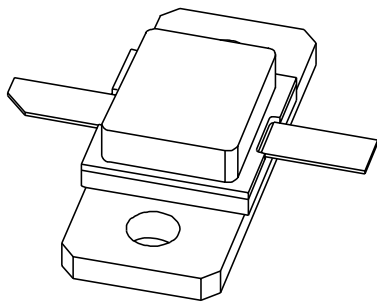


DATA SHEET



PZ1418B30U NPN microwave power transistor

Product specification
Supersedes data of 1997 Feb 19

1997 Nov 13

NPN microwave power transistor

PZ1418B30U

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

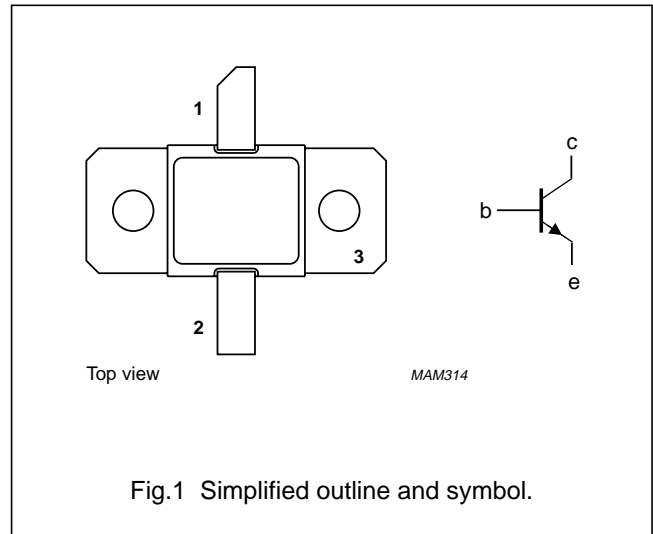
- Common base class-B broadband amplifiers under CW conditions in military and professional applications.

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.

| f (GHz) | V _{CC} (V) | P _L (W) | G _p (dB) | η _c (%) | Z _i ; Z _L (Ω) |
|------------|---------------------|--------------------|---------------------|--------------------|-------------------------------------|
| 1.4 to 1.8 | 28 | ≥27 | ≥7.3 | ≥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.

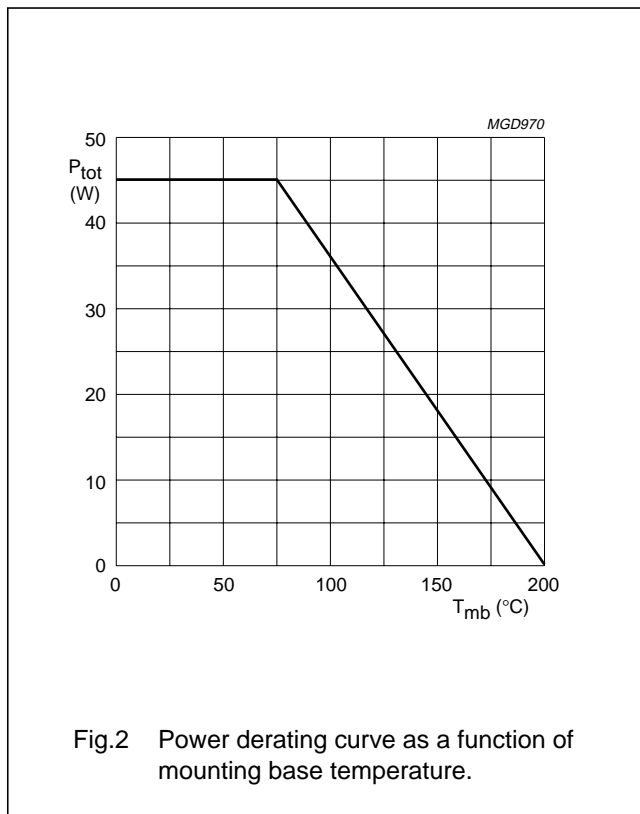
NPN microwave power transistor

PZ1418B30U

LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-------------------|--------------------------------|-------------------------|------|------|------|
| V _{CBO} | collector-base voltage | open emitter | – | 40 | V |
| V _{CEO} | collector-emitter voltage | open base | – | 15 | V |
| V _{CES} | collector-emitter voltage | R _{BE} = 0 | – | 35 | V |
| V _{EBO} | emitter-base voltage | open collector | – | 3 | V |
| I _C | collector current (DC) | | – | 4 | A |
| P _{tot} | total power dissipation | T _{mb} ≤ 75 °C | – | 45 | W |
| T _{stg} | storage temperature | | –65 | +200 | °C |
| T _j | operating junction temperature | | – | 200 | °C |
| T _{slid} | soldering temperature | | – | 235 | °C |



