

# VHF Power Amplifier Module

## **BGY43**

Broadband VHF Amplifier

# DATASHEET

OEM – Philips

Source: Philips Data Handbook SC09

RF Power Modules and Transistors for Mobile Phones 1996

**VHF power amplifier module****BGY43****FEATURES**

- Broadband VHF amplifier
- 13 W output power
- Direct operation from 12 V vehicle electrical systems

**APPLICATIONS**

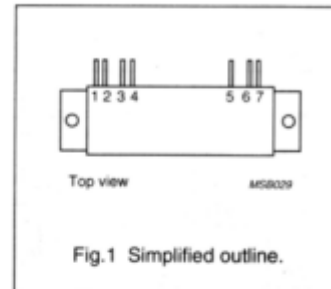
- Mobile communication equipment operating in the 148 to 174 MHz frequency range.

**DESCRIPTION**

The BGY43 is a two-stage amplifier module in a SOT132B package. The module consists of a two stage RF amplifier using NPN silicon planar transistor dies with lumped-element matching components, in a plastic stripline encapsulation. The negative supply is internally connected to the flange.

**PINNING - SOT132B**

PIN	DESCRIPTION
1	RF input
2	ground
3	V <sub>S1</sub>
4	ground
5	V <sub>S2</sub>
6	ground
7	RF output
Flange	ground

**QUICK REFERENCE DATA**RF performance at T<sub>n</sub> = 25 °C.

MODE OF OPERATION	f (MHz)	V <sub>S1</sub> ; V <sub>S2</sub> (V)	P <sub>D</sub> (mW)	P <sub>L</sub> (W)	Z <sub>S</sub> ; Z <sub>L</sub> (Ω)
CW	148 to 174	12.5	≤150; typ 80	>13	50

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

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

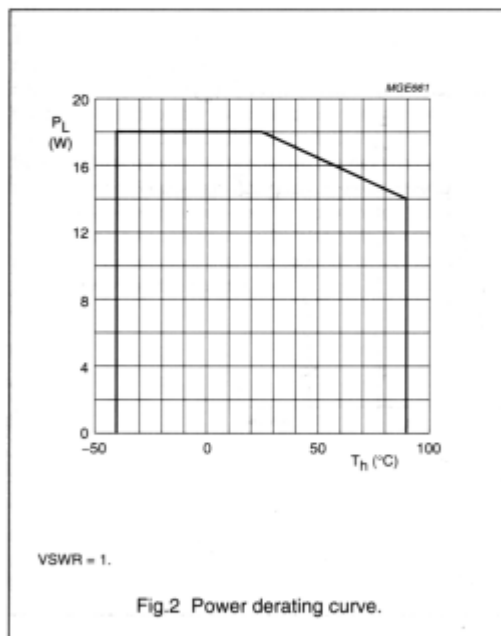
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## LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_{S1}$	DC supply voltage	–	16.5	V
$V_{S2}$	DC supply voltage	–	16.5	V
$V_i$	RF input terminal voltage	–	$\pm 25$	V
$V_o$	RF output terminal voltage	–	$\pm 25$	V
$P_D$	input drive power	–	300	mW
$P_L$	load power	–	18	W
$T_{stg}$	storage temperature	–40	+100	°C
$T_h$	operating heatsink temperature	–	90	°C



