GETX-5351S-X3CDA

Asymmetricl 10G EPON OLT Transceiver

Features

- Single Fiber Transceiver with single mode SC receptacle
- 1577nm continuous-mode 10.3125G/s transmitter with EML laser
- 1310nm burst-mode 1.25G/s receiver with APD-TIA
- Single 3.3V power supply
- LVPECL compatible data input /output
- Burst mode received signal strength indication (RSSI) output
- Complies with IEEE P802.3™D3.2 10/1GBASE–PRX30
- Digital diagnostic interface compliant with SFF-8472 Rev 9.4
- Complies with XFP MSA
- Complies with RoHS directive (2002/95/EC)
- Operating case temperature:

  Standard : 0 to +70°C

Applications

Asymmetric 10G/1G Ethernet Passive Optical Network OLT

Description

The GETX-5351S-X3CDA transceiver is the high performance module for single fiber by using 1577nm continuous-mode transmitter and 1310nm burst-mode receiver. It is optical line terminal(OLT) for IEEE P802.3™D3.2 10/1GBASE–PRX30. The optical transceiver is compliant with XFP Multi-Source Agreement (MSA).

The transmitter section uses a 1577nm EML LD with automatic power control (APC) function and temperature compensation circuitry to ensure stable extinction ratio over all operating temperature range. and is Class Ⅰ laser compliant IEC825 and CDRH standards.

The receiver has a hermetically packaged APD-TIA (trans-impedance amplifier) pre-amplifier and a limiting amplifier with LVPECL compatible differential outputs. The receiver also supports burst mode RSSI output which is enabled by a trigger. Burst mode RSSI function can satisfy system the demand of

monitoring the power from any ONU.

Absolute Maximum Ratings

Table 1 - Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Units	Notes
Storage Temperature	Tst	-40	+85	°C	-
Operating Case Temperature	Tc	0	70	°C	-
Operating Humidity	RH	5	90	%	Non-condensing
Input Voltage	-	GND	Vcc	V	-
Power Supply Voltage	Vcc3	0	3.6	V	-
Power Supply Voltage	Vcc5	0	6	V	-

Recommended Operating Conditions

Table 2 - Recommended Operating Conditions

Parameter		Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	Tc	0		+70	°C
Power Supply Voltage		Vcc3	3.13	3.3	3.47	V
Power Supply Voltage		Vcc5	4.75	5	5.25	V
Power Supply Current		Icc3			1000	mA
Power Supply Current		Icc5			500	mA

Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Data Rate			10.3125		Gb/S	
Centre Wavelength	λc	1575	1577	1580	nm	
Spectral Width	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Output Power(BOL)	Pout	2		5	dBm	1

Extinction Ratio		ER	6			dB	
Average Launch Power-OFF Transmitter		Poff			-39	dBm	
Optical Eye Diagram		Compliant with IEEE P802.3™D3.2 Figure 75–8					
Optical Rise/Fall Time (20%~80%)		tr/tf			26	ps	
Data Input Swing Differential		V_{IN}	200		1000	mV	2
Input Differential Impedance		Z_{IN}	90	100	110	Ω	
TX Disable	Disable		2.0		Vcc	V	
	Enable		0		0.8	V	
Receiver							
Data Rate				1.25		Gb/S	
Centre Wavelength		λc	1260	1310	1360	nm	
Receiver Sensitivity		Sen			-29.87	dBm	3
Stressed receive sensitivity		Sen			-28.38	dBm	4
Receiver Overload		Sat	-9			dBm	3
Damage threshold		-	-5			dBm	
Receiver Burst Dynamic Range			22			dB	
$T_{receiver\_settling}$		-			400	ns	
Data Output Voltage - High		VOH	VccR -1.05		VccR – 0.85	V	5
Data Output Voltage - Low		VOL	VccR -1.84		VccR – 1.60	V	5
LOS De-assert Level		LOS_D			-31	dBm	
LOS Assert Level		LOS_A	-45			dBm	
LOS Detect Hysteresis		-	1			dBm	
LOS_Det High		-	2.0		VCC	V	
LOS_Det Low		-	0		0.8	V	
LOS De-assert Time		LOS_D T			500	ns	
LOS Assert Time		LOS_A T			500	ns	
Reciever Power DDM (RSSI) Error		RXDDM			+/-3	dBm	

Notes:

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2^7-1 test pattern @1.25Gbps and ER=10dB, BER ≤$1*10^{-10}$
4. Vertical eye–closure penalty=1.4dB, Stressed eye jitter=0.28UI pk to pk
5. Internally DC-coupled.

