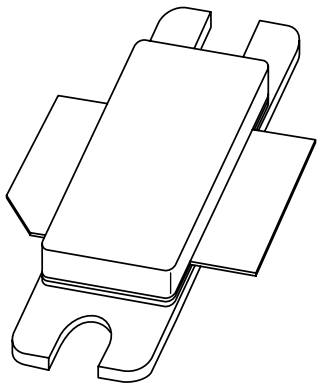


DATA SHEET



BLF1048 UHF power LDMOS transistor

Preliminary specification
Supersedes data of 1999 July 01

2000 Feb 02

UHF power LDMOS transistor

BLF1048

FEATURES

- High power gain
- Easy power control
- Excellent ruggedness
- Source on underside eliminates DC isolators, reducing common mode inductance
- Designed for broadband operation (HF to 1 GHz).

APPLICATIONS

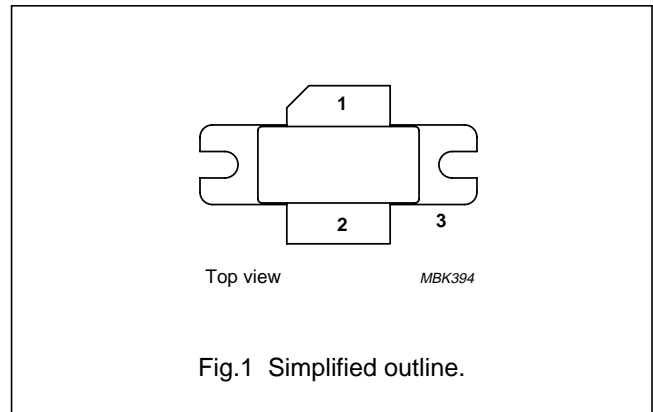
- Communication transmitter applications in the UHF frequency range.

DESCRIPTION

Silicon N-channel enhancement mode lateral D-MOS transistor encapsulated in a 2-lead flange package (SOT502A) with a ceramic cap. The common source is connected to the mounting flange.

PINNING - SOT502A

| PIN | DESCRIPTION |
|-----|-----------------------------|
| 1 | drain |
| 2 | gate |
| 3 | source, connected to flange |



QUICK REFERENCE DATA

RF performance at $T_h = 25\text{ }^\circ\text{C}$ in a common source test circuit.

| MODE OF OPERATION | f (MHz) | V_{DS} (V) | P_L (W) | G_p (dB) | η_D (%) | d_{im} (dBc) |
|-----------------------|--------------------------|--------------|-----------|------------|--------------|----------------|
| CW, class-AB (2-tone) | $f_1 = 960; f_2 = 960.1$ | 26 | 90 (PEP) | >14 | >35 | ≤ -26 |
| CW, class-AB (1-tone) | 960 | 26 | 90 | >14 | >45 | – |

CAUTION

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A and SNW-FQ-302B.

UHF power LDMOS transistor

BLF1048

LIMITING VALUES

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

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|-----------|----------------------|------|----------|------|
| V_{DS} | drain-source voltage | – | 65 | V |
| V_{GS} | gate-source voltage | – | ± 20 | V |
| I_D | drain current (DC) | – | 9 | A |
| T_{stg} | storage temperature | –65 | +150 | °C |
| T_j | junction temperature | – | 200 | °C |

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------|--|---|-------|------|
| $R_{th\ j-h}$ | thermal resistance from junction to heatsink | $T_h = 25\text{ °C}$; $P_{tot} = 100\text{ W}$; note 1 | 1.15 | K/W |

Note

1. Determined under specified RF operating conditions, based on maximum peak junction temperature.

CHARACTERISTICS $T_j = 25\text{ °C}$ unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---------------|----------------------------------|--|------|------|------|------------------|
| $V_{(BR)DSS}$ | drain-source breakdown voltage | $V_{GS} = 0$; $I_D = 1.4\text{ mA}$ | 65 | – | – | V |
| V_{GSth} | gate-source threshold voltage | $V_{DS} = 10\text{ V}$; $I_D = 140\text{ mA}$ | 4 | – | 5 | V |
| I_{DSS} | drain-source leakage current | $V_{GS} = 0$; $V_{DS} = 26\text{ V}$ | – | – | 10 | μA |
| I_{DSX} | drain cut-off current | $V_{GS} = V_{GSth} + 9\text{ V}$; $V_{DS} = 10\text{ V}$ | 25 | – | – | A |
| I_{GSS} | gate leakage current | $V_{GS} = \pm 20\text{ V}$; $V_{DS} = 0$ | – | – | 250 | nA |
| g_{fs} | forward transconductance | $V_{DS} = 10\text{ V}$; $I_D = 7\text{ A}$ | – | 4 | – | S |
| R_{DSon} | drain-source on-state resistance | $V_{GS} = V_{GSth} + 9\text{ V}$; $I_D = 7\text{ A}$ | – | 150 | – | $\text{m}\Omega$ |
| C_{is} | input capacitance | $V_{GS} = 0$; $V_{DS} = 26\text{ V}$; $f = 1\text{ MHz}$ | – | 92 | – | pF |
| C_{os} | output capacitance | $V_{GS} = 0$; $V_{DS} = 26\text{ V}$; $f = 1\text{ MHz}$ | – | 74 | – | pF |
| C_{rs} | feedback capacitance | $V_{GS} = 0$; $V_{DS} = 26\text{ V}$; $f = 1\text{ MHz}$ | – | 3 | – | pF |

