CGD1046HI

1 GHz, 27 dB gain GaAs high output power doubler Rev. 1 — 30 July 2010 Produc

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.

1.2 Features and benefits

- Excellent linearity
- Superior levels of ESD protection
- Extremely low noise
- Excellent return loss properties
- Gain compensation over temperature
- Rugged construction
- Unconditionally stable
- Thermally optimized design
- 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

Quick reference data

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

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
Gp	power gain	f = 45 MHz		-	25.5	-	dB
		f = 1003 MHz		26.5	27	28	dB
СТВ	composite triple beat	$V_o = 56.4 \text{ dBmV}$ at 1003 MHz	[1]	-	-75	-65	dBc
CCN	carrier-to-composite noise	$V_o = 56.4 \text{ dBmV}$ at 1003 MHz	[1]	57	63	-	dBc
I _{tot}	total current		[2]	-	450	465	mΑ

^{[1] 79} NTSC channels [f = 54 MHz to 550 MHz] + 75 digital channels [f = 550 MHz to 1003 MHz] (-6 dB offset); tilt extrapolated to 13.5 dB at 1003 MHz.



^[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	1 3 5 7 9
5	+V _B	9
7, 8	common	12 3 7 8
9	output	sym095

3. Ordering information

Table 3. Ordering information

Type number	Package				
	Name	Description	Version		
CGD1046HI	-	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	ı	Min	Max	Unit
V_{B}	supply voltage			-	30	V
$V_{i(RF)}$	RF input voltage	single tone		-	75	dBmV
V _{ESD}	electrostatic discharge voltage	Human Body Model (HBM); According JEDEC standard 22-A114E	<u>[1]</u> .	•	2000	V
		Biased; According IEC61000-4-2	•	•	1500	V
T _{stg}	storage temperature		-	-40	+100	°C
T_mb	mounting base temperature		-	-20	+100	°C

^[1] The ESD pulse of 2000 V corresponds to a class 2 sensitivity level.

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5. Characteristics

Table 5. Characteristics

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

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
G_p	power gain	f = 45 MHz		-	25.5	-	dB
		f = 1003 MHz		26.5	27	28	dB
SL _{sl}	slope straight line	f = 45 MHz to 1003 MHz	[1]	0.7	-	2.2	dB
FL	flatness of frequency response	f = 45 MHz to 1003 MHz	[2]	-	-	1	dB
RLin	input return loss	f = 45 MHz to 160 MHz		20	-	-	dB
		f = 160 MHz to 320 MHz		19	-	-	dB
		f = 320 MHz to 640 MHz		18	-	-	dB
		f = 640 MHz to 870 MHz		17	-	-	dB
		f = 870 MHz to 1003 MHz		16	-	-	dB
RL_out	output return loss	f = 45 MHz to 160 MHz		20	-	-	dB
		f = 160 MHz to 320 MHz		18	-	-	dB
		f = 320 MHz to 640 MHz		17	-	-	dB
		f = 640 MHz to 870 MHz		16	-	-	dB
		f = 870 MHz to 1003 MHz		16	-	-	dB
NF	noise figure	f = 50 MHz		-	4.5	5.5	dB
		f = 1003 MHz		-	5	6	dB
I _{tot}	total current		[3]	-	450	465	mA
79 NTSC	channels + 75 digital channels						
СТВ	composite triple beat	V _o = 56.4 dBmV at 1003 MHz	[4]	-	−75	-65	dBc
CSO	composite second-order distortion	V _o = 56.4 dBmV at 1003 MHz	[4]	-	-70	-63	dBc
Xmod	cross modulation	V _o = 56.4 dBmV at 1003 MHz	[4]	-	-68	-	dB
CCN	carrier-to-composite noise	V _o = 56.4 dBmV at 1003 MHz	[4]	57	63	-	dBc
79 NTSC channels							
СТВ	composite triple beat	V _o = 58.4 dBmV at 1003 MHz	[5]	-	-70	-	dBc
CSO	composite second-order distortion	V _o = 58.4 dBmV at 1003 MHz	[5]	-	-67	-	dBc
Xmod	cross modulation	V _o = 58.4 dBmV at 1003 MHz	[5]	-	-64	-	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 = 54 MHz to 550 MHz] + 75 digital channels [f = 550 MHz to 1003 MHz] (-6 dB offset); tilt extrapolated to 13.5 dB at 1003 MHz.

^{[5] 79} NTSC channels [f = 54 MHz to 550 MHz]; tilt extrapolated to 13.5 dB at 1003 MHz.

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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

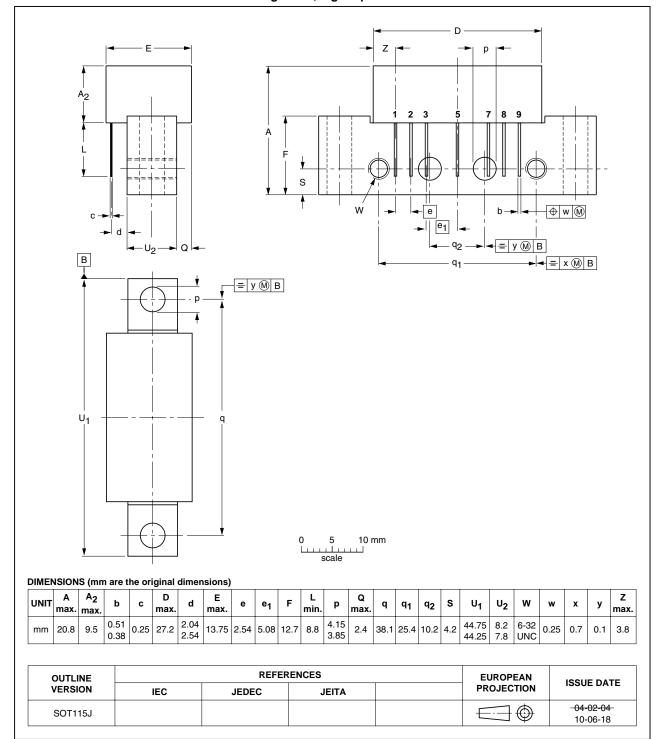


Fig 1. Package outline SOT115J

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7. Abbreviations

Table 6. Abbreviations

Acronym	Description
CATV	Community Antenna TeleVision
ESD	ElectroStatic Discharge
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
CGD1046HI v.1	20100730	Product data sheet	-	-

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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.
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