RoHS compliant
CL-SFP-GPON-OLT 20-49BP
Hot Pluggable, GPON OLT SFP Transceiver
Single SC,+3.3V, 2.5Gb Tx/1.25Gb Rx, 1490nm Tx/1310nm Rx, Class B+

Features

- SFP Package with SC receptacle
- 1.244Gbps, 1310nm BM APD Receiver
- 2.488Gbps, 1490nm Transmitter With Isolator
- Fast Signal Detect feature reduces ranging overhead
- Simplified OLT Reset Timing
- Compliant With ITU-T G.984.2
- Squelched RX output
- Up to 20km distance at 9/125μm G.652 SMF
- Operating Case Temperature
- Commercial: 0℃~+70℃ Industrial: -40℃~+85℃

Application

- GPON 20km OLT Side
- Access Networks
- Fiber to the Home, Curb, Office (FTTx)

Ordering Information

PART NUMBER	INPUT/OUTPUT	SIGNAL DETECT	VOLTAGE	TEMPERATURE
CL-SFP-GPON-OLT 20-49BP	AC/AC	TTL	3.3V/5V	0°C to 70 °C
CL-SFP-GPON-OLT 20-49BP i	AC/AC	TTL	3.3V/5V	-40°C to 85 °C

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Regulatory Compliance*

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12
		EN 60825-1:2007
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50285865 0001	EN 55022:2010
		EN 55024:2010
CB	JPTUV-049251	IEC 60825-1
		IEC 60950-1
FCC	WTF14F0514437E	47 CFR PART 15 OCT., 2013
FDA	1331340-000	CDRH 1040.10
ROHS	RHS01G006464	2011/65/EU

*The above certificate number updated to June 2014, because some certificate will be updated every year, such as FCC, FDA and ROHS. For the latest certification information, please check with Carelink.

Product Description

Carelink's high performance GPON OLT transceiver module is designed for Passive Optical Network application, 2.488Gbps downstream and 1.244Gbps upstream. It is fully compliant with ITU-T G.984.2.
The GPON OLT transceiver is packaged of small form factor pluggable with SC receptacle. The digital diagnostic monitoring function is compliant with SFP MSA.
The module consists of 1490nm DFB Laser, APD detector and WDM filter in a high-integrated optical sub-assembly. It transmits 2.488Gbps at 1490nm, and receives 1.244Gbps at 1310nm in burst mode.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_S	-40	+85	°C
Supply Voltage	V_{CC}	0	4.0	V
Operating Relative Humidity		5	95	%

*Exceeding any one of these values may destroy the device permanently.

Recommended Operating Conditions

Parameter	Symbol		Min.	Typical	Max.	Unit
Power Supply Voltage	V_{CC}		3.13	3.3	3.47	V
Power Supply Current	I_{CC}				500	mA
Operating Case Temperature	T_C	CL-SFP-GPON-OLT 20-49BP DD	0		+70	°C
		CL-SFP-GPON-OLT 20-49BP DDi	-40		85	
Relative Humidity	RH		5		95	%
Date Rate	Upstream/Downstream			1.244/2.488		Gbps

Performance Specifications – Electrical

Parameter		Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter							
LVPECL Compatible Inputs(Differential)		Vin	200		1600	mVpp	AC coupled internally
Input Impedance (Differential)		Zin	90	100	110	ohms	Rin > 100 kohms @ DC
Tx Disable			2		Vcc	V	
Tx Enable			0		0.8		
Tx Fault_High			2.4		Vcc	V	
Tx Fault_Normal			0		0.4		
Receiver							
LVPECL Outputs (Differential)		Vout	400		1600	mVpp	DC coupled outputs
BRST_DET	High		2		Vcc	V	
	Low		0		0.8	V	

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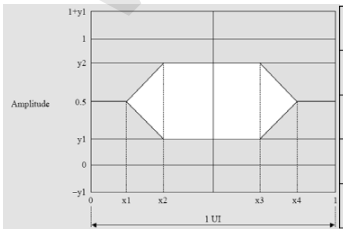
Performance Specifications – Optical

