

# DATA SHEET

**PMBFJ108;  
PMBFJ109; PMBFJ110**  
N-channel junction FETs

Product specification  
File under Discrete Semiconductors, SC07

April 1995

# N-channel junction FETs

# PMBFJ108; PMBFJ109; PMBFJ110

### FEATURES

- High-speed switching
- Interchangeability of drain and source connections
- Low  $R_{DSon}$  at zero gate voltage ( $< 8 \Omega$  for PMBFJ108).

### DESCRIPTION

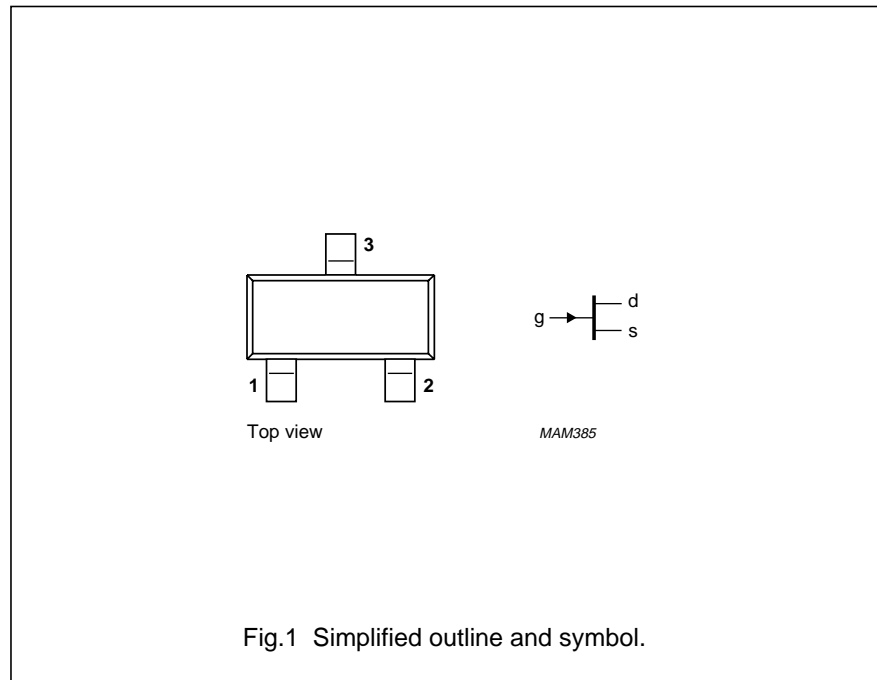
Symmetrical N-channel junction FETs in a SOT23 envelope. Intended for use in applications such as analog switches, choppers and commutators and in audio amplifiers.

### PINNING - SOT23

PIN	DESCRIPTION
1	drain
2	source
3	gate

### Note

1. Drain and source are interchangeable.



### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage		–	$\pm 25$	V
$V_{GSO}$	gate-source voltage		–	–25	V
$V_{GDO}$	drain-drain voltage		–	–25	V
$I_G$	forward gate current (DC)			50	mA
$P_{tot}$	total power dissipation	$T_{amb} = 25^\circ\text{C}$ ; note 1	–	250	mW
$T_{stg}$	storage temperature		–65	150	$^\circ\text{C}$
$T_j$	operating junction temperature		–	150	$^\circ\text{C}$

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## THERMAL RESISTANCE

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j-a}$	from junction to ambient (note 1)	500	K/W

