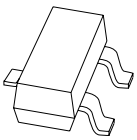


PMEGxx05ET series

0.5 A very low V_F MEGA Schottky barrier rectifiers in SOT23 package

Rev. 01 — 15 July 2005 Product data sheet

1. Product profile

1.1 General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOT23 small Surface Mounted Device (SMD) plastic package.

Table 1: Product overview

Type number	Package		Configuration
	Philips	JEITA	
PMEG2005ET	SOT23	-	single diode
PMEG3005ET	SOT23	-	single diode
PMEG4005ET	SOT23	-	single diode

1.2 Features

- Forward current: 0.5 A
- Very low forward voltage
- Small SMD plastic package

1.3 Applications

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

PHILIPS

1.4 Quick reference data

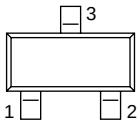
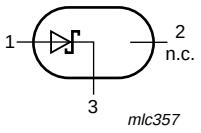
Table 2: Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current			-	-	0.5	A
V_R	reverse voltage						
	PMEG2005ET			-	-	20	V
	PMEG3005ET			-	-	30	V
	PMEG4005ET			-	-	40	V
V_F	forward voltage	I_F = 500 mA	[1]				
	PMEG2005ET			-	355	390	mV
	PMEG3005ET			-	380	430	mV
	PMEG4005ET			-	420	470	mV

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

2. Pinning information

Table 3: Pinning

Pin	Description	Simplified outline	Symbol
1	anode		
2	not connected		
3	cathode		

3. Ordering information

Table 4: Ordering information

Type number	Package		
	Name	Description	Version
PMEG2005ET	-	plastic surface mounted package; 3 leads	SOT23
PMEG3005ET	-	plastic surface mounted package; 3 leads	SOT23
PMEG4005ET	-	plastic surface mounted package; 3 leads	SOT23

4. Marking

Table 5: Marking codes

Type number	Marking code [1]
PMEG2005ET	P3*
PMEG3005ET	P4*
PMEG4005ET	P5*

[1] * = -: made in Hong Kong
* = p: made in Hong Kong
* = t: made in Malaysia
* = W: made in China

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					
	PMEG2005ET			-	20	V
	PMEG3005ET			-	30	V
	PMEG4005ET			-	40	V
I_F	forward current			-	0.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ ms; $\delta \leq 0.5$		-	3.9	A
I_{FSM}	non-repetitive peak forward current	$t_p = 8$ ms square wave	[1]	-	10	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	280	mW
			[2]	-	420	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			–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] 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	[1] [2]	-	-	440	K/W
			[1] [3]	-	-	300	K/W

[1] 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 will be available on request.

[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 cm^2.

