



# PMBFJ108; PMBFJ109; PMBFJ110

N-channel junction FETs

Rev. 4 — 20 September 2011

Product data sheet

## 1. Product profile

### 1.1 General description

Symmetrical N-channel junction FETs in a SOT23 package.

### 1.2 Features and benefits

- High-speed switching
- Interchangeability of drain and source connections
- Low  $R_{DS(on)}$  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 <sup>[1]</sup>	Simplified outline	Symbol
1	drain		 sym053
2	source		
3	gate		

[1] Drain and source are interchangeable.

### 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 <sup>[1]</sup>
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)		-	$\pm 25$	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	$T_{amb} = 25\text{ °C}$	<sup>[1]</sup> -	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		<sup>[1]</sup> 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
<b>Switching times (see Figure 2)</b>						
$t_d$	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).

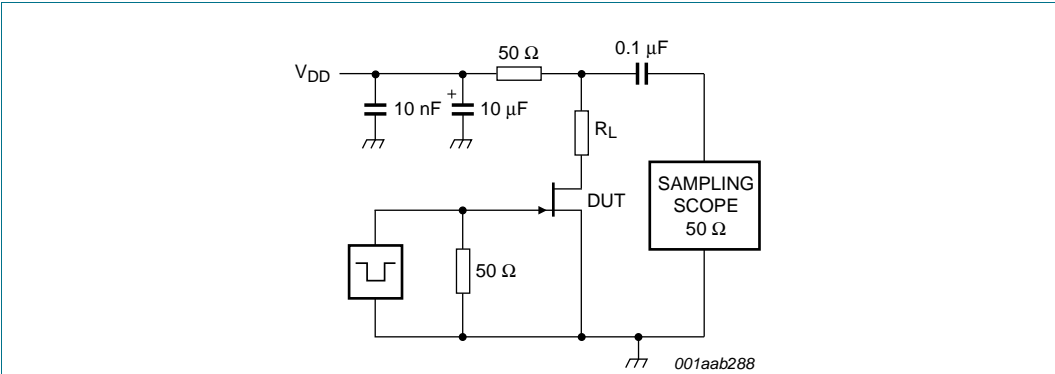


Fig 1. Switching circuit.

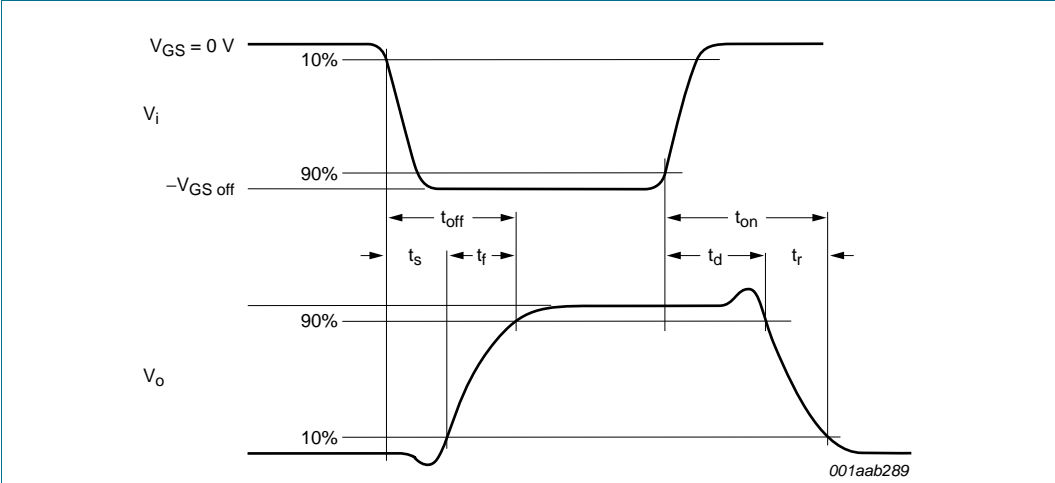


Fig 2. Input and output waveforms.

