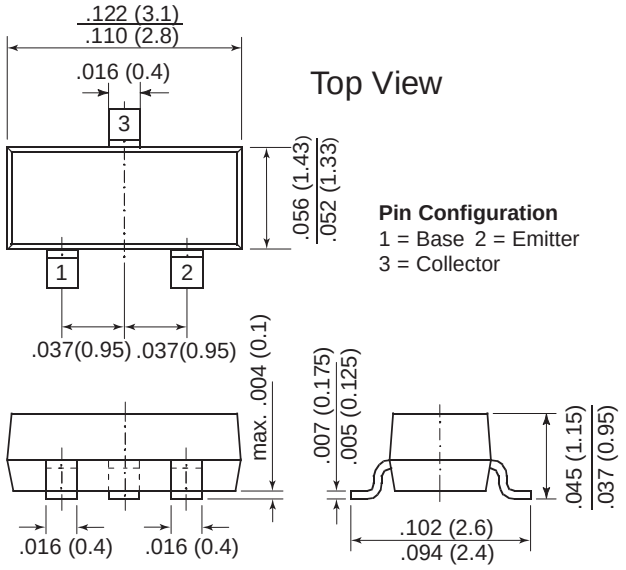
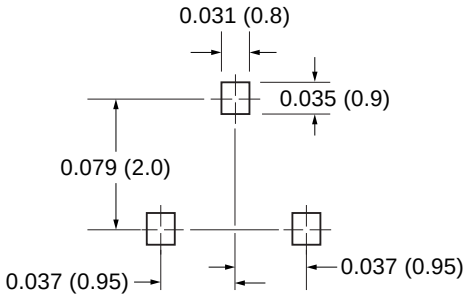
Small Signal Transistor (NPN)

TO-236AB (SOT-23)



Mounting Pad Layout



Dimensions in inches and (millimeters)

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), 30K/box
E9/3K per 7” reel (8mm tape), 30K/box

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.

Parameter	Symbol	Value	Unit
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(1)	°C/W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_S	–65 to +150	°C

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

Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter		Symbol	Test Condition	Min	Typ	Max	Unit
DC Current Gain	BCX70G	h_{FE}	V_{CE} = 5 V, I_C = 10 µA	—	—	—	—
	BCX70H		V_{CE} = 5 V, I_C = 10 µA	30	—	—	
	BCX70J		V_{CE} = 5 V, I_C = 10 µA	40	—	—	
	BCX70K		V_{CE} = 5 V, I_C = 10 µA	100	—	—	
	BCX70G		V_{CE} = 5 V, I_C = 2 mA	120	—	220	
	BCX70H		V_{CE} = 5 V, I_C = 2 mA	180	—	310	
	BCX70J		V_{CE} = 5 V, I_C = 2 mA	250	—	460	
	BCX70K		V_{CE} = 5 V, I_C = 2 mA	380	—	630	
	BCX70G		V_{CE} = 1 V, I_C = 50 mA	50	—	—	
	BCX70H		V_{CE} = 1 V, I_C = 50 mA	70	—	—	
	BCX70J		V_{CE} = 1 V, I_C = 50 mA	90	—	—	
	BCX70K		V_{CE} = 1 V, I_C = 50 mA	100	—	—	
Collector-Emitter Saturation Voltage		V_{CEsat}	I_C = 10 mA, I_B = 0.25 mA	50	—	350	mV
			I_C = 50 mA, I_B = 1.25 mA	100	—	550	
Base-Emitter Saturation Voltage		V_{BEsat}	I_C = 10 mA, I_B = 0.25 mA	600	—	850	mV
			I_C = 50 mA, I_B = 1.25 mA	700	—	1050	
Base-Emitter Voltage		V_{BE}	V_{CE} = 5 V, I_C = 2 mA	550	650	750	mV
			V_{CE} = 5 V, I_C = 10 µA	—	520	—	
			V_{CE} = 1 V, I_C = 50 mA	—	780	—	
Collector Cut-off Current		I_{CBO}	V_{CB} = 45 V, V_{BE} = 0 V	—	—	20	nA
			V_{CB} = 45 V, V_{BE} = 0 V, T_A = 150°C	—	—	20	µA
Emitter Cut-off Current		I_{EBO}	V_{EB} = 4 V, I_C = 0	—	—	20	nA
Gain-Bandwidth Product		f_T	V_{CE} = 5 V, I_C = 10 mA, f = 100 MHz	100	250	—	MHz
Collector-Base Capacitance		C_{CBO}	V_{CB} = 10 V, f = 1 MHz, I_E = 0	—	2.5	—	pF
Emitter-Base Capacitance		C_{EBO}	V_{EB} = 0.5 V, f = 1 MHz, I_C = 0	—	8	—	pF
Noise Figure		F	V_{CE} = 5 V, I_C = 200 µA, R_S = 2 kΩ, f = 1 kHz, B = 200 Hz	—	2	6	dB
Small Signal Current Gain	BCX70G	h_{fe}	V_{CE} = 5 V, I_C = 2 mA, f = 1.0 kHZ	—	200		
	BCX70H			—	260		
	BCX70J			—	330		
	BCX70K			—	520		
Turn-on Time at R_L = 990Ω (see fig. 1)		t_{on}	V_{CC} = 10 V, I_C = 10 mA, $I_{B(on)}$ = -$I_{B(off)}$ = 1 mA	—	85	150	ns
Turn-off Time at R_L = 990Ω (see fig. 1)		t_{off}	V_{CC} = 10 V, I_C = 10 mA, $I_{B(on)}$ = -$I_{B(off)}$ = 1 mA	—	480	800	ns

Ratings and Characteristic Curves

Fig. 1 Switching Waveforms