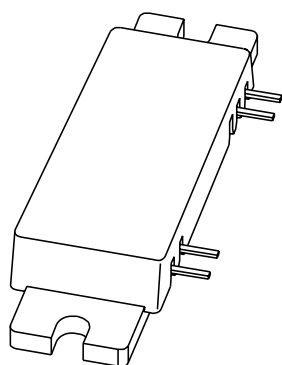


DATA SHEET



BGY925 UHF amplifier module

Product specification
Supersedes data of 1999 Dec 01

2000 Feb 02

UHF amplifier module

BGY925

FEATURES

- 26 V nominal supply voltage
- 23 W output power into a load of 50 Ω with an RF drive power of 36 mW.

APPLICATIONS

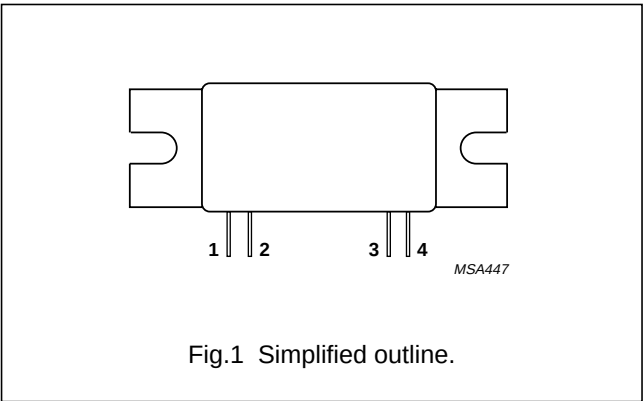
- Base station transmitting equipment operating in the 920 to 960 MHz frequency range.

DESCRIPTION

The BGY925 is a three-stage UHF amplifier module in a SOT365A package. It consists of one NPN silicon planar transistor die and two silicon MOSFET dies mounted on a metallized ceramic AlN substrate, together with matching and bias circuitry.

PINNING - SOT365A

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



QUICK REFERENCE DATA

RF performance at T_{mb} = 25 °C.

MODE OF OPERATION	f (MHz)	V _{S1} , V _{S2} (V)	P _L (W)	G _p (dB)	η (%) (note 1)	Z _S , Z _L (Ω)
CW	920 to 960	26	23	≥28	≥30	50

Note

1. At P_L = 16 W.

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V _{S1}	DC supply voltage	–	28	V
V _{S2}	DC supply voltage	–	28	V
P _D	input drive power	–	80	mW
P _L	load power	–	32	W
T _{stg}	storage temperature	–30	+100	°C
T _{mb}	operating mounting-base temperature	–10	+90	°C

