

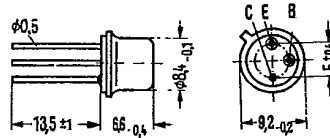
**NPN Silicon Transistor for VHF Output Stages  
in Broadband Amplifiers**

**BFX 55**

SIEMENS AKTIENGESELLSCHAFT

BFX 55 is an epitaxial NPN silicon planar transistor in a TO 39 case (5 C 3 DIN 41873). The collector has been electrically connected to the case. The transistor is especially suitable for use in VHF output stages of antenna channel and broadband amplifiers.

Type	Ordering code
BFX 55	Q60206-X55



Approx weight 1.5 g Dimensions in mm

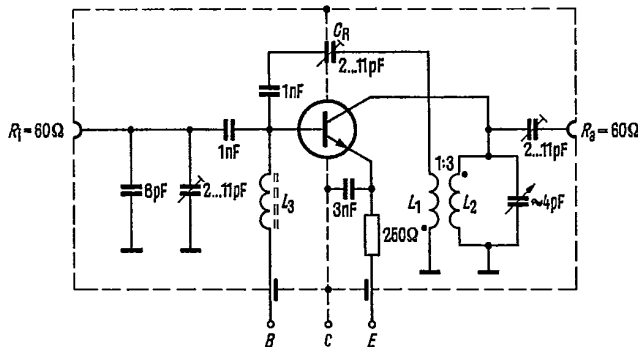
**Maximum ratings**

Collector-emitter voltage	$V_{CE0}$	40	V
Collector-base voltage	$V_{CB0}$	60	V
Emitter-base voltage	$V_{EB0}$	3.5	V
Collector current	$I_C$	400	mA
Base current	$I_B$	100	mA
Junction temperature	$T_j$	200	°C
Storage temperature range	$T_{stg}$	-65 to +175	°C
Total power dissipation ( $T_{case} \leq 68^\circ\text{C}$ )	$P_{tot}$	2.2	W

**Thermal resistance**

Junction to ambient air	$R_{thJA}$	$\leq 220$	K/W
Junction to case	$R_{thJC}$	$\leq 60$	K/W

**Test circuit for power gain  $f = 200$  MHz**



(Transistor cooled by mounted radiator of  $R_{th} = 30$  K/W)

- $L_1$  1 turn 0.5 CuLS (enameled, silk insulated copper wire)
- $L_2$  3 turns 6.5  $\varnothing$ , spacing 1.5 mm, 1  $\varnothing$  silvered Cu
- $L_3$  20 turns 0.5 CuLS on SIFERRIT core B 63310-A 3004-X 025 transformed load resistance  $R_L = 450 \Omega$

SIEMENS AKTIENGESELLSCHAFT

Static characteristics ( $T_{amb} = 25^{\circ}\text{C}$ )

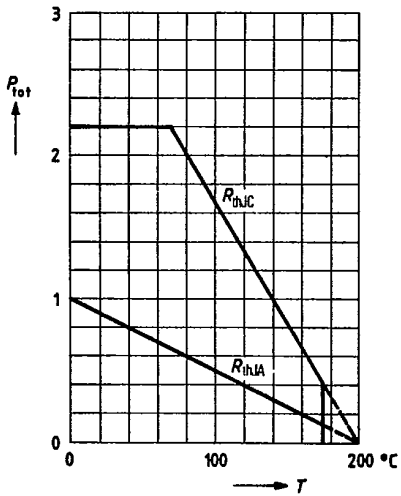
Collector cutoff current ( $V_{CB0} = 40\text{ V}$ )	$I_{CB0}$	$\leq 50$	nA
Collector-base breakdown voltage ( $I_{CBS} = 100\ \mu\text{A}$ )	$V_{(BR)CBS}$	$> 60$	V
DC current gain ( $I_C = 50\text{ mA}$ ; $V_{CE} = 5\text{ V}$ )	$h_{FE}$	30 to 160	-

Dynamic characteristics ( $T_{amb} = 25^{\circ}\text{C}$ )

