

1.25Gbps Bi-Di GPON ONU SFF Transceiver (UGP-N2)

1310nm /1490nm

Features

- Single fiber bi-directional data links with 1.244Gbps upstream and 2.488Gbps downstream
- 1310nm burst-mode transmitter with DFB laser, AC/AC couple, low level turn on
- 1490nm continuous-mode receiver with APD-TIA
- 2X10 SFF package with SC receptacle or SC/APC pigtail
- Single 3.3V power supply, low power consumption
- RoHS Compliance
- Case operating temperature: 0~70 °C
- Compliant with SFF MSA and SFF-8472
- Compliant with ITU-T G.984.2 GPON ONU Class B+

Applications

- FTTx
- GPON ONU Class B+

Part numbers

<i>P/N</i>	<i>Data Rate</i>	<i>Wavelength</i>	<i>Connector</i>
UGP-N1	1.25G TX	1310Tx/1490Rx	SC receptacle
UGP-N2	1.25G TX	1310Tx/1490Rx	SC/APC pigtail

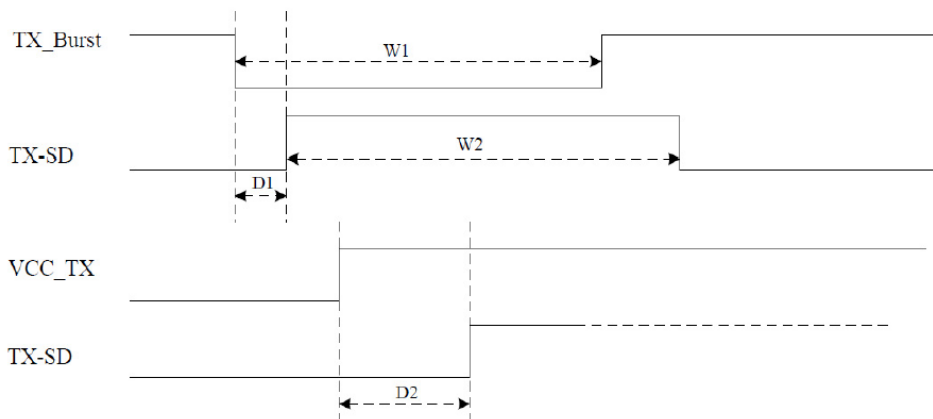
Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T _S	-40		+85	°C
Case Temperature	T _C	0		+70	°C
Supply Voltage	V _{CC}	0		4	V
Relative Humidity	RH	0		95	%
Soldering Temperature				260/10	°C/S
Bending Radius				30	mm
Pigtail Fiber Contact Temperature				85	°C
Pull force of pigtail				1	Kg

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Data Input Differential Swing	Vin PP	200		1600	mV	
LVTTTL Transmit Burst Input Voltage - Low	Vben_off	2		Vcc	V	
LVTTTL Transmit Burst Input Voltage - High	Vben_on	0		0.8	V	
Signal detect of transmitter	SD	2.4		Vcc	V	
Input Differential Impedance	Zin		100		Ω	
Signal delay of TX-SD	D1			200	ns	1
Pulse width of TX-SD, TX-Burst	W1-W2			350	ns	1
Turn on of TX-SD	D2			3	s	1
Receiver Section:						
Data Output Differential Swing	Vout,pp	400		1000	mv	
SD Voltage High	VOH	2.4		Vcc	V	
SD Voltage Low	VOL	0		0.4	V	

