PMEG4010BEV

1 A very low VF MEGA Schottky barrier rectifier

2 September 2020 Product data sheet

1. General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in an ultra small SOT666 Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Forward current: ≤ 1 A
- Reverse voltage: ≤ 40 V
- Very low forward voltage
- Ultra small plastic SMD package
- AEC-Q101 qualified

3. Applications

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

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	T_{sp} ≤ 55 °C	[1]	-	-	1	A
V_R	reverse voltage	T_j = 25 °C		-	-	40	V

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

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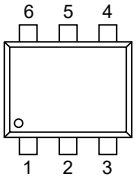
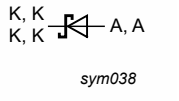
5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 SOT666	
2	K	cathode		
3	A	anode		
4	A	anode		
5	K	cathode		
6	K	cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG4010BEV	SOT666	plastic, surface-mounted package; 6 leads; 0.5 mm pitch; 1.6 mm x 1.2 mm x 0.55 mm body	SOT666

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG4010BEV	G4

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_R	reverse voltage	T_j = 25 °C		-	40	V
I_F	forward current	$T_{sp} \leq$ 55 °C	[1]	-	1	A
I_{FRM}	repetitive peak forward current	$t_p \leq$ 1 ms; $\delta \leq$ 0.5	[2]	-	3.5	A
I_{FSM}	non-repetitive peak forward current	t_p = 8 ms; square wave	[2]	-	10	A
T_j	junction temperature		[3]	-	150	°C
T_{amb}	ambient temperature		[3]	-65	150	°C
T_{stg}	storage temperature			-65	150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
[2] Only valid if pins 3 and 4 are connected in parallel.
[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.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	405	K/W
			[1] [3]	-	-	215	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]	-	-	80	K/W

[1] 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.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
[3] Only valid if pins 3 and 4 are connected in parallel.
[4] Soldering point of cathode tab.

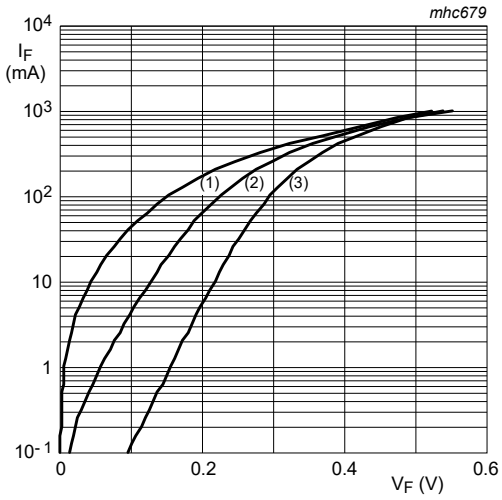
10. Characteristics

Table 7. Characteristics

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

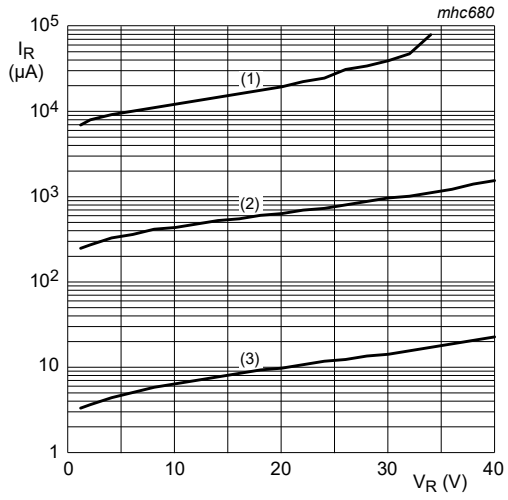
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 0.1 mA	[1]	-	95	130	mV
		I_F = 1 mA	[1]	-	155	210	mV
		I_F = 10 mA	[1]	-	220	270	mV
		I_F = 100 mA	[1]	-	295	350	mV
		I_F = 500 mA	[1]	-	420	470	mV
		I_F = 1000 mA	[1]	-	540	640	mV
I_R	reverse current	V_R = 10 V	[1]	-	7	20	µA
		V_R = 40 V	[1]	-	30	100	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz		-	43	50	pF

[1] Pulsed test: $t_p \leq 300$ µs; $\delta \leq 0.02$



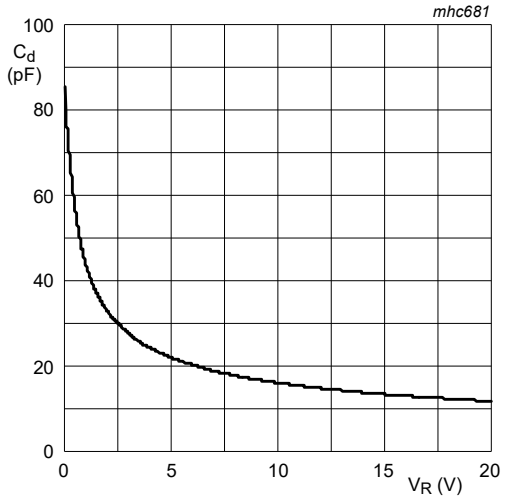
Pulsed condition
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C