Transition frequency ( $I_C = 50\text{ mA}$ ; $V_{CE} = 15\text{ V}$ )	$f_T$	700	MHz
Reverse transfer capacitance ( $I_C = 1\text{ mA}$ ; $V_{CE} = 10\text{ V}$ ; $f = 1\text{ MHz}$ )	$C_{12e}$	2.5 (<3.5)	pF
Power gain ( $f = 200\text{ MHz}$ ; $R_L = 450\ \Omega$ ; see test circuit) ( $I_C = 40\text{ mA}$ ; $V_{CB} = 25\text{ V}$ )	$G_{pe}$	16	dB
Output voltage ( $I_C = 40\text{ mA}$ ; $V_{CB} = 25\text{ V}$ ; $d_{IM} = 30\text{ dB}$ ; $R_L = 60\ \Omega$ )	$V_{o\ rms}$	2.4	V

Total perm. power dissipation versus temperature

$P_{tot} = f(T)$ ;  $R_{th}$  = parameter



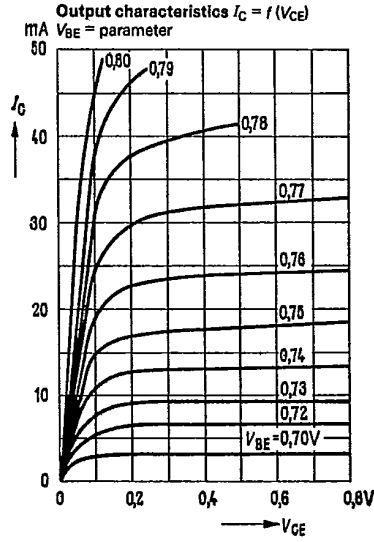
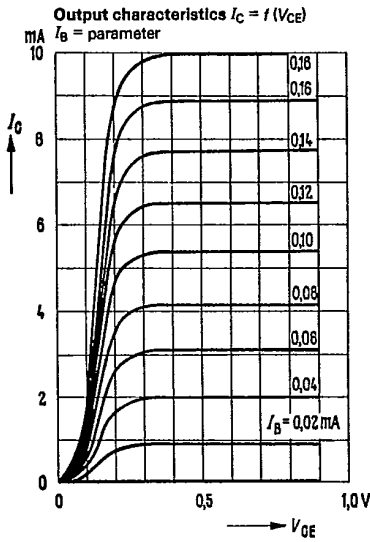
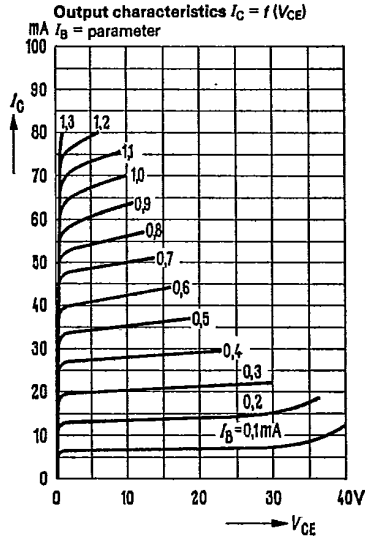
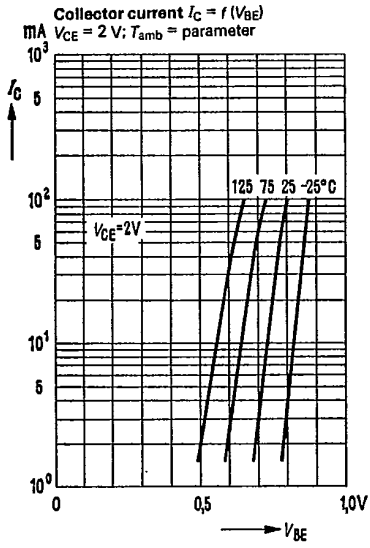
SIEMENS AKTIENGESELLSCHAFT

