

E3 1.2 GHZ COMPACT AMPLIFIER



E3 is a single active output intelligent amplifier. The output amplifier stage uses high performance GaN amplifier, making the usable output level range especially wide.

DOCSIS 3.1 and OFDM requirements have been taken in account in this product. The downstream frequency band reaches 1.2 GHz which ensures fulfilment of all future bandwidth needs. The upstream signal path is flexible and it can be updated to 204 MHz.

E3 has a slot for plug-in RIS module. It can be equipped with E61 RIS receiver module which adds ingress switch remote control and USB connector for local configuration with a PC or mobile device. Another option is E62 transponder, which is identical to E61 but contains also return path monitoring transmitter.

Features

- 1.2 GHz 2nd generation GaN technology
- Return path supports 204 MHz bandwidth
- RFF feature helps in return path alignment
- Electrical adjustments with pushbuttons and display
- Intelligent cable simulator at input
- Intelligent return path re-alignment after bandwidth change
- Optional PC, tablet or smartphone control via Bluetooth or USB (E61 & E62)
- Optional RIS receiver for remote ingress switch control (E61 & E62)
- Optional monitoring transmitter (E62)
- Power saving mode
- Excellent ESD and surge protection

Technical specifications

Downstream signal path

Frequency range	85...1218 MHz	
Return loss	20 dB	1)
Maximum gain	42.0 dB	2)
Gain control range	-26...0 dB	3)
Input slope control range	-13...20 dB	3)
Interstage slope control range	0...15 dB	4)
Flatness	±0.5 dB	5)
Test point	20 dB	6)
Group delay	2 ns	
Noise figure	8.5 dB	7)
U _{max} (112 QAM channels) @1.0 GHz	113.5 dBμV	8)
U _{max} (138 QAM channels) @1.2 GHz	110.5 dBμV	9)
CINR	See curves	10)
CTB 41 channels	116.5 dBμV	11)
CSO 41 channels	116.5 dBμV	11)

Upstream signal path

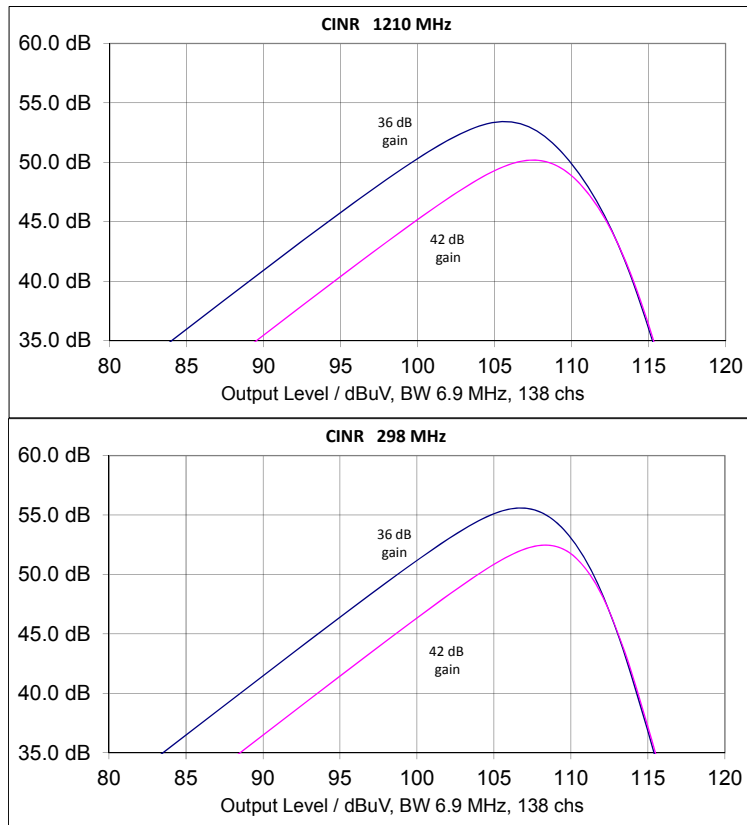
Frequency range	5...65 / 85 / 204 MHz	
Return loss	18 dB	12)
Gain	28 dB	
Gain control range	-20...0 dB	13)
Input gain control	0 / -10 dB	
Ingress switching	0 / -6 / < -40 dB	
Slope control range	0...15 dB	14)
Flatness	±0.5 dB	
Noise figure	< 6.0 dB	15)
CINR	See curves	16)

