

# DATA SHEET

## **BF1107; BF1107W** N-channel single gate MOS-FETs

Product specification  
Supersedes data of 1998 Jun 22

1999 May 14

# N-channel single gate MOS-FETs

# BF1107; BF1107W

## FEATURES

- Currentless RF switch.

## APPLICATIONS

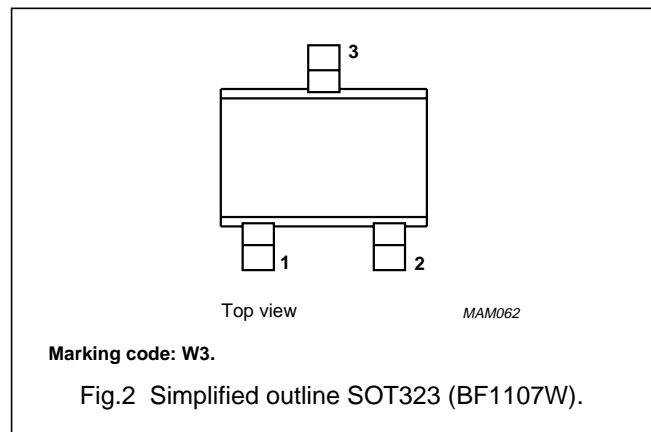
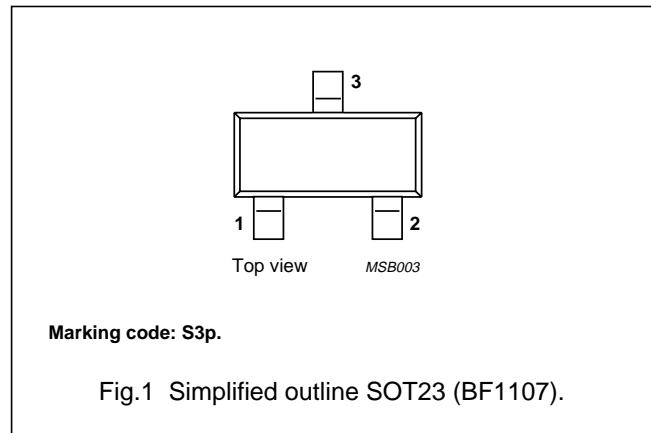
- Various RF switching applications such as:
  - Passive loop through for VCR tuner
  - Transceiver switching.

## DESCRIPTION

The BF1107 and BF1107W are depletion type field-effect transistors in SOT23 and SOT323 packages respectively. The low loss and high isolation capabilities of this MOS-FET provide excellent RF switching functions. Integrated diodes between gate and source and between gate and drain protect against excessive input voltage surges. Drain and source are interchangeable.

## PINNING

PIN	DESCRIPTION	
	BF1107	BF1107W
1	drain	drain
2	source	source
3	gate	gate



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$ S_{21(on)} ^2$	losses (on-state)	$R_S = R_L = 50 \Omega$ ; $f = 50$ to $860$ MHz	-	-	2.5	dB
$ S_{21(off)} ^2$	isolation (off-state)		30	-	-	dB
$R_{DSon}$	drain-source on-resistance	$V_{GS} = 0$ ; $I_D = 1$ mA	-	12	20	$\Omega$
$V_{GSoff}$	pinch-off voltage	$I_D = 20 \mu A$ ; $V_{DS} = 1$ V	-	-3	-4.5	V

## CAUTION

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A and SNW-FQ-302B.

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**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage	–	3	V
$V_{SD}$	source-drain voltage	–	3	V
$V_{DG}$	drain-gate voltage	–	7	V
$V_{SG}$	source-gate voltage	–	7	V
$I_D$	drain current	–	10	mA
$T_{stg}$	storage temperature	–65	+150	°C
$T_j$	junction temperature	–	150	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j-s}$	thermal resistance from junction to soldering point; note 1	260	K/W

**Note**

1. Soldering point of the gate lead.

**STATIC CHARACTERISTICS**

$T_j = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)GSS}$	gate-source breakdown voltage	$V_{DS} = 0$ ; $I_{GS} = 0.1\text{ mA}$	7	–	–	V
$V_{GSoff}$	gate-source pinch-off voltage	$V_{DS} = 1\text{ V}$ ; $I_D = 20\text{ }\mu\text{A}$	–	–3	–4.5	V
$I_{DSX}$	drain-source leakage current	$V_{GS} = -5\text{ V}$ ; $V_{DS} = 2\text{ V}$	–	–	10	$\mu\text{A}$
$I_{GSS}$	gate cut-off current	$V_{GS} = -5\text{ V}$ ; $V_{DS} = 0$	–	–	100	nA