UHF amplifier module

BGY925

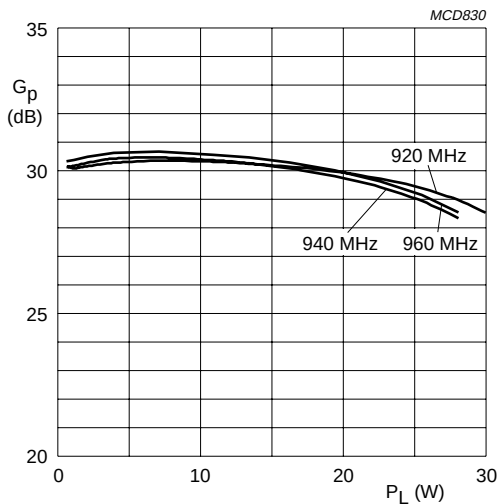
CHARACTERISTICS

$Z_S = Z_L = 50 \Omega$; $P_L = 23 \text{ W}$; $V_{S1} = V_{S2} = 26 \text{ V}$; $T_{mb} = 25 \text{ }^\circ\text{C}$; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range		920	–	960	MHz
I_{S1}	supply current		–	50	–	mA
I_{S2}	supply current	$P_D < -60 \text{ dBm}$	–	500	–	mA
P_L	load power		23	–	–	W
G_p	power gain	$160 \text{ mW} \leq P_L < 2 \text{ W}$	28	30	34	dB
		$2 \text{ W} \leq P_L \leq 23 \text{ W}$	28	30	32	dB
η	efficiency	$P_L = 16 \text{ W}$	30	–	–	%
H_2	second harmonic	$P_L = 16 \text{ W}$	–	–	–35	dBc
H_3	third harmonic	$P_L = 16 \text{ W}$	–	–	–40	dBc
$V_{SWR_{in}}$	input VSWR		–	–	2:1	
	stability	$V_{SWR} \leq 3 : 1$ through all phases; $V_{S2} = 26 \text{ to } 27 \text{ V}$; $P_L = 23 \text{ W}$	–	–	–60	dBc
	reverse intermodulation	$P_{carrier} = 16 \text{ W}$; $P_{interference} = 1.6 \text{ } \mu\text{W}$; $f_i = f_c \pm 600 \text{ kHz}$	–	–80	–	dBc
	direct intermodulation	$P_{carrier} = 16 \text{ W}$; $P_{interference} = 1.6 \text{ mW}$; $f_i = f_c + 270 \text{ kHz}$	–	–55	–	dBc
NF	noise figure				8	dBc
B	AM bandwidth	corner frequency = 3 dB; $P_{carrier} = 16 \text{ W}$; modulation = 20%	2	–	–	MHz
	ruggedness	$V_{SWR} \leq 5 : 1$ through all phases; $V_{S2} = 26 \text{ V}$; $P_L = 23 \text{ W}$	no degradation			

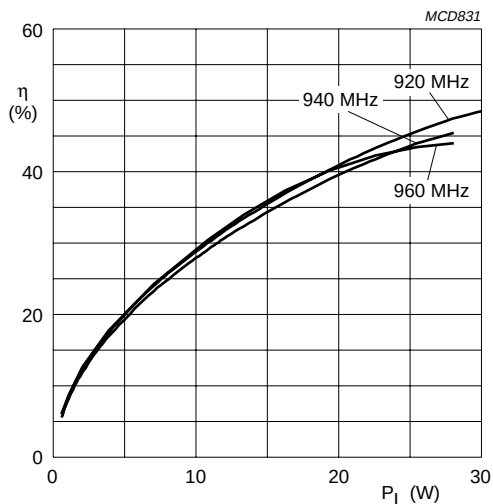
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BGY925



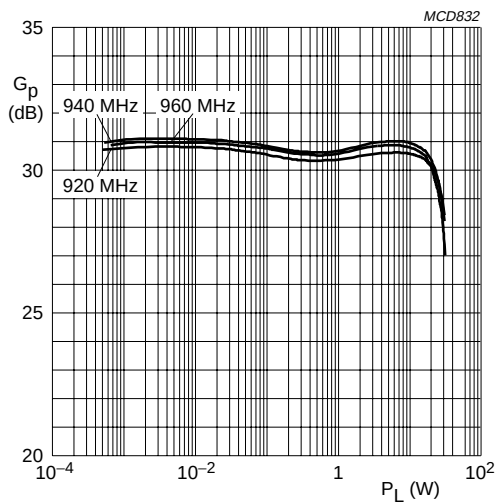
$Z_S = Z_L = 50 \Omega$; $V_{S1} = V_{S2} = 26 \text{ V}$; $T_{mb} = 25 \text{ }^\circ\text{C}$.

Fig.2 Power gain as a function of load power; typical values.



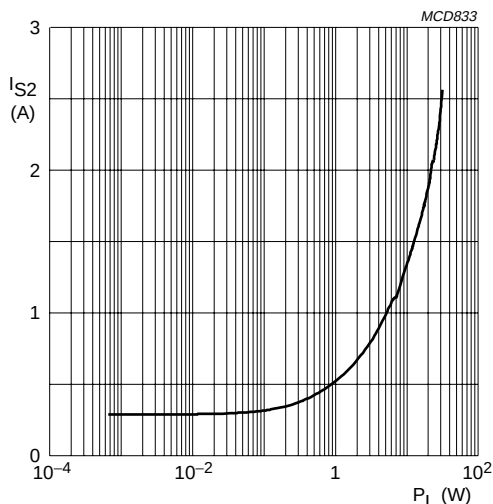
$Z_S = Z_L = 50 \Omega$; $V_{S1} = V_{S2} = 26 \text{ V}$; $T_{mb} = 25 \text{ }^\circ\text{C}$.

Fig.3 Efficiency as a function of load power; typical values.



$Z_S = Z_L = 50 \Omega$; $V_{S1} = V_{S2} = 26 \text{ V}$; $T_{mb} = 25 \text{ }^\circ\text{C}$.

