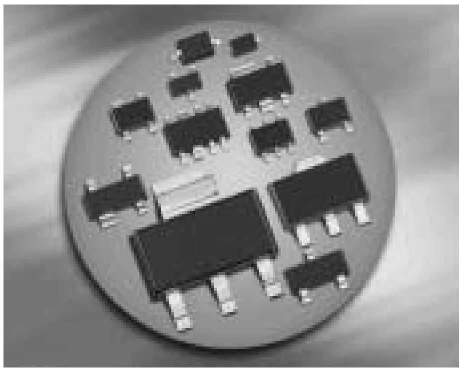
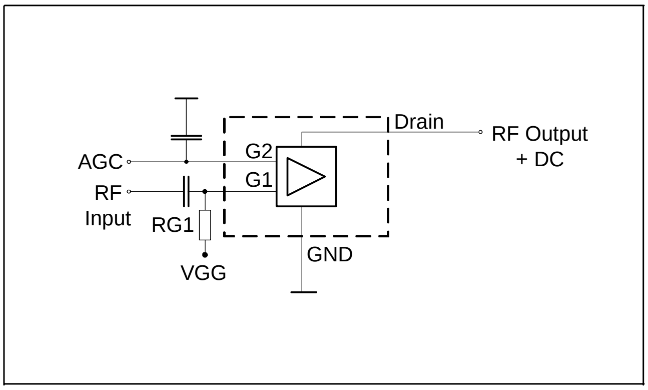
Silicon N-Channel MOSFET Tetrode



- For low noise, high gain controlled input stages up to 1GHz
- Operating voltage 5V
- Pb-free (RoHS compliant) package[1)]
- Qualified according AEC Q101

AEC Qualified RoHS



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

Class 2 (2000V - 4000V) pin to pin **H**uman **B**ody **M**odel

Type	Package	Pin Configuration						Marking
BF2030	SOT143	1= S	2=D	3=G2	4=G1	-	-	NDs
BF2030R	SOT143R	1= D	2=S	3=G1	4=G2	-	-	NDs
BF2030W	SOT343	1= D	2=S	3=G1	4=G2	-	-	NDs

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	8	V
Continuous drain current	I_D	40	mA
Gate 1/ gate 2-source current	$\pm I_{G1/2SM}$	10	
Gate 1 (external biasing)	$+V_{G1SE}$	6	V
Total power dissipation	P_{tot}		mW
$T_S \leq 76$ °C, BF2030, BF2030R		200	
$T_S \leq 94$ °C, BF2030W		200	
Storage temperature	T_{stg}	-55 ... 150	°C
Channel temperature	T_{ch}	150	

[1]Pb-containing package may be available upon special request

Thermal Resistance

Parameter	Symbol	Value	Unit
Channel - soldering point[1)]	R_{thchs}		K/W
BF2030/ BF2030R		≤370	
BF2030W		≤280	

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

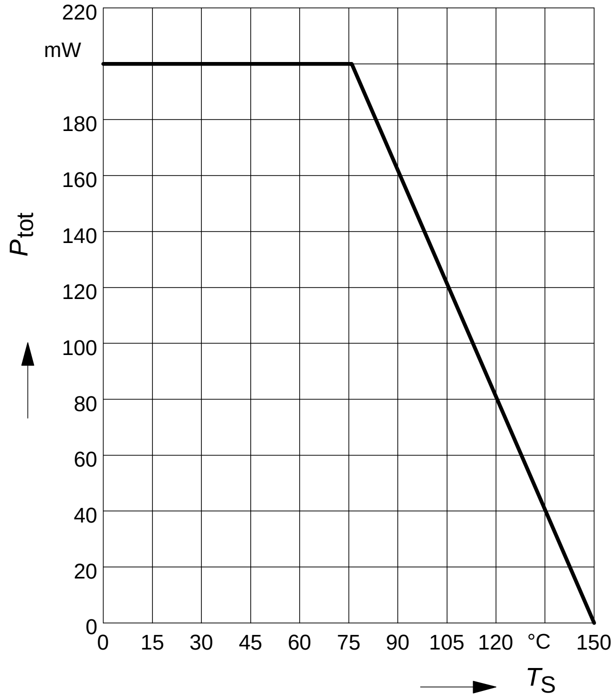
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain-source breakdown voltage I_D = 20 µA, V_{G1S} = 0 , V_{G2S} = 0	$V_{(BR)DS}$	10	-	-	V
Gate1-source breakdown voltage $+I_{G1S}$ = 10 mA, V_{G2S} = 0 , V_{DS} = 0	$+V_{(BR)G1SS}$	6	-	15	
Gate2-source breakdown voltage $+I_{G2S}$ = 10 mA, V_{G1S} = 0 , V_{DS} = 0	$+V_{(BR)G2SS}$	6	-	15	
Gate1-source leakage current V_{G1S} = 5 V, V_{G2S} = 0 , V_{DS} = 0	$+I_{G1SS}$	-	-	50	nA
Gate2-source leakage current V_{G2S} = 5 V, V_{G1S} = 0 , V_{DS} = 0	$+I_{G2SS}$	-	-	50	
Drain current V_{DS} = 5 V, V_{G1S} = 0 , V_{G2S} = 4 V	I_{DSS}	-	-	50	µA
Drain-source current V_{DS} = 5 V, V_{G2S} = 4 V, R_{G1} = 100 kΩ	I_{DSX}	-	12	-	mA
Gate1-source pinch-off voltage V_{DS} = 5 V, V_{G2S} = 4 V, I_D = 20 µA	$V_{G1S(p)}$	0.3	0.5	-	V
Gate2-source pinch-off voltage V_{DS} = 5 V, I_D = 20 µA	$V_{G2S(p)}$	0.3	0.6	-	

