Product data sheet

1. General description

Planar Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD123W small and flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Average forward current: I_{F(AV)} ≤ 3 A
- Reverse voltage: V_R ≤ 40 V
- Low forward voltage
- High power capability due to clip-bond technology
- Small and flat lead SMD plastic package

3. Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- · Reverse polarity protection
- Low power consumption applications

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
I _{F(AV)}	average forward current	δ = 0.5; f = 20 kHz; square wave; T _{sp} \leq 130 °C	-	-	3	Α
V _R	reverse voltage	T _j = 25 °C	-	-	40	V
V _F	forward voltage	I _F = 3 A; T _j = 25 °C	-	460	540	mV
I _R	reverse current	V _R = 40 V; T _j = 25 °C	-	25	100	μΑ

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]	1 2	К - [€]- А
2	А	anode	CFP3 (SOD123W)	sym001

[1] The marking bar indicates the cathode.



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6. Ordering information

Table 3. Ordering information

Type number	Package							
	Name	Description	Version					
PMEG4030ER	CFP3	plastic, surface mounted package; 2 terminals; 2.6 mm x 1.7 mm x 1 mm body	SOD123W					

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG4030ER	BF

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(AV)}	average forward current	δ = 0.5; f = 20 kHz; square wave; $T_{amb} \le$ 40 °C	[1]	-	3	А
		δ = 0.5; f = 20 kHz; square wave; T _{sp} ≤ 130 °C		-	3	А
FSM	non-repetitive peak forward current	t_p = 8.3 ms; half sine wave; $T_{j(init)}$ = 25 °C		-	50	А
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[2]	-	0.57	W
			[3]	-	0.95	W
			[1]	-	1.8	W
Γ _j	junction temperature			-	150	°C
Γ _{amb}	ambient temperature			-55	150	°C
T _{stg}	storage temperature			-65	150	°C

- Device mounted on a ceramic PCB, Al_2O_3 , standard footprint. Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint. Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

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9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
R _{th(j-a)}	thermal resistance from	1	[1] [2]	-	-	220	K/W
	junction to ambient		[1] [3]	-	-	130	K/W
			[1] [4]	-	-	70	K/W
R _{th(j-sp)}	thermal resistance from junction to solder point		[5]	-	-	18	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] Device mountted on an FR4 PCB, single-sided copper, tin-plated, mouting pad for cathode 1 cm².
- [4] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.
- [5] Soldering point of cathode tab.

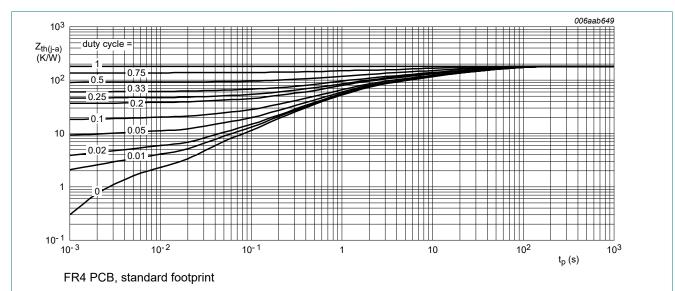


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

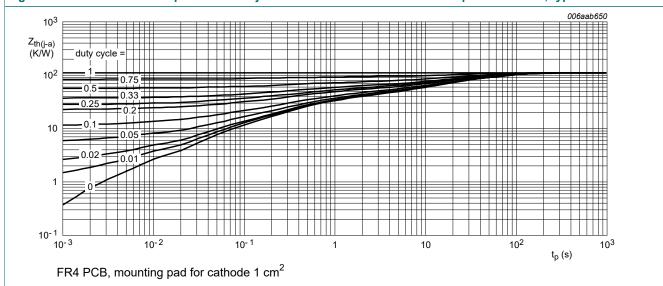
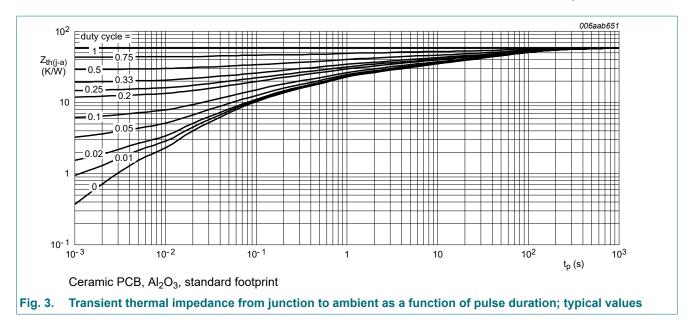


