



PMBFJ174; PMBFJ175; PMBFJ176; PMBFJ177

P-channel silicon field-effect transistors

Rev. 3.0 — 24 January 2020

Product data sheet

1 Product profile

1.1 General 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.

1.2 Quick reference data

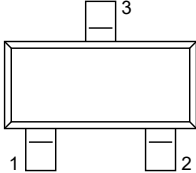

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{DS}	drain-source voltage		30	-	30	V
V_{GS0}	gate-source voltage		-	-	30	V
$-I_G$	gate current		-	-	50	mA
P_{tot}	total power dissipation	up to $T_{amb} = 25\text{ °C}$	-	-	300	mW
$-I_{DSS}$	drain current	$-V_{DS} = 15\text{ V}; V_{GS} = 0$				
		PMBFJ174	20	-	135	mA
		PMBFJ175	7	-	70	mA
		PMBFJ176	2	-	35	mA
		PMBFJ177	1.5	-	20	mA
$R_{DS\ on}$	drain-source ON-resistance	$-V_{DS} = 0.1\text{ V}; V_{GS} = 0$				
		PMBFJ174	-	-	85	Ω
		PMBFJ175	-	-	125	Ω
		PMBFJ176	-	-	250	Ω
		PMBFJ177	-	-	300	Ω



2 Pinning information

Table 2. Pinning

Pin	Description ^[1]		Simplified outline	Symbol
1	drain			 sym053
2	source			
3	gate			

[1] Drain and source are interchangeable.

3 Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMBFJ174	-	plastic surface mounted package; 3 leads	SOT23
PMBFJ175			
PMBFJ176			
PMBFJ177			

4 Marking

Table 4. Marking

Type number	Marking code ^[1]
PMBFJ174	*6X
PMBFJ175	*6W
PMBFJ176	*6S
PMBFJ177	*6Y

[1] * = manufacturing site

5 Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	drain-source voltage		30	30	V
V_{GSO}	gate-source voltage		-	30	V
V_{GDO}	gate-drain voltage		-	30	V

Symbol	Parameter	Conditions		Min	Max	Unit
$-I_G$	gate current (DC)			-	50	mA
P_{tot}	total power dissipation	$T_{amb} = 25\text{ °C}$	[1]	-	300	mW
T_{stg}	storage temperature range			-65	150	°C
T_j	junction temperature			-	150	°C

[1] Mounted on a ceramic substrate, 8 mm × 10 mm × 0.7 mm.

6 Thermal characteristics

Table 6. Thermal characteristics

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

Symbol	Parameter	Conditions		Typ	Unit
$R_{th(j-a)}$	junction to ambient in free air thermal resistance			430	K/W

7 Static characteristics

Table 7. Static characteristics

$T_j = 25\text{ °C}$ unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{GSS}	gate cut-off current						
	PMBFJ174	$V_{GS} = 20\text{ V}; V_{DS} = 0\text{ V}$		-	-	1	nA
	PMBFJ175	$V_{GS} = 20\text{ V}; V_{DS} = 0\text{ V}$		-	-	1	nA
	PMBFJ176	$V_{GS} = 20\text{ V}; V_{DS} = 0\text{ V}$		-	-	1	nA
$-I_{DSX}$	drain cut-off current						
	PMBFJ174	$-V_{DS} = 15\text{ V}; V_{GS} = 10\text{ V}$		-	-	1	nA
	PMBFJ175	$-V_{DS} = 15\text{ V}; V_{GS} = 10\text{ V}$		-	-	1	nA
	PMBFJ176	$-V_{DS} = 15\text{ V}; V_{GS} = 10\text{ V}$		-	-	1	nA
$-I_{DSS}$	drain current						
	PMBFJ174	$V_{DS} = -15\text{ V}; V_{GS} = 0\text{ V}$		20	-	135	mA
	PMBFJ175	$-V_{DS} = 15\text{ V}; V_{GS} = 0\text{ V}$		7	-	70	mA
	PMBFJ176	$-V_{DS} = 15\text{ V}; V_{GS} = 0\text{ V}$		2	-	35	mA
$V_{(BR)GSS}$	gate-source breakdown voltage						
	PMBFJ174	$I_G = 1\text{ }\mu\text{A}; V_{DS} = 0\text{ V}$		-	-	30	V
	PMBFJ175	$I_G = 1\text{ }\mu\text{A}; V_{DS} = 0\text{ V}$		-	-	30	V
	PMBFJ176	$I_G = 1\text{ }\mu\text{A}; V_{DS} = 0\text{ V}$		-	-	30	V
	PMBFJ177	$I_G = 1\text{ }\mu\text{A}; V_{DS} = 0\text{ V}$		-	-	30	V

