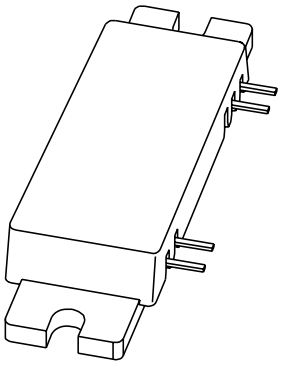
DATA SHEET



BGY2016
UHF amplifier module

Product specification
Supersedes data of 2000 Jan 04

2000 Oct 17

Philips
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UHF amplifier module BGY2016

FEATURES

- 26 V nominal supply voltage
- 16 W output power into a load of 50 Ω with an RF drive power of ≤20 mW.

APPLICATIONS

- Base station transmitting equipment operating in the 1805 to 1990 MHz frequency band.

DESCRIPTION

The BGY2016 is a three-stage UHF amplifier module in a SOT365A package with a plastic cap. It consists of three NPN silicon planar transistor dies mounted together with matching and bias circuit components on a metallized ceramic AlN substrate.

PINNING - SOT365A

PIN	DESCRIPTION
1	RF input
2	V_{S1}
3	V_{S2}
4	RF output
Flange	ground

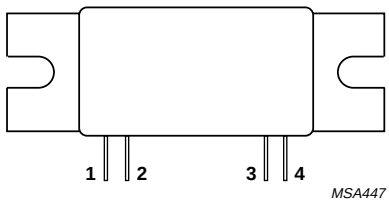


Fig.1 Simplified outline.

QUICK REFERENCE DATA

RF performance at T_{mb} = 25 °C.

MODE OF OPERATION	f (MHz)	V_{S1} (V)	V_{S2} (V)	P_L (W)	G_p (dB)	η (%)	Z_S; Z_L (Ω)
CW	1805 to 1990	5	26	≥16	≥28	≥30	50

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{S1}	DC supply voltage		4.5	5.5	V
V_{S2}	DC supply voltage		–	28	V
P_D	input drive power		–	120	mW
P_L	load power	T_{mb} = 25 °C	–	20	W
T_{stg}	storage temperature		–30	+100	°C
T_{mb}	operating mounting base temperature		–10	+90	°C

CHARACTERISTICS

T_{mb} = 25 °C; V_{S1} = 5 V; V_{S2} = 26 V; P_L = 16 W; Z_S = Z_L = 50 Ω unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency		1805	–	1990	MHz
I_{S1}	supply current		–	80	–	mA
I_{S2}	supply current	P_D < –60 dBm	–	430	–	mA
P_L	load power	P_D < 20 mW	16	–	–	W
G_p	power gain		28	–	35	dB
ΔG_p	in band gain variation	f = 1805 to 1880 MHz; P_L = 5 W	–	–	2	dB
		f = 1930 to 1990 MHz; P_L = 5 W	–	–	2	dB
$\lvert G_{p1} - G_{p2} \rvert$	gain expansion	G_{p1} at P_L = 160 mW; G_{p2} at P_L = 5 mW	–	–	±1	dB
η	efficiency	P_L = 16 W	30	–	–	%
H_2	second harmonic	P_L = 16 W	–	–	–35	dBc
H_3	third harmonic	P_L = 16 W	–	–	–40	dBc
$VSWR_{in}$	input VSWR		–	–	2 : 1	
	stability	VSWR ≤ 2 : 1 through all phases; P_L ≤ 16 W; V_{S2} = 25 to 27 V	–	–	–60	dBc
	reverse intermodulation	$P_{carrier}$ = 16 W; $P_{reverse}$ = –40 dBc; f_i = f_c ±200 kHz	–	–	–53	dBc
B	AM bandwidth	corner frequency = 3 dB; $P_{carrier}$ = 16 W; modulation = 20%	2	–	–	MHz
	ruggedness	VSWR ≤ 5 : 1 through all phases	no degradation			

