1. General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD128 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-bonding technology
- Small and flat lead SMD plastic package
- AEC-Q101 qualified
- High temperature T_i ≤ 175 °C
- · Capable for reflow and wave soldering

3. Applications

- · Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Reverse polarity protection
- Low power consumption applications
- · High temperature 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; $T_{amb} \le 85$ °C; square wave	[1]	-	-	3	Α
		δ = 0.5; f = 20 kHz; $T_{sp} \le 165$ °C; square wave		-	-	3	Α
V _R	reverse voltage	T _j = 25 °C		-	-	40	V
V _F	forward voltage	I _F = 3 A; T _j = 25 °C		-	430	490	mV
I _R	reverse current	$V_R = 40 \text{ V}; T_j = 25 ^{\circ}\text{C}$		-	35	200	μΑ

[1] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.



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5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]		к _} А
2	А	anode	1	sym001

^[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMEG4030ETP	CFP5	plastic, surface mounted package; 2 terminals; 4 mm pitch; 3.8 mm x 2.6 mm x 1 mm body	SOD128

7. Marking

Table 4. Marking codes

Type number	Marking code
PMEG4030ETP	C3

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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; $T_{amb} \le 85$ °C; square wave	[1]	-	3	Α
		δ = 0.5; f = 20 kHz; $T_{sp} \le 165$ °C; square wave		-	3	А
I _{FSM}	non-repetitive peak forward current	t_p = 8 ms; square wave; $T_{j(init)}$ = 25 °C		-	50	А
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[2]	-	750	mW
			[3]	-	1.25	W
			[1]	-	2.5	W
T _j	junction temperature			-	175	°C
T _{amb}	ambient temperature			-55	175	°C
T _{stg}	storage temperature			-65	175	°C

- [1] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.
- [2] 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.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
R _{th(j-a)}	thermal resistance from junction to ambient		[1] [2]	-	-	200	K/W
			[1] [3]	-	-	120	K/W
			[1] [4]	-	-	60	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		<u>[5]</u>	-	-	12	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.

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^[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

^[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

^[4] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.

^[5] Soldering point of cathode tab.

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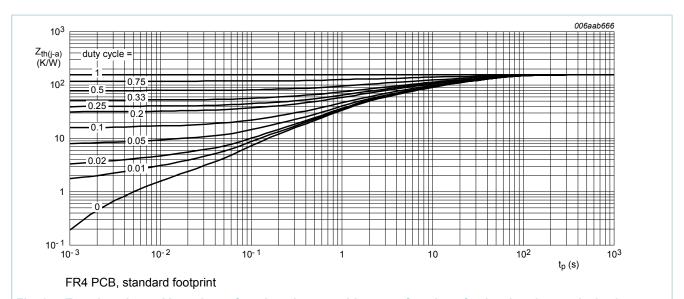


Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

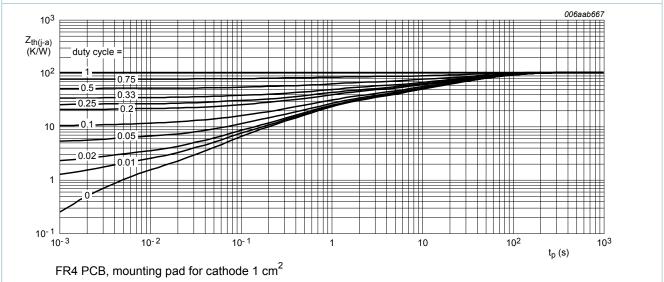
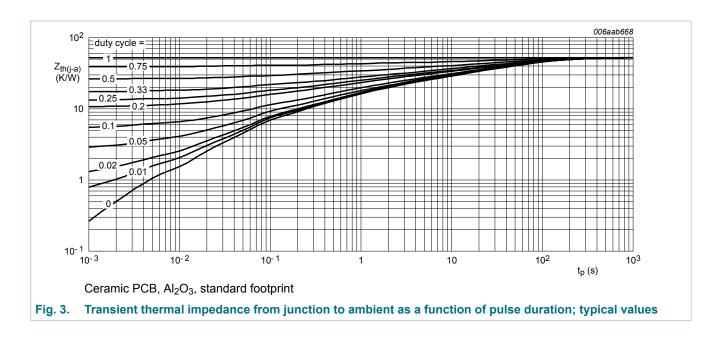


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

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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	-	285	320	mV
		I _F = 1 A; T _j = 25 °C	-	360	420	mV
		I _F = 3 A; T _j = 25 °C	-	430	490	mV
		I _F = 3 A; T _j = 125 °C	-	330	380	mV
I _R reverse current	reverse current	V _R = 10 V; T _j = 25 °C	-	7	-	μA
		V _R = 40 V; T _j = 25 °C	-	35	200	μA
		V _R = 10 V; T _j = 125 °C	-	6	-	mA
		V _R = 40 V; T _j = 125 °C	-	23	-	mA
C _d	diode capacitance	V _R = 1 V; f = 1 MHz; T _j = 25 °C	-	350	-	pF
		$V_R = 10 \text{ V}; f = 1 \text{ MHz}; T_j = 25 \text{ °C}$	-	140	-	pF

