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DATA SHEET

PMBFJ174 to 177
P-channel silicon field-effect transistors

Product specification

April 1995

P-channel silicon field-effect transistors PMBFJ174 to 177

DESCRIPTION

Silicon symmetrical p-channel junction FETs in plastic microminiature SOT23 envelopes.They are intended for application with analogue switches, choppers, commutators etc. using SMD technology. A special feature is the interchangeability of the drain and source connections.

PINNING

1 = drain
2 = source
3 = gate

Note

1. Drain and source are interchangeable.

Marking codes:

174 : p6X
175 : p6W
176 : p6S
177 : p6Y

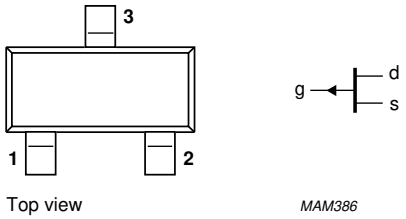


Fig.1 Simplified outline and symbol, SOT23.

QUICK REFERENCE DATA

Drain-source voltage	$\pm V_{DS}$	max.		30			V
Gate-source voltage	V_{GSO}	max.		30			V
Gate current	$-I_G$	max.		50			mA
Total power dissipation							
up to T_{amb} = 25 °C	P_{tot}	max.		300			mW
			PMBFJ174	**175**	**176**	**177**	
Drain current							
$-V_{DS}$ = 15 V; V_{GS} = 0	$-I_{DSS}$	>	20	7	2	1.5	mA
		<	135	70	35	20	mA
Drain-source ON-resistance							
$-V_{DS}$ = 0.1 V; V_{GS} = 0	$R_{DS\ on}$	<	85	125	250	300	Ω

RATINGS

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

Drain-source voltage	$\pm V_{DS}$	max.	30	V
Gate-source voltage	V_{GSO}	max.	30	V
Gate-drain voltage	V_{GDO}	max.	30	V
Gate current (d.c.)	$-I_G$	max.	50	mA
Total power dissipation				
up to T_{amb} = 25 °C[1]	P_{tot}	max.	300	mW
Storage temperature range	T_{stg}		−65 to + 150	°C
Junction temperature	T_j	max.	150	°C

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j\text{-}a}$	=	430	K/W

STATIC CHARACTERISTICS

T_j = 25 °C unless otherwise specified

			PMBFJ174	175	176	177	
Gate cut-off current							
V_{GS} = 20 V; V_{DS} = 0	I_{GSS}	<	1	1	1	1	nA
Drain cut-off current							
$-V_{DS}$ = 15 V; V_{GS} = 10 V	$-I_{DSX}$	<	1	1	1	1	nA
Drain current							
$-V_{DS}$ = 15 V; V_{GS} = 0	$-I_{DSS}$	>	20	7	2	1.5	mA
		<	135	70	35	20	mA
Gate-source breakdown voltage							
I_G = 1 μA; V_{DS} = 0	$V_{(BR)GSS}$	>	30	30	30	30	V
Gate-source cut-off voltage							
$-I_D$ = 10 nA; V_{DS} = −15 V	$V_{GS\ off}$	>	5	3	1	0.8	V
		<	10	6	4	2.25	V
Drain-source ON-resistance							
$-V_{DS}$ = 0.1 V; V_{GS} = 0	$R_{DS\ on}$	<	85	125	250	300	Ω

Note

1. Mounted on a ceramic substrate of 8 mm × 10 mm × 0.7 mm.

DYNAMIC CHARACTERISTICS

T_j = 25 °C unless otherwise specified

Input capacitance, f = 1 MHz						
V_{GS} = 10 V; V_{DS} = 0 V	C_{is}	typ.	8			pF
V_{GS} = V_{DS} = 0	C_{is}	typ.	30			pF
Feedback capacitance, f = 1 MHz						
V_{GS} = 10 V; V_{DS} = 0 V	C_{rs}	typ.	4			pF
Switching times (see Fig.2 + 3)		**PMBFJ174**	**175**	**176**	**177**	
Delay time	t_d	typ.	2	5	15	20 ns
Rise time	t_r	typ.	5	10	20	25 ns
Turn-on time	t_{on}	typ.	7	15	35	45 ns
Storage temperature	t_s	typ.	5	10	15	20 ns
Fall time	t_f	typ.	10	20	20	25 ns
Turn-off time	t_{off}	typ.	15	30	35	45 ns
Test conditions:	$-V_{DD}$		10	6	6	6 V
	$V_{GS\ off}$		12	8	6	3 V
	R_L		560	1200	2000	2900 Ω
	$V_{GS\ on}$		0	0	0	0 V

