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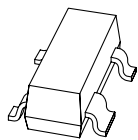
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Kind regards,

Team Nexperia



# BAS28

## High-speed double diode

Rev. 3 — 22 July 2010

Product data sheet

## 1. Product profile

### 1.1 General description

Two high-speed switching diodes fabricated in planar technology, and encapsulated in a small SOT143B Surface-Mounted Device (SMD) plastic package. The diodes are not connected.

### 1.2 Features and benefits

- High switching speed:  $t_{rr} \leq 4$  ns
- Reverse voltage:  $V_R \leq 75$  V
- Repetitive peak reverse voltage:  $V_{RRM} \leq 85$  V
- Repetitive peak forward current:  $I_{FRM} \leq 500$  mA
- AEC-Q101 qualified
- Small SMD package

### 1.3 Applications

- High-speed switching in e.g. surface-mounted circuits

### 1.4 Quick reference data

Table 1. Quick reference data

| Symbol    | Parameter             | Conditions   | Min   | Typ | Max | Unit    |
|-----------|-----------------------|--------------|-------|-----|-----|---------|
| Per diode |                       |              |       |     |     |         |
| $I_F$     | forward current       |              | [1] - | -   | 215 | mA      |
| $I_R$     | reverse current       | $V_R = 75$ V | -     | -   | 1   | $\mu$ A |
| $V_R$     | reverse voltage       |              | -     | -   | 75  | V       |
| $t_{rr}$  | reverse recovery time |              | [2] - | -   | 4   | ns      |

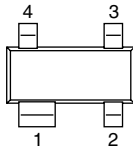
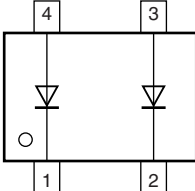
[1] Device mounted on an FR4 Printed-Circuit Board (PCB).

[2] When switched from  $I_F = 10$  mA to  $I_R = 10$  mA;  $R_L = 100$   $\Omega$ ; measured at  $I_R = 1$  mA.



## 2. Pinning information

Table 2. Pinning

| Pin | Description       | Simplified outline                                                                  | Graphic symbol                                                                      |
|-----|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| 1   | cathode (diode 1) |  |  |
| 2   | cathode (diode 2) |                                                                                     |                                                                                     |
| 3   | anode (diode 2)   |                                                                                     |                                                                                     |
| 4   | anode (diode 1)   |                                                                                     |                                                                                     |

006aab100

## 3. Ordering information

Table 3. Ordering information

| Type number | Package |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | Name    | Description                              | Version |
| BAS28       | -       | plastic surface-mounted package; 4 leads | SOT143B |

## 4. Marking

Table 4. Marking codes

| Type number | Marking code <sup>[1]</sup> |
|-------------|-----------------------------|
| BAS28       | JT*                         |

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

## 5. Limiting values

**Table 5. Limiting values**

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

| Symbol           | Parameter                           | Conditions               | Min      | Max  | Unit |
|------------------|-------------------------------------|--------------------------|----------|------|------|
| Per diode        |                                     |                          |          |      |      |
| V <sub>RRM</sub> | repetitive peak reverse voltage     |                          | -        | 85   | V    |
| V <sub>R</sub>   | reverse voltage                     |                          | -        | 75   | V    |
| I <sub>F</sub>   | forward current                     |                          | [1] -    | 215  | mA   |
| I <sub>FRM</sub> | repetitive peak forward current     |                          | -        | 500  | mA   |
| I <sub>FSM</sub> | non-repetitive peak forward current | square wave              | [3]      |      |      |
|                  |                                     | t <sub>p</sub> = 1 μs    | -        | 4    | A    |
|                  |                                     | t <sub>p</sub> = 1 ms    | -        | 1    | A    |
|                  |                                     | t <sub>p</sub> = 1 s     | -        | 0.5  | A    |
| Per device       |                                     |                          |          |      |      |
| P <sub>tot</sub> | total power dissipation             | T <sub>amb</sub> = 25 °C | [1][2] - | 250  | mW   |
| T <sub>j</sub>   | junction temperature                |                          | -        | 150  | °C   |
| T <sub>stg</sub> | storage temperature                 |                          | -65      | +150 | °C   |

[1] Device mounted on an FR4 PCB.

[2] One diode loaded.

[3]  $T_j = 25\text{ °C}$  prior to surge.

