

# PMEG4010EH; PMEG4010EJ; PMEG4010ET

1 A very low  $V_F$  MEGA Schottky barrier rectifiers

Rev. 04 — 21 March 2007

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 Surface-Mounted Device (SMD) plastic packages.

Table 1. Product overview

Type number	Package			Configuration
	NXP	JEITA	JEDEC	
PMEG4010EH	SOD123F	-	-	single
PMEG4010EJ	SOD323F	SC-90	-	single
PMEG4010ET	SOT23	-	TO-236AB	single

### 1.2 Features

- Forward current:  $I_F \leq 1$  A
- Reverse voltage:  $V_R \leq 40$  V
- Very low forward voltage
- Small SMD plastic packages

### 1.3 Applications

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

### 1.4 Quick reference data



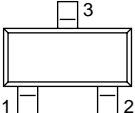
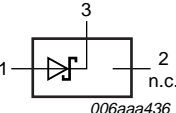
Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55$ °C	-	-	1	A
$V_R$	reverse voltage		-	-	40	V
$V_F$	forward voltage	$I_F = 1000$ mA	[1]	540	640	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
<b>SOD123F; SOD323F</b>			
1	cathode	 <p>001aab540</p>	 <p>sym001</p>
2	anode		
<b>SOT23</b>			
1	anode		 <p>006aaa436</p>
2	n.c.		
3	cathode		

[1] The marking bar indicates the cathode.

## 3. Ordering information

**Table 4. Ordering information**

Type number	Package		
	Name	Description	Version
PMEG4010EH	-	plastic surface-mounted package; 2 leads	SOD123F
PMEG4010EJ	SC-90	plastic surface-mounted package; 2 leads	SOD323F
PMEG4010ET	-	plastic surface-mounted package; 3 leads	SOT23

## 4. Marking

**Table 5. Marking codes**

Type number	Marking code <sup>[1]</sup>
PMEG4010EH	AB
PMEG4010EJ	AL
PMEG4010ET	*AW

[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		-	40	V		
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	-	1	A		
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms}; \delta \leq 0.25$					
			PMEG4010EH	-	7	A	
			PMEG4010EJ	-	7	A	
			PMEG4010ET	-	5	A	
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p = 8\text{ ms}$	-	9	A		
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$					
			PMEG4010EH	[1][3]	-	375	mW
				[2][3]	-	830	mW
			PMEG4010EJ	[1][3]	-	350	mW
				[2][3]	-	830	mW
			PMEG4010ET	[1]	-	280	mW
				[2]	-	420	mW
			$T_j$	junction temperature		-	150
$T_{amb}$	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<sup>2</sup>.

[3] Reflow soldering is the only recommended soldering method.

## 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]					
			PMEG4010EH	[2][4]	-	-	330	K/W
				[3][4]	-	-	150	K/W
	PMEG4010EJ	[2][4]	-	-	350	K/W		
				[3][4]	-	-	150	K/W
	PMEG4010ET	[2]	-	-	440	K/W		
			[3]	-	-	300	K/W	
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[5]					
		PMEG4010EH		-	-	60	K/W	
		PMEG4010EJ		-	-	55	K/W	
		PMEG4010ET		-	-	120	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 mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.
- [4] Reflow soldering is the only recommended soldering method.
- [5] Soldering point of cathode tab.

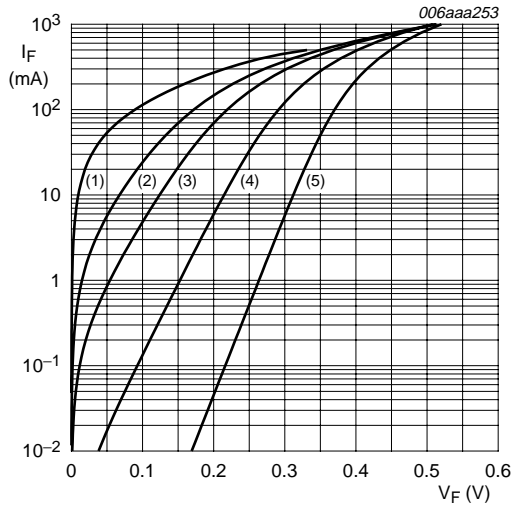
## 7. Characteristics

**Table 8. Characteristics**

$T_{amb} = 25\text{ }^\circ\text{C}$  unless otherwise specified.

