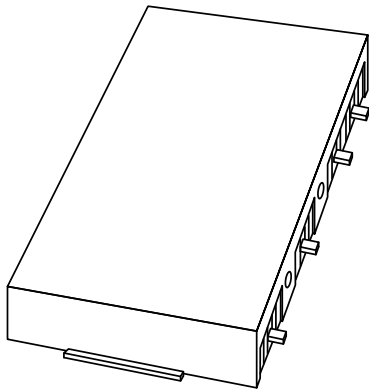


DATA SHEET



BGY122A; BGY122B UHF amplifier modules

Product specification
Supersedes data of 1997 Dec 01

1998 May 11

UHF amplifier modules

BGY122A; BGY122B

FEATURES

- Single 4.8 V nominal supply voltage
- 1.2 W output power
- Easy control of output power by DC voltage
- Very high efficiency (typ. 55%)
- Silicon bipolar technology
- Standby current less than 100 μ A.

APPLICATIONS

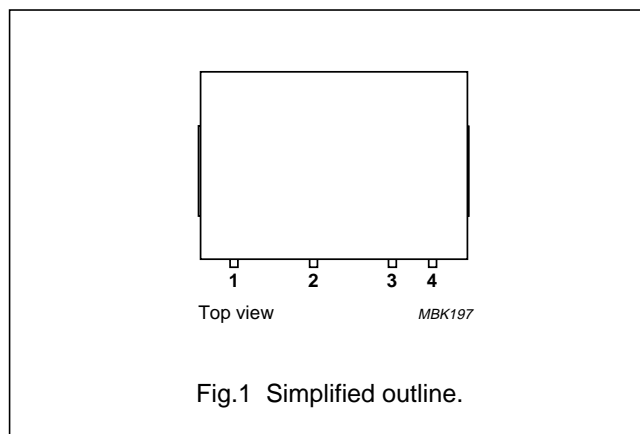
- Hand-held transmitting equipment operating in the 824 to 849 MHz and 872 to 905 MHz frequency ranges.

DESCRIPTION

The BGY122A and BGY122B are three-stage UHF amplifier modules in a SOT388B 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 1.2 W into a load of 50 Ω with an RF drive power of 2 mW.

PINNING - SOT388B

| 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) | η (%) | $Z_S; Z_L$ (Ω) |
|---------|-------------------|------------|-----------|-----------|-------------|------------|-------------------------|
| BGY122A | CW | 824 to 849 | 4.8 | 1.2 | ≥ 27.8 | typ. 55 | 50 |
| BGY122B | CW | 872 to 905 | 4.8 | 1.2 | ≥ 27.8 | typ. 55 | 50 |

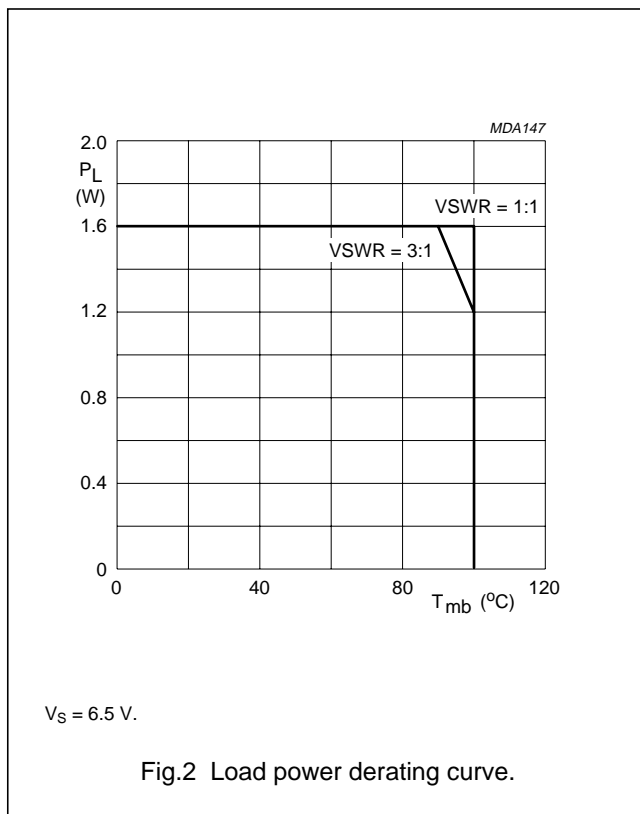
UHF amplifier modules

BGY122A; BGY122B

LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|-------------------------------------|--------------------|------|------|------|
| V_S | DC supply voltage | $V_C = 0; P_D = 0$ | – | 10 | V |
| V_C | DC control voltage | | – | 3.5 | V |
| P_D | input drive power | | – | 5 | mW |
| P_L | load power | | – | 1.6 | W |
| T_{stg} | storage temperature | | –40 | +100 | °C |
| T_{mb} | operating mounting base temperature | | –30 | +100 | °C |