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

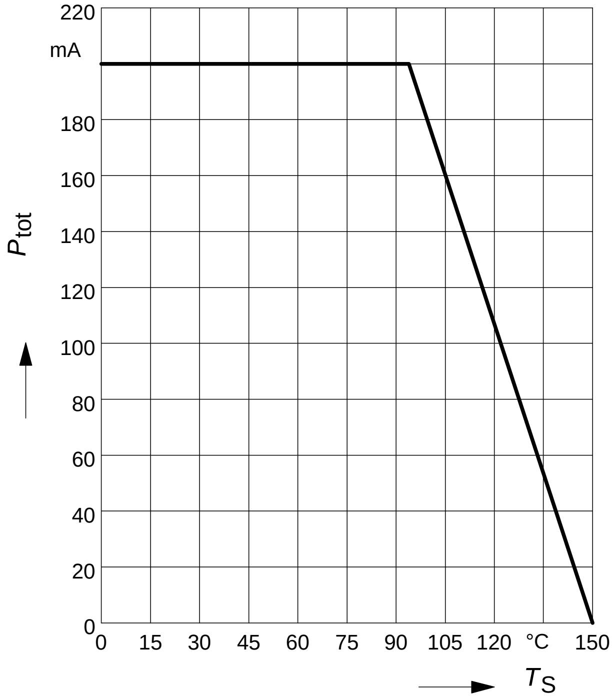
Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Forward transconductance V_{DS} = 5 V, I_D = 10 mA, V_{G2S} = 4 V	g_{fs}	27	31	-	mS
Gate1 input capacitance V_{DS} = 5 V, I_D = 10 mA, V_{G2S} = 4 V, f = 10 MHz	C_{g1ss}	-	2.4	2.8	pF
Output capacitance V_{DS} = 5 V, I_D = 10 mA, V_{G2S} = 4 V, f = 10 MHz	C_{dss}	-	1.3	-	
Power gain V_{DS} = 5 V, I_D = 10 mA, V_{G2S} = 4 V, f = 800 MHz	G_p	20	23	-	dB
Noise figure V_{DS} = 5 V, I_D = 10 mA, V_{G2S} = 4 V, f = 800 MHz	F	-	1.5	2.2	dB
Gain control range V_{DS} = 5 V, V_{G2S} = 4...0 V, f = 800 MHz	ΔG_p	40	50	-	

