

DATA SHEET

BGY118A; BGY118B; BGY118D UHF amplifier modules

Product specification
Supersedes data of April 1994
File under Discrete Semiconductors, SC09

1996 May 21

UHF amplifier modules

BGY118A; BGY118B; BGY118D

FEATURES

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

APPLICATIONS

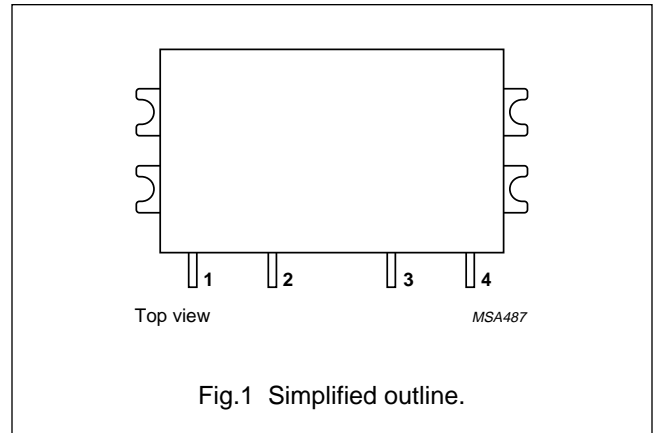
- Hand-held transmitting equipment operating in the 824 to 849 MHz, 872 to 905 MHz and 898 to 928 MHz frequency ranges respectively.

DESCRIPTION

The BGY118A, BGY118B and BGY118D are three-stage UHF amplifier modules in a SOT321A package. Each module consists of three NPN silicon planar transistor chips mounted together with matching and bias circuit components on a metallized ceramic substrate.

PINNING SOT321A

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



QUICK REFERENCE DATA

RF performance at $T_{mb} = 25\text{ }^\circ\text{C}$.

TYPE	MODE OF OPERATION	f (MHz)	V_S (V)	P_L (W)	G_P (dB)	η (%)	Z_S, Z_L (Ω)
BGY118A	CW	824 to 849	4.8	1.2	≥ 27.8	typ. 55	50
BGY118B	CW	872 to 905	4.8	1.2	≥ 27.8	typ. 55	50
BGY118D	CW	898 to 928	4.8	1.2	≥ 27.8	typ. 55	50

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LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_S	DC supply voltage	–	7	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

CHARACTERISTICS

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

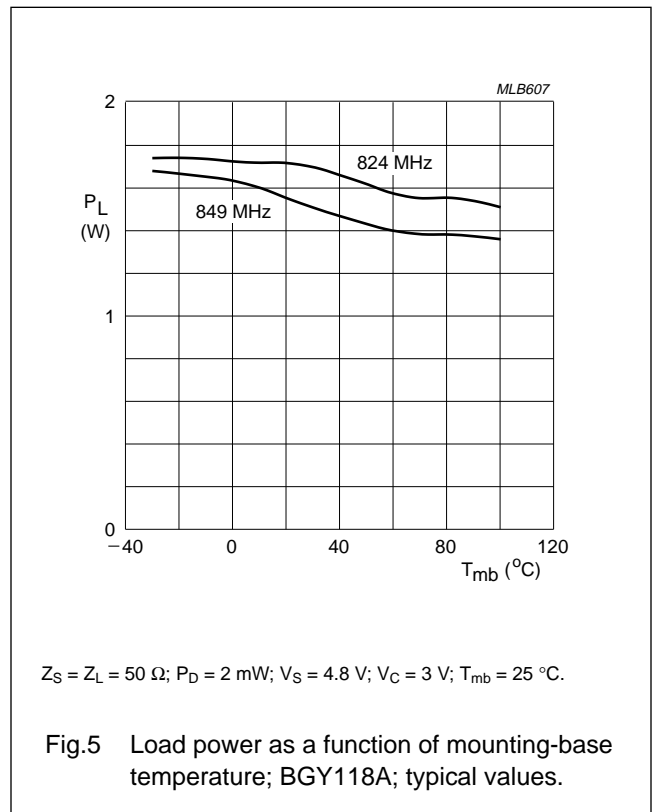
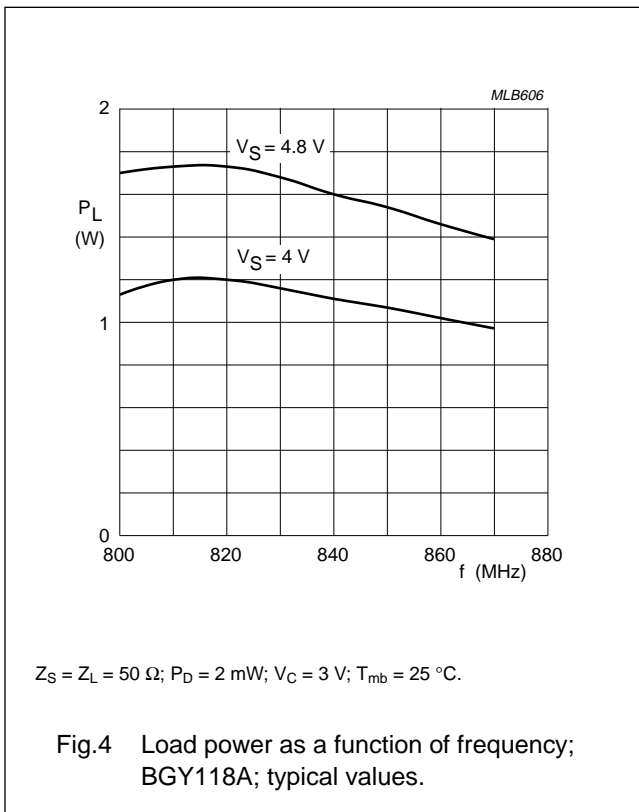
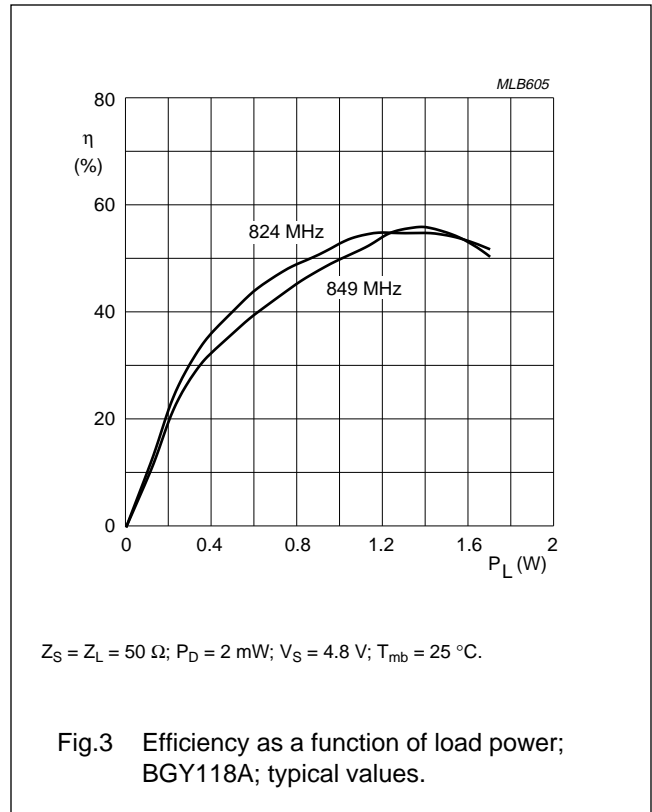
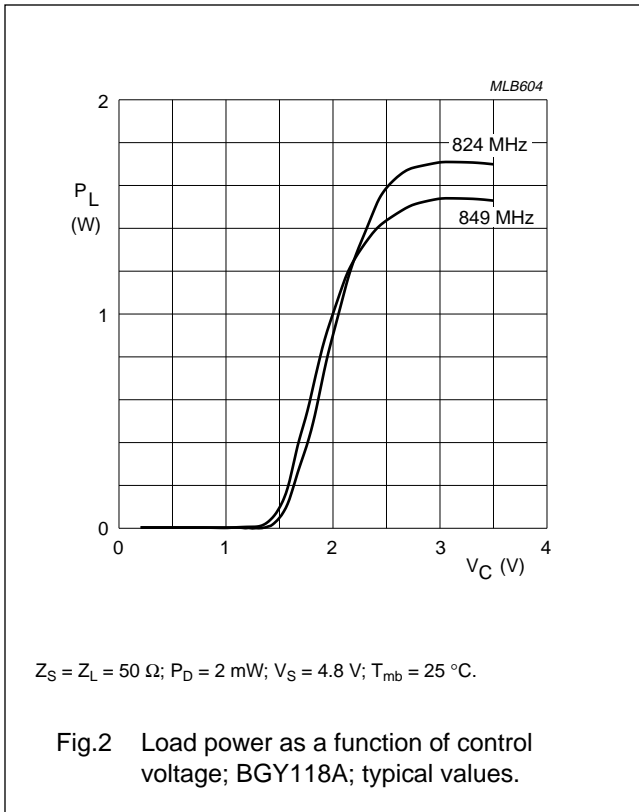
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency BGY118A BGY118B BGY118D		824 872 898	– – –	849 905 928	MHz MHz MHz
I_Q	total leakage current	$V_C = 0$; $P_D < -60 \text{ dBm}$	–	–	100	μA
I_C	control current	adjust V_C for $P_L = 1.2 \text{ W}$	–	–	500	μA
P_L	load power		1.2	–	–	W
G_P	power 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 $P = 1.2 \text{ W}$	–	–	–40	dBc
H_3	third harmonic	adjust V_C for $P_L = 1.2 \text{ W}$	–	–	–40	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; note 1	–	–	–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			

