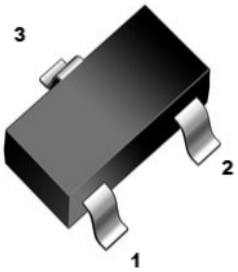
BCX70

NPN Plastic-Encapsulate Transistors

1. Features

SOT-23

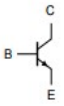


- NPN Silicon Epitaxial Planar Transistors for switching and AF amplifier applications.
- Suited for low level, low noise, low frequency applications in hybrid circuits.
- Low current, low voltage.
- As complementary types, BCX71 Series PNP transistors are recommended.

2. Mechanical Data

- Case:Molded Plastic,SOT-23 .
- Epoxy:UL 94V-0 rate flame retardant.
- Terminals:Plated Leads Solderable per MIL-STD-750,Method-2026.
- Marking: BCX70G, AG ; BCX70H,AH ; BCX70J,AJ ; BCX70K,AK
- Mounting Position : Any.

1 base
2 emitter
3 collector



3. Maximum Ratings

Electrical Characteristics Rating at 25℃ ambient temperature unless otherwise specified.

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	BV_{CBO}	45	V
Collector-Emitter Voltage	BV_{CEO}	45	V
Emitter-Base Voltage	BV_{EBO}	5	V
Collector Current	I_C	200	mA
Base Current	I_B	50	mA
Power Dissipation	P_{tot}	250	mW
Junction Temperature	T_j	150	℃
Storage Temperature	T_{stg}	-65～+150	℃
Thermal Resistance Junction to Ambient Air	$R_{\theta JA}$	$500_{(1)}$	℃/W

Note

1.Mounted on FR-4 printed-circuit board.

4. Electrical Characteristics (T_A=25℃ unless otherwise noted)

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

5. Rating And Characteristic Curves

Fig.1 Total power dissipation Ptot = f (TA*; TS)
* Package mounted on epoxy

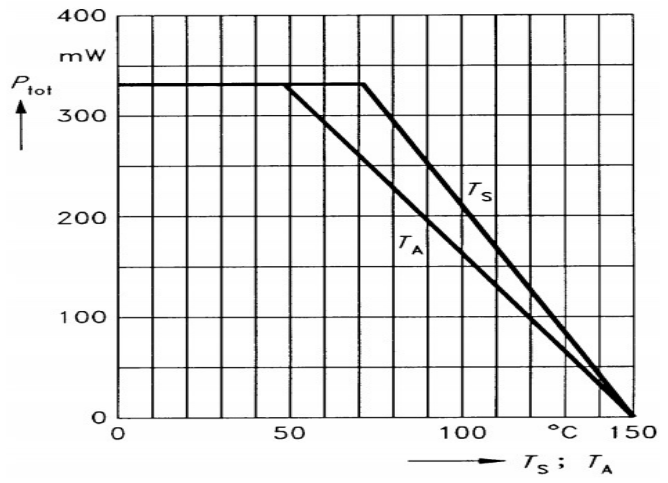


Fig.2 Collector-base capacitance CCBO = f (VCBO)
Emitter-base capacitance CEBO = f (VEBO)

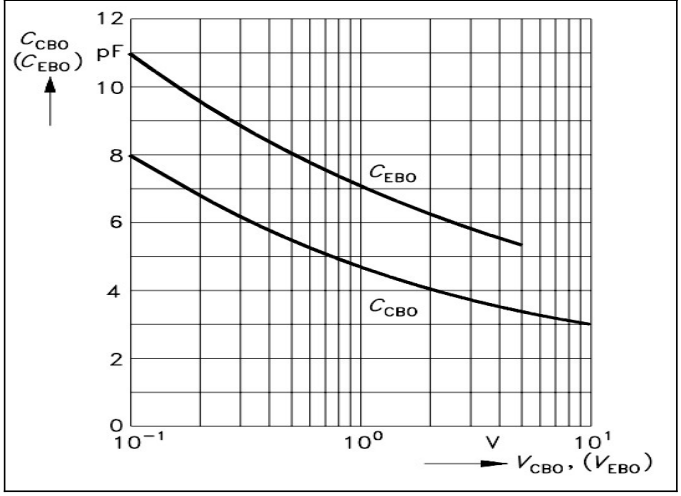


Fig.3 Permissible pulse load Ptot max/Ptot DC = f (tp)