## 6. Thermal characteristics

**Table 6. Thermal characteristics**

| Symbol                              | Parameter                                     | Conditions  | Min | Typ | Max | Unit |
|-------------------------------------|-----------------------------------------------|-------------|-----|-----|-----|------|
| <b>Per device; one diode loaded</b> |                                               |             |     |     |     |      |
| $R_{th(j-a)}$                       | thermal resistance from junction to ambient   | in free air | [1] | -   | 500 | K/W  |
| $R_{th(j-t)}$                       | thermal resistance from junction to tie-point |             | -   | -   | 360 | K/W  |

[1] Device mounted on an FR4 PCB.

## 7. Characteristics

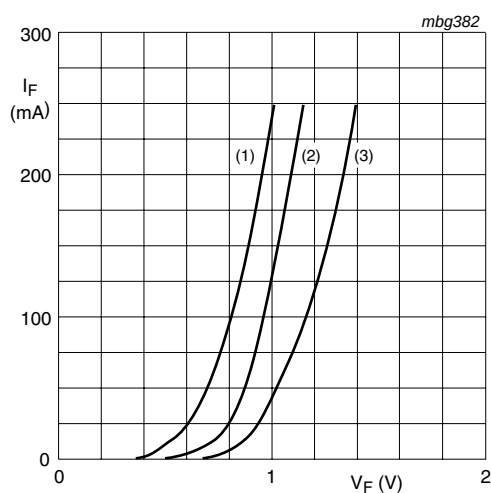
**Table 7. Characteristics**

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

| Symbol           | Parameter                | Conditions                                             | Min | Typ | Max  | Unit          |
|------------------|--------------------------|--------------------------------------------------------|-----|-----|------|---------------|
| <b>Per diode</b> |                          |                                                        |     |     |      |               |
| $V_F$            | forward voltage          | $I_F = 1\text{ mA}$                                    | -   | -   | 715  | mV            |
|                  |                          | $I_F = 10\text{ mA}$                                   | -   | -   | 855  | mV            |
|                  |                          | $I_F = 50\text{ mA}$                                   | -   | -   | 1    | V             |
|                  |                          | $I_F = 150\text{ mA}$                                  | -   | -   | 1.25 | V             |
| $I_R$            | reverse current          | $V_R = 25\text{ V}$                                    | -   | -   | 30   | nA            |
|                  |                          | $V_R = 75\text{ V}$                                    | -   | -   | 1    | $\mu\text{A}$ |
|                  |                          | $V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$ | -   | -   | 30   | $\mu\text{A}$ |
|                  |                          | $V_R = 75\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$ | -   | -   | 50   | $\mu\text{A}$ |
| $C_d$            | diode capacitance        | $f = 1\text{ MHz}; V_R = 0\text{ V}$                   | -   | -   | 1.5  | pF            |
| $t_{rr}$         | reverse recovery time    | [1]                                                    | -   | -   | 4    | ns            |
| $V_{FR}$         | forward recovery voltage | [2]                                                    | -   | -   | 1.75 | V             |

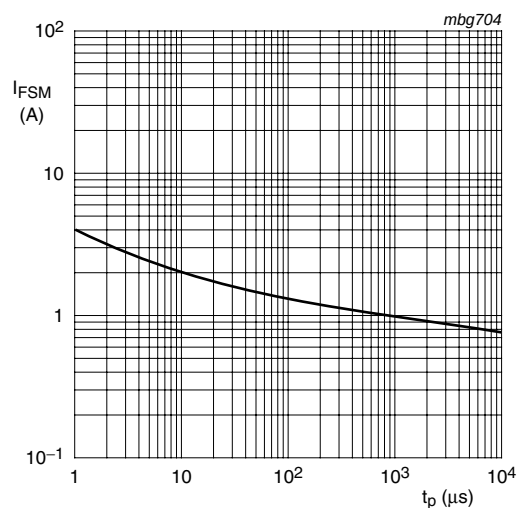
[1] When switched from  $I_F = 10\text{ mA}$  to  $I_R = 10\text{ mA}$ ;  $R_L = 100\text{ }\Omega$ ; measured at  $I_R = 1\text{ mA}$ .

[2] When switched from  $I_F = 10\text{ mA}$ ;  $t_r = 20\text{ ns}$ .



