

# DATA SHEET

**PZ1418B15U**

**NPN microwave power transistor**

Product specification  
Supersedes data of November 1994

1997 Feb 19

**NPN microwave power transistor**

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**FEATURES**

- Interdigitated structure provides high emitter efficiency
- Diffused emitter ballasting resistors providing excellent current sharing and withstanding a high VSWR
- Gold metallization realizes very stable characteristics and excellent lifetime
- Multicell geometry gives good balance of dissipated power and low thermal resistance
- Internal input and output prematching ensures good stability and easy broadband use.

**APPLICATIONS**

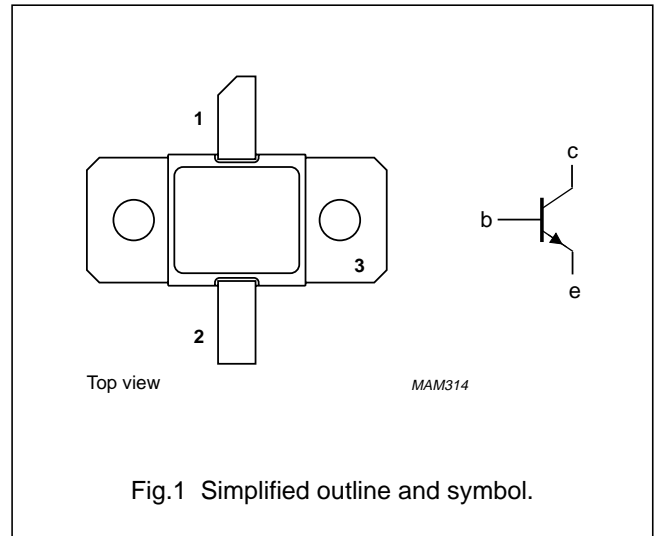
- Common base class-B wideband amplifiers under CW conditions in military and professional applications, and to drive the type PZ1418B30U.

**DESCRIPTION**

NPN silicon planar epitaxial microwave power transistor in a SOT443A metal ceramic flange package with the base connected to the flange.

**PINNING - SOT443A**

| PIN | DESCRIPTION              |
|-----|--------------------------|
| 1   | collector                |
| 2   | emitter                  |
| 3   | base connected to flange |



**QUICK REFERENCE DATA**

RF performance up to  $T_{mb} = 25\text{ }^\circ\text{C}$  in a common base class-B wideband amplifier.

| MODE OF OPERATION | f (GHz)    | V <sub>CC</sub> (V) | P <sub>L</sub> (W) | G <sub>p</sub> (dB) | η <sub>c</sub> (%) | Z <sub>i</sub> ; Z <sub>L</sub> (Ω) |
|-------------------|------------|---------------------|--------------------|---------------------|--------------------|-------------------------------------|
| Class-B           | 1.4 to 1.8 | 28                  | ≥12.5              | ≥7                  | ≥38                | see Figs 6 and 7                    |

**WARNING**

Product and environmental safety - toxic materials

This product contains beryllium oxide. The product is entirely safe provided that the BeO slab is not damaged. All persons who handle, use or dispose of this product should be aware of its nature and of the necessary safety precautions. After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with the general or domestic waste.

