

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

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

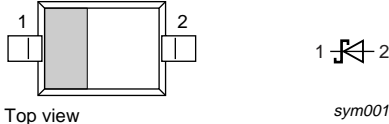
| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PMEG2010BEA | V1 |
| PMEG3010BEA | V2 |
| PMEG4010BEA | V3 |
| PMEG2010BEV | G6 |
| PMEG3010BEV | G5 |
| PMEG4010BEV | G4 |

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 |

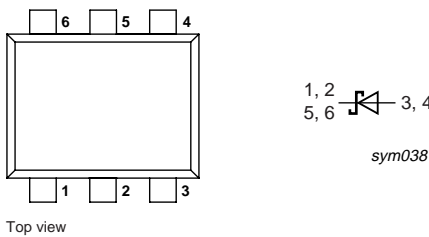


Top view

sym001

The marking bar indicates the cathode.

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



Top view

sym038

Fig.2 Simplified outline (SOT666) and symbol.

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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 | $T_s \leq 55^\circ\text{C}$; note 1 | – | 1 | A |
| I_{FRM} | repetitive peak forward current | $t_p \leq 1\text{ ms}$; $\delta \leq 0.5$; note 2 | – | 3.5 | A |
| I_{FSM} | non-repetitive peak forward current | $t_p = 8\text{ ms}$; square wave; note 2 | – | 10 | A |
| T_j | junction temperature | note 3 | – | 150 | $^\circ\text{C}$ |
| T_{amb} | operating ambient temperature | note 3 | –65 | +150 | $^\circ\text{C}$ |
| T_{stg} | storage temperature | | –65 | +150 | $^\circ\text{C}$ |

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.

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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

$T_{amb} = 25^\circ\text{C}$ 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 |

