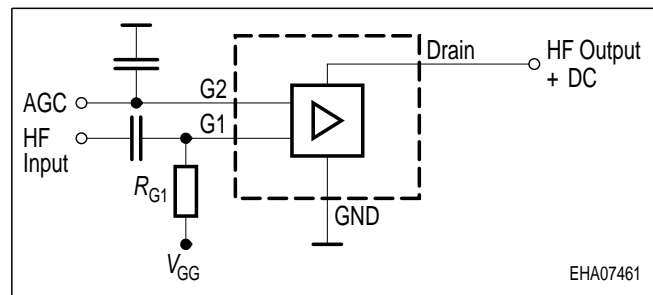
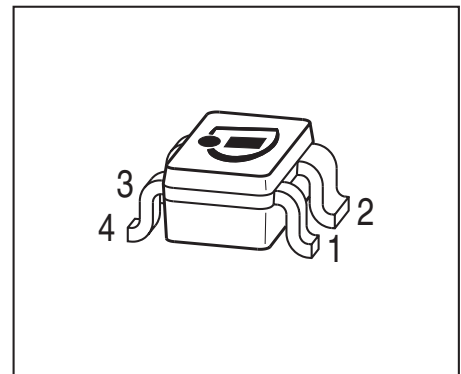


**Silicon N-Channel MOSFET Tetrode**

- Low noise gain controlled input stages of UHF-and VHF - tuners with 3V up to 5V supply voltage
- Integrated gate protection diodes
- Low noise figure
- High gain, high forward transadmittance
- Improved cross modulation at gain reduction



**ESD (Electrostatic discharge) sensitive device, observe handling precaution!**

Type	Package	Pin Configuration						Marking
BF5030W	SOT343	1=D	2=S	3=G1	4=G2	-	-	KXs

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	8	V
Continuous drain current	$I_D$	25	mA
Gate 1/ gate 2-source current	$\pm I_{G1/2SM}$	1	
Gate 1/ gate 2-source voltage	$\pm V_{G1/G2S}$	6	V
Total power dissipation $T_S \leq 78 \text{ }^\circ\text{C}$	$P_{tot}$	200	mW
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>	$R_{thchs}$	$\leq 280$	K/W

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

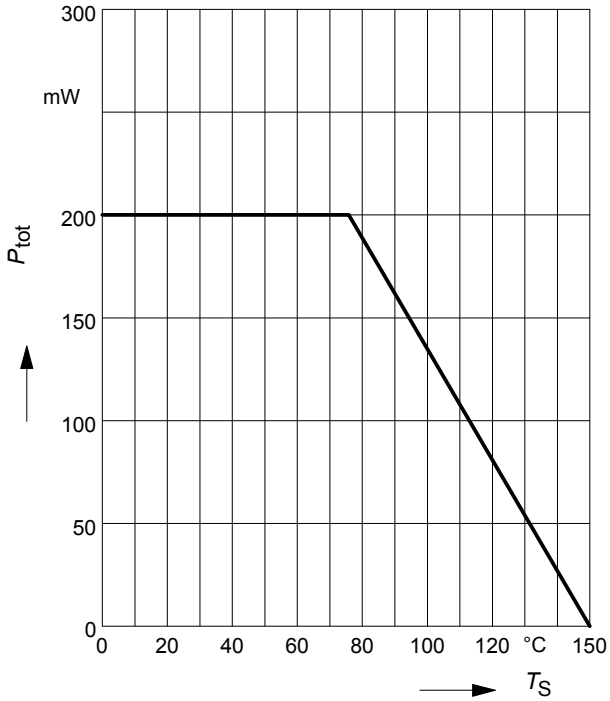
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics</b>					
Drain-source breakdown voltage $I_D = 1 \mu\text{A}$ , $V_{G1S} = 0$ , $V_{G2S} = 0$	$V_{(BR)DS}$	12	-	-	V
Gate1-source breakdown voltage $+I_{G1S} = 10 \text{ mA}$ , $V_{G2S} = 0$ , $V_{DS} = 0$	$+V_{(BR)G1SS}$	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 $V_{G1S} = 6 \text{ V}$ , $V_{G2S} = 0$ , $V_{DS} = 0$	$+I_{G1SS}$	-	-	50	nA
Gate2-source leakage current $V_{G2S} = 6 \text{ V}$ , $V_{G1S} = 0$ , $V_{DS} = 0$	$+I_{G2SS}$	-	-	50	
Drain current $V_{DS} = 3 \text{ V}$ , $V_{G1S} = 0$ , $V_{G2S} = 3 \text{ V}$	$I_{DSS}$	-	-	100	
Drain-source current $V_{DS} = 3 \text{ V}$ , $V_{G2S} = 3 \text{ V}$ , $R_{G1} = 68 \text{ k}\Omega$	$I_{DSX}$	-	12	-	mA
Gate1-source pinch-off voltage $V_{DS} = 3 \text{ V}$ , $V_{G2S} = 3 \text{ V}$ , $I_D = 20 \mu\text{A}$	$V_{G1S(p)}$	-	0.6	-	V
Gate2-source pinch-off voltage $V_{DS} = 3 \text{ V}$ , $V_{G1S} = 3 \text{ V}$ , $I_D = 20 \mu\text{A}$	$V_{G2S(p)}$	-	0.7	-	

