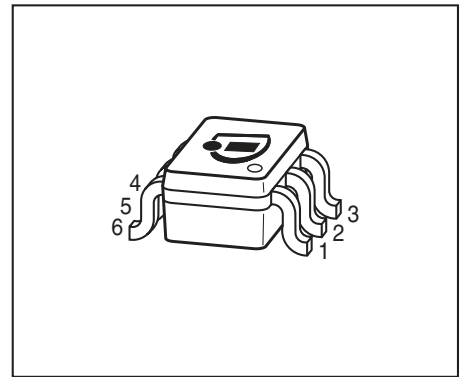
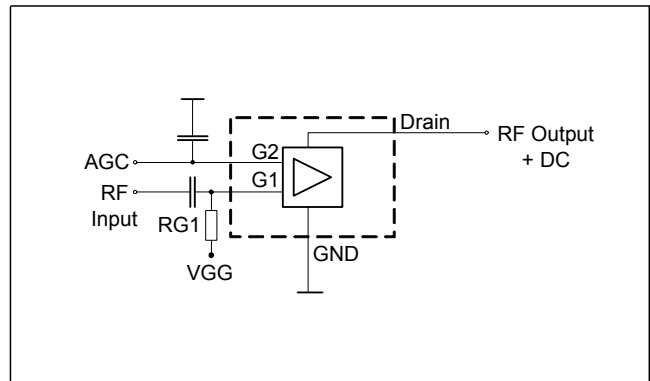
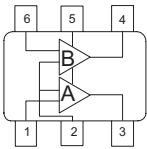


DUAL - N-Channel MOSFET Tetrode

- 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
- Biasing network partially integrated


BG5130R


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

Type	Package	Pin Configuration						Marking
BG5130R	SOT363	1=G1*	2=S	3=D*	4=D**	5=G2	6=G1**	KYs

* For amp. A; ** for amp. B

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 ¹⁾	R_{thchs}	≤ 280	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC Characteristics

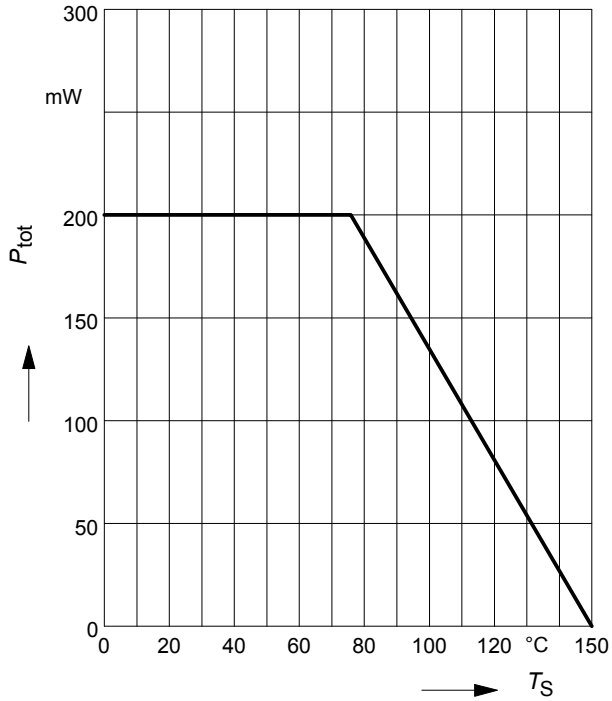
Drain-source breakdown voltage $I_D = 1 \mu\text{A}$, $V_{G1S} = 0$, $V_{G2S} = 0$	$V_{(BR)DS}$	12	-	-	V
Gate1-source breakdown voltage $+I_{G1S} = 10 \text{ mA}$, $V_{G2S} = 0$, $V_{DS} = 0$	$+V_{(BR)G1SS}$	6	-	15	
Gate2-source breakdown voltage $+I_{G2S} = 10 \text{ mA}$, $V_{G1S} = 0$, $V_{DS} = 0$	$+V_{(BR)G2SS}$	6	-	15	
Gate1-source leakage current $V_{G1S} = 6 \text{ V}$, $V_{G2S} = 0$	$+I_{G1SS}$	-	-	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 $V_{DS} = 3 \text{ V}$, $V_{G2S} = 3 \text{ V}$, $R_{G1} = 100 \text{ k}\Omega$	I_{DSX}	-	10	-	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	-	