APPLICATION INFORMATION

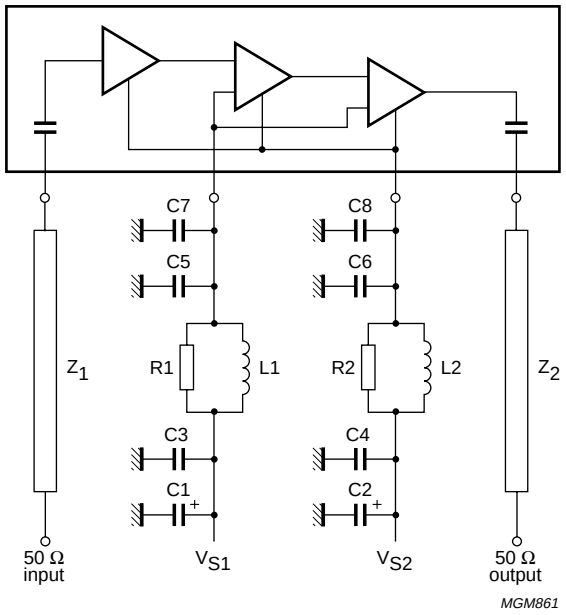


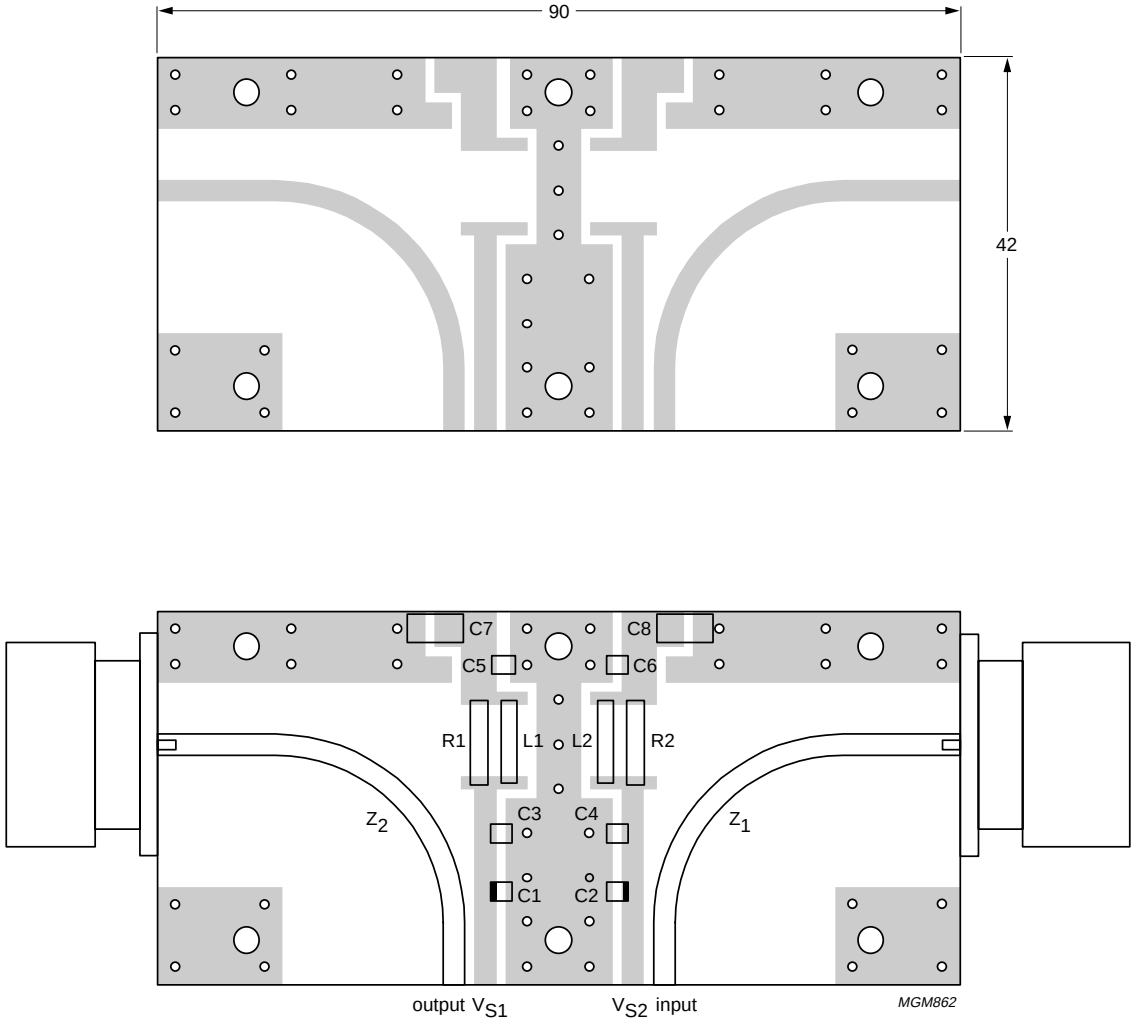
Fig.2 Test circuit.

