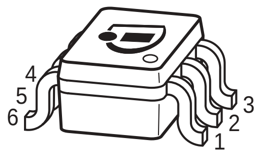
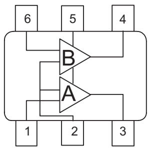
DUAL N-Channel MOSFET Tetrode



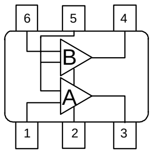
- Two gain controlled input stages for UHF and VHF -tuners e.g. (NTSC, PAL)
- Optimized for UHF (amp. B) and VHF (amp. A)
- Integrated gate protection diodes
- High AGC-range, low noise figure, high gain
- Improved cross modulation at gain reduction
- Pb-free (RoHS compliant) package
- Qualified according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

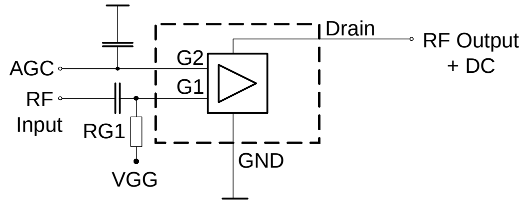
AEC Qualified RoHS

BG3123



BG3123R





ESD (**E**lectro**s**tatic **d**ischarge) sensitive device, observe handling precaution!

Type	Package	Pin Configuration						Marking
BG3123	SOT363	1=G1*	2=G2	3=D*	4=D**	5=S	6=G1**	KOs
BG3123R	SOT363	1=G1*	2=S	3=D*	4=D**	5=G2	6=G1**	KRs

* 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		mA
amp. A		25	
amp. B		20	
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}	$\leq$ 150	K/W

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

Electrical Characteristics at T_A = 25°C, unless otherwise specified

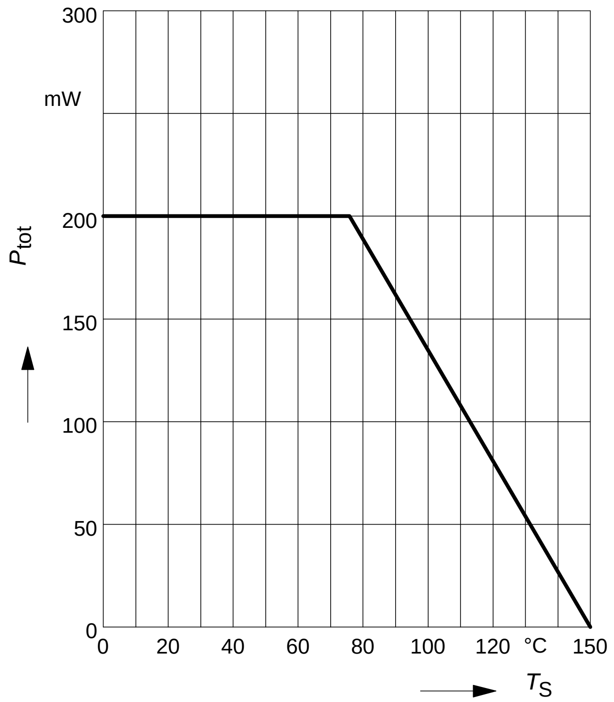
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain-source breakdown voltage I_D = 10 µA, V_{G1S} = 0 V, V_{G2S} = 0 V	$V_{(BR)DS}$	12	-	-	V
Gate1-source breakdown voltage $+I_{G1S}$ = 10 mA, V_{G2S} = 0 V, V_{DS} = 0 V	$+V_{(BR)G1SS}$	6	-	15	
Gate2-source breakdown voltage $+I_{G2S}$ = 10 mA, V_{G1S} = 0 V, V_{DS} = 0 V	$+V_{(BR)G2SS}$	6	-	15	
Gate1-source leakage current V_{G1S} = 6 V, V_{G2S} = 0 V	$+I_{G1SS}$	-	-	50	µA
Gate2-source leakage current V_{G2S} = 8 V, V_{G1S} = 0 V, V_{DS} = 0 V	$+I_{G2SS}$	-	-	50	nA
Drain current V_{DS} = 5 V, V_{G1S} = 0 V, V_{G2S} = 4.5 V	I_{DSS}	-	-	10	µA
Drain-source current	I_{DSX}				mA
V_{DS} = 5 V, V_{G2S} = 4 V, R_{G1} = 60 kΩ, amp. A		-	14	-	
V_{DS} = 5 V, V_{G2S} = 4 V, R_{G1} = 50 kΩ, amp. B		-	14	-	
Gate1-source pinch-off voltage V_{DS} = 5 V, V_{G2S} = 4 V, I_D = 20 µA	$V_{G1S(p)}$	-	0.7	-	V
Gate2-source pinch-off voltage V_{DS} = 5 V, I_D = 20 µA	$V_{G2S(p)}$	-	0.6	-	