Diagnostics

Table 5 – Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal / External
	-40 to +85			
Vcc3	3.0 to 3.6	V	±3%	Internal / External
Vcc5	4.75 to 5.25	V	±3%	Internal / External
Bias Current	0 to 150	mA	±10%	Internal / External
TX Power	2 to 5	dBm	±3dB	Internal / External
RX Power	-30 to -9	dBm	±3dB	Internal / External

Timing Characteristics for Digital RSSI

Table 6 –Timing Characteristics for Digital RSSI

Parameter	Symbol	Min.	TYP	MAX	UNITS
Trigger delay	Td	300			ns
Sample time	Ts	600			ns
Internal I2C Delay	TI2C			500	us
Digital RSSI		Figure 1			

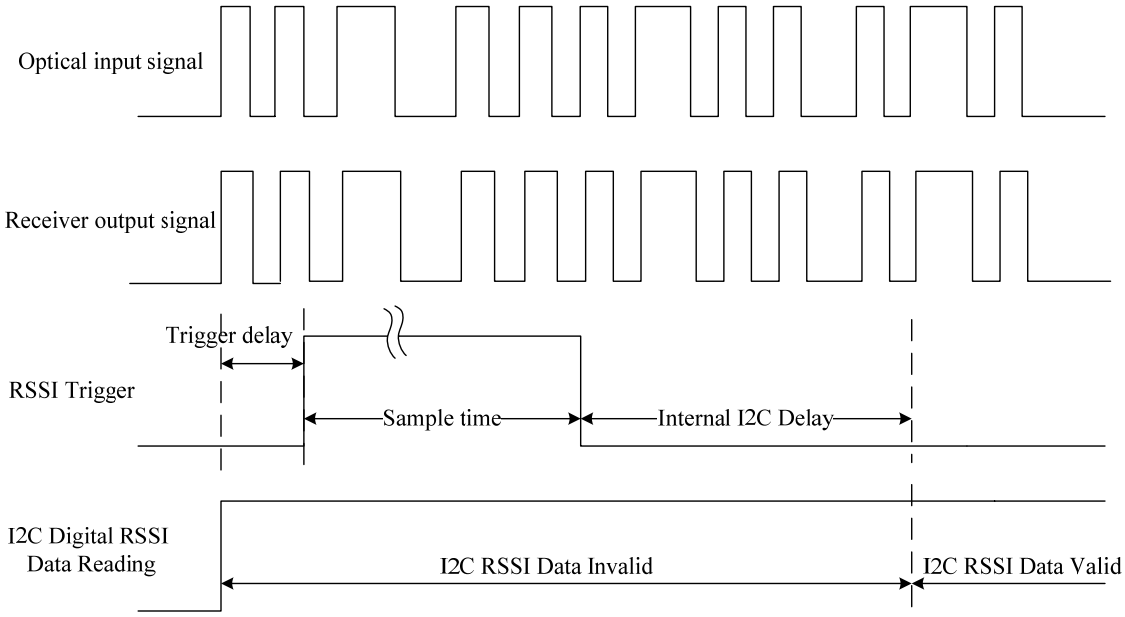
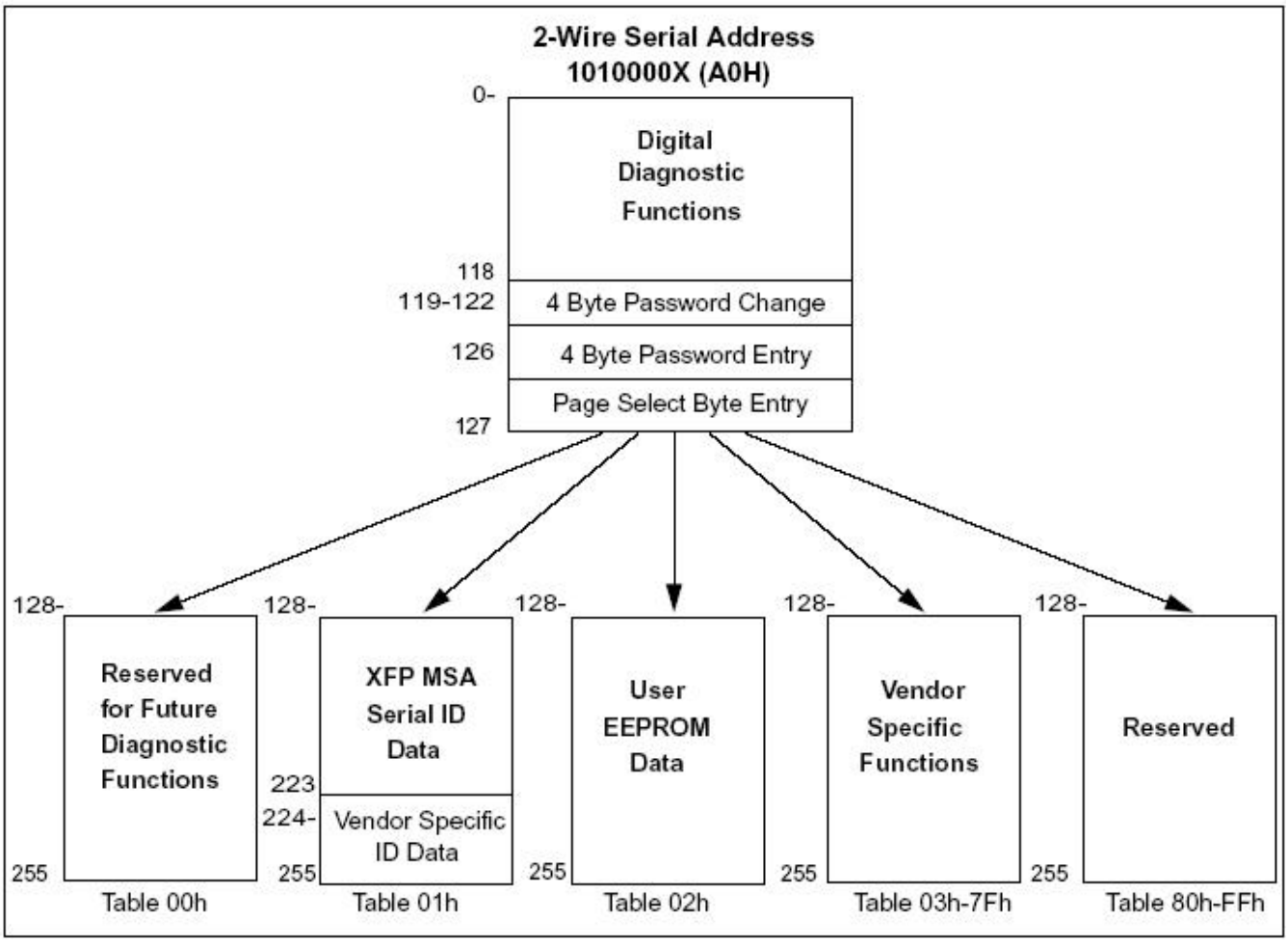