Note

- BGY118A, BGY118B: $f_n = f_o + 45 \text{ MHz}$.
BGY118D: $f_n = f_o - 55 \text{ MHz}$.

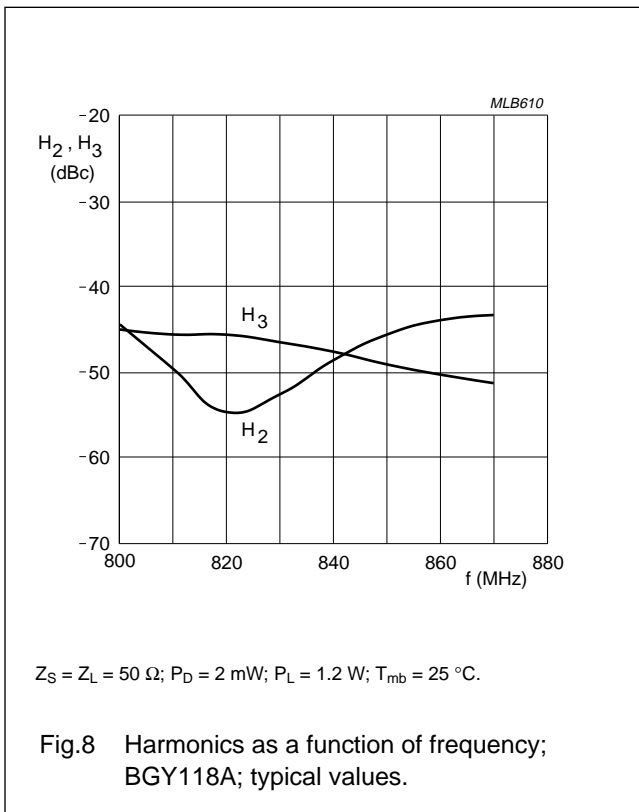
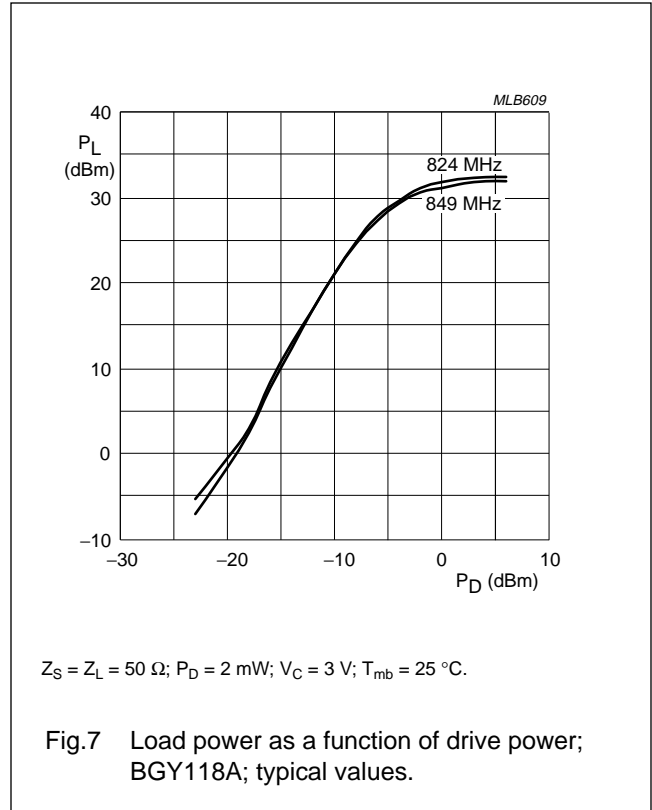
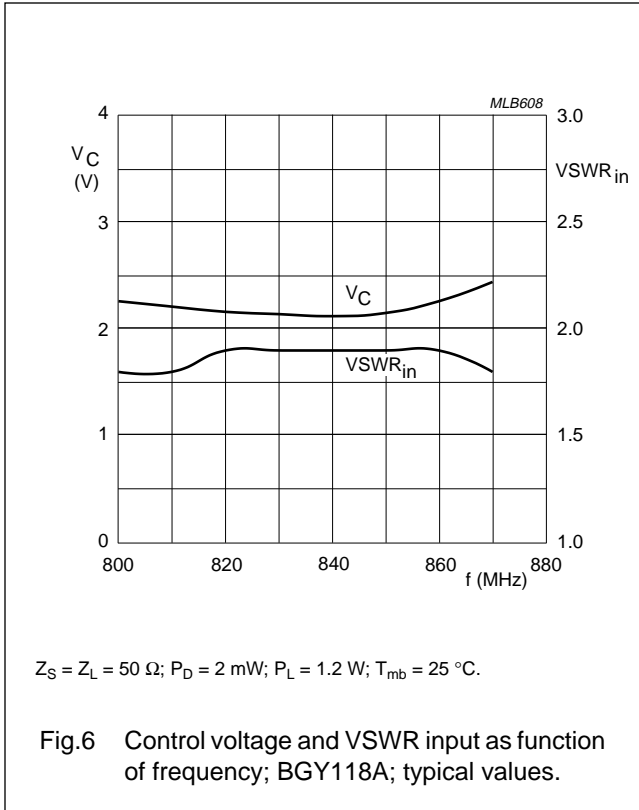
UHF amplifier modules