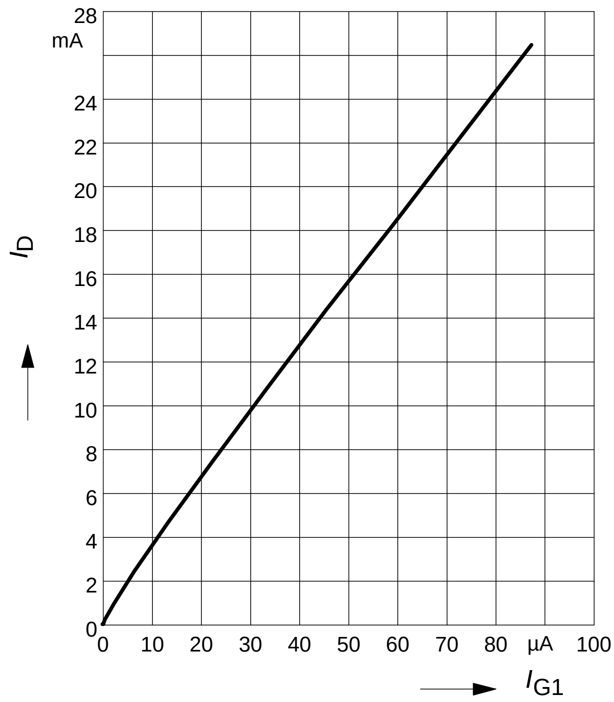
Total power dissipation $P_{tot} = f(T_S)$
BF2030, BF2030R



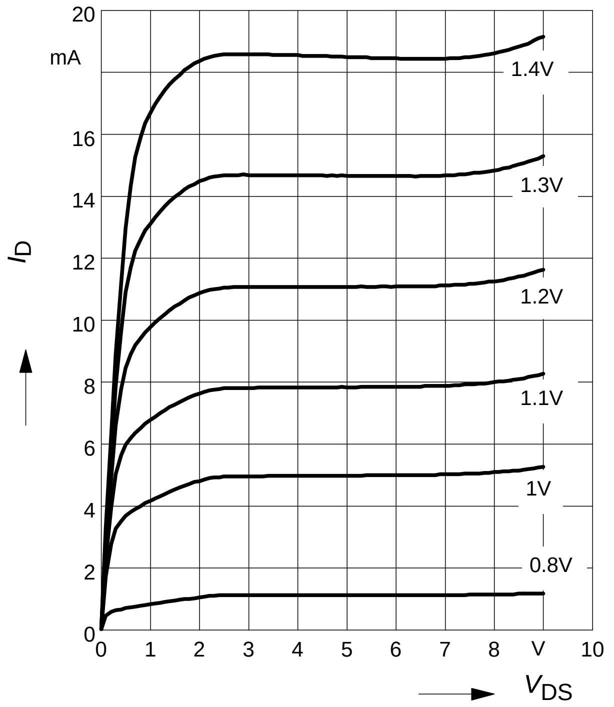
Total power dissipation $P_{tot} = f(T_S)$
BF2030W



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



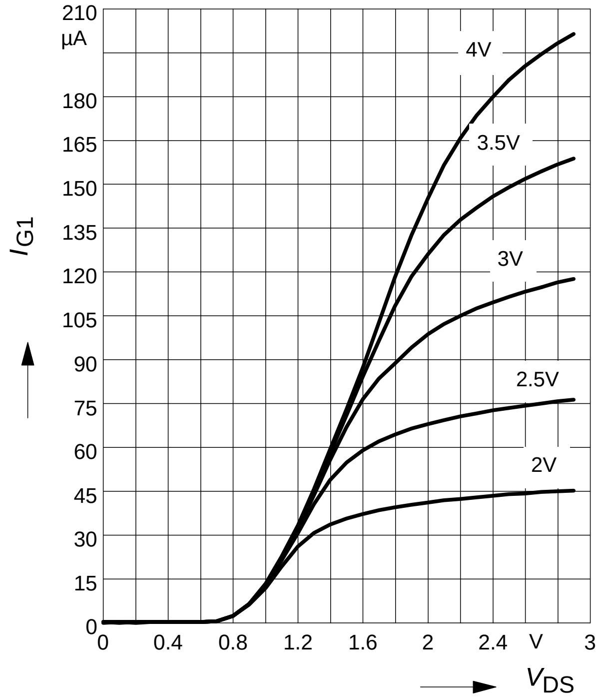
Output characteristics $I_D = f(V_{DS})$
V_{G2S} = 4V
V_{G1S} = Parameter



