

DATA SHEET

LXE18300X

NPN microwave power transistor

Product specification
Supersedes data of January 1992
File under Discrete Semiconductors, SC15

1997 Feb 18

NPN microwave power transistor

LXE18300X

FEATURES

- Internal input and output prematching ensures a good stability and allows an easier design of wideband circuits
- Diffused emitter ballasting resistors provide excellent current sharing and withstanding at a high VSWR
- Interdigitated structure provides high emitter efficiency
- Gold metallization realizes very good stability of the characteristics and excellent lifetime
- Multicell geometry gives good balance of dissipated power and low thermal resistance.

APPLICATIONS

Intended for use in common emitter class AB power amplifiers for military and professional applications at frequencies from 1.6 to 1.85 GHz, in CW conditions.

DESCRIPTION

NPN silicon planar epitaxial microwave power transistor in a SOT439A metal ceramic flange package with emitter connected to flange.

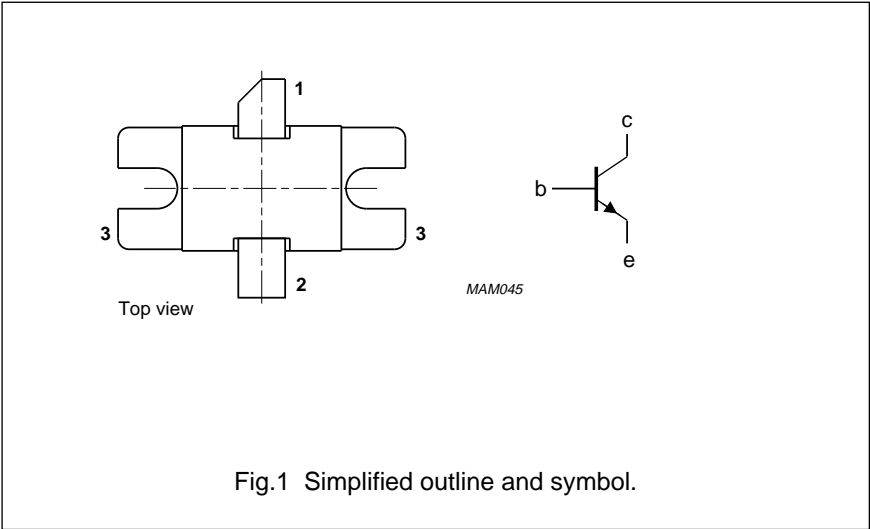
QUICK REFERENCE DATA

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

| MODE OF OPERATION | f (GHz) | V _{CE} (V) | I _{CQ} (A) | P _{L1} (W) | G _{PO} (dB) |
|-------------------|---------|---------------------|---------------------|---------------------|----------------------|
| Class AB (CW) | 1.85 | 24 | 0.3 | ≥27 | ≥8 |

PINNING - SOT439A

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



| 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. |

MAINTENANCE TYPE - NOT RECOMMENDED FOR NEW DESIGNS; SEE INDEX SECTION OF SC15

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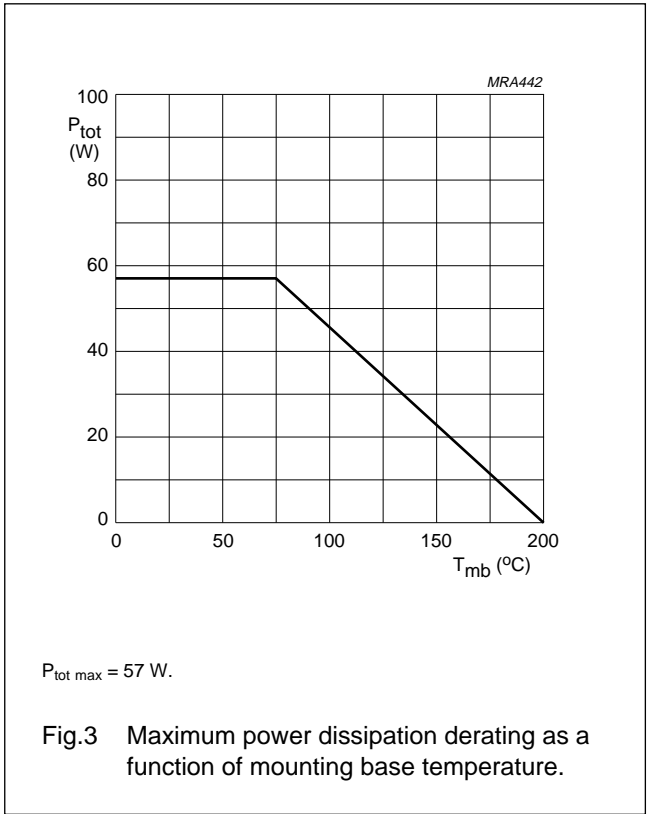
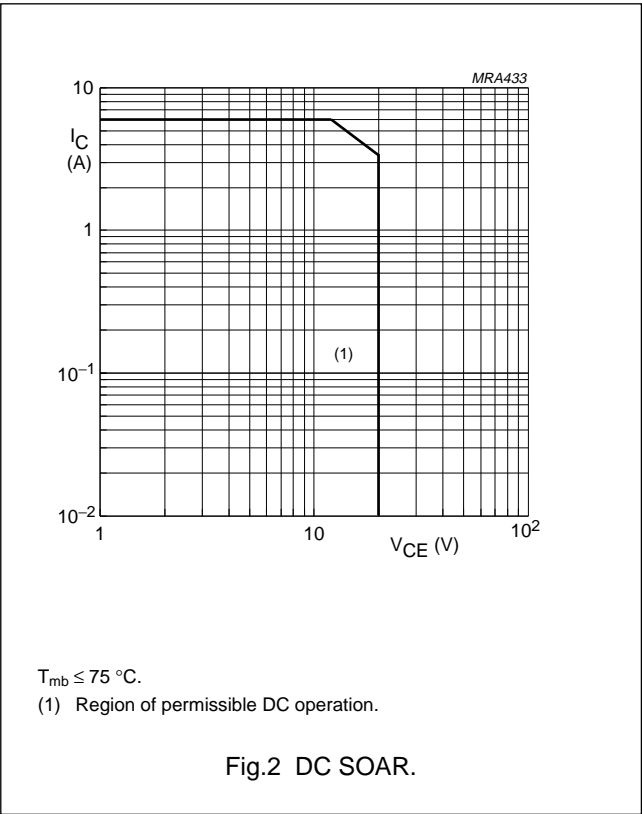
LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|--------------------------------|-------------------------|------|------|------|
| V _{CBO} | collector-base voltage | open emitter | – | 45 | V |
| V _{CER} | collector-emitter voltage | R _{BE} = 220 Ω | – | 30 | V |
| V _{CEO} | collector-emitter voltage | open base | – | 20 | V |
| V _{EBO} | emitter-base voltage | open collector | – | 3 | V |
| I _C | collector current | | – | 6 | A |
| P _{tot} | total power dissipation | T _{mb} = 75 °C | – | 57 | W |
| T _{stg} | storage temperature range | | –65 | +200 | °C |
| T _j | operating junction temperature | | – | 200 | °C |
| T _{sld} | soldering temperature | t ≤ 10 s; note 1 | – | 235 | °C |