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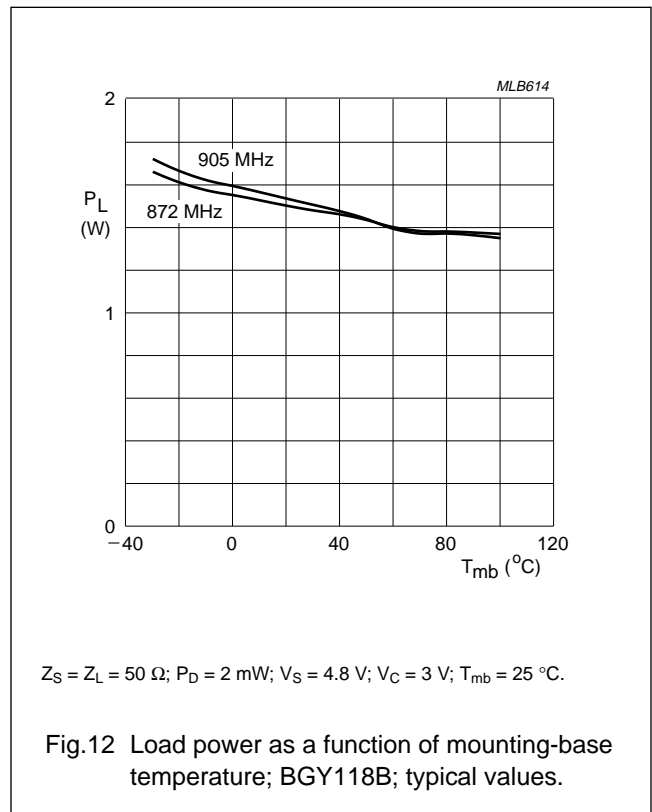
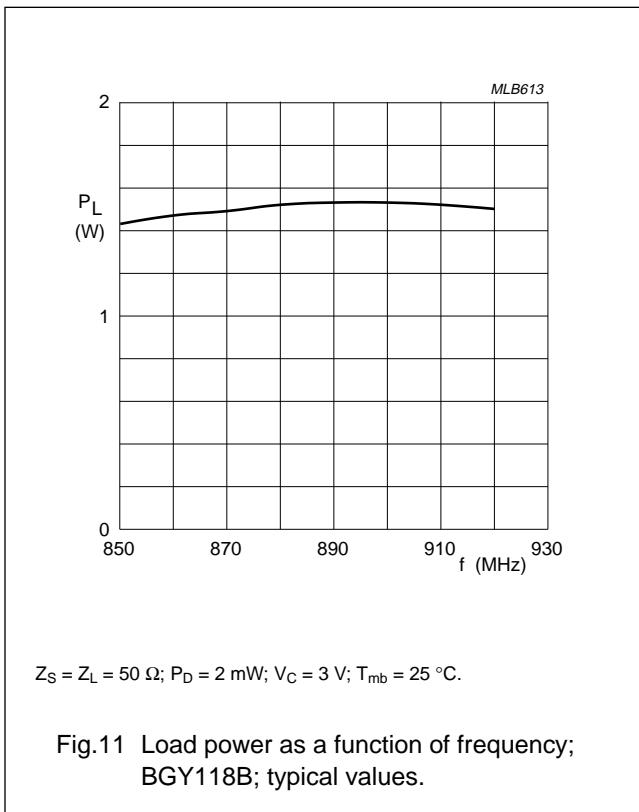
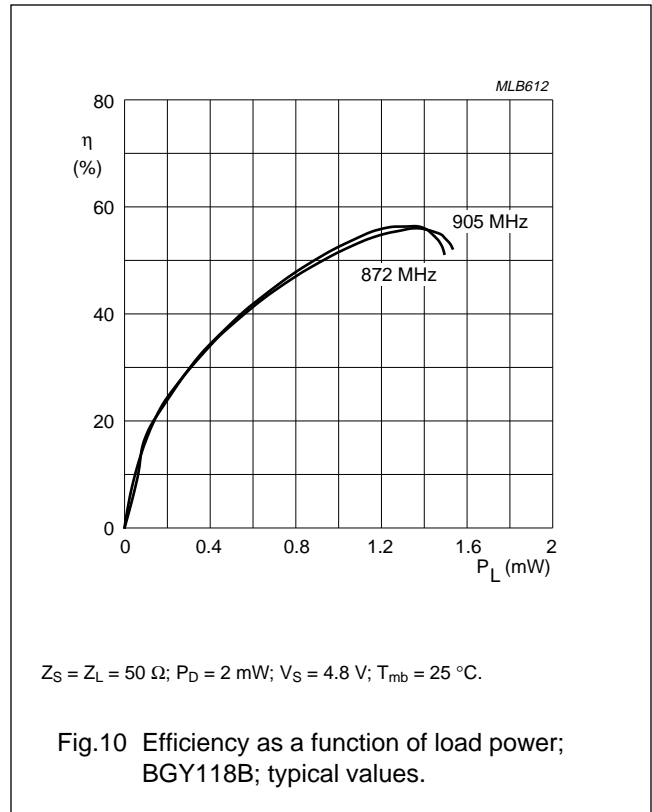
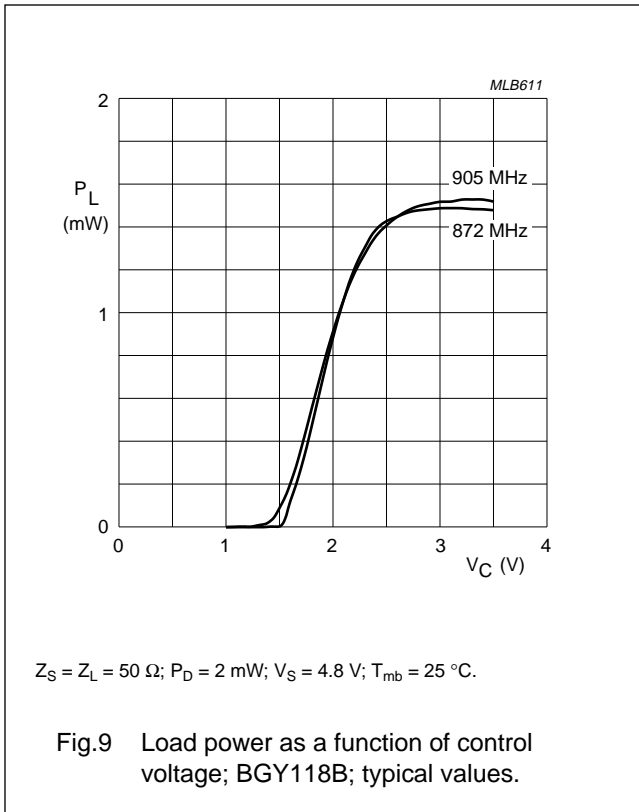
