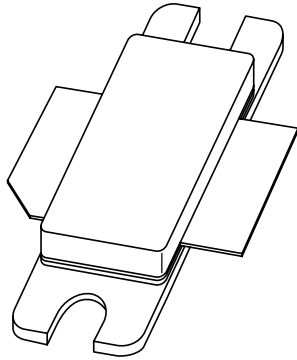


# DATA SHEET



**BLF1049**

**Base station LDMOS transistor**

Product specification  
Supersedes data of 2001 Dec 05

2003 May 14

## Base station LDMOS transistor

## BLF1049

## FEATURES

- Typical performance at a supply voltage of 27 V:
  - 1-tone CW;  $I_{DQ} = 1000$  mA
  - Output power = 125 W
  - Gain = 16.5 dB
  - Efficiency = 54%
  - EDGE output power = 45 W (AV)
  - ACPR400 = -64 dBc at 400 kHz (EDGE;  $I_{DQ} = 750$  mA)
  - EVM = 2% rms (AV) (EDGE;  $I_{DQ} = 750$  mA)
- Easy power control
- Excellent ruggedness
- High power gain
- Excellent thermal stability
- Designed for broadband operation (800 to 1000 MHz)
- Internally matched for ease of use.

## APPLICATIONS

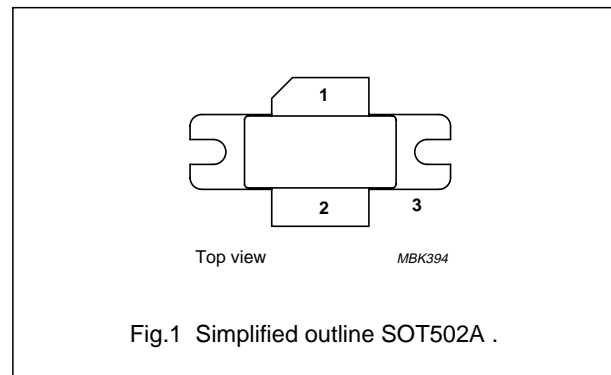
- RF power amplifier for GSM, EDGE and CDMA base stations and multicarrier applications in the 800 to 1000 MHz frequency range.

## DESCRIPTION

125 W LDMOS power transistor for base station applications at frequencies from 800 MHz to 1000 MHz.

## PINNING - SOT502A

PIN	DESCRIPTION
1	drain
2	gate
3	source; connected to flange



## QUICK REFERENCE DATA

Typical RF performance at  $T_h = 25$  °C in a common source test circuit.

MODE OF OPERATION	f (MHz)	$P_L$ (W)	$G_p$ (dB)	$\eta_D$ (%)	$d_3$ (dBc)	ACPR 400 (dBc)	EVM % rms (AV)
2-tone	920	125 (PEP)	15.5	37	-32	-	-
1-tone CW		125	16.5	54	-	-	-
GSM EDGE		45 (AV)	15	32	-	-64	2

## LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_{DS}$	drain-source voltage	-	75	V
$V_{GS}$	gate-source voltage	-	$\pm 15$	V
$T_{stg}$	storage temperature	-65	150	°C
$T_j$	junction temperature	-	200	°C

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-c}$	thermal resistance from junction to case	$T_h = 25\text{ }^\circ\text{C}$ , $P_L = 35\text{ W (AV)}$ , note 1	0.42	K/W
$R_{th\ j-h}$	thermal resistance from junction to heatsink	$T_h = 25\text{ }^\circ\text{C}$ , $P_L = 35\text{ W (AV)}$ , note 2	0.62	K/W

## Notes

1. Thermal resistance is determined under RF operating conditions.
2. Depending on mounting condition in application.

## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0$ ; $I_D = 3\text{ mA}$	75	–	–	V
$V_{GSth}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$ ; $I_D = 300\text{ mA}$	4	–	5	V
$I_{DSS}$	drain-source leakage current	$V_{GS} = 0$ ; $V_{DS} = 36\text{ V}$	–	–	3	$\mu\text{A}$
$I_{DSX}$	on-state drain current	$V_{GS} = V_{GSth} + 9\text{ V}$ ; $V_{DS} = 10\text{ V}$	45	–	–	A
$I_{GSS}$	gate leakage current	$V_{GS} = \pm 20\text{ V}$ ; $V_{DS} = 0$	–	–	1	$\mu\text{A}$
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}$ ; $I_D = 10\text{ A}$	–	9	–	S
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = 9\text{ V}$ ; $I_D = 10\text{ A}$	–	60	–	$\text{m}\Omega$

