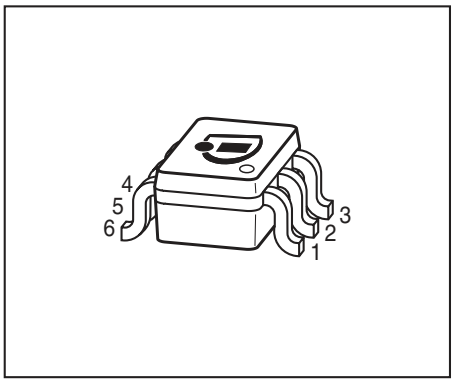
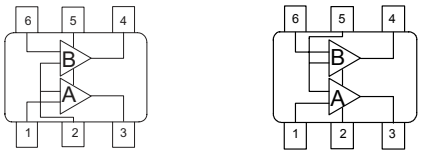
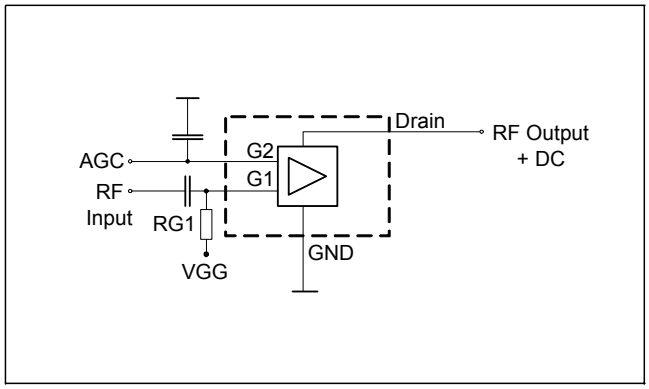
DUAL N-Channel MOSFET Tetrode



- 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

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}	≤ 150	K/W

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

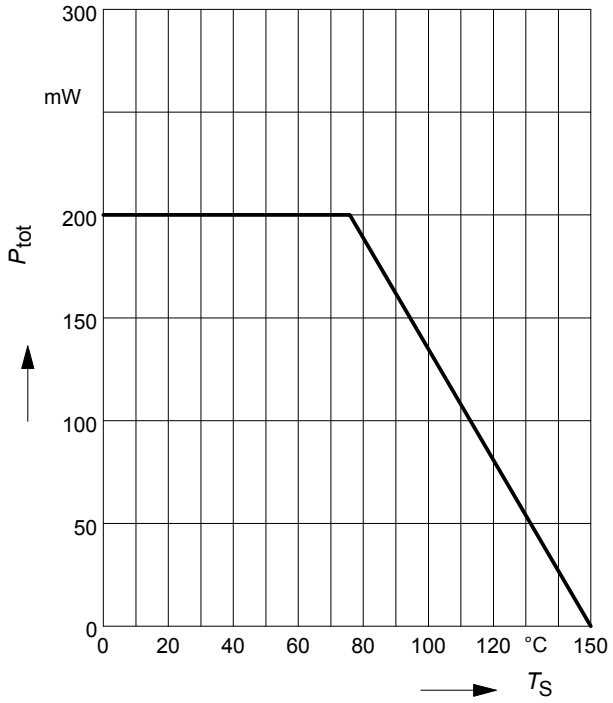
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain-source breakdown voltage I_D = 10 µA, V_{G1S} = 0 V, V_{G2S} = 0 V	$V_{(BR)DS}$	12	-	-	V
Gate1-source breakdown voltage +I_{G1S} = 10 mA, V_{G2S} = 0 V, V_{DS} = 0 V	+$V_{(BR)G1SS}$	6	-	15	
Gate2-source breakdown voltage +I_{G2S}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

