PMEG2015EH; PMEG2015EJ

20 V, 1.5 A very low V_F MEGA Schottky barrier rectifiers

Rev. 02 — 7 April 2005 Product data sheet

1. Product profile

1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifiers with an integrated guard ring for stress protection encapsulated in small and flat SMD plastic packages.

Table 1: Product overview

Type number	Package		Configuration
	Philips	JEITA	
PMEG2015EH	SOD123F	-	single diode
PMEG2015EJ	SOD323F	SC-90	single diode

1.2 Features

- Forward current: ≤ 1.5 A
- Reverse voltage: ≤ 20 V
- Very low forward voltage
- Small and flat lead SMD plastic packages

1.3 Applications

- Low voltage rectification
- High efficiency DC-to-DC conversion
- Switch mode power supply
- Inverse polarity protection
- Low and medium power general applications

1.4 Quick reference data

Table 2: Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	$T_{sp} \leq 55$ °C		-	-	1.5	A
V_R	reverse voltage			-	-	20	V
V_F	forward voltage	$I_F = 1.5$ A	[1]	-	560	660	mV

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

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2. Pinning information

Table 3: Pinning

Pin	Description	Simplified outline	Symbol
1	cathode [1]	 001aab540	 sym001
2	anode		

[1] The marking bar indicates the cathode.

3. Ordering information

Table 4: Ordering information

Type number	Package		
	Name	Description	Version
PMEG2015EH	-	plastic surface mounted package; 2 leads	SOD123F
PMEG2015EJ	SC-90	plastic surface mounted package; 2 leads	SOD323F

4. Marking

Table 5: Marking codes

Type number	Marking code
PMEG2015EH	AD
PMEG2015EJ	EL

5. Limiting values

Table 6: Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_R	reverse voltage			-	20	V
I_F	forward current	$T_{sp} \leq 55$ °C		-	1.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ ms; $\delta \leq 0.25$		-	5.5	A
I_{FSM}	non-repetitive peak forward current	square wave; $t_p = 8$ ms	[1]	-	9	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C				
	PMEG2015EH		[1]	-	375	mW
			[2]	-	830	mW
	PMEG2015EJ		[1]	-	360	mW
			[2]	-	830	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			–65	+150	°C

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Table 6: Limiting values *...continued*

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

Symbol	Parameter	Conditions	Min	Max	Unit
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] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.

6. Thermal characteristics

Table 7: Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air					
	PMEG2015EH		[1] [2]	-	-	330	K/W
			[2] [3]	-	-	150	K/W
	PMEG2015EJ		[1] [2]	-	-	350	K/W
			[2] [3]	-	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point						
	PMEG2015EH			-	-	60	K/W
	PMEG2015EJ			-	-	55	K/W

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

[2] For Schottky barrier diodes thermal run-away 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 are available on request.

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.

7. Characteristics

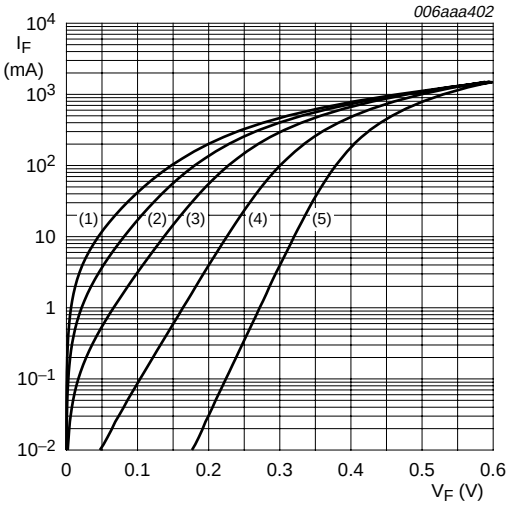
Table 8: Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 10 mA	[1]	-	240	270	mV
		I_F = 100 mA	[1]	-	300	350	mV
		I_F = 500 mA	[1]	-	400	460	mV
		I_F = 1 A	[1]	-	480	550	mV
		I_F = 1.5 A	[1]	-	560	660	mV
I_R	reverse current	V_R = 5 V		-	5	10	µA
		V_R = 8 V		-	7	20	µA
		V_R = 10 V		-	8	30	µA
		V_R = 15 V		-	10	50	µA
		V_R = 20 V		-	15	70	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz		-	40	50	pF

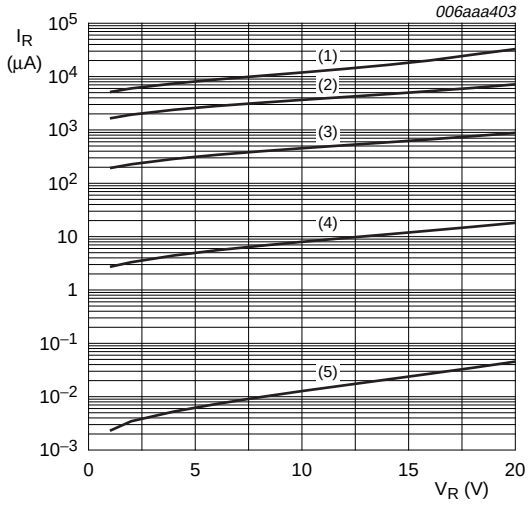
[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

