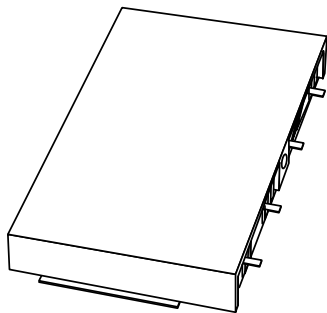


# DATA SHEET



## **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

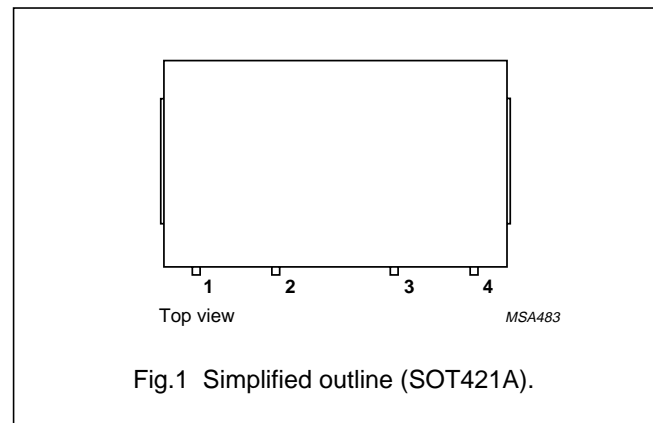
- Portable communication equipment operating in the 400 to 440 MHz and 430 to 488 MHz frequency ranges respectively.

