DATA SHEET

PMBFJ111; PMBFJ112; PMBFJ113
N-channel junction FETs

Product specification

April 1995

File under Discrete Semiconductors, SC07

Philips Semiconductors

PHILIPS

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N-channel junction FETs

PMBFJ111; PMBFJ112; PMBFJ113

FEATURES

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

DESCRIPTION

Symmetrical N-channel junction FETs in a surface mount SOT23 envelope. Intended for use in applications such as analog switches, choppers, commutators, multiplexers and thin and thick film hybrids.

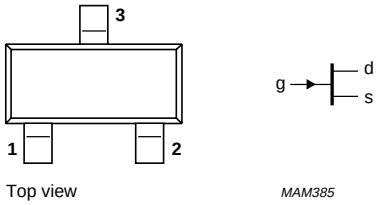

Fig.1 Simplified outline and symbol.

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

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THERMAL CHARACTERISTICS

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

SYMBOL	PARAMETER	MAX.	UNIT
$R_{th\ j\text{-}a}$	from junction to ambient (note 1)	430	K/W
$R_{th\ j\text{-}a}$	from junction to ambient (note 2)	500	K/W

Notes

1. Mounted on a ceramic substrate, 8 mm × 10 mm × 0.7 mm.
2. Mounted on printed circuit board.

STATIC CHARACTERISTICS

T_j = 25 °C.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$-I_{GSS}$	reverse gate current	$-V_{GS}$ = 15 V; V_{DS} = 0	–	1	nA
I_{DSS}	drain current	V_{GS} = 0; V_{DS} = 15 V			
	PMBFJ111		20	–	mA
	PMBFJ112		5	–	
	PMBFJ113		2	–	
$-V_{(BR)GSS}$	gate-source breakdown voltage	$-I_G$ = 1 μA; V_{DS} = 0	40	–	V
$-V_{GS(off)}$	gate-source cut-off voltage	I_D = 1 μA; V_{DS} = 5 V			
	PMBFJ111		3	10	V
	PMBFJ112		1	5	
	PMBFJ113		0.5	3	
$R_{DS(on)}$	drain-source on-resistance	V_{GS} = 0 V; V_{DS} = 0.1 V			
	PMBFJ111		–	30	Ω
	PMBFJ112		–	50	
	PMBFJ113		–	100	

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DYNAMIC CHARACTERISTICS

T_j = 25 °C.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
C_{iss}	input capacitance	V_{DS} = 0 $-V_{GS}$ = 10 V f = 1 MHz	6	–	pF
		V_{DS} = 0 $-V_{GS}$ = 0 f = 1 MHz T_{amb} = 25 °C	22	28	pF
C_{rss}	feedback capacitance	V_{DS} = 0 $-V_{GS}$ = 10 V f = 1 MHz	3	–	pF
Switching times (see Fig.2)					
t_r	rise time	note 1	6	–	ns
t_{on}	turn-on time	note 1	13	–	ns
t_f	fall time	note 1	15	–	ns
t_{off}	turn-off time	note 1	35	–	ns

Notes

1. Test conditions for switching times are as follows:
   V_{DD} = 10 V, V_{GS} = 0 to $-V_{GS(off)}$ (all types);
   $-V_{GS(off)}$ = 12 V, R_L = 750 Ω (PMBFJ111);
   $-V_{GS(off)}$ = 7 V, R_L = 1550 Ω (PMBFJ112);
   $-V_{GS(off)}$ = 5 V, R_L = 3150 Ω (PMBFJ113).

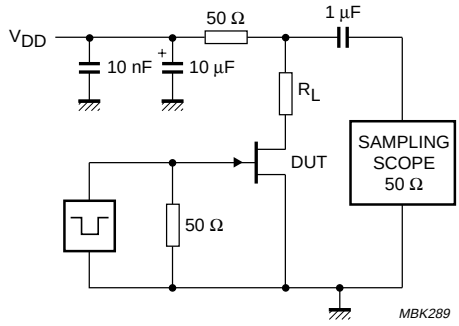

Fig.2 Switching circuit.