Note

1. Up to 0.2 mm from ceramic.



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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | MAX. | UNIT |
|----------------|--------------------------------|-----------------------------|------|------|
| $R_{th\ j-mb}$ | from junction to mounting base | $T_j = 100\ ^\circ\text{C}$ | 1.7 | K/W |
| $R_{th\ mb-h}$ | from mounting base to heatsink | note 1 | 0.2 | K/W |

Note

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

CHARACTERISTICS

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|---------------------------|---|------|------|---------------|
| I_{CBO} | collector cut-off current | $V_{CB} = 20\ \text{V}; I_E = 0$ | – | 3 | mA |
| | | $V_{CB} = 40\ \text{V}; I_E = 0$ | – | 30 | mA |
| I_{CER} | collector cut-off current | $V_{CE} = 30\ \text{V}; R_{BE} = 220\ \Omega$ | – | 30 | mA |
| I_{CEO} | collector cut-off current | $V_{CE} = 20\ \text{V}; I_B = 0$ | – | 30 | mA |
| I_{EBO} | emitter cut-off current | $V_{EB} = 1.5\ \text{V}; I_C = 0$ | – | 300 | μA |
| h_{FE} | DC current gain | $V_{CE} = 3\ \text{V}; I_C = 3\ \text{A}$ | 20 | 100 | |

APPLICATION INFORMATION

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

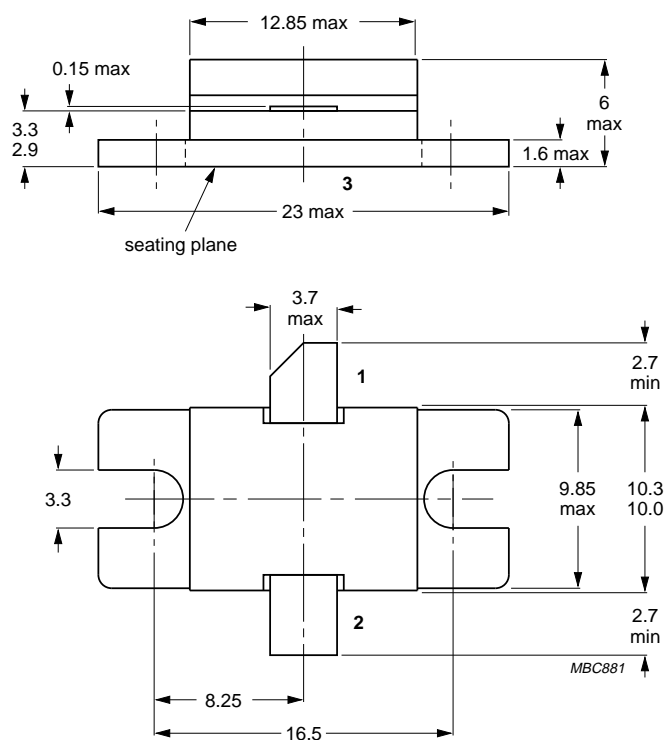
| MODE OF OPERATION | f (GHz) | V_{CE} (V) | I_{CQ} (A) | P_{L1} (W) | G_{PO} (dB) |
|-------------------|------------|-----------------|-----------------|---------------------|-------------------|
| Class AB (CW) | 1.85 | 24 | 0.3 | ≥ 27 ; typ. 30 | ≥ 8 ; typ. 9 |

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PACKAGE OUTLINE



Dimensions in mm.

Torque on screws: max. 0.4 Nm.

Recommended screw: M3.

Recommended pitch for mounting screws: 19 mm.

Fig.4 SOT439A.

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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 this 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.

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