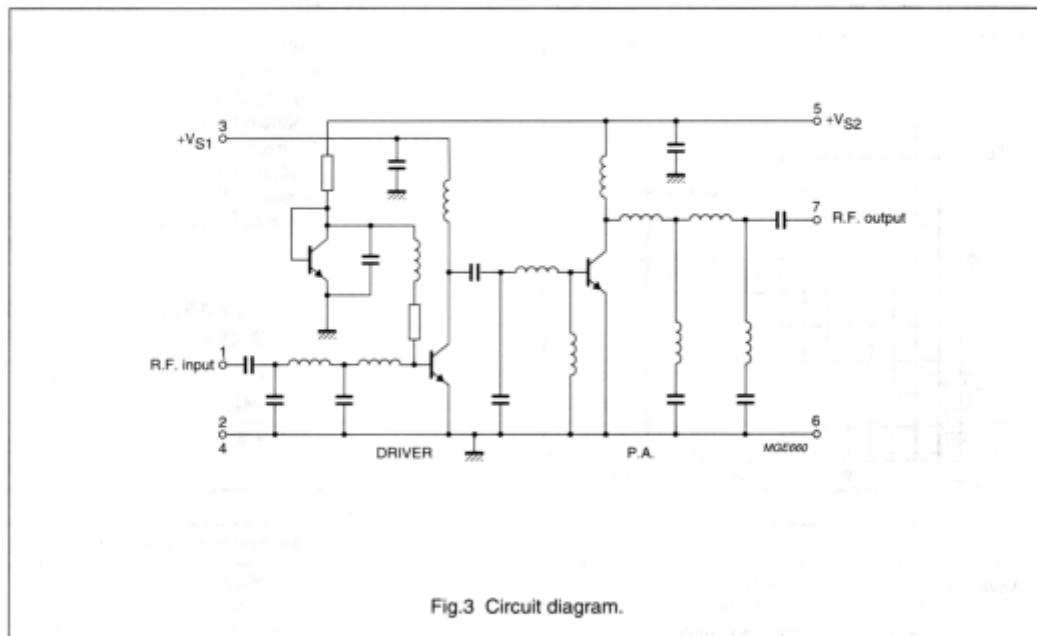
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## CHARACTERISTICS

 $Z_S = Z_L = 50 \Omega$ ;  $V_{S1} = V_{S2} = 12.5 \text{ V}$ ;  $f = 148 \text{ to } 174 \text{ MHz}$ ;  $T_h = 25 \text{ }^\circ\text{C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{Q1}$	leakage current	$P_D = 0$	–	5	–	mA
$I_{Q2}$	leakage current	$P_D = 0$	–	15	–	mA
$P_D$	input drive power	$P_L = 13 \text{ W}$	–	80	150	mW
$\eta$	efficiency	$P_L = 13 \text{ W}$	40	48	–	%
$H_2$	second harmonic		–25	–34	–	dBc
$H_3$	third harmonic		–25	–34	–	dBc
$VSWR_{in}$	input VSWR	with respect to $50 \Omega$	–	1 : 1.5	–	



**VHF power amplifier module****BGY43****Stability**

The module is stable with a load VSWR up to 3:1 (all phases) when operated within the following conditions:  
 $V_{S1} = V_{S2} = 10 \text{ V to } 16.5 \text{ V}$ ;  $P_D = 30 \text{ to } 300 \text{ mW}$ ;  
 $f = 148 \text{ to } 174 \text{ MHz}$ ;  $P_L \leq 18 \text{ W}$  (matched).

**Ruggedness**

The module will withstand a load mismatch VSWR of 50:1 (all phases) for short period overload conditions, with drive power and DC supply voltages at maximum values, providing the combination does not result in the matched RF output power rating being exceeded.

**MOUNTING**

To ensure good thermal transfer the module should be mounted on a heatsink with a flat surface with heat-conducting compound applied between module and heatsink. If an isolation washer is used, heatsink compound should be applied to both sides of the washer. Burrs and thickening of the holes in the heatsink should be removed and 3 mm bolts tightened to a torque of 0.5 Nm. The leads of the devices may be soldered directly into a circuit using a soldering iron with a maximum temperature of 245 °C for not more than 10 seconds at a distance of at least 1 mm from the plastic.

**APPLICATION INFORMATION****Power rating**

In general, it is recommended that the output power from the module under nominal conditions should not exceed 16 W in order to provide an adequate safety margin under fault conditions.

**Output power control**

The module is not designed to be operated over a wide range of output power levels. The purpose of the output power control is to set the nominal output power level. The preferred method of output power control is by varying the drive power between 30 and 200 mW. The next option is by varying  $V_{S1}$  between 6 and 12.5 V.

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