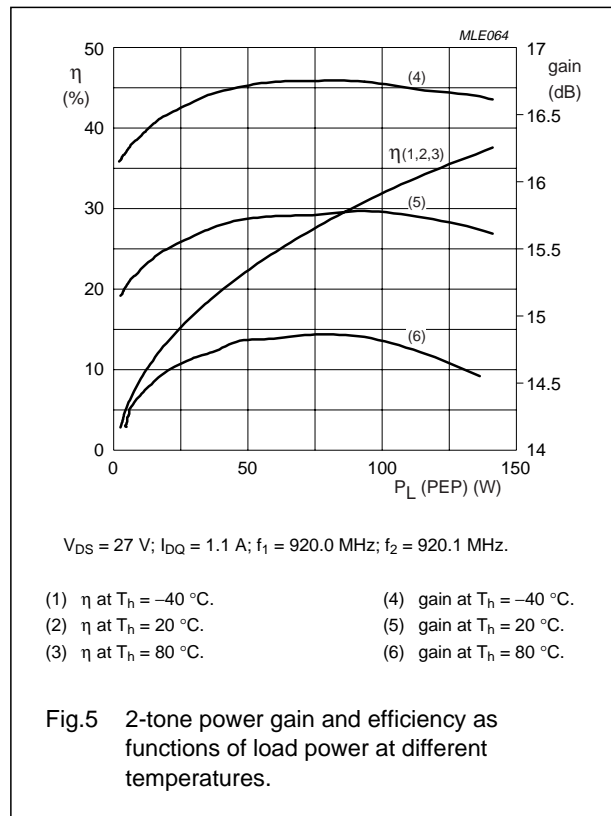
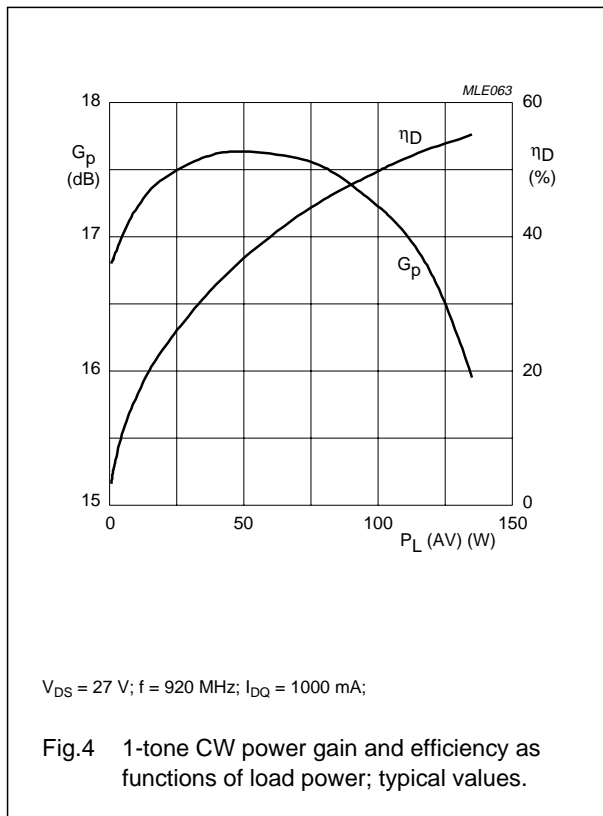
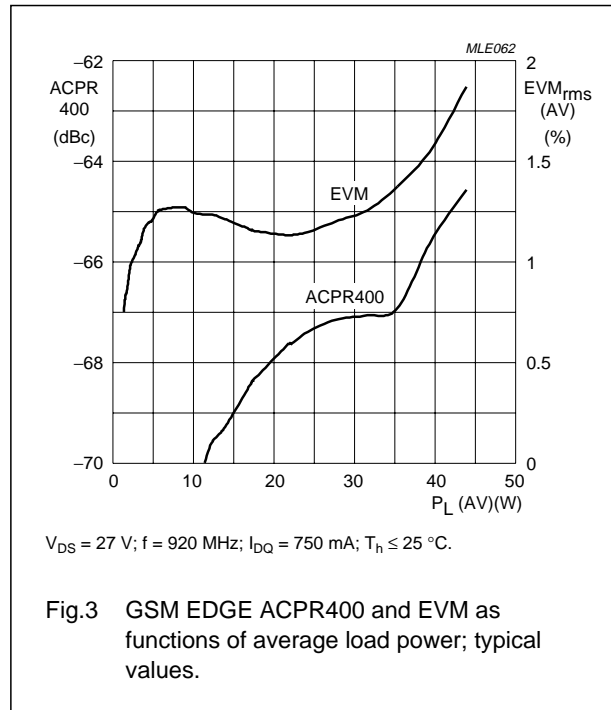
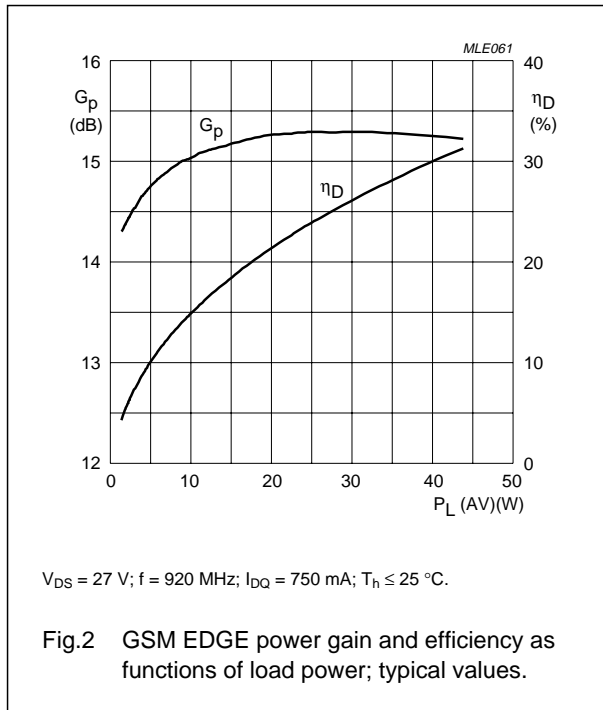
## APPLICATION INFORMATION

