

PMEG4002EL

40 V, 0.2 A low V_F MEGA Schottky barrier rectifier in leadless ultra small SOD882 package

Rev. 01 — 17 February 2004

Product data sheet

1. Product profile

1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier diode with an integrated guard ring for stress protection encapsulated in a SOD882 leadless ultra small plastic package.

1.2 Features

- Forward current: 0.2 A
- Reverse voltage: 40 V
- Low forward voltage
- Leadless ultra small plastic package
- Power dissipation comparable to SOT23.

1.3 Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Low voltage rectification
- Blocking diodes
- Low power consumption applications.

1.4 Quick reference data

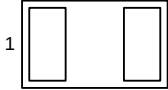
Table 1: Quick reference data

Symbol	Parameter	Value	Unit
I_F	forward current	0.2	A
V_R	reverse voltage	40	V

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2. Pinning information

Table 2: Discrete pinning

Pin	Description	Simplified outline	Symbol
1	cathode	 Bottom view	 sym001
2	anode		
		 Top view 001aaa332	

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
PMEG4002EL	-	leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.5 mm	SOD882

4. Marking

Table 4: Marking

Type number	Marking code
PMEG4002EL	F4

5. Limiting values

Table 5: Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_R	continuous reverse voltage		-	40	V
I_F	continuous forward current		-	0.2	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ ms; $\delta \leq 0.25$	-	1	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8$ ms square wave	-	3	A
T_j	junction temperature	[1]	-	150	°C
T_{amb}	operating ambient temperature	[1]	-65	+150	°C
T_{stg}	storage temperature		-65	+150	°C

- [1] For Schottky barrier diodes thermal run-away 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.

6. Thermal characteristics

Table 6: Thermal characteristics

Symbol	Parameter	Conditions	Value	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	^[1] ^[2] 500	K/W

- [1] Refer to SOD882 standard mounting conditions (footprint), FR4 with 60 μ m copper strip line.

- [2] For Schottky barrier diodes thermal run-away 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.

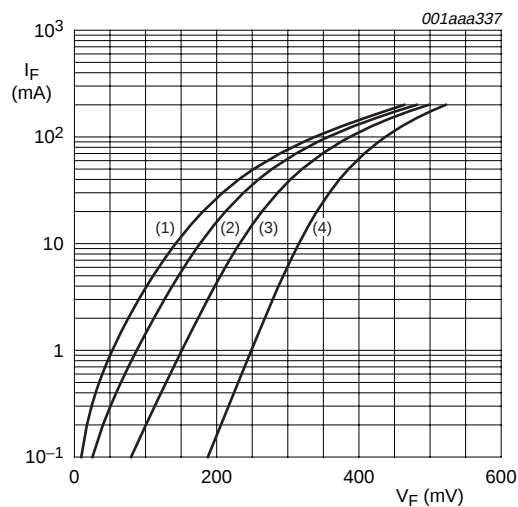
7. Characteristics

Table 7: Characteristics

$T_{amb} = 25^\circ\text{C}$ unless otherwise specified.

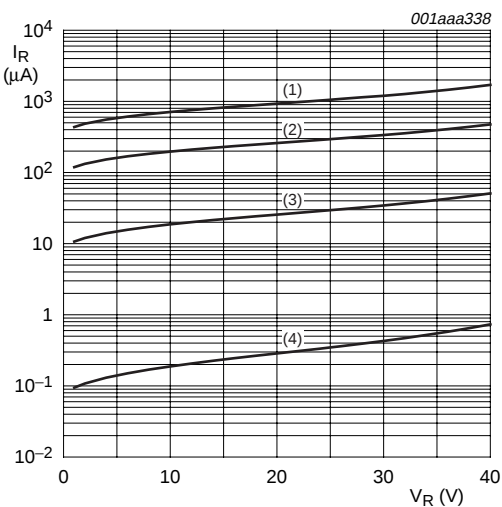
Symbol	Parameter	Conditions	Typ	Max	Unit
V_F	continuous forward voltage	see Figure 1			
		$I_F = 0.1\text{ mA}$	190	220	mV
		$I_F = 1\text{ mA}$	250	290	mV
		$I_F = 10\text{ mA}$	320	360	mV
		$I_F = 100\text{ mA}$	440	500	mV
		$I_F = 200\text{ mA}$	520	600	mV
I_R	continuous reverse current	see Figure 2	^[1]		
		$V_R = 25\text{ V}$	0.3	0.5	μA
		$V_R = 40\text{ V}$	0.7	10	μA
C_d	diode capacitance	$V_R = 1\text{ V}$; $f = 1\text{ MHz}$; see Figure 3	14	20	pF

- [1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.



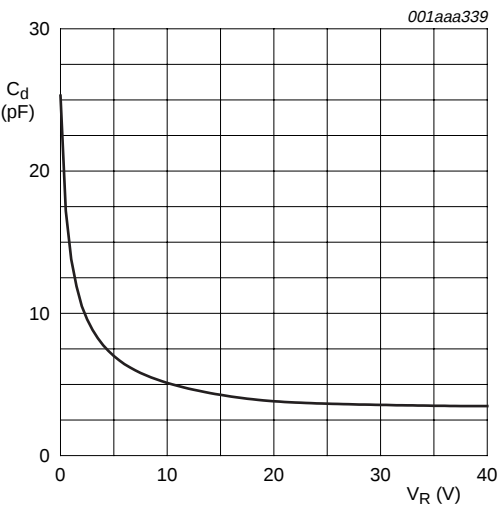
- (1) $T_j = 150\text{ °C}$.
- (2) $T_j = 125\text{ °C}$.
- (3) $T_j = 85\text{ °C}$.
- (4) $T_j = 25\text{ °C}$.

