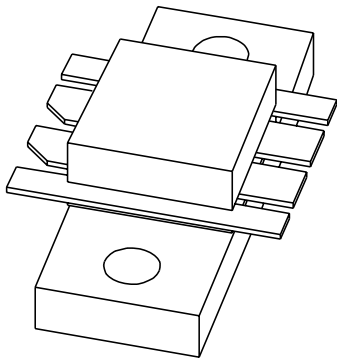


DATA SHEET



BLF246B

VHF push-pull power MOS
transistor

Product specification
Supersedes data of October 1992

1999 Jan 28

VHF push-pull power MOS transistor

BLF246B

FEATURES

- High power gain
- Easy power control
- Good thermal stability
- Gold metallization ensures excellent reliability.

APPLICATIONS

Large signal applications in the VHF frequency range.

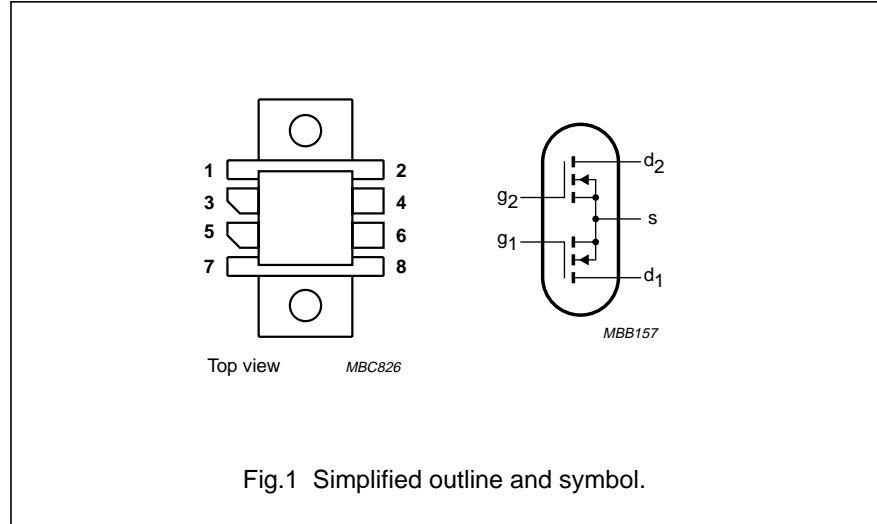
DESCRIPTION

Silicon N-channel enhancement mode vertical D-MOS push-pull transistor encapsulated in an 8-lead SOT161A balanced flange package with a ceramic cap. All leads are isolated from the flange.

PINNING - SOT161A

PIN	DESCRIPTION
1	source
2	source
3	drain 1
4	gate 1
5	drain 2
6	gate 2
7	source
8	source

PIN CONFIGURATION



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.

WARNING

Product and environmental safety - toxic materials

This product contains beryllium oxide. The product is entirely safe provided that the BeO disc is not damaged. All persons who handle, use or dispose of this product should be aware of its nature and of the necessary safety precautions. After use, dispose of as chemical or special waste according to the regulations applying at the location of the user. It must never be thrown out with the general or domestic waste.

QUICK REFERENCE DATA

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

MODE OF OPERATION	f (MHz)	V _{DS} (V)	P _L (W)	G _p (dB)	η _D (%)
CW, class-AB	175	28	60	>14	>55

VHF push-pull power MOS transistor

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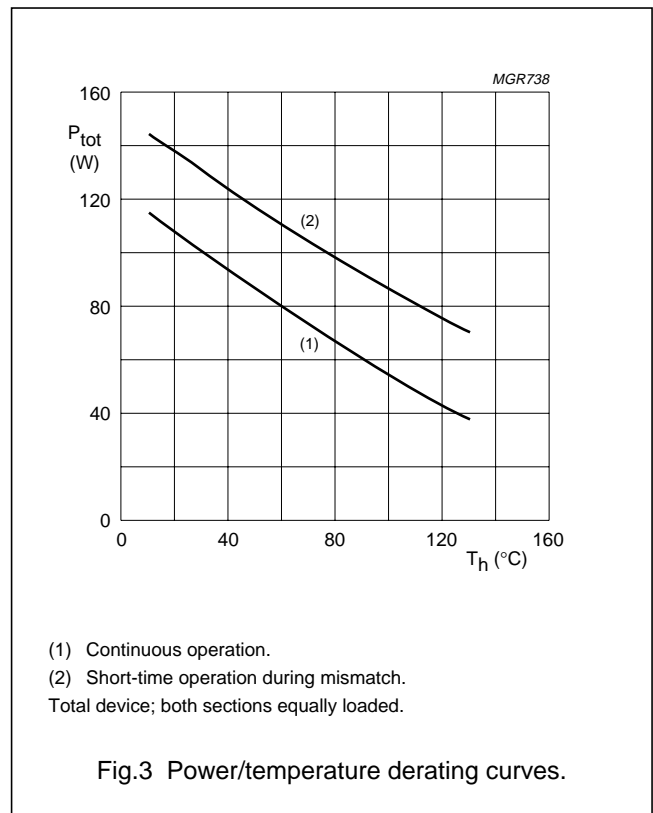
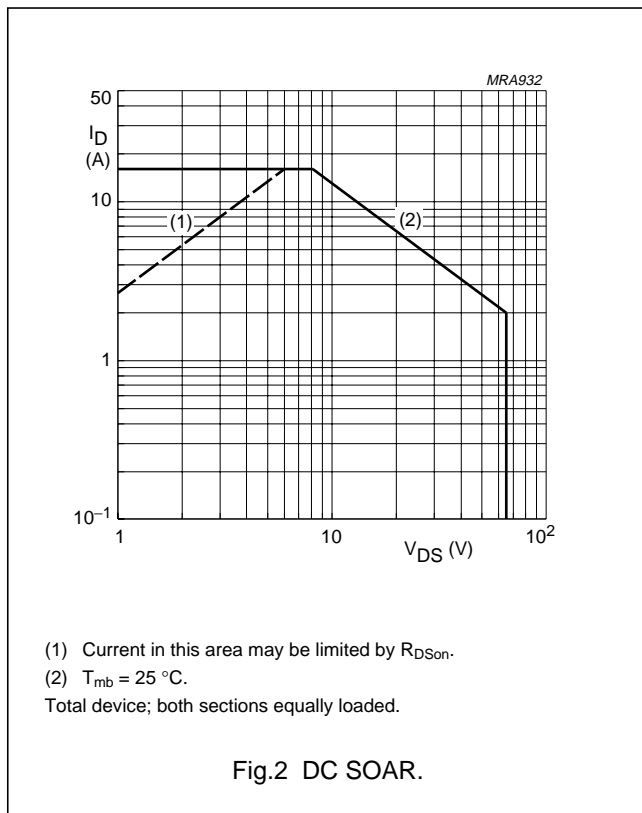
LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per transistor section unless otherwise specified					
V_{DS}	drain-source voltage		–	65	V
V_{GS}	gate-source voltage		–	± 20	V
I_D	drain current (DC)		–	8	A
P_{tot}	total power dissipation	$T_{mb} \leq 25\text{ }^\circ\text{C}$ total device; both sections equally loaded	–	130	W
T_{stg}	storage temperature		–65	+150	$^\circ\text{C}$
T_j	junction temperature		–	200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-mb}$	thermal resistance from junction to mounting base	total device; both sections equally loaded	1.35	K/W
$R_{th\ mb-h}$	thermal resistance from mounting base to heatsink	total device; both sections equally loaded	0.25	K/W