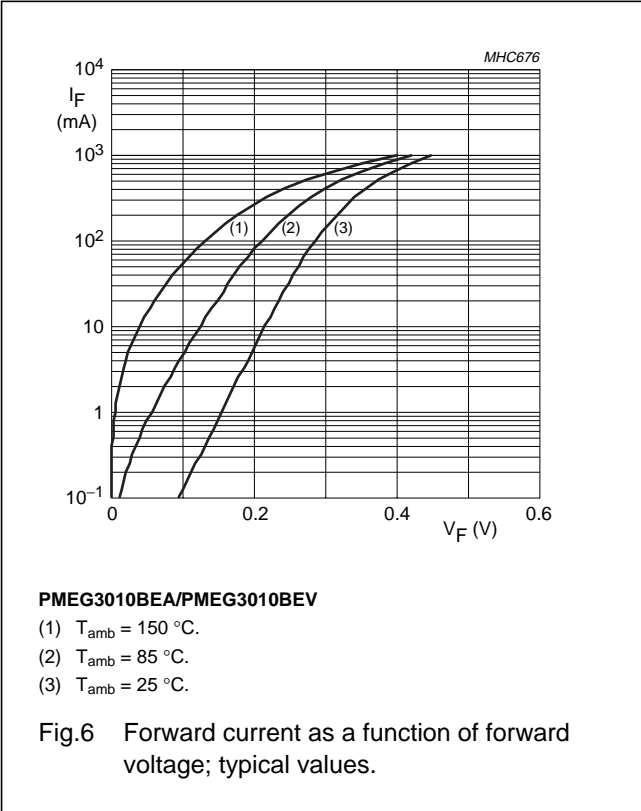
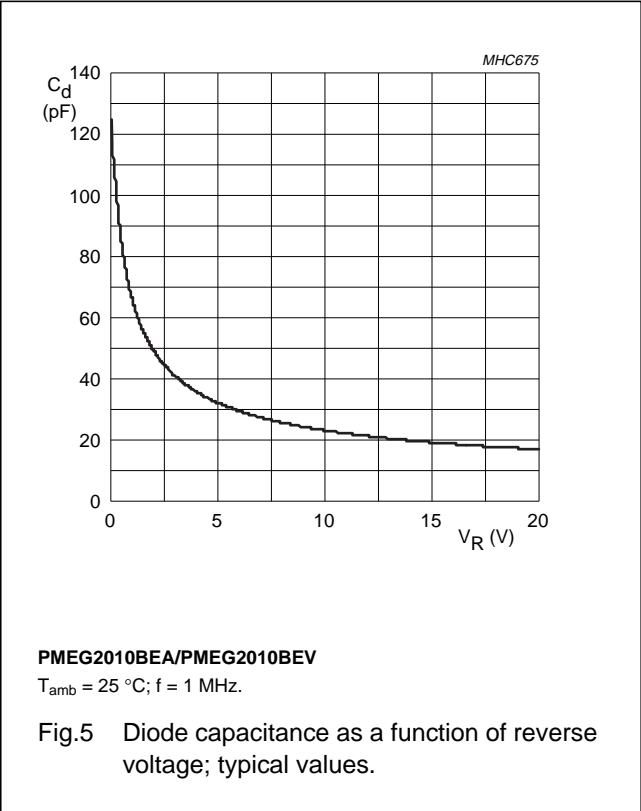
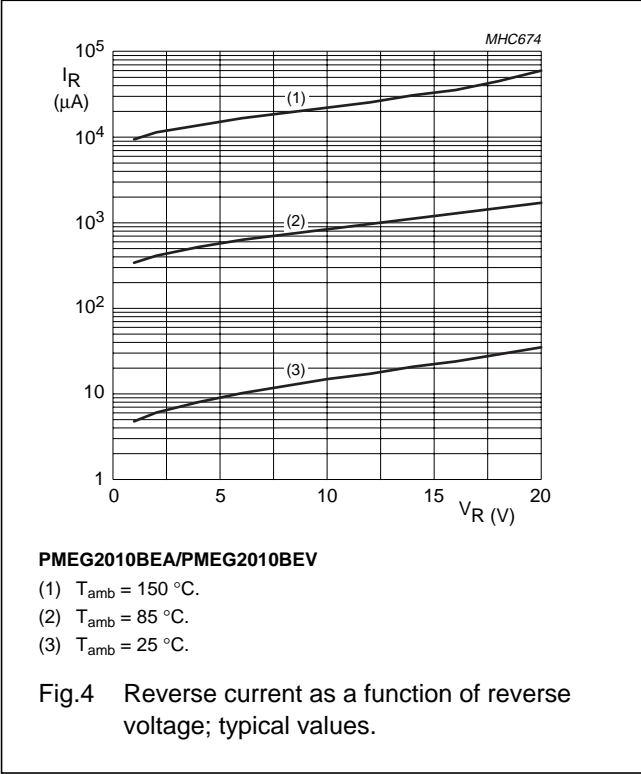
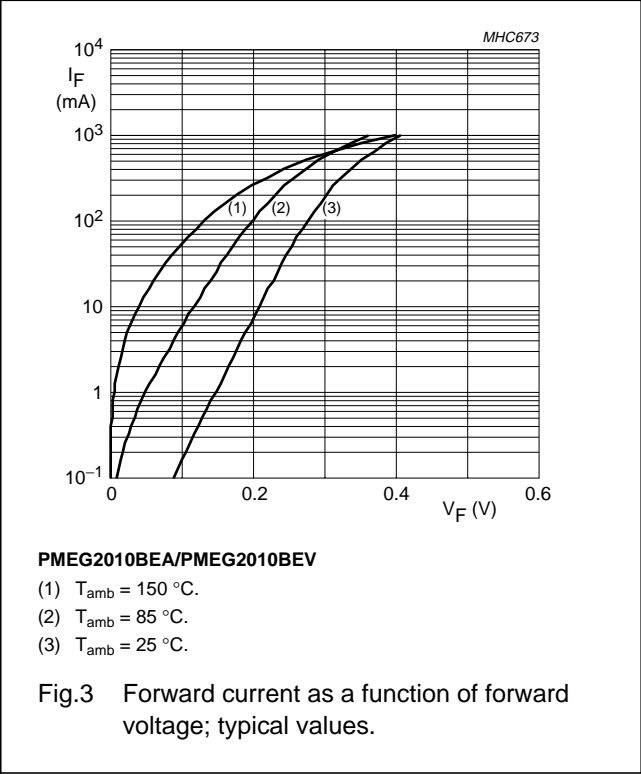
Note

