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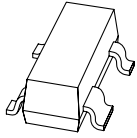
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Kind regards,

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 | μ A |
| V_R | reverse voltage | | - | - | 75 | V |
| t_{rr} | reverse recovery time | | [2] - | - | 4 | ns |

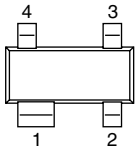
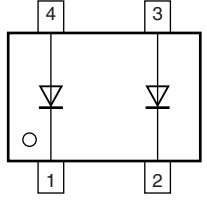
[1] Device mounted on an FR4 Printed-Circuit Board (PCB).

[2] When switched from $I_F = 10$ mA to $I_R = 10$ mA; $R_L = 100$ Ω ; 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 ^[1] |
|-------------|-----------------------------|
| 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_{RRM} | repetitive peak reverse voltage | | - | 85 | V | |
| V_R | reverse voltage | | - | 75 | V | |
| I_F | forward current | | [1] | 215 | mA | |
| I_{FRM} | repetitive peak forward current | | - | 500 | mA | |
| I_{FSM} | non-repetitive peak forward current | square wave | [3] | | | |
| | | $t_p = 1 \mu\text{s}$ | - | 4 | A | |
| | | $t_p = 1 \text{ms}$ | - | 1 | A | |
| | | $t_p = 1 \text{s}$ | - | 0.5 | A | |
| Per device | | | | | | |
| P_{tot} | total power dissipation | $T_{amb} = 25 \text{ }^\circ\text{C}$ | [1][2] | - | 250 | mW |
| T_j | junction temperature | | - | 150 | $^\circ\text{C}$ | |
| T_{stg} | storage temperature | | -65 | +150 | $^\circ\text{C}$ | |

[1] Device mounted on an FR4 PCB.

[2] One diode loaded.

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

6. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-------------------------------------|-----------------------------------------------|-------------|-----|-----|-----|------|
| Per device; one diode loaded | | | | | | |
| $R_{th(j-a)}$ | 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

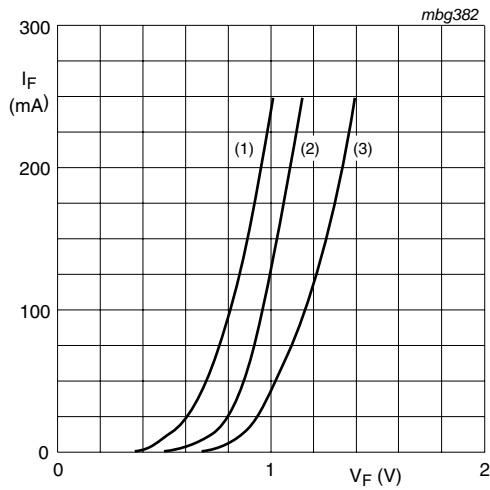
Table 7. Characteristics

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|--------------------------|--------------------------------------------------------|-----|-----|------|---------------|
| Per diode | | | | | | |
| 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 | μA |
| | | $V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$ | - | - | 30 | μA |
| | | $V_R = 75\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$ | - | - | 50 | μA |
| 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 |

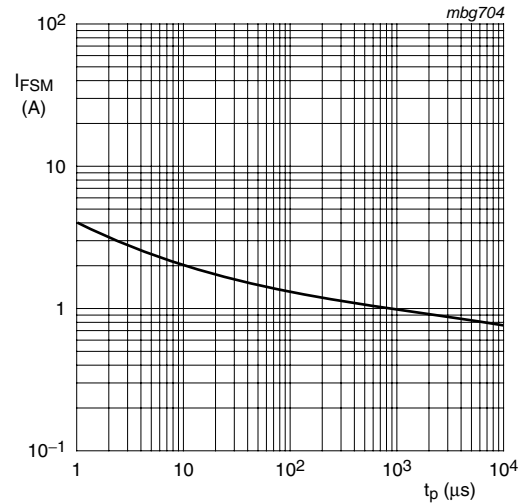
[1] When switched from $I_F = 10\text{ mA}$ to $I_R = 10\text{ mA}$; $R_L = 100\text{ }\Omega$; measured at $I_R = 1\text{ mA}$.