- (1)  $T_j = 150\text{ }^{\circ}\text{C}$ ; typical values
- (2)  $T_j = 25\text{ }^{\circ}\text{C}$ ; typical values
- (3)  $T_j = 25\text{ }^{\circ}\text{C}$ ; maximum values

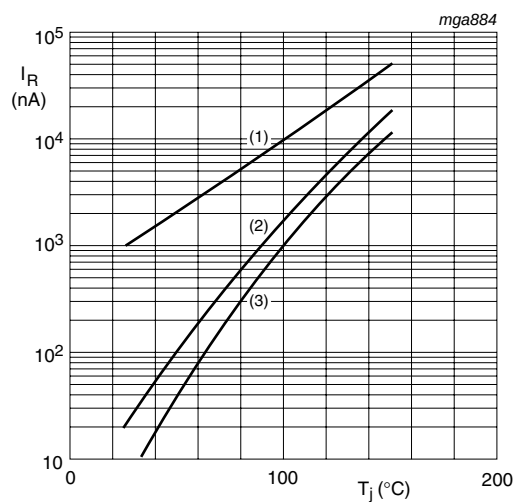
**Fig 1. Forward current as a function of forward voltage**



Based on square wave currents.

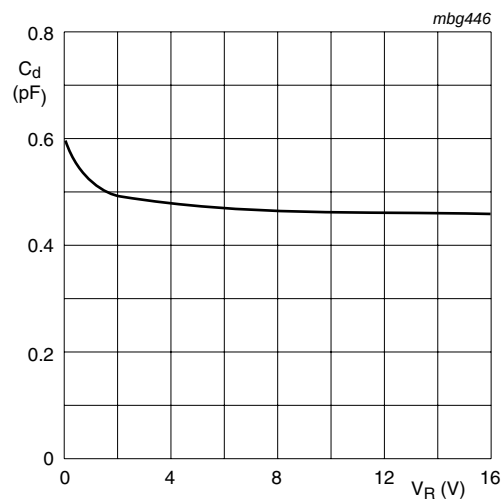
$T_j = 25\text{ }^{\circ}\text{C}$ ; prior to surge

**Fig 2. Non-repetitive peak forward current as a function of pulse duration; maximum values**



$V_R = V_{Rmax}$   
(1)  $V_R = 75\text{ V}$ ; maximum values  
(2)  $V_R = 75\text{ V}$ ; typical values  
(3)  $V_R = 25\text{ V}$ ; typical values

Fig 3. Reverse current as a function of junction temperature



$f = 1\text{ MHz}$ ;  $T_j = 25\text{ }^{\circ}\text{C}$

Fig 4. Diode capacitance as a function of reverse voltage; typical values

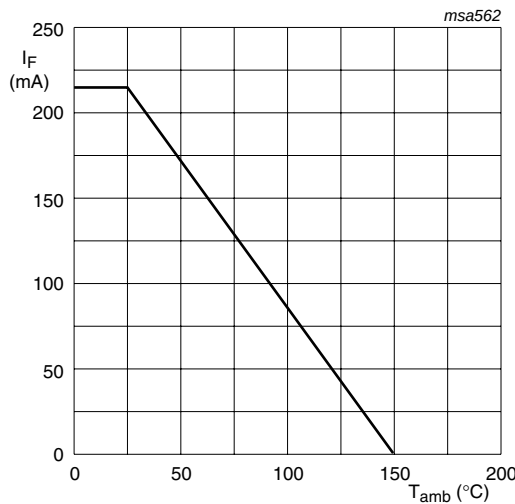
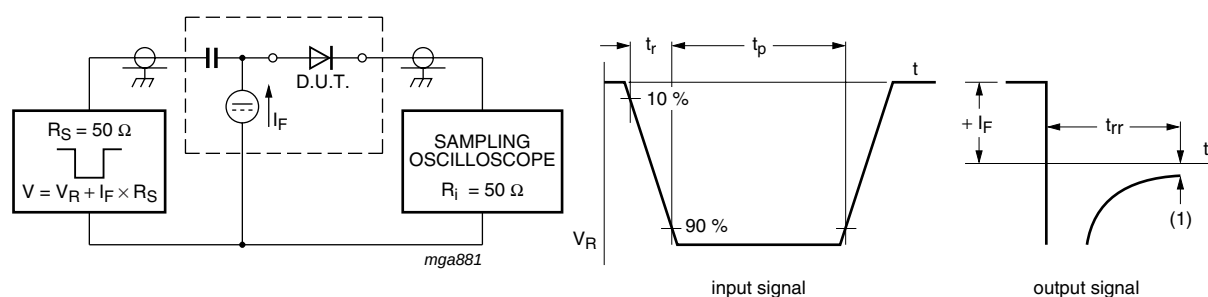


