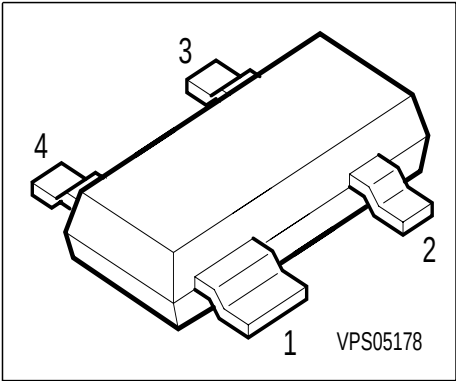
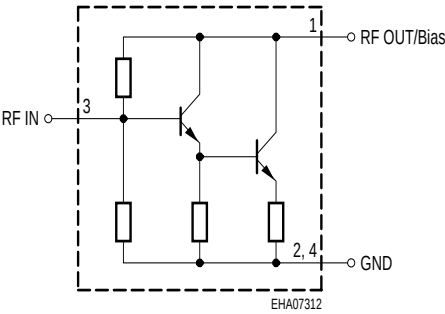


Silicon Bipolar MMIC-Amplifier

Preliminary data

- Cascadable 50 Ω -gain block
- 11 dB typical gain at 1.0 GHz
- 9 dBm typical P_{-1dB} at 1.0 GHz
- 3 dB-bandwidth: DC to 2.0 GHz

Circuit Diagram



Type	Marking	Ordering Code	Pin Configuration				Package
BGA 312	BMs	Q62702-G0042	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}	10	dBm
Junction temperature	T_j	150	$^\circ\text{C}$
Ambient temperature	T_A	-65 ...+150	
Storage temperature	T_{stg}	-65 ...+150	

Thermal Resistance

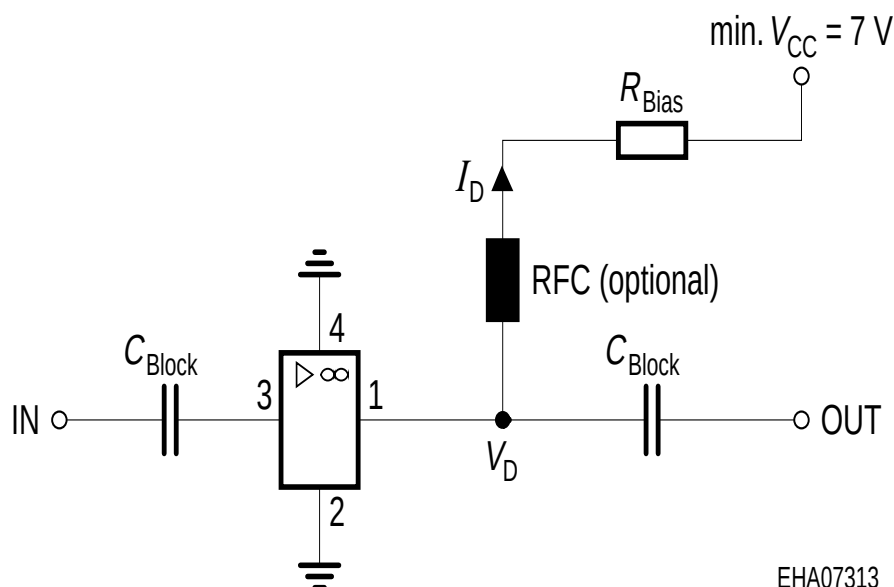
Junction - soldering point ¹⁾	R_{thJS}	≤ 205	K/W
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1) T_S is measured on the collector lead at the soldering point to the pcb

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$	- - -	12 11 10	- - -	dB
Insertion point gain flatness $f = 0.1\text{ GHz to }0.6\text{ GHz}$	$\Delta S_{21} ^2$	-	+0.6	-	
Noise figure $f = 0.1\text{ GHz}$ $f = 1\text{ GHz}$ $f = 2\text{ GHz}$	NF	- - -	5.5 6 7	- - -	
1dB compression point $f = 1\text{ GHz}$	$P_{-1\text{dB}}$	-	9	-	dBm
Return loss input $f = 0.1\text{ GHz to }2\text{ GHz}$	RL_{in}	-	20	-	dB
Return loss output $f = 0.1\text{ GHz to }3\text{ GHz}$	RL_{out}	-	14	-	

