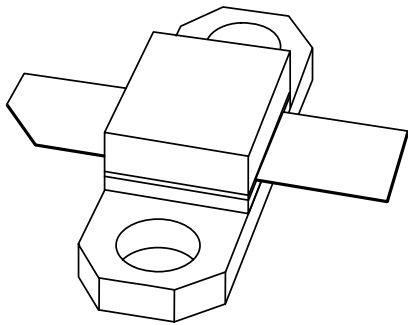


DATA SHEET



BLF2045 UHF power LDMOS transistor

Preliminary specification

1999 Dec 06

UHF power LDMOS transistor

BLF2045

FEATURES

- High power gain
- Easy power control
- Excellent ruggedness
- Source on underside eliminates DC isolators, reducing common mode inductance
- Designed for broadband operation.

APPLICATIONS

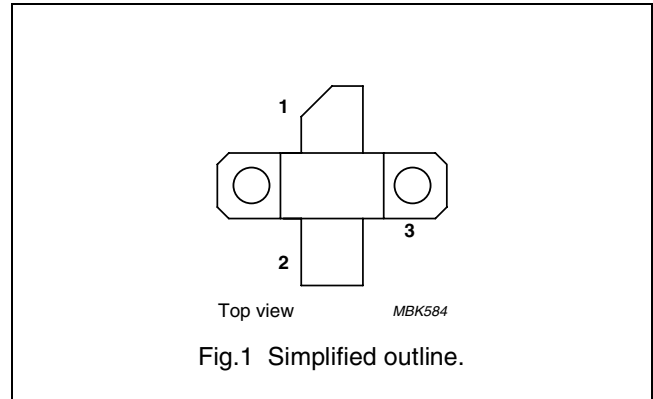
- Communication transmitter applications (PCN/PCS) in the 1.8 to 2.2 GHz frequency range.

DESCRIPTION

Silicon N-channel enhancement mode lateral D-MOS transistor encapsulated in a 2-lead flange package (SOT467C) with a ceramic cap. The common source is connected to the mounting flange.

PINNING - SOT467C

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



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)	PL (W)	G_p (dB)	η_D (%)	d_{im} (dBc)
2-tone, class-AB	$f_1 = 2000; f_2 = 2000.1$	26	30 (PEP)	>10	>30	≤ -25

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{DS}	drain-source voltage		-	65	V
V_{GS}	gate-source voltage		-	± 15	V
I_D	drain current (DC)		-	4.5	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.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-h}$	thermal resistance from junction to heatsink	$P_{tot} = 87.5\ W; T_h = 25\ ^\circ C;$ note 1	2	K/W