Electrical Characteristics at T_A = 25°C, unless otherwise specified

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}				mS
amp. A		-	30	-	
amp. B		-	25	-	
Gate1 input capacitance	C_{g1ss}				pF
f = 10 MHz, amp. A		-	1.9	-	
f = 10 MHz, amp. B		-	1.5	-	
Output capacitance	C_{dss}				
f = 10 MHz, amp. A		-	1.3	-	
f = 10 MHz, amp. B		-	1.1	-	
Power gain	G_p				dB
f = 800 MHz, amp. A		-	25	-	
f = 800 MHz, amp. B		-	24	-	
f = 45 MHz, amp. A		-	32	-	
f = 45 MHz, amp. B		-	30	-	
Noise figure	F				dB
f = 800 MHz, amp. A		-	1.8	-	
f = 800 MHz, amp. B		-	1.8	-	
f = 45 MHz, amp. A		-	1.4	-	
f = 45 MHz, amp. B		-	1.6	-	
Gain control range V_{G2S} = 4 ... 0 V , f = 800 MHz	ΔG_p	45	-	-	
Cross-modulation k=1%, f_w=50MHz, f_{unw}=60MHz	X_{mod}				-
amp.A , AGC = 0 dB		90	96	-	
amp. B, AGC = 0 dB		90	97	-	
amp. A , AGC = 10 dB		-	91	-	
amp. B , AGC = 10 dB		-	94	-	
amp. A, AGC = 40 dB		98	103	-	
amp. B, AGC = 40 dB		98	104	-	

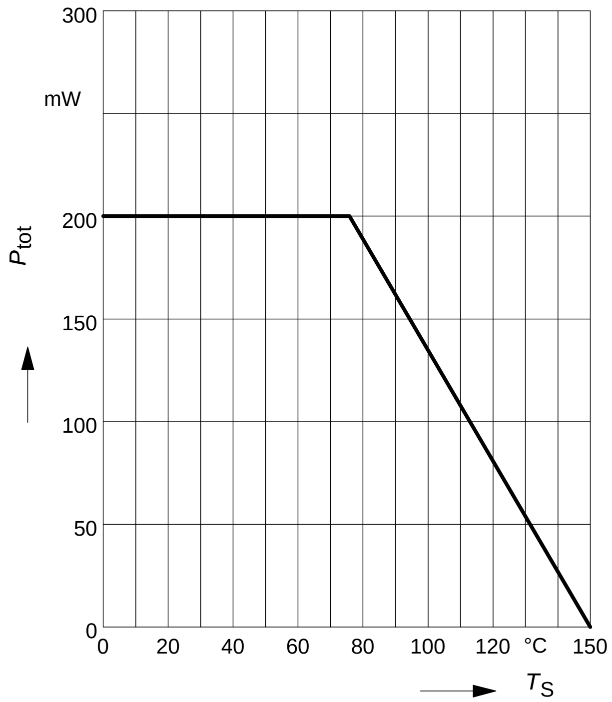
Total power dissipation $P_{tot} = f(T_S)$

