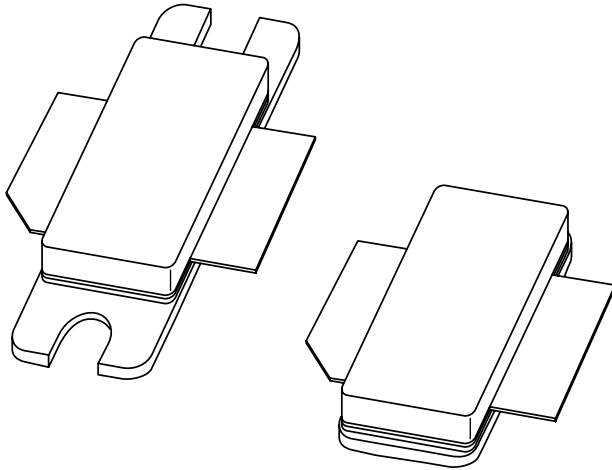


# DATA SHEET



## **BLF0810-90; BLF0810S-90** Base station LDMOS transistors

Product specification  
Supersedes data of 2003 May 09

2003 Jun 12

**Base station LDMOS transistors**

**BLF0810-90; BLF0810S-90**

**FEATURES**

- Typical CDMA IS95 performance at standard settings with a supply voltage of 27 V and  $I_{DQ}$  of 560 mA. Adjacent channel bandwidth is 30 kHz, adjacent channel at  $\pm 750$  kHz:
  - Output power = 15 W (AV)
  - Gain = 16 dB
  - Efficiency = 27%
  - ACPR = -46 dBc at 750 kHz and BW = 30 kHz
- 70 W CW performance
- 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**

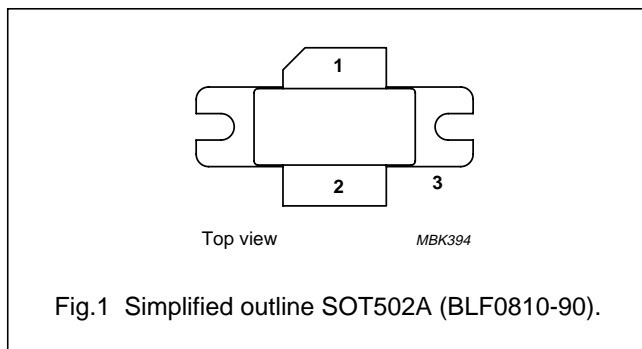
- RF power amplifier for GSM, EDGE and CDMA base stations and multicarrier operations in the 800 to 1000 MHz frequency range.

**DESCRIPTION**

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

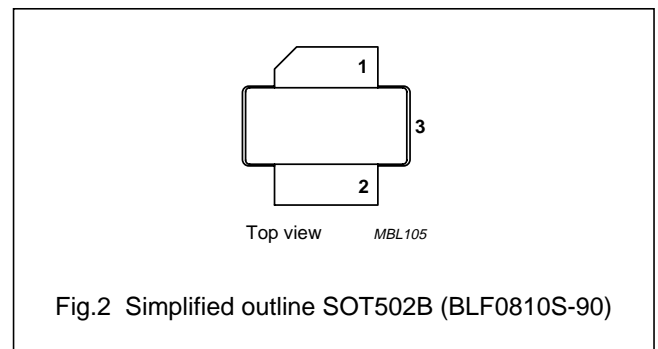
**PINNING - SOT502A**

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



**PINNING - SOT502B**

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)	$V_{DS}$ (V)	$P_L$ (W)	$G_p$ (dB)	$\eta_D$ (%)	$d_3$ (dBc)	ACPR 750 (dBc)
Class-AB (2-tone)	$f_1 = 890.0; f_2 = 890.1$	27	70 (PEP)	16	39	-28	-
CDMA (IS95)	890	27	15 (AV)	16	27	-	-46

## Base station LDMOS transistors

## BLF0810-90; BLF0810S-90

**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	–	±15	V
$T_{stg}$	storage temperature	–65	150	°C
$T_j$	junction temperature	–	200	°C

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-c}$	thermal resistance from junction to case	$T_h = 25\text{ °C}$ , $P_L = 35\text{ W (AV)}$ , note 1	1	K/W
$R_{th\ j-hs}$	thermal resistance from heatsink to junction	$T_h = 25\text{ °C}$ , $P_L = 35\text{ W (AV)}$ , note 2	1.3	K/W

**Notes**

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

**CHARACTERISTICS**

$T_j = 25\text{ °C}$  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	$V_{GS} = 0$ ; $V_{DS} = 36\text{ V}$	–	–	1.5	μA
$I_{DSX}$	on-state drain current	$V_{GS} = V_{GSth} + 9\text{ V}$ ; $V_{DS} = 10\text{ V}$	24	–	–	A
$I_{GSS}$	gate leakage current	$V_{GS} = \pm 20\text{ V}$ ; $V_{DS} = 0$	–	–	0.5	μA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}$ ; $I_D = 10\text{ A}$	–	4.4	–	S
$R_{DSon}$	drain-source on-state resistance	$V_{GS} = 9\text{ V}$ ; $I_D = 10\text{ A}$	–	120	–	mΩ

Base station LDMOS transistors

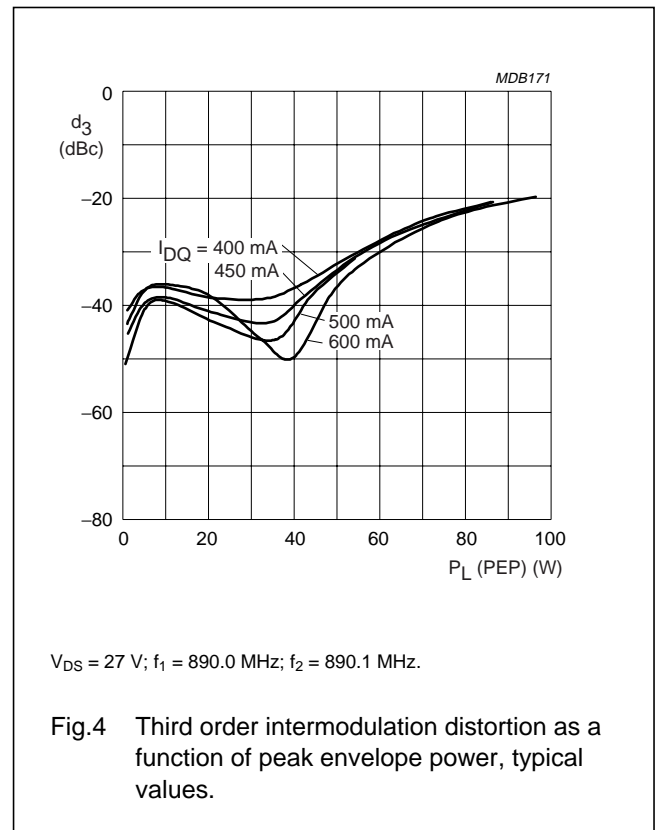
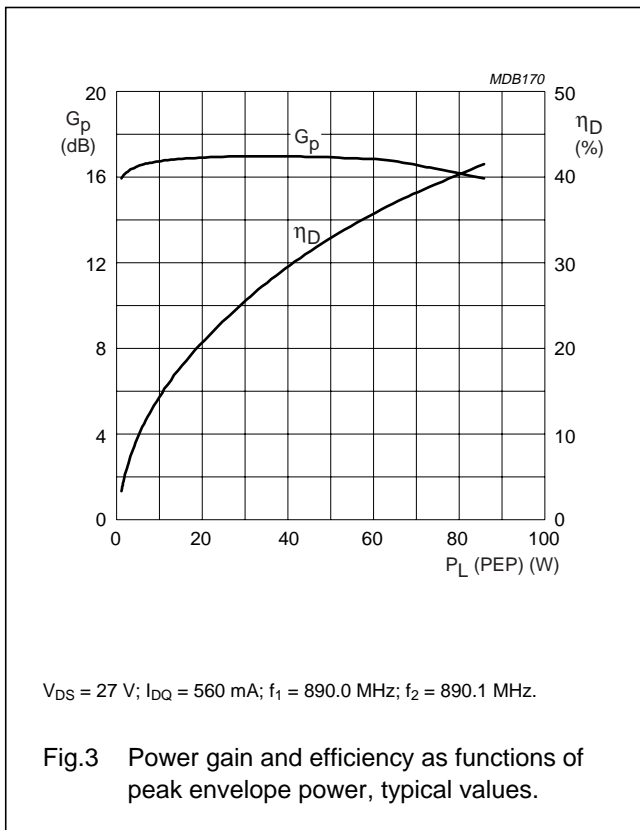
BLF0810-90; BLF0810S-90

APPLICATION INFORMATION

RF performance in a common source class-AB circuit.

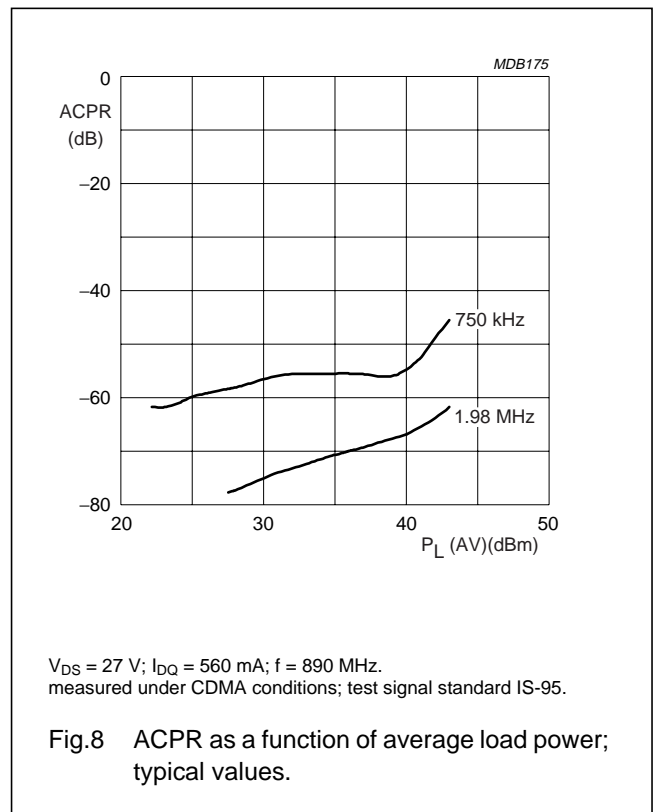
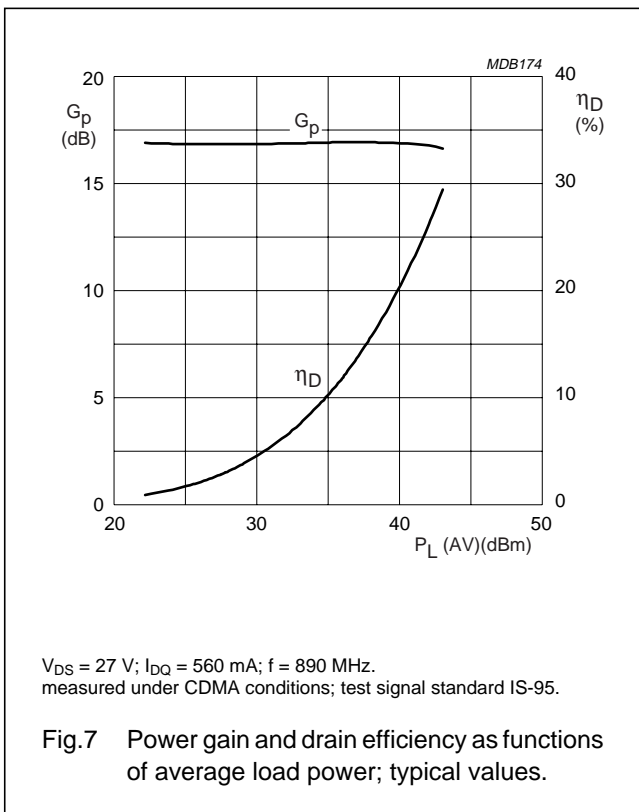
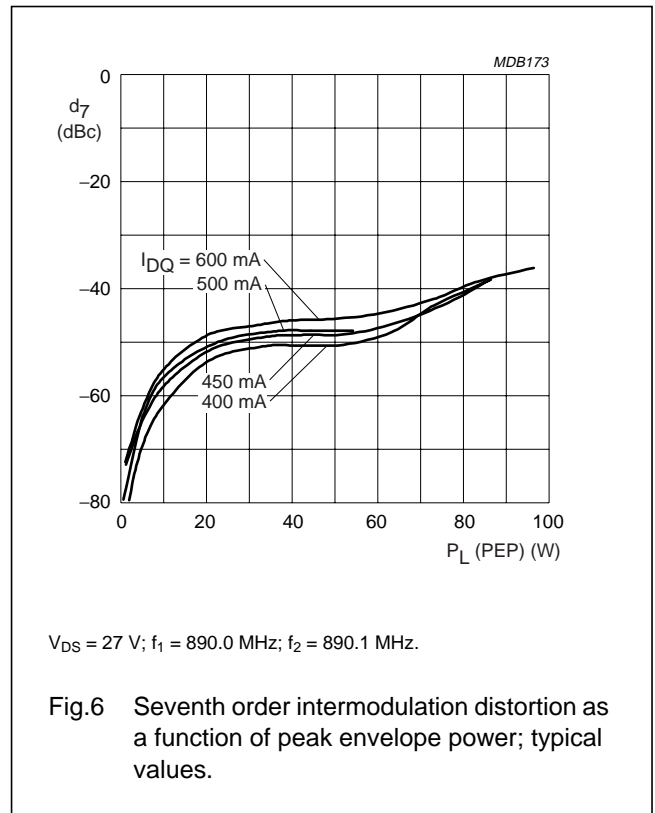
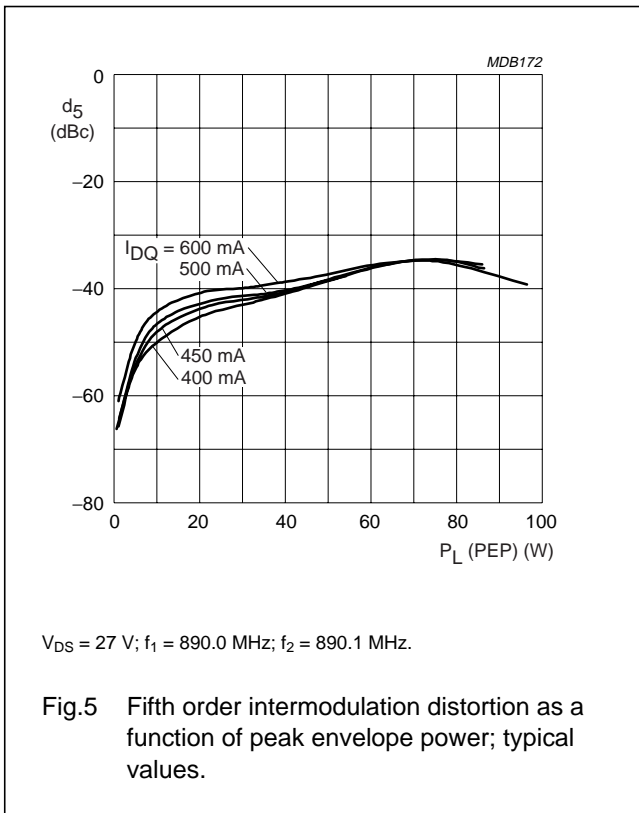
$V_{DS} = 27\text{ V}$ ;  $I_{DQ} = 560\text{ mA}$ ;  $f = 890\text{ MHz}$ ;  $T_h = 25\text{ }^\circ\text{C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Mode of operation: 2-tone CW, 100 kHz spacing</b>						
$G_p$	gain power	$P_L = 45\text{ W (PEP)}$	15	16.5	–	dB
$\eta_D$	drain efficiency		29	32	–	%
IRL	input return loss		–	–10	–6	dB
$d_3$	third order intermodulation distortion		–	–40	–	dBc
$G_p$	gain power	$P_L = 63\text{ W (PEP)}$	–	16.5	–	dB
$\eta_D$	drain efficiency		33	38	–	%
$d_3$	third order intermodulation distortion		–	–32	–27	dBc
	ruggedness	VSWR = 10 : 1 through all phases; $P_L = 125\text{ W (PEP)}$	no degradation in output power			
<b>Mode of operation: CDMA, IS95 (pilot, paging, sync and traffic codes 8 to 13)</b>						
$G_p$	gain power	$P_L = 15\text{ W (AV)}$	–	16	–	dB
$\eta_D$	drain efficiency	$P_L = 15\text{ W (AV)}$	–	27	–	%
ACPR 750	adjacent channel power ratio	at BW = 30 kHz	–	–46	–	dBc



