

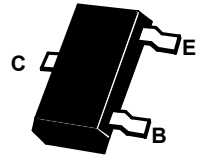
SOT23 PNP SILICON PLANAR SMALL SIGNAL TRANSISTORS

BCX71

ISSUE 3 – MARCH 2005

PARTMARKING DETAIL –

- BCX71G – BG
- BCX71H – BH
- BCX71J – BJ
- BCX71K – BK
- BCX71GR – CG
- BCX71HR – 6P
- BCX71JR – J8
- BCX71KR – CK

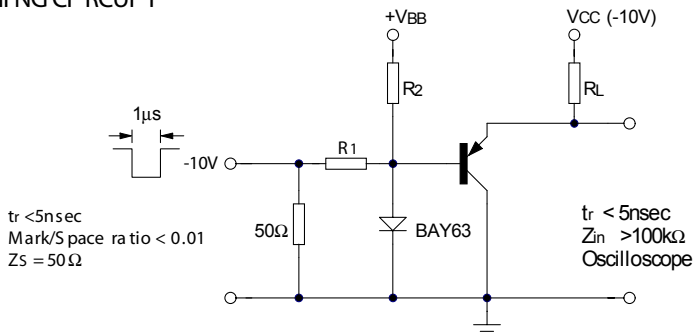


SOT23

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|--|---------------|-------------|-------------|
| Collector-Base Voltage | V_{CES} | -45 | V |
| Collector-Emitter Voltage | V_{CEO} | -45 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Continuous Collector Current | I_C | -200 | mA |
| Base Current | I_B | -50 | mA |
| Power Dissipation at $T_{amb}=25^{\circ}C$ | P_{TOT} | 330 | mW |
| Operating and Storage Temperature Range | $T_J:T_{stg}$ | -55 to +150 | $^{\circ}C$ |

SWITCHING CIRCUIT



FOUR TERMINAL NETWORK DATA ($I_C=2mA$, $V_{CE}=5V$, $f=1kHz$)

| | h_{FE} Group G | | | h_{FE} Group F | | | h_{FE} Group J | | | h_{FE} Group K | | | |
|-----------|------------------|------|------|------------------|------|------|------------------|------|------|------------------|------|------|-----------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | |
| h_{11e} | 1.6 | 2.7 | 4.5 | 2.5 | 3.6 | 6.0 | 3.2 | 4.5 | 8.5 | 4.5 | 7.5 | 12 | K |
| h_{12e} | | 1.5 | | | 2 | | | 2 | | | 3 | | 10^{-4} |
| h_{21e} | | 200 | | | 260 | | | 330 | | | 520 | | |
| h_{22e} | | 18 | 30 | | 24 | 50 | | 30 | 60 | | 50 | 100 | μs |

Spice parameter data is available upon request for this device

BCX71

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| PARAMETER | | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---------------------------------------|-----------|---------------|-------------------|-------------------------|----------------|---------------------|--|
| Collector-Emitter Breakdown Voltage | | $V_{(BR)CEO}$ | -45 | | | V | $I_{CEO} = -2\text{mA}$ |
| Emitter-Base Breakdown Voltage | | $V_{(BR)EBO}$ | -5 | | | V | $I_{EBO} = -1\mu\text{A}$ |
| Collector-Emitter Cut-off Current | | I_{CES} | | | -20 -20 | nA μA | $V_{CE} = -45\text{V}$ $V_{CE} = -45\text{V}, T_{amb} = 150^{\circ}\text{C}$ |
| Emitter-Base Cut-Off Current | | I_{EBO} | | | -20 | nA | $V_{EBO} = -4\text{V}$ |
| Collector-Emitter Saturation Voltage | | $V_{CE(sat)}$ | | -0.12 -0.25 | -0.25 -0.55 | V V | $I_C = -10\text{mA}, I_B = -0.25\text{mA}$ $I_C = -50\text{mA}, I_B = -1.25\text{mA}$ |
| Base-Emitter Saturation Voltage | | $V_{BE(sat)}$ | -0.60 -0.68 | -0.70 -0.80 | -0.85 -1.05 | V V | $I_C = -10\text{mA}, I_B = -0.25\text{mA}$ $I_C = -50\text{mA}, I_B = -1.25\text{mA}$ |
| Base - Emitter Voltage | | V_{BE} | -0.6 | -0.55 -0.65 -0.72 | -0.75 | V V V | $I_C = -10\mu\text{A}, V_{CE} = -5\text{V}$ $I_C = -2\text{mA}, V_{CE} = -5\text{V}$ $I_C = -50\text{mA}, V_{CE} = -1\text{V}$ |
| Static Forward Current Transfer Ratio | BCX71G | h_{FE} | 120 60 | 140 170 | 220 | | $I_C = -10\mu\text{A}, V_{CE} = -5\text{V}$ $I_C = -2\text{mA}, V_{CE} = -5\text{V}$ $I_C = -50\text{mA}, V_{CE} = -1\text{V}$ |
| | BCX71H | | 30 180 80 | 200 250 | 310 | | $I_C = -10\mu\text{A}, V_{CE} = -5\text{V}$ $I_C = -2\text{mA}, V_{CE} = -5\text{V}$ $I_C = -50\text{mA}, V_{CE} = -1\text{V}$ |
| | BCX71J | | 40 250 100 | 270 350 | 460 | | $I_C = -10\mu\text{A}, V_{CE} = -5\text{V}$ $I_C = -2\text{mA}, V_{CE} = -5\text{V}$ $I_C = -50\text{mA}, V_{CE} = -1\text{V}$ |
| | BCX71K | | 100 380 110 | 340 500 | 630 | | $I_C = -10\mu\text{A}, V_{CE} = -5\text{V}$ $I_C = -2\text{mA}, V_{CE} = -5\text{V}$ $I_C = -50\text{mA}, V_{CE} = -1\text{V}$ |
| Transition Frequency | | f_T | | 180 | | MHz | $I_C = -10\text{mA}, V_{CE} = -5\text{V}$ $f = 100\text{MHz}$ |
| Emitter-Base Capacitance | | C_{ebo} | | 11 | | pF | $V_{EBO} = -0.5\text{V}, f = 1\text{MHz}$ |
| Collector-Base Capacitance | | C_{cbo} | | | 6 | pF | $V_{CBO} = -10\text{V}, f = 1\text{MHz}$ |
| Noise Figure | | N | | 2 | 6 | dB | $I_C = -0.2\text{mA}, V_{CE} = -5\text{V}$ $R_G = 2\text{K}\Omega, f = 1\text{KHz}$ $\Delta f = 200\text{Hz}$ |
| Switching times: | | | | | | | |
| Delay Time | t_d | | | 35 | | ns | |
| Rise Time | t_r | | | 50 | | ns | |
| Turn-on Time | t_{on} | | | 85 | 150 | ns | |
| Storage Time | t_s | | | 400 | | ns | |
| Fall Time | t_f | | | 80 | | ns | |
| Turn-Off Time | t_{off} | | | 480 | 800 | ns | |
| | | | | | | | $-I_C : I_{B1} : -I_{B2} = 10:1:1\text{mA}$ $R_1 = R_2 = 5\text{K}\Omega$ $V_{BB} = -3.6\text{V}, R_L = 990\Omega$ |

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle