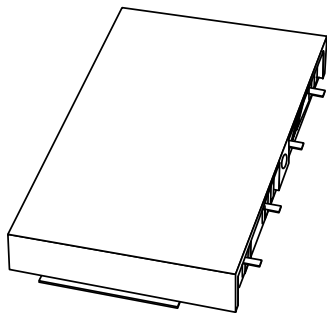


# DATA SHEET



## **BGY148A; BGY148B** HF amplifier modules

Product specification  
Supersedes data of 1997 Jul 14

1998 May 13

# HF amplifier modules

# BGY148A; BGY148B

## FEATURES

- Single 6 V nominal supply voltage
- 3 W output power
- Easy control of output power by DC voltage
- Silicon bipolar technology
- Standby current less than 100  $\mu$ A.

## APPLICATIONS

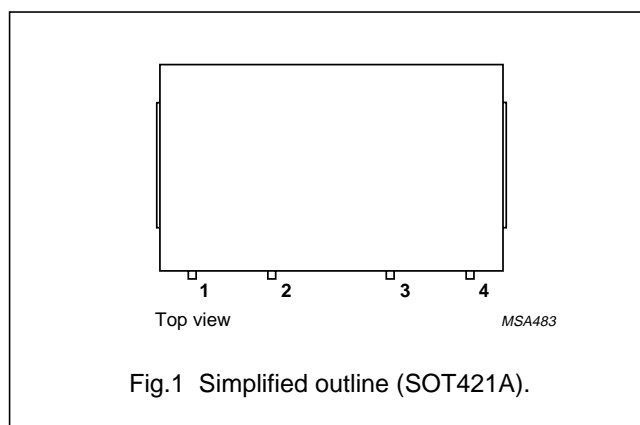
- Portable communication equipment operating in the 400 to 440 MHz and 430 to 488 MHz frequency ranges respectively.

## DESCRIPTION

The BGY148A and BGY148B are three-stage UHF amplifier modules in a SOT421A package. Each module consists of three 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 3 W into a load of 50  $\Omega$  with an RF drive power of 10 mW.

## PINNING - SOT421A

PIN	DESCRIPTION
1	RF input
2	$V_C$
3	$V_S$
4	RF output
Flange	ground



## QUICK REFERENCE DATA

RF performance at  $T_{mb} = 25$  °C.

TYPE	MODE OF OPERATION	f (MHz)	$V_S$ (V)	$P_L$ (W)	$G_p$ (dB)	$\eta$ (%)	$Z_S; Z_L$ ( $\Omega$ )
BGY148A	CW	400 to 440	6	$\geq 3$	$\geq 24.8$	typ. 53	50
BGY148B	CW	430 to 488	6	$\geq 3$	$\geq 24.8$	typ. 53	50

## LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
$V_S$	DC supply voltage	-	8.5	V
$V_C$	DC control voltage	-	4	V
$P_D$	input drive power	-	20	mW
$P_L$	load power	-	3.5	W
$T_{stg}$	storage temperature	-40	+100	°C
$T_{mb}$	operating mounting-base temperature; note1	-30	+100	°C

## Note

1. In order to control the mounting-base temperature, proper heatsinking of the underside of the device is required. It is therefore advisable that the device is mounted on a printed-circuit board with metallized through holes.

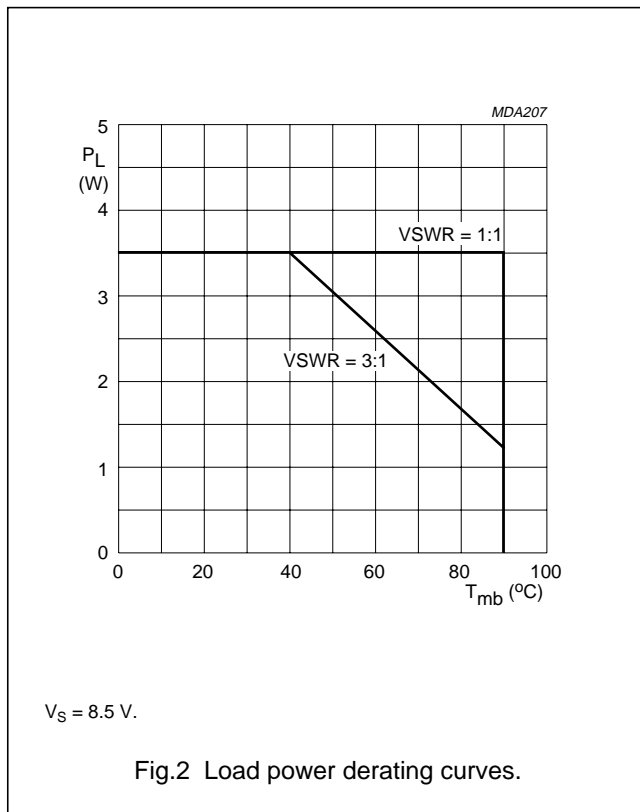
HF amplifier modules

BGY148A; BGY148B

**CHARACTERISTICS**

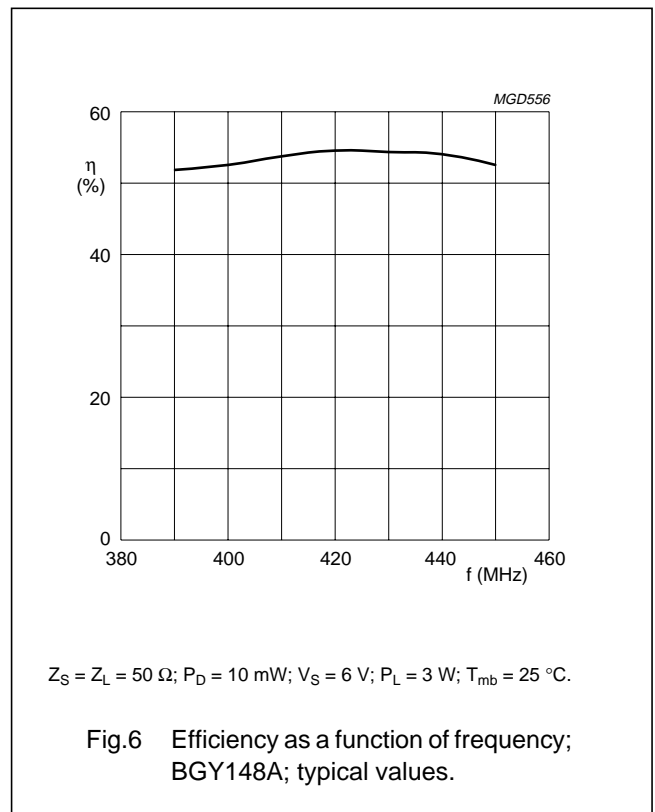
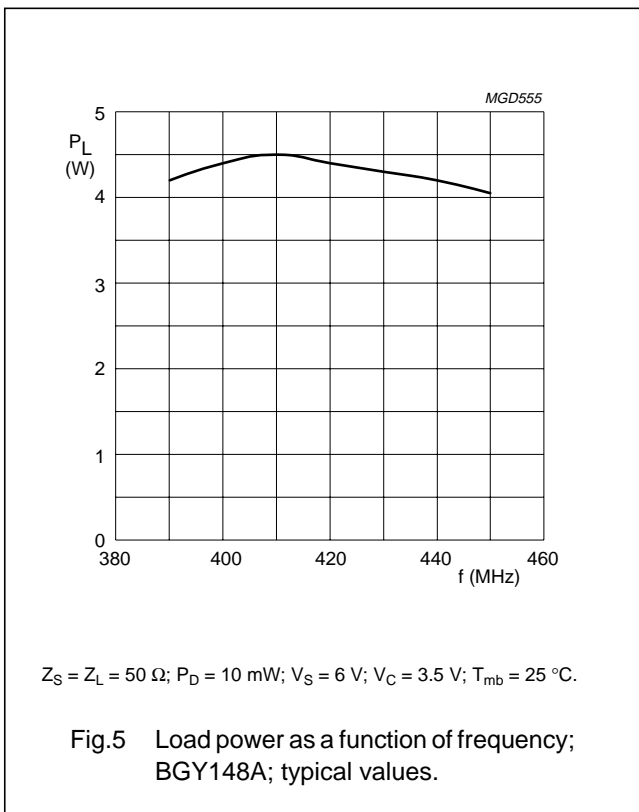
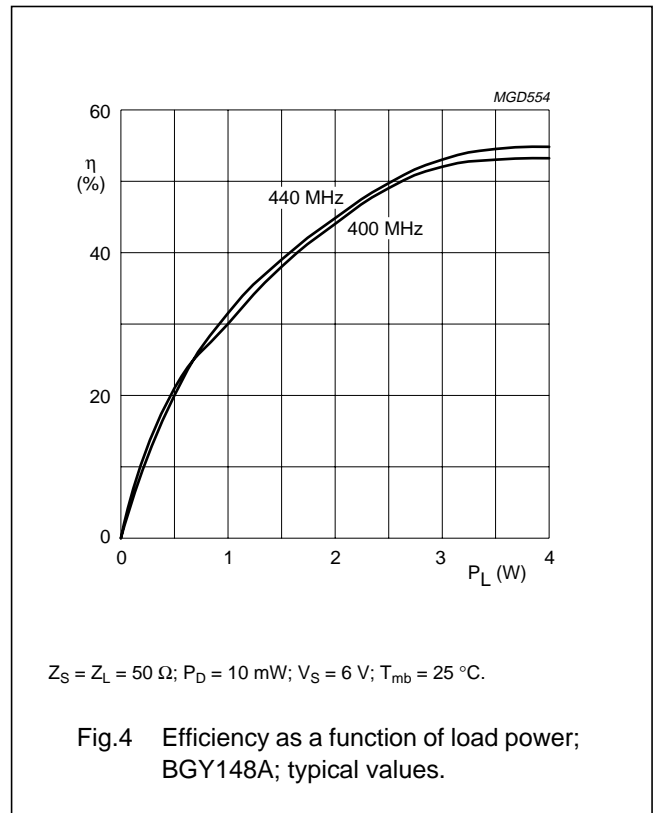
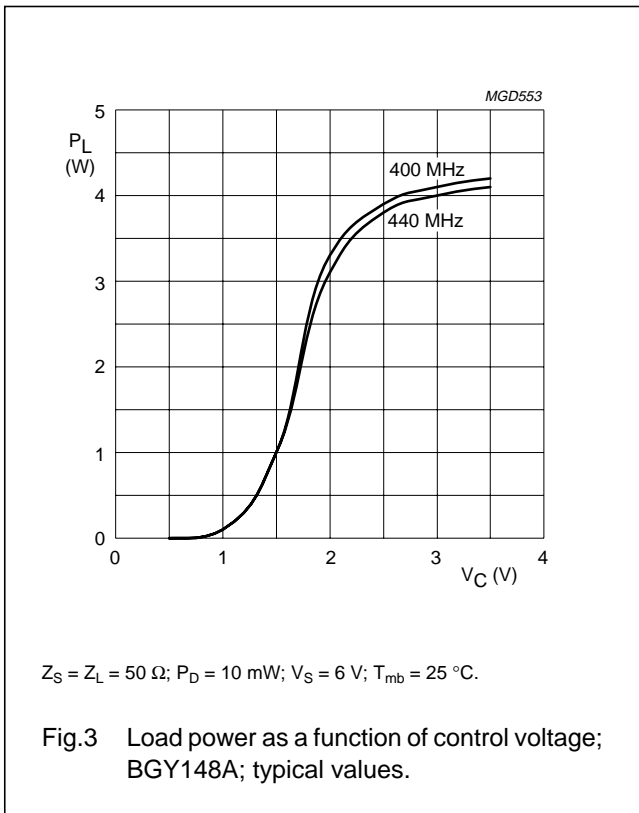
$Z_S = Z_L = 50 \Omega$ ;  $P_D = 10 \text{ mW}$ ;  $V_S = 6 \text{ V}$ ;  $V_C \leq 3.5 \text{ V}$ ;  $T_{mb} = 25 \text{ }^\circ\text{C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency range BGY148A BGY148B		400 430	– –	440 488	MHz MHz
$I_Q$	total quiescent current	$V_C = 0$ ; $P_D = 0$	–	–	100	$\mu\text{A}$
$I_C$	control current	adjust $V_C$ for $P_L = 3 \text{ W}$	–	–	500	$\mu\text{A}$
$P_L$	load power		3	–	–	W
$G_p$	power gain	adjust $V_C$ for $P_L = 3 \text{ W}$	24.8	–	–	dB
$\eta$	efficiency	adjust $V_C$ for $P_L = 3 \text{ W}$	46	53	–	%
$H_2$	second harmonic	adjust $V_C$ for $P_L = 3 \text{ W}$	–	–	–38	dBc
$H_3$	third harmonic	adjust $V_C$ for $P_L = 3 \text{ W}$	–	–	–38	dBc
$V_{SWR_{in}}$	input VSWR	adjust $V_C$ for $P_L = 3 \text{ W}$	–	–	3 : 1	
	control range	$V_C = 0$ to $3.5 \text{ V}$	10	–	–	dB
	stability	$P_D = 5$ to $20 \text{ mW}$ ; $V_S = 5$ to $8.5 \text{ V}$ ; $P_L \leq 3.5 \text{ W}$ ; $V_{SWR} \leq 4 : 1$ through all phases	–	–	–60	dBc
	ruggedness	$V_S = 8.5 \text{ V}$ ; adjust $V_C$ for $P_L = 3.5 \text{ W}$ ; $V_{SWR} \leq 4 : 1$ through all phases	no degradation			



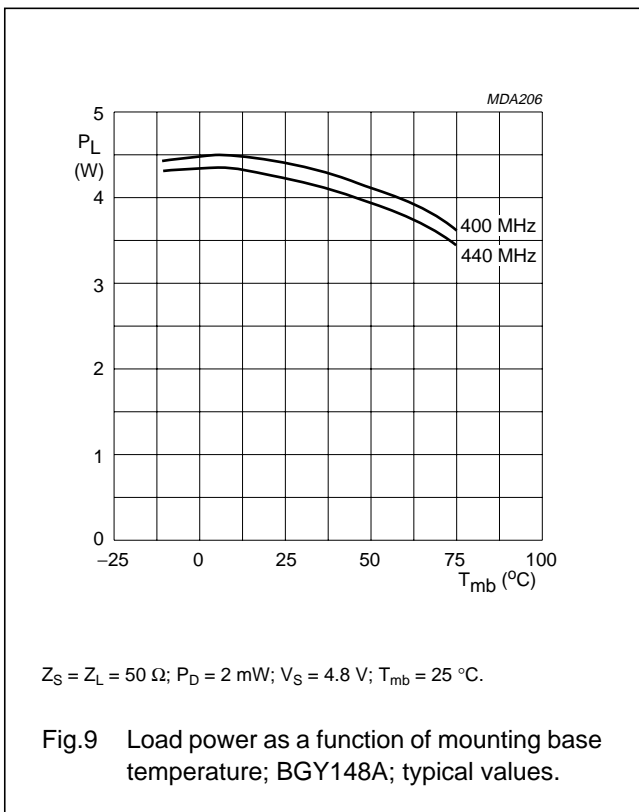
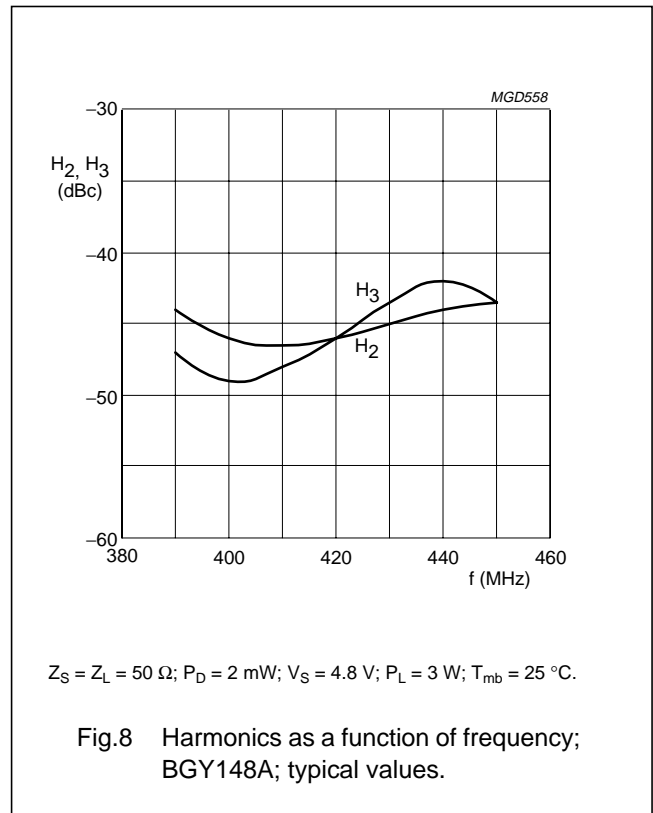
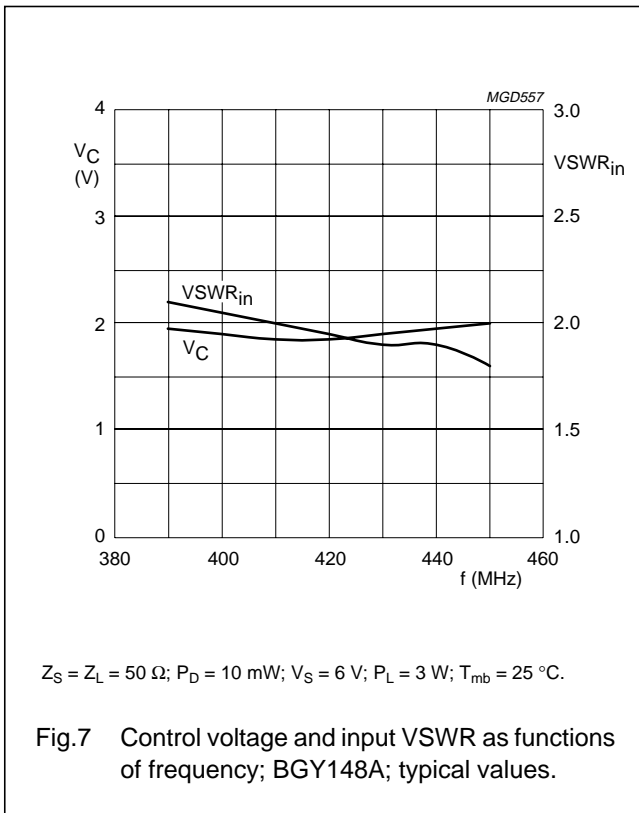
HF amplifier modules

