

# BF1107

N-channel single gate MOSFET

Rev. 04 — 9 January 2007

Product data sheet

## 1. Product profile

### 1.1 General description

The BF1107 is a depletion type field-effect transistor in a SOT23 package. The low loss and high isolation capabilities of this MOSFET 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.

#### CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

### 1.2 Features

- Currentless RF switch

### 1.3 Applications

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

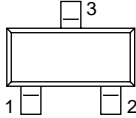
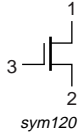
### 1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$L_{ins(on)}$	on-state insertion loss	$V_{SG} = V_{DG} = 0\text{ V}$ ; $f = 50\text{ MHz to }860\text{ MHz}$				
		$R_S = R_L = 50\ \Omega$	-	-	2.5	dB
		$R_S = R_L = 75\ \Omega$	-	-	3.5	dB
$ISL_{off}$	off-state isolation	$V_{SG} = V_{DG} = 5\text{ V}$ ; $f = 50\text{ MHz to }860\text{ MHz}$				
		$R_S = R_L = 50\ \Omega$	30	-	-	dB
		$R_S = R_L = 75\ \Omega$	30	-	-	dB
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = 0\text{ V}$ ; $I_D = 1\text{ mA}$	-	12	20	$\Omega$
$V_{GS(p)}$	gate-source pinch-off voltage	$V_{DS} = 1\text{ V}$ ; $I_D = 20\ \mu\text{A}$	-	-3	-4.5	V

## 2. Pinning information

Table 2. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	drain <a href="#">[1]</a>		
2	source <a href="#">[1]</a>		
3	gate		

[1] Drain and source are interchangeable

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BF1107	-	plastic surface-mounted package; 3 leads	SOT23

## 4. Marking

Table 4. Marking

Type number	Marking code
BF1107	S3p

## 5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	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

## 6. Thermal characteristics

**Table 6. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[1] 260	K/W

[1] Soldering point of the gate lead.

## 7. Static characteristics

**Table 7. Static characteristics**

$T_j = 25\text{ }^\circ\text{C}$ .

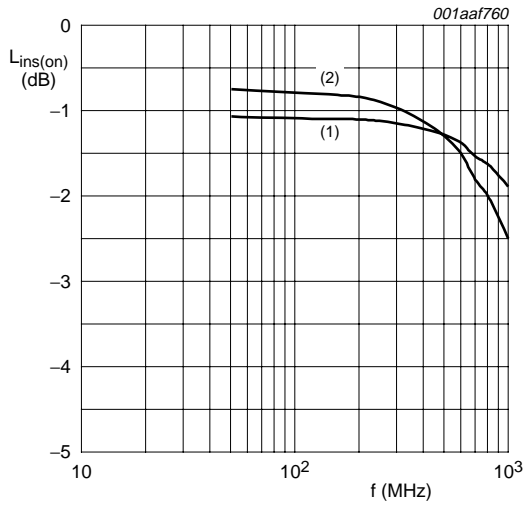
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)GSS}$	gate-source breakdown voltage	$V_{DS} = 0\text{ V}$ ; $I_{GS} = 0.1\text{ mA}$	7	-	-	V
$V_{GS(p)}$	gate-source pinch-off voltage	$V_{DS} = 1\text{ V}$ ; $I_D = 20\text{ }\mu\text{A}$	-	-3	-4.5	V
$I_{DSX}$	drain cut-off current	$V_{GS} = -5\text{ V}$ ; $V_{DS} = 2\text{ V}$	-	-	10	$\mu\text{A}$
$I_{GSS}$	gate leakage current	$V_{GS} = -5\text{ V}$ ; $V_{DS} = 0\text{ V}$	-	-	100	nA

## 8. Dynamic characteristics

**Table 8. Dynamic characteristics**

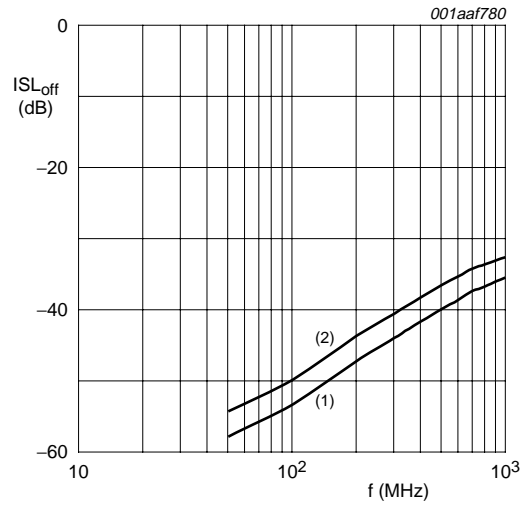
Common gate;  $T_{amb} = 25\text{ }^\circ\text{C}$ .

