DATA SHEET

PMBF4391; PMBF4392; PMBF4393

N-channel FETs

Product specification

April 1995

N-channel FETs

PMBF4391; PMBF4392; PMBF4393

DESCRIPTION

Symmetrical silicon n-channel depletion type junction field-effect transistors on a plastic microminiature envelope intended for application in thick and thin-film circuits. The transistors are intended for low-power chopper or switching applications in industry.

PINNING

1 = drain
2 = source
3 = gate

Note

1. Drain and source are interchangeable.

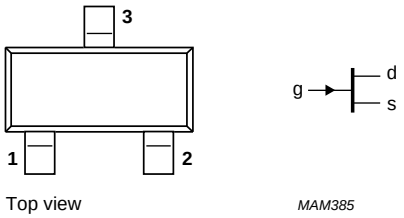


Fig.1 Simplified outline and symbol, SOT23.

Marking code

PMBF4391 = p6J
PMBF4392 = p6K
PMBF4393 = p6G

QUICK REFERENCE DATA

			PMBF4391	PMBF4392	PMBF4393	
Drain-source voltage	$\pm V_{DS}$	max.	40	40	40	V
Drain current						
V_{DS} = 20 V; V_{GS} = 0	I_{DSS}	>	50	25	5	mA
Gate-source cut-off voltage						
V_{DS} = 20 V; I_D = 1 nA	$-V_{(P)GS}$	>	4	2	0.5	V
		<	10	5	3	V
Drain-source resistance (on) at f = 1 kHz						
I_D = 0; V_{GS} = 0	$R_{ds\ on}$	<	30	60	100	Ω
Feedback capacitance at f = 1 MHz						
$-V_{GS}$ = 12 V; V_{DS} = 0	C_{rs}	<	3.5	3.5	3.5	pF
Turn-off time						
V_{DD} = 10 V; V_{GS} = 0						
I_D = 12 mA; $-V_{GSM}$ = 12 V	t_{off}	<	20	–	–	ns
I_D = 6 mA; $-V_{GSM}$ = 7 V	t_{off}	<	–	35	–	ns
I_D = 3 mA; $-V_{GSM}$ = 5 V	t_{off}	<	–	–	50	ns

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	$\pm V_{DS}$	max.	40	V
Drain-gate voltage	V_{DGO}	max.	40	V
Gate-source voltage	$-V_{GSO}$	max.	40	V
Gate current (DC)	I_G	max.	50	mA
Total power dissipation up to T_{amb} = 40 °C (1)	P_{tot}	max.	250	mW
Storage temperature range	T_{stg}	−65 to +	150	°C
Junction temperature	T_j	max.	150	°C

THERMAL RESISTANCE

From junction to ambient(1)	$R_{th\ j\text{-}a}$	=	430	K/W

CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Gate-source voltage						
I_G = 1 mA; V_{DS} = 0		V_{GSon}	<		1	V
Gate-source cut-off current						
V_{DS} = 0 V; $-V_{GS}$ = 20 V		$-I_{GSS}$	<		0.1	nA
V_{DS} = 0 V; $-V_{GS}$ = 20 V; T_{amb} = 150 °C		$-I_{GSS}$	<		0.2	µA

			PMBF4391		PMBF4392		PMBF4393	
Drain current	I_{DSS}	>	50		25		5	mA
V_{DS} = 20 V; V_{GS} = 0		<	150		75		30	mA
Gate-source breakdown voltage								
$-I_G$ = 1 µA; V_{DS} = 0	$-V_{(BR)GSS}$	>	40		40		40	V
Gate-source cut-off voltage	$-V_{(P)GS}$	>	4		2		0.5	V
I_D = 1 nA; V_{DS} = 20 V		<	10		5		3	V
Drain-source voltage (on)								
I_D = 12 mA; V_{GS} = 0	V_{DSon}	<	0.4		–		–	V
I_D = 6 mA; V_{GS} = 0	V_{DSon}	<			0.4		–	V
I_D = 3 mA; V_{GS} = 0	V_{DSon}	<	–		–		0.4	V
Drain-source resistance (on)								
I_D = 0; V_{GS} = 0; f = 1 kHz; T_{amb} = 25 °C	$r_{ds\ on}$	<	30		–		100	Ω
Drain cut-off current								
$-V_{GS}$ = 12 V; V_{DS} = 20 V	I_{DSX}	<	0.1		–		–	nA
$-V_{GS}$ = 7 V; V_{DS} = 20 V	I_{DSX}	<	–		0.1		–	nA
$-V_{GS}$ = 5 V; V_{DS} = 20 V	I_{DSX}	<	–		–		0.1	nA
$-V_{GS}$ = 12 V; V_{DS} = 20 V; T_{amb} = 150 °C	I_{DSX}	<	0.2		–		–	µA
$-V_{GS}$ = 7 V; V_{DS} = 20 V; T_{amb} = 150 °C	I_{DSX}	<	–		0.2		–	µA
$-V_{GS}$ = 5 V; V_{DS} = 20 V; T_{amb} = 150 °C	I_{DSX}	<	–		–		0.2	µA