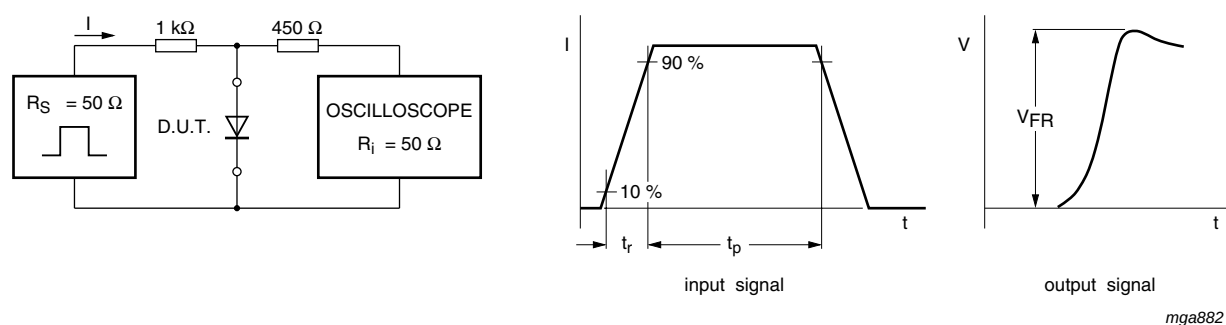
Fig 5. Forward current as a function of ambient temperature; derating curve

## 8. Test information



(1)  $I_R = 1 \text{ mA}$

**Fig 6. Reverse recovery time test circuit and waveforms**



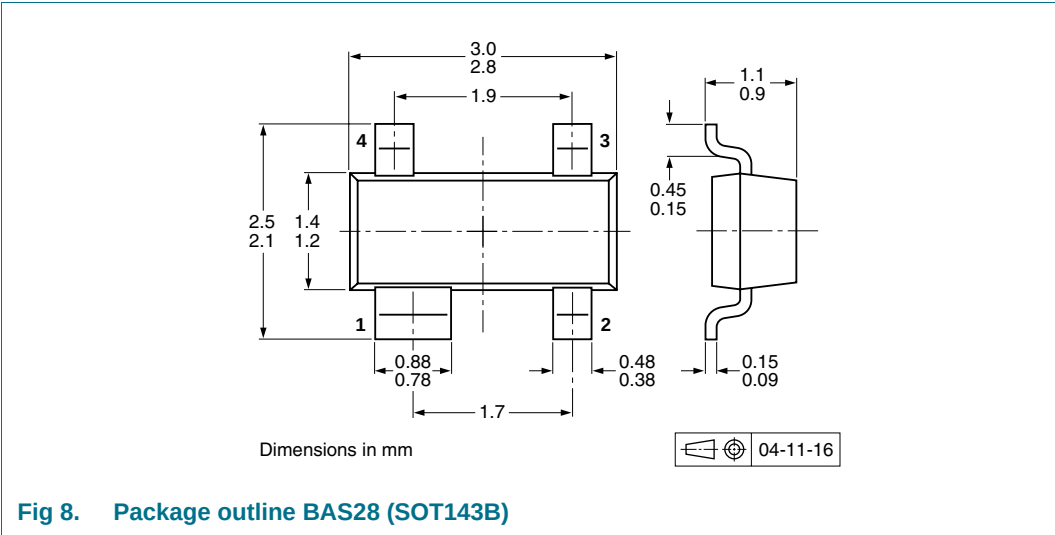
mga882

**Fig 7. Forward recovery voltage test circuit and waveforms**

### 8.1 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.

9. Package outline



10. Packing information

**Table 8. 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 |
| BAS28       | SOT143B | 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