BGY148A; BGY148B



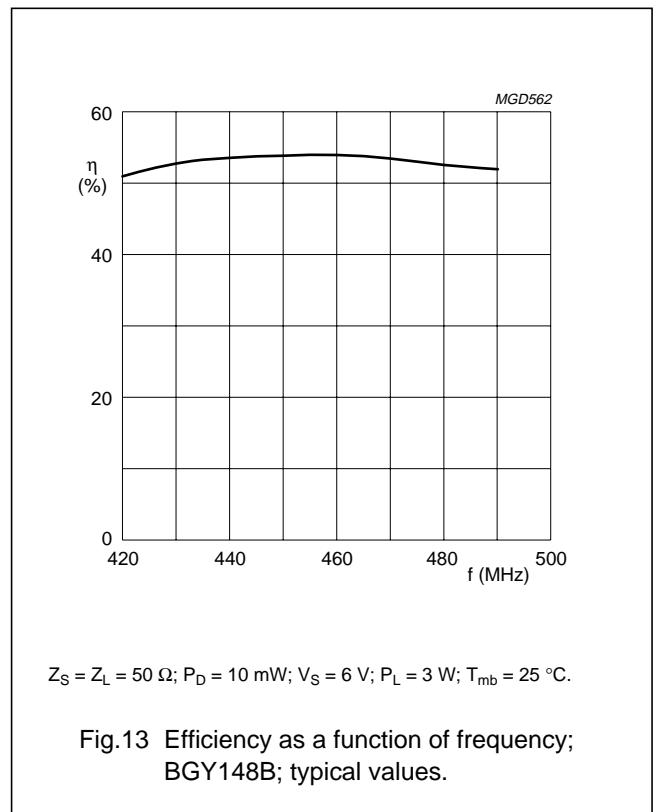
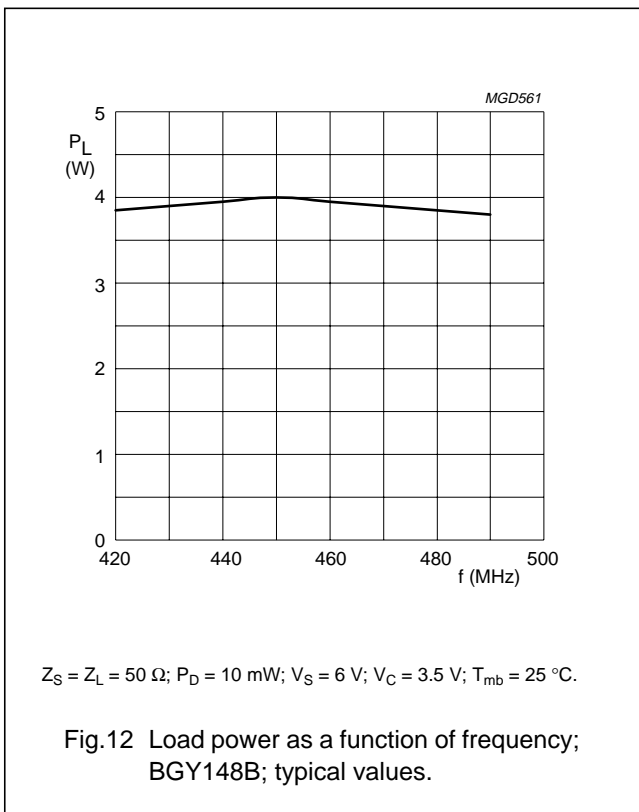
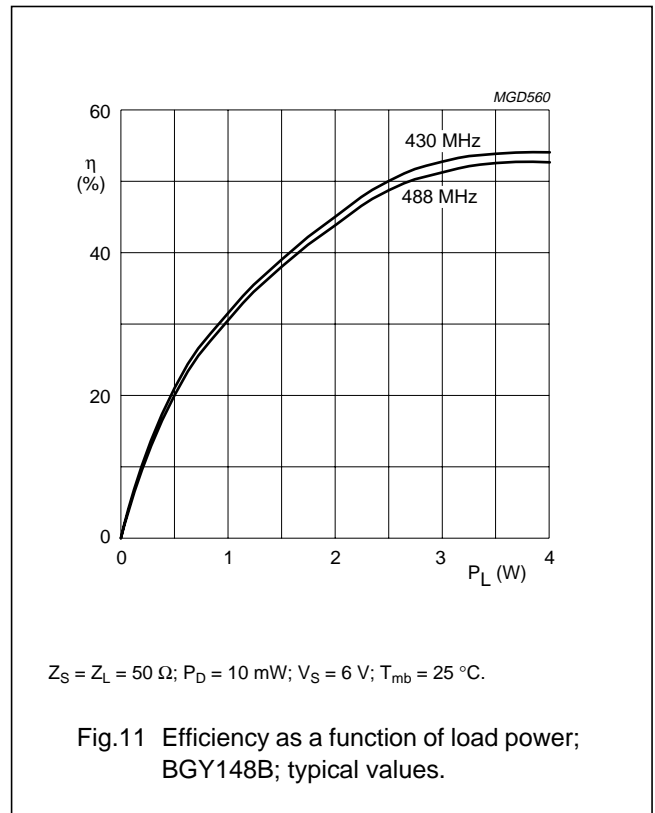
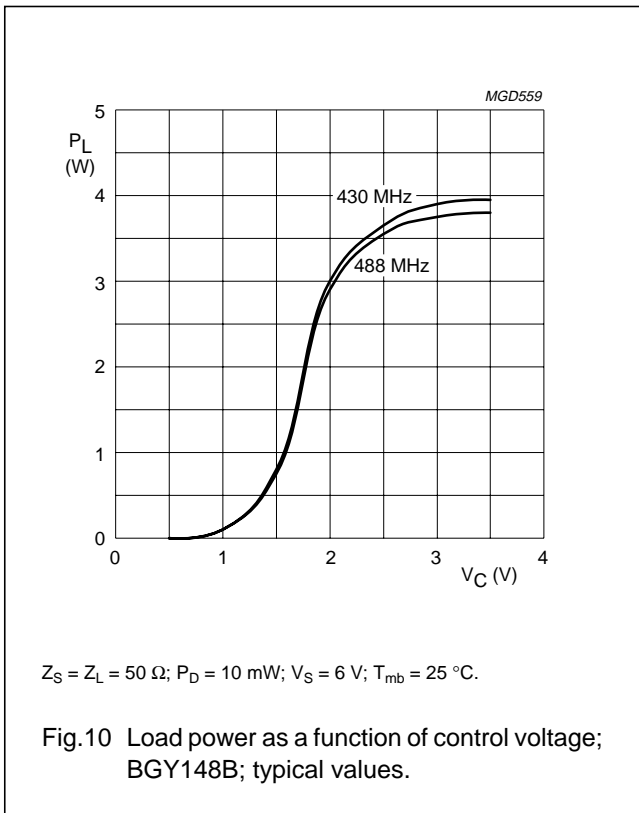
HF amplifier modules