Fig.4 Power gain as a function of load power; typical values.

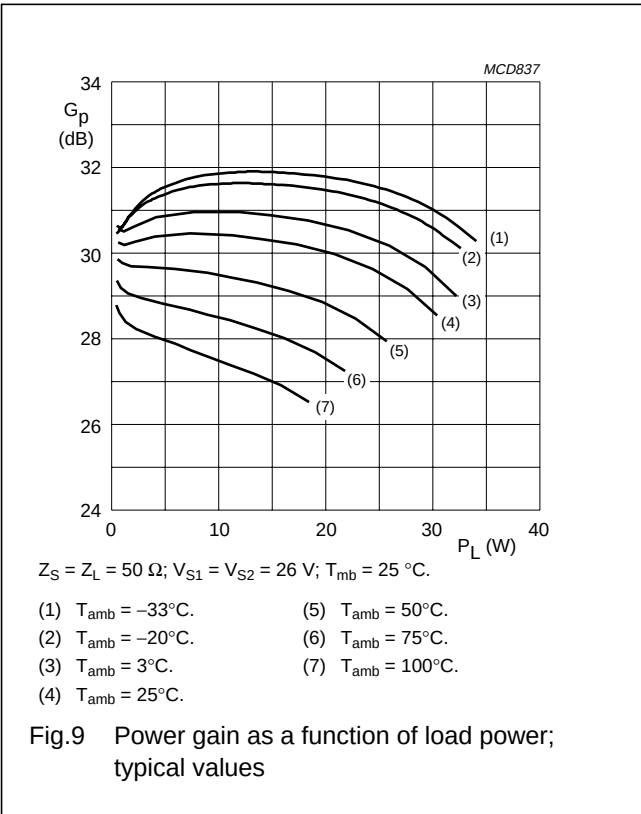
