

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	V_{CEO}	2.5	V
$T_A = -55$ °C		2.4	
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 $T_A = 25^\circ\text{C}$, unless otherwise specified

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

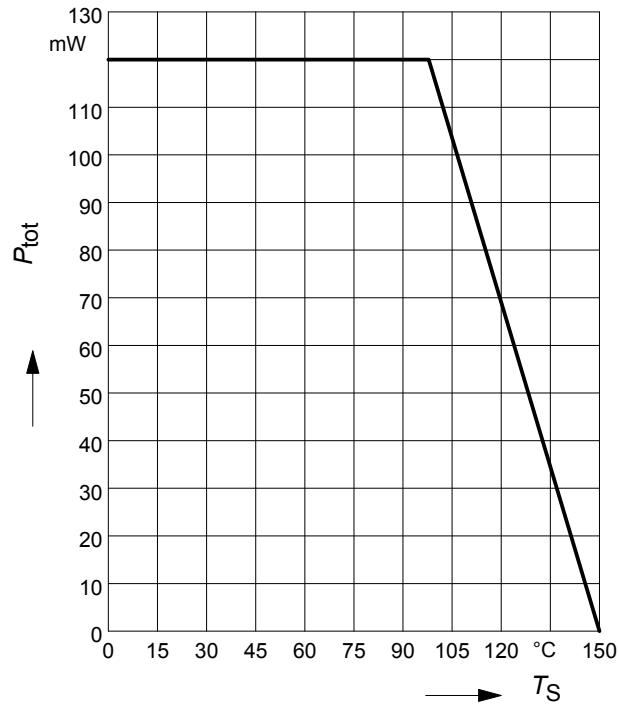
¹For the definition of R_{thJS} please refer to Application Note AN077 (Thermal Resistance Calculation)

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

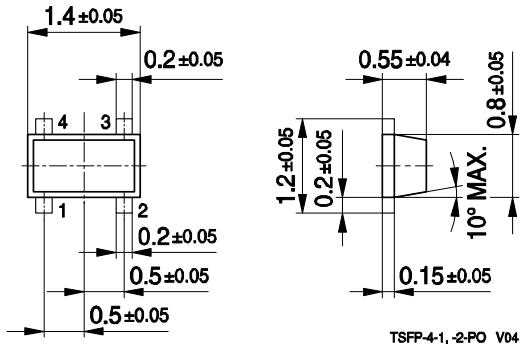
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 30 \text{ mA}, V_{CE} = 2 \text{ V}, f = 2 \text{ GHz}$	f_T	32	45	-	GHz
Collector-base capacitance $V_{CB} = 2 \text{ V}, f = 1 \text{ MHz}, V_{BE} = 0 \text{ V}$, emitter grounded	C_{cb}	-	0.07	0.14	pF
Collector emitter capacitance $V_{CE} = 2 \text{ V}, f = 1 \text{ MHz}, V_{BE} = 0 \text{ V}$, base grounded	C_{ce}	-	0.25	-	
Emitter-base capacitance $V_{EB} = 0.5 \text{ V}, f = 1 \text{ MHz}, V_{CB} = 0 \text{ V}$, collector grounded	C_{eb}	-	0.31	-	
Minimum noise figure $I_C = 2 \text{ mA}, V_{CE} = 2 \text{ V}, Z_S = Z_{\text{Sopt}}$, $f = 1.8 \text{ GHz}$	NF_{min}	-	0.95	-	dB
Power gain, maximum stable ¹⁾ $I_C = 20 \text{ mA}, V_{CE} = 2 \text{ V}, Z_S = Z_{\text{Sopt}}, Z_L = Z_{\text{Lopt}}$, $f = 1.8 \text{ GHz}$	G_{ms}	-	22.5	-	dB
Insertion power gain $V_{CE} = 2 \text{ V}, I_C = 20 \text{ mA}, f = 1.8 \text{ GHz}$, $Z_S = Z_L = 50 \Omega$	$ S_{21} ^2$	-	20.5	-	
Third order intercept point at output $V_{CE} = 2 \text{ V}, I_C = 20 \text{ mA}, f = 1.8 \text{ GHz}$, $Z_S = Z_{\text{Sopt}}, Z_L = Z_{\text{Lopt}}$	$IP3$	-	23.5	-	dBm
1dB compression point $I_C = 20 \text{ mA}, V_{CE} = 2 \text{ V}, Z_S = Z_{\text{Sopt}}, Z_L = Z_{\text{Lopt}}$, $f = 1.8 \text{ GHz}$	$P_{-1\text{dB}}$	-	10.5	-	

¹ $G_{\text{ms}} = |S_{21}| / S_{12}|$

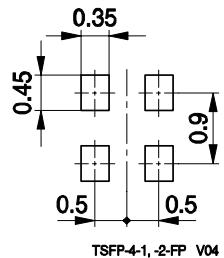
Total power dissipation $P_{\text{tot}} = f(T_S)$



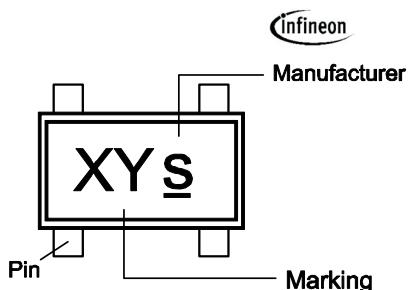
Package Outline



Foot Print

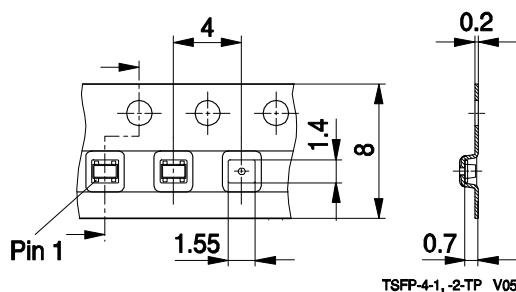


Marking Layout (Example)



Standard Packing

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



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