BGY148A; BGY148B



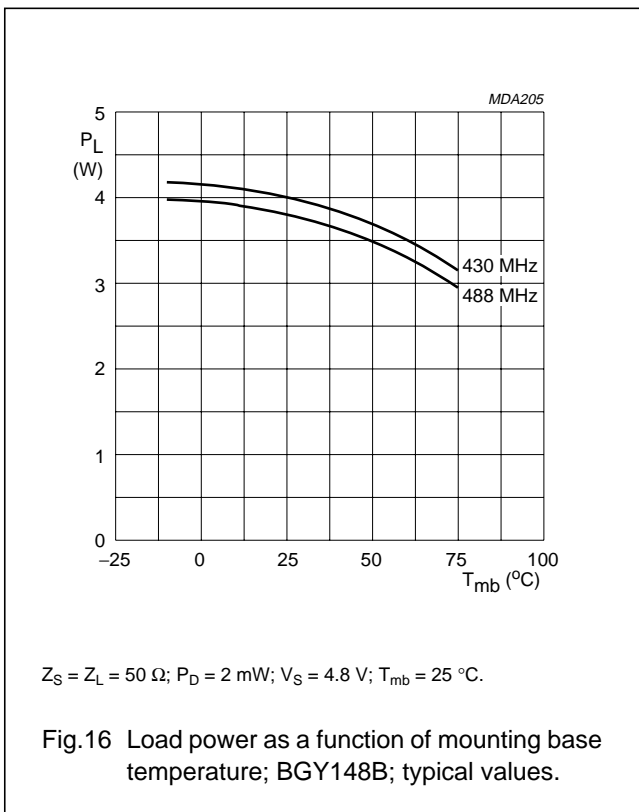
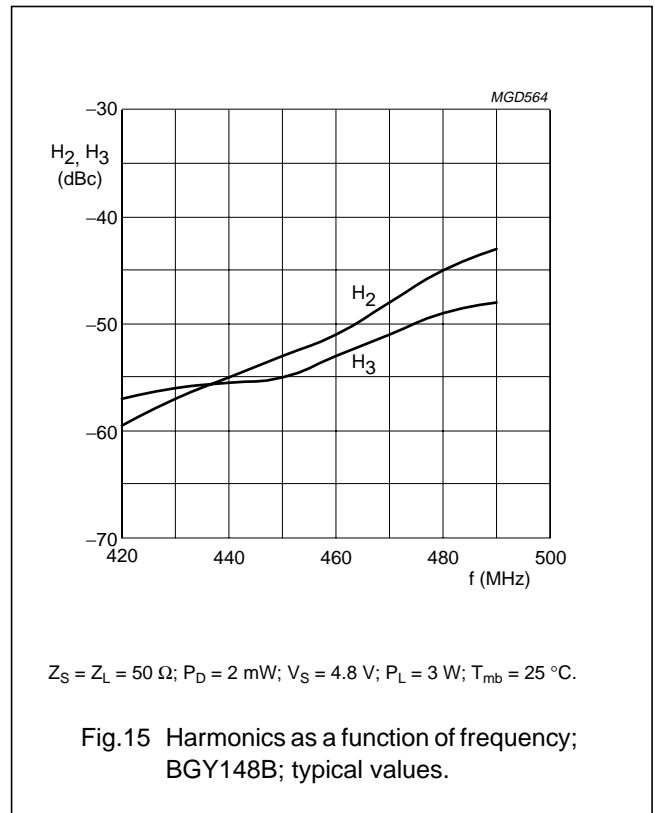
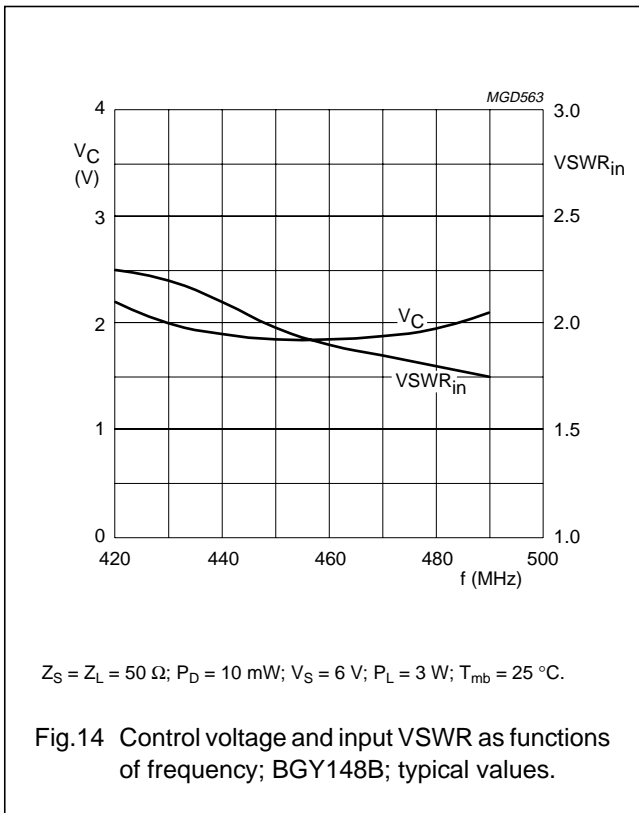
HF amplifier modules