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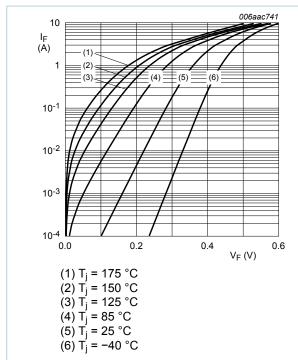


Fig. 4. Forward current as a function of forward voltage; typical values

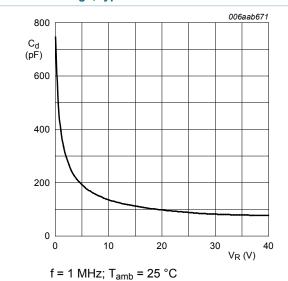


Fig. 6. Diode capacitance as a function of reverse voltage; typical values

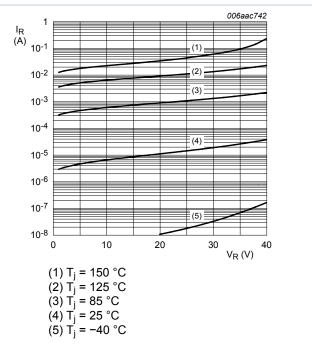
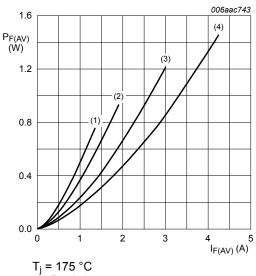


Fig. 5. Reverse current as a function of reverse voltage; typical values



(1) $\delta = 0.1$ (2) $\delta = 0.2$ (3) $\delta = 0.5$ (4) $\delta = 1.0$

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

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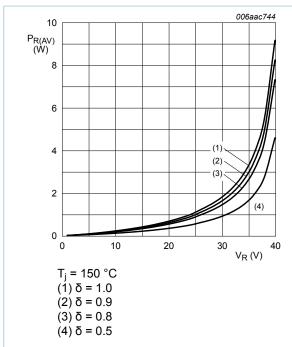


Fig. 8. Average reverse power dissipation as a function of reverse voltage; typical values

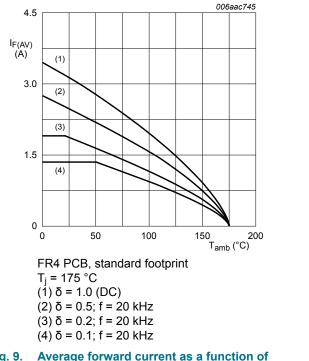


Fig. 9. Average forward current as a function of ambient temperature; typical values

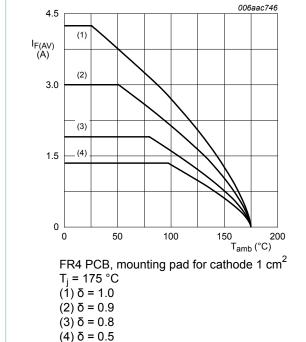


Fig. 10. Average forward current as a function of ambient temperature; typical values

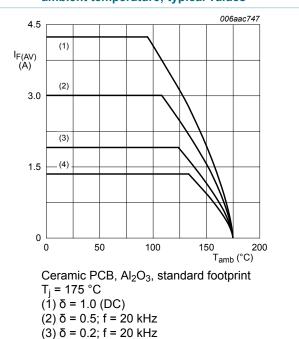
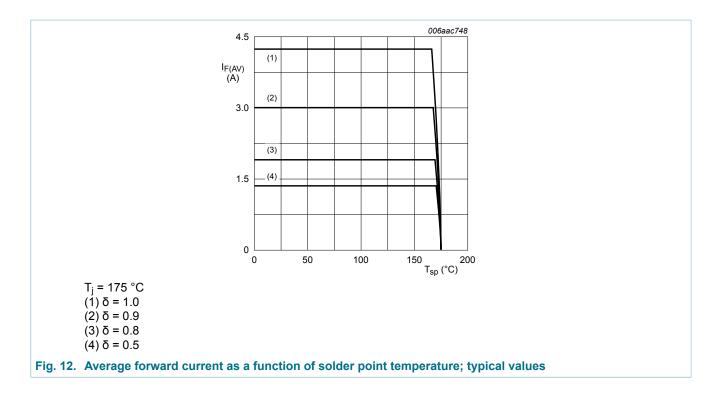