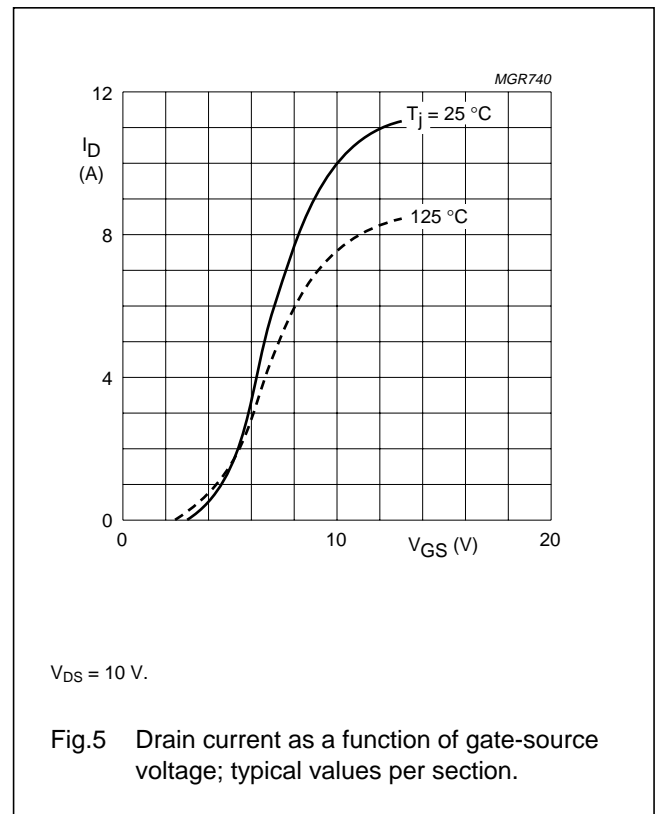
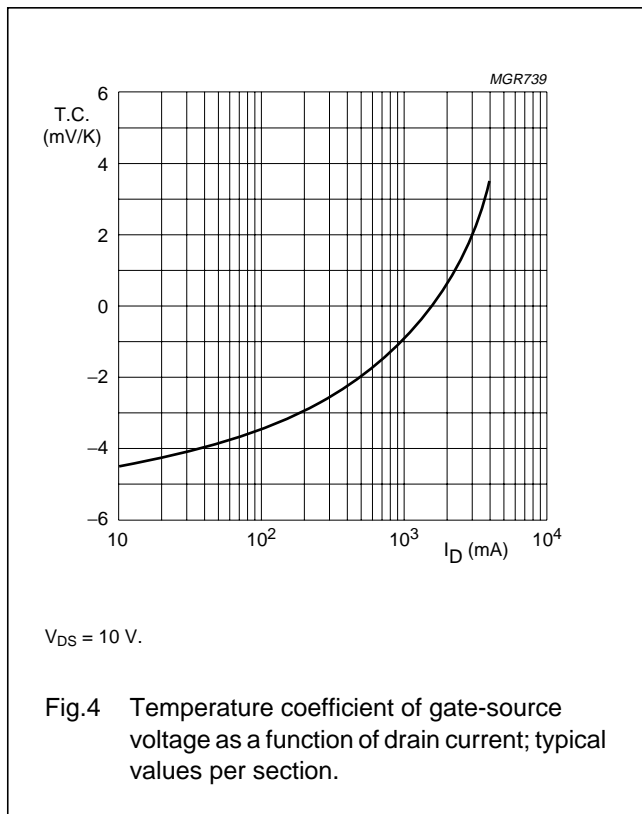
VHF push-pull power MOS transistor

