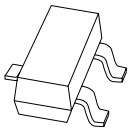


PMBFJ108; PMBFJ109; PMBFJ110

N-channel junction FETs

Rev. 03 — 4 August 2004 Product data sheet

1. Product profile

1.1 General description

Symmetrical N-channel junction FETs in a SOT23 package.

1.2 Features

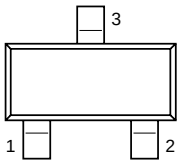
- High-speed switching
- Interchangeability of drain and source connections
- Low R_{DSon} at zero gate voltage (< 8 Ω for PMBFJ108).

1.3 Applications

- Analog switches
- Choppers and commutators
- Audio amplifiers.

2. Pinning information

Table 1: Pinning

Pin	Description [1]	Simplified outline	Symbol
1	drain	 SOT23	 sym053
2	source		
3	gate		

[1] Drain and source are interchangeable.

PHILIPS

3. Ordering information

Table 2: Ordering information

Type number	Package		
	Name	Description	Version
PMBFJ108	-	plastic surface mounted package; 3 leads	SOT23
PMBFJ109			
PMBFJ110			

4. Marking

Table 3: Marking

Type number	Marking code [1]
PMBFJ108	38*
PMBFJ109	39*
PMBFJ110	40*

[1] * = p: Made in Hong Kong
* = t: Made in Malaysia
* = W: Made in China

5. Limiting values

Table 4: Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{DS}	drain-source voltage (DC)			-	±25	V
V_{GSO}	gate-source voltage			-	–25	V
V_{GDO}	gate-drain voltage			-	–25	V
I_G	forward gate current (DC)			-	50	mA
P_{tot}	total power dissipation	T_{amb} = 25 °C	[1]	-	250	mW
T_{stg}	storage temperature			–65	+150	°C
T_j	junction temperature			-	150	°C

[1] Mounted on an FR4 printed-circuit board.

6. Thermal characteristics

Table 5: Thermal characteristics

Symbol	Parameter	Conditions		Typ	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1]	500	K/W

[1] Mounted on an FR4 printed-circuit board.

7. Static characteristics

Table 6: Static characteristics
T_j = 25 °C.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_{GSS}	gate-source leakage current	V_{GS} = –15 V; V_{DS} = 0 V	-	-	–3	nA
I_{DSX}	drain-source cut-off current	V_{GS} = –10 V; V_{DS} = 5 V	-	-	3	nA
I_{DSS}	drain-source leakage current					
	PMBFJ108	V_{GS} = 0 V; V_{DS} = 15 V	80	-	-	mA
	PMBFJ109	V_{GS} = 0 V; V_{DS} = 15 V	40	-	-	mA
	PMBFJ110	V_{GS} = 0 V; V_{DS} = 15 V	10	-	-	mA
$V_{(BR)GSS}$	gate-source breakdown voltage	I_G = –1 µA; V_{DS} = 0 V	-	-	–25	V
V_{GSoff}	gate-source cut-off voltage					
	PMBFJ108	I_D = 1 µA; V_{DS} = 5 V	–10	-	–3	V
	PMBFJ109	I_D = 1 µA; V_{DS} = 5 V	–6	-	–2	V
	PMBFJ110	I_D = 1 µA; V_{DS} = 5 V	–4	-	–0.5	V
R_{DSon}	drain-source on-state resistance					
	PMBFJ108	V_{GS} = 0 V; V_{DS} = 0.1 V	-	-	8	Ω
	PMBFJ109	V_{GS} = 0 V; V_{DS} = 0.1 V	-	-	12	Ω
	PMBFJ110	V_{GS} = 0 V; V_{DS} = 0.1 V	-	-	18	Ω

8. Dynamic characteristics

Table 7: Dynamic characteristics
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
C_{iss}	input capacitance	V_{DS} = 0 V; V_{GS} = –10 V; f = 1 MHz		-	15	30	pF
		V_{DS} = 0 V; V_{GS} = 0 V; f = 1 MHz; T_{amb} = 25 °C		-	50	85	pF
C_{rss}	feedback capacitance	V_{DS} = 0 V; V_{GS} = –10 V; f = 1 MHz		-	8	15	pF
Switching times (see Figure 2)							
t_d	delay time		[1]	-	2	-	ns
t_{on}	turn-on time		[1]	-	4	-	ns
t_s	storage time		[1]	-	4	-	ns
t_{off}	turn-off time		[1]	-	6	-	ns

[1] Test conditions for switching times are as follows:
V_{DD} = 1.5 V, V_{GS} = 0 V to V_{GSoff} (all types);
V_{GSoff} = –12 V, R_L = 100 Ω (PMBFJ108);
V_{GSoff} = –7 V, R_L = 100 Ω (PMBFJ109);
V_{GSoff} = –5 V, R_L = 100 Ω (PMBFJ110).

