

## 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

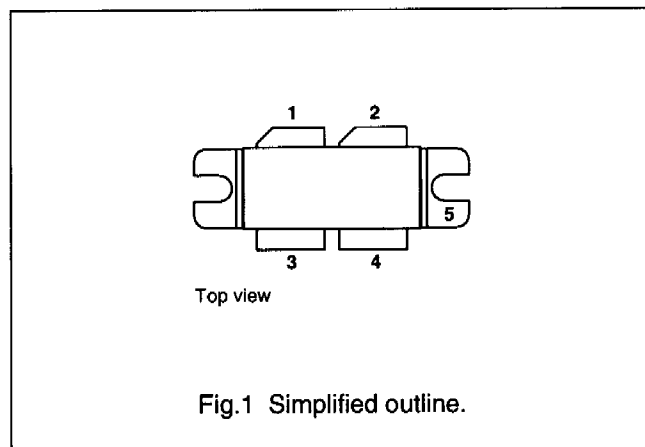
- Communication transmitter applications in the UHF frequency range.

### 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)         | $\eta_D$ (%) | $\Delta G_p$ (dB) |
|-----------------------|-------------|--------------|---------------------------------|--------------------|--------------|-------------------|
| CW, class-AB          | 860         | 32           | 150                             | >13.5<br>typ. 14.5 | >50          | $\leq 1$          |
| PAL BG (TV); class-AB | 860 (ch 69) | 32           | >150<br>typ. 170<br>(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 | $T_{mb} \leq 25\text{ °C}$ | –    | 318  | W    |
| $T_{stg}$ | storage temperature     |                            | –65  | +150 | °C   |
| $T_j$     | junction temperature    |                            | –    | 200  | °C   |

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## THERMAL CHARACTERISTICS

| SYMBOL         | PARAMETER   | CONDITIONS                                      | VALUE | UNIT |
|----------------|---|---|-------|------|
| $R_{th\ j-mb}$ | thermal resistance from junction to mounting base | $T_{mb} = 25\text{ °C}; P_{tot} = 318\text{ W}$ | 0.55  | K/W  |
| $R_{th\ mb-h}$ | thermal resistance from mounting base to heatsink |   | 0.2   | K/W  |

## CHARACTERISTICS

$T_j = 25\text{ °C}$ ; per section; unless otherwise specified.

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

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## APPLICATION INFORMATION

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

| MODE OF OPERATION     | f (MHz)                      | $V_{DS}$ (V) | $I_{DQ}$ (A) | $P_L$ (W)                        | $G_p$ (dB)         | $\eta_D$ (%) | $d_{im}$ (dBc) | $\Delta G_p$ (dB) |
|-----------------------|------------------------------|--------------|--------------|----------------------------------|--------------------|--------------|----------------|-------------------|
| CW; class-AB          | 860                          | 32           | 1            | 150                              | >13.5<br>typ. 14.5 | >50          | –              | ≤1                |
| 2-tone; class-AB      | $f_1 = 860$<br>$f_1 = 860.1$ | 32           | 1            | 150 (PEP)                        | >14                | >40          | ≤–25           | –                 |
| PAL BG (TV); class-AB | 860<br>(ch 69)               | 32           | 1            | > 150<br>typ. 170<br>(peak sync) | >14                | >40          | –              | note 1            |