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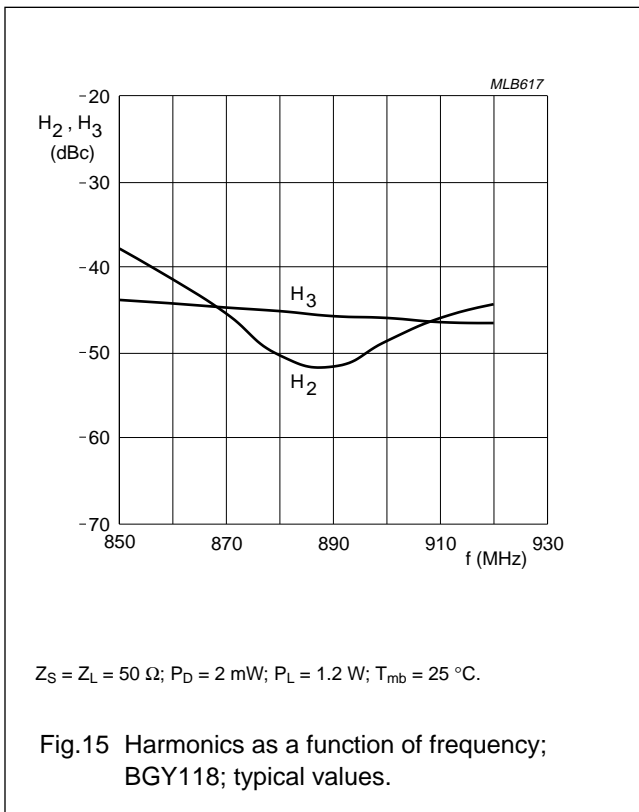
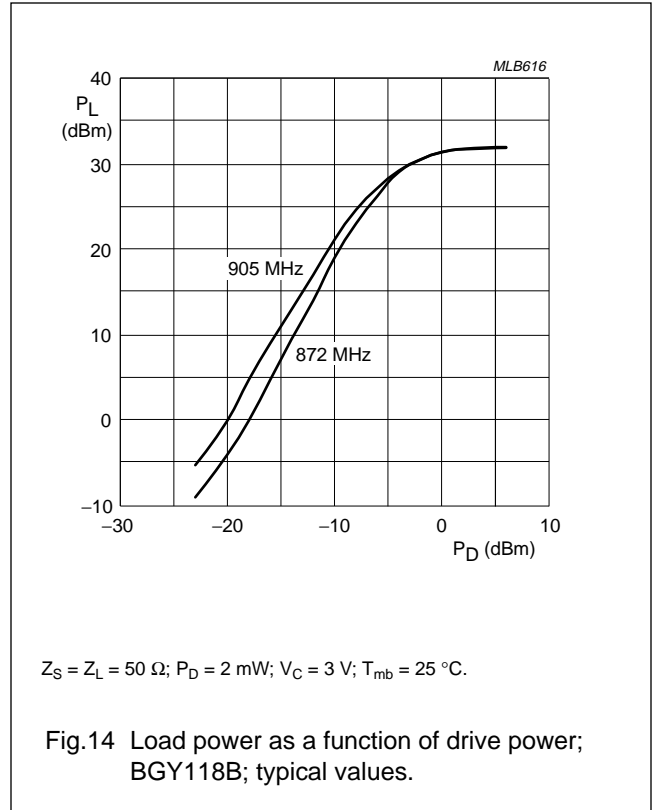
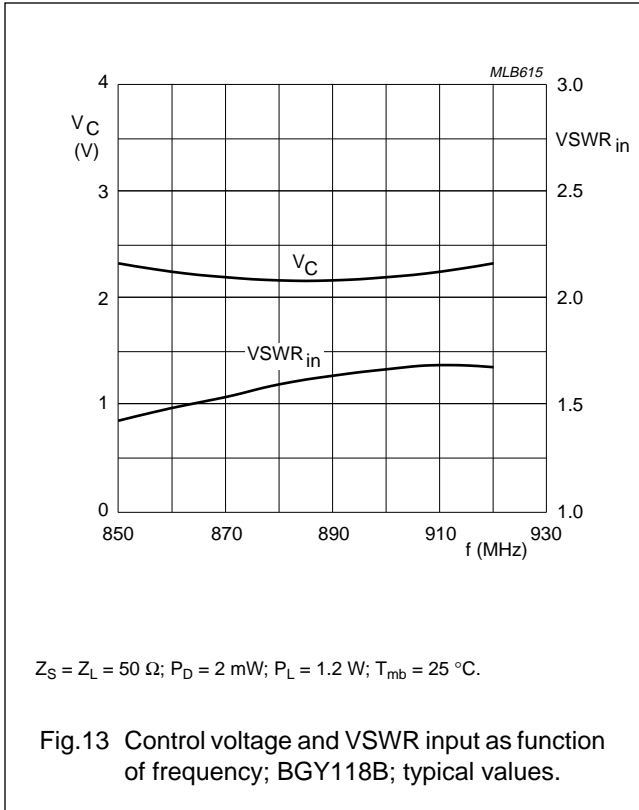