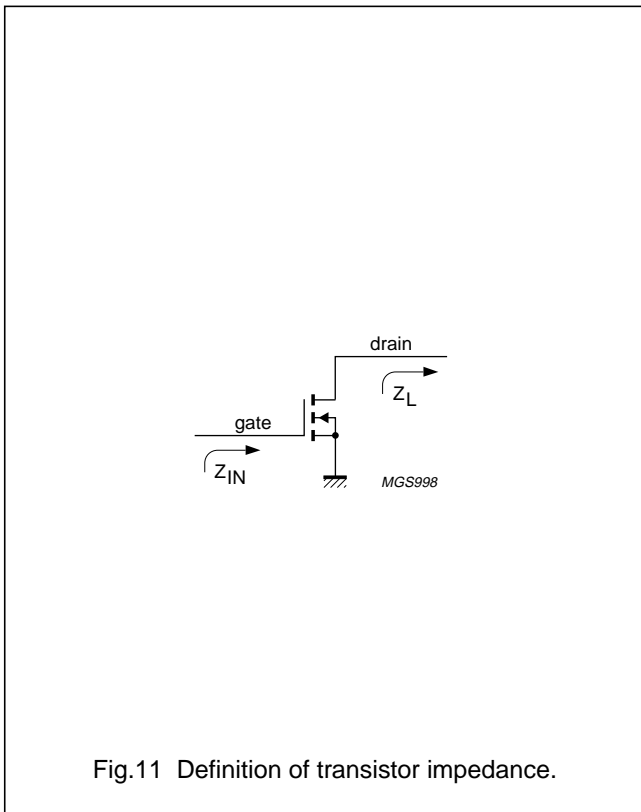
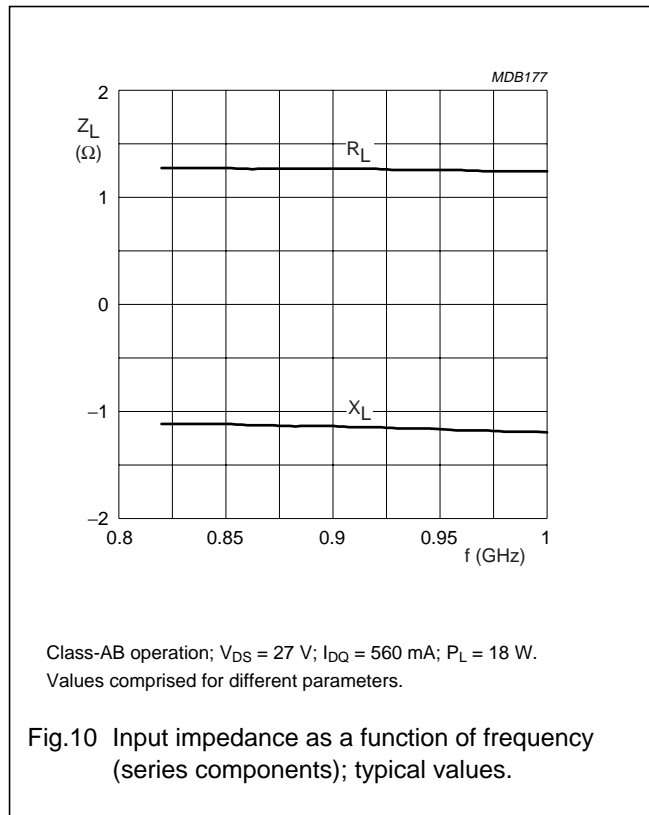
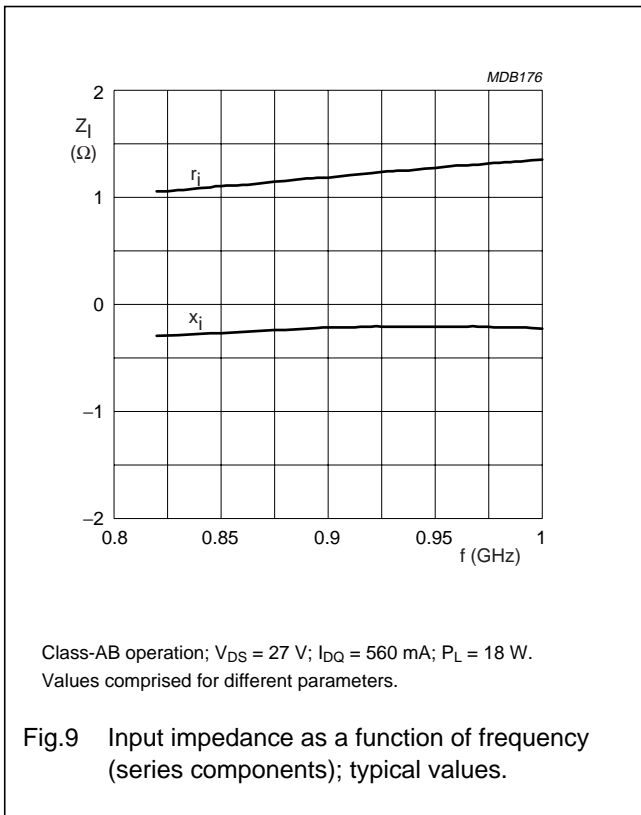
Base station LDMOS transistors