NPN microwave power transistor

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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | MAX. | UNIT |
|----------------|---|---|------|------|
| $R_{th\ j-mb}$ | thermal resistance from junction to mounting-base | $T_j = 75\text{ }^\circ\text{C}$ | 2.2 | 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

1. See "Mounting recommendations in the General part of handbook SC19a".

CHARACTERISTICS

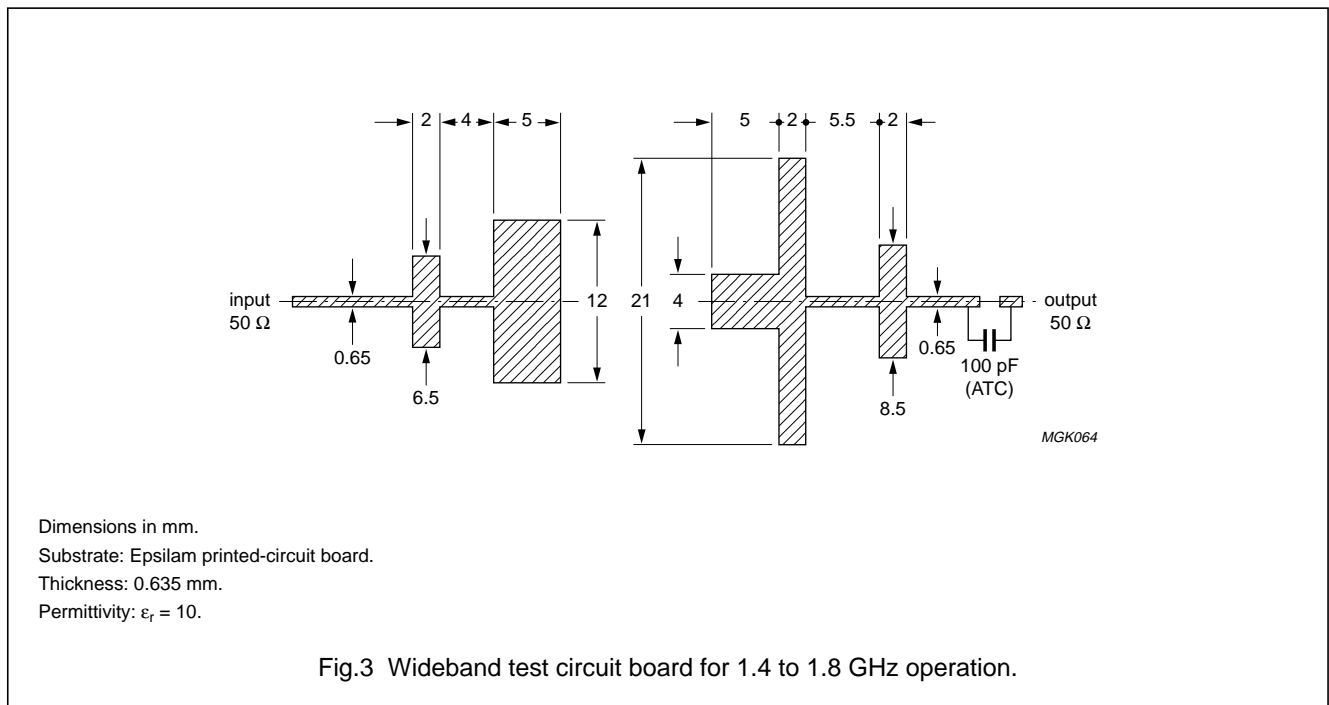
$T_{mb} = 25\text{ }^\circ\text{C}$ unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MAX. | UNIT |
|-----------|---------------------------|------------------------------------|------|---------------|
| I_{cBO} | collector cut-off current | $V_{CB} = 40\text{ V}; I_E = 0$ | 10 | mA |
| | | $V_{CB} = 30\text{ V}; I_E = 0$ | 5 | mA |
| I_{CES} | collector cut-off current | $V_{CE} = 35\text{ V}; R_{BE} = 0$ | 50 | mA |
| I_{EBO} | emitter cut-off current | $V_{EB} = 1.5\text{ V}; I_C = 0$ | 200 | μA |

