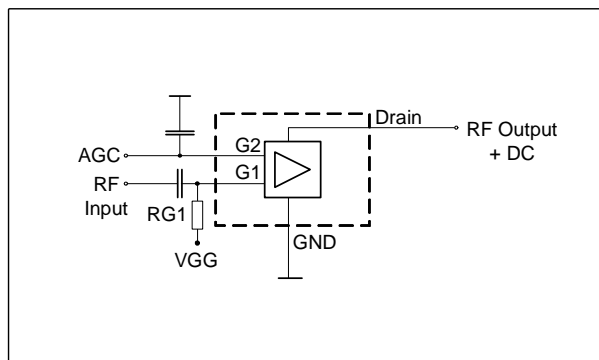
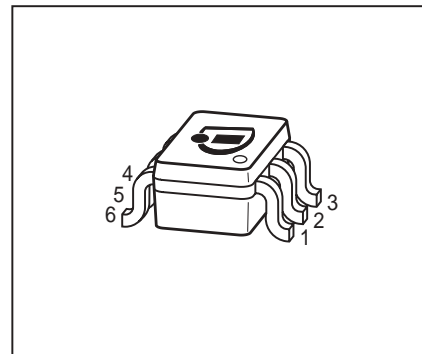
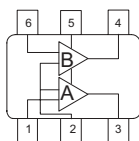


## DUAL N-Channel MOSFET Tetrode

- Two gain controlled input stage for UHF and VHF -tuners e.g. (NTSC, PAL)
- Two AGC amplifiers in one single package
- Integrated gate protection diodes
- High AGC-range, low noise figure, high gain
- Improved cross modulation at gain reduction
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



### BG3130 BG3130R



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

Type	Package	Pin Configuration						Marking
BG3130	SOT363	1=G1*	2=G2	3=D*	4=D**	5=S	6=G1**	KAs
BG3130R	SOT363	1=G1*	2=S	3=D*	4=D**	5=G2	6=G1**	KHs

\* For amp. A; \*\* for amp. B  
180° rotated tape loading orientation available

**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	$P_{tot}$	200	mW
Storage temperature	$T_{stg}$	-55 ... 150	°C
Channel temperature	$T_{ch}$	150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Channel - soldering point <sup>1)</sup>	$R_{thchs}$	≤ 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