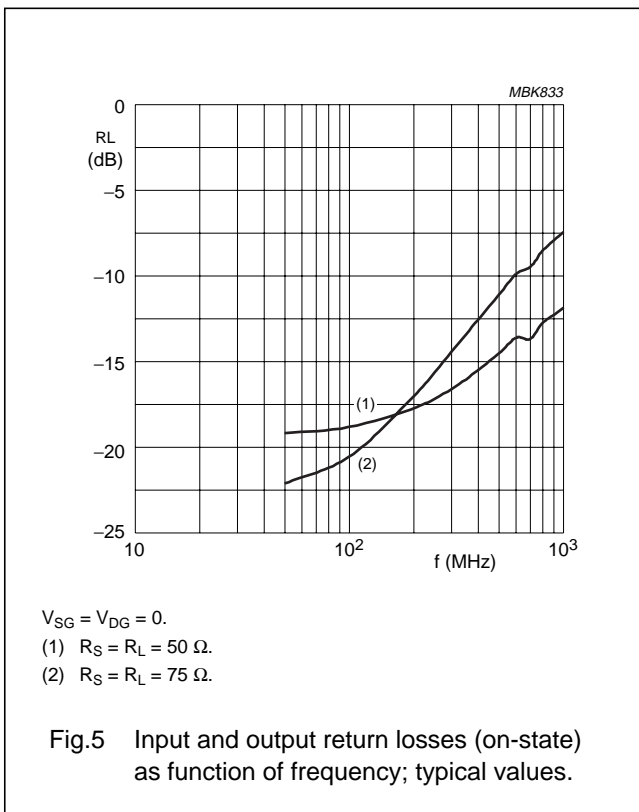
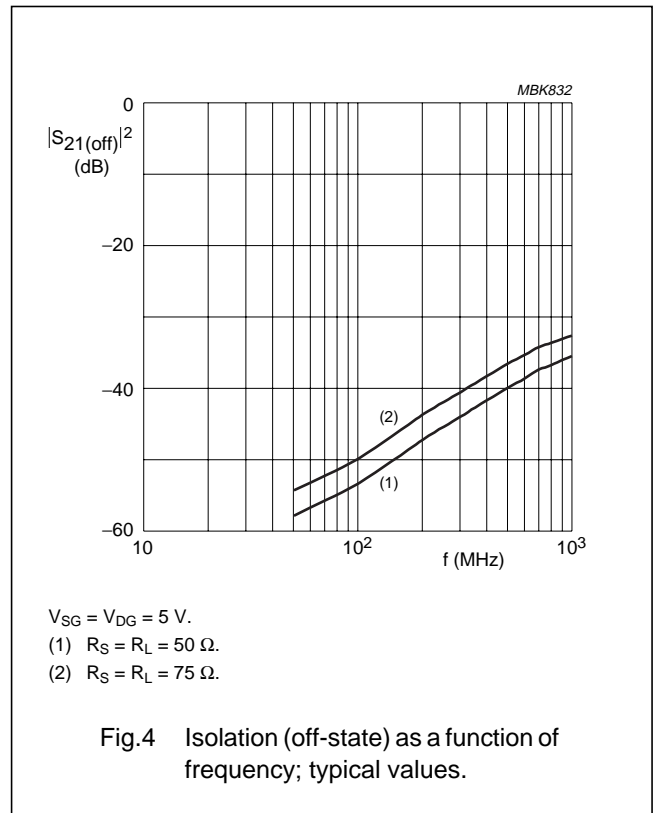
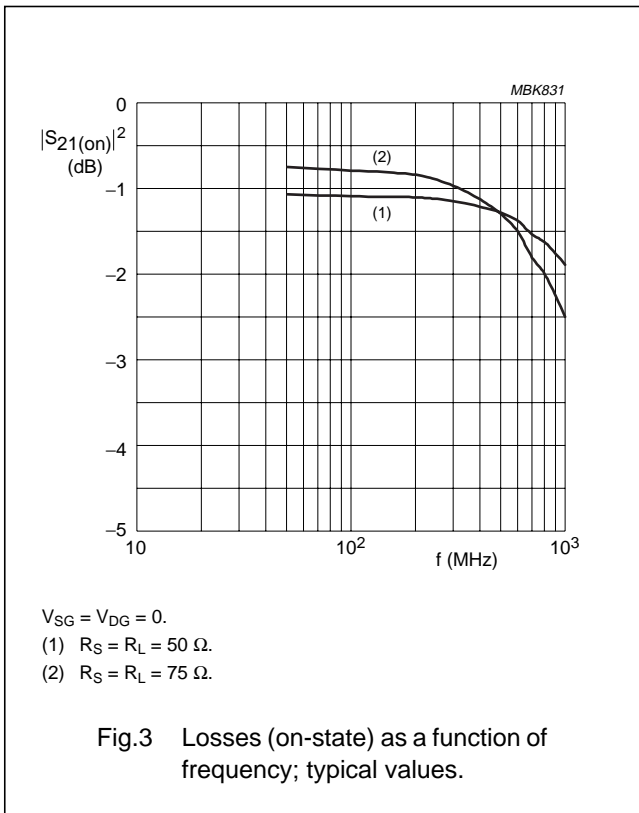
**DYNAMIC CHARACTERISTICS**