BGY148A; BGY148B



HF amplifier modules

BGY148A; BGY148B



## HF amplifier modules

## BGY148A; BGY148B

### SOLDERING

The indicated temperatures are those at the solder interfaces.

Advised solder types are types with a liquidus less than or equal to 210 °C.

Solder dots or solder prints must be large enough to wet the contact areas.

Soldering can be carried out using a conveyor oven, a hot air oven, an infrared oven or a combination of these ovens. A double reflow process is permitted.

Hand soldering must be avoided because the soldering iron tip can exceed the maximum permitted temperature of 250 °C and damage the module.

The maximum allowed temperature is 250 °C for 5 seconds.

The maximum ramp-up is 10 °C per second.

The maximum cool-down is 5 °C per second.

### Cleaning

The following fluids may be used for cleaning:

- Alcohol
- Bio-Act (Terpene Hydrocarbon)
- Acetone.

Ultrasonic cleaning should not be used since this can cause serious damage to the product.

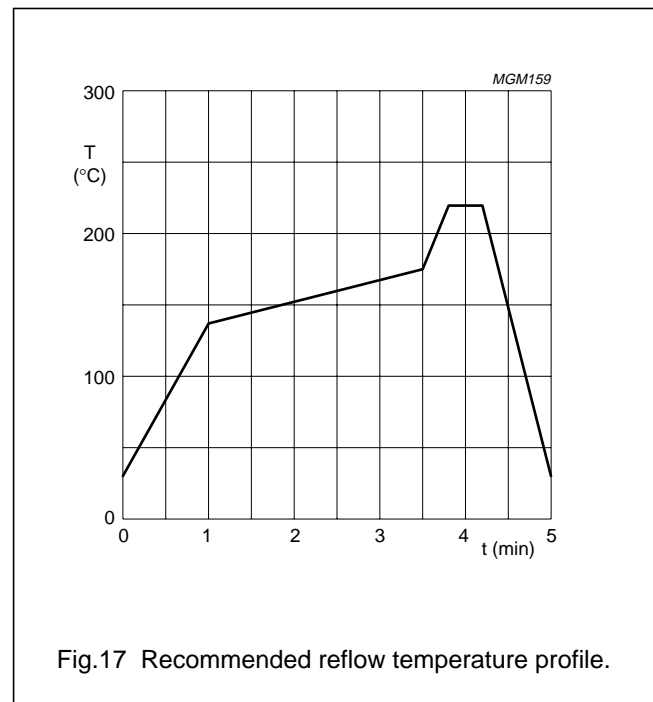
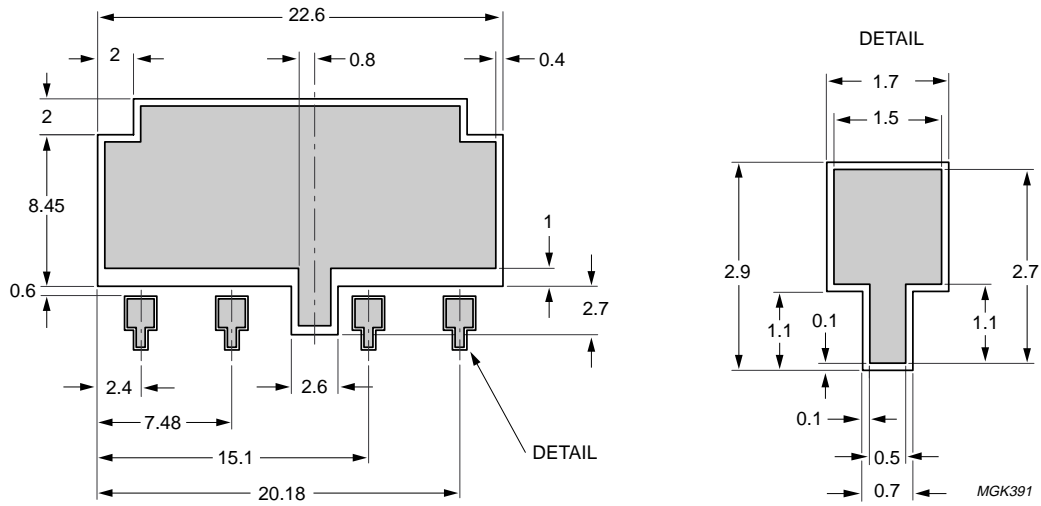


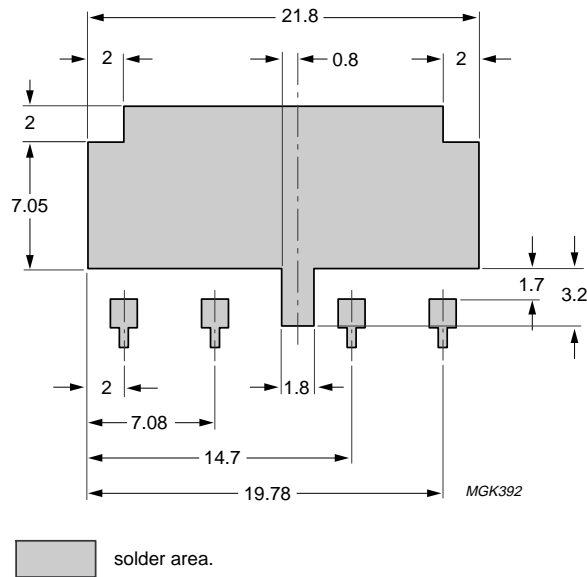
Fig.17 Recommended reflow temperature profile.

