



# PMBFJ111; PMBFJ112; PMBFJ113

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

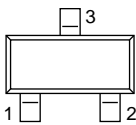

- High-speed switching
- Interchangeability of drain and source connections
- Low  $R_{DSon}$  at zero gate voltage ( $< 30 \Omega$  for PMBFJ111).

### 1.3 Applications

- Analog switches
- Choppers
- Commutators
- Multiplexers
- Thin and thick film hybrids.

## 2. Pinning information

Table 1. Pinning

Pin	Description <sup>[1]</sup>	Simplified outline	Symbol
1	drain		
2	source		
3	gate		

[1] Drain and source are interchangeable.

### 3. Ordering information

Table 2. Ordering information

Type number	Package		Version
	Name	Description	
PMBFJ111	-	plastic surface mounted package; 3 leads	SOT23
PMBFJ112			
PMBFJ113			

### 4. Marking

Table 3. Marking

Type number	Marking code <sup>[1]</sup>
PMBFJ111	41*
PMBFJ112	42*
PMBFJ113	47*

[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)		-	±40	V
$V_{GSO}$	gate-source voltage		-	-40	V
$V_{GDO}$	gate-drain voltage		-	-40	V
$I_G$	forward gate current (DC)		-	50	mA
$P_{tot}$	total power dissipation	$T_{amb} = 25\text{ °C}$	[1] -	300	mW
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-	150	°C

[1] Mounted on a ceramic substrate, 8 mm × 10 mm × 0.7 mm.

### 6. Thermal characteristics

Table 5. Thermal characteristics

$$T_j = P (R_{th(j-t)} + R_{th(t-s)} + R_{th(s-a)}) + T_{amb}$$

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1] 430	K/W
	thermal resistance from junction to ambient		[2] 500	K/W

[1] Mounted on a ceramic substrate, 8 mm × 10 mm × 0.7 mm.

[2] Mounted on printed circuit board.

## 7. Static characteristics

**Table 6. Static characteristics**

$T_j = 25\text{ °C}$ .

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{GSS}$	gate-source leakage current	$V_{GS} = -15\text{ V}; V_{DS} = 0\text{ V}$	-	-	-1	nA
$I_{DSS}$	drain-source leakage current					
	PMBFJ111	$V_{GS} = 0\text{ V}; V_{DS} = 15\text{ V}$	20	-	-	mA
	PMBFJ112	$V_{GS} = 0\text{ V}; V_{DS} = 15\text{ V}$	5	-	-	mA
	PMBFJ113	$V_{GS} = 0\text{ V}; V_{DS} = 15\text{ V}$	2	-	-	mA
$V_{(BR)GSS}$	gate-source breakdown voltage	$I_G = -1\text{ }\mu\text{A}; V_{DS} = 0\text{ V}$	-40	-	-	V
$V_{GSoff}$	gate-source cut-off voltage					
	PMBFJ111	$I_D = 1\text{ }\mu\text{A}; V_{DS} = 5\text{ V}$	-10	-	-3	V
	PMBFJ112	$I_D = 1\text{ }\mu\text{A}; V_{DS} = 5\text{ V}$	-5	-	-1	V
	PMBFJ113	$I_D = 1\text{ }\mu\text{A}; V_{DS} = 5\text{ V}$	-3	-	-0.5	V
$R_{DSon}$	drain-source on-state resistance					
	PMBFJ111	$V_{GS} = 0\text{ V}; V_{DS} = 0.1\text{ V}$	-	-	30	$\Omega$
	PMBFJ112	$V_{GS} = 0\text{ V}; V_{DS} = 0.1\text{ V}$	-	-	50	$\Omega$
	PMBFJ113	$V_{GS} = 0\text{ V}; V_{DS} = 0.1\text{ V}$	-	-	100	$\Omega$

## 8. Dynamic characteristics

**Table 7. Dynamic characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$C_{iss}$	input capacitance	$V_{DS} = 0\text{ V}; V_{GS} = -10\text{ V}; f = 1\text{ MHz}$	-	6	-	pF
		$V_{DS} = 0\text{ V}; V_{GS} = 0\text{ V}; f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$	-	22	28	pF
$C_{rss}$	feedback capacitance		-	3	-	pF
<b>Switching times; see <a href="#">Figure 2</a></b>						
$t_r$	rise time		[1]	6	-	ns
$t_{on}$	turn-on time		[1]	13	-	ns
$t_f$	fall time		[1]	15	-	ns
$t_{off}$	turn-off time		[1]	35	-	ns