List of components (See Figs 2 and 3)

COMPONENT	DESCRIPTION	VALUE	CATALOGUE NO.
C1, C2	electrolytic capacitor	10 μF; 35 V	–
C3, C4	multilayer ceramic chip capacitor	10 nF; 50 V	–
C5, C6	multilayer ceramic chip capacitor	100 pF; 50 V	–
C7, C8	multilayer ceramic chip capacitor	10 pF; 50 V	–
L1, L2	Grade 4S2 Ferroxcube bead	–	4330 030 36300
R1, R2	metal film resistor	10 Ω; 0.4 W	2322 195 13109
Z_1, Z_2	stripline; note 1	50 Ω	–

Note

1. The striplines are on a double copper-clad printed-circuit board (RO5880) with ε_r = 2.2 and thickness = 0.79 mm.



Dimensions in mm.

Fig.3 Printed-circuit board component layout.

MOUNTING RECOMMENDATIONS

To ensure a good thermal contact and to prevent mechanical stress when bolted down, the flatness of the mounting base is designed to be typically better than 0.1 mm. The mounting area of the heatsink should be flat and free from burrs and loose particles. The heatsink should be rigid and not prone to bowing under thermal cycling conditions. The thickness of a solid heatsink should be not less than 5 mm to ensure a rigid assembly.

A thin, even layer of thermal compound should be applied between the mounting base and the heatsink to achieve the best possible thermal contact resistance. Excessive use of thermal compound will result in an increase in thermal resistance and possible bowing of the mounting base; too little will also result in poor thermal conduction.