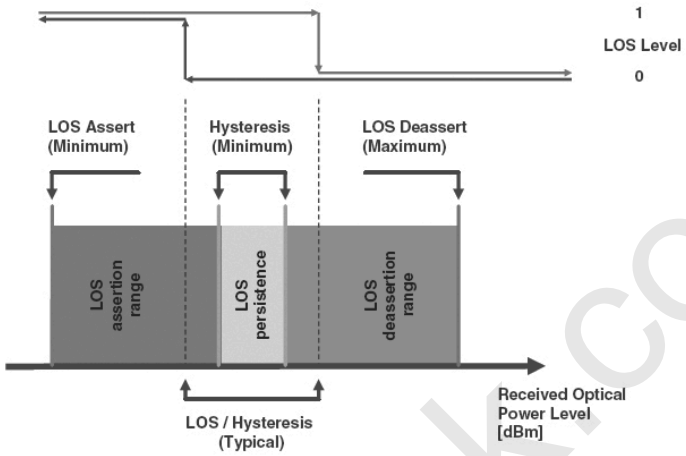
Parameter	Symbol	Min.	Typical	Max.	Unit
Date Rate (Upstream/Downstream)			1.244/2.488		Gbps
Transmitter					
Centre Wavelength	λ_C	1480	1490	1500	nm
Spectral Width (-20dB)	Δλ			1	nm
Side Mode Suppression Ratio	SMSR	30			dB
Average Output Power*(note3)	Pout	1.5		5	dBm
Downstream optical penalty				1	dB
Extinction Ratio*(note4)	ER	10			dB
Tolerance to Tx back reflection		-15			dB
Rise/Fall Time(20%～80%)*(note4)(note5)	tr/tf			160	ps
Output Optical Eye*(note4)(note6)	ITU-T G.984.2 Compliant				
Optical Output Power with TX OFF	P_off			-40	dBm
Receiver					
Centre Wavelength	λc	1260	1310	1360	nm
Receiver Sensitivity*(note7)	Pmin			-28	dBm
Receiver Overload*(note7)	Pmax	-8			dBm
Receiver Burst-Mode Dynamic Range*(note8)		15	20		dB
Receiver Reflectance	CR			-20	dB
Signal Detect Assert Level	SDA			-30	dBm
Signal Detect De-Assert Level	SDD	-45			dBm
Signal Detect Hysteresis*(note9)		0.5	2	6	dB.
Receiver CID Tolerance	CID	72			bits
Maximum Receiver Reflectance	Rx_r			-20	dB

Note3: Measured with 9/125um G.652 SMF.
Note4: Filtered, Measured with PRBS2_{23}-1 test pattern @2.488Gbps.
Note5: Measured with the Bessel-Thompson filter OFF.
Note6: Eye pattern mask