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



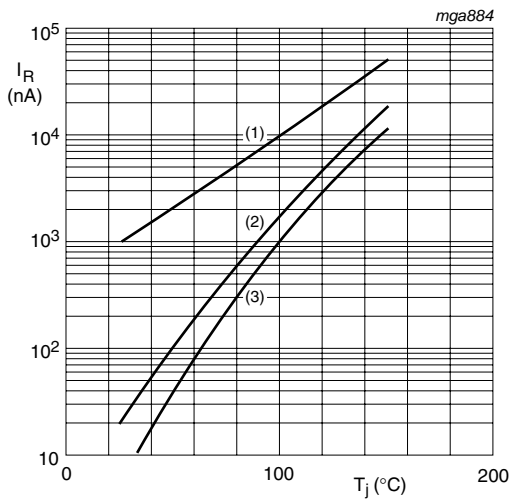
- (1) $T_j = 150\text{ }^{\circ}\text{C}$; typical values
- (2) $T_j = 25\text{ }^{\circ}\text{C}$; typical values
- (3) $T_j = 25\text{ }^{\circ}\text{C}$; maximum values

Fig 1. Forward current as a function of forward voltage



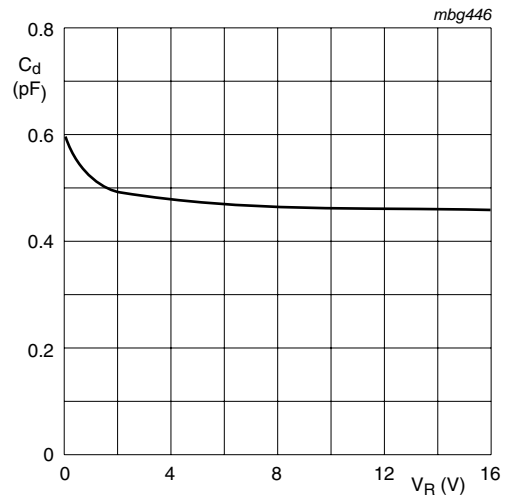
Based on square wave currents.
 $T_j = 25\text{ }^{\circ}\text{C}$; prior to surge

