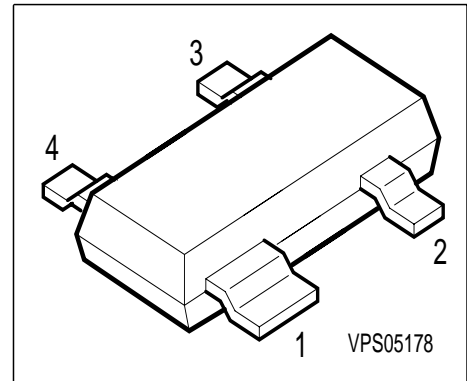


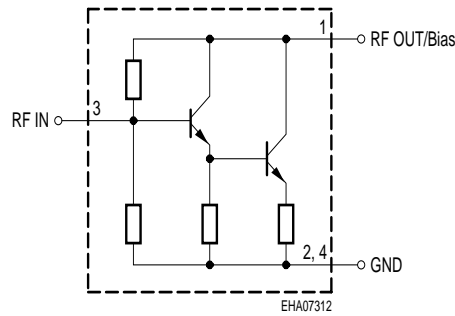
Silicon Bipolar MMIC-Amplifier

Preliminary data

- Cascadable 50 Ω -gain block
- 16 dB typical gain at 1.0 GHz
- 12 dBm typical P_{-1dB} at 1.0 GHz
- 3 dB-bandwidth: DC to 1.2 GHz



Circuit Diagram



Type	Marking	Ordering Code	Pin Configuration				Package
BGA 318	BNs	Q62702-G0043	1 RFout/bias	2 GND	3 RFinput	4 GND	SOT-143

Maximum Ratings

Parameter	Symbol	Value	Unit
Device current	I_D	60	mA
Total power dissipation, $T_S \leq 99\text{ }^\circ\text{C}$	P_{tot}	250	mW
R_F input power	P_{RFIn}	5	dBm
Junction temperature	T_j	150	$^\circ\text{C}$
Ambient temperature	T_A	-65 ...+150	
Storage temperature	T_{stg}	-65 ...+150	

Thermal Resistance

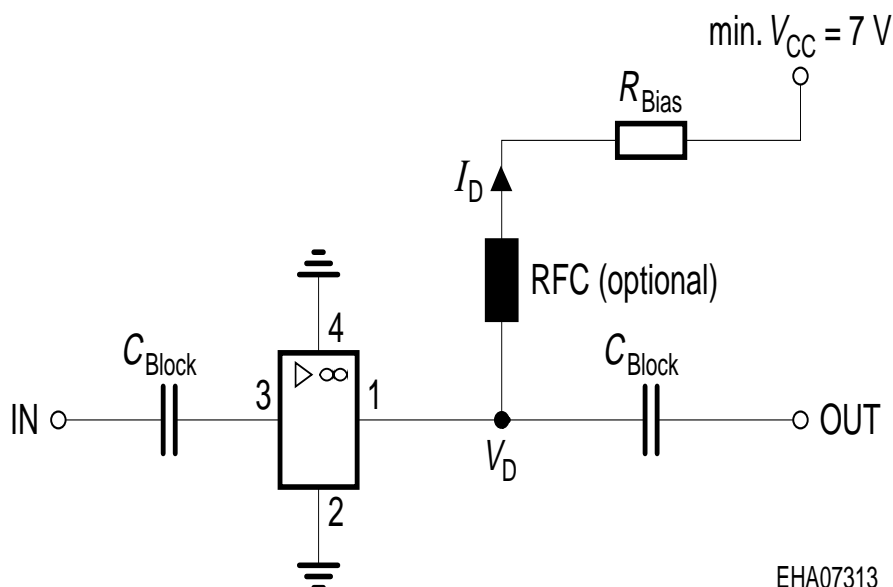
Junction - soldering point ¹⁾	R_{thJS}	≤ 205	K/W
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1) T_S is measured on the collector lead at the soldering point to the pcb

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC characteristics ($V_D = 4.7\text{ V}$, $Z_0 = 50\text{ }\Omega$)					
Insertion power gain $f = 0.1\text{ GHz}$ $f = 1\text{ GHz}$ $f = 1.8\text{ GHz}$	$ S_{21} ^2$	-	18 16 12	-	dB
Insertion point gain flatness $f = 0.1\text{ GHz to }0.6\text{ GHz}$	$\Delta S_{21} ^2$	-	+0.7	-	
Noise figure $f = 0.1\text{ GHz}$ $f = 1\text{ GHz}$ $f = 2\text{ GHz}$	NF	-	3.5 4 5	-	
1dB compression point $f = 1\text{ GHz}$	P_{-1dB}	-	12	-	dBm
Return loss input $f = 0.1\text{ GHz to }2\text{ GHz}$	RL_{in}	-	14	-	dB
Return loss output $f = 0.1\text{ GHz to }3\text{ GHz}$	RL_{out}	-	10	-	