¹⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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

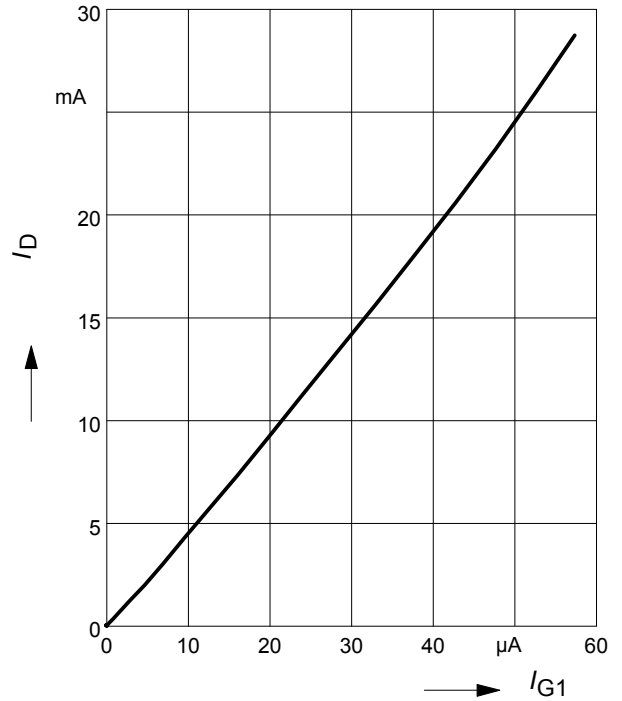
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics - (verified by random sampling)					
Forward transconductance $V_{DS} = 3\text{ V}$, $V_{G2S} = 3\text{ V}$	g_{fs}	-	41	-	mS
Gate1 input capacitance $V_{DS} = 3\text{ V}$, $V_{G2S} = 3\text{ V}$, $f = 10\text{ MHz}$	C_{g1ss}	-	2.7	-	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 $V_{DS} = 3\text{ V}$, $V_{G2S} = 3\dots 0\text{ V}$, $f = 800\text{ MHz}$	ΔG_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 $P_{tot} = f(T_S)$