## 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.

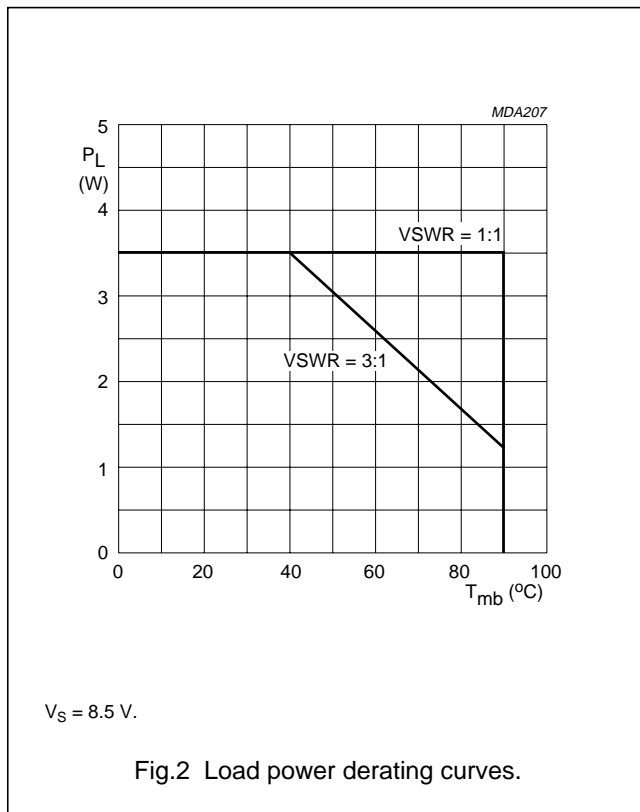
HF amplifier modules

BGY148A; BGY148B

**CHARACTERISTICS**

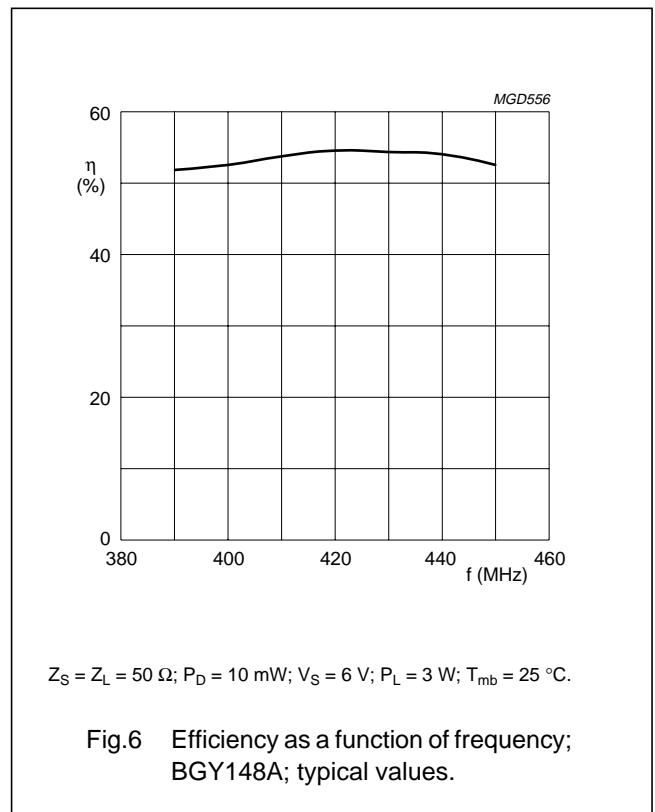
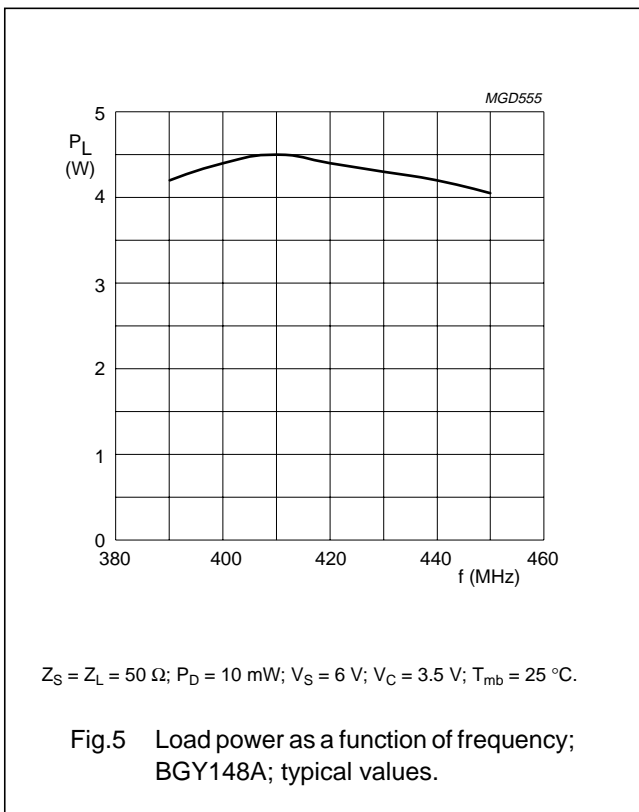
