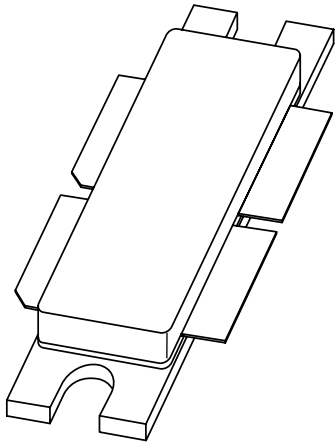


# DATA SHEET



## **BLF2022-120** UHF push-pull power LDMOS transistor

Preliminary specification

2000 Dec 12

# UHF push-pull power LDMOS transistor

# BLF2022-120

### 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 2.2 GHz).

### APPLICATIONS

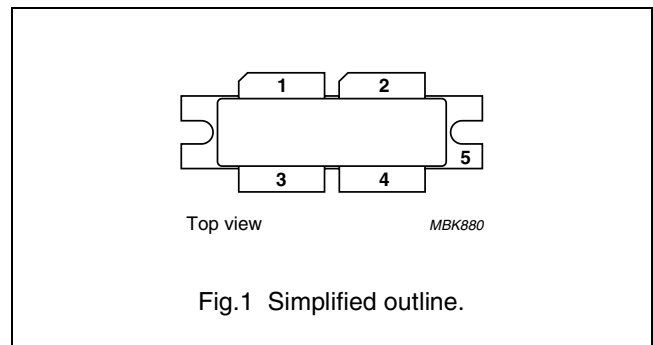
- Common source class-AB operation for PCN and PCS applications in the 2000 to 2200 MHz frequency range.

### DESCRIPTION

Push-pull silicon N-channel enhancement mode lateral D-MOS transistor encapsulated in a 4-lead flange package (SOT539A) with a ceramic cap. The common source is connected to the mounting flange.

### PINNING - SOT539A

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  $T_h = 25\text{ °C}$  in a common source test circuit.

MODE OF OPERATION	f (MHz)	$V_{DS}$ (V)	$P_L$ (W)	$G_p$ (dB)	$\eta_D$ (%)	$d_{im}$ (dBc)
2-tone, class-AB	$f_1 = 2170$ ; $f_2 = 2170.1$	28	120 (PEP)	>11	>30	$\leq -25$

### 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	–	$\pm 15$	V
$I_D$	drain current (DC)	–	18	A
$T_{stg}$	storage temperature	–65	+150	°C
$T_j$	junction temperature	–	200	°C

### 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 push-pull power LDMOS transistor

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-mb}$	thermal resistance from junction to mounting-base	$P_L = 120\ W; T_{mb} = 50\ ^\circ C$ , note 1	0.35	K/W
$R_{th\ mb-h}$	thermal resistance from mounting-base to heatsink		0.15	K/W

## Note

1. Thermal resistance is determined under nominal 2-tone RF operating conditions.

## CHARACTERISTICS

$T_j = 25\ ^\circ C$ ; per section unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0; I_D = 1.4\ mA$	65	–	–	V
$V_{GSth}$	gate-source threshold voltage	$V_{DS} = 10\ V; I_D = 140\ mA$	4.4	–	5.5	V
$I_{DSS}$	drain-source leakage current	$V_{GS} = 0; V_{DS} = 26\ V$	–	–	10	$\mu A$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GSth} + 9\ V; V_{DS} = 10\ V$	18	–	–	A
$I_{GSS}$	gate leakage current	$V_{GS} = \pm 15\ V; V_{DS} = 0$	–	–	25	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\ V; I_D = 5\ A$	–	4.2	–	S
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = V_{GSth} + 9\ V; I_D = 5\ A$	–	0.15	–	$\Omega$
$C_{rs}$	feedback capacitance	$V_{GS} = 0; V_{DS} = 26\ V; f = 1\ MHz$ ; note 1	–	3.4	–	pF

## Note

1. Capacitance of die only.

## APPLICATION INFORMATION

RF performance in a common source class-AB circuit.  $T_h = 25\ ^\circ C$ ;  $R_{th\ j-h} = 0.5\ K/W$ ; unless otherwise specified.