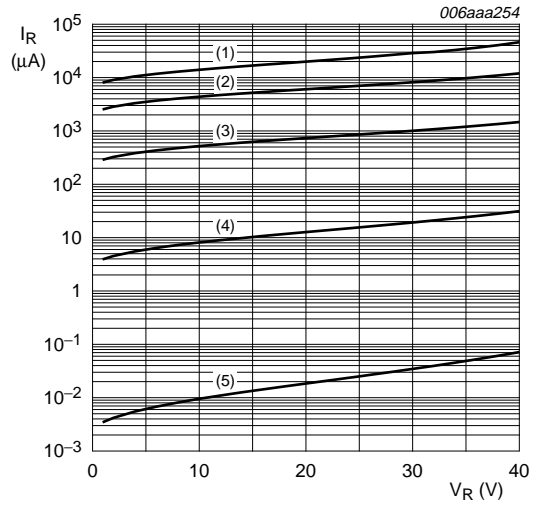
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 0.1\text{ mA}$	-	95	130	mV
		$I_F = 1\text{ mA}$	-	155	210	mV
		$I_F = 10\text{ mA}$	-	220	270	mV
		$I_F = 100\text{ mA}$	-	295	350	mV
		$I_F = 500\text{ mA}$	-	420	470	mV
		$I_F = 1000\text{ mA}$	-	540	640	mV
$I_R$	reverse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

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



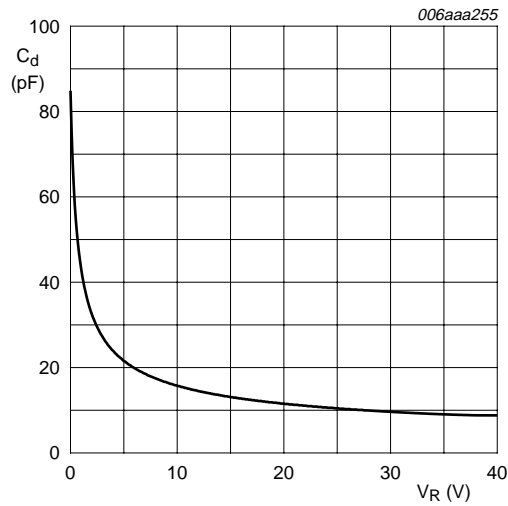
- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

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



- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

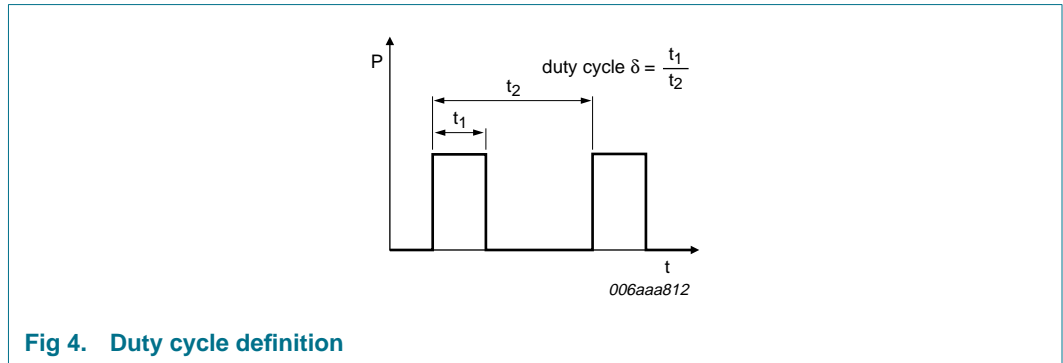
**Fig 2. Reverse current as a function of reverse voltage; typical values**



