Prisma D-PON System ONT and Upstream Receiver

The Cisco® Prisma® D-PON System is a fiber-to-the-home (FTTH) solution specifically designed for RF and DOCSIS® based service providers. This system provides the benefits of a FTTH passive optical network (PON) while maintaining existing HFC back-office systems such as the billing support system (BSS), operations support system (OSS), broadcast video, narrowcast video, switched digital video, VOD, DOCSIS data, DOCSIS VOIP, and VDOC. The D-PON system allows for incremental FTTH growth on an adaptable, low-maintenance architecture, while using the existing back-office infrastructure and cable-friendly customer premise equipment (CPE).

The solution consists of the following components:

- Prisma D-PON 1550 nm Downstream Transmitter (data sheet part number 7016765)
- Prisma EDFA Optical Amplifier (data sheet part number 7016765)
- Prisma D-PON Optical Network Terminal (ONT)
- Prisma D-PON Upstream Receiver
- Prisma D-PON WDM LGX Modules (data sheet part number 7017620)

The Prisma D-PON Upstream Receiver and ONT supply the upstream optical signal for the Prisma D-PON solution. The Prisma D-PON ONT also provides the downstream and upstream optical to electrical conversion at the subscriber premise for connectivity to the CPE.

Figure 1. Prisma D-PON ONT (Left) and Upstream Receiver (Right)

Applications

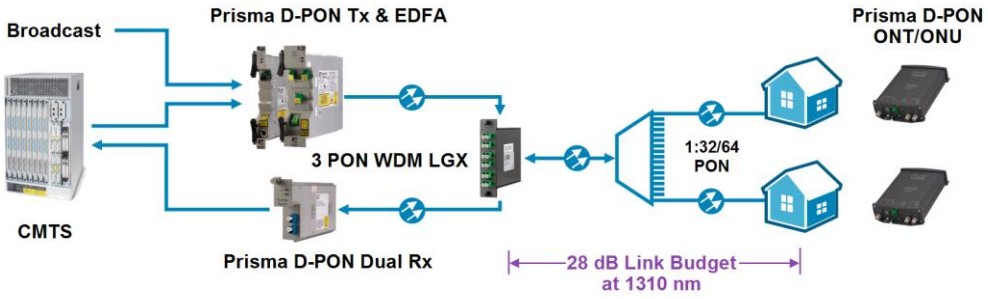
- Residential FTTH (RF video, DOCSIS voice and DOCSIS data)
- MDU FTTH (RF video, DOCSIS voice and DOCSIS data)
- RF Video overlay for Commercial xPON

Primary Features

- 1 GHz full loading (78 Analog / 75 QAM at -6 dB) downstream
- CNR 48 dB at -3.5 dBm received power (typical)
- Enables 28 dB PON upstream link budget at 1310 nm (26 dB at 1610 nm)
- Supports DOCSIS 3.0 four-channel 64 QAM upstream channel bonding
- Multiple receiver setup and control options via Intelligent Communications Interface Module (ICIM)

System Diagram

Figure 2. Prisma D-PON System Diagram



Environmental Note

This ONT does not include a weatherproof enclosure. Outdoor installation requries an additional enclosure that adequately protects against solid objects and liquids.

Product Specifications

Table 1. Prisma iW-2030 Wideband ONT

Specification	Value	Comments
Optical		
Downstream Rx Wavelength	1535 to 1565 nm	
Downstream Optical Input AGC Range	-4.5 to +2.5 dBm	
Downstream Photodiode Responsivity, minimum	0.88 A/W	
Upstream Tx Wavelength	1610 nm	
Upstream Optical Output Power (ONT)	3.0 dBm	
Optical Connection	1 SC/APC	
Electrical		
Downstream RF Bandwidth	52 to 1002 MHz (NA) 86 to 1002 MHz (EU)	
Downstream RF Output Level at 547.25 MHz, nominal	+15 dBmV, using nominal transmitter input level	
Downstream RF Output Tilt	+4.5 dB	52 to 1002 MHz
Upstream RF Bandwidth	5 to 42 MHz (NA) 5 to 65 MHz (EU)	
Upstream RF Input Level	30 dBmV/ch (nominal)	