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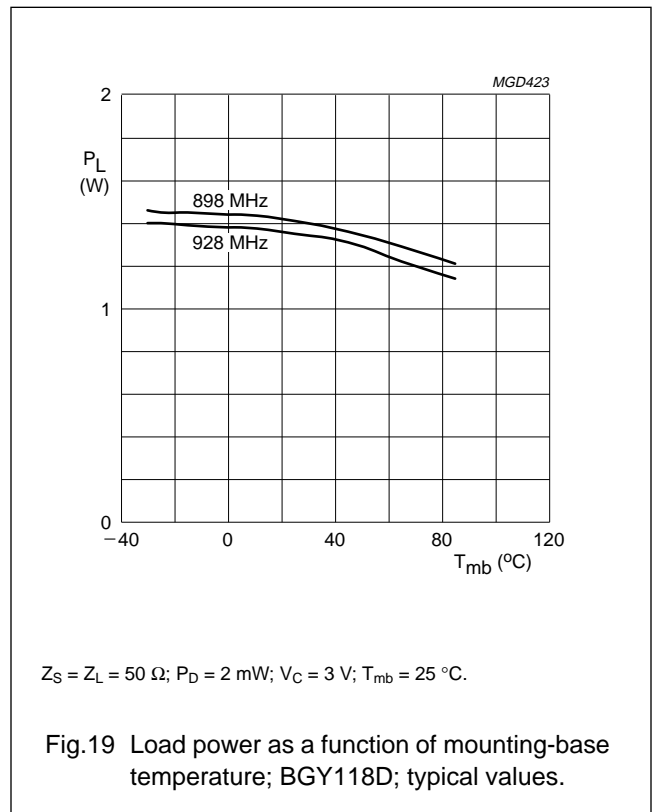
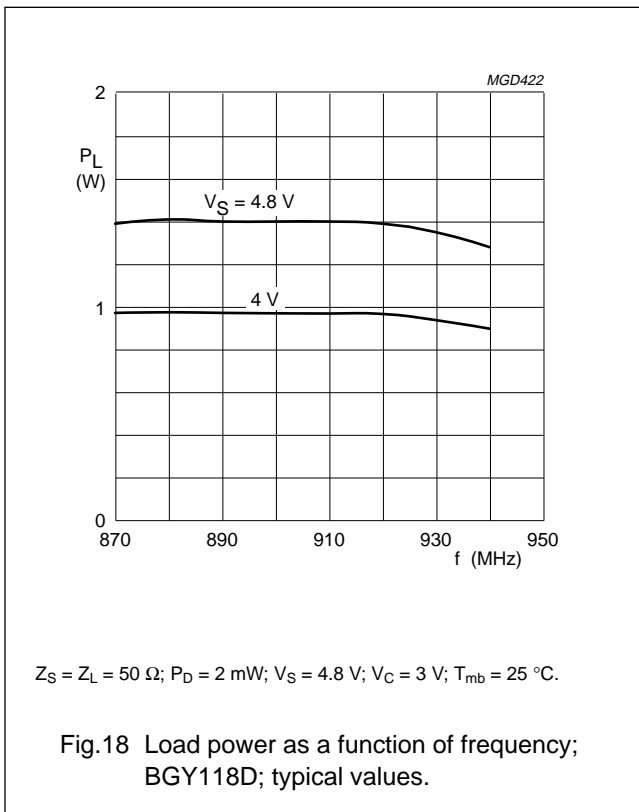
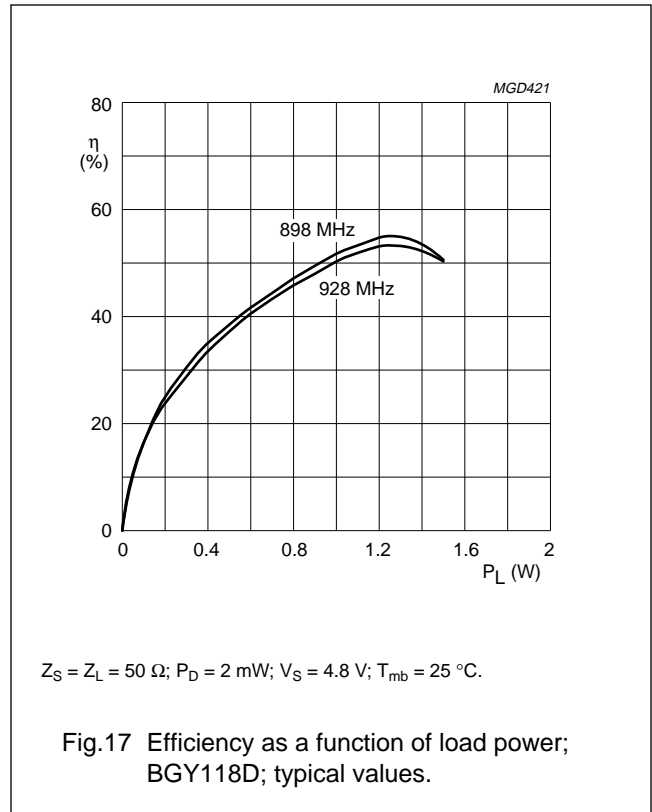
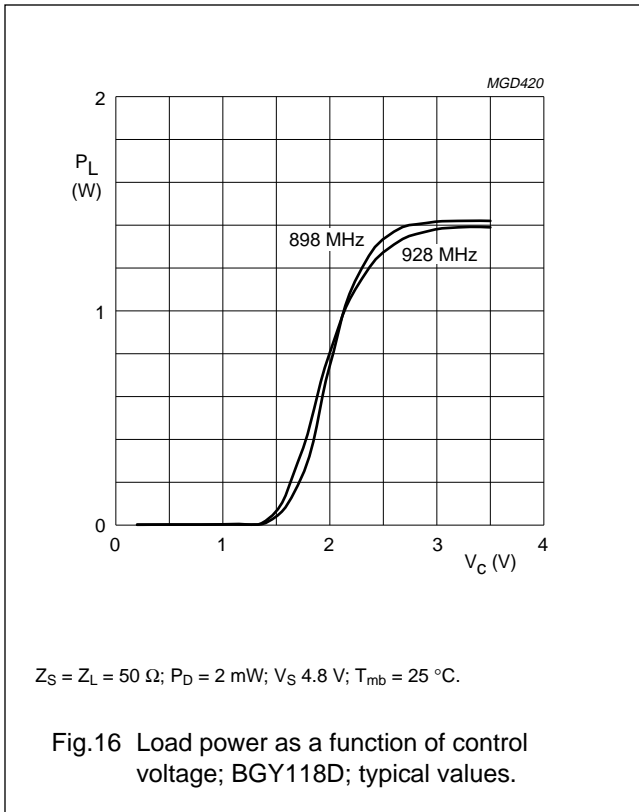