APPLICATION INFORMATION

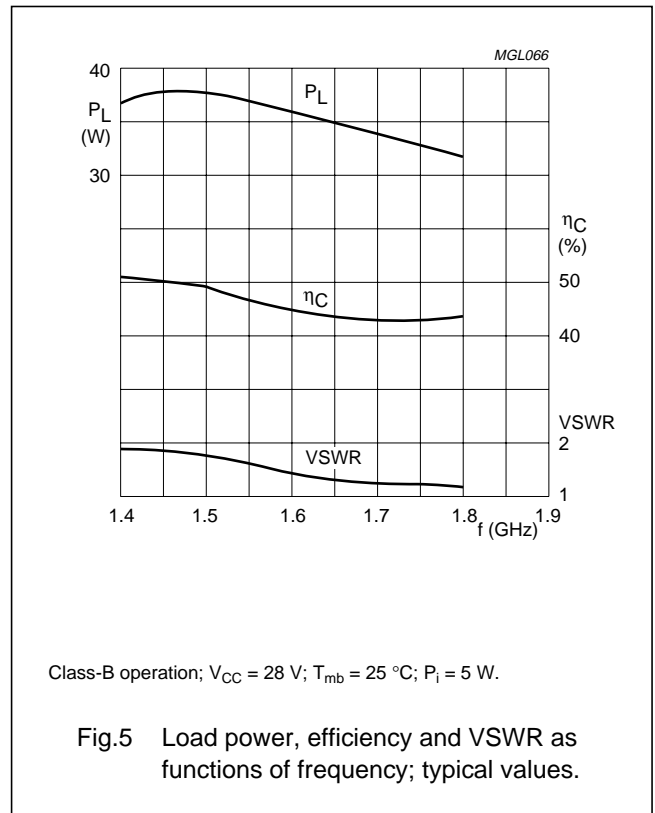
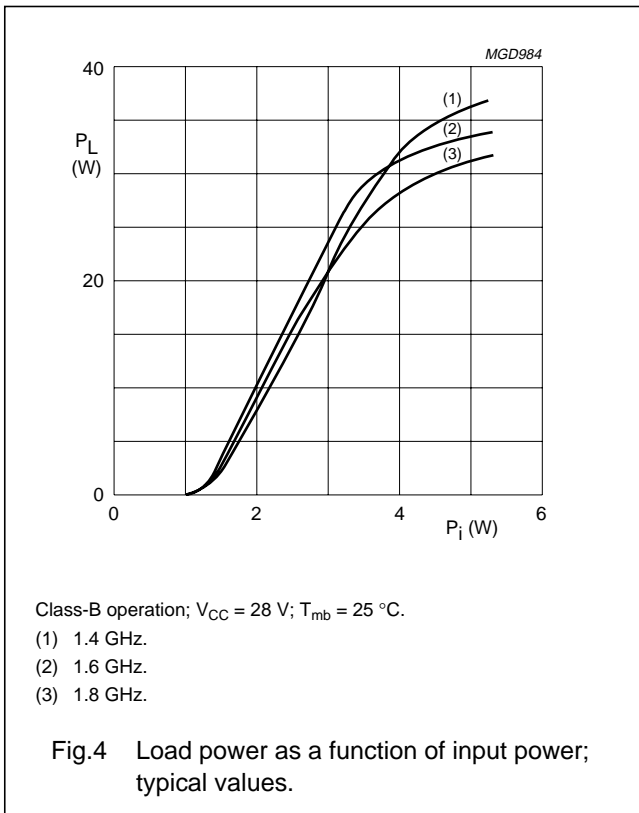
Microwave performance up to $T_{mb} = 25\text{ }^\circ\text{C}$ in a common base class B wideband amplifier.