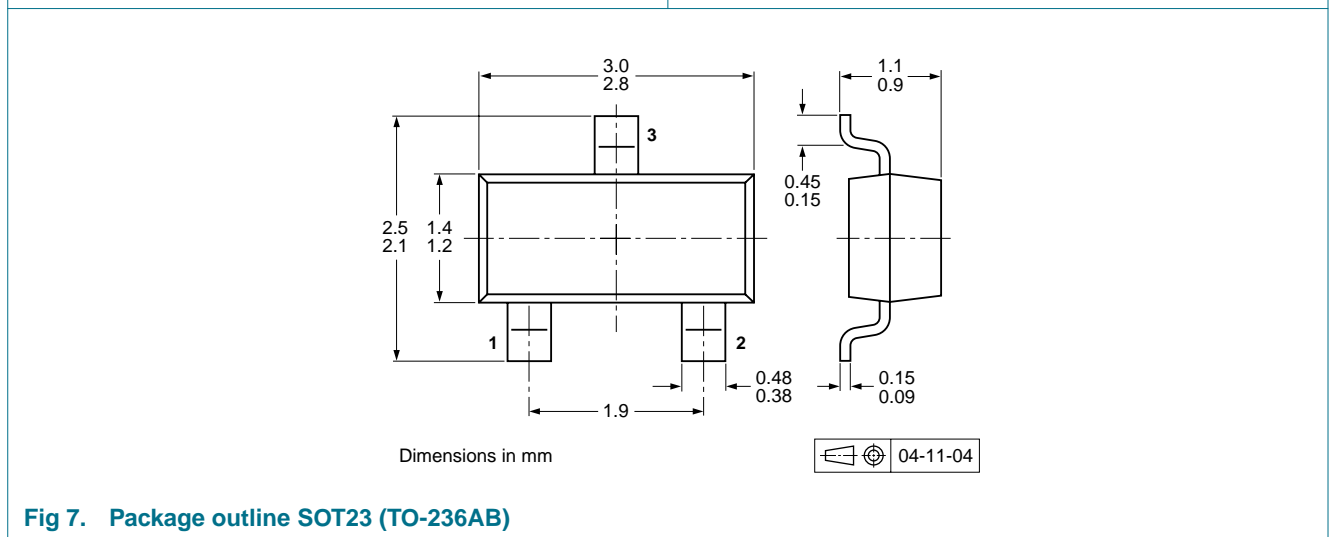
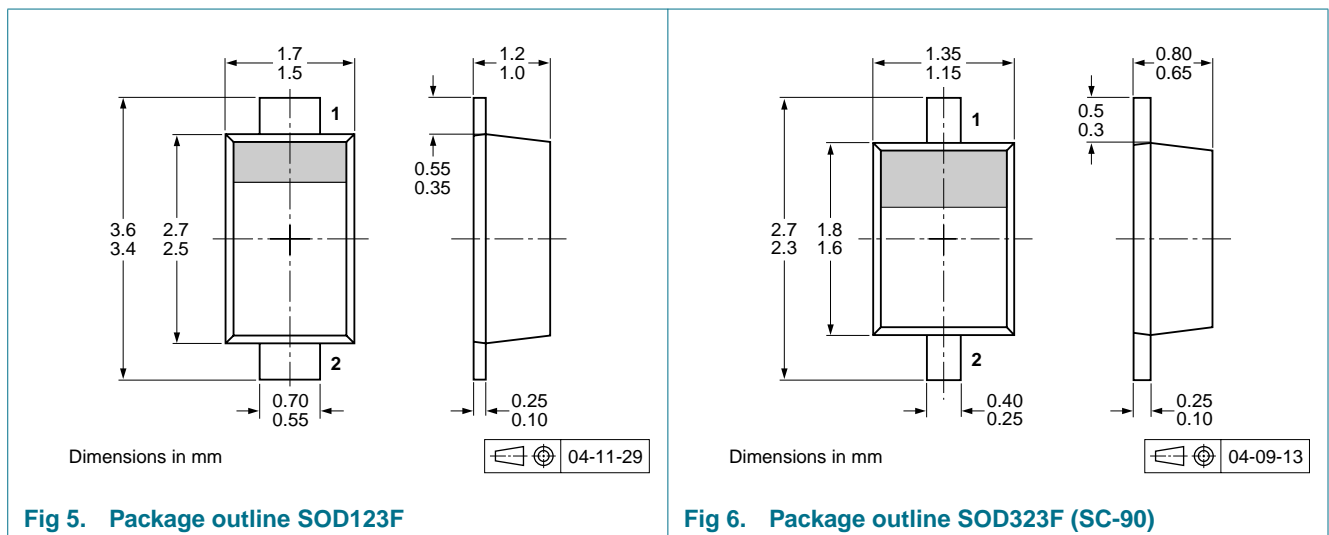
$f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$