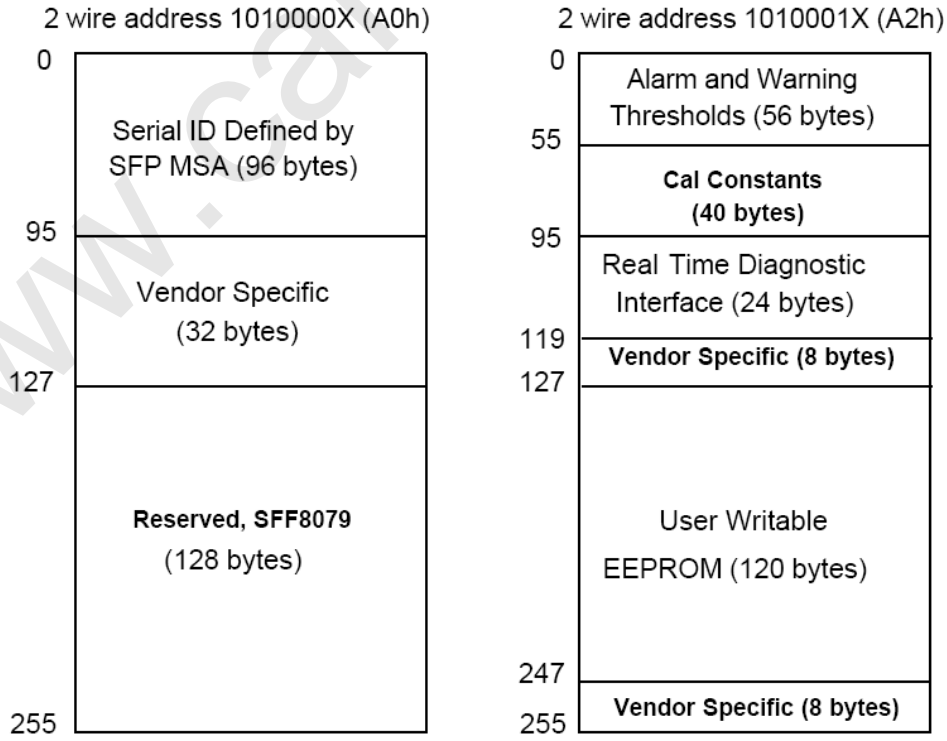
	1244.16 Mbit/s	2488.32 Mbit/s
x1/x4	0.28/0.72	---
x2/x3	0.40/0.60	---
x3 – x2	---	0.2
y1/y2	0.20/0.80	0.25/0.75

Note 7: Measured with a PRBS 2_{23}-1 test pattern @1.244Gbps, BER 1X10-10.
Note 8: The input power difference between two subsequent high and low burst data.
Note 9: LOS Hysteresis(SD signal coincides with the LOS signal inversion)



Digital Diagnostic Interface

The memory map in the following describes an extension to the memory map defined in SFP-8472. The enhanced interface uses the two wire serial bus address 1010001X (A2h) to provide diagnostic information about the module's present operating conditions.



EEPROM Serial ID Memory Contents (2-Wire Address A0h)

The following diagnostic information is according to the CL-SFP-GPON-OLT 20-49BP DD Series

Address	Name of Field	Hex	Description
Base ID Fields			
00	Identifier	03	SFP physical device (soldered device)
01	Ext. Identifier	04	Serial ID module supported
02	Connector	01	SC
03-10	Transceiver Codes	00 00 00 00 00 00 00 00	Undefined
11	Encoding	03	NRZ
12	BR, Nominal	19	Nominal 2.488Gbps (indicate transmitter data rate)
13	Reserved	00	-
14	Length (9um)-km	14	20km @9/125um fiber
15	Length (9um)-100m	C8	20000m @9/125um fiber
16-18	Length for MMF	00	Undefined for GPON
19	Reserved	00	-
20-35	Vendor Name	45 4F 50 54 4F4C 49 4E 4B 20 49 4E 43 20 20 20	CARELINK INC (ASCⅡ)
36	Channel Spacing	00	-
37~39	Vendor OUI	00 00 00	-
40-55	Vendor P/N	45 4F 4C 53 2D 47	CL (ASCⅡ)
		54 2D 32 35 2D 44 20 20 20 20	
56-59	Vendor P/N Rev.	XX XX XX 20	31 2E 30 20 means 1.0 revision.
60-61	Laser Wavelength	05 D2	1490nm in Hex byte
62	DWDM Wavelength Fraction	00	Undefined
63	CC_BASE	XX	Check sum of byte 0-62
Extended ID Fields			
64-65	Options	00 1C	TX_Fault, TX_Dis, Signal Detect are implemented
66	BR, Max.	00	-

67	BR, Min.	00	-
68-83	Vendor SN	XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX XX	Vendor serial number in ASCII
84-91	Date Code	XX XX XX XX XX XX 20 20	Vendor date code in ASCII (Year Month Date)
92	Diagnostic Monitoring Type	XX	External or Internal Calibration.
93	Enhanced options	E0	Alarm/Warning flags, soft TX_DIS, TX_FAULT if SP implemented.
94	SFF-8472 compliant	02	SFP-8472 compliant with revision 9.5
95	CC_EXT	XX	Check sum of bytes 64-94
Vendor Specific ID Fields			
96-127	Vendor Specific	00	Vendor specific EEPROM
128-256	Reserved	00	Reserved for future use

*The "XX" byte should be filled in according to practical case. For more information, please refer to the related document of SFP Multi-Source Agreement (MSA).