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

V_{DS} = 5V

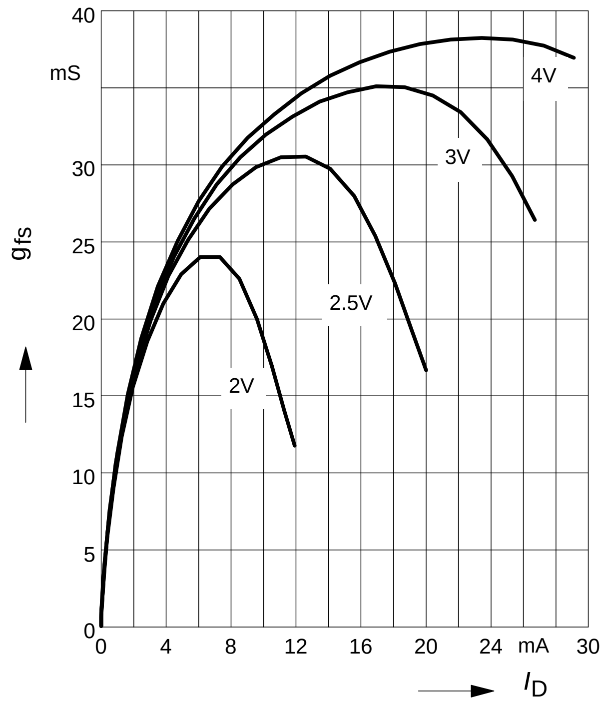
V_{G2S} = Parameter



Gate 1 forward transconductance

$g_{fs} = f(I_D)$

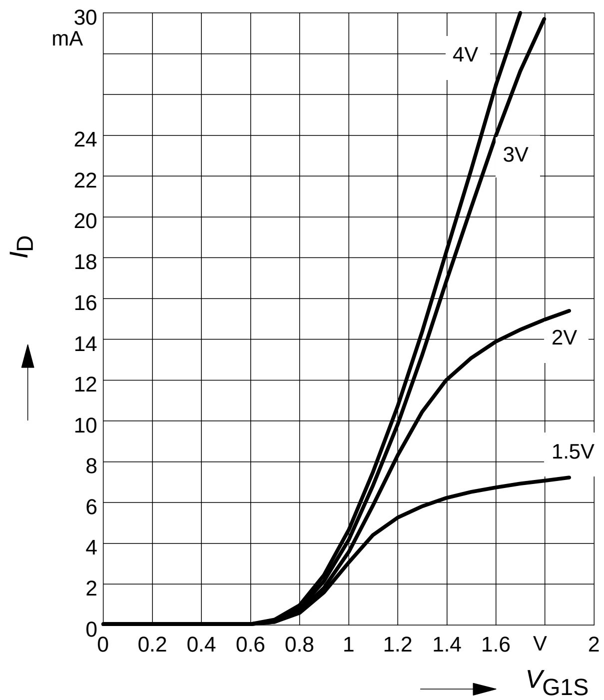
V_{DS} = 5V, V_{G2S} = Parameter



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

V_{DS} = 5V

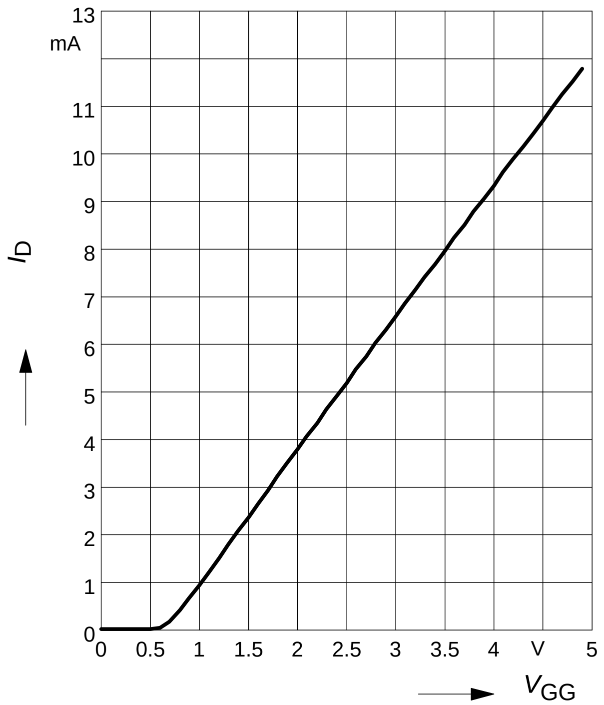
V_{G2S} = Parameter



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

V_{DS} = 5V, V_{G2S} = 4V, R_{G1} = 100kΩ

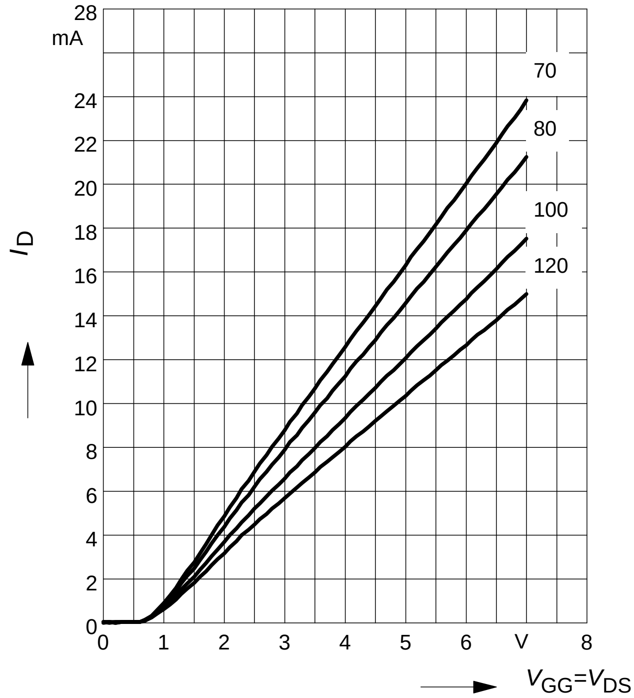
(connected to V_{GG}, V_{GG}=gate1 supply voltage)