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CHARACTERISTICS

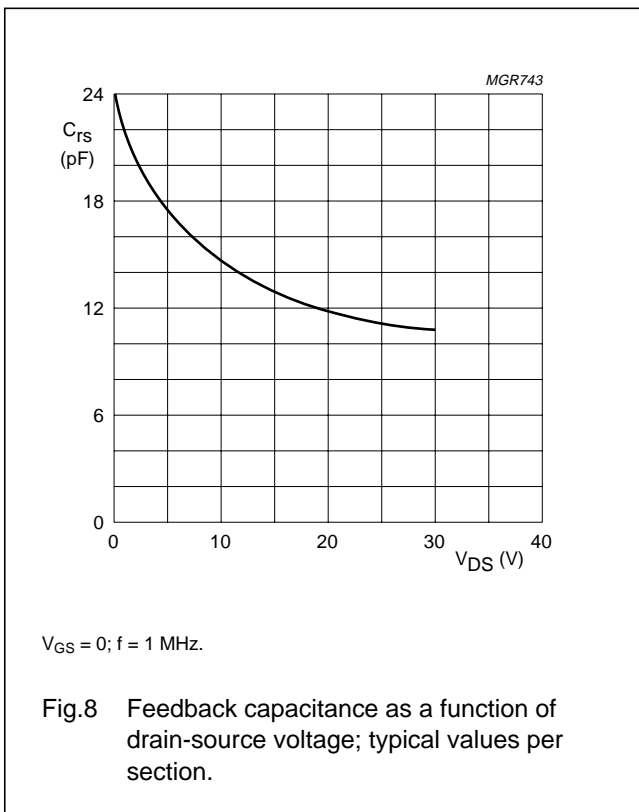
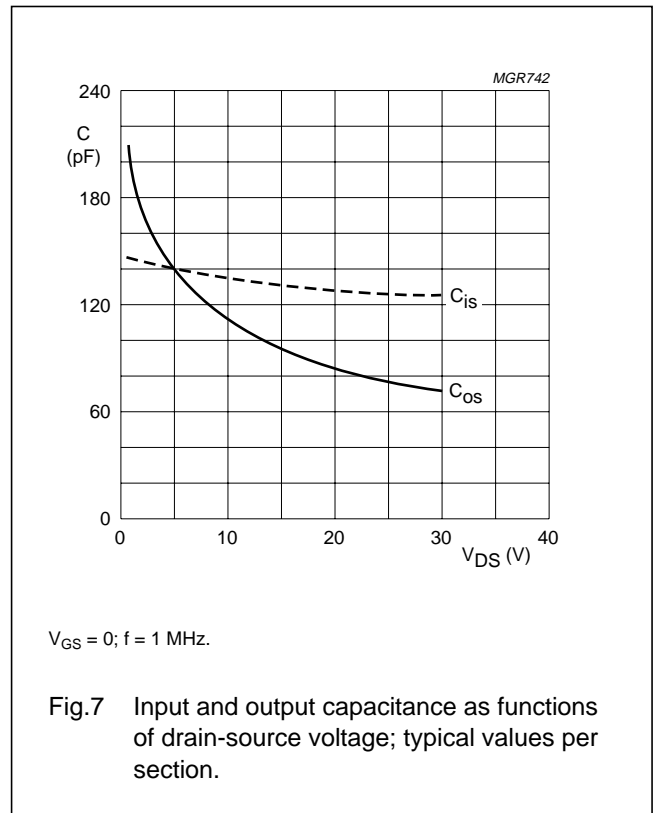
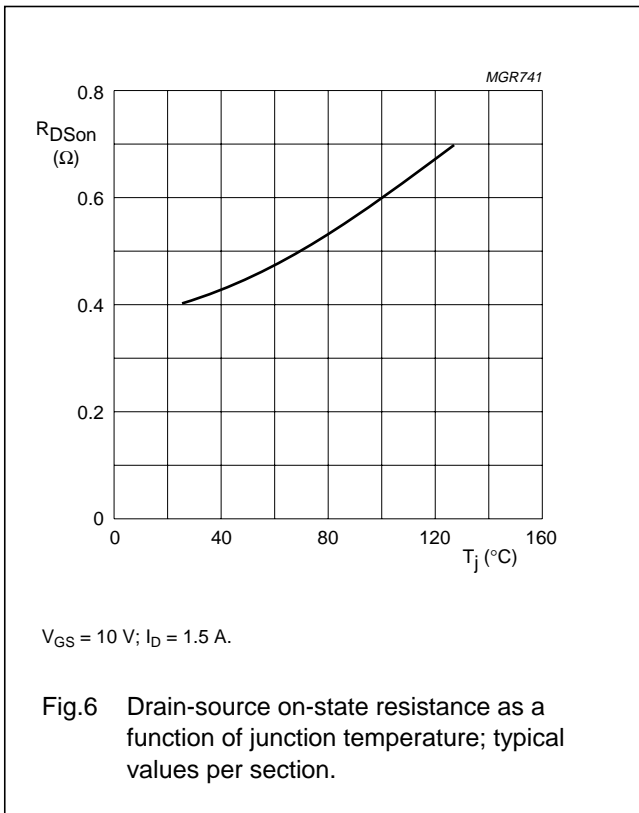
$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per transistor section						
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0; I_D = 10\text{ mA}$	65	–	–	V
I_{DSS}	drain-source leakage current	$V_{GS} = 0; V_{DS} = 28\text{ V}$	–	–	2	mA
I_{GSS}	gate-source leakage current	$V_{GS} = \pm 20\text{ V}; V_{DS} = 0$	–	–	1	μA
V_{GSth}	gate-source threshold voltage	$I_D = 10\text{ mA}; V_{DS} = 10\text{ V}$	2	–	4.5	V
g_{fs}	forward transconductance	$I_D = 1.5\text{ A}; V_{DS} = 10\text{ V}$	1.2	1.8	–	S
R_{DSon}	drain-source on-state resistance	$I_D = 1.5\text{ A}; V_{GS} = 10\text{ V}$	–	0.4	0.75	Ω
I_{DSX}	on-state drain current	$V_{GS} = 10\text{ V}; V_{DS} = 10\text{ V}$	–	10	–	A
C_{is}	input capacitance	$V_{GS} = 0; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$	–	125	–	pF
C_{os}	output capacitance	$V_{GS} = 0; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$	–	75	–	pF
C_{rs}	feedback capacitance	$V_{GS} = 0; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$	–	11	–	pF