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

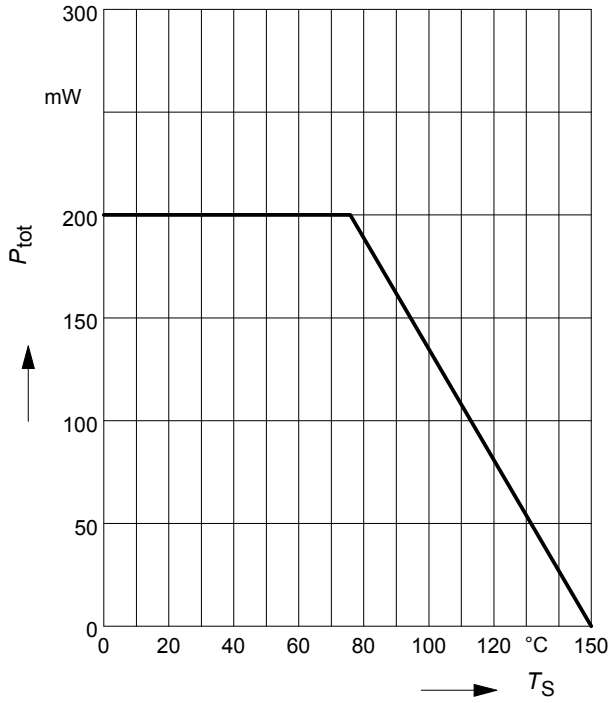
Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
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	ΔG_p	45	-	-	
V_{G2S} = 4 ... 0 V , f = 800 MHz					
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	-	

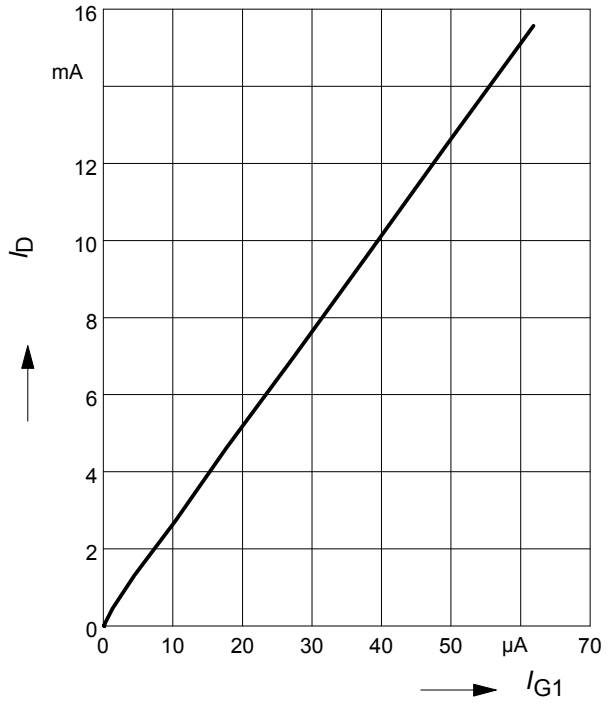
Total power dissipation $P_{tot} = f(T_S)$
amp. A



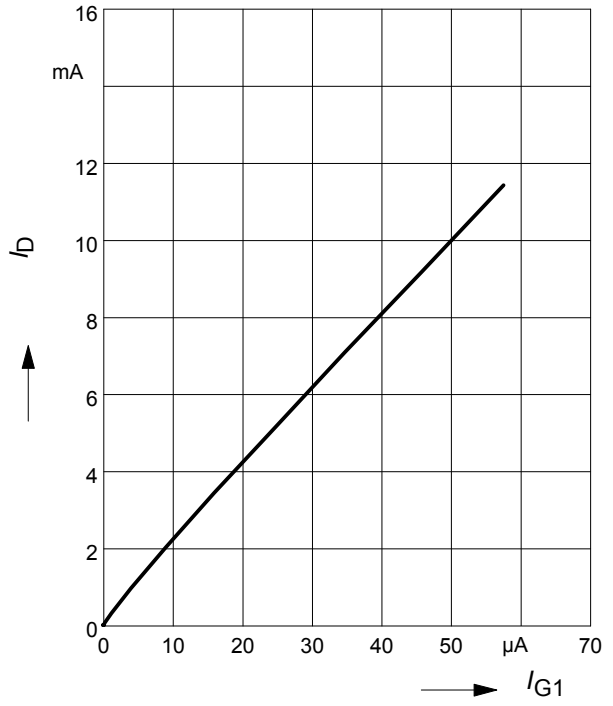
Total power dissipation $P_{tot} = f(T_S)$
amp. B



