DATA SHEET

BF1107; BF1107W
N-channel single gate MOS-FETs

Product specification
Supersedes data of 1998 Jun 22

1999 May 14

Philips
Semiconductors

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N-channel single gate MOS-FETs BF1107; BF1107W

FEATURES

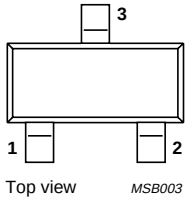
- Currentless RF switch.

APPLICATIONS

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

DESCRIPTION

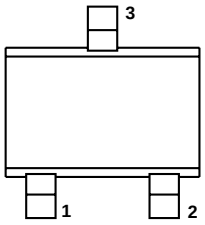
The BF1107 and BF1107W are depletion type field-effect transistors in SOT23 and SOT323 packages respectively. The low loss and high isolation capabilities of this MOS-FET provide excellent RF switching functions. Integrated diodes between gate and source and between gate and drain protect against excessive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



Top view MSB003

Marking code: S3p.

Fig.1 Simplified outline SOT23 (BF1107).



Top view MAM062

Marking code: W3.

Fig.2 Simplified outline SOT323 (BF1107W).

PINNING

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

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$\lvert S_{21(on)} \rvert^2$	losses (on-state)	$R_S = R_L = 50\ \Omega$; f = 50 to 860 MHz	–	–	2.5	dB
$\lvert S_{21(off)} \rvert^2$	isolation (off-state)		30	–	–	dB
R_{DSon}	drain-source on-resistance	$V_{GS} = 0$; $I_D = 1$ mA	–	12	20	Ω
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
$R_{th\ j\text{-}s}$	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 °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 mA	7	–	–	V
V_{GSoff}	gate-source pinch-off voltage	V_{DS} = 1 V; I_D = 20 μA	–	–3	–4.5	V
I_{DSX}	drain-source leakage current	V_{GS} = –5 V; V_{DS} = 2 V	–	–	10	μA
I_{GSS}	gate cut-off current	V_{GS} = –5 V; V_{DS} = 0	–	–	100	nA

DYNAMIC CHARACTERISTICS

Common gate; T_{amb} = 25°C.

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

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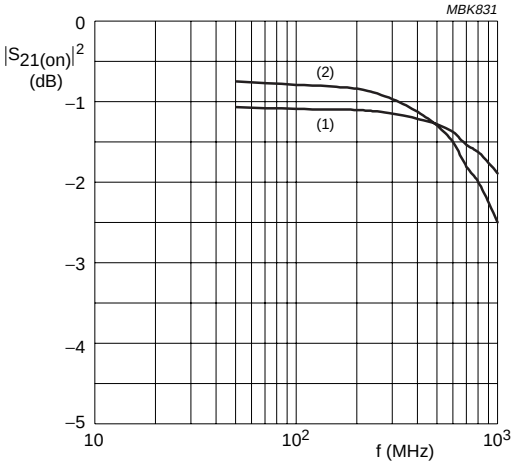
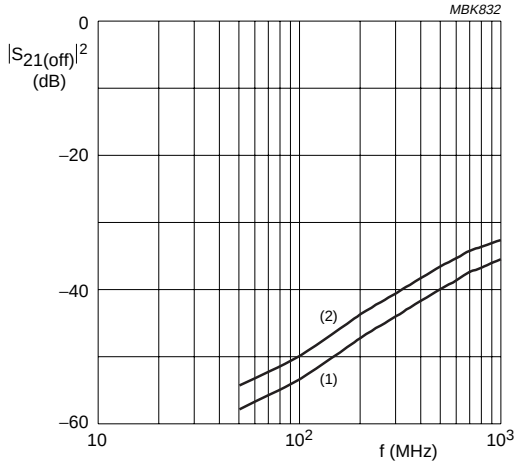


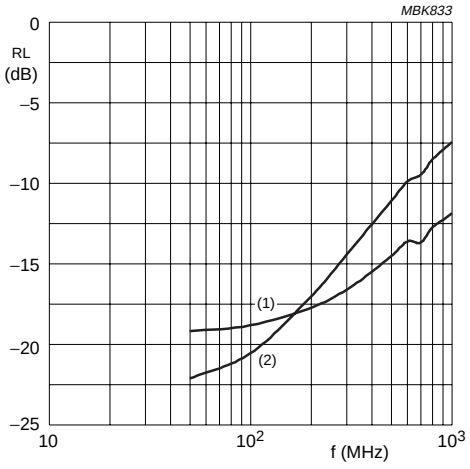
$V_{SG} = V_{DG} = 0$.
(1) $R_S = R_L = 50\ \Omega$.
(2) $R_S = R_L = 75\ \Omega$.

Fig.3 Losses (on-state) as a function of frequency; typical values.



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

Fig.4 Isolation (off-state) as a function of frequency; typical values.



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

Fig.5 Input and output return losses (on-state) as function of frequency; typical values.