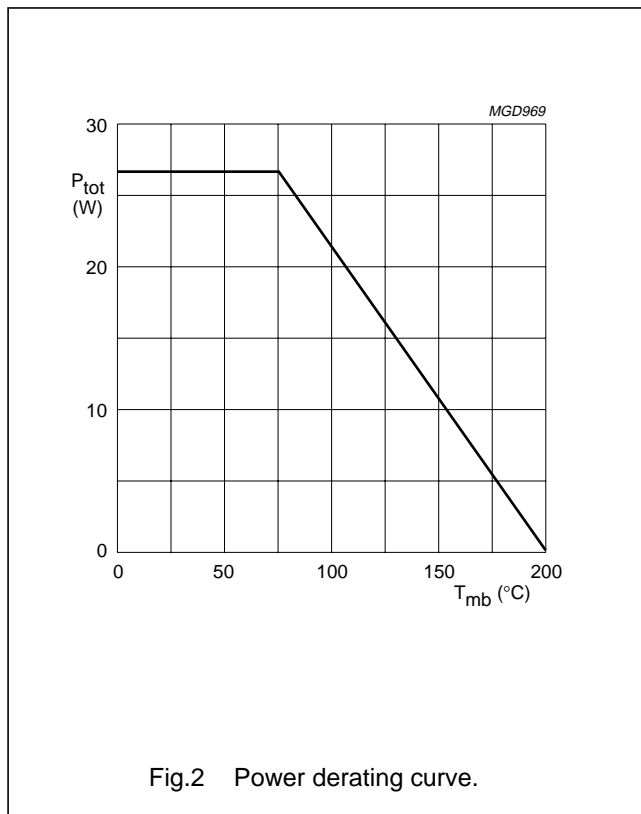
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**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL            | PARAMETER                      | CONDITIONS              | MIN. | MAX. | UNIT |
|-------------------|--------------------------------|-------------------------|------|------|------|
| V <sub>CBO</sub>  | collector-base voltage         | open emitter            | –    | 40   | V    |
| V <sub>CEO</sub>  | collector-emitter voltage      | open base               | –    | 15   | V    |
| V <sub>CES</sub>  | collector-emitter voltage      | R <sub>BE</sub> = 0 Ω   | –    | 35   | V    |
| V <sub>EBO</sub>  | emitter-base voltage           | open collector          | –    | 3    | V    |
| I <sub>C</sub>    | collector current (DC)         |                         | –    | 2    | A    |
| P <sub>tot</sub>  | total power dissipation        | T <sub>mb</sub> ≤ 75 °C | –    | 27   | W    |
| T <sub>stg</sub>  | storage temperature            |                         | –65  | +200 | °C   |
| T <sub>j</sub>    | operating junction temperature |                         | –    | 200  | °C   |
| T <sub>slid</sub> | soldering temperature          |                         | –    | 235  | °C   |



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## THERMAL CHARACTERISTICS

| SYMBOL         | PARAMETER   | CONDITIONS                                | MAX. | UNIT |
|----------------|---|---|------|------|
| $R_{th\ j-mb}$ | thermal resistance from junction to mounting-base | $T_j = 75\text{ }^\circ\text{C}$          | 4    | K/W  |
| $R_{th\ mb-h}$ | thermal resistance from mounting-base to heatsink | $T_j = 75\text{ }^\circ\text{C}$ ; note 1 | 0.2  | K/W  |

### Note

- See "Mounting recommendations in the General part of handbook SC15".

