

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

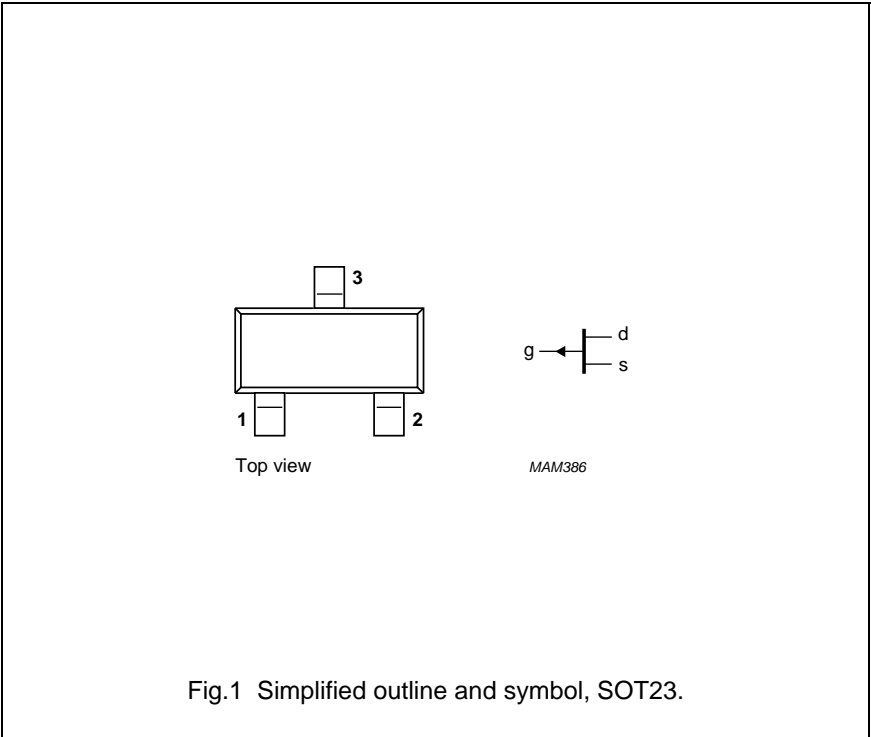
- 1 = drain
- 2 = source
- 3 = gate

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 $-V_{DS} = 15\text{ V}; V_{GS} = 0$	$-I_{DSS}$		PMBFJ174	175	176	177	
		>	20	7	2	1.5	mA
		<	135	70	35	20	mA
Drain-source ON-resistance $-V_{DS} = 0.1\text{ V}; V_{GS} = 0$	$R_{DS\ on}$	<	85	125	250	300	Ω

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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 Ω

Note

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

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DYNAMIC CHARACTERISTICS

T_j = 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 _{is}	typ.	8				pF
C _{is}	typ.	30				pF
C _{rs}	typ.	4				pF
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t _d	typ.	2	5	15	20 ns	
t _r	typ.	5	10	20	25 ns	
t _{on}	typ.	7	15	35	45 ns	
t _s	typ.	5	10	15	20 ns	
t _f	typ.	10	20	20	25 ns	
t _{off}	typ.	15	30	35	45 ns	
−V _{DD}	10	6	6	6	V	
V _{GS off}	12	8	6	3	V	
R _L	560	1200	2000	2900	Ω	
V _{GS on}	0	0	0	0	V	

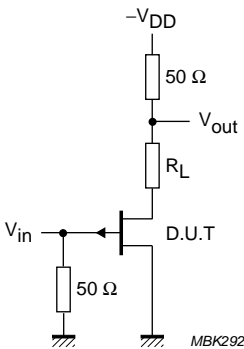
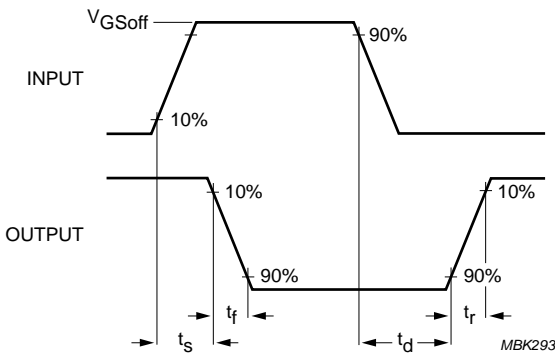