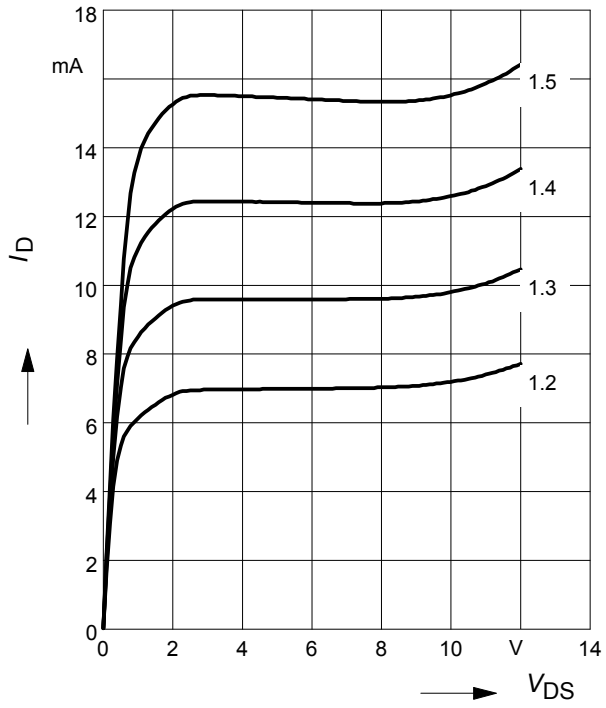
Drain current $I_D = f(I_{G1})$
V_{G2S} = 4V
amp. A



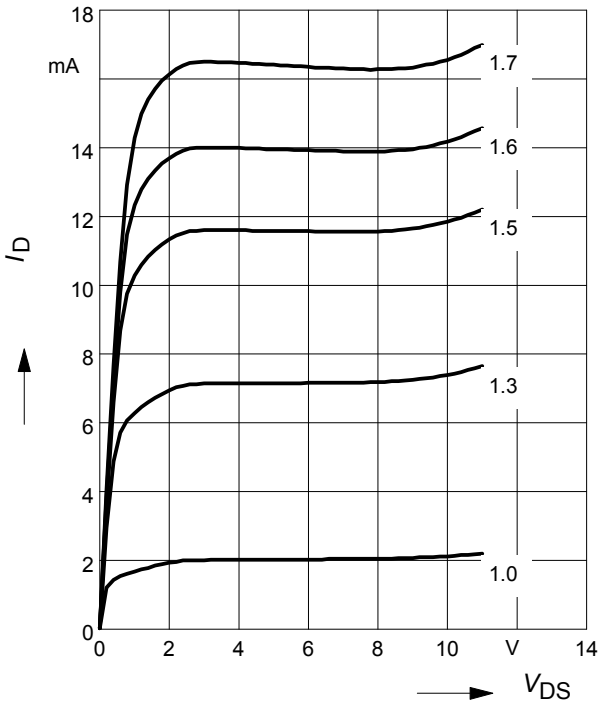
Drain current $I_D = f(I_{G1})$
V_{G2S} = 4V
amp. B



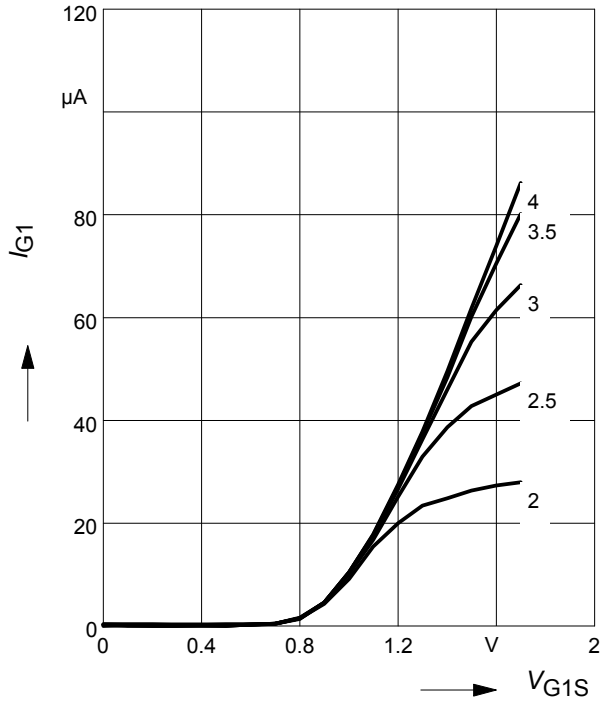
Output characteristics $I_D = f(V_{DS})$
V_{G2S} = 4V, V_{G1S} = Parameter in V
amp. A