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Base station LDMOS transistors

BLF0810-90; BLF0810S-90



Base station LDMOS transistors

BLF0810-90; BLF0810S-90

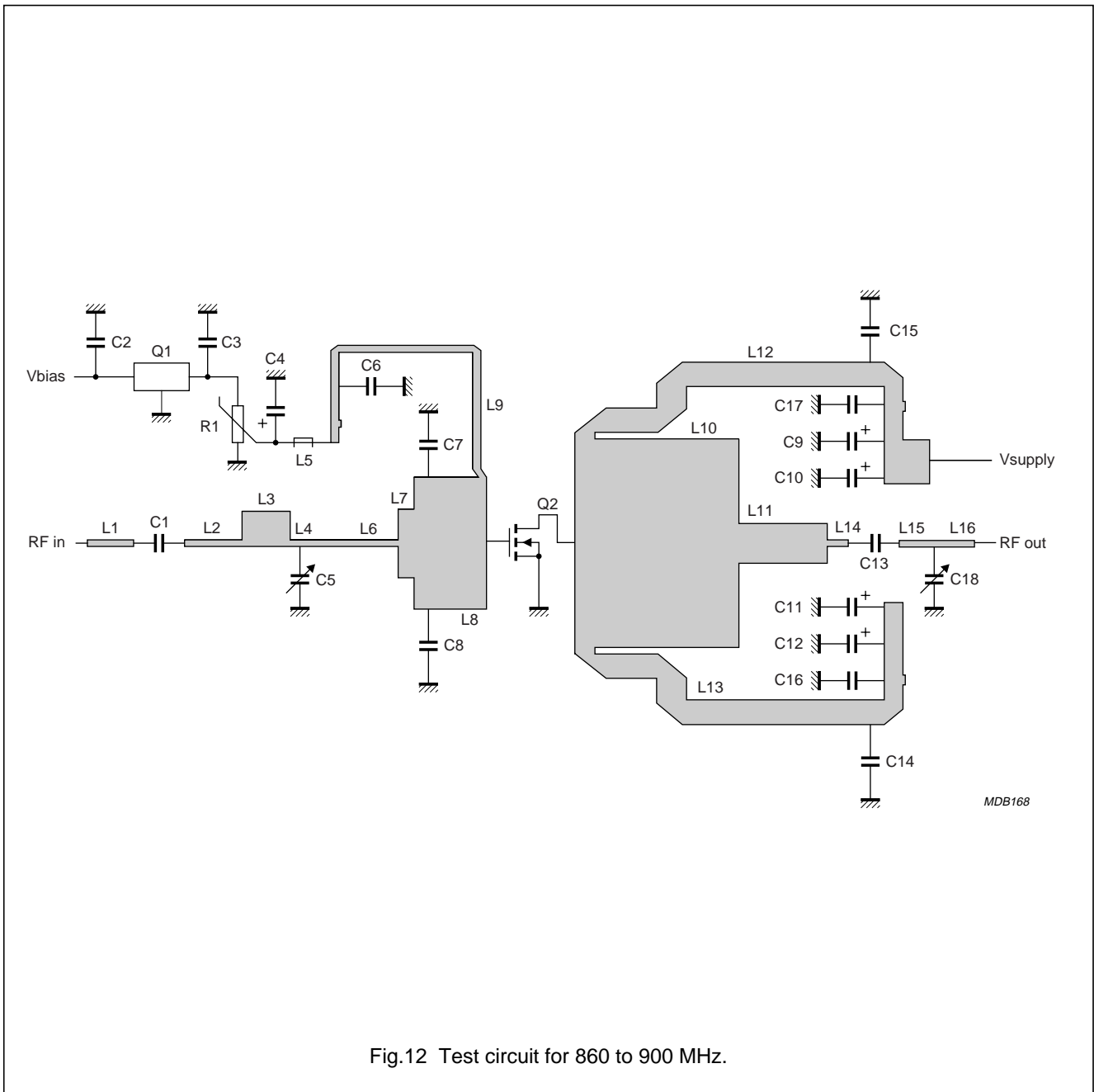
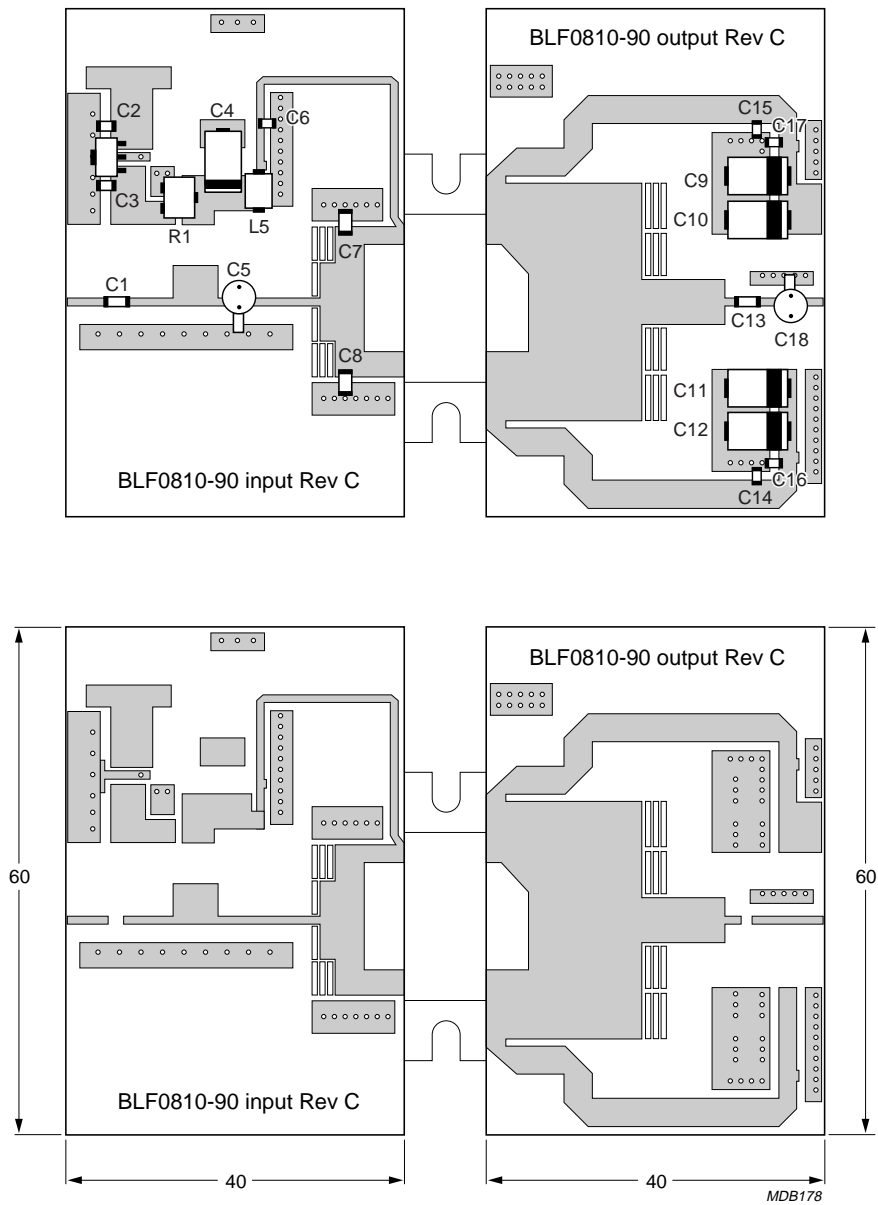