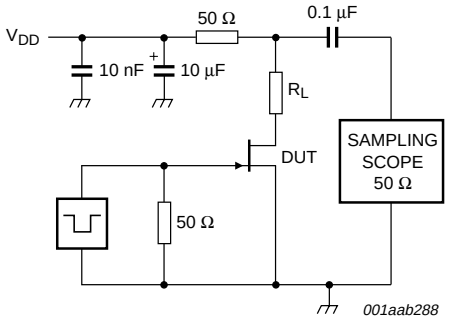


Fig 1. Switching circuit.

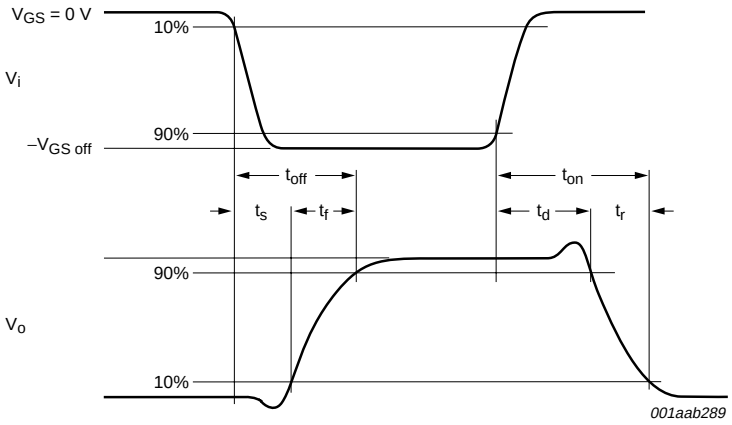
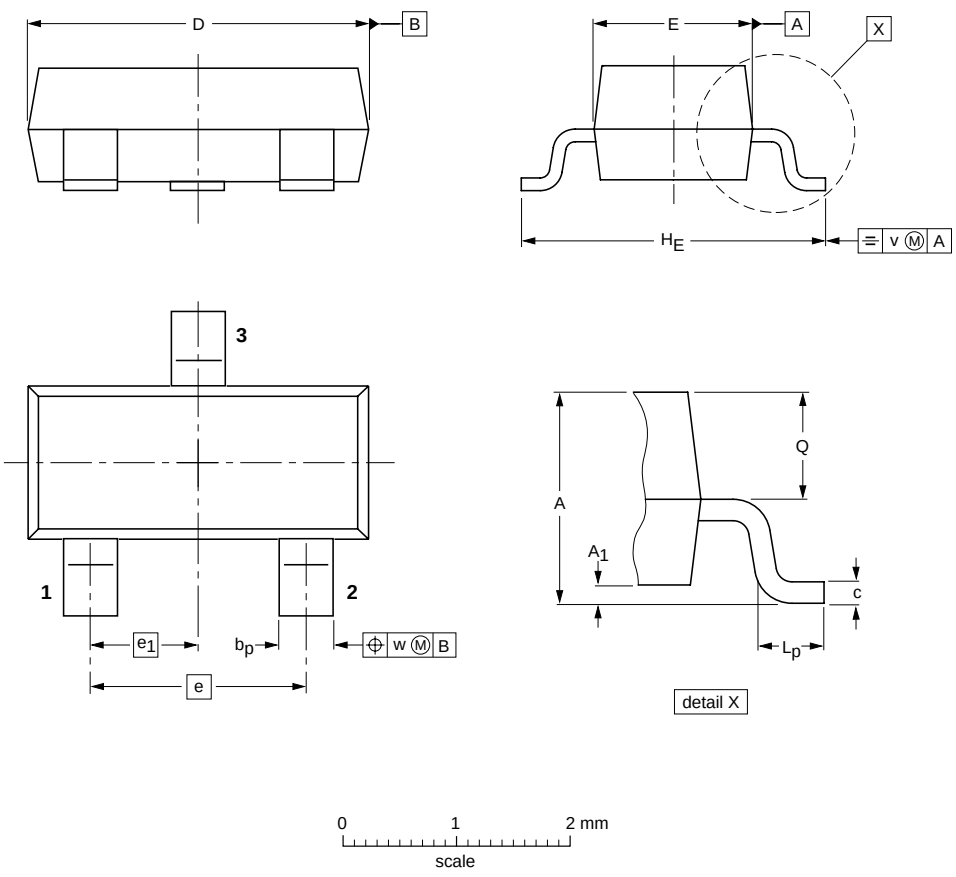


Fig 2. Input and output waveforms.

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	EIAJ			
SOT23		TO-236AB				~~97-02-28~~ 99-09-13

Fig 3. Package outline.

10. Revision history

Table 8: Revision history

Document ID	Release date	Data sheet status	Change notice	Order number	Supersedes
PMBFJ108_109_110_3	20040804	Product data sheet	-	9397 750 13401	PMBFJ108_109_110_CNV_2
Modifications:	• The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors. • Table 3 “Marking”: Added new marking code.				
PMBFJ108_109_110_CNV_2	19971201	Product specification	-	not applicable	-

11. Data sheet status

Level	Data sheet status [1]	Product status [2] [3]	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

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

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

12. Definitions

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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.

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15. Contents

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