

# DATA SHEET

## **PMBFJ174 to 177**

P-channel silicon field-effect  
transistors

Product specification

April 1995



P-channel silicon field-effect transistors

PMBFJ174 to 177

DESCRIPTION

Silicon symmetrical p-channel junction FETs in plastic microminiature SOT23 envelopes. They are intended for application with analogue switches, choppers, commutators etc. using SMD technology. A special feature is the interchangeability of the drain and source connections.

PINNING

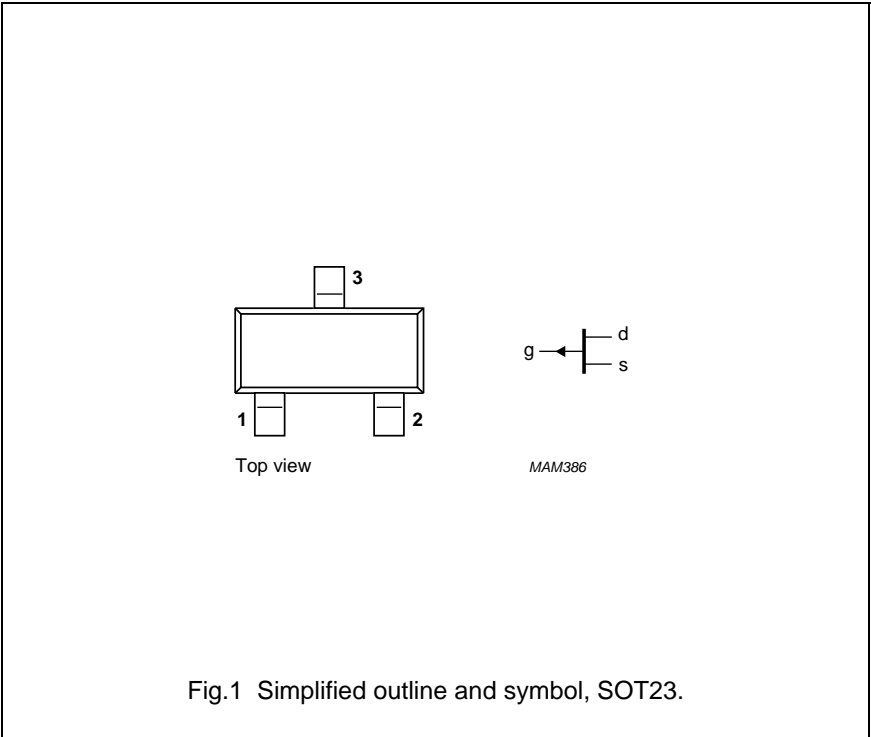
- 1 = drain
- 2 = source
- 3 = gate

Note

- 1. Drain and source are interchangeable.

Marking codes:

- 174 : p6X
- 175 : p6W
- 176 : p6S
- 177 : p6Y



QUICK REFERENCE DATA

Drain-source voltage	$\pm V_{DS}$	max.	30	V
Gate-source voltage	$V_{GSO}$	max.	30	V
Gate current	$-I_G$	max.	50	mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}$	$P_{tot}$	max.	300	mW
Drain current				
$-V_{DS} = 15\text{ V}; V_{GS} = 0$	$-I_{DSS}$	<div><div>PMBFJ174</div><div>&gt; 20</div><div>&lt; 135</div></div>	<div><div>175</div><div>7</div><div>70</div></div>	<div><div>176</div><div>2</div><div>35</div></div> <div><div>177</div><div>1.5 mA</div><div>20 mA</div></div>
Drain-source ON-resistance $-V_{DS} = 0.1\text{ V}; V_{GS} = 0$	$R_{DS\ on}$	<	<div><div>85</div><div>125</div><div>250</div></div>	<div><div>300 <math>\Omega</math></div></div>

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**RATINGS**

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	$\pm V_{DS}$	max.	30	V
Gate-source voltage	$V_{GSO}$	max.	30	V
Gate-drain voltage	$V_{GDO}$	max.	30	V
Gate current (d.c.)	$-I_G$	max.	50	mA
Total power dissipation up to $T_{amb} = 25\text{ }^{\circ}\text{C}^{(1)}$	$P_{tot}$	max.	300	mW
Storage temperature range	$T_{stg}$		-65 to + 150	$^{\circ}\text{C}$
Junction temperature	$T_j$	max.	150	$^{\circ}\text{C}$

**THERMAL RESISTANCE**

From junction to ambient in free air	$R_{th\ j-a}$	=	430	K/W
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**STATIC CHARACTERISTICS** $T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified