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$L_{ins(on)}$	on-state insertion loss	$V_{SG} = V_{DG} = 0\text{ V}$ ; $f = 50\text{ MHz to }860\text{ MHz}$				
		$R_S = R_L = 50\text{ }\Omega$	-	-	2.5	dB
		$R_S = R_L = 75\text{ }\Omega$	-	-	3.5	dB
$ISL_{off}$	off-state isolation	$V_{SG} = V_{DG} = 5\text{ V}$ ; $f = 50\text{ MHz to }860\text{ MHz}$				
		$R_S = R_L = 50\text{ }\Omega$	30	-	-	dB
		$R_S = R_L = 75\text{ }\Omega$	30	-	-	dB
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = 0\text{ V}$ ; $I_D = 1\text{ mA}$	-	12	20	$\Omega$
$C_{ig}$	input capacitance at gate	$f = 1\text{ MHz}$				
		$V_{SG} = V_{DG} = 5\text{ V}$	-	0.9	-	pF
		$V_{SG} = V_{DG} = 0\text{ V}$	-	1.5	2	pF
$C_{og}$	output capacitance at gate	$f = 1\text{ MHz}$				
		$V_{SG} = V_{DG} = 5\text{ V}$	-	0.9	-	pF
		$V_{SG} = V_{DG} = 0\text{ V}$	-	1.5	2	pF



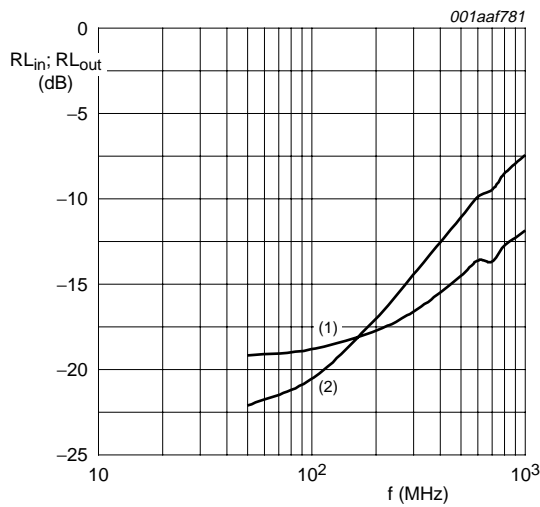
- (1)  $R_S = R_L = 50 \Omega$
- (2)  $R_S = R_L = 75 \Omega$
- $V_{SG} = V_{DG} = 0 \text{ V}$

**Fig 1. On-state insertion loss as a function of frequency; typical values**



- (1)  $R_S = R_L = 50 \Omega$
- (2)  $R_S = R_L = 75 \Omega$
- $V_{SG} = V_{DG} = 5 \text{ V}$

**Fig 2. Off-state isolation as a function of frequency; typical values**



- (1)  $R_S = R_L = 50 \Omega$
- (2)  $R_S = R_L = 75 \Omega$
- $V_{SG} = V_{DG} = 0 \text{ V}$

