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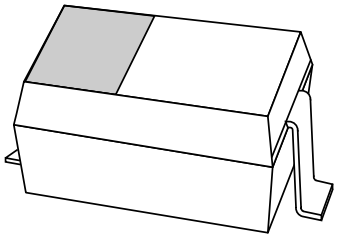
Team Nexperia

# DATA SHEET



# PMEG2005AEA; PMEG3005AEA; PMEG4005AEA

## Very low $V_F$ MEGA Schottky barrier rectifiers

Product data sheet

2003 Aug 20

# Very low $V_F$ MEGA Schottky barrier rectifiers

# PMEG2005AEA; PMEG3005AEA; PMEG4005AEA

## FEATURES

- Very low forward voltage
- High surge current
- Very small plastic SMD package.

## APPLICATIONS

- Low voltage rectification
- High efficiency DC/DC conversion
- Voltage clamping
- Inverse polarity protection
- Low power consumption applications.

## DESCRIPTION

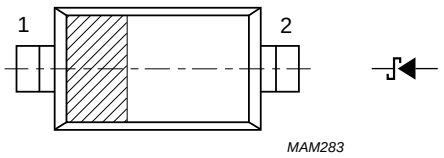
Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD323 (SC-76) very small SMD plastic package.

## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | MAX. | UNIT |
|---|---|---|---|
| $I_F$ | forward current | 0.5 | A |
| $V_R$ | reverse voltage | | |
| | PMEG2005AEA | 20 | V |
| | PMEG3005AEA | 30 | V |
| | PMEG4005AEA | 40 | V |

## PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | cathode |
| 2 | anode |




The marking bar indicates the cathode.

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

## MARKING

| TYPE NUMBER | MARKING CODE |
|---|---|
| PMEG2005AEA | E5 |
| PMEG3005AEA | E4 |
| PMEG4005AEA | E3 |

## RELATED PRODUCTS

| TYPE NUMBER | DESCRIPTION | FEATURE |
|---|---|---|
| PMEGxx05AEV | 0.5 A; 20/30/40 V very low $V_F$ MEGA Schottky rectifier | SOT666 package |
| PMEG2005EB | 0.5 A; 20 V very low $V_F$ MEGA Schottky rectifier | smaller SOD523 (SC-79) package |
| PMEG2010EA | 1 A; 20 V very low $V_F$ MEGA Schottky rectifier | higher forward current |

## LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_R$ | continuous reverse voltage | | | | |
| | PMEG2005AEA | | – | 20 | V |
| | PMEG3005AEA | | – | 30 | V |
| | PMEG4005AEA | | – | 40 | V |
| $I_F$ | continuous forward current | note 1 | – | 0.5 | A |
| $I_{FRM}$ | repetitive peak forward current | $t_p \leq 1$ ms; $\delta \leq 0.5$ | – | 3.5 | A |
| $I_{FSM}$ | non-repetitive peak forward current | $t_p = 8$ ms; square wave | – | 10 | A |
| $T_j$ | junction temperature | note 2 | – | 150 | °C |
| $T_{amb}$ | operating ambient temperature | note 2 | −65 | +150 | °C |
| $T_{stg}$ | storage temperature | | −65 | +150 | °C |

**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 determination of the reverse power losses $P_R$ and $I_{F(AV)}$ rating will be available on request.

## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j\text{-}a}$ | 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 |
| $R_{th\ j\text{-}s}$ | thermal resistance from junction to soldering point | note 4 | 90 | 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 determination of 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.

## ELECTRICAL CHARACTERISTICS

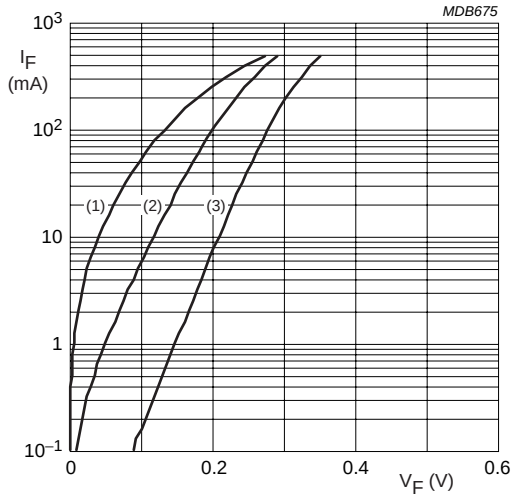
$T_{amb}$ = 25 °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | PMEG2005AEA | | PMEG3005AEA | | PMEG4005AEA | | 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 |
| $I_R$ | 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; $\delta \leq 0.02$.