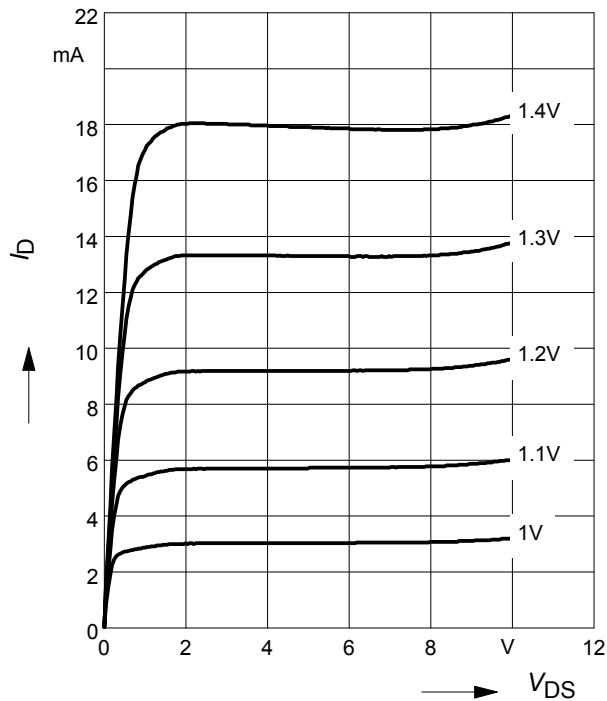


Drain current $I_D = f(I_{G1})$

$V_{G2S} = 3V$



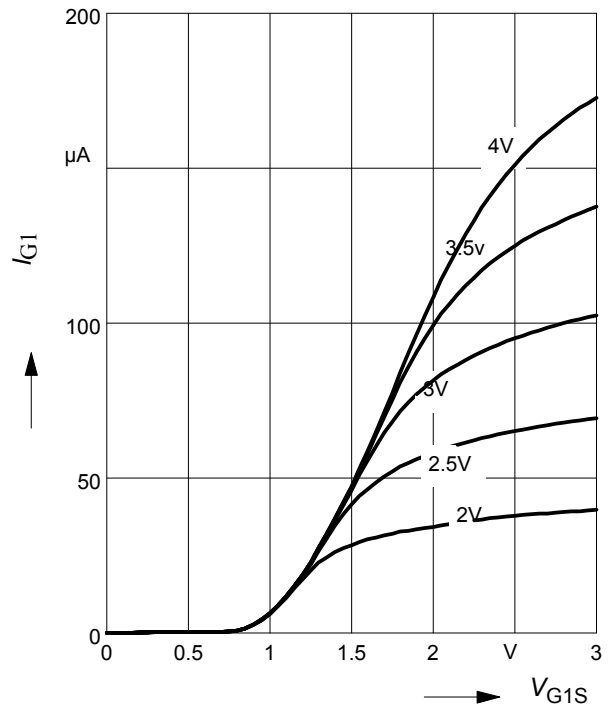
Output characteristics $I_D = f(V_{DS})$



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

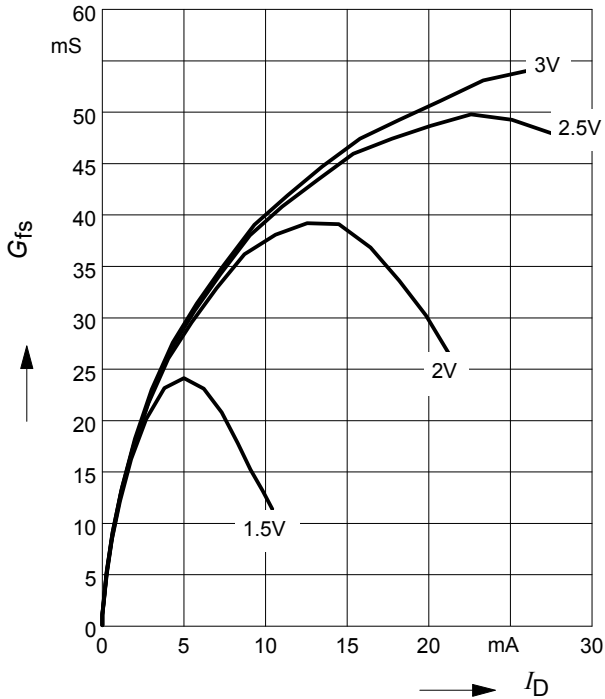
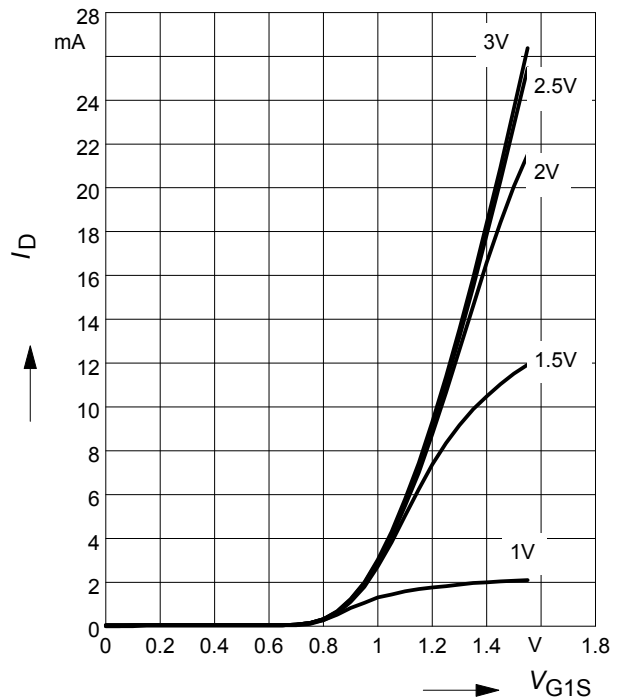
$V_{DS} = 3V$

