DATA SHEET

PMEGXX10BEA; PMEGXX10BEV

1 A very low V_F MEGA Schottky barrier rectifier

Product specification
Supersedes data of 2004 Apr 02

2004 Jun 14

Philips Semiconductors

PHILIPS

1 A very low V_F MEGA Schottky barrier rectifier

PMEGXX10BEA; PMEGXX10BEV

FEATURES

- Forward current: 1 A
- Reverse voltages: 20 V, 30 V, 40 V
- Very low forward voltage
- Ultra small and very small plastic SMD package
- Power dissipation comparable to SOT23.

APPLICATIONS

- High efficiency DC-to-DC conversion
- Voltage clamping
- Protection circuits
- Low voltage rectification
- Blocking diodes
- Low power consumption applications.

DESCRIPTION

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a very small SOD323 (SC-76) and ultra small SOT666 SMD plastic package.

MARKING

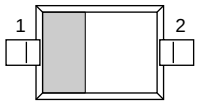
TYPE NUMBER	MARKING CODE
PMEG2010BEA	V1
PMEG3010BEA	V2
PMEG4010BEA	V3
PMEG2010BEV	G6
PMEG3010BEV	G5
PMEG4010BEV	G4

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
I_F	forward current	1	A
V_R	reverse voltage	20; 30; 40	V

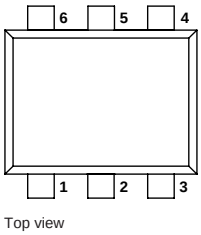
PINNING

PIN	DESCRIPTION
PMEGXX10BEA (see Fig.1)	
1	cathode
2	anode
PMEGXX10BEV (see Fig.2)	
1, 2, 5, 6	cathode
3, 4	anode



The marking bar indicates the cathode.

Fig.1 Simplified outline (SOD323; SC-76) and symbol.



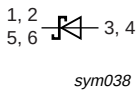


Fig.2 Simplified outline (SOT666) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PMEGXX10BEA	–	plastic surface mounted package; 2 leads	SOD323
PMEGXX10BEV		plastic surface mounted package; 6 leads	SOT666

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_R	continuous reverse voltage				
	PMEG2010BEA/PMEG2010BEV		–	20	V
	PMEG3010BEA/PMEG3010BEV		–	30	V
	PMEG4010BEA/PMEG4010BEV		–	40	V
I_F	continuous forward current	$T_s \leq 55$ °C; note 1	–	1	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ ms; $\delta \leq 0.5$; note 2	–	3.5	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8$ ms; square wave; note 2	–	10	A
T_j	junction temperature	note 3	–	150	°C
T_{amb}	operating ambient temperature	note 3	–65	+150	°C
T_{stg}	storage temperature		–65	+150	°C

Notes

1. Refer to SOD323 (SC-76) and SOT666 standard mounting conditions.
2. Only valid if pins 3 and 4 are connected in parallel (SOT666 package).
3. For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P_R are a significant part of the total power losses. Nomograms for determining the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
PMEGXX10BEA (SOD323)				
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air; notes 1 and 2	450	K/W
		in free air; notes 2 and 3	210	K/W
$R_{th(j-s)}$	thermal resistance from junction to soldering point	note 4	90	K/W
PMEGXX10BEV (SOT666)				
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air; notes 2 and 5	405	K/W
		in free air; notes 2 and 6	215	K/W
$R_{th(j-s)}$	thermal resistance from junction to soldering point	note 4	80	K/W

Notes

1. Refer to SOD323 (SC-76) standard mounting conditions.
2. For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P_R are a significant part of the total power losses. Nomograms for determining the reverse power losses P_R and $I_{F(AV)}$ rating will be available on request.
3. Device mounted on an FR4 printed-circuit board with copper clad 10 × 10 mm.
4. Solder point of cathode tab.
5. Refer to SOT666 standard mounting conditions.
6. Only valid if pins 3 and 4 are connected in parallel (SOT666 package).

