

# PMEG2010EH; PMEG2010EJ; PMEG2010ET

1 A very low  $V_F$  MEGA Schottky barrier rectifiers

Rev. 04 — 20 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
	Nexperia	JEITA	JEDEC	
PMEG2010EH	SOD123F	-	-	single
PMEG2010EJ	SOD323F	SC-90	-	single
PMEG2010ET	SOT23	-	TO-236AB	single

### 1.2 Features

- Forward current:  $I_F \leq 1$  A
- Reverse voltage:  $V_R \leq 20$  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



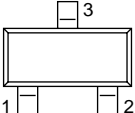
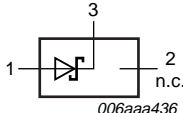
Table 2. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current	$T_{sp} \leq 55$ °C	-	-	1	A
$V_R$	reverse voltage		-	-	20	V
$V_F$	forward voltage	$I_F = 1000$ mA	[1] -	420	500	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	 001aab540	 sym001
2	anode		
<b>SOT23</b>			
1	anode		 006aaa436
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
PMEG2010EH	-	plastic surface-mounted package; 2 leads	SOD123F
PMEG2010EJ	SC-90	plastic surface-mounted package; 2 leads	SOD323F
PMEG2010ET	-	plastic surface-mounted package; 3 leads	SOT23

## 4. Marking

Table 5. Marking codes

Type number	Marking code <sup>[1]</sup>
PMEG2010EH	A9
PMEG2010EJ	AH
PMEG2010ET	*AU

[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		-	20	V		
$I_F$	forward current	$T_{sp} \leq 55\text{ °C}$	-	1	A		
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ ms}; \delta \leq 0.25$					
			PMEG2010EH	-	7	A	
			PMEG2010EJ	-	7	A	
			PMEG2010ET	-	5	A	
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p = 8\text{ ms}$	-	9	A		
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$					
			PMEG2010EH	[1]	-	375	mW
				[2]	-	830	mW
			PMEG2010EJ	[1]	-	350	mW
				[2]	-	830	mW
			PMEG2010ET	[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>.

## 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]					
			PMEG2010EH	[2]	-	-	330	K/W
				[3]	-	-	150	K/W
	PMEG2010EJ	[2]	-	-	350	K/W		
		[3]	-	-	150	K/W		
		PMEG2010ET	[2]	-	-	440	K/W	
		[3]	-	-	300	K/W		
	$R_{th(j-sp)}$	thermal resistance from junction to solder point		[4]				
			PMEG2010EH	-	-	60	K/W	
PMEG2010EJ			-	-	55	K/W		
PMEG2010ET			-	-	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] Soldering point of cathode tab.