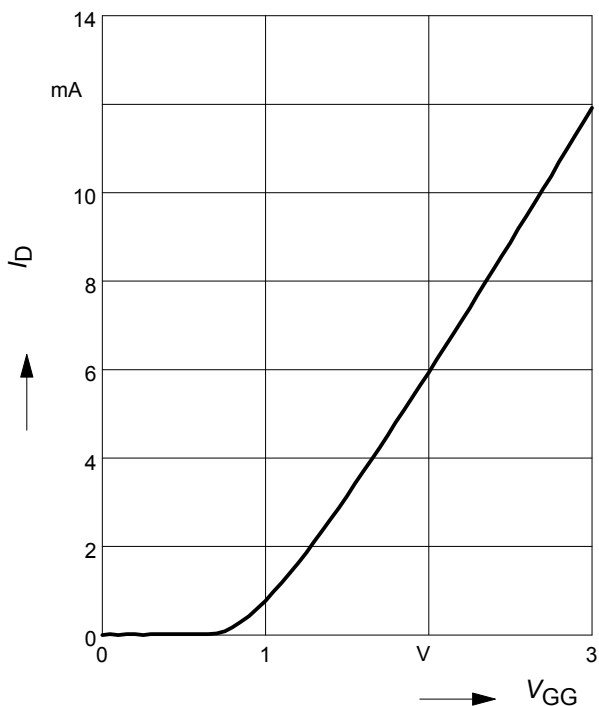
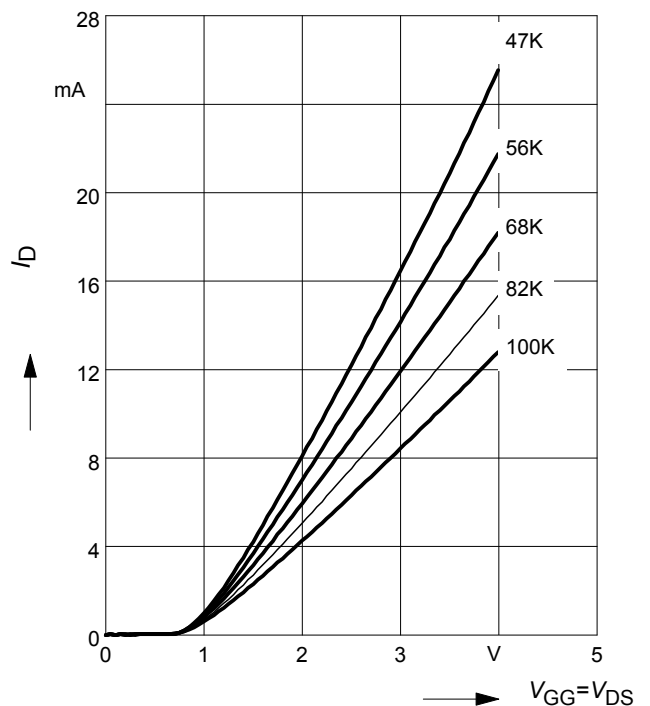
$V_{G2S} = \text{Parameter}$