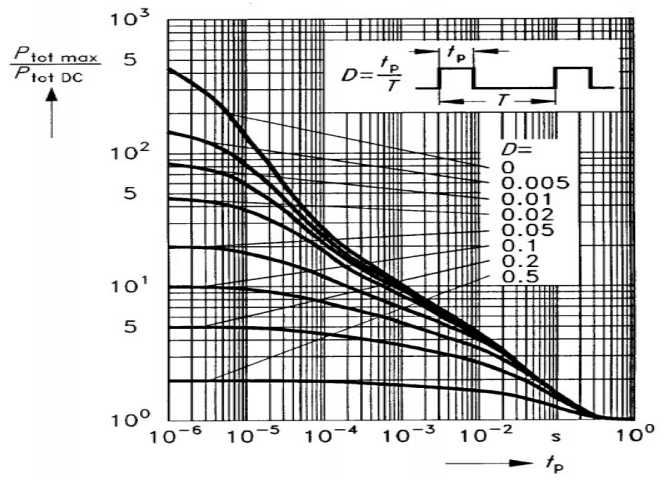


Fig.4 Transition frequency fT = f (IC)
VCE = 5 V

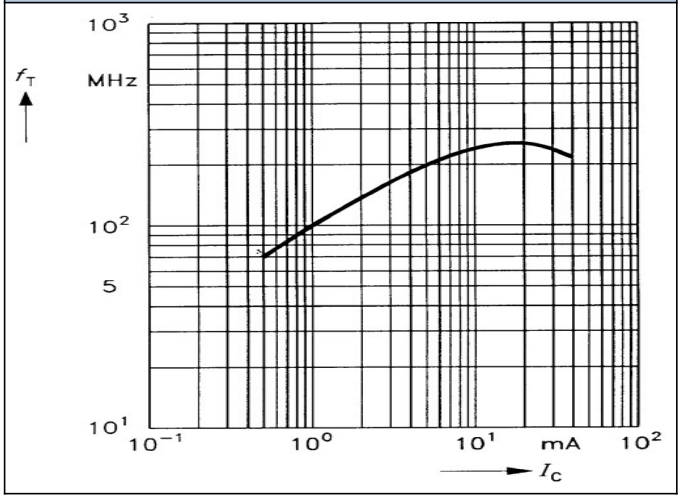


Fig.5 Base-emitter saturation voltage
IC = f (VBEsat) hFE = 40

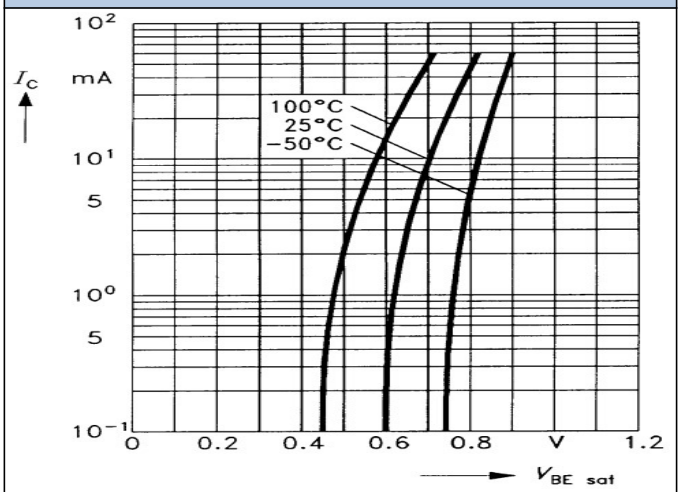
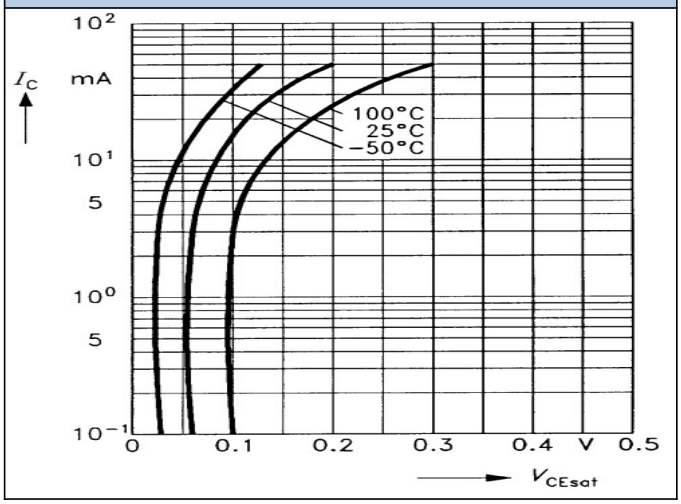