UHF amplifier modules

BGY122A; BGY122B

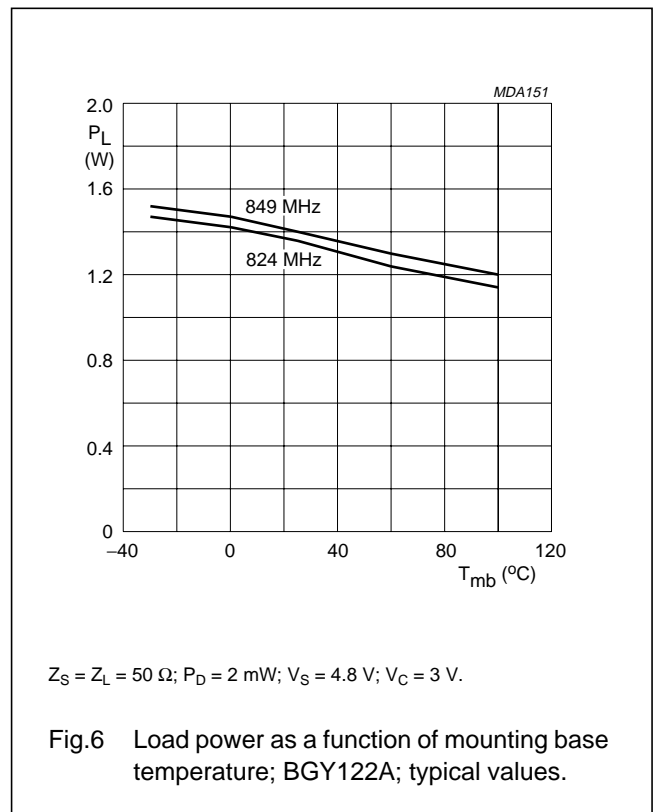
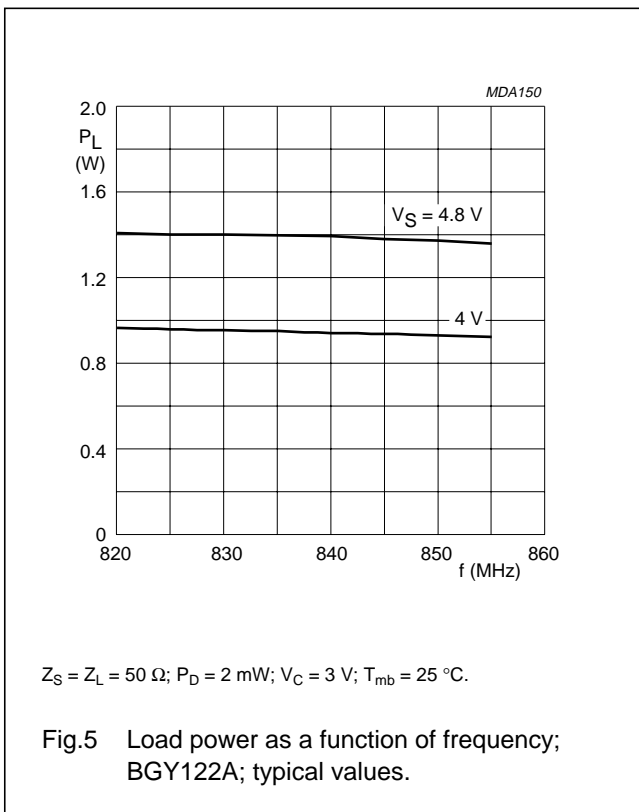
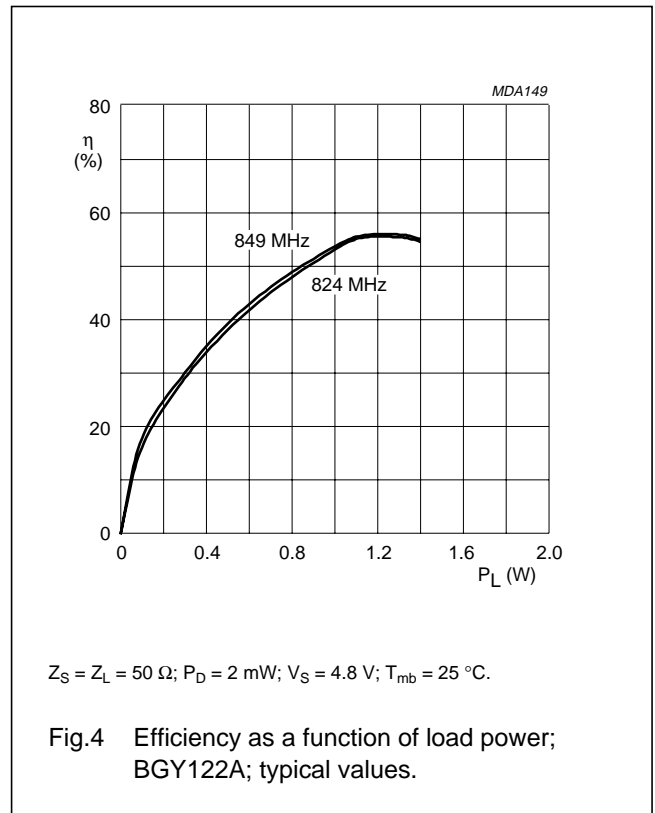
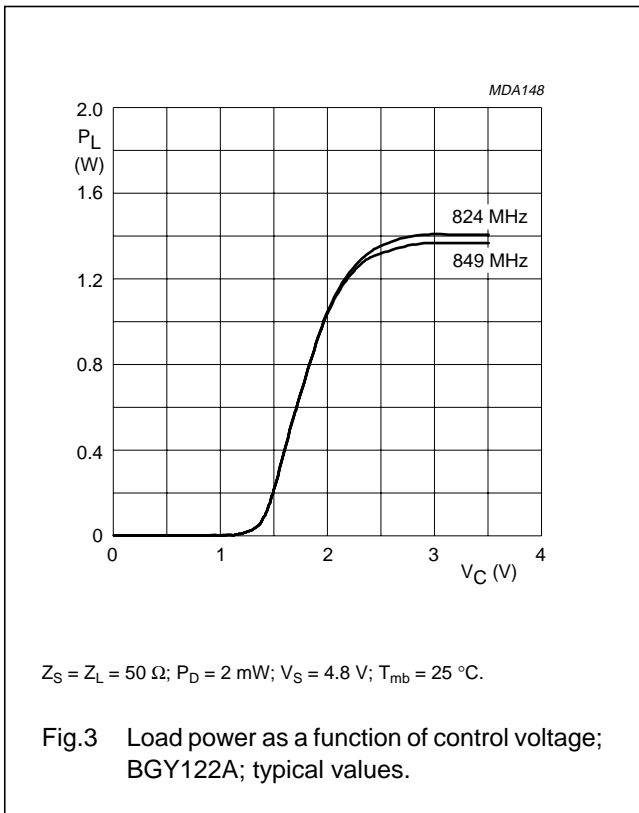
CHARACTERISTICS