RF performance in a common source class-AB circuit;  $V_{DS} = 27\text{ V}$ ;  $T_h = 25\text{ }^\circ\text{C}$ ; unless otherwise specified.

Mode of operation: 2-tone CW, 100 kHz spacing; $I_{DQ} = 1130\text{ mA}$ ; $f = 890\text{ MHz}$						
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	gain power	$P_L = 125\text{ W (PEP)}$	14.6	15.5	–	dB
$\eta_D$	drain efficiency		33	37	–	%
IRL	input return loss		–	–12	–6	dB
$d_3$	third order inter modulation distortion		–	–32	–25	dBc
Mode of operation: GSM EDGE; $I_{DQ} = 750\text{ mA}$ ; $f = 920\text{ MHz}$						
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	gain power	$P_L = 45\text{ W (AV)}$	–	15	–	dB
$\eta_D$	drain efficiency		–	32	–	%
ACPR 400	adjacent channel power ratio		–	–64	–	dBc
EVM (AV)	EVM rms average signal distortion		–	2	–	%
EVM peak	EVM rms peak signal distortion		–	2.2	–	%
Mode of operation: 1-tone CW; $I_{DQ} = 1000\text{ mA}$ ; $f = 920\text{ MHz}$						
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	gain power	$P_L = P_{L\ 1\text{ dB}} = 125\text{ W}$	–	16.5	–	dB
$\eta_D$	drain efficiency		–	54	–	%