amp. A



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

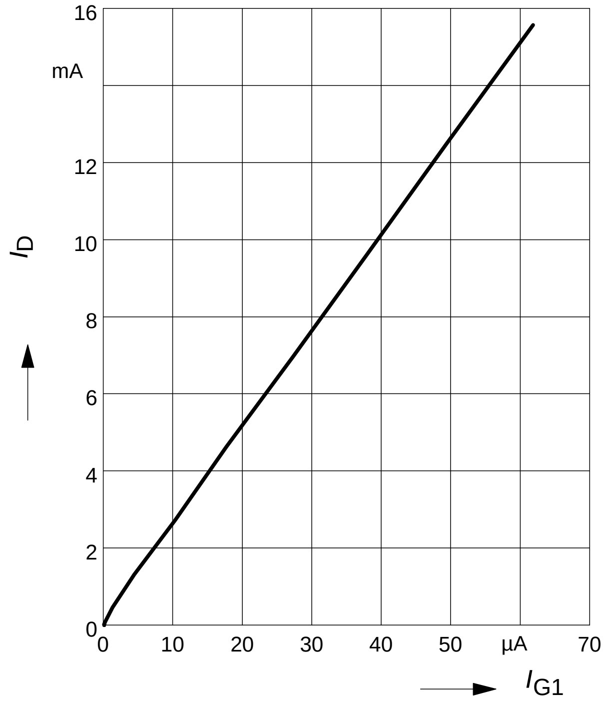
amp. B



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

V_{G2S} = 4V

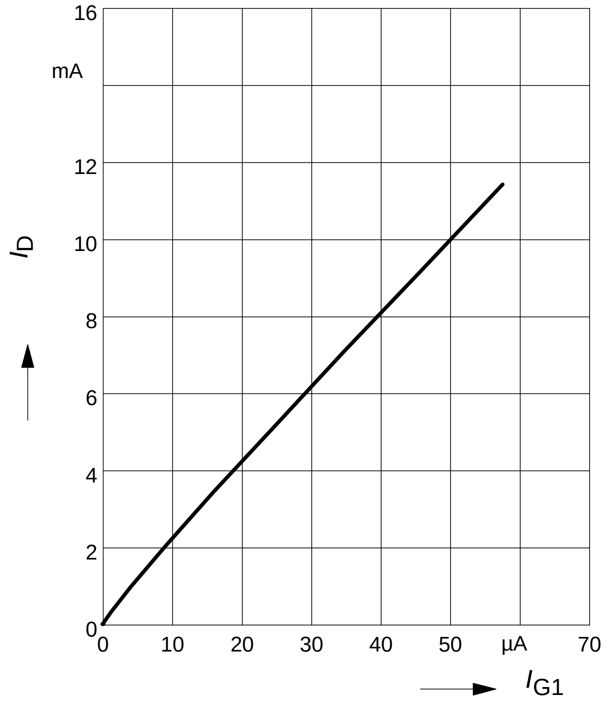
amp. A



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

V_{G2S} = 4V

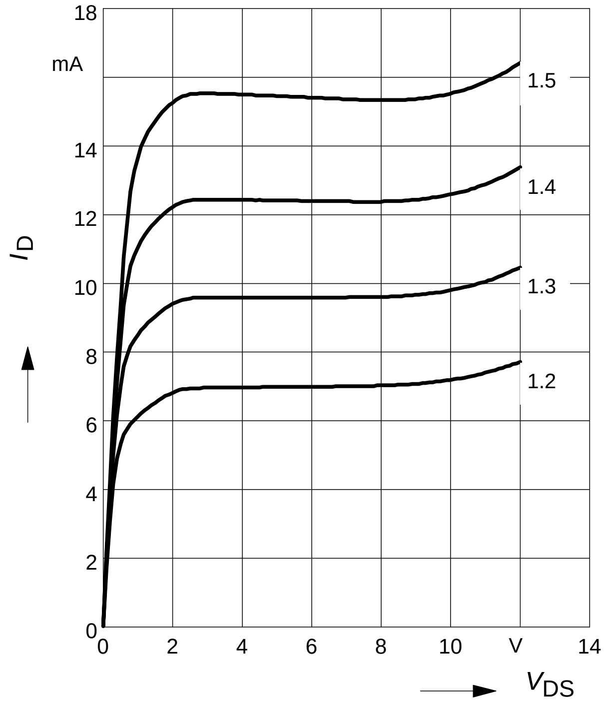
amp. B



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

V_{G2S} = 4V, V_{G1S} = Parameter in V

