

GPT-NSS4-20Dx-1

GPON OLT Transceiver, SFP, 20km Reach

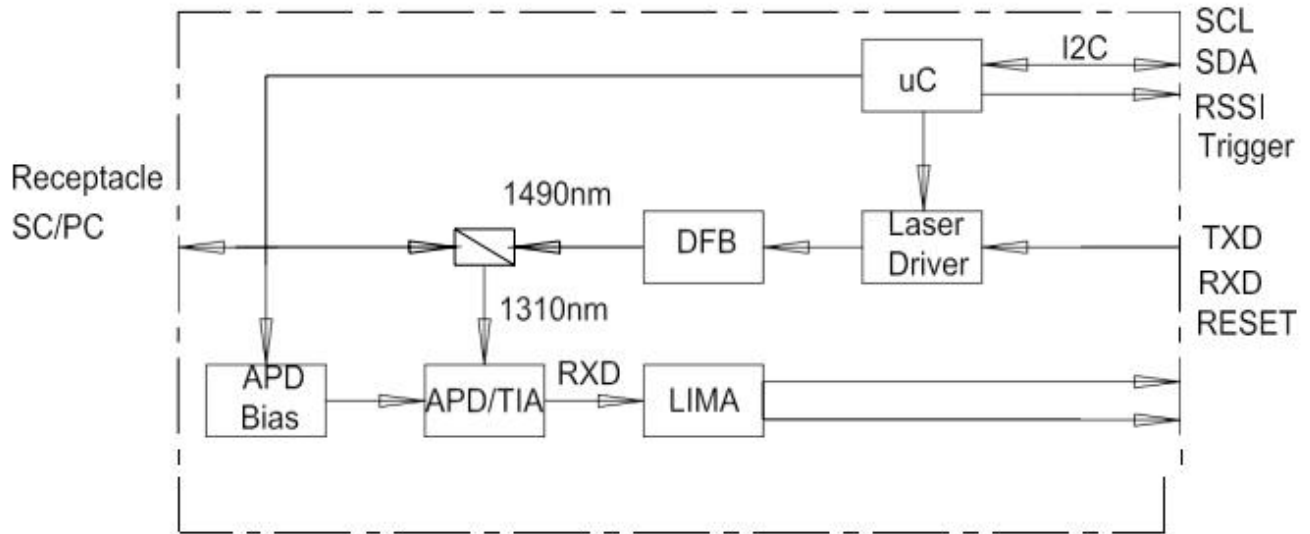
Product Features

- SFP with SC/PC Connector Transceiver
- 1490 nm DFB Tx with isolator
- 1310 nm APD Rx
- Digital diagnostics SFF-8472 Compliant
- 2488 Mbps continuous mode Transmission
- 1244 Mbps Burst mode receiver Data Rate
- RX Fast Burst Mode Detection
- Provide fast RSSI function
- Class C++ link budget
- Comply with ITU-T G984.2 Amendment 1
- Complies with RoHS directive (2002/95/EC)
- Operating case temperature:
 - Standard: 0 to +70°C
 - Industrial: -40 to +85°C

Applications

- GPON OLT Class C++
- FTTx

Function Diagram



Transceiver functional diagram

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	3.1	3.5	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	0		+70	°C
		-40		+85	°C
Power Supply Voltage	Vcc	3.1		3.5	V
Power Supply Current	Icc			500	mA
Data Rate	Tx		2.488		Gbps
	Rx		1.244		

Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λ_c	1480	1490	1500	nm	1
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side-Mode Suppression Ratio	SMSR	30	-		dB	
Average Output Power	P_{out}	4.5		10	dBm	
Extinction Ratio	ER	9			dB	
Data Input Swing Differential	V_{IN}	300		1200	mV	
Input Differential Impedance	Z_{IN}	80	100	120	Ω	
TX Disable	Disable		2.0		V_{cc}	V
	Enable		0		0.8	V
TX Fault	Fault		2.0		V_{cc}	V
	Normal		0		0.8	V
Receiver						
Centre Wavelength	λ_c	1260		1360	nm	
Receiver Sensitivity				-32	dBm	1
Saturation Optical Power		-8			dBm	1
Receiver Reflectance				-12	dB	
Receiver Burst-mode Dynamic Range		15			dB	2
Data Output Swing Differential	V_{out}	400		1600	mV	
RSSI accuracy		-3		3	dB	3
BPD Output Voltage- High	V_{IH}	2.4			V	4
BPD Output Voltage- Low	V_{IL}			0.4	V	4
Signal Detect De-Assert Time				12.8	ns	
Signal Detect Assert Time				50	ns	
RSSI Trigger Delay	TD	25	-	-	Ns	5
RSSI Trigger Width	TW	500	-	-	ns	
LOS	High	2.0		V_{cc}	V	
	Low			0.8	V	

