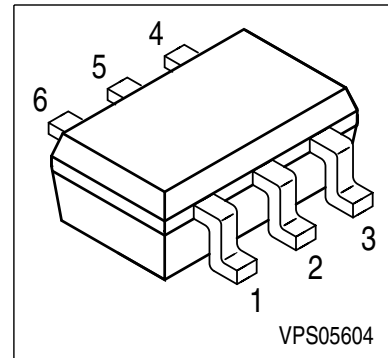
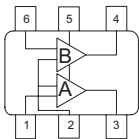
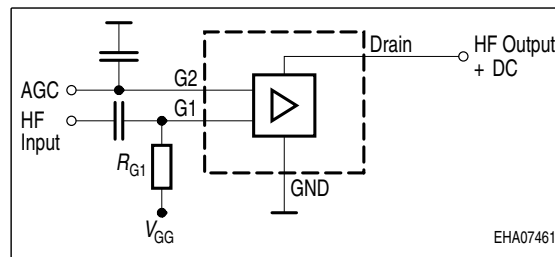
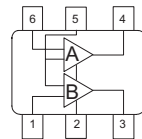


DUAL N-Channel MOSFET Tetrode

- 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


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

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 ¹⁾	R_{thchs}	≤ 280	K/W

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

Electrical Characteristics

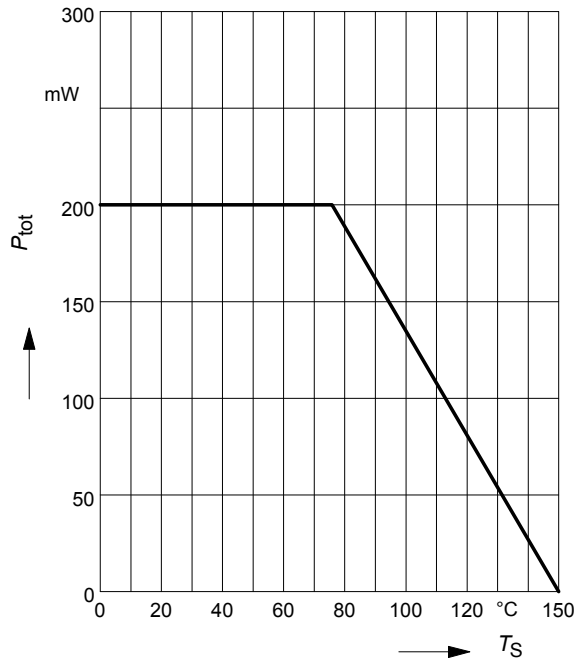
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain-source breakdown voltage $I_D = 10 \mu\text{A}$, $V_{G1S} = 0 \text{ V}$, $V_{G2S} = 0 \text{ V}$	$V_{(BR)DS}$	12	-	-	V
Gate1-source breakdown voltage $+I_{G1S} = 10 \text{ mA}$, $V_{G2S} = 0 \text{ V}$, $V_{DS} = 0 \text{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