## Notes

1. Mounted on an FR-4 printboard.

## STATIC CHARACTERISTICS

 $T_j = 25\text{ }^\circ\text{C}$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$-I_{GSS}$	reverse gate current	$-V_{GS} = 15\text{ V}$ $V_{DS} = 0$	–	3	nA
$I_{DSX}$	drain-source cut-off current	$V_{GS} = -10\text{ V}$ $V_{DS} = 5\text{ V}$	–	3	nA
$I_{DSS}$	drain current PMBFJ108 PMBFJ109 PMBFJ110	$V_{GS} = 0$ $V_{DS} = 15\text{ V}$	80 40 10	– – –	mA
$-V_{(BR)GSS}$	gate-source breakdown voltage	$-I_G = 1\text{ }\mu\text{A}$ $V_{DS} = 0$	–	25	V
$-V_{GS(off)}$	gate-source cut-off voltage PMBFJ108 PMBFJ109 PMBFJ110	$I_D = 1\text{ }\mu\text{A}$ $V_{DS} = 5\text{ V}$	3 2 0.5	10 6 4	V
$R_{DS(on)}$	drain-source on-resistance PMBFJ108 PMBFJ109 PMBFJ110	$V_{GS} = 0\text{ V}$ $V_{DS} = 0.1\text{ V}$	– – –	8 12 18	$\Omega$

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**DYNAMIC CHARACTERISTICS**

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$C_{is}$	input capacitance	$V_{DS} = 0$ $-V_{GS} = 10\text{ V}$ $f = 1\text{ MHz}$	15	30	pF
$C_{is}$	input capacitance	$V_{DS} = 0$ $-V_{GS} = 0$ $f = 1\text{ MHz}$ $T_{amb} = 25\text{ }^\circ\text{C}$	50	85	pF
$C_{rs}$	feedback capacitance	$V_{DS} = 0$ $-V_{GS} = 10\text{ V}$ $f = 1\text{ MHz}$	8	15	pF
<b>Switching times</b> (see Fig.2)					
$t_d$	delay time	note 1	2	–	ns
$t_{on}$	turn-on time	note 1	4	–	ns
$t_s$	storage time	note 1	4	–	ns
$t_{off}$	turn-off time	note 1	6	–	ns

**Notes**

- Test conditions for switching times are as follows:  
 $V_{DD} = 1.5\text{ V}$ ,  $V_{GS} = 0$  to  $-V_{GS(off)}$  (all types);  
 $-V_{GS(off)} = 12\text{ V}$ ,  $R_L = 100\text{ }\Omega$  (PMBFJ108);  
 $-V_{GS(off)} = 7\text{ V}$ ,  $R_L = 100\text{ }\Omega$  (PMBFJ109);  
 $-V_{GS(off)} = 5\text{ V}$ ,  $R_L = 100\text{ }\Omega$  (PMBFJ110).

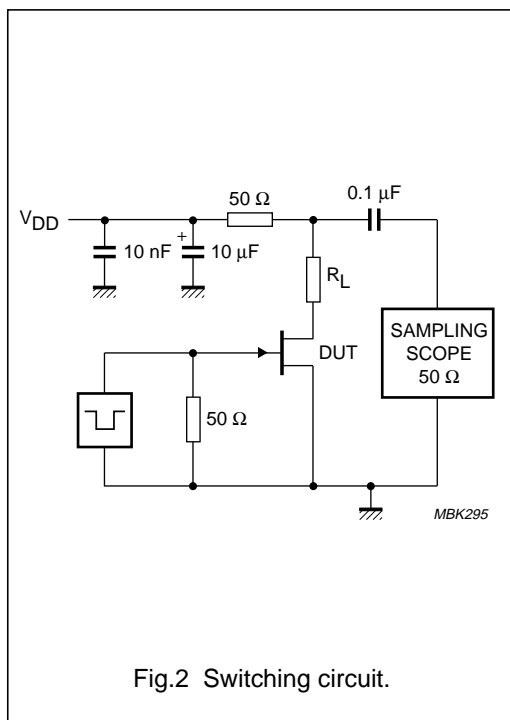


Fig.2 Switching circuit.