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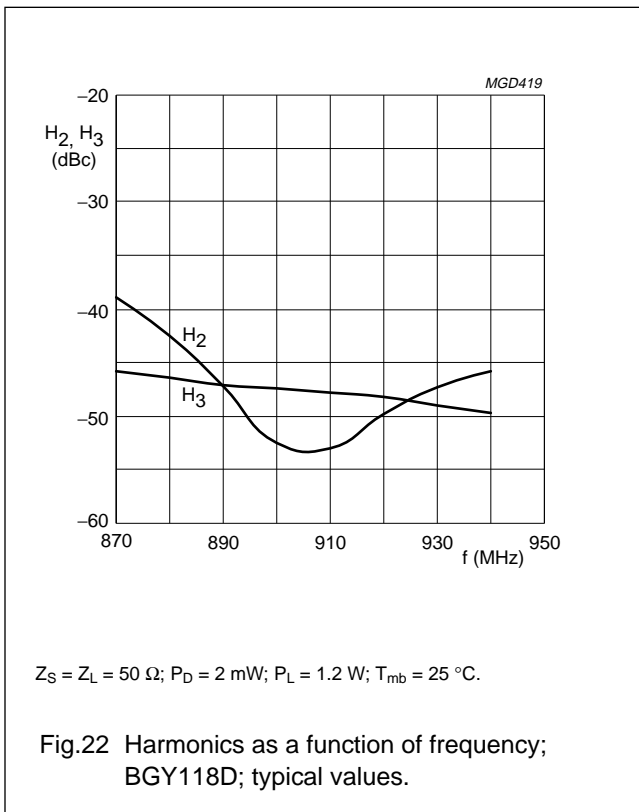
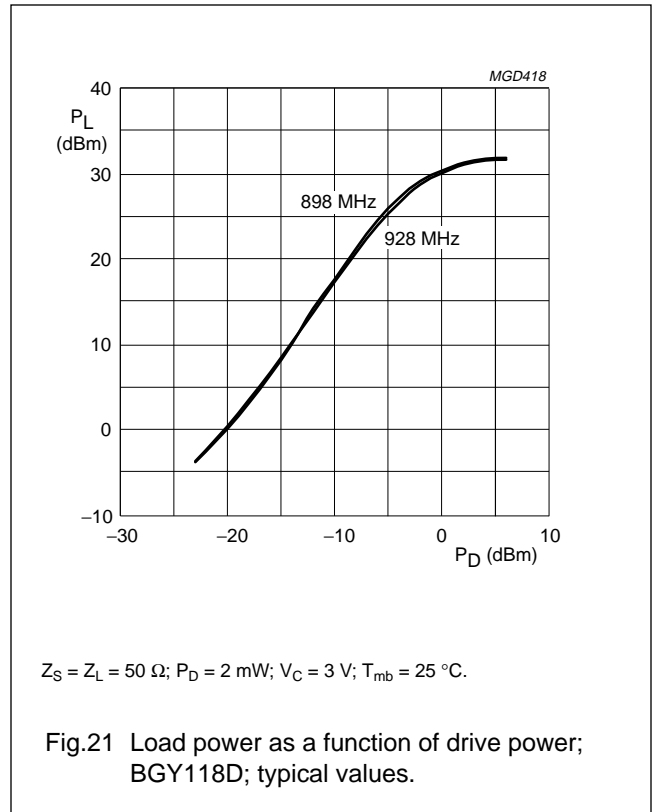
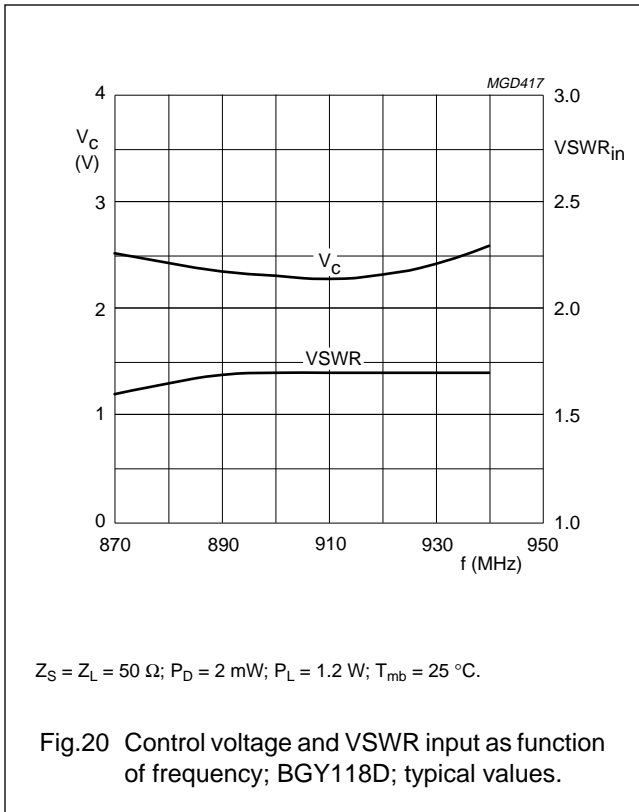