**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

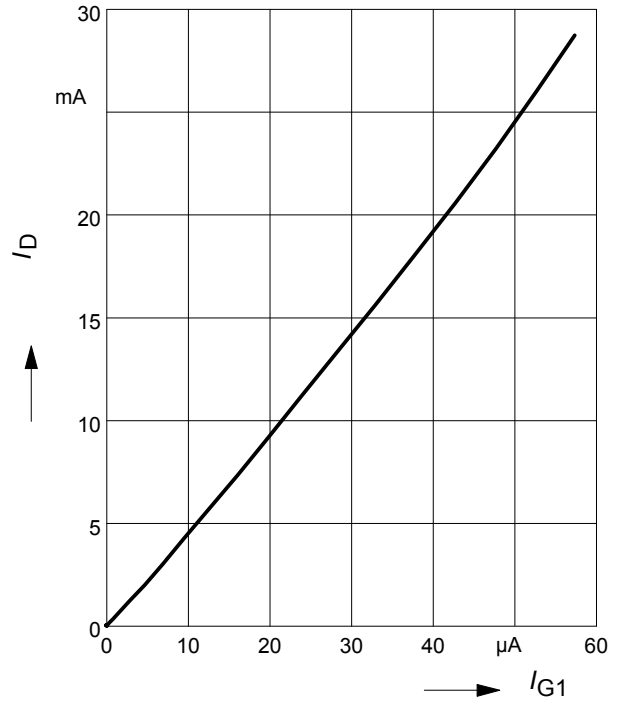
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics - (verified by random sampling)</b>					
Forward transconductance $V_{DS} = 3\text{ V}, V_{G2S} = 3\text{ V}$	$g_{fs}$	-	41	-	mS
Gate1 input capacitance $V_{DS} = 3\text{ V}, V_{G2S} = 3\text{ V}, f = 10\text{ MHz}$	$C_{g1ss}$	-	2.7	-	pF
Output capacitance $V_{DS} = 3\text{ V}, V_{G2S} = 3\text{ V}, f = 10\text{ MHz}$	$C_{dss}$	-	1.6	-	
Power gain $V_{DS} = 3\text{ V}, I_D = 10\text{ mA}, V_{G2S} = 3\text{ V}, f = 800\text{ MHz}$ $V_{DS} = 3\text{ V}, I_D = 10\text{ mA}, V_{G2S} = 3\text{ V}, f = 45\text{ MHz}$	$G_p$	-	24	-	dB
		-	35	-	
Noise figure $V_{DS} = 3\text{ V}, I_D = 10\text{ mA}, V_{G2S} = 3\text{ V}, f = 800\text{ MHz}$ $V_{DS} = 3\text{ V}, I_D = 10\text{ mA}, V_{G2S} = 3\text{ V}, f = 45\text{ MHz}$	$F$	-	1.3	-	dB
		-	1	-	
Gain control range $V_{DS} = 3\text{ V}, V_{G2S} = 3\dots 0\text{ V}, f = 800\text{ MHz}$	$\Delta G_p$	45	-	-	
Cross-modulation $k=1\%$ , $f_w=50\text{MHz}$ , $f_{unw}=60\text{MHz}$ AGC = 0 AGC = 10 dB AGC = 40 dB	$X_{mod}$	90	94	-	dB
		-	92	-	
		96	98	-	