Notes:

1. 2.488Gbps continuous-mode , PRBS2²³-1
2. Measured with 1310nm, 1.244Gbps PRBS2²³-1 burst-mode optical input, ER=10dB.BER=1x10⁻¹⁰; Single burst packet length is 40us and packet interval is 40us.
3. Input optical power level difference of adjacent burst packets
4. Receiver optical power ranged from -8dBm to -28dBm, measured with 1310nm.1.244Gbps PRBS2⁷-1 burst-mode optical input, ER=10dB, 50%duty cycle.
5. BPD assert low when module receive "Reset" signal, assert high when burst package is detected and latch to high state until next "Reset" signal.
6. Refer to first bit of the preamble.

Timing and Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Tx Disable Negate Time	t_on			2	ms
Tx Disable Assert Time	t_off			100	µs
Time To Initialize, including Reset of Tx Fault	t_init			300	ms
Tx Fault Assert Time	t_fault			100	µs
Tx Disable To Reset	t_reset	10			µs
LOS Assert Time	t_loss_on			100	µs
LOS De-assert Time	t_loss_off			100	µs
Serial ID Clock Rate	f_serial_clock		100	400	KHz
MOD_DEF (0:2)-High	V _H	2		V _{cc}	V
MOD_DEF (0:2)-Low	V _L			0.8	V

Diagnostics

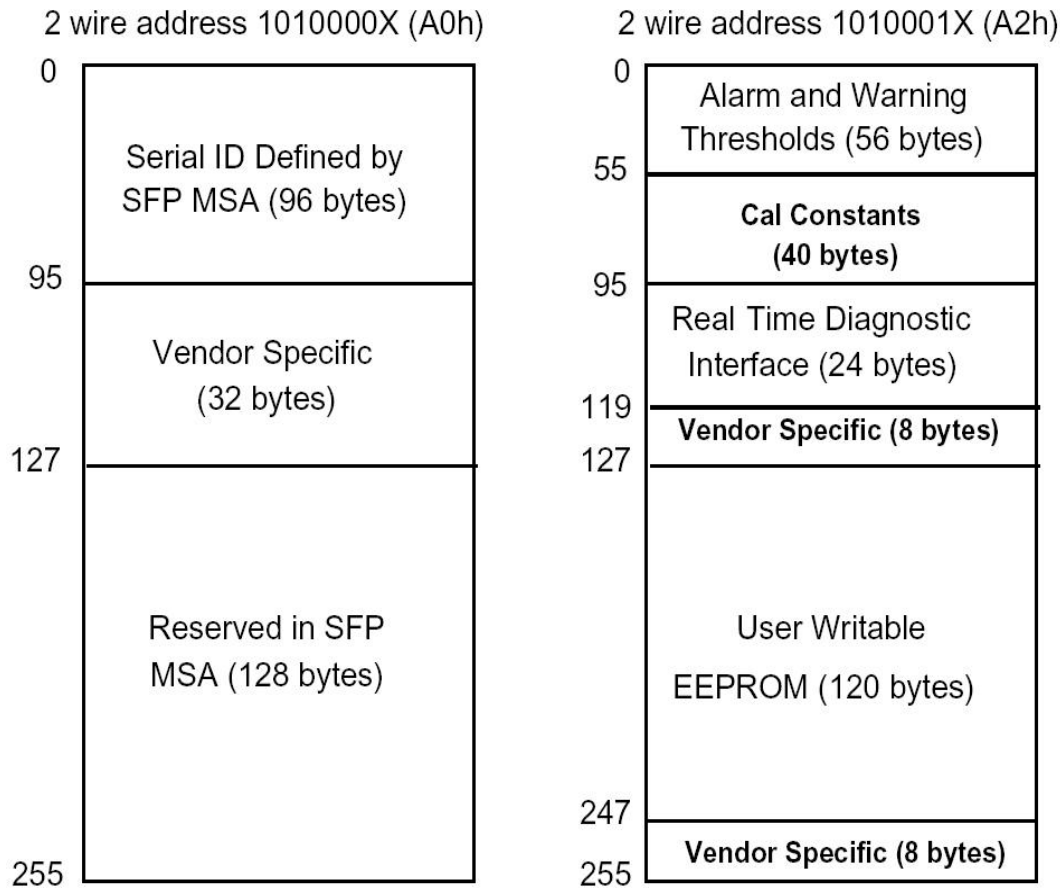
Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal
Voltage	3.0 to 3.6	V	±3%	Internal
Bias Current	0 to 100	mA	±10%	Internal
TX Power	-7 to 2	dBm	±3dB	Internal
RX Power	-14 to +2	dBm	±3dB	Internal

Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

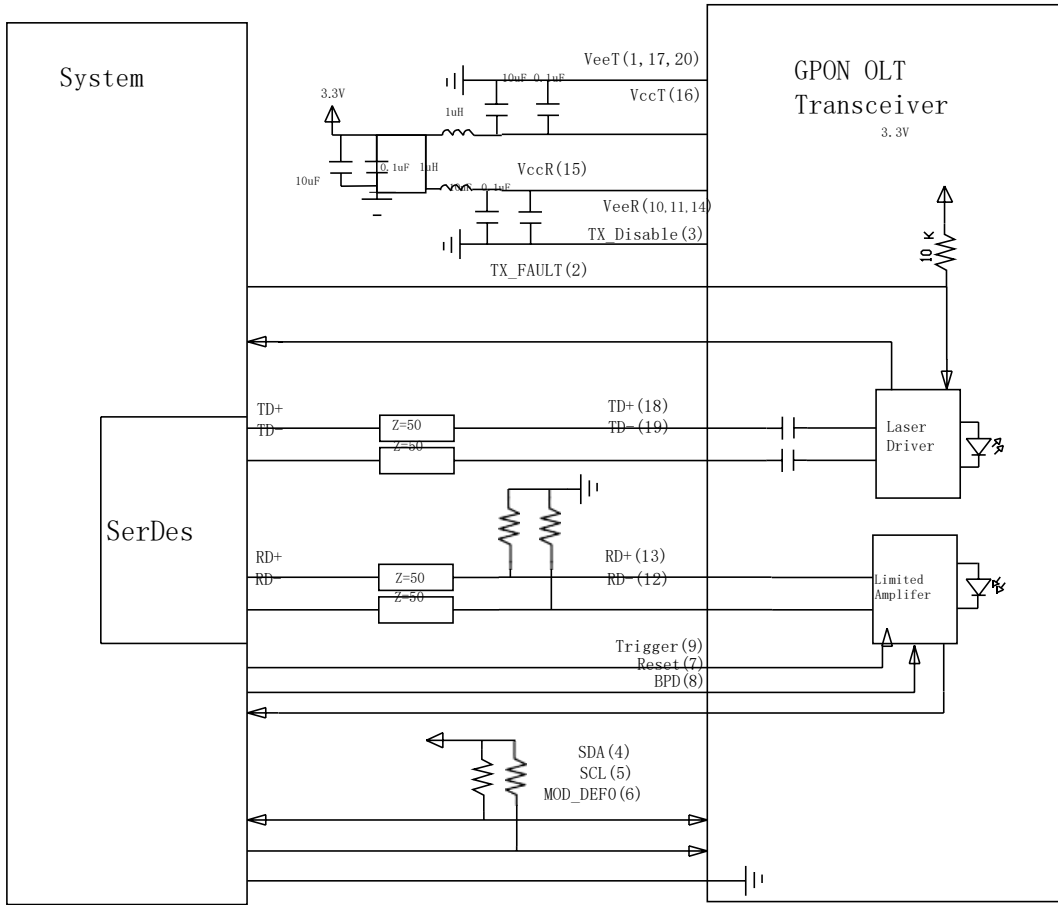
The digital diagnostic memory map specific data field defines as following.