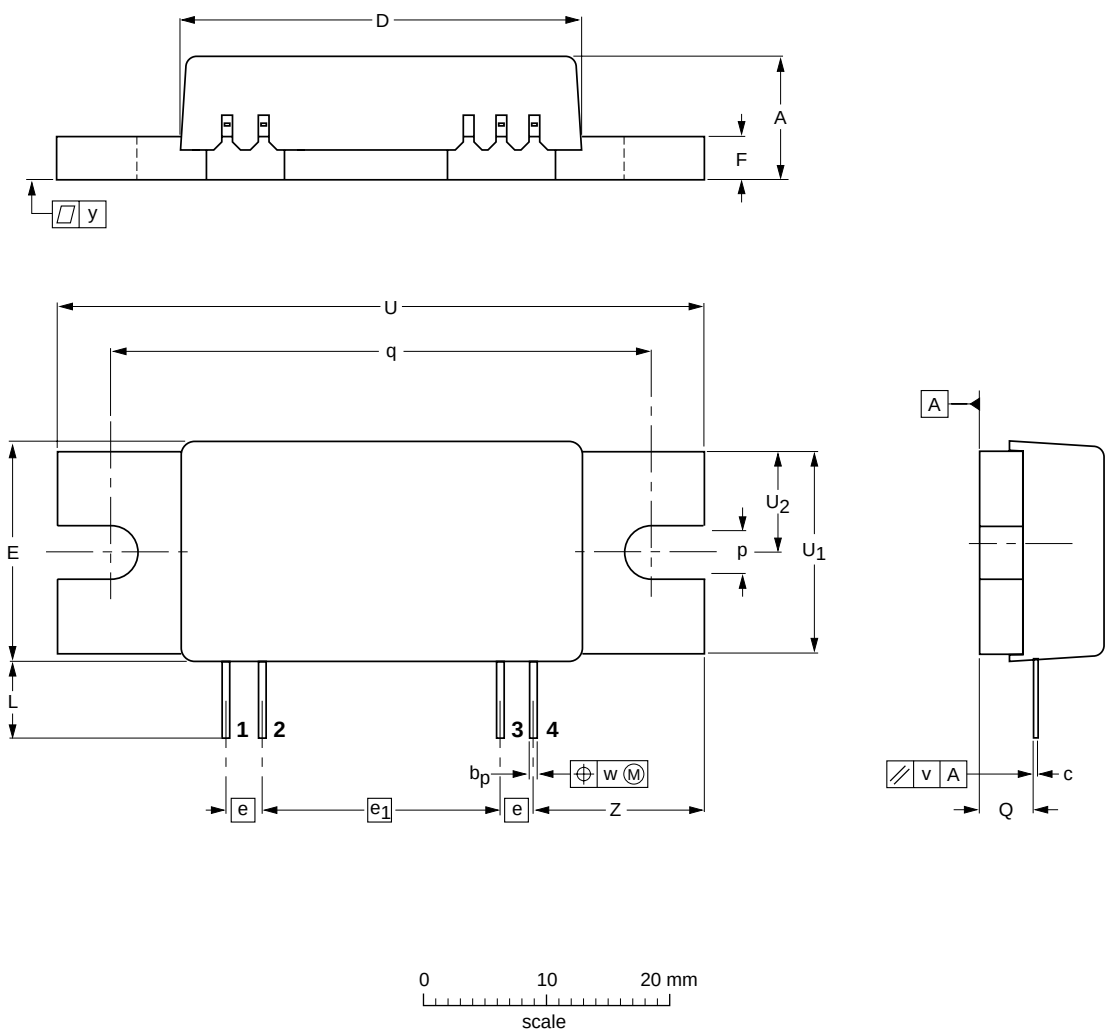
The module should be mounted to the heatsink using 3 mm bolts with flat washers. The bolts should first be tightened to “finger tight” and then further tightened in alternating steps to a maximum torque of 0.4 to 0.6 Nm.

Once mounted on the heatsink, the module leads can be soldered to the printed-circuit board. A soldering iron may be used up to a temperature of 250 °C for a maximum of 10 seconds at a distance of 2 mm from the plastic cap.

ESD precautions must be taken to protect the device from electrostatic damage.

PACKAGE OUTLINE

Plastic rectangular single-ended flat package; flange mounted; 2 mounting holes; 4 in-line leads SOT365A



DIMENSIONS (mm are the original dimensions)

UNIT	A	b_p	c	D	E	e	e_1	F	L	p	Q	q	U	U_1	U_2	v	w	y	Z
mm	9.5 9.0	0.56 0.46	0.3 0.2	30.1 29.9	18.6 18.4	2.54	17.78	3.25 3.15	6.5 6.1	4.1 3.9	4.0 3.8	40.74 40.54	48.0 48.4	15.4 15.2	7.75 7.55	0.3	0.25	0.1	12.8 12.6

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT365A						99-02-06

DATA SHEET STATUS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS [1]
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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.

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