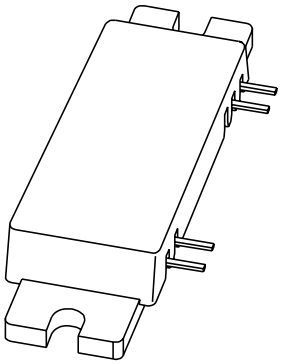
DATA SHEET



BGY1816
UHF amplifier module

Product specification
Supersedes data of 1998 Apr 09

1998 May 27

Philips
Semiconductors

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UHF amplifier module BGY1816

FEATURES

- 26 V nominal supply voltage
- 16 W output power into a load of 50 Ω with an RF drive power of ≤63 mW.

APPLICATIONS

- Base station transmitting equipment operating in the 1805 to 1880 MHz frequency band.

DESCRIPTION

The BGY1816 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

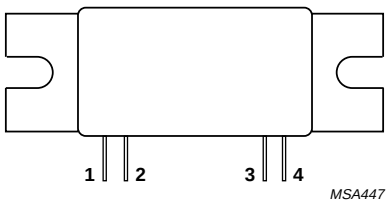


Fig.1 Simplified outline.

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 1880	5	26	≥16	≥24	≥30	50

LIMITING VALUES

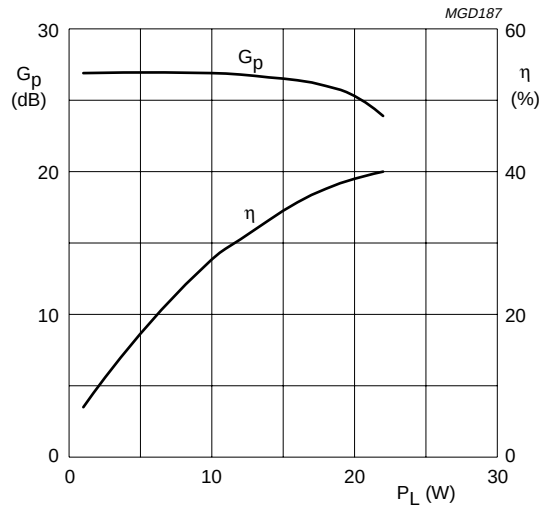
In accordance with the Absolute Maximum Rating System (IEC 134).

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

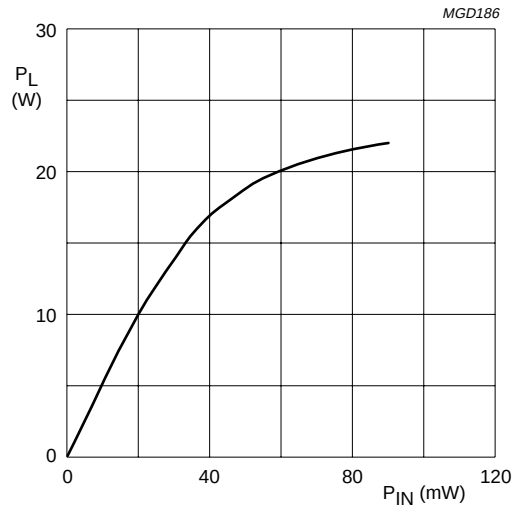
T_{mb} = 25 °C; V_{S1} = 5 V; V_{S2} = 26 V; P_L = 16 W; $Z_S = Z_L$ = 50 Ω unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency		1805	–	1880	MHz
I_{S1}	supply current		–	80	–	mA
I_{S2}	supply current	P_D < –60 dBm	–	430	–	mA
P_L	load power	P_D < 63 mW	16	–	–	W
G_p	power gain		24	–	28	dB
η	efficiency		30	–	–	%
H_2	second harmonic		–	–	–35	dBc
H_3	third harmonic		–	–	–40	dBc
$VSWR_{in}$	input VSWR		–	–	1.6 : 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			



f = 1850 MHz; V_{S1} = 5 V; V_{S2} = 26 V; $Z_S = Z_L$ = 50 Ω; T_{mb} = 25 °C.

Fig.2 Power gain and efficiency as functions of load power; typical values.



f = 1850 MHz; V_{S1} = 5 V; V_{S2} = 26 V; $Z_S = Z_L$ = 50 Ω; T_{mb} = 25 °C.

Fig.3 Load power as a function of input power; typical values.

APPLICATION INFORMATION

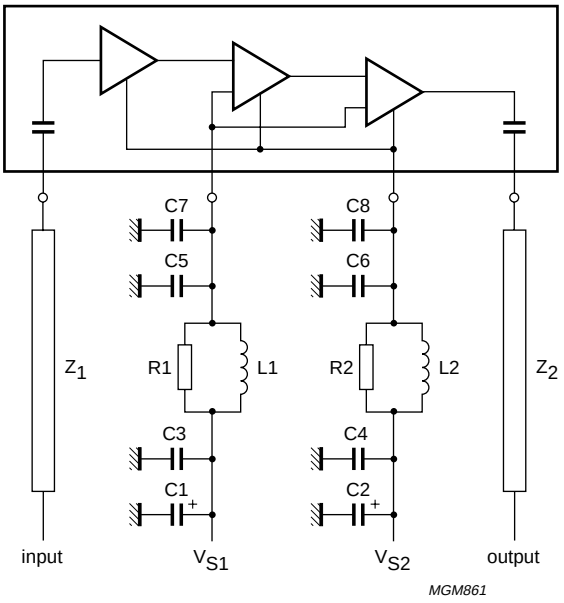


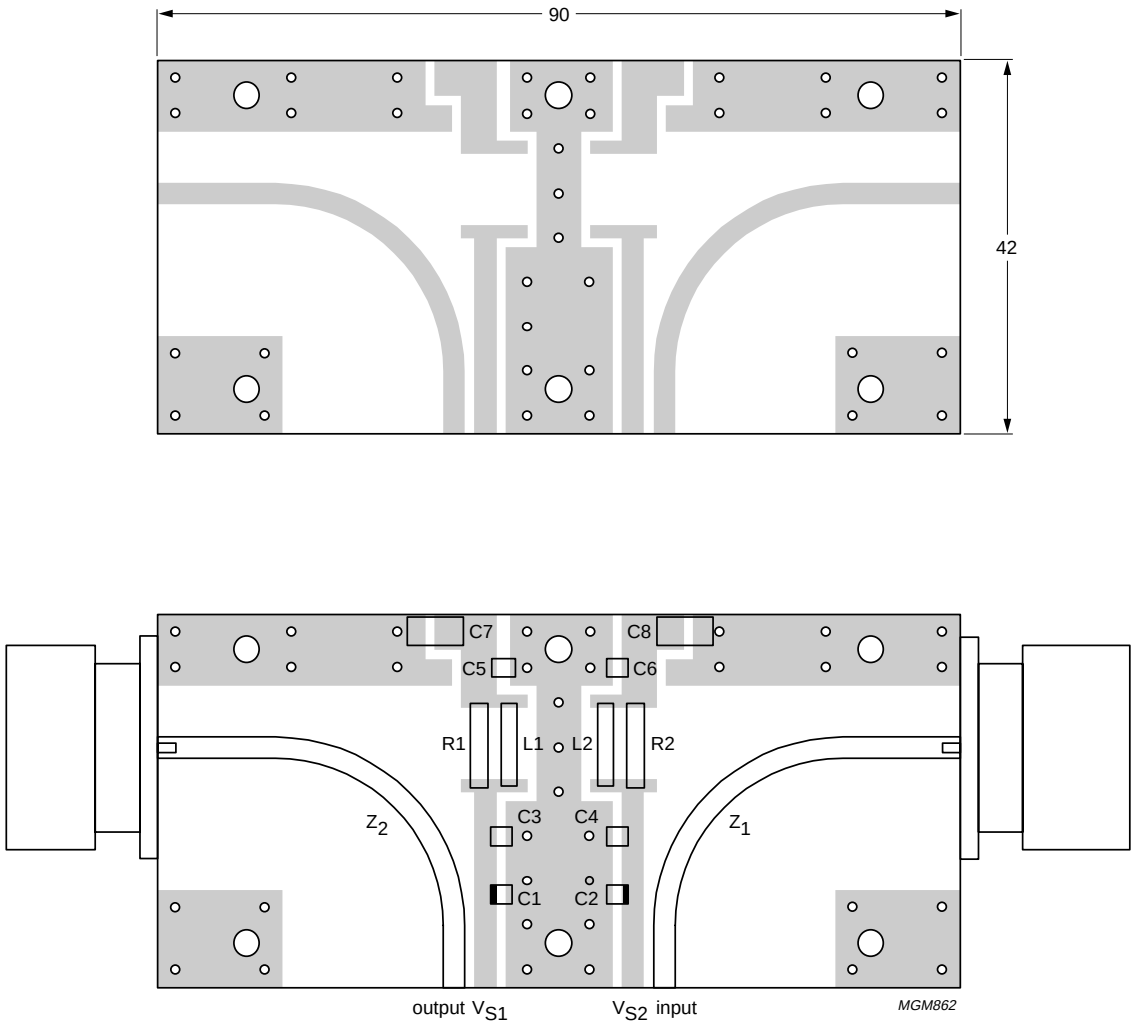
Fig.4 Test circuit.