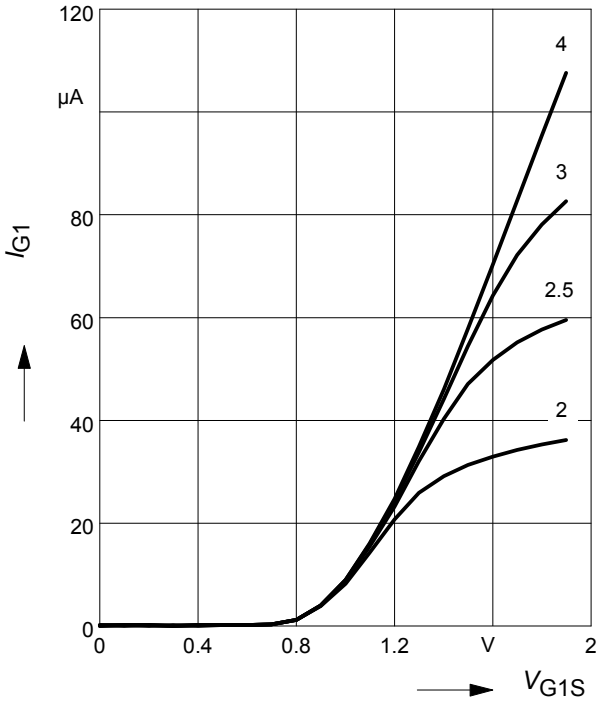
Output characteristics $I_D = f(V_{DS})$
V_{G2S} = 4V, V_{G1S} = Parameter in V
amp. B



Gate 1 current $I_{G1} = f(V_{G1S})$
V_{DS} = 5V, V_{G2S} = Parameter in V
amp. A



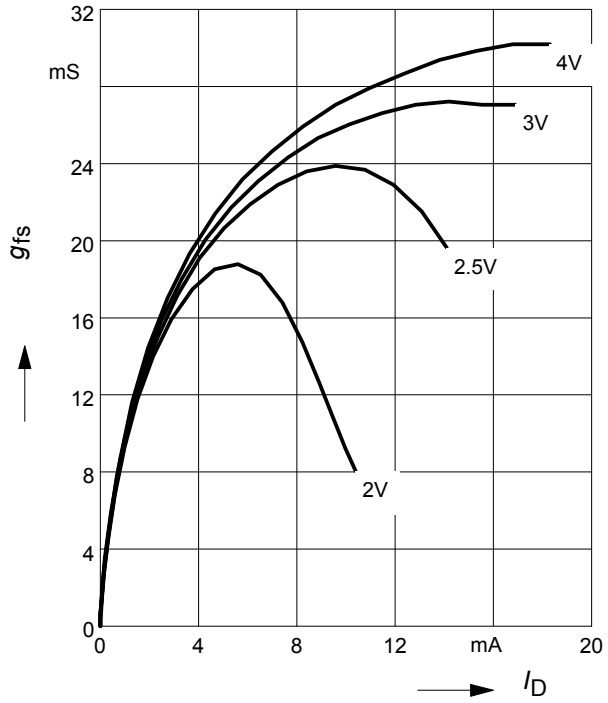
Gate 1 current $I_{G1} = f(V_{G1S})$
V_{DS} = 5V, V_{G2S} = Parameter in V
amp. B