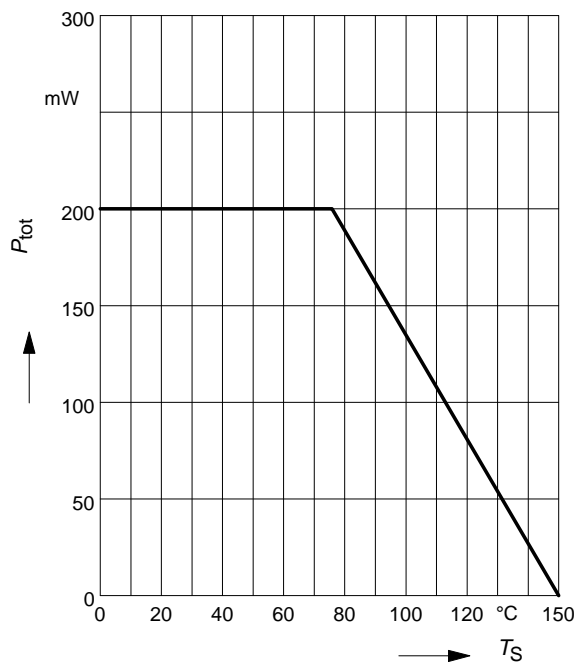
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain-source breakdown voltage $I_D = 10\ \mu\text{A}$ , $V_{G1S} = 0\ \text{V}$ , $V_{G2S} = 0\ \text{V}$	$V_{(\text{BR})\text{DS}}$	12	-	-	V
Gate1-source breakdown voltage $+I_{G1S} = 10\ \text{mA}$ , $V_{G2S} = 0\ \text{V}$ , $V_{\text{DS}} = 0\ \text{V}$	$+V_{(\text{BR})\text{G1SS}}$	6	-	15	
Gate2-source breakdown voltage $+I_{G2S} = 10\ \text{mA}$ , $V_{G1S} = 0\ \text{V}$ , $V_{\text{DS}} = 0\ \text{V}$	$+V_{(\text{BR})\text{G2SS}}$	6	-	15	
Gate1-source leakage current $V_{G1S} = 6\ \text{V}$ , $V_{G2S} = 0\ \text{V}$	$+I_{G1SS}$	-	-	50	$\mu\text{A}$
Gate2-source leakage current $V_{G2S} = 8\ \text{V}$ , $V_{G1S} = 0\ \text{V}$ , $V_{\text{DS}} = 0\ \text{V}$	$+I_{G2SS}$	-	-	50	nA
Drain current $V_{\text{DS}} = 5\ \text{V}$ , $V_{G1S} = 0\ \text{V}$ , $V_{G2S} = 4.5\ \text{V}$	$I_{\text{DSS}}$	-	-	10	$\mu\text{A}$
Drain-source current $V_{\text{DS}} = 5\ \text{V}$ , $V_{G2S} = 4\ \text{V}$ , $R_{G1} = 120\ \text{k}\Omega$	$I_{\text{DSX}}$	-	10	-	mA
Gate1-source pinch-off voltage $V_{\text{DS}} = 5\ \text{V}$ , $V_{G2S} = 4\ \text{V}$ , $I_D = 20\ \mu\text{A}$	$V_{G1S(\text{p})}$	-	0.7	-	V
Gate2-source pinch-off voltage $V_{\text{DS}} = 5\ \text{V}$ , $I_D = 20\ \mu\text{A}$	$V_{G2S(\text{p})}$	-	0.6	-	

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics $V_{DS} = 5V$ , $V_{G2S} = 4V$ , ( $I_D = 14\text{ mA}$ ) (verified by random sampling)					
Forward transconductance	$g_{fs}$	-	33	-	mS
Gate1 input capacitance $f = 10\text{ MHz}$	$C_{g1ss}$	-	1.9	-	pF
Output capacitance $f = 10\text{ MHz}$	$C_{dss}$	-	1.1	-	
Power gain $f = 800\text{ MHz}$ $f = 45\text{ MHz}$	$G_p$	- -	24 31	- -	dB
Noise figure $f = 800\text{ MHz}$ $f = 45\text{ MHz}$	$F$	- -	1.3 1.7	- -	
Gain control range $V_{G2S} = 4 \dots 0\text{ V}$ , $f = 800\text{ MHz}$	$\Delta G_p$	45	-	-	
Cross-modulation $k=1\%$ , $f_w=50\text{MHz}$ , $f_{unw}=60\text{MHz}$ AGC = 0 dB AGC = 10 dB AGC = 40 dB	$X_{mod}$	90 - 96	- 87 100	- - -	-