Fig.6 Collector-emitter saturation voltage
IC = f (VCEsat) hFE = 40



5. Rating And Characteristic Curves

Fig.7 Collector current IC = f (VBE)
VCE = 5 V

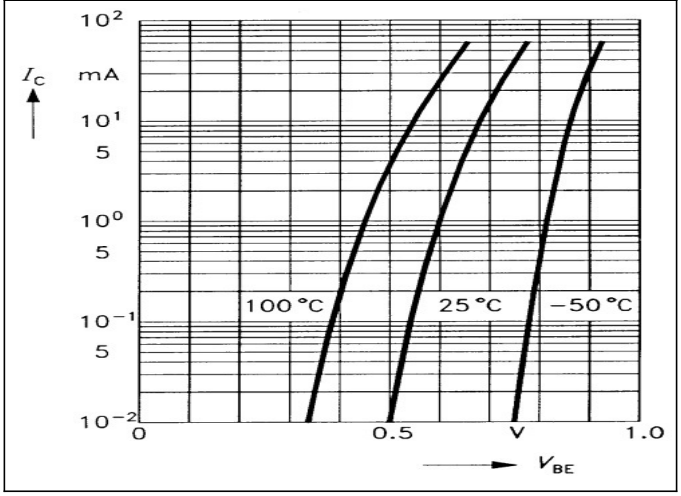
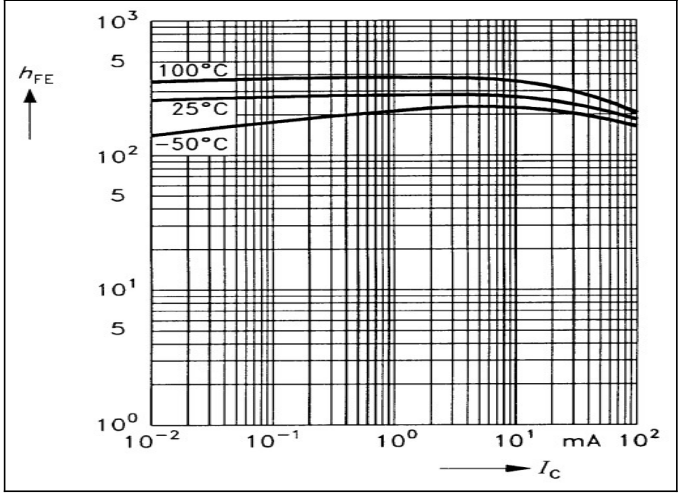
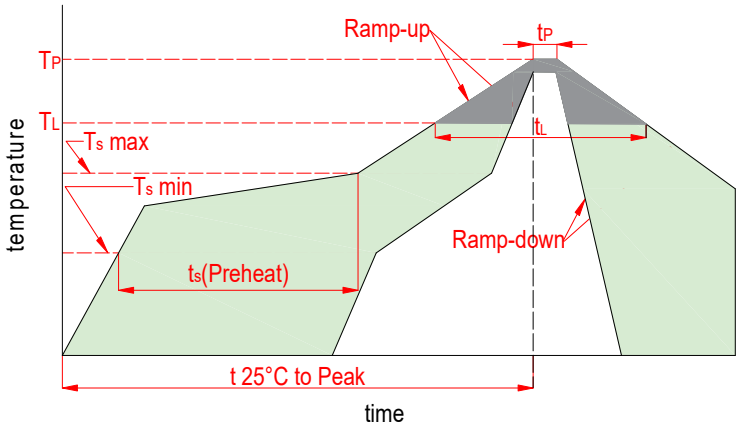


Fig.8 DC current gain hFE = f (IC)
VCE = 5 V

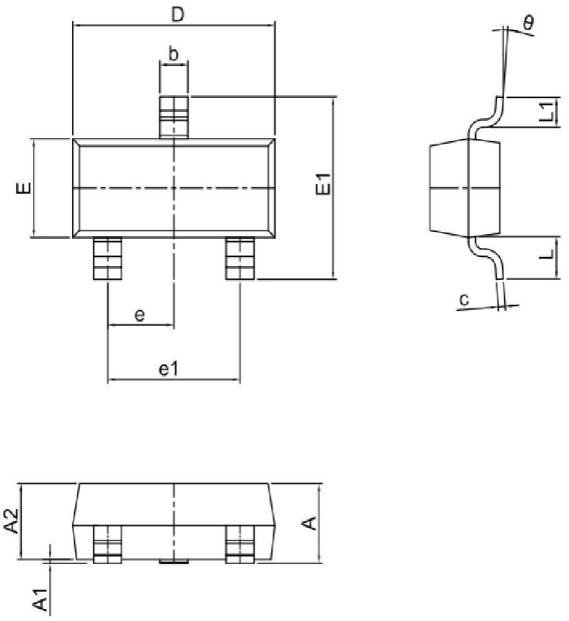


6. Soldering Parameters



Reflow Condition		Lead-free
Pre Heat	Temp. min(T_s(min))	150℃
	Temp. max(T_s(min))	200℃
	Time(min to max)(t_s)	60~120s
Aver. ramp up rate(Liquidus Temp.)(T_L)to peak		3℃/s max
T_S(max) to T_L-Ramp-up Rate		3℃/s max
Reflow	Temp.(T_L)(Liquidus)	217℃
	Temp.(t_L)(Liquidus)	60~150s
Peak Temp.(T_P)		$260^{+0/-5}$℃
Time within actual peak Temp.(t_p)		30s max
Ramp-down Rate		6℃/s max
Time 25℃ to peak Tempe.(T_p)		8 minutes max
Do not exceed		260℃

7. Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.035	0.055	0.900	1.400
A1	0.000	0.004	0.000	0.100
A2	0.035	0.051	0.900	1.300
b	0.012	0.020	0.300	0.500
c	0.003	0.007	0.080	0.190
D	0.106	0.122	2.700	3.100
E	0.047	0.065	1.200	1.650
E1	0.087	0.118	2.200	3.000
e	0.035	0.040	0.890	1.020
e1	0.070	0.080	1.780	2.040
L1	0.008	0.020	0.200	0.500

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