Common gate;  $T_{amb} = 25\text{ °C}$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$ S_{21(on)} ^2$	losses (on-state)	$V_{SG} = V_{DG} = 0$ ; $R_S = R_L = 50\text{ }\Omega$ ; $f = 50\text{ to }860\text{ MHz}$	–	–	2.5	dB
		$V_{SG} = V_{DG} = 0$ ; $R_S = R_L = 75\text{ }\Omega$ ; $f = 50\text{ to }860\text{ MHz}$	–	–	3.5	dB
$ S_{21(off)} ^2$	isolation (off-state)	$V_{SG} = V_{DG} = 5\text{ V}$ ; $R_S = R_L = 50\text{ }\Omega$ ; $f = 50\text{ to }860\text{ MHz}$	30	–	–	dB
		$V_{SG} = V_{DG} = 5\text{ V}$ ; $R_S = R_L = 75\text{ }\Omega$ ; $f = 50\text{ to }860\text{ MHz}$	30	–	–	dB
$R_{DSon}$	drain-source on-resistance	$V_{GS} = 0$ ; $I_D = 1\text{ mA}$	–	12	20	$\Omega$
$C_{ig}$	input capacitance	$V_{SG} = V_{DG} = 5\text{ V}$ ; $f = 1\text{ MHz}$	–	0.9	–	pF
		$V_{SG} = V_{DG} = 0$ ; $f = 1\text{ MHz}$	–	1.5	2	pF
$C_{og}$	output capacitance	$V_{SG} = V_{DG} = 5\text{ V}$ ; $f = 1\text{ MHz}$	–	0.9	–	pF
		$V_{SG} = V_{DG} = 0$ ; $f = 1\text{ MHz}$	–	1.5	2	pF

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PACKAGE OUTLINES

Plastic surface mounted package; 3 leads

SOT23

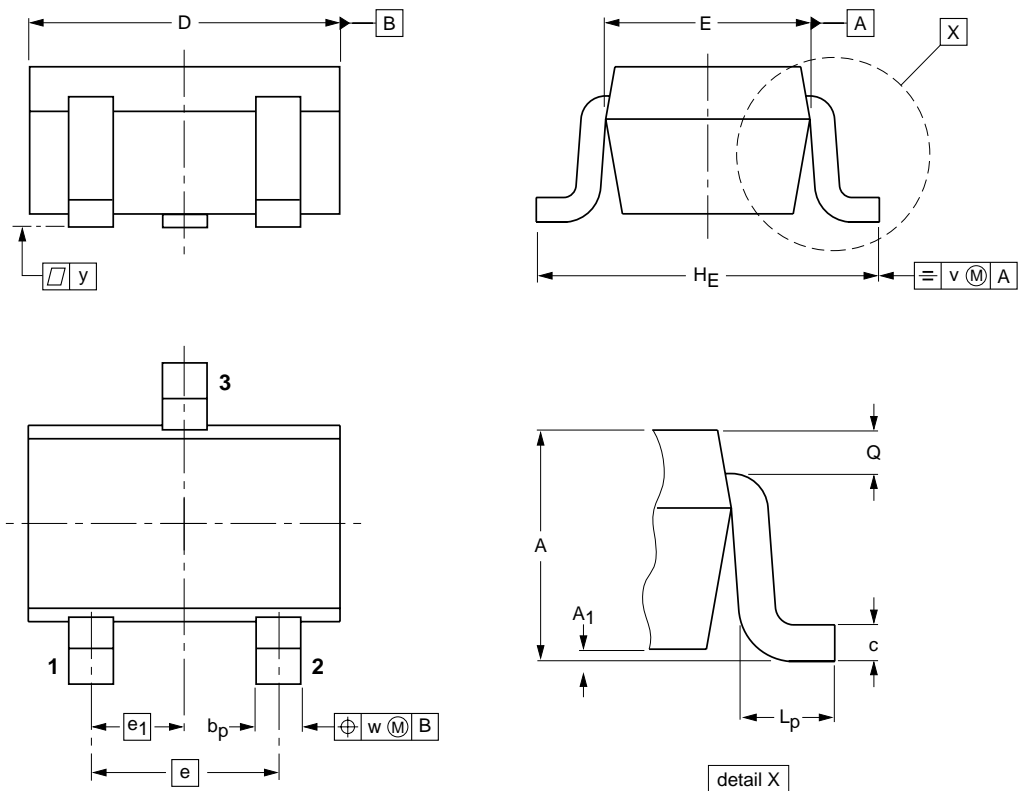


N-channel single gate MOS-FETs

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Plastic surface mounted package; 3 leads

SOT323



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w
mm	1.1 0.8	0.1	0.4 0.3	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT323			SC-70			97-02-28

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**DEFINITIONS**

<b>Data sheet status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

**LIFE SUPPORT APPLICATIONS**

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