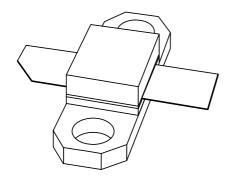
DISCRETE SEMICONDUCTORS

DATA SHEET



BLL1214-35L-band radar LDMOS driver transistor

Product specification

2002 Sep 27





L-band radar LDMOS driver transistor

BLL1214-35

FEATURES

- · High power gain
- · Easy power control
- Excellent ruggedness
- Source on mounting base eliminates DC isolators, reducing common mode inductance.

APPLICATIONS

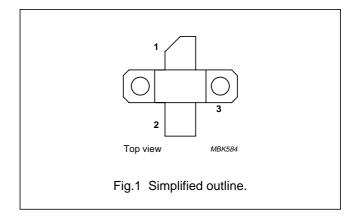
 L-band radar applications in the 1200 to 1400 MHz frequency range.

DESCRIPTION

Silicon N-channel enhancement mode lateral D-MOS transistor encapsulated in a 2-lead flange package (SOT467C) with a ceramic cap. The common source is connected to the flange.

PINNING - SOT467C

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



QUICK REFERENCE DATA

RF performance at T_h = 25 °C in a common source test circuit.

| MODE OF OPERATION | f | V _{DS} | P _L | G _p | η _D |
|---|--------------|-----------------|----------------|----------------|----------------|
| | (MHz) | (V) | (W) | (dB) | (%) |
| Pulsed class-AB; t = 1 ms; δ = 10 % | 1200 to 1400 | 36 | 35 | >13 | >43 |

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|-------------------------|---|------|------|------|
| V_{DS} | drain-source voltage | | _ | 75 | V |
| V_{GS} | gate-source voltage | | _ | ±15 | V |
| P _{tot} | total power dissipation | under RF conditions; T _h ≤ 25 °C | _ | 110 | W |
| T _{stg} | storage temperature | | -65 | +150 | °C |
| Tj | junction temperature | | _ | 200 | °C |

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THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---------------------|---|--------------------------------|-------|------|
| Z _{th j-h} | thermal impedance from junction to heatsink | T _h = 25 °C; note 1 | 1.1 | K/W |

Note

1. Thermal resistance is determined under RF operating conditions; t_p = 1 ms, δ = 10 %.

CHARACTERISTICS

T_i = 25 °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------------------|----------------------------------|---|------|------|------|------|
| V _{(BR)DSS} | drain-source breakdown voltage | $V_{GS} = 0$; $I_D = 0.7 \text{ mA}$ | 75 | _ | _ | ٧ |
| V _{GSth} | gate-source threshold voltage | V _{DS} = 10 V; I _D = 70 mA | 4.5 | _ | 5.5 | V |
| I _{DSS} | drain-source leakage current | V _{GS} = 0; V _{DS} = 36 V | _ | _ | 10 | μΑ |
| I _{DSX} | on-state drain current | V _{GS} = V _{GSth} + 9 V; V _{DS} = 10 V | 10 | _ | _ | Α |
| I _{GSS} | gate leakage current | $V_{GS} = \pm 20 \text{ V}; V_{DS} = 0$ | _ | _ | 125 | nA |
| g _{fs} | forward transconductance | V _{DS} = 10 V; I _D = 2.5 A | _ | 2 | _ | S |
| R _{DSon} | drain-source on-state resistance | V _{GS} = 10 V; I _D = 2.5 A | _ | 300 | _ | mΩ |

APPLICATION INFORMATION

RF performance in a common source class-AB circuit. $T_h = 25$ °C; $Z_{th\ mb-h} = 0.65$ K/W, unless otherwise specified.

| MODE OF OPERATION | f (MHz) | V _{DS} (V) | I _{DQ} (mA) | P _L (W) | G _p (dB) | η _D (%) |
|---|--------------|---------------------|-------------------------|-----------------------|------------------------|-----------------------|
| Pulsed class-AB; t = 1 ms; δ = 10 % | 1200 to 1400 | 36 | 50 | 35 | >13 | >43 |

Ruggedness in class-AB operation

The BLL1214-35 is capable of withstanding a load mismatch corresponding to VSWR = 5: 1 through all phases under the following conditions: $V_{DS} = 36$ V; frequency from 1200 MHz to 1400 MHz at rated load power.

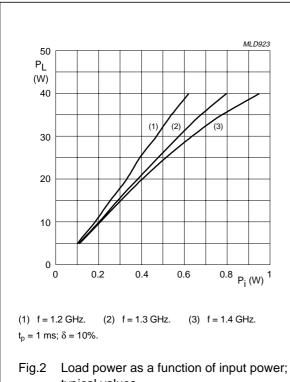
Typical impedance

| FREQUENCY (GHZ) | Z _S (Ω) | Z _L (Ω) |
|--------------------|-----------------------|-----------------------|
| 1.20 | 6.48 – j 3.9 | 1.95 + j 3.27 |
| 1.25 | 3.88 – j 3.2 | 1.90 + j 2.57 |
| 1.30 | 3.28 – j 2.4 | 2.01 + j 2.27 |
| 1.35 | 2.55 – j 1.48 | 2.20 + j 2.26 |
| 1.40 | 1.69 – j 0.51 | 1.72 + j 2.35 |

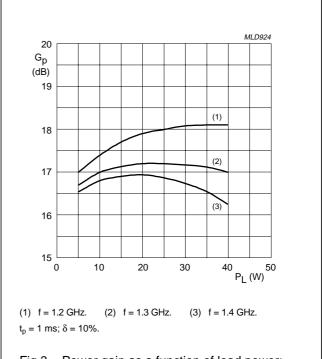
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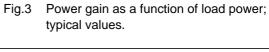
L-band radar LDMOS driver transistor