## CHARACTERISTICS

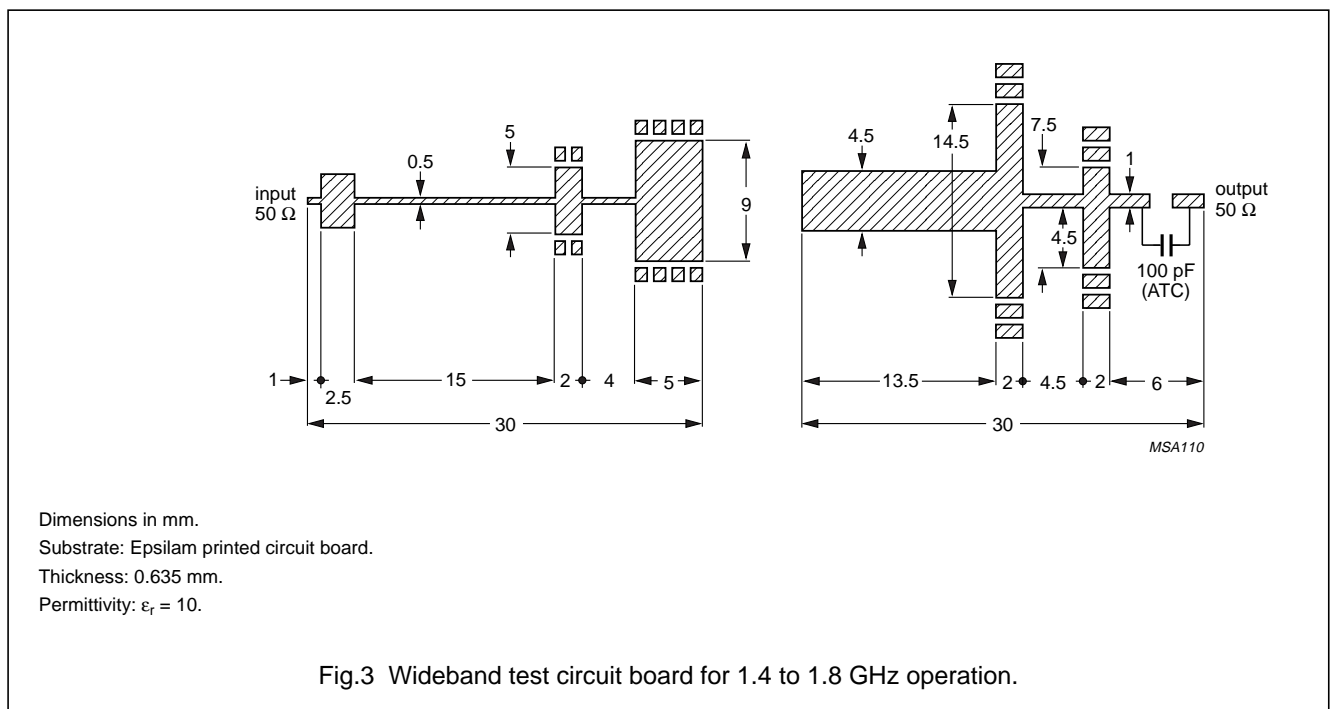
$T_{mb} = 25\text{ }^\circ\text{C}$  unless otherwise specified.

| SYMBOL    | PARAMETER                 | CONDITIONS                         | MAX. | UNIT          |
|-----------|---------------------------|------------------------------------|------|---------------|
| $I_{cBO}$ | collector cut-off current | $V_{CB} = 40\text{ V}; I_E = 0$    | 5    | mA            |
|           |                           | $V_{CB} = 30\text{ V}; I_E = 0$    | 2.5  | mA            |
| $I_{CES}$ | collector cut-off current | $V_{CE} = 35\text{ V}; R_{BE} = 0$ | 25   | mA            |
| $I_{EBO}$ | emitter cut-off current   | $V_{EB} = 1.5\text{ V}; I_C = 0$   | 100  | $\mu\text{A}$ |