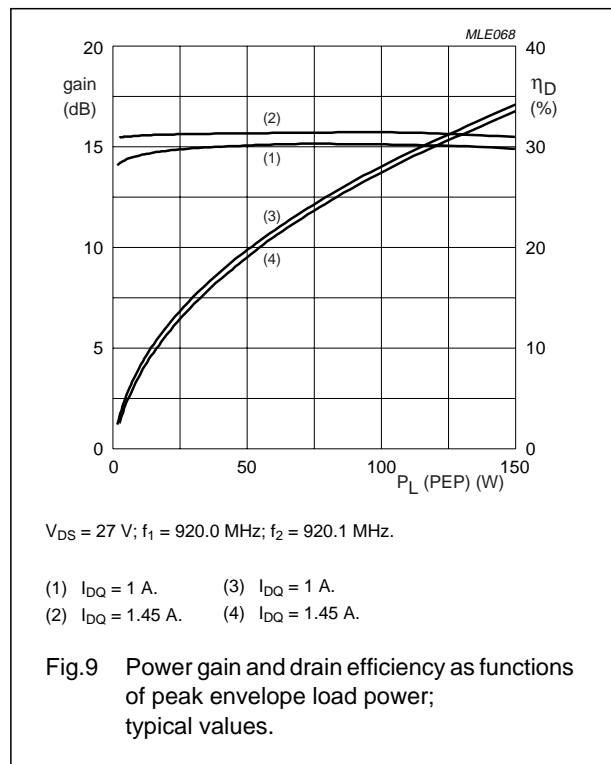
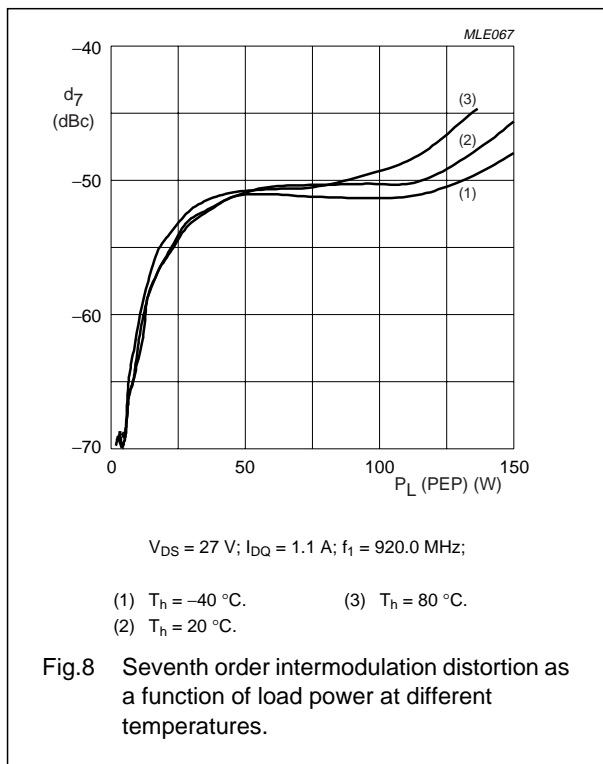
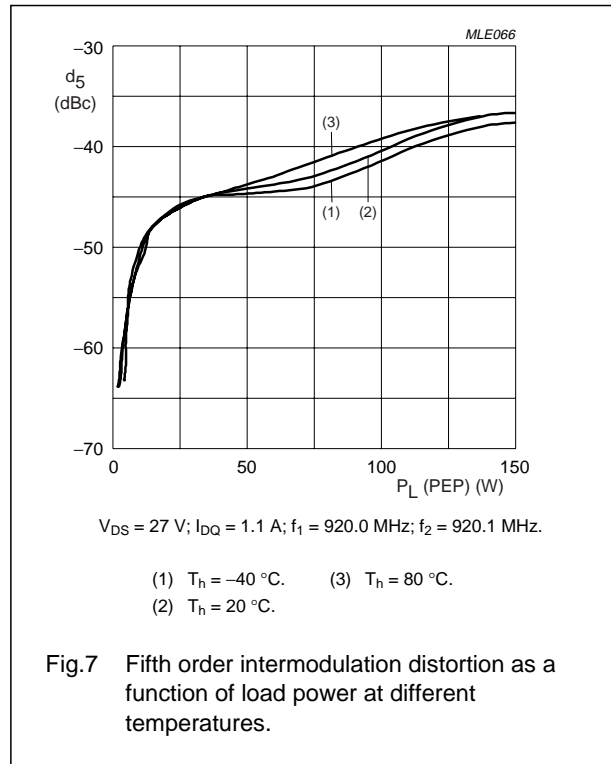
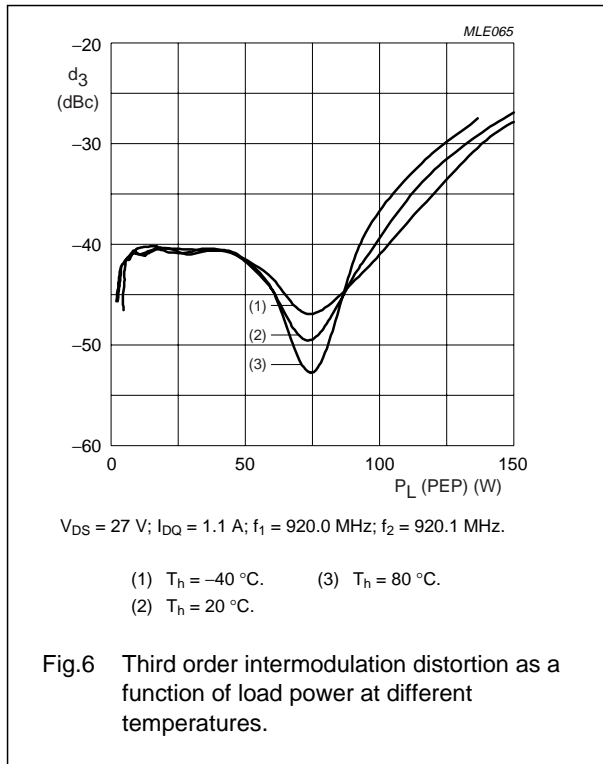