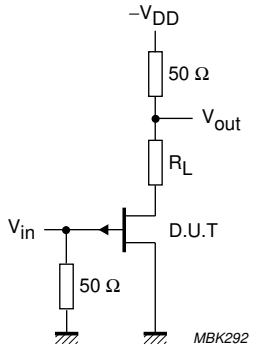
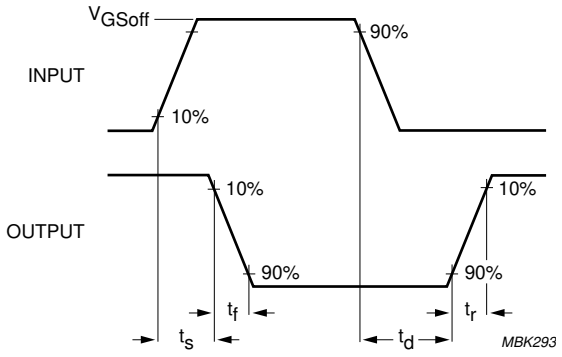


Fig.2 Switching times test circuit



Rise time input voltage < 1 ns

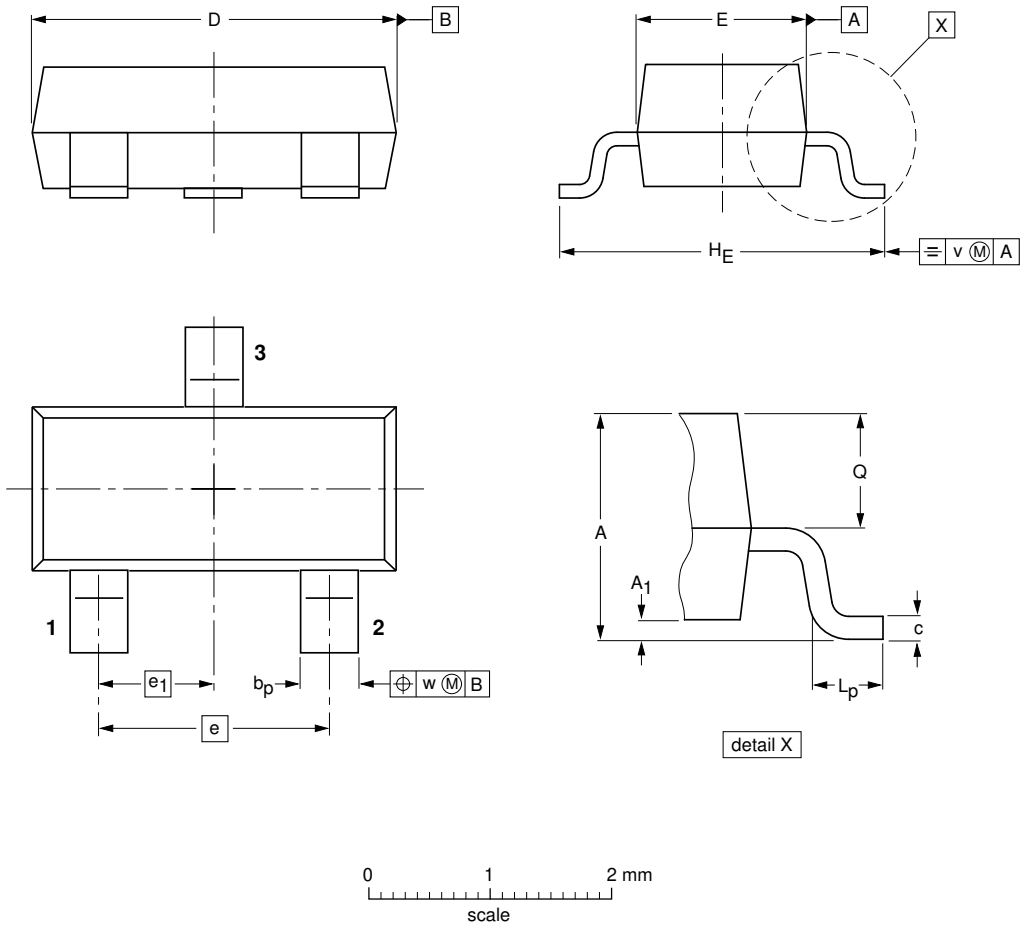
Fig.3 Input and output waveforms

$t_d + t_r = t_{on}$

$t_s + t_f = t_{off}$

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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