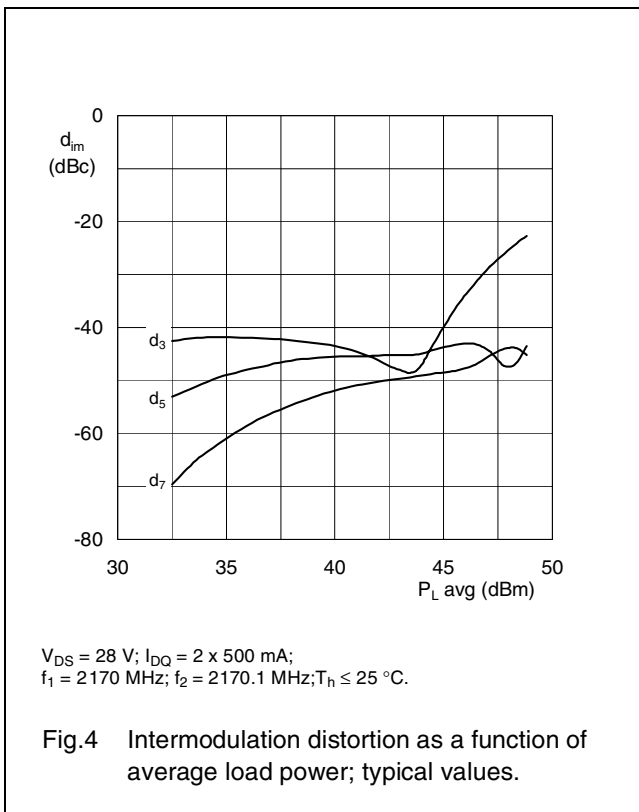
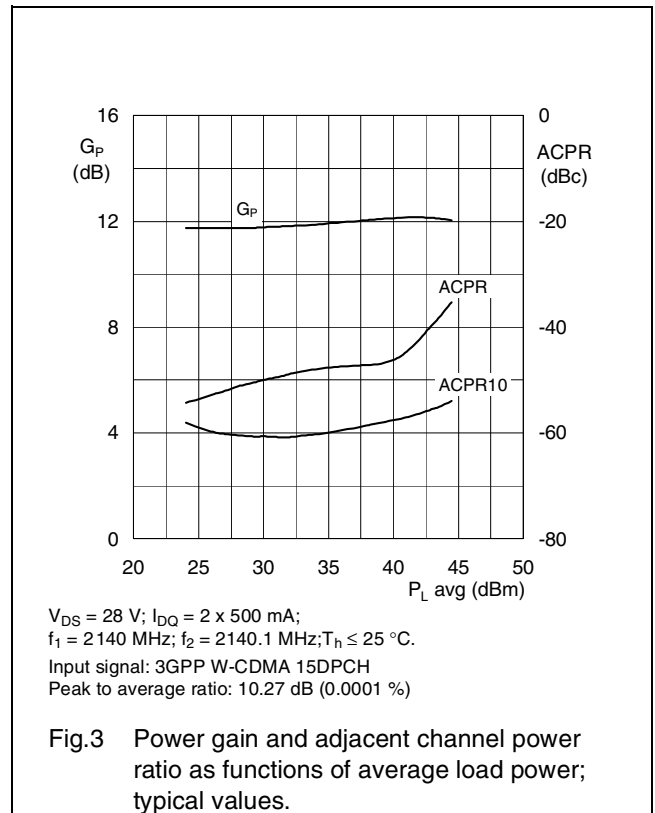
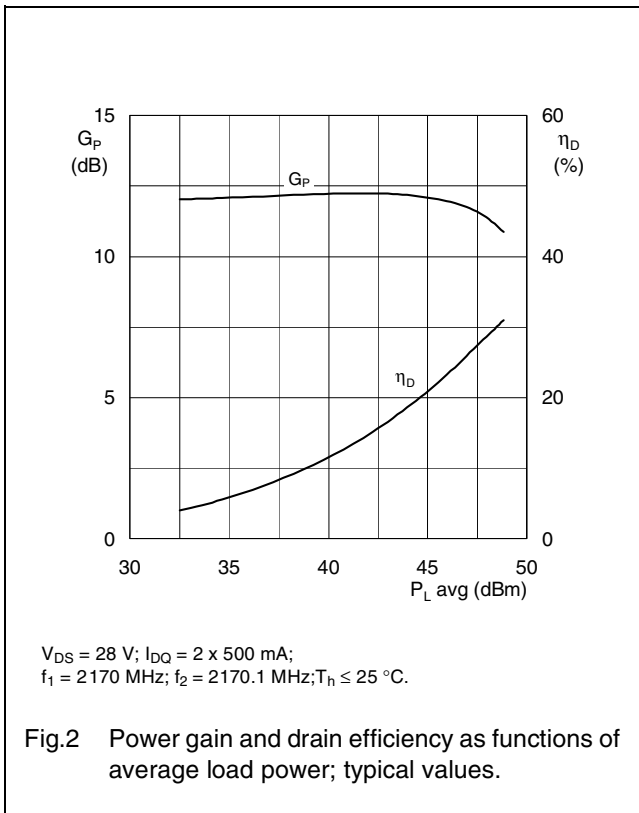
MODE OF OPERATION	f (MHz)	$V_{DS}$ (V)	$I_{DQ}$ (mA)	$P_L$ (W)	$G_p$ (dB)	$\eta_D$ (%)	$d_{im}$ (dBc)
2-tone, class-AB	$f_1 = 2170; f_2 = 2170.1$	28	2 x 500	120 (PEP)	>11	>30	$\leq -25$

## Ruggedness in class-AB operation

The BLF2022-120 is capable of withstanding a load mismatch corresponding to  $V_{SWR} = 10 : 1$  through all phases under the following conditions:  $V_{DS} = 28\ V$ ;  $f = 2170\ MHz$ ,  $P_L = 120\ W$  (CW).