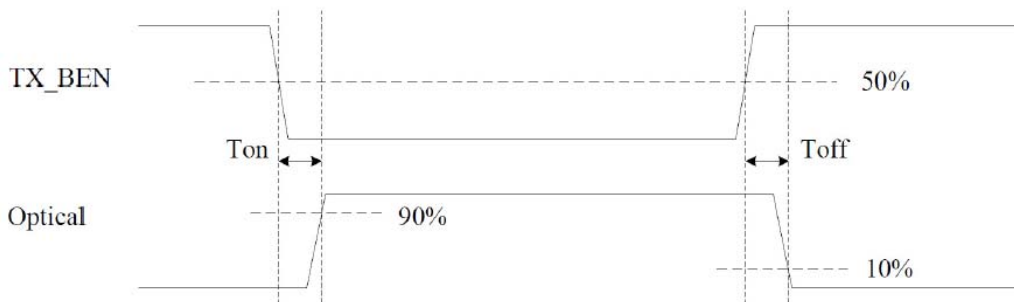
Note 1: Timing diagram of TX_SD



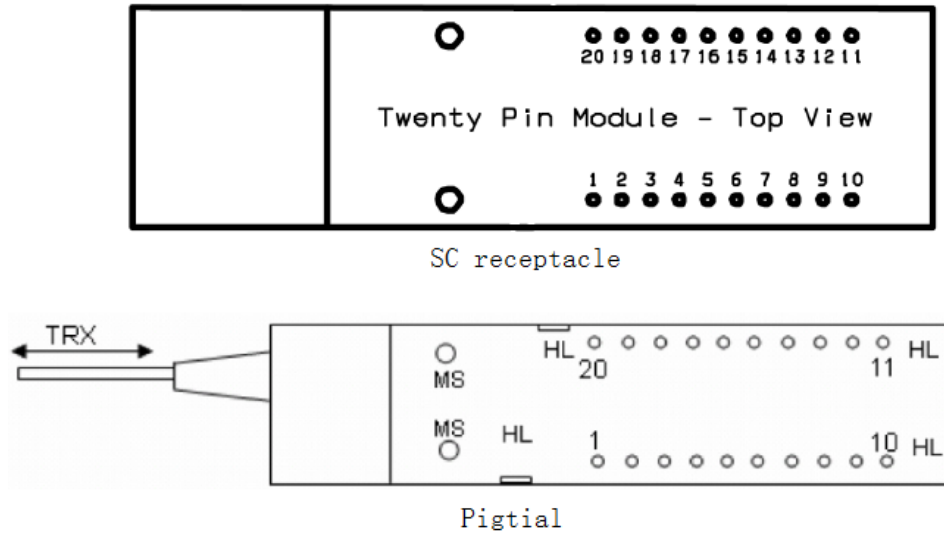
Optical Parameters

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λ	1260	1310	1360	nm	
Spectral Width	σ			1	nm	
Optical Output Power	Pout	0.5		5	dBm	
Extinction Ratio	ER	10			dB	
Optical Rise/Fall Time	tr / tf			260	ps	
Turn on	Ton			12.8	ns	1
Turn off	Toff			12.8	ns	1
Eye diagram	Comply with ITU-T 984.2					
Receiver Section:						
Optical Input Wavelength	λ	1480	1490	1500	nm	
Receiver Overload	Pol	-8			dBm	
RX Sensitivity	Sen			-28	dBm	
RX_LOS Assert	LOS A	-40			dBm	
RX_LOS De-assert	LOS D			-30	dBm	
RX_LOS Hysteresis	LOS H	0.5		5	dB	
G 984.5 WDM Isolation	Iso1	28			dB	
	Iso2	35			dB	

Note 1: Timing diagram in Burst Mode Sequence



Pin Assignment



Pin Function Definitions

Pin No	Name	Function	Note
1	NC	Internally Connected	Do not use
2	NC	Internally Connected	Do not use
3	NC	Internally Connected	Do not use
4	NC	Internally Connected	Do not use
5	NC	Internally Connected	Do not use
6	VEER	Receiver Signal Ground	
7	VCCR	Receiver Power Supply	
8	SD	Receiver Signal-Detect Indication	1
9	RD-	Inverted Receiver Data Output	2
10	RD+	Non-inverted Receiver Data Output	
11	VCCT	Transmitter Power Supply	
12	VEET	Transmitter Signal Ground	
13	TX_Burst	Transmitter Burst Control	3
14	TD+	Transmitter Non-inverted Data Input	4
15	TD-	Transmitter Inverted Data Input	
16	VEET	Transmitter Signal Ground	
17	SCL	I ² C Serial Clock	LVTTTL, External Pull-Up Required
18	SDA	I ² C Serial DATA	LVTTTL, External Pull-Up Required

19	TX_Fault	Transmitter Fault	5
20	TX_SD	TX Transmitter State Indication,	6

Notes:

Note 1: TTL logic output, with internal 10KΩ pull-up resistor.

Note 2: AC coupled internally.

Note 3: Transmitter Burst Enable Control pin, A Low level Enable TX optical output.

Note 4: LVPECL input, DC coupled internally.

Note 5: TTL logic output, pulled up by a 10K resistor on the host board.