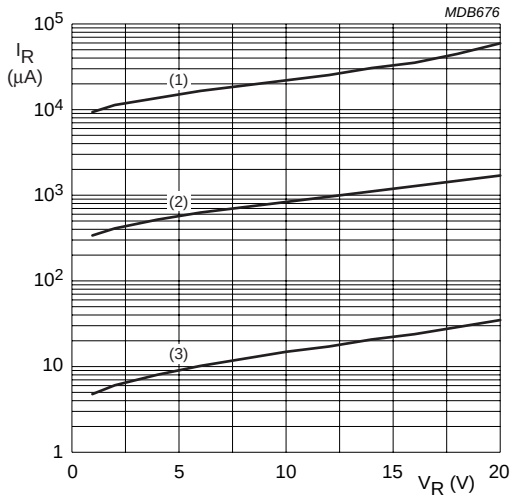
## GRAPHICAL DATA




**PMEG2005AEA**

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

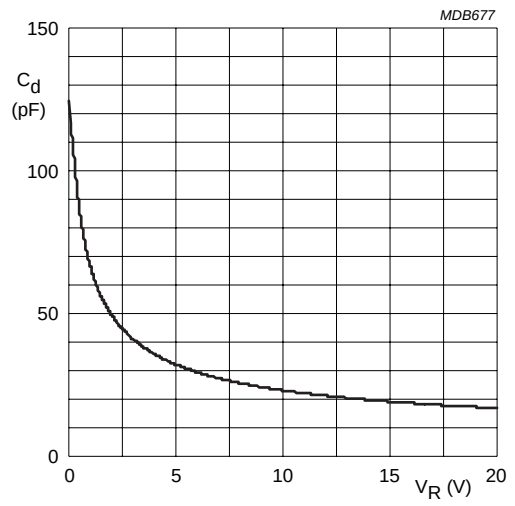
Fig.2 Forward current as a function of forward voltage; typical values.




**PMEG2005AEA**

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

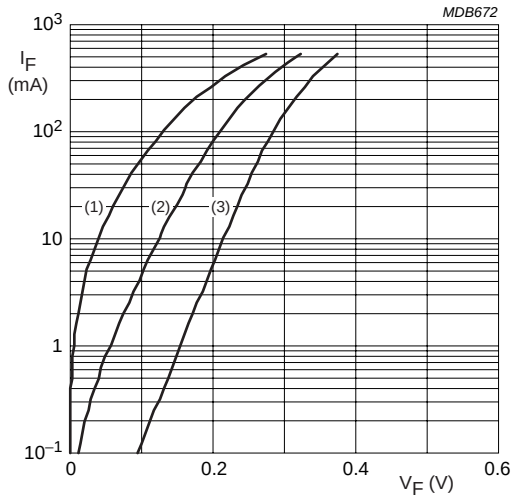
Fig.3 Reverse current as a function of reverse voltage; typical values.




**PMEG2005AEA**

f = 1 MHz; $T_{amb}$ = 25 °C.

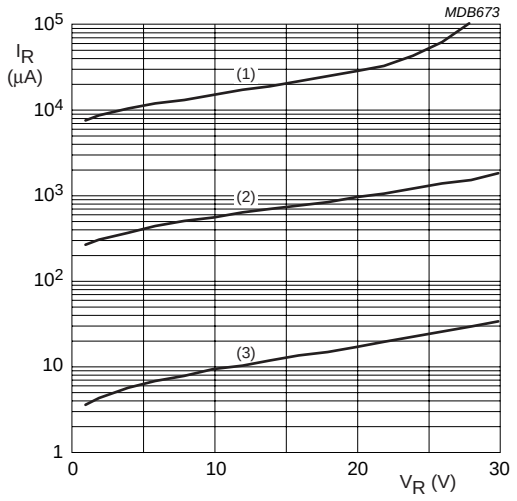
Fig.4 Diode capacitance as a function of reverse voltage; typical values.




**PMEG3005AEA**

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

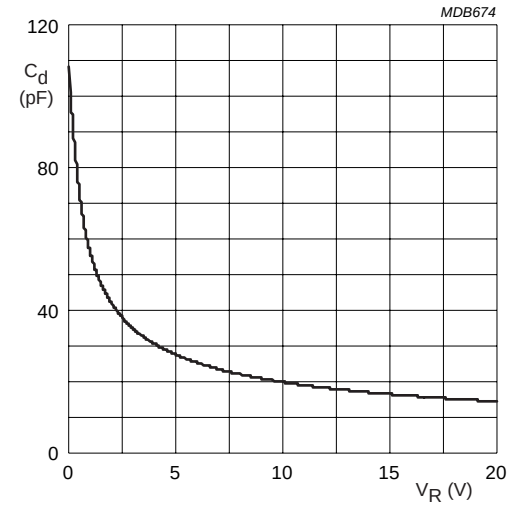
Fig.5 Forward current as a function of forward voltage; typical values.




**PMEG3005AEA**

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

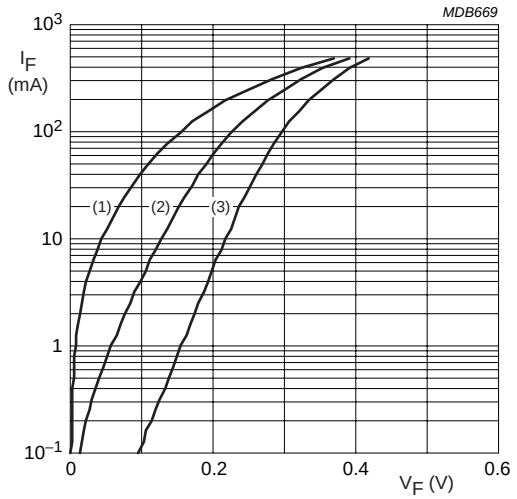
Fig.6 Reverse current as a function of reverse voltage; typical values.