y-parameters (common source)								
V_{DS} = 20 V; V_{GS} = 0; f = 1 MHz; T_{amb} = 25 °C			**PMBF4391**		**PMBF4392**	**PMBF4393**	
Input capacitance	C_{is}	<	14		14	14	pF
Feedback capacitance							
$-V_{GS}$ = 12 V ; V_{DS} = 0	C_{rs}	<	3.5		–	–	pF
$-V_{GS}$ = 7 V ; V_{DS} = 0	C_{rs}	<	–		3.5	–	pF
$-V_{GS}$ = 5 V ; V_{DS} = 0	C_{rs}	<	–		–	3.5	pF
Switching times							
V_{DD} = 10 V ; V_{DS} = 0							
Conditions I_D and $-V_{GSoff}$	I_D	=	12		6	3	mA
	$-V_{GS\ off}$	=	12		7	5	V
	R_L	=	750		1550	3150	Ω
Rise time	t_r	<	5		5	5	ns
Turn on time	t_{on}	<	15		15	15	ns
Fall time	t_f	<	15		20	30	ns
Turn off time	t_{off}	<	20		35	50	ns

Note

1. Mounted on a ceramic substrate of 8 mm × 10 mm × 0,7 mm.

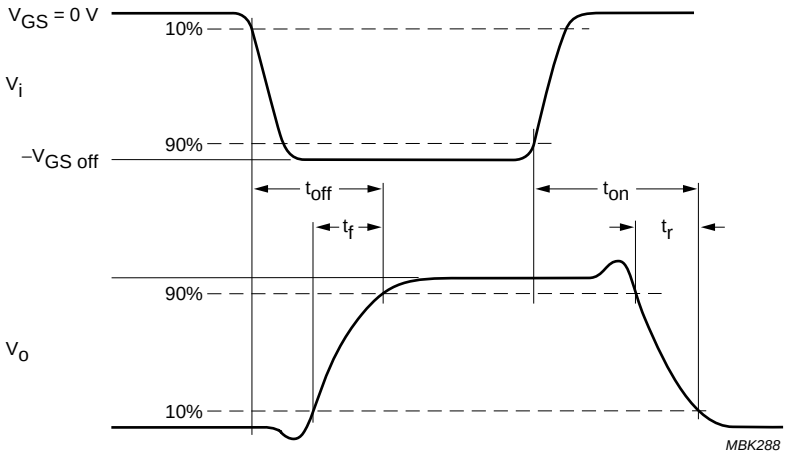


Fig.2 Switching times waveforms.

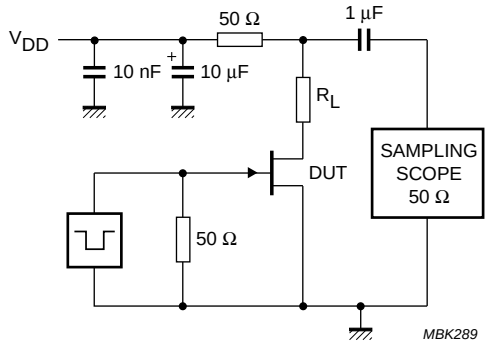


Fig.3 Test circuit.

