



# 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  $R_{D\text{Son}}$  at zero gate voltage ( $< 8 \Omega$  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.

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### 3. Ordering information

Table 2: Ordering information

Type number	Package		Version
	Name	Description	
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	$T_{amb} = 25\text{ °C}$	[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**

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

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

## 8. Dynamic characteristics

**Table 7: Dynamic characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$C_{iss}$	input capacitance	$V_{DS} = 0\text{ V}; V_{GS} = -10\text{ V}; f = 1\text{ MHz}$	-	15	30	pF
		$V_{DS} = 0\text{ V}; V_{GS} = 0\text{ V}; f = 1\text{ MHz}; T_{amb} = 25\text{ }^\circ\text{C}$	-	50	85	pF
$C_{rss}$	feedback capacitance	$V_{DS} = 0\text{ V}; V_{GS} = -10\text{ V}; f = 1\text{ MHz}$	-	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

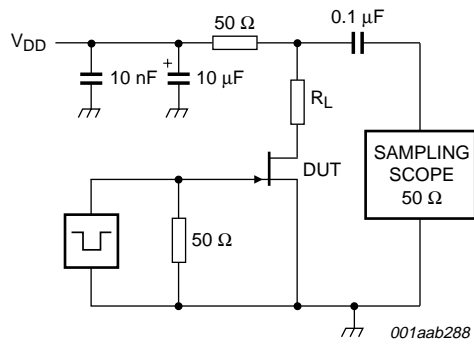
[1] Test conditions for switching times are as follows:

$V_{DD} = 1.5\text{ V}, V_{GS} = 0\text{ V}$  to  $V_{GSoff}$  (all types);

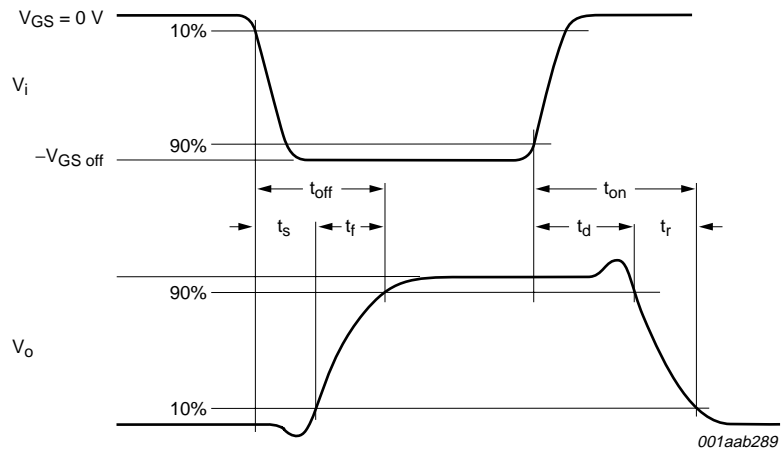
$V_{GSoff} = -12\text{ V}, R_L = 100\text{ }\Omega$  (PMBFJ108);

$V_{GSoff} = -7\text{ V}, R_L = 100\text{ }\Omega$  (PMBFJ109);

$V_{GSoff} = -5\text{ V}, R_L = 100\text{ }\Omega$  (PMBFJ110).