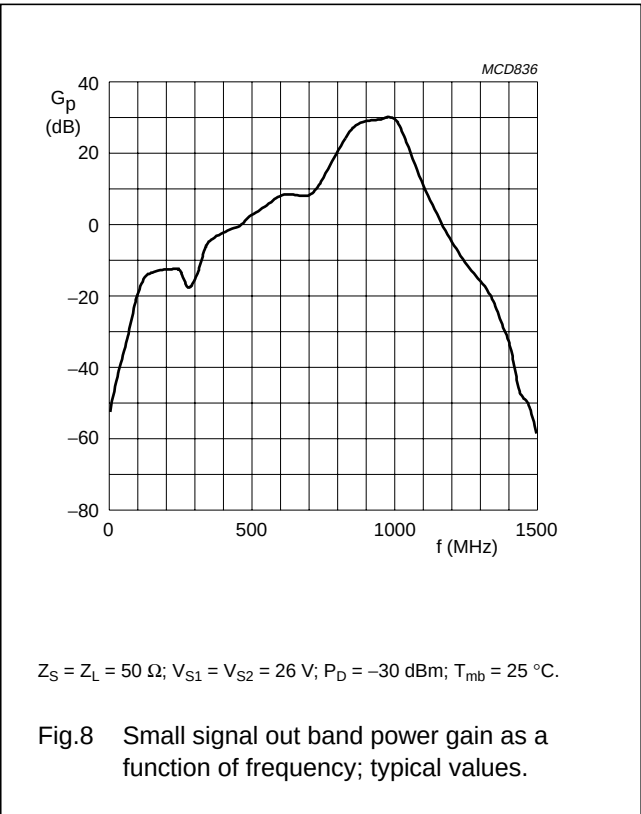
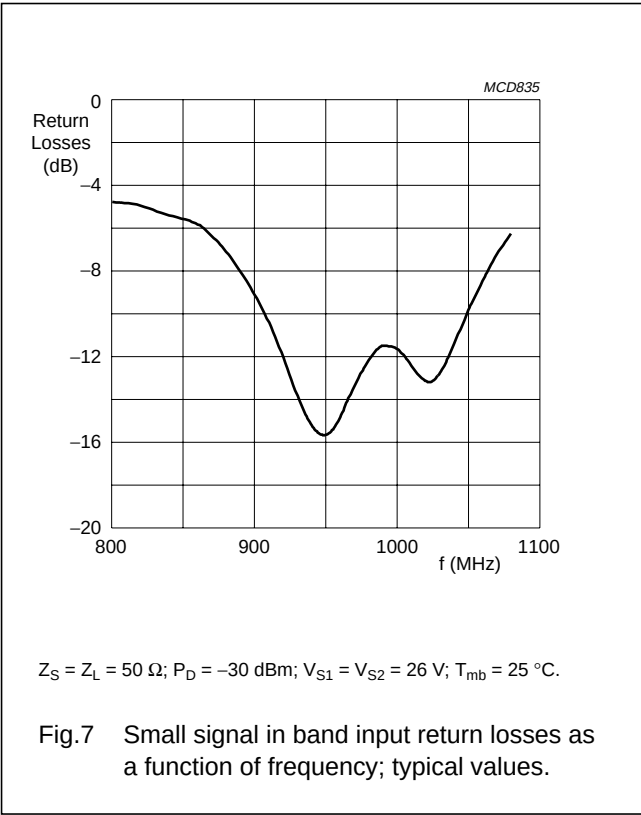
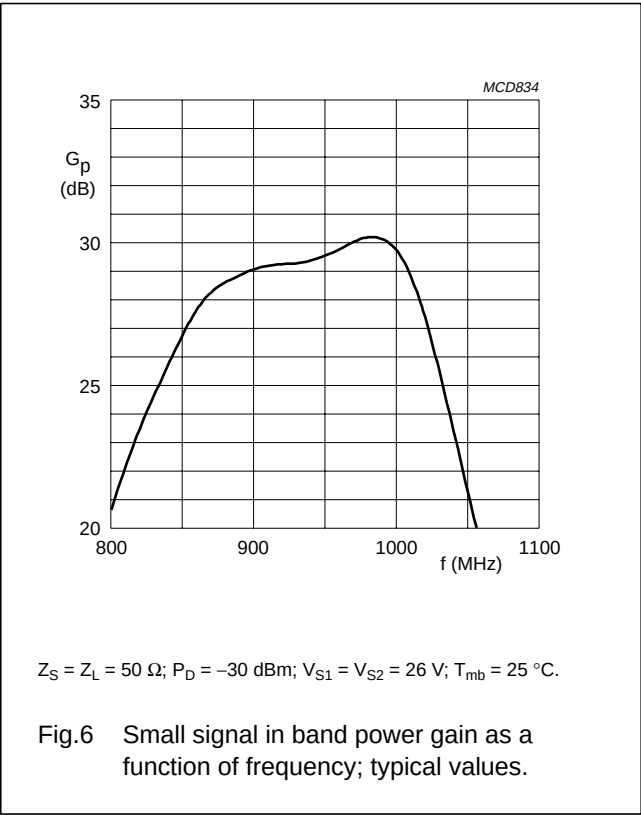


