

## ACE2 INTELLIGENT BROADBAND AMPLIFIER



ACE2 is the most advanced compact amplifier on the market. It has 1.2 GHz frequency range and integrated electrical controls in both up- and downstream.

ACE2 has double diplex filter possibility that allows remote upgrade of the upstream path. New settings for upstream gain and slope will be calculated automatically when new diplexers are taken into use.

The upstream signal path has many advantages over other products on the market. It has extremely high gain with intelligent adjustment. The upstream signal path can be cut off with ingress switch via local or remote control.

ACE2 supports Remote Ingress Switching (RIS), allowing remote return path ingress switch and diplexer selection. RIS uses narrowband one-way FSK communication channel and automatically searches for and locks into HDM155 RIS controller's carrier within the tuning range.

The external USB port enables local control with a PC or an Android mobile device.

### Features

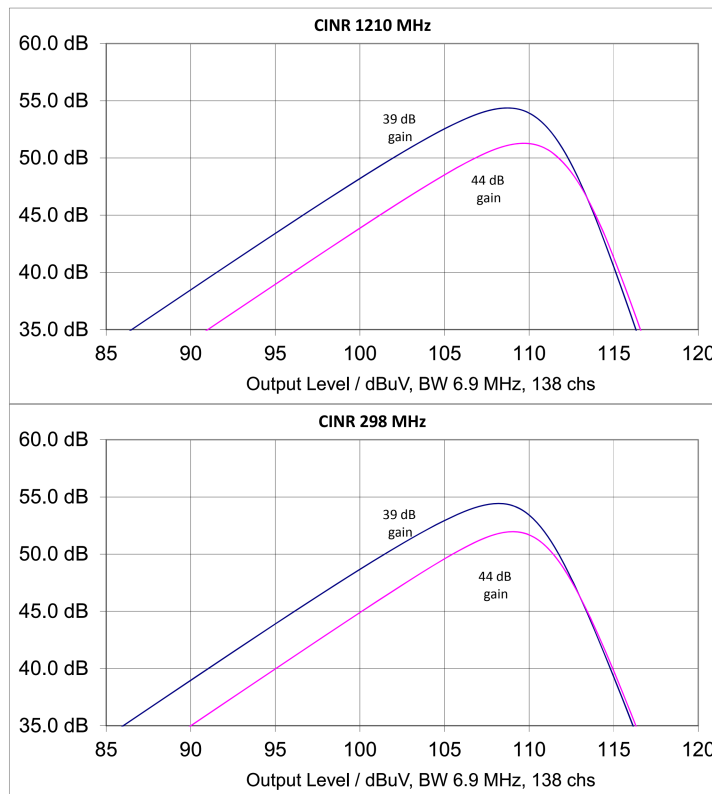
- 1.2 GHz 2<sup>nd</sup> generation GaN technology
- Return path supports 204 MHz bandwidth
- Remote power supply with active PFC
- Intelligent continuous adjustments
- Automatic return path re-alignment
- Local control through external USB connection
- Intelligent cable simulator at input
- Excellent ESD and surge protection
- Remote ingress switch control
- Remote frequency split change

