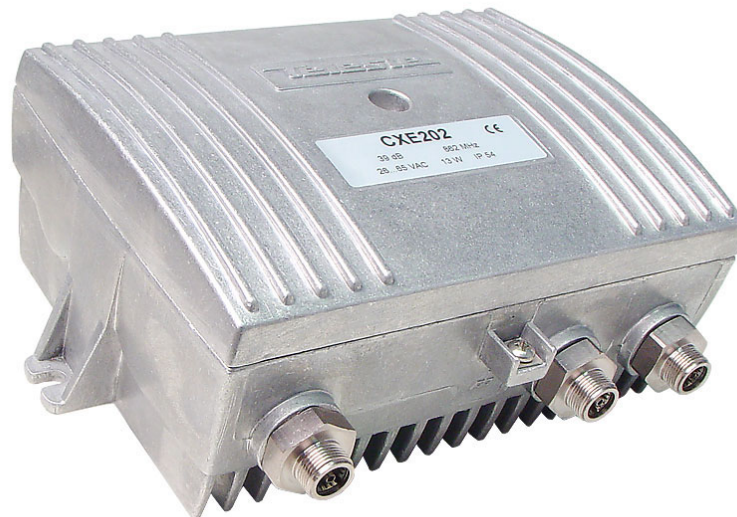


CXE202 UNIVERSAL AMPLIFIER



The CXE202 is a dual output amplifier. It has two gain modes in one product. Gain can be selected on the field according to wanted operation. Higher gain is designed for distribution purposes and lower gain is suitable for line extender use.

All signal controls are using standard attenuator pads to minimize the selection of spare plugs. Return path termination is done automatically, if return amplifier module is not in use.

Amplifier stages are using GaAs-FET technology, which guarantees the highest CTB and CSO performance with optimal power need.

Features

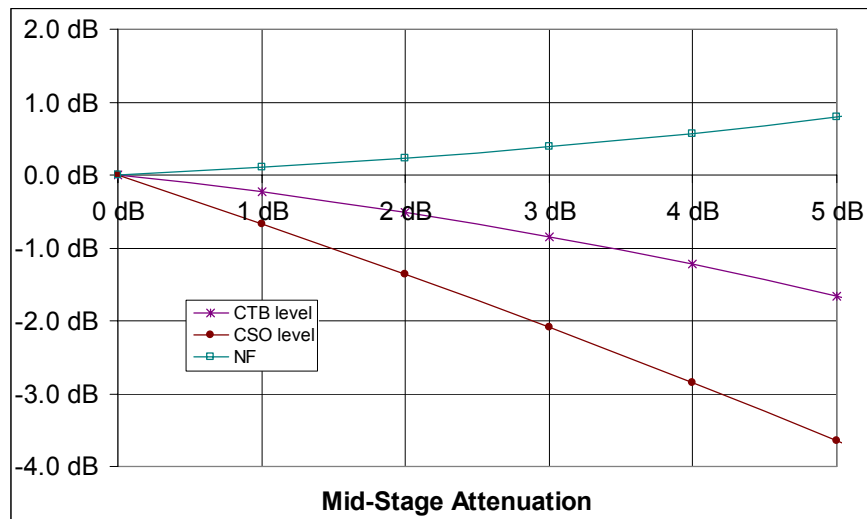
- All adjustments with plug-in attenuator pads
- GaAs-FET technology in use
- 6 A feed through current
- Cable simulator option at input
- Mid-stage gain control
- Optimized power dissipation capacity
- Temperature compensating pads for US and DS channels available
- Possible to use splitter or tap module at output
- Automatic return path termination
- Improved ESD and surge protection

