

ETP-NS11-20CP1

EPON OLT T1490nm/R1310nm PX20++, SFP Transceiver

Features

- Single fiber bi-directional data links symmetric 1.25Gbps application
- 1490nm continuous-mode DFB laser transmitter and 1310nm burst-mode APD-TIA receiver • Reset-less burst-mode receiver simply the system design
- +5~+8dBm high Average Launch Optical Power • More than 25dB wide dynamic range
- 0 to 70° C operating case temperature
- Single 3.3V power supply
- Digital diagnostic monitoring interface
- Digital burst RSSI function to monitor the input optical power level • LVPECL compatible data input/output interface
- LVTTTL transmitter disable control • LVTTTL transmitter laser fault alarm
- LVTTTL receiver loss of signal indication
- Low EMI and excellent ESD protection
- Class I laser safety standard IEC-60825 compliant • RoHS-6 compliance for SOEB4366-PSGE



Applications

- Gigabit Ethernet Passive Optical Networks (GEPON) 20Km 1:32 application or 10Km 1:64 application.

Standards

- Complies with FDA 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 200
- Complies with SFP Multi-Source Agreement (MSA) SFF-8074i • Complies with SFF-8472 Rev 9.5
- Complies with IEEE 802.3ah™-2004
- Complies with FCC 47 CFR Part 15, Class B

Absolute Maximum Ratings

Table 1 - Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Note
Storage Ambient Temperature	T _{STG}	-40	85	°C	
Operating Case Temperature	T _c	0	70	°C	
Operating Humidity	OH	5	95	%	
Power Supply Voltage	V _{cc}	0	4	V	
Receiver Damaged Threshold		+4		dBm	

Recommended Operating Environment

Table 2 - Recommended Operating Environment

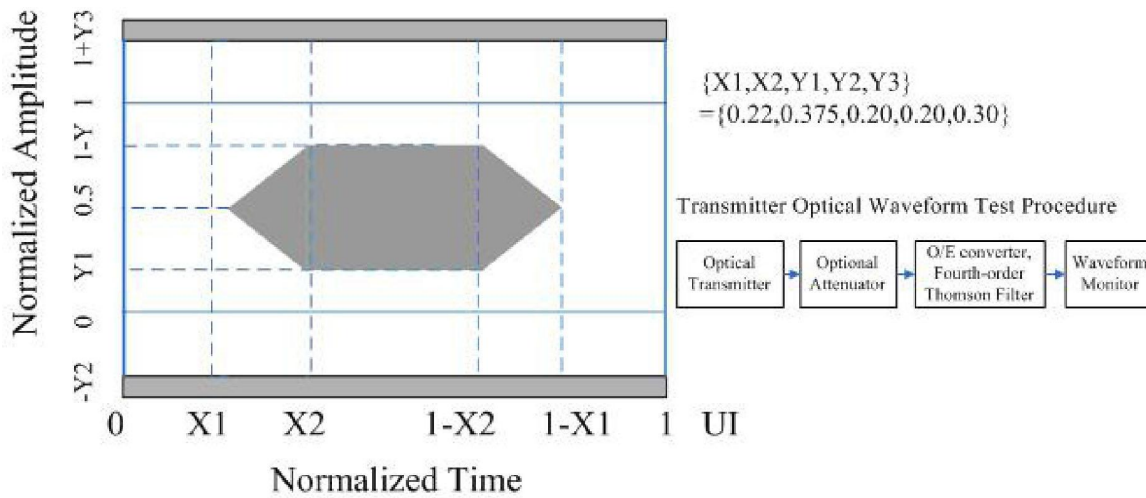
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Supply Voltage	V _{cc}	3.13	3.3	3.47	V	
Operating Case Temperature	T _c	0		70	°C	
Operating Humidity Range	OH	5		95	%	
Data Rate			1.25		Gbit/s	
Data Rate Drift		-100		+100	PPM	

Transmitter Optical Characteristics

Table 3- Transmitter Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Center Wavelength	λ_c	1480		1500	nm	
Optical Spectrum Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Optical Power	AOP	+5		+8	dBm	Launched into SMF
Power-OFF Transmitter Optical Power				-39	dBm	Launched into SMF
Extinction Ratio	ER	9			dB	PRBS 2 ⁷ -1 test pattern @1.25Gbit/s
Total Jitter	TJ			0.43	UI	PRBS 2 ⁷ -1 test pattern @1.25Gbit/s