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

## 8. Test information



## 9. Package outline



## 10. Packing information

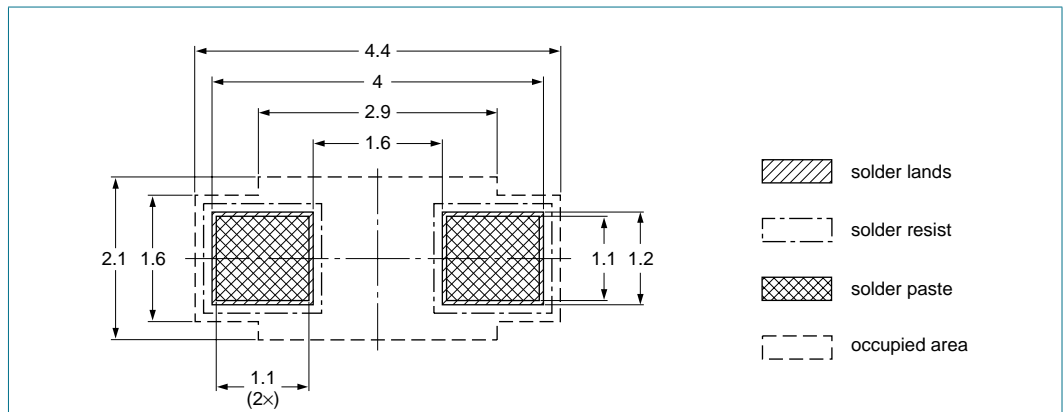
**Table 9. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG4010EH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG4010EJ	SOD323F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG4010ET	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235

[1] For further information and the availability of packing methods, see [Section 14](#).

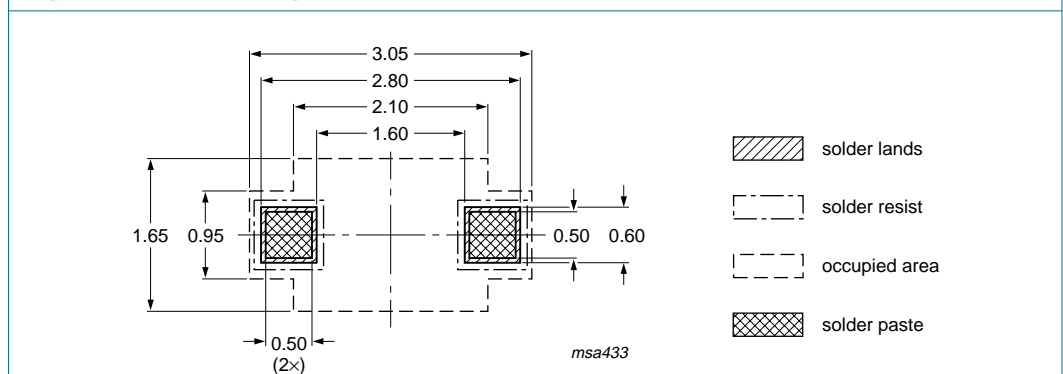
## 11. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

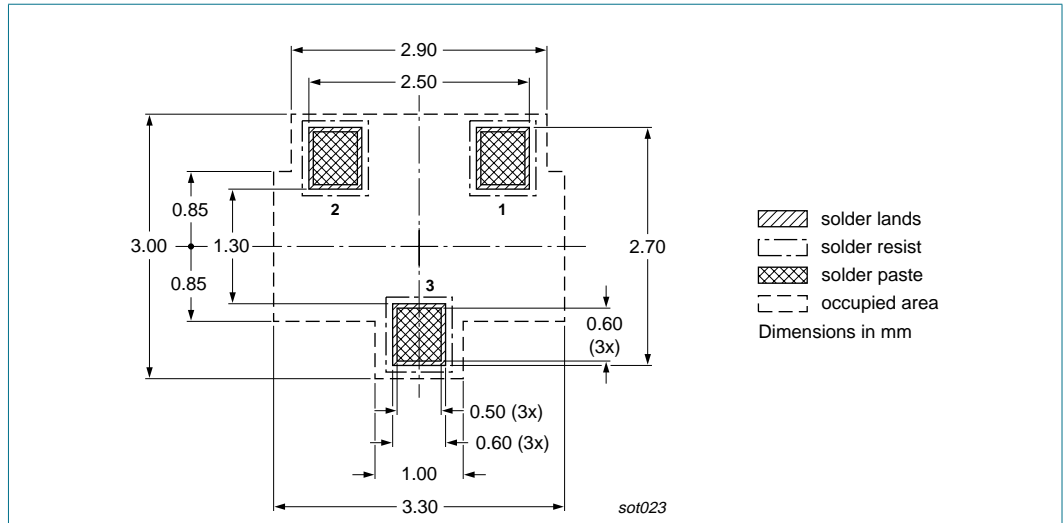
**Fig 8. Reflow soldering footprint SOD123F**