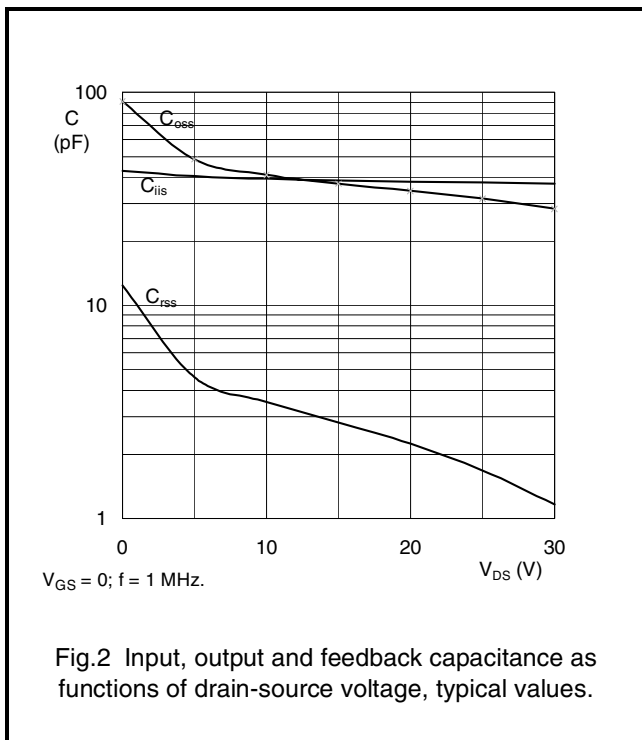
Note

1. Thermal resistance is determined under specified RF operating conditions.

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0; I_D = 0.7\ mA$	65	–	–	V
V_{GSth}	gate-source threshold voltage	$V_{DS} = 10\ V; I_D = 70\ mA$	1.5	–	3.5	V
I_{DSS}	drain-source leakage current	$V_{GS} = 0; V_{DS} = 26\ V$	–	–	5	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GSth} + 9\ V; V_{DS} = 10\ V$	9	–	–	A
I_{GSS}	gate leakage current	$V_{GS} = \pm 15\ V; V_{DS} = 0$	–	–	125	nA
g_{fs}	forward transconductance	$V_{DS} = 10\ V; I_D = 2.5\ A$	–	2	–	S
R_{DSon}	drain-source on-state resistance	$V_{GS} = V_{GSth} + 9\ V; I_D = 2.5\ A$	–	340	–	$m\Omega$
C_{is}	input capacitance	$V_{GS} = 0; V_{DS} = 26\ V; f = 1\ MHz$	–	38	–	pF
C_{os}	output capacitance	$V_{GS} = 0; V_{DS} = 26\ V; f = 1\ MHz$	–	31	–	pF
C_{rs}	feedback capacitance	$V_{GS} = 0; V_{DS} = 26\ V; f = 1\ MHz$	–	1.7	–	pF



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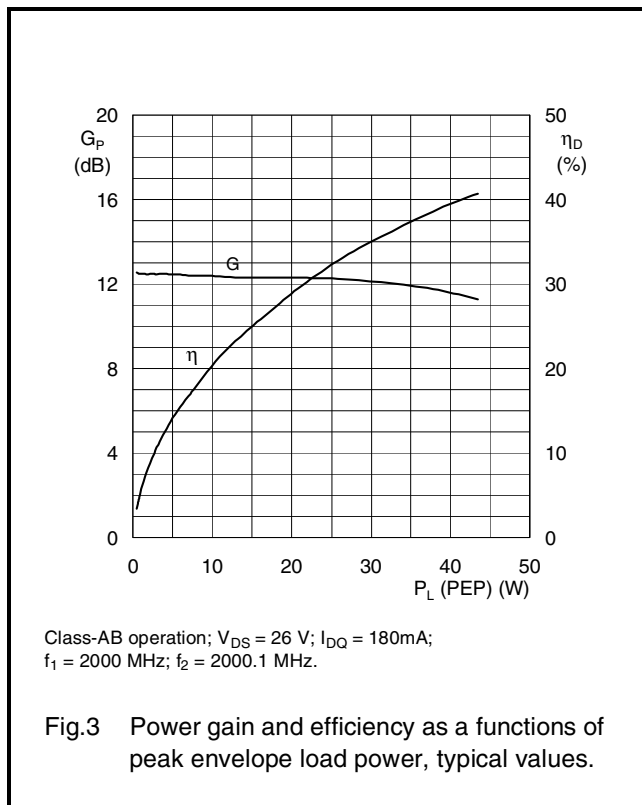
APPLICATION INFORMATION

RF performance in a common source class-AB circuit. $T_h = 25\text{ }^\circ\text{C}$; $R_{th\text{ mb-h}} = 0.65\text{ K/W}$, unless otherwise specified.

MODE OF OPERATION	f (MHz)	V _{DS} (V)	I _{DQ} (mA)	P _L (W)	G _p (dB)	η _D (%)	d _{im} (dBc)
2-tone, class-AB	f ₁ = 2000; f ₂ = 2000.1	26	180	30 (PEP)	>10	>30	≤-25

