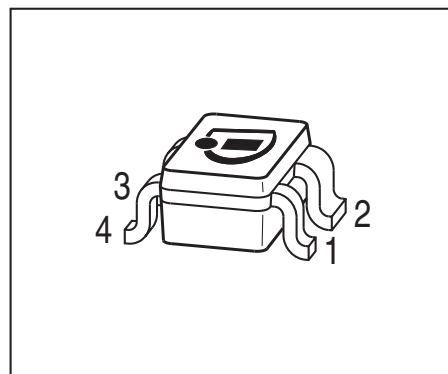


High Performance NPN Bipolar RF Transistor

- High performance low noise amplifier
- Low minimum noise figure of typ. 0.8 dB @ 1.8 GHz
- For a wide range of non automotive applications such as WLAN, WiMax, UWB, Bluetooth, GPS, SDARs, DAB, LNB, UMTS/LTE and ISM bands
- Easy to use standard package with visible leads
- Pb-free (RoHS compliant) package



ESD (Electrostatic discharge) sensitive device, observe handling precaution!

Type	Marking	Pin Configuration						Package
BF776	R3s	1=B	2=E	3=C	4=E	-	-	SOT343

Maximum Ratings at $T_A = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Collector-emitter voltage $T_A = 25\text{ °C}$ $T_A = -55\text{ °C}$	V_{CEO}	4.0 3.5	V
Collector-emitter voltage	V_{CES}	13	
Collector-base voltage	V_{CBO}	13	
Emitter-base voltage	V_{EBO}	1.2	
Collector current	I_C	50	mA
Base current	I_B	3	
Total power dissipation ¹⁾ $T_S \leq 90\text{ °C}$	P_{tot}	200	mW
Junction temperature	T_J	150	°C
Ambient temperature	T_A	-55 ... 150	
Storage temperature	T_{Stg}	-55 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ²⁾	R_{thJS}	≤ 300	K/W

¹⁾ T_S is measured on the emitter lead at the soldering point to the pcb

²⁾ For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	4	4.7	-	V
Collector-emitter cutoff current $V_{CE} = 5\text{ V}, V_{BE} = 0$	I_{CES}	-	1	-	nA
Collector-base cutoff current $V_{CB} = 5\text{ V}, I_E = 0$	I_{CBO}	-	1	-	
Emitter-base cutoff current $V_{EB} = 0.5\text{ V}, I_C = 0$	I_{EBO}	-	10	-	
DC current gain $I_C = 30\text{ mA}, V_{CE} = 3\text{ V}, \text{ pulse measured}$	h_{FE}	-	180	-	-

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 30\text{ mA}$, $V_{CE} = 3\text{ V}$, $f = 1\text{ GHz}$	f_T	-	46	-	GHz
Collector-base capacitance $V_{CB} = 3\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, emitter grounded	C_{cb}	-	0.09	-	pF
Collector emitter capacitance $V_{CE} = 3\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, base grounded	C_{ce}	-	0.25	-	
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$, $V_{CB} = 0$, collector grounded	C_{eb}	-	0.5	-	
Noise figure $I_C = 5\text{ mA}$, $V_{CE} = 3\text{ V}$, $f = 1.8\text{ GHz}$, $Z_S = Z_{Sopt}$ $I_C = 5\text{ mA}$, $V_{CE} = 3\text{ V}$, $f = 6\text{ GHz}$, $Z_S = Z_{Sopt}$	F	- -	0.8 1.3	- -	dB
Power gain, maximum stable ¹⁾ $I_C = 30\text{ mA}$, $V_{CE} = 3\text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 1.8\text{ GHz}$	G_{ms}	-	24	-	dB
Power gain, maximum available ¹⁾ $I_C = 30\text{ mA}$, $V_{CE} = 3\text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 6\text{ GHz}$	G_{ma}	-	12.5	-	dB
Transducer gain $I_C = 30\text{ mA}$, $V_{CE} = 3\text{ V}$, $Z_S = Z_L = 50\ \Omega$, $f = 1.8\text{ GHz}$ $f = 6\text{ GHz}$	$ S_{21e} ^2$	- -	21.5 11	- -	dB
Third order intercept point at output ²⁾ $V_{CE} = 3\text{ V}$, $I_C = 30\text{ mA}$, $Z_S = Z_L = 50\ \Omega$, $f = 1.8\text{ GHz}$	IP_3	-	28	-	dBm
1dB Compression point at output $I_C = 30\text{ mA}$, $V_{CE} = 3\text{ V}$, $Z_S = Z_L = 50\ \Omega$, $f = 1.8\text{ GHz}$	P_{-1dB}	-	13	-	

¹⁾ $G_{ma} = |S_{21e}| / |S_{12e}| (k - (k^2 - 1)^{1/2})$, $G_{ms} = |S_{21e}| / |S_{12e}|$
²⁾ IP_3 value depends on termination of all intermodulation frequency components.
Termination used for this measurement is $50\ \Omega$ from 0.1 MHz to 6 GHz

SPICE Parameter

For the SPICE model as well as for S-parameters (including noise parameters) please refer to our internet website www.infineon.com/rf.models.

Please consult our website and download the latest versions before actually starting your design.

The simulation data have been generated and verified using typical devices. The BF776 SPICE model reflects the typical DC- and RF-performance with high accuracy.

Technical drawing of a 4-pin D-subminiature connector. The drawing includes a perspective view on the left and two orthographic views on the right. The top orthographic view shows the front of the connector with dimensions: overall width 2 ± 0.2 , pin pitch 1.3 , pin width 0.15 , and pin spacing $0.3^{+0.1}_{-0.05}$. The bottom orthographic view shows the side profile with dimensions: overall height $0.6^{+0.1}_{-0.05}$, pin height 0.1 MAX. , and pin diameter 0.1 . The drawing also includes a $4 \times \text{M}0.1$ hole pattern and a $0.2 \text{ M}0.1 \text{ A}$ hole pattern.

Technical drawing of a mechanical part with dimensions: 0.6, 0.8, 1.6, 1.15, and 0.9.

Pin 1

Manufacturer

2005, June
Date code (YM)

BGA420
Type code

[illegible]

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