Technical specifications

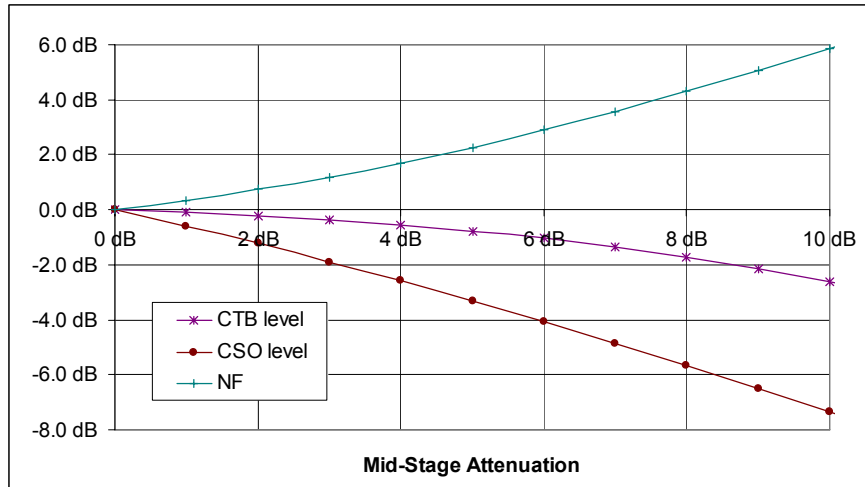
Parameter	Specification	Note
Downstream signal path (all values with the diplex filters)		
Frequency range	47 / 54 / 70 / 85...862 MHz	
Return loss	18 dB	1
Gain	33.0 / 39.0 dB	2
Input attenuator control range	20 dB	3
Input equaliser control range	22 dB	4
Cable simulator	9 dB	3
Mid-stage slope	8 / 0 dB	5
Flatness	± 0.5 dB	6
Group delay	2 ns	7
Noise figure (33.0 / 39.0 dB mode)	6.4 / 5.6 dB	8
Test point	20 dB	9
CTB 42 channels	112.0 dB μ V	10
CSO 42 channels	115.0 dB μ V	10
XMOD 42 channels	111.0 dB μ V	10
CTB 110 / 77 channels	65.0 / 73.0 dBc	11
CSO 110 / 77 channels	64.0 / 67.0 dBc	11
XMOD 110 / 77 channels	63.0 / 70.0 dBc	11
More CTB / CSO / XMOD data	see note	12
Upstream signal path (Return module and diplex filters are installed into the CXE202)		
Frequency range	5...30 / 42 / 50 / 65 MHz	
Return loss	18 dB	13
Gain	22.0 / -4.0 dB	14
Gain control range	20 dB	15
Equaliser control range	7 dB	16
Flatness	± 1.0 dB	
Return TP	0 dB	17
Noise figure	6.0 dB	18
Output level, DIN 45004B	113.0 dB μ V	18
General		
Hum modulation	70 dB	19
Maximum current feed through	6.0 A / port	19
Supply voltage	26...65 VAC / ±30...90 VDC 180...255 VAC	
Power consumption (low / high gain)	13.0 / 14.0 W	20
AC-current need	see note	21
Input / Output connectors	F- f / IEC-f / PG11 / 5/8" / 3.5/12	
Test point connectors	F- female	
Dimensions	182 (210) x 140 (148) x 84 mm	
Weight	1.6 kg	
Operating temp	-40...+55 °C	
Class of enclosure	IP 54	
EMC	EN50083-2	
ESD	4 kV	22
Surge	6 kV	23

Notes

- 1) The limiting curve is defined at 40 MHz -1.5 dB / octave.
- 2) Typical gain values at 862 MHz. Guaranteed minimum values are 32.0 and 38.5 dB. 0 dB plugs but diplex filters are used. The gain mode can be selected with jumpers and fine adjusted with the plug of JDA9xx series in mid-stage position.
- 3) Value can be selected by plugging the suitable plug-in attenuator from JDA-series.
- 4) This is the maximum cable length to be equalized. It corresponds a slope 16 dB between 85...862 MHz. Slope is typically 80% of the used JDA-plug value.
- 5) Cable equivalent slope between 47...862 MHz. Slope can be selected with jumpers.
- 6) Typical value. The guaranteed value is ± 0.75 dB. Flatness is defined with mid-stage equaliser and 2 pcs of diplex filters. All other used plug modules are 0 dB jumpers. Spec is valid 2 MHz after the starting frequency of the selected diplex filter.
- 7) Typical value for 4.43 MHz band. Measured at channel S2. At higher frequencies the specification is better.
- 8) Typical value with 8 dB sloped output. Guaranteed value is 1.0 dB worse. 0 dB input attenuator and equalisers are used.
Corresponding value in flat operation mode is a 5.6 dB (for both gain modes).
- 9) Output TP is from a directional coupler and has a ± 1.0 dB tolerance. The output test point can be used as an injection point for return path test signal. Input TP is a transformer type and it is having an accuracy of ± 2.0 . It can be used as the output test point for the return signal
- 10) According to EN50083-3. Amplifier output was 8 dB cable equivalent sloped. All results are typical values in room temperature, which can be used in system calculations. XMOD is measured at the lowest channel.
The highest recommended output level for the amplifier is 111.0 dBuV with 42 channels.
Valid for both gain modes.