S parameter

Operating point:  $V_{CE} = 15 \text{ V}$ ,  $I_C = 50 \text{ mA}$ ,  $Z_o = 50 \Omega$

f (MHz)	S <sub>11</sub>	φ	S <sub>21</sub>	φ	S <sub>12</sub>	φ	S <sub>22</sub>	φ
0,1	0,470	-172	6,25	85	0,042	77	0,455	-13
0,2	0,505	176	3,18	73	0,078	84	0,444	-17
0,3	0,540	171	2,13	65	0,114	90	0,447	-24
0,4	0,577	165	1,66	56	0,158	94	0,452	-33
0,5	0,604	161	1,36	51	0,209	97	0,451	-45
0,6	0,634	157	1,12	47	0,272	98	0,464	-58
0,7	0,637	153	0,95	44	0,332	97	0,478	-70
0,8	0,644	148	0,84	43	0,398	95	0,498	-82
0,9	0,650	143	0,76	45	0,471	93	0,526	-92
1,0	0,639	139	0,69	46	0,532	90	0,535	-99
1,1	0,620	134	0,65	49	0,586	87	0,524	-106
1,2	0,599	128	0,64	51	0,630	83	0,526	-113
1,3	0,574	121	0,64	53	0,673	79	0,505	-117
1,4	0,559	116	0,65	54	0,705	76	0,480	-121
1,5	0,549	110	0,65	54	0,722	72	0,442	-129
1,6	0,557	105	0,66	54	0,741	68	0,439	-137
1,7	0,580	104	0,67	54	0,761	66	0,439	-144
1,8	0,585	105	0,66	53	0,742	63	0,453	-156
1,9	0,593	102	0,65	51	0,723	59	0,473	-165
2,0	0,647	103	0,64	50	0,706	56	0,505	-174

SIEMENS AKTIENGESELLSCHAFT



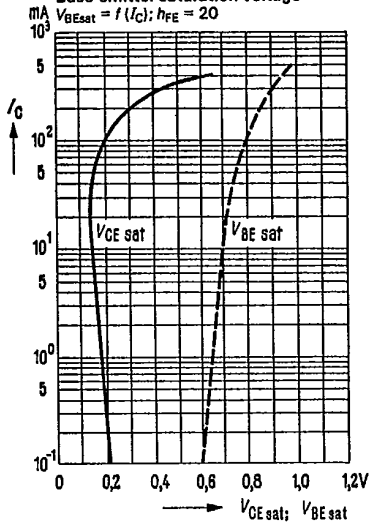
SIEMENS AKTIENGESELLSCHAFT

Collector-emitter saturation voltage

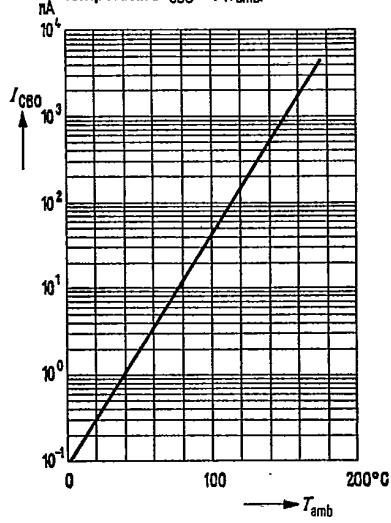
$V_{CE sat} = f(I_C)$

Base-emitter saturation voltage

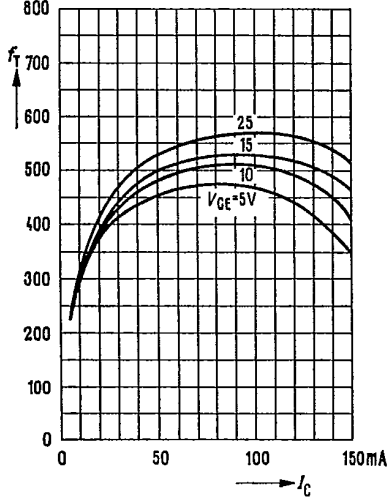
$V_{BE sat} = f(I_C); h_{FE} = 20$



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



Transition frequency  $f_T = f(I_C)$   
 $V_{CE} = \text{parameter}$



Reverse transfer capacitance  
 $C_{12e} = f(V_{CB})$