VHF push-pull power MOS transistor

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VHF push-pull power MOS transistor

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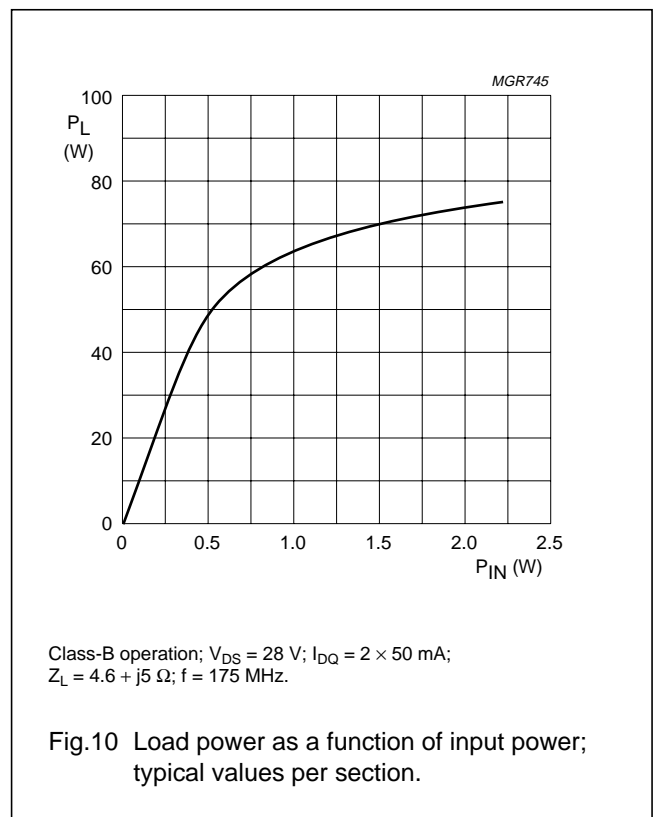
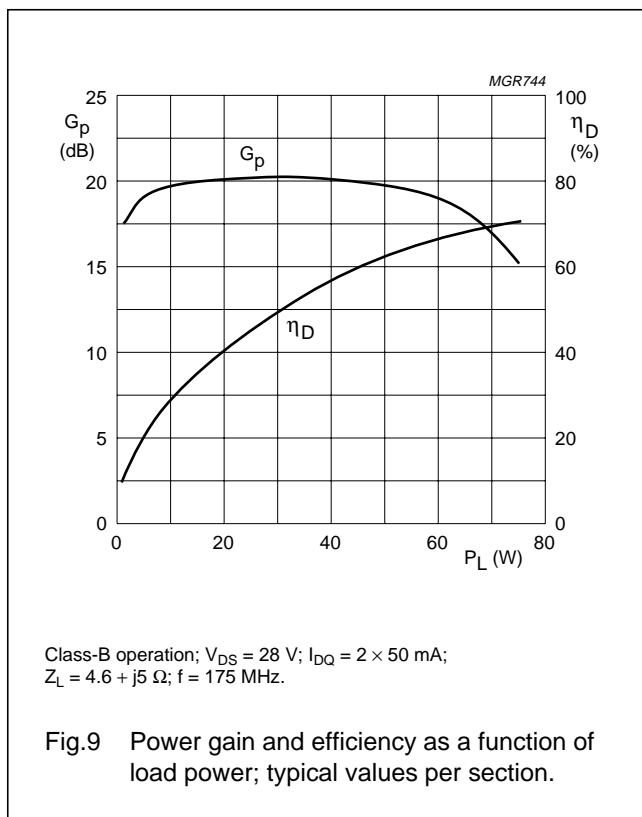
APPLICATION INFORMATION

RF performance in CW operation in a push-pull, common source, class-B circuit. $T_h = 25\text{ }^\circ\text{C}$; $R_{th\ mb-h} = 0.25\text{ K/W}$; unless otherwise specified.

