

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 monitoring transmitter, lid sensor and RF power measurement.

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
- Adjustable cable simulator at input
- Intelligent return path re-alignment after bandwidth change
- Power saving mode
- Excellent ESD and surge protection
- Local 65 VAC injection port
- Optional PC, tablet or smartphone control via BT or USB (E61 & E62)
- Optional RIS receiver for remote ingress switch control (E61 & E62)
- Optional lid sensor and monitoring transmitter (E62)
- Optional RF power measurement with automatic power save control, automatic alignment and ALSC (E62)

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} (138 QAM channels) @1.2 GHz	110.5 dBμV	8)
CINR (CCN)	See curves	9)

Upstream signal path

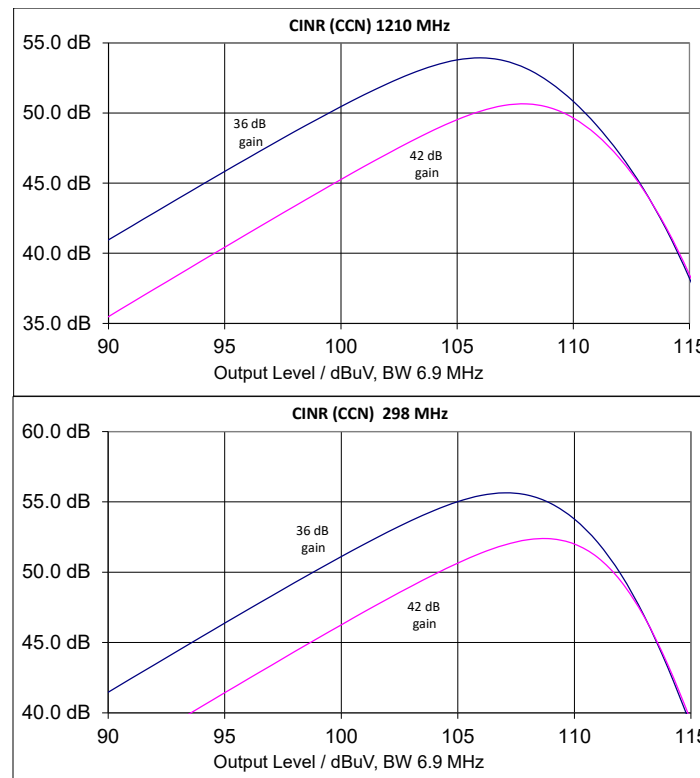
Frequency range	5...65 / 85 / 204 MHz	
Return loss	18 dB	10)
Gain	28 dB	
Gain control range	-20...0 dB	11)
Input gain control	0 / -10 dB	
Ingress switching	0 / -6 / < -40 dB	
Slope control range	0...15 dB	12)
Flatness	±0.5 dB	
Noise figure	< 6.0 dB	13)
CINR	See curves	14)

General

Supply voltage	27...65 / 205...255 Vac	
Power consumption	17 / 14 W	15)
Maximum current feed through	7 A / RF port	16)
Hum modulation	70 dB	17)
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	18)
EMC compatibility	IEC 60728 -2	
Safety	EN 60728 -11	
ESD	4 kV	19)
Surge	6 kV (EN 60728-3)	

Notes

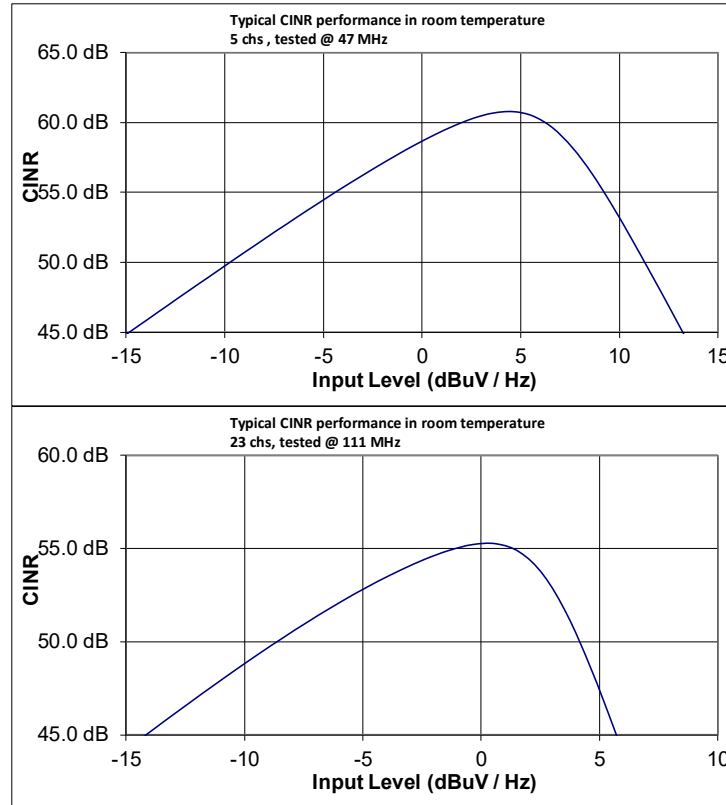
- 1) The limiting curve is defined at 40 MHz -2.0 dB / octave. Always better than 12 dB.
- 2) This is a nominal gain in room temperature at highest frequency. Gain is defined from port to port with 2 diplex filters and 0 dB output module installed. Guaranteed gain is 41.0 dB.
- 3) Electrical control with step size 0.5 dB step.
Adjustable cable simulator is used for negative input slope values.
- 4) Slope is defined between 85...1218 MHz. Electrical control 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 1210 MHz. BER measurement has been done on the worst channel between 110...1218 MHz. In power save mode output level is reduced by 1 dB.
- 9) CINR according to IEC60728-3. Full digital loading up to 1218 MHz.



