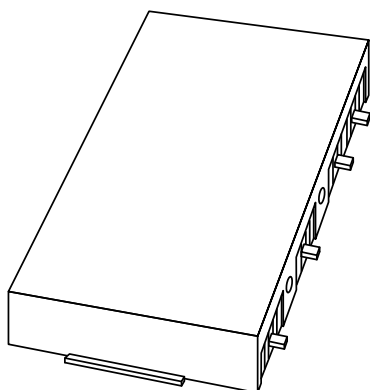


DATA SHEET



BGY240 UHF amplifier module

Preliminary specification
Supersedes data of 1997 Dec 02
File under Discrete Semiconductors, SC09

1998 Jan 15

UHF amplifier module

BGY240

FEATURES

- 3.5 V nominal supply voltage
- 3 W output power
- Easy output power control by DC voltage.

APPLICATIONS

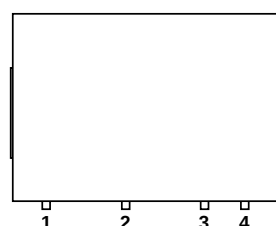
- Digital cellular radio systems with Time Division Multiple Access (TDMA) operation (GSM systems) in the 890 to 915 MHz frequency range.

DESCRIPTION

The BGY240 is a three-stage UHF amplifier module in a SOT388C package. The module consists of three NPN silicon planar transistor dies mounted together with matching and bias circuit components on a metallized ceramic substrate. The back of the SOT388C heatsink is plated with 5 μm PbSn.

PINNING - SOT388C

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



Top view

MBK197

Fig.1 Simplified outline

QUICK REFERENCE DATA

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

MODE OF OPERATION	f (MHz)	V_S (V)	V_C (V)	P_L (W)	G_p (dB)	η (%)	Z_S, Z_L (Ω)
Pulsed; $\delta = 1 : 8$	890 to 915	3.5	≤ 2.2	≥ 3 typ. 3.5	≥ 35	typ. 44	50

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_S	DC supply voltage	$V_C < 0.2\text{ V}$; no RF	–	6	V
		$V_C \geq 0.2\text{ V}$	–	5	V
V_C	DC control voltage		–	3	V
P_D	input drive power		–	5	mW
P_L	load power		–	3.8	W
T_{stg}	storage temperature		–40	+100	$^{\circ}\text{C}$
T_{mb}	operating mounting base temperature		–30	+100	$^{\circ}\text{C}$

CAUTION

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A and SNW-FQ-302B.

