CGY1047 1 GHz, 27 dB gain GaAs push-pull amplifier Rev. 01 — 30 July 2009

**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 Heterojunction Field Effect Transistor (HFET) GaAs dies.

### **1.2 Features**

- 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 to 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	Тур	Max	Unit
G <sub>p</sub>	power gain	f = 45 MHz	25.0	-	27.0	dB
		f = 1003 MHz	27.0	27.75	28.5	dB
СТВ	composite triple beat	$V_o = 44 \text{ dBmV}$	<u>[1]</u> _	-64	-	dBc
CCN	carrier-to-composite noise	$V_o = 44 \text{ dBmV}$	<u>[1]</u> _	65	-	dBc
I <sub>tot</sub>	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).



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## 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	2370 sym095

## 3. Ordering information

Table 3. Orde	ering inform	ation	
Type number	Package		
	Name	Description	Version
CGY1047	-	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; $2 \times 6-32$ 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
VB	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	<u>[1]</u>	-	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.

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## 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	Тур	Max	Unit
Gp	power gain	f = 45 MHz		25.0	-	27.0	dB
		f = 1003 MHz		27.0	27.75	28.5	dB
SL <sub>sl</sub>	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 <sub>in</sub>	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 <sub>out</sub>	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 <sub>tot</sub>	total current		[3]	230	250	270	mA
79 NTSC	channels + 75 digital channels						
СТВ	composite triple beat	V <sub>o</sub> = 44 dBmV	[4]	-	-64	-	dBc
CSO	composite second-order distortion	V <sub>o</sub> = 44 dBmV	[4]	-	-66	-	dBc
Xmod	cross modulation	V <sub>o</sub> = 44 dBmV	[4]	-	-60	-	dB
CCN	carrier-to-composite noise	V <sub>o</sub> = 44 dBmV	[4]	-	65	-	dBc
79 NTSC	channels						
СТВ	composite triple beat	V <sub>o</sub> = 44 dBmV	[5]	-	-	-62	dBc
CSO	composite second-order distortion	V <sub>o</sub> = 44 dBmV	[5]	-	-	-64	dBc
Xmod	cross modulation	V <sub>o</sub> = 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.

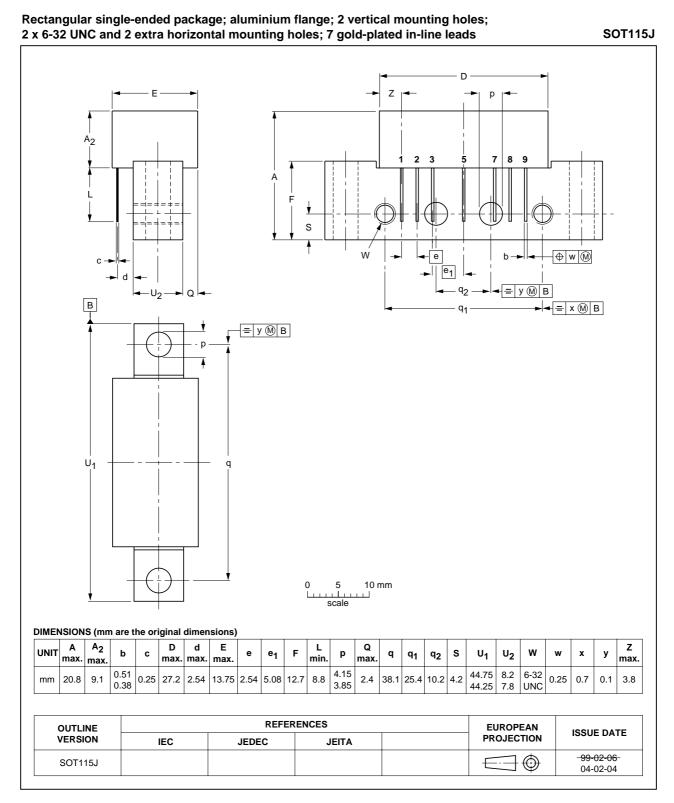
[5] 79 NTSC channels [f = 55.25 MHz to 550 MHz]; flat out level.

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### 6. Package outline



### Fig 1. Package outline SOT115J

1 GHz, 27 dB gain GaAs push-pull amplifier

## 7. Abbreviations

Table 6.	Abbreviations
Acronym	Description
CATV	Community Antenna TeleVision
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_1	20090730	Product data sheet	-	-

#### 1 GHz, 27 dB gain GaAs push-pull amplifier

## 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.
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[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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