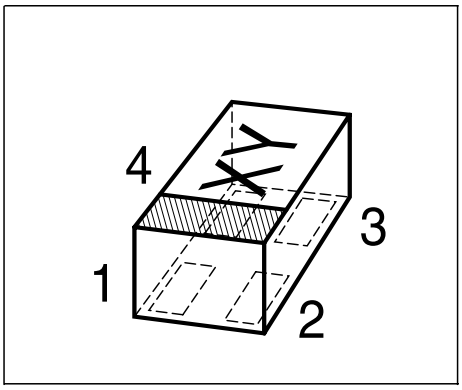
NPN Silicon RF Transistor

Preliminary data



- For highest gain low noise amplifier
  at 1.8 GHz
  Outstanding G_{ms} = 21 dB
  Noise Figure F = 0.9 dB
- Gold metallization for high reliability
- **SIEGET** ® **45** GHz f_T**- Line**
- **C**hip **S**cale **P**ackage
  typical dimension: 1.0 x 0.6 x 0.5mm

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

Type	Marking	Pin Configuration				Package
BFP 540ECSP	ATs	1 = B	2 = E	3 = C	4 = E	E-CSP

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	4.5	V
Collector-base voltage	V_{CBO}	14	
Emitter-base voltage	V_{EBO}	1	
Collector current	I_C	80	mA
Base current	I_B	4	
Total power dissipation, T_S = tbd °C [1)]	P_{tot}	tbd	mW
Junction temperature	T_j	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Junction - soldering point	R_{thJS}	≤ tbd	K/W

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

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	$V_{(BR)CEO}$	4.5	5	6.5	V
Collector-base cutoff current V_{CB} = 5 V, I_E = 0	I_{CBO}	-	-	200	nA
Emitter-base cutoff current V_{EB} = 1 V, I_C = 0	I_{EBO}	-	-	70	µA
DC current gain I_C = 20 mA, V_{CE} = 3.5 V	h_{FE}	50	110	200	-
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 50 mA, V_{CE} = 4 V, f = 1 GHz	f_T	-	29	-	GHz
Collector-base capacitance V_{CB} = 2 V, f = 1 MHz	C_{cb}	-	tbd	-	pF
Collector-emitter capacitance V_{CE} = 2 V, f = 1 MHz	C_{ce}	-	tbd	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	tbd	-	
Noise figure I_C = 5 mA, V_{CE} = 2 V, Z_S = Z_{Sopt} , f = 1.8 GHz	F	-	0.9	-	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}	-	21	-	
Insertion power gain I_C = 20 mA, V_{CE} = 2 V, f = 1.8 GHz, Z_S = Z_L = 50Ω	$\lvert S_{21}\rvert^2$	-	18.5	-	
Third order intercept point at output V_{CE} = 2 V, f = 1.8 GHz, Z_S=Z_{Sopt}, Z_L=Z_{Lopt} , I_C = 20 mA I_C = 7 mA	IP_3	 - -	 24 20	 - -	dBm
1dB compression point V_{CE} = 2 V, f = 1.8 GHz, Z_S=Z_{Sopt}, Z_L=Z_{Lopt} , I_C = 20 mA I_C = 7 mA	P_{-1dB}	 - -	 12 4	 - -	

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