WaveCEx: WDM module for PON coexistence

GPON, XGS-PON, NG-PON2, RF, OTDR

*WaveCEx: WDM module for PON coexistence (CEx)**

Features

WDM module or coexistence element designed to enable the implementation of PON access network evolutions such as XGS-PON and NG-PON2. Designed for scenarios in which services are already offered using GPON and it is desired to deploy new FTTH access technologies, allowing not only the coexistence of all of them, but the OTDR and RF signals too.

GPON and NG-PON wavelengths:

- GPON: 1290-1330nm & 1480nm-1500nm
- XGS-PON: 1260-1280nm &1575nm-1580nm
- NG-PON2: 1524-1544nm & 1596-1603nm
- NG-PON2+PtP: NG-PON2 + 1603-1625 nm

OTDR and RF wavelengths:

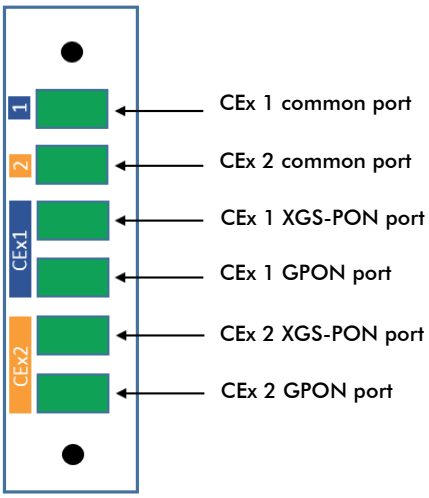
- OTDR: 1625-1675nm
- RF: 1550-1560nm

KEY FEATURE

Coexistence of new PON technologies:
Variety of WaveCEx modules for different coexistence scenarios between GPON and new PON generation (NG-PON), specifically XGS-PON and NG-PON2

WaveCEx

The device contains one or two WDM elements depending on the scenario. It allows the coexistence between xPON technologies such as GPON, XGS-PON and NG-PON2, including OTDR and RF video signals. Others wavelengths are not allowed through the WaveCEx.



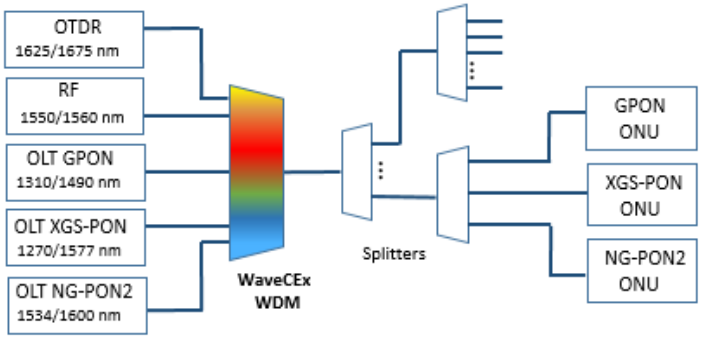
WaveCEx Scenario 1a

TELNET WaveCEx family

TELNET WaveCEx family is a variety of WDM modules for different coexistence scenarios between GPON, XGS-PON and NG-PON2 technologies, allowing the deployment of new generation technologies where it already is being offered services through GPON networks.

The WaveCEx device, in a LGX cassette, is installed between each OLT PON output port and the FTTH fiber. Depending on the coexistence scenario, some WaveCEx contain two coexistence modules per device, increasing the density and decreasing the number of devices and space required in the CPD.

This set of 12 WaveCex offers a variety of models in order to meet the needs of different scenarios:



Coexistence architecture for GPON, XGS-PON, NG-PON2, OTDR and RF technologies

- **WaveCEx 1a:** it allows the coexistence of GPON and XGS-PON technologies.
- **WaveCEx 1b:** it allows the coexistence of GPON, XGS-PON and OTDR systems.
- **WaveCEx 1c:** it allows the coexistence of GPON, XGS-PON and RF.
- **WaveCEx 1d:** it allows the coexistence of GPON, XGS-PON, OTDR and RF.
- **WaveCEx 2a:** it allows the coexistence of GPON, XGS-PON and NG-PON2 technologies.
- **WaveCEx 2b:** it allows the coexistence of GPON, XGS-PON, NG-PON2 and OTDR systems.
- **WaveCEx 2c:** it allows the coexistence of GPON, XGS-PON, NG-PON2 and RF.

Technical Specifications

- **WaveCEx 2d:** it allows the coexistence of GPON, XGS-PON, NG-PON2, OTDR and RF.
- **WaveCEx 2e:** it allows the coexistence of GPON, XGS-PON NG-PON2 + PtP and OTDR.
- **WaveCEx 2f:** it allows the coexistence of GPON, XGS-PON and NG-PON2+PtP technologies.
- **WaveCEx 2g:** it allows the coexistence of GPON and RF and NG-PON2 technologies.
- **WaveCEx 2h:** it allows the coexistence of GPON, RF and NG-PON2 technologies.