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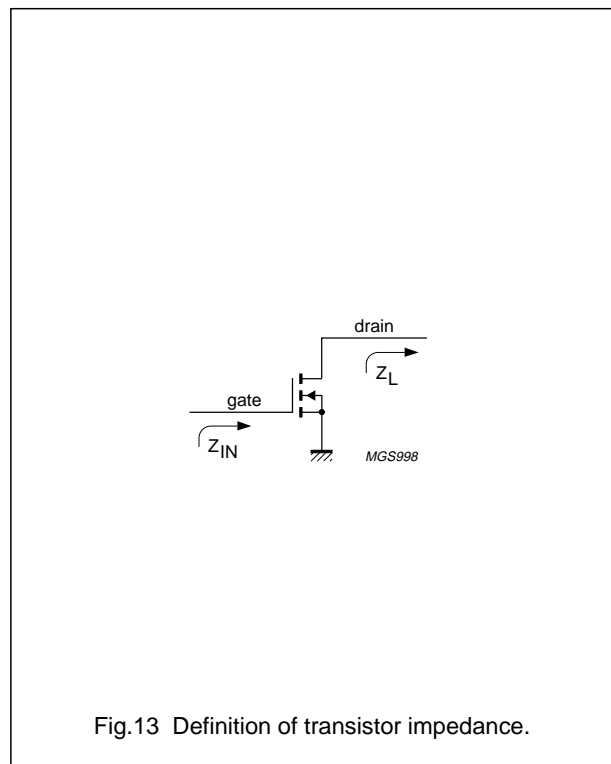
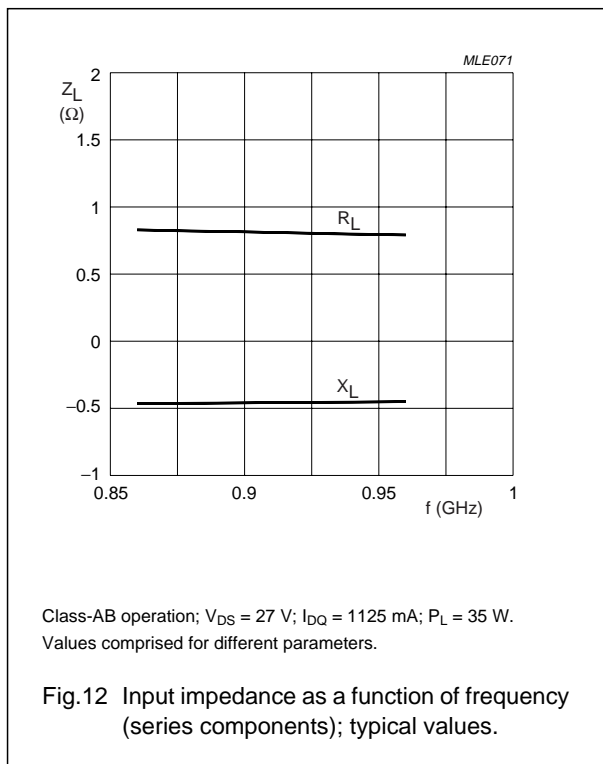
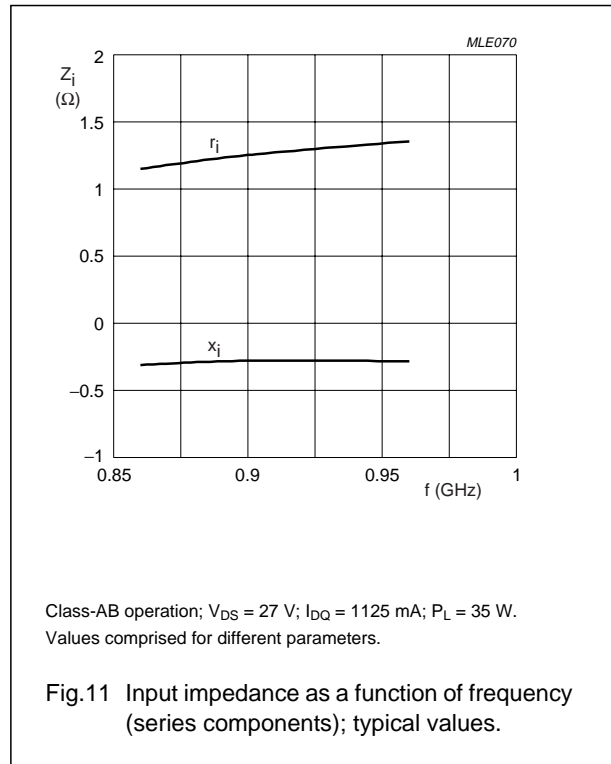