Gate 1 forward transconductance

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

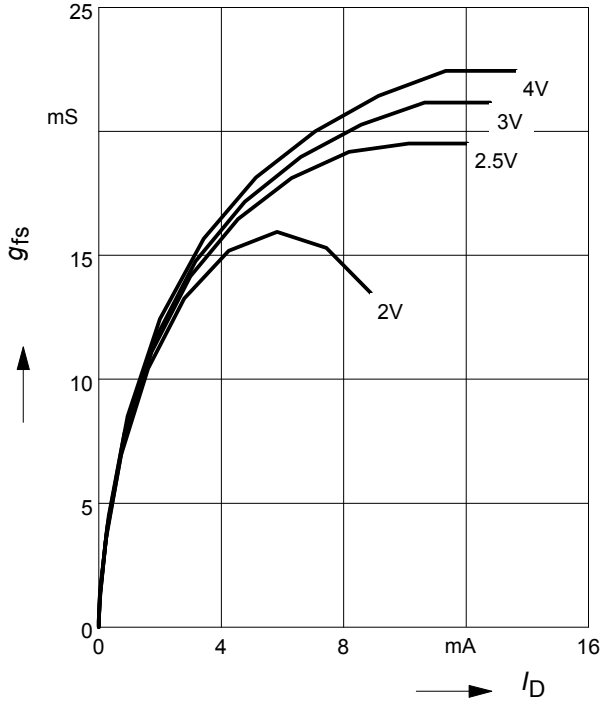
amp. A



Gate 1 forward transconductance

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

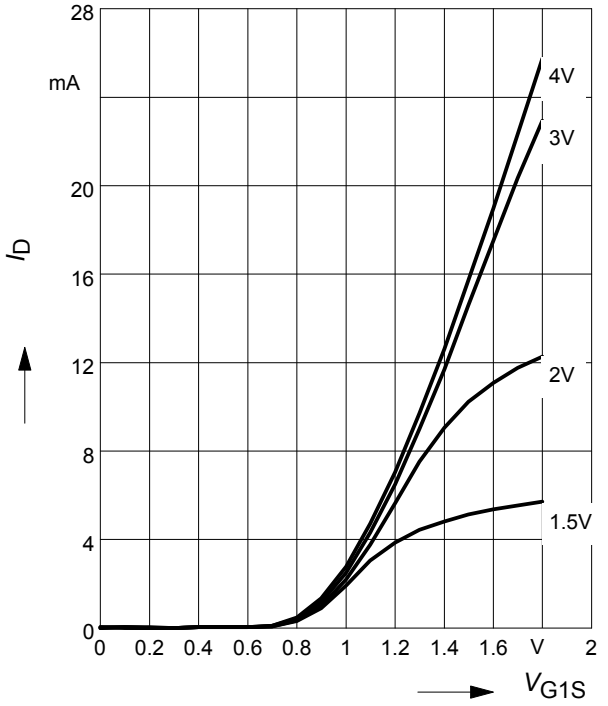
amp. B



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

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

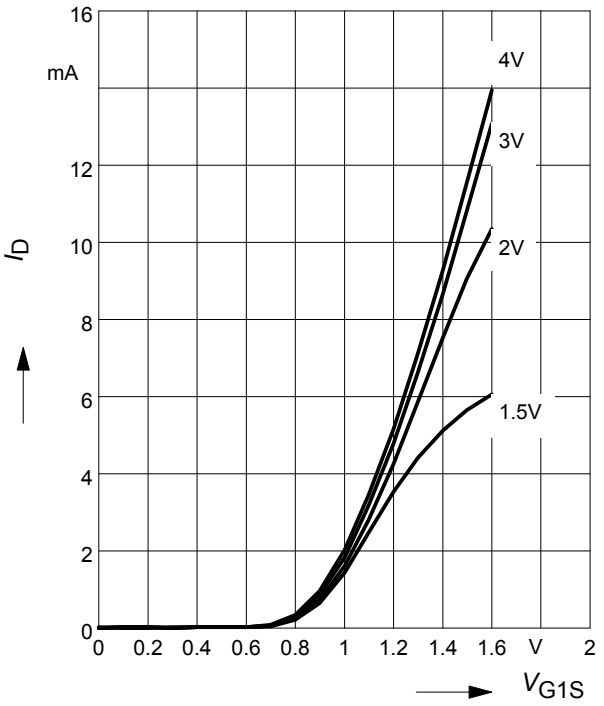
amp. A



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