Electrical Characteristics

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

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

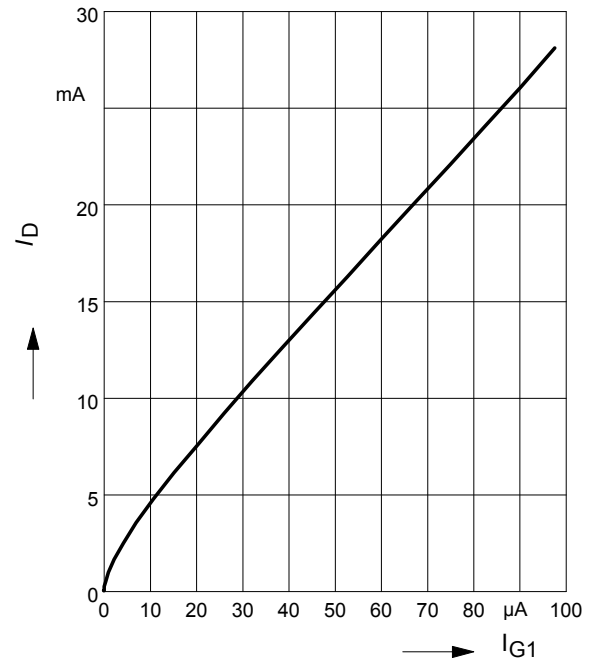
amp. A = amp. B



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

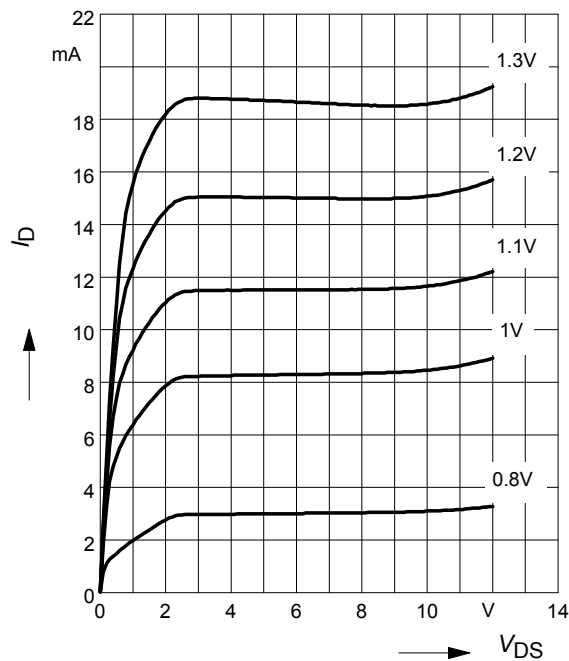
$V_{G2S} = 4V$

amp. A = amp. B



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

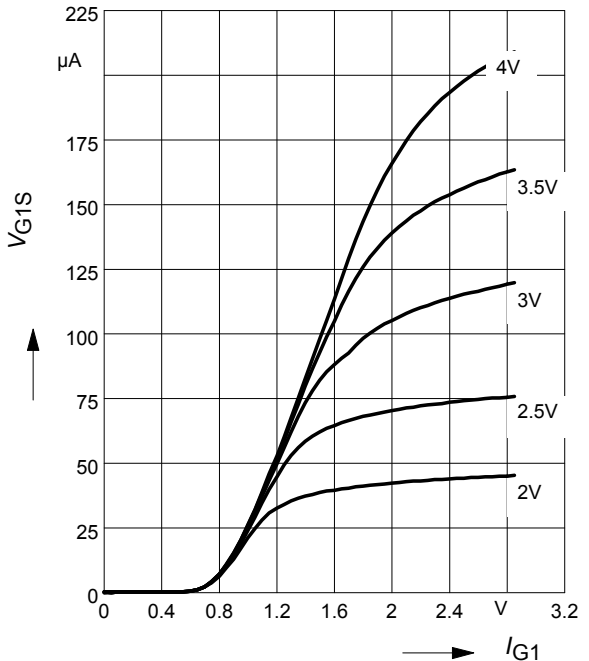
amp. A = amp. B



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

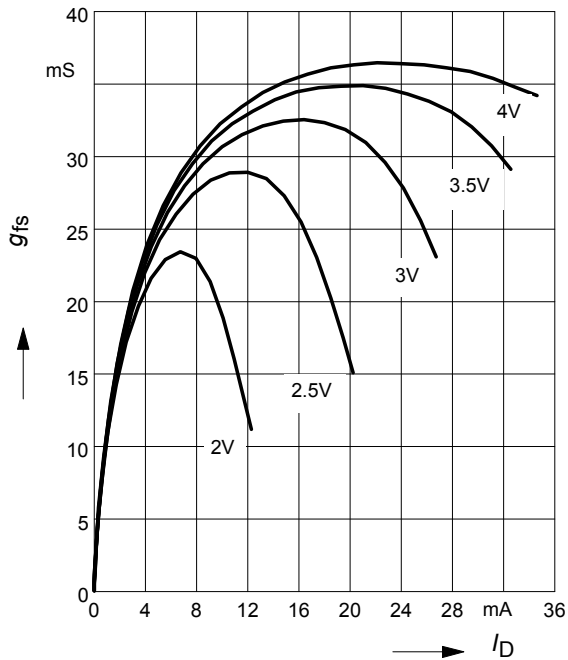
$V_{DS} = 5V, V_{G2S} = \text{Parameter}$