List of components (see Figs 4 and 5)

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 with epoxy dielectric (ε_r = 4.5); thickness = 1 mm.



Dimensions in mm.

Fig.5 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.

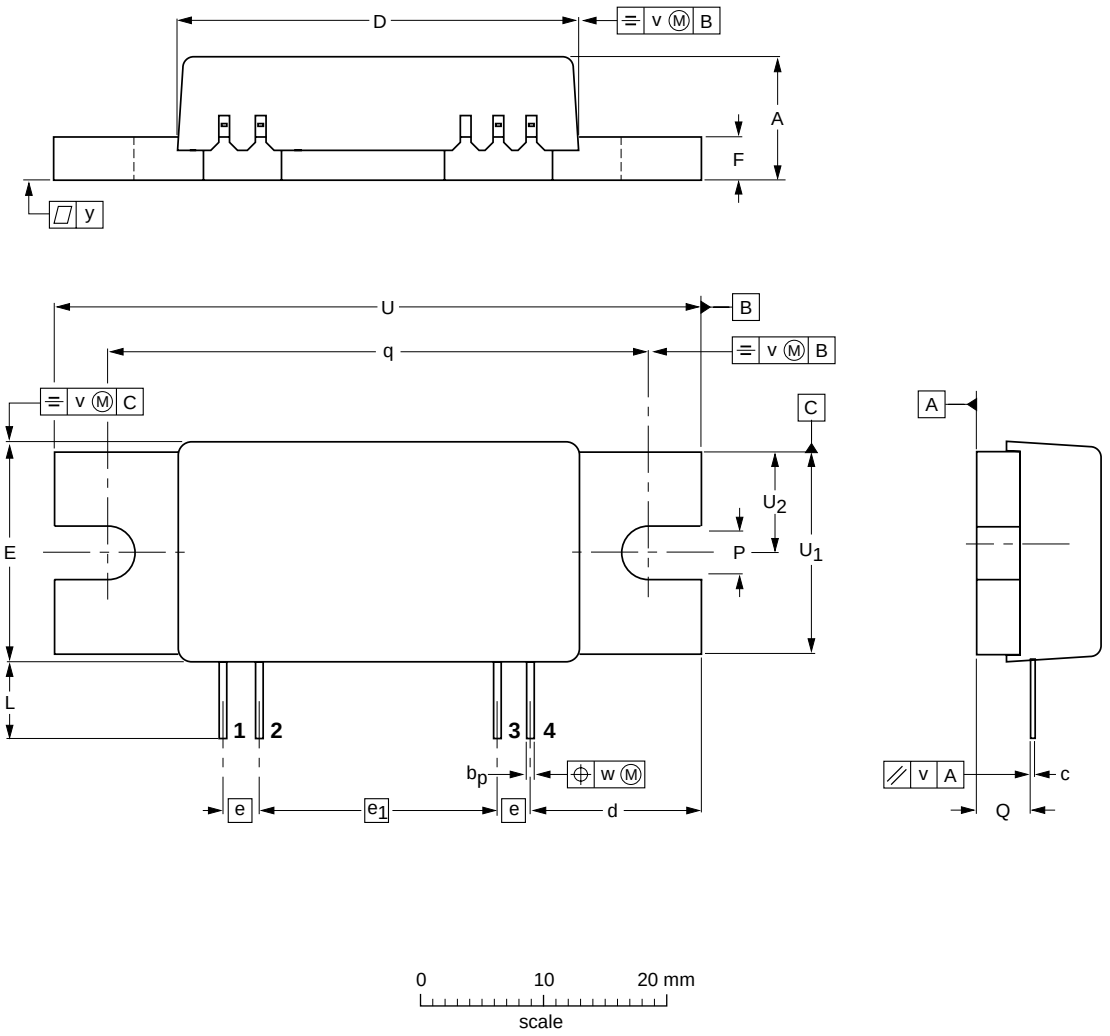
The module should be mounted to the heatsink using 3 mm bolts with flat washers. The bolts should first be tightened to “finger tight” and then further tightened in alternating steps to a maximum torque of 0.4 to 0.6 Nm.

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	d	E	e	e_1	F	L	P	Q	q	U	U_1	U_2	v	w	y
mm	9.5 9.0	0.56 0.46	0.3 0.2	30.1 29.9	12.8 12.6	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	0.2	0.25	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT365A						97-05-25

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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