XGSPON/XGPON OLT SFP+ N1 Transceiver
Up to 20KM, Tx1577nm/Rx1270nm

XG(S)PON OLT SFP+ N1

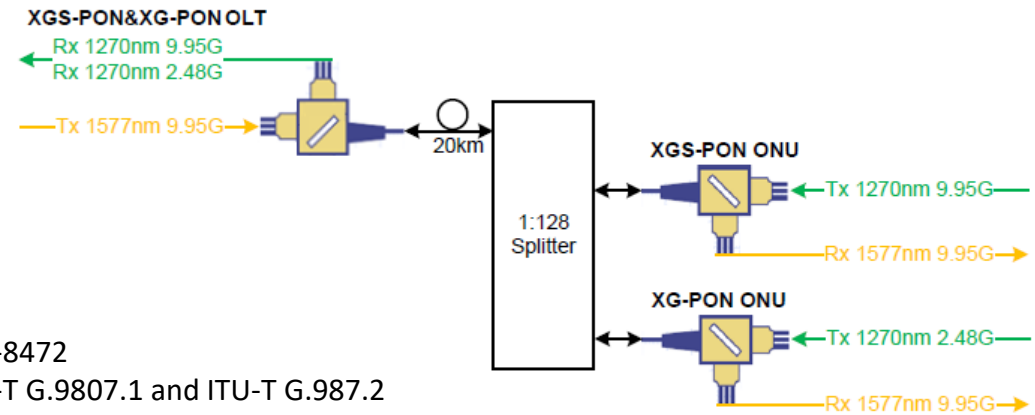
10/2.5G SFP+ XG(S) OLT transceiver	Tx1577nm Rx1270nm	Up to 20KM	0°C~+70°C
SC/UPC Connector	DDM Function	XG(S)-PON OLT N1 Module	Hot Pluggable

Overview

The XG(S)PON OLT SFP+ N1 Transceiver module is designed for dual play use, supporting XGS-PON and XG-PON transmissions up to a 20km distance. The Optical transceiver module is designed for low-cost point-to-multipoint (P2MP) Fiber to the Home (FTTH), Business or Curb (FTTx) applications. It employs a 1577nm CW mode downlink EML operating at 9.953Gb/s and a 1270nm APD/TIA burst mode uplink receiver operating at 9.953Gbps and 2.488Gb/s. It is housed in a rugged die cast SFP+ package and is designed to operate between 0 ~ 70C. The transceiver requires a 3.3V power supply for operation. The laser transmitter can be controlled by the LVTTL Tx_Disable function, and the optical receiver incorporates LVTTL Rx_SD output. This Transceiver is recommended for in use with the AirLive XGSPON OLT-2XGS OLT

Features

- 9.953Gb/s Tx CW Mode Data Rate
- 1577nm CW Mode EML
- 9.953Gb/s Rx Burst Mode Data Rate
- 2.488Gb/s Rx Burst Mode Data Rate
- 1270nm Burst Mode APD/TIA Receiver
- 3.3V Power Supply
- SFP+ with SC/UPC connector
- Hot-pluggable capability
- Support 20km transmission distance with SMF
- Low Power Consumption
- Excellent ESD protection
- DDM Supported



Standards

- Complies with SFF-8472
- Complies with ITU-T G.9807.1 and ITU-T G.987.2

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Absolute Maximum Ratings

Absolute Maximum Ratings					
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**
Storage Ambient Temperature	Tstg	-40		85	℃
Relative Humidity Storage	RHS	5		90	%
Relative Humidity Operating	RHO	5		85	%
Module Supply Voltage	Vcc3	0		3.6	V

Absolute Maximum Ratings: Control Function Logic Levels

Absolute Maximum Ratings: Control Function Logic Levels						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Tx_DISABLE	Tx_DIS	0		Vcc3+0.5	V	LVTTL
Transmitter FAULT	Tx_FAULT	0		Vcc3+0.5	V	LVTTL
Burst Mode Signal Detect	Rx_SD	0		Vcc3+0.5	V	LVTTL
Receive Reset	Rx_Reset	0		Vcc3+0.5	V	LVTTL
Receive Data Rate Select	Rate_Select	0		Vcc3+0.5	V	LVTTL
Digital RSSI Trigger Input	TRI	0		Vcc3+0.5	V	LVTTL
I^2C Serial Data	SDA	0		Vcc3+0.5	V	LVTTL
I^2C Serial Clock	SCL	0		Vcc3+0.5	V	
I^2C Clock frequency	tSCL	-		400	Khz	
Data hold time	tHD:DAT	120		-	ns	

Recommended Operating Conditions

Recommended Operating Conditions					
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**
Case Operating Temperature	Tcase	0	+25	+70	℃
Module Supply Voltage	Vcc3	3.135	3.3	3.465	V
Module Supply Current	Icc3	-	500	800	mA
Module Power Dissipation	PL	-	1.65	2.65	W

Transmitter Optical Characteristics

Transmitter Optical Characteristics						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Transmitter Type			CW Mode EML			
Coupling mode			AC			
Transmitter Signal Rate	Sdown		9.953		Gb/s	
Average Launch Power	POUT	2	-	5	dBm	
Tolerance to the Transmitter Incident Light Power	Tt	-15	-	-	dB	
Optical Center Wavelength	λC	1575	1577	1580	nm	
Spectral Width	Δλ	-	-	1	nm	
Side Mode Suppression Mode	SMSR	30	-	-	dB	
Extinction Ratio	ER	8.2	-	-	dB	

