

EPON OLT Optical Module

PRODUCT FEATURES

- Bi-directional
1250Mbps Upstream / 1250Mbps Downstream
- EEPROM with Serial ID Functionality
- Compliant IEEE 802.3ah-2004
- SFP dynamic range is more than 26dB,
30Km reach
- Support Digital Diagnostic Monitoring interface
- 1490nm Continuous mode transmitter,
And 1310nm Burst Mode Receiver
- Single + 3.3V Power Supply
- ROHS-6/6 compliant
- Laser Class 1 Product which comply with the
Requirements of IEC 60825-1 and IEC 60825-2



APPLICATIONS

- EPON OLT Class PX20++
- Burst Mode application
- FTTH WDM Broadband Access

PRODUCT DESCRIPTION

Digital Transmitter---ADFB laser diode is employed for upstream transmission at OC-24 (1250Mbps).

The optical transmitter includes a back facet photo-detector to monitor laser power for APC control.

Digital Receiver---An APD with TIA is employed for downstream data reception at OC-24 (1250Mbps).

A post amplifier is also included for CML output compatibility.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40		85	℃	
Storage Ambient Humidity	HA	5		95	%	
Power Supply Voltage	VCC	-0.3		3.7	V	
Signal Input Voltage		-0.3		V _{cc} +0.3	V	
Receiver Damage Threshold		+4.5			dBm	
Lead Soldering Temperature	TSOLD			260	℃	
Lead Soldering Time	TSOLD			10	sec	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	-40		85	℃	Without air flow
Ambient Humidity	HA	5		70	%	Non-condensing
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC			350	mA	
Power Supply Noise Rejection				100	mVp-p	100Hz to 1MHz
Data Rate			1250/1250		Mbps	Tx Rate/Rx Rate
Line Code		Scrambled NRZ				
Transmission Distance				30	km	
Coupled fiber	Single mode fiber					9/125um

Specification of Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Average Launched Power	PO	4.5		7	dBm	
Extinction Ratio	ER	9			dB	
Center Wavelength	λ _C	1480		1500	nm	DFB Laser
Side mode suppression ratio	SMSR	30			dB	
Spectrum Bandwidth(-20dB)	σ			1	nm	
Optical Rise/Fall Time	tr/tf		260		ps	Note (1)

Transmitter OFF Output Power	POff			-39	dBm	
Differential line input Impedance	RIN	90	100	110	Ohm	
Differential Data Input Swing	VDT	200		1600	mVp-p	
Output Eye Mask	Compliant with 802.3ah-2004					

Note (1). These are unfiltered 20-80% values, Measure at 2⁷-1 NRZ PRBS pattern (1.25Gbps)

Specification of Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Input Optical Wavelength	λ_{IN}	1260		1360	nm	APD
Receiver Sensitivity	PIN			-32	dBm	Note (1)
Input Saturation Power (Overload)	PSAT	-6			dBm	
Signal Detect- Assert Power	PA	-46			dBm	
Signal Detect-Deassert Power	PD			-33	dBm	Note (2)
Signal Detect- Hysteresis	PA-PD	0.5	2	6	dB	
Tolerance to reflected optical power				12	dB	
Output Data Rise/Fall time	tr/tf			150	ps	Note (3)
Optical Isolation of Receiver		40			dB	
Differential Data Output Swing	VDR	300		1500	mVp-p	AC-Coupled CML
Signal Detect Output Voltage-High	VLOSH	2.4		VCC	V	LVTTTL
Signal Detect Output Voltage-Low	VLOSL	0		0.8	V	
Signal Detect- Assert/Deassert Time				100	us	
RSSI range		-32		-6	dBm	