WaveCEx Scenario 1a	GPON and XGS-PON	2 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1 dB
Isolation	P Common <-> P GPON (XGS-PON wavelengths)	≤ 30 dB
	P Common <-> P XGS-PON (GPON wavelengths)	≤ 30 dB
Directivity	P GPON <-> P XGS-PON (GPON and XGS-PON wavelengths)	≤ 50 dB
Return Loss	All ports	≤ 55 dB
Polarization Sensitivity	Combination of all ports	Max. variation: 0.2 dB
Maximun Optical power		+23 dBm
Connector type		SC/APC

WaveCEx Scenario 1b	GPON, XGS-PON and OTDR	2 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.2 dB
	P Common <-> P OTDR (OTDR wavelength)	≤ 1.2 dB
Isolation	P Common <-> P GPON (XGS-PON and OTDR wavelengths)	≥ 30 dB
	P Common <-> P XGS-PON (GPON and OTDR wavelengths)	≥ 30 dB
	P Common <-> P OTDR (GPON and XGS-PON wavelengths)	≥ 15 dB
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Sensitivity	All ports combinations	Max. variation: 0.2 dB
Maximun Optical power		+23 dBm
Connector type		SC/APC

WaveCEx Scenario 1c	GPON, XGS-PON and RF	2 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.2 dB
	P Common <-> P RF (RF wavelength)	≤ 1 dB
Isolation	P Common <-> P GPON (XGS-PON and RF wavelengths)	≥ 30 dB
	P Common <-> P XGS-PON (GPON and RF wavelengths)	≥ 30 dB
	P Common <-> P RF (GPON and XGS-PON wavelengths)	NA
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Sensitivity	All ports combinations	Max. variation: 0.2 dB
Maximun Optical power		+23 dBm
Connector type		SC/APC

WaveCEx Scenario 1d	GPON, XGS-PON, OTDR and RF	1 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.2 dB
	P Common <-> P OTDR (OTDR wavelength)	≤ 1.6 dB
	P Common <-> P RF (RFwavelength)	≤ 1.1 dB
Isolation	P Common <-> P GPON (XGS-PON and RF wavelengths)	≥ 30 dB
	P Common <-> P XGS-PON (GPON and RF wavelengths)	≥ 30 dB
	P Common <-> P RF (GPON and XGS-PON wavelengths)	NA
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Sensitivity	All ports combinations	Max. variation: 0.2 dB
Maximun Optical power		+23 dBm
Connector type		SC/APC

Technical Specifications

WaveCEx Scenario 2a	GPON, XGS-PON, and NG-PON2	2 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.2 dB
	P Common <-> P NG-PON2 (NG-PON2 wavelengths)	≤ 1.2 dB
Isolation	P Common <-> P GPON (XGS-PON & NG-PON2 wavelengths)	≥ 30 dB
	P Common <-> P XGS-PON (GPON wavelengths)	≥ 30 dB
	P Common <-> P NG-PON2 (GPON and XGS-PON wavelengths)	≥ 30 dB
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Sensitivity	All port combinations	Max. variation: 0.2 dB
Maximun Optical power		+23 dBm
Connector type		SC/APC

WaveCEx Scenario 2b	GPON, XGS-PON, NG-PON2 and OTDR	1 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.2 dB
	P Common <-> P NG-PON2 (NG-PON2 wavelengths)	≤ 1.2 dB
	P Common <-> P OTDR (OTDR wavelengths)	≤ 1.6 dB
Isolation	P Common <-> P GPON (XGS-PON, NG-PON2, and OTDR wavelengths)	≥ 30 dB
	P Common <-> P XGS-PON (GPON, NG-PON2 and OTDR wavelengths)	≥ 30 dB
	P Common <-> P OTDR (GPON, XGS-PON and OTDR wavelengths)	≥ 30 dB
	P Common <-> P OTDR (GPON, XGS-PON and NG-PON2 wavelengths)	≥ 15 dB
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Sensitivity	All ports combinations	Max. variation: 0.2 dB
Maximun Optical power		+23 dBm
Connector type		SC/APC

WaveCEx Scenario 2c	GPON, XGS-PON, NG-PON2 and RF	1 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.2 dB
	P Common <-> P NG-PON2 (NG-PON2 wavelengths)	≤ 1.2 dB
	P Common <-> P RF (RF wavelengths)	≤ 1.1 dB
Isolation	P Common <-> P GPON (XGS-PON and NG-PON2 wavelengths)	≥ 30 dB
	P Common <-> P XGS-PON (GPON, NG-PON2 wavelengths)	≥ 30 dB
	P Common <-> P NG-PON2 (GPON, XGS-PON wavelengths)	≥ 30 dB
	P Common <-> P RF (GPON, XGS-PON and NG-PON2 wavelengths)	NA
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Dependent Loss	All ports combinations	≤ 0.2 dB
Maximun Optical power		200 mW
Connector type		SC/APC