Rise/Fall Time (20%-80%)	T_R/T_F		260	ps	Bessel-Thompson Filter OFF
RIN ₁₅ OMA			-115	dB/Hz	
Optical Return Loss Tolerance			15	dB	
Transmitter Reflectance			-10	dB	
Transmitter and Dispersion Penalty	TDP		2.3	dB	Transmit on 20km SMF
Optical Waveform Diagram	Compliant with IEEE Std 802.3ah™-2004				See the figure below



Transmitter Eye Mask Definitions and Test Procedure

Digital Diagnostic Monitoring

Table 4- Digital Diagnostic Monitoring

Parameter	Range	Accuracy	Calibration	Note
Temperature	0 to +70 °C	±3°C	Internal	LSB: 1/256° C
Voltage	2.97 to 3.63 V	±3%	Internal	LSB: 0.1mV
Bias Current	0 to 100 mA	±10%	Internal	LSB: 2uA
TX Power	0 to 8 dBm	±3dB	Internal	LSB: 0.1uW
RX Power Monitor	-6 to -33 dBm	±3dB	Internal	LSB: 0.1uW

Transmitter Electrical Characteristics

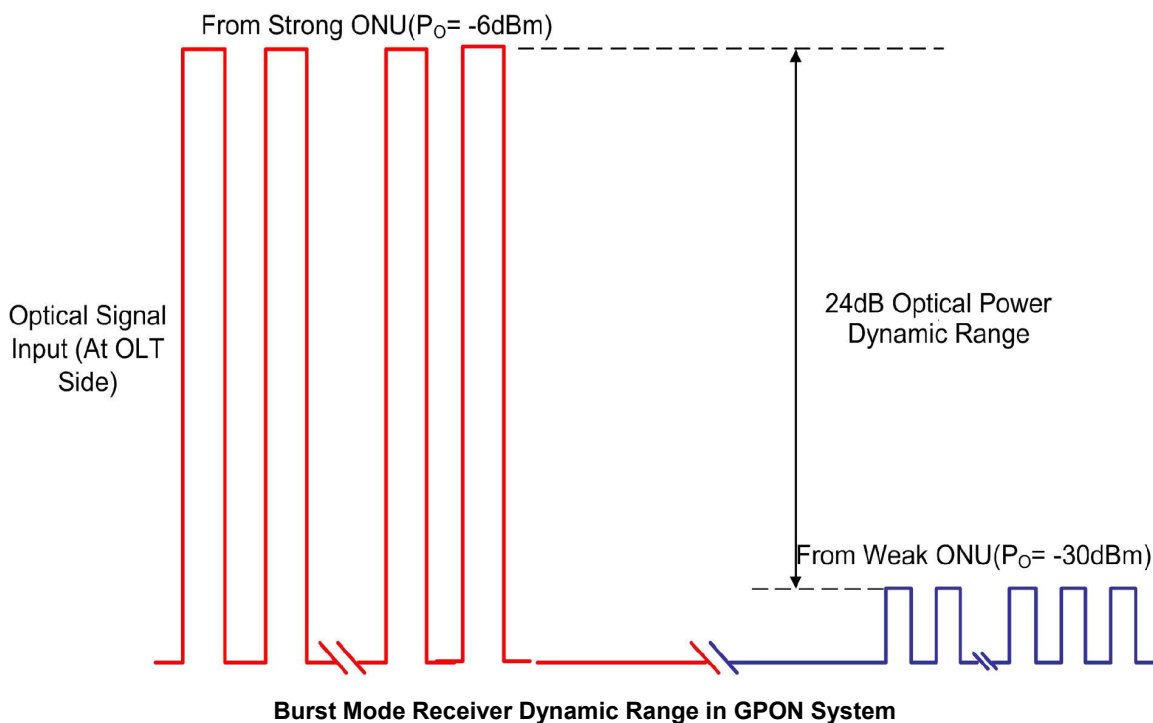
Table 5- Transmitter Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Data Input Differential Swing		200		1600	mV	LVPECL input, AC coupled
Input Differential Impedance		90	100	110	Ω	
Power Supply Current				220	mA	Load free
Transmitter Disable Voltage - Low		0		0.8	V	
Transmitter Disable Voltage - High		2.0		V _{CC}	V	
Transmitter Fault Alarm Voltage - Low		0		0.4	V	
Transmitter Fault Alarm Voltage - High		2.4		V _{CC}	V	