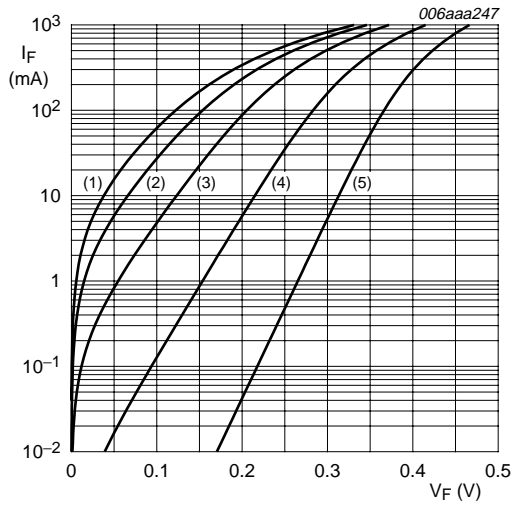
## 7. Characteristics

**Table 8. Characteristics**

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

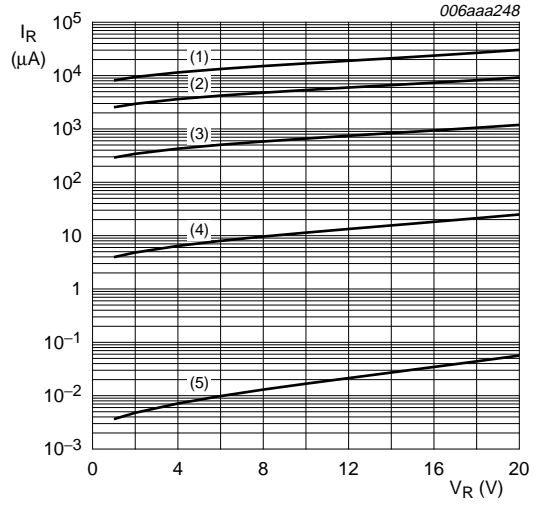
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 0.1\text{ mA}$	-	90	130	mV
		$I_F = 1\text{ mA}$	-	150	190	mV
		$I_F = 10\text{ mA}$	-	210	240	mV
		$I_F = 100\text{ mA}$	-	280	330	mV
		$I_F = 500\text{ mA}$	-	355	390	mV
		$I_F = 1000\text{ mA}$	-	420	500	mV
$I_R$	reverse current	$V_R = 10\text{ V}$	-	15	40	$\mu\text{A}$
		$V_R = 20\text{ V}$	-	40	200	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1\text{ V};$ $f = 1\text{ MHz}$	-	66	80	pF

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



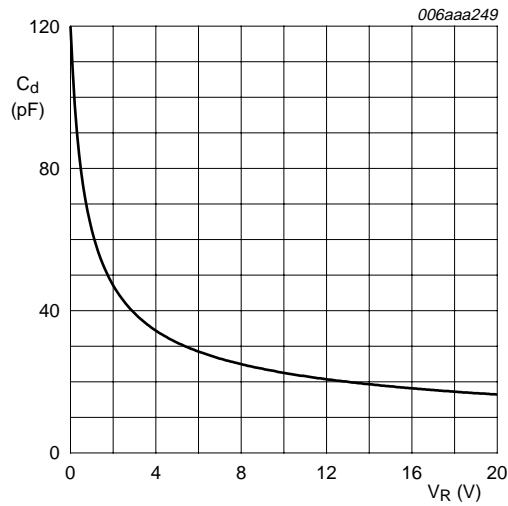
- (1)  $T_{amb} = 150\text{ °C}$
- (2)  $T_{amb} = 125\text{ °C}$
- (3)  $T_{amb} = 85\text{ °C}$
- (4)  $T_{amb} = 25\text{ °C}$
- (5)  $T_{amb} = -40\text{ °C}$

**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)  $T_{amb} = -40\text{ °C}$

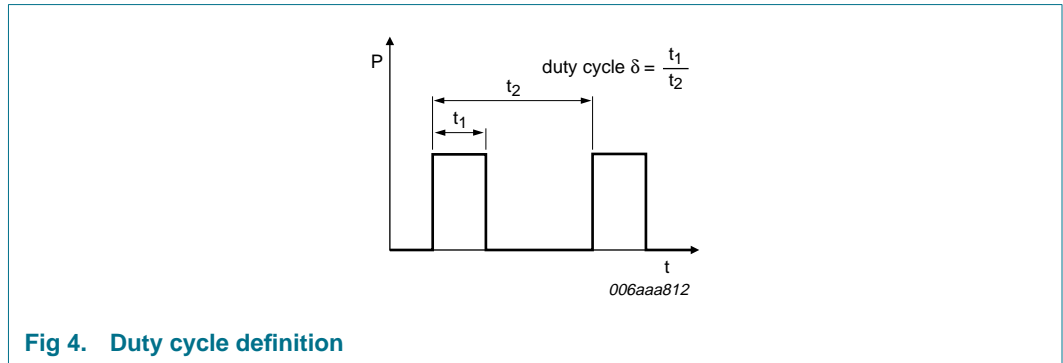
**Fig 2. Reverse current as a function of reverse voltage; typical values**



