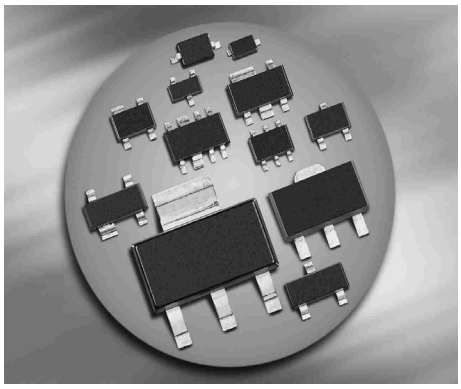
Silicon N_Channel MOSFET Tetrode



- Short-channel transistor with high S / C quality factor
- For low-noise, gain-controlled input stage up to 1 GHz
- Pb-free (RoHS compliant) package

RoHS

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

Type	Package	Pin Configuration						Marking
BF998	SOT143	1=S	2=D	3=G2	4=G1	-	-	MOs
BF998R	SOT143R	1=D	2=S	3=G1	4=G2	-	-	MRs

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	12	V
Continuous drain current	I_D	30	mA
Gate 1/ gate 2-source current	$\pm I_{G1/2SM}$	10	
Total power dissipation $T_S \leq 76$ °C, BF998, BF998R	P_{tot}	200	
Storage temperature	T_{Stg}	-55 ... 150	°C
Channel temperature	T_{ch}	150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Channel - soldering point[1)], BF998, BF998R	R_{thchs}	≤ 370	K/W

[1]For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)

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

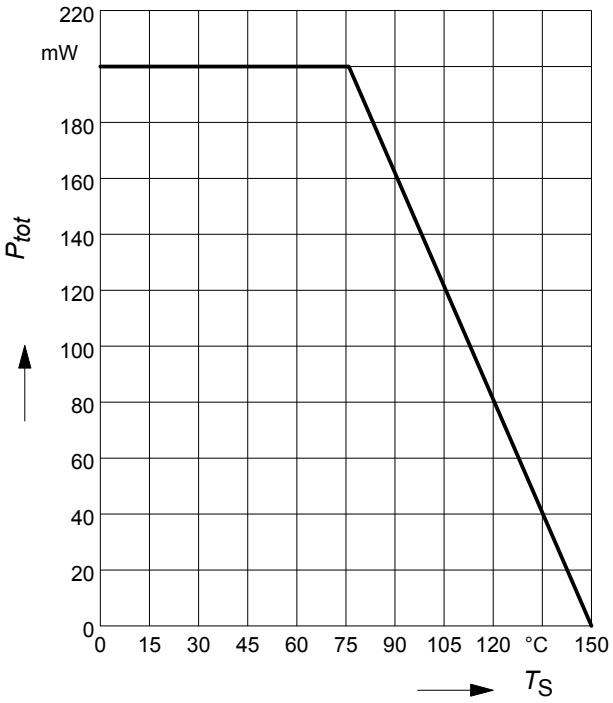
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Drain-source breakdown voltage I_D = 10 µA, V_{G1S} = -4 V, V_{G2S} = -4 V	$V_{(BR)DS}$	12	-	-	V
Gate 1 source breakdown voltage $\pm I_{G2S}$ = 10 mA, V_{G2S} = V_{DS} = 0	$\pm V_{(BR)G1SS}$	8	-	12	
Gate2 source breakdown voltage $\pm I_{G2S}$ = 10 mA, V_{G2S} = V_{DS} = 0	$\pm V_{(BR)G2SS}$	8	-	12	
Gate 1 source leakage current $\pm V_{G1S}$ = 5 V, V_{G2S} = V_{DS} = 0	$\pm I_{G1SS}$	-	-	50	nA
Gate 2 source leakage current $\pm V_{G2S}$ = 5 V, V_{G2S} = V_{DS} = 0	$\pm I_{G2SS}$	-	-	50	nA
Drain current V_{DS} = 8 V, V_{G1S} = 0 , V_{G2S} = 4 V	I_{DSS}	5	9	15	mA
Gate 1 source pinch-off voltage V_{DS} = 8 V, V_{G2S} = 4 V, I_D = 20 µA	$-V_{G1S(p)}$	-	0.8	2.5	V
Gate 2 source pinch-off voltage V_{DS} = 8 V, V_{G1S} = 0 , I_D = 20 µA	$-V_{G2S(p)}$	-	0.8	2	

