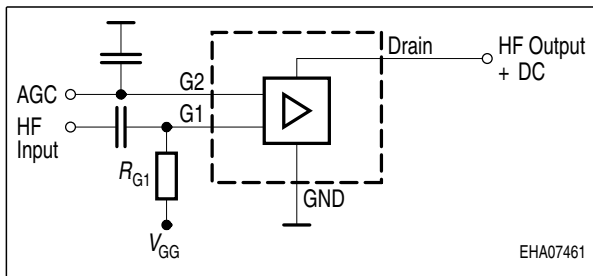
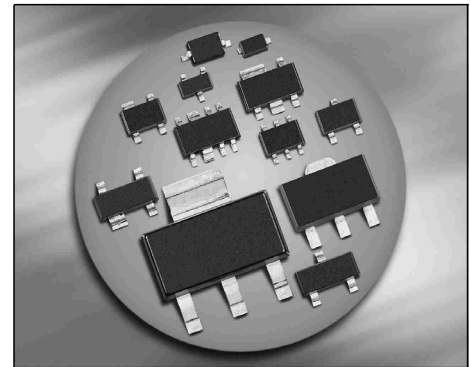


**Silicon N-Channel MOSFET Tetrode**

- For low noise, high gain controlled input stages up to 1GHz
- Operating voltage 5V



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

Class 2 (2000V - 4000V) pin to pin **Human Body Model**

Type	Package	Pin Configuration						Marking
		1= S	2=D	3=G2	4=G1	-	-	
BF2030	SOT143	1= S	2=D	3=G2	4=G1	-	-	NDs
BF2030R	SOT143R	1= D	2=S	3=G1	4=G2	-	-	NDs
BF2030W	SOT343	1= D	2=S	3=G1	4=G2	-	-	ND

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	8	V
Continuous drain current	$I_D$	20	mA
Gate 1/ gate 2-source current	$\pm I_{G1/2SM}$	10	
Gate 1 (external biasing)	$+V_{G1SE}$	6	V
Total power dissipation	$P_{tot}$		mW
$T_S \leq 76 \text{ }^\circ\text{C}$ , BF2030, BF2030R		200	
$T_S \leq 94 \text{ }^\circ\text{C}$ , BF2030W		200	
Storage temperature	$T_{stg}$	-55 ... 150	$^\circ\text{C}$
Channel temperature	$T_{ch}$	150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Channel - soldering point <sup>1)</sup> BF2030/ BF2030R BF2030W	$R_{thchs}$	≤370 ≤280	K/W

**Electrical Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**DC Characteristics**

Drain-source breakdown voltage $I_D = 20 \mu A, V_{G1S} = 0, V_{G2S} = 0$	$V_{(BR)DS}$	10	-	-	V
Gate1-source breakdown voltage $+I_{G1S} = 10 \text{ mA}, V_{G2S} = 0, V_{DS} = 0$	$+V_{(BR)G1SS}$	6	-	15	
Gate2-source breakdown voltage $+I_{G2S} = 10 \text{ mA}, V_{G1S} = 0, V_{DS} = 0$	$+V_{(BR)G2SS}$	6	-	15	
Gate1-source leakage current $V_{G1S} = 5 \text{ V}, V_{G2S} = 0, V_{DS} = 0$	$+I_{G1SS}$	-	-	50	nA
Gate2-source leakage current $V_{G2S} = 5 \text{ V}, V_{G1S} = 0, V_{DS} = 0$	$+I_{G2SS}$	-	-	50	
Drain current $V_{DS} = 5 \text{ V}, V_{G1S} = 0, V_{G2S} = 4 \text{ V}$	$I_{DSS}$	-	-	50	$\mu A$
Drain-source current $V_{DS} = 5 \text{ V}, V_{G2S} = 4 \text{ V}, R_{G1} = 100 \text{ k}\Omega$	$I_{DSX}$	-	12	-	mA
Gate1-source pinch-off voltage $V_{DS} = 5 \text{ V}, V_{G2S} = 4 \text{ V}, I_D = 20 \mu A$	$V_{G1S(p)}$	0.3	0.5	-	V
Gate2-source pinch-off voltage $V_{DS} = 5 \text{ V}, I_D = 20 \mu A$	$V_{G2S(p)}$	0.3	0.6	-	