**Technical specifications**

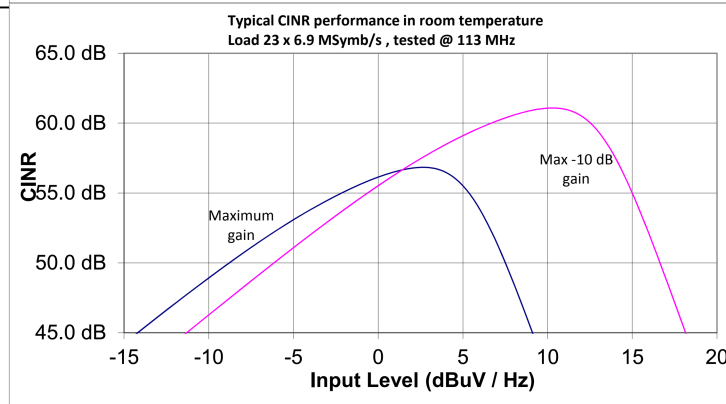
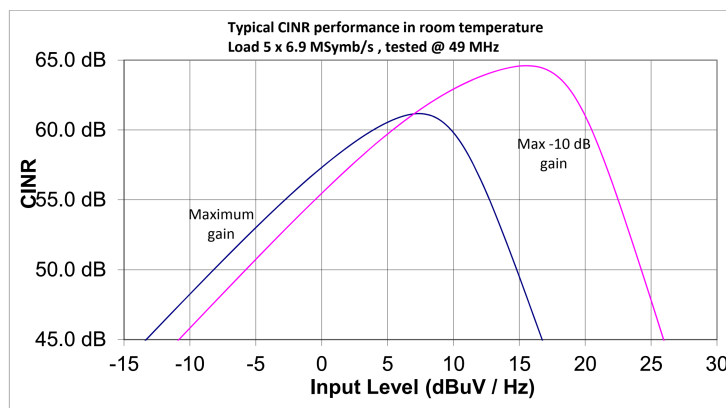
Parameter	Specification	Note
<b>Downstream signal path (values with duplex filters)</b>		
Frequency range	85...1218 MHz	
Return loss	18 dB	1)
Maximum gain	44 dB	2)
Gain control	14...44 dB	3)
Input slope control	-13...20 dB	4)
Input cable simulator	-13 dB	4)
Nominal interstage slope	13 dB	5)
Interstage slope control	8...18 dB	
Flatness	±0.5 dB	6)
Group delay	2 ns	7)
Test point	-20 dB	8)
Noise figure	8.5 dB	9)
U <sub>max</sub> (112 QAM channels) @1.0 GHz	115.0 dBμV	10)
U <sub>max</sub> (138 QAM channels) @1.2 GHz	112.0 dBμV	11)
CINR	see curves	12)
CTB 41 channels	118.0 dBμV	13)
CSO 41 channels	119.0 dBμV	13)
<b>Upstream signal path (values with duplex filters)</b>		
Frequency range	5...204 MHz	
Return loss	18 dB	14)
Maximum gain	28 dB	15)
Ingress switching	0 / -6 / < -40 dB	
Gain control	0...28 dB	16)
Slope control	0...15 dB	17)
Flatness	±0.5 dB	
Noise figure	6.5 dB	18)
CINR	See curves	19)
<b>RIS receiver</b>		
Downstream frequency range	115...130 and 245...260 MHz	20)
Recommended RIS carrier level at output	90...105 dBμV	
<b>General</b>		
Power consumption (65 / 230 V <sub>AC</sub> )	24 W	
Supply voltage	27...65 Vac / 205...255 Vac	
Maximum current feed through	7.0 A / port	21)
Hum modulation	70 dB	21)
Resistance for remote current	25 mΩ / port	
Input / Output connectors	PG11 (several adaptors available)	
Test point connectors	F- female	
Local service port connector	USB mini-B	
Dimensions	17 (20) x 23 x 9 cm	h x w x d
Weight	2.3 kg	
Operating temperature	-40...+55 °C	
Class of enclosure	IP54	22)
Environmental (salt mist, cyclic)	IEC 60068-2-52, severity 1	
Safety	EN60728-11 / EN60065	
EMC	EN50083-2	
ESD	4 kV	23)
Surge	6 kV (EN 60728-3)	

**Notes**

- 1) The limiting curve is defined at 40 MHz -1.5 dB / octave.
- 2) Gain is defined with diplex filters.
- 3) Electrical control with 1 dB step.
- 4) Slope is defined between 85...1218 MHz. Electrical control with 1 dB step. Input slope control includes a cable simulator which is automatically activated when negative slope values are selected. When the cable simulator is activated, the maximum gain is reduced by 13 dB.
- 5) Slope is defined between 85...1218 MHz.
- 6) Typical value in room temperature. The guaranteed value is  $\pm 0.8$  dB. Flatness is defined with nominal settings and 2 diplex filters. All other used plug modules are 0 dB jumpers. The specification is valid 5 MHz after the starting frequency of the selected diplex filter.
- 7) Typical value for 4.43 MHz band,  $f > 120$  MHz. CXF065 diplex filters are in use.
- 8) Output TP has a tolerance of  $\pm 0.8$  dB between 85...1006 MHz and  $\pm 1.0$  dB between 1006...1218 MHz. The TP is defined with 0 dB plug as OUTPUT MODULE. Input TP is a transformer type with  $\pm 1.5$  dB tolerance between 5...1006 MHz. At higher frequency tolerance is  $\pm 2.0$  dB. Input TP tolerance is defined with 3 dB input attenuator.
- 9) Typical value between 100... 1006 MHz with the maximum gain and nominal slope. Guaranteed value is 2 dB higher over the band 85...1218 MHz.
- 10) Typical value according to IEC60728-3-1. Channels have 13 dB cable equivalent slope between 85...1006 MHz and signal level has been defined at 1002 MHz. BER measurement has been done on the worst channel between 110...1006 MHz.
- 11) Typical value. Channels have 13 dB cable equivalent slope between 85...1218 MHz and signal level has been defined at 1210 MHz. BER measurement has been done on the worst channel between 110...1214 MHz.
- 12) CINR (Downstream)



- 13) According to EN60728-3. Amplifier output is 13 dB cable equivalent sloped between 85...1006 MHz and signal level is defined at 862 MHz. All results are typical values in room temperature.
- 14)  $8 < f < 80$  MHz,  $f > 80$  MHz -1.5 dB / octave.
- 15) 28 dB gain is available in 65 MHz and 85 MHz mode. In 204 MHz mode gain is 29 dB.
- 16) Electrical control with 1 dB step. This control is automatically divided between interstage and output attenuators. In 204 MHz mode gain range is 1...29 dB.
- 17) Electrical control with 1 dB step. Pivot point of slope control is set automatically based on selected duplexers to either 85 MHz or 204 MHz. In 204 MHz mode slope range is 0...18 dB with no flatness spec for 15...18 dB range.
- 18) Guaranteed value is 1 dB worse.
- 19) CINR (Upstream)



- 20) Automatic scanning with 0.25 MHz step.
- 21) At any frequency from 15 to 1006 MHz when the remote current is less than 7 A. Hum is 65 dB between 10...15 MHz and 1006...1218 MHz. Value is valid for one signal port. 12 A is the maximum total current which can be locally injected into all ports simultaneously
- 22) The housing is tested to be class of IP67. However, in standard delivery condition the lowest side wall is equipped with a 1 mm ventilation hole. Then the practical enclosure class is IP54.
- 23) EN61000-4-2, contact discharge to enclosure and RF-ports.