| f (GHz) | V_{CC} (V) | P_L (W) | G_p (dB) | η_c (%) | $Z_i; Z_L$ (Ω) |
|------------|--------------|----------------------|------------------------|----------------------|-------------------------|
| 1.4 to 1.8 | 28 | ≥ 27 typ. 35 | ≥ 7.3 typ. 8.4 | ≥ 38 typ. 45 | see Figs 6 and 7 |



NPN microwave power transistor

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NPN microwave power transistor

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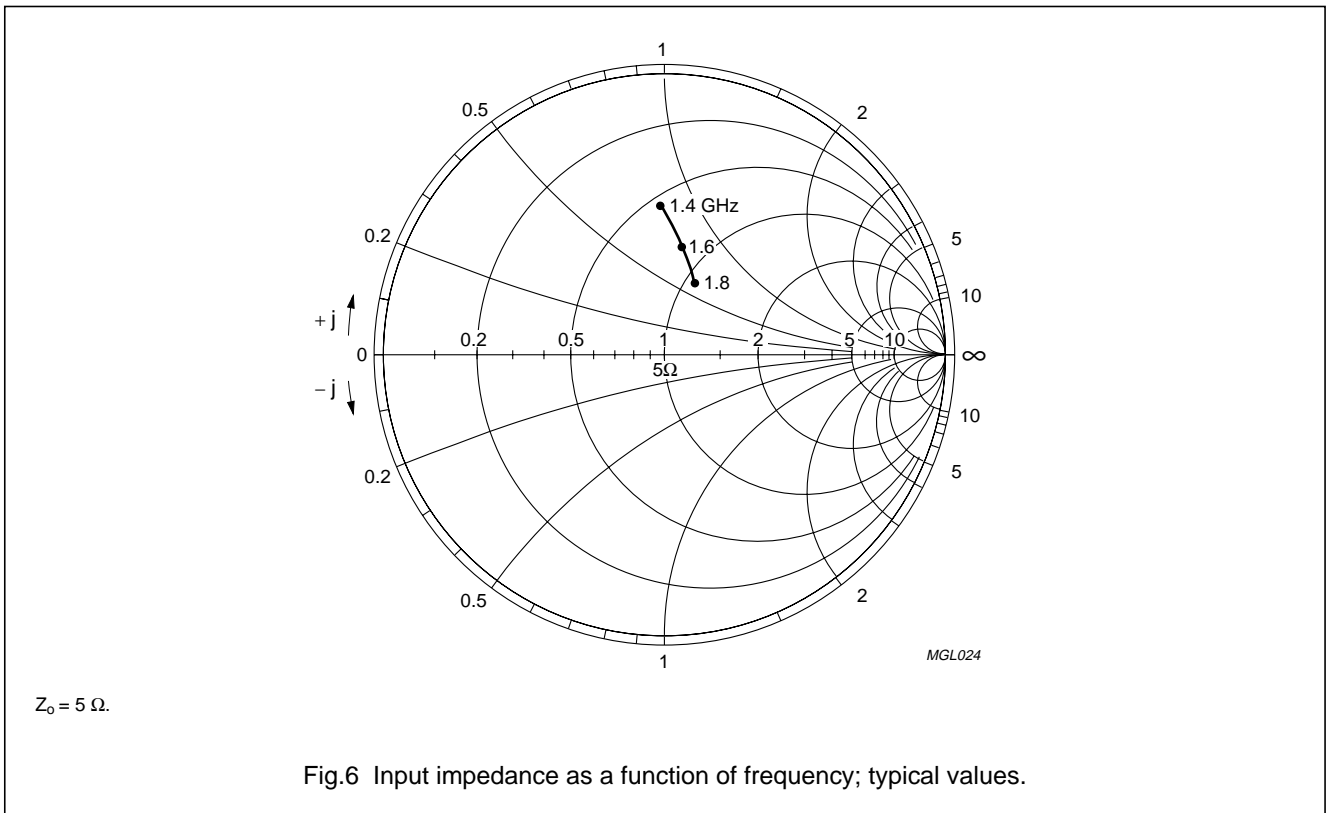


Fig.6 Input impedance as a function of frequency; typical values.