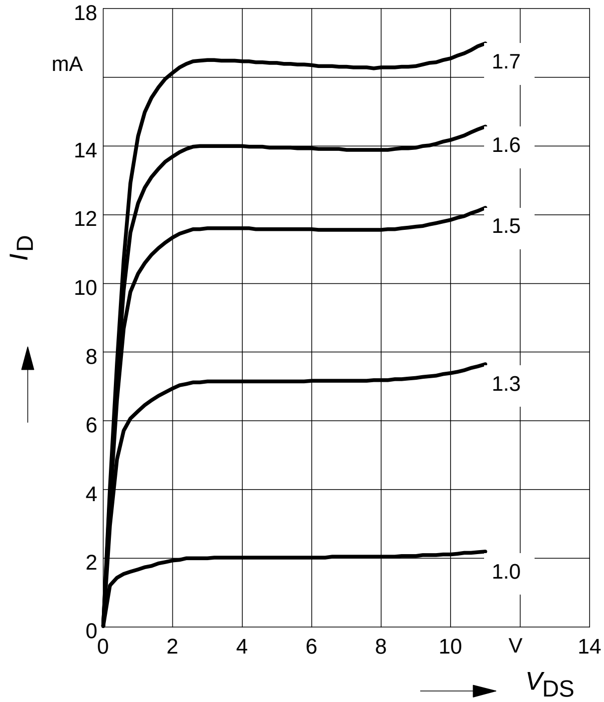
amp. A



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

V_{G2S} = 4V, V_{G1S} = Parameter in V

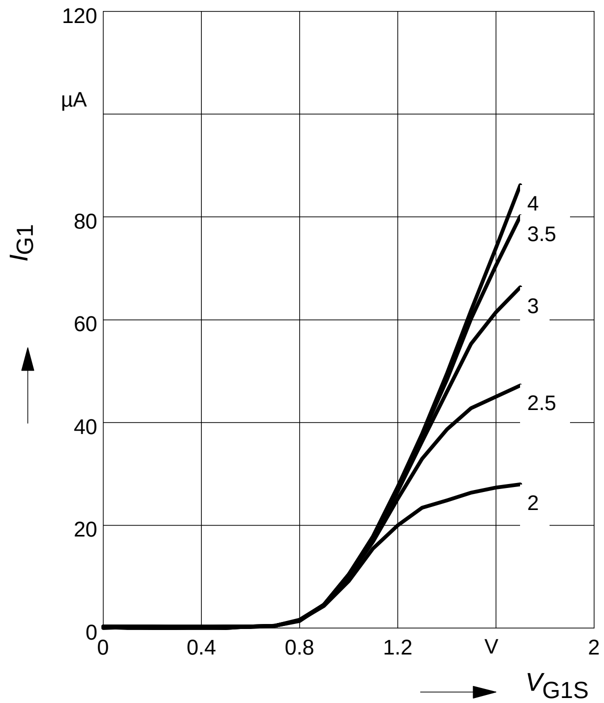
amp. B



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

V_{DS} = 5V, V_{G2S} = Parameter in V

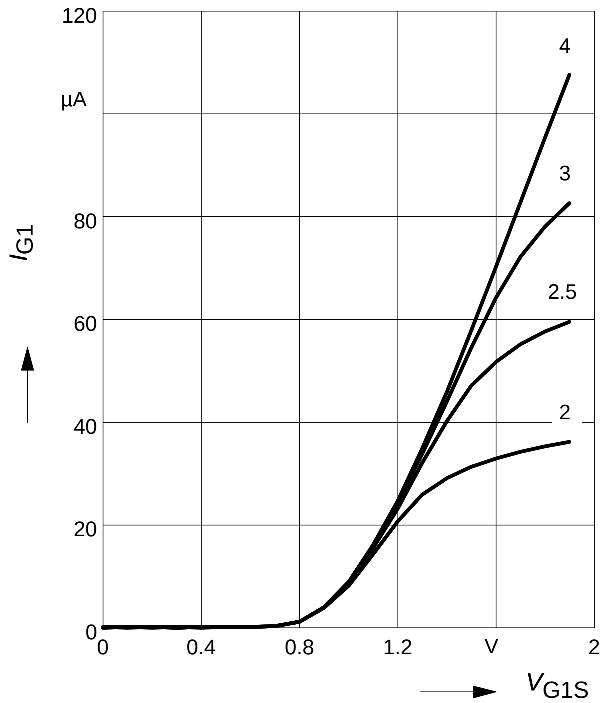
amp. A



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

V_{DS} = 5V, V_{G2S} = Parameter in V

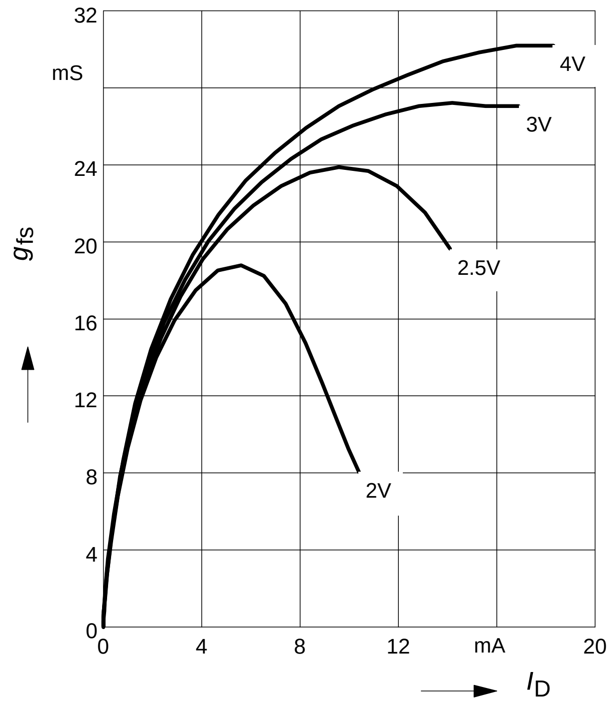
amp. B