This picture shows how the CTB / CSO / NF values are changing when the gain is adjusted with mid-stage attenuator from 39.0 to 34.0 dB. Valid for 8 dB sloped response with CENELEC raster.

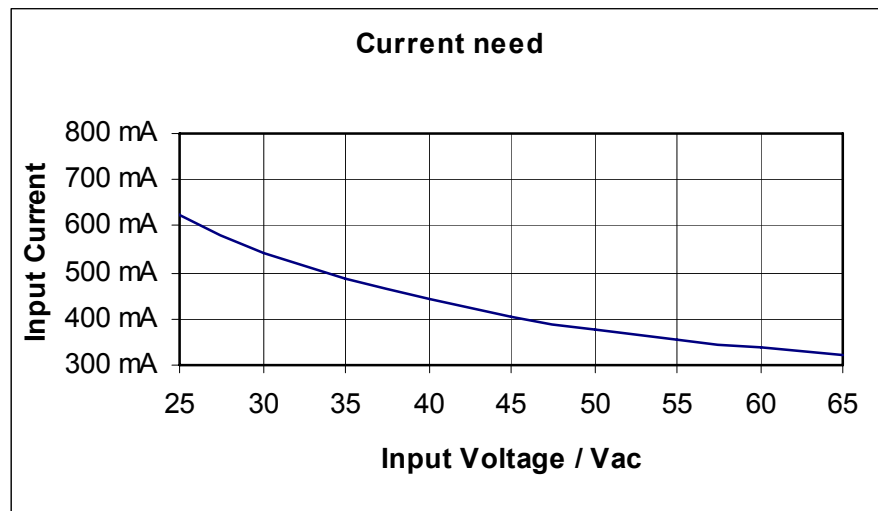


The change of CTB / CSO / NF values when the gain is adjusted with mid-stage attenuator from 33.0 to 23.0 dB. Valid for 8 dB sloped response with CENELEC raster.

- 11) Measured with 77 and 110 NTSC channels. Amplifier output was 12 dB linearly sloped and the used levels were at 55 / 550 / 750 / 862 MHz 35.0 / 42.5 / 45.5 / 47.0 dBmV. All results are typical values in room temperature, which can be used in system calculations. XMOD is measured at 55.25 MHz. The high end of the frequency band up to 862 MHz was fulfilled with QAM channels having a level of -6 dB relative to analogue CW carriers. The highest recommended output level for the amplifier is 49 dBmV with 110 channels and 51 dBmV with 77 channels.
- 12) Here are listed the values with flat output and 42 channels. Conditions are like in note 9. Values are valid for both gain modes.

CTB:	110.0 dBuV
CSO:	115.0 dBuV
XMOD:	108.0 dBuV
- 13) Valid over the band 7...65 MHz.
- 14) Active (CXR200) / passive (AC6140) return module. Other pads are 0 dB modules.
- 15) The gain can be adjusted with the plugs of JDA9xx series.
- 16) The pivot point is at 65 MHz. In 30 MHz operation the control range is 2.5 lower. This means that the reached maximum gain in 30 MHz operation is 2.5 dB lower when maximum slope is used. The slope is adjusted with the plugs of JDA9xx series.
- 17) 0 dB is the attenuation between return input connector and TP. Valid with CXR200 and AC6120.
- 18) Typical values, which can be used in network design. Valid with the active module CXR200.
- 19) 70 dB hum value is valid at any frequency from 10 to 862 MHz, when the remote current is less than 6.0 A / port. 7.0 A is the maximum current, which can be locally injected into all ports together.
With f-type connector it is recommended that the current is less than 2 A / port.
- 20) Valid with the active return path. With the passive return path the value is 2.0 W lower.