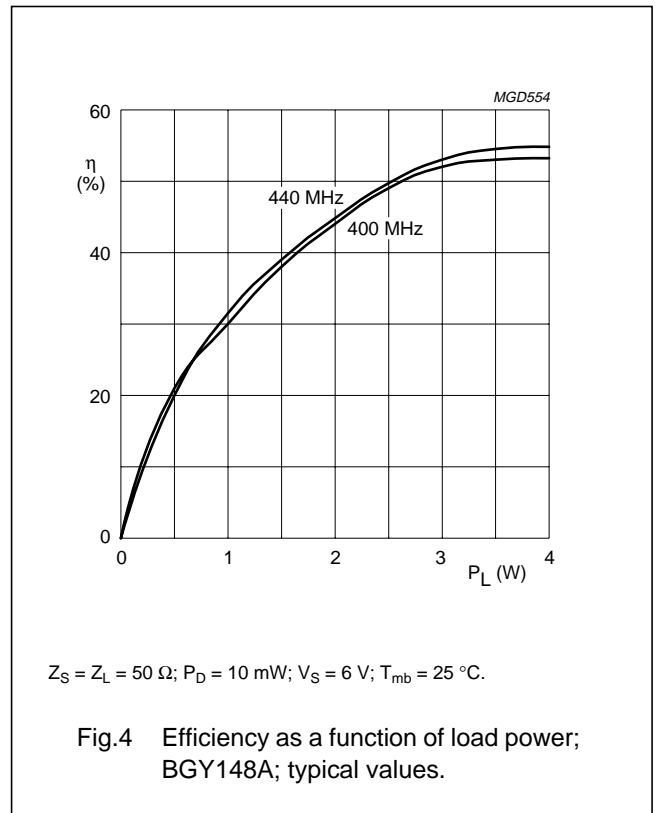
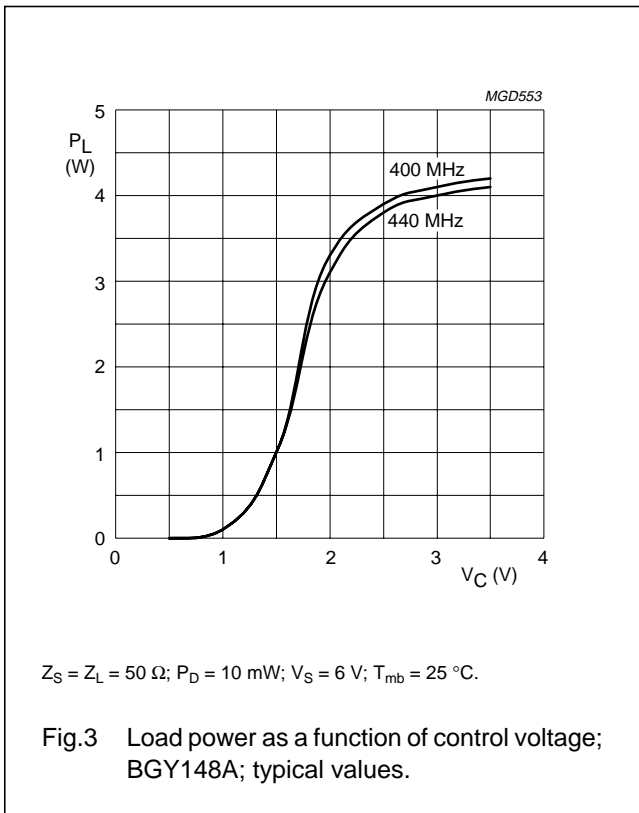
$Z_S = Z_L = 50 \Omega$ ;  $P_D = 10 \text{ mW}$ ;  $V_S = 6 \text{ V}$ ;  $V_C \leq 3.5 \text{ V}$ ;  $T_{mb} = 25 \text{ }^\circ\text{C}$ ; unless otherwise specified.