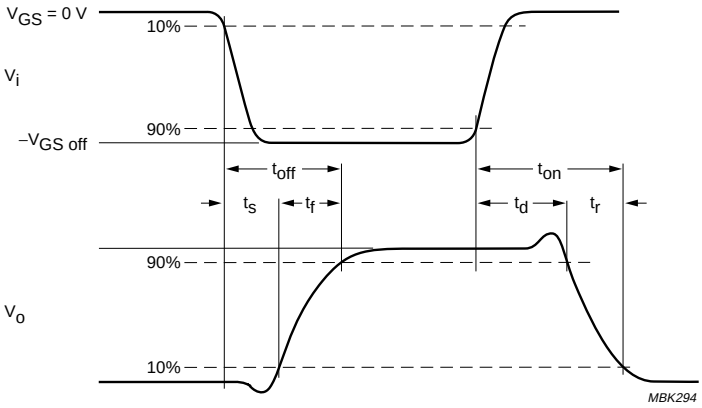

Fig.3 Input and output waveforms.

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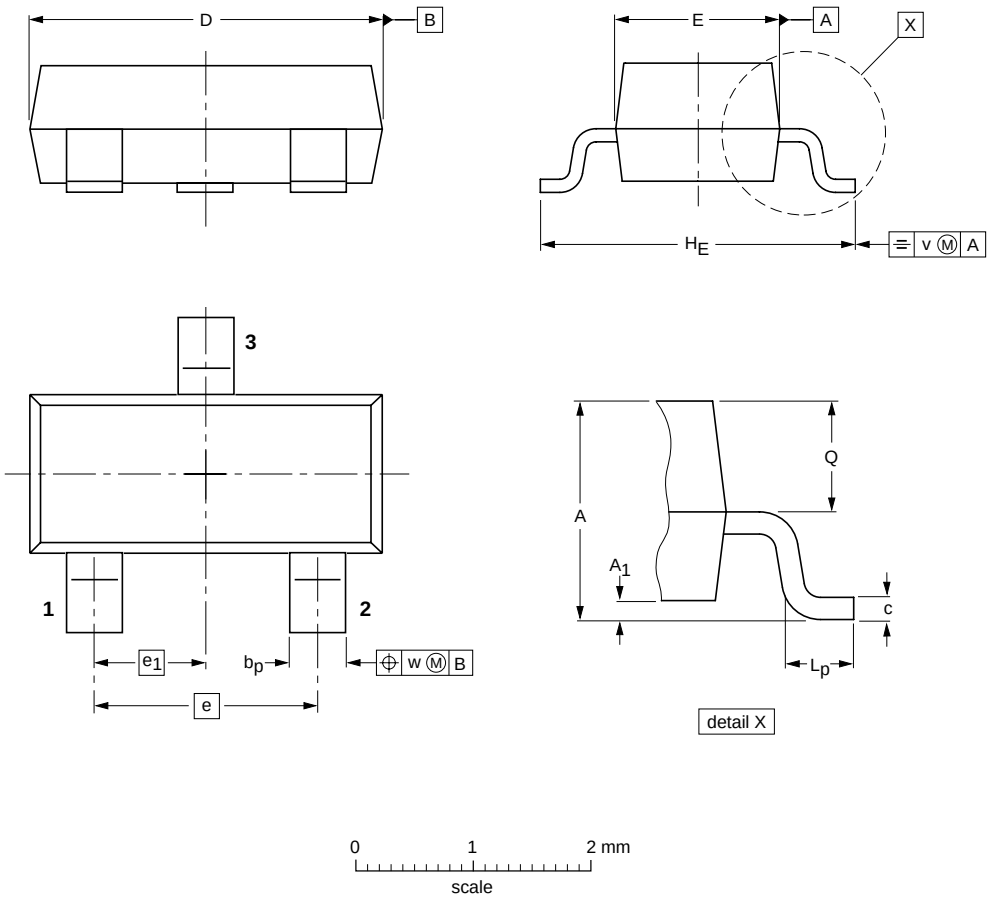
PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_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	EIAJ			
SOT23						97-02-28

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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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