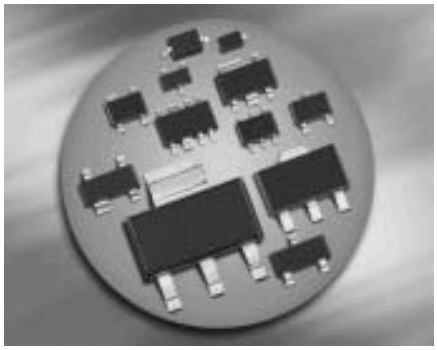
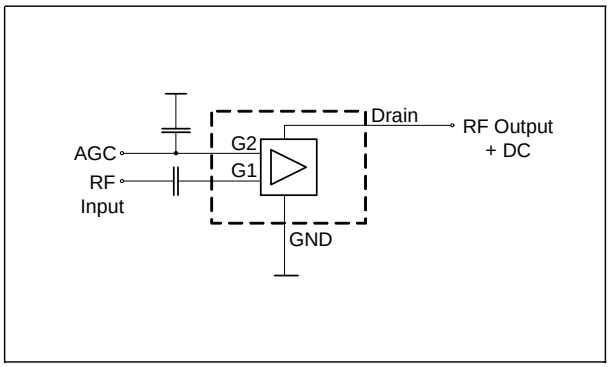
Silicon N-Channel MOSFET Tetrode



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



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

Type	Package	Pin Configuration						Marking
BF1005	SOT143	1=S	2=D	3=G2	4=G1	-	-	MZs
BF1005R	SOT143R	1=D	2=S	3=G1	4=G2	-	-	MZs

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	$\pm I_{G1/2SM}$	10	
Gate 1 (external biasing)	$+V_{G1SE}$	3	V
Total power dissipation $T_S \leq 76$ °C	P_{tot}	200	mW
Storage temperature	T_{stg}	-55 ... 150	°C
Channel temperature	T_{ch}	150	

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

Note:
It is not recommended to apply external DC-voltage on Gate 1 in active mode.

Thermal Resistance

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

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

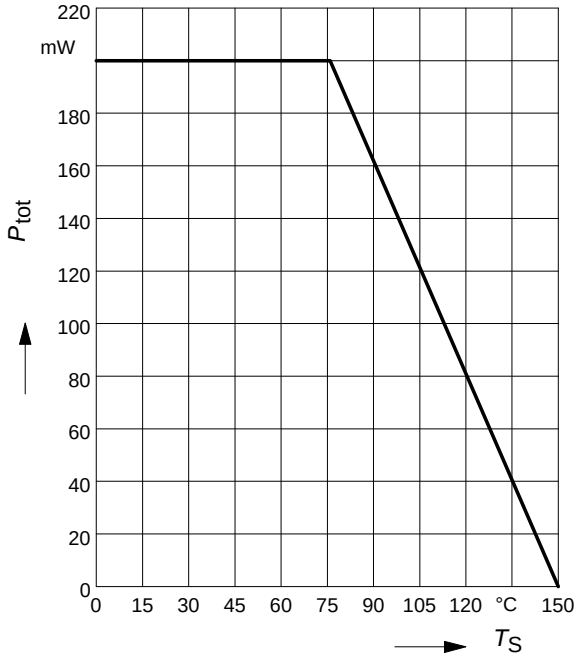
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain-source breakdown voltage I_D = 650 µA, V_{G1S} = 0 , V_{G2S} = 0	$V_{(BR)DS}$	12	-	-	V
Gate1-source breakdown voltage +I_{G1S} = 10 mA, V_{G2S} = 0 , V_{DS} = 0	+$V_{(BR)G1SS}$	8	-	12	
Gate2 source breakdown voltage ±I_{G2S} = 10 mA, V_{G1S} = 0 , V_{DS} = 0	±$V_{(BR)G2SS}$	8	-	13	
Gate1-source leakage current V_{G1S} = 0 , V_{G2S} = 6 V	+I_{G1SS}	-	100	-	µA
Gate 2 source leakage current ±V_{G2S} = 8 V, V_{G1S} = 0 , V_{DS} = 0	±I_{G2SS}	-	-	50	nA
Drain current V_{DS} = 5 V, V_{G1S} = 0 , V_{G2S} = 4 V	I_{DSS}	-	-	1.5	mA
Operating current (selfbiased) V_{DS} = 5 V, V_{G2S} = 4 V	I_{DSO}	8	10	16	
Gate2-source pinch-off voltage V_{DS} = 5 V, I_D = 100 µA	$V_{G2S(p)}$	-	1	-	V