CHARACTERISTICS

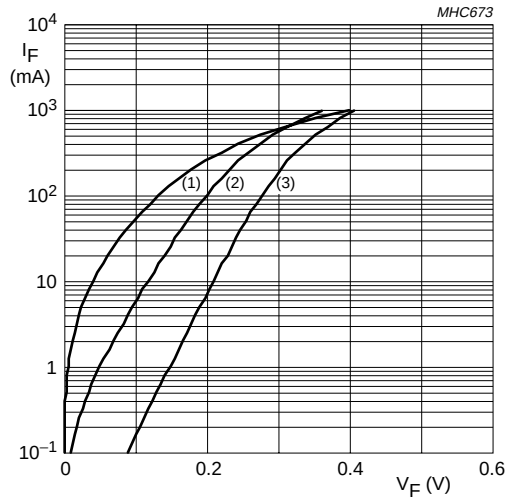
T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	PMEG2010BEA/ PMEG2010BEV		PMEG3010BEA/ PMEG3010BEV		PMEG4010BEA/ PMEG4010BEV		UNIT
			TYP.	MAX.	TYP.	MAX.	TYP.	MAX.	
V_F	forward voltage	I_F = 0.1 mA	90	130	90	130	95	130	mV
		I_F = 1 mA	150	190	150	200	155	210	mV
		I_F = 10 mA	210	240	215	250	220	270	mV
		I_F = 100 mA	280	330	285	340	295	350	mV
		I_F = 500 mA	355	390	380	430	420	470	mV
		I_F = 1000 mA	420	500	450	560	540	640	mV
I_R	continuous reverse current	V_R = 10 V; note 1	15	40	12	30	7	20	µA
		V_R = 20 V; note 1	40	200	–	–	–	–	µA
		V_R = 30 V; note 1	–	–	40	150	–	–	µA
		V_R = 40 V; note 1	–	–	–	–	30	100	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz	66	80	55	70	43	50	pF

Note

1. Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

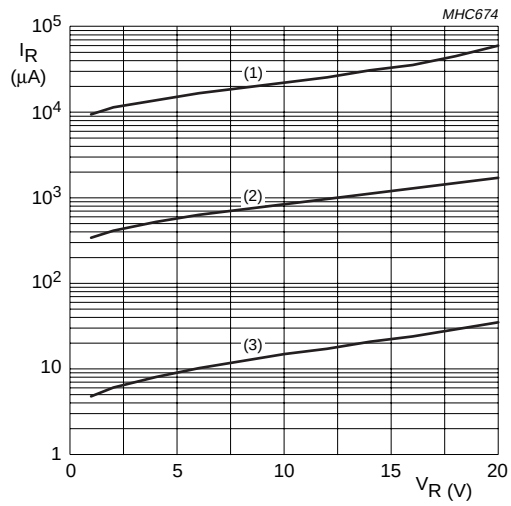
GRAPHICAL DATA



PMEG2010BEA/PMEG2010BEV

(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

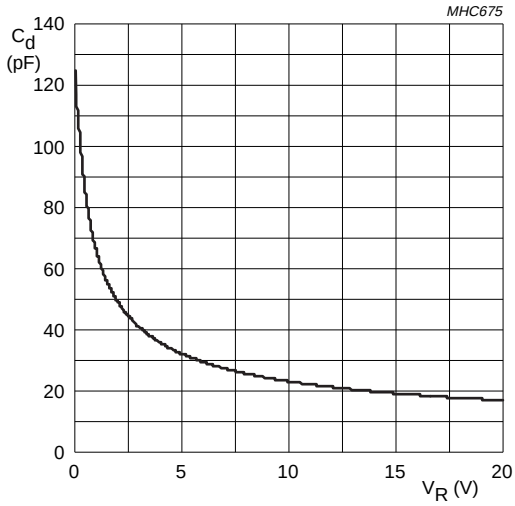
Fig.3 Forward current as a function of forward voltage; typical values.



PMEG2010BEA/PMEG2010BEV

(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

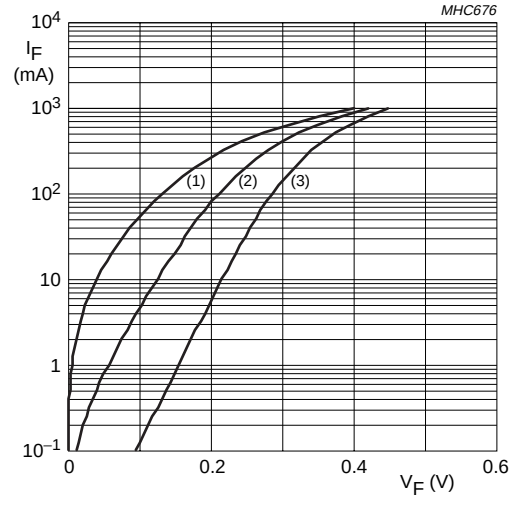
Fig.4 Reverse current as a function of reverse voltage; typical values.