$Z_S = Z_L = 50 \Omega$; $P_D = 2 \text{ mW}$; $V_S = 4.8 \text{ V}$; $V_C \leq 3 \text{ V}$; $T_{mb} = 25 \text{ }^\circ\text{C}$; unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT | |
|----------------|-------------------------|---|----------------|------|-------|---------------|--|
| f | frequency | | | | | | |
| | BGY122A | | 824 | – | 849 | MHz | |
| | BGY122B | | 872 | – | 905 | MHz | |
| I_Q | total quiescent current | $V_C = 0$; $P_D < -60 \text{ dBm}$ | – | – | 100 | μA | |
| I_C | control current | adjust V_C for $P_L = 1.2 \text{ W}$ | – | – | 500 | μA | |
| P_L | load power | $V_C = 3 \text{ V}$ | 1.2 | – | – | W | |
| G_p | power gain | adjust V_C for $P_L = 1.2 \text{ W}$ | 27.8 | – | – | dB | |
| η | efficiency | adjust V_C for $P_L = 1.2 \text{ W}$ | 50 | 55 | – | % | |
| H_2 | second harmonic | adjust V_C for $P_L = 1.2 \text{ W}$ | – | – | –36 | dBc | |
| H_3 | third harmonic | adjust V_C for $P_L = 1.2 \text{ W}$ | – | – | –36 | dBc | |
| $V_{SWR_{in}}$ | input VSWR | adjust V_C for $P_L = 1.2 \text{ W}$ | – | – | 3 : 1 | | |
| | stability | $P_D = 0$ to +6 dBm; $V_S = 4$ to 6.5 V; $V_C = 0$ to 3 V; $P_L \leq 1.2 \text{ W}$; $V_{SWR} \leq 6 : 1$ through all phases | – | – | –60 | dBc | |
| | isolation | $V_C = 0$ | – | –40 | – | dBm | |
| P_n | noise power | adjust V_C for $P_L = 1.2 \text{ W}$; bandwidth = 30 kHz; $f_n = f_o + 45 \text{ MHz}$ | – | – | –90 | dBm | |
| | ruggedness | $V_S = 6.5 \text{ V}$; adjust V_C for $P_L = 1.4 \text{ W}$; $V_{SWR} \leq 10 : 1$ through all phases | no degradation | | | | |

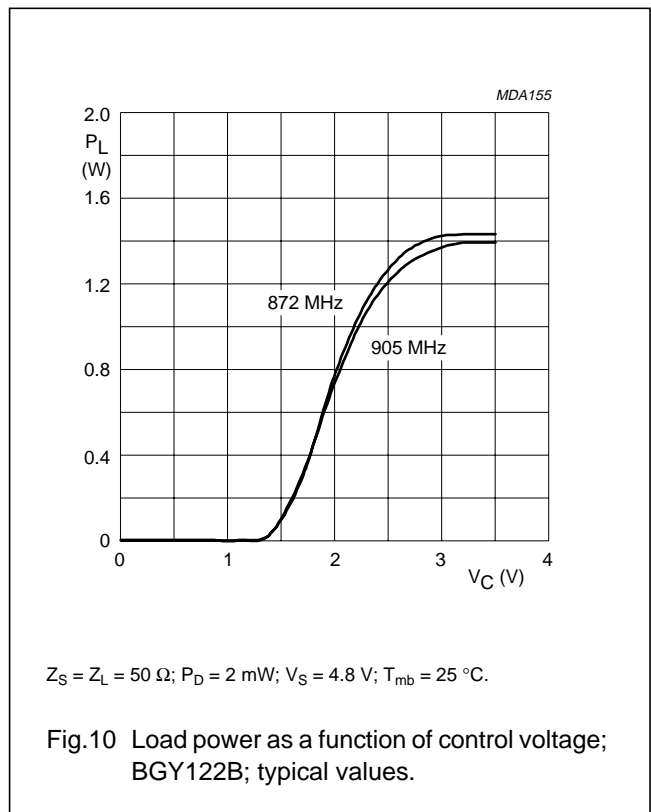
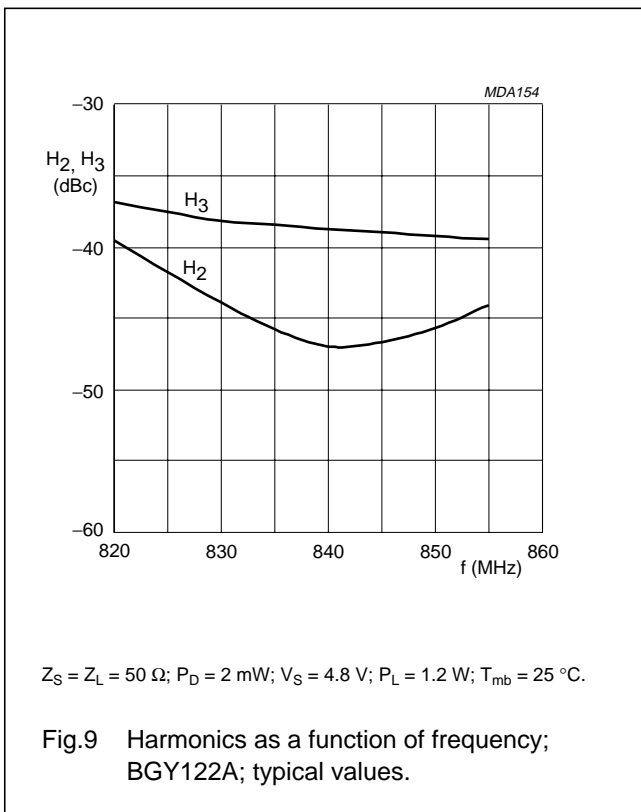
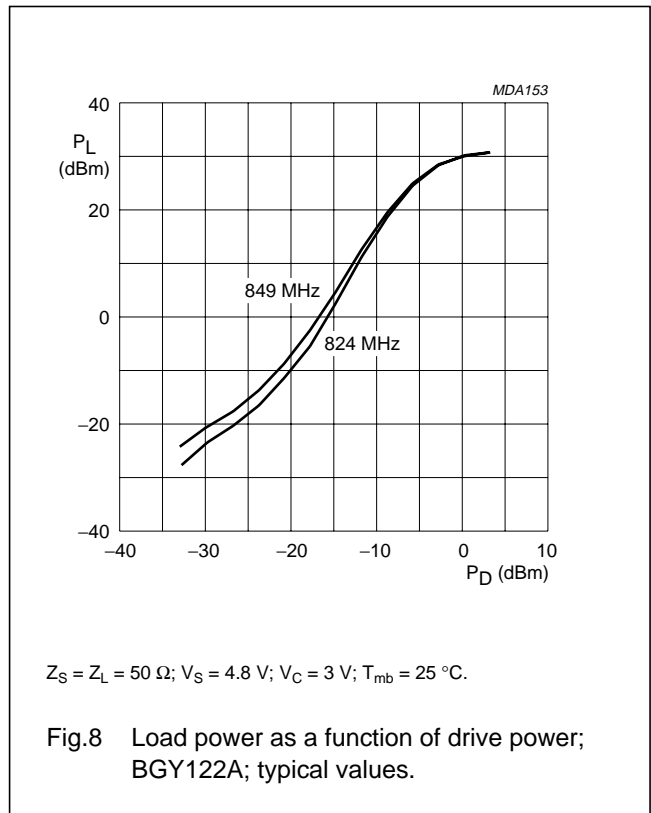
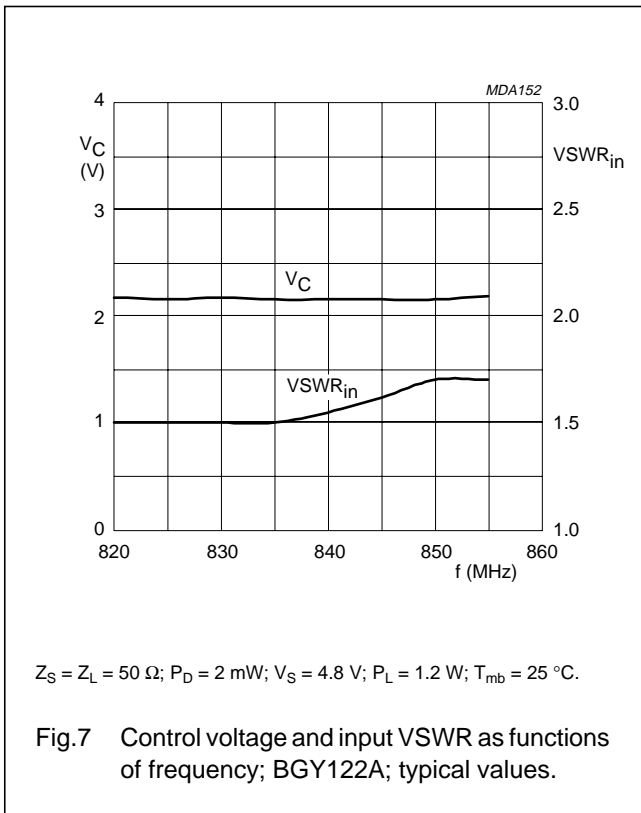
UHF amplifier modules

