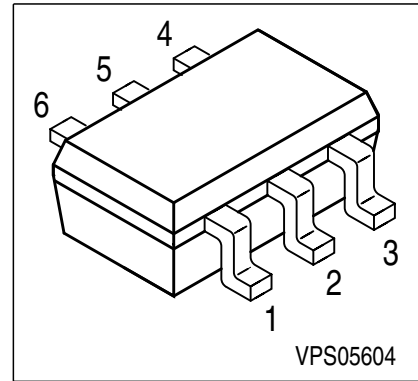
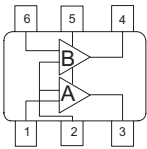
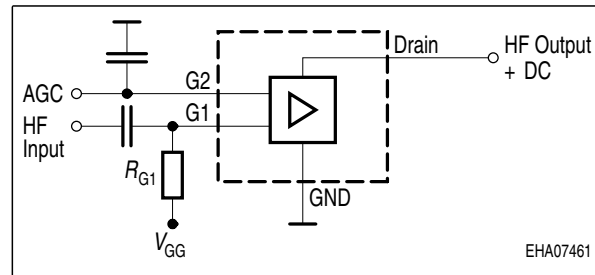
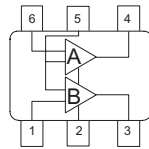


**DUAL N-Channel MOSFET Tetrode**

- Low noise gain controlled input stages of UHF- and VHF-tuners with 5V supply voltage
- Two AGC amplifiers in one single package
- Integrated gate protection diodes
- Low noise figure
- High gain, high forward transadmittance
- Improved cross modulation at gain reduction
- High AGC-range


**BG3140**

**BG3140R**


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

Type	Package	Pin Configuration						Marking
BG3140	SOT363	1=G1	2=G2	3=D	4=D	5=S	6=G1	KDs
BG3140R	SOT363	1=G1	2=S	3=D	4=D	5=G2	6=G1	KKs

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, $T_S \leq 78^\circ\text{C}$	$P_{tot}$	160	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>	$R_{thchs}$	$\leq 280$	K/W

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

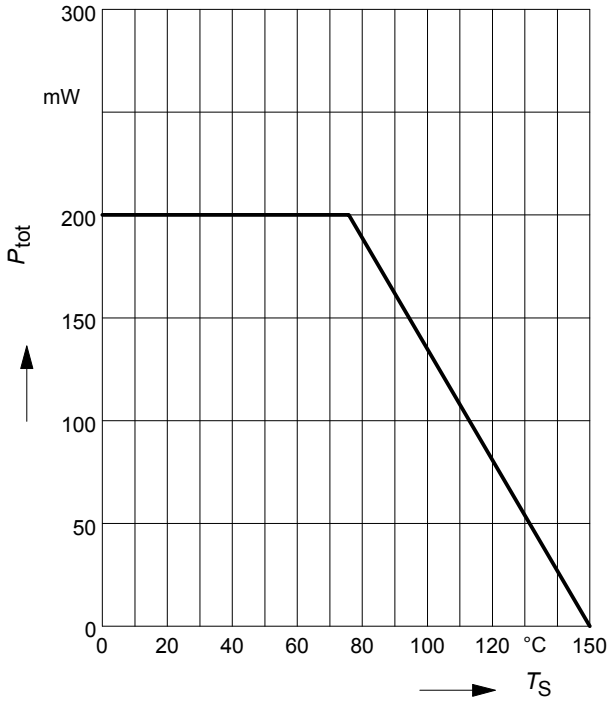
**Electrical Characteristics**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics</b>					
Drain-source breakdown voltage $I_D = 10 \mu\text{A}$ , $V_{G1S} = 0$ , $V_{G2S} = 0$	$V_{(BR)DS}$	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	$\mu\text{A}$
Gate2-source leakage current $V_{G2S} = 8 \text{ V}$ , $V_{G1S} = 0$ , $V_{DS} = 0$	$+I_{G2SS}$	-	-	50	nA
Drain current $V_{DS} = 5 \text{ V}$ , $V_{G1S} = 0$ , $V_{G2S} = 4.5 \text{ V}$	$I_{DSS}$	-	-	10	$\mu\text{A}$
Drain-source current $V_{DS} = 5 \text{ V}$ , $V_{G2S} = 4 \text{ V}$ , $R_{G1} = 70 \text{ k}\Omega$	$I_{DSX}$	-	15	-	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**