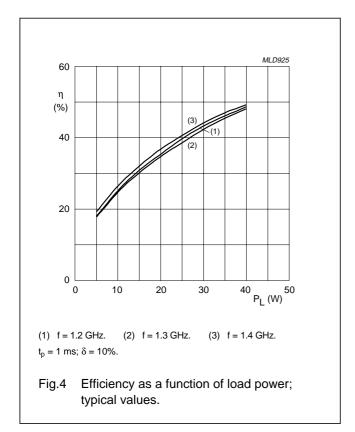
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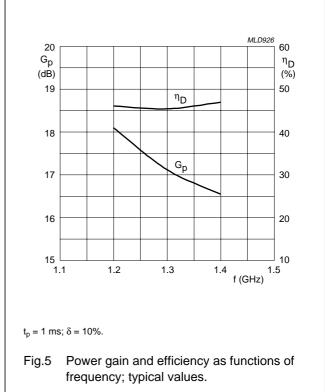


typical values.



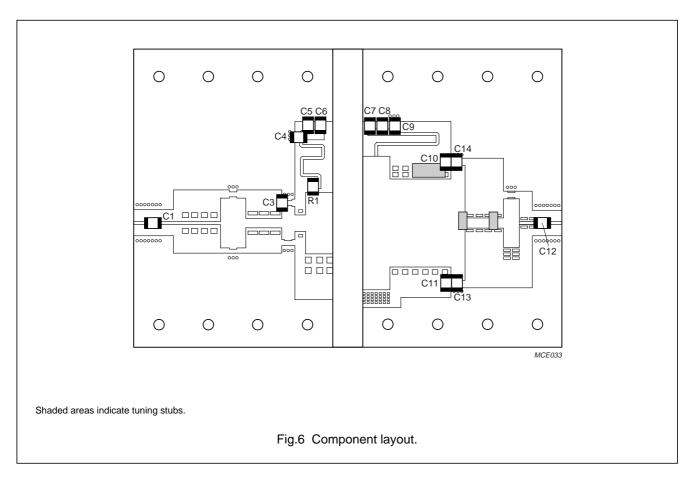






L-band radar LDMOS driver transistor

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List of components (see Fig.6)

| COMPONENT | DESCRIPTION | VALUE | CATALOGUE NO. |
|-----------|---------------|-------------|---------------|
| C1, C12 | capacitor | 51 pF | ATC100A |
| C3 | capacitor | 6.8 pF | ATC100A |
| C4, C9 | capacitor | 47 pF | ATC100A |
| C6, C7 | capacitor | 4.7 μF/50 V | 475 50k 952 |
| C5, C8 | capacitor | 2.3 nF | ATC100B |
| C10 | capacitor | 2.7 pF | ATC100A |
| C11 | capacitor | 1.0 pF | ATC100A |
| C13, C14 | capacitor | 1.5 pF | ATC100A |
| R1 | chip resistor | 82 Ω | |

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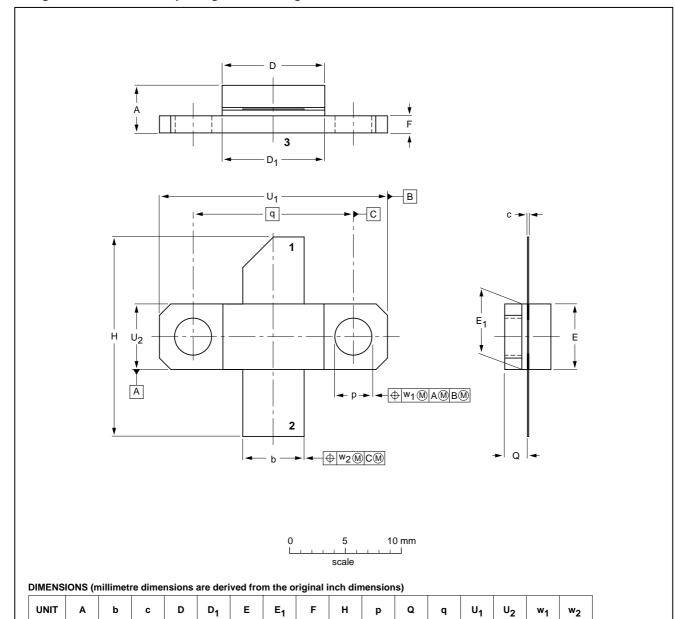
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PACKAGE OUTLINE

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads

SOT467C



| OUTLINE | REFERENCES | | | EUROPEAN | ISSUE DATE | |
|---------|------------|-------|------|----------|------------|---------------------------------|
| VERSION | IEC | JEDEC | EIAJ | | PROJECTION | ISSUE DATE |
| SOT467C | | | | | | 99-12-06 99-12-28 |

18.54

17.02

0.73

3.43

3.18

0.135

0.125

2.21

1.96

0.087 0.077 20.45

20.19

0.805

0.795

14.27

5.97

0.235

0.25

0.51

0.020

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4.67

0.184

mm

5.59

5.33

0.220

0.15

0.10

0.006

9.25

9.04

0.364

0.356

9.02

0.365

0.355

5.92

5.77

0.233

5.97

5.72

0.235

0.225

1.65

1.40

0.065

0.055

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DATA SHEET STATUS

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|----------------------|----------------------------------|--|
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Printed in The Netherlands

613524/01/pp8

Date of release: 2002 Sep 27

Document order number: 9397 750 09541

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