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

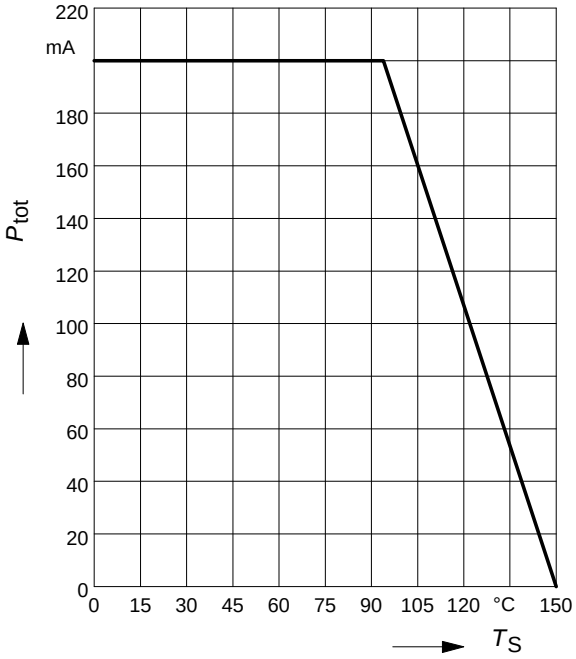
Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Forward transconductance V_{DS} = 5 V, V_{G2S} = 4.5 V	g_{fs}	20	24	-	mS
Gate1 input capacitance V_{DS} = 5 V, V_{G2S} = 4 V, f = 10 MHz	C_{g1ss}	-	2.1	2.5	pF
Output capacitance V_{DS} = 5 V, V_{G2S} = 4 V, f = 10 MHz	C_{dss}	-	1.3	-	
Power gain (self biased) V_{DS} = 5 V, V_{G2S} = 4 V, f = 800 MHz	G_p	17	19	-	dB
Noise figure V_{DS} = 5 V, V_{G2S} = 4 V, f = 800 MHz	F	-	1.6	2.5	dB
Gain control range V_{DS} = 5 V, V_{G2S} = 4V ...0V, f = 800 GHz	ΔG_p	40	50	-	

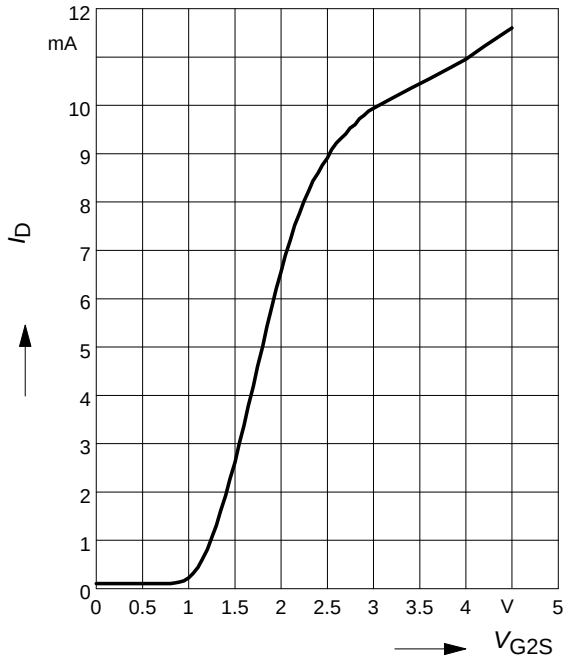
Total power dissipation $P_{tot} = f(T_S)$
BF1005, BF1005R



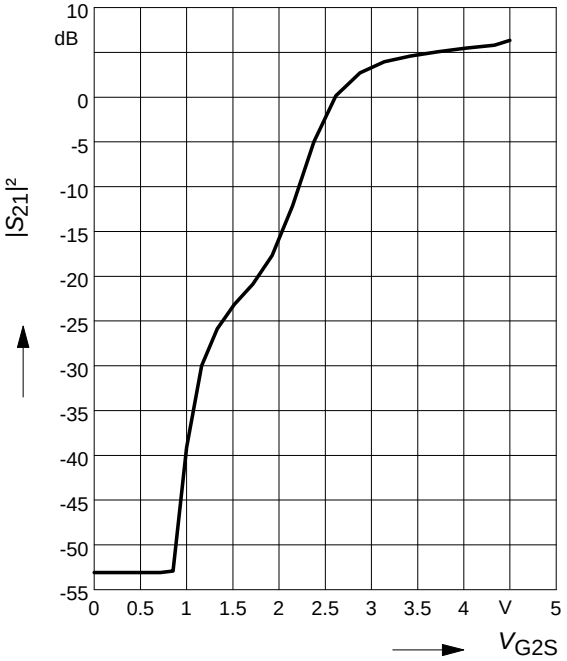
Total power dissipation $P_{tot} = f(T_S)$
BF1005W



