

# UHF Amplifier Module

## **BGY113B**

7W UHF Amplifier

# DATASHEET

OEM – Philips

Source: Philips Data Handbook SC09

RF Power Modules and Transistors for Mobile Phones 1996

**UHF amplifier modules****BGY113A; BGY113B****FEATURES**

- 7.5 V nominal supply voltage
- 7 W output power
- Easy control of output power by DC voltage.

**APPLICATIONS**

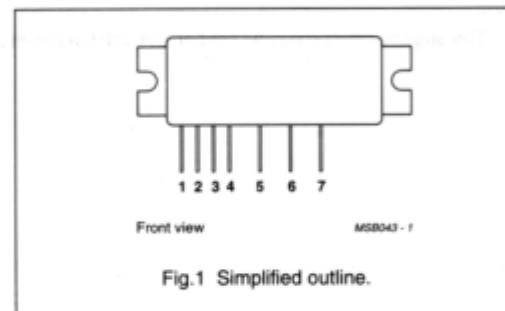
- Hand-held communication equipment operating in the frequency bands 400 to 440 MHz and 430 to 470 MHz respectively.

**DESCRIPTION**

The BGY113A and BGY113B are four-stage UHF amplifier modules in a 7-lead SOT288D package. The modules consist of four NPN silicon planar transistor dies mounted together with matching and bias circuit components on a metallized ceramic substrate. The modules produce an output power of 7 W into a load of  $50 \Omega$  with an RF drive power of 1 mW.

**PINNING - SOT288D**

PIN	DESCRIPTION
1	RF input
2	$V_{S1}$
3	$V_C$
4	$V_{S2}$
5	$V_{S3}$
6	$V_{S4}$
7	RF output
Flange	ground

**QUICK REFERENCE DATA**

RF performance at  $T_{mb} = 25^\circ\text{C}$ .

TYPE NUMBER	MODE OF OPERATION	f (MHz)	$V_S$ (V)	$P_L$ (W)	$G_p$ (dB)	$\eta$ (%)	$Z_S; Z_L$ ( $\Omega$ )
BGY113A	CW	400 to 440	7.5	$\geq 7$	$\geq 38.5$	$\geq 40$	50
BGY113B	CW	430 to 470	7.5	$\geq 7$	$\geq 38.5$	$\geq 40$	50

**WARNING****Product and environmental safety - toxic materials**

This product contains beryllium oxide. The product is entirely safe provided that the BeO discs are 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.