BGY122A; BGY122B



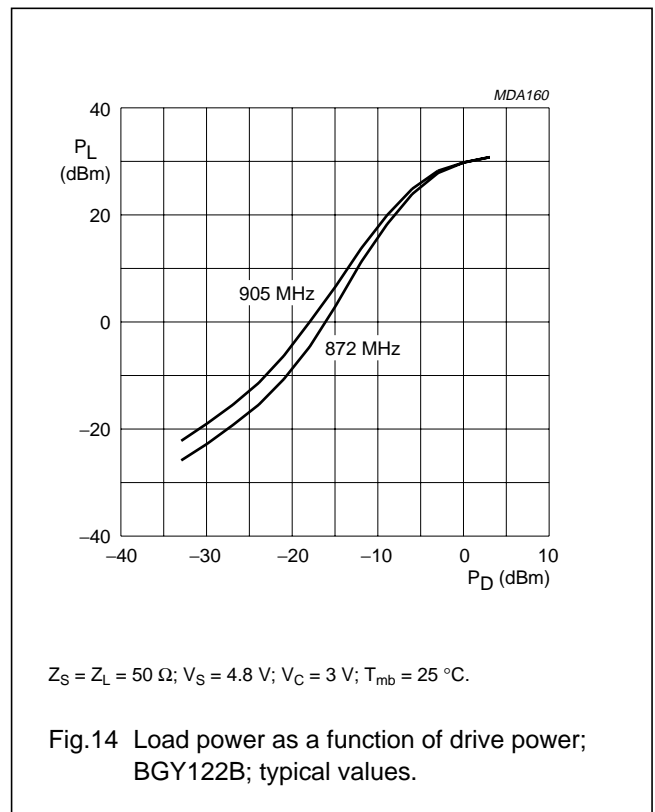
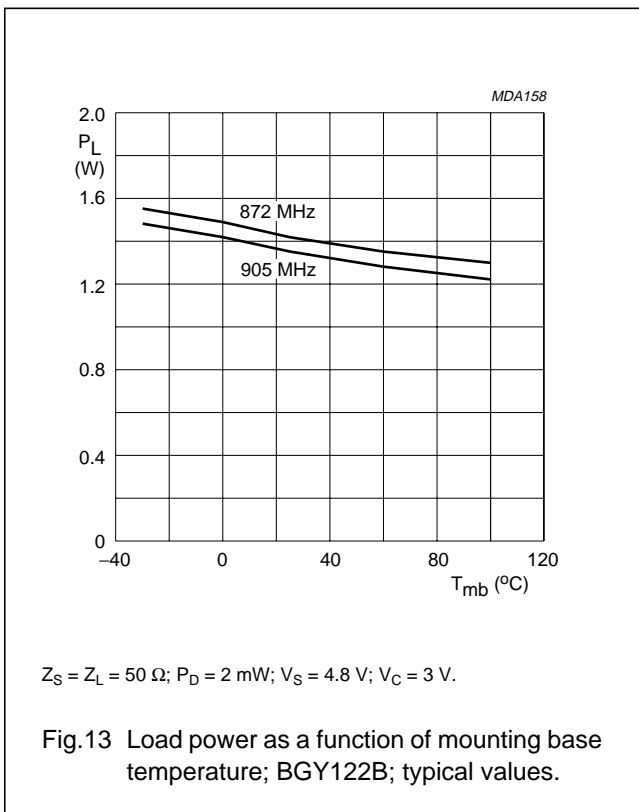
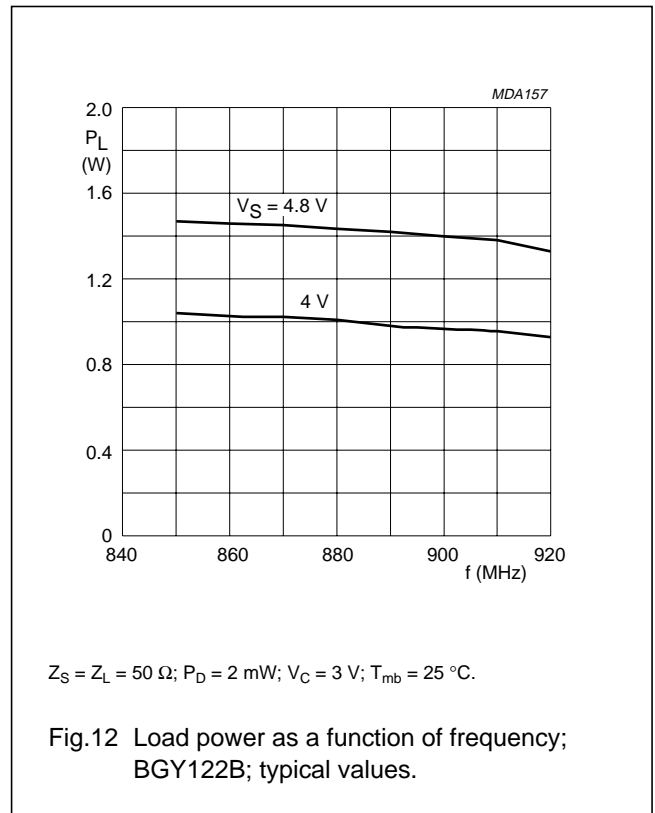
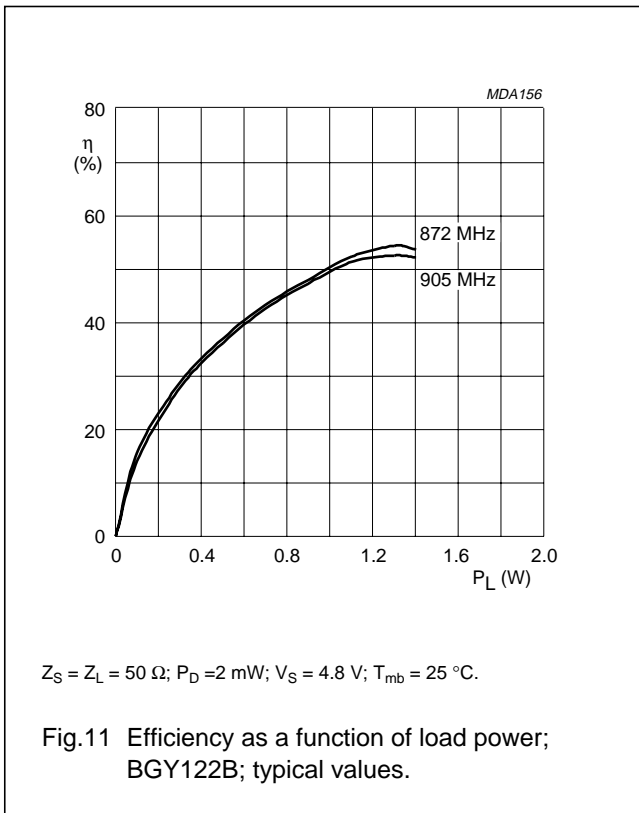
UHF amplifier modules

