eoptolink®

EOLS-GET-20 Series

OLT for IEEE 802.3ah-2004 PX20-D
Single Fiber Bi-Directional Transceiver
1.25Gbps Downstream and 1.25Gbps Upstream
RoHS6 Compliant

Features

◆ SFP Package with SC connector

◆ 1.25Gbps, 1310nm BM APD Receiver

◆ 1.25Gbps, 1490nm Continuous-Mode

  Transmitter

◆ Compliant With IEEE 802.3ah-2004

◆ Up to 20km distance at 9/125μm G.652

  SMF

◆ BM Rx with Settling Time less than 400ns

◆ Transmitter：AC Coupling Input

◆ Receiver：DC or AC Coupling Output

◆ LVTTL transmitter disable control

◆ Operating Case Temperature

  Commercial: 0℃~+70℃

  Industrial：-40℃~+85℃

◆ Compliant with SFP MSA

◆ Rx JAM Function

Applications

◆ EPON 20km OLT Side

◆ Access Networks

◆ Fiber to the Home, Curb, Office
  (FTTx)

Ordering information

Part No.	Input/ Output	Rx Signal Indicator	JAM	DDM	BM Digital RSSI	Interface	Temp.
EOLS-GET-20-D*(note1)	AC/DC	LOS	YES	YES	NO	SC	Commercial
EOLS-GET-20-DI*(note1)	AC/DC	LOS	YES	YES	NO	SC	Industrial
EOLS-GET-20-DB	AC/DC	LOS	NO	YES	NO	SC	Commercial

PON Series

EOLS-GET-20-DIB	AC/DC	LOS	NO	YES	NO	SC	Industrial
EOLS-GET-20-DE	AC/DC	LOS	YES	YES	YES	SC	Commercial
EOLS-GET-20-DIE	AC/DC	LOS	YES	YES	YES	SC	Industrial
EOLS-GET-20-DG	AC/DC	LOS	NO	YES	YES	SC	Commercial
EOLS-GET-20-DIG	AC/DC	LOS	NO	YES	YES	SC	Industrial

Note1: Standard version

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 50135430 0001	EN 55022:2006
		EN 55024:1998+A1+A2
CB	JPTUV-024038-M1	IEC 60825-2
		IEC 60950-1
FCC	WTF13F0503735E	47 CFR PART 15 OCT., 2010
	WTF13F0503732E	47 CFR PART 15 OCT., 2010
FDA	1230816-000	CDRH 1040.10
ROHS	RLSZF00163462	2011/65/EU

Product Description

Eoptolink's high performance EPON OLT transceiver module is designed for Passive Optical Network application, 1.25Gbps downstream and 1.25Gbps upstream. It is fully compliant with IEEE 802.3ah-2004.

The EPON OLT transceiver is packaged of small form factor pluggable with SC connector. The digital diagnostic monitoring function is fully 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 1.25Gbps at 1490nm, and receives 1.25Gbps at 1310nm in burst mode.

Absolute Maximum Ratings

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

Note2: 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}				300	mA
Operating Temperature	T_C	EOLS-GET-20-D	0		+70	℃
		EOLS-GET-20-DI	-40		+85	
Relative Humidity	RH		5		95	%
Date Rate	Upstream/Downstream			1.25/1.25		Gbps

Performance Specifications - Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
LVPECL Compatible Inputs(Differential)	Vin	200		1600	mVpp	AC coupled internally
Power Supply Current	I_{CC_Tx}			200	mA	
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
Power Supply Current	I_{CC_Rx}			150	mA	
Rx_LOS	LOS	2		Vcc	V	
	Normal	0		0.8	V	

Performance Specifications - Optical

Parameter	Symbol	Min.	Typical	Max.	Unit
9µm Core Diameter SMF			20		km
Date Rate (Upstream/Downstream)			1.25/1.25		Gbps