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

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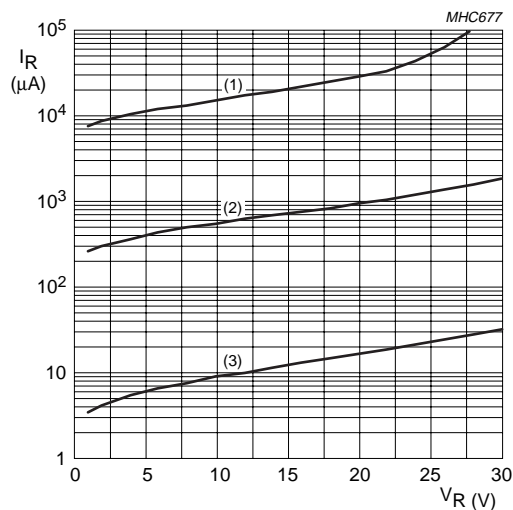
PMEGXX10BEA;
PMEGXX10BEV

GRAPHICAL DATA



1 A very low V_F MEGA Schottky barrier rectifier

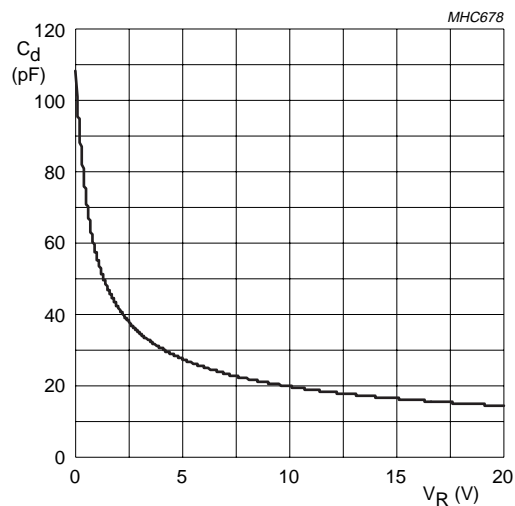
PMEGXX10BEA; PMEGXX10BEV



PMEG3010BEA/PMEG3010BEV

- (1) $T_{amb} = 150^\circ C$.
(2) $T_{amb} = 85^\circ C$.
(3) $T_{amb} = 25^\circ C$.

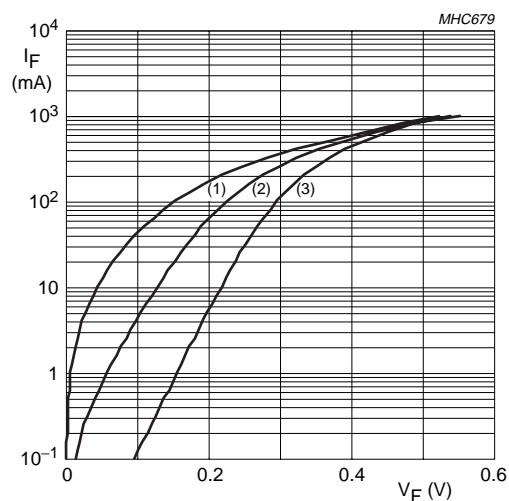
Fig.7 Reverse current as a function of reverse voltage; typical values.



PMEG3010BEA/PMEG3010BEV

$T_{amb} = 25^\circ C$; $f = 1$ MHz.

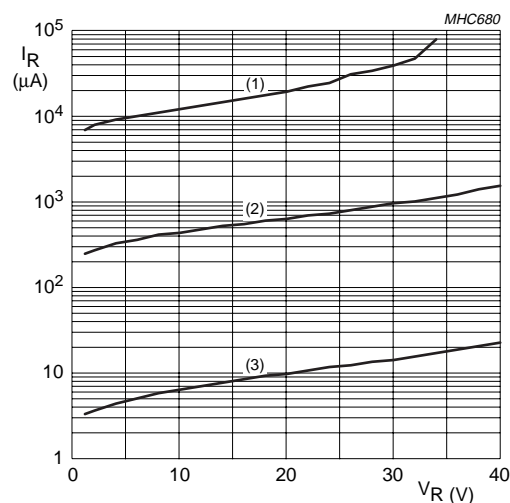
Fig.8 Diode capacitance as a function of reverse voltage; typical values.



PMEG4010BEA/PMEG4010BEV

- (1) $T_{amb} = 150^\circ C$.
(2) $T_{amb} = 85^\circ C$.
(3) $T_{amb} = 25^\circ C$.