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

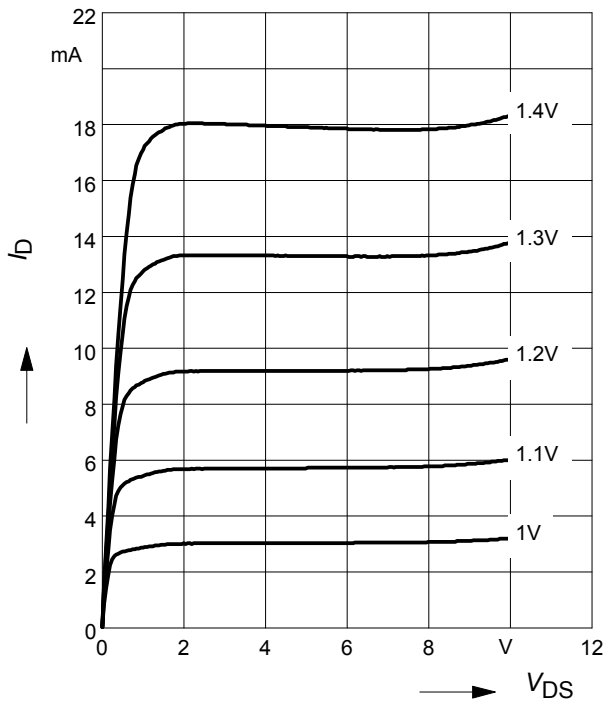


**Drain current  $I_D = f(I_{G1})$**

$V_{G2S} = 3V$



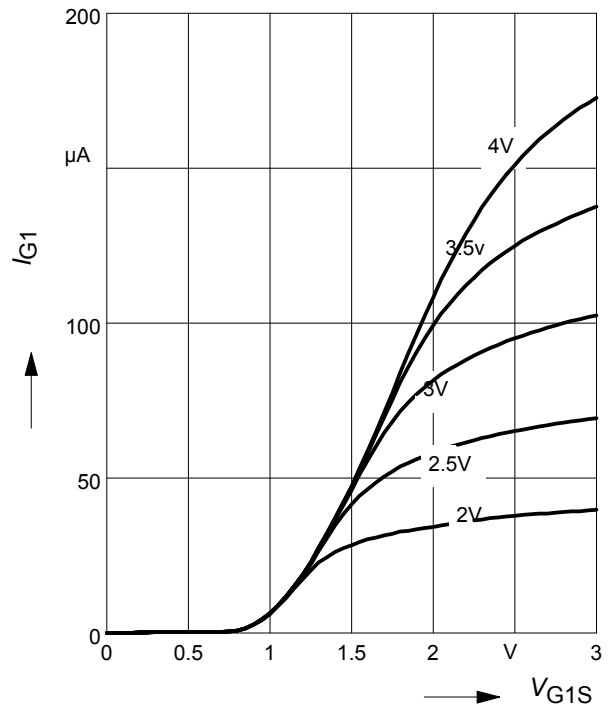
**Output characteristics  $I_D = f(V_{DS})$**