- 10) $8 \text{ MHz} < f < 80 \text{ MHz}$, $f > 80 \text{ MHz}$ -1.5 dB / octave.
- 11) Electrical control with 0.5 dB step.
- 12) 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.

13) Guaranteed value is 1 dB worse.

14) CINR according to IEC60728-3.



15) Without RIS module.

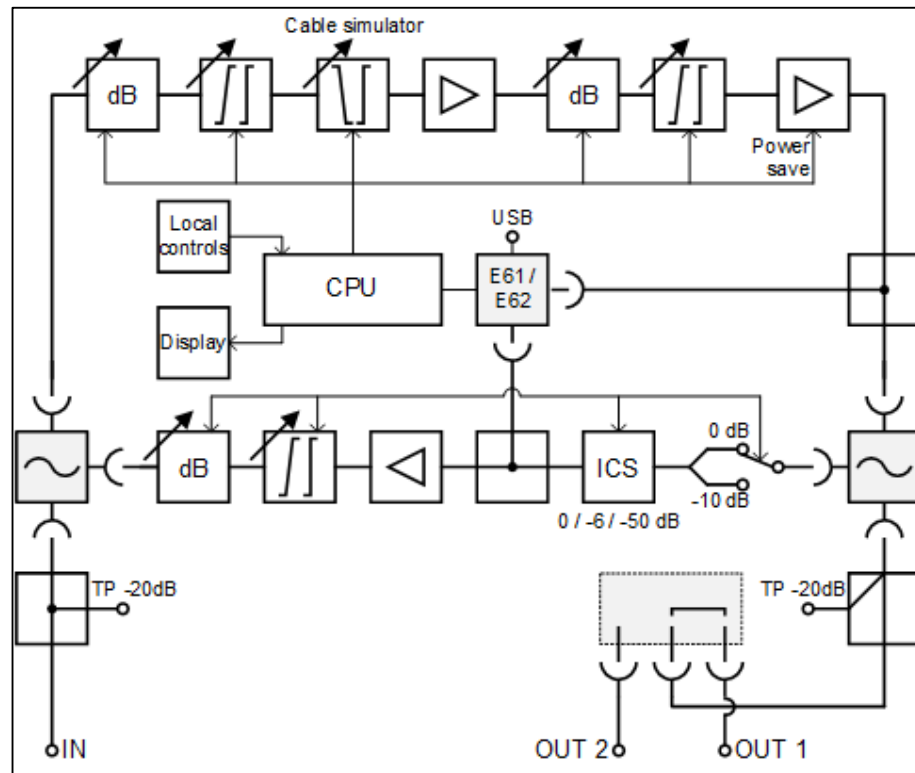
Power consumption is reduced by 3.0 W in Power Save mode.

16) 5 A is the maximum current that can be fed locally through side port at PSU (Gain and power supply selection G).

17) At any frequency from 15 to 1218 MHz when the remote current is less than 7 A. HUM is defined for one RF port.

18) 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.

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

Block diagram

Ordering

E3 configuration map

1	2	3	4	5	6
1	1 2 3 4	1	1 2	1 2	1
E3	-	-	-	-	-

1-1 Gain and power supply
F 42 dB, 230 VAC PSU 3rd gen
G 42 dB, 65 VAC PSU 3rd gen

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 (PG11sealing 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 (PG11sealing 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 S)
C 204/258 MHz (2 x CXF204)
D 204/258 MHz (1 x CXF204)
E 65/85 MHz (CXF065 + CXF065 10)
F 65/85 MHz (CXF065 + CXF065 19)
G 204/258 MHz (CXF204 + CXF204 UA6)
H 85/105 MHz (CXF085 S + CXF085 19)
I 204/258 MHz (CXF204 + CXF204 10)
J 204/258 MHz (CXF204 + CXF204 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, Rev024

This specification refers to Gain and power supply selections (1-1) E,F&G (3rd gen.). Specification versions lower than 3.0 are valid for selections A,B,C&D.

Gain and power supply selections (1-1) A&B (1st gen.) with 0/13 dB selectable interstage slope and cable simulator.

Selections C&D (2nd gen.) with 0...15 dB adjustable interstage slope control instead of selectable 0/13 dB control.

Selections (1-1) E,F&G (3rd gen.) has 0...13 dB adjustable cable simulator instead of selectable 0/13 dB. Selection G has also a local 65 VAC feeding port.