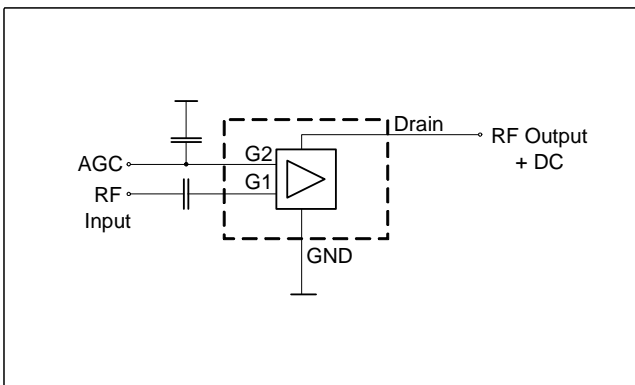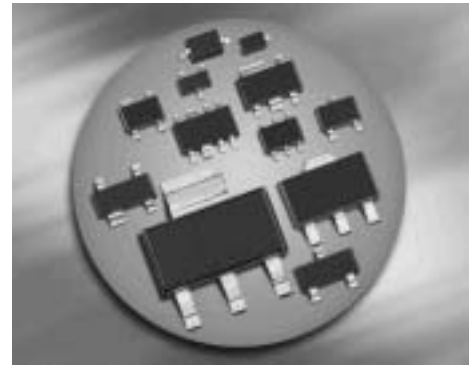## Silicon N-Channel MOSFET Tetrode

- For low noise, high gain controlled input stages up to 1 GHz
- Operating voltage 5 V
- Integrated biasing network
- 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!

Type	Package	Pin Configuration						Marking
BF1005S	SOT143	1=S	2=D	3=G2	4=G1	-	-	NZs
BF1005SR	SOT143R	1=D	2=S	3=G1	4=G2	-	-	NZs

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.

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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 $\pm I_{G2S}$ = 10 mA, V_{G1S} = 0 , V_{DS} = 0	$\pm V_{(BR)G2SS}$	8	-	13	
Gate1-source leakage current V_{G1S} = 6 V, V_{G2S} = 0	$+I_{G1SS}$	-	100	-	µA
Gate 2 source leakage current $\pm V_{G2S}$ = 8 V, V_{G1S} = 0 , V_{DS} = 0	$\pm I_{G2SS}$	-	-	50	nA
Drain current V_{DS} = 5 V, V_{G1S} = 0 , V_{G2S} = 4 V	I_{DSS}	-	-	800	µA
Operating current (selfbiased) V_{DS} = 5 V, V_{G2S} = 4 V	I_{DSO}	8	13	16	mA
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}	26	30	-	mS
Gate1 input capacitance V_{DS} = 5 V, V_{G2S} = 4 V, f = 1 MHz	C_{g1ss}	-	2.4	2.7	pF
Output capacitance V_{DS} = 5 V, V_{G2S} = 4 V, f = 100 MHz	C_{dss}	-	1.3	-	
Power gain (self biased) V_{DS} = 5 V, V_{G2S} = 4 V, f = 800 MHz	G_p	20	22	-	dB
Noise figure V_{DS} = 5 V, V_{G2S} = 4 V, f = 800 MHz	F	-	1.6	2.1	dB
Gain control range V_{DS} = 5 V, V_{G2S} = 4 V ... 0 V, f = 800 MHz	ΔG_p	40	50	-	

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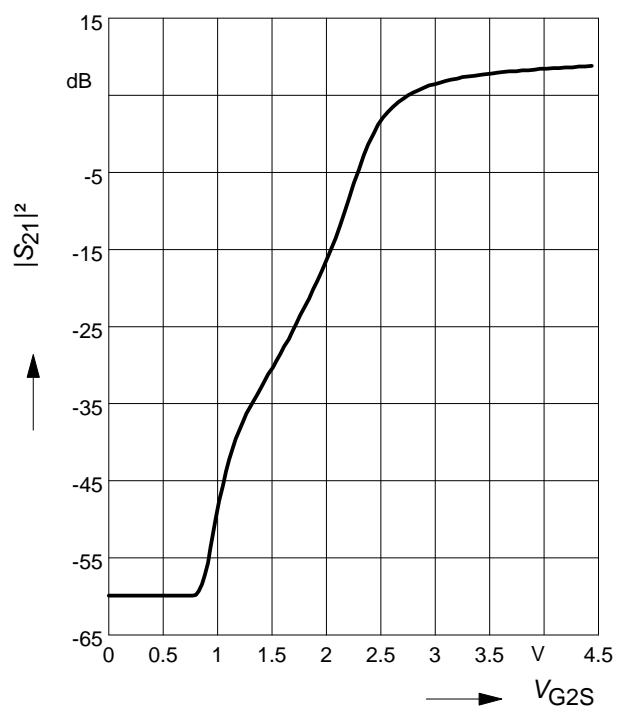**Total power dissipation** $P_{\text{tot}} = f(T_S)$