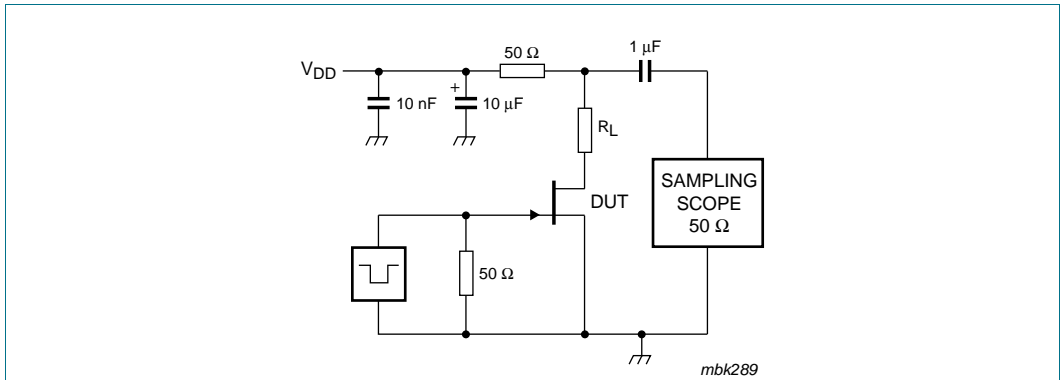
[1] Test conditions for switching times are as follows:

$V_{DD} = 10\text{ V}, V_{GS} = 0\text{ V}$  to  $V_{GSoff}$  (all types);

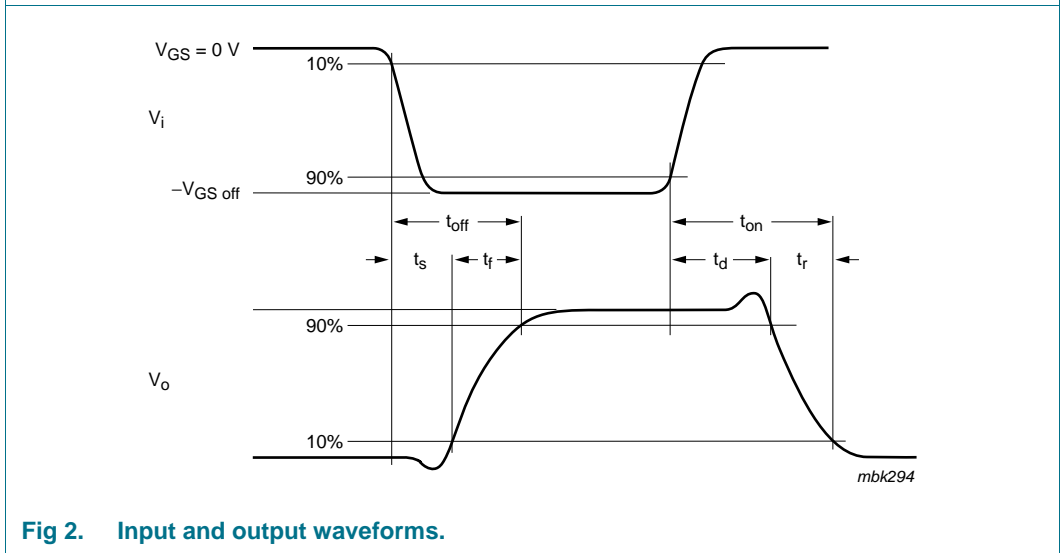
$V_{GSoff} = -12\text{ V}, R_L = 750\text{ }\Omega$  (PMBFJ111);

$V_{GSoff} = -7\text{ V}, R_L = 1550\text{ }\Omega$  (PMBFJ112);

$V_{GSoff} = -5\text{ V}, R_L = 3150\text{ }\Omega$  (PMBFJ113).



