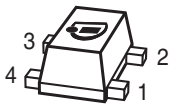
Low Noise Silicon Bipolar RF Transistor



- 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

RoHS

ESD (**E**lectro**s**tatic **d**ischarge) 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	V_{CEO}		V
T_A = 25 °C		2.5	
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)]	P_{tot}	120	mW
$T_S \leq$ 98 °C			
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 °C, unless otherwise specified

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

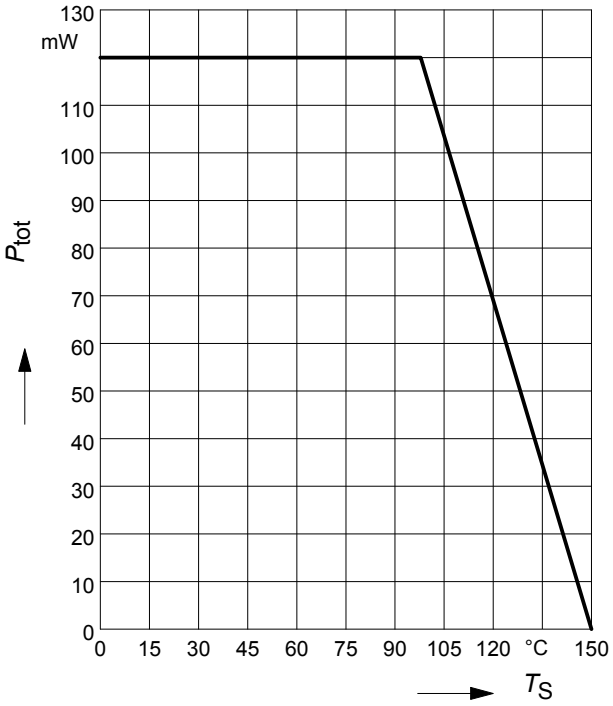
[1]For the definition of R_{thJS} please refer to Application Note AN077 (Thermal Resistance Calculation)

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

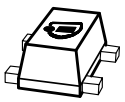
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 30 mA, V_{CE} = 2 V, f = 2 GHz	f_T	32	45	-	GHz
Collector-base capacitance V_{CB} = 2 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.07	0.14	pF
Collector emitter capacitance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

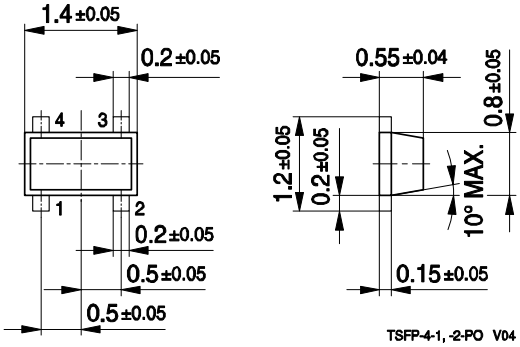
[1] $G_{ms} = |S_{21} / S_{12}|$

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

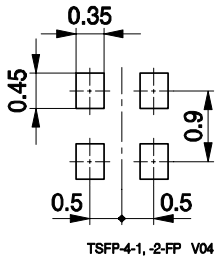


Package Outline

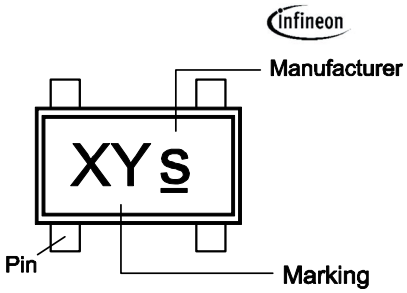




Foot Print

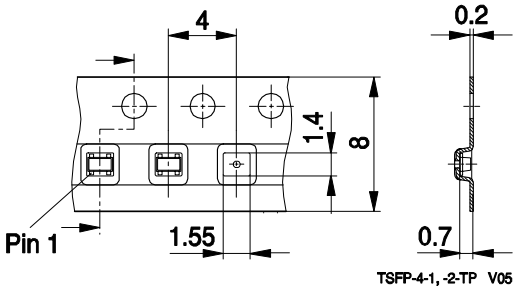


Marking Layout (Example)



Standard Packing

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



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