BGY122A; BGY122B



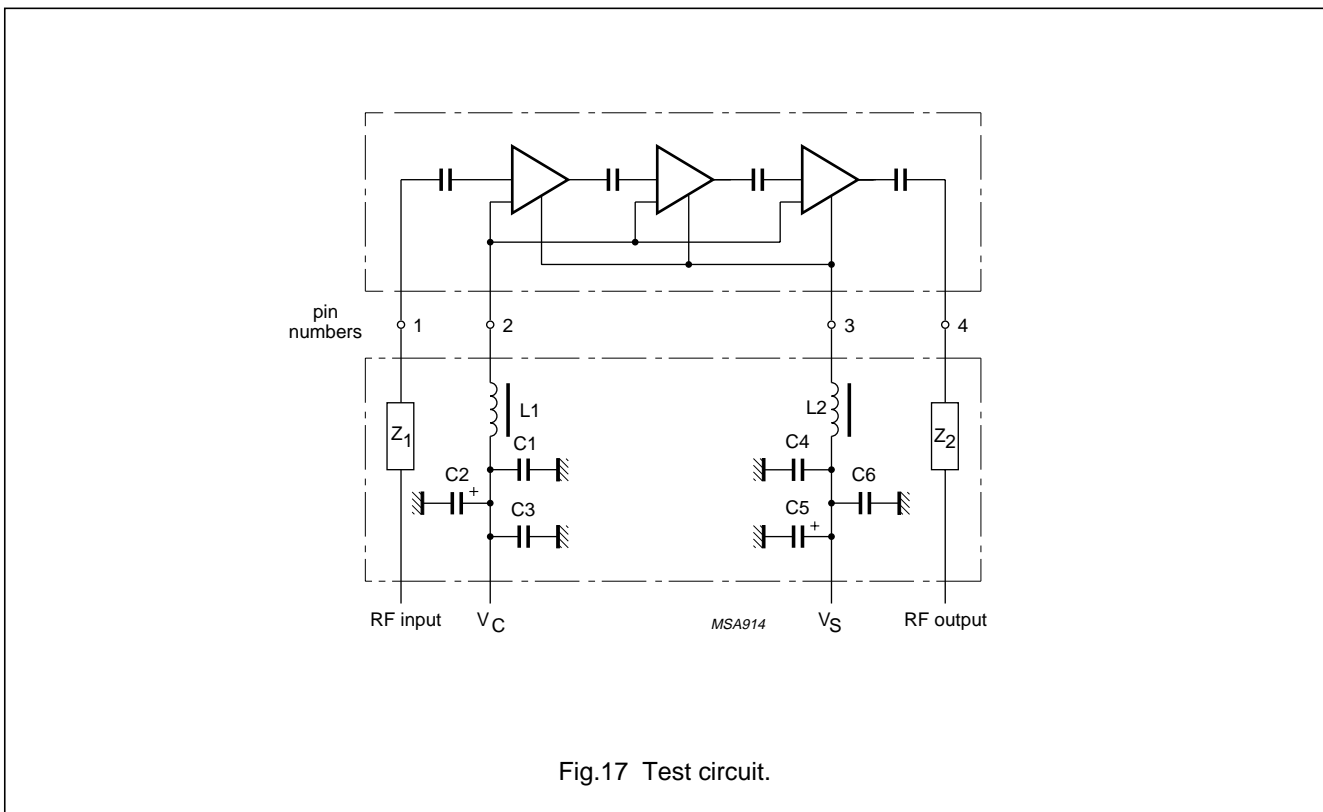
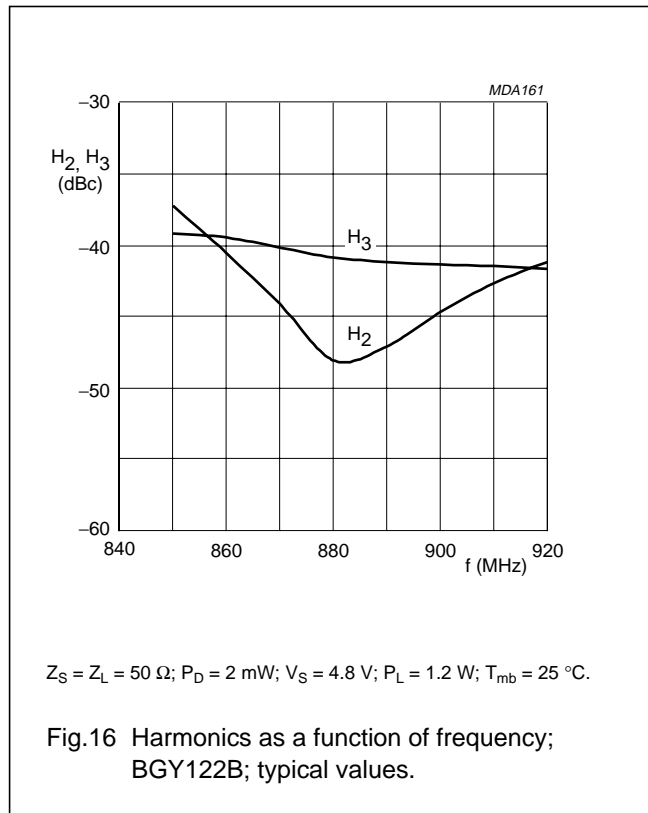
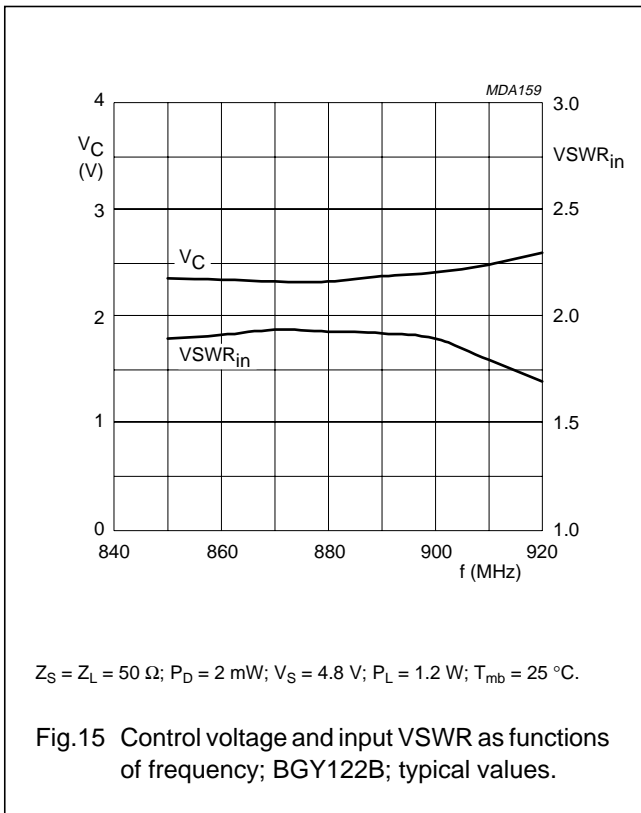
UHF amplifier modules