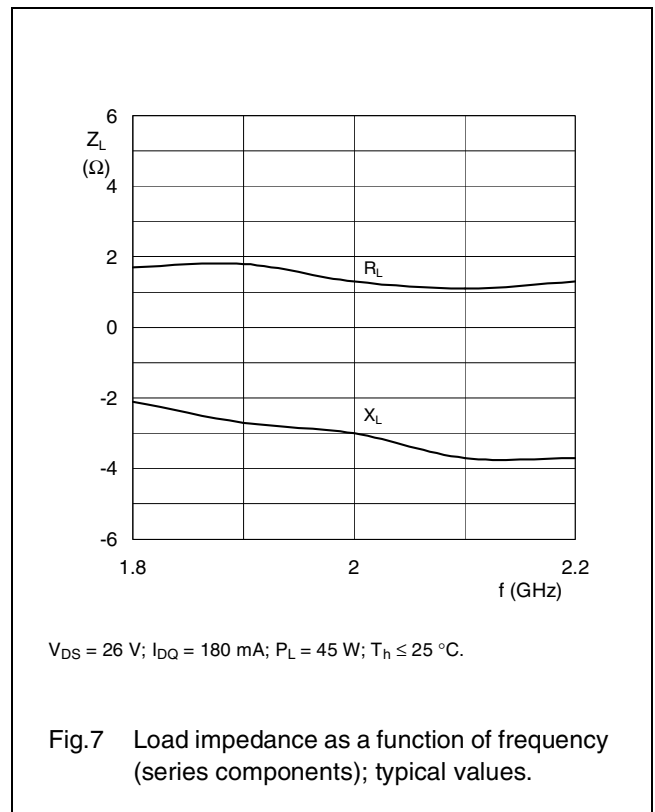
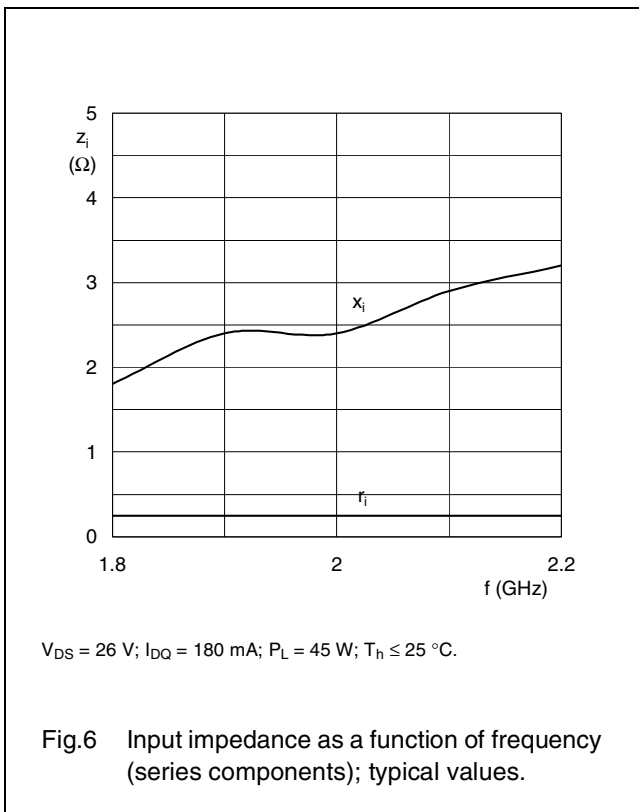