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

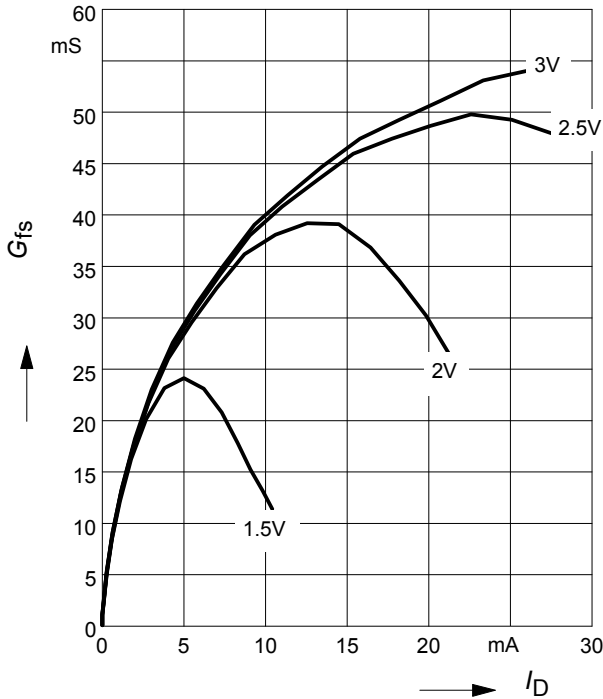
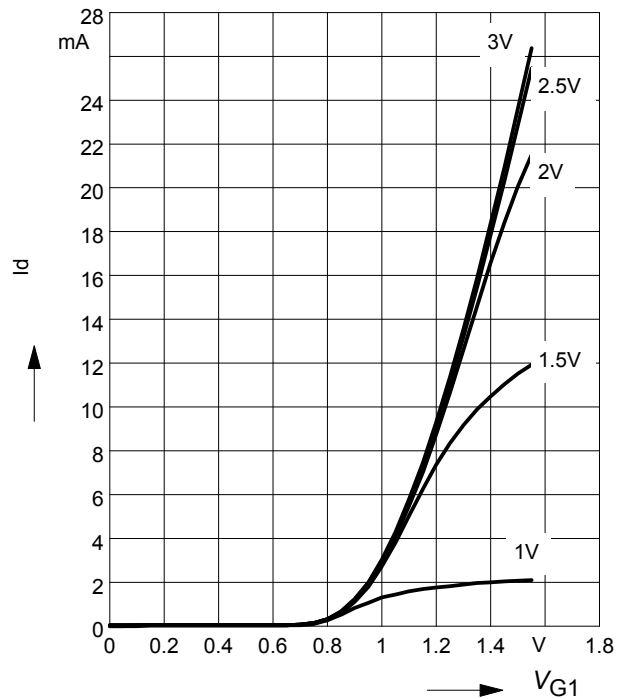
$V_{DS} = 3V$