Drain current $I_D = f(V_{G2S})$

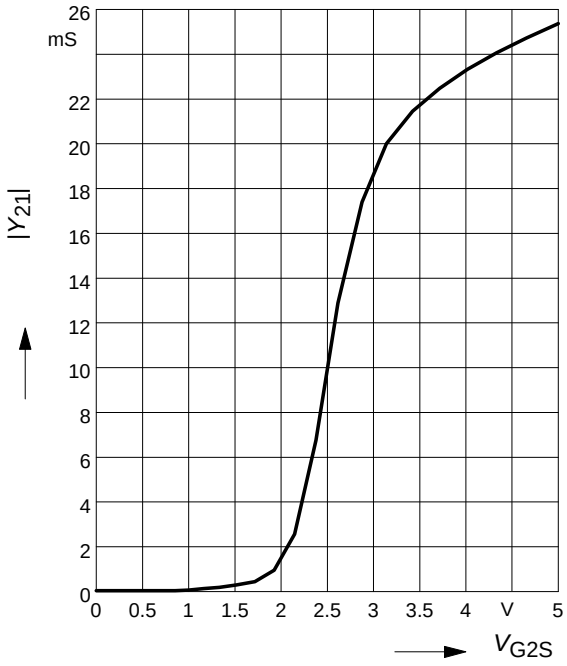


Insertion power gain
$|S_{21}|^2 = f(V_{G2S})$



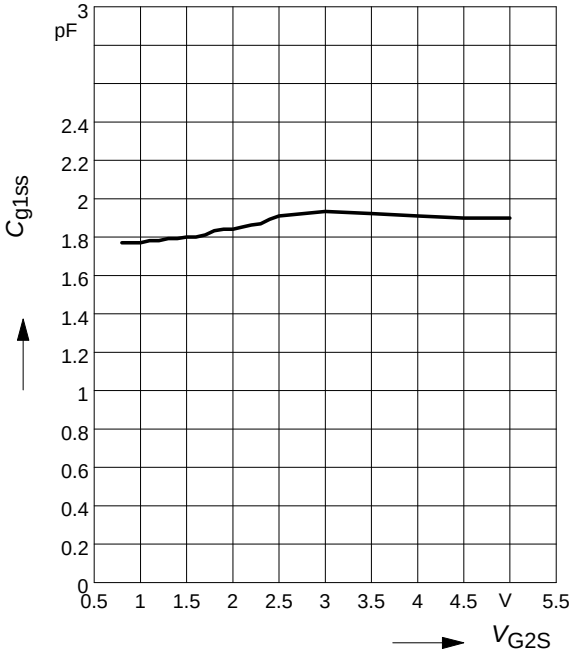
Forward transfer admittance

$|Y_{21}| = f(V_{G2S})$



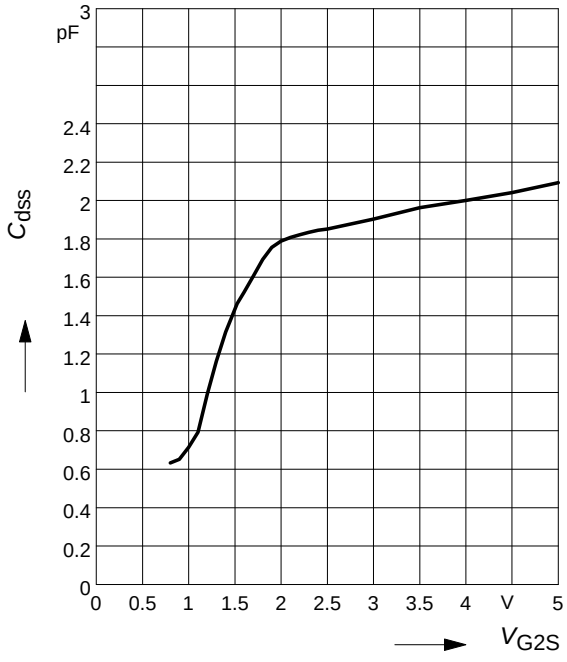
Gate 1 input capacitance $C_{g1ss} = f(V_{g2s})$

