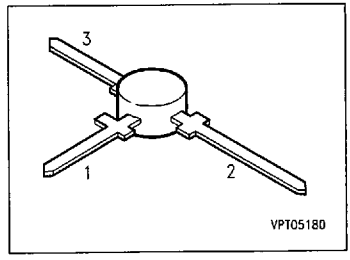
SIEMENS

NPN Silicon RF Transistor

BFT 65

- For low-distortion broadband amplifiers up to 1 GHz at collector currents from 10 mA to 30 mA.



ESD: Electrostatic discharge sensitive device, observe handling precautions!

Type	Marking	Ordering Code	Pin Configuration 1	2	3	Package[1]
BFT 65	BFT 65	Q62702-F451	E	C	B	T-plast

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE0}	15	V
Collector-emitter voltage, $V_{BE} = 0$	V_{CES}	20	
Emitter-base voltage	V_{EB0}	2.5	
Collector current	I_C	50	mA
Base current	I_B	10	
Total power dissipation, $T_S \leq 94$ °C[3]	P_{tot}	400	mW
Junction temperature	T_j	150	°C
Ambient temperature range	T_A	– 65 ... + 150	
Storage temperature range	T_{stg}	– 65 ... + 150	

Thermal Resistance

Junction - ambient[2]	$R_{th\,JA}$	≤ 220	K/W
Junction - soldering point[3]	$R_{th\,JS}$	≤ 140	

1) For detailed information see chapter Package Outlines.
2) Package mounted on alumina 15 mm × 16.7 mm × 0.7 mm.
3) T_S is measured on the collector lead at the soldering point to the pcb.

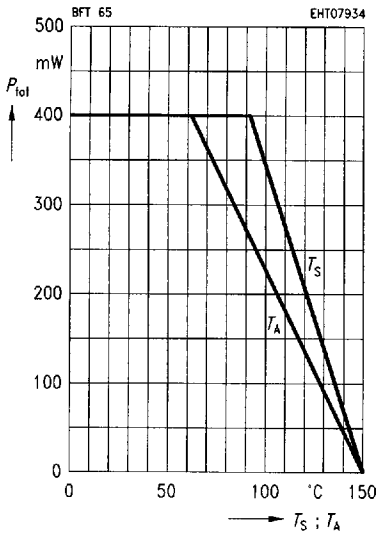
Electrical Characteristics
at T_A = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CE0}$	15	–	–	V
Collector-emitter cutoff current V_{CE} = 20 V, V_{BE} = 0	I_{CES}	–	–	10	µA
Collector-base cutoff current V_{CB} = 10 V, I_E = 0	I_{CB0}	–	–	50	nA
Emitter-base cutoff current V_{EB} = 2.5 V, I_C = 0	I_{EB0}	–	–	100	µA
DC current gain I_C = 25 mA, V_{CE} = 8 V I_C = 50 mA, V_{CE} = 5 V	h_{FE}	 30 30	 – –	 – –	–

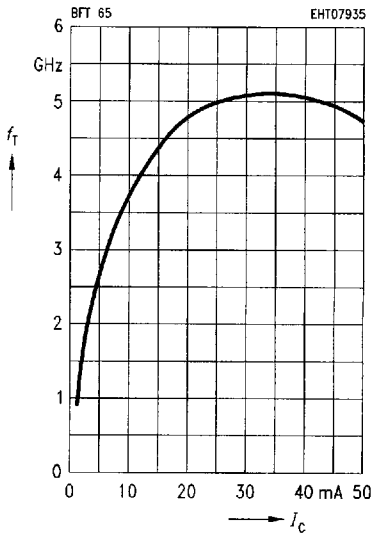
Electrical Characteristics
at T_A = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency I_C = 25 mA, V_{CE} = 8 V, f = 200 MHz	f_T	–	5	–	GHz
Collector-base capacitance V_{CB} = 10 V, V_{BE} = v_{be} = 0, f = 1 MHz	C_{cb}	–	0.53	–	pF
Collector-emitter capacitance V_{CE} = 10 V, V_{BE} = v_{be} = 0, f = 1 MHz	C_{ce}	–	0.3	–	
Output capacitance V_{CE} = 10 V, V_{BE} = v_{be} = 0, f = 1 MHz	C_{obs}	–	0.85	–	
Noise figure I_C = 10 mA, V_{CE} = 8 V, f = 800 MHz, Z_S = 60 Ω	F	–	2.8	–	dB
Power gain I_C = 25 mA, V_{CE} = 8 V, f = 800 MHz, Z_S = 60 Ω, Z_L = Z_{Lopt}	G_{pe}	–	12	–	
Transducer gain I_C = 25 mA, V_{CE} = 8 V, f = 500 MHz, Z_0 = 50 Ω	$\lvert S_{21e} \rvert^2$	–	16	–	
Linear output voltage two-tone intermodulation test I_C = 25 mA, V_{CE} = 8 V, d_{im} = 60 dB f_1 = 806 MHz, f_2 = 810 MHz, Z_S = Z_L = 50 Ω	V_{O1} = V_{O2}	–	240	–	mV
Third order intercept point I_C = 25 mA, V_{CE} = 8 V, f = 800 MHz	IP_3	–	30.5	–	dBm