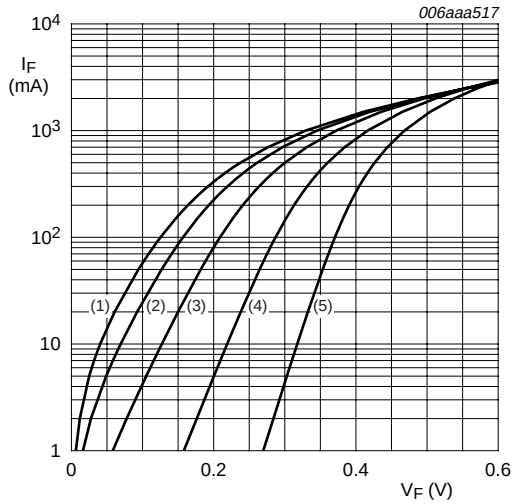
7. Characteristics

Table 8: Characteristics

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

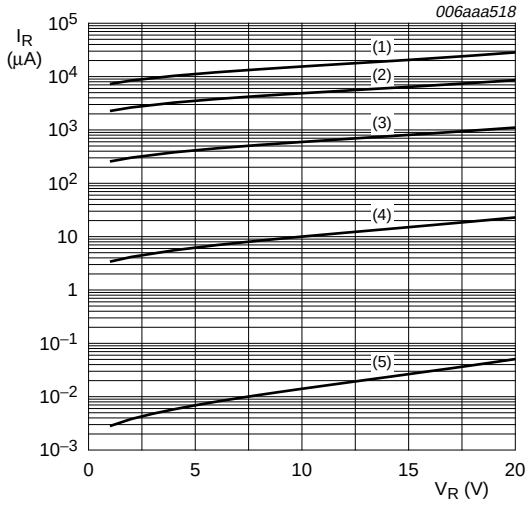
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage		[1]				
	PMEG2005ET	I_F = 0.1 mA		-	90	130	mV
		I_F = 1 mA		-	150	190	mV
		I_F = 10 mA		-	210	240	mV
		I_F = 100 mA		-	280	330	mV
		I_F = 500 mA		-	355	390	mV
	PMEG3005ET	I_F = 0.1 mA		-	90	130	mV
		I_F = 1 mA		-	150	200	mV
		I_F = 10 mA		-	215	250	mV
		I_F = 100 mA		-	285	340	mV
		I_F = 500 mA		-	380	430	mV
	PMEG4005ET	I_F = 0.1 mA		-	95	130	mV
		I_F = 1 mA		-	155	210	mV
		I_F = 10 mA		-	220	270	mV
		I_F = 100 mA		-	295	350	mV
		I_F = 500 mA		-	420	470	mV
I_R	reverse current						
	PMEG2005ET	V_R = 10 V		-	15	40	µA
		V_R = 20 V		-	40	200	µA
	PMEG3005ET	V_R = 10 V		-	12	30	µA
		V_R = 30 V		-	40	150	µA
	PMEG4005ET	V_R = 10 V		-	7	20	µA
		V_R = 40 V		-	30	100	µA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz					
	PMEG2005ET			-	66	80	pF
	PMEG3005ET			-	55	70	pF
	PMEG4005ET			-	43	50	pF

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



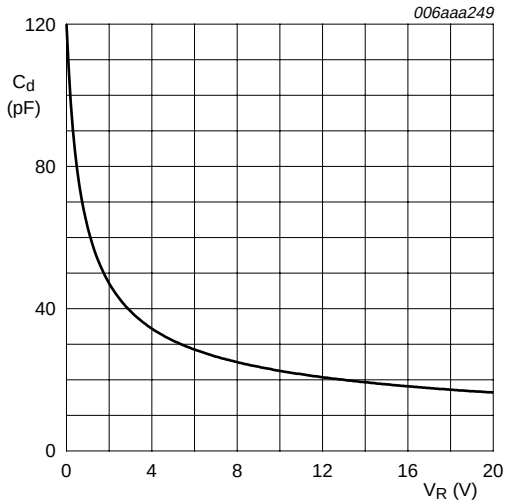
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °C

Fig 1. PMEG2005ET: Forward current as a function of forward voltage; typical values



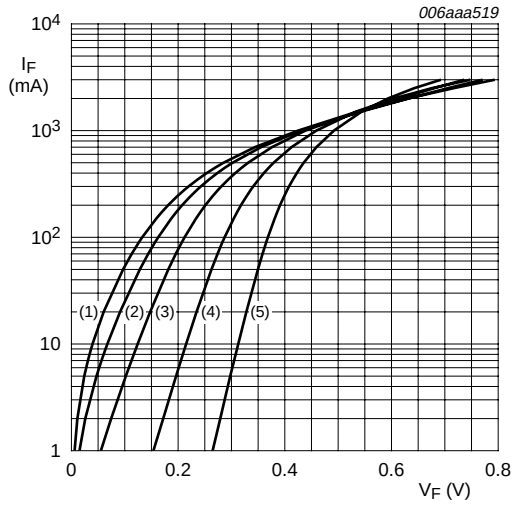
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °C

Fig 2. PMEG2005ET: Reverse current as a function of reverse voltage; typical values