**Fig 3. Input and output return loss (on-state) as a function of frequency; typical values**

**9. Package outline**

Plastic surface-mounted package; 3 leads

SOT23

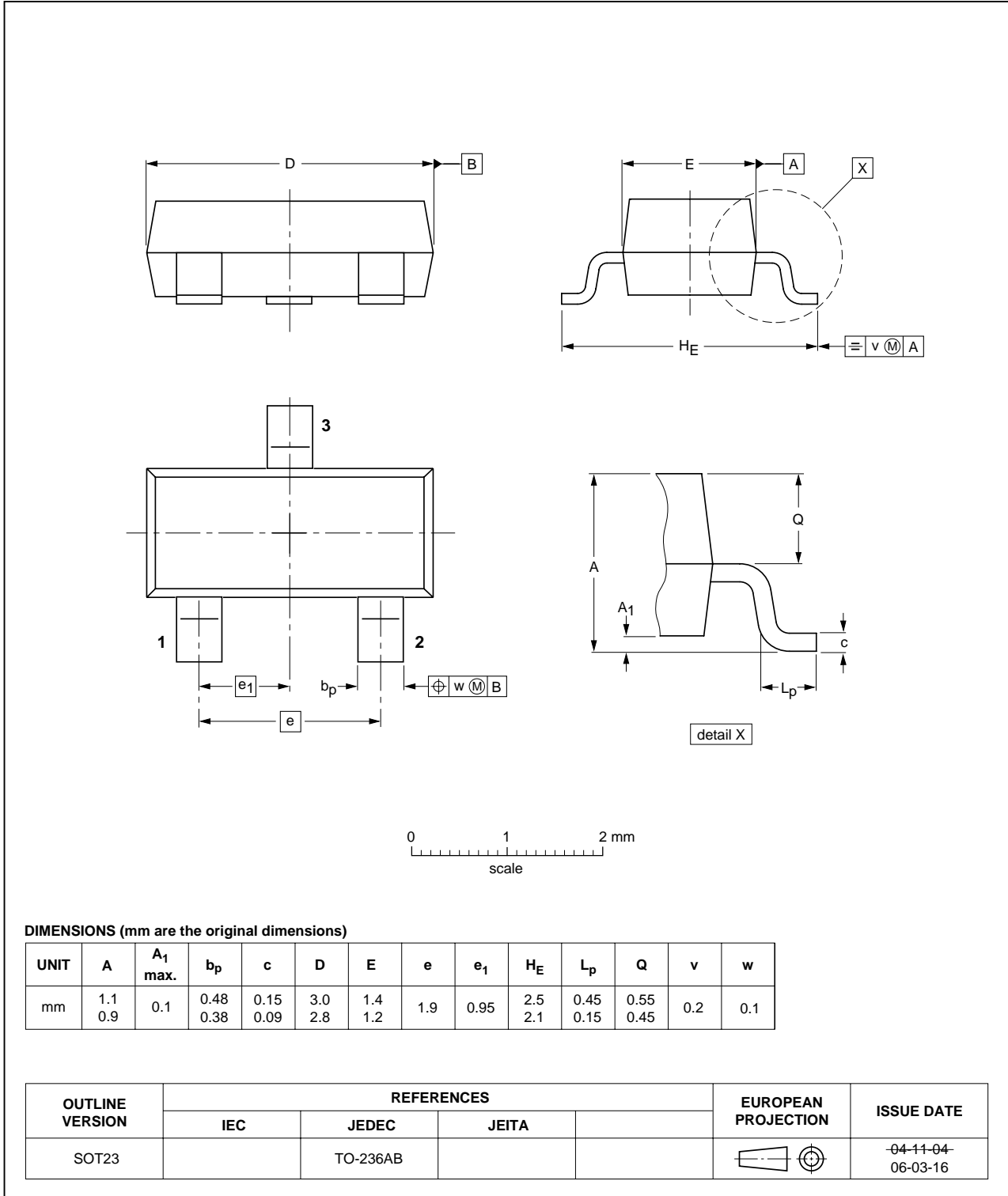


Fig 4. Package outline SOT23

## 10. Abbreviations

**Table 9. Abbreviations**

Acronym	Description
MOSFET	Metal-Oxide Semiconductor Field-Effect Transistor
RF	Radio Frequency
VCR	Videocassette Recorder

## 11. Revision history

**Table 10. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
BF1107_4	20070109	Product data sheet	-	BF1107_1107W_3
Modifications:		<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Symbol notation has been adapted to comply with the current guidelines of NXP Semiconductors.</li> <li>Product type BF1107W has been removed from this data sheet.</li> </ul>		
BF1107_1107W_3 (9397 750 05776)	19990514	Product data sheet	-	BF1107_2
BF1107_2 (9397 750 03969)	19980622	Product data sheet	-	BF1107_N_1
BF1107_N_1 (9397 750 03695)	19980407	Preliminary data sheet	-	-

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### 12.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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