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



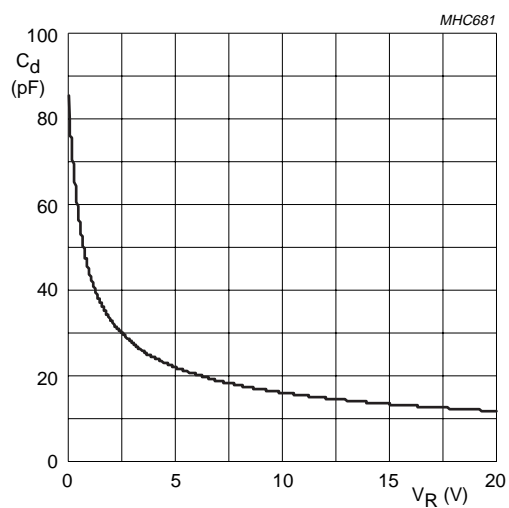
PMEG4010BEA/PMEG4010BEV

- (1) $T_{amb} = 150^\circ C$.
(2) $T_{amb} = 85^\circ C$.
(3) $T_{amb} = 25^\circ C$.

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

1 A very low V_F MEGA Schottky barrier rectifier

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PMEG4010BEA/PMEG4010BEV

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

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

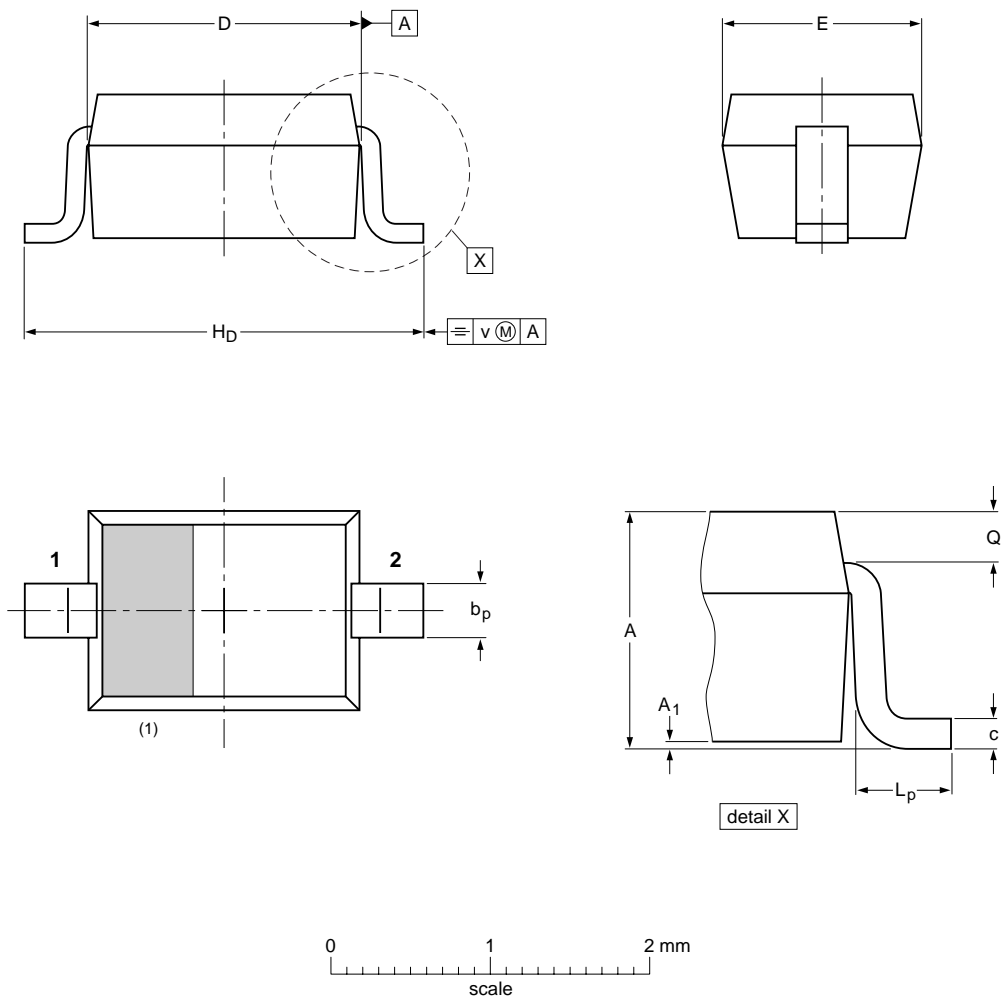
1 A very low V_F MEGA Schottky
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PMEGXX10BEV

