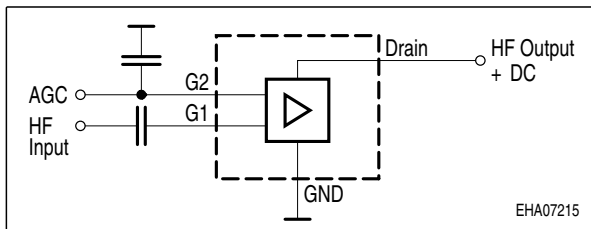
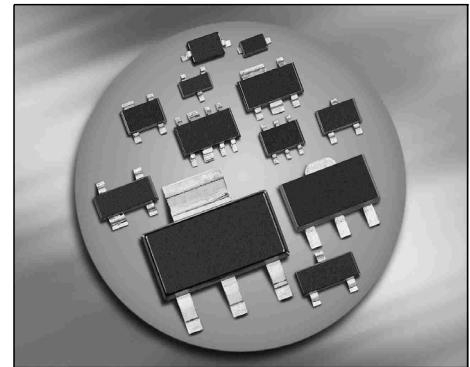


**Silicon N\_Channel MOSFET Tetrode**

- For low noise, high gain controlled input stage up to 1 GHz
- Operating voltage 9 V
- Integrated biasing network



**ESD: Electrostatic discharge sensitive device, observe handling precaution!**

Type	Package	Pin Configuration						Marking
BF1009S	SOT143	1=S	2=D	3=G2	4=G1	-	-	JLs
BF1009SR	SOT143R	1=D	2=S	3=G1	4=G2	-	-	JLs

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	12	V
Continuous drain current	$I_D$	25	mA
Gate 1/ gate 2-source current	$\pm I_{G1/2SM}$	10	
Gate 1 (external biasing)	$+V_{G1SE}$	3	V
Total power dissipation	$P_{tot}$		mW
$T_S \leq 76 \text{ }^\circ\text{C}$ , BF1009S, BF1009SR		200	
$T_S \leq 94 \text{ }^\circ\text{C}$ , BF1009W		200	
Storage temperature	$T_{stg}$	-55 ... 150	$^\circ\text{C}$
Channel temperature	$T_{ch}$	150	

**Note:**

**It is not recommended to apply external DC-voltage on Gate 1 in active mode.**

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Channel - soldering point <sup>1)</sup> BF1009S, BF1009SR BF1009SW	$R_{thchs}$	$\leq 370$ $\leq 280$	K/W

**Electrical Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**DC Characteristics**

Drain-source breakdown voltage $I_D = 300 \mu A, V_{G1S} = 0, V_{G2S} = 0$	$V_{(BR)DS}$	12	-	-	V
Gate1-source breakdown voltage $+I_{G1S} = 10 \text{ mA}, V_{G2S} = 0, V_{DS} = 0$	$+V_{(BR)G1SS}$	8	-	12	
Gate2 source breakdown voltage $\pm I_{G2S} = 10 \text{ mA}, V_{G1S} = 0, V_{DS} = 0$	$\pm V_{(BR)G2SS}$	10	-	16	
Gate1-source leakage current $V_{G1S} = 6 \text{ V}, V_{G2S} = 0$	$+I_{G1SS}$	-	-	60	$\mu A$
Gate 2 source leakage current $\pm V_{G2S} = 8 \text{ V}, V_{G1S} = 0, V_{DS} = 0$	$\pm I_{G2SS}$	-	-	50	nA
Drain current $V_{DS} = 9 \text{ V}, V_{G1S} = 0, V_{G2S} = 6 \text{ V}$	$I_{DSS}$	-	-	500	$\mu A$
Operating current (selfbiased) $V_{DS} = 9 \text{ V}, V_{G2S} = 6 \text{ V}$	$I_{DSO}$	10	14	19	mA
Gate2-source pinch-off voltage $V_{DS} = 9 \text{ V}, I_D = 100 \mu A$	$V_{G2S(p)}$	-	0.9	-	V

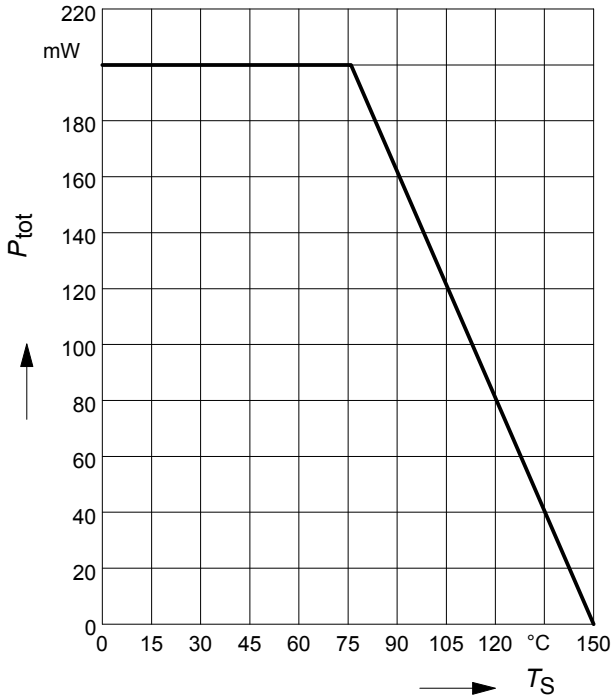
<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