Receiver Optical Characteristics

Table 6- Receiver Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Wavelength		1260		1360	nm	
Sensitivity	SEN			-33	dBm	PRBS 2 ²³ -1+72CID@124 4Mbps BER $\leq 1 \times 10^{-10}$
Saturation Optical Power	SAT	-6			dBm	
Dynamic Range		25			dB	See the figure below
Loss Of Signal De-assert Level				-34	dBm	
Loss Of Signal Assert Level		-45			dBm	
Loss Of Signal Hysteresis		0.5		6	dBm	
Receiver Reflectance				-12	dB	



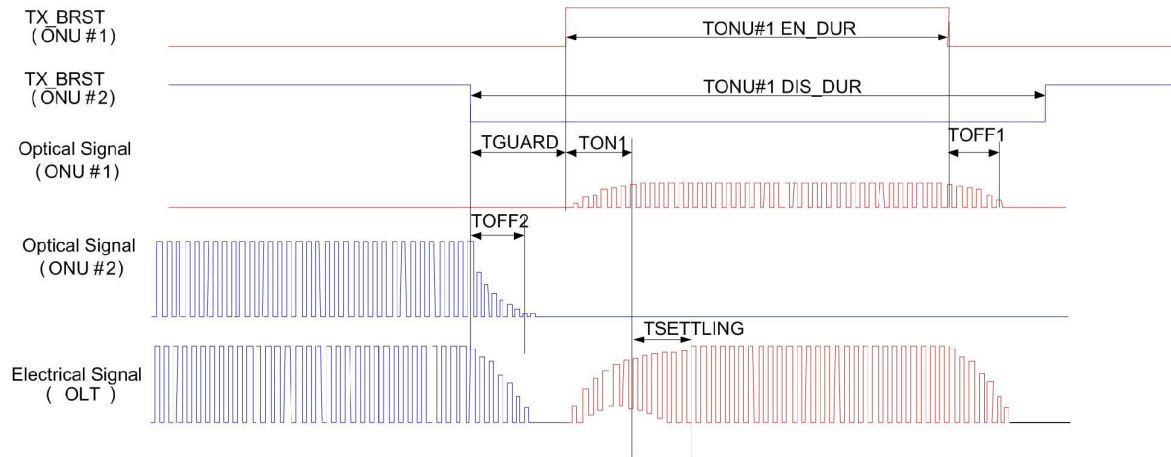
Receiver Electrical Characteristics

Table 7- Receiver Electrical Characteristics

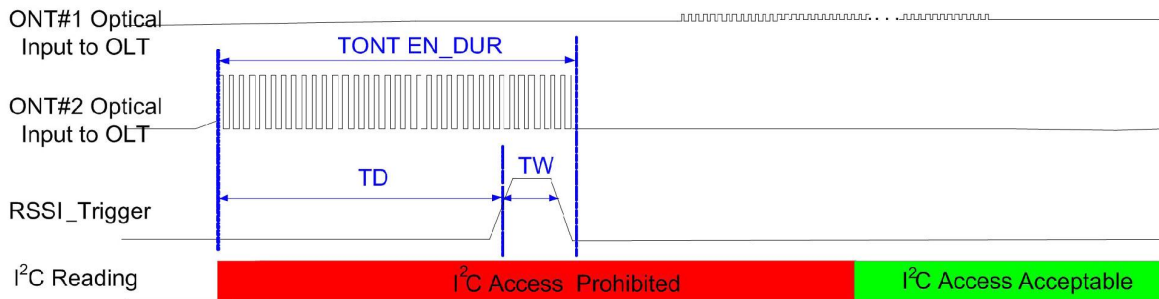
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Threshold Settling Time	T_{SETTLING}			250	ns	See the figure below
Power Supply Current				160	mA	Load free
Data Output Voltage - Low (-Vcc)		-1.81		-1.62	V	
Data Output Voltage - High (-Vcc)		-1.02		-0.88	V	
Data Output Differential Swing		400		1600	mV	LVPECL output, DC coupled
Loss Of Signal Assert Time			0.5		μs	
Loss Of Signal Deassert Time			0.5		μs	
Loss Of Signal Voltage - Low		0		0.4	V	
Loss Of Signal Voltage - High		2.4		Vcc	V	
RSSI Trigger-Low		0		0.8	V	
RSSI Trigger-High		2.0		Vcc	V	
RSSI Trigger width	T_w	300			ns	

