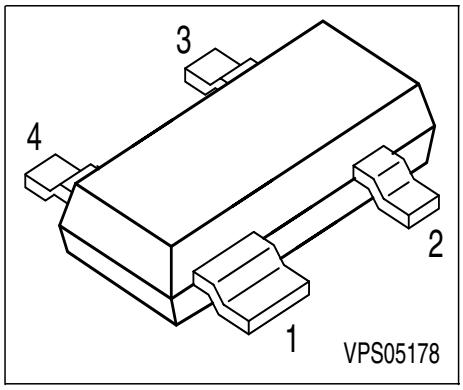
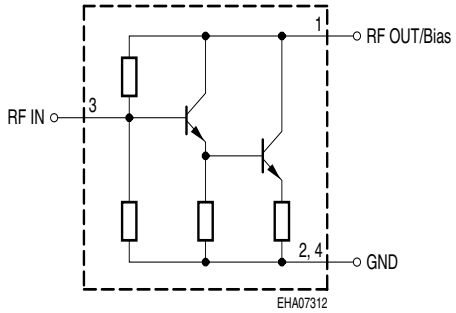
**Silicon Bipolar MMIC-Amplifier**

- 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 | Pin Configuration | | | | Package |
|---|---|---|---|---|---|---|
| BGA 318 | BNs | 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, $T_S \leq 99$ °C[1)] | $P_{tot}$ | 250 | mW |
| RF input power | $P_{RFin}$ | 5 | 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 | | - | 18 | - | |
| $f$ = 1 GHz | | - | 16 | - | |
| $f$ = 1.8 GHz | | - | 12 | - | |
| Insertion point gain flatness | $\Delta \|S_{21}\|^2$ | - | +-0.7 | - | dB |
| $f$ = 0.1 GHz to 0.6 GHz | | | | | |
| Noise figure | $NF$ | | | | dB |
| $f$ = 0.1 GHz | | - | 3.5 | - | |
| $f$ = 1 GHz | | - | 4 | - | |
| $f$ = 2 GHz | | - | 5 | - | |
| 1dB compression point | $P_{-1dB}$ | - | 12 | - | dBm |
| $f$ = 1 GHz | | | | | |
| Return loss input | $RL_{in}$ | - | 14 | - | dB |
| $f$ = 0.1 GHz to 2 GHz | | | | | |
| Return loss output | $RL_{out}$ | - | 10 | - | |
| f = 0.1 GHz to 3 GHz | | | | | |

**Typical biasing configuration**

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

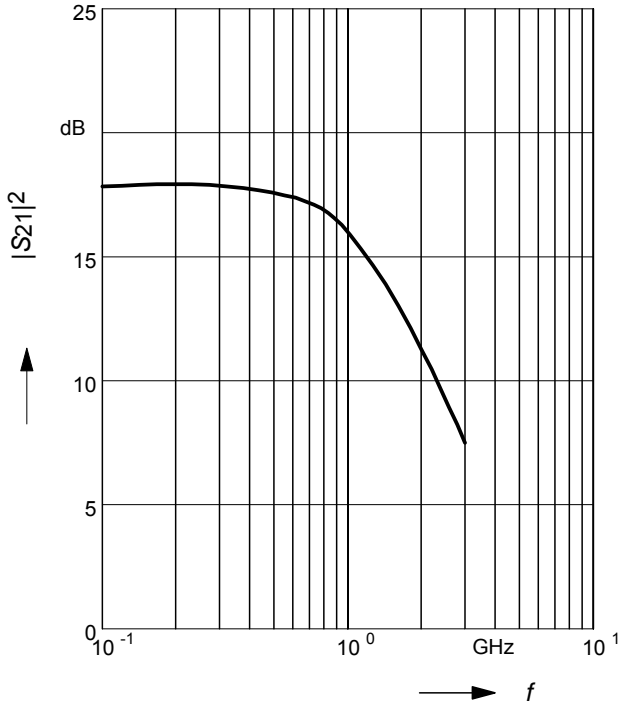
$V_D$ = 4.7V

**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, $Z_o$ = 50 Ω | | | | | | | | |
| 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 |

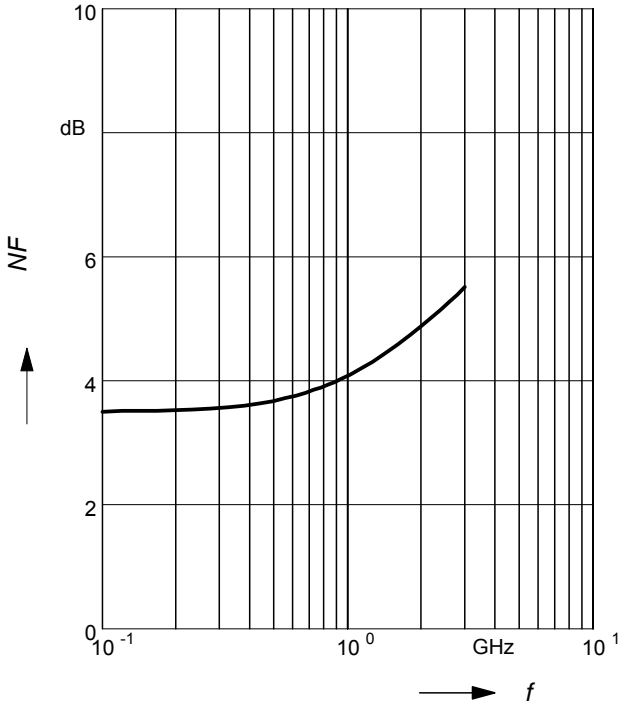
**Insertion power gain** $|S_{21}|^2 = f(f)$

$V_D$ = 4.7V, $I_D$ = 35 mA




**Noise figure** $NF = f(f)$

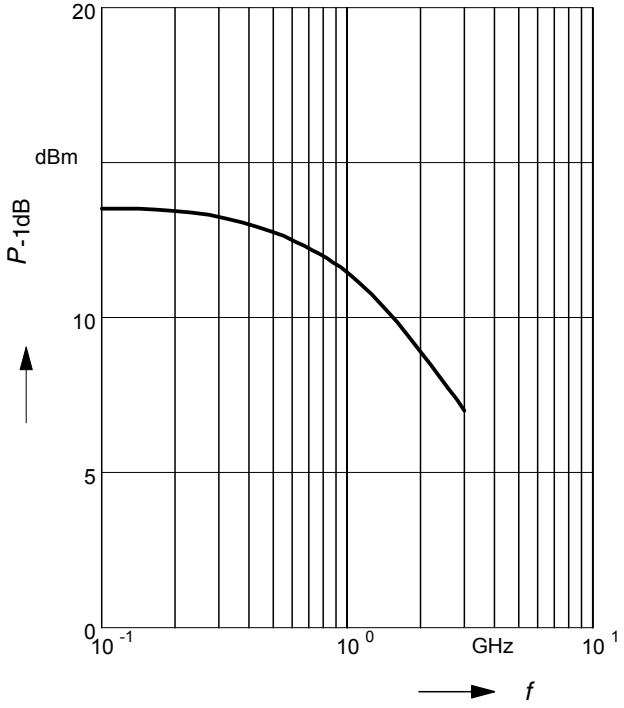
$V_D$ = 4.7V, $I_D$ = 35 mA



**Output power 1-dB-gain compression**

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

$V_D$ = 4.7V, $I_D$ = 35 mA



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