GPON OLT SFP transceiver (with DDM function)
1244Mbps Upstream /2488Mbps Downstream

PRODUCT FEATURES

- Bi-directional
  1244Mbps Upstream/2488Mbps Downstream
- EEPROM with Serial ID Functionality
- Compliant with ITU-T G.984.2
- SFP package with SC/UPC
- 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

- GPON OLT Class C++
- Burst Mode application
- FTTX WDM Broadband Access

PRODUCT DESCRIPTION

Digital Transmitter---A DFB laser diode is employed for downstream transmission at 2488Mbps. 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 upstream burst data reception at 1244Mbps. 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		Vcc+0.3	V	
Receiver Damage Threshold		+3			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	℃	I07
Ambient Humidity	HA	5		70	%	Non-condensing
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC			500	mA	
Power Supply Noise Rejection				100	mVp-p	100Hz to 1MHz
Data Rate			2488/1244		Mbps	Tx Rate/Rx Rate
Transmission Distance				20	km	
Coupled fiber	Single mode fiber					9/125um

Specification of Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Average Launched Power	PO	4.5		10	dBm	Note (1)
Extinction Ratio	ER	8.2			dB	Note (1)
Center Wavelength	λC	1480	1490	1500	nm	DFB Laser
Side mode suppression ratio	SMSR	30			dB	
RMS Spectral Width				1	nm	
Transmitter OFF Output Power	POff			-40	dBm	
Jitter P-P				0.1	UI	4kHz~10MHz
Differential line input Impedance	RIN	90	100	110	Ohm	
Differential Data Input Swing	VDT	200		1600	mVp-p	Internal AC coupled
Input common mode voltage	VCM	1.4		Vcc-0.2	V	
Output Eye Mask	Compatible with ITU-T G984.2					Note (1)

Specification of Receiver

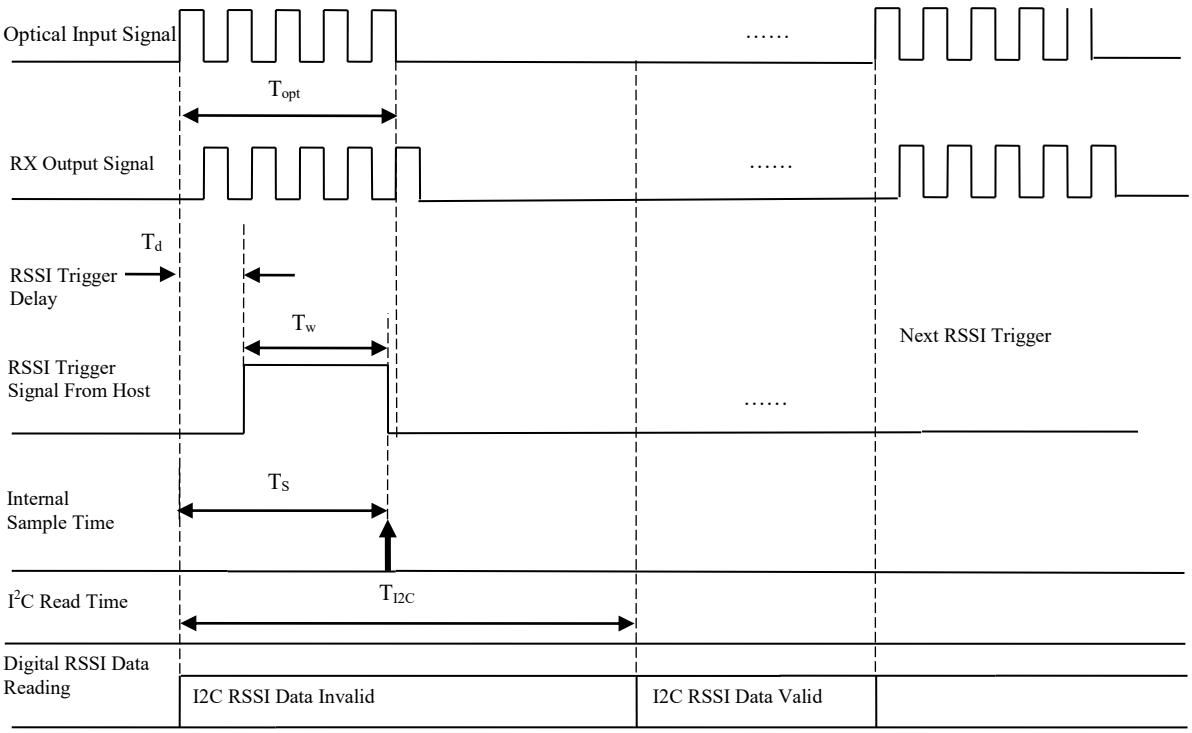
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Input Optical Wavelength	λIN	1290		1330	nm	APD
Receiver Sensitivity	PIN			-30	dBm	Note (2)
Input Saturation Power (Overload)	PSAT	-8			dBm	
Signal Detect- Assert Power	PA	-45			dBm	
Signal Detect-Deassert Power	PD			-31	dBm	Note (2)
Signal Detect- Hysteresis	PA-PD	0.5	2	6	dB	
Receiver reflectance				-12	dB	
Optical Isolation of Receiver		40			dB	
Differential Data Output Swing	VDR	400		1600	mVp-p	DC-Coupled CML
Signal Detect Output Voltage-High	VLOSH	2.4		VCC	V	LVTTL
Signal Detect Output Voltage-Low	VLOSL	0		0.4	V	
Receiver Dynamic range		15			dB	
RSSI range		-30		-8	dBm	Accuracy +/- 3dB