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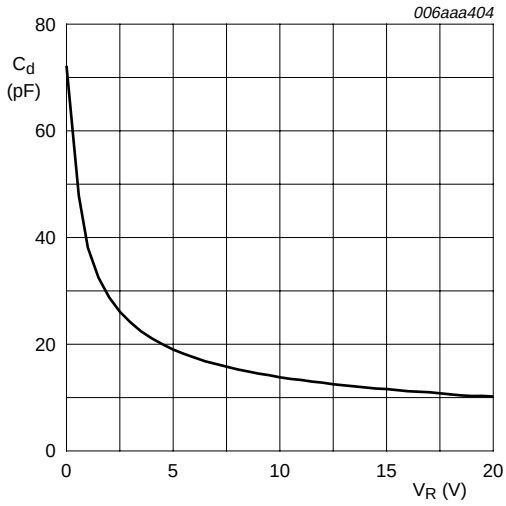
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °C

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



(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °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

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8. Package outline

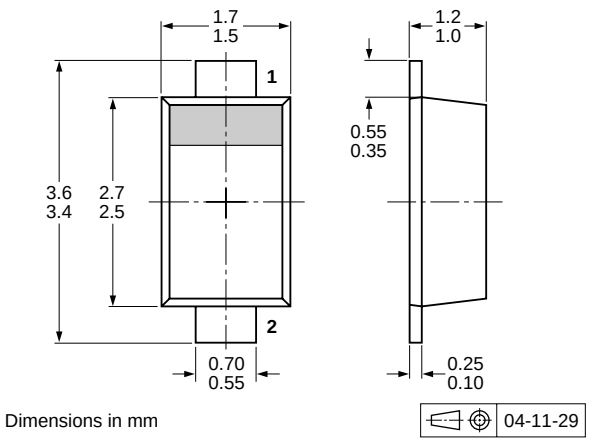


Fig 4. Package outline SOD123F

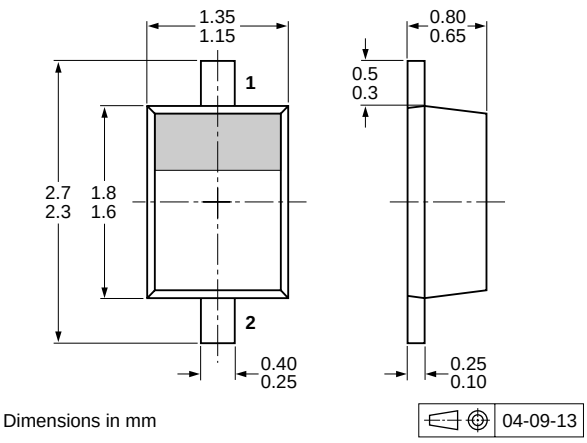


Fig 5. Package outline SOD323F (SC-90)

9. Packing information

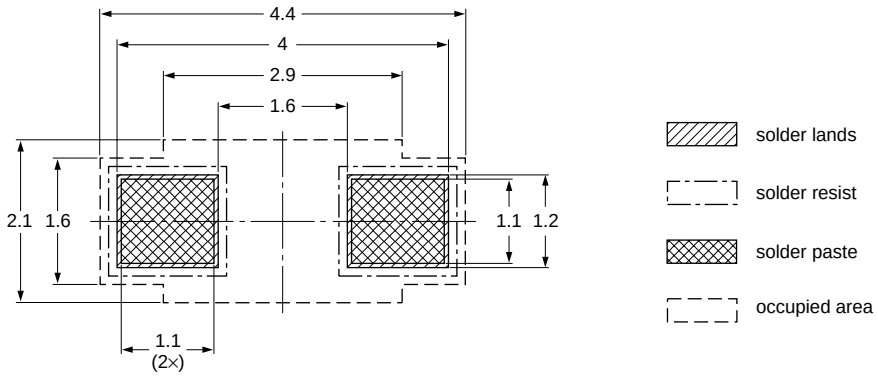
Table 9: Packing methods

The -xxx numbers are the last three digits of the 12NC ordering code. [1]

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG2015EH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG2015EJ	SOD323F			

[1] For further information and the availability of packing methods, see Section 15.

10. Soldering

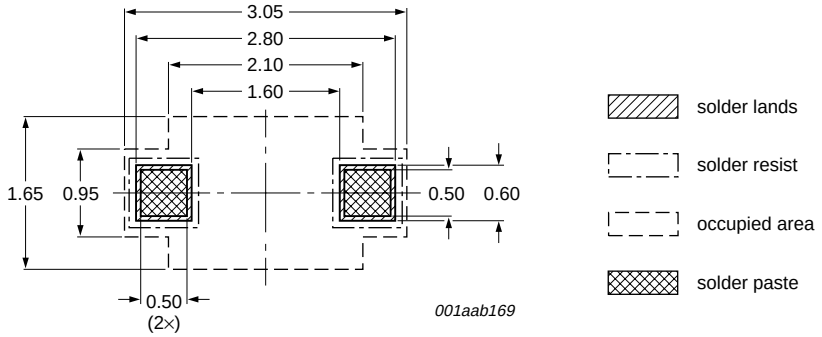


Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 6. Reflow soldering footprint SOD123F

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Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 7. Reflow soldering footprint SOD323F (SC-90)

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11. Revision history

Table 10: Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
PMEG2015EH_EJ_2	20050407	Product data sheet	-	9397 750 14916	PMEG2015EJ_1
Modifications:	• Type PMEG2015EH added • Table 6 P_{tot} values for PMEG2015EJ amended				
PMEG2015EJ_1	20050302	Product data sheet	-	9397 750 14594	-

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12. Data sheet status

Level	Data sheet status [1]	Product status [2] [3]	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

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[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

13. Definitions

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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