Receiver Optical Characteristics

Receiver Optical Characteristics						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Notes**
Receiver Type		Burst Mode APD/TIA				
Optical Center Wavelength	λ	1260	1270	1280	nm	
Damage Optical Power	Pd	-3	-	-	dBm	
Receiver Sensitivity	PIN	-	-	-26	dBm	@9.953Gbps, N1
		-	-	-27.5	dBm	@2.488Gbps, N1
Receiver Optical Overload	PIN (MAX)	-5	-	-	dBm	@9.953Gbps, N1
		-7	-	-	dBm	@2.488Gbps, N1
Reflectance of Rx	ORL	-	-	-20	dBm	@1260~1360nm
Dynamic Range	DR	15	-	-	dB	
Immunity from Continuous Identical Digits	CID	72	-	-	Bits	

Note: Sensitivity and Overload Test Condition:
1. 9.953Gbps: BER@10^{-3} PRBS 2^{31}-1 ER=6.0dB
2. 2.488Gbps: BER@10^{-4} PRBS 2^{23}-1 ER=8.2dB

Transmitter Electrical Characteristics

Transmitter Electrical Characteristics						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Tx Differential Input Amplitude	VIN	120	-	820	mV	
Tx Differential Input Impendence	ZIN	90	100	110	Ω	
Tx_DIS = HIGH (Transmitter OFF / DISABLED)	VIH	0.7*VCC3	-	VCC3	V	LVTTL (Control INPUT)
Tx_DIS = LOW (Transmitter ON / ENABLED)	VIL	0	-	0.8	V	LVTTL (Control INPUT)
TX_Fault=HIGH(Fault)	VOH	2.4	-	VCC3	V	LVTTL (Monitor OUTPUT)
TX_Fault=Low (Normal)	VOL	0	-	0.4	V	LVTTL (Monitor OUTPUT)

Receiver Electrical Characteristics

Receiver Electrical Characteristics						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Rx Differential Output Impendence	ZOUT	90	100	110	Ω	
Rx_Data Differential Output Voltage Amplitude	VOUT	300	-	800	mV	LVCML
Rx_SD=HIGH	VOH	2.4	-	VCC3	V	Note 1
Rx_SD=LOW	VOL	0	-	0.4	V	Note 1
Rx_Reset=HIGH	VIH	2.0	-	VCC3	V	Note 2
Rx_Reset=LOW	VIL	0	-	0.8	V	Note 2
Rate_Select=HIGH	VIH	2.0	-	VCC3	V	Note 2
Rate_Select=LOW	VIL	0	-	0.8	V	Note 2
TRI=HIGH	VIH	0.7*VCC3	-	VCC3	V	Note 2
TRI=LOW	VIL	0	-	0.8	V	Note 2

Note:
1. LVTTL (Monitor OUTPUT)
2. LVTTL (Control INPUT)

Digital RSSI Sample/Hold Timing

Digital RSSI Sample/Hold Timing						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Optical Input Signal Width	Tont	300	-	-	ns	
RSSI Trigger Delay	Ttri (TRI Delay)	0	300	-	ns	
RSSI Trigger Width	TI2C (TRI Width)	500	-	Tont-Ttri	ns	
I^2C Read Time	Tp	500	-	-	us	
RSSI Monitor Range	Pmon	-26	-	-5	dBm	N1
RSSI Precision	Prssi	-3	+/-2	3	dB	
Ttri+Ti2c<Tont						

I2C Serial Logic

I2C Serial Logic						
Parameter	**Symbol**	**State**	**Logic**	**Min.**	**Max.**	**Unit**
I^2C Serial Data	SDA	HIGH	LVTTL	0.7*VCC3	VCC3	V
	SDA	LOW	LVTTL	0	0.8	V
I^2C Serial Clock	SCL	HIGH	LVTTL	0.7*VCC3	VCC3	V
	SCL	LOW	LVTTL	0	0.8	V

Specification

Model	AirLive XG(S)PON OLT SFP+ N1

Hardware

- **Power Supply Voltage:**
  3.135V~3.465V
  Typical Power Supply Voltage: 3.3V
- **Standard**
  Complies with SFF-8472
  Complies with ITU-T G.9807.1 and ITU-T G.987.2
  Complies with IEC 61000-4-2, IEC 610004-3
- **Transmitter (Electrical - Optical)**
  Data Rate:
  - 9.953Gbps
  Optical Center Wavelength:
  - Min.:1575nm
  - Typical: 1577nm
  - Max.: 1580nm

  Receiver –(Optical, Electrical)
  Data Rate:
  - 2.488Gbps
  - 9.953Gbps

  Operating Wavelength:
  - Min. 1260nm
  - Typical: 1270nm
  - Max. 1280nm

  RSSI Timing Specification
  Optical Input Signal Width: Min 300s
  RSSI Trigger Delay: Min 0ns, Typ. 300ns
  RSSI Trigger Width: Min 500ns
  I^2C Read Time: 500us

Environment

- **Case Operating Temperature:** 0°C to +70°C
- **Storage Temperature:** -40°C to +85°C
- **Operating Relative Humidity**: 5%~85%, non-condensing
- **Storage Relative Humidity**: 5%~90%, non-condensing

Standard package of SFP

- **Product size:**
  64.90 x 13.72 x 8.55 mm(L*W*H)
- **Package size:**
  TBD cm(L*W*H)
- **Package Weight:**
  N.W: TBD kg; G.W:TBD kg
- **Package content**:
  1 x Module

Standard carton package

- **Quantity:** 10 pcs / 1 Blister
- **Dimensions**
  TBD cm(L*W*H)
- **Weight**
  TBD kg

Ordering Information

- **Model:**
  AirLive XG(S)PON OLT SFP+ N1
- **Name:**
  XGSPON&XGPON/GPON Combo OLT SFP+ Transceiver Optical Module 10G/2.5G 20KM Tx1577nm/Rx1270nm

** Specification will be changed without prior notice*

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