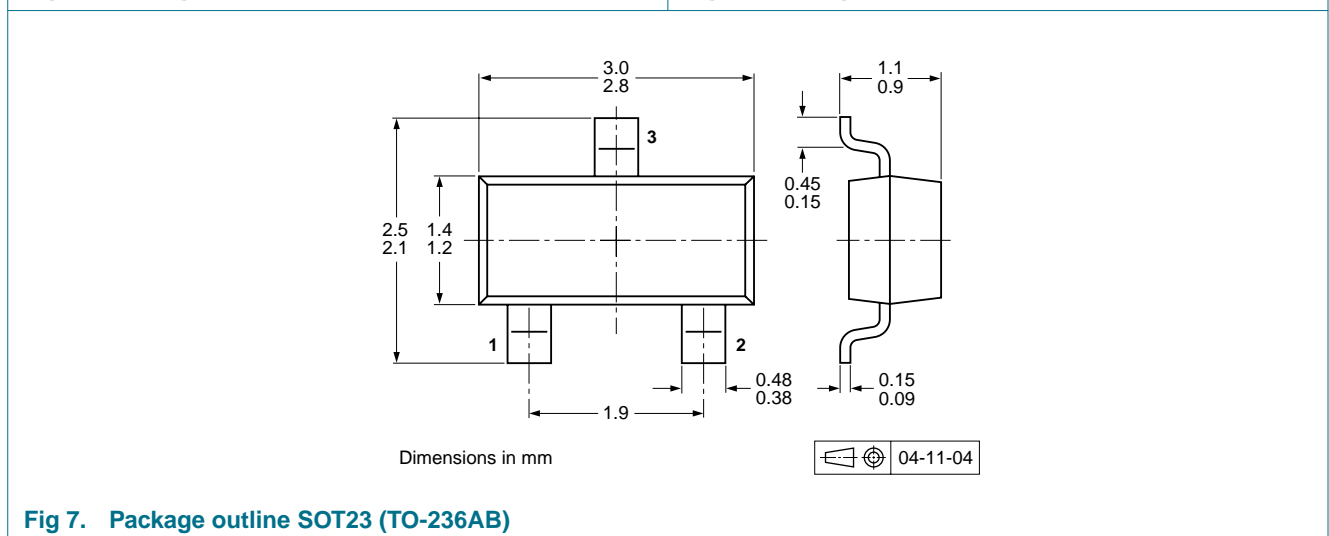
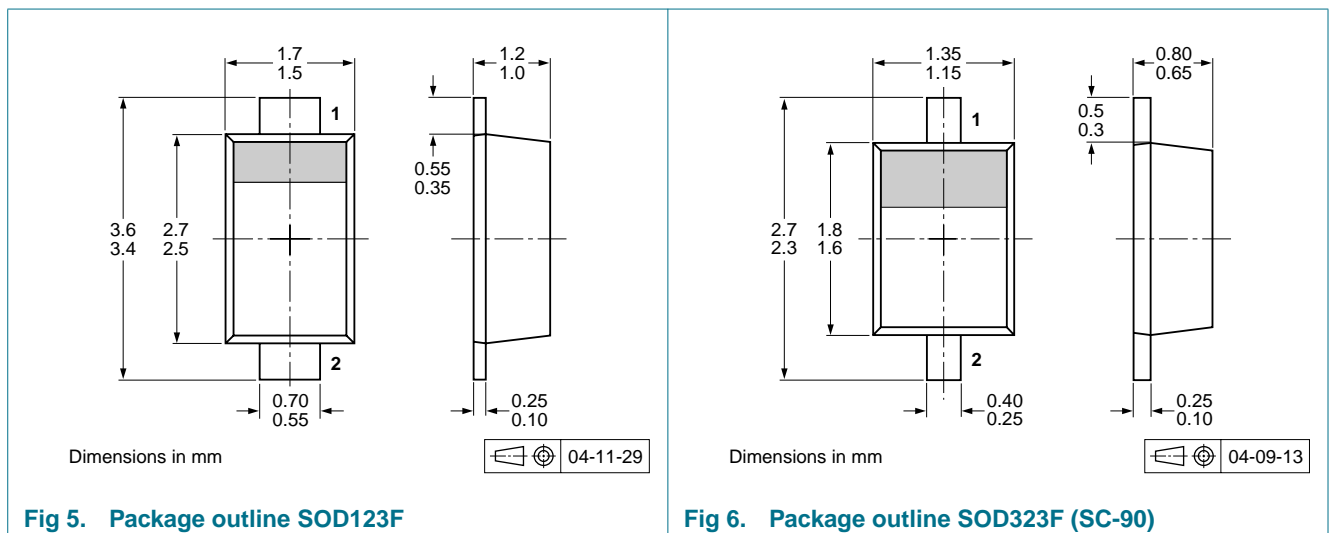
$f = 1\text{ MHz}; T_{amb} = 25\text{ °C}$