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

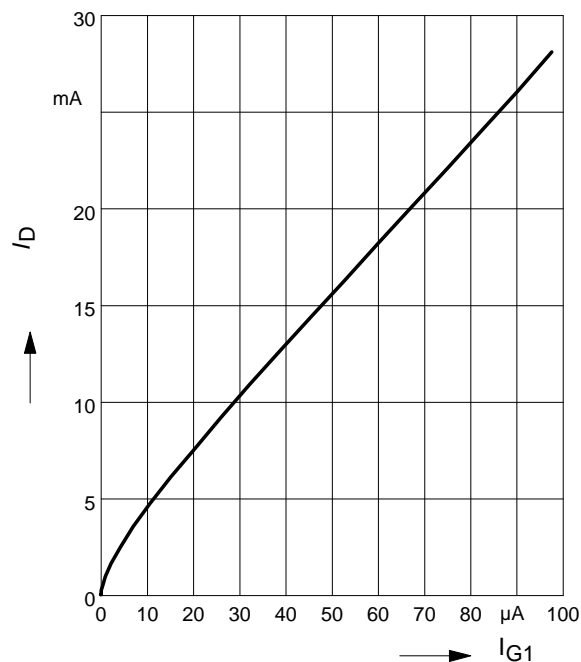
amp. A = amp. B



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

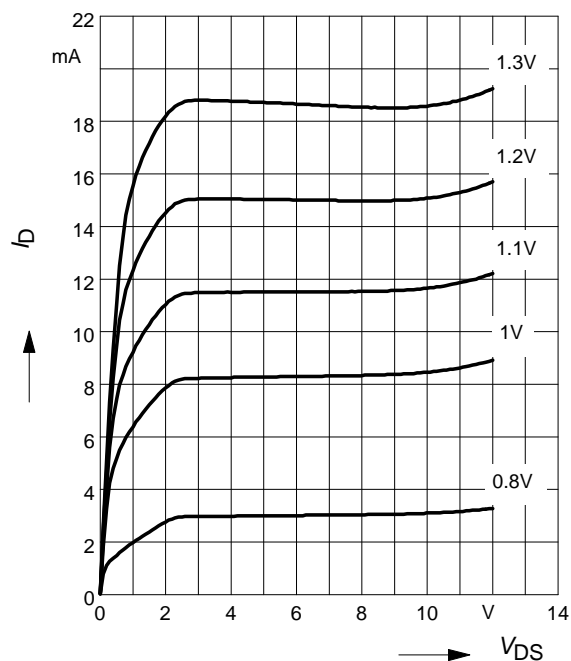
$V_{G2S} = 4V$

amp. A = amp. B



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

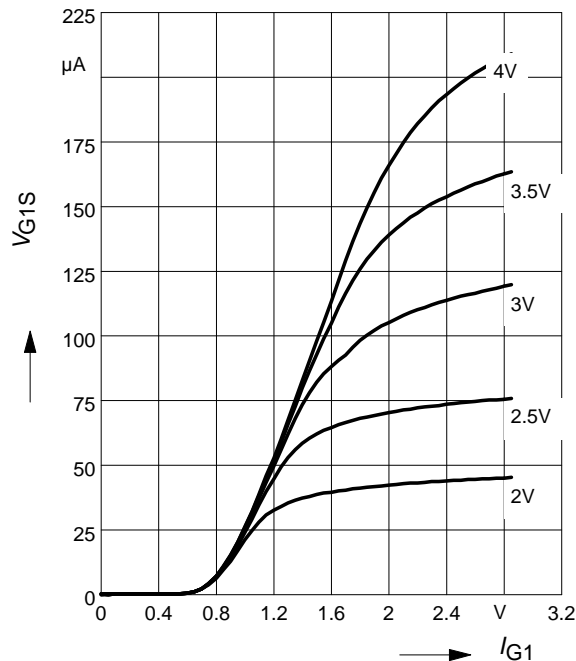
amp. A = amp. B



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

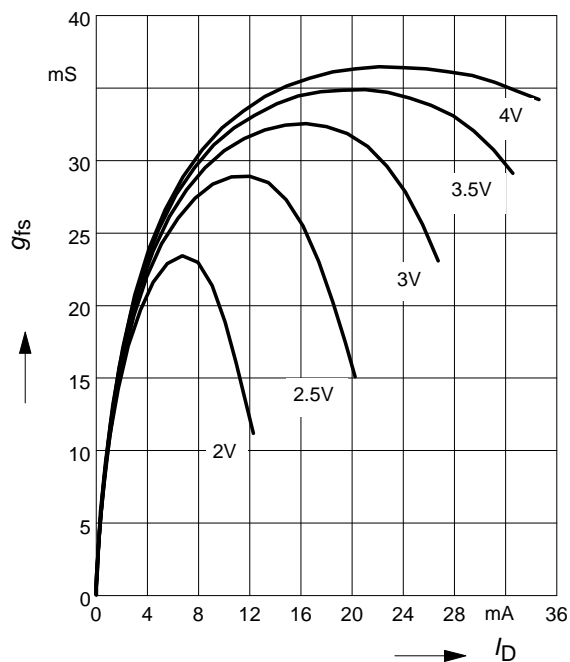
$V_{DS} = 5V$ ,  $V_{G2S} = \text{Parameter}$

