

# DATA SHEET

## **BGY32; BGY33; BGY35; BGY36** VHF power amplifier modules

Product specification  
Supersedes data of May 1991  
File under Discrete Semiconductors, SC09

1996 Jun 06

# VHF power amplifier modules

## BGY32; BGY33; BGY35; BGY36

### FEATURES

- Broadband VHF amplifiers
- 18 W output power
- Direct operation from 12 V vehicle electrical systems.

### APPLICATIONS

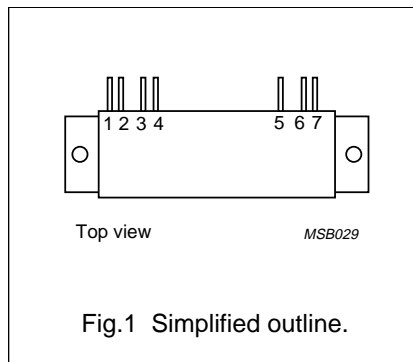
- Mobile communication equipment.

### DESCRIPTION

The BGY32, BGY33; BGY35 and BGY36 are two stage amplifier modules in a SOT132B package. Each module comprises two NPN silicon planar transistor dies together with lumped-element matching components.

### 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>h</sub> = 25 °C.

TYPE	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)
BGY32	CW	68 to 88	12.5	100	>18; typ. 23	50
BGY33	CW	80 to 108	12.5	100	>18; typ. 22	50
BGY35	CW	132 to 156	12.5	150	>18; typ. 22	50
BGY36	CW	148 to 174	12.5	150	>18; typ. 21	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.

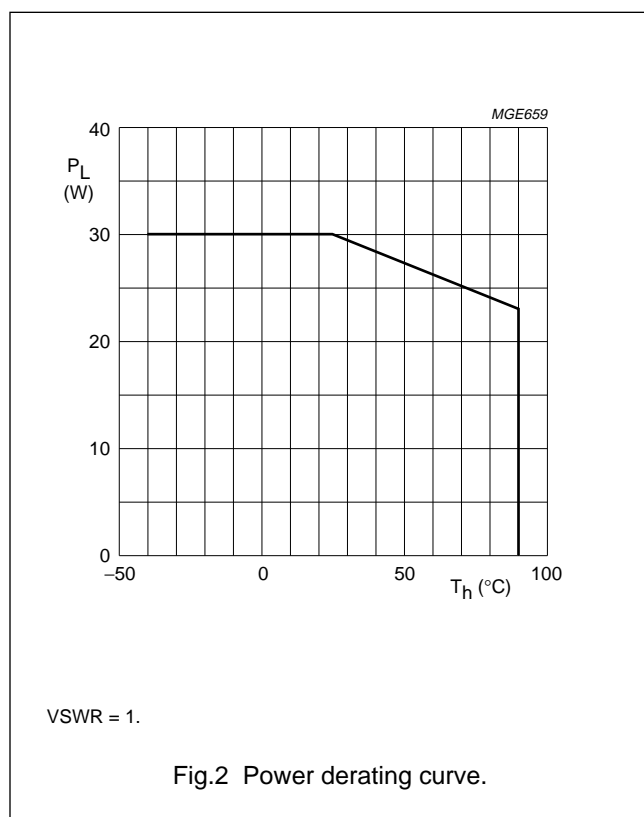
## VHF power amplifier modules

## BGY32; BGY33; BGY35; BGY36

**LIMITING VALUES**

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_{S1}$	DC supply voltage	–	15	V
$V_{S2}$	DC supply voltage	–	15	V
$V_i$	RF input terminal voltage	–	±25	V
$V_o$	RF output terminal voltage	–	±25	V
$P_D$	input drive power			
	BGY32; BGY33	–	200	mW
	BGY35; BGY36	–	300	mW
$P_L$	load power	–	30	W
$T_{stg}$	storage temperature	–40	+100	°C
$T_h$	operating heatsink temperature	–	90	°C