UHF amplifier module

BGY240

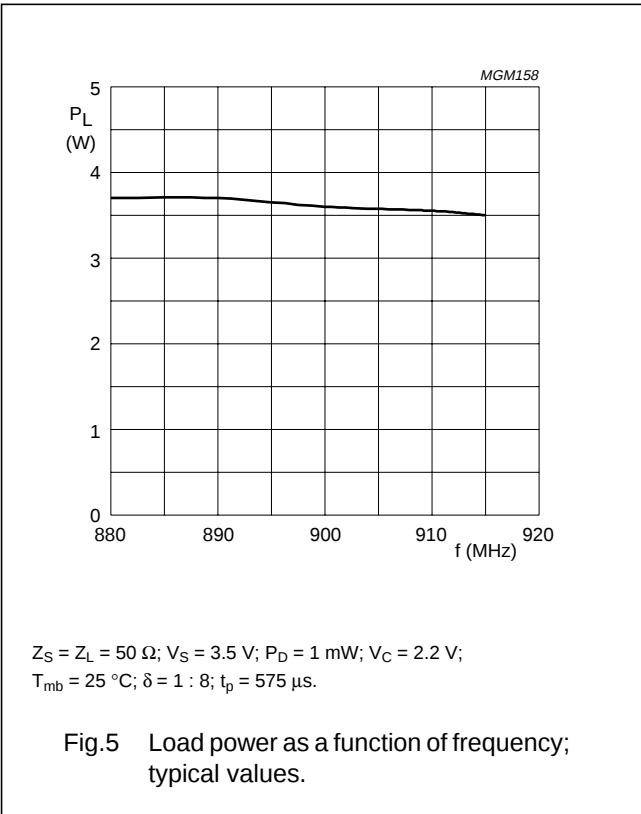
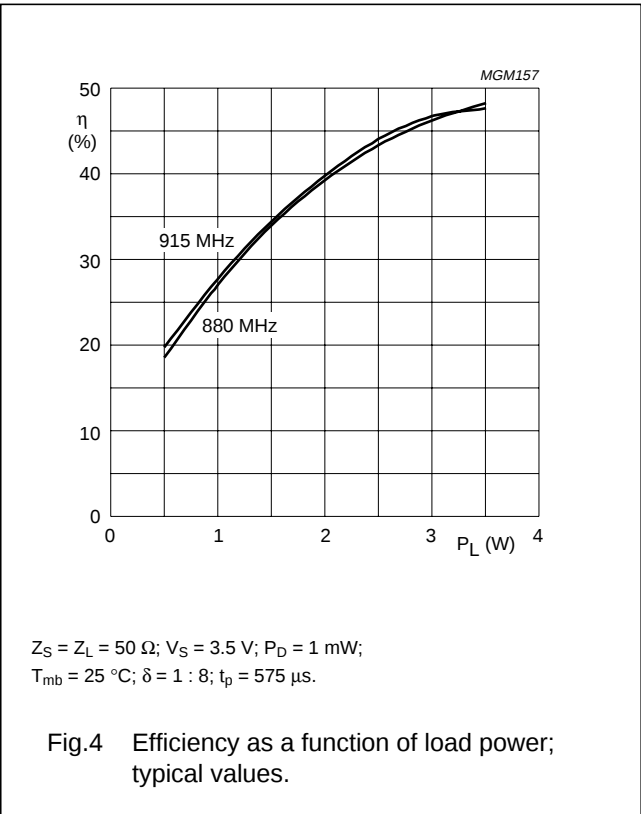
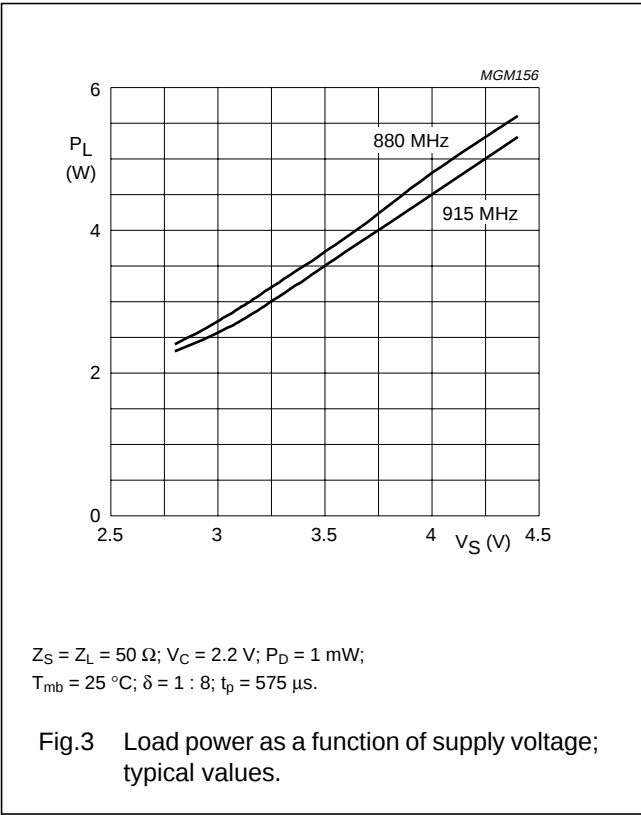
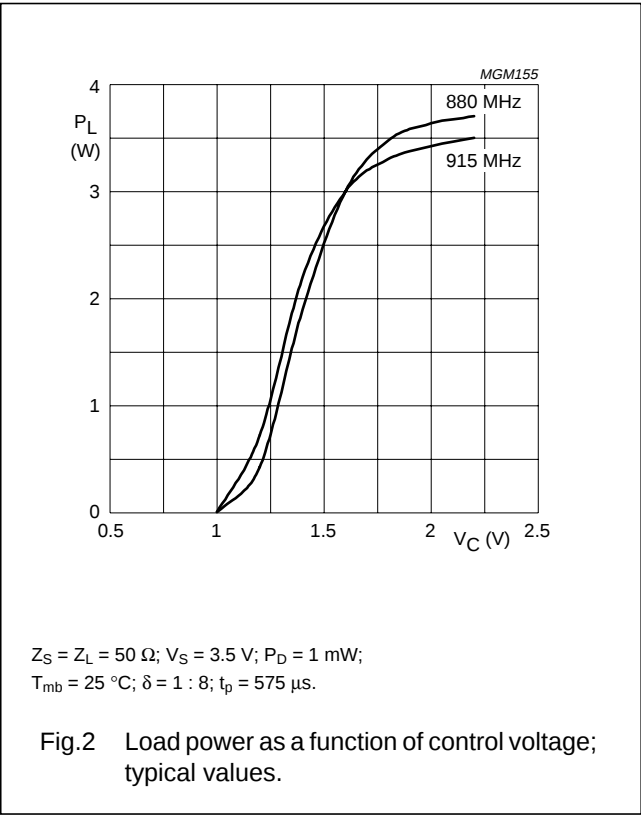
CHARACTERISTICS