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



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

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

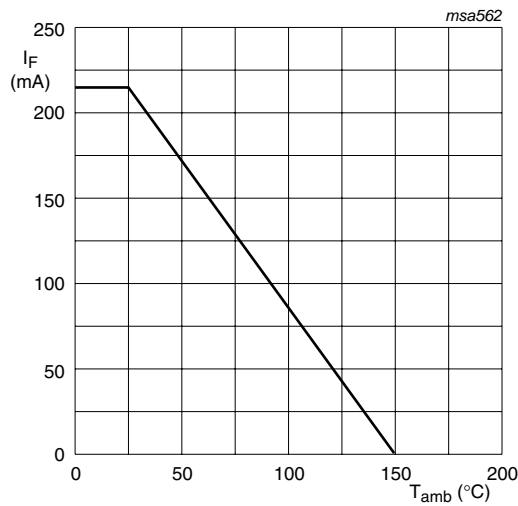


Fig 5. Forward current as a function of ambient temperature; derating curve

8. Test information

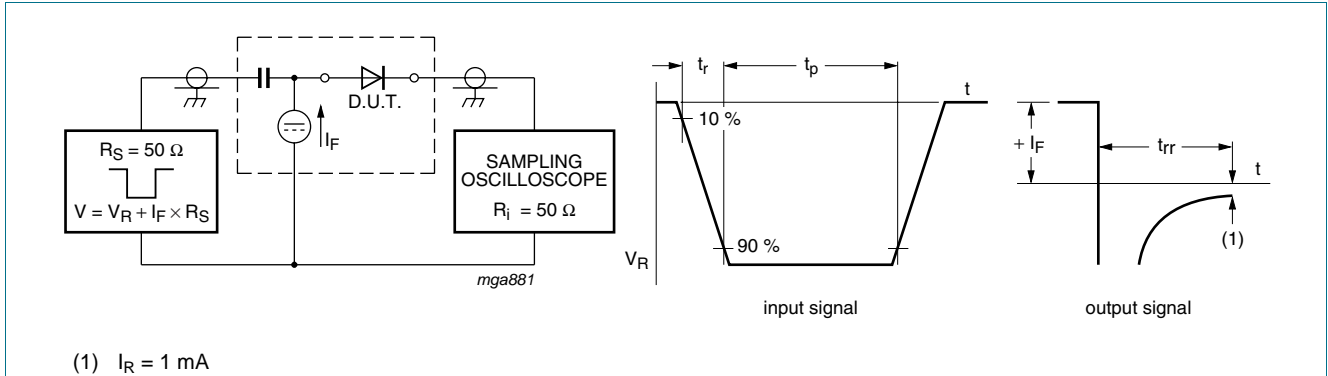


Fig 6. Reverse recovery time test circuit and waveforms

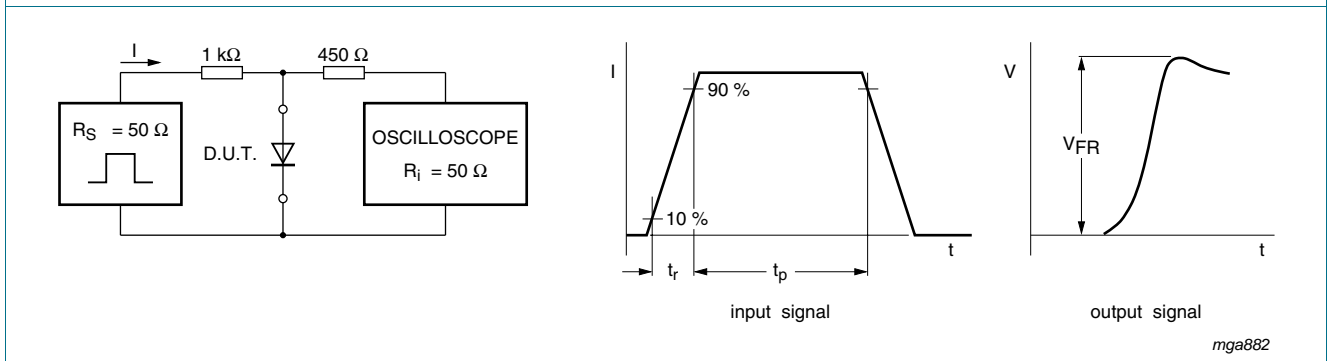