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

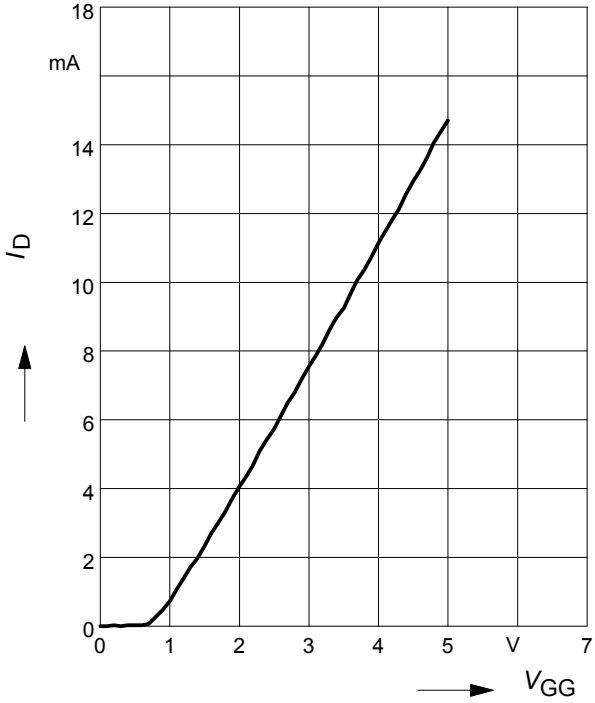
amp. B



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

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

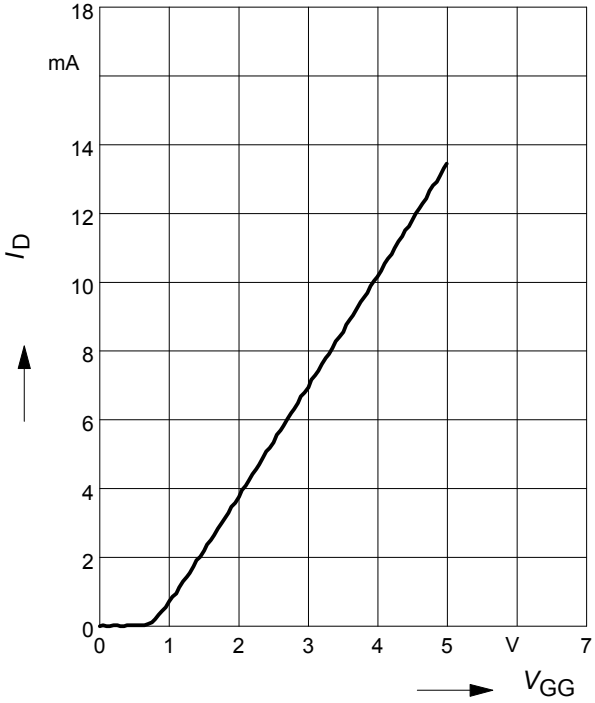
(connected to V_{GG}, V_{GG}=gate1 supply voltage)



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

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

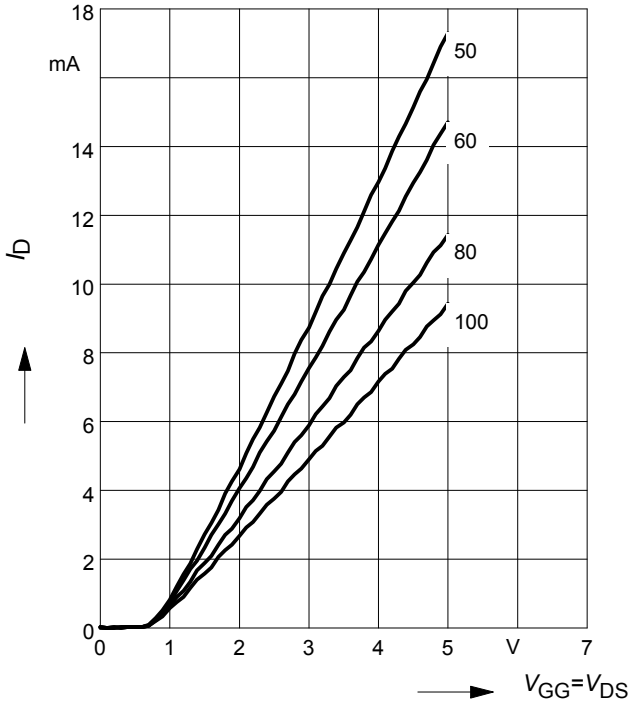
(connected to V_{GG}, V_{GG}=gate1 supply voltage)



