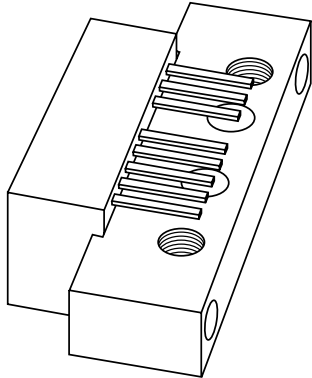


# DATA SHEET



## **CGD923**

**870 MHz, 20 dB gain power doubler  
amplifier**

Product specification

2002 Oct 08

# 870 MHz, 20 dB gain power doubler amplifier

# CGD923

## FEATURES

- High output capability
- Excellent linearity
- Extremely low noise
- Excellent return loss properties
- Rugged construction
- Gold metallization ensures excellent reliability
- Adjustable supply current.

## APPLICATIONS

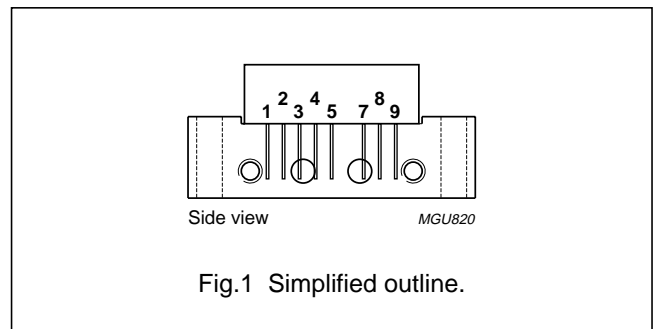
- CATV systems operating in the 40 to 870 MHz frequency range.

## DESCRIPTION

Hybrid amplifier module in a SOT115AE package operating at a voltage supply of 24 V (DC), employing both GaAs and Si dies.

## PINNING - SOT115AE

PIN	DESCRIPTION
1	input
2 and 3	common
4	I <sub>DC</sub> adjust
5	+V <sub>B</sub>
7 and 8	common
9	output



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 45 MHz	19.25	19.75	dB
		f = 870 MHz	19.5	20.5	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	–	
		pin 4 not connected	460	490	mA
		pin 4 connected to ground	385	415	mA

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>B</sub>	supply voltage	–	30	V
V <sub>i</sub>	RF input voltage			
	single tone	–	70	dBmV
	132 channels flat	–	45	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C
I <sub>DC adjust</sub>	DC current adjust	–10	0	mA

## 870 MHz, 20 dB gain power doubler amplifier

CGD923

## CHARACTERISTICS

Bandwidth 45 to 870 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75 \Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 45 MHz	19.25	19.5	19.75	dB
		f = 870 MHz	19.5	20.0	20.5	dB
SL	slope straight line	f = 45 to 870 MHz	0.0	0.5	1.0	dB
FL	flatness straight line	f = 45 to 100 MHz	-0.2	-	+0.2	dB
		f = 100 to 800 MHz	-0.6	-	+0.4	dB
		f = 800 to 870 MHz	-0.45	-	+0.2	dB
S <sub>11</sub>	input return losses	f = 40 to 80 MHz	20	-	-	dB
		f = 80 to 160 MHz	19	-	-	dB
		f = 160 to 320 MHz	18	-	-	dB
		f = 320 to 550 MHz	17	-	-	dB
		f = 550 to 870 MHz	16	-	-	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz	20	-	-	dB
		f = 80 to 160 MHz	19	-	-	dB
		f = 160 to 320 MHz	18	-	-	dB
		f = 320 to 550 MHz	17	-	-	dB
		f = 550 to 870 MHz	16	-	-	dB
S <sub>21</sub>	phase response	f = 50 MHz	-45	-	+45	deg
S <sub>12</sub>	reverse isolation	RF <sub>out</sub> to RF <sub>in</sub>	-	-	22	dB
NF	noise figure	f = 50 MHz	-	-	5	dB
		f = 870 MHz	-	-	5.5	dB
<b>Pin 4 not connected</b>						
I <sub>tot</sub>	total current consumption (DC)	note 2	460	475	490	mA
CTB	composite triple beat	79 chs; f <sub>m</sub> = 445.25 MHz; note 1	-	-	-64	dB
		79 chs flat; V <sub>o</sub> = 50 dBmV; f <sub>m</sub> = 547.25 MHz	-	-	-64	dB
		132 chs flat; V <sub>o</sub> = 48 dBmV; f <sub>m</sub> = 745.25 MHz	-	-	-56	dB
X <sub>mod</sub>	cross modulation	79 chs; f <sub>m</sub> = 55.25 MHz; note 1	-	-	-57	dB
		79 chs flat; V <sub>o</sub> = 50 dBmV; f <sub>m</sub> = 55.25 MHz	-	-	-57	dB
		132 chs flat; V <sub>o</sub> = 48 dBmV; f <sub>m</sub> = 55.25 MHz	-	-	-57	dB
CSO <sub>sum</sub>	composite second order distortion (sum)	79 chs; f <sub>m</sub> = 446.5 MHz; note 1	-	-	-60	dB
		79 chs flat; V <sub>o</sub> = 50 dBmV; f <sub>m</sub> = 548.5 MHz	-	-	-60	dB
		132 chs flat; V <sub>o</sub> = 48 dBmV; f <sub>m</sub> = 860.5 MHz	-	-	-54	dB
CSO <sub>diff</sub>	composite second order distortion (diff)	79 chs; f <sub>m</sub> = 150 MHz; note 1	-	-	-60	dB
		79 chs flat; V <sub>o</sub> = 50 dBmV; f <sub>m</sub> = 150 MHz	-	-	-60	dB
		132 chs flat; V <sub>o</sub> = 48 dBmV; f <sub>m</sub> = 150 MHz	-	-	-56	dB

