

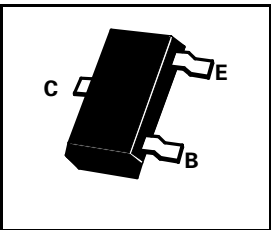
# SOT23 NPN SILICON PLANAR SMALL SIGNAL TRANSISTOR

## BCX70

ISSUE 2 – FEBRUARY 95

PARTMARKING DETAIL –

BCX70G	–	AG
BCX70H	–	AH
BCX70J	–	AJ
BCX70K	–	AK
BCX70GR	–	AW
BCX70HR	–	9P
BCX70JR	–	AX
BCX70KR	–	P9



COMPLEMENTARY TYPE – BCX71

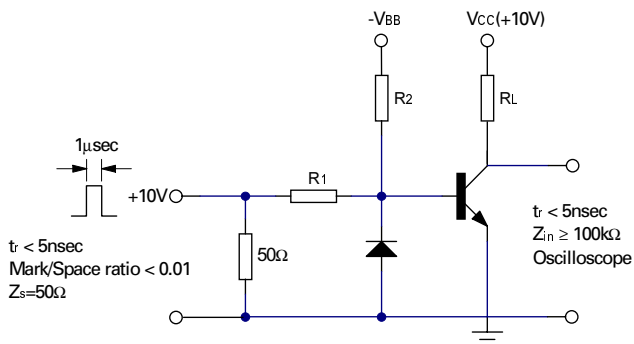
### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Collector-Emitter 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	tj:tstg	-55 to +150	$^{\circ}C$

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

	$h_{FE}$ Group G			$h_{FE}$ Group H			$h_{FE}$ 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	$k\Omega$
$h_{12e}$		1.5			2			2			3		$10^{-4}$
$h_{21e}$		200			260			330			520		
$h_{22e}$		18	30		24	50		30	60		50	100	$\mu S$

### SWITCHING CIRCUIT



# BCX70

## 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	$I_C=2\text{mA}$
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 $\mu\text{A}$	$V_{CES}=45\text{V}$ $V_{CES}=45\text{V}$ , $T_{amb}=150^{\circ}\text{C}$
Emitter-Base Cut-Off Current	$I_{EBO}$			20	nA	$V_{EBO}=4\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		0.12 0.20	0.35 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 0.70	0.70 0.83	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	$V_{BE}$	0.55	0.52 0.65 0.78	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	BCX70G	$h_{FE}$	78 170	220		$I_C=10\mu\text{A}, V_{CE}=5\text{V}$ $I_C=2\text{mA}, V_{CE}=5\text{V}$ $I_C=50\text{mA}, V_{CE}=1\text{V}$
	BCX70H	$h_{FE}$	20 180 70	145 250	310	$I_C=10\mu\text{A}, V_{CE}=5\text{V}$ $I_C=2\text{mA}, V_{CE}=5\text{V}$ $I_C=50\text{mA}, V_{CE}=1\text{V}$
	BCX70J	$h_{FE}$	40 250 90	220 350	460	$I_C=10\mu\text{A}, V_{CE}=5\text{V}$ $I_C=2\text{mA}, V_{CE}=5\text{V}$ $I_C=50\text{mA}, V_{CE}=1\text{V}$
	BCX70K	$h_{FE}$	100 380 100	300 500	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	$f_T$	125	250		MHz	$I_C=10\text{mA}, V_{CE}=5\text{V}$ $f=100\text{MHz}$
Emitter-Base Capacitance	$C_{ebo}$		8		pF	$V_{EBO}=0.5\text{V}, f=1\text{MHz}$
Collector-Base Capacitance	$C_{cbo}$			4.5	pF	$V_{CBO}=10\text{V}, f=1\text{MHz}$
Noise Figure	N		2	6	dB	$I_C=0.2\text{mA}, V_{CE}=5\text{V}$ $R_G=2\text{K}\Omega, f=1\text{KH}$ $\Delta f=200\text{Hz}$
Switching times:						
Delay Time	$t_d$		35		ns	$I_C:I_{B1}:I_{B2}=10:1:1\text{mA}$ $R_1=5\text{K}\Omega, R_2=5\text{K}\Omega$ $V_{BB}=3.6\text{V}, R_L=990\Omega$
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	

\*Measured under pulsed conditions. Pulse width=300 $\mu\text{s}$ . Duty cycle  
Spice parameter data is available upon request for this device