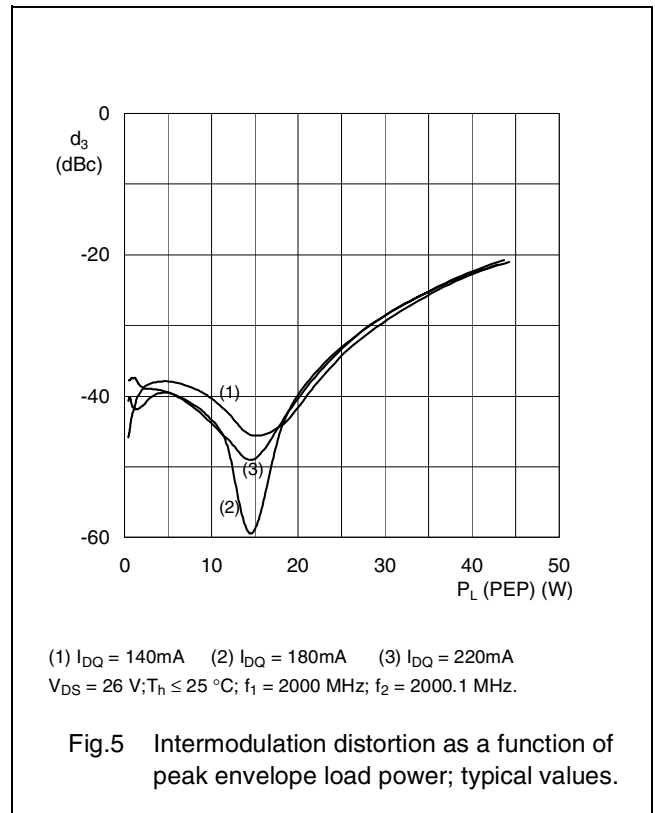
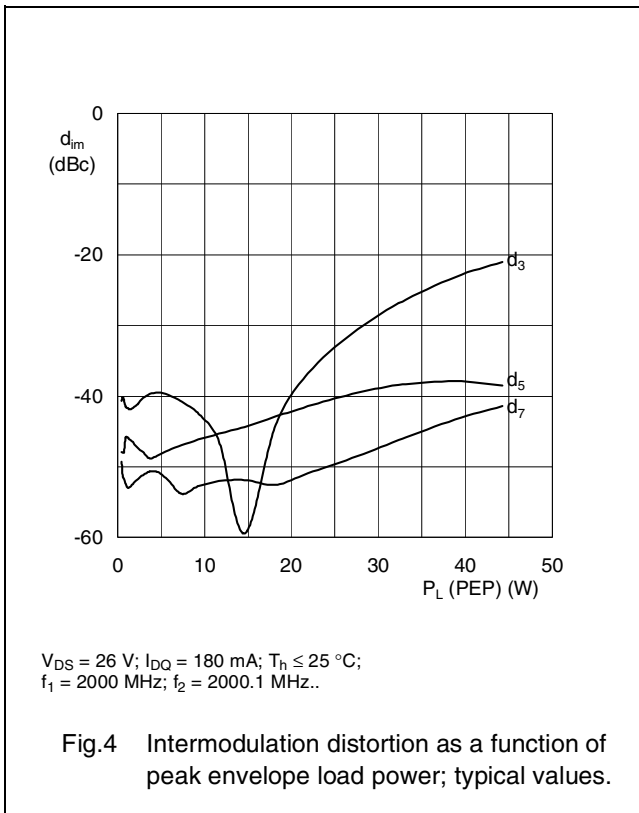
Ruggedness in class-AB operation