PON Series

Transmitter					
Centre Wavelength	λ_C	1480	1490	1500	nm
Spectral Width (-20dB)	$\Delta\lambda$			1	nm
Side Mode Suppression Ratio	SMSR	30			dB
Average Output Power*[note3]	Pout	2		7	dBm
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]	IEEE 802.3ah Compliant				
Optical Output Power with TX OFF	P_off			-40	dBm
Receiver					
Centre Wavelength	λc	1260	1310	1360	nm
Receiver Sensitivity*[note7]	Pmin			-27	dBm
Receiver Overload*[note7]	Pmax	-8			dBm
Receiver Burst-Mode Dynamic Range*[note8]		15	20		dB
Receiver Reflectance	CR			-20	dB
LOS Assert Level	LOSA	-45			dBm
LOS De-Assert Level	LOSD			-29	dBm
LOS Hysteresis*[note9]		0.5		6	Db
Receiver Settling Time	Ts			400	ns
Damage Threshold for Receiver	Pin, damage	3			dBm
Maximum Receiver Reflectance	Rx_r			-20	Db

Note3: Measured with 9/125um G.652 SMF.

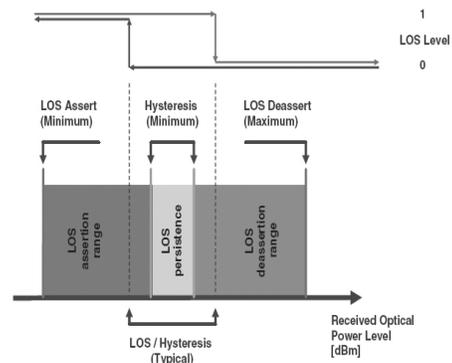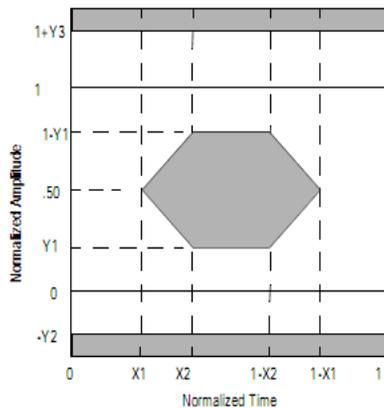Note4: Filtered, Measured with PRBS2^7-1 test pattern @1.25Gbps.

Note5: Measured with the Bessel-Thompson filter OFF.

Note 7: Measured with a PRBS 2^7-1 test pattern @1.25Gbps, BER 1×10^{-12}.

Note 8: The input power difference between two subsequent high and low burst data.

Note6: Eye pattern mask

Note9: LOS Hysteresis

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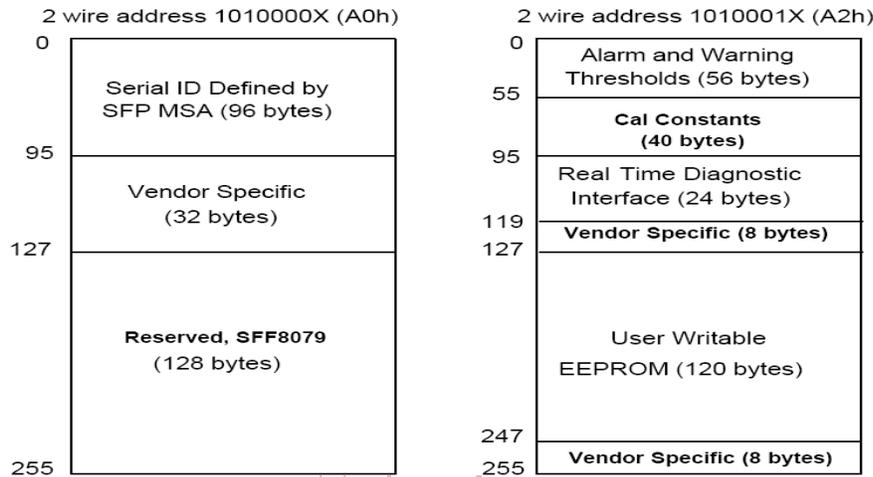
EEPROM Serial ID Memory Contents (2-Wire Address A0h)

Data Addr	Field Size (Byte)	Name Of filed	Description of field	Coded value	Hex
BASE ID FIELDS					
0	1	Identifier	Type of serial transceiver	SFP	03
1	1	Ext.Identifier	Extended identifier of Type of serial transceiver	MOD4	04
2	1	Connector	Code for connector type	SC	01
3	8	Transceiver	10G Ethernet Compliance Codes & Infiniband Compliance Codes		00
4			Part of SONET Compliance Codes		00
5			SONET Compliance Codes		00
6			Ethernet Compliance Codes	BASE-PX	80
7			Fiber Channel link length & part of Fibre Channel technology		00
8			Part of Fiber Channel transmitter technology		00
9			Fiber Channel Transmission media		00