amp. A = amp. B

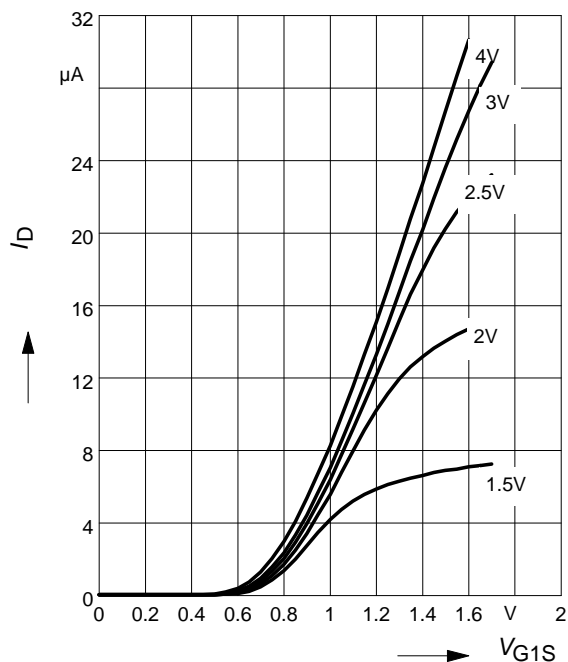


**Gate 1 forward transconductance**

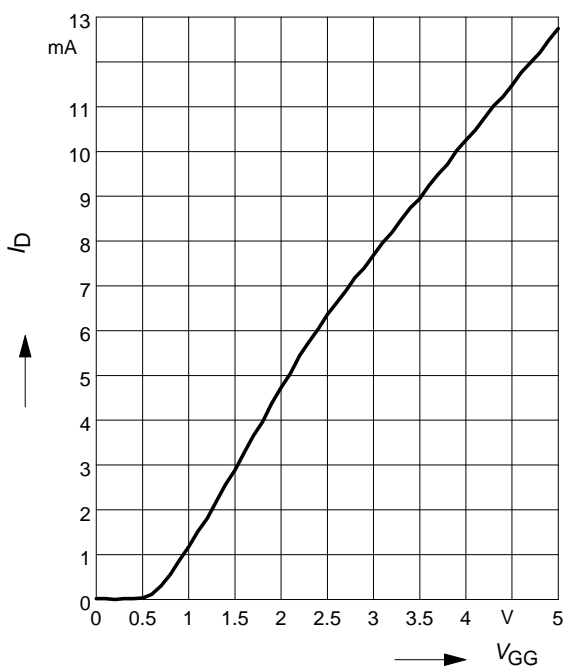
$g_{fs} = f(I_D)$ ,  $V_{DS} = 5V$ ,  $V_{G2S} = \text{Parameter}$   
amp. A = amp. B