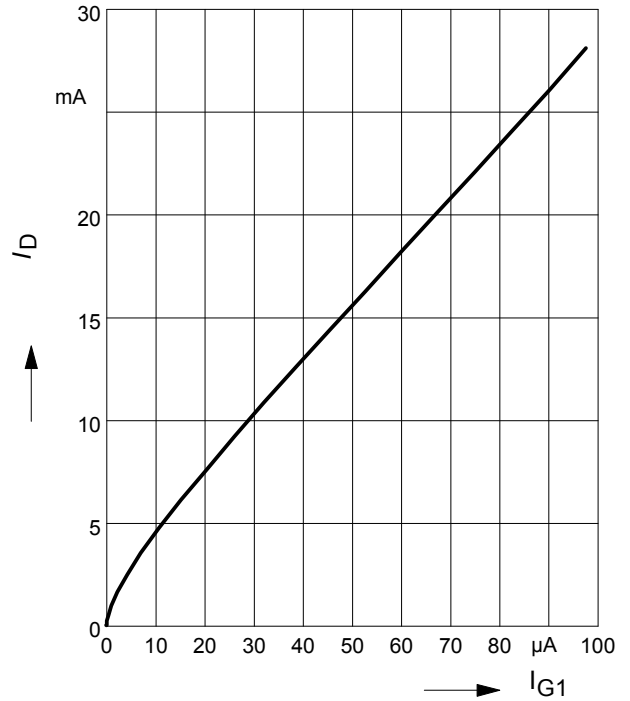
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics - (verified by random sampling)</b>					
Forward transconductance $V_{DS} = 5\text{ V}, V_{G2S} = 4\text{ V}$	$g_{fs}$	-	42	-	mS
Gate1 input capacitance $V_{DS} = 5\text{ V}, V_{G2S} = 4\text{ V}, f = 1\text{ MHz}$	$C_{g1ss}$	-	1.9	-	pF
Output capacitance $V_{DS} = 5\text{ V}, V_{G2S} = 4\text{ V}, f = 100\text{ MHz}$	$C_{dss}$	-	1.1	-	
Power gain (self biased) $V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, V_{G2S} = 4\text{ V}, f = 800\text{ MHz}$ $V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, V_{G2S} = 4\text{ V}, f = 45\text{ MHz}$	$G_p$	-	24	-	dB
		-	31	-	
Noise figure $V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, V_{G2S} = 4\text{ V}, f = 800\text{ MHz}$ $V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, V_{G2S} = 4\text{ V}, f = 45\text{ MHz}$	$F$	-	1.3	-	dB
		-	1.7	-	
Gain control range $V_{DS} = 5\text{ V}, V_{G2S} = 4...0\text{ V}, f = 800\text{ MHz}$	$\Delta G_p$	45	-	-	
Cross-modulation $k=1\%$ , $f_w=50\text{MHz}$ , $f_{unw}=60\text{MHz}$ AGC = 0 dB AGC = 10 dB AGC = 40 dB	$X_{mod}$	96	-	-	-
		-	86	-	
		96	100	-	