PMEG2010BEA/PMEG2010BEV

T_{amb} = 25 °C; f = 1 MHz.

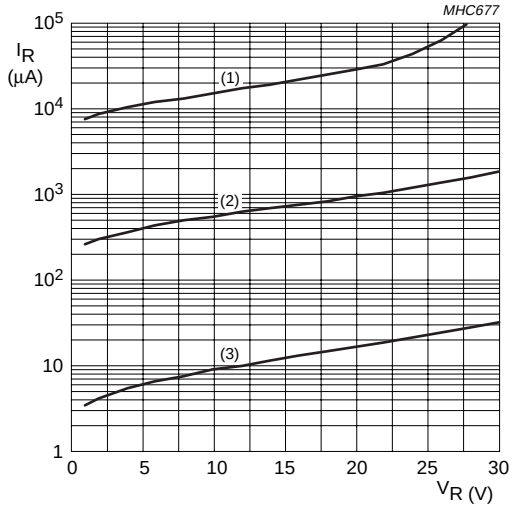
Fig.5 Diode capacitance as a function of reverse voltage; typical values.



PMEG3010BEA/PMEG3010BEV

(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

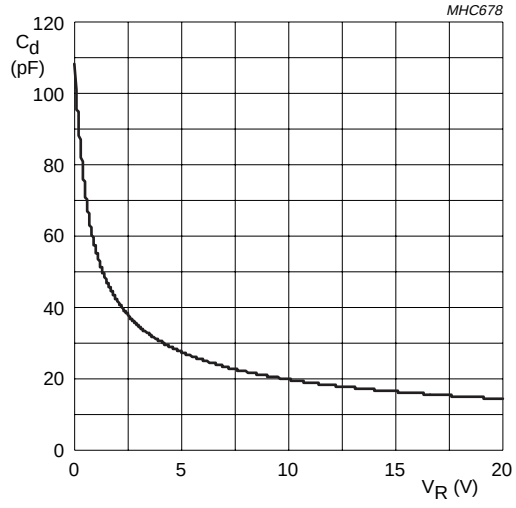
Fig.6 Forward current as a function of forward voltage; typical values.



PMEG3010BEA/PMEG3010BEV

(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

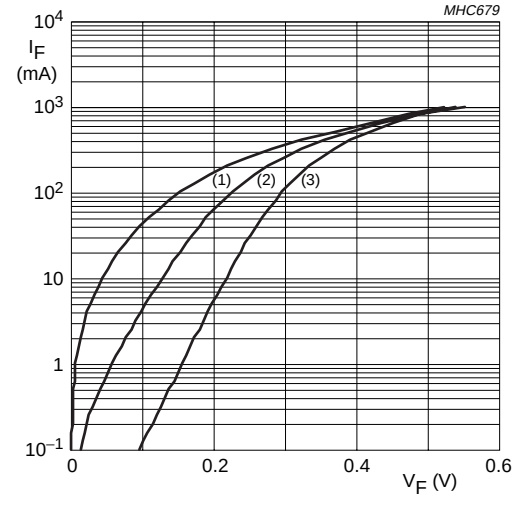
Fig.7 Reverse current as a function of reverse voltage; typical values.



PMEG3010BEA/PMEG3010BEV

T_{amb} = 25 °C; f = 1 MHz.

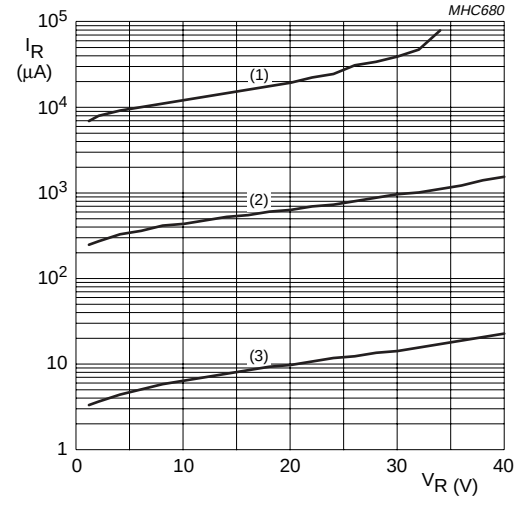
Fig.8 Diode capacitance as a function of reverse voltage; typical values.