General

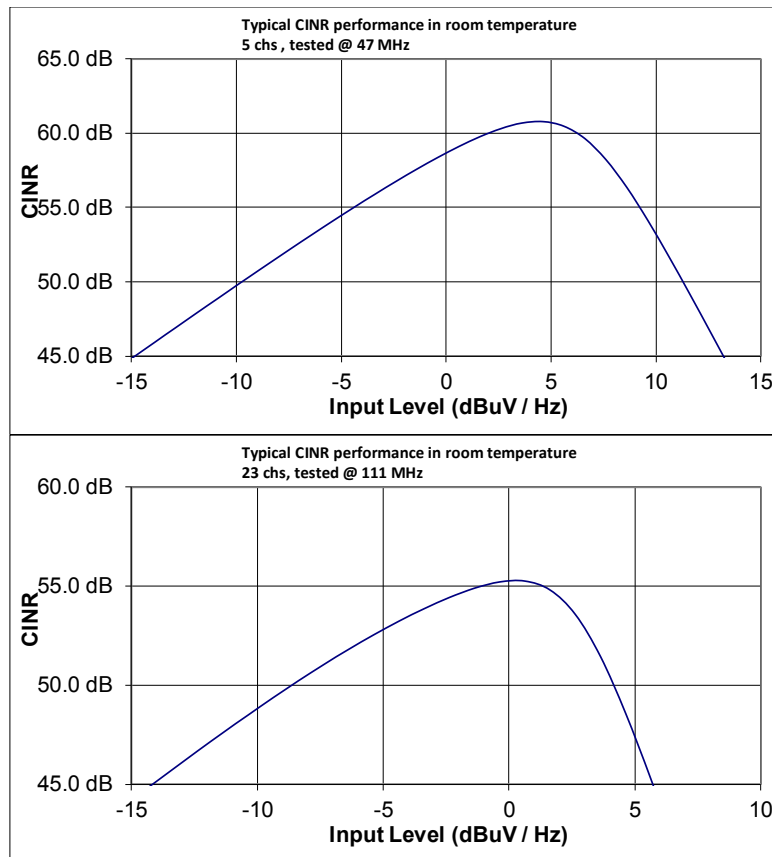
Supply voltage	27...65 / 205...255 Vac	
Power consumption	17 / 14 W	17)
Maximum current feed through	7 A / port	
Hum modulation	70 dB	18)
Input / Output connectors	F female, other types available	
Test point connector	F female	
Dimensions	18.5(21.5) x 16.0(19.0) x 7.5 cm	
Weight	1.5 kg	
Operating temp	-40...+55 °C	
Class of enclosure	IP54	19)
EMC compatibility	IEC 60728 -2	
Safety	EN 60728 -11	
ESD	4 kV	20)
Surge	6 kV (EN 60728-3)	

Notes

- 1) The limiting curve is defined at 40 MHz -2.0 dB / octave. Always better than 12 dB.
- 2) This is a nominal gain in room temperature at highest frequency. Gain is defined from port to port with 2 diplex filters and 0 dB output module installed. Guaranteed gain is 41.0 dB.
- 3) Electrical control with 0.5 dB step. Built-in 13 dB cable simulator is activated automatically when slope is adjusted to negative values.
- 4) Slope is defined between 85...1218 MHz.
 1st generation E3 has 0 / 13 dB selectable slope.
 2nd generation E3 has 0...15 dB adjustable slope with step size 1 dB.
- 5) Typical value. Guaranteed value is ± 0.9 dB. Flatness is defined with 13 dB slope, diplex filters and 0 dB output module. Specification is valid 5 MHz after the starting frequency of the selected diplex filter.
- 6) Output TP has a tolerance of ± 0.75 dB between 85...1006 MHz and ± 1.0 dB between 1006...1218 MHz. The TP is defined with 0 dB plug at output. Input TP is a transformer type with ± 1.5 dB tolerance. This TP can be used also as an injection point for a test signal of return channel.
- 7) Typical value with nominal settings. Guaranteed value is 1.0 dB worse.
- 8) Typical value according to IEC60728-3. Nominal slope in use and signal level has been defined at 1002 MHz. BER measurement has been done on the worst channel between 110...1006 MHz. In power save mode output level is reduced 1 dB.
- 9) Typical value according to IEC60728-3. Nominal slope in use and signal level has been defined at 1210 MHz. BER measurement has been done on the worst channel between 110...1218 MHz. In power save mode output level is reduced 1 dB.
- 10) CINR according to IEC60728-3. Full digital loading up to 1218 MHz.

