

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.

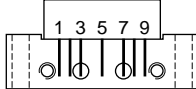
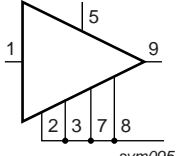
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$f = 45$ MHz	-	21.5	-	dB
		$f = 1000$ MHz	22.0	23.0	24.0	dB
I_{tot}	total current	[1]	430	450	470	mA

[1] Direct Current (DC).



2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	input		
2, 3	common		
5	+V _B		
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 _B	supply voltage		-	30	V
V _{i(RF)}	RF input voltage	single tone	-	75	dBmV
T _{stg}	storage temperature		-40	+100	°C
T _{mb}	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).

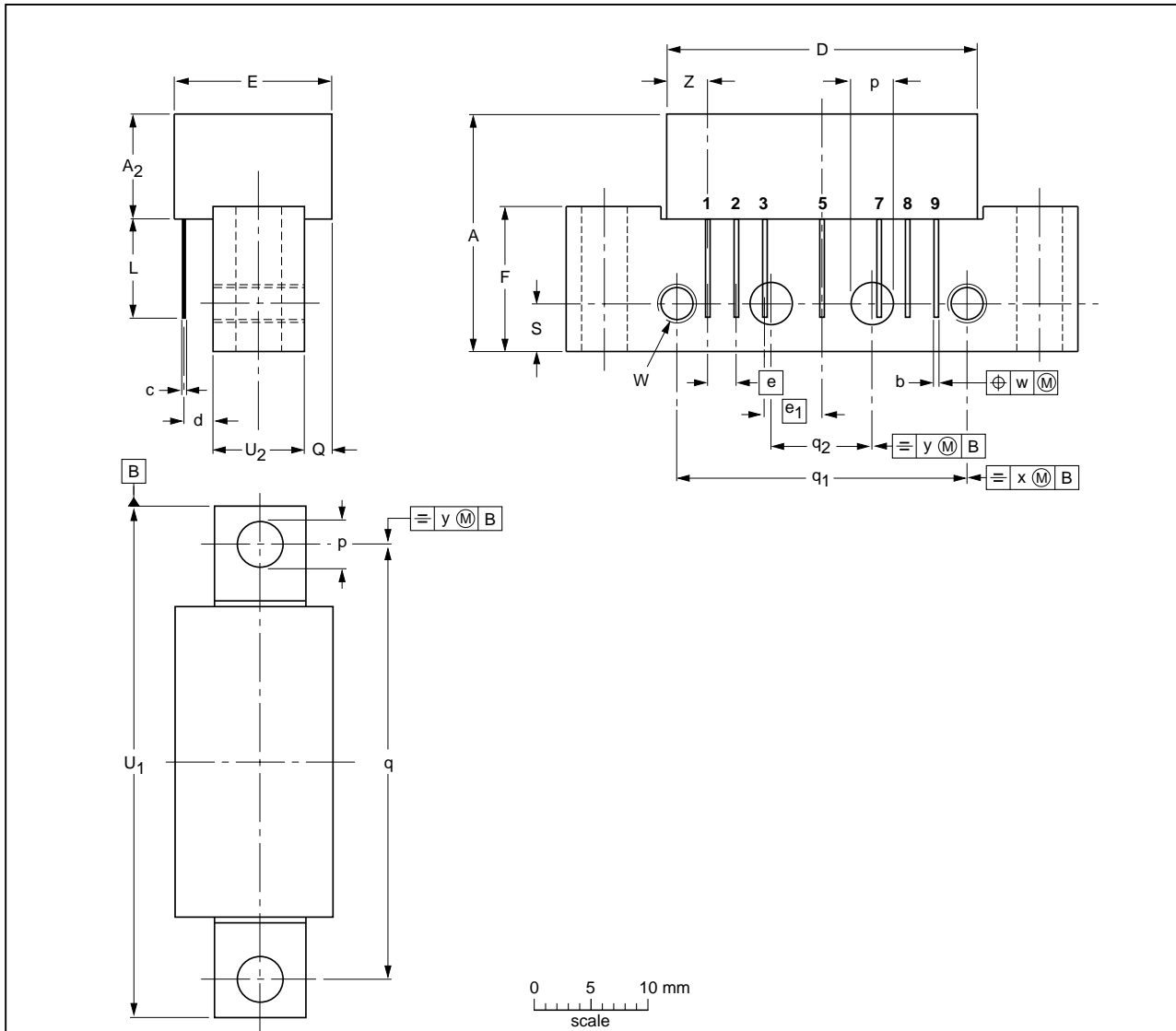
[3] 79 NTSC channels + 75 digital channels (-6 dB offset); tilt extrapolated to 18 dB at 1000 MHz.

[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 ₂ max.	b	c	D max.	d	E max.	e	e ₁	F	L min.	p	Q max.	q	q ₁	q ₂	S	U ₁	U ₂	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">• Package outline drawings have been updated to the latest version.• Legal texts have been updated.			
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 ^{[1][2]}	Product status ^[3]	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".

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