HF amplifier modules

BGY148A; BGY148B



- footprint metallization
- solder area.



- solder area.

Dimensions in mm.

Fig.18 SOT421A footprint.

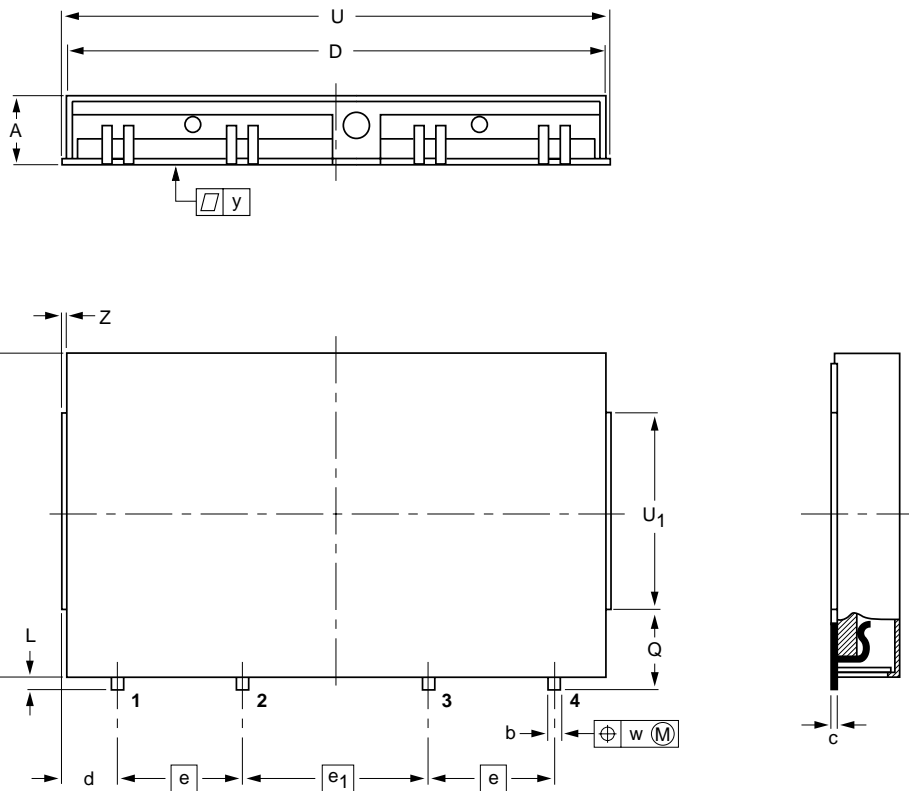
HF amplifier modules

BGY148A; BGY148B

PACKAGE OUTLINE

Ceramic single-ended flat package; 4 in-line leads

SOT421A



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	c	D	d	E	e	e <sub>1</sub>	L	Q	U	U <sub>1</sub>	w	y	Z
mm	3.0 2.6	0.56 0.46	0.30 0.20	22.1 21.7	2.4 2.0	13.4 13.0	5.08	7.62	0.7 0.3	3.4 3.0	22.4 22.0	8.2 7.8	0.25	0.15	0.25 0.05

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT421A						97-06-20

## HF amplifier modules

## BGY148A; BGY148B

**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.
<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.

# Philips Semiconductors – a worldwide company

**Argentina:** see South America

**Australia:** 34 Waterloo Road, NORTH RYDE, NSW 2113, Tel. +61 2 9805 4455, Fax. +61 2 9805 4466

**Austria:** Computerstr. 6, A-1101 WIEN, P.O. Box 213, Tel. +43 160 1010, Fax. +43 160 101 1210

**Belarus:** Hotel Minsk Business Center, Bld. 3, r. 1211, Volodarski Str. 6, 220050 MINSK, Tel. +375 172 200 733, Fax. +375 172 200 773

**Belgium:** see The Netherlands

**Brazil:** see South America

**Bulgaria:** Philips Bulgaria Ltd., Energoproject, 15th floor, 51 James Bourchier Blvd., 1407 SOFIA, Tel. +359 2 689 211, Fax. +359 2 689 102

**Canada:** PHILIPS SEMICONDUCTORS/COMPONENTS, Tel. +1 800 234 7381

**China/Hong Kong:** 501 Hong Kong Industrial Technology Centre, 72 Tat Chee Avenue, Kowloon Tong, HONG KONG, Tel. +852 2319 7888, Fax. +852 2319 7700

**Colombia:** see South America

**Czech Republic:** see Austria

**Denmark:** Prags Boulevard 80, PB 1919, DK-2300 COPENHAGEN S, Tel. +45 32 88 2636, Fax. +45 31 57 0044

**Finland:** Sinikalliontie 3, FIN-02630 ESPOO, Tel. +358 9 615800, Fax. +358 9 61580920

**France:** 51 Rue Carnot, BP317, 92156 SURESNES Cedex, Tel. +33 1 40 99 6161, Fax. +33 1 40 99 6427

**Germany:** Hammerbrookstraße 69, D-20097 HAMBURG, Tel. +49 40 23 53 60, Fax. +49 40 23 536 300

**Greece:** No. 15, 25th March Street, GR 17778 TAVROS/ATHENS, Tel. +30 1 4894 339/239, Fax. +30 1 4814 240

**Hungary:** see Austria

**India:** Philips INDIA Ltd, Band Box Building, 2nd floor, 254-D, Dr. Annie Besant Road, Worli, MUMBAI 400 025, Tel. +91 22 493 8541, Fax. +91 22 493 0966

