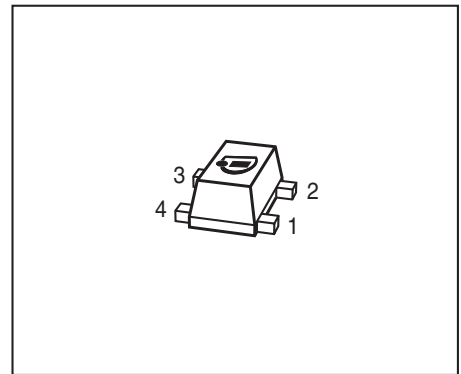


Low Noise Silicon Bipolar RF Transistor

- For highest gain and low noise amplifier
Outstanding $G_{ms} = 22.5$ dB at 1.8 GHz
Minimum noise figure $NF_{min} = 0.95$ dB at 1.8 GHz
- For oscillators up to 15 GHz
- Transition frequency $f_T = 45$ GHz
- Pb-free (RoHS compliant) and halogen-free thin small flat package with visible leads
- Qualification report according to AEC-Q101 available



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

Type	Marking	Pin Configuration						Package
BFP520F	APs	1=B	2=E	3=C	4=E	-	-	TSFP-4

Maximum Ratings at $T_A = 25$ °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Collector-emitter voltage $T_A = 25$ °C $T_A = -55$ °C	V_{CEO}	2.5 2.4	V
Collector-emitter voltage	V_{CES}	10	
Collector-base voltage	V_{CBO}	10	
Emitter-base voltage	V_{EBO}	1	
Collector current	I_C	50	mA
Base current	I_B	5	
Total power dissipation ¹⁾ $T_S \leq 98$ °C	P_{tot}	120	mW
Junction temperature	T_J	150	°C
Storage temperature	T_{Stg}	-55 ... 150	

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

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾	R_{thJS}	430	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1\text{ mA}$, $I_B = 0$	$V_{(BR)CEO}$	2.5	3	3.5	V
Collector-emitter cutoff current $V_{CE} = 10\text{ V}$, $V_{BE} = 0$	I_{CES}	-	-	10	μA
Collector-base cutoff current $V_{CB} = 5\text{ V}$, $I_E = 0$	I_{CBO}	-	-	200	mA
Emitter-base cutoff current $V_{EB} = 1\text{ V}$, $I_C = 0$	I_{EBO}	-	-	35	μA
DC current gain $I_C = 20\text{ mA}$, $V_{CE} = 2\text{ V}$, pulse measured	h_{FE}	70	110	170	-

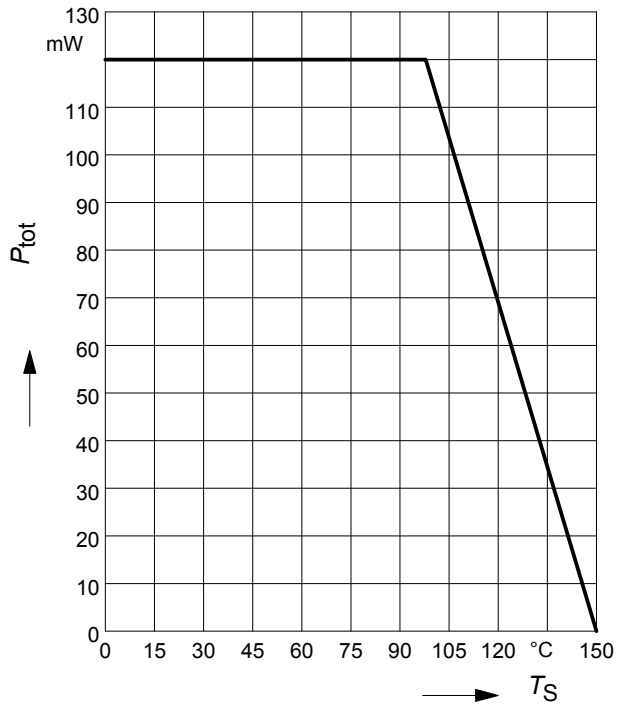
¹For the definition of R_{thJS} please refer to Application Note AN077 (Thermal Resistance Calculation)