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

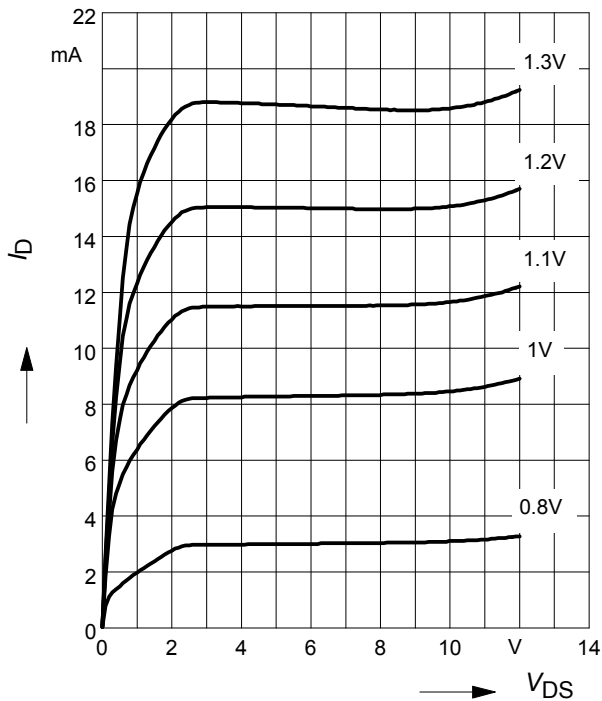


**Drain current  $I_D = f(I_{G1})$**

$V_{G2S} = 4V$



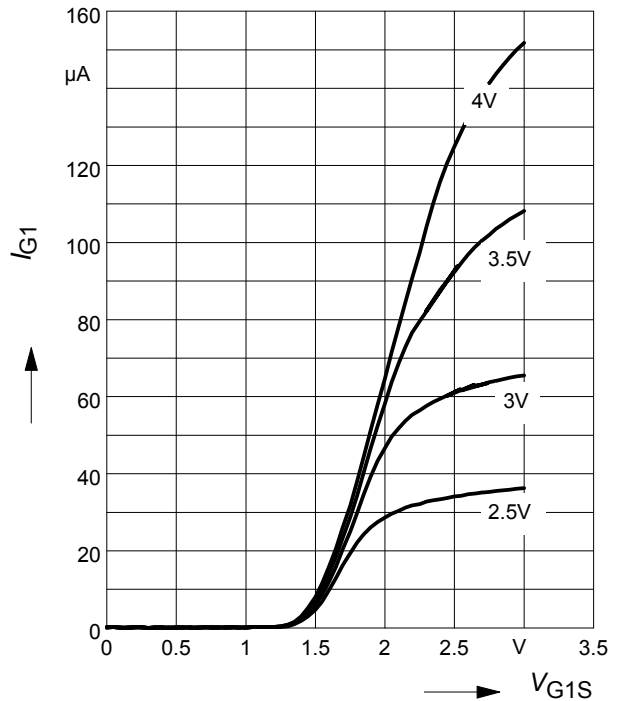
**Output characteristics  $I_D = f(V_{DS})$**



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

$V_{DS} = 5V$

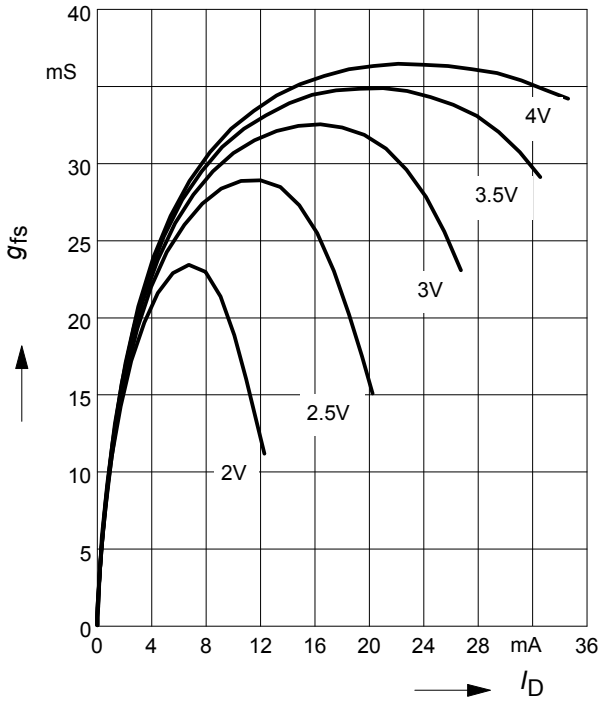
$V_{G2S} = \text{Parameter}$



**Gate 1 forward transconductance**

$g_{fs} = f(I_D)$

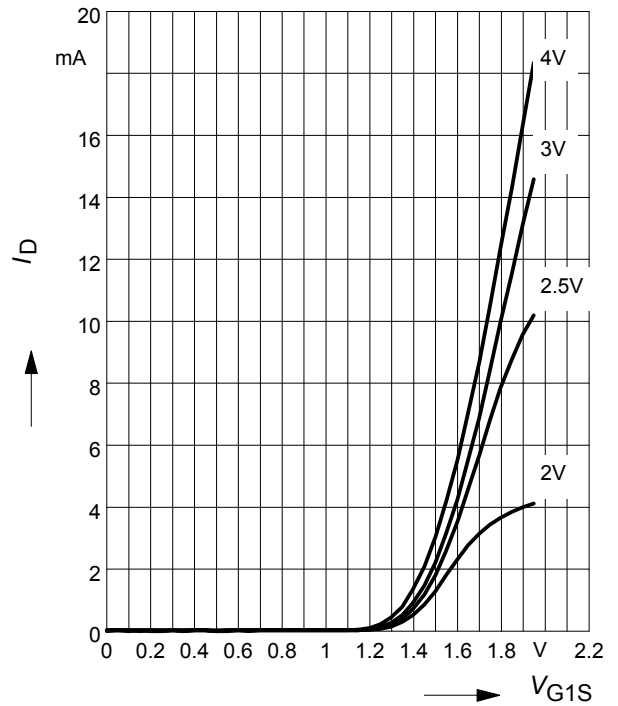
$V_{DS} = 5V, V_{G2S} = \text{Parameter}$



