

DATA SHEET

PMBFJ174 to 177 P-channel silicon field-effect transistors

Product specification
File under Discrete Semiconductors, SC07

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

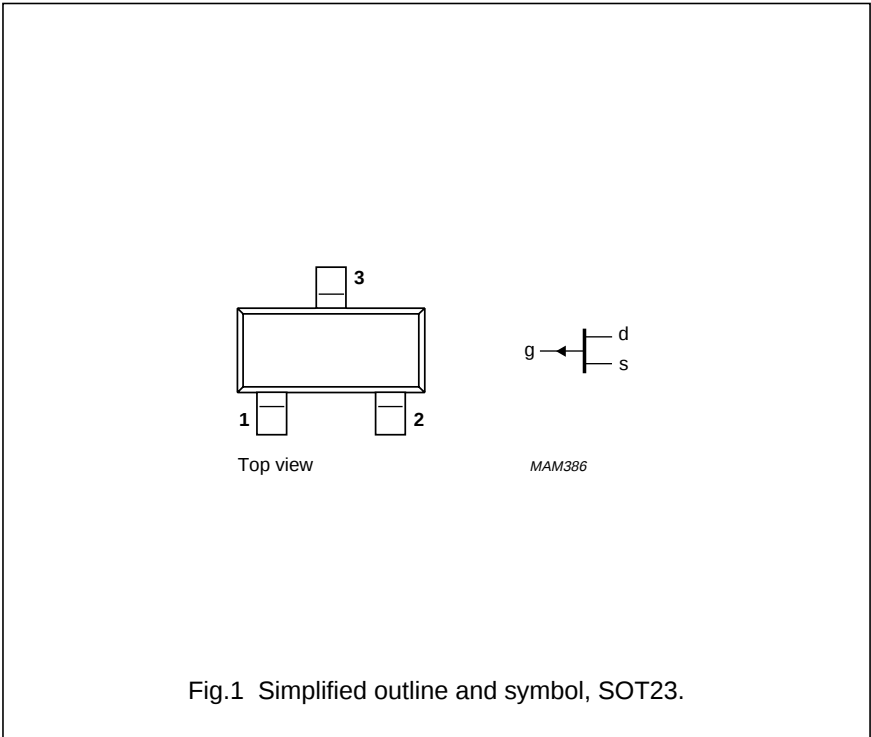


Fig.1 Simplified outline and symbol, SOT23.

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				
$-V_{DS} = 15\text{ V}; V_{GS} = 0$	$-I_{DSS}$			
Drain-source ON-resistance	$R_{DS\ on}$			
$-V_{DS} = 0,1\text{ V}; V_{GS} = 0$				

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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 $-V_{DS} = 15\text{ V}; V_{GS} = 0$	$-I_{DSS}$	> <	20 135	7 70	2 35	1,5 mA 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 10	3 6	1 4	0,8 V 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 $8\text{ mm} \times 10\text{ mm} \times 0,7\text{ mm}$.

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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
		PMBFJ174	175	176	177
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

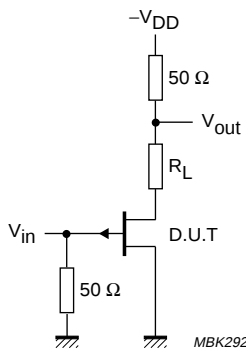
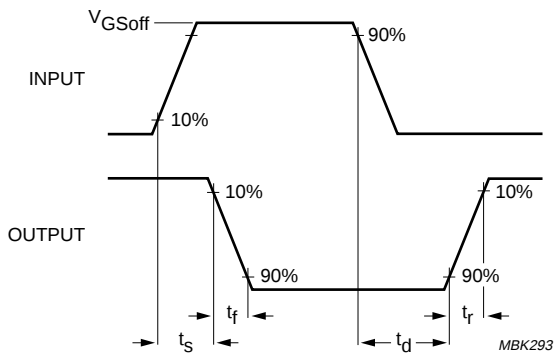


Fig.2 Switching times test circuit



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



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DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Short-form specification	The data in this specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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