E8 1.2 GHZ COMPACT OPTICAL NODE

E8 is a single active output intelligent node. The node is based on a fixed receiver and upstream transmitter. 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.

E8 has an optional USB connector for local configuration with a PC or mobile device.

Ingress switches are remotely controllable via FSK communication of an optional RIS module. This one way communication channel also enables remote update of software.

Features

- 1.2 GHz GaN technology
- Return path supports 204 MHz bandwidth
- Optical AGC (OLC)
- Electrical adjustments with pushbuttons and display
- Optional PC, tablet or smartphone control via Bluetooth or USB
- Optional RIS receiver for remote ingress switch control
- Power saving mode
- Excellent ESD and surge protection

Features in 2nd gen. version. Available in Q2/2018

- Selectable burst mode (RFoG)
- Adjustable mid-stage slope
- Internal WDM filter option

Technical specifications

Parameter	Specification	
Downstream signal path		
Light wavelength	1270…1610 nm	
Optical input power range	-7…+1 dBm	
Frequency range	85...1218 MHz	
Return loss	20 dB	1)
Gain limited output level	118 dBµV	2)
OLC gain control	0…-20 dB	
Interstage gain control	0…-20 dB	3)
Slope selection	0 / 13 dB	4)
Flatness	±0.5 dB	5)
Group delay	2 ns	6)
Test point	-20 dB	7)
Noise current density	4.5 pA/√Hz	8)
$U_{max(112\ QAM\ channels)}$ @1.0 GHz	113.5 dBµV	9)
$U_{max(138\ QAM\ channels)}$ @1.2 GHz	110.5 dBµV	10)
CTB 41channels	117.0 dBµV	11)
CSO 41channels	118.0 dBµV	11)
Upstream signal path		
Output power	+ 3 dBm	12)
Frequency range	5... 65/85/204 MHz	
Return loss	18 dB	
Ingress switching	0 / -6 / < -45 dB	
Input level	61 dBµV	13)
CINR	See curves	14)
Level control	-20…0 dB	3)
OMI test point	-5 dB	15)
Burst mode (*Not available today*)		
Laser ON delay	1 µs	16)
Laser ON min. level	63 dBµV	17)
General		
Supply voltages	27...65 Vac (*Not available today*) / 205…255 Vac	
Power consumption	18.0 / 15 W	18)
Maximum current feed through	7 A / port	
Hum modulation	70 dB	19)
Optical connectors	SC/APC	
Input / Output connectors	IEC / F- female configurable	
Test point connectors	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	20)
EMC compatibility	EN 60728 -2	
Safety	EN 60728 -11	
ESD	4 kV	21)
Surge	6 kV (EN 60728-3)	

Notes

1) The limiting curve is defined at 40 MHz -2.0 dB / octave. Return loss is always > 12 dB.

2) Conditions are: OMI 4.0 %, input power of -7 dBm and wavelength is 1310 nm.

3) Step size 0.5 dB..

4) Value defined between 85…1218 MHz. Flatness is specified in sloped mode.

5) Typical value in room temperature. Guaranteed value is ±0.9 dB.

6) Typical value for 4.43 MHz band. Measured at channel S2 when 65 or 85 MHz return path is in use. At higher frequencies the performance is better.

7) TP has a tolerance of ±0.75 dB between 85…862 MHz and ±1.0 dB between 862…1218 MHz.

8) Typical value.

9) Typical value according to IEC60728-3-1. Channels have 13 dB cable equivalent slope between 85…1218 MHz and signal level has been defined at 1002 MHz. BER measurement has been done on the worst channel between 110…1006 MHz.

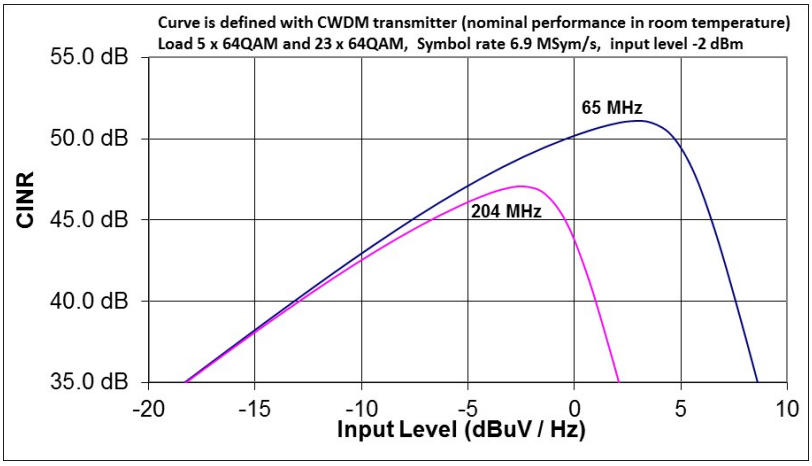
10) Typical value. Channels have 13 dB cable equivalent slope between 85…1218 MHz and signal level has been defined at 1210 MHz. BER measurement has been done on the worst channel between 110…1214 MHz.

11) IEC 60728-3. Channels have 8 dB cable equivalent slope between 85…862 MHz and signal level has been defined at 862 MHz. Optical input level -3 dBm. All results are typical values in room temperature.

12) FP laser has output power of +1 dBm.

13) Nominal return path input level for 4.0 % OMI. 0 dB input attenuator in use.

14) CINR



15) Valid when ingress switch and level control are at 0 dB.
The nominal value at this TP is 56 dBµV when OMI is set to 4 %. Tested at 20 MHz.

16) Typically. Guaranteed value is 1.3 µs.

17) Switch OFF level is 11 dB lower. 0 dB input attenuator in use. The level is valid for one return path signal. When more signals are in use, level for one signal is respectively lower.