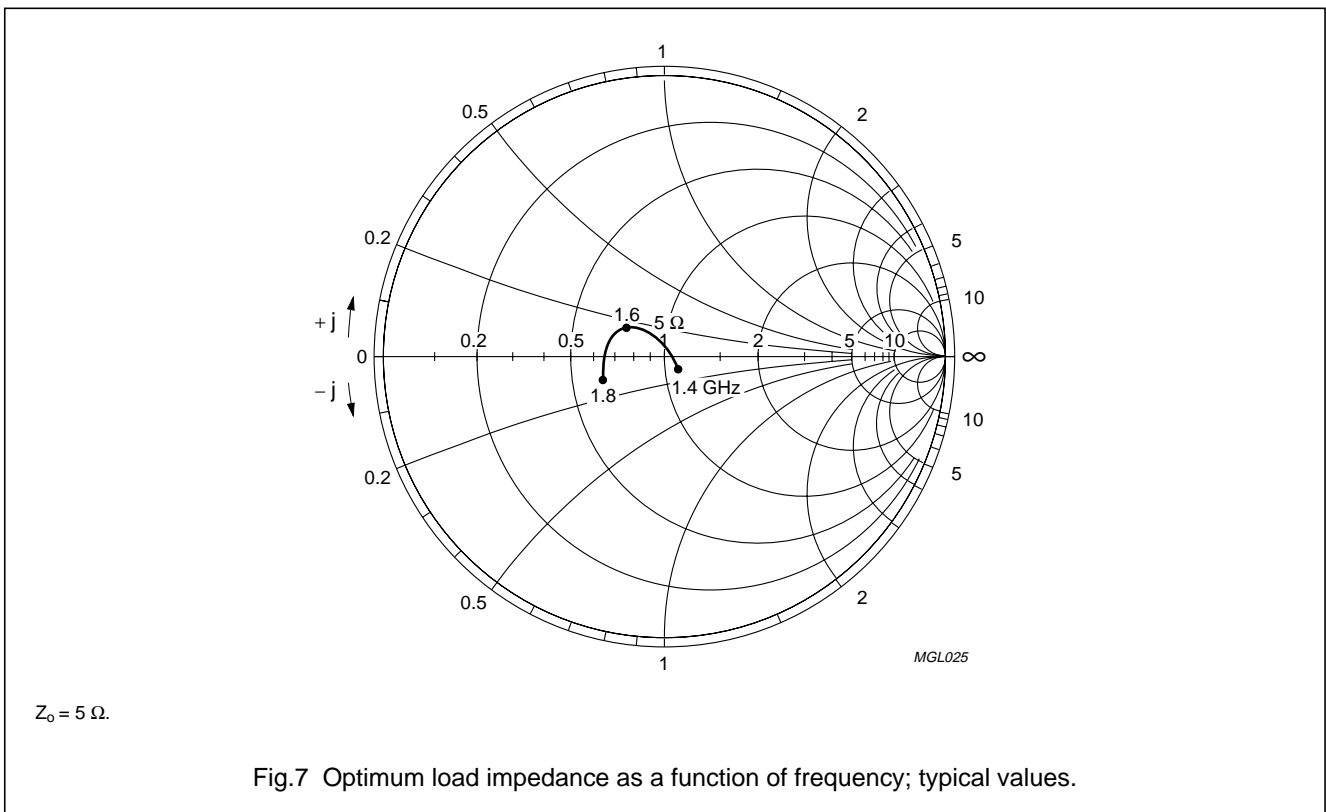


Fig.7 Optimum load impedance as a function of frequency; typical values.