## VHF power amplifier modules

## BGY32; BGY33; BGY35; BGY36

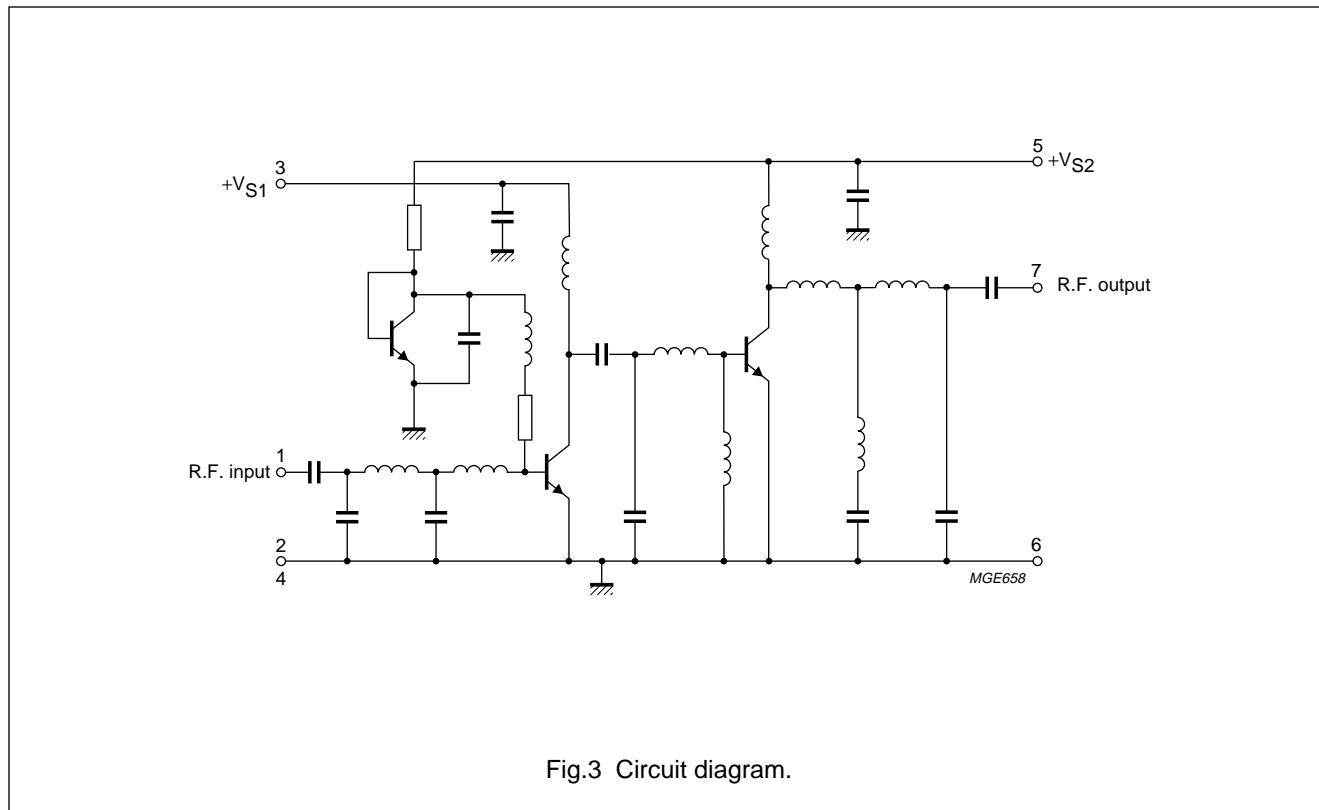
**CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency					
	BGY32		68	–	88	MHz
	BGY33		80	–	108	MHz
	BGY35		132	–	156	MHz
	BGY36		148	–	174	MHz
$I_{Q1}$	leakage current	$P_D = 0$	–	6	–	mA
$I_{Q2}$	leakage current	$P_D = 0$	–	13	–	mA
$P_L$	load power					
	BGY32	$P_D = 100 \text{ mW}$	18	23	–	W
	BGY33	$P_D = 100 \text{ mW}$	18	22	–	W
	BGY35	$P_D = 150 \text{ mW}$	18	22	–	W
	BGY36	$P_D = 150 \text{ mW}$	18	21	–	W
$\eta$	efficiency		40	50	–	%
$H_2$	second harmonic		–	–	–25	dBc
$H_3$	third harmonic		–	–	–25	dBc
$V_{SWR_{in}}$	input VSWR	with respect to $50 \Omega$	–	1.5	–	
	stability	$V_{S1} = 6 \text{ to } 15 \text{ V}$ ; $V_{S2} = 10 \text{ to } 15 \text{ V}$ ; $V_{S1} \leq V_{S2}$ ; $P_D = 50 \text{ to } 200 \text{ mW}$ ; $V_{SWR} \leq 3 : 1$ through all phases;	–	–	–60	dBc

