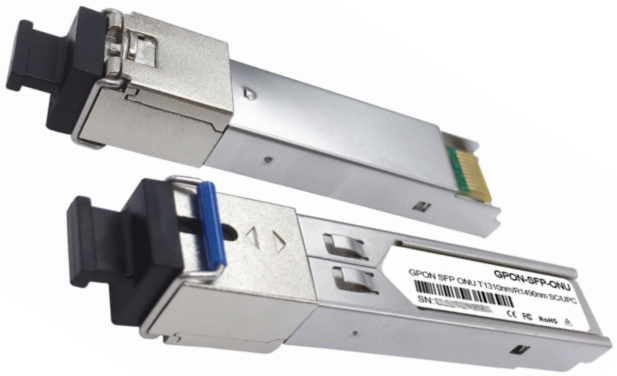
SFP GPON ONU B+ Transceiver

PRODUCT FEATURES

- BiDi SFP Single Mode TRanceiver
- SC/PC or SC/APC is optional
- Comply with ITU-T G.984.5 Class B+
- Compliant with SFF MSA-2000 and SFF-8472 V10.3
- Single +3.3 Power Supply
- LVPECL Differential Data Inputs and CML Data Outputs
- LVTTL Signal Detection Output and LVTTL Burst Control
- Complies with Telicordia (Bellcore) GR-468-CORE
- 1310nm Burst Mode Transmitter and 1490nm Continuous Mode Receiver
- 1.244Gbps DFB Laser Diode, 2.488Gbps APD-TIA Receiver
- Maximum reach 20km
- Case operating temperature:

Commercial: 0°C to +70°

Industrial: -40°C to +85°C



APPLICATIONS

- GPON ONU

PRODUCT DESCRIPTION

PLUSOPTIC's GPON-SFP-ONU-B-20KM Small Form Factor Pluggable (SFP) transceiver supports typically Tx 1.244Gbps and Rx 2.488Gbps Asymmetric Data Rate for GPON ONU application up to 20km transmission distance, it's designed meeting with ITU-T G.984.5 Class B+. SC/PC pigtail or SC/APC is for optical interface.

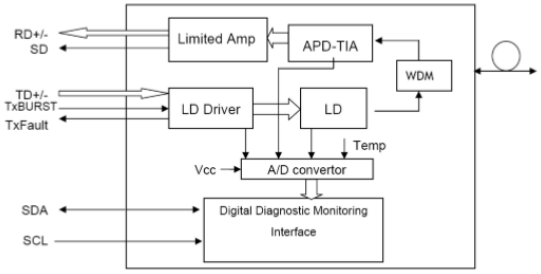


Fig 1 Transceiver Block Diagram

The module provides digital diagnostic information of its operating conditions and status, including transmitting power, laser bias, receiver input optical power, module temperature, and supply voltage. Calibration and alarm/warning threshold data are written and stored in internal memory (EEPROM). The memory map is compatible with SFF-8472, as shown in Fig. 2. The diagnostic data are raw A/D values and must be converted to real world units using calibration constants stored in EEPROM locations 56 – 95 in A2h.