## UHF amplifier modules

## BGY113A; BGY113B

**LIMITING VALUES**

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

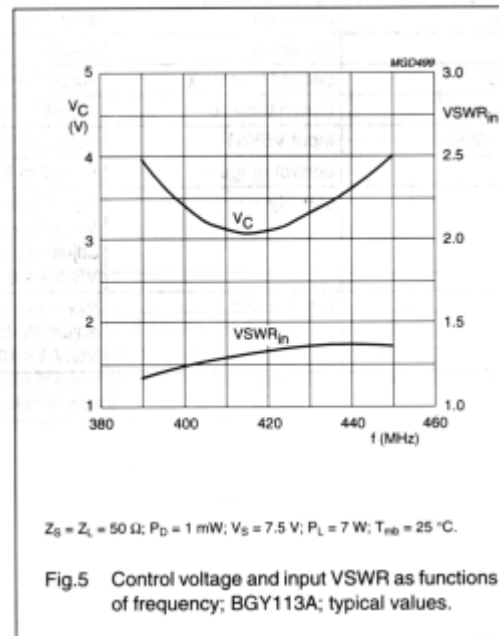
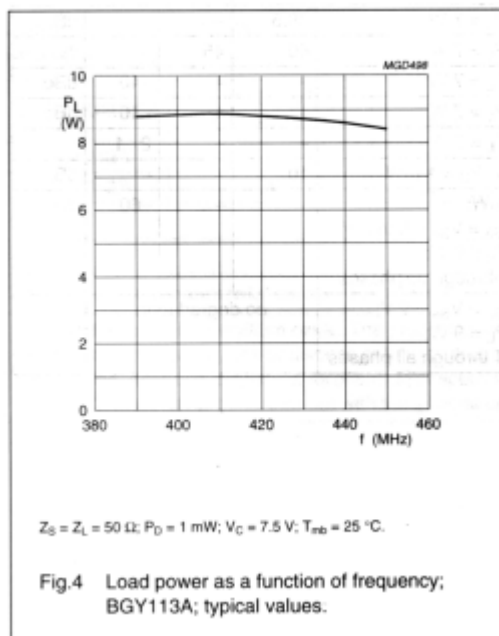
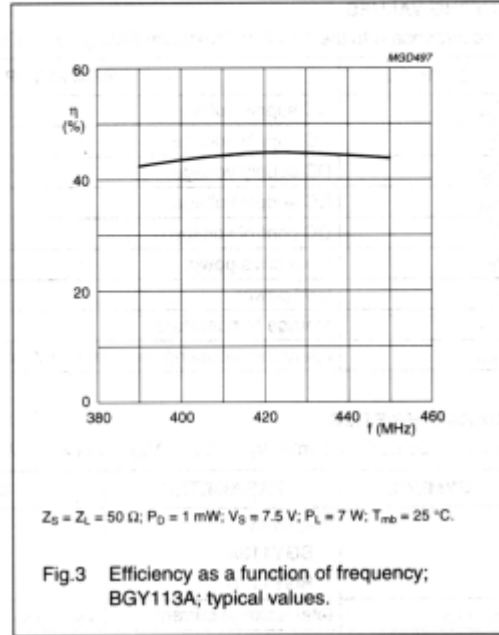
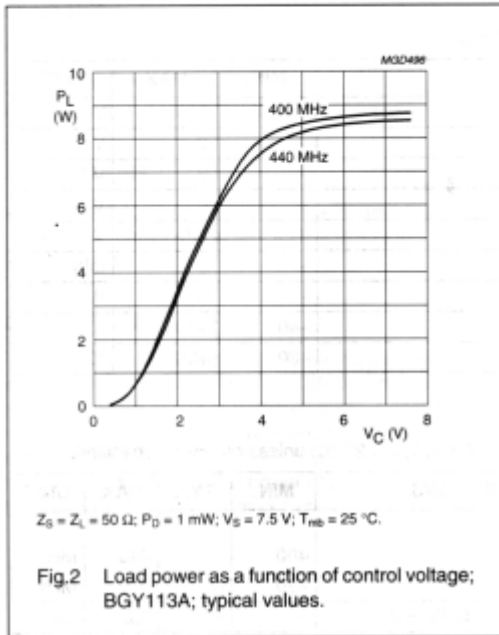
SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_{S1}$	DC supply voltage	–	9	V
$V_{S2}$	DC supply voltage	–	9	V
$V_{S3}$	DC supply voltage	–	9	V
$V_{S4}$	DC supply voltage	–	9	V
$V_C$	DC control voltage	–	7.5	V
$P_D$	input drive power	–	5	mW
$P_L$	load power	–	9	W
$T_{stg}$	storage temperature	–40	+100	°C
$T_{mb}$	operating mounting base temperature	–30	+90	°C

**CHARACTERISTICS** $Z_S = Z_L = 50 \Omega$ ;  $P_D = 1 \text{ mW}$ ;  $V_{S1} = V_{S2} = V_{S3} = V_{S4} = 7.5 \text{ V}$ ;  $V_C \leq 7.5 \text{ V}$ ;  $T_{mb} = 25 \text{ °C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency		400	–	440	MHz
	BGY113A		430	–	470	MHz
$I_{Q3} + I_{Q4}$	total leakage current	$V_{S1} = V_{S2} = V_C = 0$ ; $P_D = 0$	–	–	0.2	mA
$P_L$	load power	$V_C = 7.5 \text{ V}$	7	–	–	W
$G_p$	power gain	adjust $V_C$ for $P_L = 7 \text{ W}$	38.5	–	–	dB
$\eta$	efficiency	adjust $V_C$ for $P_L = 7 \text{ W}$	40	45	–	%
$H_2$	second harmonic	adjust $V_C$ for $P_L = 7 \text{ W}$	–	–	–40	dBc
$H_3$	third harmonic	adjust $V_C$ for $P_L = 7 \text{ W}$	–	–	–40	dBc
$VSWR_{in}$	input VSWR	adjust $V_C$ for $P_L = 7 \text{ W}$	–	–	2 : 1	
	control range	$V_C = 0$ to $7.5 \text{ V}$ ; $P_D = 1 \text{ mW}$	10	–	–	dB
	stability	$P_D = 0.5$ to $2 \text{ mW}$ ; $V_{S1} = V_{S2} = V_{S3} = V_{S4} = 5$ to $9 \text{ V}$ ; adjust $V_C$ for $P_L \leq 9 \text{ W}$ ; $VSWR \leq 6 : 1$ through all phases	–	–	–60	dBc
	ruggedness	$V_{S1} = V_{S2} = V_{S3} = V_{S4} = 9 \text{ V}$ ; adjust $V_C$ for $P_L = 9 \text{ W}$ ; $VSWR \leq 10 : 1$ through all phases	no degradation			