9. Package outline

Plastic surface-mounted package; 3 leadsSOT23

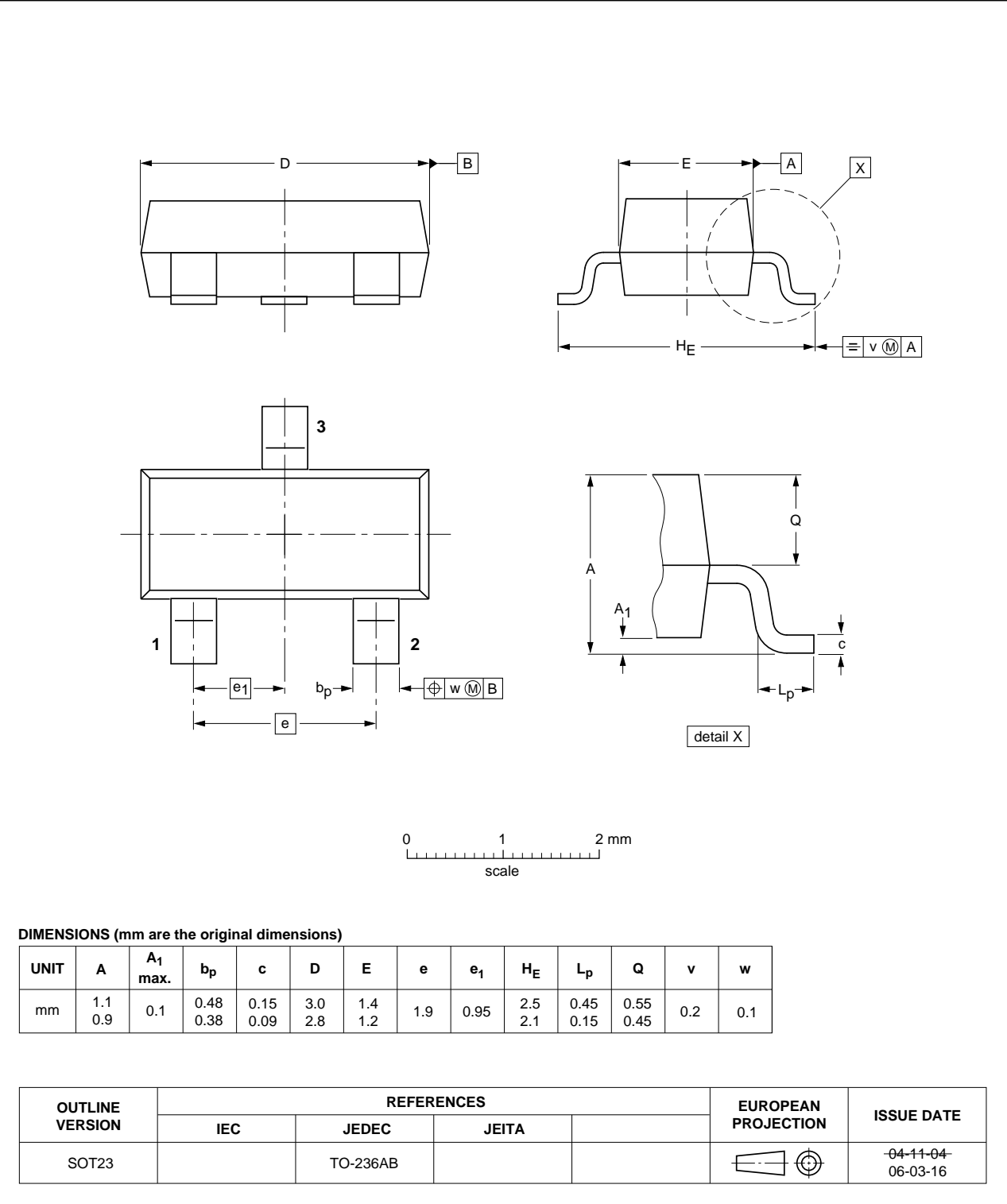


Fig 3. Package outline.

## 10. Revision history

**Table 8.** Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMBFJ108_109_110 v.4	20110920	Product data sheet	-	PMBFJ108_109_110 v.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>• Package outline drawings have been updated to the latest version.</li></ul>			
PMBFJ108_109_110 v.3 (9397 750 13401)	20040804	Product data sheet	-	PMBFJ108_109_110_CNV v.2
PMBFJ108_109_110_CNV v.2	19971201	Product specification	-	-

## 11. Legal information

### 11.1 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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