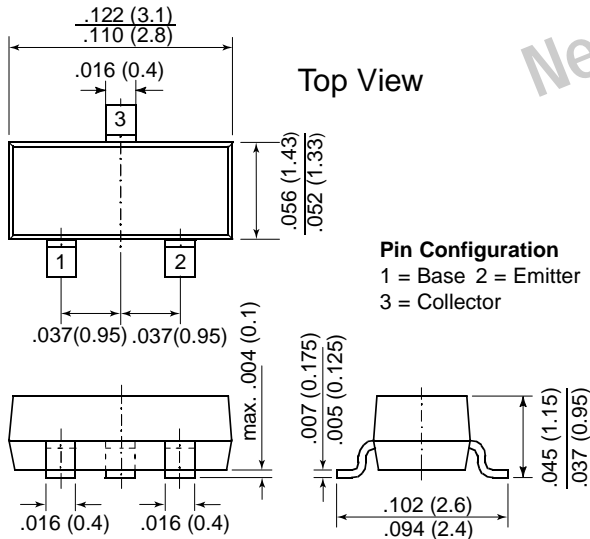


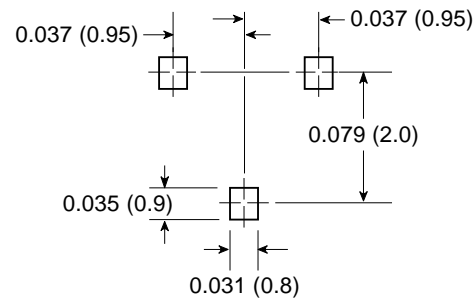


### TO-236AB (SOT-23)



New Product

### Mounting Pad Layout



## Mechanical Data

**Case:** SOT-23 Plastic Package

**Weight:** approx. 0.008g

**Marking Code:** BCX70G = AG

BCX70H = AH

BCX70J = AJ

BCX70K = AK

**Packaging Codes/Options:**

E8/10K per 13" reel (8mm tape)

E9/3K per 7" reel (8mm tape)

## Features

- NPN Silicon Epitaxial Planar Transistors for switching and AF amplifier applications.
- Suited for low level, low noise, low frequency applications in hybrid circuits.
- Low current, low voltage.
- As complementary types, BCX71 Series PNP transistors are recommended.

## Maximum Ratings & Thermal Characteristics Ratings at 25°C ambient temperature unless otherwise specified.

Parameters	Symbols	Value	Units
Collector-Base Voltage	$V_{CBO}$	45	V
Collector-Emitter Voltage	$V_{CEO}$	45	V
Emitter-Base Voltage	$V_{EBO}$	5.0	V
Collector Current	$I_C$	200	mA
Peak Base Current	$I_B$	50	mA
Power Dissipation	$P_{tot}$	250	mW
Thermal Resistance Junction to Ambient Air	$R_{\theta JA}$	500 <sup>(1)</sup>	°C/W
Junction Temperature	$T_j$	150	°C
Storage Temperature Range	$T_s$	- 65 to +150	°C

**Notes:** (1) Mounted on FR-4 printed-circuit board.

## Small Signal Transistor (NPN)

### Electrical Characteristics (T<sub>J</sub> = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
DC Current Gain	BCX70G	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 10 μA	—	—	—	—
	BCX70H	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 10 μA	30	—	—	
	BCX70J	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 10 μA	40	—	—	
	BCX70K	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 10 μA	100	—	—	
	BCX70G	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 mA	120	—	220	
	BCX70H	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 mA	180	—	310	
	BCX70J	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 mA	250	—	460	
	BCX70K	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 mA	380	—	630	
	BCX70G	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 50 mA	50	—	—	
	BCX70H	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 50 mA	70	—	—	
	BCX70J	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 50 mA	90	—	—	
	BCX70K	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 50 mA	100	—	—	
Collector-Emitter Saturation Voltage	V <sub>CEsat</sub>	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0.25 mA I <sub>C</sub> = 50 mA, I <sub>B</sub> = 1.25 mA	50 100	— —	350 550	mV
Base-Emitter Saturation Voltage	V <sub>BEsat</sub>	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0.25 mA I <sub>C</sub> = 50 mA, I <sub>B</sub> = 1.25 mA	600 700	— —	850 1050	mV
Base-Emitter Voltage	V <sub>BE</sub>	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 mA V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 μA V <sub>CE</sub> = 1 V, I <sub>C</sub> = 50 mA	550 — —	650 520 780	750 — —	mV
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> = 45 V, V <sub>BE</sub> = 0 V V <sub>CB</sub> = 45 V, V <sub>BE</sub> = 0 V T <sub>A</sub> = 150°C	— —	— —	20 20	nA μA
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> = 4 V, I <sub>C</sub> = 0	—	—	20	nA
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 10 mA f = 100 MHz	100	250	—	MHz
Collector-Base Capacitance	C <sub>CB0</sub>	V <sub>CB</sub> = 10 V, f = 1 MHz, I <sub>E</sub> = 0	—	2.5	—	pF
Emitter-Base Capacitance	C <sub>EB0</sub>	V <sub>EB</sub> = 0.5 V, f = 1 MHz, I <sub>C</sub> = 0	—	8	—	pF
Noise Figure	F	V <sub>CE</sub> = 1 V, I <sub>C</sub> = 200 μA, R <sub>S</sub> = 2 kΩ, f = 1 kHz, B = 200 Hz	—	2	6	dB
Small Signal Current Gain	h <sub>fe</sub>	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 mA, f = 1.0 kHz	— — — —	200 260 330 520		
Turn-on Time at R <sub>L</sub> = 990Ω (see fig. 1)	t <sub>on</sub>	V <sub>CC</sub> = 10 V, I <sub>C</sub> = 10 mA, I <sub>B(on)</sub> = -I <sub>B(off)</sub> = 1 mA	—	85	150	ns
Turn-off Time at R <sub>L</sub> = 990Ω (see fig. 1)	t <sub>off</sub>	V <sub>CC</sub> = 10 V, I <sub>C</sub> = 10 mA, I <sub>B(on)</sub> = -I <sub>B(off)</sub> = 1 mA	—	480	800	ns

**Ratings and Characteristic Curves**

**Fig. 1 Switching Waveforms**