Fig.12 Test circuit for 860 to 900 MHz.

Base station LDMOS transistors

BLF0810-90; BLF0810S-90



Dimensions in mm.

The components are situated on one side of the copper-clad Rogers 6006 printed-circuit board ( $\epsilon_r = 6.15$ ); thickness = 25 mm. The other side is unetched and serves as a ground plane.

Fig.13 Component layout for 860 to 900 MHz test circuit.



## Base station LDMOS transistors

## BLF0810-90; BLF0810S-90

## List of components (see Figs 12 and 13)

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	8 pF	
C7, C8	multilayer ceramic chip capacitor	8.2 pF	
R1	potentiometer	1 k $\Omega$	
Q1	7808 voltage regulator		
Q2	BLF0810-90/BLF0810S-90 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.

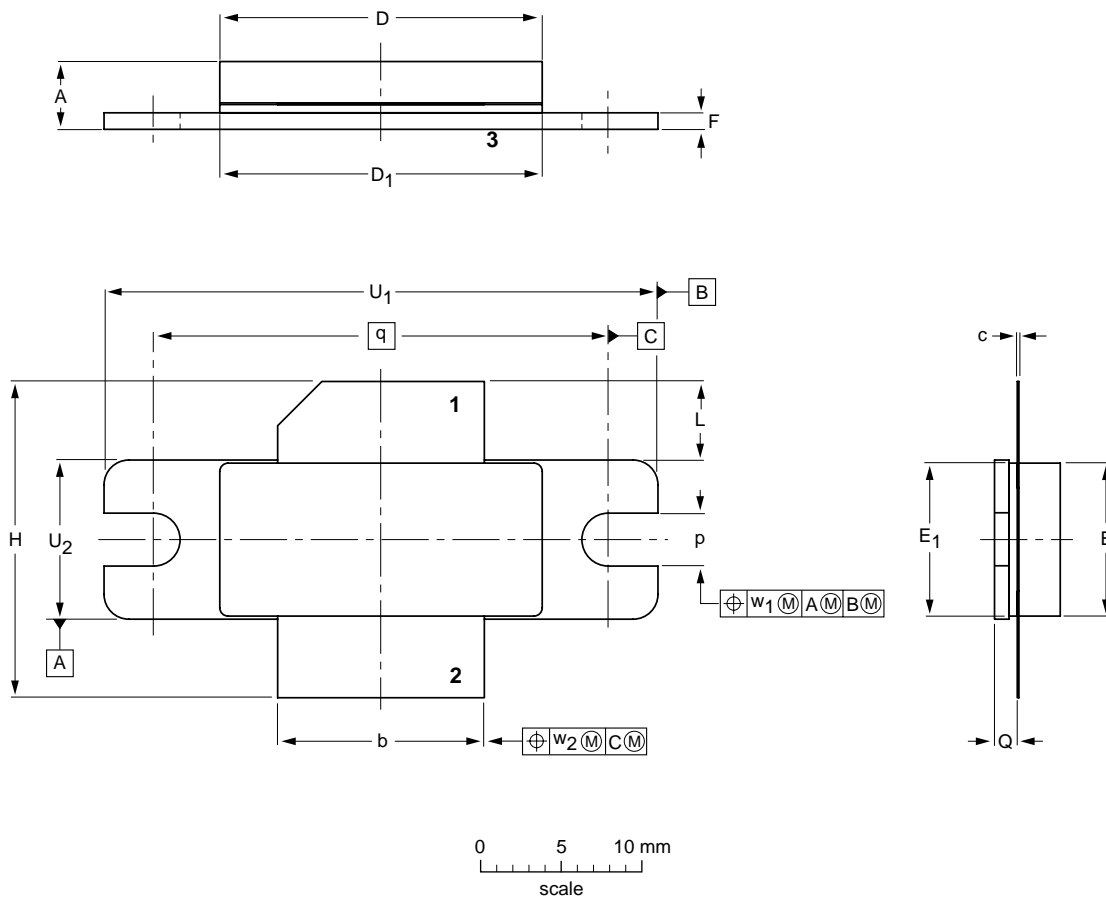
Base station LDMOS transistors

BLF0810-90; BLF0810S-90

PACKAGE OUTLINES

Flanged LDMOST ceramic package; 2 mounting holes; 2 leads

SOT502A



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

UNIT	A	b	c	D	D <sub>1</sub>	E	E <sub>1</sub>	F	H	L	p	Q	q	U <sub>1</sub>	U <sub>2</sub>	w <sub>1</sub>	w <sub>2</sub>
mm	4.72 3.43	12.83 12.57	0.15 0.08	20.02 19.61	19.96 19.66	9.50 9.30	9.53 9.25	1.14 0.89	19.94 18.92	5.33 4.32	3.38 3.12	1.70 1.45	27.94	34.16 33.91	9.91 9.65	0.25	0.51