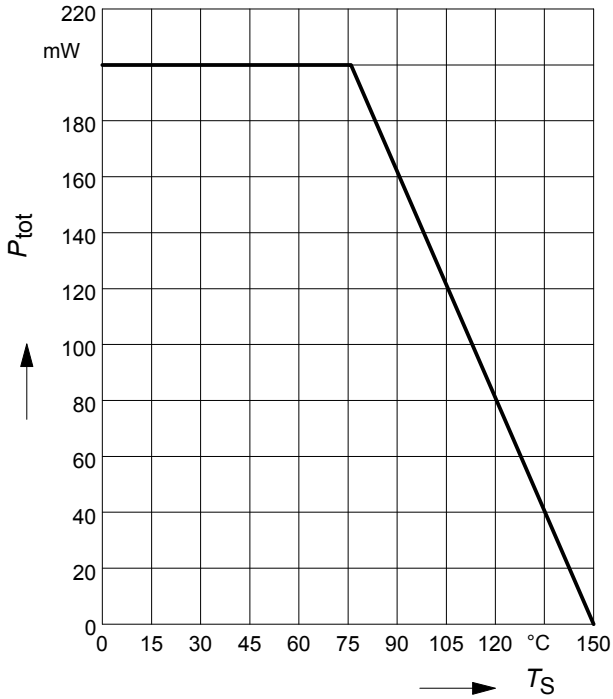
<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

**Electrical Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b> (verified by random sampling)					
Forward transconductance $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $V_{G2S} = 4\text{ V}$	$g_{fs}$	27	31	-	mS
Gate1 input capacitance $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $V_{G2S} = 4\text{ V}$ , $f = 1\text{ MHz}$	$C_{g1ss}$	-	2.4	2.8	pF
Output capacitance $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $V_{G2S} = 4\text{ V}$ , $f = 1\text{ MHz}$	$C_{dss}$	-	1.3	-	
Power gain $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $V_{G2S} = 4\text{ V}$ , $f = 800\text{ MHz}$	$G_p$	20	23	-	dB
Noise figure $V_{DS} = 5\text{ V}$ , $I_D = 10\text{ mA}$ , $V_{G2S} = 4\text{ V}$ , $f = 800\text{ MHz}$	$F$	-	1.5	2.2	dB
Gain control range $V_{DS} = 5\text{ V}$ , $V_{G2S} = 4...0\text{ V}$ , $f = 800\text{ MHz}$	$\Delta G_p$	40	50	-	

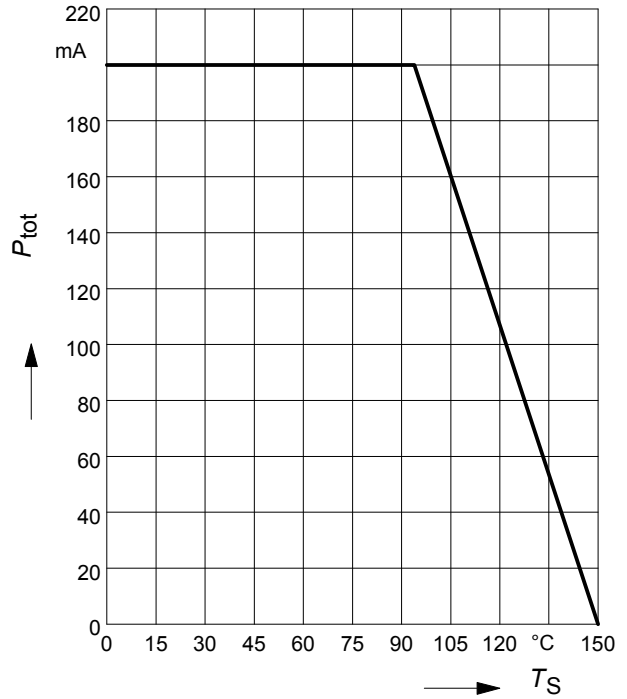
**Total power dissipation  $P_{tot} = f(T_S)$**

