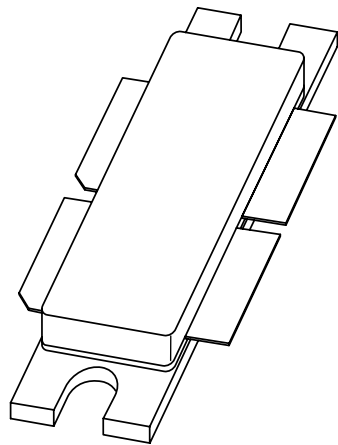


# DATA SHEET



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

Preliminary specification  
Supersedes data of 2001 Jan 04

2003 Mar 07

# UHF push-pull power LDMOS transistor

# BLF2022-120

### FEATURES

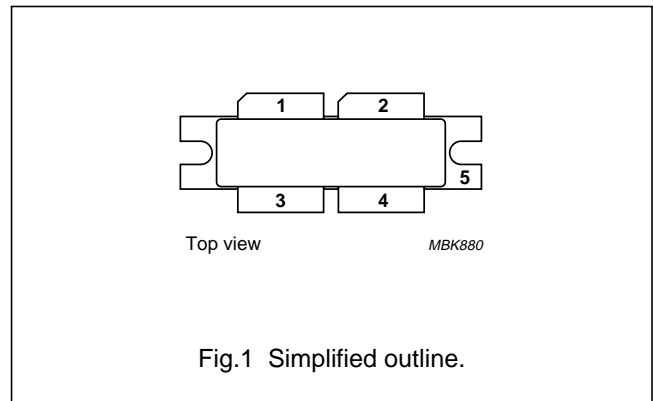
- Typical W-CDMA performance at a supply voltage of 28 V and  $I_{DQ}$  of 500 mA
  - Output power = 20 W (AV)
  - Gain = 12 dB
  - Efficiency = 15%
  - ACPR = -42 dBc at 3.84 MHz
- Easy power control
- Excellent ruggedness
- High power gain
- Excellent thermal stability
- Designed for broadband operation (2000 to 2200 MHz)
- Internally matched for ease of use.

### APPLICATIONS

- RF power amplifiers for W-CDMA base stations and multicarrier applications in the 2000 to 2200 MHz frequency range

### PINNING - SOT539A

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



### DESCRIPTION

120 W LDMOS push-pull power transistor for base station applications at frequencies from 2000 to 2200 MHz.

### QUICK REFERENCE DATA

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

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	500	120 (PEP)	>11	>30	$\leq -25$

### LIMITING VALUES

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

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	$^\circ\text{C}$
$T_j$	junction temperature	–	200	$^\circ\text{C}$

### 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

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Per section</b>						
$V_{(BR)DSS}$	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	$V_{GS} = V_{GSth} + 9\ V$ ; $V_{DS} = 5\ V$	–	0.15	–	$\Omega$
$C_{rss}$	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.  $T_h = 25\ ^\circ C$ ;  $R_{th\ mb-h} = 0.65\ K/W$ , unless otherwise specified.

