

# CGY1047

1 GHz, 27 dB gain GaAs push-pull amplifier

Rev. 2 — 29 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 Heterojunction Field Effect Transistor (HFET) GaAs dies.

### 1.2 Features and benefits

- Excellent linearity, stability and reliability
- Extremely low noise
- Excellent return loss properties
- Rugged construction
- Unconditionally stable
- Thermally optimized design
- Superior levels of ESD protection
- Compliant with Directive 2002/95/EC, regarding Restriction of the use of certain Hazardous Substances (RoHS)
- Integrated ring wave surge protection

### 1.3 Applications

- CATV systems operating in the 40 MHz to 1003 MHz frequency range

### 1.4 Quick reference data

**Table 1. Quick reference data**

Bandwidth 40 MHz to 1003 MHz;  $V_B = 24$  V (DC);  $Z_S = Z_L = 75 \Omega$ ;  $T_{mb} = 35$  °C; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$G_p$	power gain	$f = 45$ MHz	25.0	-	27.0	dB	
		$f = 1003$ MHz	27.0	27.75	28.5	dB	
CTB	composite triple beat	$V_o = 44$ dBmV	[1]	-64	-	dBc	
CCN	carrier-to-composite noise	$V_o = 44$ dBmV	[1]	65	-	dBc	
$I_{tot}$	total current		[2]	230	250	270	mA

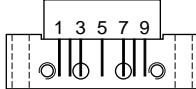
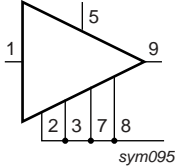
[1] 79 NTSC channels [ $f = 55.25$  MHz to 547.25 MHz] + 75 digital channels [ $f = 547.25$  MHz to 1003 MHz] (-6 dB offset); flat out level.

[2] 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
CGY1047	-	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	
V <sub>ESD</sub>	electrostatic discharge voltage	Human Body Model (HBM); According JEDEC standard 22-A114E	[1]	-	2000	V
		Biased; According IEC61000-4-2		-	2000	V
T <sub>stg</sub>	storage temperature		-40	+100	°C	
T <sub>mb</sub>	mounting base temperature		-20	+100	°C	

[1] The value of 2000 V corresponds to a class 2 classification.

## 5. Characteristics

**Table 5. Characteristics**

Bandwidth 40 MHz to 1003 MHz;  $V_B = 24$  V (DC);  $Z_S = Z_L = 75 \Omega$ ;  $T_{mb} = 35$  °C; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	f = 45 MHz	25.0	-	27.0	dB
		f = 1003 MHz	27.0	27.75	28.5	dB
$SL_{sl}$	slope straight line	f = 45 MHz to 1003 MHz	[1] 1.5	2.0	2.5	dB
FL	flatness of frequency response	f = 45 MHz to 1003 MHz	[2] -	-	0.8	dB
$RL_{in}$	input return loss	f = 45 MHz to 200 MHz	20.0	-	-	dB
		f = 200 MHz to 550 MHz	20.0	-	-	dB
		f = 550 MHz to 870 MHz	20.0	-	-	dB
		f = 870 MHz to 914 MHz	20.0	-	-	dB
		f = 914 MHz to 1003 MHz	16.0	-	-	dB
$RL_{out}$	output return loss	f = 45 MHz to 200 MHz	18.0	-	-	dB
		f = 200 MHz to 550 MHz	18.0	-	-	dB
		f = 550 MHz to 870 MHz	18.0	-	-	dB
		f = 870 MHz to 914 MHz	18.0	-	-	dB
		f = 914 MHz to 1003 MHz	16.0	-	-	dB
NF	noise figure	f = 50 MHz to 870 MHz	-	-	4.0	dB
		f = 870 MHz to 1003 MHz	-	-	4.5	dB
$I_{tot}$	total current		[3] 230	250	270	mA
<b>79 NTSC channels + 75 digital channels</b>						
CTB	composite triple beat	$V_o = 44$ dBmV	[4] -	-64	-	dBc
CSO	composite second-order distortion	$V_o = 44$ dBmV	[4] -	-66	-	dBc
Xmod	cross modulation	$V_o = 44$ dBmV	[4] -	-60	-	dB
CCN	carrier-to-composite noise	$V_o = 44$ dBmV	[4] -	65	-	dBc
<b>79 NTSC channels</b>						
CTB	composite triple beat	$V_o = 44$ dBmV	[5] -	-	-62	dBc
CSO	composite second-order distortion	$V_o = 44$ dBmV	[5] -	-	-64	dBc
Xmod	cross modulation	$V_o = 44$ dBmV	[5] -	-62	-	dB

[1]  $G_p$  at 1003 MHz minus  $G_p$  at 45 MHz.