## 870 MHz, 20 dB gain power doubler amplifier

CGD923

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
<b>Pin 4 connected to ground</b>						
$I_{tot}$	total current consumption (DC)	note 3	395	400	415	mA
CTB	composite triple beat	79 chs; $f_m = 445.25$ MHz; notes 1 and 3	–	–	–62	dB
		79 chs flat; $V_o = 50$ dBmV; $f_m = 547.25$ MHz	–	–	–62	dB
		132 chs flat; $V_o = 48$ dBmV; $f_m = 745.25$ MHz	–	–	–54	dB
$X_{mod}$	cross modulation	79 chs; $f_m = 55.25$ MHz; notes 1 and 3	–	–	–55	dB
		79 chs flat; $V_o = 50$ dBmV; $f_m = 55.25$ MHz	–	–	–55	dB
		132 chs flat; $V_o = 48$ dBmV; $f_m = 55.25$ MHz	–	–	–55	dB
CSO Sum	composite second order distortion (sum)	79 chs; $f_m = 446.5$ MHz; notes 1 and 3	–	–	–60	dB
		79 chs flat; $V_o = 50$ dBmV; $f_m = 548.5$ MHz	–	–	–60	dB
		132 chs flat; $V_o = 48$ dBmV; $f_m = 860.5$ MHz	–	–	–54	dB
CSO Diff	composite second order distortion (diff)	79 chs; $f_m = 150$ MHz; notes 1 and 3	–	–	–60	dB
		79 chs flat; $V_o = 50$ dBmV; $f_m = 150$ MHz	–	–	–60	dB
		132 chs flat; $V_o = 48$ dBmV; $f_m = 150$ MHz	–	–	–56	dB

**Notes**

- $V_o = 58$  dBmV at 870 MHz; Tilt = 7.3 dB (55 to 547 MHz) extrapolated to 12 dB at 870 MHz.
- Pin 4 is not connected.
- Pin 4 connected to ground.