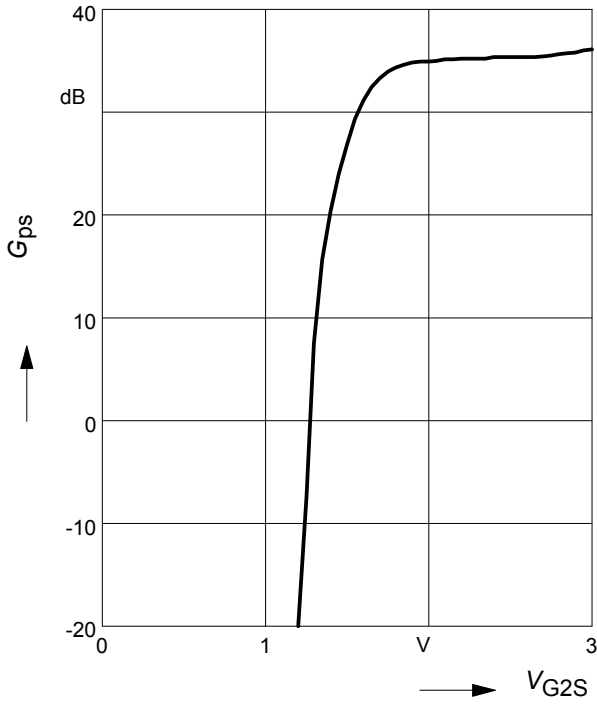
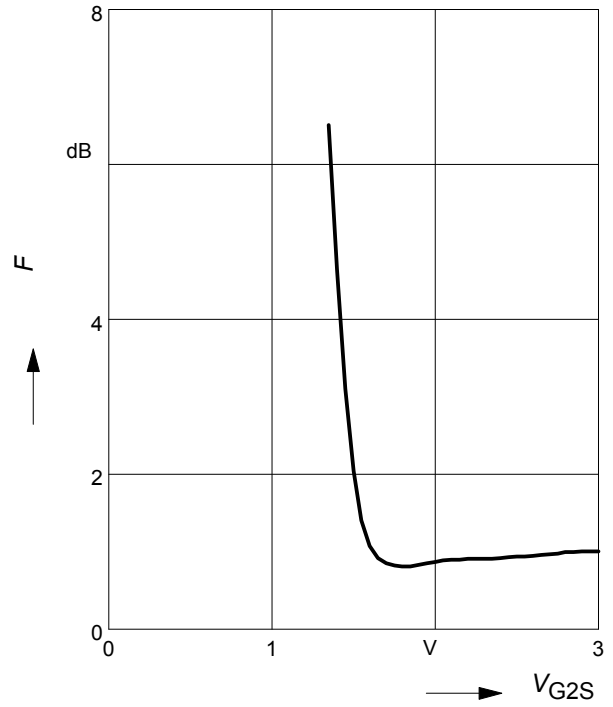
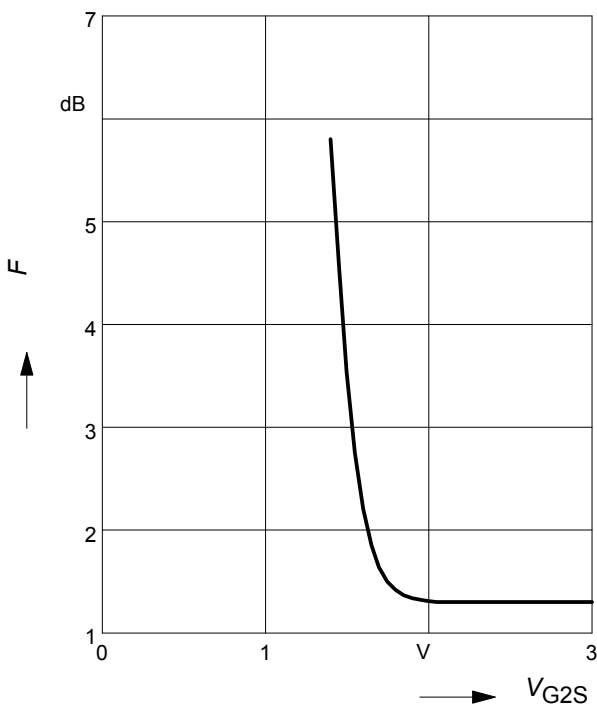
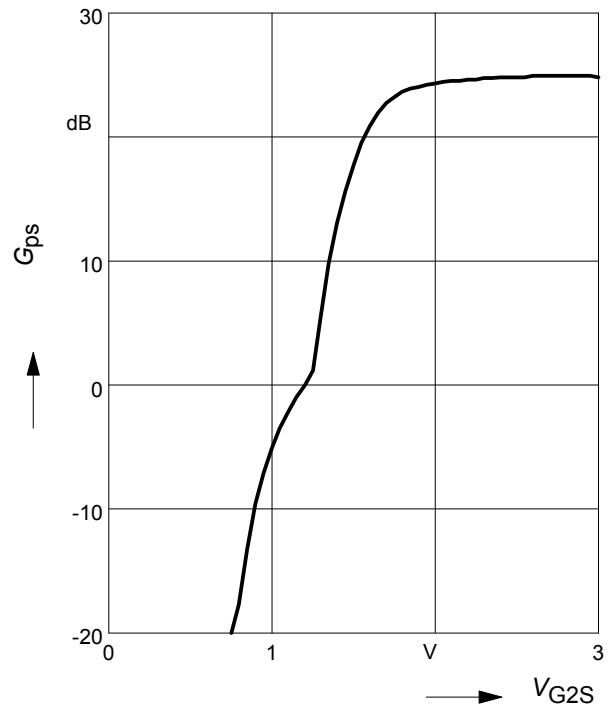