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

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10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V _F	forward voltage	I _F = 0.1 A; T _j = 25 °C	-	295	330	mV
		I _F = 1 A; T _j = 25 °C	-	380	440	mV
		I _F = 3 A; T _j = 25 °C	-	460	540	mV
I _R	reverse current	V _R = 10 V; T _j = 25 °C	-	5	-	μA
		$V_R = 40 \text{ V}; T_j = 25 \text{ °C}$	-	25	100	μΑ
C _d	diode capacitance	$V_R = 1 \text{ V; } f = 1 \text{ MHz; } T_j = 25 ^{\circ}\text{C}$	-	250	-	pF
		$V_R = 10 \text{ V; } f = 1 \text{ MHz; } T_j = 25 \text{ °C}$	-	95	-	pF

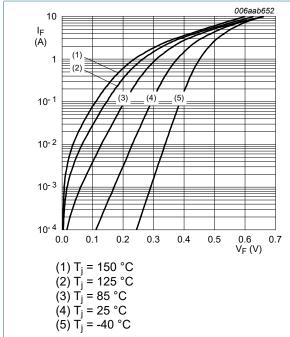


Fig. 4. Forward current as a function of forward voltage; typical values

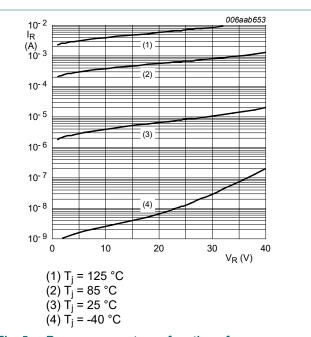


Fig. 5. Reverse current as a function of reverse voltage; typical values

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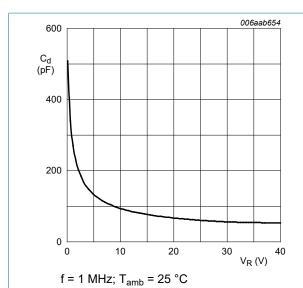
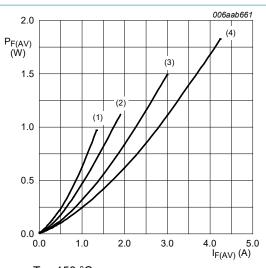
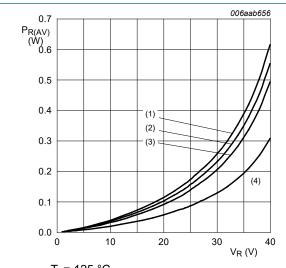


Fig. 6. Diode capacitance as a function of reverse voltage; typical values



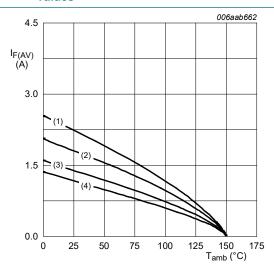
 $T_j = 150 \,^{\circ}\text{C}$ (1) $\delta = 0.1$ (2) $\delta = 0.2$ (3) $\delta = 0.5$ (4) $\delta = 1$

Fig. 7. Average forward power dissipation as a function of average forward current; typical values



 $T_j = 125 \,^{\circ}\text{C}$ (1) $\delta = 1$ (2) $\delta = 0.9$ (3) $\delta = 0.8$ (4) $\delta = 0.5$

Fig. 8. Average reverse power dissipation as a function of reverse voltage; typical values