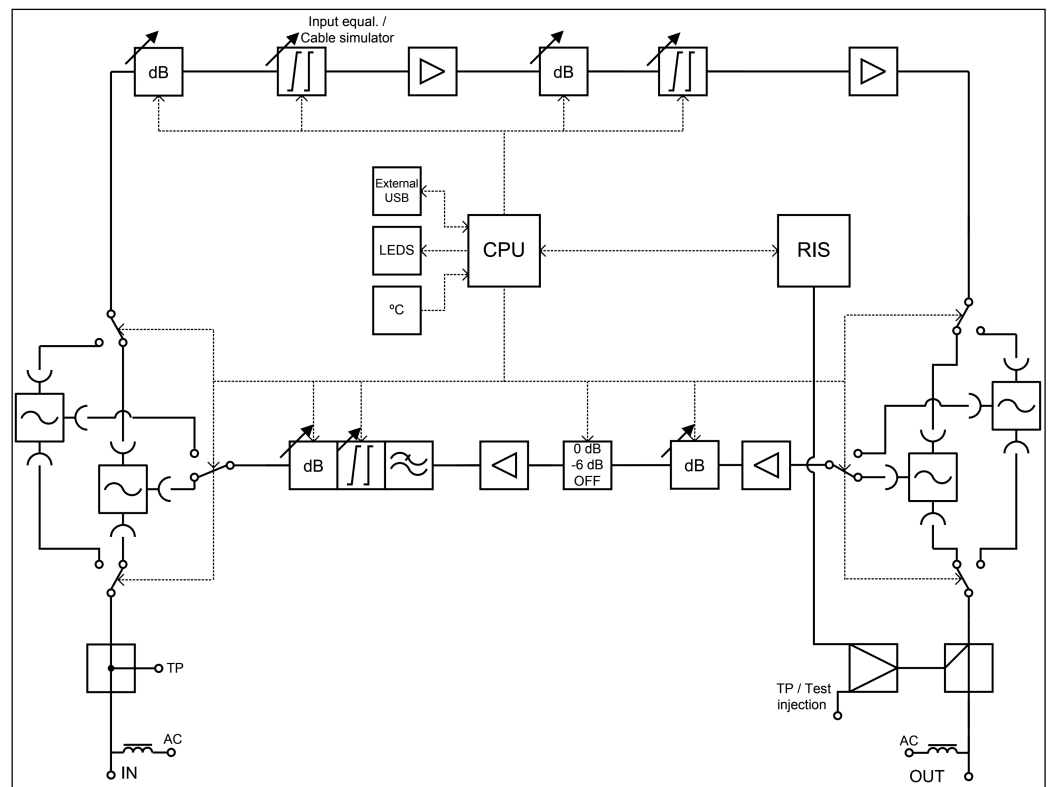
**Management functions**

- Local and remote diplex filter selection, indication with LEDs
- Local and remote return path ingress switch on / attenuated / off control
- Status LED for alarm indication
- Internal temperature measurement with alarms
- Full electrical control of all forward and return path alignments
- Easy and fast intelligent gain control
- Automatic diplex filter type detection
- Return path automatic alignment
- Uptime, total uptime and reset counters for power outage statistics
- User notes can be stored into amplifier memory
- Amplifier configuration and accessory information stored in amplifier memory
- Fast local software update via USB also without power supply

**Compatibility**

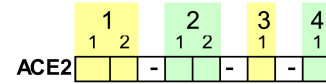
All accessories used with this product should be the newest generation available. Proper operation can guaranteed only with up-to-date accessories.

**Block diagram**



**Ordering**

**ACE2 configuration map**



<b>1-1 Gain and housing</b>
A 44 dB amplifier
<b>1-2 Power supply</b>
A Local powering, euro plug (230 VAC)
B Remote powering with cable clamp (65 VAC)
C Local powering, UK plug (230 VAC)

<b>2-1 Input connection (first from left)</b>
A PG11
B 5/8"
C IEC
D 3.5/12
E F
<b>2-2 Output 1 connection (first from right)</b>
A PG11
B 5/8"
C IEC
D 3.5/12
E F

<b>3-1 Diplexers</b>
A 2 x CXF065 + 2 x CXF204
B 2 x CXF065
C 2 x CXF204
D 2 x CXF085 + 2 x CXF204
E 2 x CXF085
X None

<b>4-1 Customer specific selections</b>
X None

DOC0022968, Rev002