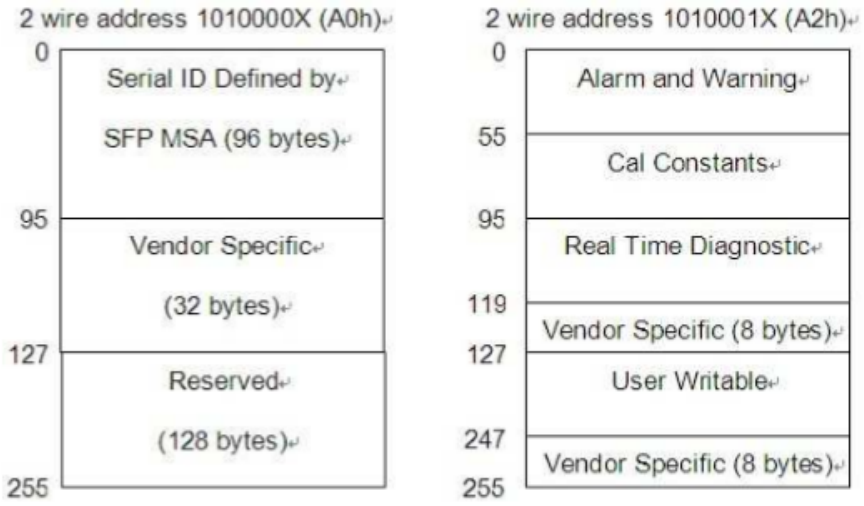


Fig 2 EEPROM Information

Regulatory Compliance

PlusOptic transceivers are Class 1 Laser Products that comply with FDA regulations. They Meet Class 1 eye safety requirements of EN 60825 and the electrical safety requirements of EN 60950.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature	Ts	-40	85	°C	
Operating Case Temperature	Tc	-40	85	°C	P/n
		0	70		P/n
Damage Threshold For Receiver	-	-	4	dBm	
Soldering Temperature / Time	-	-	260/10	° C/S	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	-
Operating Case Temperature	Tc	0	-	70	°C	P/n
		-40	-	85		P/n
Total Supply Current	-	-	-	350	mA	-

Optical Characteristics

Transmitter						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Note**
Data Rate	DR	-	1.244	-	Gbps	-
Optical Central Wavelength	λ	1260	1310	1360	nm	
Spectral Width (-20dB)	Δλ	-	-	1	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Average Optical Output Power	Po	0.5	-	5	dBm	
Extinction Ratio	Er	10	-	-	dB	-
Transmitter Reflectance	-	-	-	-12	dB	
Tx Burst ON Time	Ton	-	-	12.8	ns	-
Tx Burst OFF Time	Toff	-	-	12.8	ns	-
Rise/Fall Time	Tr/Tf	-	-	250	ps	-
Average Lauched Power of Off Transmitter	Poff	-	-	-45	dBm	-
Output Eye	Compliant with ITU-T G.984.5					
Receiver						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Note**
Data Rate	DR	-	2.488	-	Gbps	-
Operate Wavelength	-	1480	-	1500	nm	-
Sensitivity	Pr	-	-	-28	dBm	1
Saturation	Ps	-8	-	-	dBm	1
SD De-assert Level	-	-45	-	-	dBm	-
SD Assert Level	-	-	-	-28	dBm	-
SD Hysteresis	-	0.5	-	6	dB	-
Receiver Reflectane	-	-	-	-12	dB	-
RSSI Range	-	-28	-	-8	dBm	
RSSI Accuracy	-	-3	-	+3	dB	

Note:

1. Minimum Sensitivity and saturation levels for a 2^{23}-1 PRBS. BER≤10^{-10}, 2.488Gpbs, ER=9dB

Electrical Characteristics

Transmitter						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Note**
Differential Input Voltage	V_{IN-DIF}	200	-	1600	mV	-
Tx Burst Input Voltage-Low	V_{IL}	0	-	0.8	V	-
Tx Burst Input Voltage-High	V_{IH}	2.0	-	Vcc	V	-
Receiver						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Note**
Data Output Voltage Differential	$V_{OUT-DIF}$	400	-	1000	V	-
Signal Detect Output Voltage-Low	V_{SD-L}	0	-	0.8	V	-
Signal Detect Output Voltage-High	V_{SD-H}	2.0	-	Vcc	V	