BGY122A; BGY122B



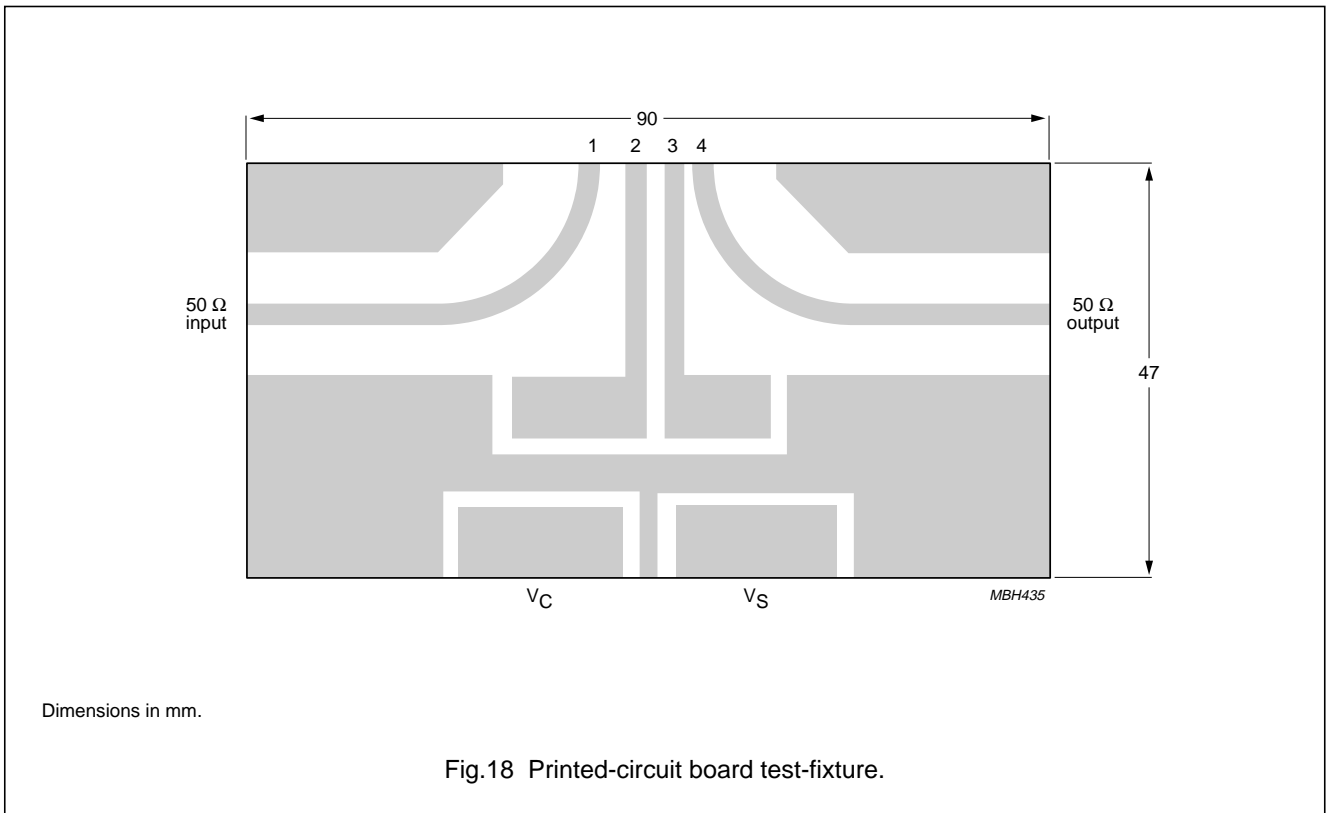
UHF amplifier modules

BGY122A; BGY122B



UHF amplifier modules

BGY122A; BGY122B



List of components (See Figs 17 and 18)

| COMPONENT | DESCRIPTION | VALUE | CATALOGUE NO. |
|---------------------------------|-----------------------------------|--------------|----------------|
| C1, C4 | multilayer ceramic chip capacitor | 100 nF | 2222 852 47104 |
| C2, C5 | tantalum capacitor | 2.2 μF; 35 V | – |
| C3, C6 | multilayer ceramic chip capacitor | 33 pF | 2222 851 13339 |