Product Specifications (continued)

Specification	Value	Comments
RF Connections	1 female F-type connector(main RF) 1 female F-type connector (-10 dB test)	5 to 1002 MHz
LEDs	1 Power ON 1 Receive Power 1 Upstream Laser ON	
DC Power Consumption	6 W DC (maximum)	
DC Connections	1 female F-type connector (12 VDC) 1 DC jack connector (12 VDC) 1 twisted-pair connector (12 VDC)	
DC Supply Voltage Range	11.5 to 15.0 VDC	
Environmental		
Operating Temperature	-4 to 140°F (-20 to 60°C)	Following a 5-minute power-up.
Storage Temperature	-40 to 185°F (-40 to 85°C)	
Operating Humidity	5 to 95% (non-condensing)	
Mechanical		
Dimensions (W x H x D)	9.4 in. x 5.75 in. x 1.88 in. (23.9 cm x 14.6 cm x 4.8 cm)	
Weight	1.5 lbs (0.7 kg)	

Table 2. Prisma D-PON iW-2030 Wideband Upstream Dual Optical Receiver

Specification	Value	Comments
Optical		
Wavelength	1260 to 1360 nm / 1603 to 1617 nm	
Optical Input Range	-17 to -23 dBm	
Optical Input Connections	2 LC/APC	
Electrical		
Bandwidth	5 to 65 MHz	
RF Output Level	20 dBmV/ch (nominal)	
RF Output Return Loss	16 dB	
Number of RF Outputs	2 (1 per optical input)	Prisma II or Prisma XD chassis
LEDs	1 On 1 Alarm	
DC Power Consumption	≤ 7.5 W DC	
Environmental		
Operating Temperature	32 to 122°F (0 to 50°C)	
Storage Temperature	-40 to 180°F (-40 to 85°C)	
Operating Humidity	5 to 95% (non-condensing)	
Mechanical		
Dimensions (W x H x D)	1.03 in x 3.5 in. x 8.8 in. (2.6 cm x 8.9 cm x 22.4 cm)	
Weight	0.9 lbs (0.4 kg)	

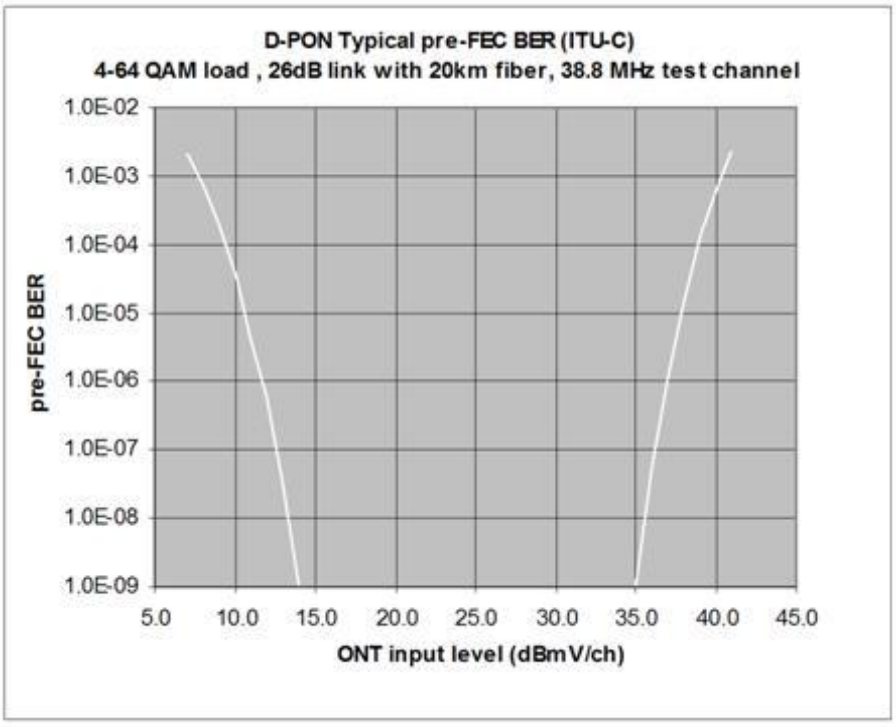
Product Specifications (continued)

