

# CGD1042H

1 GHz, 23 dB gain high output power doubler

Rev. 3 — 28 September 2010

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 junction Field Effect Transistor (HFET) GaAs dies.

#### CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

### 1.2 Features and benefits

- High output power capability
- Excellent linearity
- Extremely low noise
- Excellent return loss properties
- Rugged construction
- Unconditionally stable
- Thermal optimized design

### 1.3 Applications

- CATV systems operating in the 40 MHz to 1000 MHz frequency range

### 1.4 Quick reference data

**Table 1. Quick reference data**

Bandwidth to 1000 MHz;  $V_B = 24$  V (DC);  $T_{mb} = 35$  °C; unless otherwise specified.

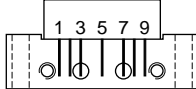
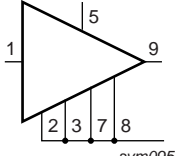
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$f = 45$ MHz	-	21.5	-	dB
		$f = 1000$ MHz	22.0	23.0	24.0	dB
$I_{tot}$	total current	[1]	430	450	470	mA

[1] Direct Current (DC).



## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	input		
2, 3	common		
5	+V <sub>B</sub>		
7, 8	common		
9	output		

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
CGD1042H	-	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 <sub>B</sub>	supply voltage		-	30	V
V <sub>i(RF)</sub>	RF input voltage	single tone	-	75	dBmV
T <sub>stg</sub>	storage temperature		-40	+100	°C
T <sub>mb</sub>	mounting base temperature		-20	+100	°C

## 5. Characteristics

**Table 5. Characteristics**

Bandwidth to 1000 MHz;  $V_B = 24\text{ V (DC)}$ ;  $T_{mb} = 35\text{ °C}$ ; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$G_p$	power gain	$f = 45\text{ MHz}$	-	21.5	-	dB	
		$f = 1000\text{ MHz}$	22.0	23.0	24.0	dB	
$SL_{sl}$	slope straight line	$f = 45\text{ MHz to }1000\text{ MHz}$	[1]	-	1.5	dB	
FL	flatness of frequency response	$f = 45\text{ MHz to }1000\text{ MHz}$	[2]	-	0.5	dB	
CTB	composite triple beat	$V_o = 55\text{ dBmV at }1000\text{ MHz}$	[3]	-	-83	dBc	
		$V_o = 59\text{ dBmV at }1000\text{ MHz}$	[3]	-	-75	-70	dBc
CSO	composite second-order distortion	$V_o = 55\text{ dBmV at }1000\text{ MHz}$	[3]	-	-80	dBc	
		$V_o = 59\text{ dBmV at }1000\text{ MHz}$	[3]	-	-76	-68	dBc
Xmod	cross modulation	$V_o = 55\text{ dBmV at }1000\text{ MHz}$	[3]	-	-75	dB	
		$V_o = 59\text{ dBmV at }1000\text{ MHz}$	[3]	-	-67	dB	
CCN	carrier-to-composite noise	$V_o = 55\text{ dBmV at }1000\text{ MHz}$	[3]	-	65	dBc	
		$V_o = 59\text{ dBmV at }1000\text{ MHz}$	[3]	55	58	-	dBc
$RL_{in}$	input return loss	$f = 45\text{ MHz to }200\text{ MHz}$	20.0	-	-	dB	
		$f = 200\text{ MHz to }550\text{ MHz}$	17.5	-	-	dB	
		$f = 550\text{ MHz to }870\text{ MHz}$	15.0	-	-	dB	
		$f = 870\text{ MHz to }914\text{ MHz}$	14.5	-	-	dB	
		$f = 914\text{ MHz to }1000\text{ MHz}$	14.0	-	-	dB	
$RL_{out}$	output return loss	$f = 45\text{ MHz to }200\text{ MHz}$	21.0	-	-	dB	
		$f = 200\text{ MHz to }550\text{ MHz}$	20.0	-	-	dB	
		$f = 550\text{ MHz to }870\text{ MHz}$	18.0	-	-	dB	
		$f = 870\text{ MHz to }914\text{ MHz}$	17.5	-	-	dB	
		$f = 914\text{ MHz to }1000\text{ MHz}$	17.0	-	-	dB	
NF	noise figure	$f = 50\text{ MHz to }1000\text{ MHz}$	-	5.0	5.5	dB	
$I_{tot}$	total current		[4]	430	450	470	mA

[1]  $G_p$  at 1000 MHz minus  $G_p$  at 45 MHz.