Gate 1 forward transconductance

$g_{fs} = f(I_D)$, V_{DS} = 5V, V_{G2S} = Parameter

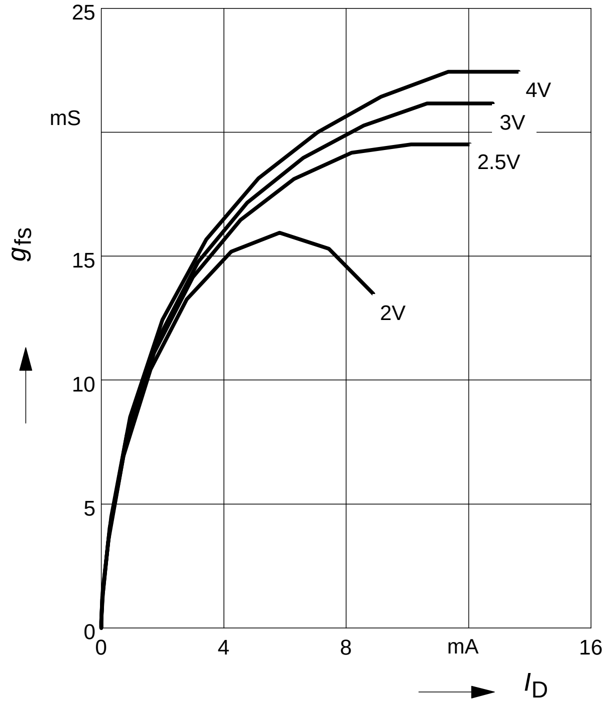
amp. A



Gate 1 forward transconductance

$g_{fs} = f(I_D)$, V_{DS} = 5V, V_{G2S} = Parameter

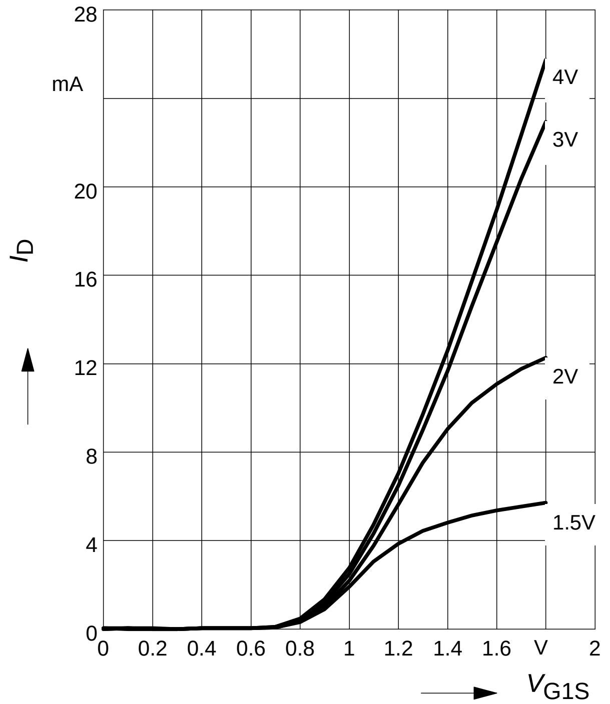
amp. B



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

V_{DS} = 5V, V_{G2S} = Parameter

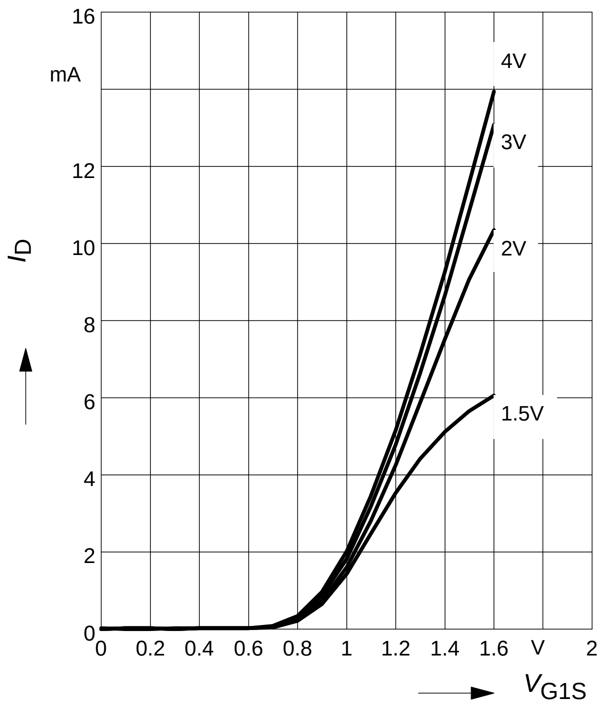
amp. A



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