$Z_S = Z_L = 50 \Omega$; $P_D = 1 \text{ mW}$; $V_S = 3.5 \text{ V}$; $V_C \leq 2.2 \text{ V}$; $f = 890 \text{ to } 915 \text{ MHz}$; $T_{mb} = 25 \text{ }^\circ\text{C}$; $\delta = 1 : 8$; $t_p = 575 \mu\text{s}$; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_Q	leakage current	$V_C = 0.2 \text{ V}$	–	–	10	μA
I_{CM}	peak control current	adjust V_C for $P_L = 2.5 \text{ W}$	–	–	3	mA
P_L	load power	$V_C = 2.2 \text{ V}$	3	3.5	–	W
G_p	power gain	adjust V_C for $P_L = 2.5 \text{ W}$	35	–	–	dB
η	efficiency	adjust V_C for $P_L = 2.5 \text{ W}$	–	44	–	%
H_2	second harmonic	adjust V_C for $P_L = 2.5 \text{ W}$	–	–	–35	dBc
H_3	third harmonic	adjust V_C for $P_L = 2.5 \text{ W}$	–	–	–33	dBc
$VSWR_{in}$	input VSWR	adjust V_C for $P_L = 2.5 \text{ W}$	–	1.8 : 1	3 : 1	
	stability	$V_S = 3 \text{ to } 5 \text{ V}$; $P_D = -2 \text{ to } 5 \text{ dBm}$; $V_C = 0 \text{ to } 2.2 \text{ V}$; $P_L \leq 3 \text{ W}$; $VSWR \leq 12 : 1$ through all phases	–	–	–60	dBc
	isolation	$V_C = 0.2 \text{ V}$	–	–45	–36	dBm
P_n	noise power	$P_L = 2.5 \text{ W}$; bandwidth = 30 kHz; 10 MHz above transmission band	–	–82	–80	dBm
	AM/PM conversion	$P_D = -2 \text{ to } 5 \text{ dBm}$; $P_L = 6 \text{ to } 34 \text{ dBm}$	–	–	3	deg/dB
	AM/AM conversion	P_D with 3% AM; $f = 100 \text{ kHz}$; $P_L = 6 \text{ to } 34 \text{ dBm}$	–	–	12	%
t_r	carrier rise time	$P_L = 6 \text{ to } 34 \text{ dBm}$; time to settle within –0.5 dB of final P_L	–	1.5	2	μs
t_f	carrier fall time	$P_L = 6 \text{ to } 34 \text{ dBm}$; time to settle within –0.5 dB of final P_L	–	1.5	2	μs
	ruggedness	$V_S = 5 \text{ V}$; adjust V_C for $P_L = 3 \text{ W}$; $VSWR \leq 12 : 1$ through all phases	no degradation			