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			



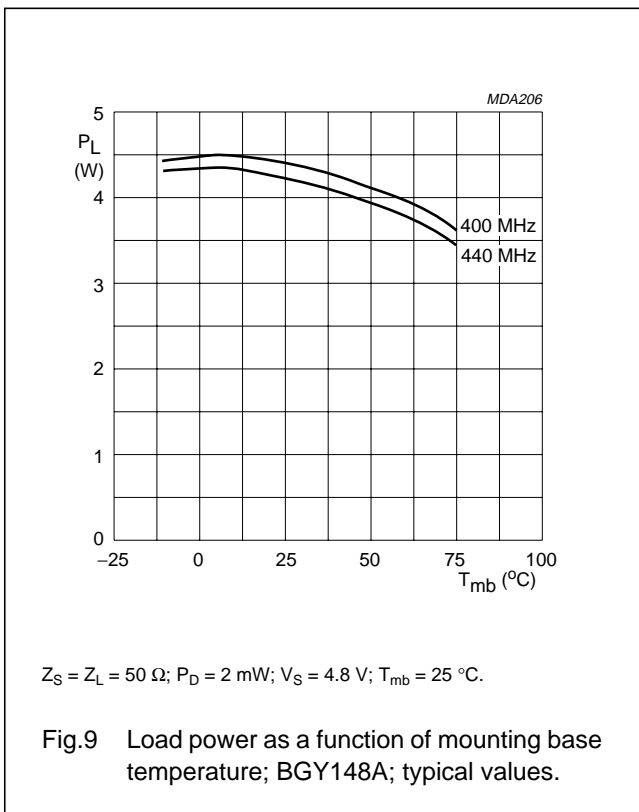
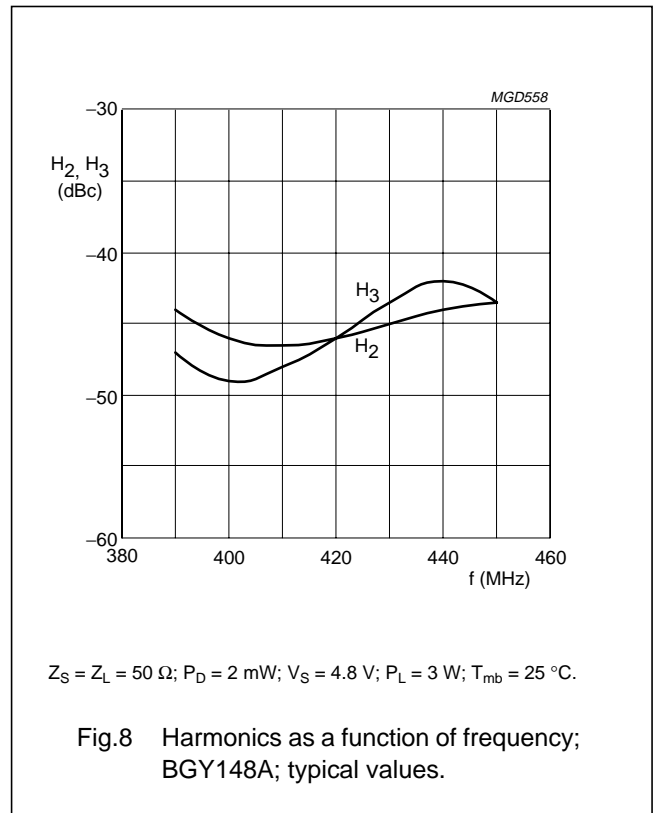
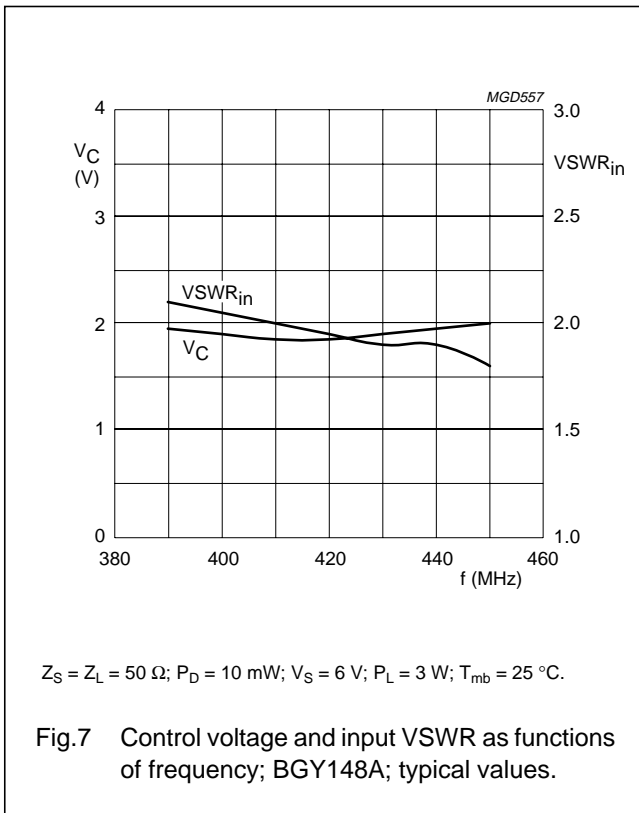
HF amplifier modules