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{GSoff}	gate-source cut-off voltage					
	PMBFJ174	-I _D = 10 nA; V _{DS} = -15 V	5	-	10	V
	PMBFJ175	-I _D = 10 nA; V _{DS} = -15 V	3	-	6	V
	PMBFJ176	-I _D = 10 nA; V _{DS} = -15 V	1	-	4	V
	PMBFJ177	-I _D = 10 nA; V _{DS} = -15 V	0.8	-	2.25	V
R _{DSon}	drain-source on resistance					
	PMBFJ174	-V _{DS} = 0.1 V; V _{GS} = 0 V	-	-	85	Ω
	PMBFJ175	-V _{DS} = 0.1 V; V _{GS} = 0 V	-	-	125	Ω
	PMBFJ176	-V _{DS} = 0.1 V; V _{GS} = 0 V	-	-	250	Ω
	PMBFJ177	-V _{DS} = 0.1 V; V _{GS} = 0 V	-	-	300	Ω

8 Dynamic characteristics

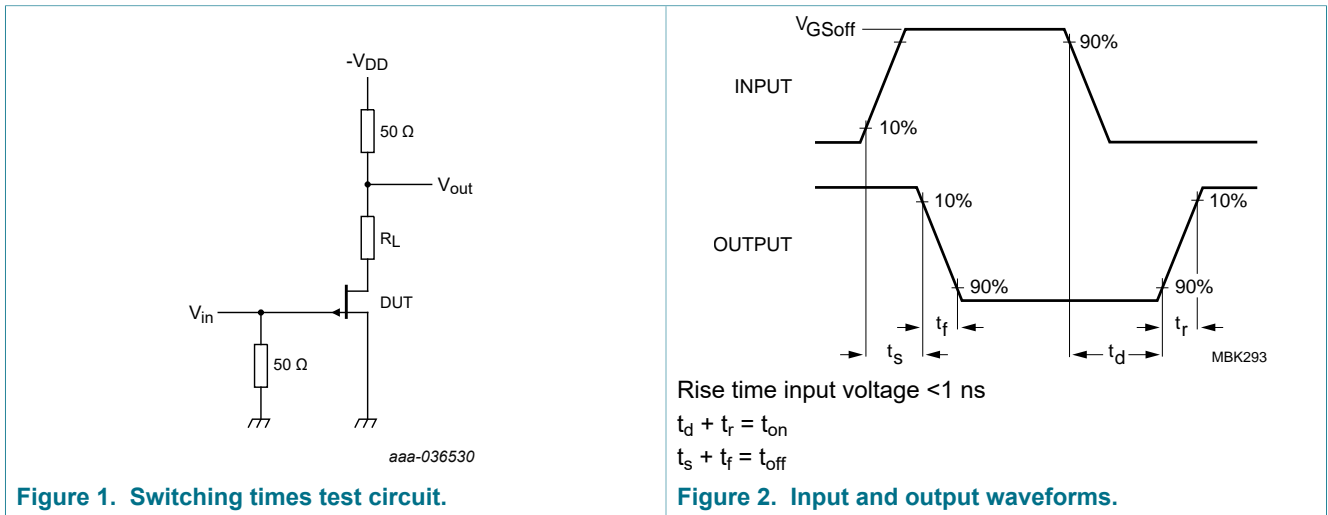
Table 8. Dynamic characteristics

T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
C _{iss}	input capacitance	V _{GS} = 10 V; V _{DS} = 0 V; f = 1 MHz	-	8	-	pF
		V _{DS} = 0 V; V _{GS} = 0 V; f = 1 MHz	-	30	-	pF
C _{rs}	feedback capacitance	V _{GS} = 10 V; V _{DS} = 0 V; f = 1 MHz	-	4	-	pF
Switching times; see Figure 1 and Figure 2, Test conditions for switching times are as follows: ^[1]						
t _d	delay time					
	PMBFJ174		-	2	-	ns
	PMBFJ175		-	5	-	ns
	PMBFJ176		-	15	-	ns
	PMBFJ177		-	20	-	ns
t _r	rise time					
	PMBFJ174		-	5	-	ns
	PMBFJ175		-	10	-	ns
	PMBFJ176		-	20	-	ns
	PMBFJ177		-	25	-	ns
t _{on}	turn-on time					
	PMBFJ174		-	7	-	ns
	PMBFJ175		-	15	-	ns
	PMBFJ176		-	35	-	ns
	PMBFJ177		-	45	-	ns

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
t_s	storage temperature					
	PMBFJ174		-	5	-	ns
	PMBFJ175		-	10	-	ns
	PMBFJ176		-	15	-	ns
t_f	fall time					
	PMBFJ174		-	10	-	ns
	PMBFJ175		-	20	-	ns
	PMBFJ176		-	20	-	ns
t_{off}	turn-off time					
	PMBFJ174		-	6	-	ns
	PMBFJ175		-	6	-	ns
	PMBFJ176		-	6	-	ns
t_{off}	turn-off time					
	PMBFJ174		-	6	-	ns
	PMBFJ175		-	6	-	ns
	PMBFJ176		-	6	-	ns