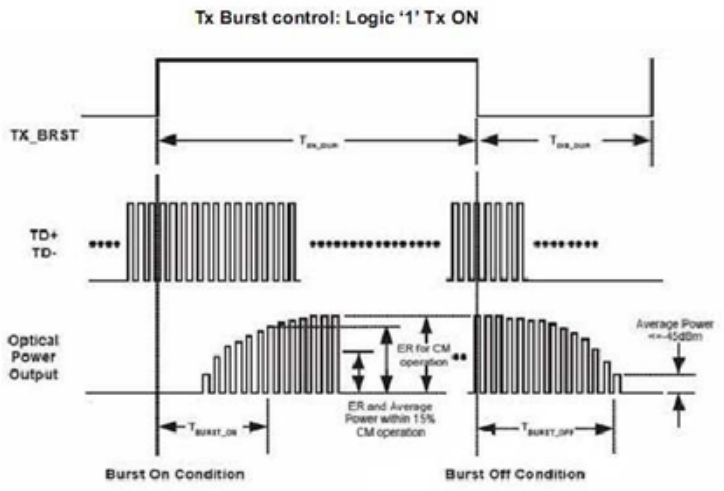
Pin Descriptions

Pin	Symbol	Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	
2	TFAULT	Transmitter Fault. Not supported.	
3	TX BURST	Transmitter Burst Mode Control. Burst Logic Low ON	
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	
7	RS0	Rate Select0, optionally controls SFP+ module receiver. When high input signaling rate>4.25 GBd and when low input signaling rate<4.25GBd	
8	LOS	Loss: Low=normal operation; High= loss of signal	
9	RS1	Rate Select1, optionally controls SFP+ module receiver. When high input signaling rate>4.25 GBd and when low input signaling rate<4.25GBd	
10	VEER	Receiver Ground (Common with Transmitter Ground)	
11	VEER	Receiver Ground (Common with Transmitter Ground)	
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	VEER	Receiver Ground (Common with Transmitter Ground)	
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	

Note:

Tx：DC coupled internally. Rx：AC coupled internally.
Input stage in SerDes IC with internal bias to Vcc-1.3V R3=R4=R5=R6=N.C, R7=100Ω
Input stage in SerDes IC without internal bias to Vcc-1.3V R3=R4=82Ω,R5=R6=130Ω,R7=N.C

Burst Mode Sequence Definition

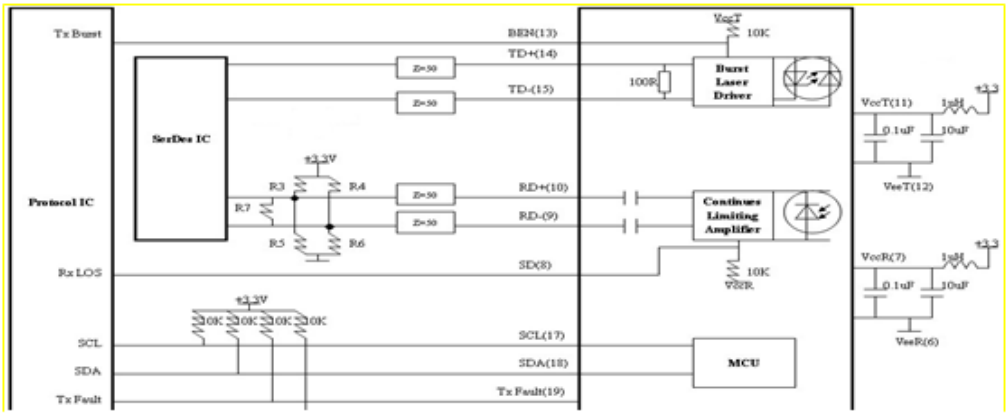


DDM THRESHOLD

CLGPONONUB/I

	Low Alarm	Low Warn	High Warn	High Alarm
CLGPONONUB	-5℃	0℃	70℃	80℃
CLGPONONUBI	-45℃	-40℃	95℃	100℃
Voltage	3V	3.1V	3.5V	3.6V
Tx Bias	0mA	0mA	70mA	90mA
Tx Power	0.5dBm	1dBm	4dBm	5dBm
Rx Power	-28dBm	-27dBm	-9dBm	-8dBm

Recommended Circuit



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Mechanical Specifications