**Electrical Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b> (verified by random sampling)					
Forward transconductance $V_{DS} = 9\text{ V}, V_{G2S} = 6\text{ V}$	$g_{fs}$	26	30	-	mS
Gate1 input capacitance $V_{DS} = 9\text{ V}, V_{G2S} = 6\text{ V}, f = 1\text{ MHz}$	$C_{g1ss}$	-	2.1	2.7	pF
Output capacitance $V_{DS} = 9\text{ V}, V_{G2S} = 6\text{ V}, f = 1\text{ MHz}$	$C_{dss}$	-	0.9	-	
Power gain (self biased) $V_{DS} = 9\text{ V}, V_{G2S} = 6\text{ V}, f = 800\text{ MHz}$	$G_p$	18	22	-	dB
Noise figure $V_{DS} = 9\text{ V}, V_{G2S} = 6\text{ V}, f = 800\text{ MHz}$	$F$	-	1.4	2.1	dB
Gain control range $V_{DS} = 9\text{ V}, V_{G2S} = 6 \dots 0\text{ V}, f = 800\text{ MHz}$	$\Delta G_p$	40	50	-	

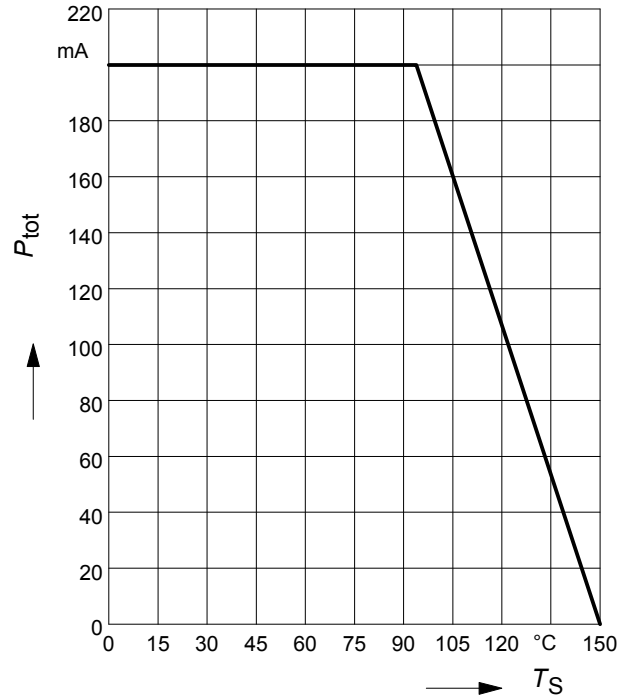
**Total power dissipation  $P_{tot} = f(T_S)$**