Typical biasing configuration



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

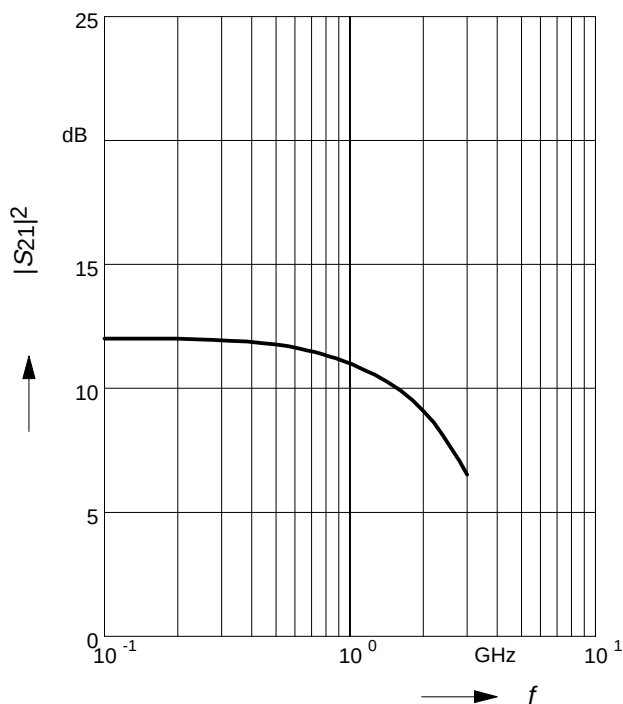
$$V_D = 4.7\text{ V}$$

S-Parameters at $T_A = 25\text{ }^{\circ}\text{C}$

f	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
$V_D = 4.7\text{ V}, Z_0 = 50\text{ }\Omega$								
0.01	0.009	17.9	3.94	179.2	0.131	0.2	0.208	-0.5
0.1	0.012	43.5	3.95	174.4	0.131	1.7	0.207	-6.2
0.3	0.027	55.8	3.93	163.4	0.133	4.8	0.204	-19.1
0.5	0.039	52.5	3.89	152.2	0.136	7.8	0.201	-31.9
0.8	0.049	33.7	3.79	135.8	0.142	11.7	0.194	-51.3
1	0.046	22.2	3.69	124.9	0.149	13.8	0.191	-64.2
1.8	0.054	-135.4	3.13	84.1	0.181	16.6	0.183	-106.8
2.4	0.147	179.9	2.63	57.6	0.205	14.7	0.182	-124.9
3	0.24	152.1	2.19	35.7	0.225	11.6	0.184	-134.9

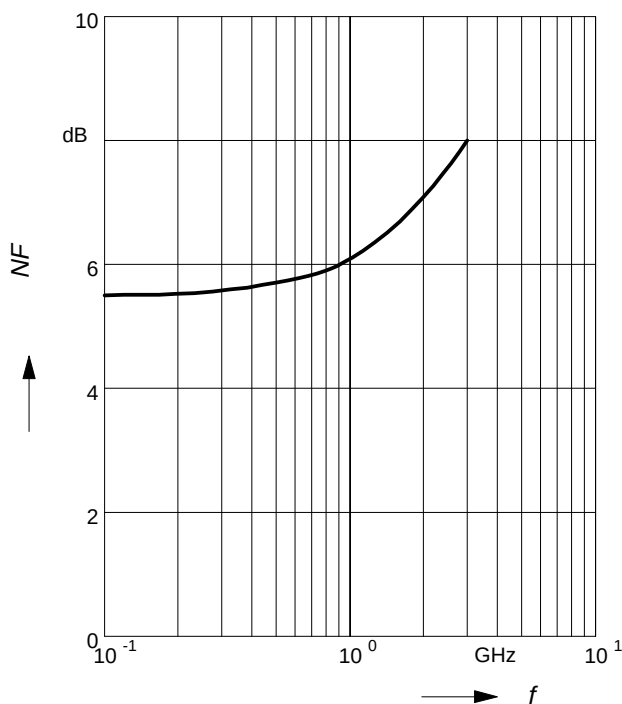
Insertion power gain $|S_{21}|^2 = f(f)$

$V_D = 4.7\text{ V}, I_D = 42\text{ mA}$



Noise figure $NF = f(f)$

$V_D = 4.7\text{ V}, I_D = 42\text{ mA}$



Output power 1-dB-gain compression

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

$$V_D = 4.7 \text{ V}, I_D = 42 \text{ mA}$$