Fig 7. Forward recovery voltage test circuit and waveforms

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

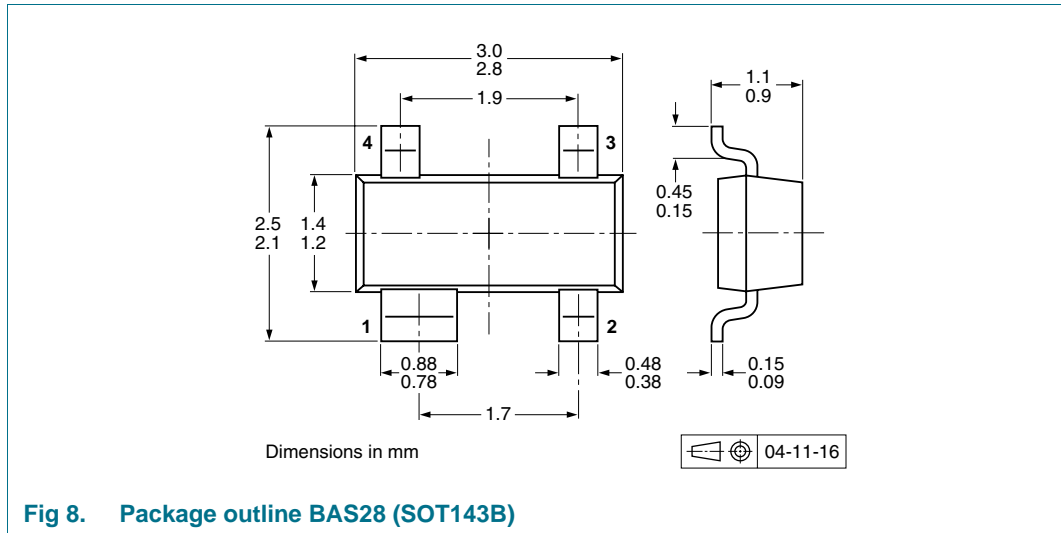


Fig 8. Package outline BAS28 (SOT143B)

10. Packing information

Table 8. Packing methods

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

| 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

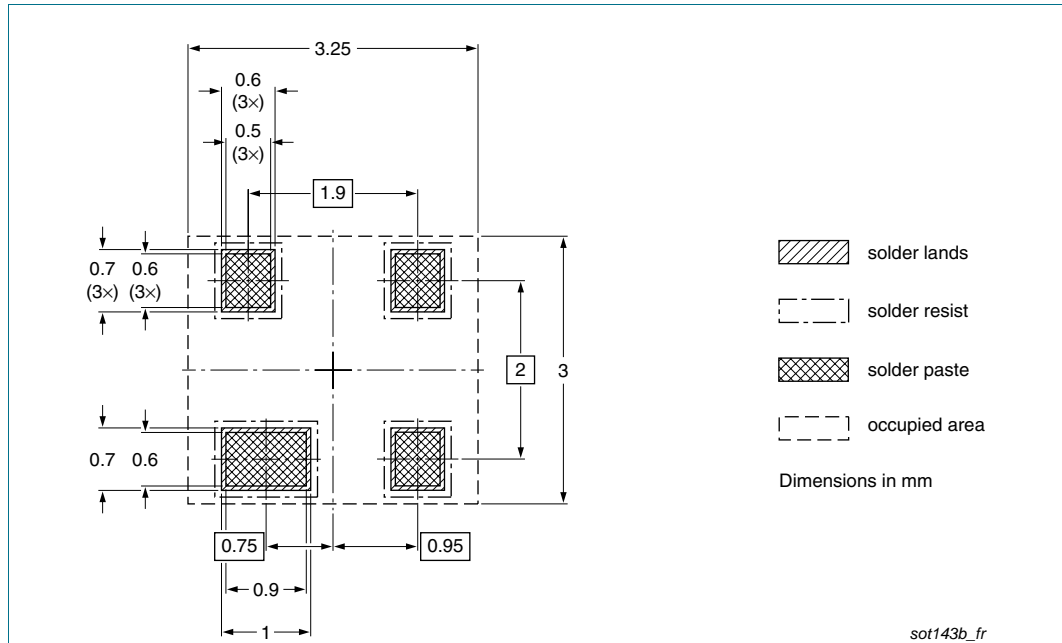


Fig 9. Reflow soldering footprint BAS28 (SOT143B)