			PMBFJ174	175	176	177
Gate cut-off current $V_{GS} = 20\text{ V}; V_{DS} = 0$	$I_{GSS}$	<	1	1	1	1 nA
Drain cut-off current $-V_{DS} = 15\text{ V}; V_{GS} = 10\text{ V}$	$-I_{DSX}$	<	1	1	1	1 nA
Drain current $-V_{DS} = 15\text{ V}; V_{GS} = 0$	$-I_{DSS}$	>	20	7	2	1.5 mA
		<	135	70	35	20 mA
Gate-source breakdown voltage $I_G = 1\text{ }\mu\text{A}; V_{DS} = 0$	$V_{(BR)GSS}$	>	30	30	30	30 V
Gate-source cut-off voltage $-I_D = 10\text{ nA}; V_{DS} = -15\text{ V}$	$V_{GS\ off}$	>	5	3	1	0.8 V
		<	10	6	4	2.25 V
Drain-source ON-resistance $-V_{DS} = 0.1\text{ V}; V_{GS} = 0$	$R_{DS\ on}$	<	85	125	250	300 $\Omega$

**Note**

1. Mounted on a ceramic substrate of 8 mm × 10 mm × 0.7 mm.

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DYNAMIC CHARACTERISTICS

T<sub>j</sub> = 25 °C unless otherwise specified

Input capacitance, f = 1 MHz

$V_{GS} = 10\text{ V}; V_{DS} = 0\text{ V}$

$V_{GS} = V_{DS} = 0$

Feedback capacitance, f = 1 MHz

$V_{GS} = 10\text{ V}; V_{DS} = 0\text{ V}$

Switching times (see Fig.2 + 3)

Delay time

Rise time

Turn-on time

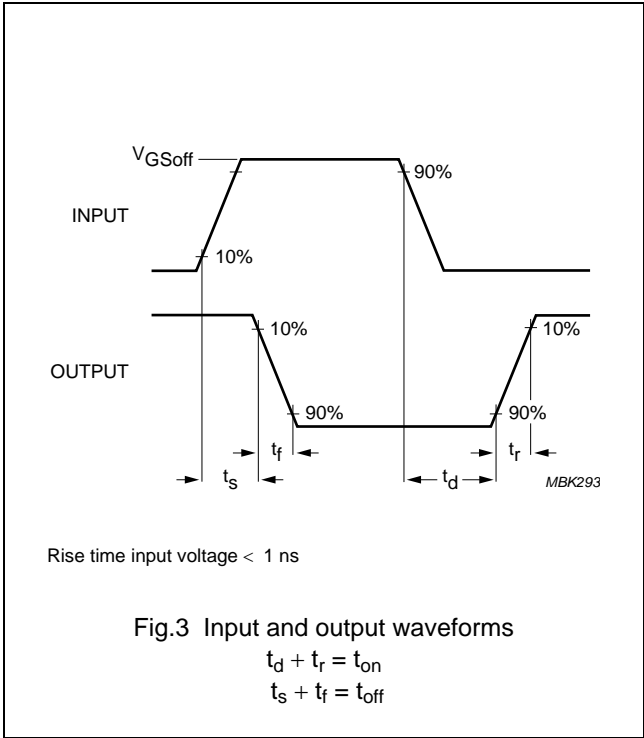
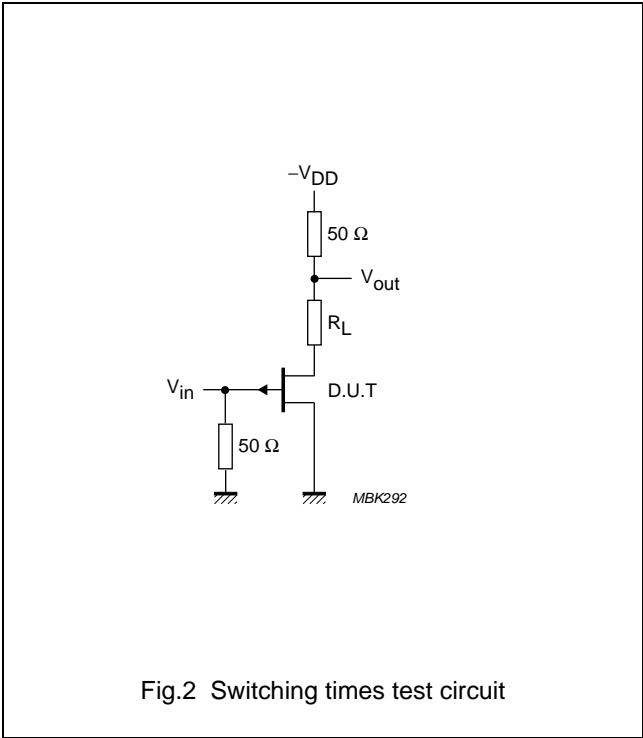
Storage temperature