**Fig 1. Switching circuit.**



**Fig 2. Input and output waveforms.**

**9. Package outline**

Plastic surface mounted package; 3 leads

SOT23

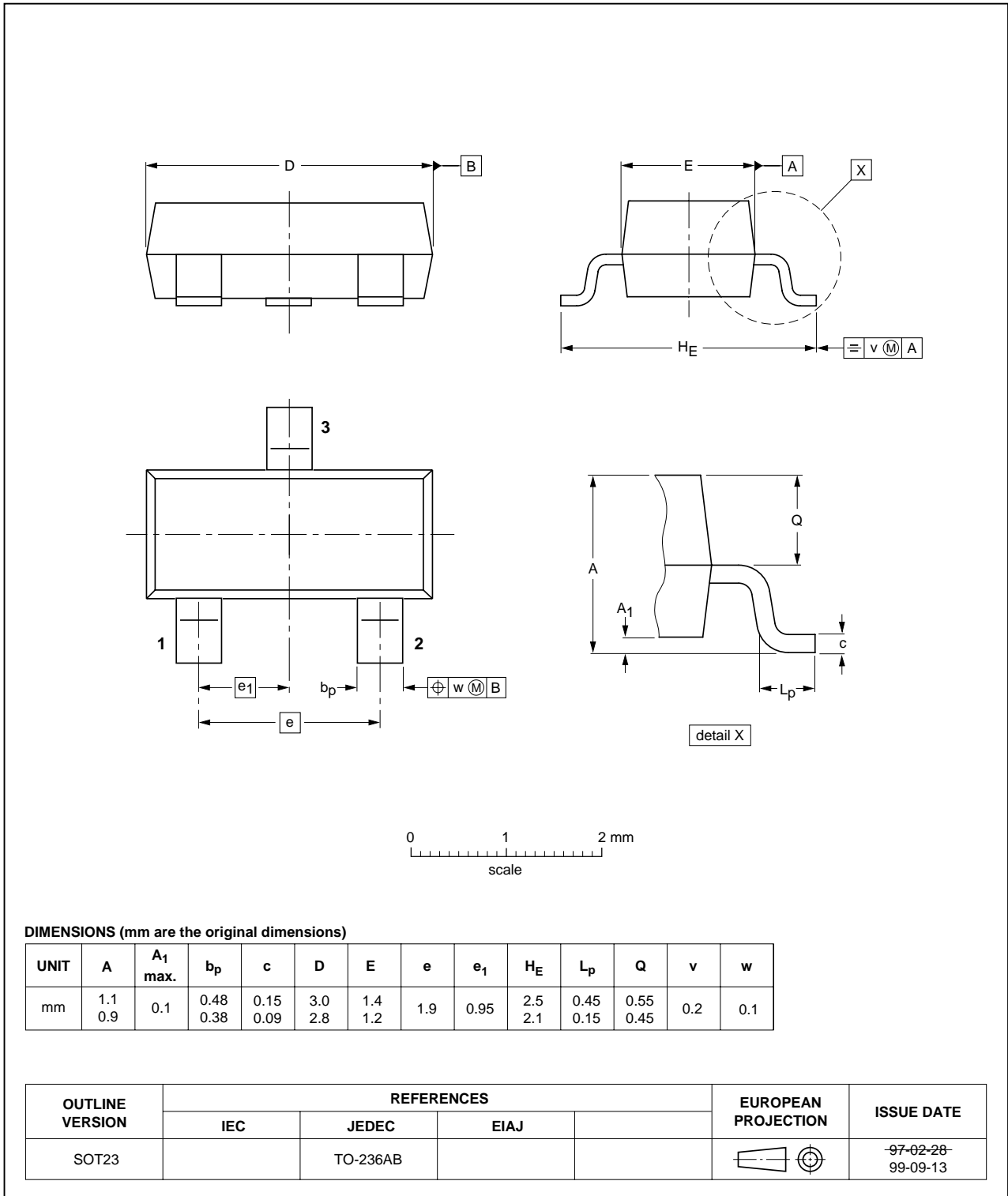


Fig 3. Package outline.

## 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:					
					<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors.</li><li><a href="#">Table 3 "Marking"</a>: Added new marking code.</li></ul>
PMBFJ108_109_110_CNV_2	19971201	Product specification	-	not applicable	-

## 11. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2]</sup> <sup>[3]</sup>	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.
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## 15. Contents

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<b>1</b>	<b>Product profile</b> .....	<b>1</b>
1.1	General description .....	1
1.2	Features .....	1
1.3	Applications .....	1
<b>2</b>	<b>Pinning information</b> .....	<b>1</b>
<b>3</b>	<b>Ordering information</b> .....	<b>2</b>
<b>4</b>	<b>Marking</b> .....	<b>2</b>
<b>5</b>	<b>Limiting values</b> .....	<b>2</b>
<b>6</b>	<b>Thermal characteristics</b> .....	<b>2</b>
<b>7</b>	<b>Static characteristics</b> .....	<b>3</b>
<b>8</b>	<b>Dynamic characteristics</b> .....	<b>3</b>
<b>9</b>	<b>Package outline</b> .....	<b>5</b>
<b>10</b>	<b>Revision history</b> .....	<b>6</b>
<b>11</b>	<b>Data sheet status</b> .....	<b>7</b>
<b>12</b>	<b>Definitions</b> .....	<b>7</b>
<b>13</b>	<b>Disclaimers</b> .....	<b>7</b>
<b>14</b>	<b>Contact information</b> .....	<b>7</b>



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