BF1005S, BF1005SR
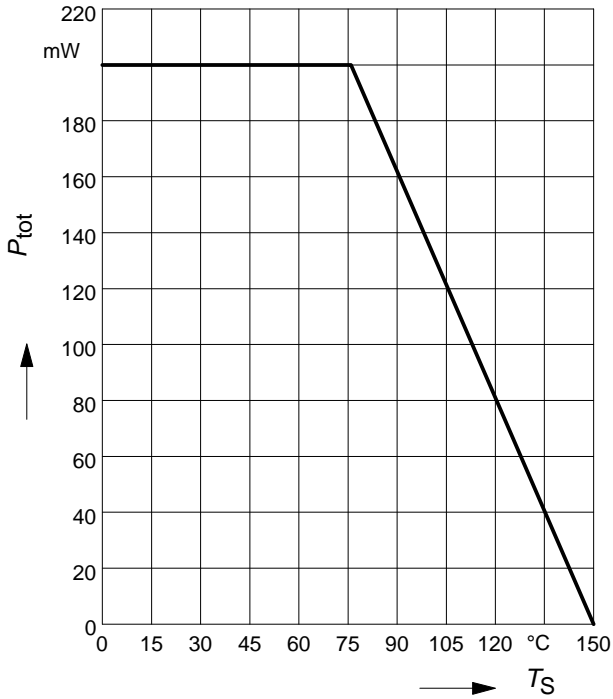
Total power dissipation $P_{\text{tot}} = f(T_S)$