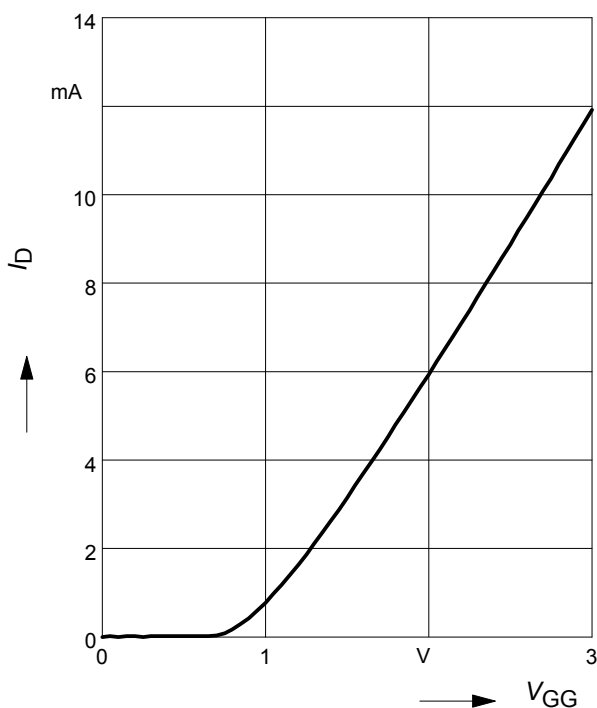
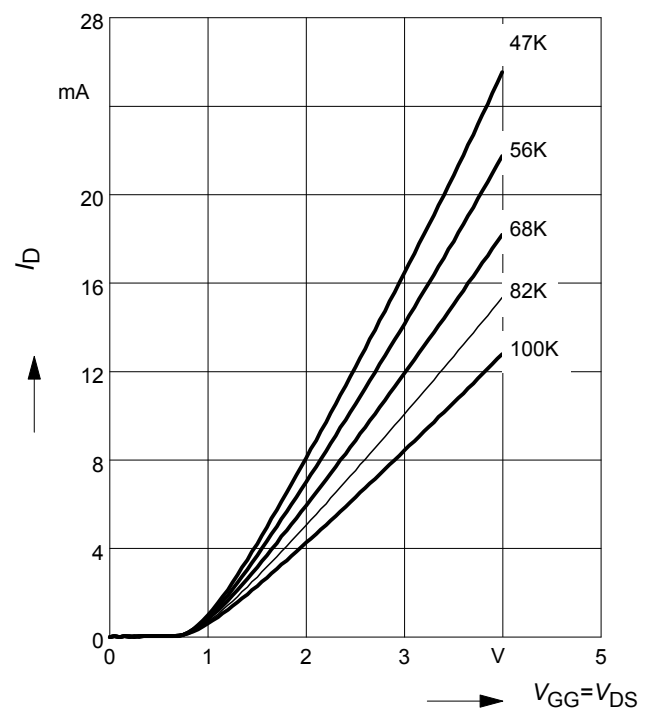
$V_{G2S} = \text{Parameter}$