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

## 8. Test information



## 9. Package outline



## 10. Packing information

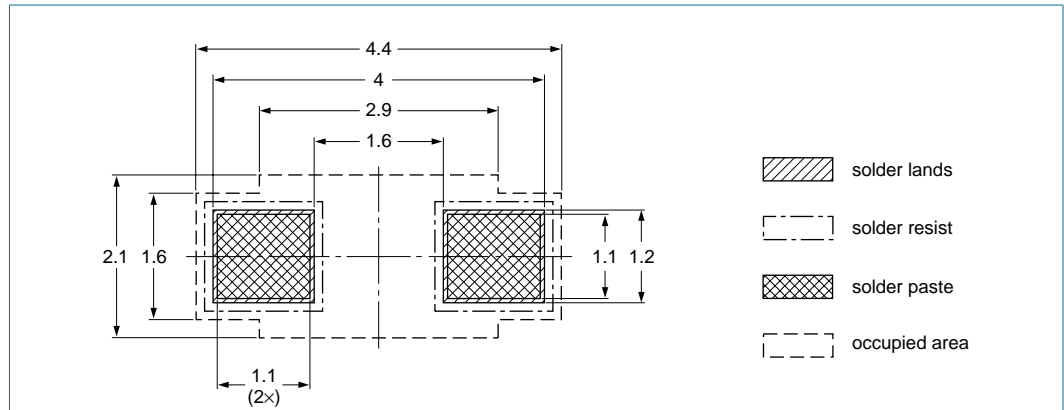
**Table 9. Packing methods**

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

Type number	Package	Description	Packing quantity	
			3000	10000
PMEG2010EH	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG2010EJ	SOD323F	4 mm pitch, 8 mm tape and reel	-115	-135
PMEG2010ET	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235

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

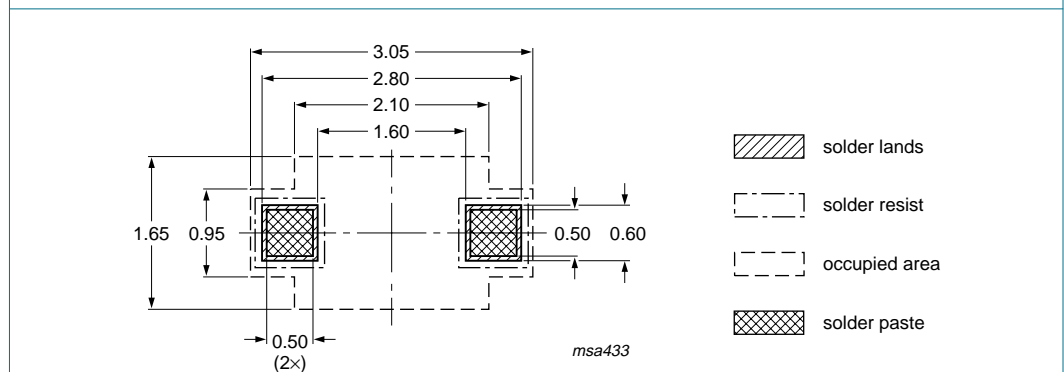
## 11. Soldering



Reflow soldering is the only recommended soldering method.