BGY148A; BGY148B



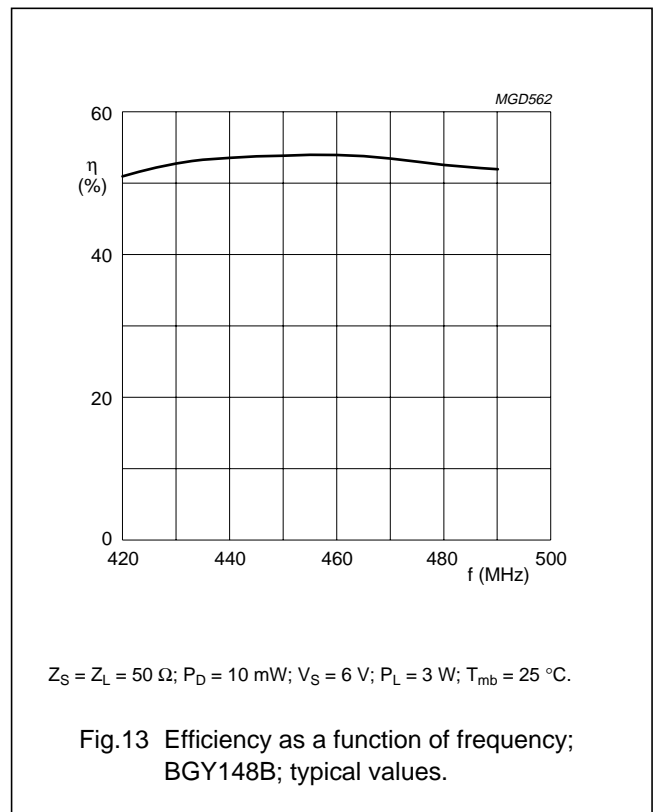
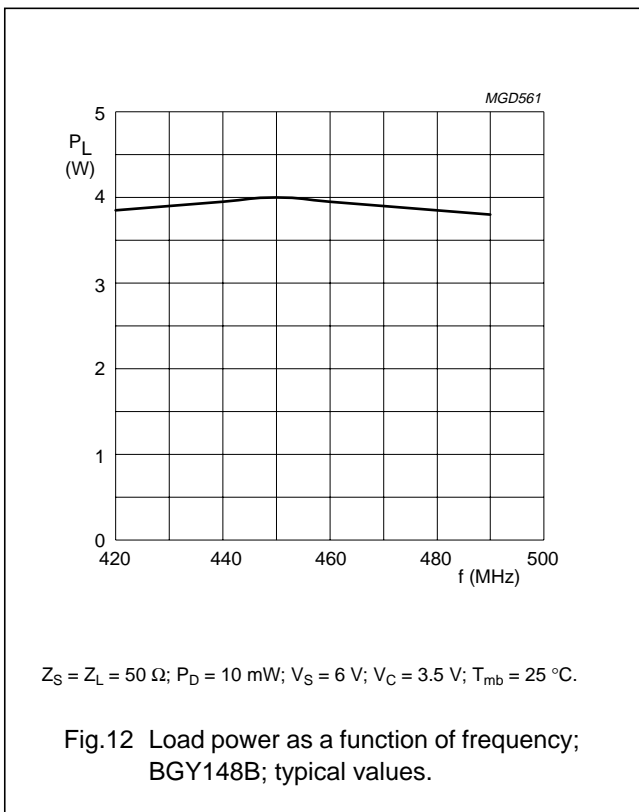
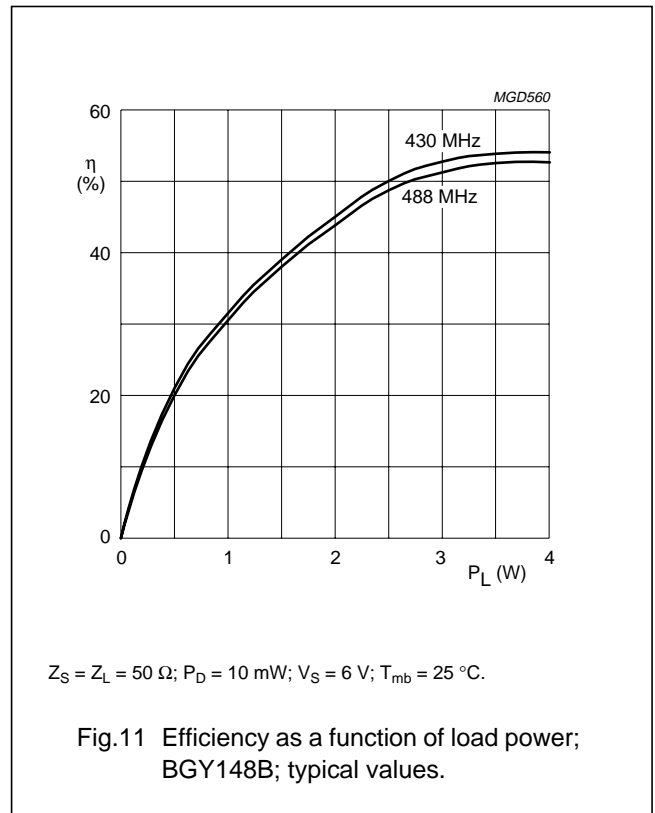
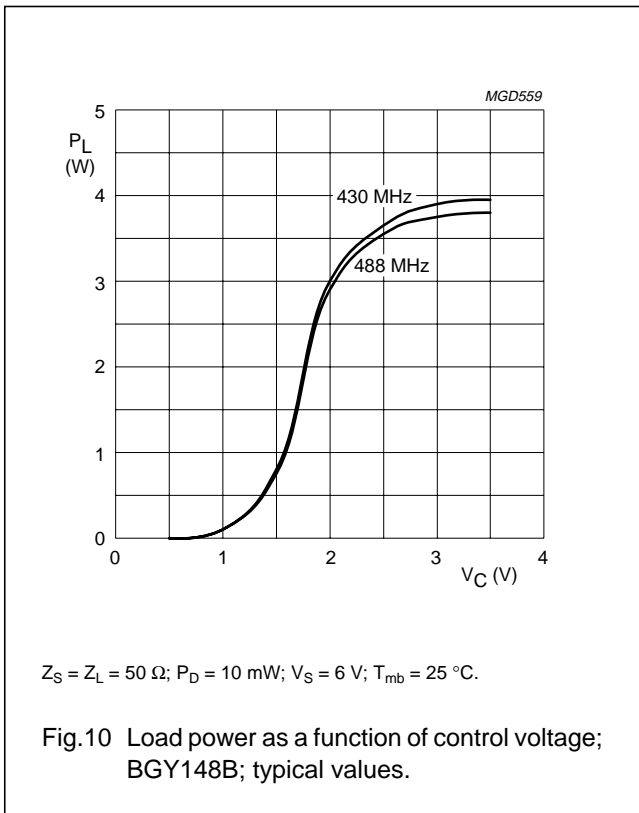
HF amplifier modules