| L1, L2 | Grade 4S2 Ferroxcube chip bead | – | 4330 030 36300 |
| Z ₁ , Z ₂ | stripline; note 1 | 50 Ω | – |

Note

- The striplines are on a double copper-clad printed-circuit board with PTFE fibreglass dielectric ($\epsilon_r = 2.2$); thickness $\frac{1}{32}$ inch.

UHF amplifier modules

BGY122A; BGY122B

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 a maximum of 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.

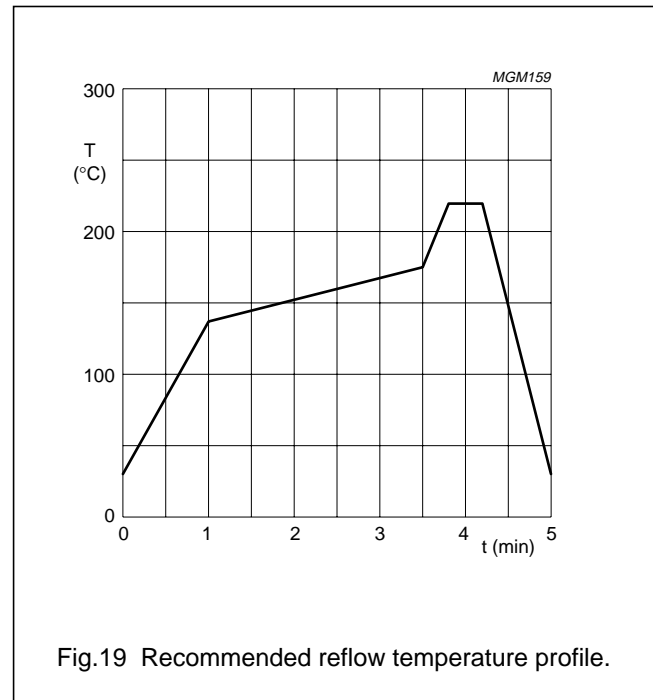
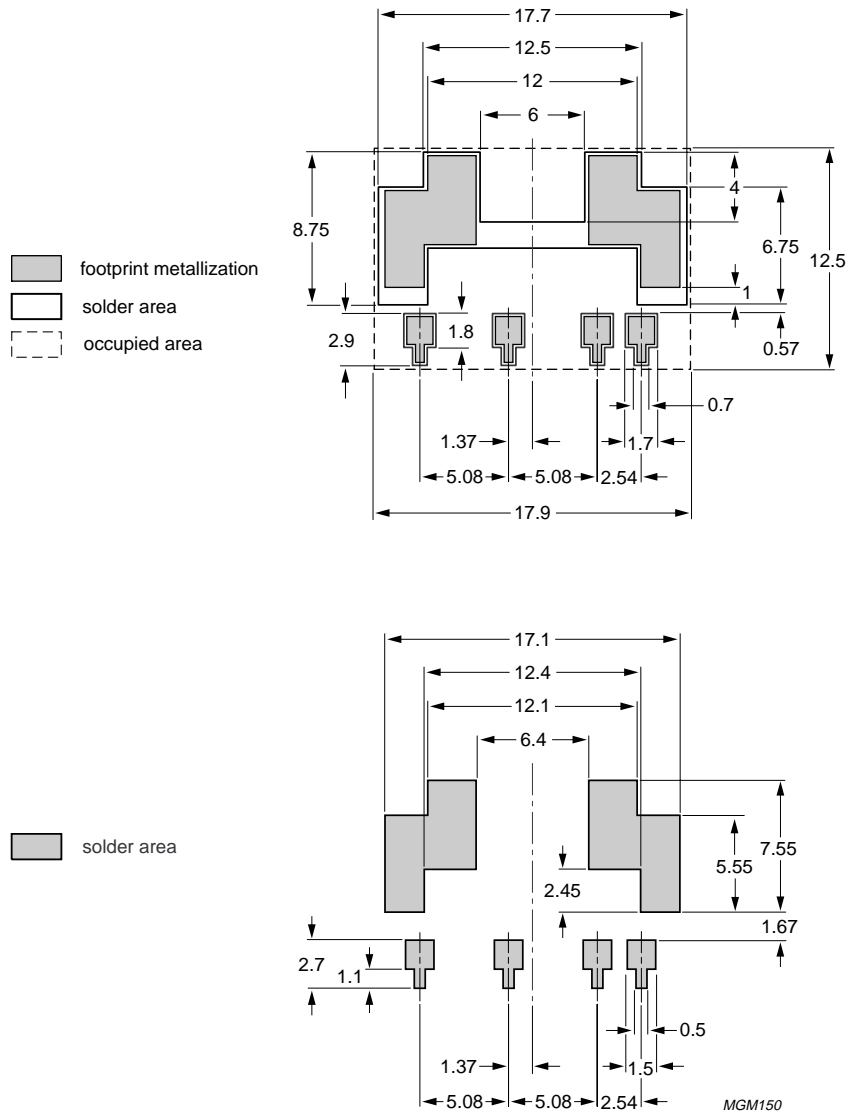