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

$V_{DS} = 5V$

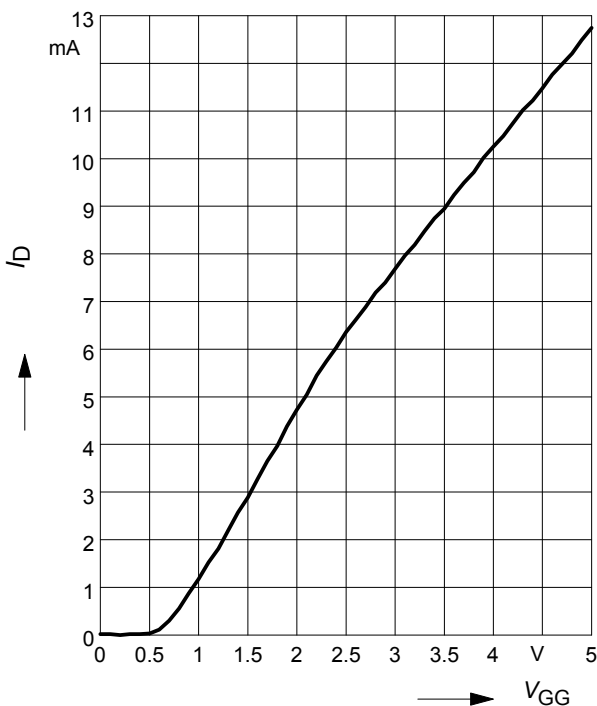
$V_{G2S} = \text{Parameter}$



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

$V_{DS} = 5V, V_{G2S} = 4V, R_{G1} = 80k\Omega$

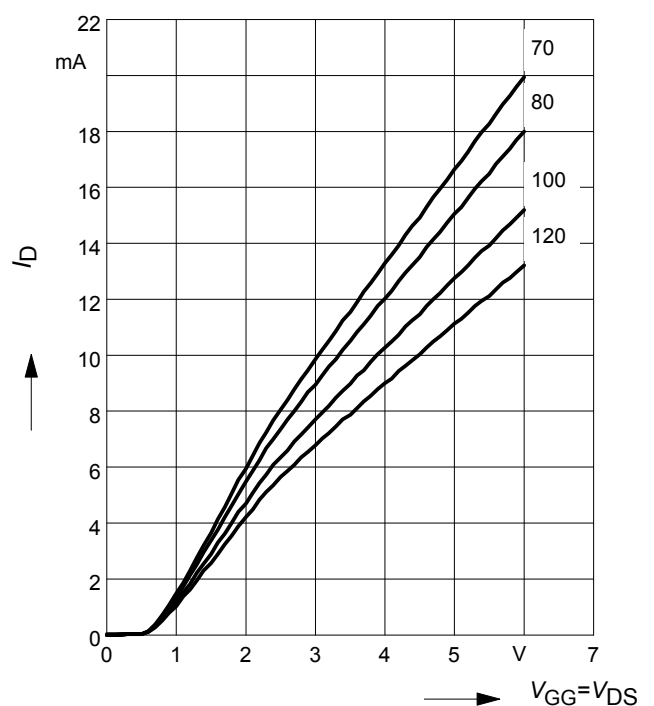
(connected to  $V_{GG}$ ,  $V_{GG} = \text{gate1 supply voltage}$ )



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

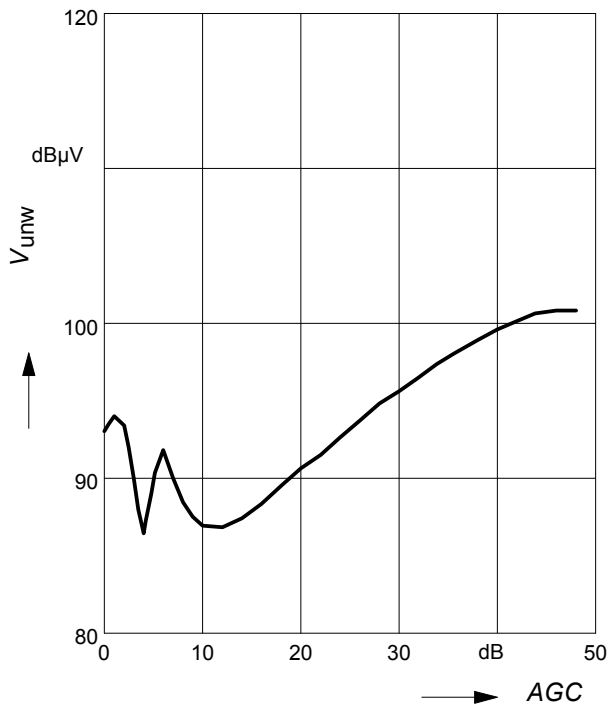
$V_{G2S} = 4V$

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



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

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



**Crossmodulation test circuit**