BGY148A; BGY148B



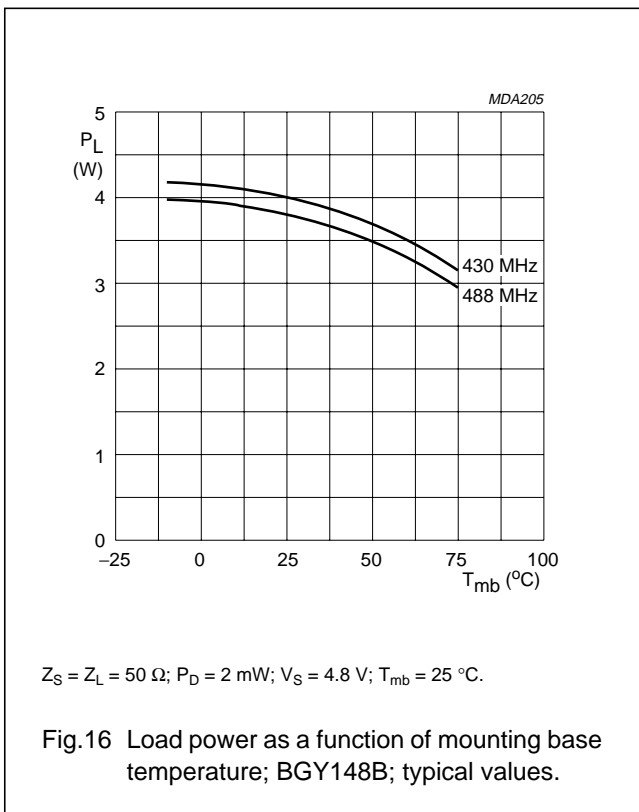
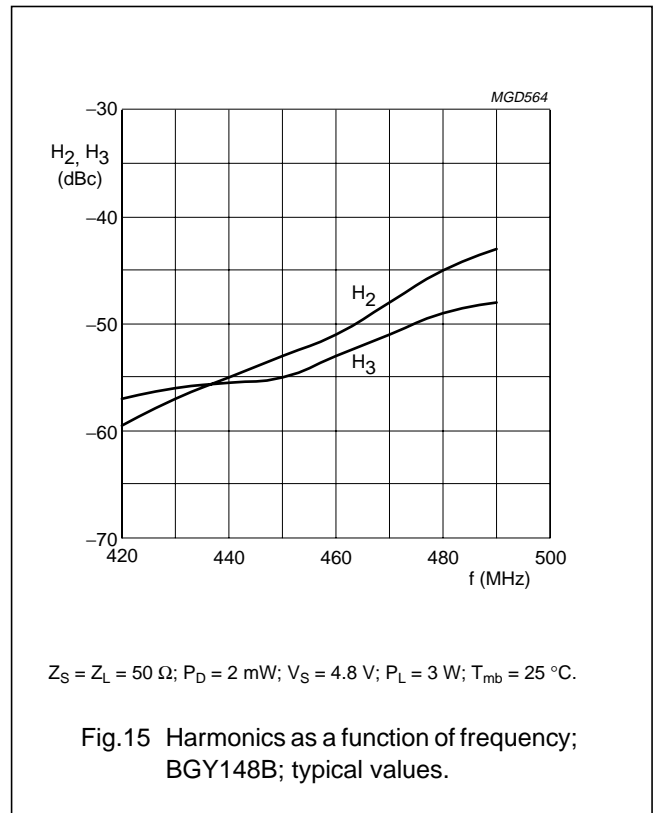
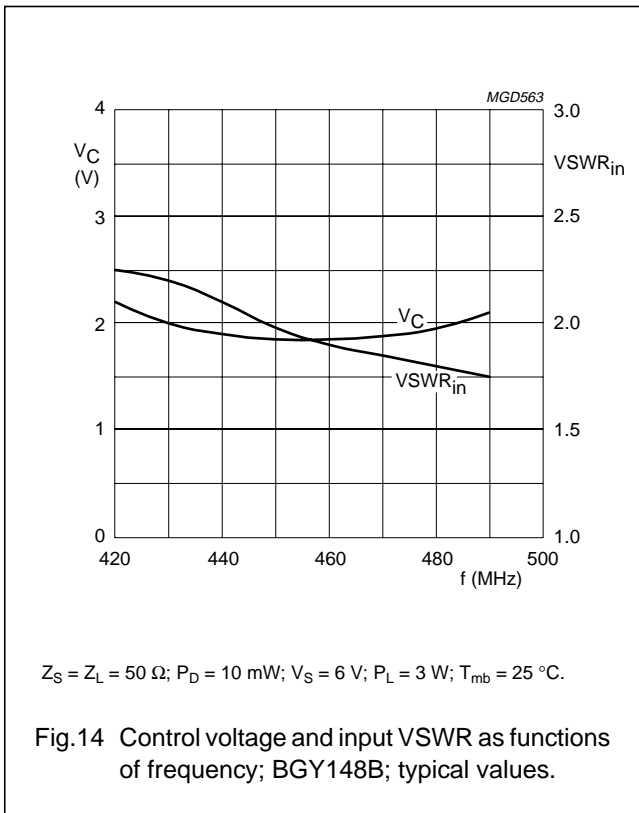
HF amplifier modules