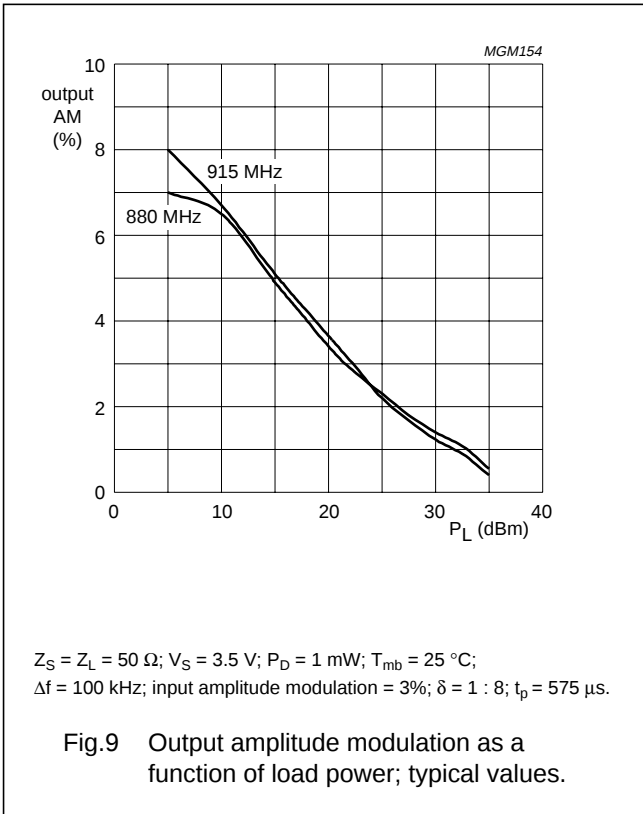
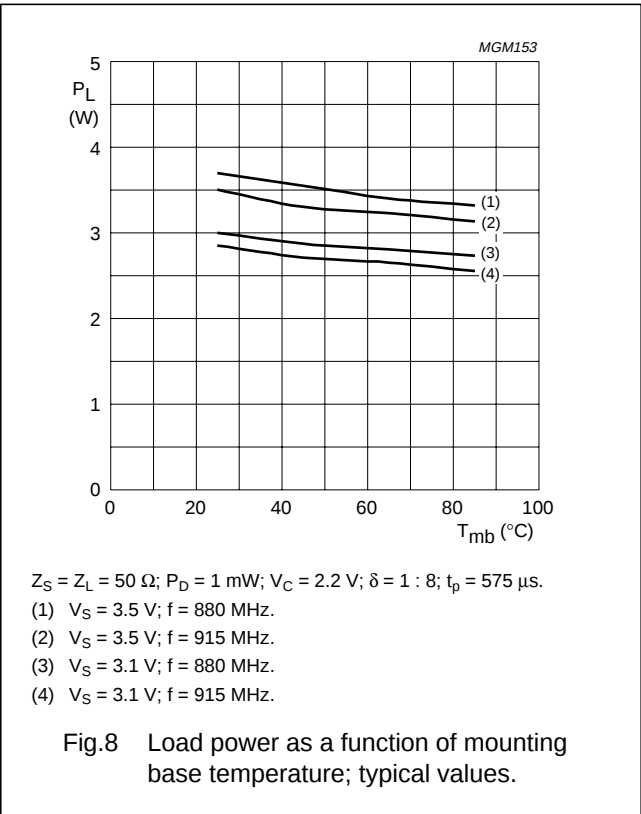
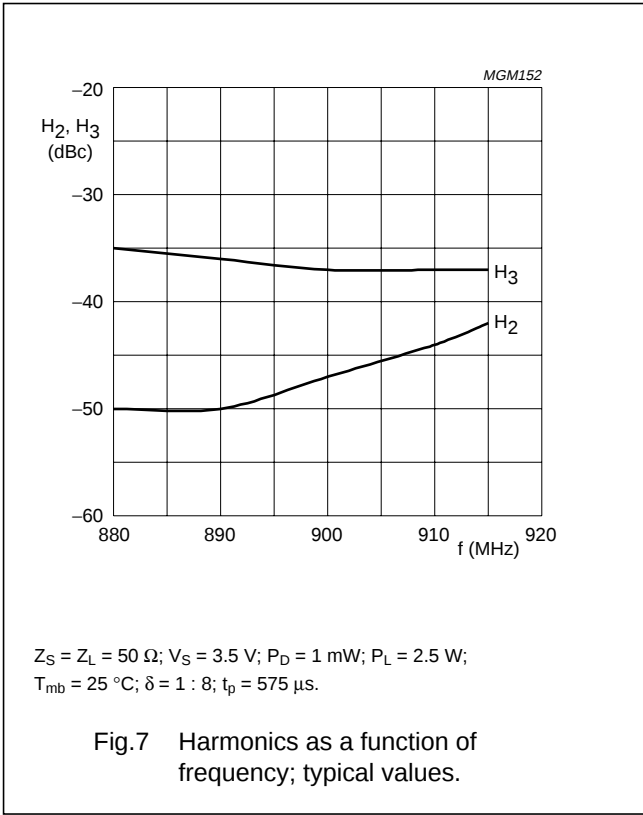
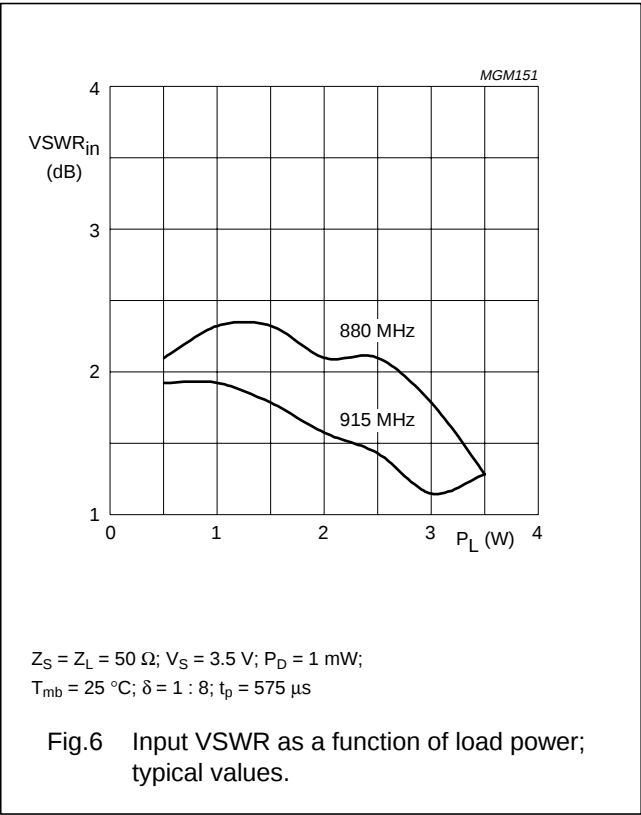
UHF amplifier module