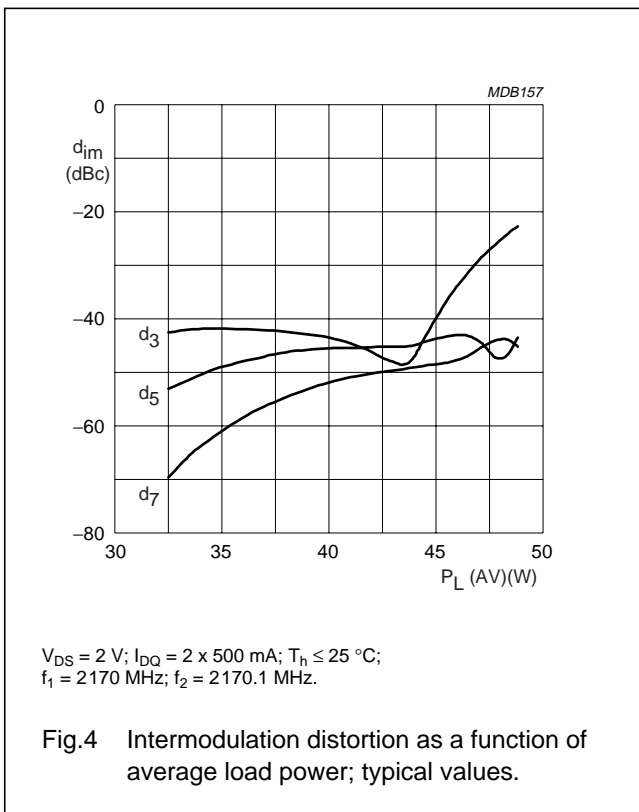
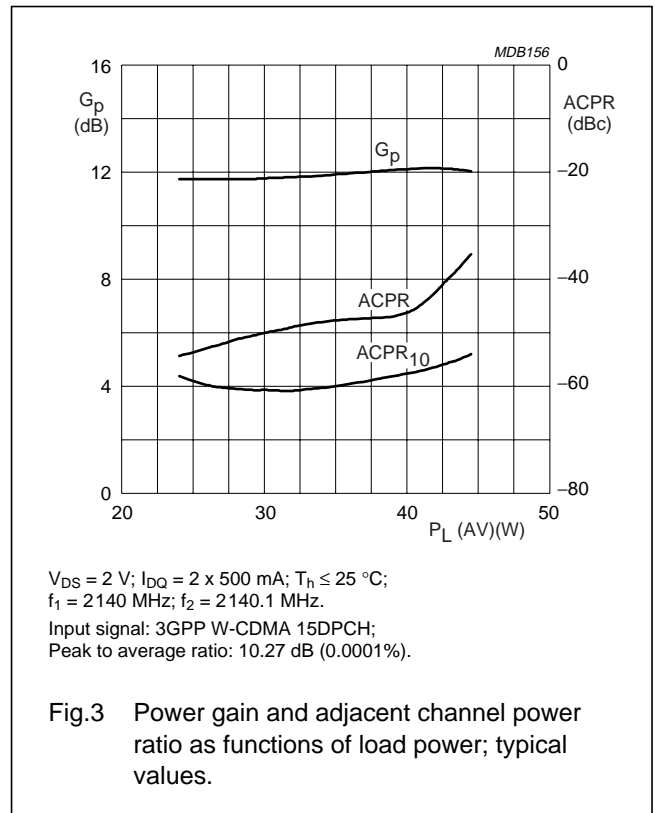
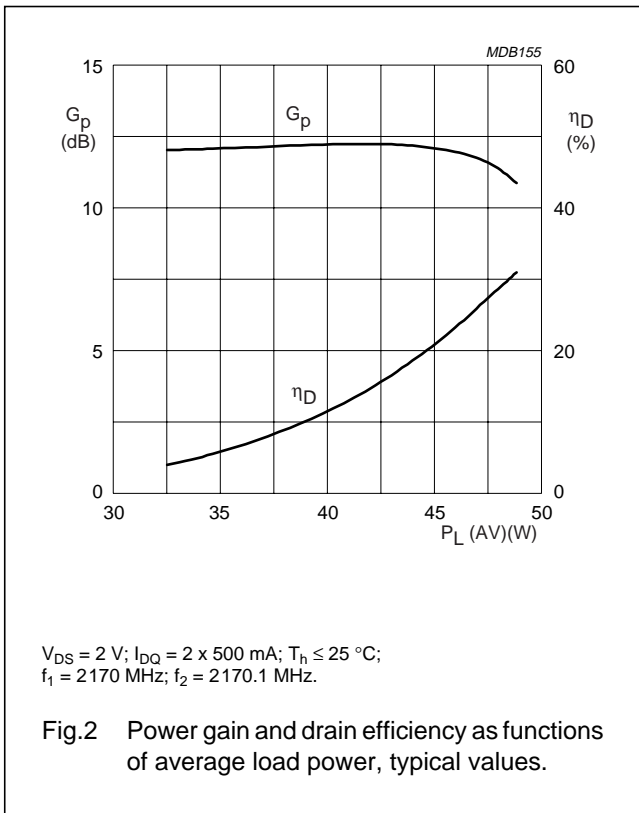
MODE OF OPERATION	f (MHz)	$V_{DS}$ (V)	$I_{DQ}$ (mA)	$P_L$ (W)	$G_p$ (dB)	$\eta_D$ (%)	$d_{im}$ (dBc)
2-tone, class-AB	$f_1 = 2170$ ; $f_2 = 2170.1$	28	2 x 500	120 (PEP)	>11	>30	$\leq -25$

