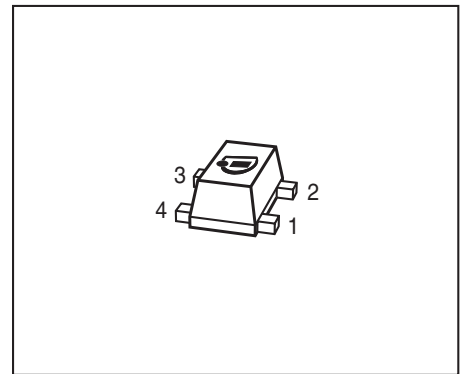


NPN Silicon Germanium RF Transistor

Target data sheet

- High gain ultra low noise RF transistor for low current operation
- Provides outstanding performance for a wide range of wireless applications up to 10 GHz and more
- Optimum gain and noise figure at low current operation
- Ideal for WLAN applications
- Outstanding noise figure $F = 0.5$ dB at 1.8 GHz
Outstanding noise figure $F = 0.75$ dB at 6 GHz
- High maximum stable and available gain
 $G_{ms} = 26$ dB at 1.8 GHz, $G_{ma} = 20.5$ dB at 6 GHz
- 150 GHz f_T -Silicon Germanium technology
- Pb-free (RoHS compliant) package



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

Type	Marking	Pin Configuration						Package
BFP720F	R9s	1 = B	2 = E	3 = C	4 = E	-	-	TSFP-4

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage $T_A > 0\text{ }^{\circ}\text{C}$ $T_A \leq 0\text{ }^{\circ}\text{C}$	V_{CEO}	4 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}	20	mA
Base current	I_{B}	2	
Total power dissipation ¹⁾ $T_S \leq \text{td}$	P_{tot}	80	mW
Operating junction temperature range	T_{jo}	-65 ... 150	$^{\circ}\text{C}$
Storage junction temperature range	T_{istg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ²⁾	R_{thJS}	$\leq \text{td}$	K/W

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 $I_{\text{C}} = 1\text{ mA}$, $I_{\text{B}} = 0$	$V_{(\text{BR})\text{CEO}}$	4	4.7	-	V
Collector-emitter cutoff current $V_{\text{CE}} = 13\text{ V}$, $V_{\text{BE}} = 0$	I_{CES}	-	-	30	μA
Collector-base cutoff current $V_{\text{CB}} = 5\text{ V}$, $I_{\text{E}} = 0$	I_{CBO}	-	-	100	nA
Emitter-base cutoff current $V_{\text{EB}} = 0.5\text{ V}$, $I_{\text{C}} = 0$	I_{EBO}	-	-	2	μA
DC current gain- $I_{\text{C}} = 13\text{ mA}$, $V_{\text{CE}} = 3\text{ V}$, pulse measured	h_{FE}	160	250	400	-

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

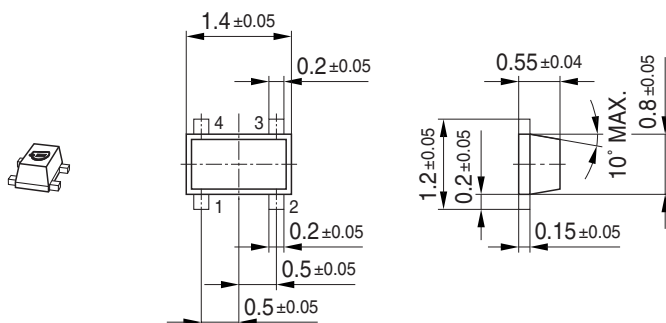
²⁾ For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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

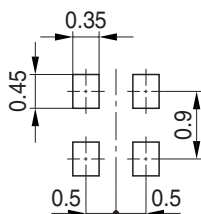
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 13\text{ mA}$, $V_{CE} = 3\text{ V}$, $f = 1\text{ GHz}$	f_T	-	45	-	GHz
Collector-base capacitance $V_{CB} = 3\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, emitter grounded	C_{cb}	-	0.06	-	pF
Collector emitter capacitance $V_{CE} = 3\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, based grounded	C_{ce}	-	0.3	-	
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$, $V_{CB} = 0$, collector grounded	C_{eb}	-	0.3	-	
Noise figure $I_C = 5\text{ mA}$, $V_{CE} = 3\text{ V}$, $f = 1.8\text{ GHz}$, $Z_S = Z_{Sopt}$ $I_C = 5\text{ mA}$, $V_{CE} = 3\text{ V}$, $f = 6\text{ GHz}$, $Z_S = Z_{Sopt}$	NF	- -	0.5 0.75	- -	dB
Power gain ¹⁾ $I_C = 13\text{ mA}$, $V_{CE} = 3\text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 1.8\text{ GHz}$	G_{ms}	-	26	-	dB
Power gain, maximum available ¹⁾ $I_C = 13\text{ mA}$, $V_{CE} = 3\text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 6\text{ GHz}$	G_{ma}	-	20.5	-	dB
Transducer gain $I_C = 13\text{ mA}$, $V_{CE} = 3\text{ V}$, $Z_S = Z_L = 50\text{ }\Omega$, $f = 1.8\text{ GHz}$ $f = 6\text{ GHz}$	$ S_{21e} ^2$	- -	24.5 16	- -	dB
Third order intercept point at output ²⁾ $V_{CE} = 3\text{ V}$, $I_C = 10\text{ mA}$, $Z_S=Z_L=50\text{ }\Omega$, $f = 1.8\text{ GHz}$	IP_3	-	20.5	-	dBm
1dB Compression point $I_C = 13\text{ mA}$, $V_{CE} = 3\text{ V}$, $Z_S=Z_L=50\text{ }\Omega$, $f = 1.8\text{ GHz}$	P_{-1dB}	-	6	-	

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

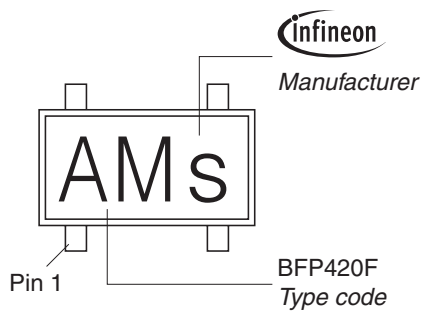
Package Outline



Foot Print

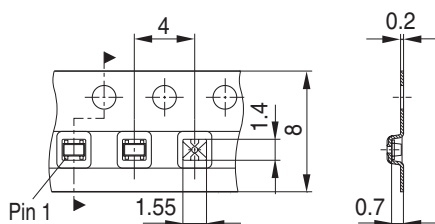


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
 Reel ø330 mm = 10.000 Pieces/Reel



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