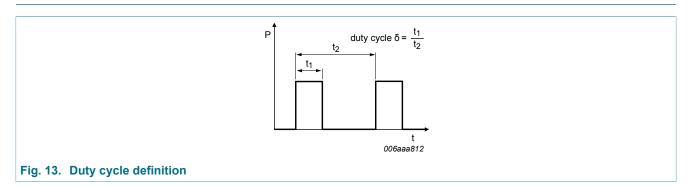
Fig. 11. Average forward current as a function of ambient temperature; typical values

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

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11. Test information



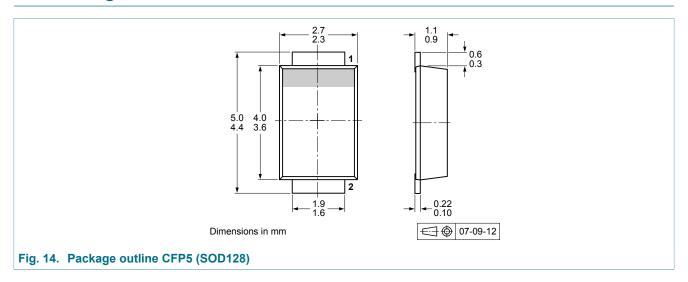
The current ratings for the typical waveforms are calculated according to the equations: $I_{F(AV)} = I_M \times \delta$ with I_M defined as peak current, $I_{RMS} = I_{F(AV)}$ at DC, and $I_{RMS} = I_M \times \sqrt{\delta}$ with I_{RMS} defined as RMS current.

Quality information

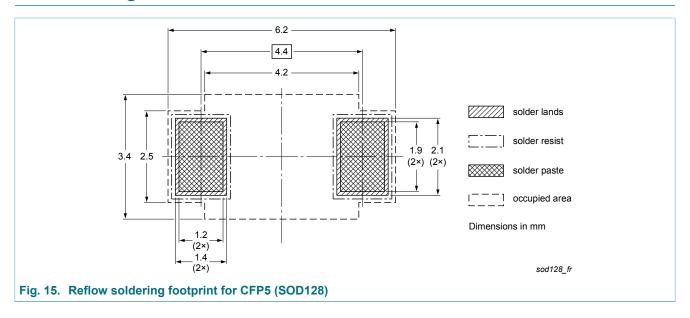
This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

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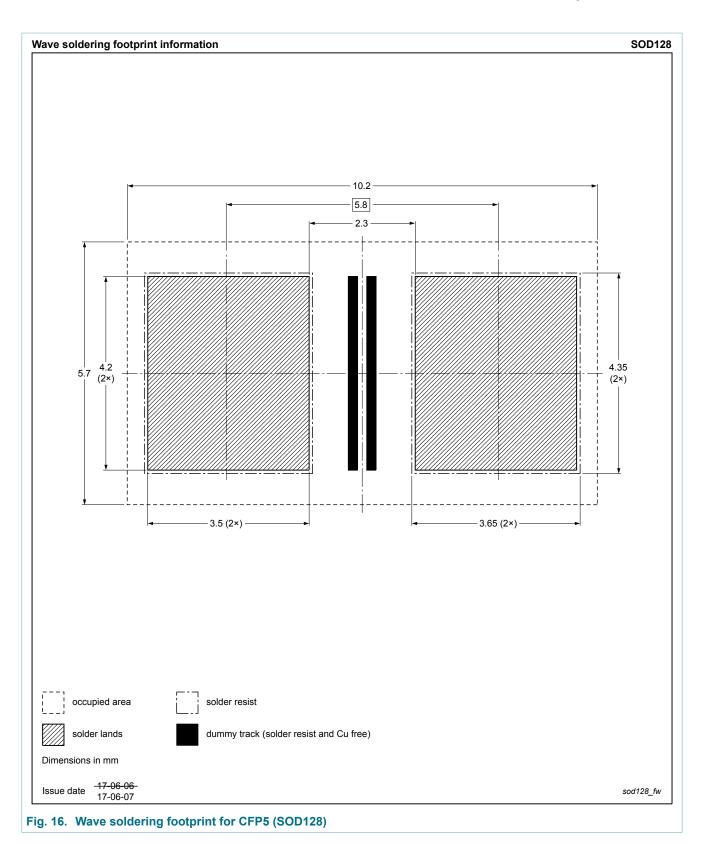
12. Package outline



13. Soldering



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14. Revision history

Table 8. Revision history

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Data sheet ID	Release date	Data sheet status	Change notice	Supersedes				
PMEG4030ETP v.2	20180328	Product data sheet	-	PMEG4030ETP v.1				
Modifications:	 Features and benefits: Capable for reflow and wave soldering added Soldering: Wave soldering footprint added 							
PMEG4030ETP v.1	20111010	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.
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