Laser Normal State: High; Laser Failure State: Low

Note6:TX_SD Assert high when Transmitter on

SFP Module EEPROM Information and Management

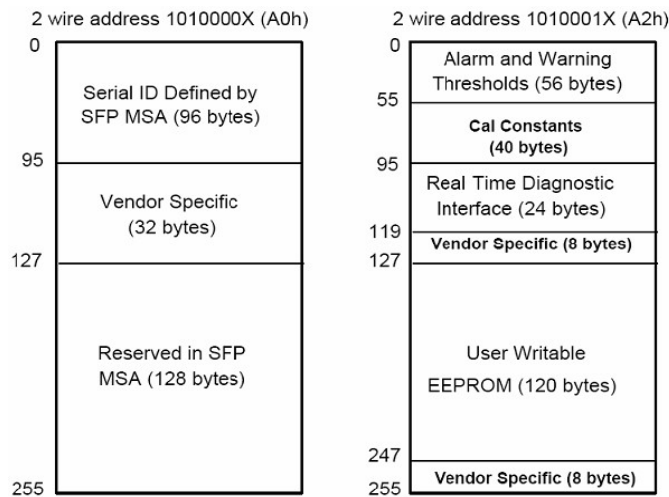


Table 2 - EEPROM Serial ID Memory Contents (A0h)

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	
11	1	Encoding	NRZ(03h)
12	1	BR, Nominal	Nominal baud rate, unit of 100Mbps
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m

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18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number(ASCII)
56-59	4	Vendor rev	Revision level for part number
60-62	3	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	specific date, read only
128-255	128	Reserved	Reserved for SFF-8079

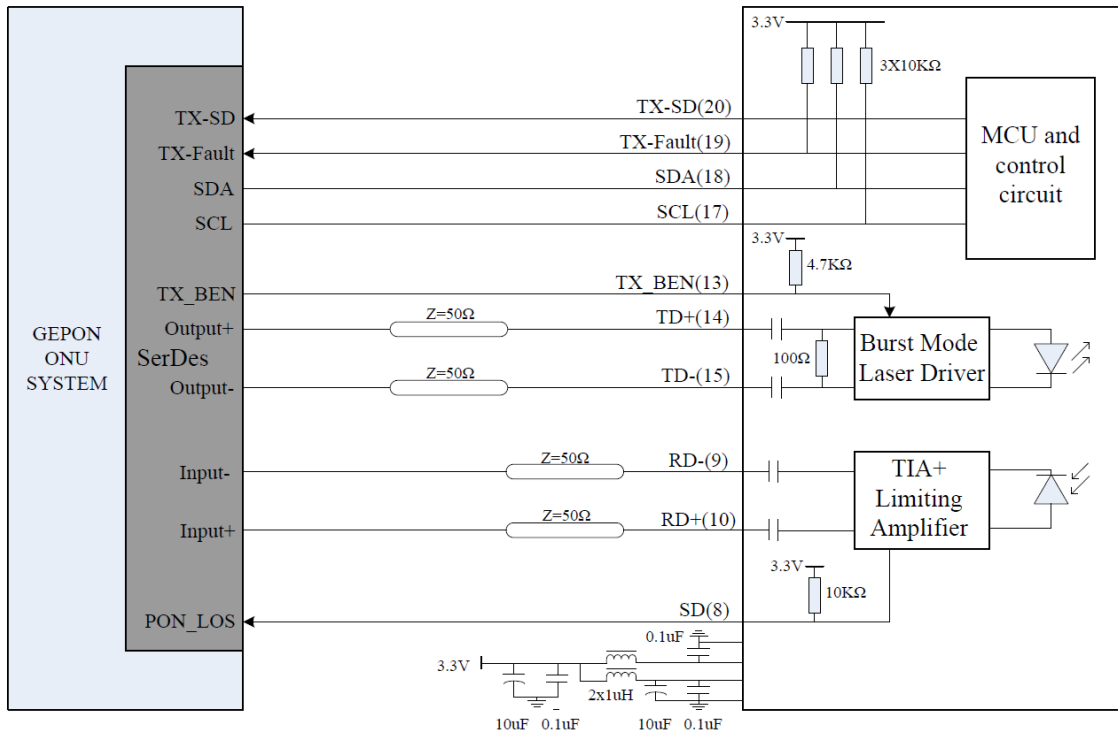
Digital Diagnostic Monitor Characteristics

Data Address	Parameter	Accuracy	Unit
96-97	Transceiver Internal Temperature	±3.0	°C
98-99	VCC3 Internal Supply Voltage	±3.0	%
100-101	Laser Bias Current	±10	%
102-103	Tx Output Power	±2.0	dBm
104-105	Rx Input Power	±2.0	dBm

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Recommended Circuit



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