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.

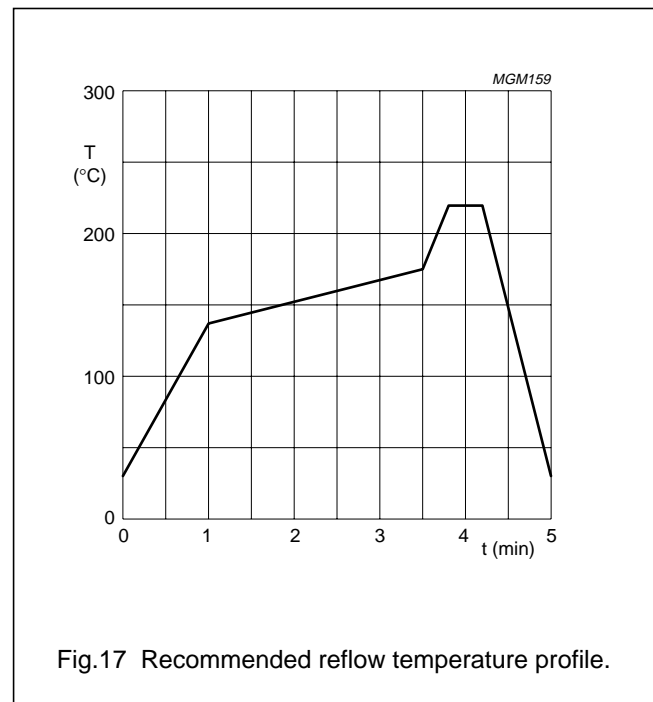
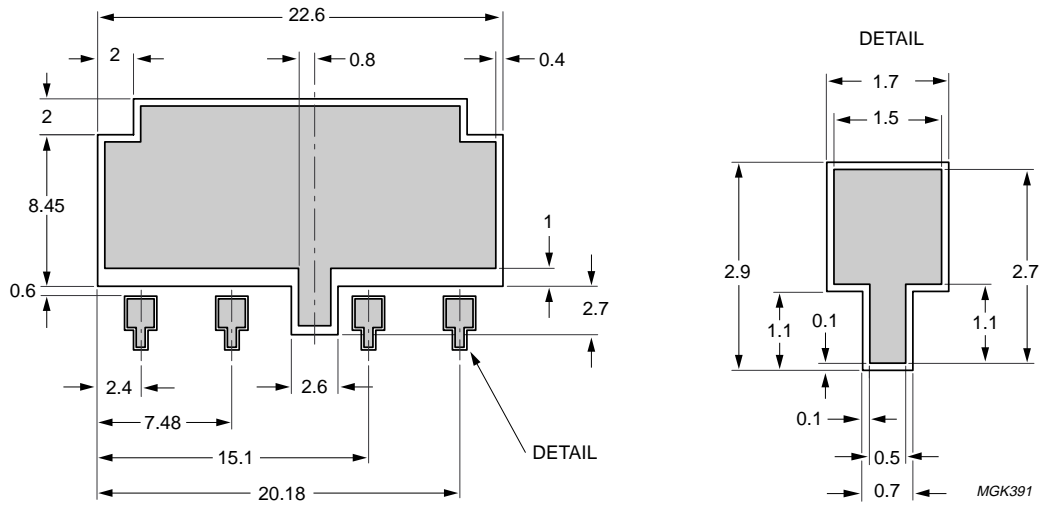


Fig.17 Recommended reflow temperature profile.