MODE OF OPERATION	f (MHz)	V _{DS} (V)	I _{DQ} (mA)	P _L (W)	G _p (dB)	η _D (%)
CW, class-B	175	28	2 × 50	60	>14 typ. 19	>55 typ. 65

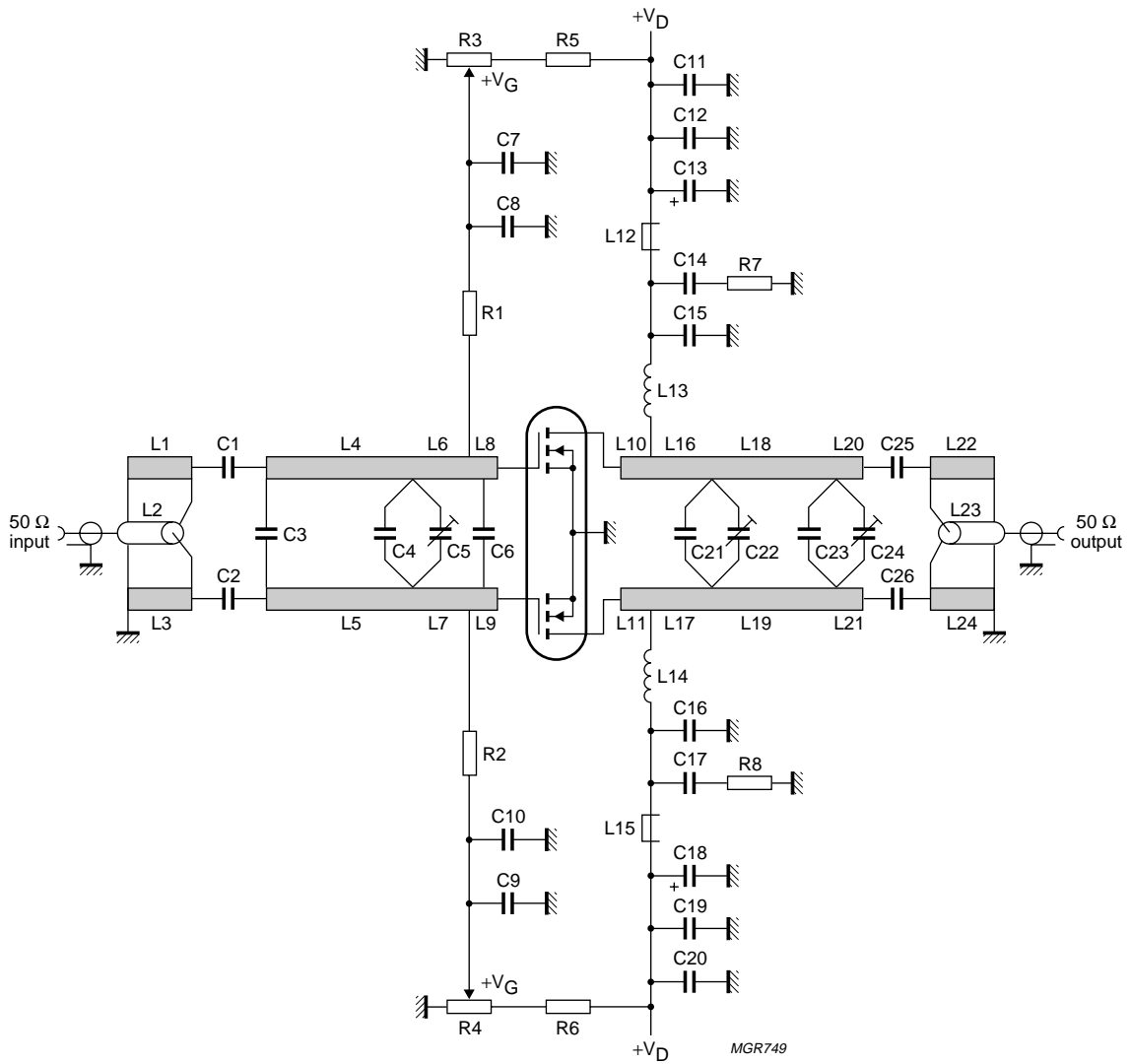
Ruggedness in class-B operation

The BLF246B is capable of withstanding a load mismatch corresponding to VSWR = 50 : 1 through all phases under the following conditions: V_{DS} = 28 V; f = 175 MHz at rated output power.



VHF push-pull power MOS transistor

BLF246B



f = 175 MHz.

Fig.11 Test circuit for class-B operation.

VHF push-pull power MOS transistor

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List of components class-B test circuit (see Figs 11 and 12)