## VHF power amplifier modules

## BGY32; BGY33; BGY35; BGY36

**Ruggedness**

The module will withstand a load mismatch VSWR of 50:1 (all phases) for short period overload conditions, with  $P_D$ ,  $V_{S1}$  and  $V_{S2}$  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 maximum 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****Supply**

An electrolytic capacitor of 10  $\mu$ F, 25 V, in parallel with a polyester capacitor of 100 nF to earth, is recommended as a decoupling arrangement for each power supply pin.

**Power rating**

In general it is recommended that the output power from the module under nominal conditions should not exceed 23 W in order to provide an adequate safety margin under fault conditions.

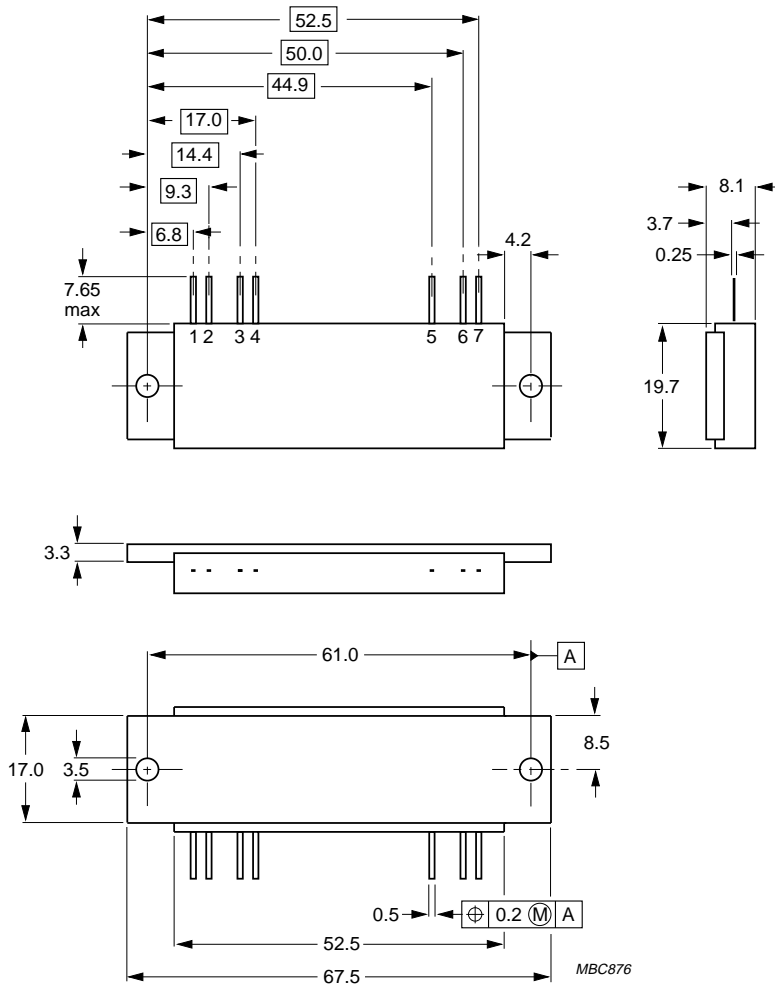
**Output power control**

The module is not designed to be operated over a large 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 50 and 200 mW. The next option is by varying  $V_{S1}$  between 6 and 12.5 V.

VHF power amplifier modules

BGY32; BGY33; BGY35; BGY36

PACKAGE OUTLINE



Dimensions in mm.

Fig.4 SOT132B.

## VHF power amplifier modules

## BGY32; BGY33; BGY35; BGY36

**DEFINITIONS**

<b>Data sheet status</b>	
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.
Short-form specification	The data in this 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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

**LIFE SUPPORT APPLICATIONS**

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.