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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

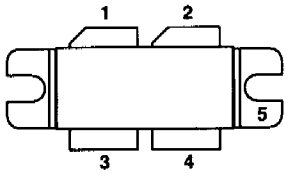
- Communication transmitter applications in the UHF frequency range.

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



Top view

Fig.1 Simplified outline.

QUICK REFERENCE DATA

RF performance at T_h = 25 °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 ≥ 33%; output sync 27%.

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

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	$T_{mb} \leq 25$ °C	–	318	W
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	200	°C

THERMAL CHARACTERISTICS

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

CHARACTERISTICS

T_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

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APPLICATION INFORMATION

RF performance in a common source 860 MHz test circuit. T_h = 25 °C; $R_{th\ mb\text{-}h}$ = 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