## APPLICATION INFORMATION

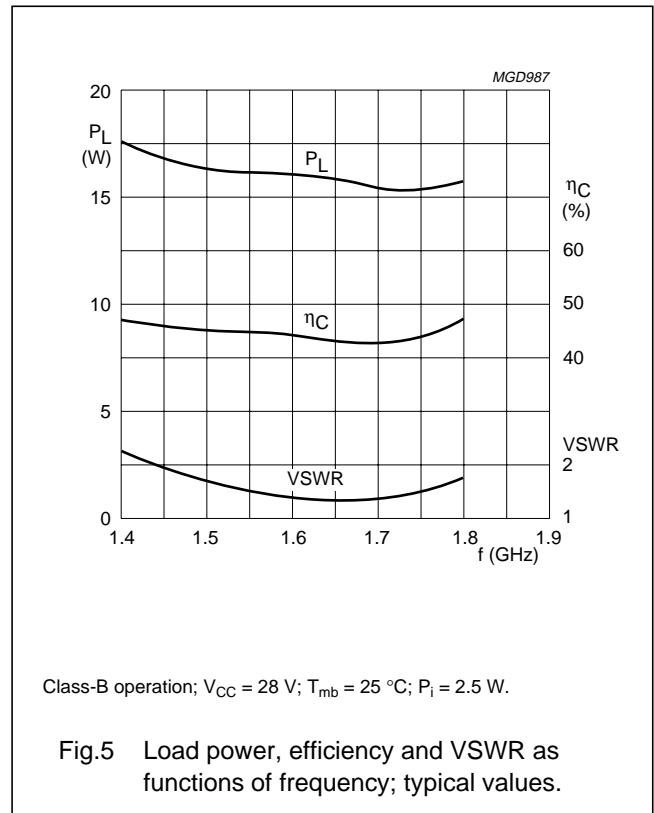
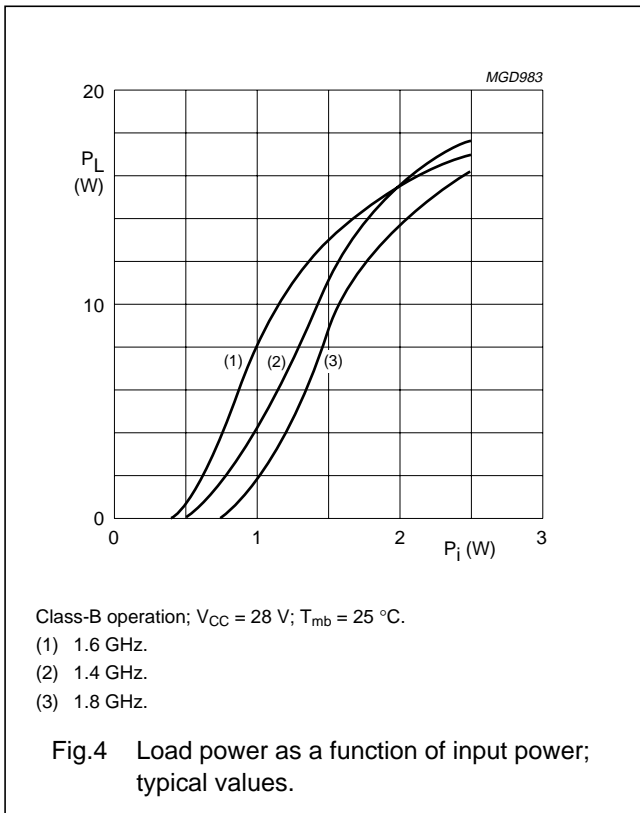
Microwave performance up to  $T_{mb} = 25\text{ }^\circ\text{C}$  in a common base class B wideband amplifier.

| MODE OF OPERATION | f (GHz)    | $V_{CC}$ (V) | $P_L$ (W)              | $G_p$ (dB)           | $\eta_c$ (%)         | $Z_i; Z_L$ ( $\Omega$ ) |
|-------------------|------------|--------------|------------------------|----------------------|----------------------|-------------------------|
| Class-B           | 1.4 to 1.8 | 28           | $\geq 12.5$<br>typ. 15 | $\geq 7$<br>typ. 7.8 | $\geq 38$<br>typ. 45 | see Figs 6 and 7        |