BF2030, BF2030R



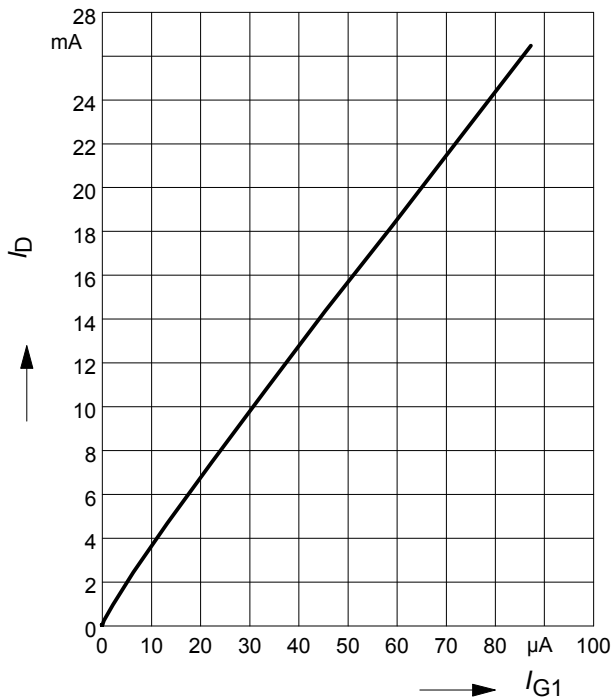
**Total power dissipation  $P_{tot} = f(T_S)$**

