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## CX3 1.2 GHZ UNIVERSAL AMPLIFIER



The CX3 is a compact dual output amplifier. It has two gain and slope modes that make this product universal. Output performance meets the requirements of forward and return path DOCSIS 3.1 signals.

Adjustments are using electrical circuits that are controlled with push buttons. A high gain return amplifier with pivot frequency variable slope control is fixed built on the mother board.

### Features

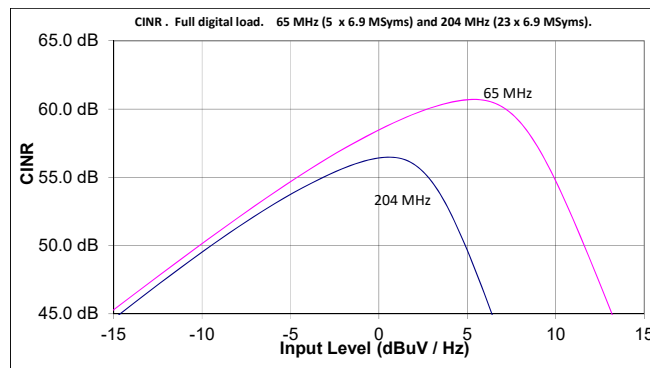
- Electrical adjustments
- 1.2 GHz forward path
- GaN technology
- 65/85/204 MHz return channel
- High gain / low gain selection
- Flat / sloped output selection
- Push buttons and LED indication for adjustments
- Cable simulator option at input
- 2 output ports

## Technical specifications

Parameter	Specification	Note
<b>Downstream signal path ( all values with the diplex filters, 0 dB output plug)</b>		
Frequency range	85...1218 MHz	
Return loss	18 dB	1)
Gain	43.0 dB	2)
Input attenuator control range	0...- 20 dB	3)
Input equaliser control range	0...20 dB	3)4)
Cable simulator	0 / -13 dB	4)
Mid-stage slope	13 / 0 dB	4)
Mid-stage gain selection	43.0 / 35.0 dB	
Flatness	± 0.5 dB	5)
Test point	20 dB	6)
Group delay	2 ns	7)
Noise figure @ 1218 MHz, flat, high gain	< 9.0 dB	
Noise figure @ 1218 MHz, flat, low gain	< 10.0 dB	
U <sub>max</sub> (138 QAM channels) @1.2 GHz	> 110.0 dBuV	8)
CTB 41 channels	> 116.0 dBμV	9)
CSO 41 channels	> 117.0 dBμV	9)
<b>Upstream signal path ( all values with the diplex filters)</b>		
Frequency range	5...204 MHz	
Return loss	18 dB	
Gain	28 dB	10)
Gain control range (output)	0...-20 dB	3)
Slope control range	0...15 dB	3)11)
Flatness	± 0.5 dB	
Noise figure (@high gain)	< 6.5 dB	
CINR	see curves	12)
<b>General</b>		
Hum modulation	65 dB	13)
Maximum feed through current	7 A	14)
Supply voltage	180...255 VAC / 28...65 VAC	
Power consumption	18.0 W	
Input / Output connectors	F- female / 5/8"	
Test point connector	F- male	
Dimensions (appr.)	22 x 21 x 8 cm	
Weight	2.1 kg	
Operating temp	-40...+55 °C	
Class of enclosure	IP67	15)
EMC compatibility	EN 60728 -2	
Safety	EN 60728 -11	
ESD	4 kV	16)
Surge	6 kV (EN 60728-3)	