Dimensions in mm

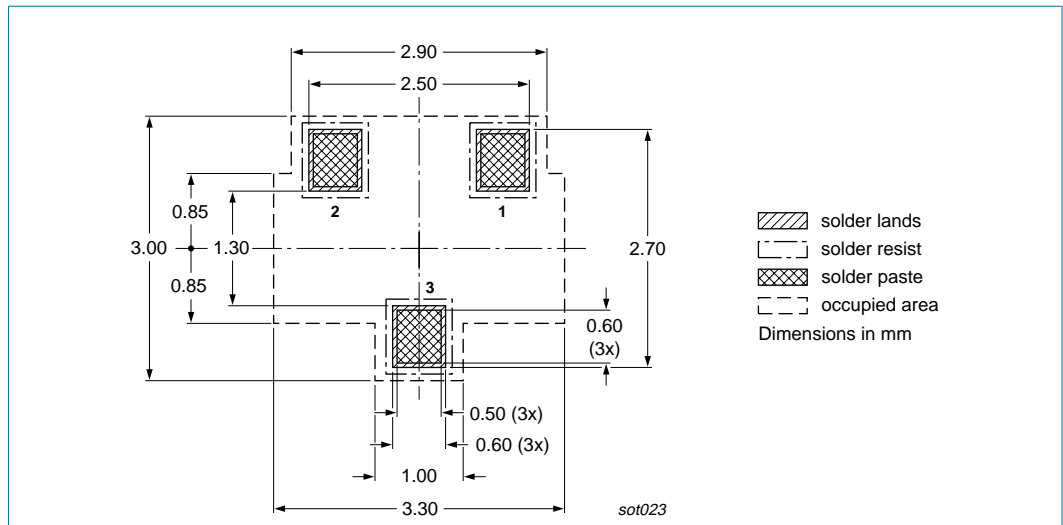
**Fig 8. Reflow soldering footprint SOD123F**



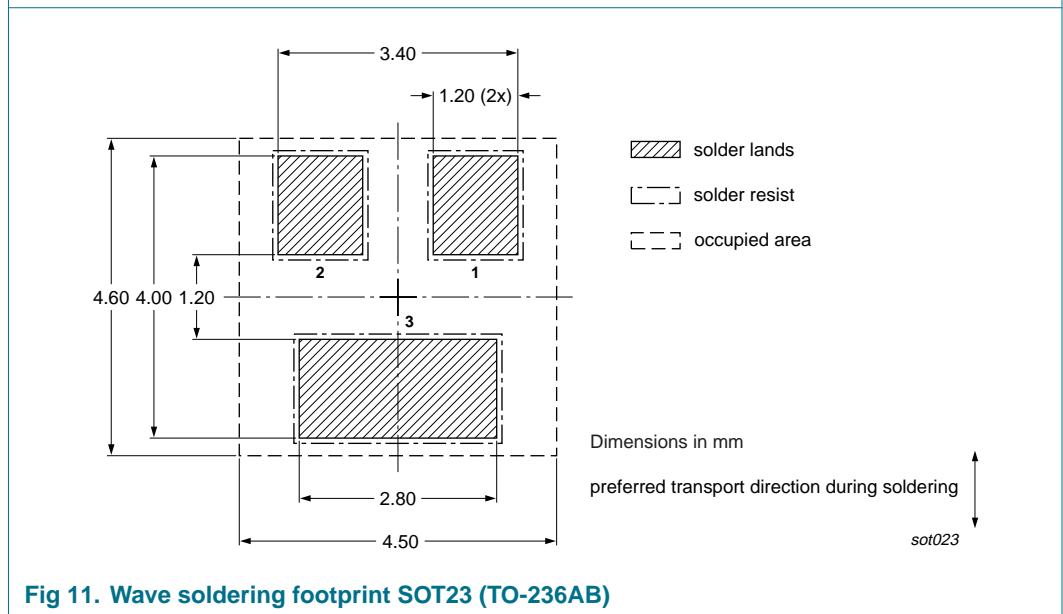
Reflow soldering is the only recommended soldering method.

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
PMEG2010EH_EJ_ET_4	20070320	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 PMEG2010EH and PMEG2010EJ separated from data sheet PMEGXX10EH_EJ_SER_3</li> <li>• Type number PMEG2010ET 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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nexperia.com>.

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