**Fig 1. Switching circuit.**



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

## 9. Package outline

Plastic surface-mounted package; 3 leads

SOT23

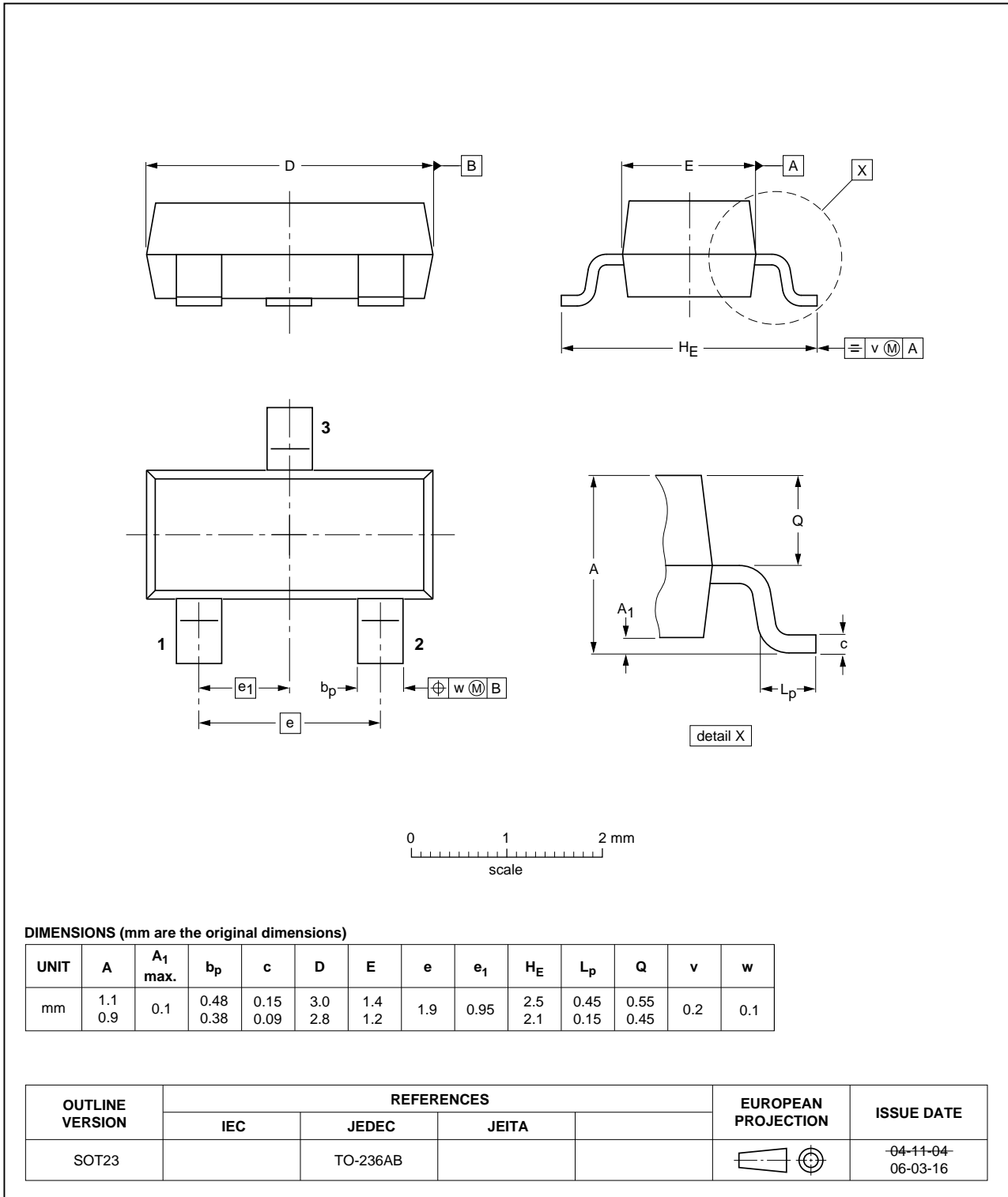


Fig 3. Package outline.

## 10. Revision history

**Table 8. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMBFJ111_112_113 v.4	20110920	Product data sheet	-	PMBFJ111_112_113 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>		
PMBFJ111_112_113 v.3 (9397 750 13402)	20040804	Product data sheet	-	PMBFJ111_112_113_CNV v.2
PMBFJ111_112_113_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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## 13. Contents

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<b>1</b>	<b>Product profile</b> . . . . .	<b>1</b>
1.1	General description . . . . .	1
1.2	Features and benefits . . . . .	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>Legal information</b> . . . . .	<b>7</b>
11.1	Data sheet status . . . . .	7
11.2	Definitions . . . . .	7
11.3	Disclaimers . . . . .	7
11.4	Trademarks . . . . .	8
<b>12</b>	<b>Contact information</b> . . . . .	<b>8</b>
<b>13</b>	<b>Contents</b> . . . . .	<b>9</b>

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