

# CGD1042H

1 GHz, 23 dB gain high output power doubler

Rev. 01 — 9 October 2007

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 Direct Current (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

- 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**

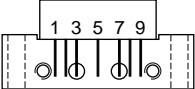
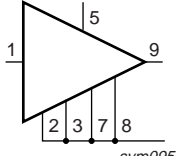
Bandwidth to 1000 MHz;  $V_B = 24$  V (DC);  $T_{mb} = 35$  °C; unless otherwise specified.

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	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;  $V_B = 24\text{ V (DC)}$ ;  $T_{mb} = 35\text{ }^{\circ}\text{C}$ ; 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	-	dBc
		$V_o = 59\text{ dBmV at }1000\text{ MHz}$	[3] -	-67	-	dBc
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

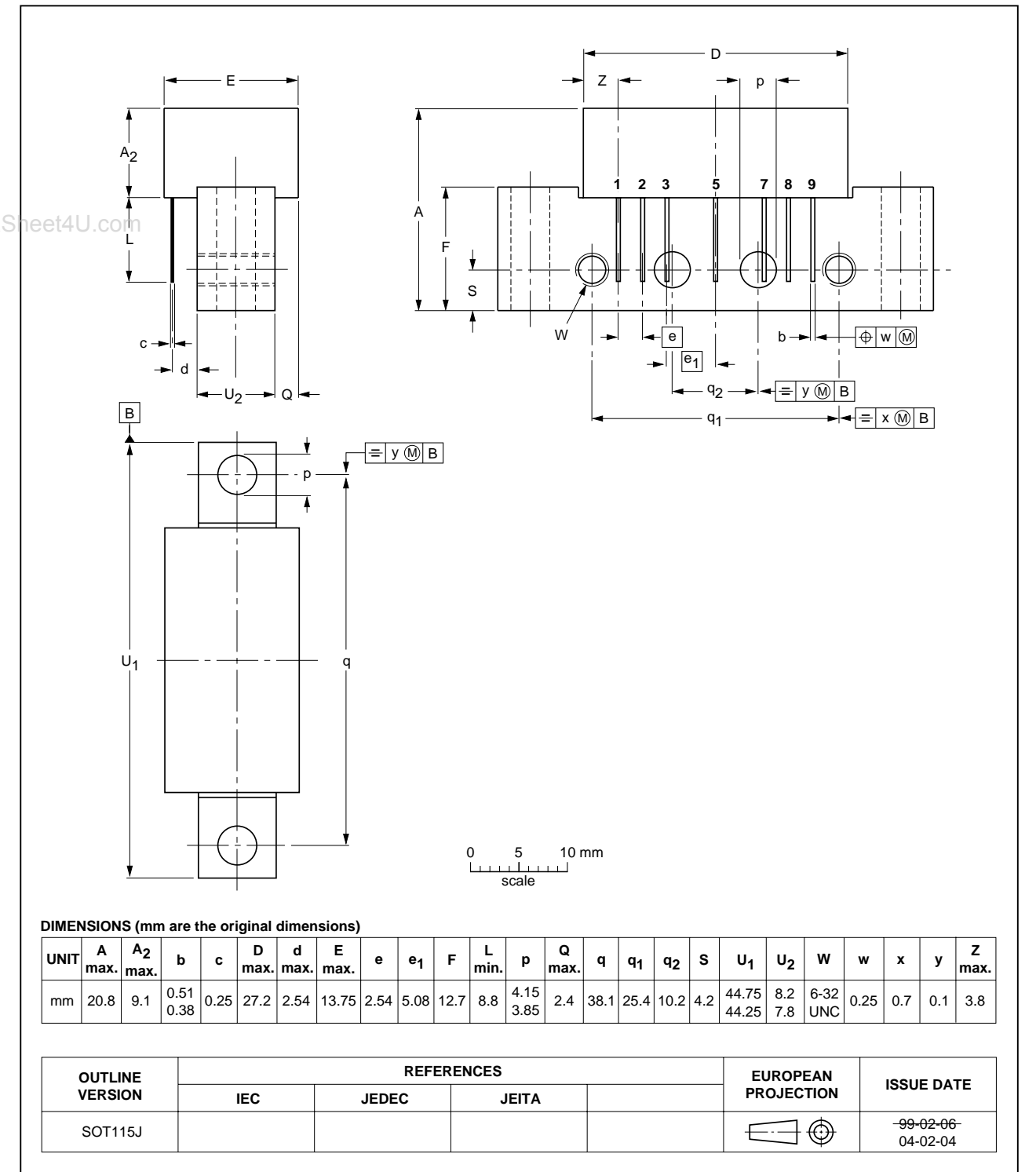


Fig 1. Package outline SOT115J

7. Abbreviations

Table 6. Abbreviations

Acronym	Description
CATV	Community Antenna TeleVision
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_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.

[1] Please consult the most recently issued document before initiating or completing a design.

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

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

### 9.2 Definitions

**Draft** — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

**Short data sheet** — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

### 9.3 Disclaimers

**General** — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

**Right to make changes** — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

**Suitability for use** — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or

malfunction of a NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

**Applications** — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

**Limiting values** — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

**Terms and conditions of sale** — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nxp.com/profile/terms>, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

**No offer to sell or license** — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

### 9.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

## 10. Contact information

For additional information, please visit: <http://www.nxp.com>

For sales office addresses, send an email to: [salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)

11. Contents

1 Product profile ..... 1

1.1 General description..... 1

1.2 Features ..... 1

1.3 Applications ..... 1

1.4 Quick reference data..... 1

2 Pinning information..... 2

3 Ordering information..... 2

4 Limiting values..... 2

5 Characteristics..... 3

6 Package outline ..... 4

7 Abbreviations..... 5

8 Revision history..... 5

9 Legal information..... 6

9.1 Data sheet status ..... 6

9.2 Definitions..... 6

9.3 Disclaimers..... 6

9.4 Trademarks..... 6

10 Contact information..... 6

11 Contents ..... 7



Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.