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

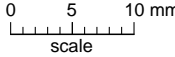
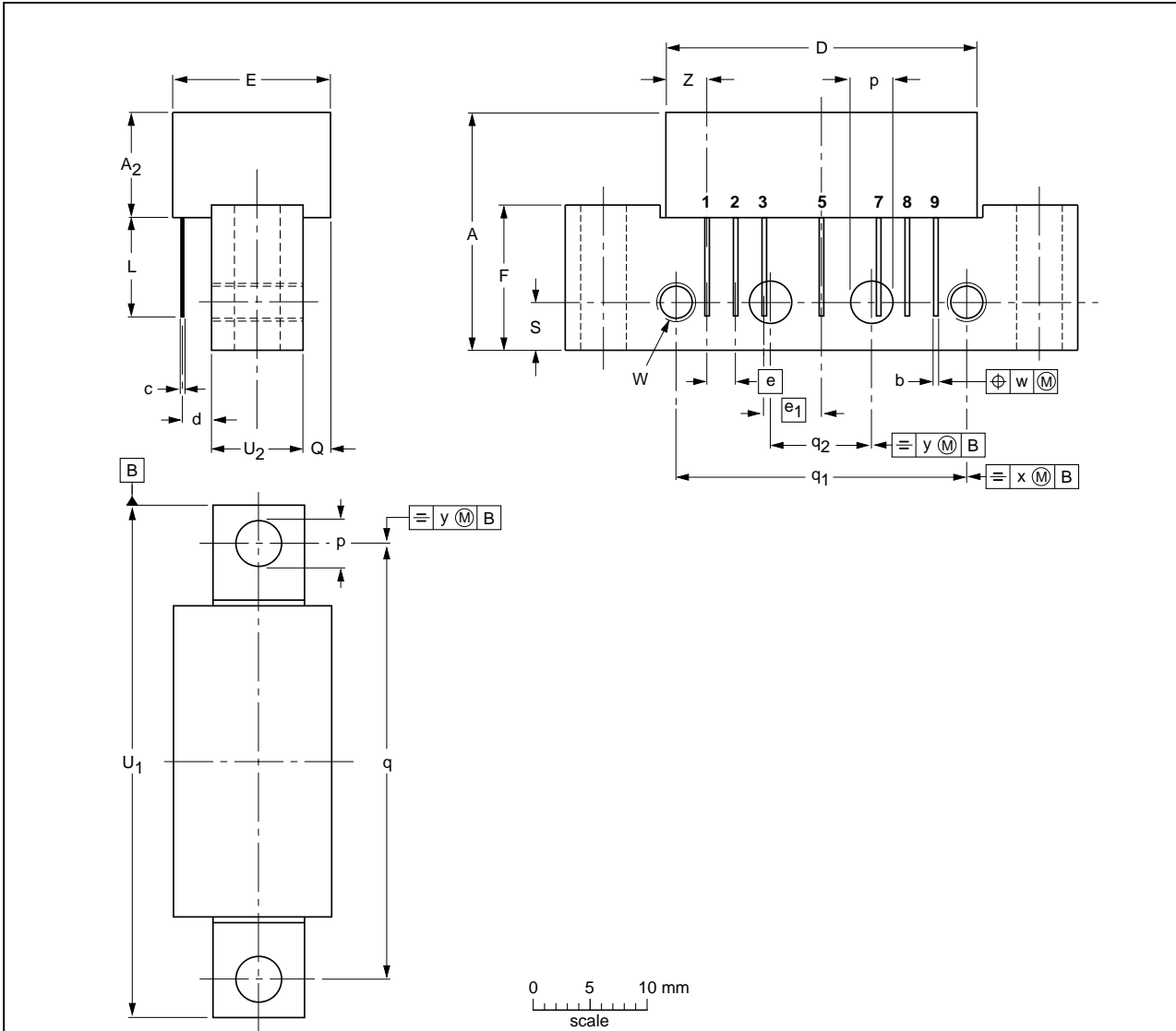
[3] 79 NTSC channels + 75 digital channels (-6 dB offset); tilt extrapolated to 18 dB at 1000 MHz.

[4] 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. Abbreviations

**Table 6. Abbreviations**

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

## 8. Revision history

**Table 7. Revision history**

Document ID	Release date	Data sheet status	Change notice	Supersedes
CGD1042H v.3	20100928	Product data sheet	-	CGD1042H v.2
Modifications:	<ul style="list-style-type: none"><li>• Package outline drawings have been updated to the latest version.</li><li>• Legal texts have been updated.</li></ul>			
CGD1042H v.2	20091116	Product data sheet	-	CGD1042H v.1
CGD1042H v.1	20071009	Product data sheet	-	-

## 9. Legal information

### 9.1 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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[2] The term 'short data sheet' is explained in section "Definitions".

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