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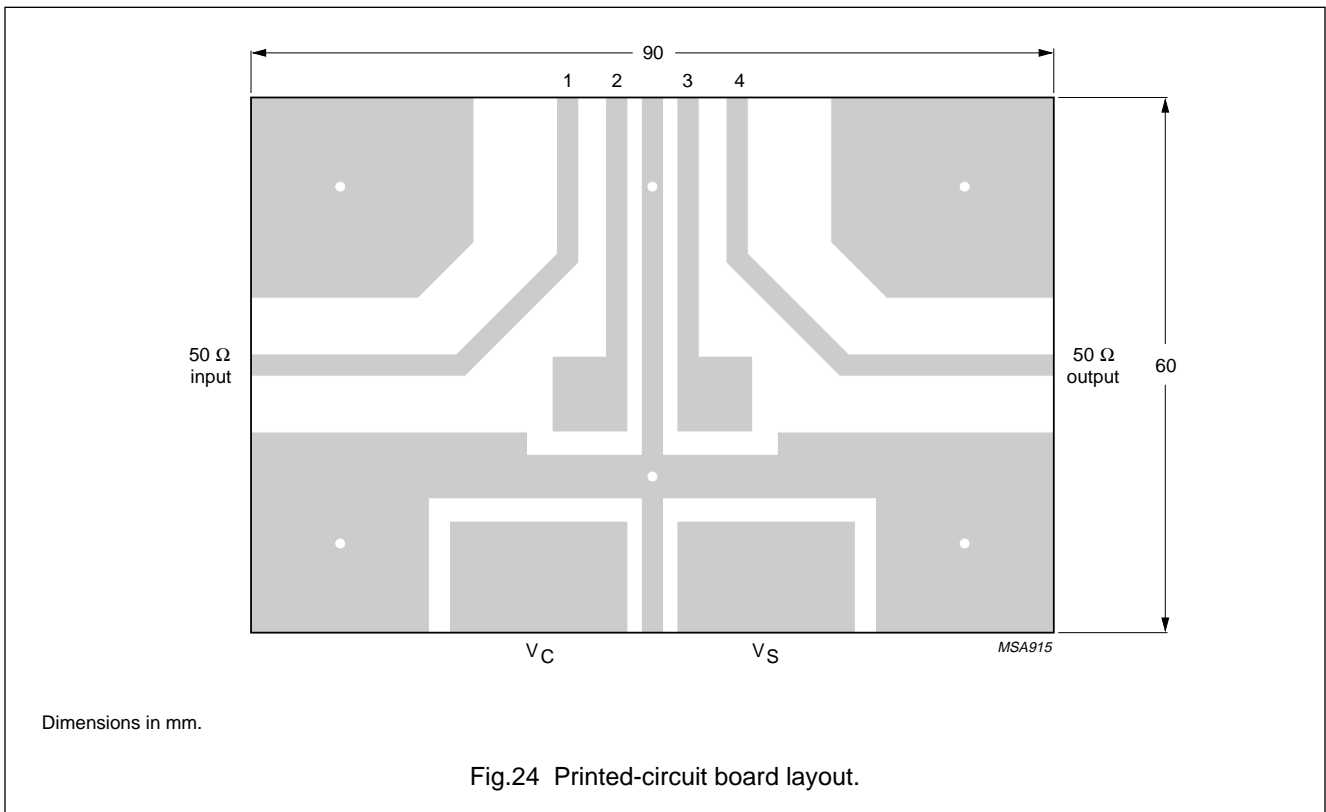
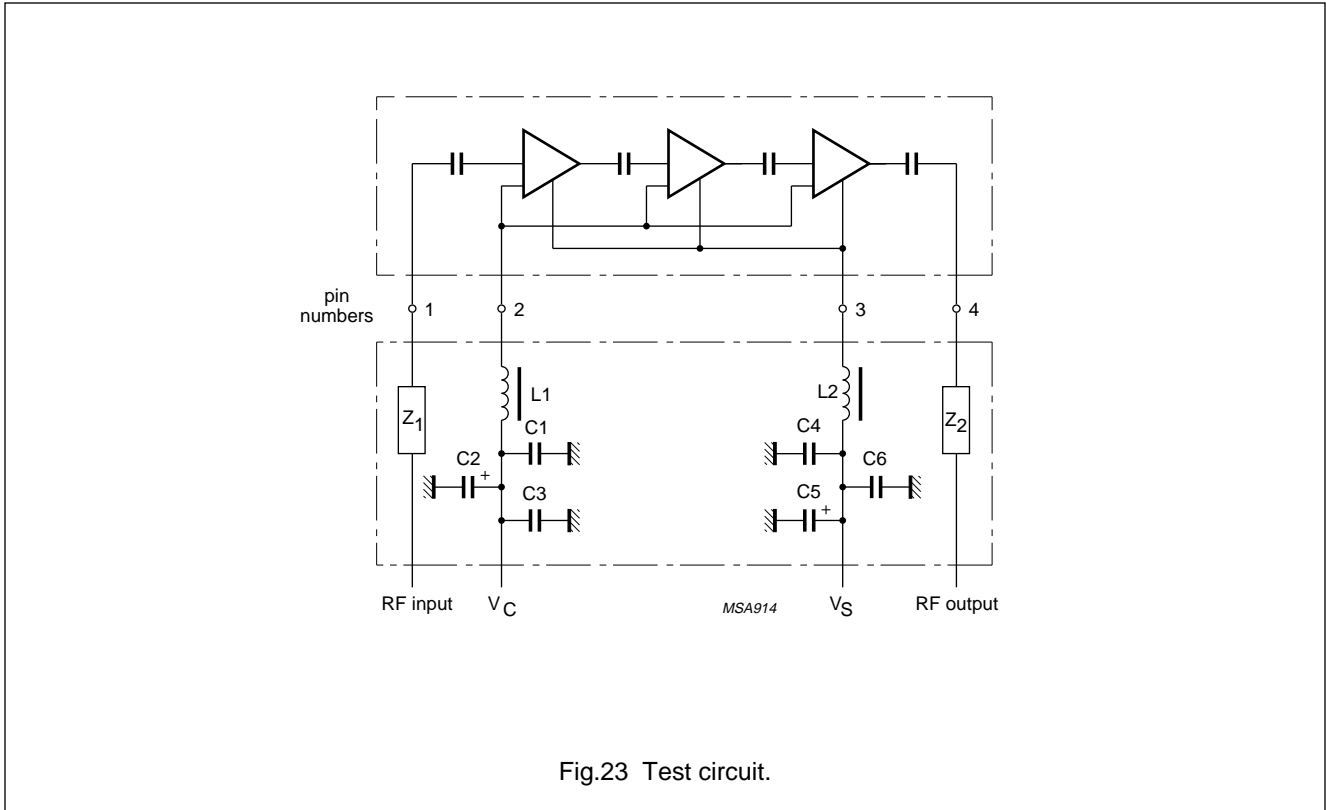
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List of components (See Fig.23)