Fig 1. Forward current as a function of forward voltage; typical values.



- (1) $T_j = 150\text{ °C}$.
- (2) $T_j = 125\text{ °C}$.
- (3) $T_j = 85\text{ °C}$.
- (4) $T_j = 25\text{ °C}$.

Fig 2. Reverse current as a function of reverse voltage; typical values.



$f = 1\text{ MHz}$; $T_{amb} = 25\text{ °C}$.

Fig 3. Diode capacitance as a function of reverse voltage; typical values.

8. Package outline

Leadless ultra small plastic package; 2 terminals; body 1.0 x 0.6 x 0.5 mm

SOD882

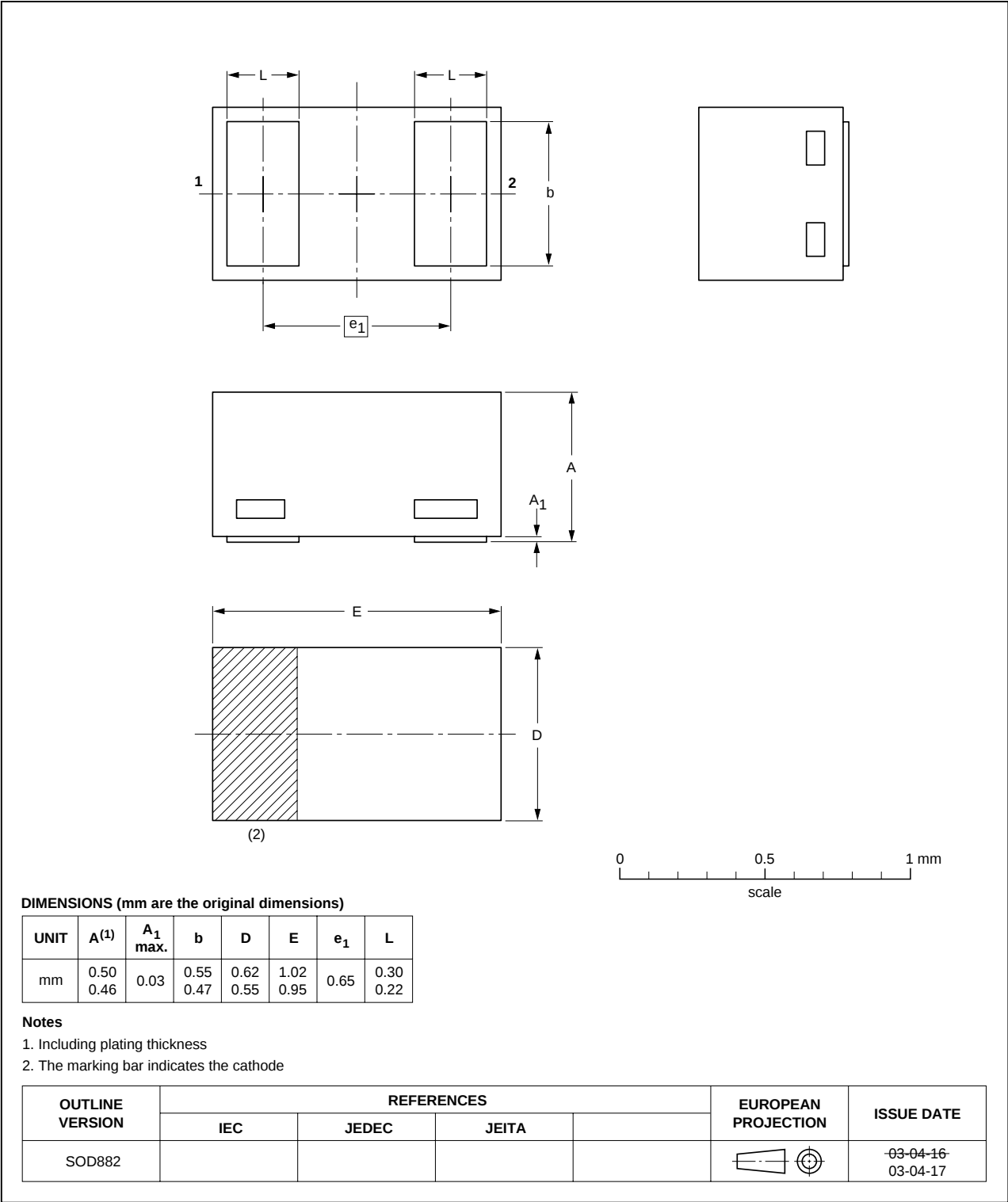


Fig 4. Package outline.

9. Revision history

Table 8: Revision history

Document ID	Release date	Data sheet status	Change notice	Order number	Supersedes
PMEG4002EL_1	20040217	Product data	-	9397 750 12467	-

10. 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.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
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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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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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