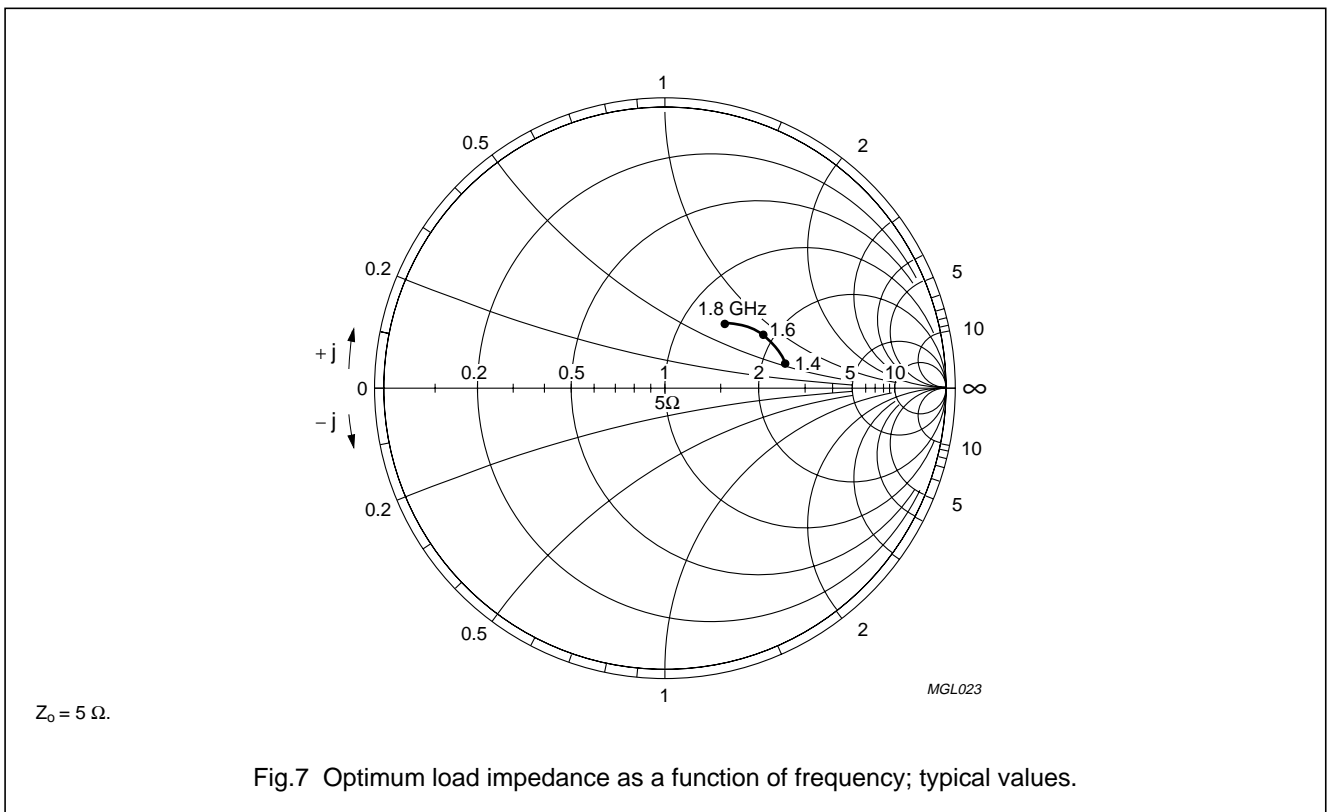
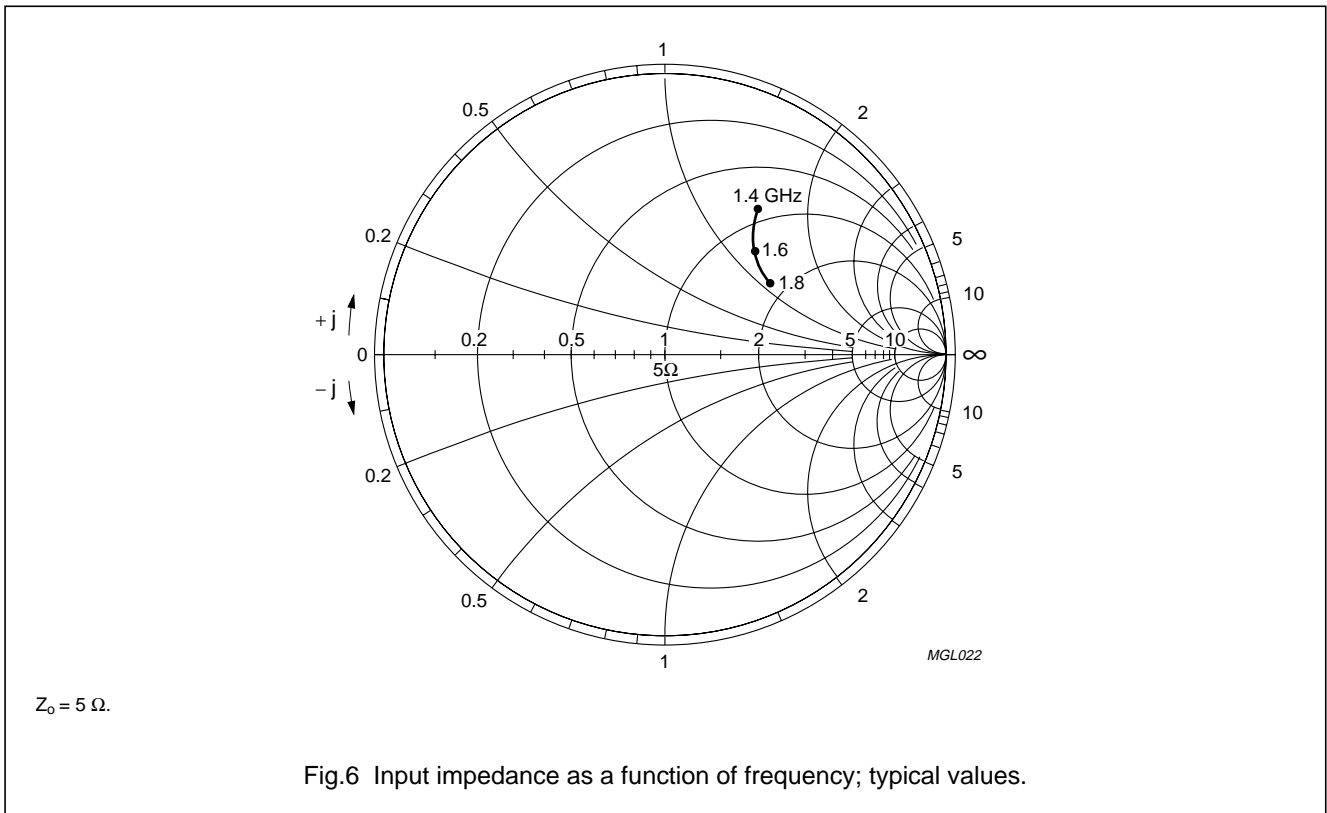
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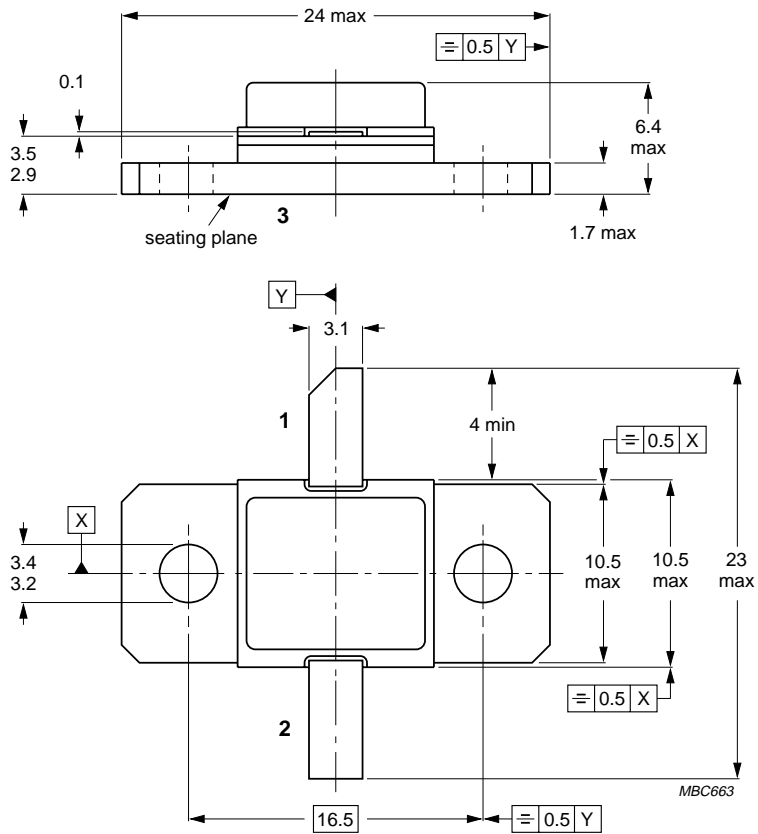
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## PACKAGE OUTLINE



Dimensions in mm.  
Torque on screw: Max. 0.5 Nm.  
Recommended screw: M3.

Fig.8 SOT443A.

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**DEFINITIONS**

| <b>Data Sheet Status</b>  |   |
|---|---|
| Objective specification   | This data sheet contains target or goal specifications for product development.       |
| Preliminary specification   | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification   | This data sheet contains final product specifications.                                |
| <b>Limiting values</b>  |   |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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. |   |
| <b>Application information</b>  |   |
| Where application information is given, it is advisory and does not form part of the specification.   |   |

**LIFE SUPPORT APPLICATIONS**

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**NOTES**

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**NOTES**

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