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

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

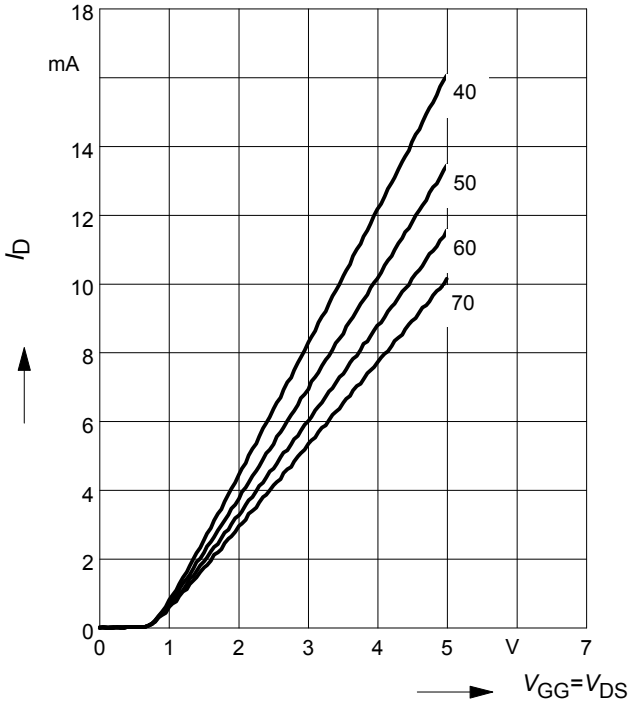
amp. A



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

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

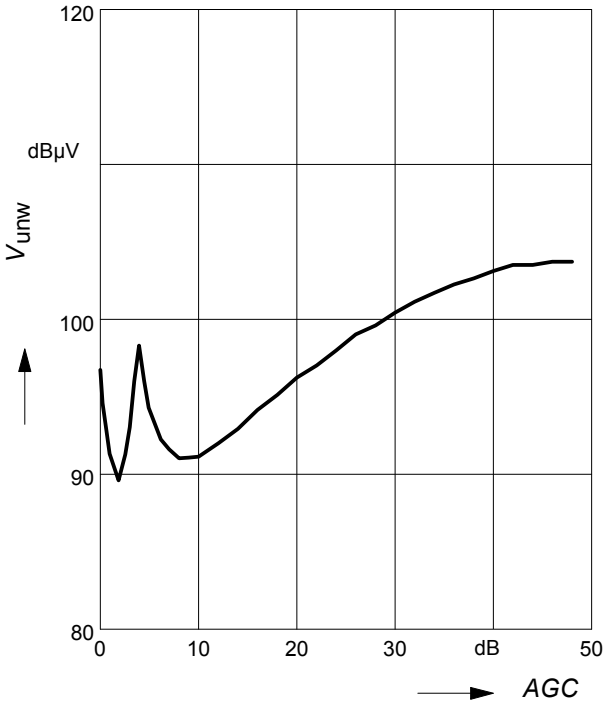
amp. B



Crossmodulation V_{unw} = (*AGC*)