- [1] $-V_{DD} = 10\text{ V}$, $V_{GSoff} = 12\text{ V}$, $R_L = 560\ \Omega$, $V_{GSon} = 0\text{ V}$ (PMBFJ174);
- $-V_{DD} = 6\text{ V}$, $V_{GSoff} = 8\text{ V}$, $R_L = 1200\ \Omega$, $V_{GSon} = 0\text{ V}$ (PMBFJ175);
- $-V_{DD} = 6\text{ V}$, $V_{GSoff} = 6\text{ V}$, $R_L = 2000\ \Omega$, $V_{GSon} = 0\text{ V}$ (PMBFJ176);
- $-V_{DD} = 6\text{ V}$, $V_{GSoff} = 3\text{ V}$, $R_L = 2900\ \Omega$, $V_{GSon} = 0\text{ V}$ (PMBFJ177);



9 Package outline

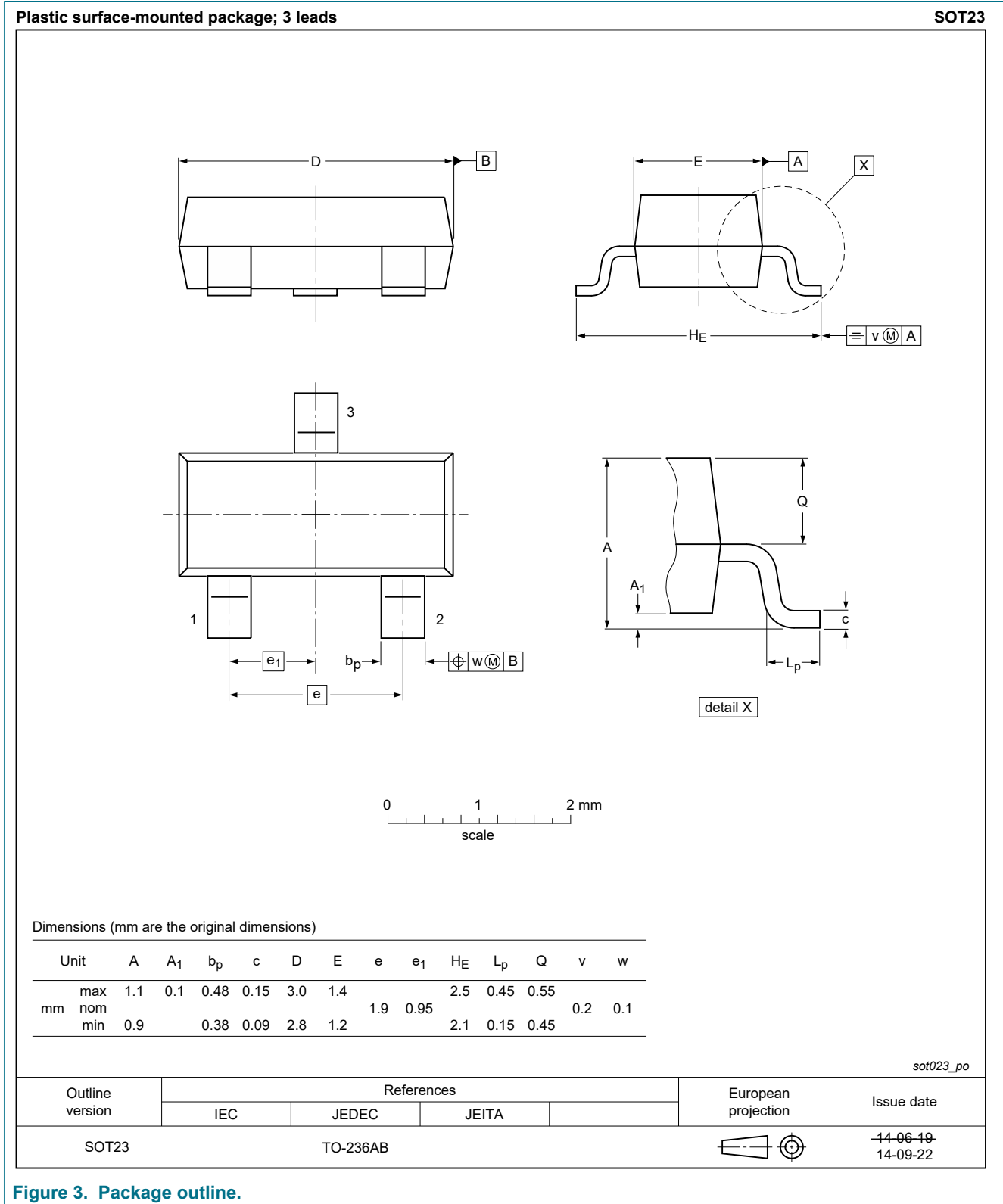


Figure 3. Package outline.

10 Revision history

Revision history

Revision number	Date	Description
3.0	20200124	Product data sheet
modification		<ul style="list-style-type: none">• adapted the notation of the manufacturing code
2.0	19950401	product data sheet
1.0		Initial version of the document

11 Legal information

11.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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[2] The term 'short data sheet' is explained in section "Definitions".

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