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.

PINNING - SOT23

PIN	DESCRIPTION
1	drain
2	source
3	gate

Note

1. Drain and source are interchangeable.

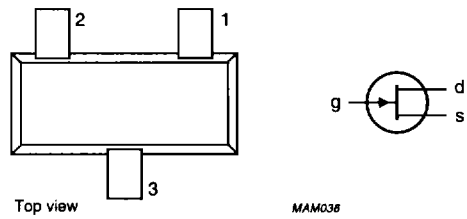

Fig.1 Simplified outline and symbol.

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

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 x 10 mm x 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 PMBFJ112 PMBFJ113	20 5 2	- - -	mA
$-V_{(BR)GSS}$	gate-source breakdown voltage	$-I_G = 1\ \mu A$ $V_{DS} = 0$		40	-	V
$-V_{GS(off)}$	gate-source cut-off voltage	$I_D = 1\ \mu A$ $V_{DS} = 5$ V	PMBFJ111 PMBFJ112 PMBFJ113	3 1 0.5	10 5 3	V
$R_{DS(on)}$	drain-source on-resistance	$V_{GS} = 0$ V $V_{DS} = 0.1$ V	PMBFJ111 PMBFJ112 PMBFJ113	- - -	30 50 100	Ω

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).

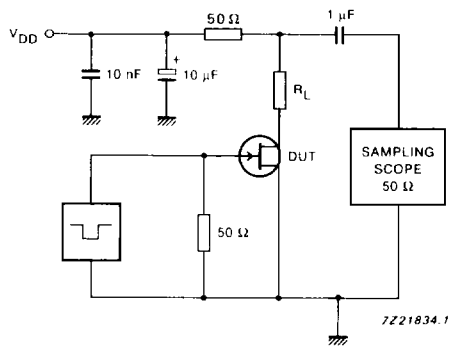

Fig.2 Switching circuit.

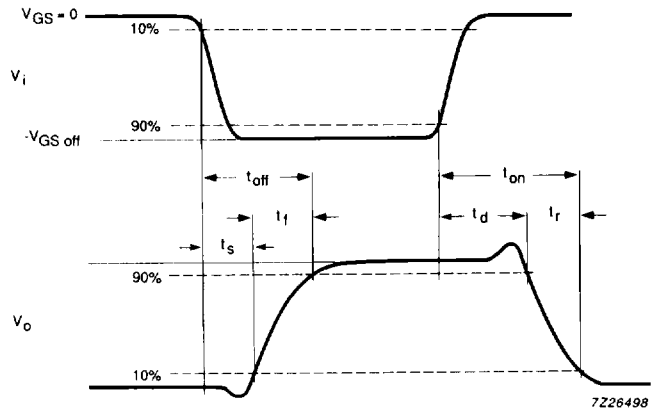

Fig.3 Input and output waveforms.