**Gate 1 forward transconductance**

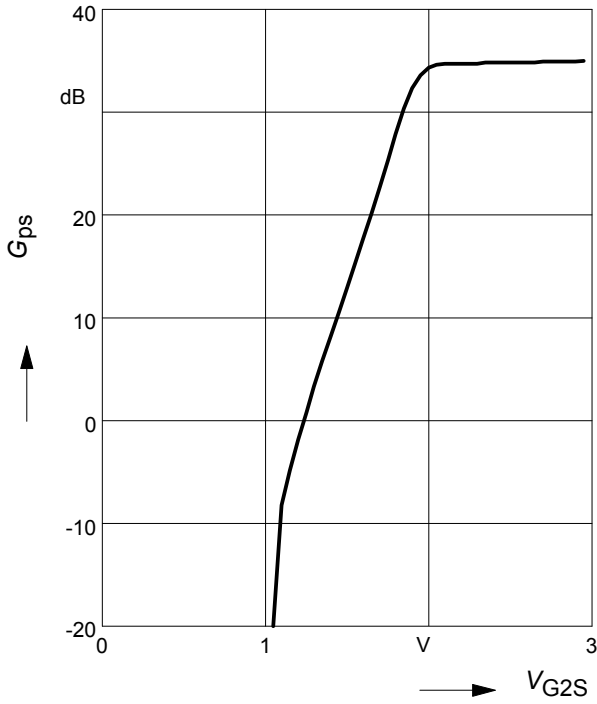
$$g_{fs} = f(I_D)$$

 $V_{DS} = 3V, V_{G2S} = \text{Parameter}$ 

**Drain current  $I_D = f(V_{G1S})$** 
 $V_{DS} = 3V$ 
 $V_{G2S} = \text{Parameter}$ 

**Drain current  $I_D = f(V_{GG})$** 
 $V_{DS} = 3V, V_{G2S} = 3V, R_{G1} = 68k\Omega$ 

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

**Drain current  $I_D = f(V_{GG})$** 
 $V_{G2S} = 3V$ 
 $R_{G1} = \text{Parameter in } k\Omega$ 


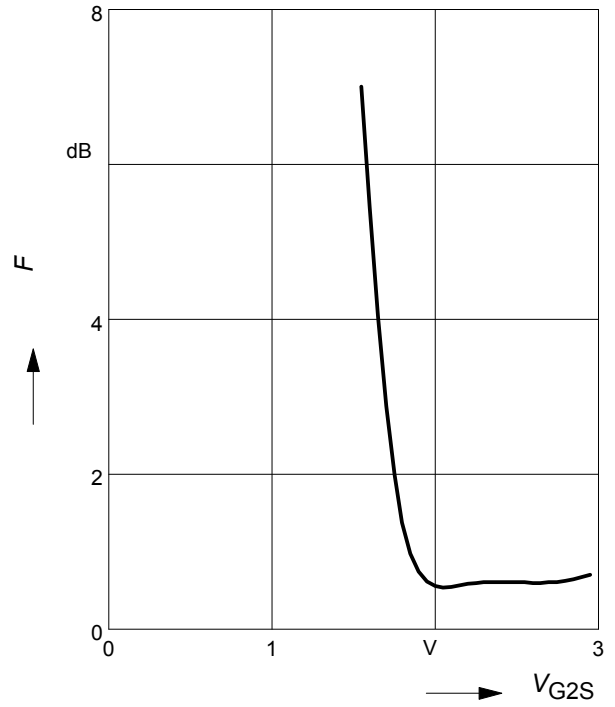