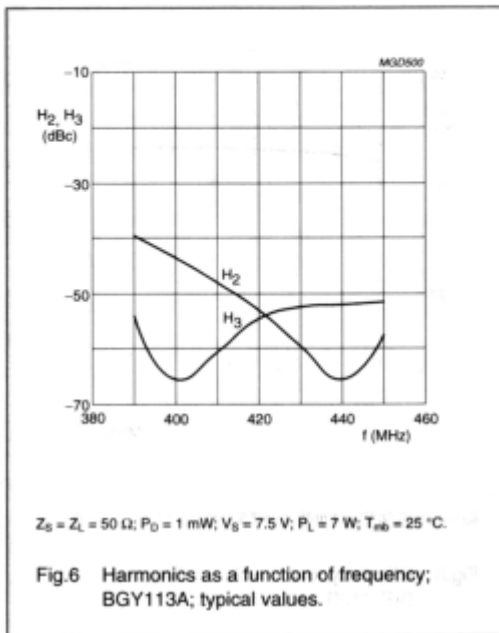
UHF amplifier modules

BGY113A; BGY113B



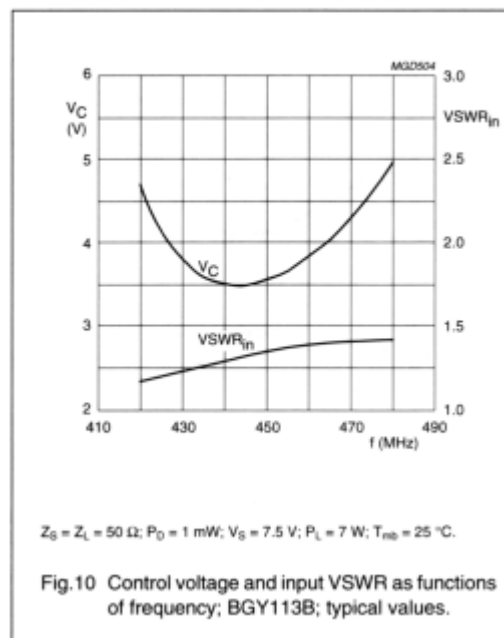
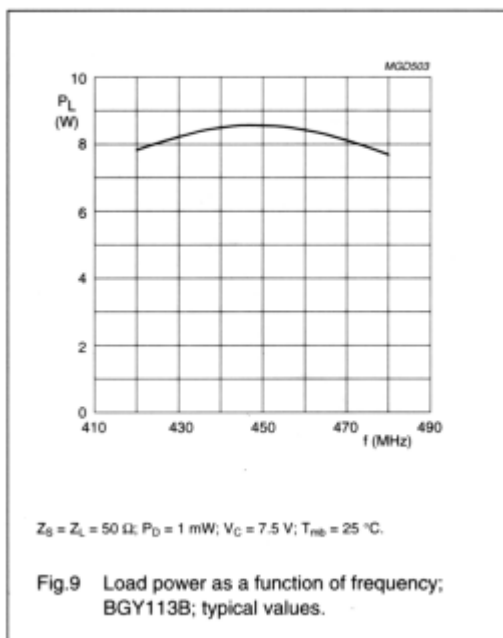
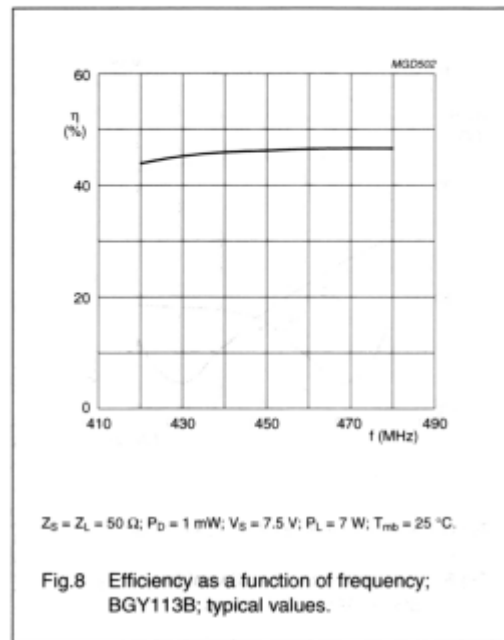
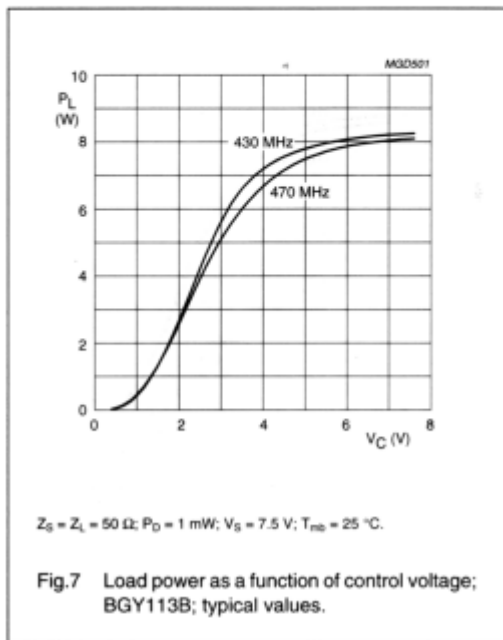
UHF amplifier modules