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

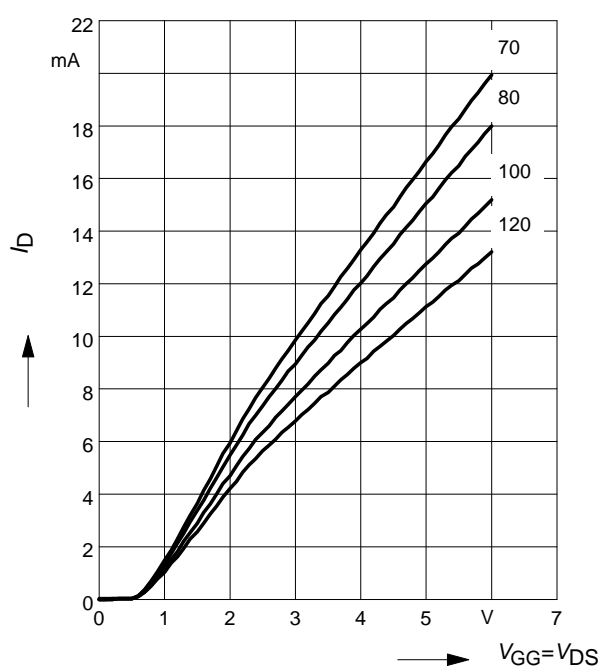
$V_{DS} = 5V$ ,  $V_{G2S} = \text{Parameter}$   
amp. A = amp. B

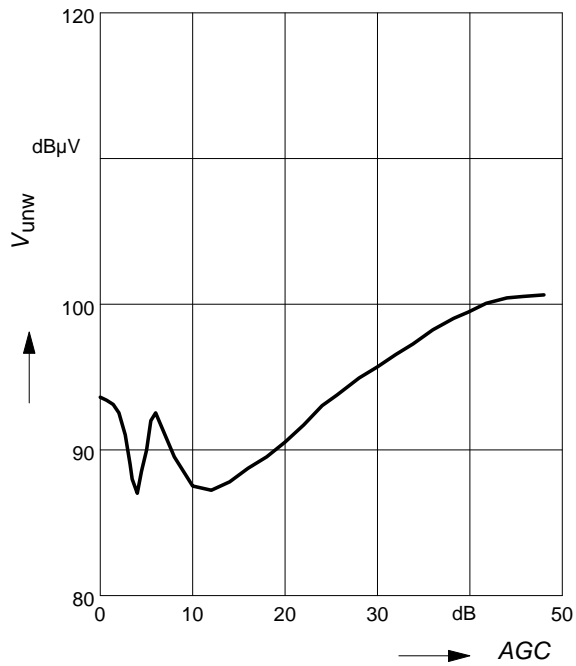

**Drain current  $I_D = f(V_{GG})$  amp.A=amp.B**

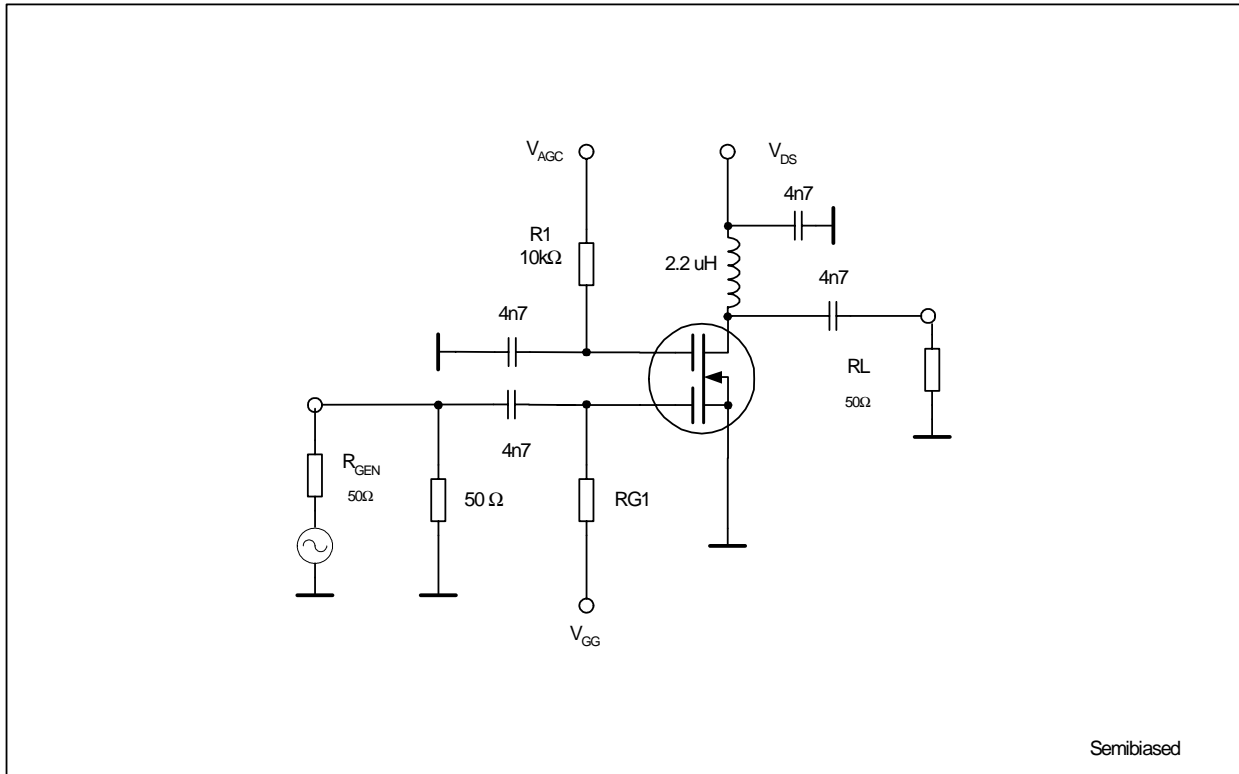
$V_{DS} = 5V$ ,  $V_{G2S} = 4V$ ,  $R_{G1} = 120k\Omega$   
(connected to  $V_{GG}$ ,  $V_{GG} = \text{gate1 supply voltage}$ )