Technical Specifications

WaveCEx Scenario 2d	GPON, XGS-PON, NG-PON2, OTDR and RF	1 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.2 dB
	P Common <-> P NG-PON2 (NG-PON2 wavelength)	≤ 1.2 dB
	P Common <-> P OTDR (OTDR wavelength)	≤ 1.6 dB
	P Common <-> P RF (RF wavelength)	≤ 1.1 dB
Isolation	P Common <-> P GPON (XGS-PON, NG-PON2 and OTDR wavelengths)	≥ 30 dB
	P Common <-> P XGS-PON (GPON, NG-PON2 and OTDR wavelengths)	≥ 30 dB
	P Common <-> P NG-PON2 (GPON and XGS-PON and OTDR wavelengths)	≥ 30 dB
	P Common <-> P OTDR (GPON, XGS-PON, NG-PON2 wavelengths)	≥ 30 dB
	P Common <-> P RF (GPON, XGS-PON, NG-PON2 and OTDR wavelengths)	NA
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Sensitivity	All ports combinations	Max. variation: 0.2 dB
Maximun Optical power		+23 dBm
Connector type		SC/APC

WaveCEx Scenario 2e	GPON, XGS-PON, NG-PON2+PtP and OTDR	1 CEx per LGX
Parameters	**Conditions**	**Value and uni**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.2 dB
	P Common <-> P NG-PON2 (NG-PON2 + PtP wavelength)	≤ 1.2 dB
	P Common <-> P OTDR (OTDR-from 1640nm- wavelength)	≤ 1.6 dB
Isolation	P Common <-> P GPON (XGS-PON, NG-PON2 + PtP and OTDR-from 1640nm- wavelengths)	≥ 30 dB
	P Common <-> P XGS-PON (GPON, NG-PON2 + PtP and OTDR-from 1640nm- wavelengths)	≥ 30 dB
	P Common <-> P NG-PON2 (GPON, XGS-PON and OTDR-from 1640nm- wavelengths)	≥ 30 dB
	P Common <-> P OTDR (GPON, XGS-PON and NG-PON2 + PtP wavelengths)	≥ 15 dB
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Sensitivity	All ports combinations	Max. variation: 0.2 dB
Maximun Optical power		+23 dBm
Connector type		SC/APC

WaveCEx Scenario 2f	GPON, XGS-PON, NG-PON2+PtP	2 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P XGS-PON (XGS-PON wavelengths)	≤ 1.0 dB
	P Common <-> P NG-PON2 (NG-PON2 + PtP wavelength)	≤ 1.0 dB
Isolation	P Common <—> P GPON (XGS-PON & NG-PON2+PtP wave-lengths)	≥ 30 dB
	Common <—> P XGS-PON (GPON wavelengths)	≥ 30 dB
	P Common <—> P NG-PON2 (GPON and XGS-PON wavelengths)	≥ 30 dB
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 50 dB
Polarization Dependent Loss	All ports combinations	≤ 0.1 dB
Polarization Mode Disper-sion		≤ 0.1 ps
Maximun Optical power		200 mW
Connector type		SC/APC

Technical Specifications

WaveCEx Scenario 2g	GPON & RF and NG-PON2	2 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON & RF (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P GPON & RF (RF wavelengths)	≤ 1.1 dB
	P Common <-> P NG-PON2 (NG-PON2 wavelength)	≤ 1.2 dB
Isolation	P Common <—> P GPON & RF (NG-PON2 wavelengths)	≥ 30 dB
	P Common <—> P NG-PON2 (GPON wavelengths)	≥ 30 dB
	P Common <—> P NG-PON2 (RF wavelengths)	≥ 30 dB
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Dependent Loss	All ports combinations	≤ 0.2 dB
Maximun Optical power		200 mW
Connector type		SC/APC

WaveCEx Scenario 2h	GPON, RF and NG-PON2	2 CEx per LGX
Parameters	**Conditions**	**Value and unit**
Attenuation (incl. connectors)	P Common <-> P GPON (GPON wavelengths)	≤ 0.8 dB
	P Common <-> P RF (RF wavelengths)	≤ 1.1 dB
	P Common <-> P NG-PON2 (NG-PON2 wavelengths)	≤ 1.2 dB
Isolation	P Common <—> P GPON (NG-PON2 wavelengths)	≥ 30 dB
	P Common <—> P RF (GPON and NG-PON2 wavelengths)	NA
	P Common <—> P NG-PON2 (GPON wavelengths)	≥ 30 dB
Directivity	All port combinations	≥ 50 dB
Return Loss	All ports	≥ 55 dB
Polarization Dependent Loss	All ports combinations	≤ 0.1 dB
Polarization Mode Dispersion		≤ 0.2 ps
Maximun Optical power		200 mW
Connector type		SC/APC

Installation
Dimensions: Cassette format: 195mm×130mm×29mm Weight: <500g 1 or 2 CEx (CEx1 and CEx 2 per cassette regardless of the type of scenario) Available in 1U rackc format
Operating range: Operating Temperature: -5 ~ 60°C Storage Tempaerature: -40 ~ 85°C Humidity: 10 ~ 93% relative

Ordering Information
Name: WaveCEx 1a, 1b, 1c, 1d, 2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h
Reference: -

** LGX encapsulation and labelling might be changed. 1U rack format available.*

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