V_{DS} = 5 V, R_{g1} = 68 kΩ

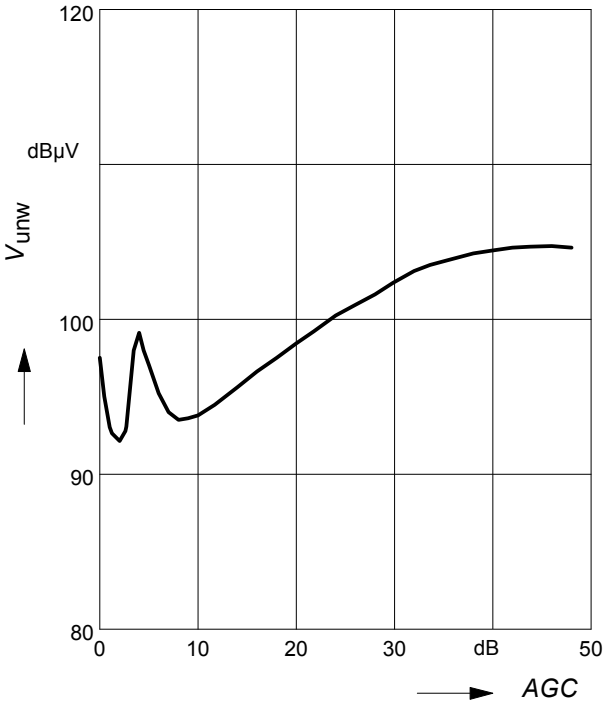
amp.A



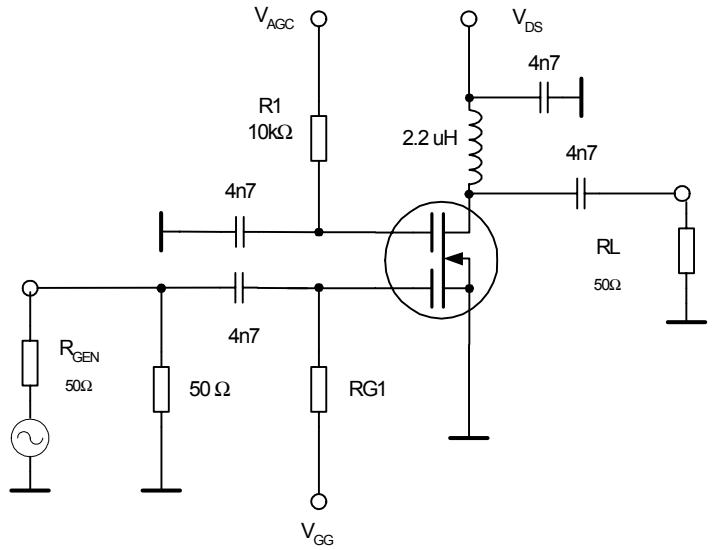
Crossmodulation V_{unw} = (*AGC*)

V_{DS} = 5 V, R_{g1} = 56 kΩ

amp.B

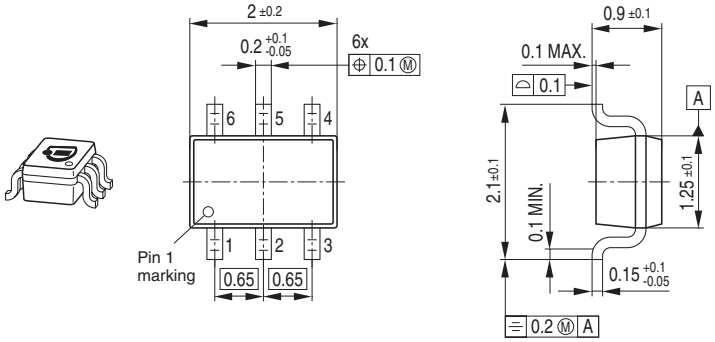


Crossmodulation test circuit

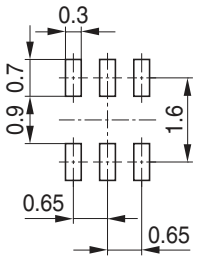


Semibiased

Package Outline

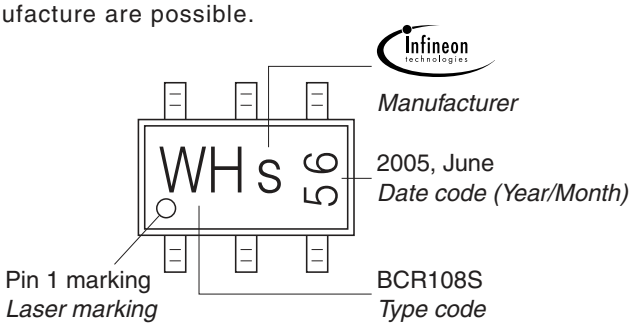


Foot Print



Marking Layout (Example)

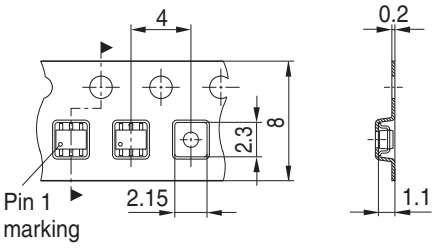
Small variations in positioning of
Date code, Type code and Manufacture are possible.



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.



Edition 2006-02-01
Published by
Infineon Technologies AG
81726 München, Germany

Attention please!

The information given in this dokument shall in no event be regarded as a guarantee of conditions or characteristics (“Beschaffenheitsgarantie”). With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office (**www.infineon.com**).

Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.
Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system.
Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.