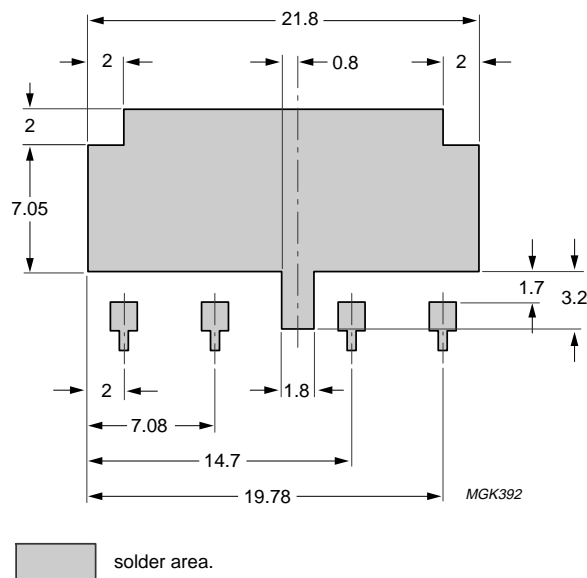


HF amplifier modules

BGY148A; BGY148B



- footprint metallization
- solder area.



Dimensions in mm.

Fig.18 SOT421A footprint.

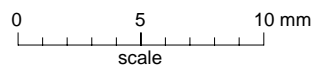
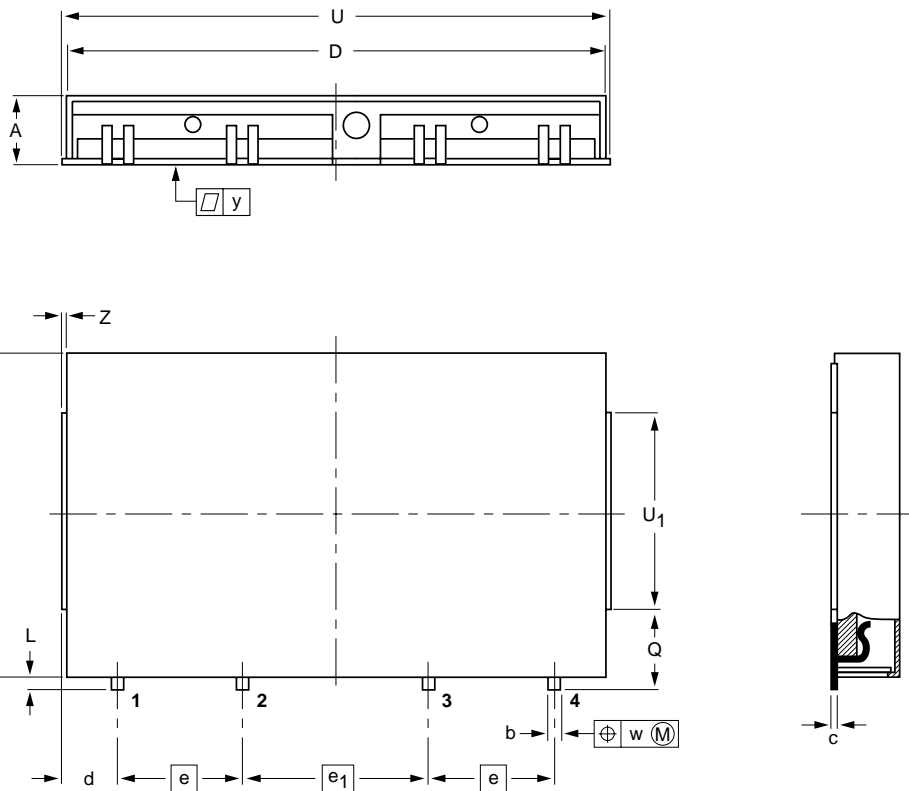
HF amplifier modules

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.	

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