Typical biasing configuration



$$R_{Bias} = V_{CC} - V_D / I_D$$

$$V_D = 4.7\text{ V}$$

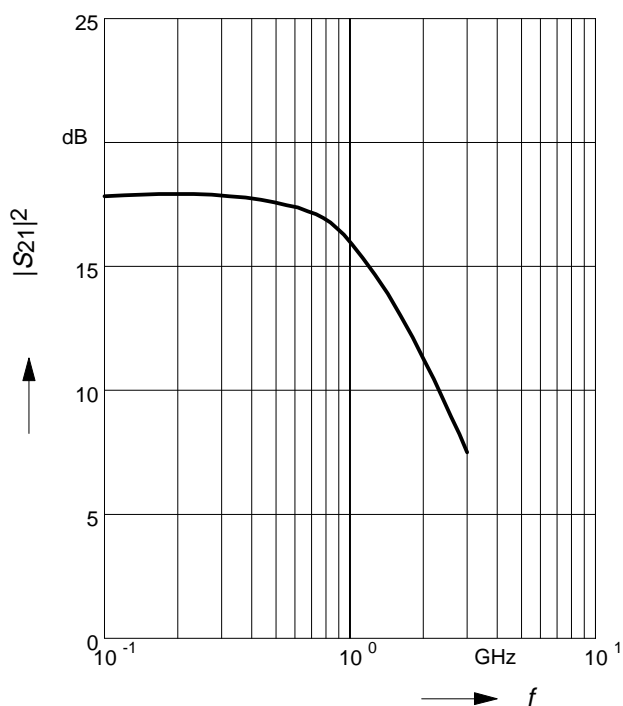
EHA07313

S-Parameters at $T_A = 25\text{ °C}$

f	S_{11}		S_{21}		S_{12}		S_{22}	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
$V_D = 4.7\text{ V}, Z_0 = 50\ \Omega$								
0.01	0.196	0.2	8.01	178.9	0.077	0.6	0.327	-0.5
0.1	0.193	-4.8	8	171.6	0.078	4.9	0.324	-8.6
0.3	0.194	-14.4	7.75	155.4	0.082	13.8	0.312	-25
0.5	0.191	-25.9	7.28	139.9	0.089	21.1	0.294	-41.2
0.8	0.184	-45	6.43	119.1	0.105	27.9	0.26	-62.9
1	0.175	-60.3	5.83	106.8	0.117	30.2	0.238	-76.2
1.9	0.185	-130.6	3.91	67.6	0.164	30.2	0.184	-113
2.4	0.241	-170.6	2.99	45.5	0.193	26.8	0.173	-124.4
3	0.298	159.6	2.38	27.6	0.218	22.8	0.178	-131.2

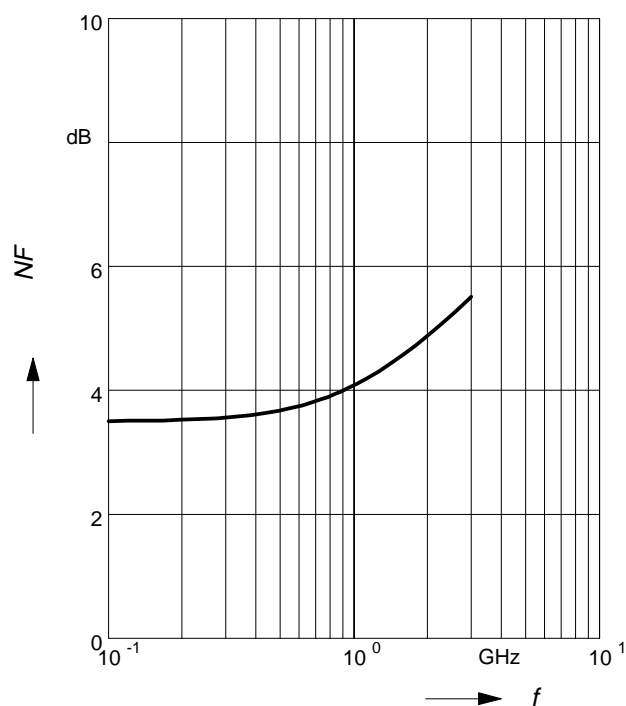
Insertion power gain $|S_{21}|^2 = f(f)$

$V_D = 4.7\text{ V}, I_D = 35\text{ mA}$



Noise figure $NF = f(f)$

$V_D = 4.7\text{ V}, I_D = 35\text{ mA}$



Output power 1-dB-gain compression

$$P_{-1dB} = f(f)$$

$$V_D = 4.7V, I_D = 35\text{ mA}$$