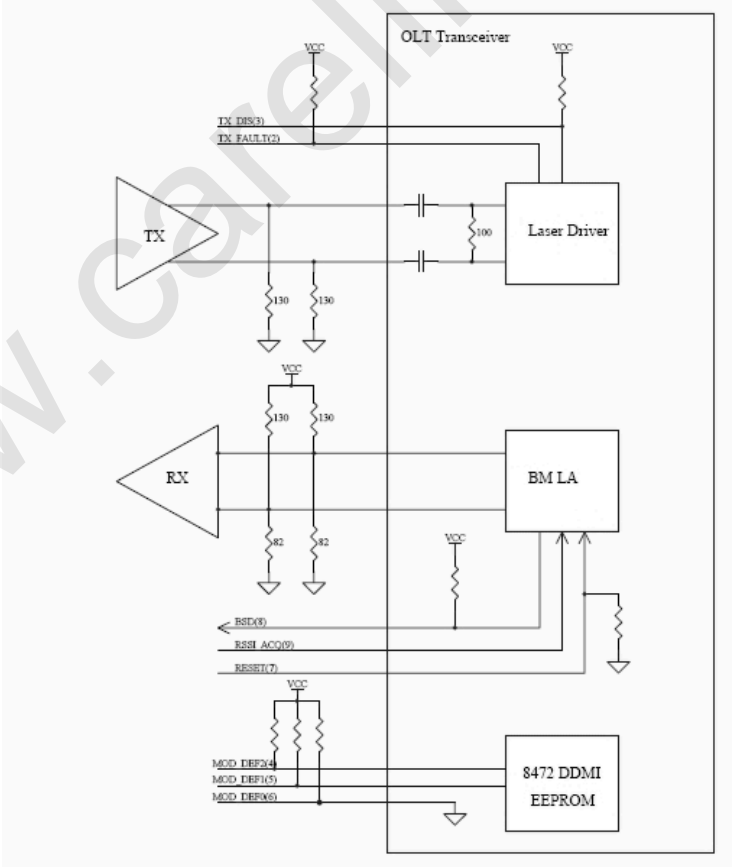
SFP Pin Function Definitions

Below figure shows the pin information of electrical interface and mounting studs. Functions are described in the following table.

Pin No.	Pin Name	Description
1	Veet	Tx Ground
2	Tx Fault	Tx Fault Alarm. LVTTL Output Active High
3	Tx DIS	Tx Disable. LVTTL input. Laser output is disabled when this pin is asserted high or left unconnected. Laser output is enabled when this pin is asserted low.
4	MOD_DEF(2)	2-Wire Serial Data I/O Pin.
5	MOD_DEF(1)	2-Wire Serial Clock Input.
6	MOD_DEF(0)	Internally Grounded
7	Reset	CMOS input. Assert "Reset" high at the end of previous burst, 2 bytes
		in duration
8	BRST_Det	LVTTL output. BRST_Det assert low when module receives "reset" signal, assert high when incoming burst is present.
9	RSSI_ACQ	RSSI acquire/hold LVTTL Input. Digital RSSI output through I2C
10	Veer	Rx Ground

11	Veer	Rx Ground
12	RXD-	Negative Data Output, LVPECL; DC coupled
13	RXD+	Positive Data Output, LVPECL; DC coupled
14	Veer	Rx Ground
15	Vcc_RX	Rx Vcc
16	Vcc_TX	Tx Vcc
17	Veet	Tx Ground
18	TXD+	Positive Data Input, LVPECL or CML (AC coupled; internally 100 ohms differential termination)
19	TXD	Negative Data Input, LVPECLor CML (AC coupled; internally 100 ohms differential termination)
20	Veet	Tx Ground
	F	Mounting Stubs

