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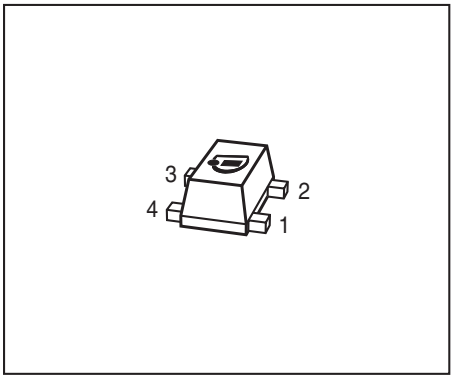
NPN Silicon RF Transistor*



- For ESD protected high gain low noise amplifier
- Excellent ESD performance
  typical value 1000 V (HBM)
- Outstanding G_{ms} = 20 dB
  Noise Figure F = 0.9 dB
- SIEGET ® 45 - Line
- Pb-free (ROHS compliant) package[1)]
- Qualified according AEC Q101

* Short term description

AEC Qualified RoHS

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

Type	Marking	Pin Configuration						Package
BFP540FESD	AUs	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		4.5	
T_A ≤ 0°C		4	
Collector-emitter voltage	V_{CES}	10	
Collector-base voltage	V_{CBO}	10	
Emitter-base voltage	V_{EBO}	1	
Collector current	I_C	80	mA
Base current	I_B	8	
Total power dissipation[2)] T_S ≤ 80 °C	P_{tot}	250	mW
Junction temperature	T_j	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

[1]Pb-containing package may be available upon special request
[2]T_S is measured on the collector lead at the soldering point to the pcb

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Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1)]	R_{thJS}	≤ 280	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	$V_{(BR)CEO}$	4.5	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}	-	-	100	nA
Emitter-base cutoff current V_{EB} = 0.5 V, I_C = 0	I_{EBO}	-	-	10	µA
DC current gain I_C = 20 mA, V_{CE} = 3.5 V, pulse measured	h_{FE}	50	110	170	-

[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 = 50 mA, V_{CE} = 4 V, f = 1 GHz	f_T	21	30	-	GHz
Collector-base capacitance V_{CB} = 2 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.16	0.26	pF
Collector emitter capacitance V_{CE} = 2 V, f = 1 MHz, V_{BE} = 0 , base grounded	C_{ce}	-	0.4	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, V_{CB} = 0 , collector grounded	C_{eb}	-	0.55	-	
Noise figure I_C = 5 mA, V_{CE} = 2 V, f = 1.8 GHz, $Z_S = Z_{Sopt}$ I_C = 5 mA, V_{CE} = 2 V, f = 3 GHz, $Z_S = Z_{Sopt}$	F	 - -	 0.9 1.3	 1.4 -	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}	-	20	-	dB
Power gain, maximum available[1)] I_C = 20 mA, V_{CE} = 2 V, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 3 GHz	G_{ma}	-	14.5	-	dB
Transducer gain I_C = 20 mA, V_{CE} = 2 V, $Z_S = Z_L$ = 50Ω, f = 1.8GHz I_C = 20 mA, V_{CE} = 2 V, $Z_S = Z_L$ = 50Ω, f = 3GHz	$\lvert S_{21e}\rvert^2$	 15.5 -	 18 13	 - -	dB
Third order intercept point at output[2)] V_{CE} = 2 V, I_C = 20 mA, $Z_S = Z_L$ = 50Ω, f = 1.8GHz	IP_3	-	24.5	-	dBm
1dB Compression point at output I_C = 20 mA, V_{CE} = 2 V, $Z_S = Z_L$ = 50Ω, f = 1.8GHz	P_{-1dB}	-	11	-	

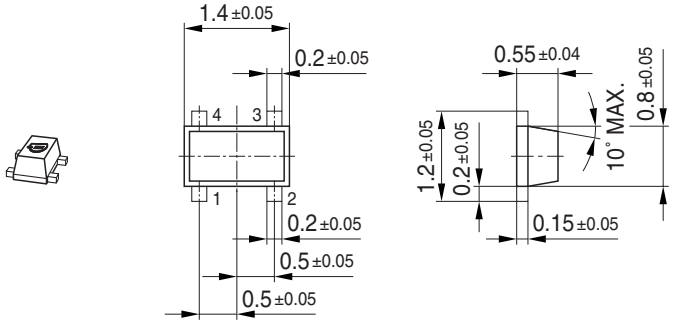
[1] $G_{ma} = |S_{21e} / S_{12e}| (k-(k^2-1)^{1/2})$, $G_{ms} = |S_{21e} / S_{12e}|$

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

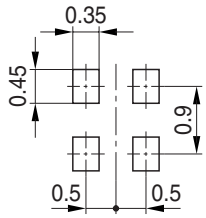
SPICE Parameter

For the SPICE model as well as for S-parameters (including noise parameters) please refer to our internet website www.infineon.com/rf.model.
Please consult our website and download the latest versions before actually starting your design.
You find the BFP540FESD SPICE model in the internet in MWO- and ADS- tools very quickly and conveniently.
The simulation data have been generated and verified using typical devices.
The BFP540FESD SPICE model reflects the typical DC- and RF-performance with high accuracy.
The SPICE model of BFP540FESD will be available in Q02 / 2010.

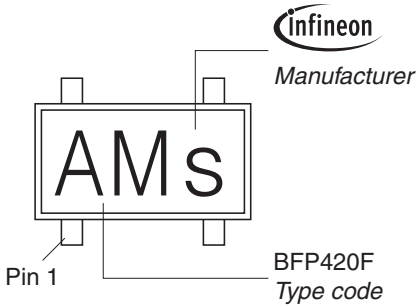
Package Outline



Foot Print

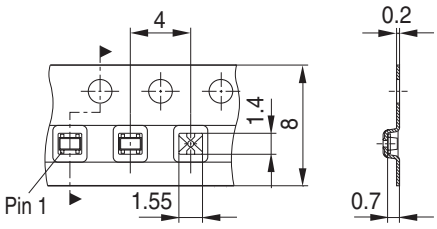


Marking Layout (Example)



Standard Packing

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



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