## Ruggedness in class-AB operation

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

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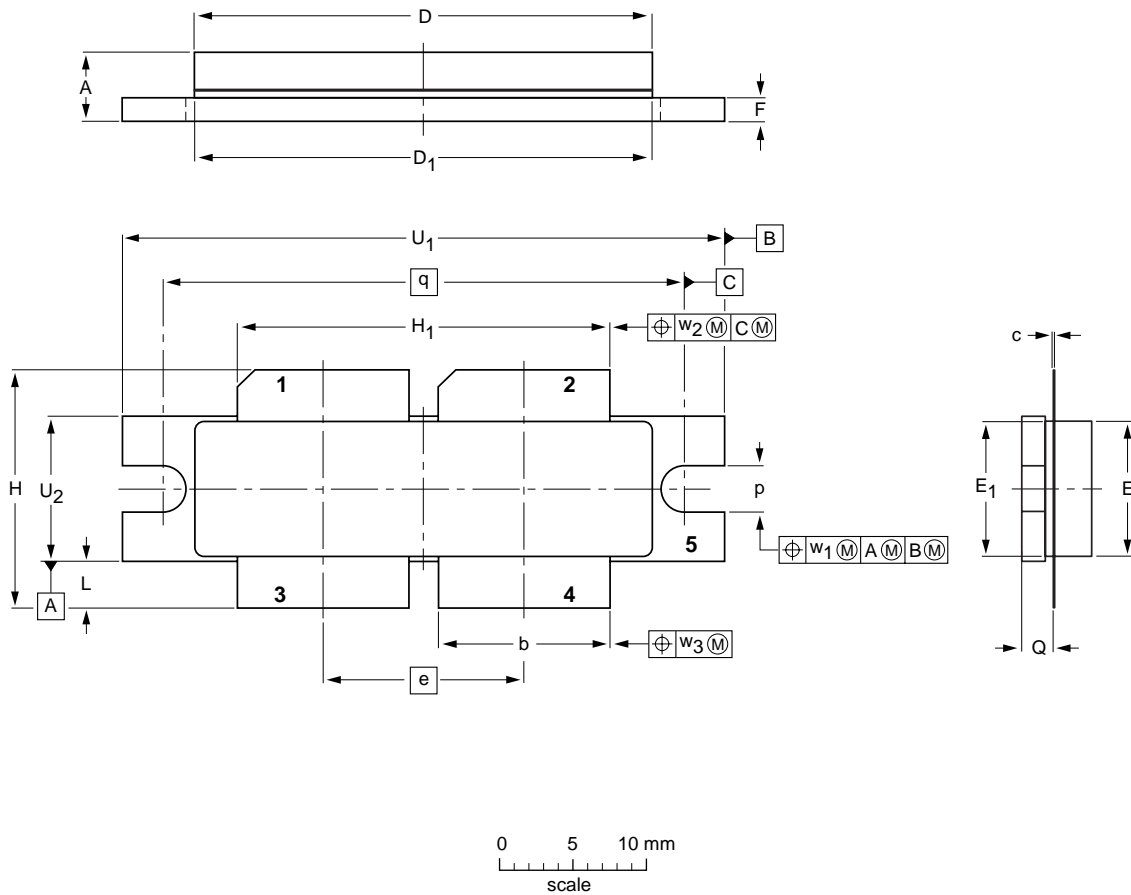
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PACKAGE OUTLINE

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

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## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	DEFINITION
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