The BLF2045 is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 26 V; P_L = 30 W (CW); f = 2000 MHz.



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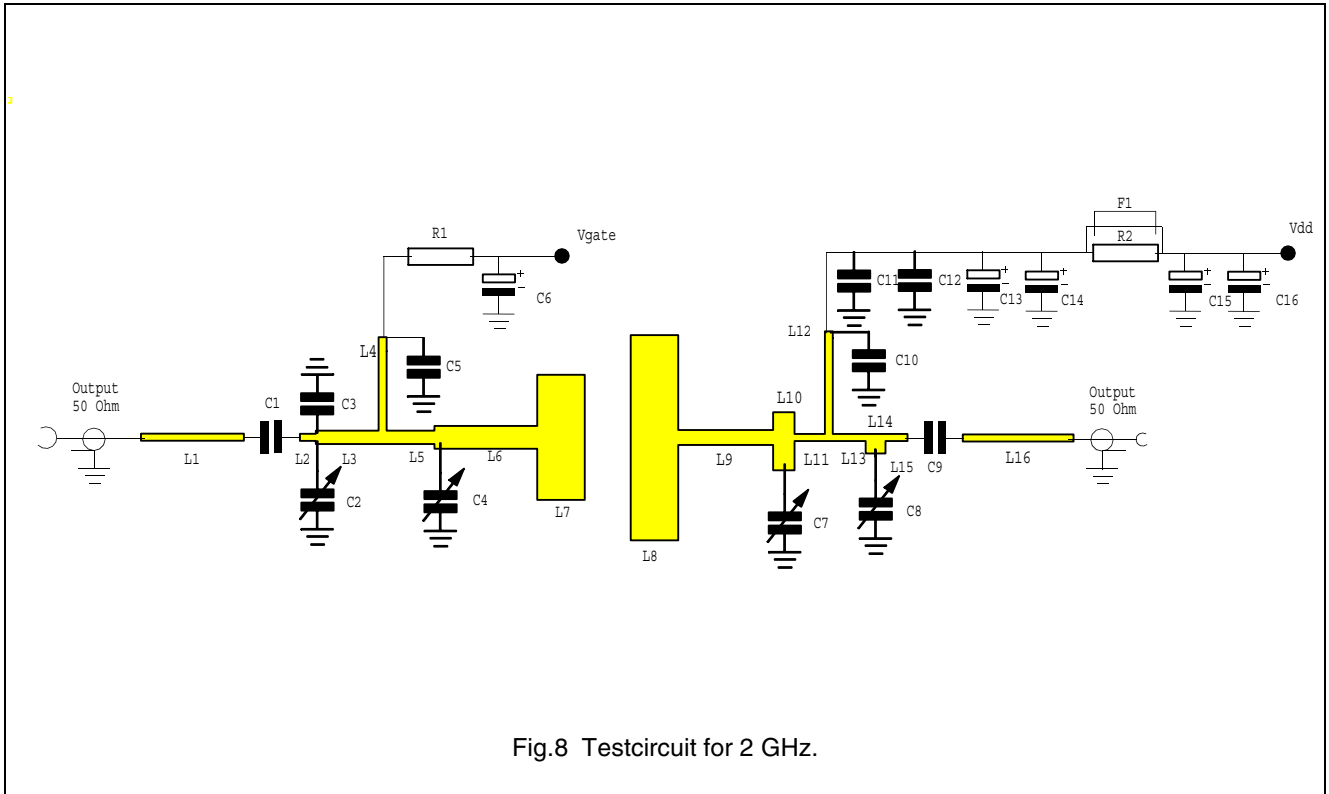


Fig.8 Testcircuit for 2 GHz.