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

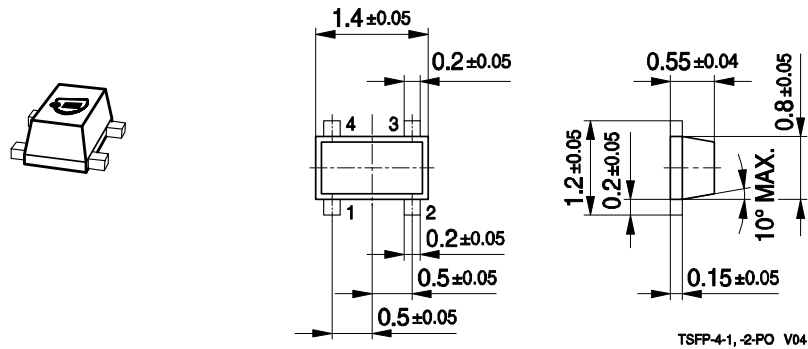
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 30\text{ mA}$, $V_{CE} = 2\text{ V}$, $f = 2\text{ GHz}$	f_T	32	45	-	GHz
Collector-base capacitance $V_{CB} = 2\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, emitter grounded	C_{cb}	-	0.07	0.14	pF
Collector emitter capacitance $V_{CE} = 2\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, 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}	-	0.31	-	
Minimum noise figure $I_C = 2\text{ mA}$, $V_{CE} = 2\text{ V}$, $Z_S = Z_{Sopt}$, $f = 1.8\text{ GHz}$	NF_{min}	-	0.95	-	dB
Power gain, maximum stable ¹⁾ $I_C = 20\text{ mA}$, $V_{CE} = 2\text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 1.8\text{ GHz}$	G_{ms}	-	22.5	-	dB
Insertion power gain $V_{CE} = 2\text{ V}$, $I_C = 20\text{ mA}$, $f = 1.8\text{ GHz}$, $Z_S = Z_L = 50\text{ }\Omega$	$ S_{21} ^2$	-	20.5	-	
Third order intercept point at output $V_{CE} = 2\text{ V}$, $I_C = 20\text{ mA}$, $f = 1.8\text{ GHz}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	$IP3$	-	23.5	-	dBm
1dB compression point $I_C = 20\text{ mA}$, $V_{CE} = 2\text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 1.8\text{ GHz}$	P_{-1dB}	-	10.5	-	

¹⁾ $G_{ms} = |S_{21} / S_{12}|$

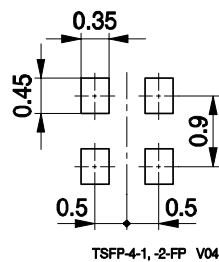
Total power dissipation $P_{\text{tot}} = f(T_S)$



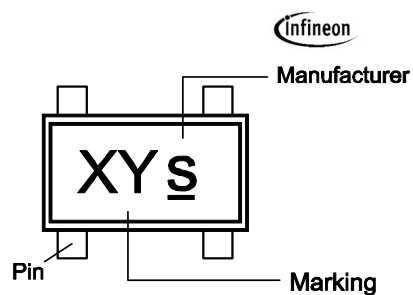
Package Outline



Foot Print

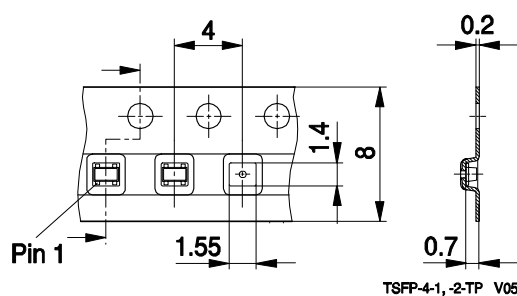


Marking Layout (Example)



Standard Packing

Reel $\varnothing 180 \text{ mm} = 3.000 \text{ Pieces/Reel}$
 Reel $\varnothing 330 \text{ mm} = 10.000 \text{ Pieces/Reel}$



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