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

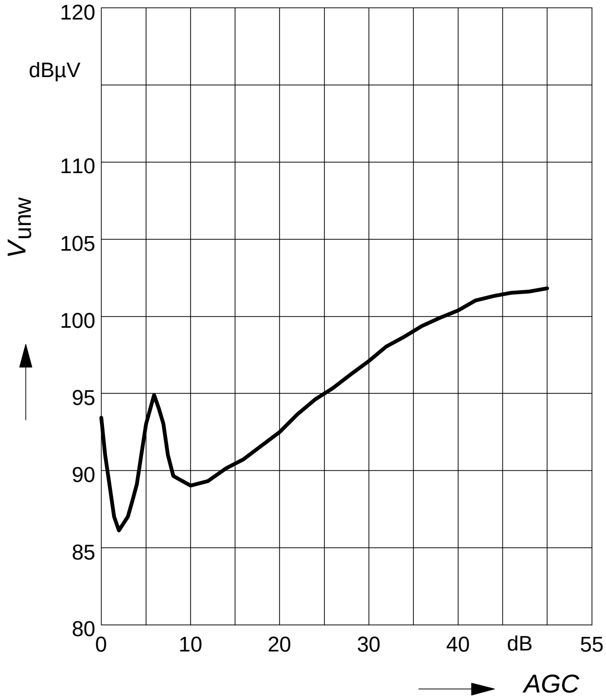
V_{G2S} = 4V

R_{G1} = Parameter in kΩ

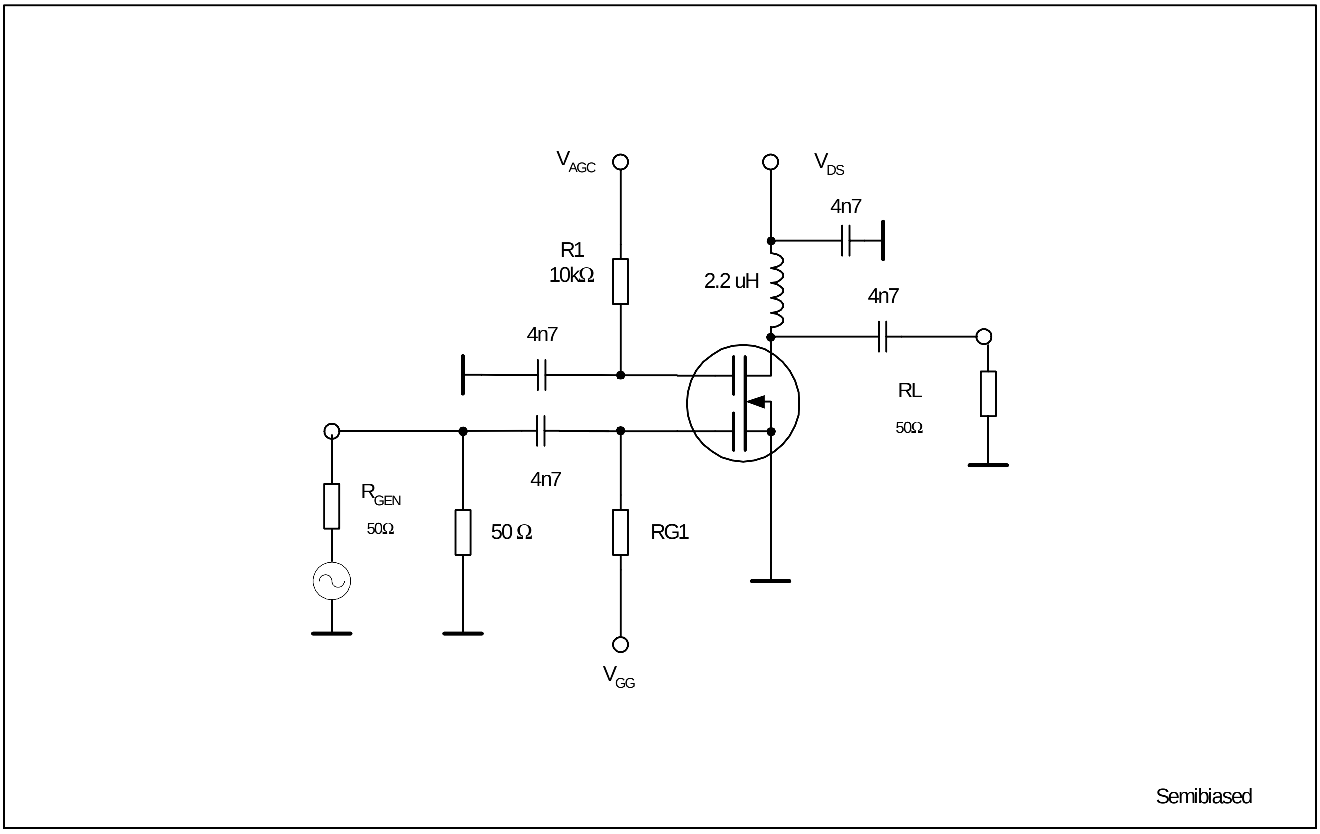


Crossmodulation V_{unw} = (AGC)

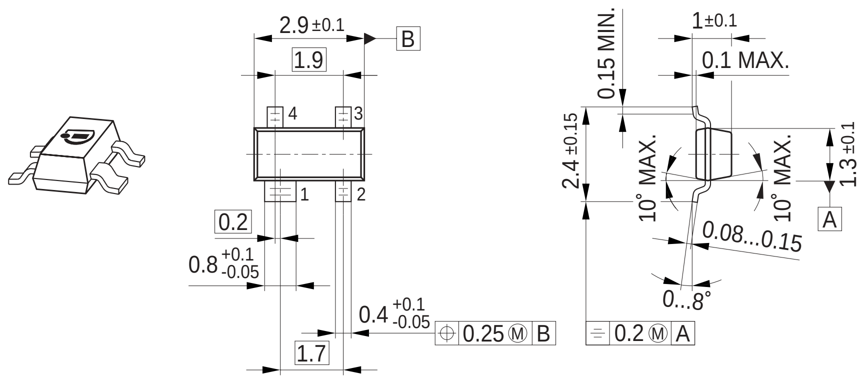
V_{DS} = 5 V



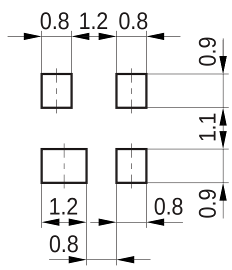
Cossmodulation test circuit



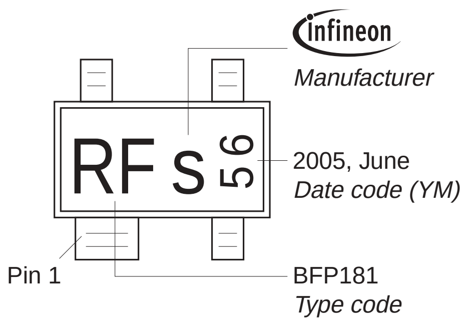
Package Outline



Foot Print

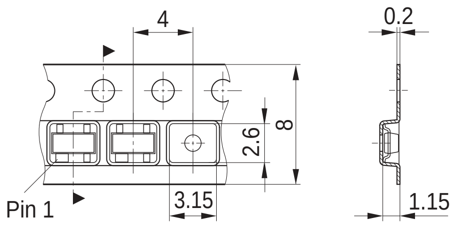


Marking Layout (Example)