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List of components

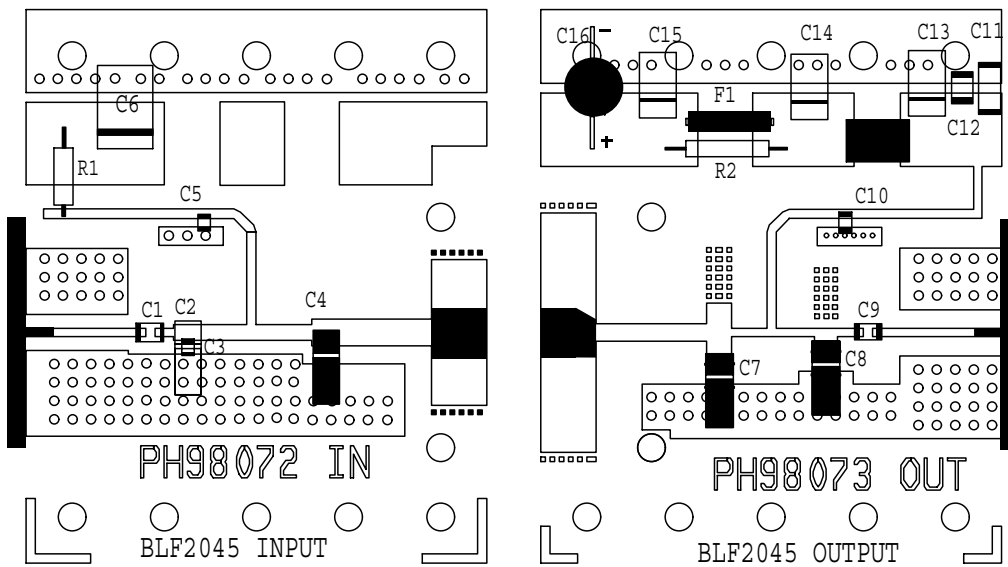
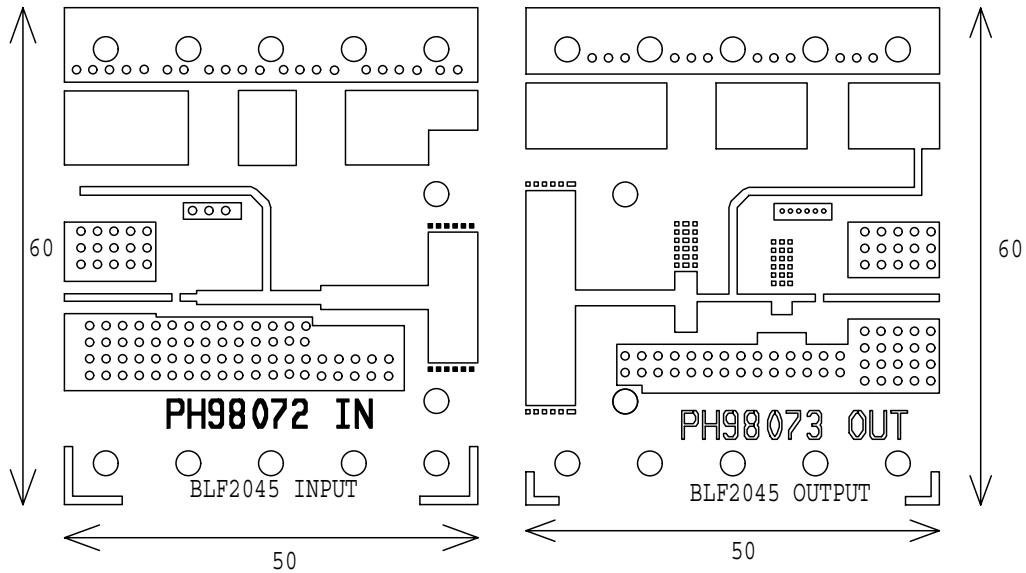
COMPONENT	DESCRIPTION	VALUE	DIMENSIONS	CATALOGUE NO.
C2, C4, C7, C8	Tekelec variable capacitor; type 37281	0.4 to 2.5 pF		
C3	multilayer ceramic chip capacitor; note 1	2.4 pF		
C1, C5, C9, C10	multilayer ceramic chip capacitor; note 1	11 pF		
C11	multilayer ceramic chip capacitor; note 2	1 nF		
C12	multilayer ceramic chip capacitor	100 nF		2222 581 16641
C6, C13, C14, C15	tantal SMD capacitor	4.5 μ F; 50 V		
C16	electrolytic capacitor	100 μ F; 63 V		2222 037 58101
F1	Ferroxcube chip-bead 8DS3/3/8/9-4S2			4330 030 36301
L1	stripline; note 3	50 Ω	13 \times 0.9 mm	
L2	stripline; note 3	50 Ω	2 \times 0.9 mm	
L3	stripline; note 3	34.3 Ω	15 \times 1.7 mm	
L4, L12	stripline; note 3	50 Ω	37 \times 0.9 mm	
L5	stripline; note 3	34.3 Ω	6 \times 1.7 mm	
L6	stripline; note 3	23.6 Ω	13 \times 2.9 mm	
L7	stripline; note 3	5.6 Ω	6 \times 15.8 mm	
L8	stripline; note 3	3.5 Ω	6 \times 26 mm	
L9	stripline; note 3	31.9 Ω	12 \times 1.9 mm	
L10	stripline; note 3	24.9 Ω	7.4 \times 2.7 mm	
L11	stripline; note 3	50 Ω	3 \times 0.9 mm	
L13	stripline; note 3	50 Ω	4.15 \times 0.9 mm	
L14	stripline; note 3	26.3 Ω	2.5 \times 2.5 mm	
L15	stripline; note 3	50 Ω	2.8 \times 0.9 mm	
L16	stripline; note 3	50 Ω	14 \times 0.9 mm	
R1, R2	metal film resistor	10 Ω , 0.6 W		2322 156 11009

Notes

1. American Technical Ceramics type 100A or capacitor of same quality.
2. American Technical Ceramics type 100B or capacitor of same quality.
3. The striplines are on a double copper-clad PCB with Teflon dielectric ($\epsilon_r = 6.15$); thickness 0.64 mm.