BGY113A; BGY113B



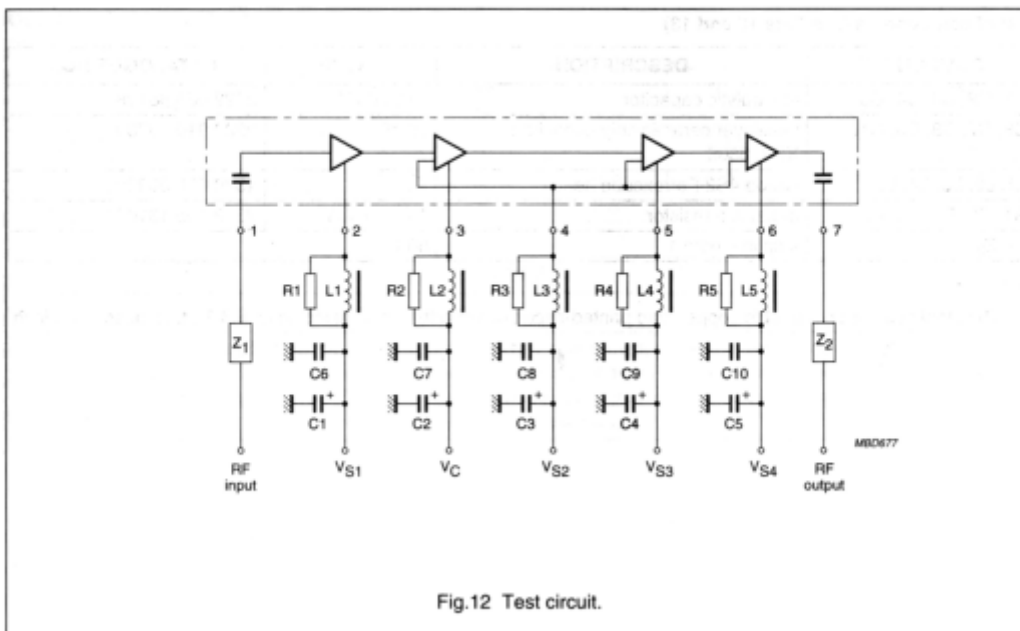
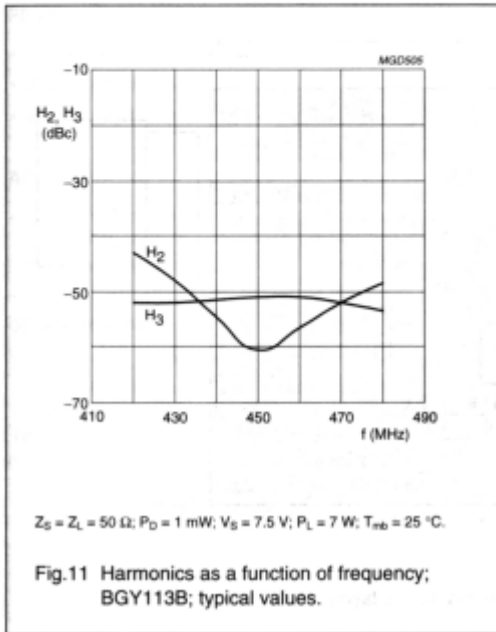
UHF amplifier modules