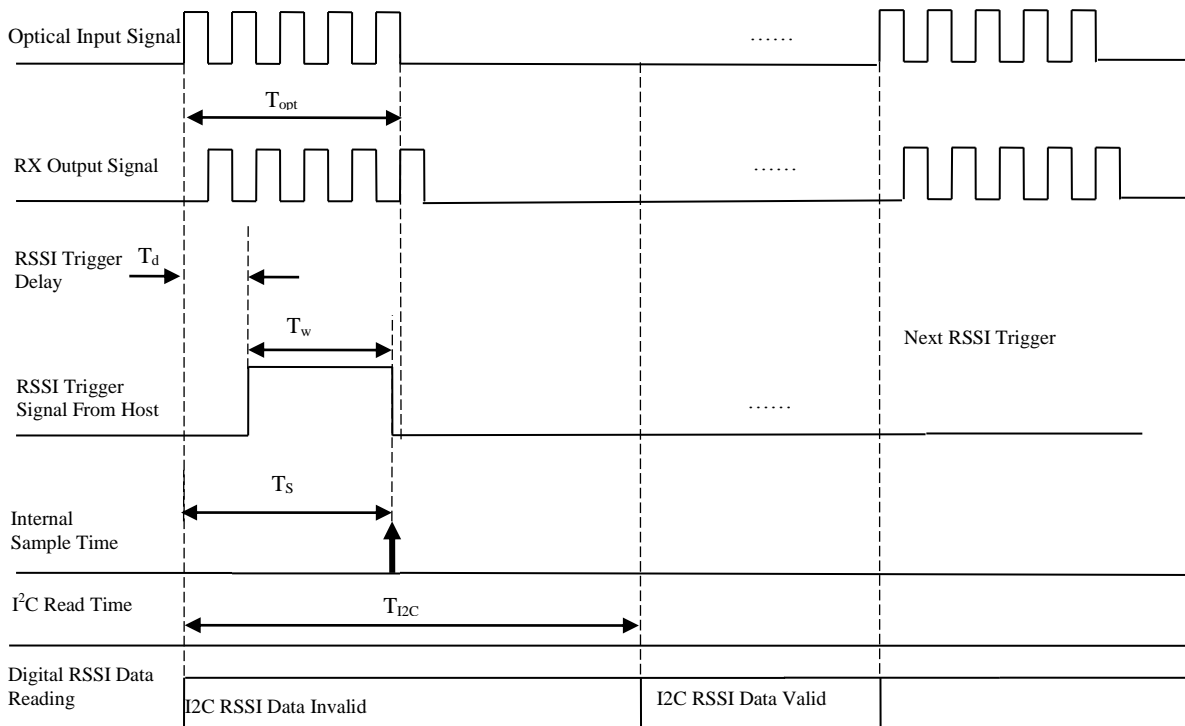
Note (1): Measured with Light source ER=10dB; BER =<10⁻¹² @PRBS=2⁷-1 NRZ.

Note (2): When SD deasserted, the data output is signal output.

Note (3): These are 20%~80% values.

Optical Characteristics

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Optical Signal Length	T_{Opt}	1184	1200	1216	ns
RSSI Trigger Delay	T_d	496	512	528	ns
RSSI Trigger Signal Width	T_w	584	600	616	ns
Internal Sample time	T_s	1080	1112	1216	ns
I2C read time	T_{I2C}	-	-	500	us
Receiver Power DDM (RSSI) Error	RXDDM	-	-	+/-3	dB



Digital Diagnostic Monitor Interface (DDMI) Description

RCI EPON OLT SFP PX20++ transceivers support the 2-wire serial communication. The DDMI WARNING and ALARM memory positions and addresses are compliant with the SFF 8472 REV9.3 specification.

The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information.

The DDMI can detect TX power, RX power, Bias current, Temperature. VCC.

Item	Monitor scope	Monitor Error
TX power	4.5dBm ~7dBm	±3dBm
RX power	-6dBm~-32dBm	±3dBm
Bias	0mA~90mA	±10%
Temperature	-40°C~85°C	±5°C
Vcc	3.0V~3.6V	±5%

SFP Pin Function Definitions

Pin#	Name	Function	Notes
1	VeeT	Transmitter Ground	-
2	TX Fault	Transmitter Fault Indication	open collector/drain output,
3	TX Disable	Transmitter Disable	Module disables on high or open
4	MOD-DEF2	Module Definition 2	2 wire serial ID interface, SDA
5	MOD-DEF1	Module Definition 1	2 wire serial ID interface,SCL
6	MOD-DEF0	Module Definition 0	Grounded in Module
7	RSSI_Trig	Receiver RSSI trigger input	High enable
8	LOS	Loss of Signal	
9	VeeR	Receiver Ground	
10	VeeR	Receiver Ground	
11	VeeR	Receiver Ground	
12	RD-	Inv. Received Data Out	DC-coupled
13	RD+	Received Data Out	DC-coupled
14	VeeR	Receiver Ground	
15	VccR	Receiver Power	3.3V± 5%
16	VccT	Transmitter Power	3.3V± 5%
17	VeeT	Transmitter Ground	
18	TD+	Transmit Data In	AC-coupled, differential lines with 100 Ω differential termination inside the module
19	TD-	Inv. Transmit Data In	AC-coupled, differential lines with 100 Ω differential termination inside the module
20	VeeT	Transmitter Ground	