Pulse generator:

t_r	<	0.5 ns
t_f	<	0.5 ns
t_p	=	100 µs
δ	=	0.01

Oscilloscope:

R_i	=	50 Ω

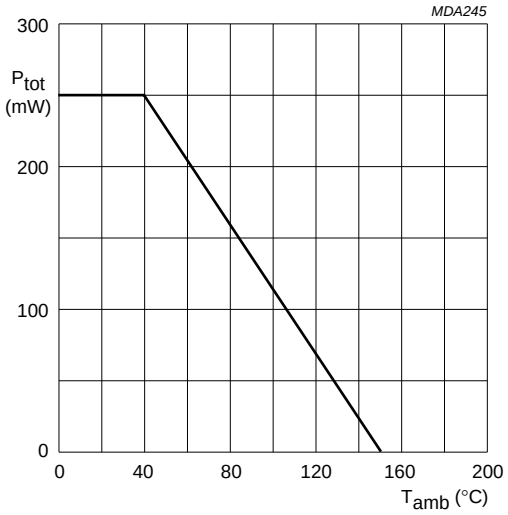
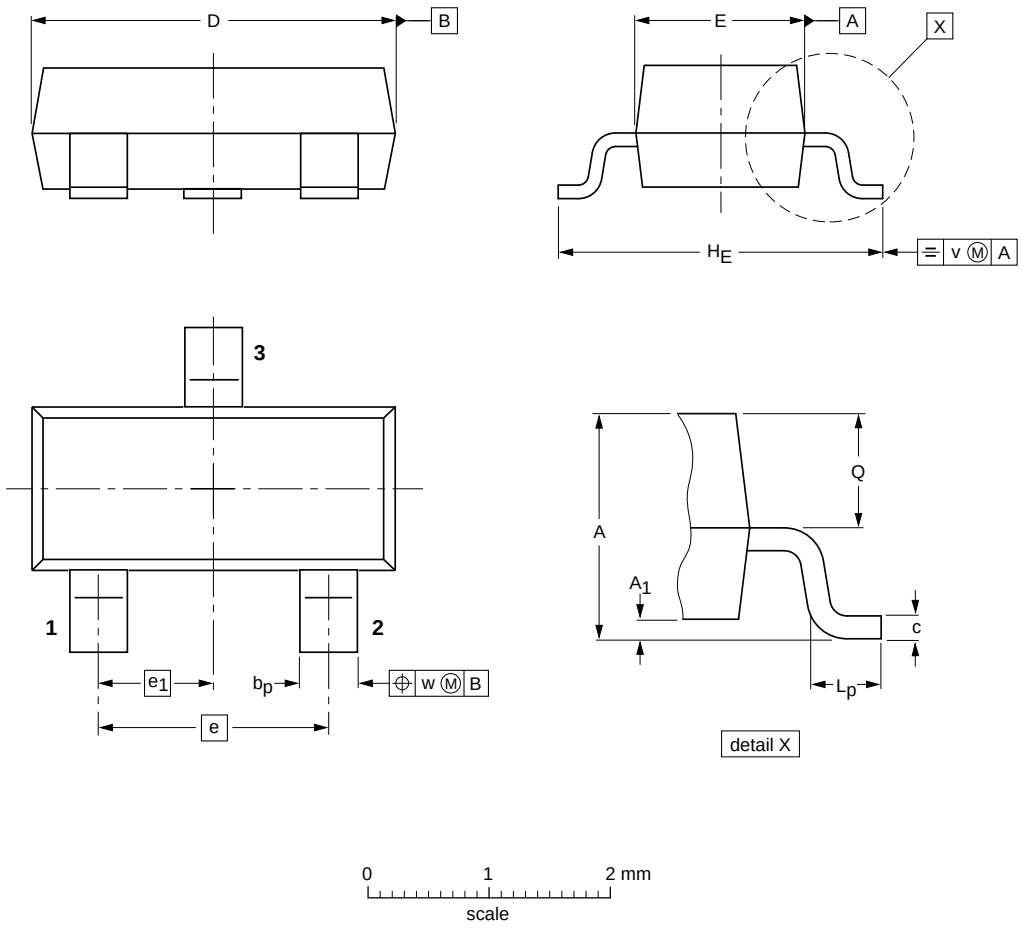


Fig.4 Power derating curve.

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	JEITA			
SOT23		TO-236AB				~~04-11-04~~ 06-03-16

DATA SHEET STATUS

DOCUMENT STATUS[1]	PRODUCT STATUS[2]	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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