BGY240



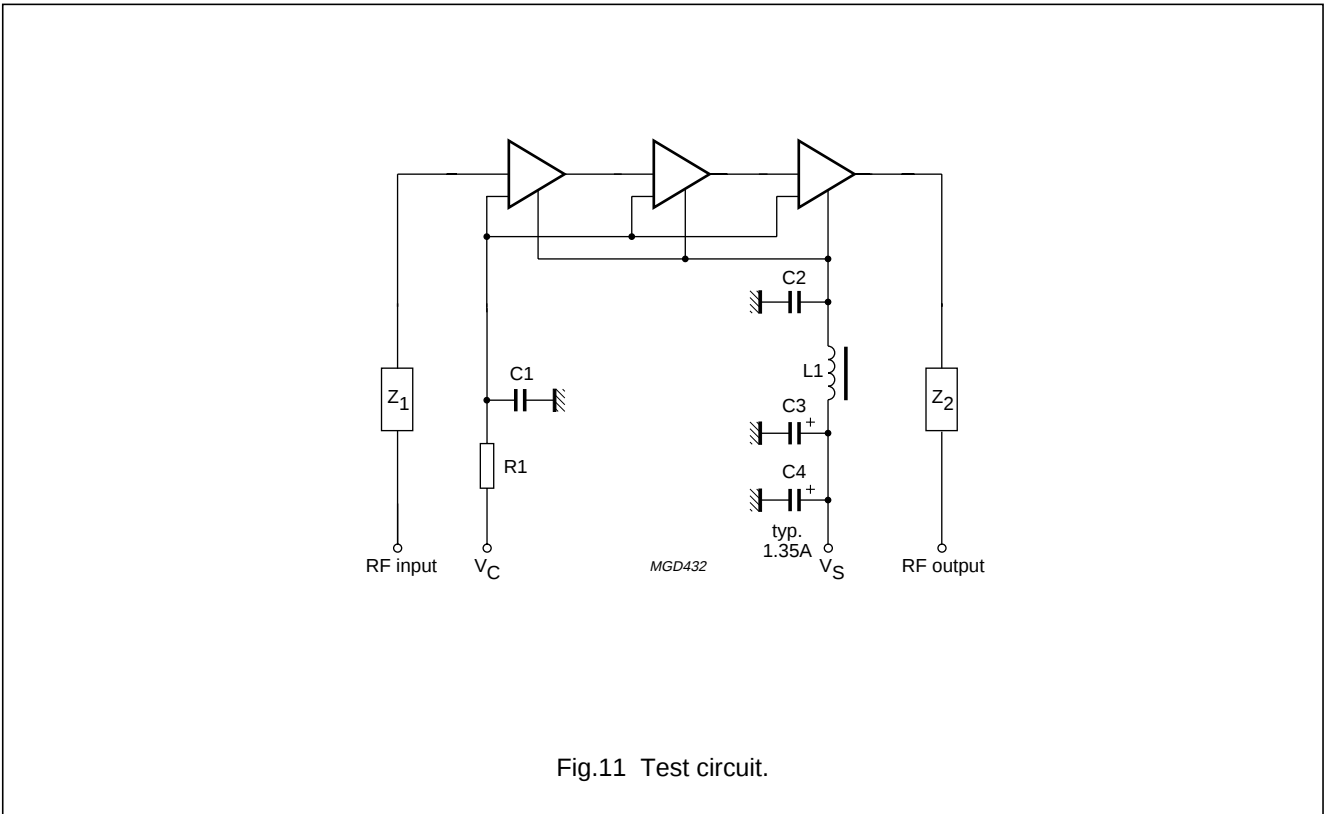
