



# CGD942C

870 MHz, 23 dB gain power doubler amplifier

Rev. 4 — 25 June 2014

Product data sheet

## 1. Product profile

### 1.1 General description

Hybrid amplifier module in a SOT115J package, operating at a supply voltage of 24 V (DC), employing Hetero Field Effect Transistor (HFET) GaAs dies.

### 1.2 Features and benefits

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

### 1.3 Applications

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

### 1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$f = 870 \text{ MHz}$	22	23	24	dB
$I_{\text{tot}}$	total current	$V_B = 24 \text{ V}$ [1]	-	450	-	mA

[1] Direct Current (DC).

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	input		
2, 3	common		
5	+ $V_B$		
7, 8	common		
9	output		



### 3. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
CGD942C	-	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 × 6-32 UNC and 2 extra horizontal mounting holes; 7 gold-plated in-line leads	SOT115J

### 4. Limiting values

Table 4. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
$V_B$	supply voltage		-	30	V
$V_{i(RF)}$	RF input voltage	single tone	-	75	dBmV
		132 channels flat	-	45	dBmV
$T_{stg}$	storage temperature		-40	+100	°C
$T_{mb}$	mounting base temperature		-20	+100	°C

### 5. Characteristics

Table 5. Characteristics

Bandwidth to 870 MHz;  $V_B = 24$  V (DC);  $T_{mb} = 35$  °C; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$G_p$	power gain	$f = 870$ MHz	22	23	24	dB	
$SL_{sl}$	slope straight line	$f = 40$ MHz to 870 MHz	[1]	1	-	2	dB
FL	flatness of frequency response	$f = 40$ MHz to 870 MHz	[2]	-	0.5	-	dB
CTB	composite triple beat	79 + 53 flat NTSC channels	[3]	-	-68	-66	dBc
		98 flat PAL channels	[4]	-	-66	-	dBc
CSO	composite second-order distortion	79 + 53 flat NTSC channels	[3]	-	-70	-67	dBc
		98 flat PAL channels	[4]	-	-66	-	dBc
Xmod	cross modulation	79 + 53 flat NTSC channels	[3]	-	-66	-58	dB
$RL_{in}$	input return loss	$f = 40$ MHz to 80 MHz	20	-	-	dB	
		$f = 80$ MHz to 160 MHz	19	-	-	dB	
		$f = 160$ MHz to 320 MHz	18	-	-	dB	
		$f = 320$ MHz to 640 MHz	18	-	-	dB	
		$f = 640$ MHz to 870 MHz	18	-	-	dB	
$RL_{out}$	output return loss	$f = 40$ MHz to 80 MHz	20	-	-	dB	
		$f = 80$ MHz to 160 MHz	19	-	-	dB	
		$f = 160$ MHz to 320 MHz	18	-	-	dB	
		$f = 320$ MHz to 640 MHz	18	-	-	dB	
		$f = 640$ MHz to 870 MHz	18	-	-	dB	

**Table 5. Characteristics ...continued**

Bandwidth to 870 MHz;  $V_B = 24\text{ V (DC)}$ ;  $T_{mb} = 35\text{ °C}$ ; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
NF	noise figure	f = 50 MHz	-	3.5	5.0	dB
		f = 870 MHz	-	3.5	5.0	dB
$I_{tot}$	total current	$V_B = 24\text{ V}$ [5]	-	450	-	mA

[1]  $G_p$  at 870 MHz minus  $G_p$  at 40 MHz.

[2] Flatness straight line (peak to valley).

[3] 79 NTSC channels (55.25 MHz to 547.25 MHz, 48 dBmV output level) + 53 NTSC channels (553.25 MHz to 870 MHz, 38 dBmV output level).