Figure 1 Digital RSSI Timing

Digital Diagnostic Memory Map

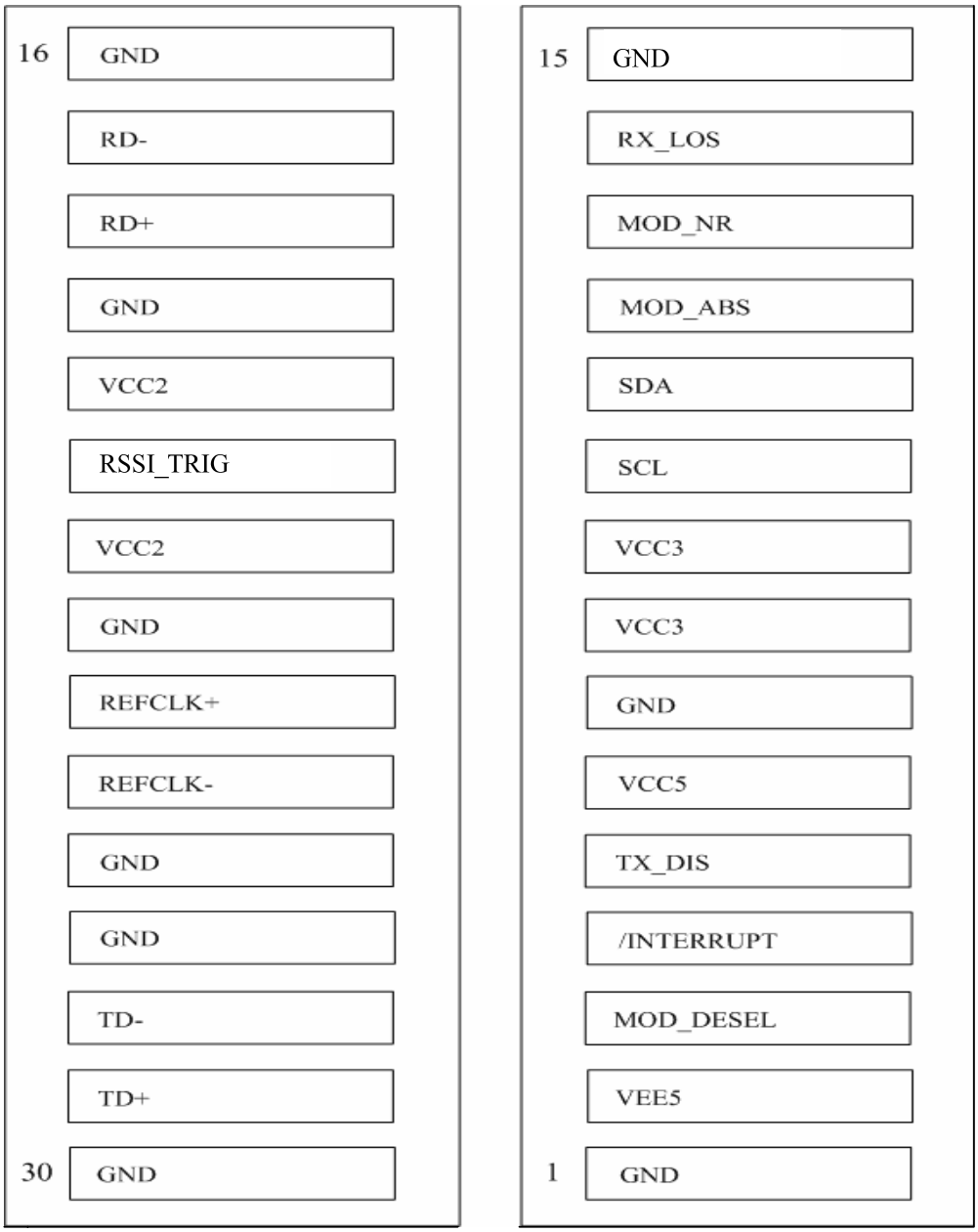
The GXDE-5351S-2CD transceivers are compliant with the current XFP Multi-Source Agreement (MSA) Specification Rev 4.5. As defined by the XFP MSA, Gigalight XFP transceivers provide digital diagnostic functions via a 2-wire
serial interface, which allows real-time access to the following operating parameters:
Transceiver temperature
Laser bias current
Transmitted optical power
Received optical power
Transceiver supply voltage
It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-users
when particular operating parameters are outside of a factory-set normal range.