21)

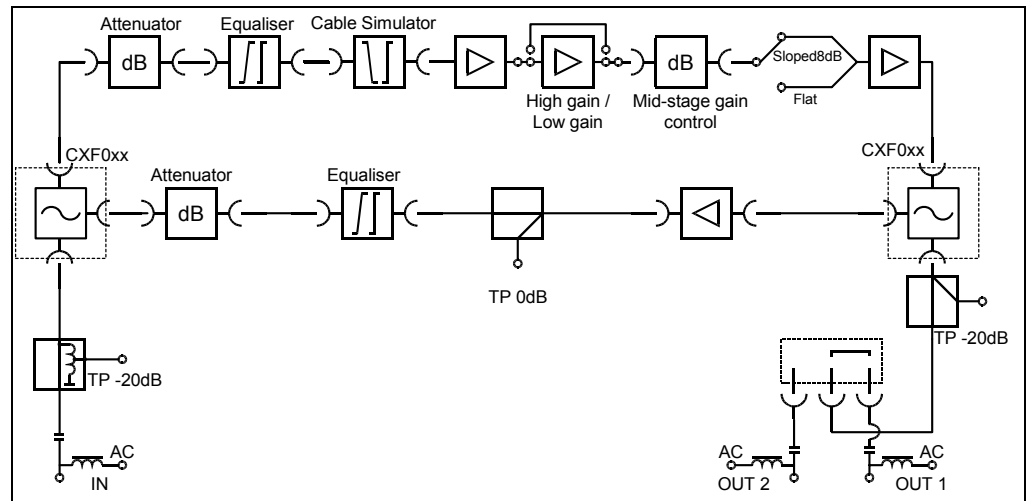


AC-current with the active return module (39.0 dB version).

22) EN61000-4-2, contact discharge to enclosure and RF-ports.

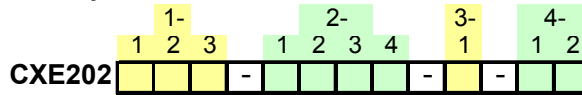
23) EN61000-4-5, 1.2 / 50 μ s pulse to RF-ports.

Block diagram



Ordering information

CXE202 configuration map



1-1 Input connection	
A	PG11
B	5/8"
C	IEC
D	3.5/12
E	F
1-2 Output 1 connection (first from right)	
A	PG11
B	5/8"
C	IEC
D	3.5/12
E	F
1-3 Output 2 connection	
A	PG11
B	5/8"
C	IEC
D	3.5/12
E	F
X	None (PG11 sealing plug)

3-1 Return path unit	
A	Active return 22 dB (CXR200) without att. and equal.
B	Active return 22 dB (CXR200) with 0 dB att. and equal. (2 x JDA900)
C	Passive return (AC6140) without att. and equal.
D	Passive return (AC6140) with 0 dB att. and equal. (2 x JDA900)
X	None

4-1 Power supply	
A	Local powering, euro plug (230 VAC)
B	Remote powering (65 VAC)
C	Remote powering with cable clamp (65 VAC)
D	Local powering, UK plug (230 VAC)
4-2 Amplifier type	
B	33/39 dB, universal amplifier

2-1 Diplexer filters	
A	30/47 MHz (2 x CXF030)
B	42/54 MHz (2 x CXF042)
C	50/70 MHz (2 x CXF050)
D	65/85 MHz (2 x CXF065)
E	65/85 MHz (CXF065 + CXF065 18)
K	Forward path jumper (2 x CXF000)
X	None
2-2 Input attenuator and equaliser	
B	1 x 0 dB plug (JDA900, cable simulator)
C	3 x 0 dB plugs (3 x JDA900)
X	None
2-3 Interstage attenuation	
A	0 dB (JDA900)
B	2 dB (JDA902)
C	4 dB (JDA904)
D	6 dB (JDA906)
E	8 dB (JDA908)
X	None
2-4 Output module	
A	0 dB, 1 output in use (AC6120)
B	Splitter -3.7 dB, 2 outputs in use (AC6124)
C	Tap -8 dB, 2 outputs in use (AC6128)
D	Tap -12 dB, 2 outputs in use (AC6112)
E	Tap -16 dB, 2 outputs in use (AC6116)
F	Tap -20 dB, 2 outputs in use (AC6119)
X	None

DOC0012066, Rev006 Preliminary