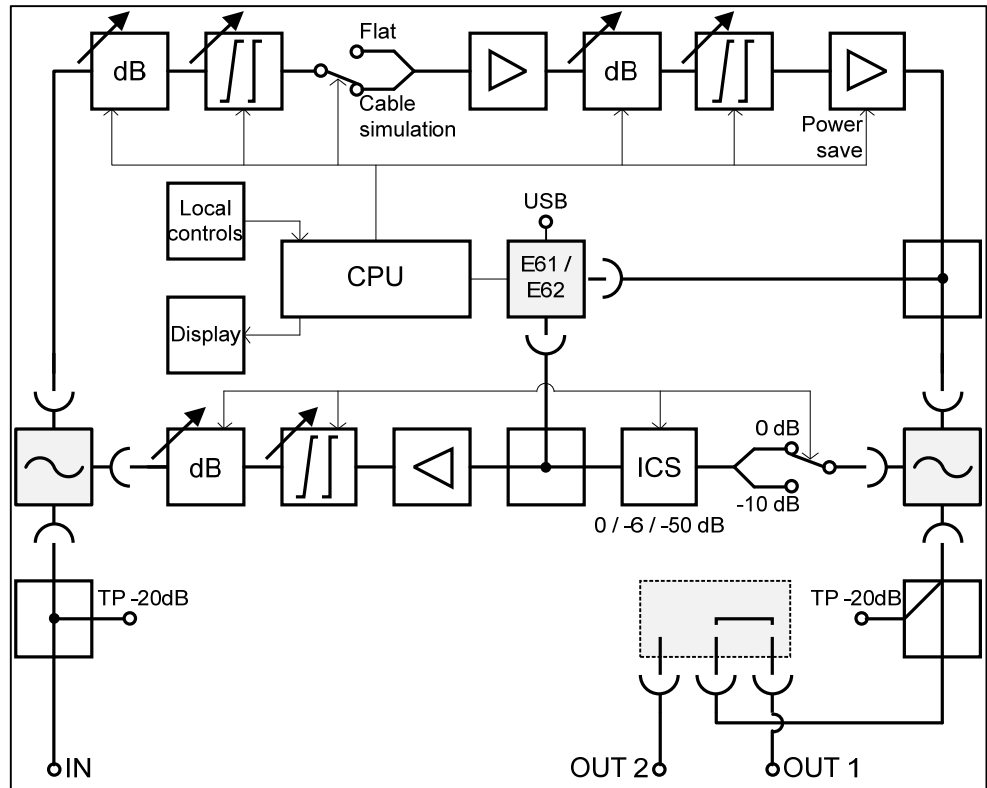


- 11) According to IEC60728-3. Tested with nominal gain and slope. Signal level is defined at 862 MHz. All results are typical values in room temperature.
- 12) $8 \text{ MHz} < f < 80 \text{ MHz}$, $f > 80 \text{ MHz}$ -1.5 dB / octave.
- 13) Electrical control with 0.5 dB step.
- 14) Electrical control with 0.5 dB step. Pivot point of slope control is set automatically based on selected diplexers to either 85 MHz or 204 MHz.
- 15) Guaranteed value is 1 dB worse.
- 16) CINR according to IEC60728-3.



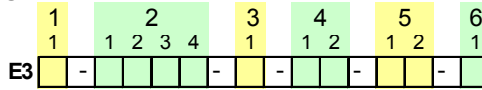
- 17) Without RIS module.
Power consumption is reduced by 3.0 W in Power Save mode.
- 18) At any frequency from 15 to 1218 MHz when the remote current is less than 7 A. HUM is defined for one port. Locally powered amplifier has no separate power injection port, thus powering is possible only through RF ports.
- 19) 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. Thus the practical enclosure class is IP54.
- 20) EN61000-4-2, contact discharge to enclosure and RF-ports.

Block diagram



Ordering

E3 configuration map



1-1 Gain and power supply
A 42 dB , 65 VAC PSU
C Customer specific option
D 42 dB , 230 VAC PSU

2-1 Input connection (first from left)
A PG11
B 5/8"
C IEC
D 3.5/12
E F
K Customer specific option

2-2 2nd port from left
X None (PG11 sealing plug)

2-3 Output 2 connection
A PG11
B 5/8"
C IEC
D 3.5/12
E F
K Customer specific option
X None (PG11 sealing plug)

2-4 Output 1 connection (first from right)
A PG11
B 5/8"
C IEC
D 3.5/12
E F
K Customer specific option

3-1 Diplexers
A 65/85 MHz (2 x CXF065)
B 85/105 MHz (2 x CXF085)
C 204/258 MHz (2 x CXF204)
D 204/258 MHz (1x CXF204)
E 65/85 MHz (CXF065 +CXF065 10)
F 65/85 MHz (CXF065 +CXF065 19)
X None

4-1 Output module
A 0 dB (AC6120)
B Splitter (AC6124)
X None

4-2 RIS module
A E61
B E62
X None

5-1 Software
A Factory default

5-2 Settings
A Factory default

6-1 Customer specific selections
B Customer specific option
C Ventilation hole closed
X None

DOC0032279, Rev011