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} = 8 V, I_D = 10 mA, V_{G2S} = 4 V	g_{fs}	20	24	-	-
Gate1 input capacitance V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 10 MHz	C_{g1ss}	-	2.1	2.5	pF
Gate 2 input capacitance V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 10 MHz	C_{g2ss}	-	1.2	-	pF
Feedback capacitance V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 10 MHz	C_{dg1}	-	25	-	fF
Output capacitance V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 10 MHz	C_{dss}	-	1.1	-	pF
Power gain V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 45 MHz V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 800 MHz	G_p	 - -	 28 20	 - -	dB
Noise figure V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 45 MHz V_{DS} = 8 V, I_D = 10 mA, V_{G2S} = 4 V, f = 800 MHz	F	 - -	 2.8 1.8	 - -	dB
Gain control range V_{DS} = 8 V, V_{G2S} = 4 ...-2 V, f = 800 MHz	ΔG_p	40	50	-	

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

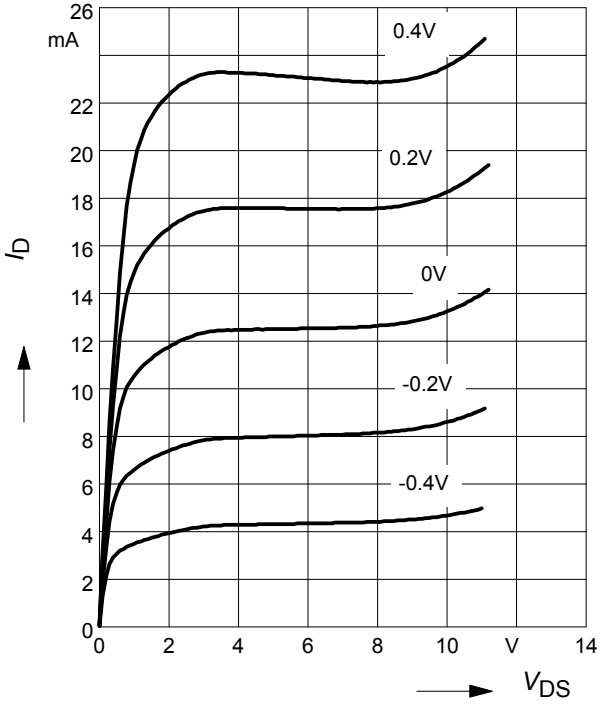
BF998, BF998R



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

V_{G2S} = 4 V

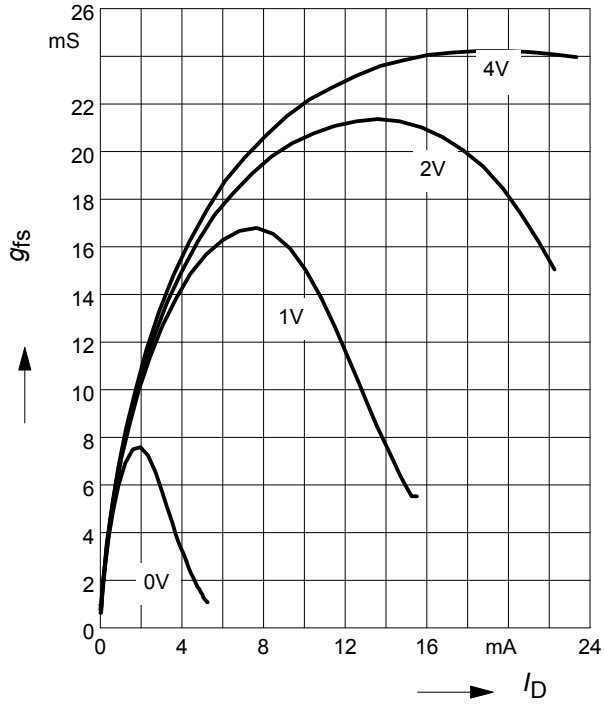
V_{G1S} = Parameter



Gate 1 forward transconductance

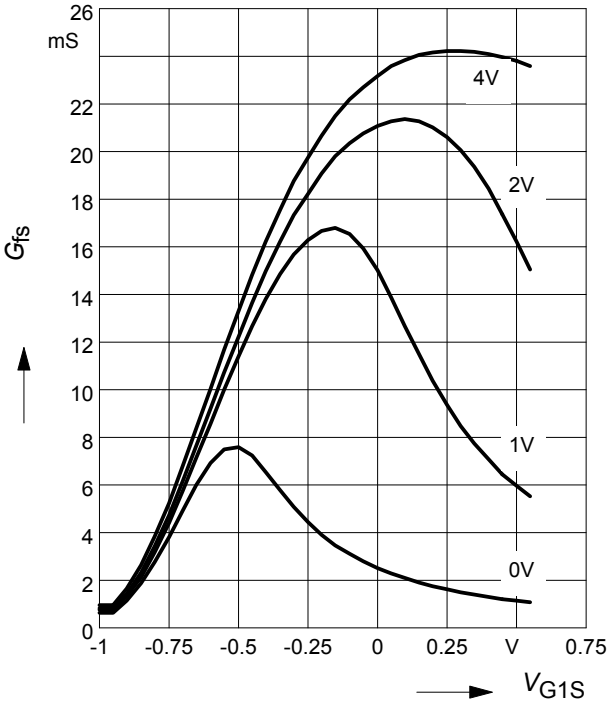
$g_{fs} = f(I_D)$

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



Gate 1 forward transconductance

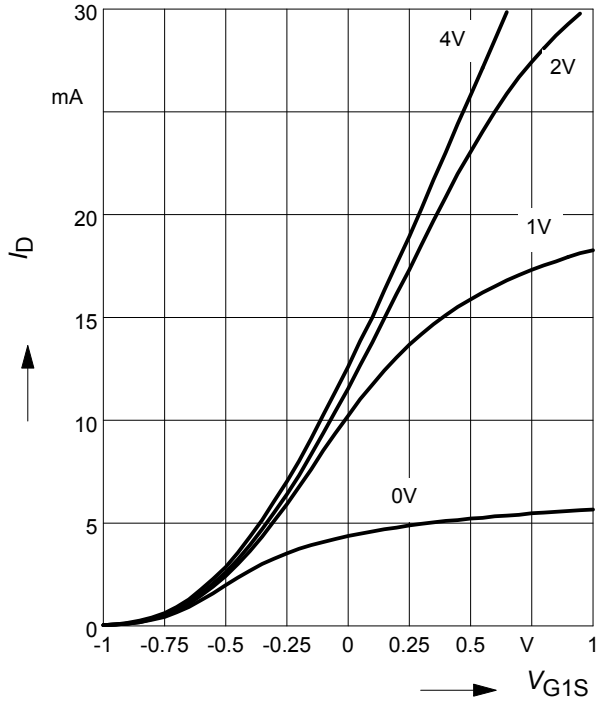
$g_{fs1} = f(V_{G1S})$



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