amp. A = amp. B



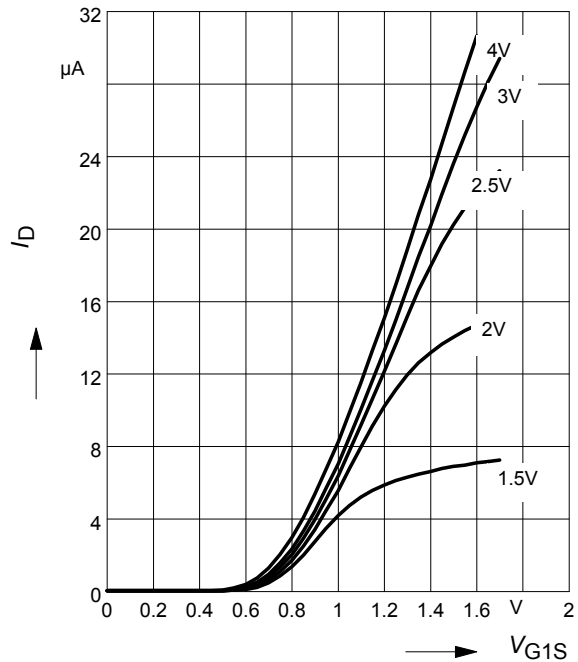
Gate 1 forward transconductance

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



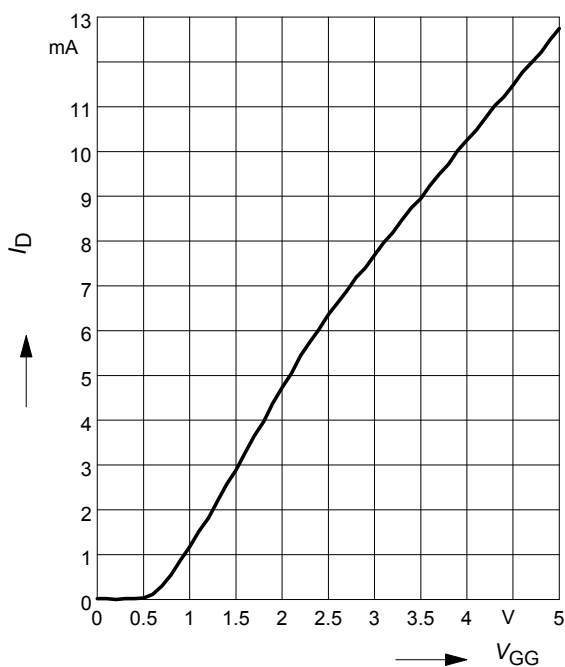
Drain current $I_D = f(V_{G1S})$

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



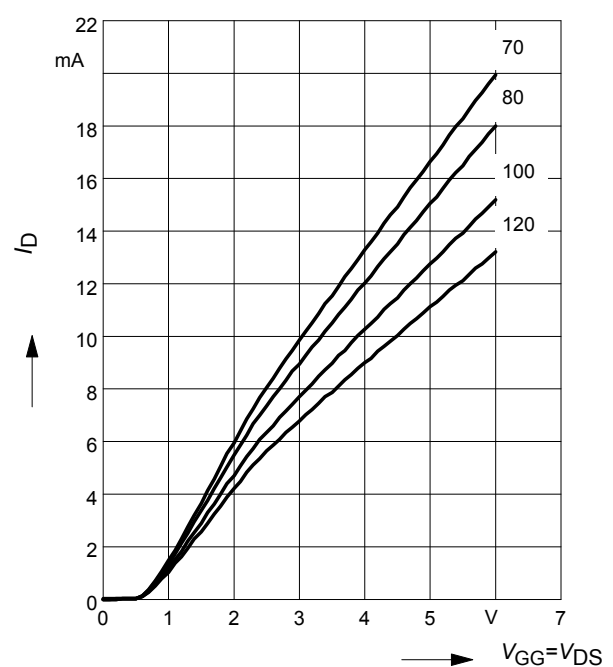
Drain current $I_D = f(V_{GG})$ amp.A=amp.B

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



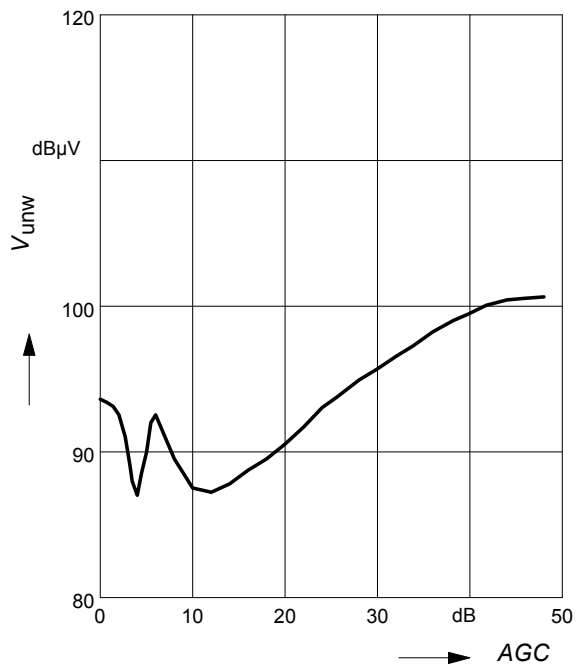
Drain current $I_D = f(V_{GG})$

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



Crossmodulation $V_{unw} = (AGC)$

$V_{DS} = 5\text{ V}$, $R_{g1} = 68\text{ k}\Omega$



Crossmodulation test circuit