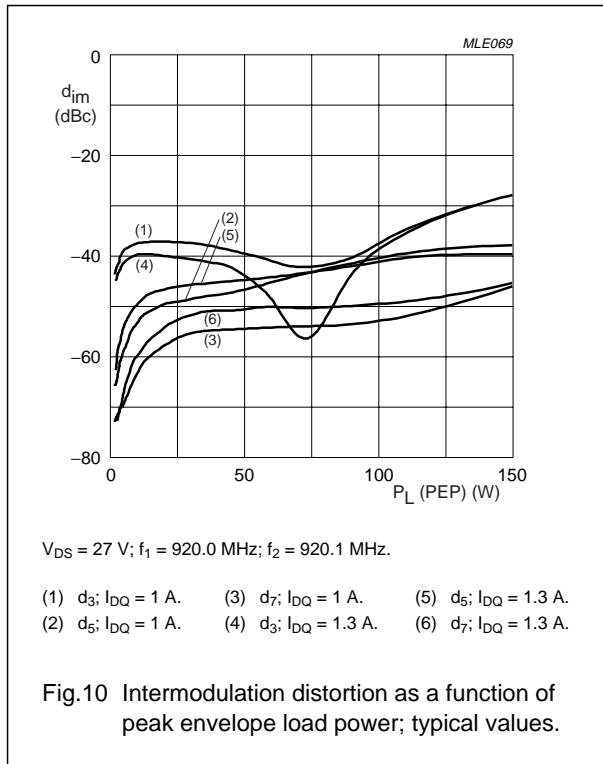
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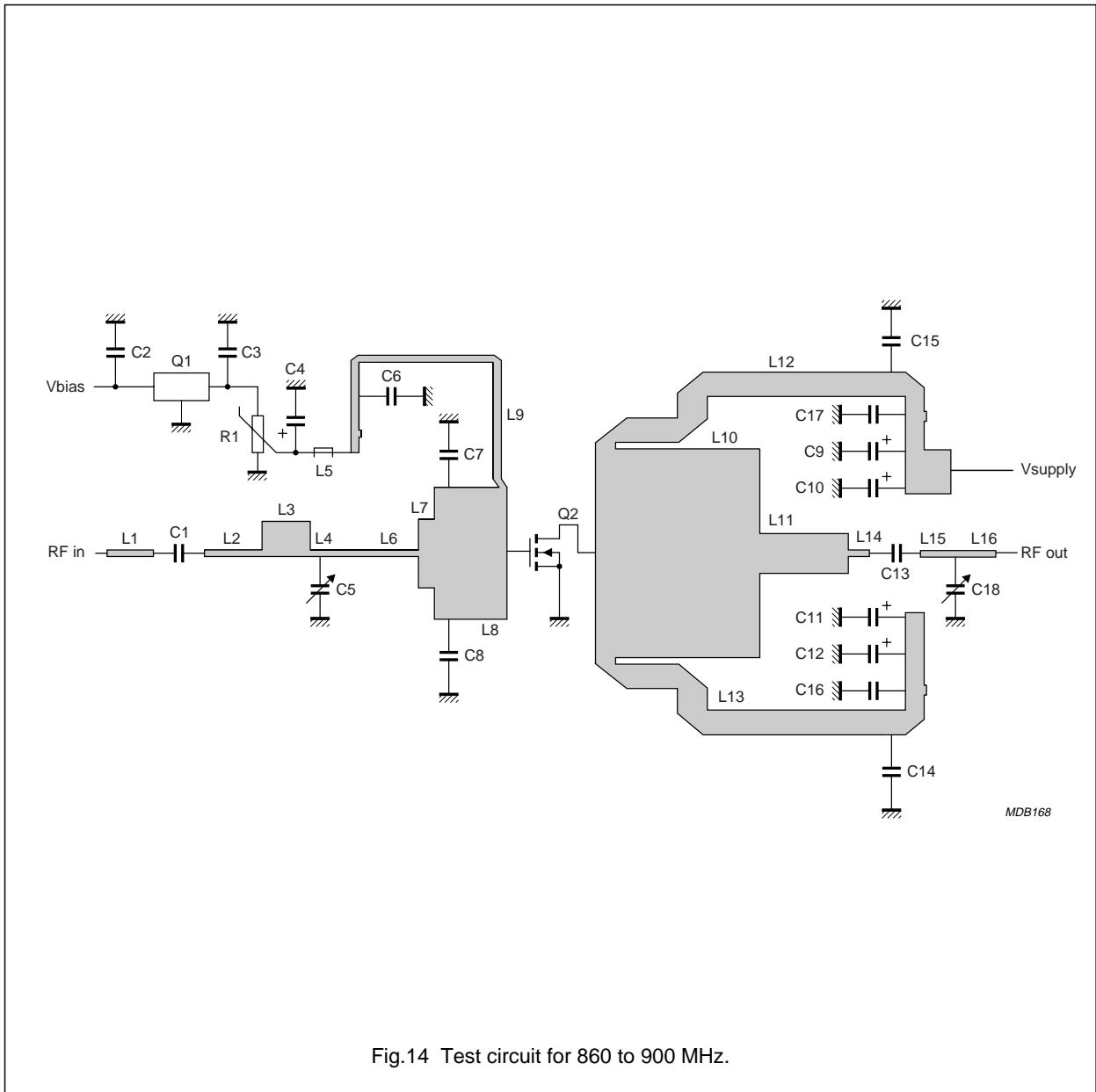
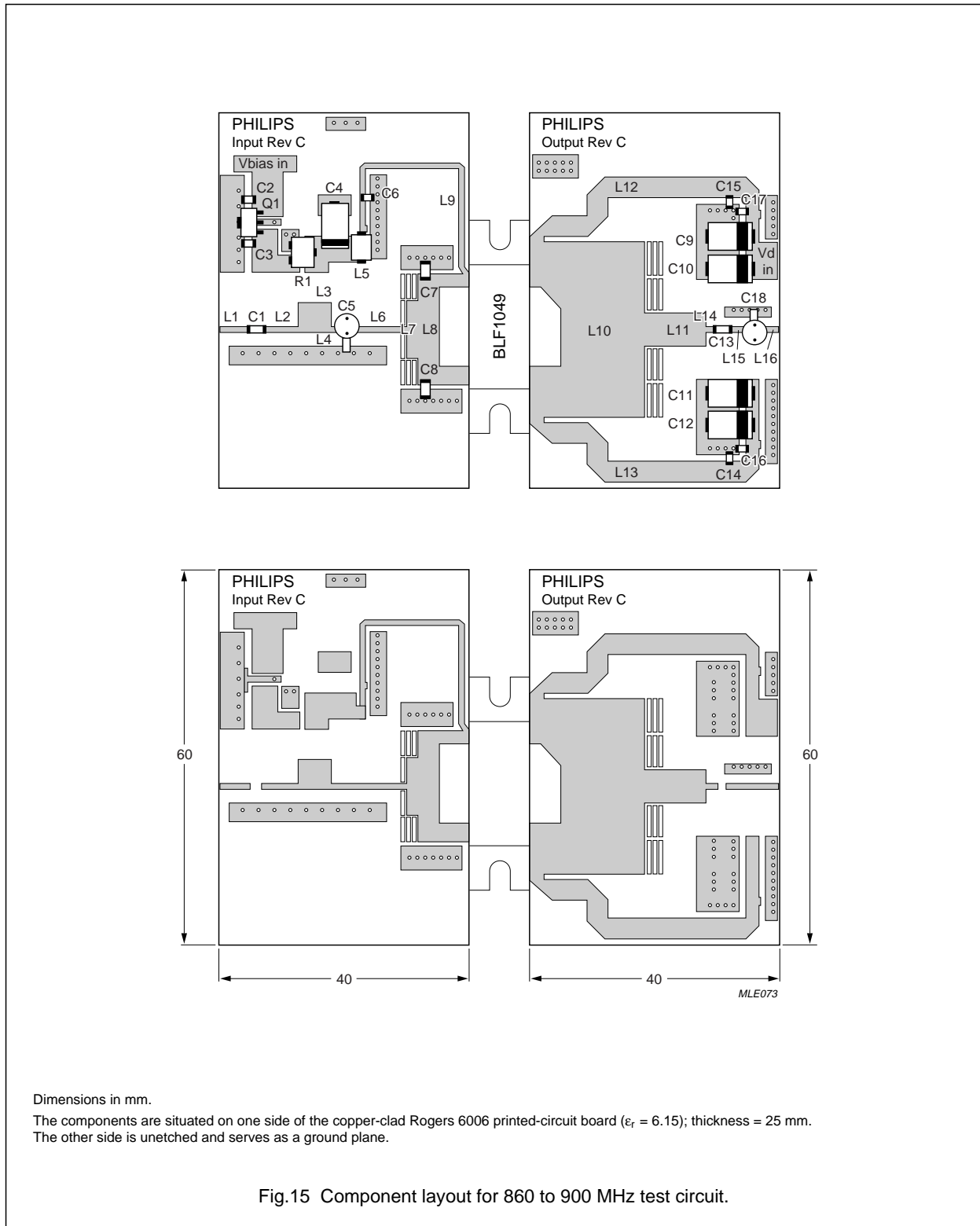