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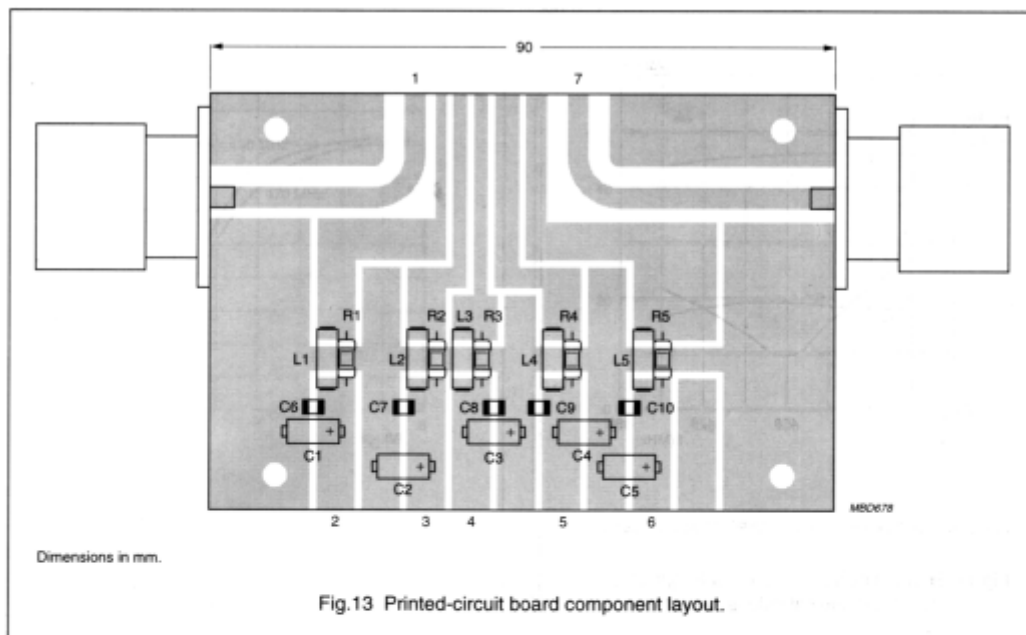
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## List of components (see Figs 12 and 13)

COMPONENT	DESCRIPTION	VALUE	CATALOGUE NO.
C1, C2, C3, C4, C5	electrolytic capacitor	1 $\mu$ F; 63 V	2222 085 68108
C6, C7, C8, C9, C10	multilayer ceramic chip capacitor; X7R, 0805	18 nF	2222 910 16739
L1, L2, L3, L4, L5	Grade 4S2 Ferroxcube bead		4330 030 36300
R1, R2, R3, R4, R5	metal film resistor	10 $\Omega$ ; 0.4 W	2322 195 13109
Z1, Z2	stripline; note 1	50 $\Omega$	—

## Note

- The striplines are on a double copper-clad printed-circuit board with epoxy dielectric ( $\epsilon_r = 4.7$ ); thickness =  $\frac{1}{16}$  inch.