Fig.19 Recommended reflow temperature profile.

UHF amplifier modules

BGY122A; BGY122B



Dimensions in mm.

Fig.20 Footprint SOT388B.

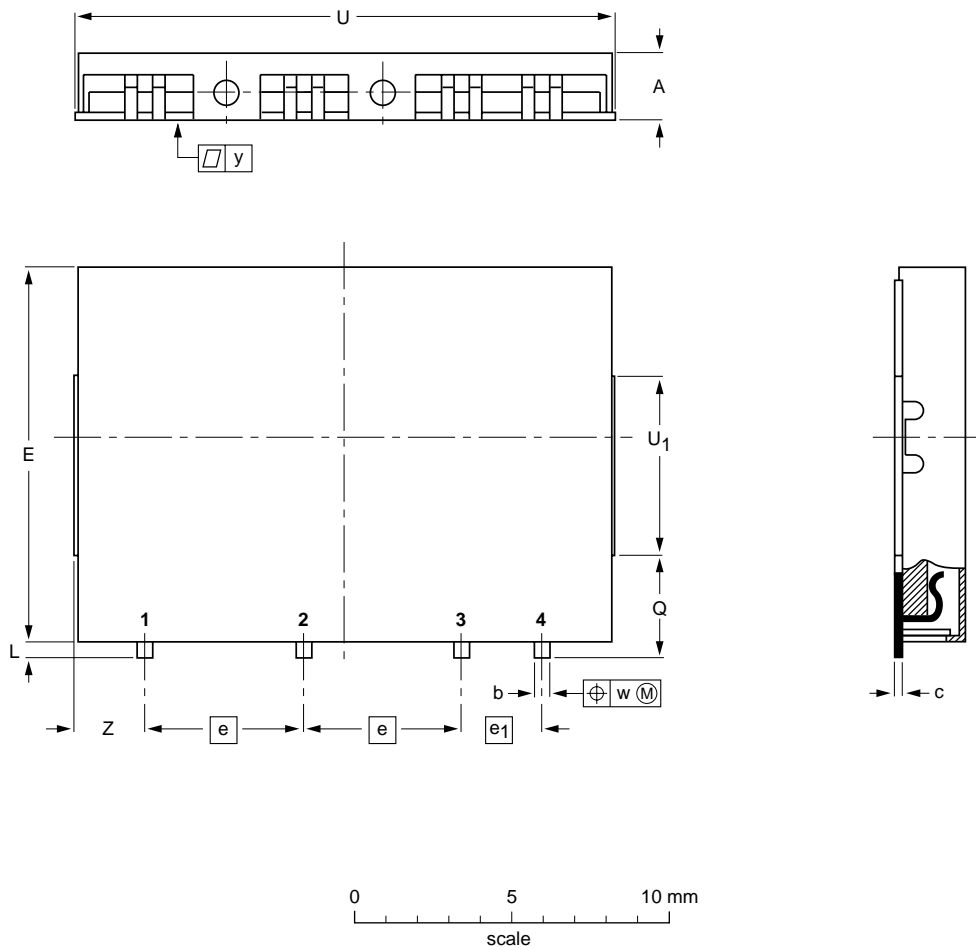
UHF amplifier modules

BGY122A; BGY122B

PACKAGE OUTLINE

Rectangular single-ended surface-mount package; metal cap; 4 in-line leads

SOT388B



DIMENSIONS (mm are the original dimensions)

| UNIT | A | b | c | e | e ₁ | E | L | Q | U | U ₁ | w | y | Z |
|------|------------|--------------|--------------|------|----------------|--------------|------------|------------|--------------|----------------|------|------|------------|
| mm | 2.2 1.8 | 0.56 0.46 | 0.30 0.20 | 5.08 | 2.54 | 12.2 11.8 | 0.7 0.3 | 3.4 3.0 | 17.3 16.9 | 6.0 5.6 | 0.25 | 0.15 | 2.3 1.9 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|------|--|---------------------|------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT388B | | | | | | 97-11-19 |

UHF amplifier modules

BGY122A; BGY122B

DEFINITIONS

| | |
|---|---|
| Data sheet status | |
| 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. |
| Limiting values | |
| 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. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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UHF amplifier modules

BGY122A; BGY122B

NOTES

UHF amplifier modules

BGY122A; BGY122B

NOTES

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