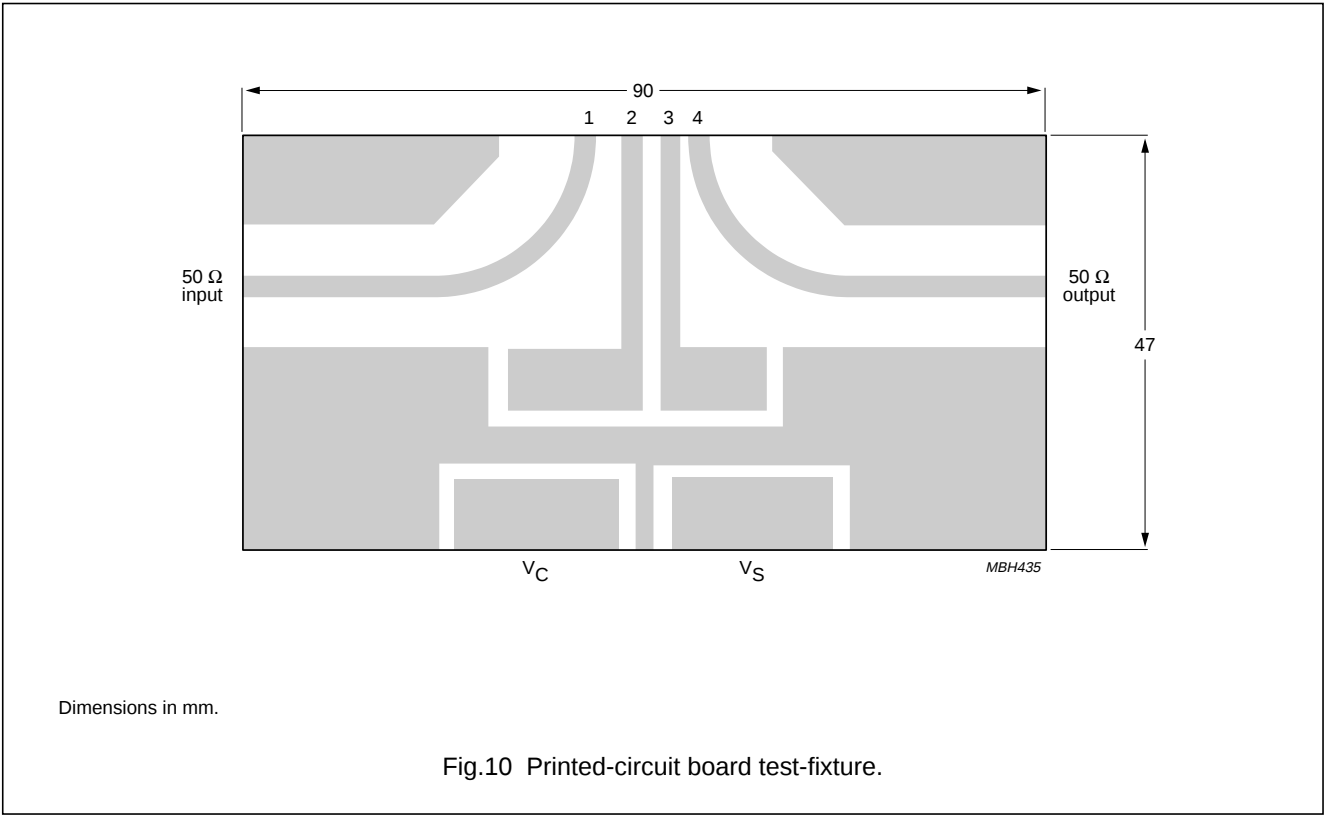
UHF amplifier module