**PMEG3005AEA**

f = 1 MHz; $T_{amb}$ = 25 °C.

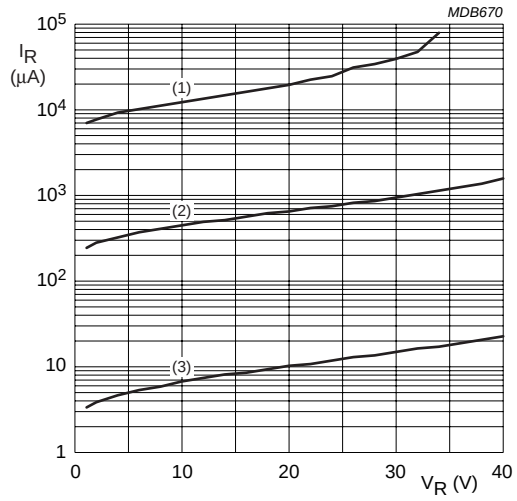
Fig.7 Diode capacitance as a function of reverse voltage; typical values.




**PMEG4005AEA**

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

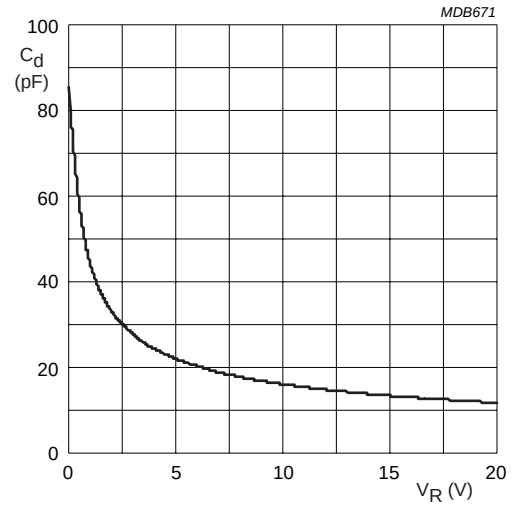
Fig.8 Forward current as a function of forward voltage; typical values.




**PMEG4005AEA**

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

Fig.9 Reverse current as a function of reverse voltage; typical values.



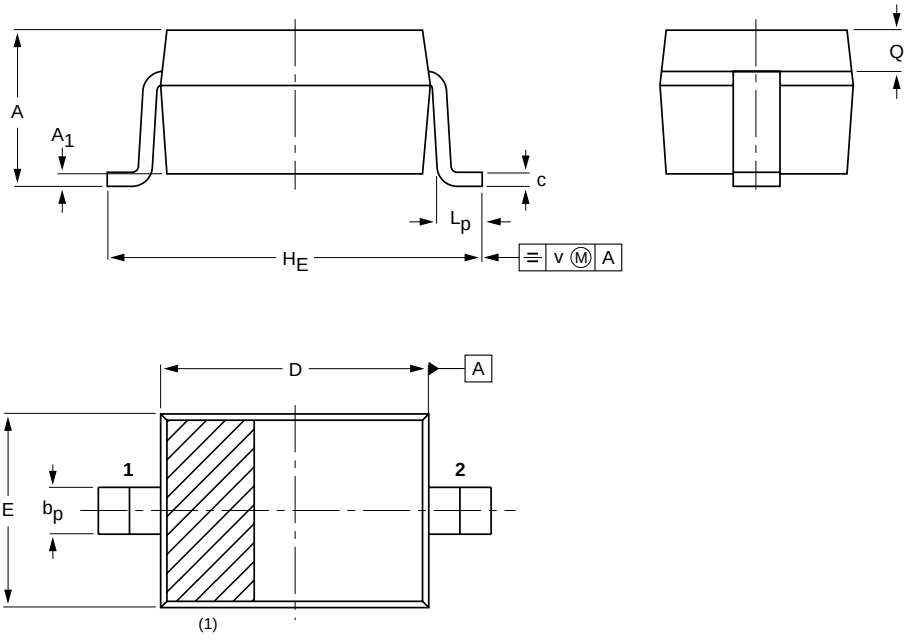

**PMEG4005AEA**

f = 1 MHz; $T_{amb}$ = 25 °C.

Fig.10 Diode capacitance as a function of reverse voltage; typical values.

## PACKAGE OUTLINE

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




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $A_1$ max. | $b_p$ | c | D | E | $H_E$ | $L_p$ | Q | v |
|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1<br>0.8 | + 0.05<br>– 0.05 | 0.40<br>0.25 | 0.25<br>0.10 | 1.8<br>1.6 | 1.35<br>1.15 | 2.7<br>2.3 | 0.45<br>0.15 | 0.25<br>0.15 | 0.2 |

**Note**

1. The marking bar indicates the cathode.

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOD323 | | | SC-76 | | | ~~98-09-14~~<br>99-09-13 |

**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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