V_{DS} = 5V, V_{G2S} = Parameter

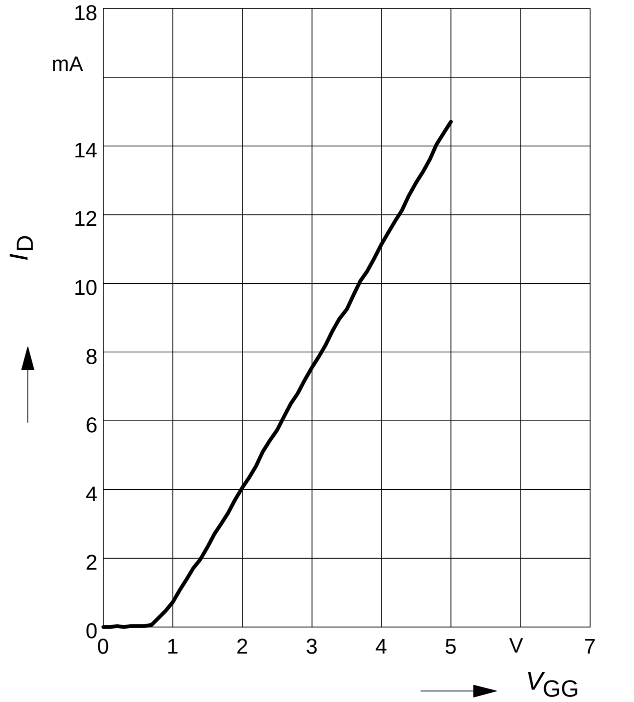
amp. B



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

V_{DS} = 5V, V_{G2S} = 4V, R_{G1} = 60kΩ

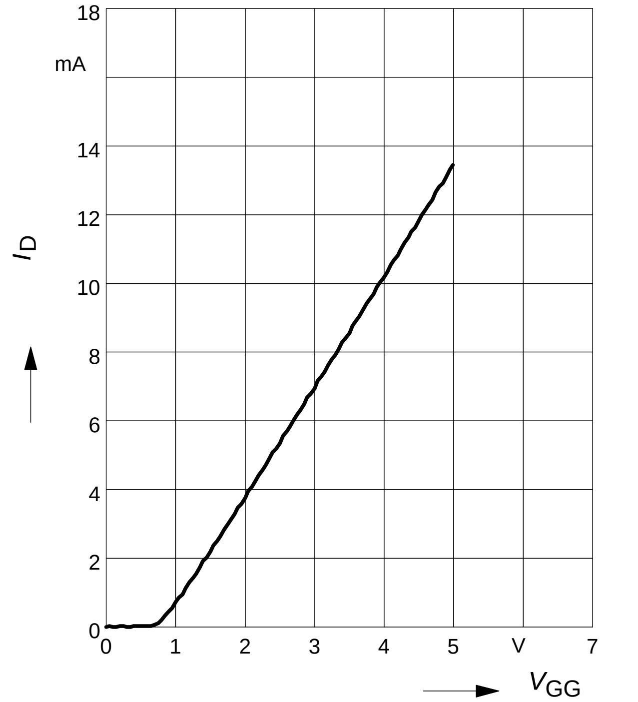
(connected to V_{GG}, V_{GG}=gate1 supply voltage)



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

V_{DS} = 5V, V_{G2S} = 4V, R_{G1} = 50kΩ

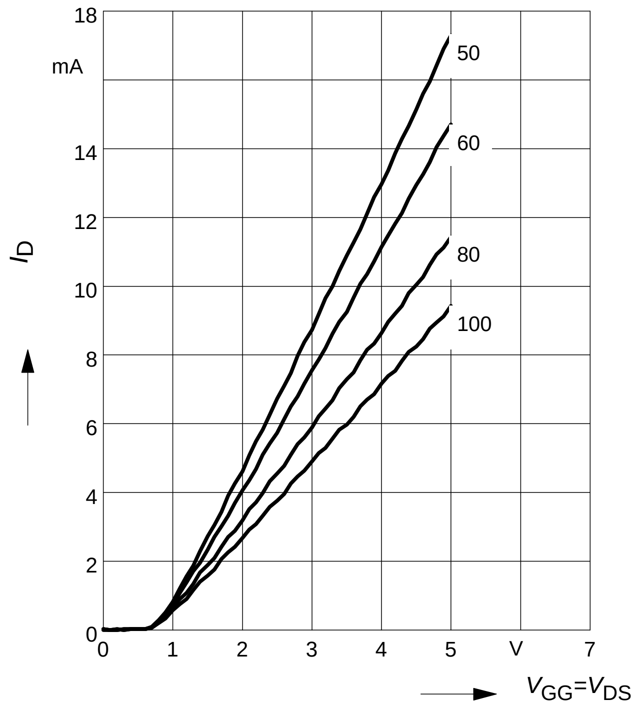
(connected to V_{GG}, V_{GG}=gate1 supply voltage)