Fig.14 Test circuit for 860 to 900 MHz.

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## Base station LDMOS transistor

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## List of components (see Figs 14 and 15)

COMPONENT	DESCRIPTION	VALUE	DIMENSIONS
C1, C6, C13, C14, C15, C16, C17	multilayer ceramic chip capacitor; note 1	68 pF	
C2	multilayer ceramic chip capacitor; note 1	330 nF	
C3	multilayer ceramic chip capacitor; note 1	100 nF	
C4, C9, C10, C11, C12	tantalum capacitor	10 $\mu$ F	
C5, C18	air trimmer capacitor	5 pF	
C7, C8	multilayer ceramic chip capacitor	8.2 pF	
R1	potentiometer	1 k $\Omega$	
Q1	7808 voltage regulator		
Q2	BLF1049 LDMOS transistor		
L1	stripline; note 2		5.22 $\times$ 0.92 mm
L2	stripline; note 2		6.47 $\times$ 0.92 mm
L3	stripline; note 2		5.38 $\times$ 4.8 mm
L4	stripline; note 2		2.4 $\times$ 0.92 mm
L5	ferroxcube		
L6	stripline; note 2		9.73 $\times$ 0.92 mm
L7	stripline; note 2		1.82 $\times$ 9.3 mm
L8	stripline; note 2		8.15 $\times$ 17.9 mm
L9	stripline; note 2		44 $\times$ 0.92 mm
L10	stripline; note 2		18.45 $\times$ 28.3 mm
L11	stripline; note 2		9.95 $\times$ 5.38 mm
L12, L13	stripline; note 2		37.6 $\times$ 3.35 mm
L14	stripline; note 2		2.36 $\times$ 0.92 mm
L15, L16	stripline; note 2		4.22 $\times$ 0.92 mm

