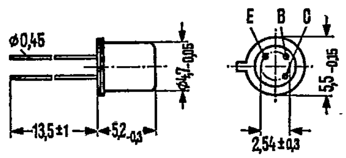
NPN Silicon Planar Transistors

BSX 48
BSX 49

BSX 48 and BSX 49 are double diffused epitaxial silicon planar transistors in TO 18 case (18 A 3 DIN 41876). Their collectors are electrically connected to the case.
The transistors are designed for use as high-speed switches and are particularly suitable for driving magnetic cores.
For data on the switching behavior of the transistors refer to the characteristics of the corresponding types BSY 34 and BSY 58.

Type	Ordering code
BSX 48	Q60218-X48
BSX 49	Q60218-X49



Approx. weight 0.3 g   Dimensions in mm

Maximum ratings		BSX 48	BSX 49	
Collector-emitter voltage	V_{CEO}	25	40	V
Collector-emitter voltage	V_{CES}	50	60	V
Collector-base voltage	V_{CBO}	50	60	V
Emitter-base voltage	V_{EBO}	5	5	V
Collector current	I_C	600	600	mA
Base current	I_B	200	200	mA
Junction temperature	T_j	200	200	°C
Storage temperature range	T_{stg}	−65 to +200	−65 to +200	°C
Total power dissipation ($T_{case} \leq 45\,°C$)	P_{tot}	1	1	W
Thermal resistance				
Junction to ambient air	R_{thJA}	≤500	≤500	K/W
Junction to case	R_{thJC}	≤150	≤150	K/W

Static characteristics (T_{amb} = 25 °C)

At a collector emitter-voltage of V_{CE} = 1 V and the following collector currents, the following values apply:

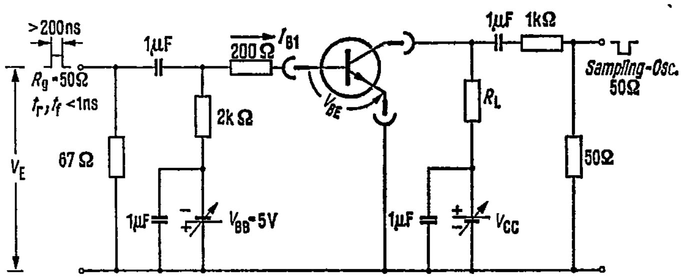
Type	BSX 48			BSX 49		
I_C mA	$h_{FE} = I_C/I_B$	V_{BEsat} V[1)]	V_{CEsat} V[1)]	$h_{FE} = I_C/I_B$	V_{BEsat} V[1)]	V_{CEsat}[1)]
1	23	0.62	–	23	0.62	–
10	37	0.70	–	37	0.70	–
100	42 (>17)*	0.85	0.17	42 (>25)*	0.85	0.17
500	25	1.2 (<1.5)*	0.6 (<1.5)*	25 (>10)	1.2 (<1.5)*	0.6 (<1.0)*

1) The transistor is saturated to such an extent that the DC current gain decreases to h_{FE} = 10.
* AQL = 0.65%

BSX 48
BSX 49

Static characteristics (T_{amb} = 25°C)		**BSX 48**	**BSX 49**	
Collector cutoff current (V_{CBO} = 50 V)	I_{CBO}	<120*	<70*	nA
Collector-emitter breakdown voltage (I_{CEO} = 10 mA)	$V_{(BR)CEO}$	>25	>40	V
Collector-base breakdown voltage (I_{CBO} = 100 µA)	$V_{(BR)CBO}$	>50	>60	V
Emitter-base breakdown voltage (I_{EBO} = 100 µA)	$V_{(BR)EBO}$	>5	>5	V
Dynamic characteristics (T_{amb} = 25°C)				
Transition frequency (I_C = 30 mA; V_{CE} = 10 V; f = 100 MHz)	f_T	400 (>250)	400 (>250)	MHz
Collector-base capacitance (V_{CBO} = 10 V)	C_{CBO}	4.5 (<6)	4.5 (<6)	pF
Emitter-base capacitance (V_{EBO} = 1 V)	C_{EBO}	22	22	pF
Switching times:				
Operating point: I_C = 150 mA; I_{B1} = 15 mA;	t_{on}	35	30	ns
$-I_{B2}$ = 15 mA; R_L = 150 Ω	t_{off}	60	50	ns
Operating point: I_C = 500 mA; I_{B1} = 50 mA; $-I_{B2}$ = 25 mA; V_E = 15 V				
R_L = 80 Ω for BSX 49 (V_{CC} = 40 V)	t_{on}	35 (<65)	30 (<50)	ns
R_L = 50 Ω for BSX 48 (V_{CC} = 25 V)	t_{off}	65 (<110)	65 (<95)	ns