Gate 1 forward transconductance

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

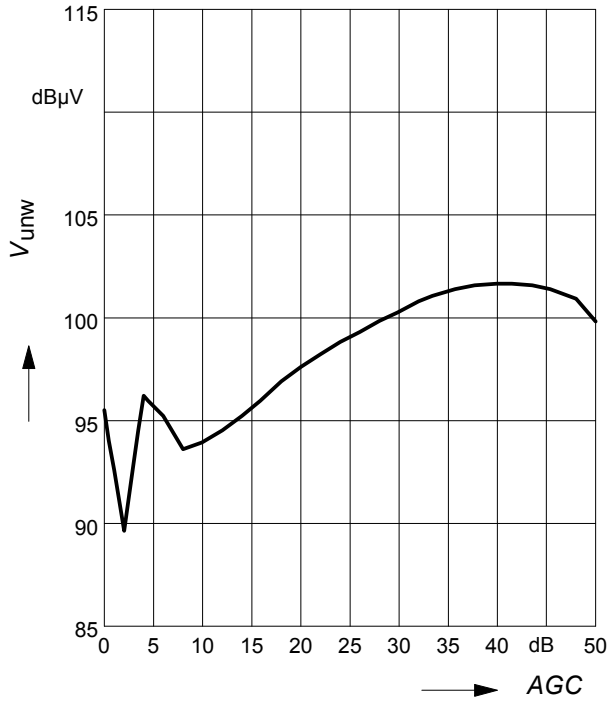
 $V_{DS} = 3V, V_{G2S} = \text{Parameter}$

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


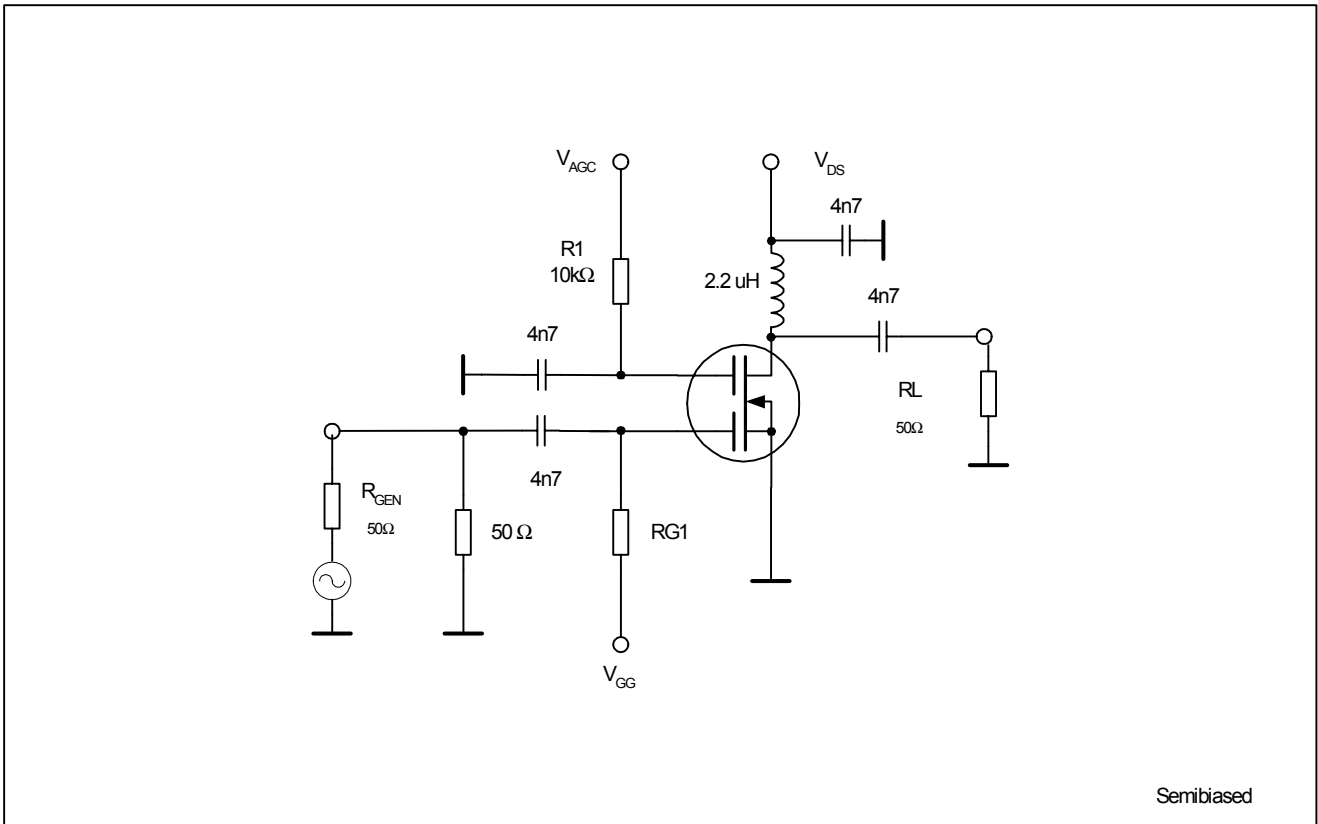
Power gain $G_{ps} = f(V_{G2S})$
 $f = 45 \text{ MHz}$

