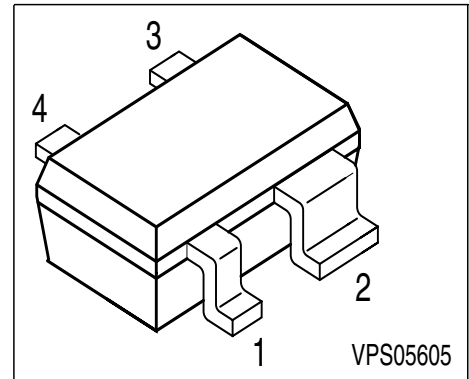


NPN Silicon RF Transistor

Preliminary data

- For highest gain low noise amplifier at 1.8 GHz
- Outstanding $G_{ms} = 21.0$ dB
Noise Figure $F = 0.9$ dB
- Gold metallization for high reliability
- SIEGET 45 - Line
- Excellent ESD performance
typical value > 1000 V (HBM)


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

Type	Marking	Pin Configuration						Package
BFP540ESD	AUs	1=B	2=E	3=C	4=E	-	-	SOT343

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage $T_A > 0^\circ\text{C}$ $T_A \leq 0^\circ\text{C}$	V_{CEO}	4 3.5	V
Collector-emitter voltage	V_{CES}	12	
Collector-base voltage	V_{CBO}	12	
Emitter-base voltage	V_{EBO}	1	
Collector current	I_C	80	mA
Base current	I_B	8	
Total power dissipation ¹⁾ $T_S \leq 77^\circ\text{C}$	P_{tot}	250	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ²⁾	R_{thJS}	≤ 290	K/W

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

²For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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

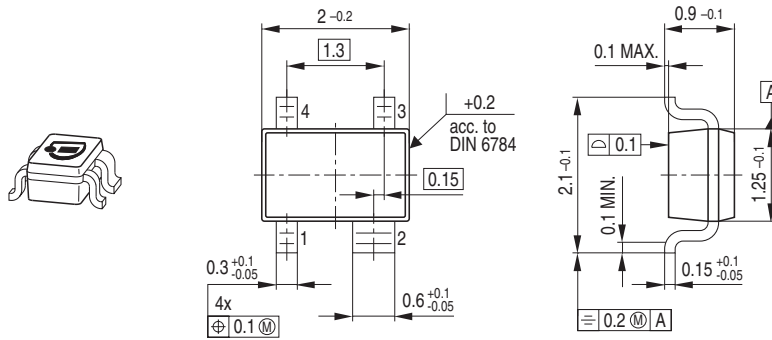
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$	$V_{(BR)CEO}$	4	4.5	-	V
Collector-emitter cutoff current $V_{CE} = 12 \text{ V}, V_{BE} = 0$	I_{CES}	-	-	10	μA
Collector-base cutoff current $V_{CB} = 5 \text{ V}, I_E = 0$	I_{CBO}	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 0.5 \text{ V}, I_C = 0$	I_{EBO}	-	-	10	μA
DC current gain $I_C = 20 \text{ mA}, V_{CE} = 3.5 \text{ V}$, pulse measured	h_{FE}	50	110	185	-

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

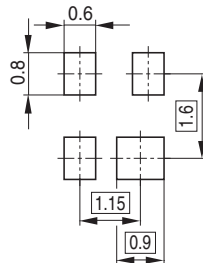
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 50 \text{ mA}$, $V_{CE} = 3.5 \text{ V}$, $f = 1 \text{ GHz}$	f_T	25	34	-	GHz
Collector-base capacitance $V_{CB} = 2 \text{ V}$, $f = 1 \text{ MHz}$	C_{cb}	-	0.15	0.24	pF
Collector emitter capacitance $V_{CE} = 2 \text{ V}$, $f = 1 \text{ MHz}$	C_{ce}	-	0.41	-	
Emitter-base capacitance $V_{EB} = 0.5 \text{ V}$, $f = 1 \text{ MHz}$	C_{eb}	-	0.65	-	
Noise figure $I_C = 5 \text{ mA}$, $V_{CE} = 2 \text{ V}$, $f = 1.8 \text{ GHz}$, $Z_S = Z_{Sopt}$ $I_C = 5 \text{ mA}$, $V_{CE} = 2 \text{ V}$, $f = 3 \text{ GHz}$, $Z_S = Z_{Sopt}$	F	-	0.9 1.3	1.4 -	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}	-	21	-	dB
Power gain, maximum available ¹⁾ $I_C = 20 \text{ mA}$, $V_{CE} = 2 \text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 3 \text{ GHz}$	G_{ma}	-	15.5	-	dB
Transducer gain $I_C = 20 \text{ mA}$, $V_{CE} = 2 \text{ V}$, $Z_S = Z_L = 50 \Omega$, $f = 1.8 \text{ GHz}$ $I_C = 20 \text{ mA}$, $V_{CE} = 2 \text{ V}$, $Z_S = Z_L = 50 \Omega$, $f = 3 \text{ GHz}$	$ S_{21e} ^2$	16 -	18.5 14	- -	dB
Third order intercept point at output ²⁾ $V_{CE} = 2 \text{ V}$, $I_C = 20 \text{ mA}$, $f = 1.8 \text{ GHz}$, $Z_S = Z_L = 50 \Omega$	IP_3	-	25	-	dBm
1dB Compression point at output $I_C = 20 \text{ mA}$, $V_{CE} = 2 \text{ V}$, $Z_S = Z_L = 50 \Omega$, $f = 1.8 \text{ GHz}$	P_{-1dB}	-	11.5	-	

¹⁾ $G_{ma} = |S_{21e} / S_{12e}| (k - (k^2 - 1)^{1/2})$, $G_{ms} = |S_{21e} / S_{12e}|$
²⁾ IP_3 value depends on termination of all intermodulation frequency components.
Termination used for this measurement is 50Ω from 0.1 MHz to 6 GHz

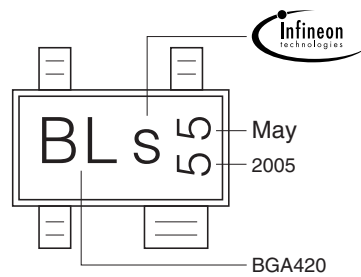
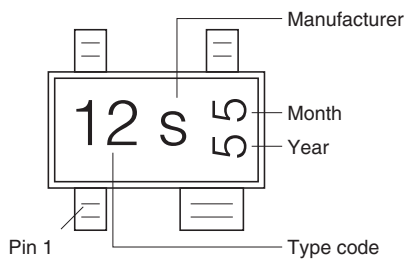
Package Outline



Foot Print



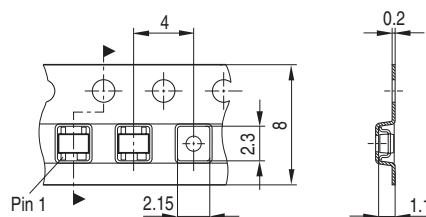
Marking Layout



Example

Packing

Code E6327: Reel 1180 mm = 3.000 Pieces/Reel
 Code E6433: Reel 1330 mm = 10.000 Pieces/Reel



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