Fall time

Turn-off time

Test conditions:

C <sub>is</sub>	typ.	8			pF
C <sub>is</sub>	typ.	30			pF
C <sub>rs</sub>	typ.	4			pF
	<b>PMBFJ174</b>	<b>175</b>	<b>176</b>	<b>177</b>	
t <sub>d</sub>	typ.	2	5	15	20 ns
t <sub>r</sub>	typ.	5	10	20	25 ns
t <sub>on</sub>	typ.	7	15	35	45 ns
t <sub>s</sub>	typ.	5	10	15	20 ns
t <sub>f</sub>	typ.	10	20	20	25 ns
t <sub>off</sub>	typ.	15	30	35	45 ns
-V <sub>DD</sub>		10	6	6	6 V
V <sub>GS off</sub>		12	8	6	3 V
R <sub>L</sub>		560	1200	2000	2900 Ω
V <sub>GS on</sub>		0	0	0	0 V



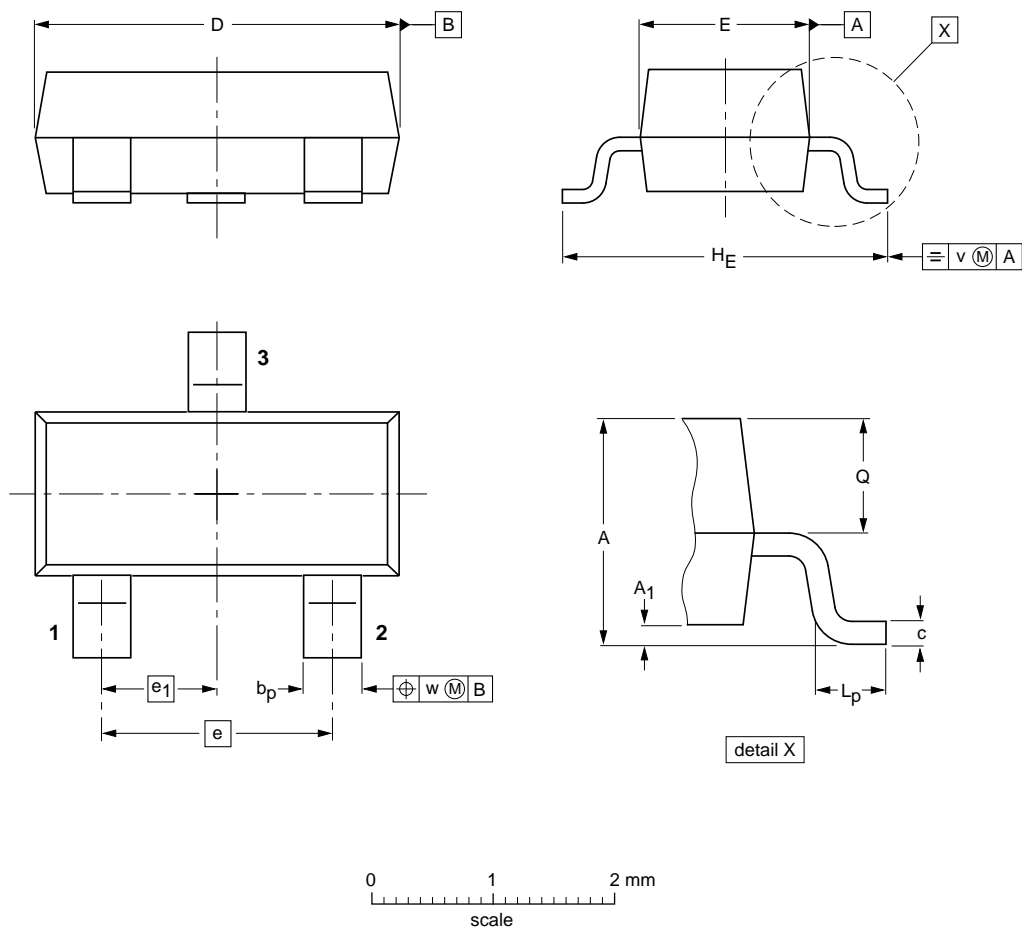
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PACKAGE OUTLINE

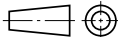
Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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	JEITA			
SOT23		TO-236AB				04-11-04 06-03-16

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## DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

## **Contact information**

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