**Power gain  $G_{ps} = f(V_{G2S})$**

$f = 45 \text{ MHz}$



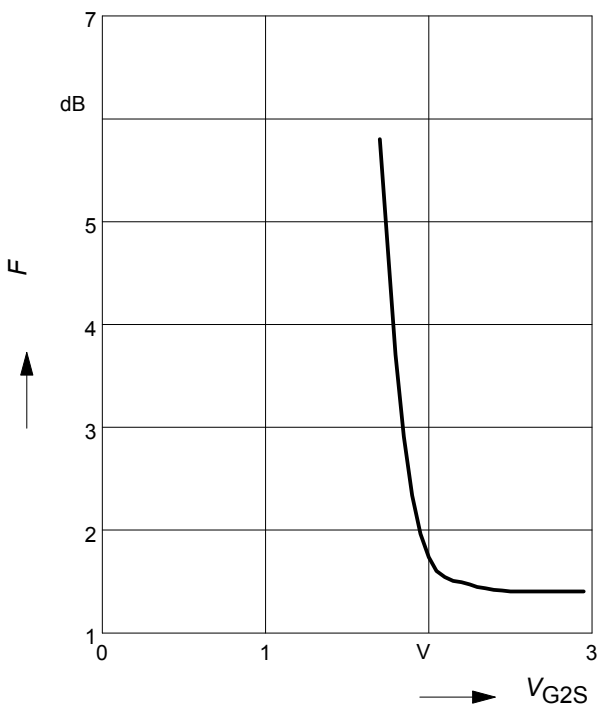
**Noise figure  $F = f(V_{G2S})$**

$f = 45 \text{ MHz}$



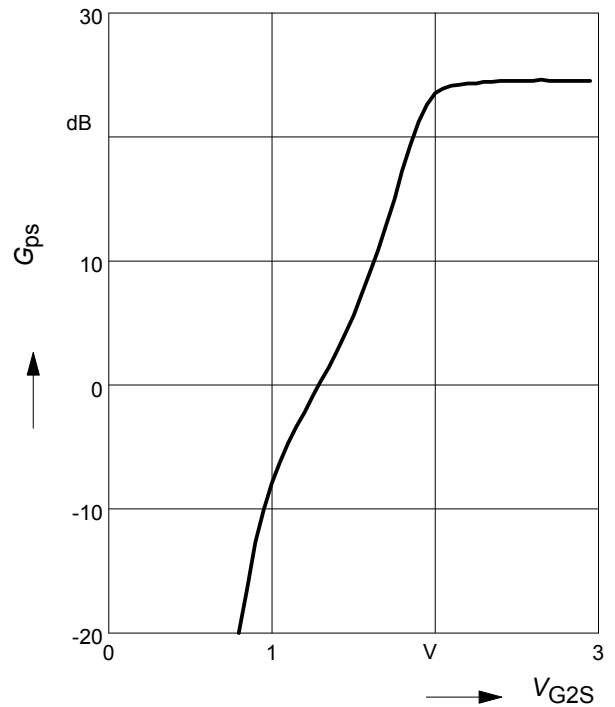
**Noise figure  $F = f(V_{G2S})$**

$f = 800 \text{ MHz}$



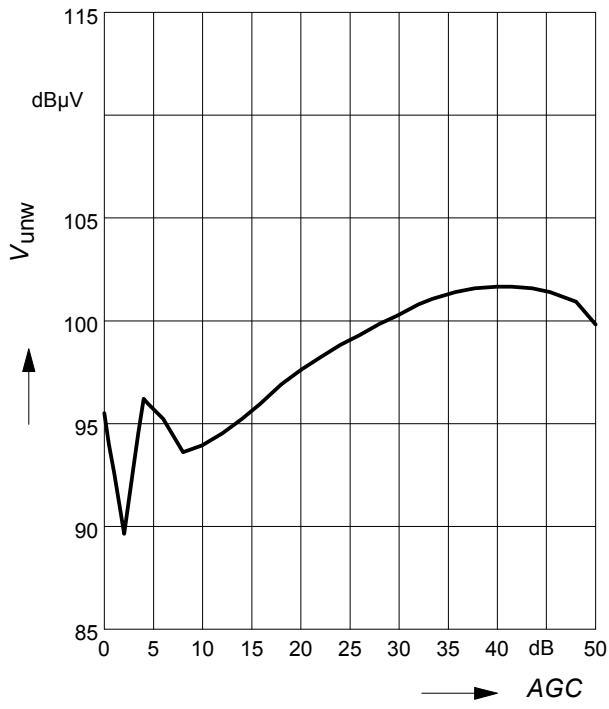
**Power gain  $G_{ps} = f(V_{G2S})$**

$f = 800 \text{ GHz}$

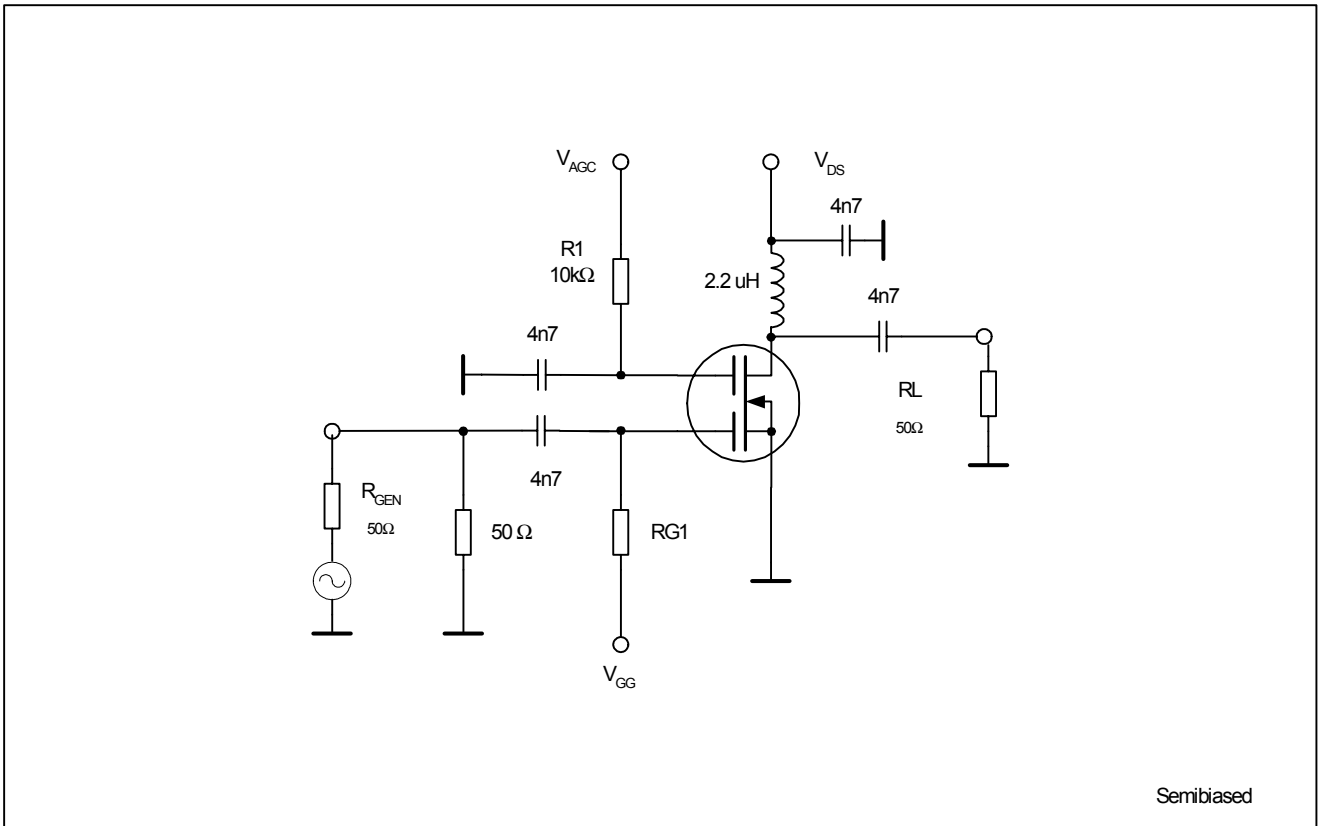


**Crossmodulation  $V_{unw} = (AGC)$**

$V_{DS} = 3\text{ V}$ ,  $R_{g1} = 68\text{ k}\Omega$