inches	0.186 0.135	0.505 0.495	0.006 0.003	0.788 0.772	0.786 0.774	0.374 0.366	0.375 0.364	0.045 0.035	0.785 0.745	0.210 0.170	0.133 0.123	0.067 0.057	1.100	1.345 1.335	0.390 0.380	0.01	0.02

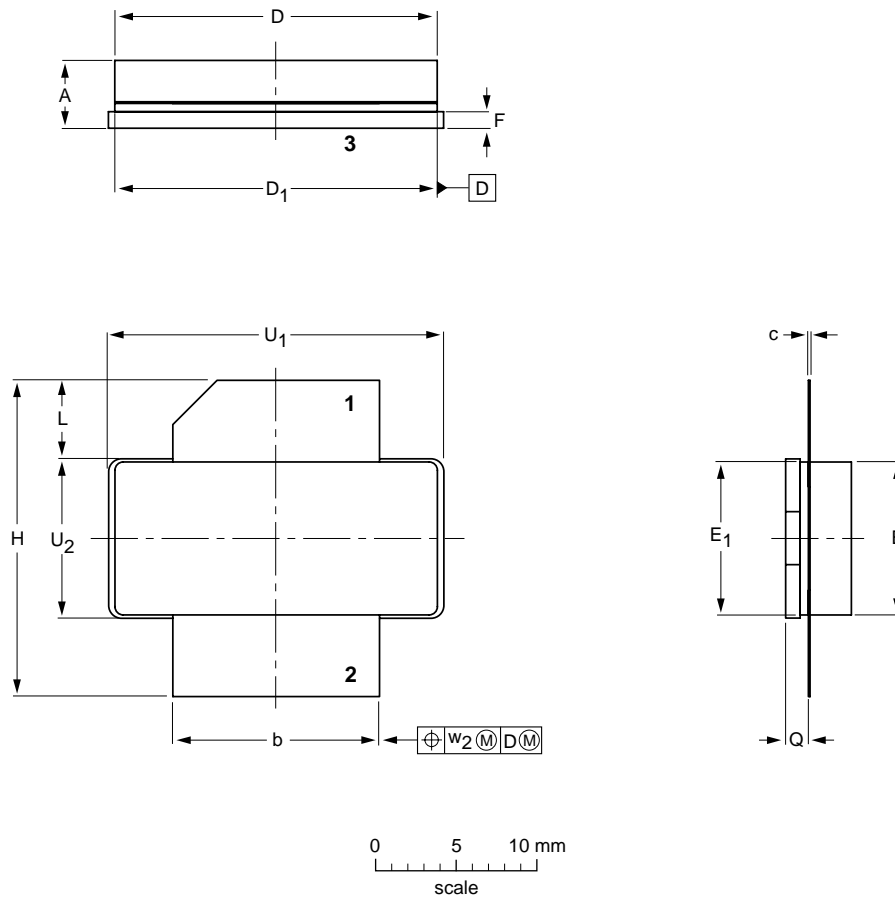
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT502A						99-12-28- 03-01-10

Base station LDMOS transistors

BLF0810-90; BLF0810S-90

Earless flanged LDMOST ceramic package; 2 leads

SOT502B



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

UNIT	A	b	c	D	D <sub>1</sub>	E	E <sub>1</sub>	F	H	L	Q	U <sub>1</sub>	U <sub>2</sub>	w <sub>2</sub>
mm	4.72	12.83	0.15	20.02	19.96	9.50	9.53	1.14	19.94	5.33	1.70	20.70	9.91	0.25
	3.43	12.57	0.08	19.61	19.66	9.30	9.25	0.89	18.92	4.32	1.45	20.45	9.65	
inches	0.186	0.505	0.006	0.788	0.786	0.374	0.375	0.045	0.785	0.210	0.067	0.815	0.390	0.010
	0.135	0.495	0.003	0.772	0.774	0.366	0.364	0.035	0.745	0.170	0.057	0.805	0.380	

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT502B						99-12-28- 03-01-10

## Base station LDMOS transistors

## BLF0810-90; BLF0810S-90

## DATA SHEET STATUS

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

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**NOTES**

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**NOTES**

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