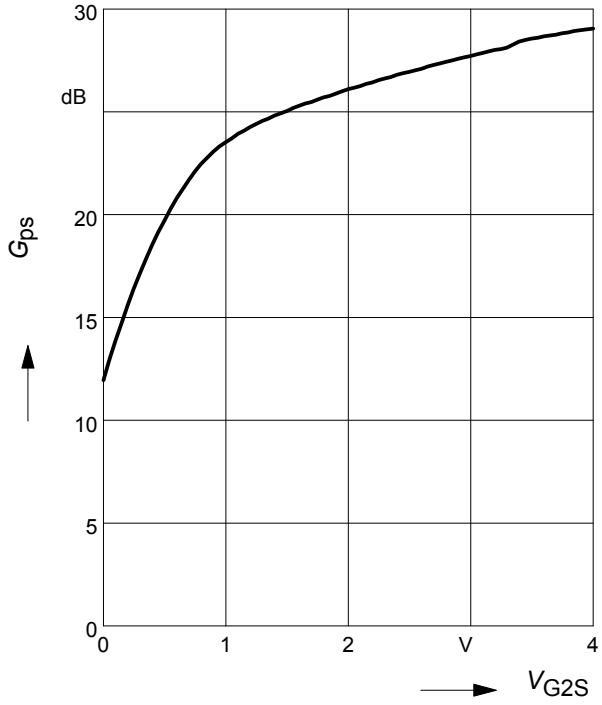
V_{DS} = 5V

V_{G2S} = Parameter



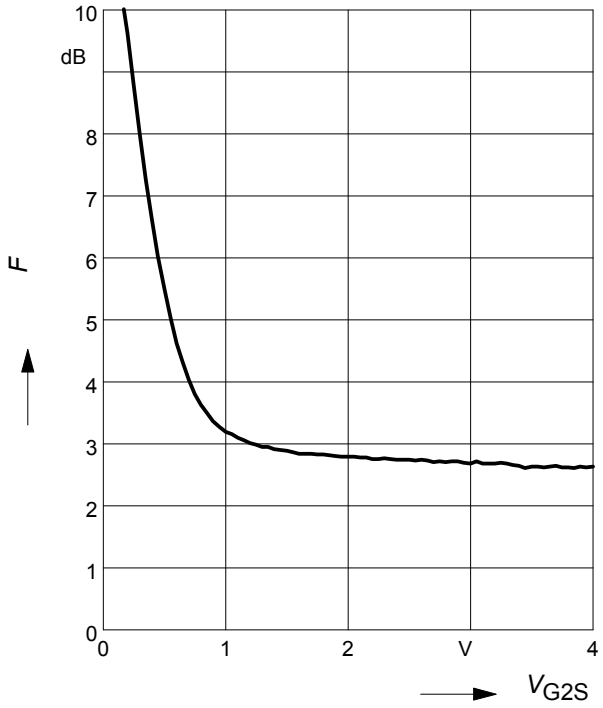
Power gain $G_{ps} = f(V_{G2S})$

f = 45 MHz



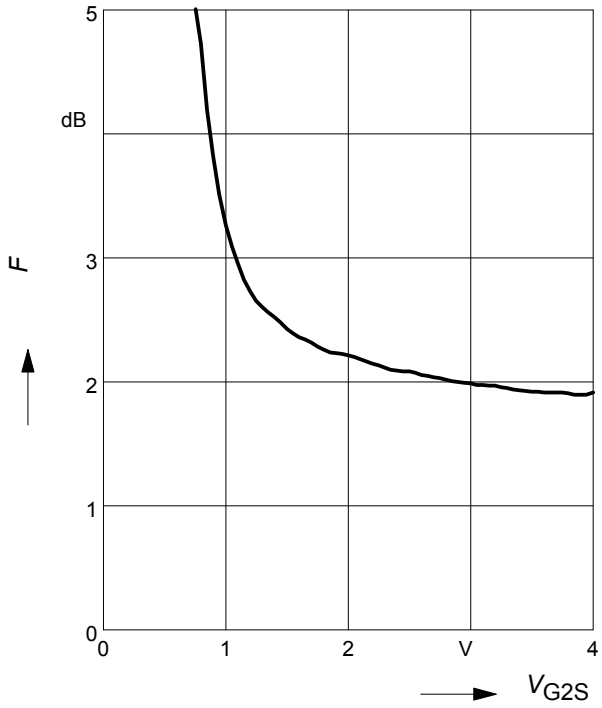
Noise figure $F = f(V_{G2S})$

f = 45 MHz

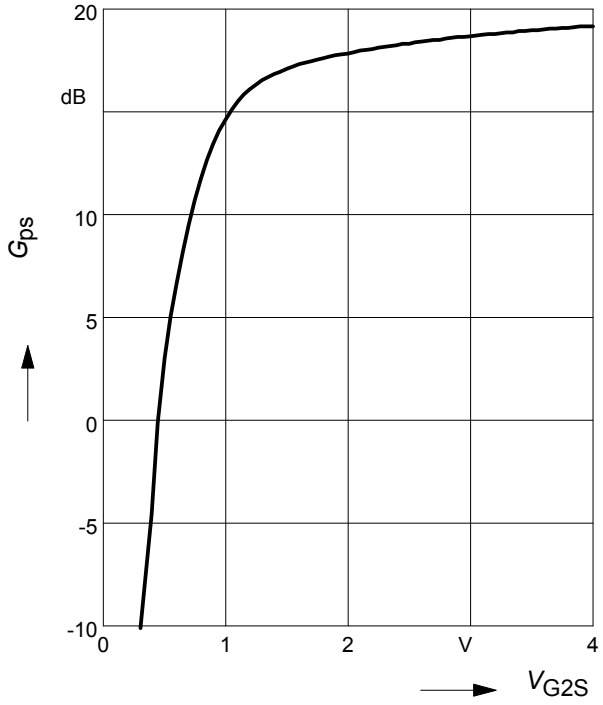


Noise figure $F = f(V_{G2S})$

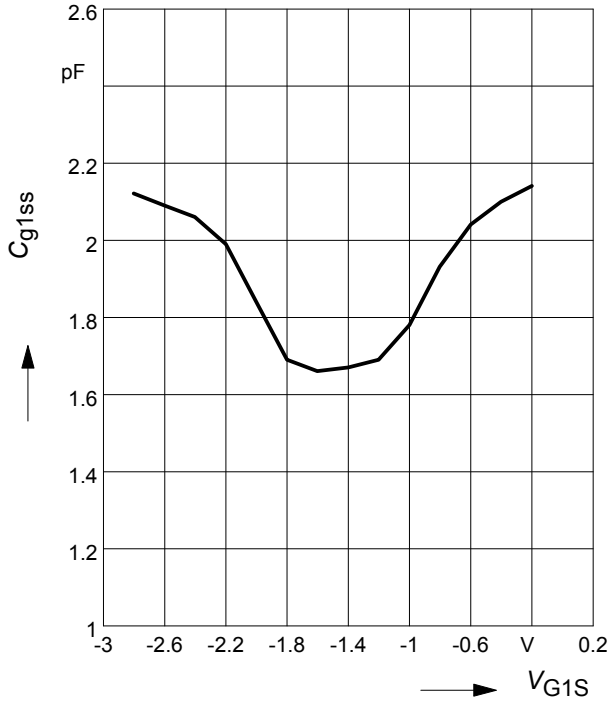
f = 800 MHz



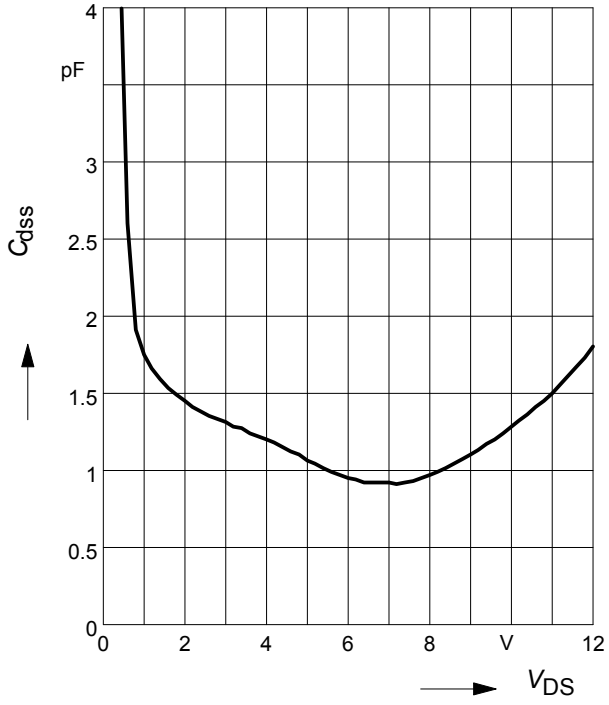
Power gain $G_{ps} = f\ (V_{G2S})$
f = 800 MHz