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

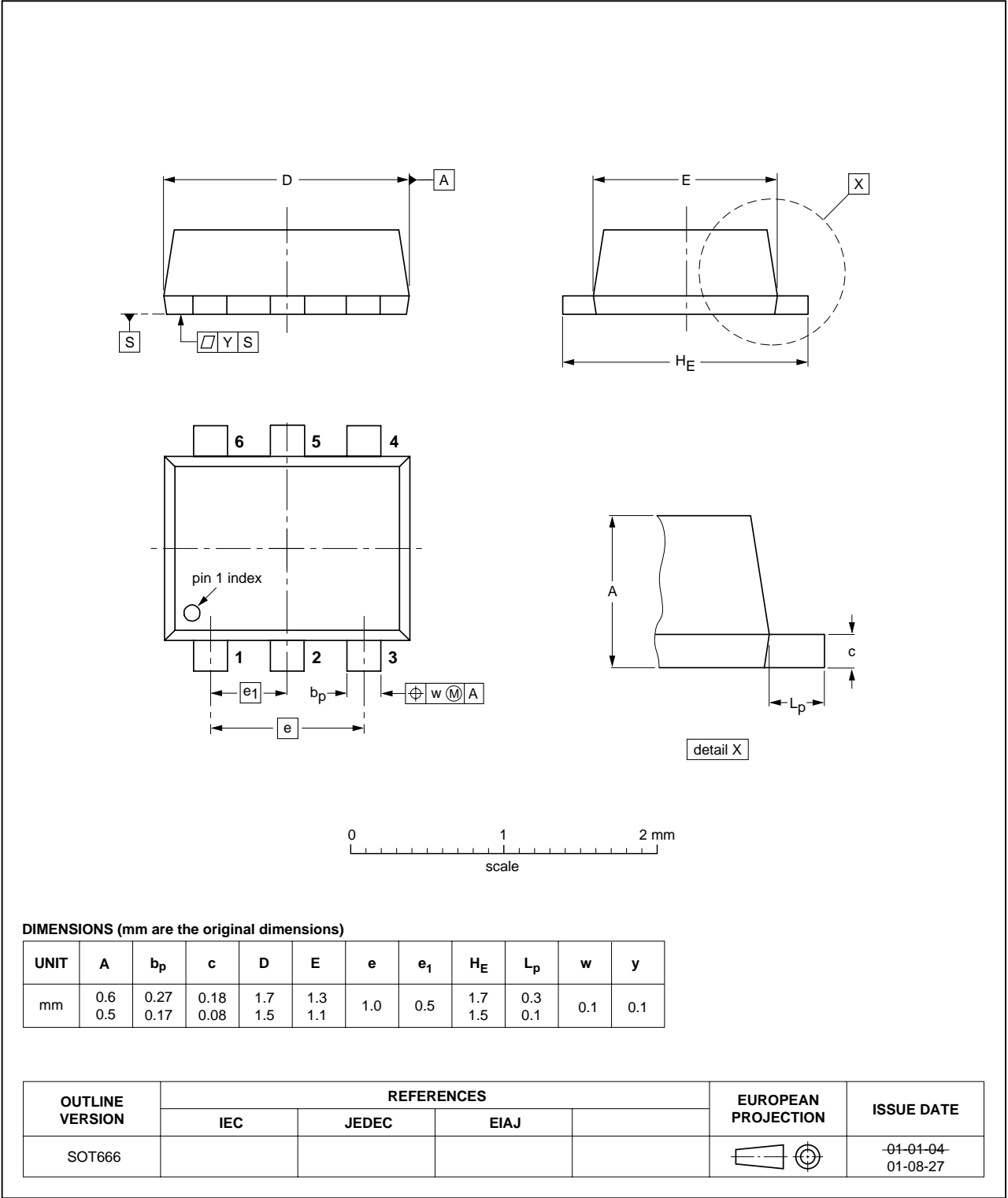
| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|-------|--|------------------------|-----------------------|
| | IEC | JEDEC | JEITA | | | |
| SOD323 | | | SC-76 | | | -99-09-13 03-12-17 |

1 A very low V_F MEGA Schottky
barrier rectifier

PMEGXX10BEA;
PMEGXX10BEV

Plastic surface mounted package; 6 leads

SOT666



1 A very low V_F MEGA Schottky barrier rectifier

PMEGXX10BEA;
PMEGXX10BEV

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Printed in The Netherlands

R76/04/pp11

Date of release: 2004 Jun 14

Document order number: 9397 750 13234

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