The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller inside the transceiver, which is accessed through the 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL pin) is generated by the host. The positive edge clocks data into the XFP transceiver into those segments of its memory map that are not write-protected. The negative edge clocks data from the XFP transceiver. The serial data signal (SDA pin) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8 bit parameters, addressed from 000h to the maximum address of the memory.

Pin Definitions

Pin Diagram



Pin Descriptions

Pin	Signal Name	Description	Notes
1	GND	Module Ground	Note 1
2	VEE5	Optional –5.2 Power Supply – **Not required**	Note 3
3	MOD-DESEL	Module De-select; When held low allows the module to , respond to 2-wire serial interface commands	
4	INTERRUPT	Interrupt (bar); Indicates presence of an important condition which can be readover the serial 2-wire interface	Note 2
5	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6	VCC5	+5 Power Supply	Note 3
7	GND	Module Ground	Note 1
8	VCC3	+3.3V Power Supply	
9	VCC3	+3.3V Power Supply	
10	SCL	Serial 2 wire interface clock	Note 2
11	SDA	Serial 2 wire interface data line	Note 2
12	MOD_ABS	Module Absent; Indicates module is not present. Grounded in the module.	Note 2
13	MOD_NR	Module Not Ready;	Note 2
14	RX_LOS	Receiver Loss of Signal indicator	Note 2
15	GND	Module Ground	Note 1
16	GND	Module Ground	Note 1
17	RD-	Receiver inverted data output	
18	RD+	Receiver non-inverted data output	
19	GND	Module Ground	Note 1
20	VCC2	+1.8V Power Supply– **Not required**	Note 3
21	RSSI_TRIG	RSSI trigger signal input from the host	
22	VCC2	+1.8V Power Supply– **Not required**	Note 3
23	GND	Module Ground	Note 1

24	REFCLK+	Reference Clock non-inverted input, AC coupled on the host board – **Not required**	Note 3
25	REFCLK-	Reference Clock inverted input, AC coupled on the host board – **Not required**	Note 3
26	GND	Module Ground	Note 1
27	GND	Module Ground	Note 1
28	TD-	Transmitter inverted data input	
29	TD+	Transmitter non-inverted data input	
30	GND	Module Ground	Note 1

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1) .Module ground pins GND are isolated from the module case and chassis ground within the module.

2). Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

3). Not connected internally.

Recommended Interface Circuit

TBD

Mechanical Dimensions

TBD

Ordering information

Part Number	Product Description
GETX-5351S-X3CDA	Tx 1577nm, Rx 1310nm ,10.3125Gbps/1.25Gbps, 10G/1GBASE- PRX30, 0ºC ~ +70ºC With Digital Diagnostic Monitoring

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