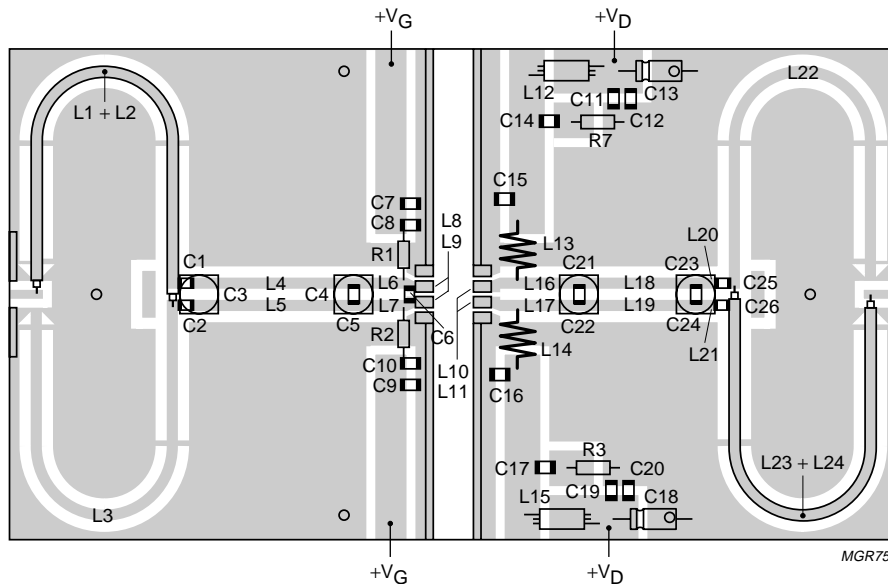
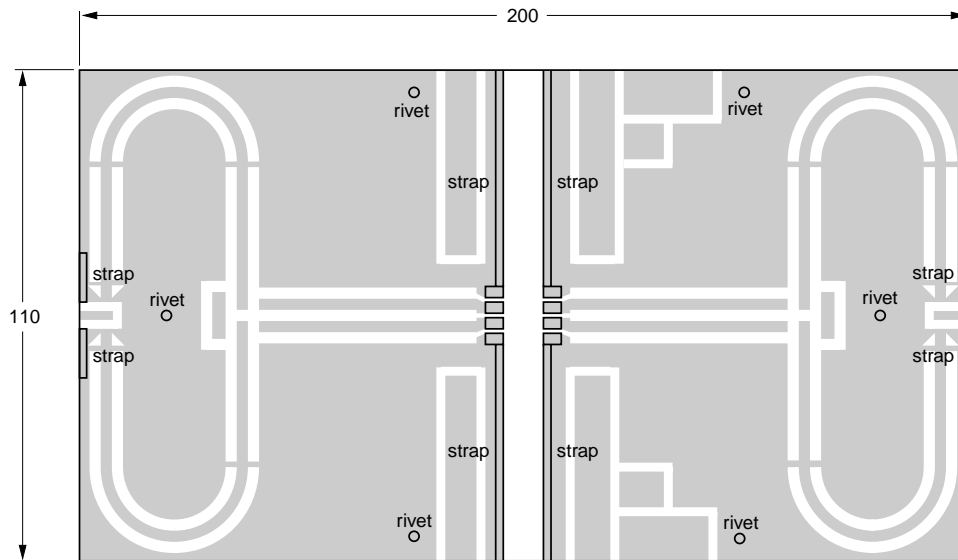
COMPONENT	DESCRIPTION	VALUE	DIMENSIONS	CATALOGUE No.
C1, C2, C25, C26	multilayer ceramic chip capacitor (note 1)	91 pF		
C3	film dielectric trimmer	4 to 40 pF		2222 809 08002
C4	multilayer ceramic chip capacitor (note 1)	180 pF		
C5, C22, C24	film dielectric trimmer	5 to 60 pF		2222 809 08003
C6	multilayer ceramic chip capacitor (note 1)	100 pF		
C7, C9, C12, C14, C17, C19	multilayer ceramic chip capacitor (note 1)	100 nF		2222 852 47104
C8, C10, C15, C16	multilayer ceramic chip capacitor (note 1)	680 pF		
C11, C20	multilayer ceramic chip capacitor (note 1)	10 nF		2222 852 47103
C13, C18	electrolytic capacitor	10 μ F, 63 V		
C21	multilayer ceramic chip capacitor (note 1)	82 pF		
C23	multilayer ceramic chip capacitor (note 1)	33 pF		
L1, L3, L22, L24	stripline (note 2)	55 Ω	111 \times 2.5 mm	
L2, L23	semi-rigid cable	50 Ω	length 111 mm ext. dia 2.2 mm	
L4, L5	stripline (note 2)	50 Ω	6.5 \times 2.8 mm	
L6, L7	stripline (note 2)	50 Ω	35 \times 2.8 mm	
L8, L9	stripline (note 2)	50 Ω	5 \times 2.8 mm	
L10, L11	stripline (note 2)	50 Ω	9 \times 2.8 mm	
L12, L15	grade 3B Ferroxcube wideband HF choke			4312 020 36642
L13, L14	4 turns enamelled 1 mm copper wire	50 nH	length 6.5 mm int. dia. 4 mm leads 2 \times 5 mm	
L16, L17	stripline (note 2)	50 Ω	17 \times 2.8 mm	
L18, L19	stripline (note 2)	50 Ω	26 \times 2.8 mm	
L20, L21	stripline (note 2)	50 Ω	4 \times 2.8 mm	
R1, R2, R7, R8	metal film resistor	0.4 W, 10 Ω		
R3, R4	10 turns potentiometer	50 k Ω		
R5, R6	metal film resistor	0.4 W, 205 k Ω		

Notes

1. American Technical Ceramics (ATC) capacitor, type 100B or other capacitor of the same quality.
2. The striplines are on a double copper-clad printed circuit board with epoxy glass dielectric ($\epsilon_r = 4.5$); thickness $\frac{1}{16}$ inch. The other side of the board is fully metallized and used as a ground plane. The ground planes on each side of the board are connected together by means of copper straps and hollow rivets.