## Notes

- American Technical Ceramics type 100A or capacitor of same quality.
- The striplines are on a double copper-clad Rogers 6006 printed-circuit board ( $\epsilon_r = 6.15$ ); thickness = 0.64 mm.

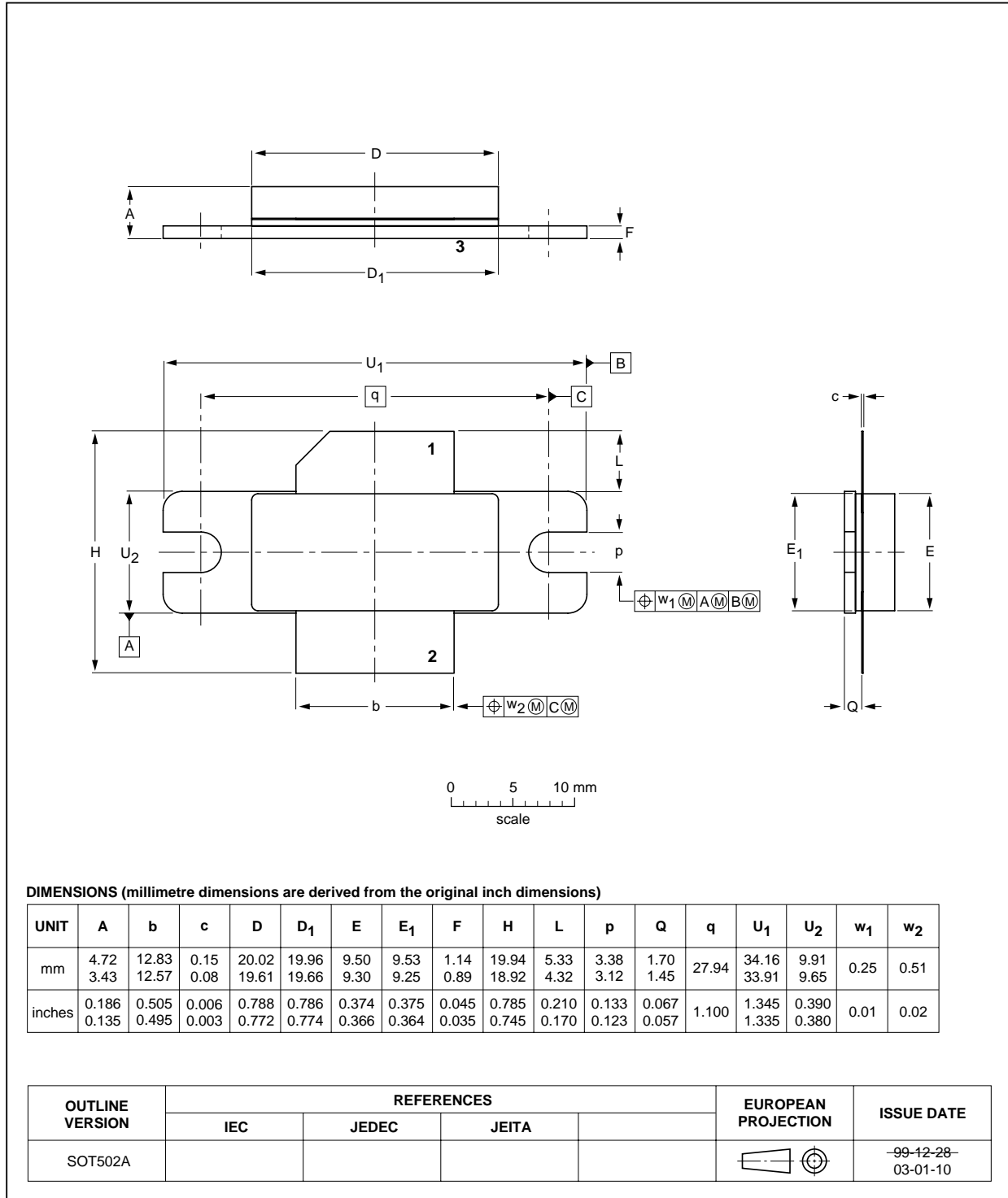
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PACKAGE OUTLINE

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads

SOT502A



## Base station LDMOS transistor

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