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

V_{G2S} = 4V, R_{G1} = Parameter in kΩ

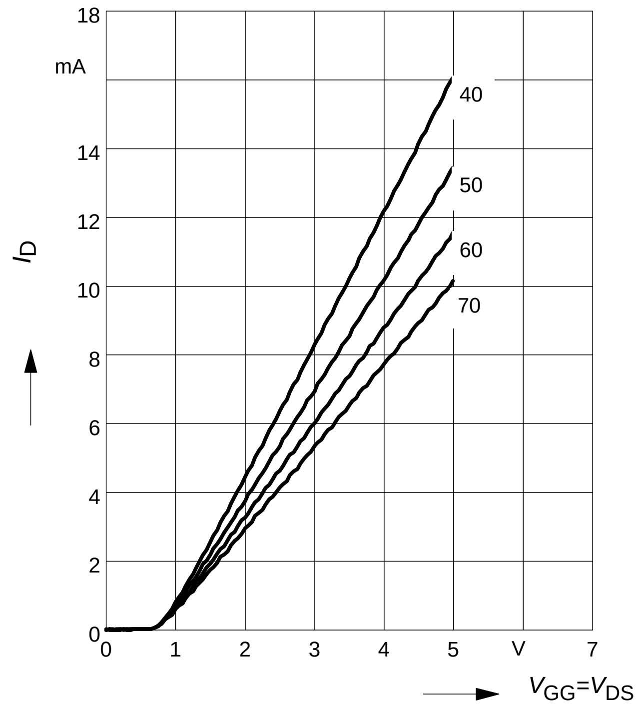
amp. A



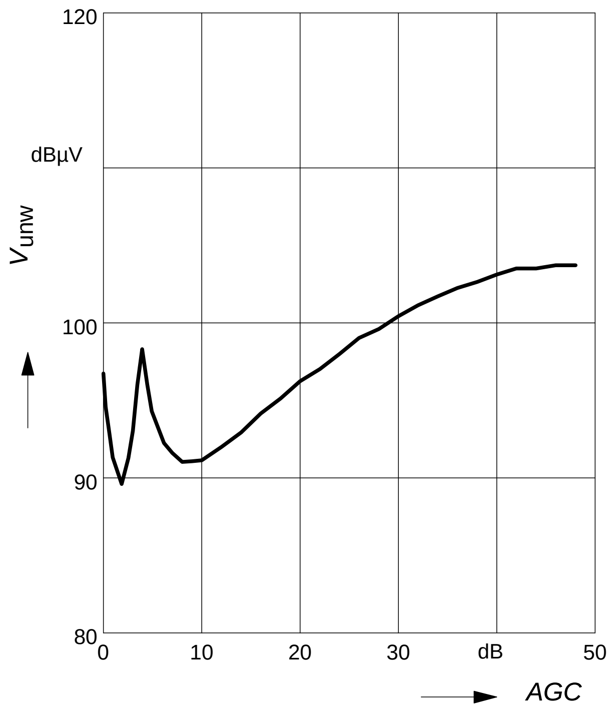
Drain current $I_D = f(V_{GG})$

V_{G2S} = 4V, R_{G1} = Parameter in kΩ

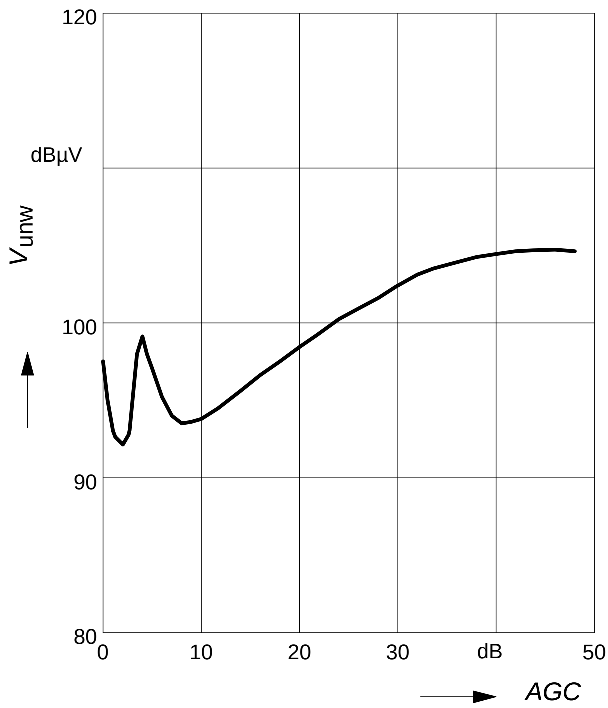
amp. B



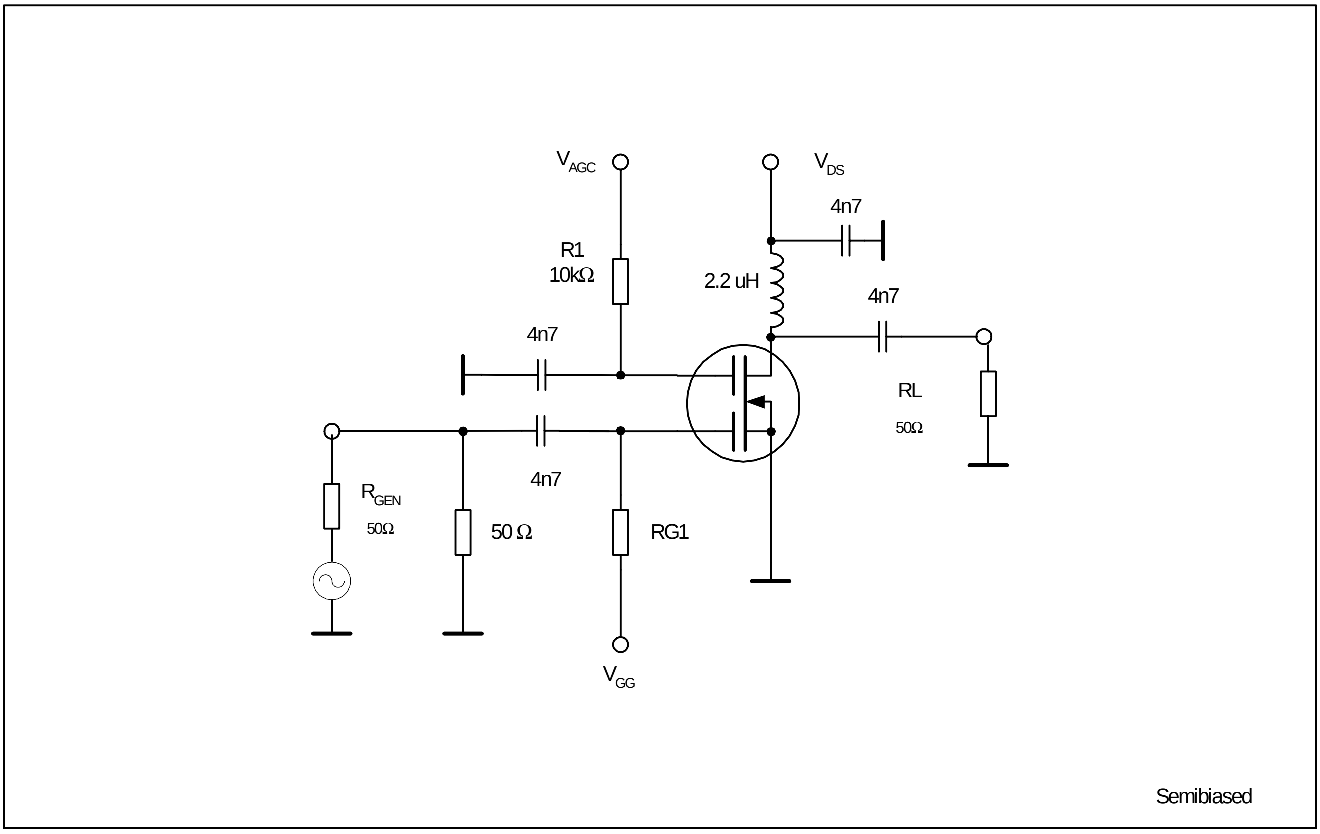
Crossmodulation V_{unw} = (AGC)
V_{DS} = 5 V, R_{g1} = 68 kΩ
amp.A



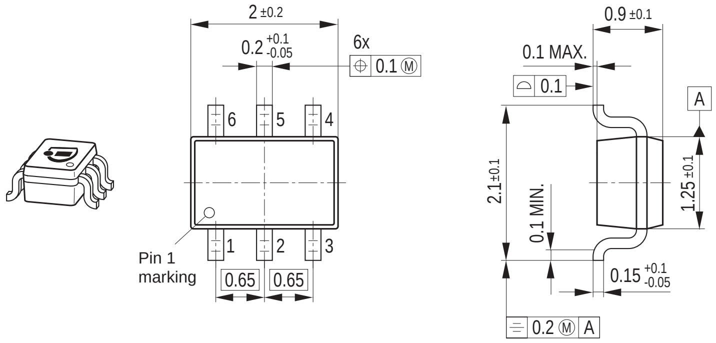