BF1009S, BF1009SR

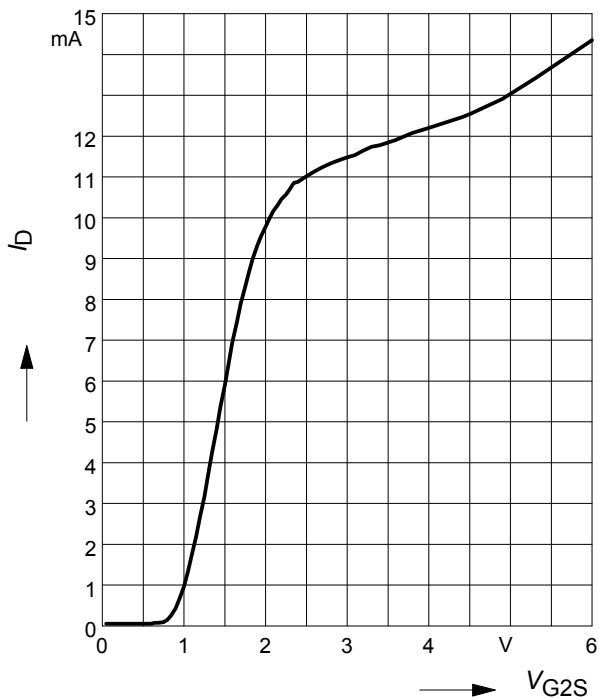


**Total power dissipation  $P_{tot} = f(T_S)$**

BF1009SW

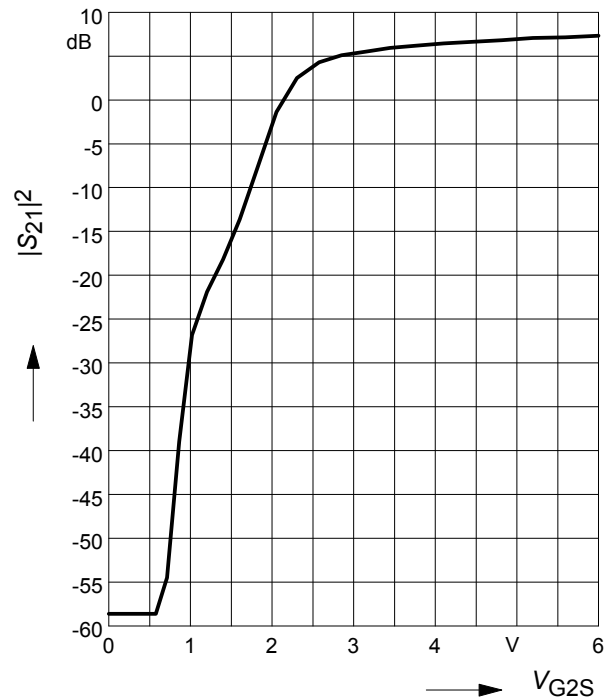


**Drain current  $I_D = f(V_{G2S})$**



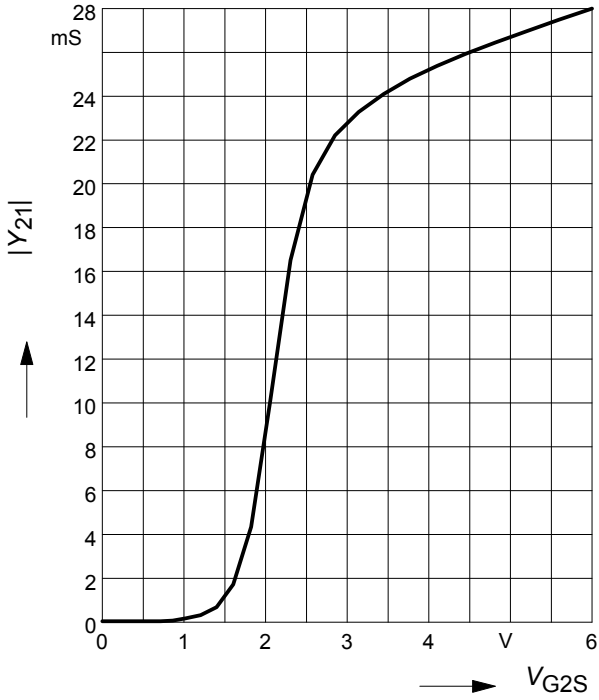
**Insertion power gain**

$|S_{21}|^2 = f(V_{G2S})$



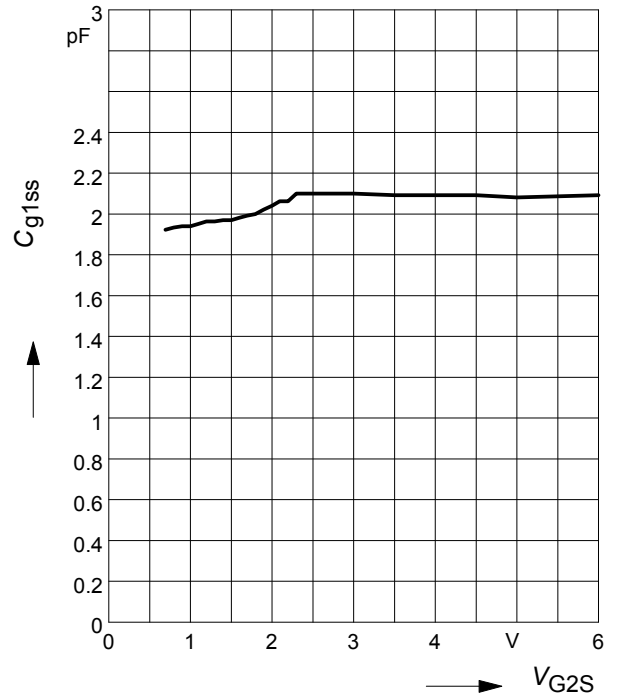
**Forward transfer admittance**

$|Y_{21}| = f(V_{G2S})$



**Gate 1 input capacitance  $C_{g1ss} = f(V_{G2S})$**

$f = 200\text{MHz}$



**Output capacitance  $C_{dss} = f(V_{G2S})$**

$f = 200\text{MHz}$