**Indonesia:** PT Philips Development Corporation, Semiconductors Division, Gedung Philips, Jl. Buncit Raya Kav.99-100, JAKARTA 12510, Tel. +62 21 794 0040 ext. 2501, Fax. +62 21 794 0080

**Ireland:** Newstead, Clonskeagh, DUBLIN 14, Tel. +353 1 7640 000, Fax. +353 1 7640 200

**Israel:** RAPAC Electronics, 7 Kehilat Saloniki St, PO Box 18053, TEL AVIV 61180, Tel. +972 3 645 0444, Fax. +972 3 649 1007

**Italy:** PHILIPS SEMICONDUCTORS, Piazza IV Novembre 3, 20124 MILANO, Tel. +39 2 6752 2531, Fax. +39 2 6752 2557

**Japan:** Philips Bldg 13-37, Kohnan 2-chome, Minato-ku, TOKYO 108-8507, Tel. +81 3 3740 5130, Fax. +81 3 3740 5077

**Korea:** Philips House, 260-199 Itaewon-dong, Yongsan-ku, SEOUL, Tel. +82 2 709 1412, Fax. +82 2 709 1415

**Malaysia:** No. 76 Jalan Universiti, 46200 PETALING JAYA, SELANGOR, Tel. +60 3 750 5214, Fax. +60 3 757 4880

**Mexico:** 5900 Gateway East, Suite 200, EL PASO, TEXAS 79905, Tel. +9-5 800 234 7381

**Middle East:** see Italy

**Netherlands:** Postbus 90050, 5600 PB EINDHOVEN, Bldg. VB, Tel. +31 40 27 82785, Fax. +31 40 27 88399

**New Zealand:** 2 Wagener Place, C.P.O. Box 1041, AUCKLAND, Tel. +64 9 849 4160, Fax. +64 9 849 7811

**Norway:** Box 1, Manglerud 0612, OSLO, Tel. +47 22 74 8000, Fax. +47 22 74 8341

**Pakistan:** see Singapore

**Philippines:** Philips Semiconductors Philippines Inc., 106 Valero St. Salcedo Village, P.O. Box 2108 MCC, MAKATI, Metro MANILA, Tel. +63 2 816 6380, Fax. +63 2 817 3474

**Poland:** Ul. Lukiska 10, PL 04-123 WARSZAWA, Tel. +48 22 612 2831, Fax. +48 22 612 2327

**Portugal:** see Spain

**Romania:** see Italy

**Russia:** Philips Russia, Ul. Usatcheva 35A, 119048 MOSCOW, Tel. +7 095 755 6918, Fax. +7 095 755 6919

**Singapore:** Lorong 1, Toa Payoh, SINGAPORE 319762, Tel. +65 350 2538, Fax. +65 251 6500

**Slovakia:** see Austria

**Slovenia:** see Italy

**South Africa:** S.A. PHILIPS Pty Ltd., 195-215 Main Road Martindale, 2092 JOHANNESBURG, P.O. Box 7430 Johannesburg 2000, Tel. +27 11 470 5911, Fax. +27 11 470 5494

**South America:** Al. Vicente Pinzon, 173, 6th floor, 04547-130 SÃO PAULO, SP, Brazil, Tel. +55 11 821 2333, Fax. +55 11 821 2382

**Spain:** Balmes 22, 08007 BARCELONA, Tel. +34 93 301 6312, Fax. +34 93 301 4107

**Sweden:** Kottbygatan 7, Akalla, S-16485 STOCKHOLM, Tel. +46 8 5985 2000, Fax. +46 8 5985 2745

**Switzerland:** Allmendstrasse 140, CH-8027 ZÜRICH, Tel. +41 1 488 2741 Fax. +41 1 488 3263

**Taiwan:** Philips Semiconductors, 6F, No. 96, Chien Kuo N. Rd., Sec. 1, TAIPEI, Taiwan Tel. +886 2 2134 2865, Fax. +886 2 2134 2874

**Thailand:** PHILIPS ELECTRONICS (THAILAND) Ltd., 209/2 Sanpavuth-Bangna Road Prakanong, BANGKOK 10260, Tel. +66 2 745 4090, Fax. +66 2 398 0793

**Turkey:** Talatpasa Cad. No. 5, 80640 GÜLTEPE/ISTANBUL, Tel. +90 212 279 2770, Fax. +90 212 282 6707

**Ukraine:** PHILIPS UKRAINE, 4 Patrice Lumumba str., Building B, Floor 7, 252042 KIEV, Tel. +380 44 264 2776, Fax. +380 44 268 0461

**United Kingdom:** Philips Semiconductors Ltd., 276 Bath Road, Hayes, MIDDLESEX UB3 5BX, Tel. +44 181 730 5000, Fax. +44 181 754 8421

**United States:** 811 East Arques Avenue, SUNNYVALE, CA 94088-3409, Tel. +1 800 234 7381

**Uruguay:** see South America

**Vietnam:** see Singapore

**Yugoslavia:** PHILIPS, Trg N. Pasica 5/v, 11000 BEOGRAD, Tel. +381 11 625 344, Fax. +381 11 635 777

**For all other countries apply to:** Philips Semiconductors, International Marketing & Sales Communications, Building BE-p, P.O. Box 218, 5600 MD EINDHOVEN, The Netherlands, Fax. +31 40 27 24825

**Internet:** <http://www.semiconductors.philips.com>

© Philips Electronics N.V. 1998

SCA60

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.

The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Printed in The Netherlands

125108/00/03/pp12

Date of release: 1998 May 13

Document order number: 9397 750 03849

*Let's make things better.*

**Philips  
Semiconductors**



**PHILIPS**



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

**[LittleDiode.com](http://LittleDiode.com)**

Looking forward to providing you with the best possible service.