## Notes

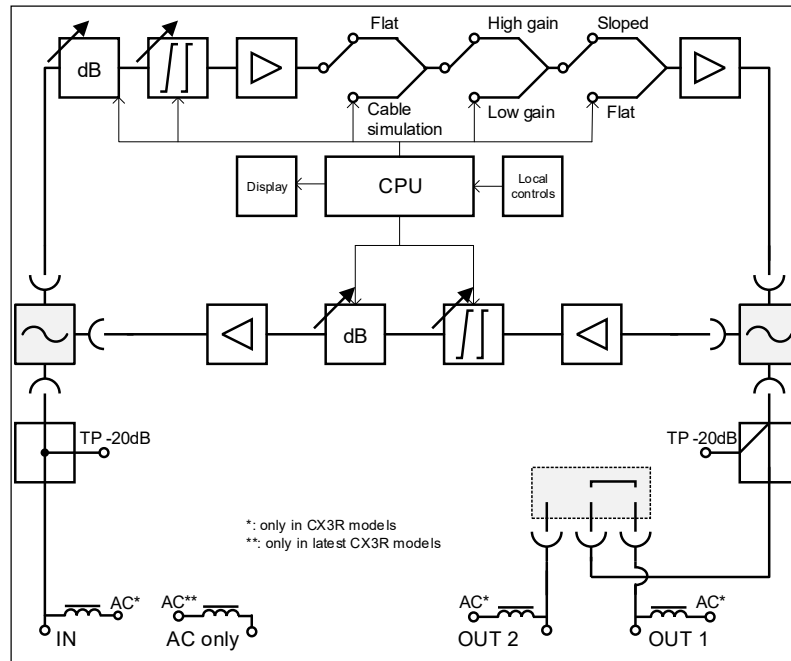
- 1) The limiting curve is defined at 80 MHz -2.0 dB / octave, at least 12 dB.
- 2) This is the nominal gain at 1218 MHz. Guaranteed minimum gain is 42.0 dB.
- 3) Step size is 0.5 dB.
- 4) Defined between 85...1218 MHz.
- 5) Typical value. The guaranteed value is  $\pm 0.9$  dB.
- 6) Output TP is from a directional coupler and has a  $\pm 1.0$  dB tolerance. Input TP is a transformer type and it is having an accuracy of  $\pm 2.0$ .
- 7) Typical value for 4.43 MHz band , when  $f > 130$  MHz.
- 8) Typical performance according to IEC60728-3. Full digital loading up to 1218 MHz was used. 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...1218 MHz.  
Local powered amplifiers manufactured before March 2020 have 106.5 dB $\mu$ V Umax value.
- 9) According to EN50083-3. Amplifier output was 13 dB sloped between 85...1218 MHz and high gain mode was used. Output level is defined highest channel 862 MHz.
- 10) Guaranteed minimum gain is 27.0 dB, maximum gain is 29.0 dB. Defined with 0 dB slope in 65 and 204 MHz configuration.
- 11) Pivot frequency can be selected between 204 MHz and 85 MHz.
- 12)



Measurement is done at 49 MHz in 65 MHz case and at 113 MHz in 204 MHz case.

- 13) With 5 A current between 10...1218 MHz.
- 14) Valid only in 65 VAC powered version.
- 15) Housing itself is IP67, but when 230 VAC product is in question, classification is IP54.
- 16) EN61000-4-2, contact discharge to enclosure and RF-ports.

Block diagram



\*\*: CX3 remote powered models have an additional local power feeding port since 2020 that can be used for inserting 28...65 V AC directly to the CX3 amplifier. The local power feeding port "AC-only" requires use of optional KDP001 power inserter for EMC safe operation"

Ordering

Availability of each item and delivery time must be checked before ordering.

Ordering code	Product	Configuration (installed)	Package contents
CX3L065	1,2 GHz Amplifier 230 VAC	2 x CXD065, 2 x F female adapter, 1 x 5/8 sealing adapter, 1 x CXM1 output jumper	1 x F female adapter, 1 x CXM4 output splitter
CX3R065	1,2 GHz Amplifier 65 VAC	2 x CXD065, 2 x 5/8 sealing adapter, 1 x CXM1 output jumper	1 x CXM4 output splitter module
CX3L085	1,2 GHz Amplifier 230 VAC	2 x CXD085, 2 x F female adapter, 1 x 5/8 sealing adapter, 1 x CXM1 output jumper	1 x F female adapter, 1 x CXM4 output splitter
CX3R085	1,2 GHz Amplifier 65 VAC	2 x CXD085, 2 x 5/8 sealing adapter, 1 x CXM1 output jumper	1 x CXM4 output splitter module
CX3R085A	1,2 GHz Amplifier 65 VAC This is a special customer model	2 x CXD085, 1 x 5/8 sealing adapter, 3x3.5/12 adapters, CXM4 splitter, special label inside of the lid	CXM1 output jumper
CX3L204	1,2 GHz Amplifier 230 VAC	2 x CXD204, 2 x F female adapter, 1 x 5/8 sealing adapter, 1 x CXM1 output jumper	1 x F female adapter, 1 x CXM4 output splitter
CX3R204	1,2 GHz Amplifier 65 VAC	2 x CXD204, 2 x 5/8 sealing adapter, 1 x CXM1 output jumper	1 x CXM4 output splitter module
CXD065	Diplex filter 65/85 MHz		
CXD085	Diplex filter 85/105 MHz		
CXD204	Diplex filter 204/258 MHz		
CXM1	0 dB output jumper		
CXM4	splitter module		
CXM8	8 dB tap module		
CXM14	14 dB tap module		
KDP001	65 VAC power inserter		