Crossmodulation V_{unw} = (AGC)
V_{DS} = 5 V, R_{g1} = 56 kΩ
amp.B



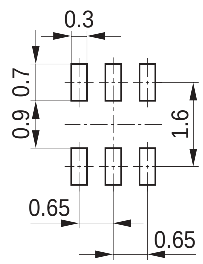
Crossmodulation test circuit



Package Outline

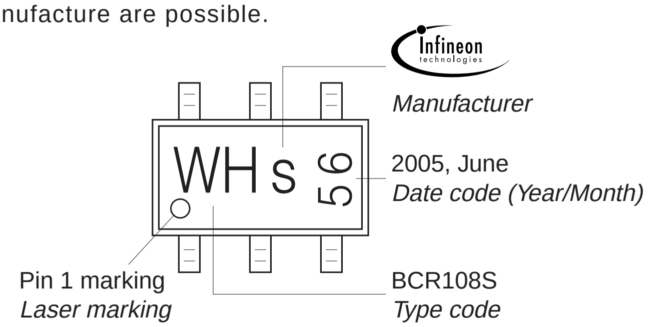


Foot Print



Marking Layout (Example)

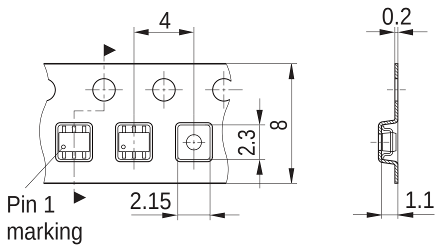
Small variations in positioning of
Date code, Type code and Manufacture are possible.



Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.



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