BF1005SW
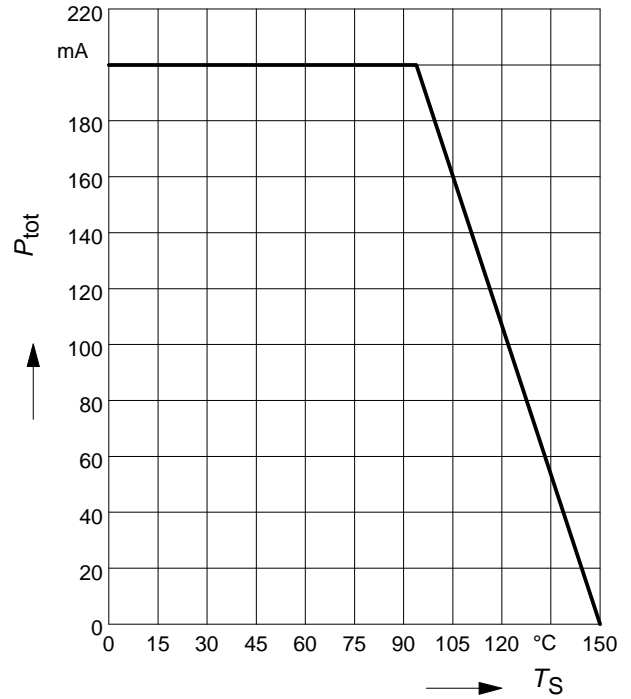
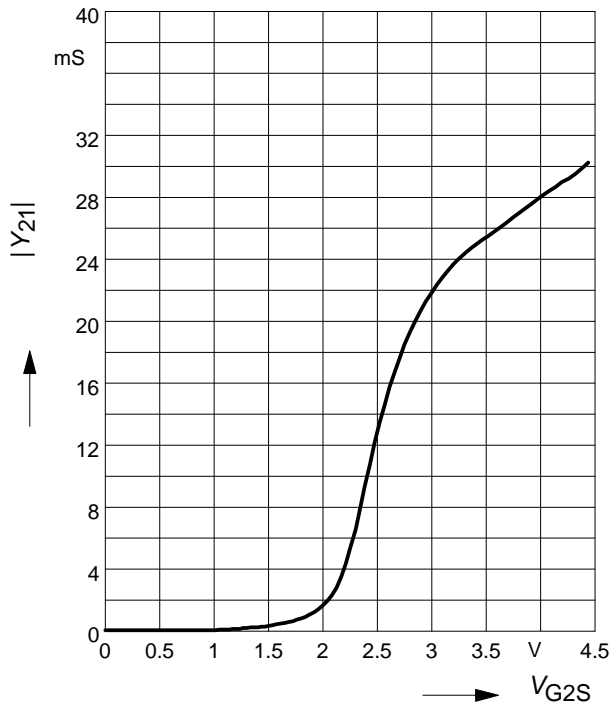**Drain current** $I_D = f(V_{\text{G2S}})$
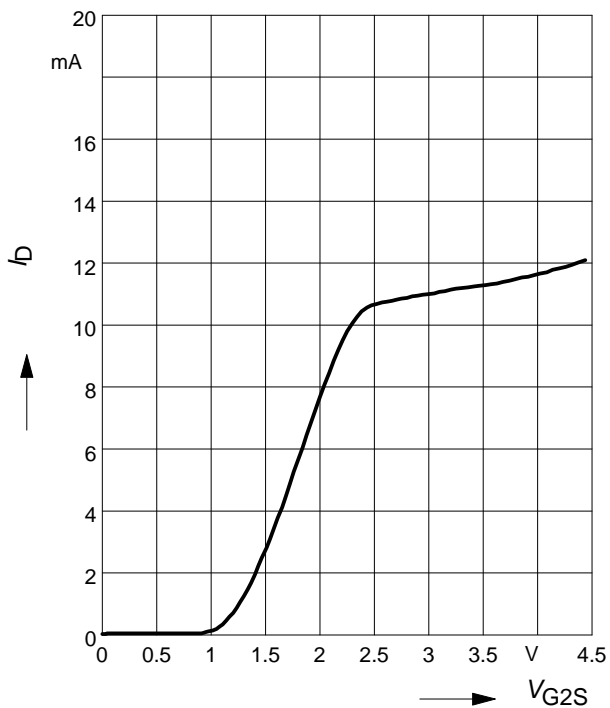
Insertion power gain
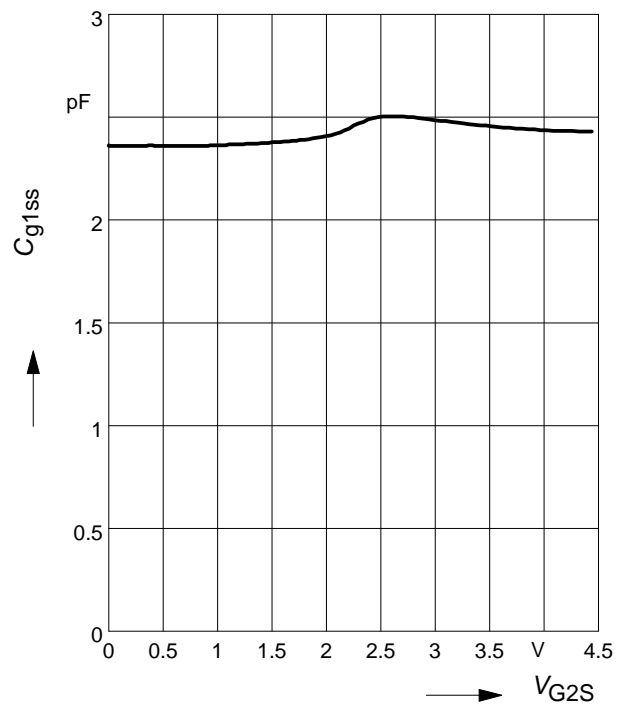
$|S_{21}|^2 = f(V_{\text{G2S}})$
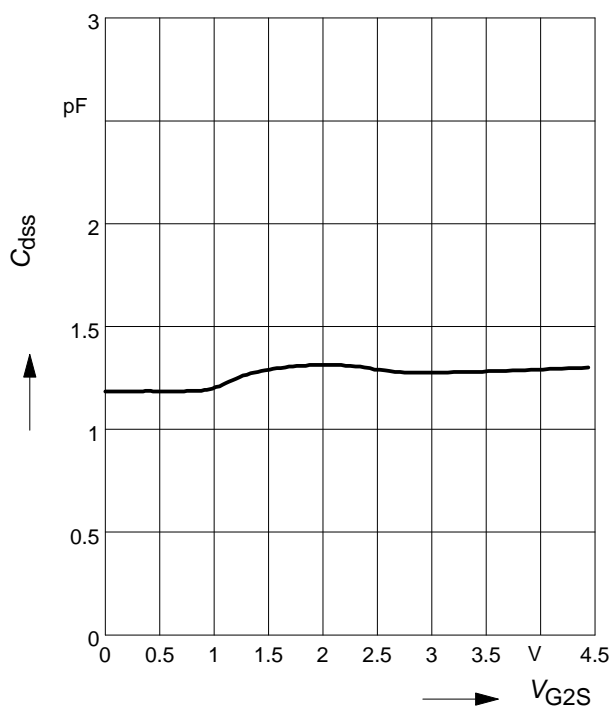