BF2030W



**Drain current  $I_D = f(I_{G1})$**

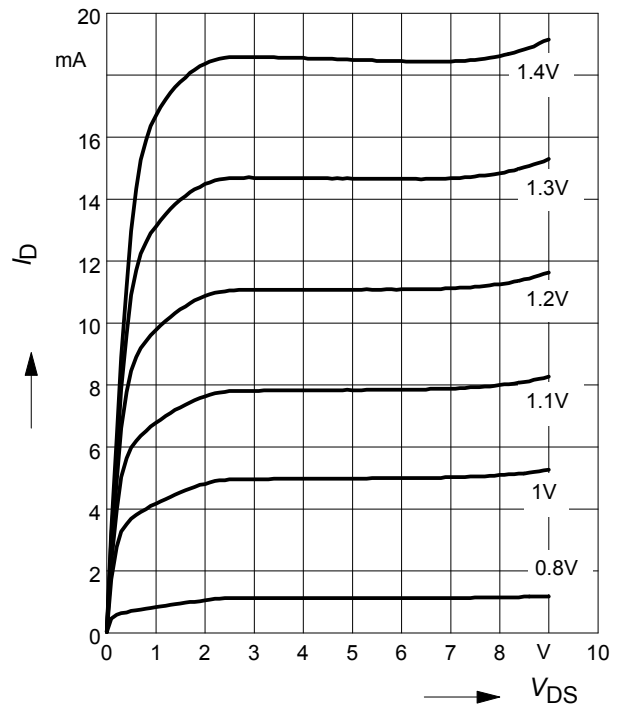
$V_{G2S} = 4V$



**Output characteristics  $I_D = f(V_{DS})$**

$V_{G2S} = 4V$

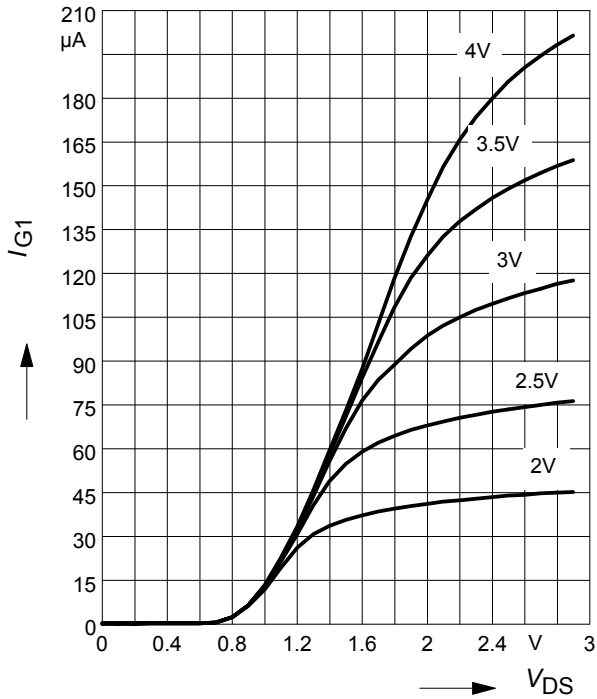
$V_{G1S} = \text{Parameter}$



**Gate 1 current  $I_{G1} = f(V_{G1S})$**

$V_{DS} = 5V$

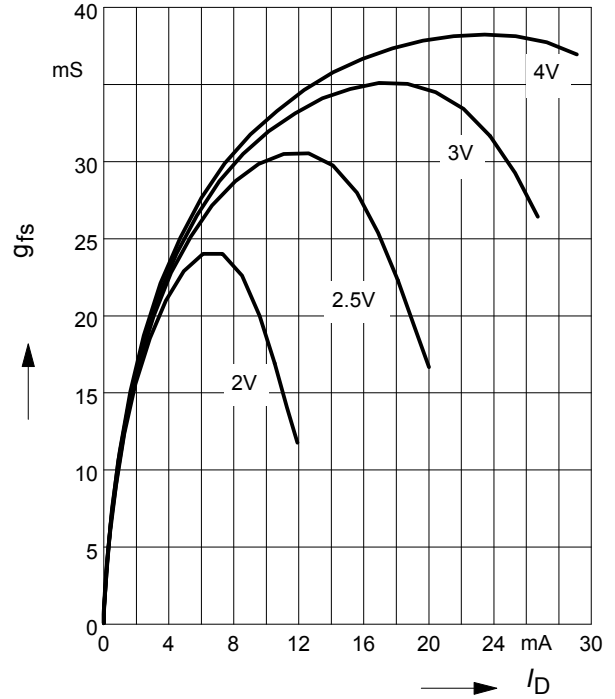
$V_{G2S} = \text{Parameter}$



**Gate 1 forward transconductance**

$g_{fs} = f(I_D)$

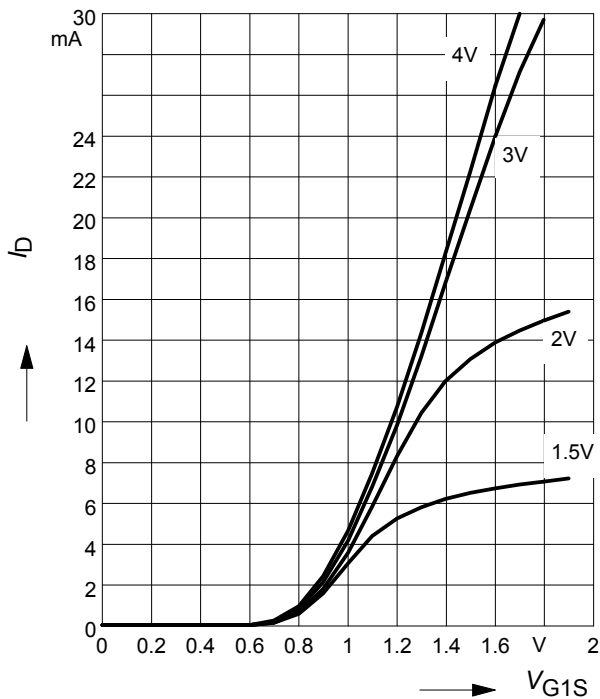
$V_{DS} = 5V, V_{G2S} = \text{Parameter}$