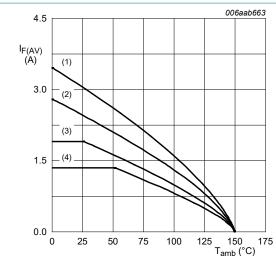
FR4 PCB, standard footprint $T_j = 150 \,^{\circ}\text{C}$ (1) $\delta = 1$; DC

(2) $\delta = 0.5$; f = 20 kHz(3) $\delta = 0.2$; f = 20 kHz

(4) $\delta = 0.1$; f = 20 kHz

Fig. 9. Average forward current as a function of ambient temperature; typical values

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FR4 PCB, mounting pad for cathode 1 cm²

 $T_i = 150 \, ^{\circ}C$

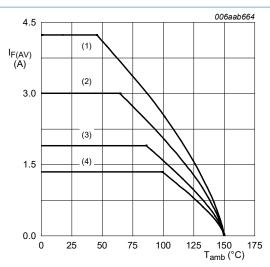
 $(1) \delta = 1; DC$

(2) $\delta = 0.5$; f = 20 kHz

(3) $\delta = 0.2$; f = 20 kHz

(4) $\delta = 0.1$; f = 20 kHz

Fig. 10. Average forward current as a function of ambient temperature; typical values



Ceramic PCB, Al₂O₃, standard footprint

 $T_i = 150 \, ^{\circ}C$

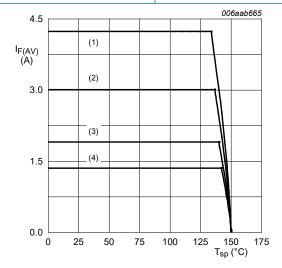
(1) $\delta = 1$; DC

(2) $\delta = 0.5$; f = 20 kHz

(3) $\delta = 0.2$; f = 20 kHz

(4) $\delta = 0.1$; f = 20 kHz

Fig. 11. Average forward current as a function of ambient temperature; typical values



T_i = 150 °C

 $(1) \delta = 1; DC$

(2) $\delta = 0.5$; f = 20 kHz

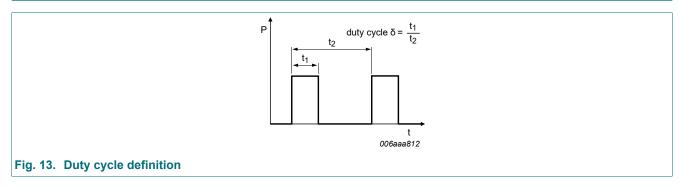
(3) $\delta = 0.2$; f = 20 kHz

(4) $\delta = 0.1$; f = 20 kHz

Fig. 12. Average forward current as a function of solder point temperature; typical values

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11. Test information



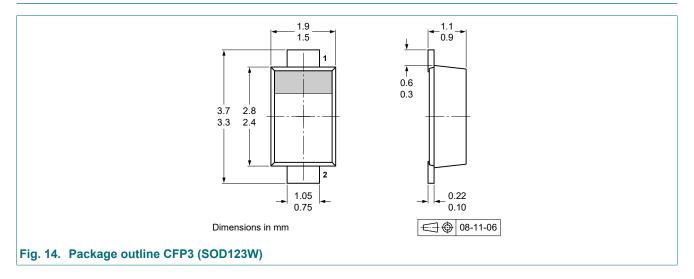
The current ratings for the typical waveforms are calculated according to the equations:

 $I_{F(AV)} = I_M \times \delta$ with I_M defined as peak current

 $I_{RMS}=I_{F(AV)}$ at DC

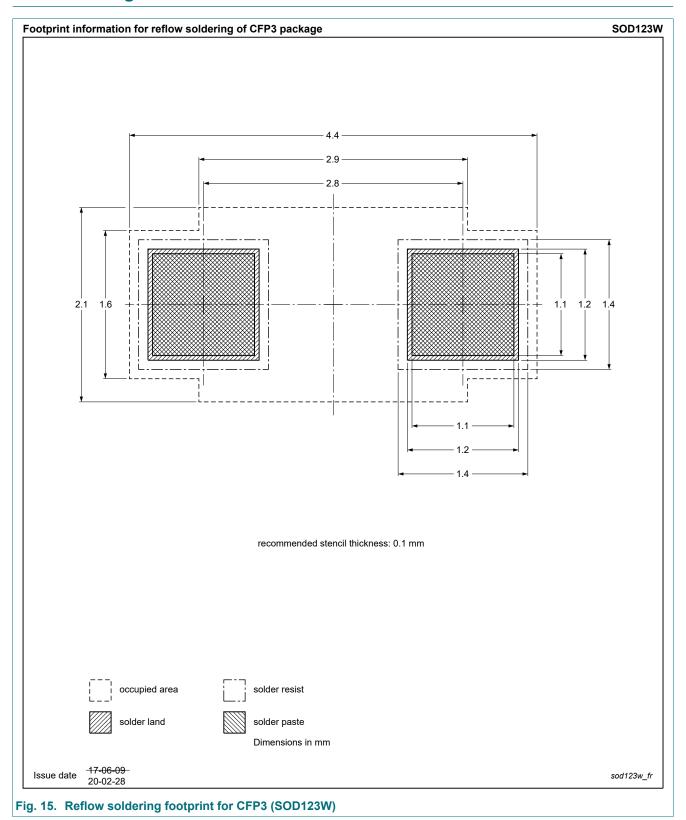
 I_{RMS} = I_{M} × $\sqrt{\delta}$ with I_{RMS} defined as RMS current

12. Package outline

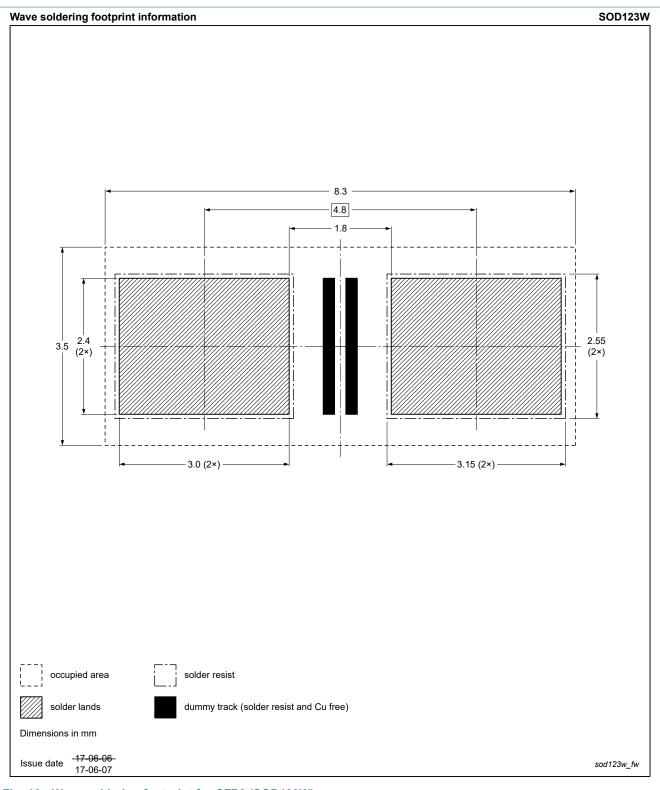


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13. Soldering



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14. Revision history

Table 8. Revision history

table of Novicion motory							
Data sheet ID	Release date	Data sheet status	Change notice	Supersedes			
PMEG4030ER v.4	20230123	Product data sheet	-	PMEG4030ER v.3			
Modifications:	 Features and benefit 	Features and benefits: "AEC-Q101 qualified" removed					
PMEG4030ER v.3	20230101	Product data sheet	-	PMEG4030ER v.2			
PMEG4030ER v.2	20171212	Product data sheet	-	PMEG4030ER_1			
PMEG4030ER_1	20090811	Product data sheet	-	-			

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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.

- 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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