RSSI Trigger Delay	T_D	2			μs	
I2C Access Prohibited Time		500			μs	
Optical Signal During Time	TONU EN_DUR	2.3			μs	

Timing Parameter Definitions in Burst More Sequence

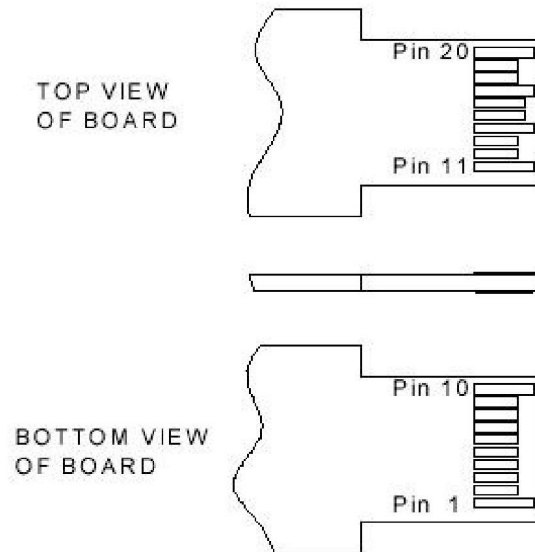


RSSI Timing Sequence



Pin Assignment

Pin Diagram



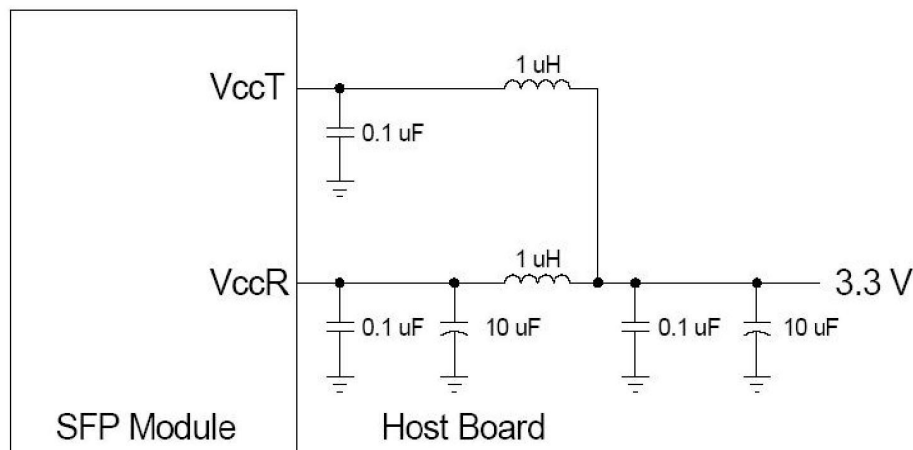
Pin Descriptions

Table 8-Pin Descriptions

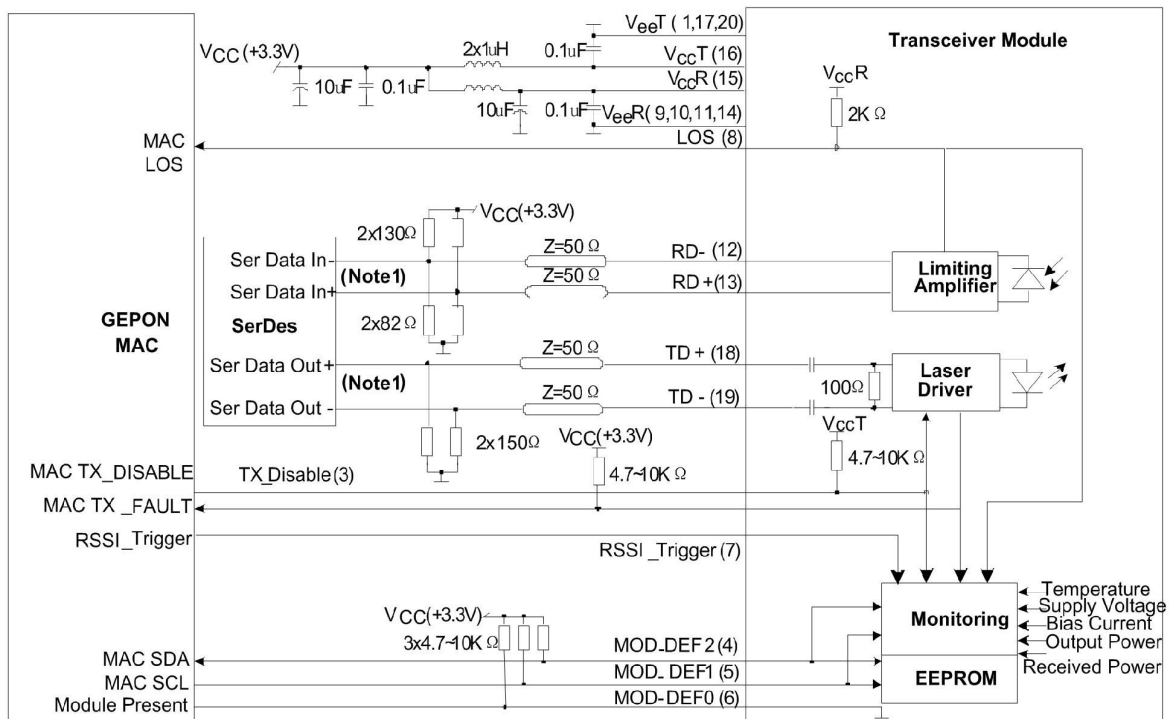
Pin	Name	Description	Note
1	V _{EE} T	Transmitter Ground	
2	TX Fault	Transmitter Fault Indication	High: abnormal; Low: normal
3	TX Disable	Transmitter Disable	High: transmitter disable; Low: transmitter enable
4	MOD-DEF2	Module Definition 2	The data line of two wire serial interface
5	MOD-DEF1	Module Definition 1	The clock line of two wire serial interface
6	MOD-DEF0	Module Definition 0	Connected to Ground in the transceiver
7	RSSI Trigger	RSSI Trigger for Transceiver A/D Conversion	High: enable RSSI A/D conversion
8	LOS	Loss of Signal	High: Loss of signal Low: Signal Detect
9	V _{EE} R	Receiver Ground	
10	V _{EE} R	Receiver Ground	
11	V _{EE} R	Receiver Ground	
12	RD-	Inv. Receiver Data Out	LVPECL logic output, DC coupled
13	RD+	Receiver Data Out	LVPECL logic output, DC coupled
14	V _{EE} R	Receiver Ground	

15	V _{CC} R	Receiver Power	
16	V _{CC} T	Transmitter Power	
17	V _{EE} T	Transmitter Ground	
18	TD+	Transmit Data In	LVPECL logic input, AC coupled
19	TD-	Inv. Transmit Data In	LVPECL logic input, AC coupled
20	V _{EE} T	Transmitter Ground	