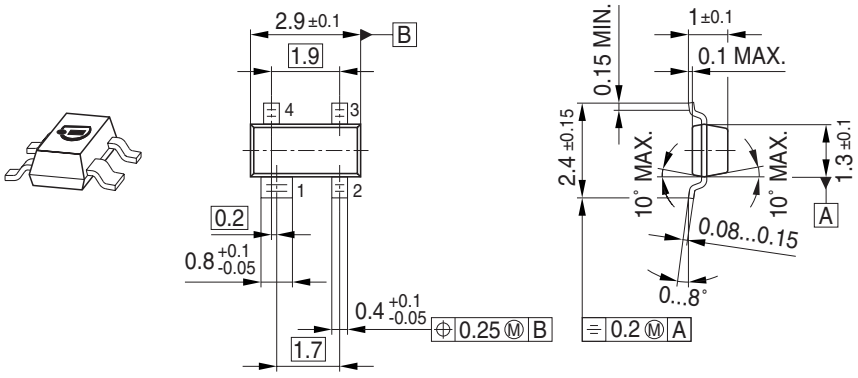
Gate 1 input capacitance $C_{g1ss} = f\ (V_{G1S})$



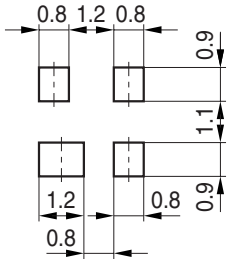
Output capacitance $C_{dss} = f(V_{DS})$



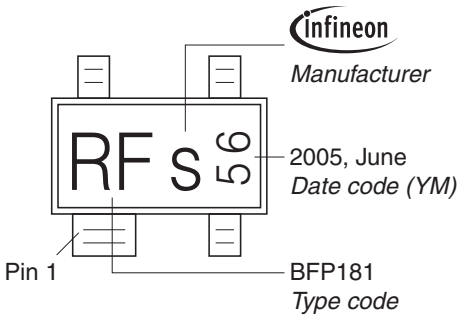
Package Outline



Foot Print

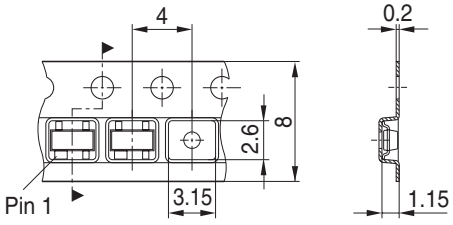


Marking Layout (Example)

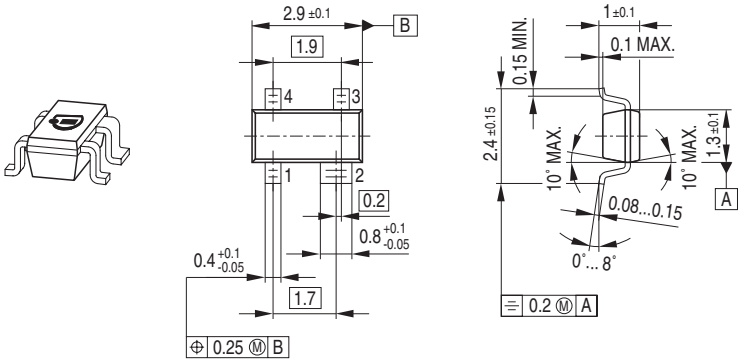


Standard Packing

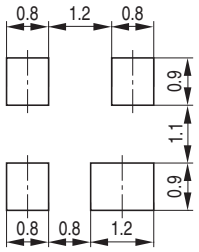
Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel



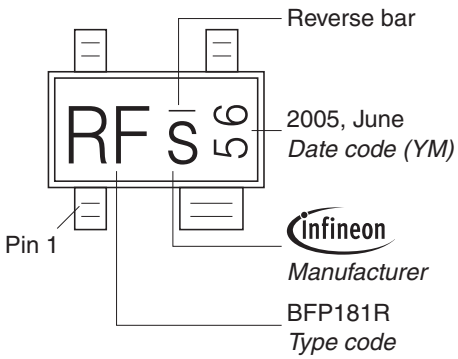
Package Outline



Foot Print

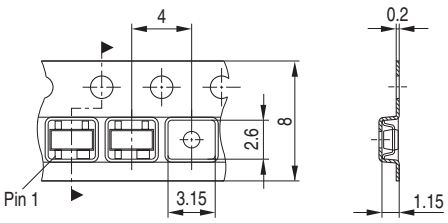


Marking Layout (Example)



Standard Packing

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



Edition 2009-11-16

Published by
Infineon Technologies AG
81726 Munich, Germany

Legal Disclaimer

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. 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 the 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 the nearest Infineon Technologies Office.
Infineon Technologies components may be used in life-support devices or systems only 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.