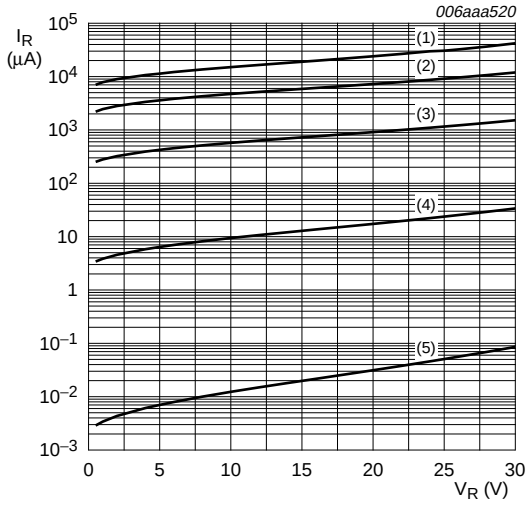
T_{amb} = 25 °C; f = 1 MHz

Fig 3. PMEG2005ET: Diode capacitance as a function of reverse voltage; typical values



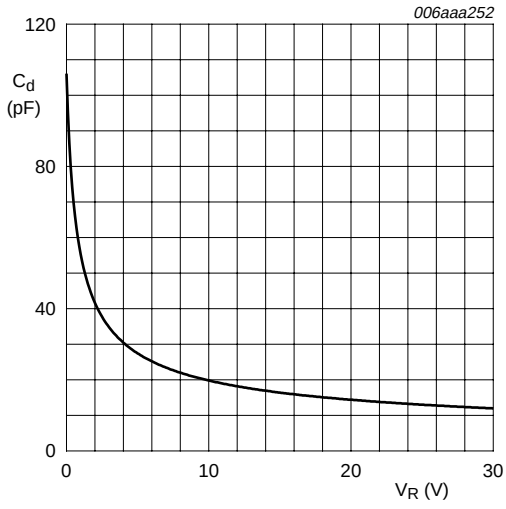
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °C

Fig 4. PMEG3005ET: Forward current as a function of forward voltage; typical values



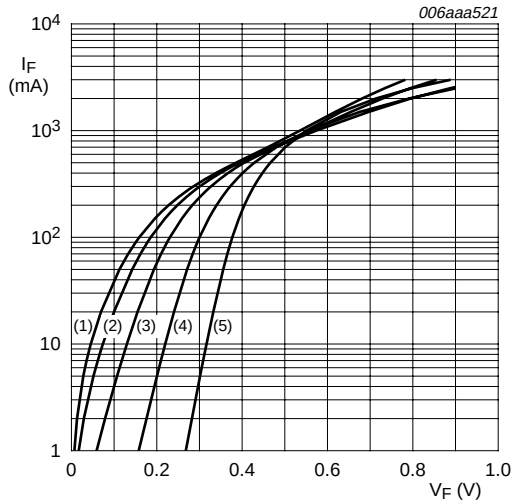
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °C

Fig 5. PMEG3005ET: Reverse current as a function of reverse voltage; typical values



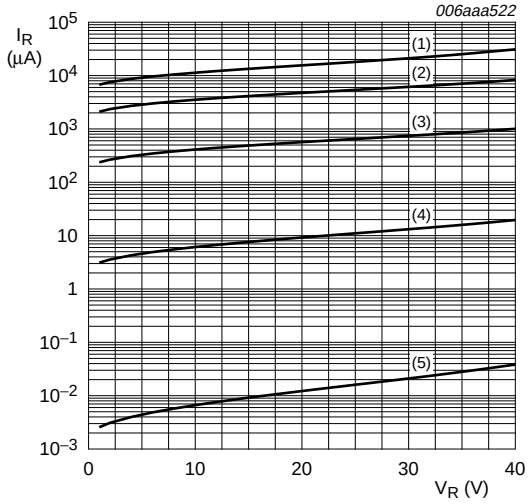
T_{amb} = 25 °C; f = 1 MHz

Fig 6. PMEG3005ET: Diode capacitance as a function of reverse voltage; typical values