10			Fiber Channel speed			00
11	1	Encoding	Code for high speed serial encoding algorithm	8B10B		01
12	1	BR, Nominal	Nominal signalling rate, units of 100MBd.	1.25Gbps		0D
13	1	Rate Identifier	Type of rate select functionality			00
14	1	Length(SMF,km)	Link length supported for single mode fiber, units of km	20(km)		14
15	1	Length (SMF)	Link length supported for single mode fiber, units of 100 m	200(100m)		C8
16	1	Length (50um)	Link length supported for 50 um OM2 fiber, units of 10 m			00
17	1	Length (62.5um)	Link length supported for 62.5 um OM1 fiber, units of 10 m			00
18	1	Length (Copper)	Link length supported for copper, units of meters			00
19	1	Length (OM3)	Link length supported for 50 um OM3 fiber, units of 10 m			00
20					E	45
21					O	4F
22					P	50
23					T	54
24					O	4F
25					L	4C
26					I	49
27	16	Vendor name	Vendor name (ASCII)		N	4E
28					K	4B
29						20
30					I	49
31					N	4E
32					C	43
33					<space>	20
34					<space>	20
35					<space>	20
36	1		Reserved			00
37						00
38	3	Vendor OUI	SFP vendor IEEE company ID			00
39						00
40					E	45
41	16	Vendor PN	Part number provided by vendor (ASCII)		O	4F
42					L	4C

43				S	53
44				-	2D
45				G	47
46				E	45
47				T	54
48				-	2D
49				2	32
50				0	30
51				-	2D
52				x	xx
53				x	xx
54				<space>	20
55				<space>	20
56	4	Vendor rev	Revision level for part number provided by vendor (ASCII)	1	31
57				.	2E
58				0	30
59				<space>	20
60	2	Wavelength	Laser Wavelength	1490nm	05
61					D2
62	1		Reserved		00
63	1	CC_BASE	Check code for Base ID Fields (addresses 0 to 62)	Note10	xx
64	2	Options	Indicates which optional transceiver signals are implemented	TX_DISABLE, TX_FAULT signal,Rx_LOS	00
65					1A
66	1	BR, max	Upper bit rate margin, units of %		00
67	1	BR, min	Lower bit rate margin, units of %		00
68	16	Vendor SN	Serial number provided by vendor (ASCII)	S	53
69				x	xx
70				x	xx
71				x	xx
72				x	xx
73				x	xx
74				x	xx
75				x	xx
76				x	xx
77				x	xx
78				<space>	20
79				<space>	20
80				<space>	20

81				<space>	20
82				<space>	20
83				<space>	20
84	8	Date code	Vendor's manufacturing date code	Year	xx
85				Year	xx
86				Month	xx
87				Month	xx
88				Day	xx
89				Day	xx
90				<Space>	20
91				<Space>	20
92	1	Diagnostic Monitoring Type	Type of diagnostic monitoring is implemented	DD Implemented; Externally Calibrated; Average Power	58
93	1	Enhanced Options	Optional enhanced features are implemented	Optional Alarm/warning Flags Implemented,Optional soft TX_FAULT monitoring,Optional soft RX_LOS monitoring	B0
94	1	SFF-8472 Compliance	Revision of SFF-8472 the transceiver complies with	Rev 9.5of SFF-8472.	02
95	1	CC_EXT	Check code for the Extended ID Fields (addresses 64 to 94)	Note 11	xx

Note 10: The check code shall be the low order 8 bits of the sum of the contents of all the bytes from byte 0 to byte 62, inclusive.

Note 11: The check code shall be the low order 8 bits of the sum of the contents of all the bytes from byte 64 to byte 94, inclusive.