$Z_S = Z_L = 50 \Omega$; $V_{S1} = V_{S2} = 26 \text{ V}$; $T_{mb} = 25 \text{ }^\circ\text{C}$;
 $f = 920 \text{ to } 960 \text{ MHz}$.

Fig.5 Supply current as a function of load power; typical values.

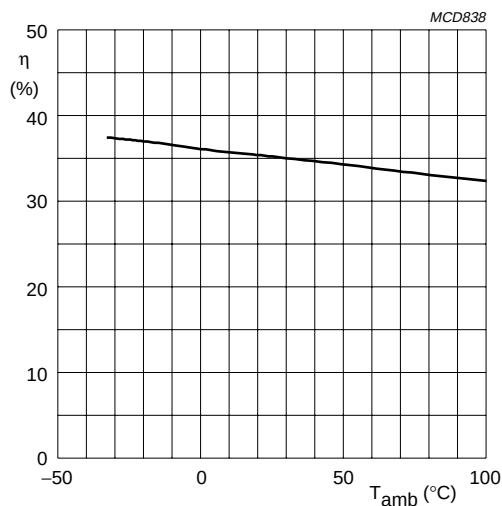
UHF amplifier module

BGY925



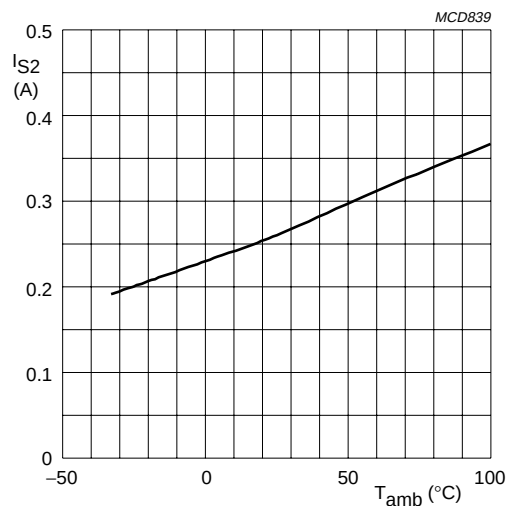
UHF amplifier module

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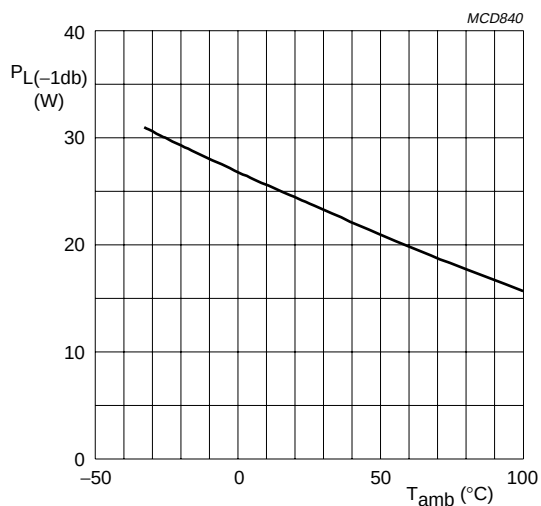
$Z_S = Z_L = 50 \, \Omega$; $P_L = 16 \, \text{W}$; $V_{S1} = V_{S2} = 26 \, \text{V}$.

Fig.10 Efficiency as a function of ambient temperature; typical values.



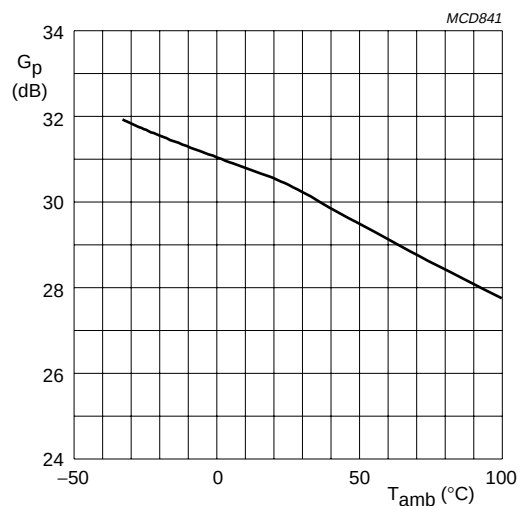
$Z_S = Z_L = 50 \, \Omega$; $V_{S1} = V_{S2} = 26 \, \text{V}$; $P_D = 0$.

Fig.11 Quiescent current as a function of ambient temperature; typical values.



$Z_S = Z_L = 50 \, \Omega$; $P_{ref} = 5 \, \text{W}$; $V_{S1} = V_{S2} = 26 \, \text{V}$.

Fig.12 Load power at -1 dB gain as a function of ambient temperature; typical values.



$Z_S = Z_L = 50 \, \Omega$; $P_L = 5 \, \text{W}$; $V_{S1} = V_{S2} = 26 \, \text{V}$.

Fig.13 Power gain as a function of ambient temperature; typical values.

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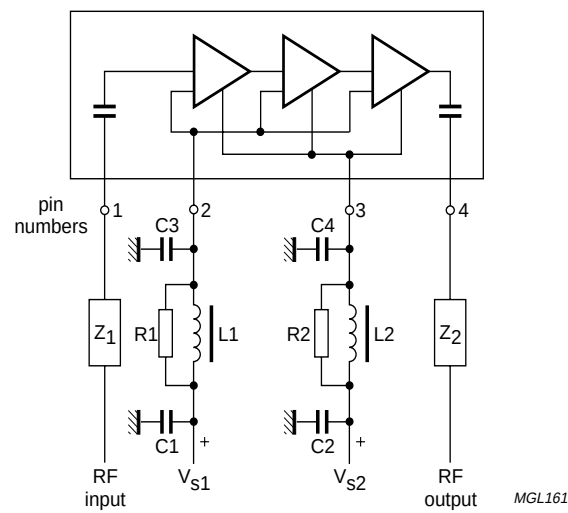


Fig.14 Test circuit.