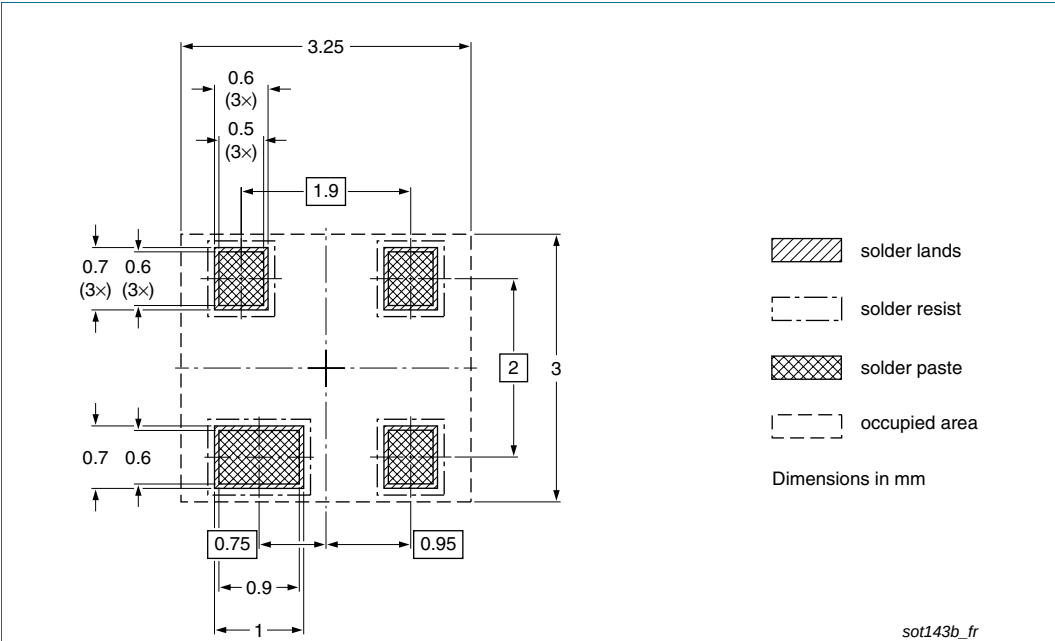


Fig 9. Reflow soldering footprint BAS28 (SOT143B)

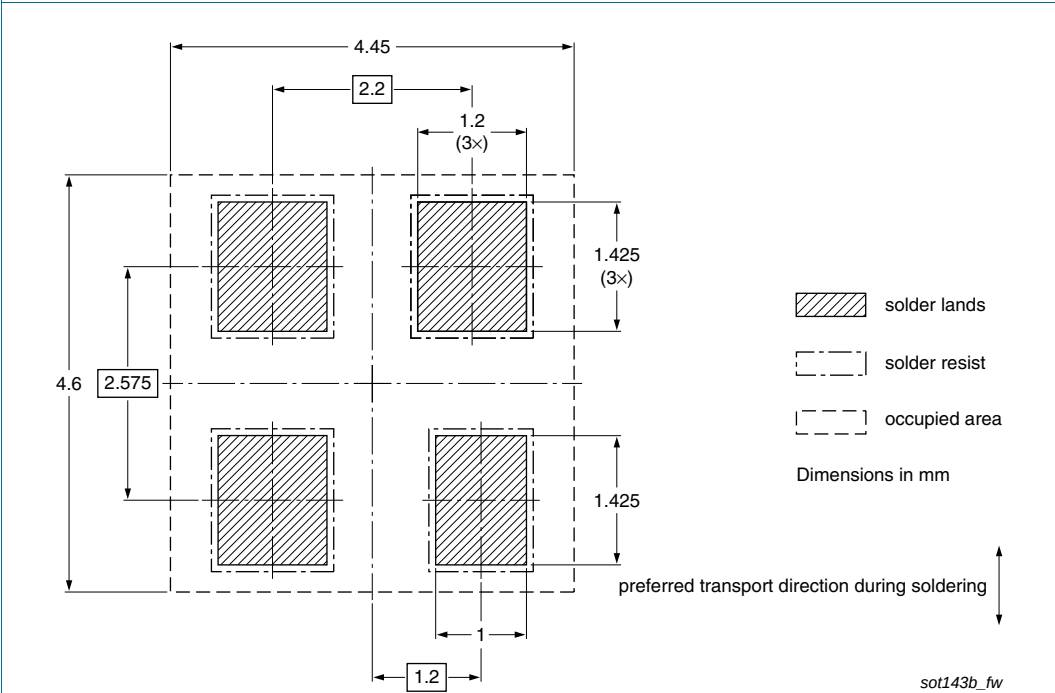


Fig 10. Wave soldering footprint BAS28 (SOT143B)

## 12. Revision history

Table 9. Revision history

| Document ID    | Release date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Data sheet status     | Change notice | Supersedes |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|------------|
| BAS28 v.3      | 20100722                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Product data sheet    | -             | BAS28_2    |
| 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>• <a href="#">Section 1.1 "General description"</a>: amended</li><li>• <a href="#">Section 4 "Marking"</a>: updated</li><li>• <a href="#">Table 1 "Quick reference data"</a>: added</li><li>• <a href="#">Section 8 "Test information"</a>: added</li><li>• <a href="#">Figure 8</a>: superseded by minimized package outline drawing</li><li>• <a href="#">Section 10 "Packing information"</a>: added</li><li>• <a href="#">Section 11 "Soldering"</a>: added</li><li>• <a href="#">Section 13 "Legal information"</a>: updated</li></ul> |                       |               |            |
| BAS28_2        | 19960910                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Product specification | -             | BAS28_1    |
| BAS28_1        | 19960403                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Product specification | -             | -          |

## 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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