[2] Flatness is defined as peak deviation to straight line.

[3] Direct Current (DC).

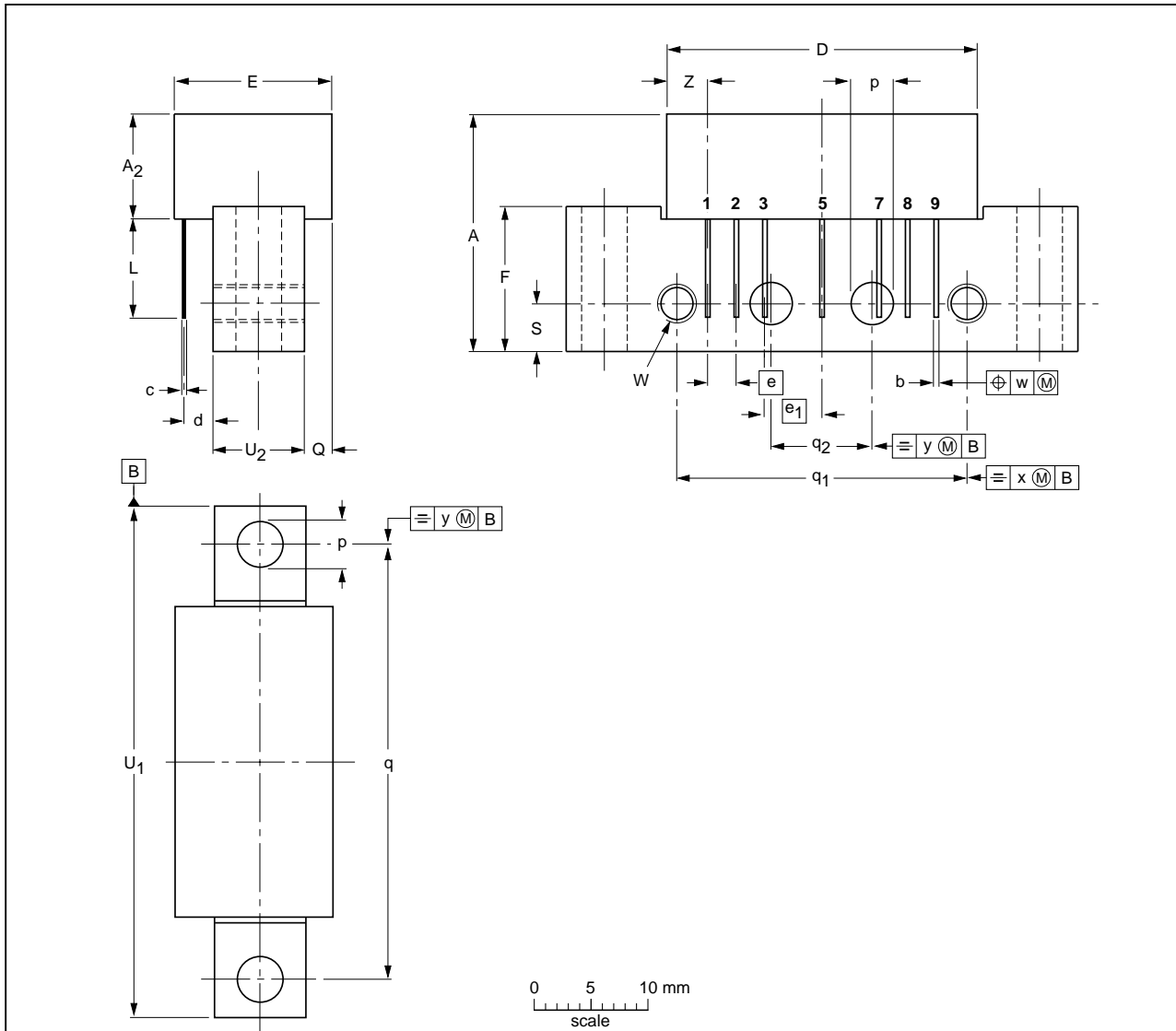
[4] 79 NTSC channels [f = 55.25 MHz to 547.25 MHz] + 75 digital channels [f = 547.25 MHz to 1003 MHz] (-6 dB offset); flat out level.

[5] 79 NTSC channels [f = 55.25 MHz to 550 MHz]; flat out level.

## 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
ESD	ElectroStatic Discharge
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
CGY1047 v.2	20100929	Product data sheet	-	CGY1047 v.1
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>			
CGY1047 v.1	20090730	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".

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