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 $V_{unw} = (AGC)$

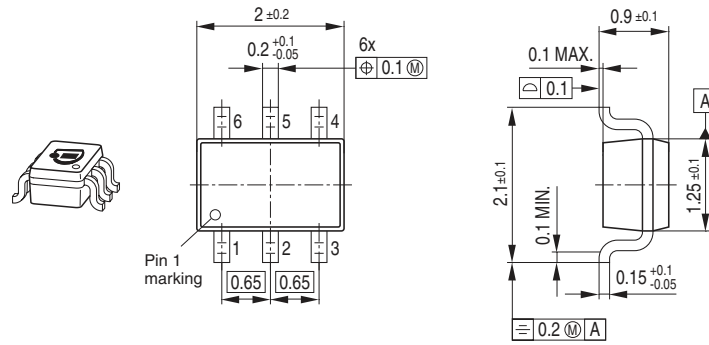
$V_{DS} = 3\text{ V}$, $R_{g1} = 68\text{ k}\Omega$



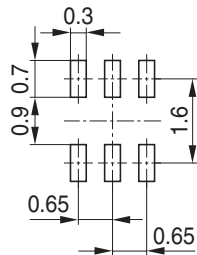
Crossmodulation test circuit



Package Outline

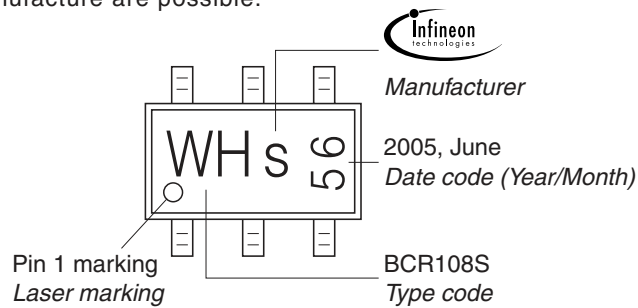


Foot Print



Marking Layout (Example)

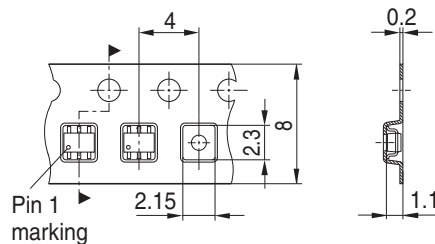
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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