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Forward transfer admittance

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

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

f = 200MHz

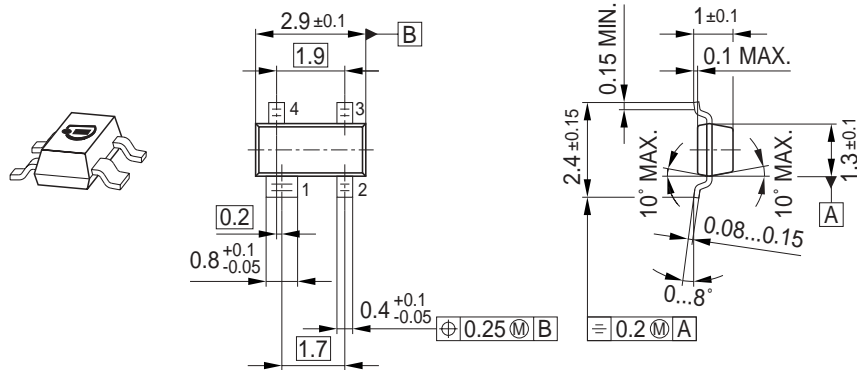**Output capacitance** $C_{dss} = f(V_{G2S})$
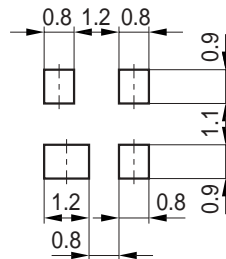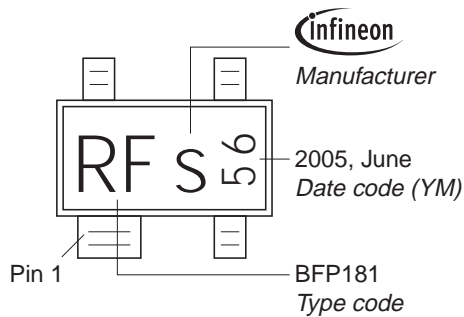
f = 200MHz

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Package Outline

Foot Print

Marking Layout (Example)

Manufacturer

RF s 56

2005, June
Date code (YM)

Pin 1

BFP181
Type code

Standard Packing

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

Pin 1

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Package Outline

Foot Print

Marking Layout (Example)

- Reverse bar
- 2005, June *Date code (YM)*
- RF S 56
- Pin 1
- **Infineon** *Manufacturer*
- BFP181R *Type code*

Standard Packing

Reel ⌀180 mm = 3.000 Pieces/Reel
Reel ⌀330 mm = 10.000 Pieces/Reel
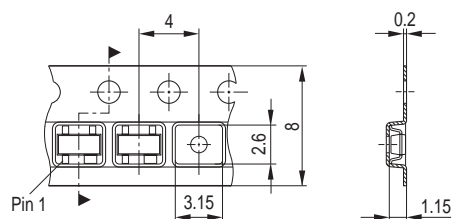
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