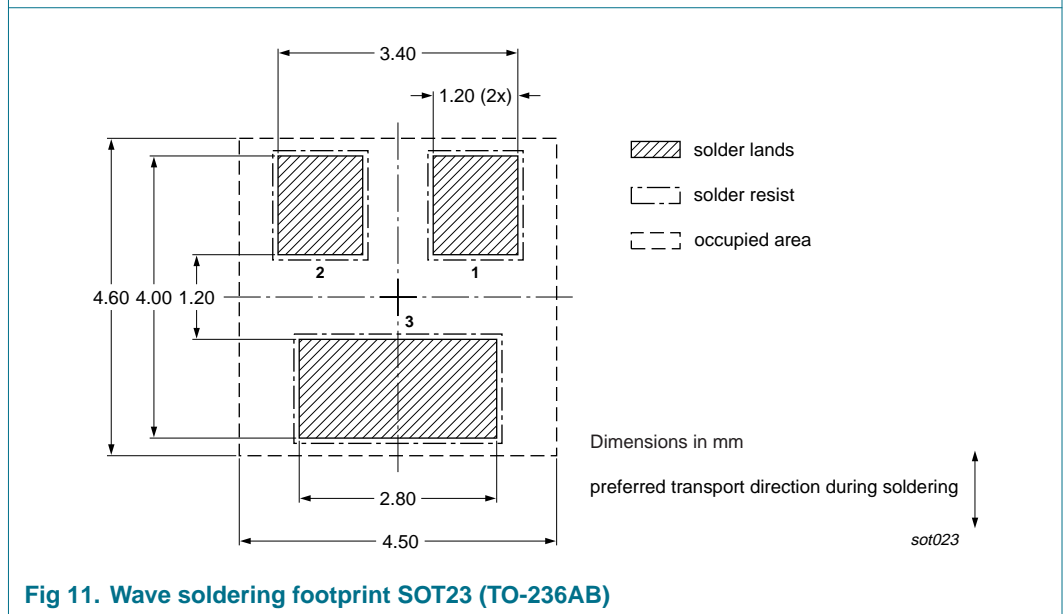
Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 9. Reflow soldering footprint SOD323F (SC-90)**



**Fig 10. Reflow soldering footprint SOT23 (TO-236AB)**



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



## 12. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMEG4010EH_EJ_ET_4	20070321	Product data sheet	-	PMEGXX10EH_EJ_SER_3
Modifications: <ul style="list-style-type: none"> <li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>• Legal texts have been adapted to the new company name where appropriate.</li> <li>• Type numbers PMEG4010EH and PMEG4010EJ separated from data sheet PMEGXX10EH_EJ_SER_3</li> <li>• Type number PMEG4010ET added</li> <li>• <a href="#">Section 1.1 "General description"</a>: amended</li> <li>• <a href="#">Section 1.2 "Features"</a>: amended</li> <li>• <a href="#">Section 1.3 "Applications"</a>: amended</li> <li>• <a href="#">Section 8 "Test information"</a>: added</li> <li>• <a href="#">Figure 7, 10 and 11</a>: added</li> <li>• <a href="#">Section 13 "Legal information"</a>: updated</li> </ul>				
PMEGXX10EH_EJ_SER_3	20050411	Product data sheet	-	PMEGXX10EJ_SER_2
PMEGXX10EJ_SER_2	20050131	Product data sheet	-	PMEGXX10EJ_SER_1
PMEGXX10EJ_SER_1	20040907	Objective data sheet	-	-

## 13. Legal information

### 13.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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