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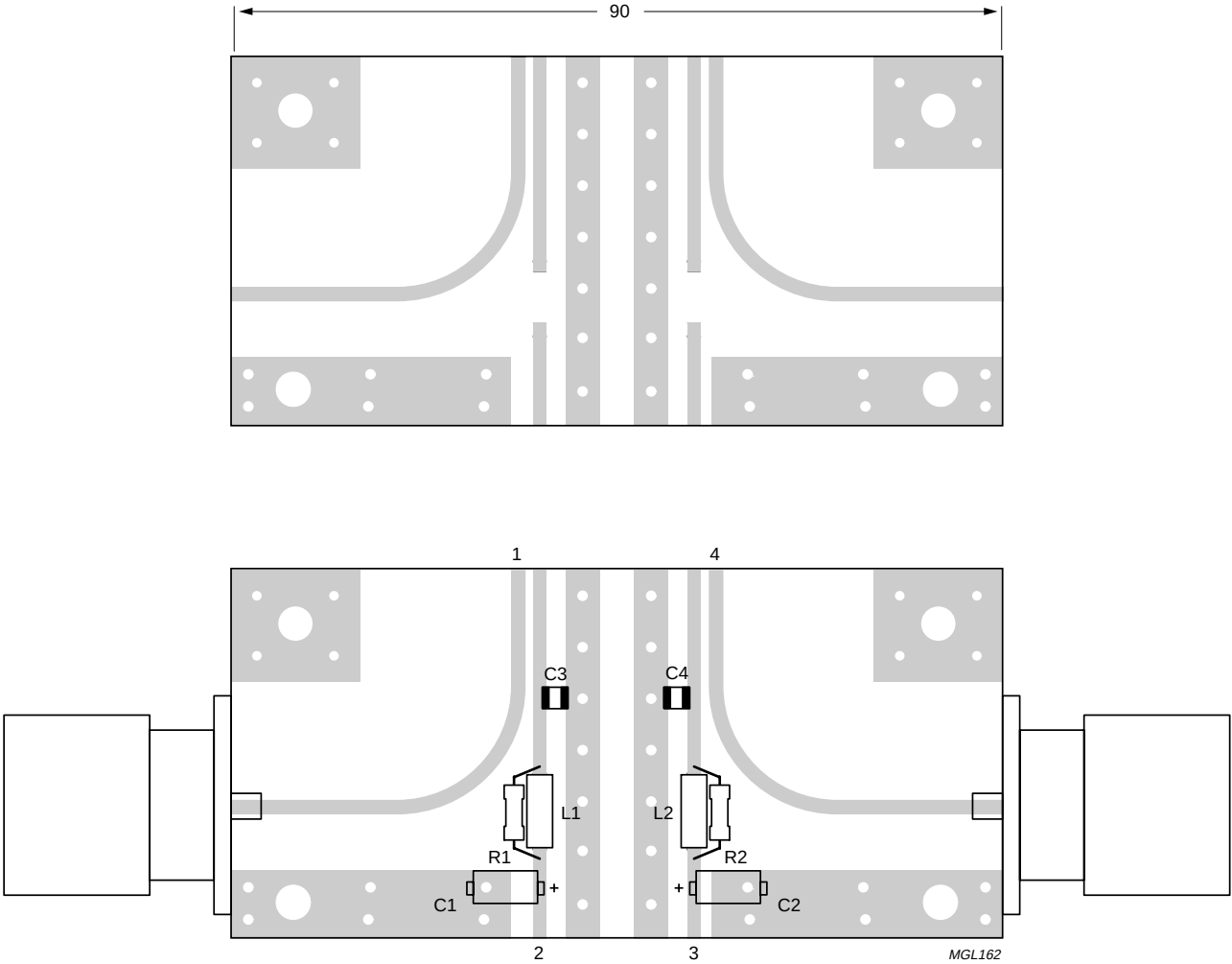


Fig.15 Printed-circuit board component layout.

Dimensions in mm.

