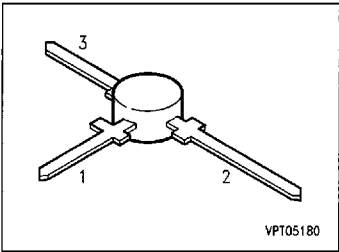


NPN Silicon RF Transistor

BFQ 69

- For low-noise broadband amplifiers in antenna and telecommunications systems at collector currents from 1 mA to 25 mA.



ESD: Electrostatic discharge sensitive device, observe handling precautions!

Type	Marking	Ordering Code	Pin Configuration			Package ¹⁾
			1	2	3	
BFQ 69	BFQ 69	Q62702-F780	E	C	B	T-plast

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CE0}	15	V
Collector-base voltage	V_{CB0}	25	
Emitter-base voltage	V_{EB0}	2	
Collector current	I_C	30	mA
Base current	I_B	4	
Total power dissipation, $T_s \leq 102\text{ °C}^{3)}$	P_{tot}	300	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⁾	$R_{th JA}$	≤ 240	K/W
Junction - soldering point ³⁾	$R_{th JS}$	≤ 160	

1) For detailed dimensions 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 Characteristicsat $T_A = 25^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC Characteristics

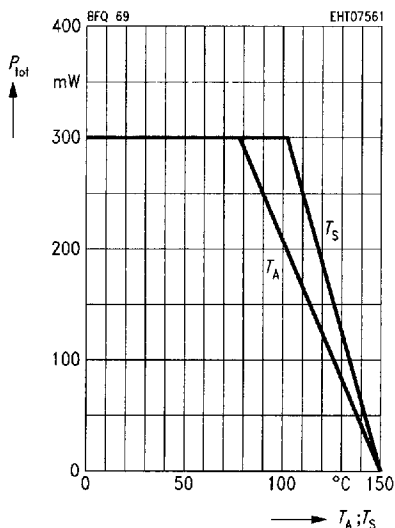
Collector-emitter breakdown voltage $I_C = 1\text{ mA}$, $I_B = 0$	$V_{(BR)CE0}$	15	—	—	V
Collector-emitter cutoff current $V_{CE} = 25\text{ V}$, $V_{BE} = 0$	I_{CES}	—	—	100	μA
Collector-base cutoff current $V_{CB} = 10\text{ V}$, $I_E = 0$	I_{CBO}	—	—	50	nA
Emitter-base cutoff current $V_{EB} = 2\text{ V}$, $I_C = 0$	I_{EB0}	—	—	100	μA
DC current gain $I_C = 15\text{ mA}$, $V_{CE} = 10\text{ V}$	h_{FE}	50	120	250	—

AC Characteristics

Transition frequency $I_C = 15\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 200\text{ MHz}$	f_T	—	5.8	—	GHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $V_{BE} = V_{be} = 0$, $f = 1\text{ MHz}$	C_{cb}	—	0.35	0.5	pF
Collector-emitter capacitance $V_{CE} = 10\text{ V}$, $V_{BE} = V_{be} = 0$, $f = 1\text{ MHz}$	C_{ce}	—	0.29	—	
Output capacitance $V_{CE} = 10\text{ V}$, $V_{BE} = V_{be} = 0$, $f = 1\text{ MHz}$	C_{obs}	—	0.65	—	
Noise figure $I_C = 3\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 10\text{ MHz}$, $Z_S = 75\ \Omega$ $I_C = 5\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 800\text{ MHz}$, $Z_S = 50\ \Omega$	F	— —	0.9 1.4	1.3 —	dB
Power gain $I_C = 10\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 800\text{ MHz}$, $Z_S = 50\ \Omega$, $Z_L = Z_{Lopt}$	G_{pe}	—	16.5	—	
Linear output voltage two-tone intermodulation test $I_C = 25\text{ mA}$, $V_{CE} = 10\text{ V}$, $d_{IM} = 60\text{ dB}$, $f_1 = 806\text{ MHz}$, $f_2 = 810\text{ MHz}$, $Z_S = Z_L = 50\ \Omega$	$V_{o1} = V_{o2}$	—	170	—	mV
Third order intercept point $I_C = 25\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 800\text{ MHz}$	IP_3	—	27.5	—	dBm

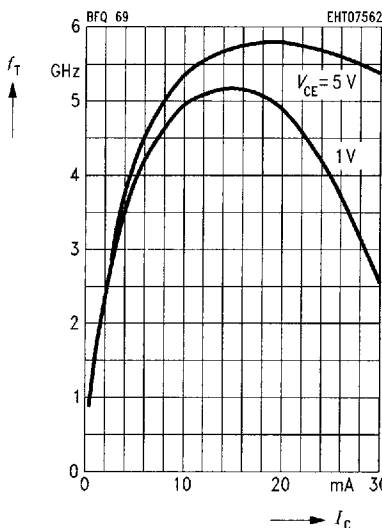
Total power dissipation $P_{\text{tot}} = f(T_A^*; T_S)$

*Package mounted on alumina



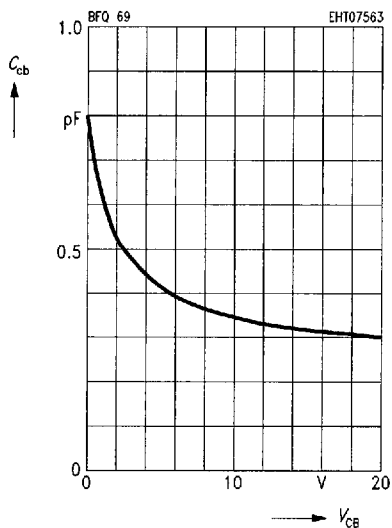
Transition frequency $f_T = f(I_C)$

$f = 200 \text{ MHz}$



Collector-base capacitance $C_{cb} = f(V_{CB})$

$V_{BE} = V_{be} = 0$, $f = 1 \text{ MHz}$



Noise figure $F = f(I_C)$

$V_{CE} = 10 \text{ V}$, $f = 10 \text{ MHz}$