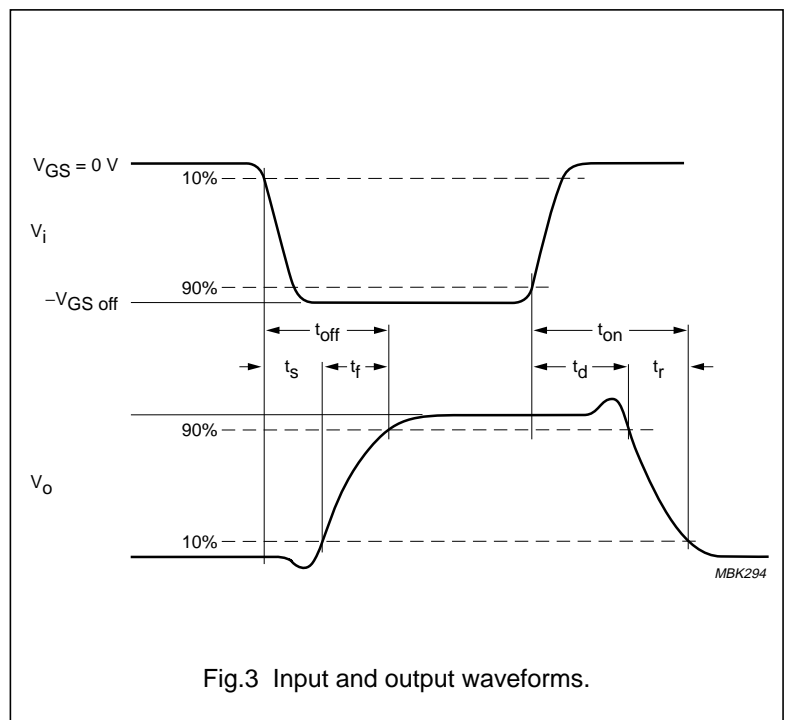


Fig.3 Input and output waveforms.

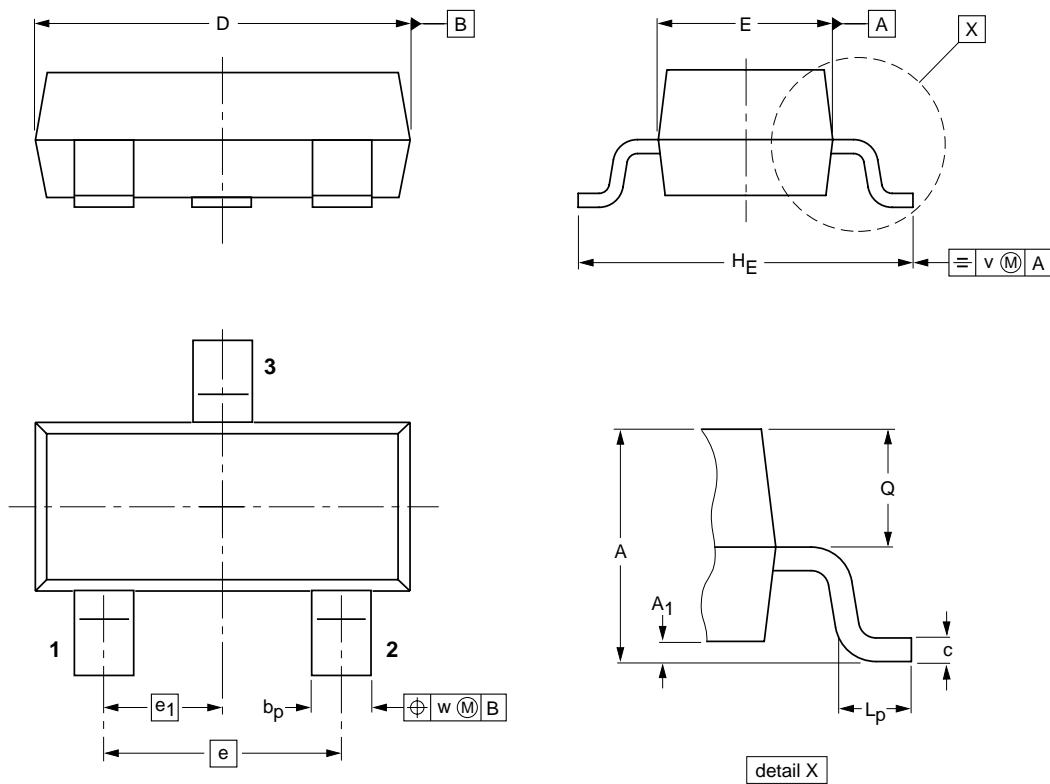
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PACKAGE OUTLINE

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	EIAJ			
SOT23						97-02-28

## N-channel junction FETs

PMBFJ108;  
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<b>Data sheet status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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