Fig.2 Switching times test circuit



Rise time input voltage < 1 ns

Fig.3 Input and output waveforms
 $t_d + t_r = t_{on}$
 $t_s + t_f = t_{off}$

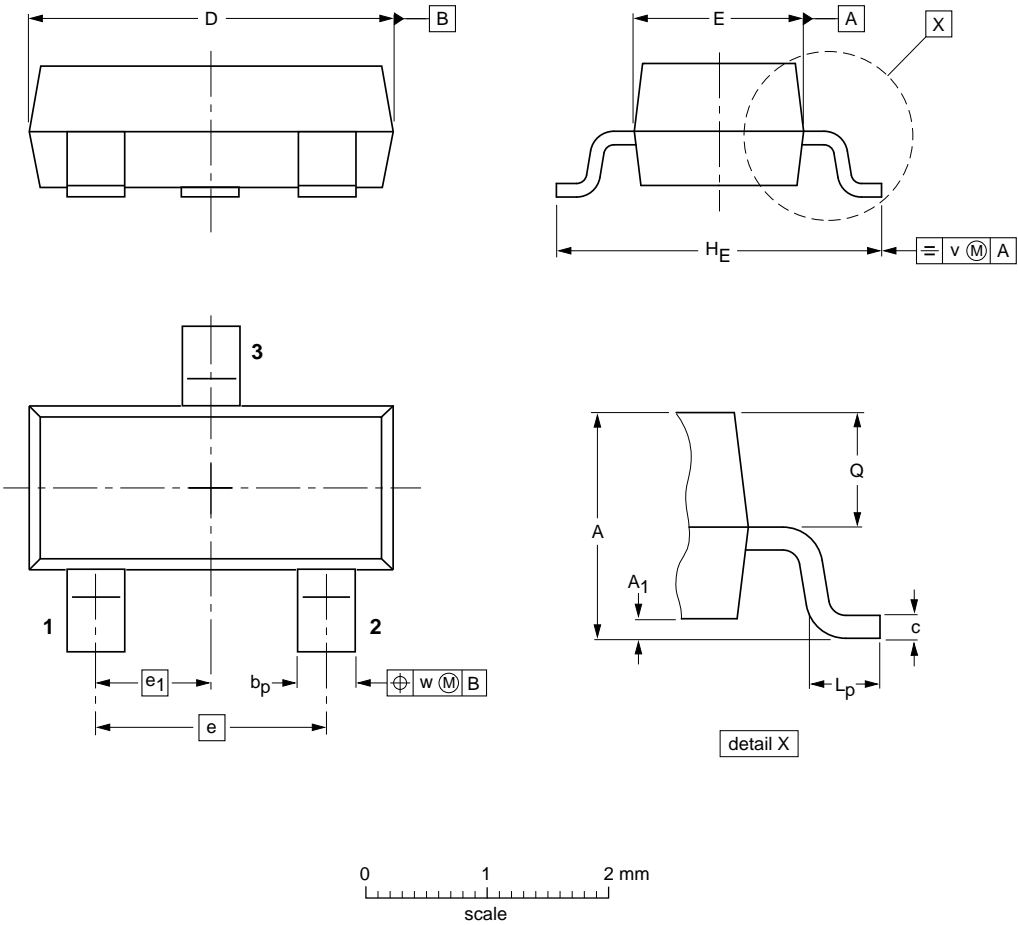
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PACKAGE OUTLINE

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	JEITA			
SOT23		TO-236AB				04-11-04 06-03-16

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DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	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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Printed in The Netherlands

R77/02/8

Date of release: April 1995

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