APPLICATION INFORMATIONRF performance in a common source class-AB circuit. $T_h = 25\text{ °C}$; $R_{th\ j-h} = 1.15\text{ K/W}$, unless otherwise specified.

| MODE OF OPERATION | f (MHz) | V_{DS} (V) | P_L (W) | G_p (dB) | η_D (%) | d_{im} (dBc) |
|-----------------------|-----------------------------|--------------|-----------|------------|--------------|----------------|
| CW, class-AB (2-tone) | $f_1 = 960$; $f_2 = 960.1$ | 26 | 90 (PEP) | >14 | >35 | ≤ -26 |
| CW, class-AB (1-tone) | 960 | 26 | 90 | >14 | >45 | – |

Ruggedness in class-AB operationThe BLF1048 is capable of withstanding a load mismatch corresponding to $VSWR = 10 : 1$ through all phases under the following conditions: $V_{DS} = 26\text{ V}$; $f = 960\text{ MHz}$ at rated load power.

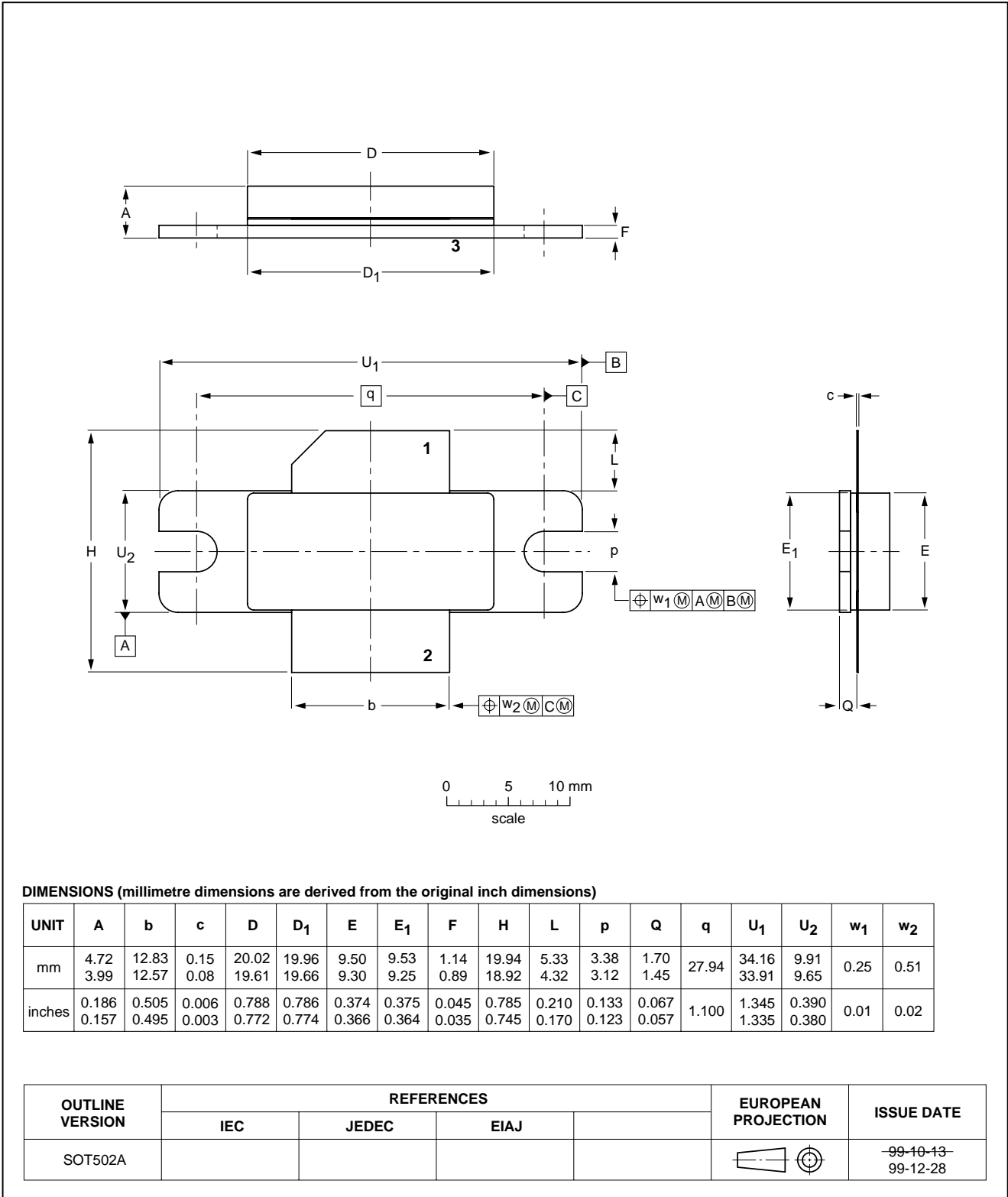
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BLF1048

PACKAGE OUTLINE

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads

SOT502A



UHF power LDMOS transistor

BLF1048

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.

UHF power LDMOS transistor

BLF1048

NOTES

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BLF1048

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