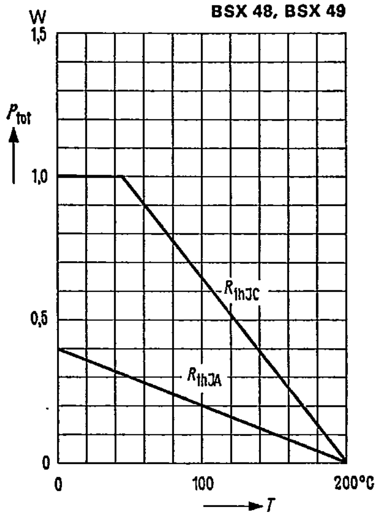
Test circuit for switching times



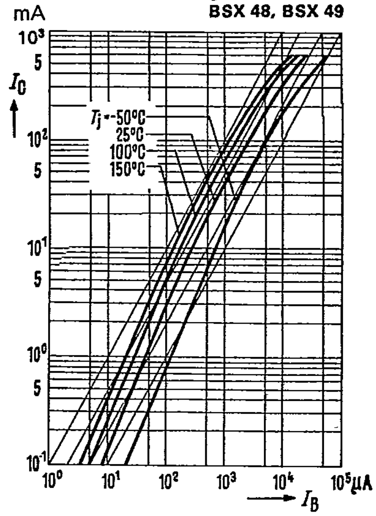
* AQL = 0.65%

BSX 48
BSX 49

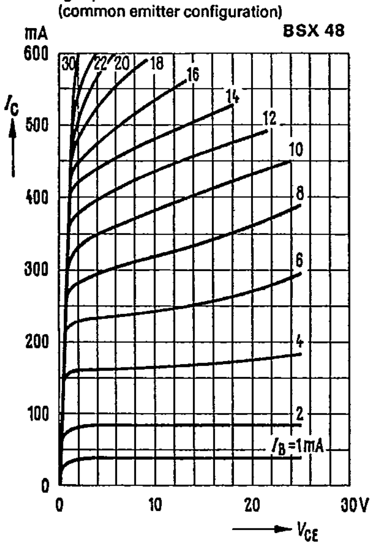
Total perm. power dissipation versus temperature
$P_{tot} = f(T)$; R_{th} = parameter



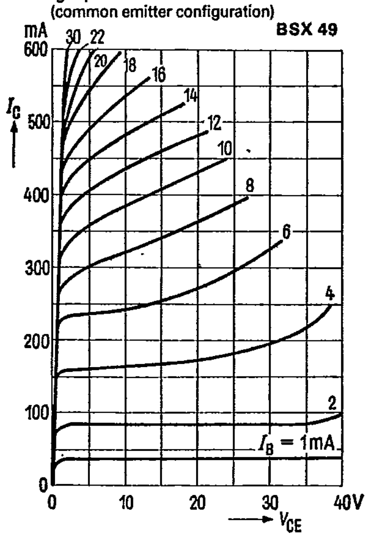
Collector current $I_C = f(I_C)$
V_{CE} = 1 V
(common emitter configuration)



Output characteristics $I_C = f(V_{CE})$
I_B = parameter
(common emitter configuration)

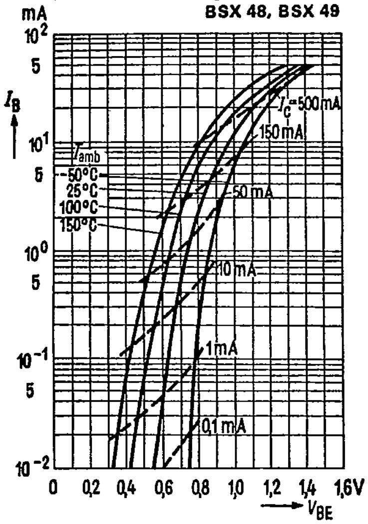


Output characteristics $I_C = f(V_{CE})$
I_B = parameter
(common emitter configuration)

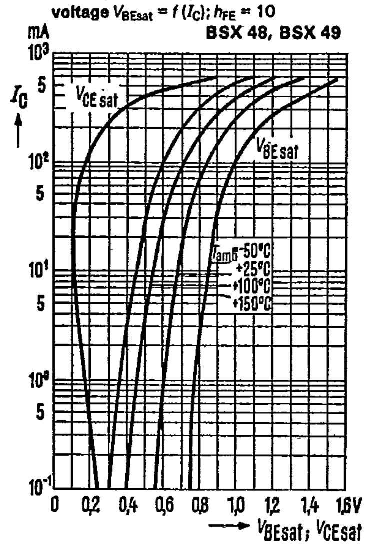


BSX 48
BSX 49

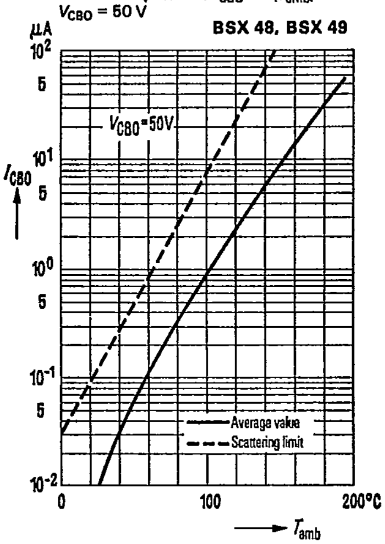
Input characteristics $I_B = f(V_{BE})$
$V_{CE} = 1$ V
(common emitter configuration)



Collector-emitter saturation voltage $V_{CEsat} = f(I_C)$; $h_{FE} = 10$
Base-emitter saturation voltage $V_{BEsat} = f(I_C)$; $h_{FE} = 10$



Collector cutoff current versus temperature $I_{CBO} = f(T_{amb})$
$V_{CBO} = 50$ V



Collector-base capacitance
$C_{CBO} = f(V_{CBO})$
Emitter-base capacitance
$C_{EBO} = f(V_{EBO})$