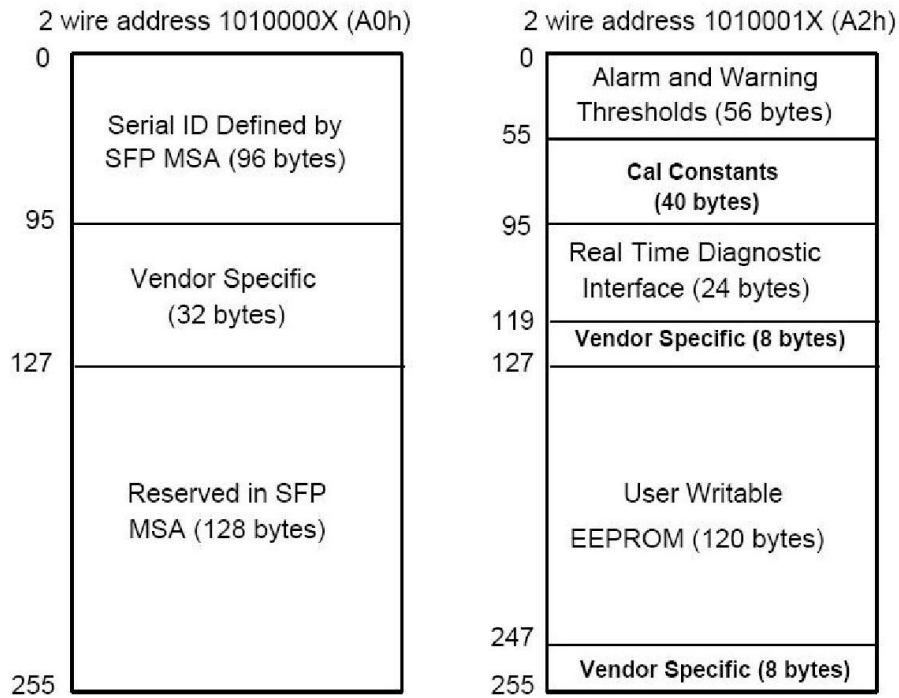
SFP Recommended Host Board Power Supply Filtering Network



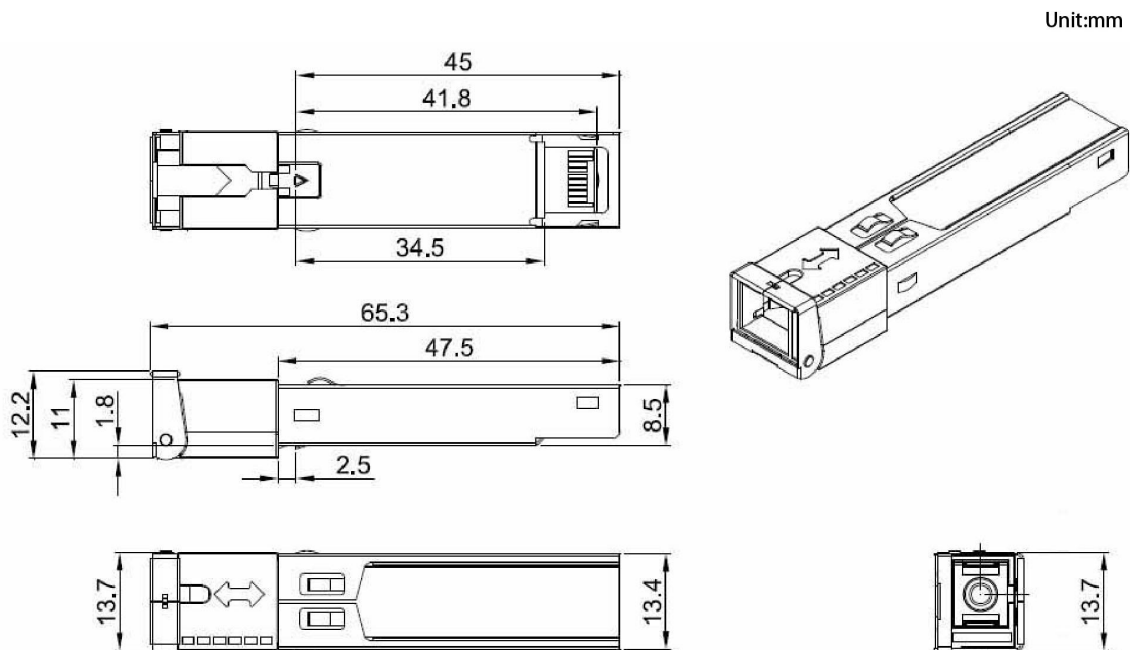
Typical Interface Circuit



EEPROM Information



Mechanical Specifications



Ordering information

Table 9- Ordering information

Part Number	Product Description
ETP-NS11-20CP1	SFP, 1.25G, T1490nm/R1310nm, SC/UPC, EPON OLT PX20++, 0 ~ +70°C, with DDM

AscentOptics reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed as a result of their use or application. No rights under any patent accompany the sale of any such product(s) or information. Edition: Apr. 2019 Published by Ascent Optics Co.,Ltd. Copyright © Ascent Optics All Rights Reserved.

E-mail: sales@ascentoptics.com

Web : <http://www.ascentoptics.com>