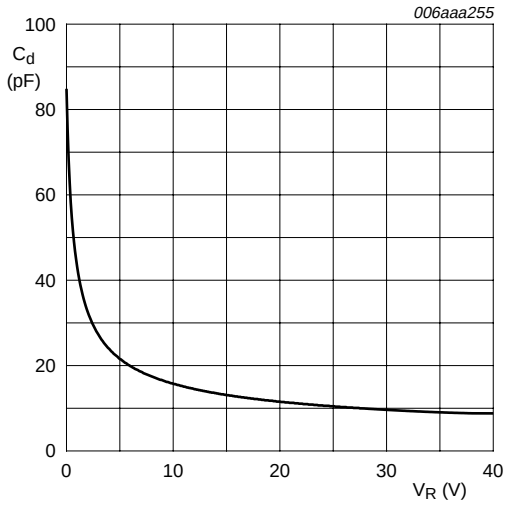
(1) T_{amb} = 150 °C
(2) T_{amb} = 125 °C
(3) T_{amb} = 85 °C
(4) T_{amb} = 25 °C
(5) T_{amb} = –40 °C

Fig 7. PMEG4005ET: 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 8. PMEG4005ET: Reverse current as a function of reverse voltage; typical values



T_{amb} = 25 °C; f = 1 MHz

Fig 9. PMEG4005ET: Diode capacitance as a function of reverse voltage; typical values

8. Package outline

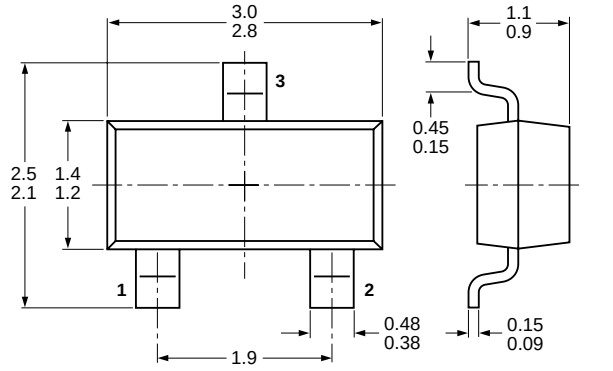


Fig 10. Package outline SOT23 (TO-236AB)

9. Packing information

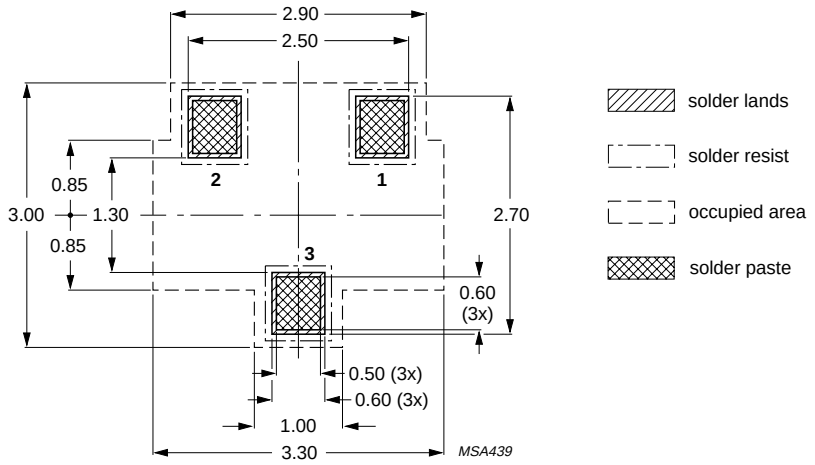
Table 9: Packing methods

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

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG2005ET	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235
PMEG3005ET				
PMEG4005ET				

[1] For further information and the availability of packing methods, see Section 16.

10. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 11. Reflow soldering footprint SOT23 (TO-236AB)

11. Revision history

Table 10: Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
PMEGXX05ET_SER_1	20050715	Product data sheet	-	9397 750 15183	-

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).

[1] Please consult the most recently issued data sheet before initiating or completing a design.

[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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17. Contents

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