**Drain current  $I_D = f(V_{G1S})$**

$V_{DS} = 5V$

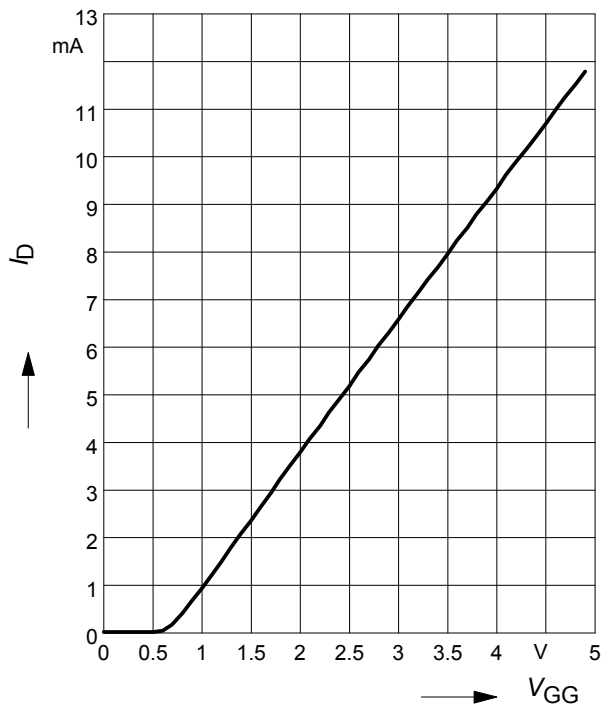
$V_{G2S} = \text{Parameter}$



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

$V_{DS} = 5V, V_{G2S} = 4V, R_{G1} = 100k\Omega$

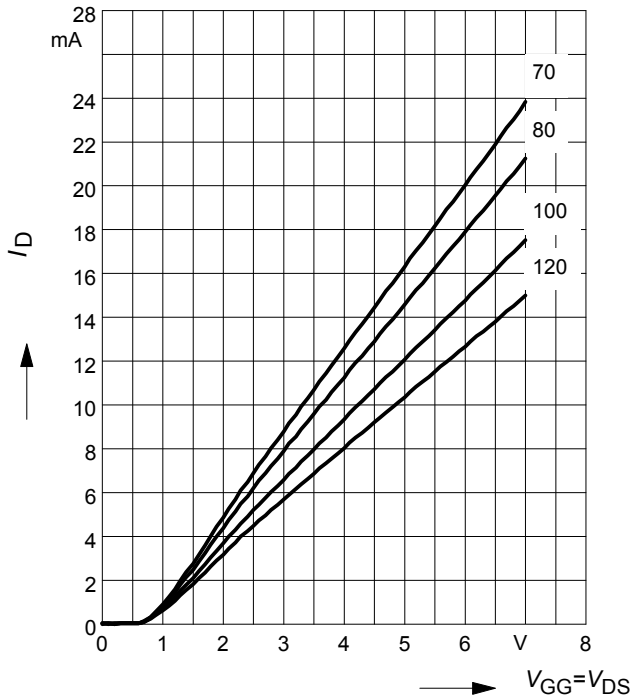
(connected to  $V_{GG}$ ,  $V_{GG} = \text{gate1 supply voltage}$ )



Drain current  $I_D = f(V_{GG})$

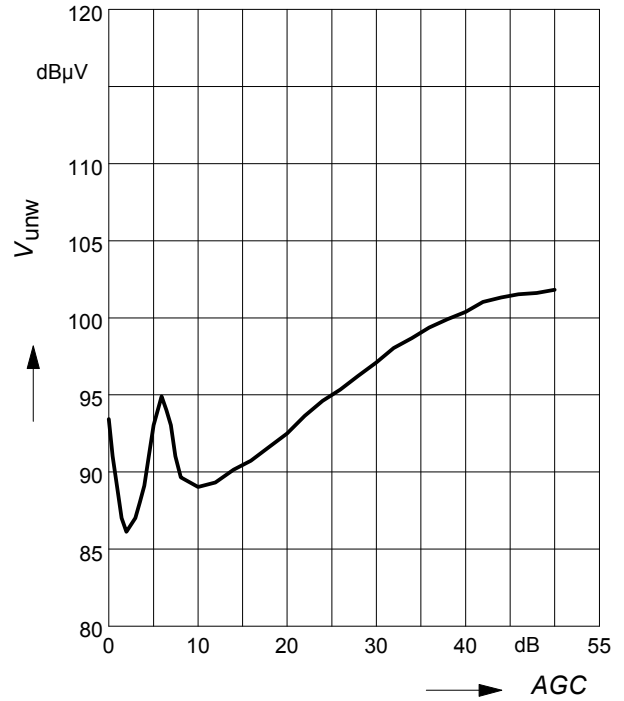
$V_{G2S} = 4V$

$R_{G1}$  = Parameter in  $k\Omega$



Crossmodulation  $V_{unw} = (AGC)$

$V_{DS} = 5V$



Crossmodulation test circuit