Recommend Circuit Schematic



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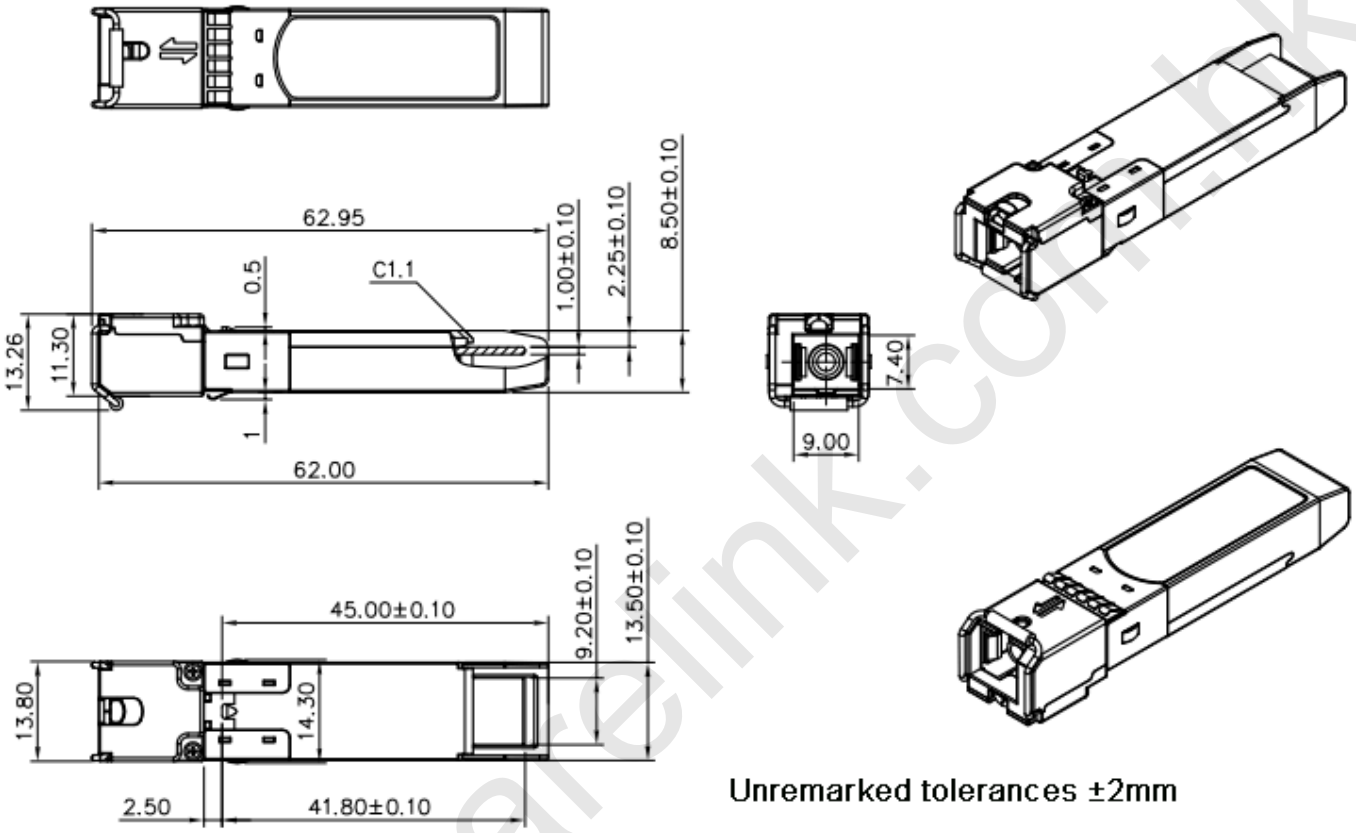
Mechanical Specifications



Unremarked tolerances ±2mm