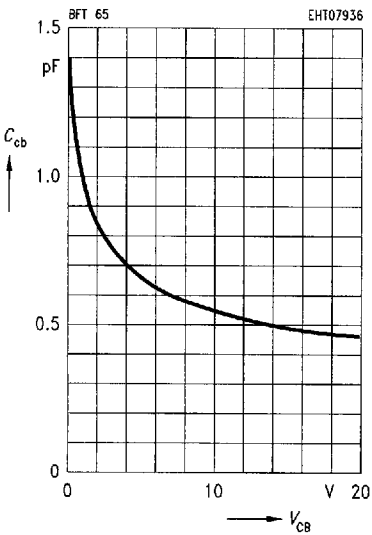
Total power dissipation $P_{tot} = f(T_A^*; T_S)$
*Package mounted on alumina



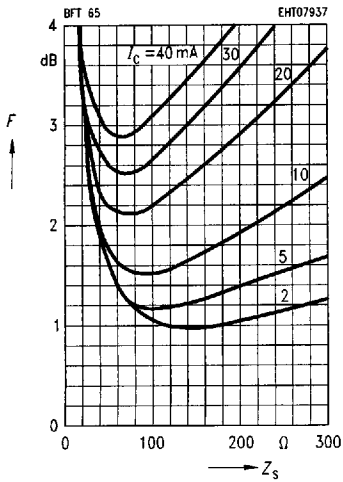
Transition frequency $f_T = f(I_C)$
V_{CE} = 5 V, f = 200 MHz



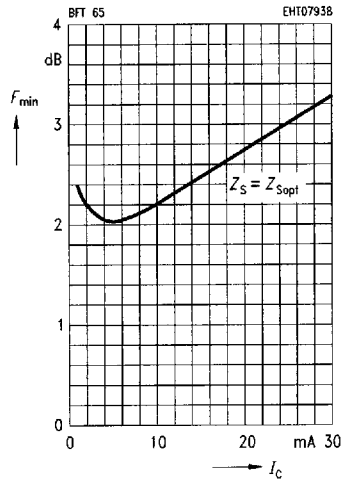
Collector-base capacitance $C_{cb} = f(V_{CB})$
$V_{BE} = v_{be} = 0$, f = 1 MHz



Noise figure $F = f(Zs)$
V_{CE} = 8 V, f = 10 MHz



Noise figure $F_{min} = f(Ic)$
V_{CE} = 8 V, f = 800 MHz, $Z_{Lopt}(G)$



Common Emitter S Parameters

f	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	**MAG**	**ANG**	**MAG**	**ANG**	**MAG**	**ANG**	**MAG**	**ANG**
I_C = 25 mA, V_{CE} = 8 V, Z_0 = 50 Ω								
0.1	0.347	– 101	25.813	122	0.017	64	0.668	– 27
0.2	0.330	– 140	15.191	103	0.027	64	0.453	– 25
0.3	0.323	– 159	10.430	98	0.038	68	0.361	– 31
0.4	0.341	– 169	7.915	89	0.047	72	0.411	– 35
0.5	0.343	– 174	6.311	85	0.058	72	0.441	– 23
0.6	0.347	179	5.236	80	0.068	71	0.340	– 19
0.7	0.347	174	4.604	76	0.081	72	0.346	– 35
0.8	0.351	168	3.994	74	0.093	71	0.403	– 34
0.9	0.392	169	3.629	71	0.099	73	0.362	– 28
1.0	0.386	168	3.254	67	0.109	72	0.340	– 36
1.1	0.377	161	2.969	64	0.118	71	0.355	– 37
1.2	0.410	157	2.125	61	0.127	70	0.332	– 41
1.3	0.415	156	2.538	59	0.133	70	0.346	– 43
1.4	0.438	152	2.383	57	0.151	70	0.327	– 46
1.5	0.439	153	2.212	54	0.157	69	0.345	– 49
1.6	0.458	150	2.083	51	0.163	69	0.326	– 48
1.7	0.461	149	1.963	49	0.175	68	0.312	– 51
1.8	0.492	146	1.832	47	0.162	68	0.284	– 57
1.9	0.502	147	1.749	44	0.191	66	0.317	– 64
2.0	0.503	146	1.683	41	0.202	65	0.295	– 61