

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 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

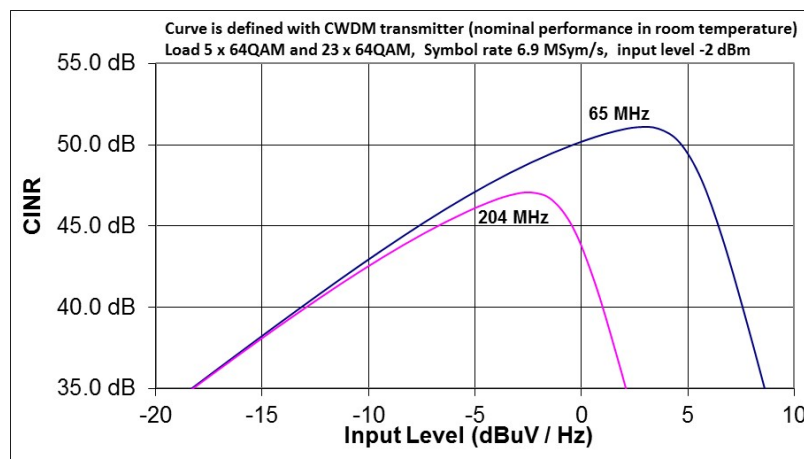
- 1.2 GHz 2nd generation GaN technology
- Return path supports 204 MHz bandwidth
- Optical AGC (OLC)
- Electrical adjustments with pushbuttons and display
- Selectable burst mode (RFoG)
- Automatic laser clipping mitigation
- Internal WDM filter option
- Optional PC, tablet or smartphone control via 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

Parameter	Specification	
Downstream signal path		
Light wavelength	1270...1610 nm	
Optical input power range	-7...+1 dBm	1)
Frequency range	85...1218 MHz	
Return loss	20 dB	2)
Gain limited output level	118 dB μ V	3)
OLC gain control	-7...+1 dBm	
Gain control range	-20...0 dB	4)
Slope control range	0...15 dB	5)
Flatness	\pm 0.5 dB	6)
Group delay	2 ns	7)
Test point	-20 dB	8)
Noise current density	4.5 pA/ \sqrt Hz	9)
U _{max} (112 QAM channels) @1.0 GHz	113.5 dB μ V	10)
U _{max} (138 QAM channels) @1.2 GHz	110.5 dB μ V	11)
CTB 41channels	116.5 dB μ V	12)
CSO 41channels	116.5 dB μ V	12)
Upstream signal path		
Output power	+3 dBm	13)
Frequency range	5...65 / 85 / 204 MHz	
Return loss	18 dB	
Ingress switching	0 / -6 / < -45 dB	
Input level	61 dB μ V	14)
CINR	See curves	15)
Level control	-20...0 dB	4)
OMI test point	-5 dB	16)
Burst mode		
Laser ON delay	1 μ s	17)
Laser ON min. level	63 dB μ V	18)
General		
Supply voltages	27...65 Vac 205...255 Vac	
Power consumption	18 / 15 W	19)
Maximum current feed through	7 A / port	
Hum modulation	70 dB	20)
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	IP43	21)
EMC compatibility	IEC60728 -2	
Safety	EN 60728 -11	
ESD	4 kV	22)
Surge	6 kV (EN 60728-3)	