Table 3. Prisma D-PON Upstream System Performance[1]

Specification	Value	Comments
Upstream Optical Link Loss, maximum	26 dB at 1610 nm	For Downstream performance, refer to Prisma D-PON 1550 Tx and EDFA Data Sheet, part number 7016765.
Upstream Pre-FEC 1e-6 BER Dynamic Range with Four 64 QAM at 5.12 Msps	> 25 dB typical < 38.8 MHz (NA and EU) > 20 dB typical 38.8 - 61.8 MHz (EU only)	With four 64 QAM at 5.12 Msps loading, using ITU C test channel
Upstream RF Link Gain	-10 dB	ONT RF input to Rx output
DOCSIS Compatibility	DOCSIS 3.0	Four-channel 64 QAM upstream bonding

Note:

1. Upstream system performance with Prisma D-PON iW-2030 or EU iW-2030 ONT, 28 dB optical link for 1310 nm (26 dB optical link for 1610 nm), and D-PON Wideband Upstream Dual Optical Rx. Optical link consists of WDM, 20 km fiber, and 1x32 optical splitter. Specifications represent a two-wavelength system. Overlay of additional wavelengths may impact performance.



Prisma D-PON System Ordering Information[1]

Table 4. Transmission Optics

Description	Part Number
(P2-15TXF-08EM-GHZ-SA-5060) 1550 Tx, NT78, 8 dBm, SA, 1550-60	737217
(P2-EDFA-FMOD-4X21.5-LA 2-WIDE) Opt Amp, 4 x 21.5 dBm, SA-LA	4028553
(P2-EDFA-FMOD-8X21.5-LA 2-WIDE) Opt Amp, 8 x 21.5 dBm, SA-LA	4029654
(P2-PS-M-A-S) Prisma II Power Supply	4012765
Kit, Prisma II Module Blank (6 pk)	716307
(P2-ICIM-MSO) ICIM, MSO version	4025187

Table 5. Headend Receivers

Description	Part Number
(P2-HD-RXR-DPON-WB-LP) D-PON Wideband HD Dual Rev Rx, 5-65MHz	4025368
(P2-HM) HD Host Module	4008281

Table 6. Passives

Description	Part Number
LGX-BWDM-DPON-1310/1490/1550/1610 LA-TRPL	4028628
LGX-BWDM-DPON-1310/1550/1610 LA-TRPL	4028627
LGX Chassis, 4 RU, 12 slot, 72 pos Bulkhead Conn, Unloaded	750182

Table 7. Subscriber ONTs

Description	Part Number
D-PON ONT iW-2030 -20 to +60C (NA wideband, 1610 nm)	4036319.1610
D-PON ONT iW-2030 -20 to +60C (EU wideband, 1610 nm)	4036796.1610

Table 8. ONT Accessories

Description	Part Number
100-120 VAC / 50-60 Hz, 12 VDC / 1 A Wall-Mount PS - NA, Japan	4035083
PS, 12 VDC / 1 A, 100-120 VAC / 50-60 Hz, Wall-Mount F-Conn for NA and Japan	4028842
PS, 12 VDC / 1 A, 230 VAC / 50 Hz, Wall-Mount, Linear Switching for Australia	4035080
220 VAC / 50-60 Hz, 12 VDC / 1 A Wall-Mount PS - Korea	4035079
230-240 VAC / 50-60 Hz, 12 VDC / 1 A Wall-Mount PS - UK	4035082
PS, 12 VDC / 1 A, 230 VAC / 50-60 Hz, Wall-Mount, Linear Switching for Europe	4035081
Indoor fiber splice enclosure and cover	4029691
CYL-BWDM-DPON-13101490/15501610-900-SA (WDM to accommodate a 1310/1490 overlay)	4035899

Note:

1. To order fiber optic jumpers for headend components as needed, please see *Fiber Optical Jumper data sheet*, part number 7001079.

Service and Support

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