COMPONENT	DESCRIPTION	VALUE	CATALOGUE NO.
C1, C4	multilayer ceramic chip capacitor	100 nF	2222 852 47104
C2, C5	tantalum capacitor	2.2 μ F; 35 V	
C3, C6	multilayer ceramic chip capacitor	33 pF	2222 851 13339
L1, L2	Ferroxcube coil	5 μ H	3122 108 20153
Z ₁ , Z ₂	stripline; note 1	50 Ω	

Note

1. The striplines are on a double copper-clad PCB with PTFE fibre-glass dielectric ($\epsilon_r = 2.2$); thickness 1/32 inch.

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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.

Footprints for soldering should cover the module contact area +0.1 mm on all sides.

Soldering can be carried out using a conveyor oven, a hot air oven, an infrared oven or a combination of these ovens.

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 temperature profile and soldering time is indicated as follows (see Fig.25):

t = 350 s at 100 °C

t = 300 s at 125 °C

t = 200 s at 150 °C

t = 100 s at 175 °C

t = 50 s at 200 °C

t = 5 s at 250 °C (maximum temperature).

Cleaning

The following fluids may be used for cleaning:

- Alcohol
- Bio-Act (Terpene Hydrocarbon)
- Triclean B/S
- Acetone.

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

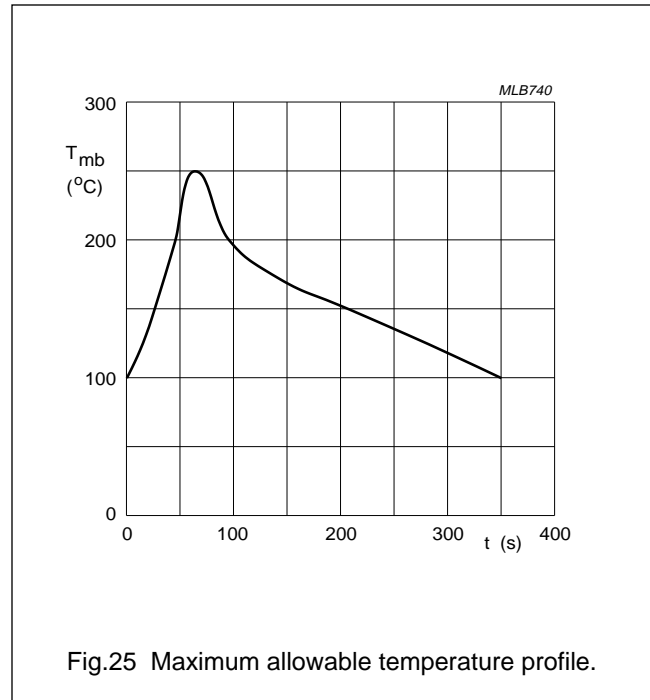
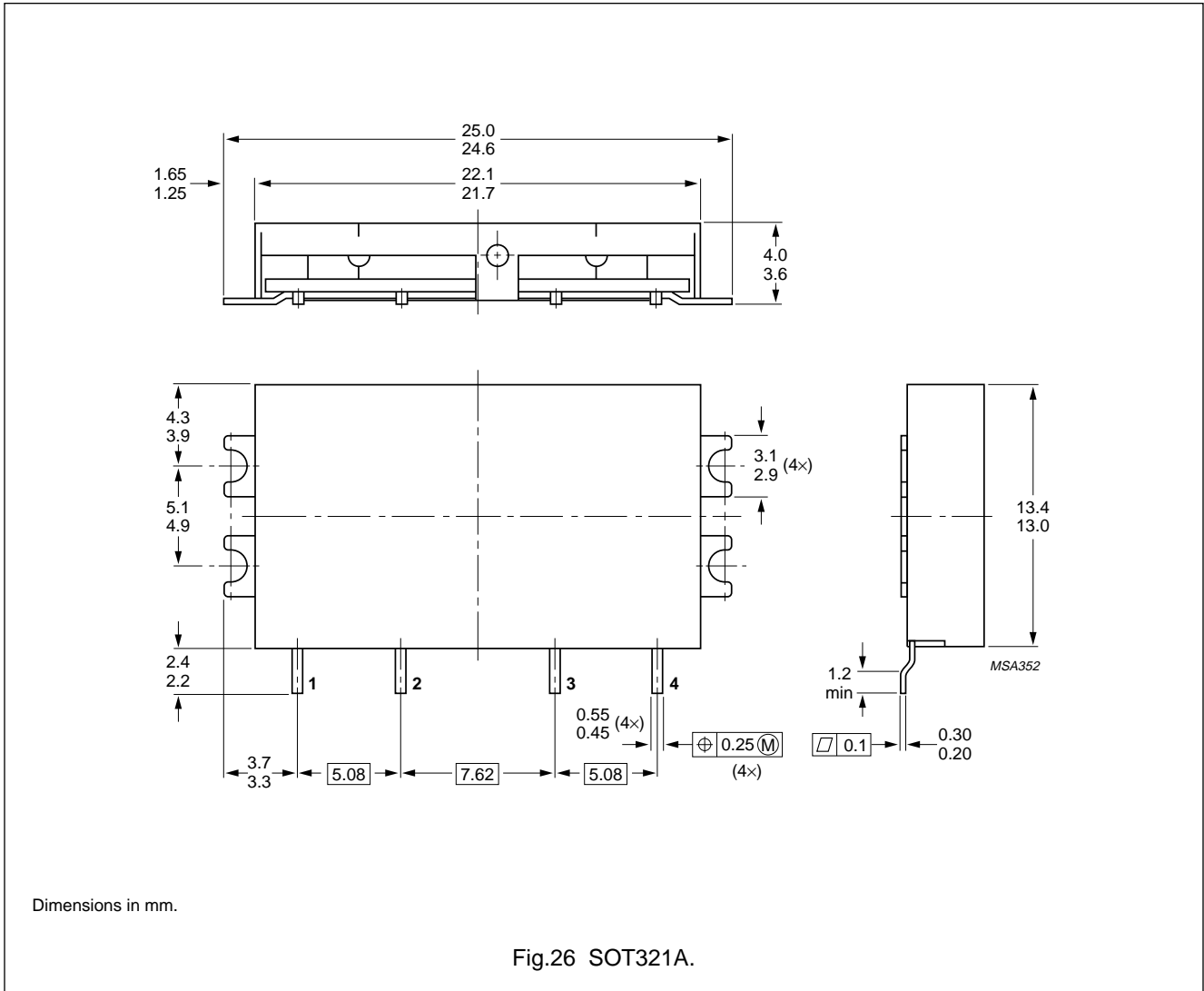


Fig.25 Maximum allowable temperature profile.

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PACKAGE OUTLINE



UHF amplifier modules

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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.	

LIFE SUPPORT APPLICATIONS

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