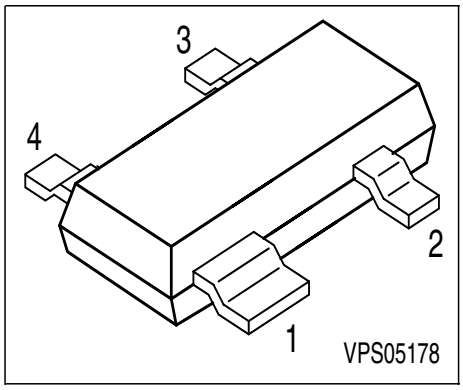
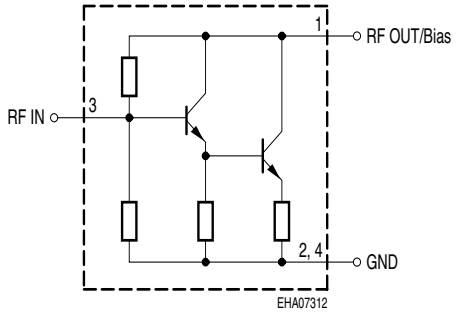
Silicon Bipolar MMIC-Amplifier

- Cascadable 50 Ω-gain block
- 9 dB typical gain at 1.0 GHz
- 9 dBm typical P_{-1dB} at 1.0 GHz
- 3 dB-bandwidth: DC to 2.4 GHz



Circuit Diagram



Type	Marking	Pin Configuration				Package
BGA 310	BLs	1 RFout/bias	2 GND	3 RF input	4 GND	SOT-143

Maximum Ratings

Parameter	Symbol	Value	Unit
Device current	I_D	60	mA
Total power dissipation, $T_S \leq 99$ °C[1)]	P_{tot}	250	mW
RF input power	P_{RFin}	10	dBm
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}	≤ 205	K/W

[1] T_S is measured on the collector 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.	
AC characteristics (V_D = 4.7 V, Z_o = 50 Ω)					
Insertion power gain	$\|S_{21}\|^2$				dB
f = 0.1 GHz		-	10	-	
f = 1 GHz		-	9	-	
f = 1.8 GHz		-	8	-	
Insertion point gain flatness	$\Delta \|S_{21}\|^2$	-	+-0.5	-	dB
f = 0.1 GHz to 0.6 GHz					
Noise figure	NF				dB
f = 0.1 GHz		-	6	-	
f = 1 GHz		-	6.5	-	
f = 2 GHz		-	7	-	
1dB compression point	P_{-1dB}	-	9	-	dBm
f = 1 GHz					
Return loss input	RL_{in}	-	20	-	dB
f = 0.1 GHz to 2 GHz					
Return loss output	RL_{out}	-	15	-	
f = 0.1 GHz to 3 GHz					

Typical biasing configuration

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

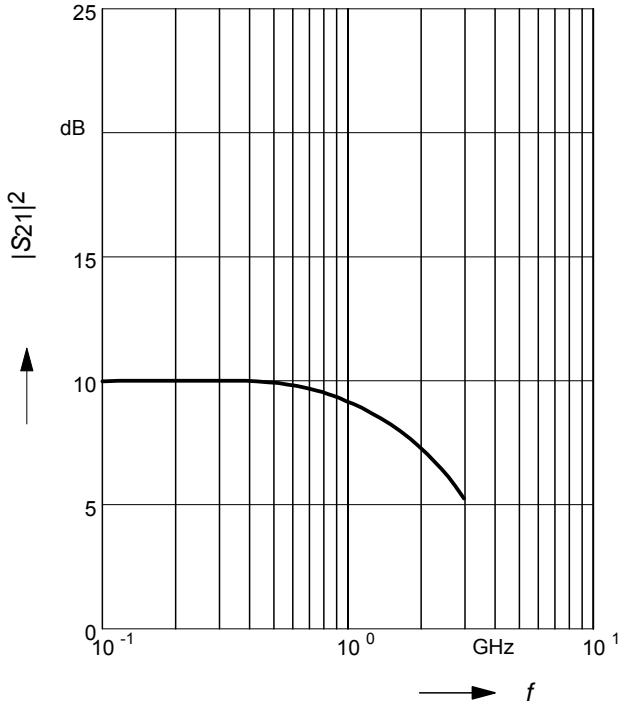
V_D = 4.7V

S-Parameters at T_A = 25 °C

f	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
V_D = 4.7 V, Z_o = 50Ω								
0.01	0.051	176.4	3.22	179.3	0.149	0.2	0.159	-0.5
0.1	0.053	168.1	3.23	174.9	0.149	1.2	0.158	-6.1
0.3	0.053	141.9	3.22	164.6	0.15	3.4	0.157	-19
0.5	0.058	123.9	3.2	154.2	0.152	5.4	0.155	-31.7
0.8	0.054	98.2	3.17	138.7	0.157	8.1	0.153	-51.3
1	0.049	86.1	3.12	128.4	0.162	9.7	0.153	-64.3
1.8	0.053	-164.9	2.79	88	0.188	12	0.16	-106.6
2.4	0.161	-177.7	2.41	60.8	0.208	10.6	0.168	-123.7
3	0.257	153.9	2.03	38.2	0.225	8.2	0.178	-133.1

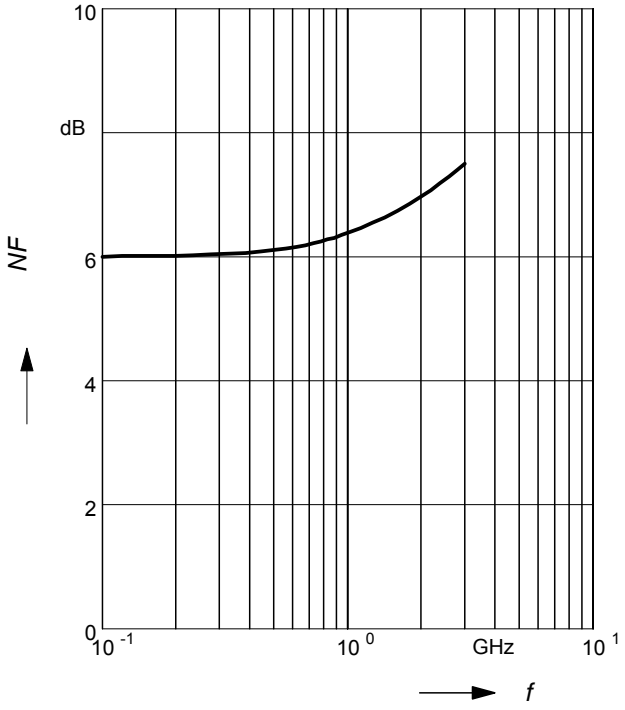
Insertion power gain $|S_{21}|^2 = f(f)$

V_D = 4.7 V, I_D = 42 mA



Noise figure $NF = f(f)$

V_D = 4.7 V, I_D = 42 mA



Output power 1-dB-gain compression

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

V_D = 4.7 V, I_D = 42 mA