f = 200MHz

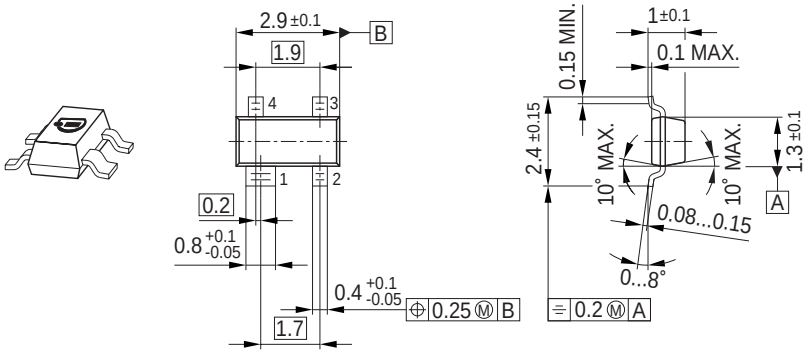


Output capacitance $C_{dss} = f(V_{G2S})$

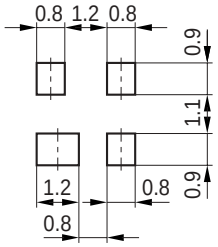
f = 200MHz



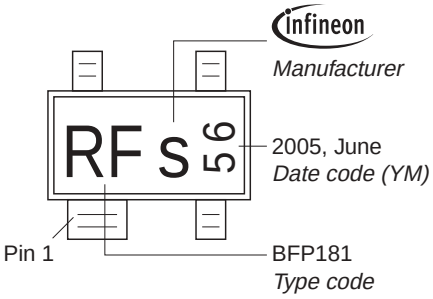
Package Outline



Foot Print

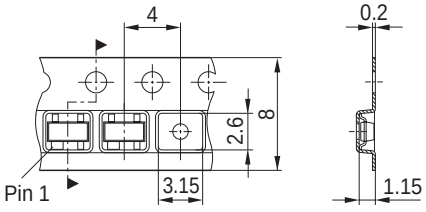


Marking Layout (Example)

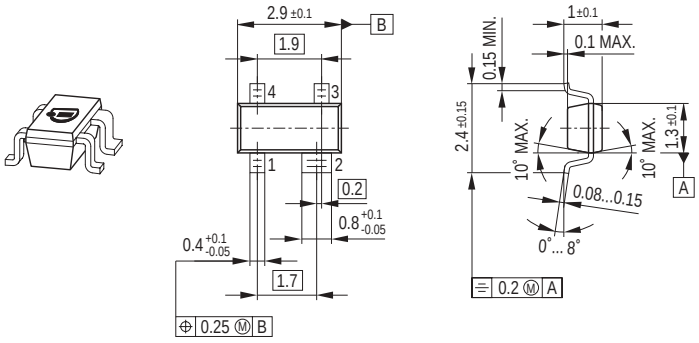


Standard Packing

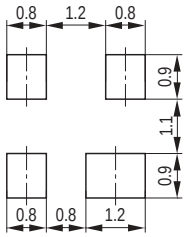
Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel



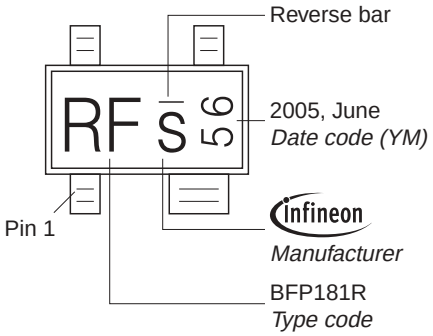
Package Outline



Foot Print

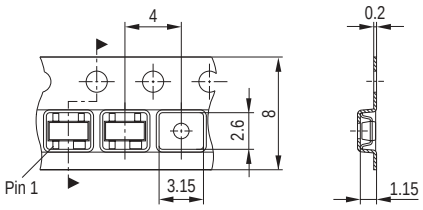


Marking Layout (Example)



Standard Packing

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