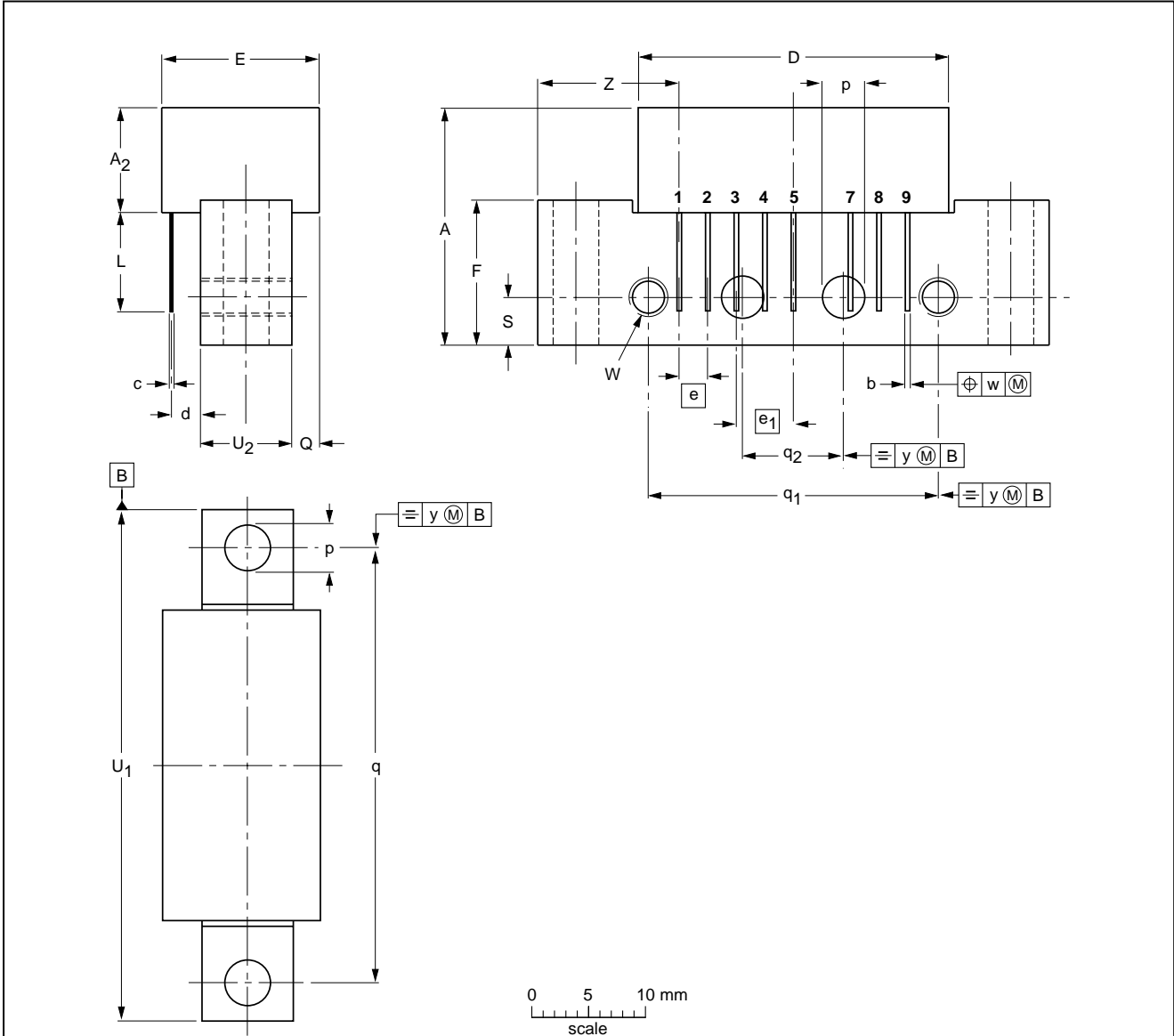
870 MHz, 20 dB gain power doubler amplifier

CGD923

PACKAGE OUTLINE

Rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; 8 gold-plated in-line leads

SOT115AE



DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A <sub>2</sub> max.	b	c	D max.	d max.	E max.	e	e <sub>1</sub>	F	L min.	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	S	U <sub>1</sub> max.	U <sub>2</sub>	W	w	y	Z max.
mm	20.8	9.1	0.51 0.38	0.25	27.2	2.54	13.75	2.54	5.08	12.7	8.8	4.15 3.85	2.4	38.1	25.4	10.2	4.2	44.75	8	6-32 UNC	0.25	0.1	12

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT115AE					02-08-28

## 870 MHz, 20 dB gain power doubler amplifier

CGD923

## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

## Notes

1. Please consult the most recently issued data sheet before initiating or completing a design.
2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.
3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

## DEFINITIONS

**Short-form specification** — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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** — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

## DISCLAIMERS

**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 Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

**Right to make changes** — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status 'Production'), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no licence or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

---

870 MHz, 20 dB gain power doubler amplifier

CGD923

---

<b>CAUTION</b>
----------------

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.
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

# ***Philips Semiconductors – a worldwide company***

## **Contact information**

For additional information please visit <http://www.semiconductors.philips.com>. Fax: +31 40 27 24825

For sales offices addresses send e-mail to: [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com).

© Koninklijke Philips Electronics N.V. 2002

SCA74

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

613518/01/pp8

Date of release: 2002 Oct 08

Document order number: 9397 750 10106

*Let's make things better.*

**Philips  
Semiconductors**



**PHILIPS**