VHF push-pull power MOS transistor

BLF246B



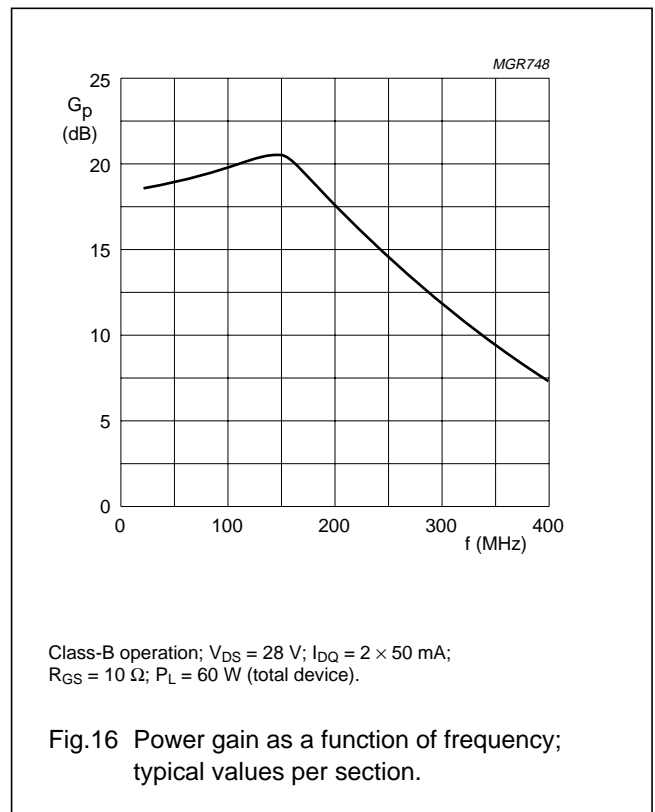
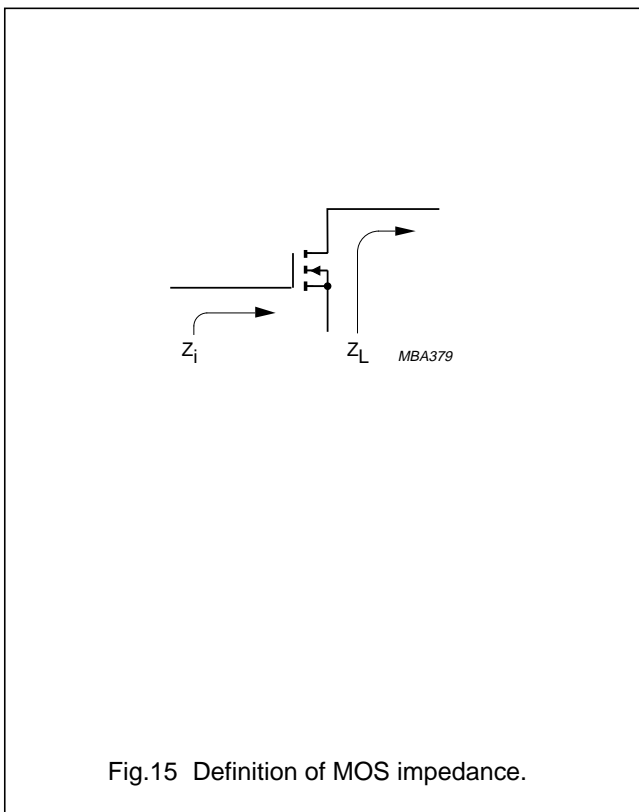
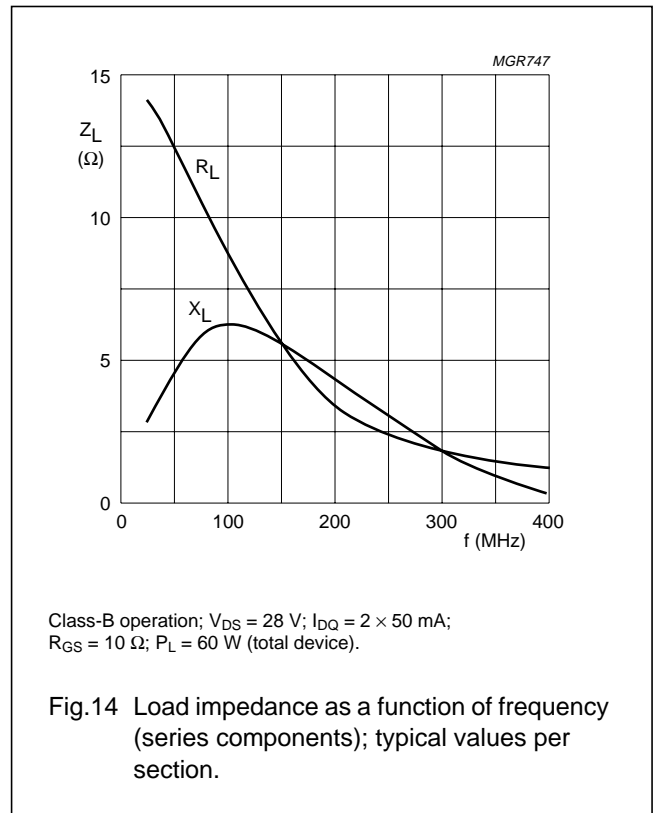
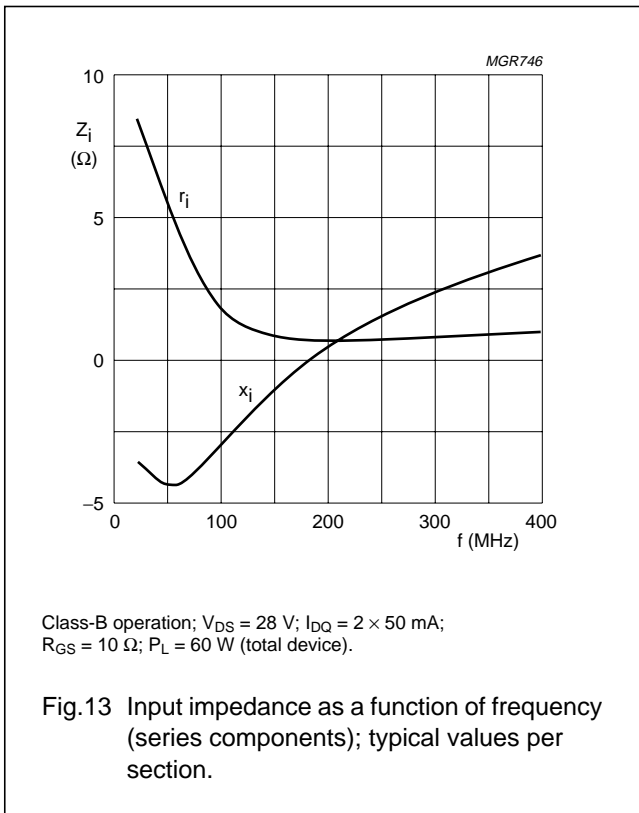
Dimensions in mm.