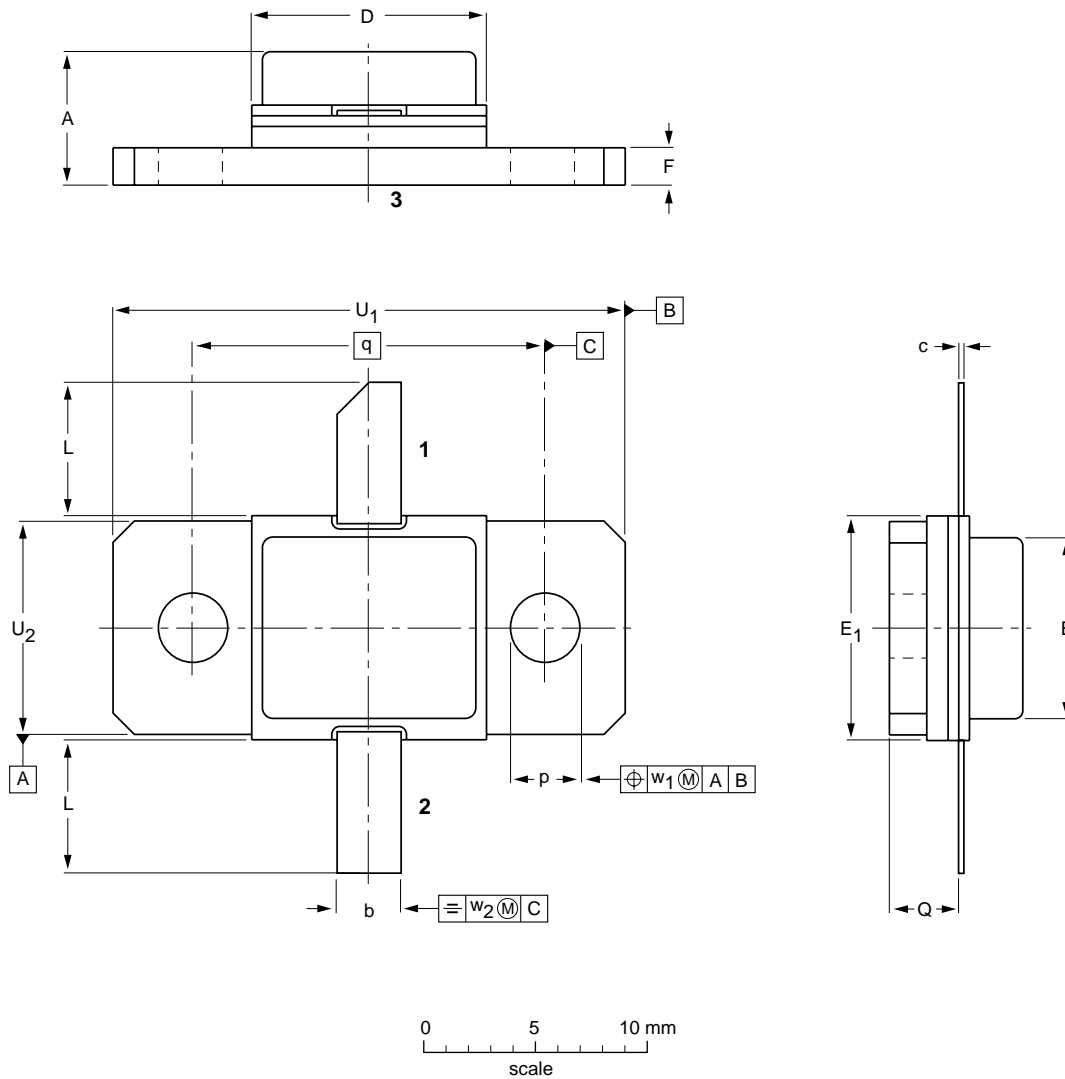
NPN microwave power transistor

PZ1418B30U

PACKAGE OUTLINE

Flanged hermetic ceramic package; 2 mounting holes; 2 leads

SOT443A



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

| UNIT | A | b | c | D | E | E ₁ | F | L | p | Q | q | U ₁ | U ₂ | w ₁ | w ₂ |
|------|--------------|--------------|--------------|---------------|--------------|----------------|--------------|--------------|--------------|--------------|-------|----------------|----------------|----------------|----------------|
| mm | 6.33 4.87 | 3.21 2.89 | 0.16 0.07 | 10.47 9.90 | 8.13 7.87 | 10.22 9.90 | 1.61 1.44 | 6.25 5.74 | 3.41 3.20 | 3.61 2.84 | 16.51 | 23.12 22.70 | 9.91 9.70 | 0.51 | 1.02 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|------|--|---------------------|------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT443A | | | | | | 97-05-23 |

NPN microwave power transistor

PZ1418B30U

DEFINITIONS

| Data Sheet Status | |
|---|---|
| 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. |
| Limiting values | |
| 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. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

NPN microwave power transistor

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NOTES

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NOTES

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Printed in The Netherlands

127147/00/03/pp12

Date of release: 1997 Nov 13

Document order number: 9397 750 03055

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