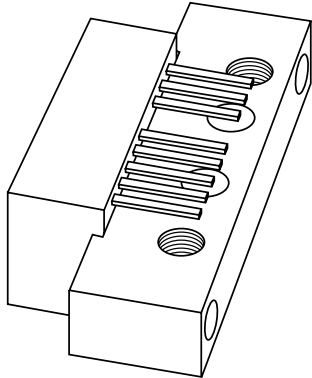


# DATA SHEET



**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

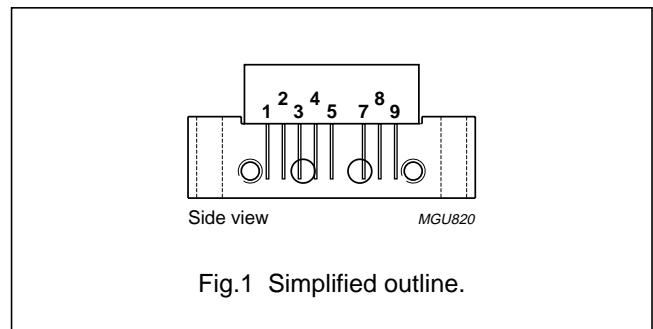
- CATV systems operating in the 40 to 870 MHz frequency range.

### 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

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**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

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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.

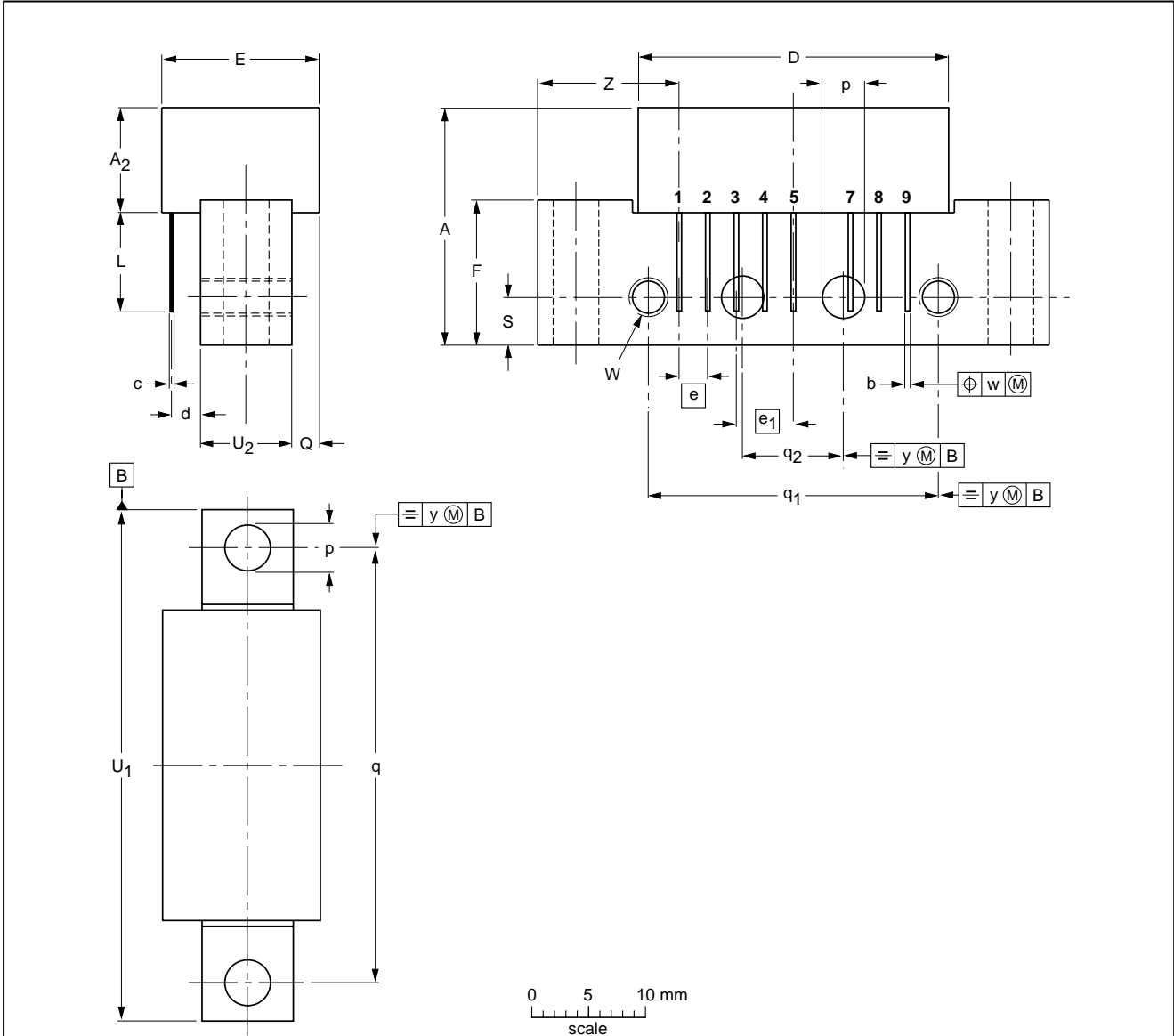
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PACKAGE OUTLINE

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

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## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	DEFINITION
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<b>CAUTION</b>
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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.
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