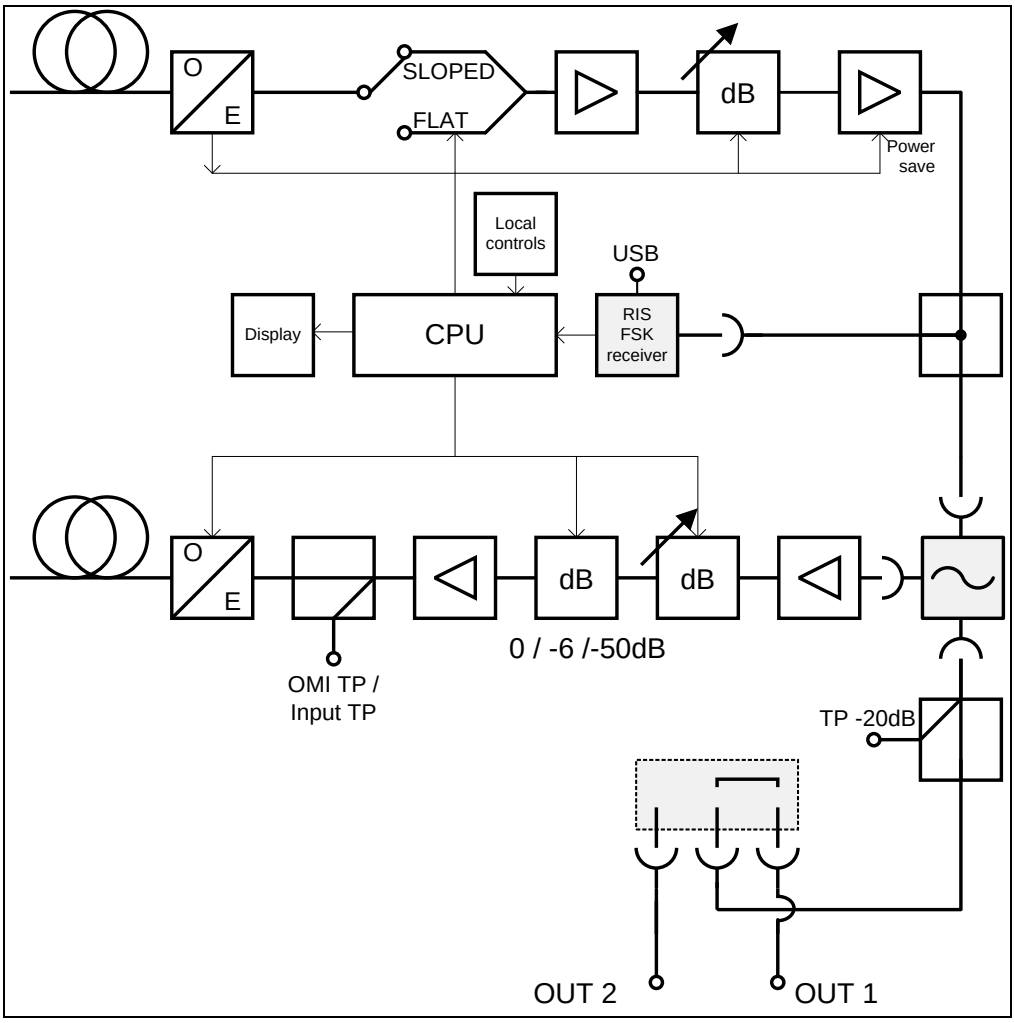
18) Without an RIS receiver.
Power consumption is 15 W in Power Save mode

19) At any frequency from 15 to 1218 MHz when the remote current is less than 6 A. HUM is defined for one port.

20) 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.

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

Block diagram

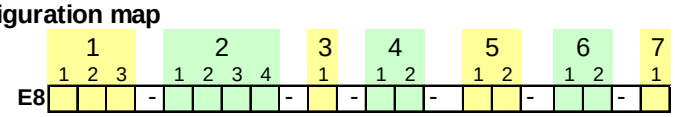


Compatibility

All accessories that will be used together with this product, should use the latest version available. By using only up-to-date accessories a proper operation can be ensured.

Ordering information

E8 configuration map



1-1 Platform	
A	1.2 GHz GaN, 65 VAC PSU
B	1.2 GHz GaN, 230 VAC PSU
1-2 Future reservation	
X	None
1-3 Future reservation	
X	None

2-1 Optical connector for TX (first from left)	
A	SC/APC, 8 deg.
X	None (no TX in use)
2-2 Optical connector for RX (2nd from left)	
A	SC/APC, 8 deg.
2-3 Output 2 connection	
A	PG11
B	5/8"
C	IEC
D	3.5/12
E	F
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

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

4-1 Return path TX	
27	CWDM 1270 nm
29	CWDM 1290 nm
31	CWDM 1310 nm
33	CWDM 1330 nm
35	CWDM 1350 nm
37	CWDM 1370 nm
39	CWDM 1390 nm
40	FP 1310 nm
41	CWDM 1410 nm
43	CWDM 1430 nm
45	DFB 1310 nm
46	CWDM 1450 nm
47	CWDM 1470 nm
49	CWDM 1490 nm
51	CWDM 1510 nm
53	CWDM 1530 nm
55	CWDM 1550 nm
57	CWDM 1570 nm
59	CWDM 1590 nm
61	CWDM 1610 nm
XX	None

5-1 Output module	
A	0 dB (AC6120)
B	Splitter (AC6124)
X	None
5-2 RIS module	
A	E61
X	None

6-1 Softaware	
A	Factory default
6-2 Settings	
A	Factory default

7-1 Future reservation	
X	None

DOC0032712, Rev004