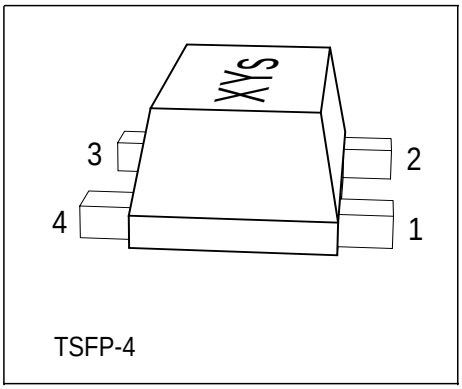
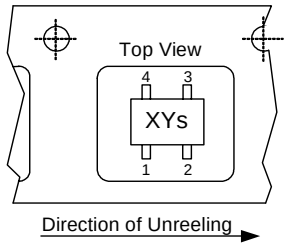
NPN Silicon Germanium RF Transistor*



- High gain ultra low noise RF transistor
- Provides outstanding performance for a wide range of wireless applications up to 10 GHz
- Ideal for CDMA and 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 gain
  G_{ms} = 27.5 dB at 1.8 GHz
- Gold metallization for extra high reliability
- 150 GHz f_T-Silicon Germanium technology

* Short-term description



ESD: **E**lectro**s**tatic **d**ischarge sensitive device, observe handling precaution!

Type	Marking	Pin Configuration						Package
BFP740F	R7s	1=B	2=E	3=C	4=E	-	-	TSFP-4

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}		V
T_A > 0°C		4	
T_A ≤ 0°C		3.5	
Collector-emitter voltage	V_{CES}	13	
Collector-base voltage	V_{CBO}	13	
Emitter-base voltage	V_{EBO}	1.2	
Collector current	I_C	30	mA
Base current	I_B	3	
Total power dissipation[1)] T_S ≤ 90°C	P_{tot}	160	mW
Junction temperature	T_j	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

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

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1)]	R_{thJS}	≤ 370	K/W

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	$V_{(BR)CEO}$	4	4.7	-	V
Collector-emitter cutoff current V_{CE} = 13 V, V_{BE} = 0	I_{CES}	-	-	30	µA
Collector-base cutoff current V_{CB} = 5 V, I_E = 0	I_{CBO}	-	-	100	nA
Emitter-base cutoff current V_{EB} = 0.5 V, I_C = 0	I_{EBO}	-	-	3	µA
DC current gain I_C = 25 mA, V_{CE} = 3 V	h_{FE}	160	250	400	-

[1]For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 25 mA, V_{CE} = 3 V, f = 1 GHz	f_T	-	42	-	GHz
Collector-base capacitance V_{CB} = 3 V, f = 1 MHz	C_{cb}	-	0.08	-	pF
Collector emitter capacitance V_{CE} = 3 V, f = 1 MHz	C_{ce}	-	0.25	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	0.45	-	
Noise figure I_C = 8 mA, V_{CE} = 3 V, f = 1.8 GHz, $Z_S = Z_{Sopt}$ I_C = 8 mA, V_{CE} = 3 V, f = 6 GHz, $Z_S = Z_{Sopt}$	F	 - -	 0.5 0.75	 - -	dB
Power gain, maximum stable[1)] I_C = 25 mA, V_{CE} = 3 V, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 1.8 GHz	G_{ms}	-	27.5	-	dB
Power gain, maximum available[1)] I_C = 25 mA, V_{CE} = 3 V, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 6 GHz	G_{ma}	-	19	-	dB
Transducer gain I_C = 25 mA, V_{CE} = 3 V, $Z_S = Z_L$ = 50 Ω, f = 1.8 GHz I_C = 25 mA, V_{CE} = 3 V, $Z_S = Z_L$ = 50 Ω, f = 6 GHz	$\lvert S_{21e}\rvert^2$	 - -	 25 14.5	 - -	dB
Third order intercept point at output[2)] V_{CE} = 3 V, I_C = 25 mA, f = 1.8 GHz, $Z_S = Z_L$ = 50 Ω	IP_3	-	26	-	dBm
1dB Compression point at output I_C = 25 mA, V_{CE} = 3 V, $Z_S = Z_L$ = 50 Ω, f = 1.8 GHz	P_{-1dB}	-	12	-	

[1] $G_{ma} = |S_{21e} / S_{12e}| (k-(k^2-1)^{1/2})$, $G_{ms} = |S_{21e} / S_{12e}|$

[2] IP3 value depends on termination of all intermodulation frequency components.
Termination used for this measurement is 50Ω from 0.1 MHz to 6 GHz

Published by Infineon Technologies AG,
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