PMEG4010BEA/PMEG4010BEV

(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

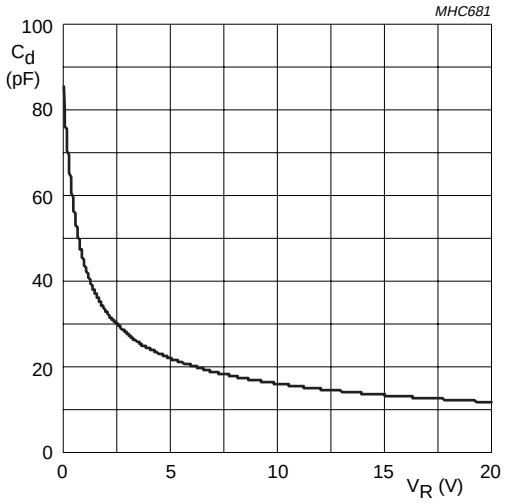
Fig.9 Forward current as a function of forward voltage; typical values.



PMEG4010BEA/PMEG4010BEV

(1) T_{amb} = 150 °C.
(2) T_{amb} = 85 °C.
(3) T_{amb} = 25 °C.

Fig.10 Reverse current as a function of reverse voltage; typical values.

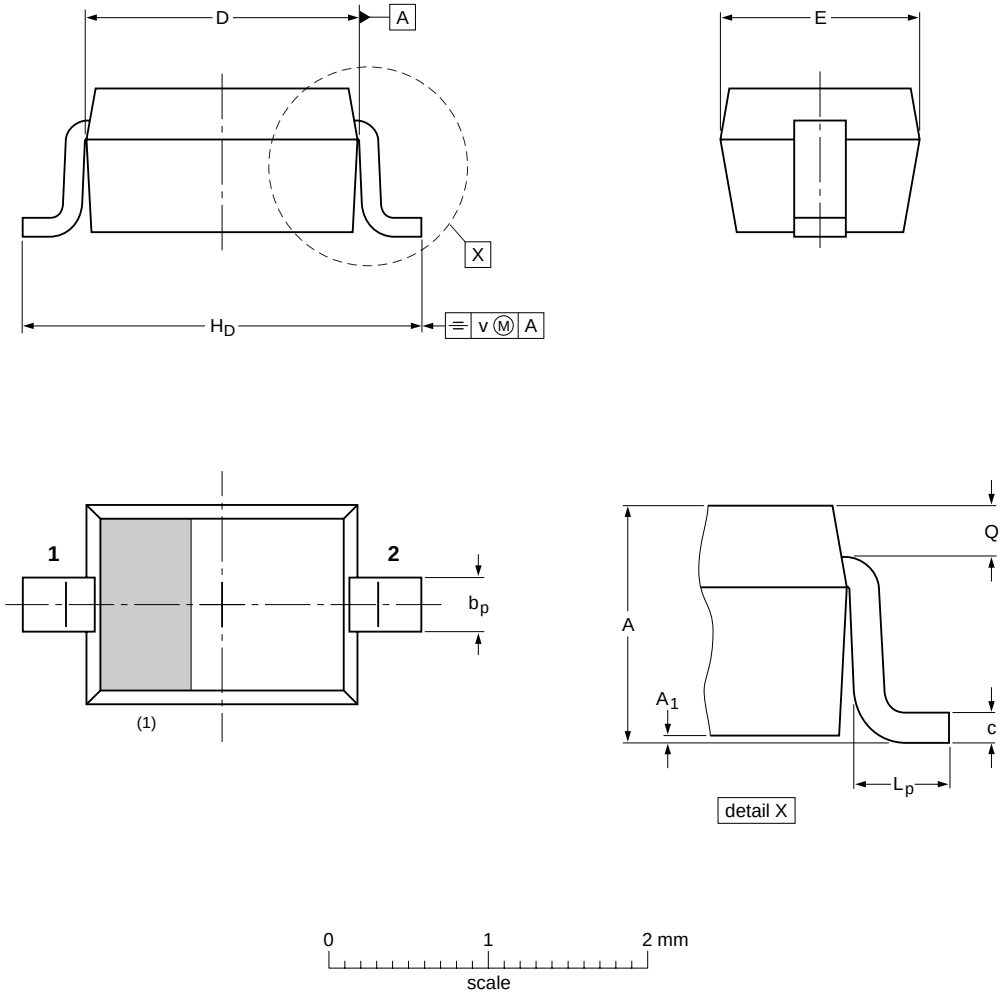


PMEG4010BEA/PMEG4010BEV
T_{amb} = 25 °C; f = 1 MHz.

