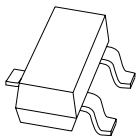


BF1107

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

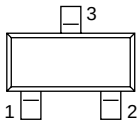
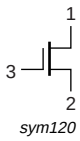
1.4 Quick reference data

Table 1. Quick reference data

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

2. Pinning information

Table 2. Discrete pinning

Pin	Description		Simplified outline	Symbol
1	drain	[1]		
2	source	[1]		
3	gate			

sym120

[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 °C.

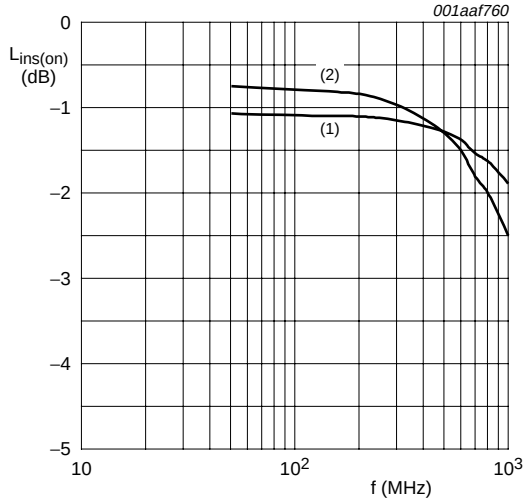
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)GSS}$	gate-source breakdown voltage	V_{DS} = 0 V; I_{GS} = 0.1 mA	7	-	-	V
$V_{GS(p)}$	gate-source pinch-off voltage	V_{DS} = 1 V; I_D = 20 µA	-	–3	–4.5	V
I_{DSX}	drain cut-off current	V_{GS} = –5 V; V_{DS} = 2 V	-	-	10	µA
I_{GSS}	gate leakage current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

8. Dynamic characteristics

Table 8. Dynamic characteristics

Common gate; T_{amb} = 25 °C.

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

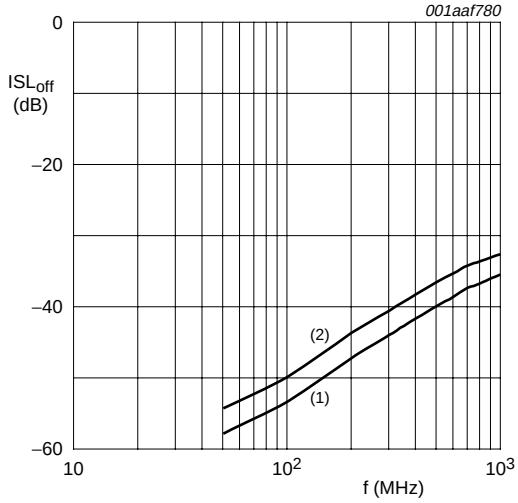


(1) $R_S = R_L = 50\ \Omega$

(2) $R_S = R_L = 75\ \Omega$

$V_{SG} = V_{DG} = 0$ V

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

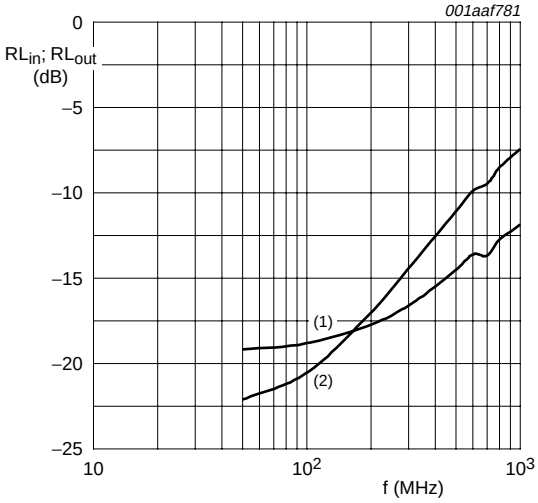


(1) $R_S = R_L = 50\ \Omega$

(2) $R_S = R_L = 75\ \Omega$

$V_{SG} = V_{DG} = 5$ V

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



(1) $R_S = R_L = 50\ \Omega$

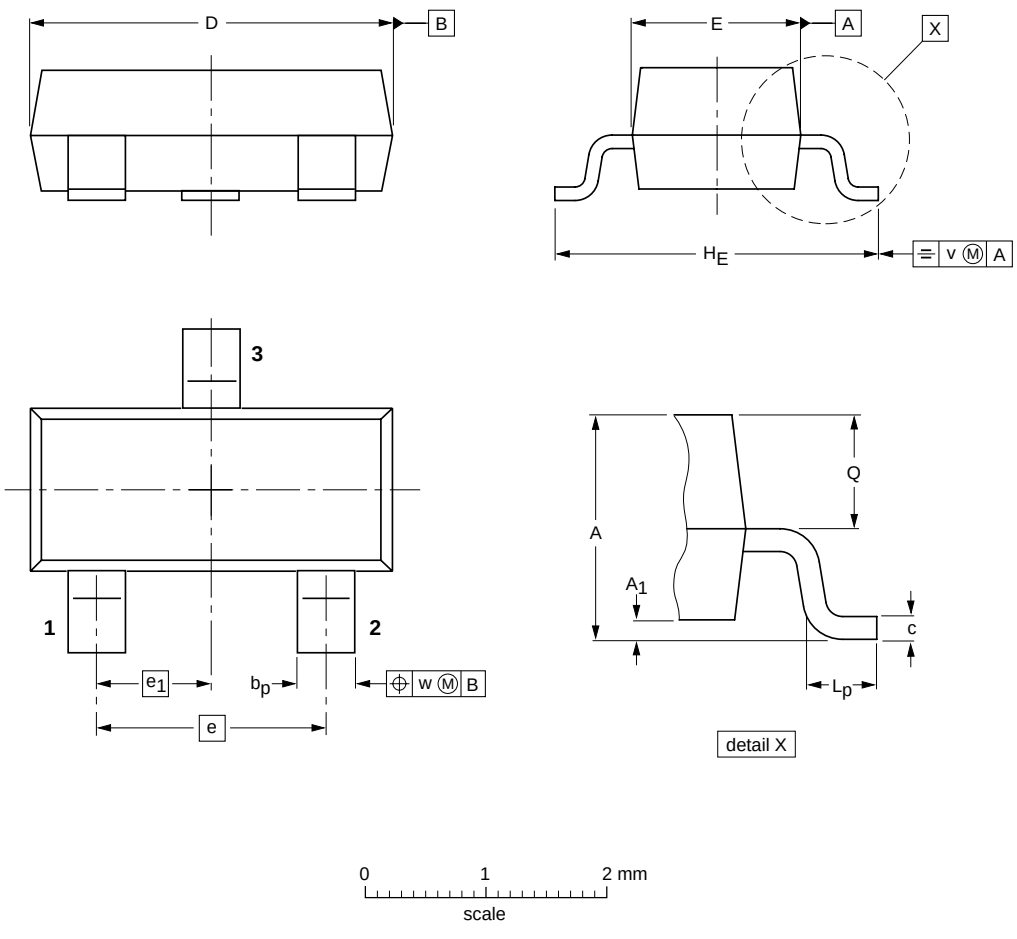
(2) $R_S = R_L = 75\ \Omega$

$V_{SG} = V_{DG} = 0$ 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**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				~~04-11-04~~ 06-03-16

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:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Symbol notation has been adapted to comply with the current guidelines of NXP Semiconductors. • Product type BF1107W has been removed from this data sheet.			
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	-	-

12. Legal information

12.1 Data sheet status

Document status[1][2]	Product status[3]	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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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