UHF push-pull power LDMOS transistor

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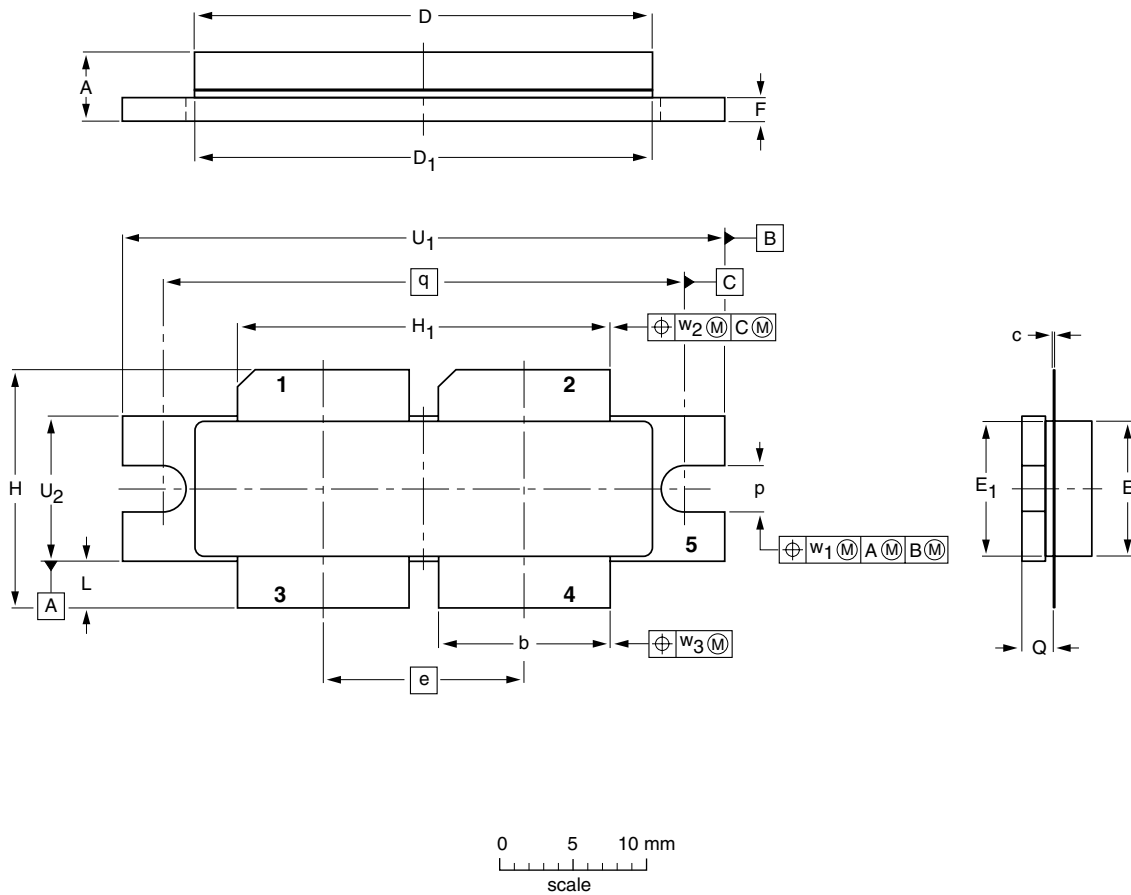
UHF push-pull power LDMOS transistor

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PACKAGE OUTLINE

Flanged balanced LDMOST ceramic package; 2 mounting holes; 4 leads

SOT539A



DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A	b	c	D	D <sub>1</sub>	e	E	E <sub>1</sub>	F	H	H <sub>1</sub>	L	p	Q	q	U <sub>1</sub>	U <sub>2</sub>	w <sub>1</sub>	w <sub>2</sub>	w <sub>3</sub>
mm	5.33 3.96	11.81 11.56	0.15 0.08	31.55 30.94	31.52 30.96	13.72	9.50 9.30	9.53 9.27	1.75 1.50	17.12 16.10	25.53 25.27	3.73 2.72	3.30 3.05	2.31 2.01	35.56	41.28 41.02	10.29 10.03	0.25	0.51	0.25
inches	0.210 0.156	0.465 0.455	0.006 0.003	1.242 1.218	1.241 1.219	0.540	0.374 0.366	0.375 0.365	0.069 0.059	0.674 0.634	1.005 0.995	0.147 0.107	0.130 0.120	0.091 0.079	1.400	1.625 1.615	0.405 0.395	0.010	0.020	0.010

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT539A						99-12-28 00-03-03

## UHF push-pull power LDMOS transistor

BLF2022-120

## DATA SHEET STATUS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS <sup>(1)</sup>
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

## Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

## DEFINITIONS

**Short-form specification** — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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.

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