

N-channel junction FETs

PMBFJ111; PMBFJ112; PMBFJ113

FEATURES

- High-speed switching
- Interchangeability of drain and source connections
- Low R_{DSon} at zero gate voltage ($< 30 \Omega$ 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.

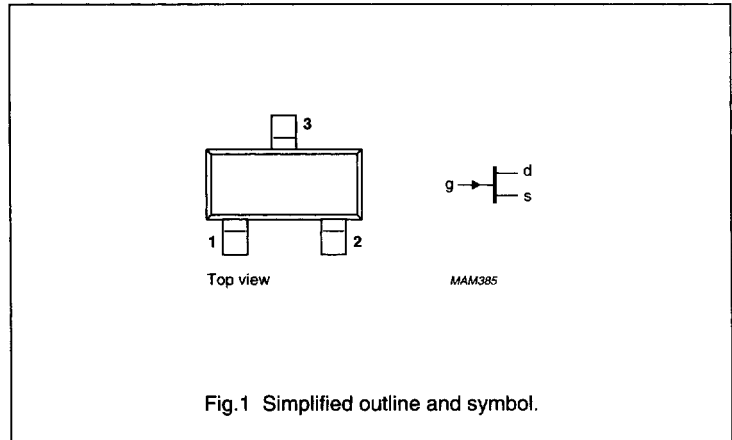


Fig.1 Simplified outline and symbol.

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	$T_{amb} = 25 \text{ }^\circ\text{C}$; note 1	-	300	mW
T_{stg}	storage temperature		-65	150	$^\circ\text{C}$
T_j	operating junction temperature		-	150	$^\circ\text{C}$

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

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

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

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

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DYNAMIC CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
C_{iss}	input capacitance	$V_{DS} = 0$ $-V_{GS} = 10\text{ V}$ $f = 1\text{ MHz}$	6	-	pF
		$V_{DS} = 0$ $-V_{GS} = 0$ $f = 1\text{ MHz}$ $T_{amb} = 25\text{ }^\circ\text{C}$	22	28	pF
C_{rss}	feedback capacitance	$V_{DS} = 0$ $-V_{GS} = 10\text{ V}$ $f = 1\text{ MHz}$	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:

- $V_{DD} = 10\text{ V}$, $V_{GS} = 0$ to $-V_{GS(off)}$ (all types);
- $-V_{GS(off)} = 12\text{ V}$, $R_L = 750\text{ }\Omega$ (PMBFJ111);
- $-V_{GS(off)} = 7\text{ V}$, $R_L = 1550\text{ }\Omega$ (PMBFJ112);
- $-V_{GS(off)} = 5\text{ V}$, $R_L = 3150\text{ }\Omega$ (PMBFJ113).