The circuit and components are situated on one side of the PTFE fibre-glass board, the other side being fully metallized, to serve as a ground plane. Earth connections are made by means of copper straps and hollow rivets for a direct contact between upper and lower sheets.

Fig.12 Component layout for 175 MHz class-B test circuit.

VHF push-pull power MOS transistor

BLF246B



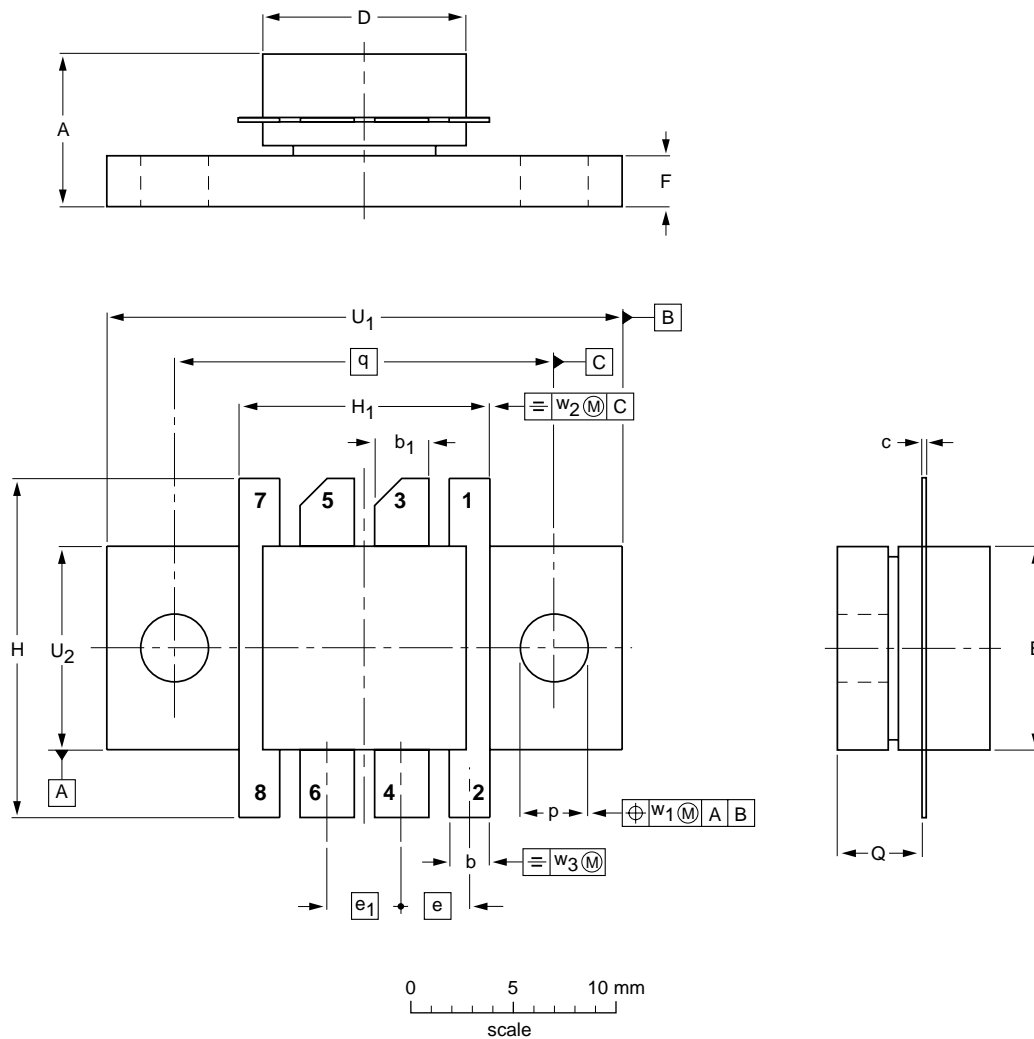
VHF push-pull power MOS transistor

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PACKAGE OUTLINE

Flanged ceramic package; 2 mounting holes; 8 leads

SOT161A



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

UNIT	A	b	b ₁	c	D	E	e	e ₁	F	H	H ₁	p	Q	q	U ₁	U ₂	w ₁	w ₂	w ₃
mm	7.27 6.47	2.04 1.77	2.93 2.66	0.18 0.10	10.22 10.00	10.22 10.00	3.50	3.80	2.70 2.08	17.00 16.00	12.83 12.57	3.36 2.92	4.32 4.06	18.42	24.97 24.71	10.34 10.08	0.51	1.02	0.26
inches	0.286 0.255	0.080 0.070	0.115 0.105	0.007 0.004	0.402 0.394	0.402 0.394	0.138	0.150	0.106 0.082	0.669 0.630	0.505 0.495	0.132 0.120	0.170 0.160	0.725	0.983 0.973	0.407 0.397	0.02	0.04	0.01

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT161A						97-06-28

VHF push-pull power MOS transistor

BLF246B

DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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VHF push-pull power MOS transistor

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NOTES

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NOTES

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微波光电部专业代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波 CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件：晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子元件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

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