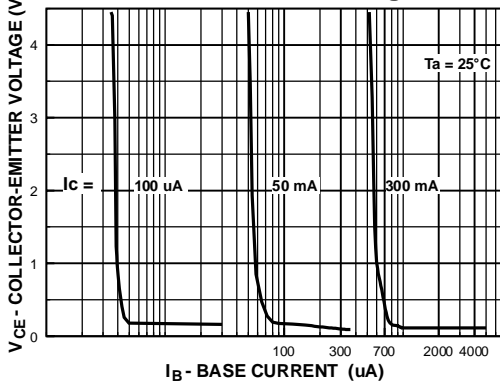
Collector-Cutoff Current vs Ambient Temperature



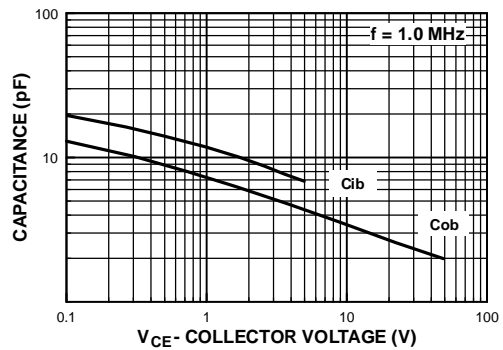
Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base



Collector Saturation Region

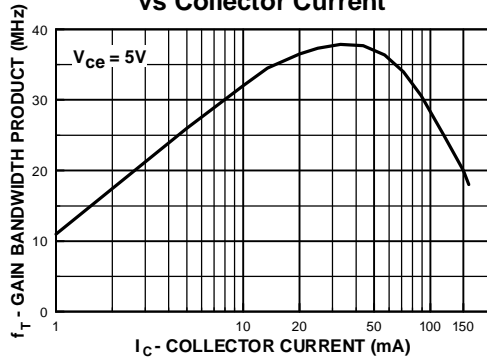


Input and Output Capacitance vs Reverse Voltage

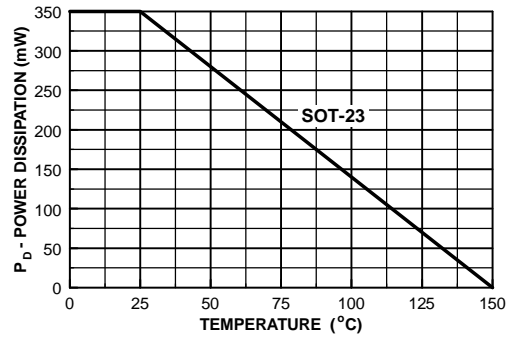


Typical Characteristics (continued)

Gain Bandwidth Product
vs Collector Current



Power Dissipation vs
Ambient Temperature



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|--------------------------|------------------------|---|
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