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



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

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



T_{amb} = 25 °C; f = 1 MHz

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

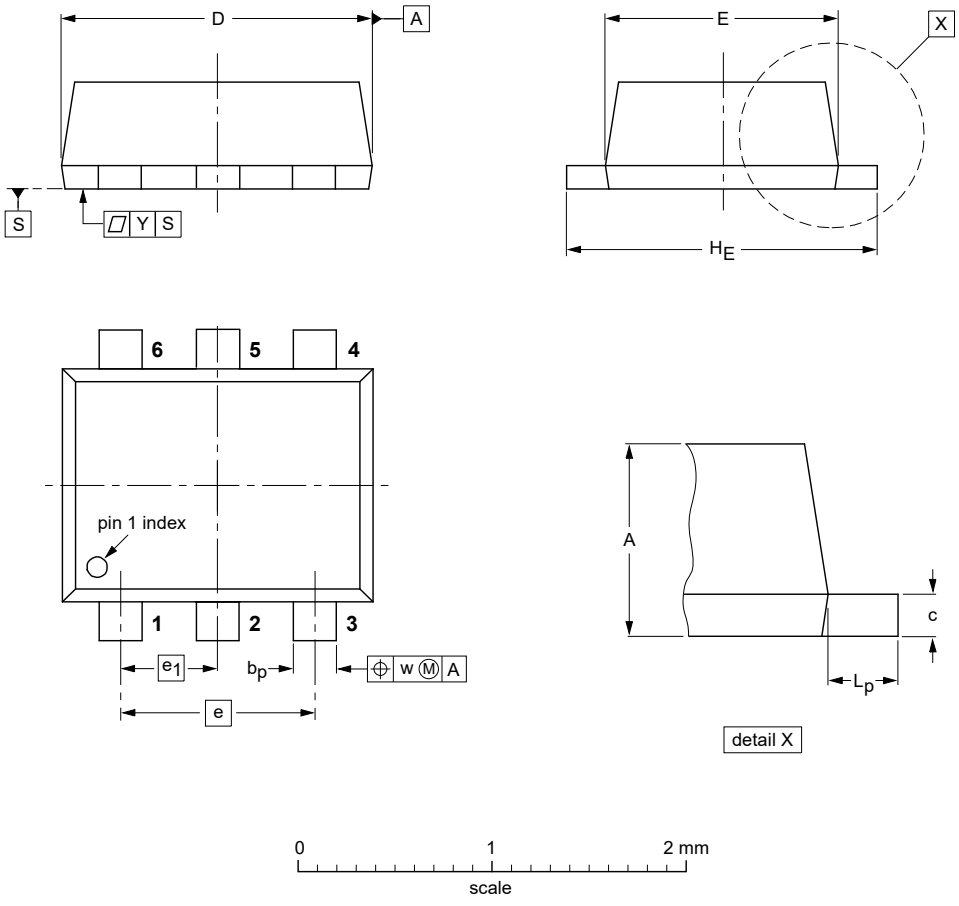
11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

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	JEITA			
SOT666						~~04-11-08~~ 06-03-16

Fig. 4. Package outline SOT666

13. Soldering

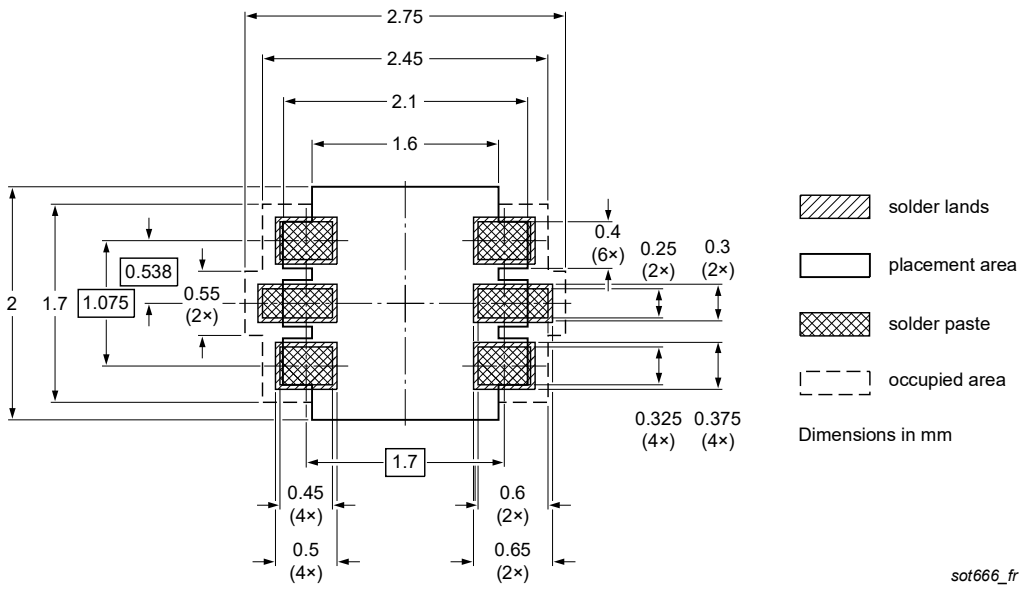


Fig. 5. Reflow soldering footprint for SOT666

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4010BEV v.3	20200902	Product data sheet	-	PMEGXX10BEA_ PMEGXX10BEV v.2
Modifications:	• Family data sheet reduced to single type data sheet. • The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate.			
PMEGXX10BEA_ PMEGXX10BEV v.2	200406142	Product data sheet	-	PMEGXX10BEA_ PMEGXX10BEV v.1
PMEGXX10BEA_ PMEGXX10BEV v.1	20040402	Product data sheet	-	-

15. Legal information

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.

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
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