

UHF power LDMOS transistor

BLF861A

FEATURES

- High power gain
- Easy power control
- Excellent ruggedness
- Designed to withstand abrupt load mismatch errors
- Source on underside eliminates DC isolators; reducing common mode inductance
- Designed for broadband operation (UHF band)
- Internal input and output matching for high gain and optimum broadband operation.

APPLICATIONS

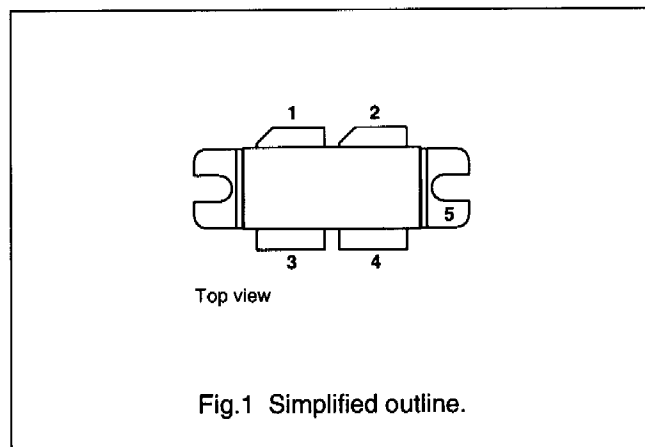
- Communication transmitter applications in the UHF frequency range.

DESCRIPTION

Silicon N-channel enhancement mode lateral D-MOS push-pull transistor in a SOT540A package with ceramic cap. The common source is connected to the mounting flange.

PINNING - SOT540A

| PIN | DESCRIPTION |
|-----|----------------------------|
| 1 | drain 1 |
| 2 | drain 2 |
| 3 | gate 1 |
| 4 | gate 2 |
| 5 | source connected to flange |



QUICK REFERENCE DATA

RF performance at $T_h = 25^\circ\text{C}$ in a common source 860 MHz test circuit.

| MODE OF OPERATION | f (MHz) | V_{DS} (V) | P_L (W) | G_p (dB) | η_D (%) | ΔG_p (dB) |
|-----------------------|-------------|--------------|---------------------------------|--------------------|--------------|-------------------|
| CW, class-AB | 860 | 32 | 150 | >13.5 typ. 14.5 | >50 | ≤ 1 |
| PAL BG (TV); class-AB | 860 (ch 69) | 32 | >150 typ. 170 (peak sync) | >14 | >40 | note 1 |

Note

1. Sync compression: input sync $\geq 33\%$; output sync 27%.



LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|-------------------------|-------------------------|------|------|------|
| V _{DS} | drain-source voltage | | – | 65 | V |
| V _{GS} | gate-source voltage | | – | ±15 | V |
| I _D | drain current (DC) | | – | 18 | A |
| P _{tot} | total power dissipation | T _{mb} ≤ 25 °C | – | 318 | W |
| T _{stg} | storage temperature | | –65 | +150 | °C |
| T _j | junction temperature | | – | 200 | °C |

UHF power LDMOS transistor

BLF861A

THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|----------------------|---|---|-------|------|
| R _{th j-mb} | thermal resistance from junction to mounting base | T _{mb} = 25 °C; P _{tot} = 318 W | 0.55 | K/W |
| R _{th mb-h} | thermal resistance from mounting base to heatsink | | 0.2 | K/W |

CHARACTERISTICST_j = 25 °C; per section; unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------------------|----------------------------------|---|------|------|------|------|
| V _{(BR)DSS} | drain-source breakdown voltage | V _{GS} = 0; I _D = 1.5 mA | 65 | – | – | V |
| V _{GSth} | gate-source threshold voltage | V _{DS} = 10 V; I _D = 150 mA | 4 | – | 5.5 | V |
| I _{DSS} | drain-source leakage current | V _{GS} = 0; V _{DS} = 32 V | – | – | 2.2 | µA |
| I _{DSX} | drain cut-off current | V _{GS} = V _{GSth} + 9 V; V _{DS} = 10 V | 18 | – | – | A |
| I _{GSS} | gate leakage current | V _{GS} = ±15 V; V _{DS} = 0 | – | – | 25 | nA |
| g _{fs} | forward transconductance | V _{DS} = 10 V; I _D = 4 A | – | 4 | – | S |
| R _{DSon} | drain-source on-state resistance | V _{GS} = V _{GSth} + 9 V; I _D = 4 A | – | 160 | – | mΩ |
| C _{iss} | input capacitance | V _{GS} = 0; V _{DS} = 32 V; f = 1 MHz ⁽¹⁾ | – | 82 | – | pF |
| C _{oss} | output capacitance | V _{GS} = 0; V _{DS} = 32 V; f = 1 MHz ⁽¹⁾ | – | 40 | – | pF |
| C _{rss} | feedback capacitance | V _{GS} = 0; V _{DS} = 32 V; f = 1 MHz ⁽¹⁾ | – | 6 | – | pF |

UHF power LDMOS transistor

BLF861A

APPLICATION INFORMATIONRF performance in a common source 860 MHz test circuit. T_h = 25 °C; R_{th mb-h} = 0.15 K/W; unless otherwise specified.

| MODE OF OPERATION | f (MHz) | V _{DS} (V) | I _{DQ} (A) | P _L (W) | G _p (dB) | η _D (%) | d _{im} (dBc) | ΔG _p (dB) |
|-----------------------|--|---------------------|---------------------|----------------------------------|---------------------|--------------------|-----------------------|----------------------|
| CW; class-AB | 860 | 32 | 1 | 150 | >13.5 typ. 14.5 | >50 | – | ≤1 |
| 2-tone; class-AB | f ₁ = 860 f ₁ = 860.1 | 32 | 1 | 150 (PEP) | >14 | >40 | ≤–25 | – |
| PAL BG (TV); class-AB | 860 (ch 69) | 32 | 1 | > 150 typ. 170 (peak sync) | >14 | >40 | – | note 1 |