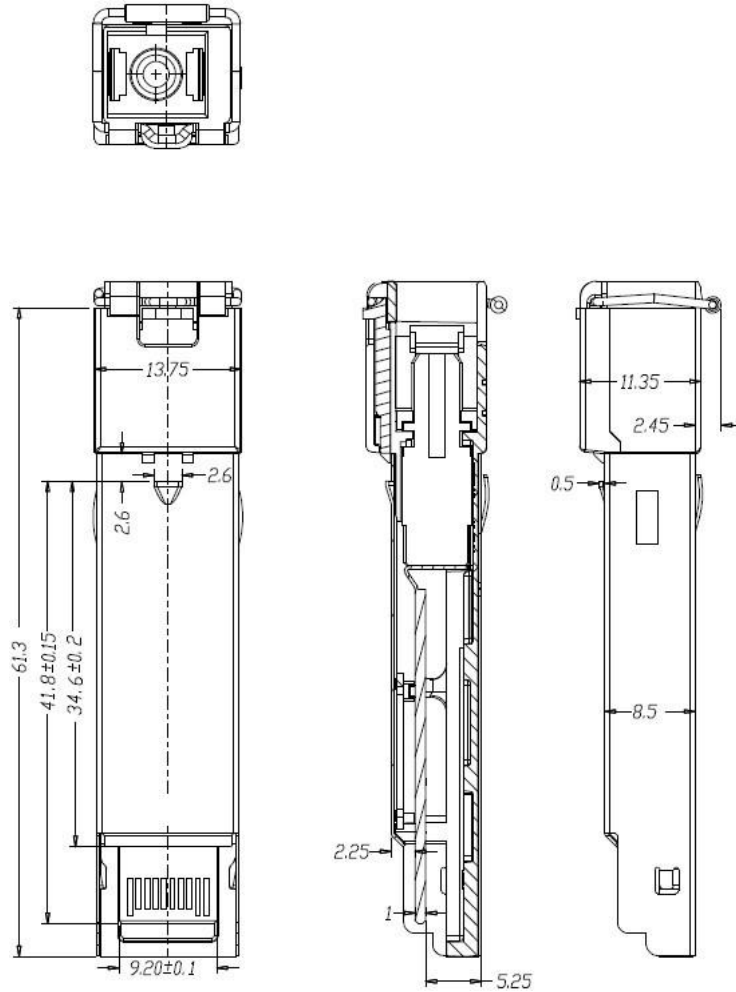
Pin Descriptions

Pin	Signal Name	Function
1	VeeT	Transmitter Ground
2	TX_Fault	Transmitter Fault Indication, LVTTTL Output, Active High
3	TX_Disable	Transmitter Disable, LVTTTL Input. Optical output power is off when this PIN is high or left unconnected.
4	SDA	I2C Data
5	SCL	I2C Clock
6	MOD-DEF(0)	Internally grounded
7	Reset	Receiver Reset , LVTTTL Input. Set "Reset" high at the end of previous burst, 2 bytes in duration
8	BPD	Burst Packet Detect, LVTTTL output. BPD assert low when module receives "reset" signal, assert high when incoming burst is present.
9	RSSI_Trigger	RSSI Trigger Signal from Host, LVTTTL input.
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Inv. Received Data Out, LVPECL,DC coupled
13	RD+	Received Data Out, LVPECL,DC coupled
14	VeeR	Receiver Ground
15	VccR	Receiver Power
16	VccT	Transmitter Power
17	VeeT	Transmitter Ground
18	TD+	Transmit Data In, LVPECL or CML (AC coupled; internally 100 ohms differential termination)
19	TD-	Inv. Transmit Data In, LVPECL or CML (AC coupled; internally 100 ohms differential termination)
20	VeeT	Transmitter Ground

Recommended Interface Circuit



Mechanical Dimensions



Ordering information

Part Number	Product Description
GPT-NSS4-20DC-1	1490nm/1310nm, 2.488Gbps/1.244Gbps, SC/UPC, 20km, 0~+70 ° C, with DDM, CLASS C++
GPT-NSS4-20DI-1	1490nm/1310nm, 2.488Gbps/1.244Gbps, SC/UPC, 20km, -40~85 ° C, with DDM, CLASS C++

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