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

$V_{G2S} = 4V$ ,  $R_{G1} = \text{Parameter in } k\Omega$   
amp. A = amp. B

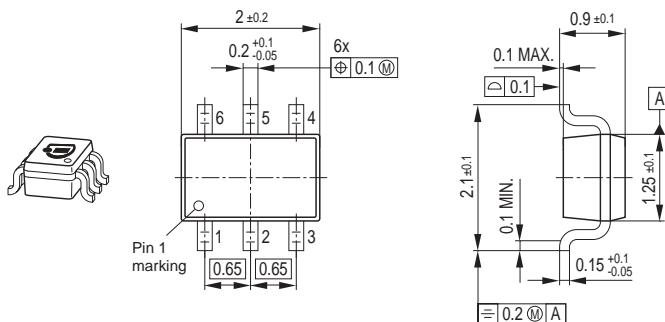


**Crossmodulation  $V_{unw} = (AGC)$** 
 $V_{DS} = 5 \text{ V}, R_{g1} = 68 \text{ k}\Omega$ 


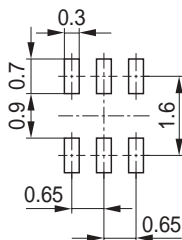
**Crossmodulation test circuit**




## Package Outline

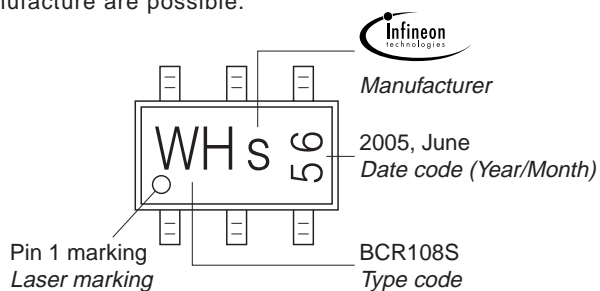


## Foot Print



## Marking Layout (Example)

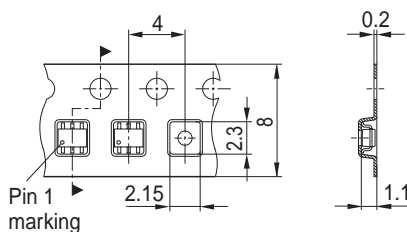
Small variations in positioning of Date code, Type code and Manufacture are possible.



## 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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