[1] Measured with a PRBS2^23-1 test pattern, @2.5Gb/s.
[2] Measured with single burst packet@1.25Gb/s, EX=10dB, BER=1X10^{-12}, data packet length 2048~10240 bits, preamble=44bits, gap time Tg=32bits.

Timing Characteristics for Digital RSSI

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Optical Signal Length	TOpt	600			ns
RSSI Trigger Delay	Td	50			ns
RSSI Trigger Signal Width	Tw	500			ns
I2C read time	TI2C	-	-	500	us
Reciever Power DDM (RSSI) Error	RXDDM	-	-	+/-3	dB

Timing Diagrams for Digital RSSI



Digital Diagnostic Monitor Interface (DDMI) Description

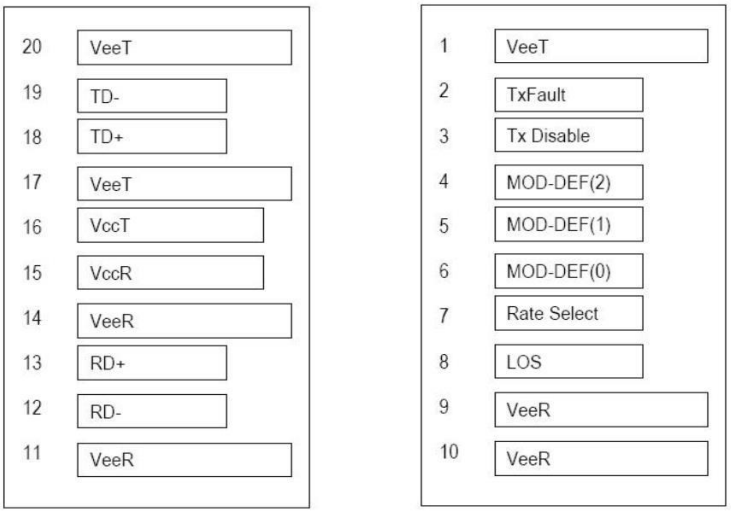
RCI GPON OLT SFP C++ transceivers support the 2-wire serial communication. The DDMI WARNING and ALARM memory positions and addresses are compliant with the SFF 8472 REV9.3 specification.

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 .

	Monitor scope	Monitor Error
TX power	4.5dBm~10dBm	±3 dBm
RX power	-6dBm~-30dBm	±3dBm
Bias	0mA~90mA	±10%
Temperature	0℃~70℃	±3 ℃
Vcc	2.8V~3.8V	±3 %

SFP Pin Function Definitions



Pin No.	Pin Name	Description
1	VeeT	Tx Ground
2	Tx Fault	Indicate the TX fail.
3	TX Disable	Transmitter Disable-Module disables on high or open
4	MOD_DEF(2)	2-Wire Serial Data I/O Pin.(SDA)
5	MOD_DEF(1)	2-Wire Serial Clock Input.(SCL)
6	MOD_DEF(0)	Internally Grounded
7	Reset	Reset signal input
8	LOS	Set LOS is that active high when signal is detected. (LVTTL);
9	RSSI_Trigger	Receiver RSSI trigger input (High Level avtive)
10	VeeR	Rx Ground
11	VeeR	Rx Ground
12	RXD-	Inverted Receiver Data Output (DC-Coupled internally)
13	RXD+	Non-Inverted Receiver Data Output (DC-Coupled internally)
14	VeeR	Rx Ground
15	Vcc_RX	Rx Vcc
16	Vcc_TX	Tx Vcc
17	Veet	Tx Ground
18	TXD+	Non-Inverted Transmitter Data Input (AC-Coupled)
19	TXD-	Inverted Transmitter Data Input (AC-Coupled)
20	Veet	Tx Ground

Regulatory Compliance

Feature	Reference	Performance
Electrostatic Discharge (ESD)	IEC/EN 61000-4-2	Compatible with standards
Radio Frequency Electromagnetic Field Immunity	IEC/EN 61000-4-3	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	IEC/EN 60825-1 IEC/EN 60825-2	Class 1 laser product
Component Recognition	IEC/EN 60950	Compatible with standards
ROHS	2002/95/EC	Compatible with standards