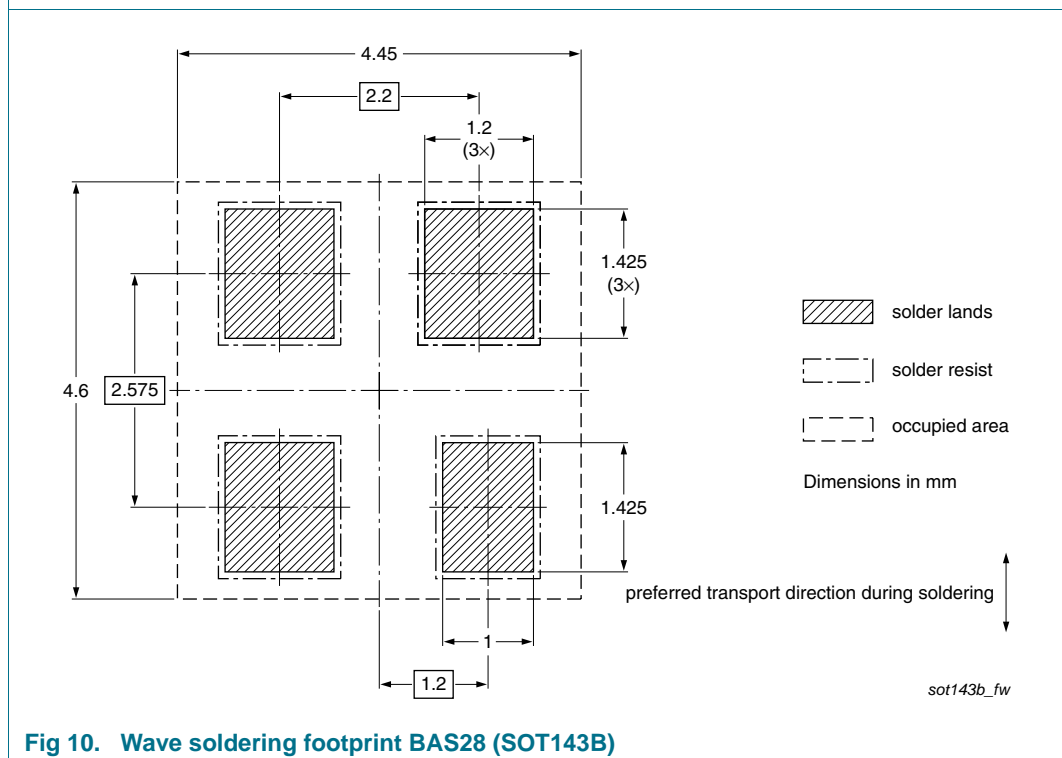


Fig 10. Wave soldering footprint BAS28 (SOT143B)

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"> • The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Section 1.1 “General description”: amended • Section 4 “Marking”: updated • Table 1 “Quick reference data”: added • Section 8 “Test information”: added • Figure 8: superseded by minimized package outline drawing • Section 10 “Packing information”: added • Section 11 “Soldering”: added • Section 13 “Legal information”: updated | | | |
| BAS28_2 | 19960910 | Product specification | - | BAS28_1 |
| BAS28_1 | 19960403 | Product specification | - | - |

13. Legal information

13.1 Data sheet status

| Document status ^{[1][2]} | Product status ^[3] | 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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15. Contents

| | | |
|-----------|------------------------------------------|-----------|
| 1 | Product profile | 1 |
| 1.1 | General description | 1 |
| 1.2 | Features and benefits | 1 |
| 1.3 | Applications | 1 |
| 1.4 | Quick reference data | 1 |
| 2 | Pinning information | 2 |
| 3 | Ordering information | 2 |
| 4 | Marking | 2 |
| 5 | Limiting values | 3 |
| 6 | Thermal characteristics | 3 |
| 7 | Characteristics | 4 |
| 8 | Test information | 6 |
| 8.1 | Quality information | 6 |
| 9 | Package outline | 7 |
| 10 | Packing information | 7 |
| 11 | Soldering | 8 |
| 12 | Revision history | 9 |
| 13 | Legal information | 10 |
| 13.1 | Data sheet status | 10 |
| 13.2 | Definitions | 10 |
| 13.3 | Disclaimers | 10 |
| 13.4 | Trademarks | 11 |
| 14 | Contact information | 11 |
| 15 | Contents | 12 |

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