UHF amplifier module

BGY925

List of components (See Figs 14 and 15)

COMPONENT	DESCRIPTION	VALUE	CATALOGUE NO.
C1, C2	electrolytic capacitor	10 μ F; 35 V	
C3, C4	multilayer ceramic chip capacitor	100 nF; 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 ($\epsilon_r = 4.5$); thickness = 1 mm.

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.

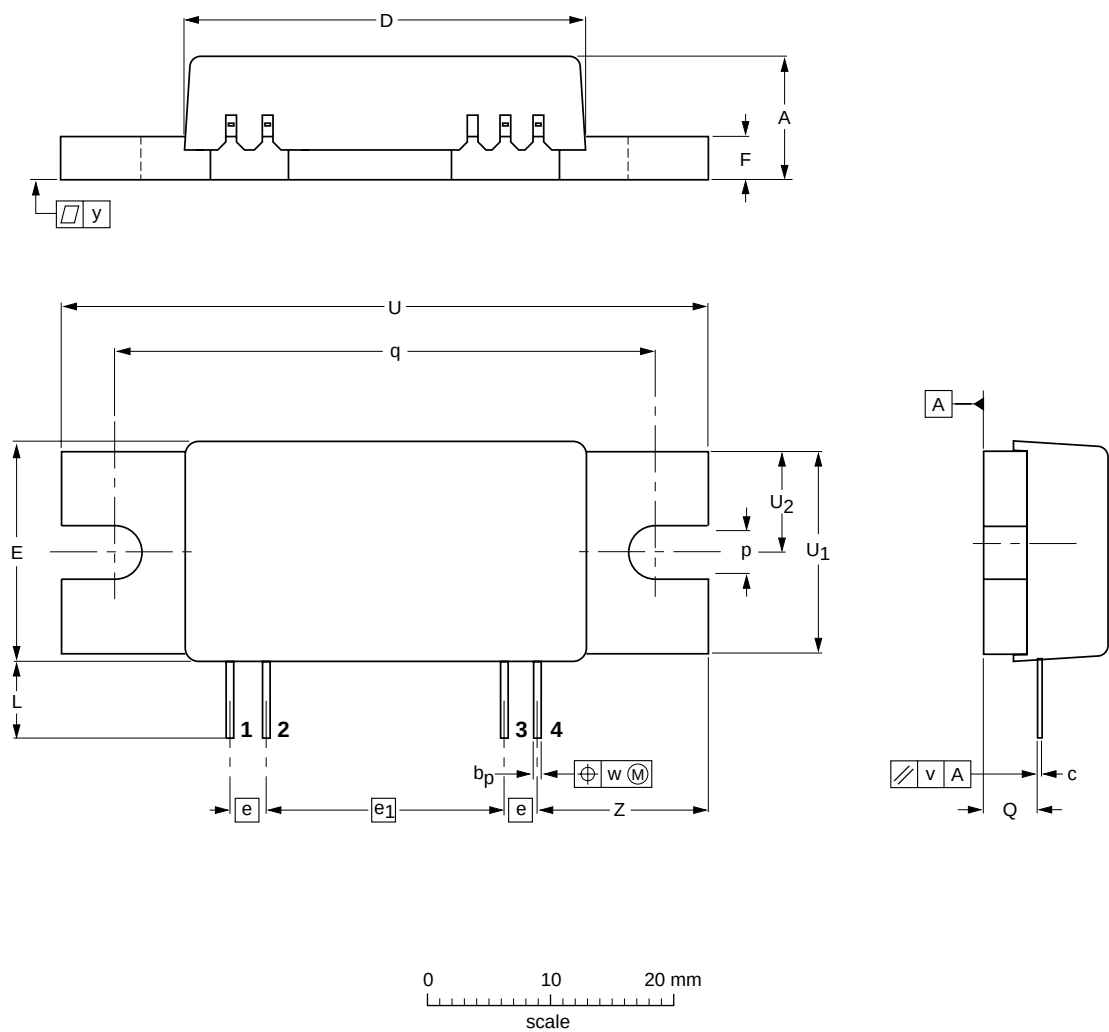
ESD precautions must be taken to protect the device from electrostatic damage.

UHF amplifier module

BGY925

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

UHF amplifier module

BGY925

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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Printed in The Netherlands

603516/04/pp12

Date of release: 2000 Feb 02

Document order number: 9397 750 06749

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