BGY240



UHF amplifier module

BGY240



UHF amplifier module

BGY240

List of components (see Fig.11)

COMPONENT	DESCRIPTION	VALUE	DIMENSIONS	CATALOGUE NO.
C1, C2	multilayer ceramic chip capacitor	680 pF		2222 851 11681
C3	tantalum capacitor	2.2 μ F; 35 V		–
C4	electrolytic capacitor	47 μ F; 40 V		2222 030 37479
L1	Grade 4S2 Ferroxcube bead			4330 030 36300
Z ₁ , Z ₂	stripline; note 1	50 Ω	width 2.33 mm	–
R1	metal film resistor	100 Ω ; 0.6 W		2322 156 11001

Note

1. 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 module

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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.

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)
- Triclean B/S
- Acetone.

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

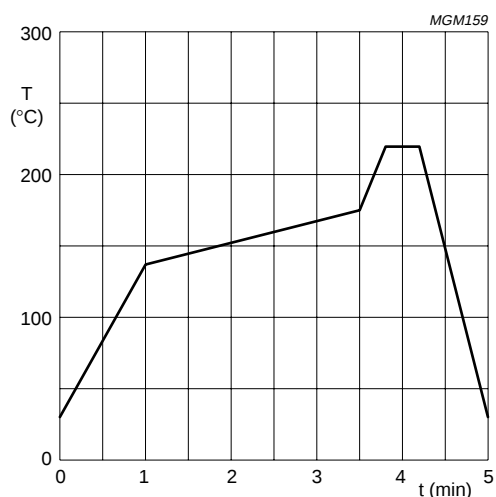
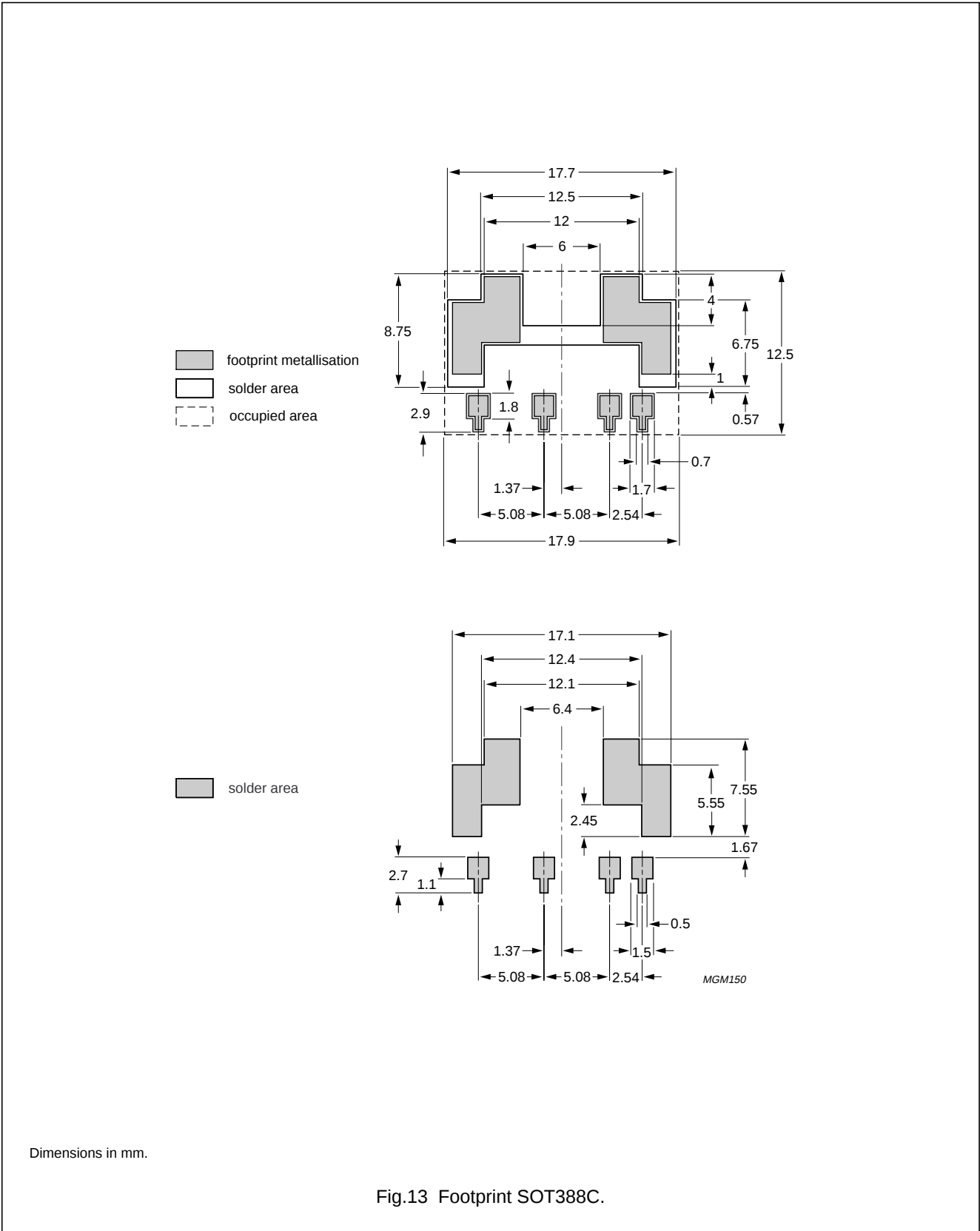


Fig.12 Recommended reflow temperature profile.