Notes

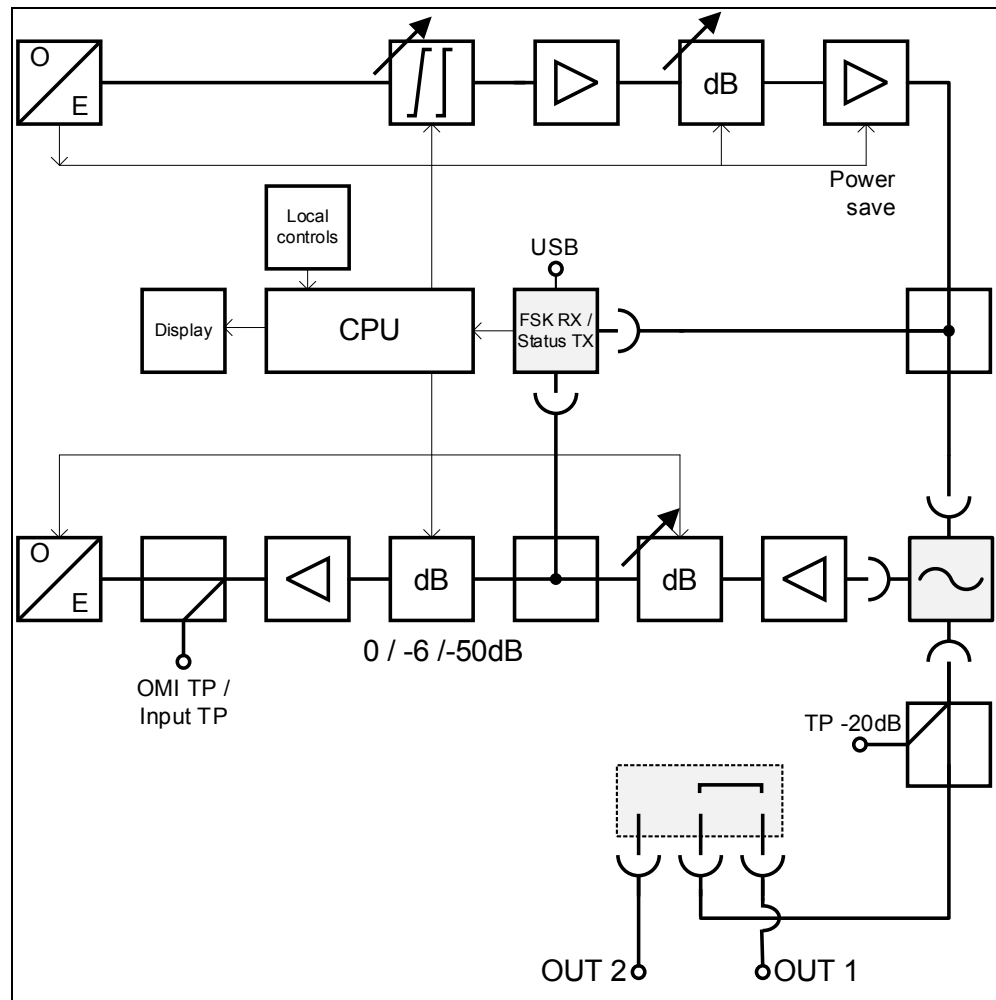
- 1) This range is valid without optical filters.
- 2) The limiting curve is defined at 40 MHz -2.0 dB / octave. Always better than 12 dB.
- 3) Conditions are: OMI 4.0 %, input power -7 dBm and wavelength 1310 nm.
- 4) Step size 0.5 dB.
- 5) Slope is defined between 85...1218 MHz.
1st generation E8 has 0 / 13 dB selectable slope.
2nd generation E8 has 0...15 dB adjustable slope with step size 1 dB.
- 6) Typical value. Guaranteed value is ± 0.9 dB. Flatness is specified with 13 dB slope.
- 7) 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.
- 8) TP has a tolerance of ± 0.75 dB between 85...862 MHz and ± 1.0 dB between 862...1218 MHz.
- 9) Typical value.
- 10) 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.
- 11) 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.
- 12) 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.
- 13) Spec is valid with and without optical filter.
- 14) Nominal return path input level for 4.0 % OMI. 0 dB input attenuator in use.
- 15) CINR



- 16) Valid when ingress switch and level control are at 0 dB.
The nominal value at this TP is 56 dB μ V when OMI is set to 4 %. Tested at 20 MHz.
- 17) Typical value. Guaranteed value is 1.3 μ s.
- 18) Laser OFF level is 11 dB lower. 0 dB input attenuator in use. The level is valid for a single return path signal. When more signals are in use, level for one signal is respectively lower.
- 19) Without RIS module.
Power consumption is reduced by 3.0 W in Power Save mode.

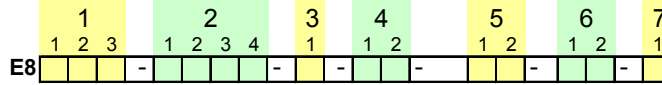
- 20) At any frequency from 15 to 1218 MHz when the remote current is less than 6 A. HUM is defined for one port.
This node has no separate power injection port at PSU, but powering is possible only through RF ports.
- 21) The node housing is tested to be class of IP67. However, external fibre adaptors are limiting IP class to be IP43.
- 22) EN61000-4-2, contact discharge to enclosure and RF-ports.

Block diagram



Ordering information

E8 configuration map



1-1 Platform	
C	1.2 GHz GaN, 65 VAC PSU, 2nd gen.
D	1.2 GHz GaN, 230 VAC PSU, 2nd gen.
1-2 Future reservation	
X	None
1-3 Optical filter	
A	WDM 1270...1360 (RX) / 1470...1610 (TX)
B	WDM 1544...1558 (RX) / 1270...1530 + 1570...1610 nm (TX)
X	None
2-1 Optical connector for TX or WDM (first from left)	
A	SC/APC, 8 deg.
X	None (no TX or WDM in use)
2-2 Optical connector for RX (2nd from left)	
A	SC/APC, 8 deg.
X	None
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)
G	204/258 MHz (CXF204 19)
X	None

4-1 Return path TX	
10	FP 1310 nm
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
41	CWDM 1410 nm
43	CWDM 1430 nm
45	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
B	E62
X	None
6-1 Software	
A	Factory default
6-2 Settings	
A	Factory default
7-1 Future reservation	
X	None