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Dimensions in mm.

The components are situated on one side of the copper-clad printed-circuit board with Teflon dielectric ($\epsilon_r = 6.15$), thickness 0.64 mm. The other side is unetched and serves as a ground plane.

Fig.9 Component layout for 2 GHz class-AB test circuit.

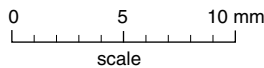
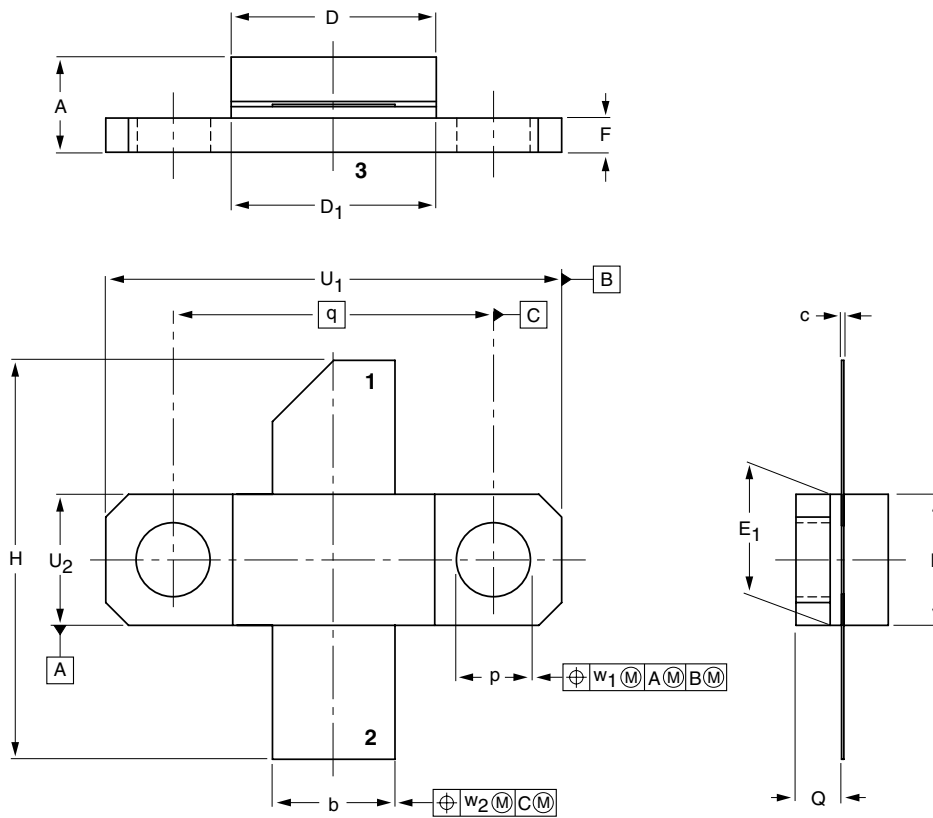
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PACKAGE OUTLINE

Flanged LDMOST package; 2 mounting holes; 2 leads

SOT467C



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

UNIT	A	b	c	D	D ₁	E	E ₁	F	H	p	Q	q	U ₁	U ₂	w ₁	w ₂
mm	4.67 3.94	5.59 5.33	0.15 0.10	9.25 9.04	9.27 9.02	5.92 5.77	5.97 5.72	1.65 1.40	18.54 17.02	3.43 3.18	2.21 1.96	14.27	20.45 20.19	5.97 5.72	0.25	0.51
inch	0.184 0.155	0.220 0.210	0.006 0.004	0.364 0.356	0.365 0.355	0.233 0.227	0.235 0.225	0.065 0.055	0.73 0.67	0.135 0.125	0.087 0.077	0.562	0.805 0.795	0.235 0.225	0.010	0.020

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT467C						99-10-28 99-12-06

UHF power LDMOS transistor

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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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