UHF amplifier module

BGY240



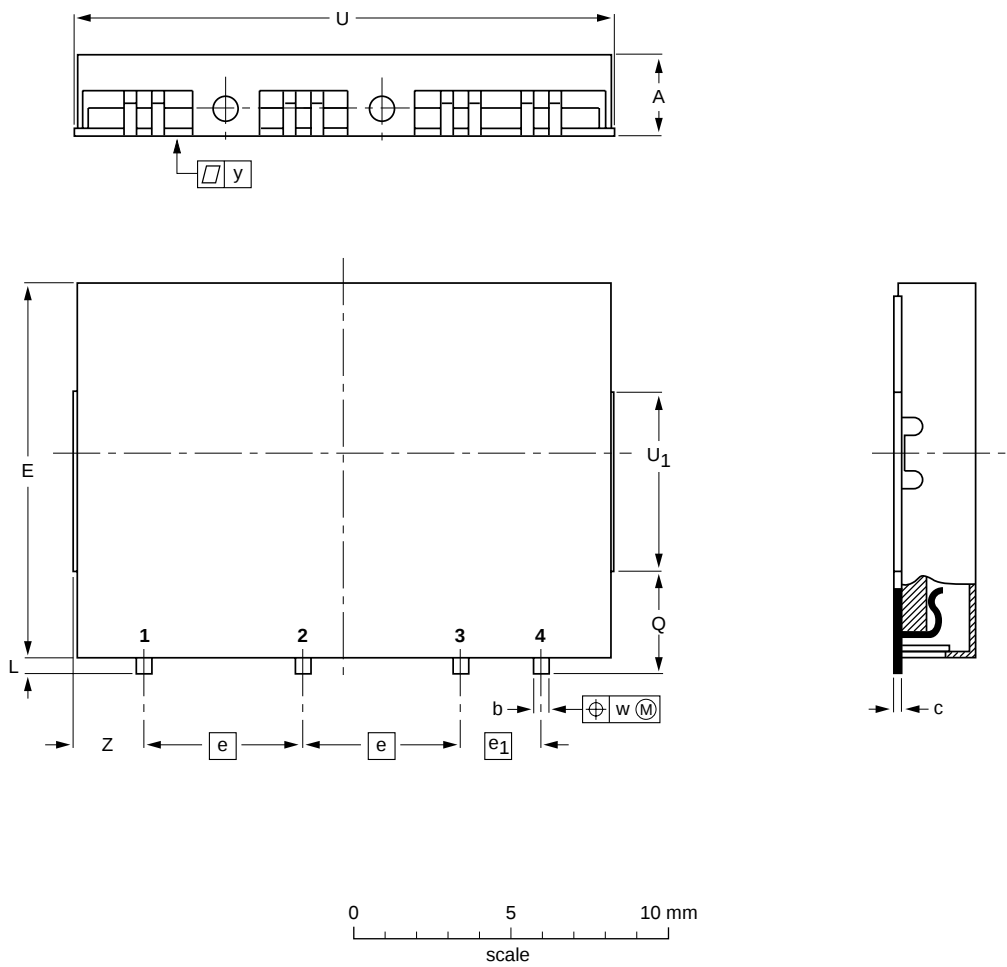
UHF amplifier module

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PACKAGE OUTLINE

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

SOT388C



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	c	e	e ₁	E	L	Q	U	U ₁	w	y	Z
mm	2.7 2.3	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			
SOT388C						97-10-02

UHF amplifier module

BGY240

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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Tel. +61 2 9805 4455, Fax. +61 2 9805 4466

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

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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: see Singapore

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,
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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

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

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Russia: Philips Russia, Ul. Usatcheva 35A, 119048 MOSCOW,
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Singapore: Lorong 1, Toa Payoh, SINGAPORE 1231,
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South Africa: S.A. PHILIPS Pty Ltd., 195-215 Main Road Martindale,
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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 3 301 6312, Fax. +34 3 301 4107

Sweden: Kottbygatan 7, Akalla, S-16485 STOCKHOLM,
Tel. +46 8 632 2000, Fax. +46 8 632 2745

Switzerland: Allmendstrasse 140, CH-8027 ZÜRICH,
Tel. +41 1 488 2686, Fax. +41 1 488 3263

Taiwan: Philips Semiconductors, 6F, No. 96, Chien Kuo N. Rd., Sec. 1,
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Thailand: PHILIPS ELECTRONICS (THAILAND) Ltd.,
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Turkey: Talatpasa Cad. No. 5, 80640 GÜLTEPE/ISTANBUL,
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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,
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