Fig.11 Diode capacitance as a function of reverse voltage; typical values.

PACKAGE OUTLINES

Plastic surface mounted package; 2 leads **SOD323**



DIMENSIONS (mm are the original dimensions)

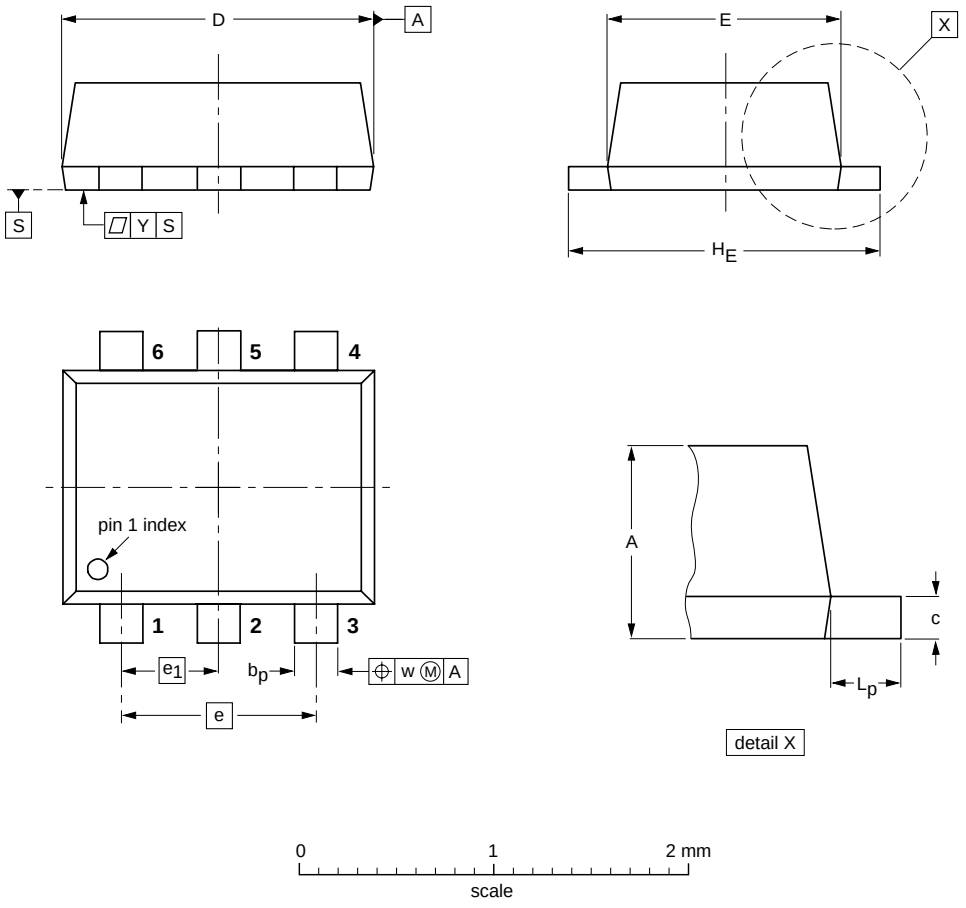
UNIT	A	A_1 max	b_p	c	D	E	H_D	L_p	Q	v
mm	1.1 0.8	0.05	0.40 0.25	0.25 0.10	1.8 1.6	1.35 1.15	2.7 2.3	0.45 0.15	0.25 0.15	0.2

Note

1. The marking bar indicates the cathode

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOD323			SC-76			~~99-09-13~~ 03-12-17

Plastic surface mounted package; 6 leads **SOT666**



DIMENSIONS (mm are the original dimensions)

UNIT	A	b_p	c	D	E	e	e_1	H_E	L_p	w	y
mm	0.6 0.5	0.27 0.17	0.18 0.08	1.7 1.5	1.3 1.1	1.0	0.5	1.7 1.5	0.3 0.1	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT666						~~01-01-04~~ 01-08-27

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS(1)	PRODUCT STATUS(2)(3)	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

Notes

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3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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