Standard Packing

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



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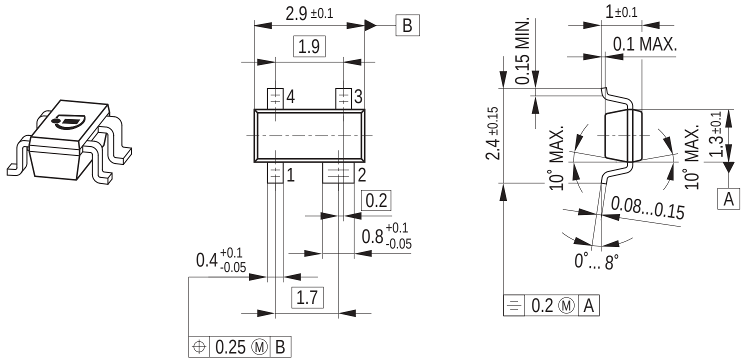

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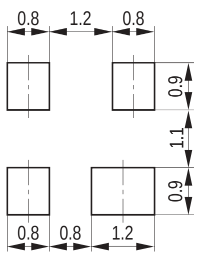

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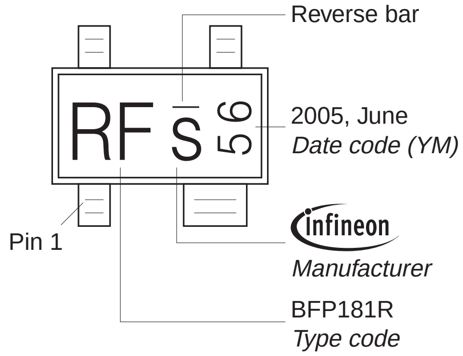

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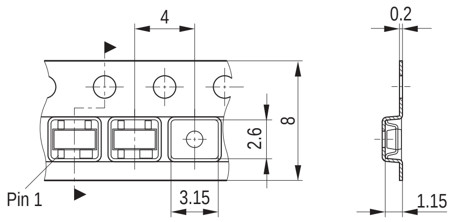

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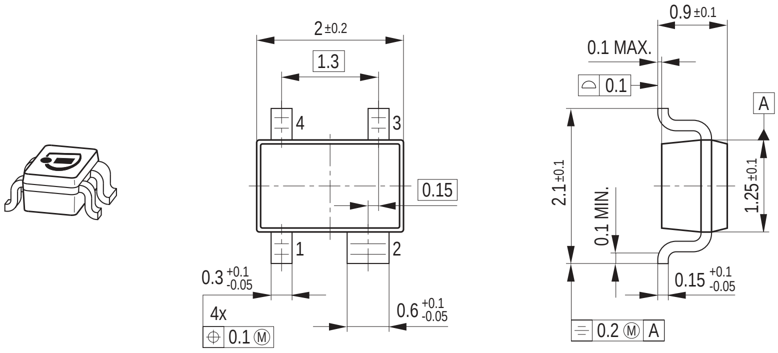

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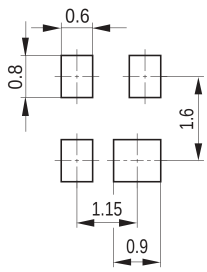

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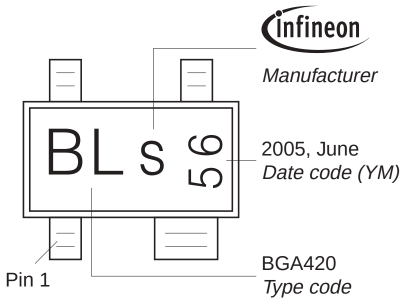

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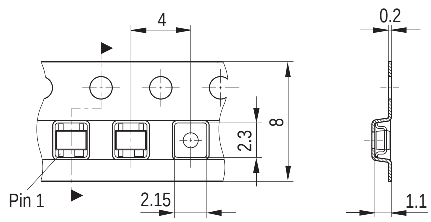

Edition 2006-02-01
Published by
Infineon Technologies AG
81726 München, Germany

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