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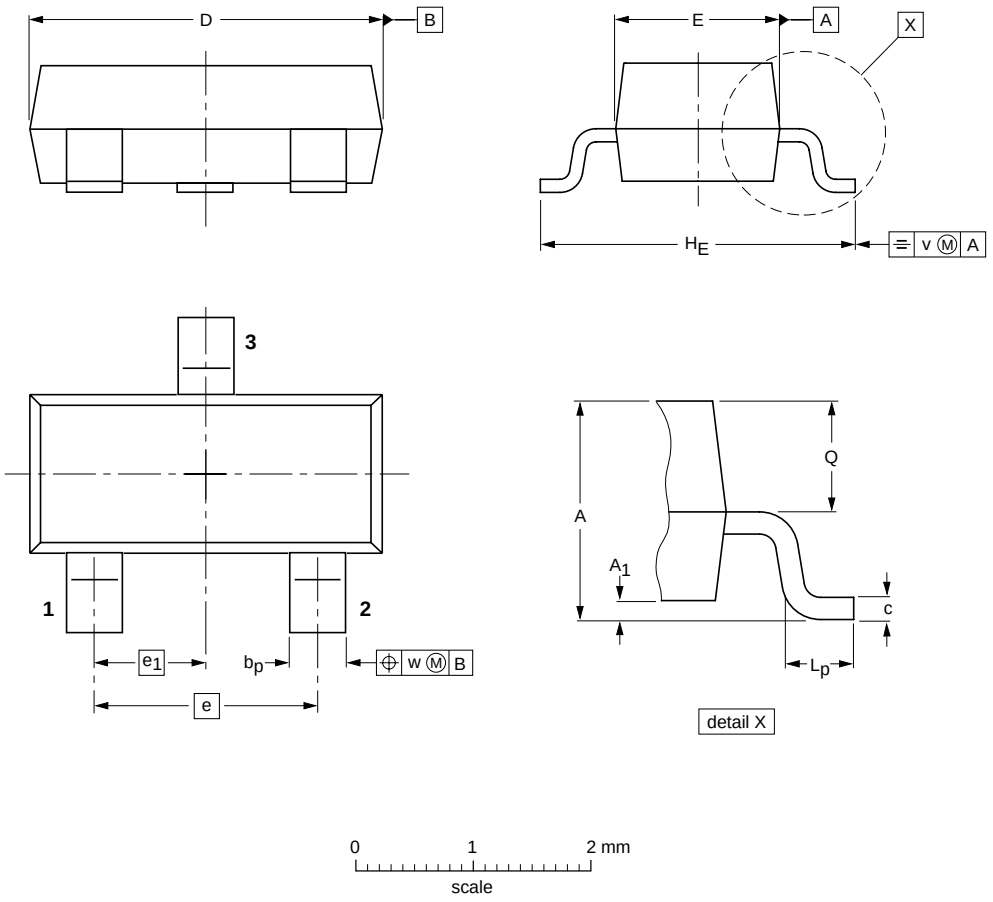
PACKAGE OUTLINES

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	EIAJ			
SOT23						97-02-28

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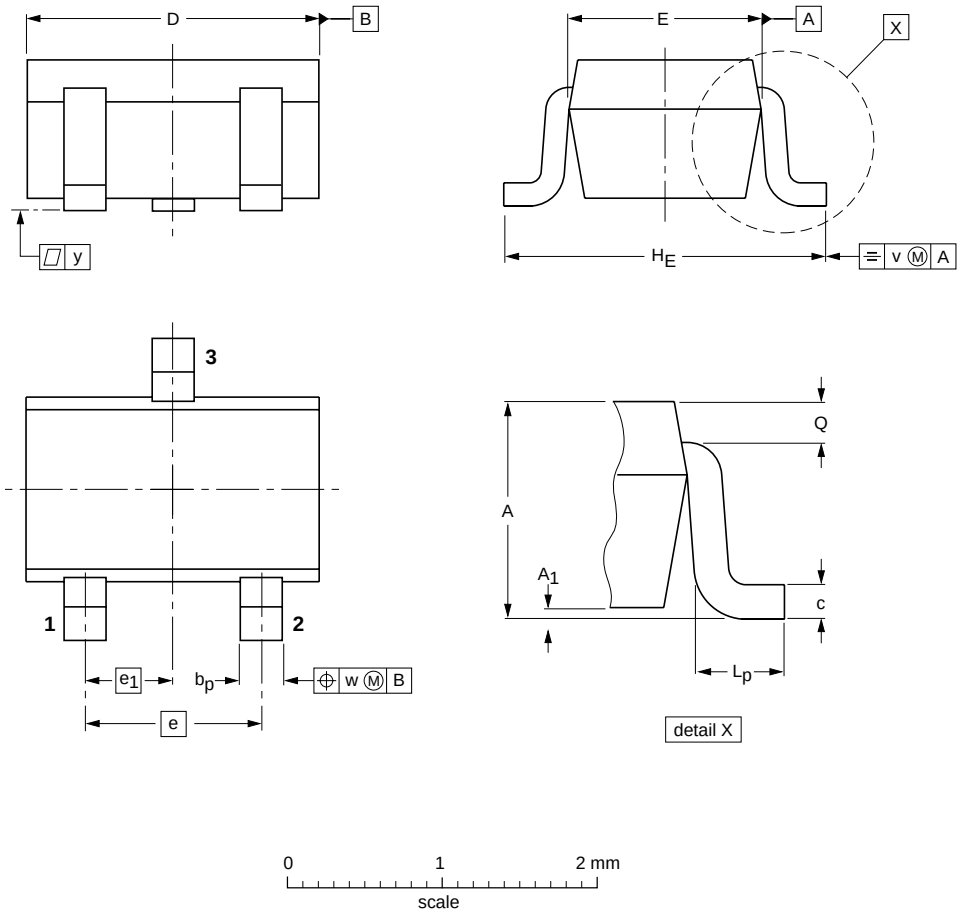
Plastic surface mounted package; 3 leads **SOT323**



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 0.8	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

Data sheet status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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