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	NC/RSSI	Not Connected or RSSI Triger（Optional）.
8	LOS	LOSS, ASSERT HIGH WHEN LOSS OF SIGNAL
9	Veer	Rx Ground
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, LVPECL or CML (AC coupled; internally 100 ohms differential termination)
20	Veet	Tx Ground
	F	Mounting Studs

Recommend Circuit Schematic
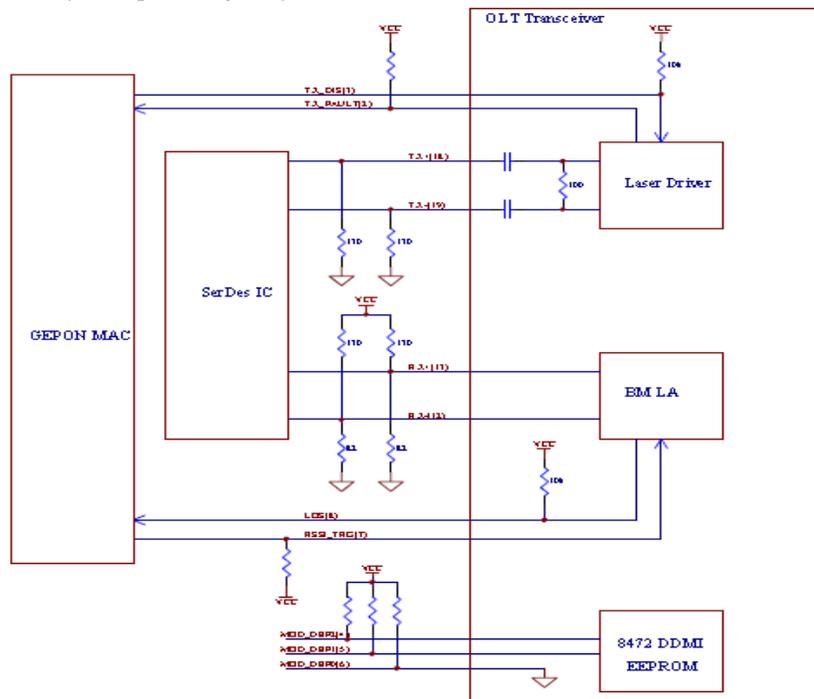
Mechanical Specifications
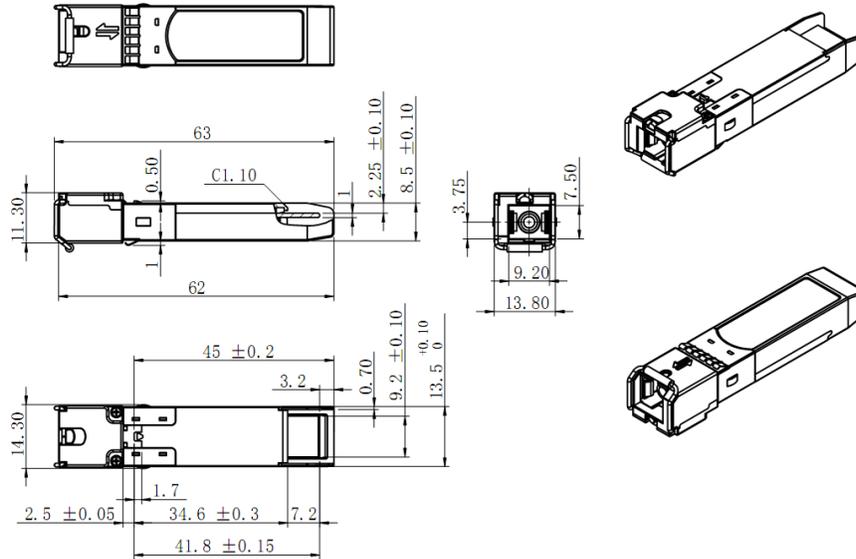
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Revision History

Revision	Initiate	Review	Approve	DCN	Date
V3.a	Cathy	Kelly		Initialed.	Mar 19, 2010
V3.b	Cathy			Updated.	July 1, 2010
V3.c	Kelly			Add product list with couple mode, burst level and Rx signal indicator, and change SD to LOS.	May 18, 2011
V3.d	Kelly			Update A0h, sensitivity.	June 28, 2011
V3.e	Arvin	Alex, Kelly		Correct pin name of 8 and 9. Update ordering information and SDD value .	July 8, 2011
V3.f	Angela	Kelly		Update LOSA&LOSD and add Circuit Schematic	Nov 16,2012

| V3.g | Angela | Daquan.dong | Alex | Update LOSA | August 26, 2013 |
| V4.a | Yi.Wan, Abby | Kelly | | Update Regulatory Compliance and EEPROM | June 13, 2014 |

Notice:

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