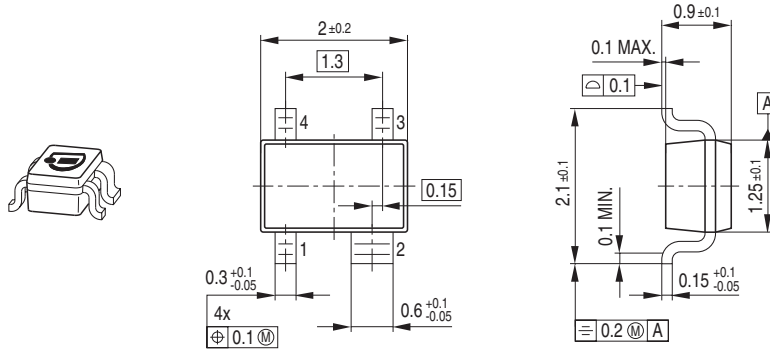


Crossmodulation test circuit

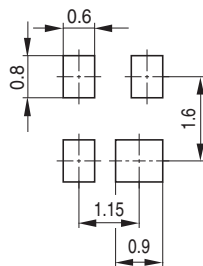




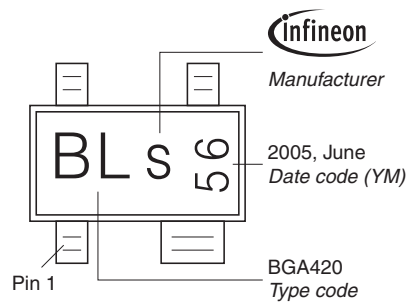
Package Outline



Foot Print

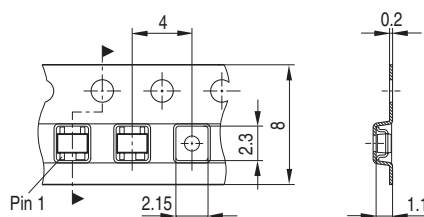


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel  
 Reel ø330 mm = 10.000 Pieces/Reel



Edition 2006-02-01  
Published by  
Infineon Technologies AG  
81726 München, Germany  
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