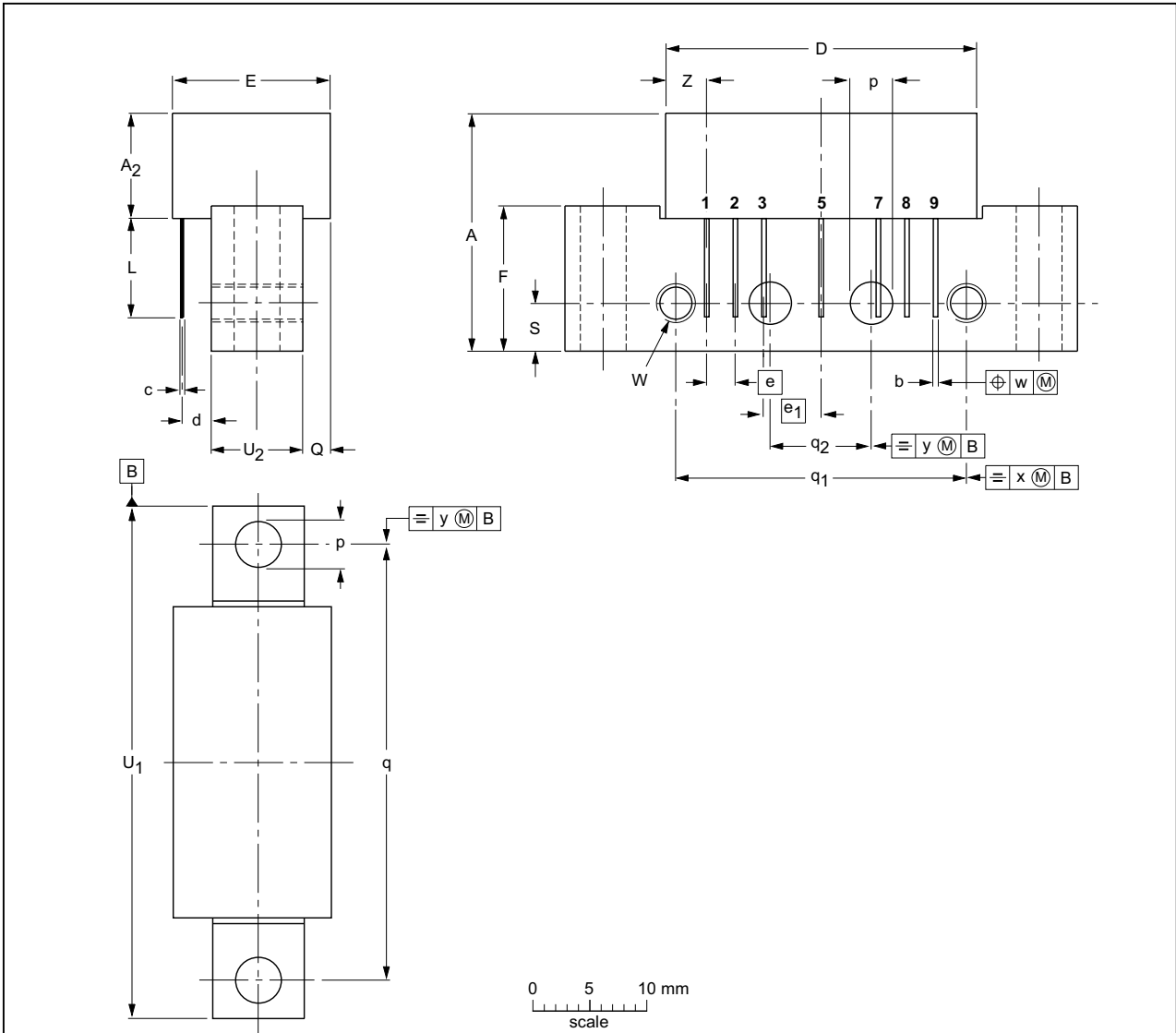
[4]  $V_o = 48\text{ dBmV}$ .

[5] Direct Current (DC).

6. Package outline

Rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; 7 gold-plated in-line leads

SOT115J



DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A <sub>2</sub> max.	b	c	D max.	d	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>	U <sub>2</sub>	W	w	x	y	Z max.
mm	20.8	9.5	0.51 0.38	0.25	27.2	2.04 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 44.25	8.2 7.8	6-32 UNC	0.25	0.7	0.1	3.8

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT115J					-04-02-04 10-06-18

Fig 1. Package outline SOT115J

## 7. Handling information

### CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.

Such precautions are described in the *ANSI/ESD S20.20*, *IEC/ST 61340-5*, *JESD625-A* or equivalent standards.

## 8. Abbreviations

Table 6. Abbreviations

Acronym	Description
CATV	Community Antenna TeleVision
DC	Direct Current
GaAs	Gallium-Arsenide
NTSC	National Television Standard Committee
PAL	Phase-Alternation Line
RF	Radio Frequency
UNC	UNified Coarse thread

## 9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
CGD942C v.4	20140625	Product data sheet	-	CGD942C v.3
Modifications:	<ul style="list-style-type: none"> <li>• <a href="#">Table note 3 on page 3</a>: 997.25 MHz has been changed to 870 MHz.</li> <li>• <a href="#">Section 7 on page 5</a>: The ESD warning has been moved here from the front page.</li> <li>• Legal texts have been updated.</li> </ul>			
CGD942C v.3	20100929	Product data sheet	-	CGD942C v.2
CGD942C v.2	20091119	Product data sheet	-	CGD942C v.1
CGD942C v.1	20070607	Product data sheet	-	-

## 10. Legal information

### 10.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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