

SOXPB-2399-60

10Gb/s BIDI XFP 60km Transceiver

PRODUCT FEATURES

- Hot-pluggable XFP footprint
- Supports 9.95Gb/s to 11.3Gb/s bit rates
- XFI Loopback Mode
- 1270nm DFB laser and APD receiver for XPBL-273396-60D
1330nm DFB laser and APD receiver for XPBL-332796-60D
- RoHS-6 Compliant (lead-free)
- Power dissipation < 3.5W
- Case operating temperature: 0°C ~ 70°C
- Up to 60km transmission on SMF
- 2-wire interface with integrated Digital Diagnostic monitoring
- EEPROM with Serial ID Functionality
- Compliant with XFP MSA with LC connector

APPLICATIONS

- 10GBASE-BX10.3125Gb/s Ethernet
- 10GBASE-BX9.953Gb/s Ethernet
- SONET OC-192 & SDH STM-64.1

PRODUCT DESCRIPTION

XFBL-XXYY96-60 is a hot-pluggable 3.3V Small-Form-Factor transceiver module. It is designed expressly for high-speed communication applications that require rates up to 11.3 Gb/s, it is designed to be compliant with XFPMSA. The module data link up to 60 km in 9/125 μm single mode fiber.

I . Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40	-	85	°C	
Storage Ambient Humidity	HA	5	-	95	%	
Operating Relative Humidity	RH	-	-	85	%	
Power Supply Voltage	VCC	-0.3	-	4	V	
Signal Input Voltage	VCC	Vcc-0.3	-	Vcc+0.3	V	

II . Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0	-	70	°C	Without airflow
Power Supply Voltage	VCC	3.14	3.3	3.47	V	
Power Supply Current	ICC	-	-	600	mA	
Data Rate	BR	9.95	10.3125	11.3	Gbps	
Transmission Distance	TD	2	-	60	km	
Coupled fiber	Single mode fiber					



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III. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Average Launched Power	PO	0	-	5	dBm	
Average Launched Power (Laser Off)	POUT-OFF	-	-	-45	dBm	Note(1)
Centre Wavelength Range	λ_C	1260	1270	1280	nm	XFBL-273396-60D
		1320	1330	1340	nm	XFBL-332796-60D
Side mode suppression ratio	SMSR	30	-	-	dB	
Spectrum Bandwidth (-20dB)	σ	-	-	1	nm	
Extinction Ratio	ER	3.5		-	dB	Note(2)
Output Eye Mask	Compliant with IEEE 802.3a requirements					Note(2)
Receiver						
Input Optical Wavelength	λ_{IN}	1320	1330	1340	nm	XFBL-273396-60D
		1260	1270	1280	nm	XFBL-332796-60D
Receiver Sensitivity in average	P _{sen}	-	-	-22	dBm	Note(3)
Input Saturation Power (Overload)	P _{SAT}	-6	-	-	dBm	Note(3)
LOS-Assert Power	PA	-38	-	-	dBm	
LOS-Deassert Power	PD	-	-	-23	dBm	

LOS-Hysteresis	PHys	0.5	-	4	dB	
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Note:

1. The optical power is launched into SMF
2. Measured with RPBS2^31-1 test pattern @ 10.3125 Gbs
3. Measured with RPBS2^31-1 test pattern @ 10.3125 Gbs BER = $<10^{-12}$

IV. Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Total power supply current	Icc	-	-	600	mA	
Transmitter						
Differential Data Input Voltage	VDT	120	-	820	mVp-p	
Differential line input Impedance	RIN	85	100	115	Ohm	
Transmitter Fault Output-High	VFaultH	2.4	-	Vcc	V	
Transmitter Fault Output-Low	VFaultL	-0.3	-	0.8	V	
Transmitter Disable Voltage-High	VDisH	2	-	Vcc+0.3	V	
Transmitter Disable Voltage-low	VDisL	-0.3	-	0.8	V	
Receiver						
Differential Data Output Voltage	VDR	300	-	850	mVp-p	
Differential line Output Impedance	ROUT	80	100	120	Ohm	
Receiver LOS Pullup Resistor	RLOS	4.7	-	10	KOhm	
Data Output Rise/Fall time	tr/tf	20	-	-	ps	
LOS Output Voltage-High	VLOSH	2	-	Vcc	V	
LOS Output Voltage-Low	VLOSL	-0.3	-	0.4	V	

V. PinAssignment

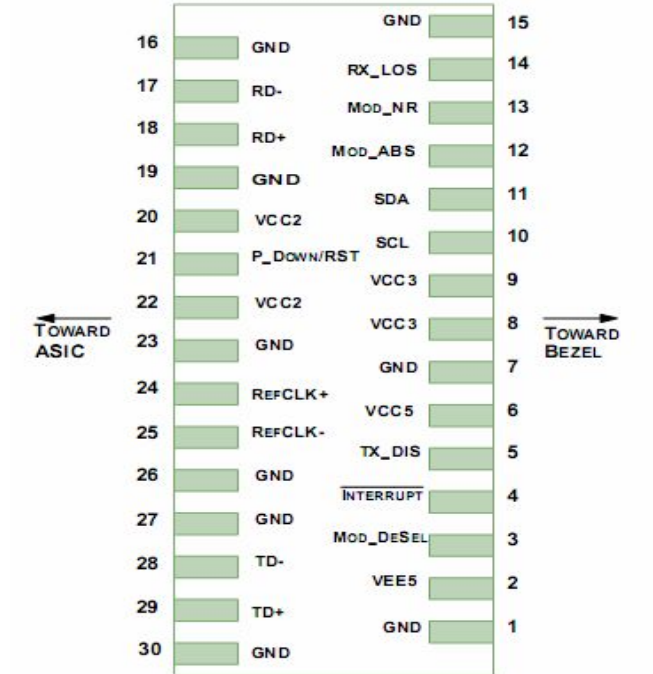


Diagram of Host Board Connector Block Pin Numbers and Name

Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply - Not required	
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I	SCL	Serial 2-wire interface clock	2
11	LVTTL/O	SDA	Serial 2-wire interface data line	2
12	LVTTL-O	Mod_Abs	Module Absent; Indicates module is not present. Grounded in the module.	2
13	LVTTL-O	Mod_NR	Module Not Ready; XGIGA defines it as a logical OR between RX_LO and Loss of Lock in TX/RX.	2
14	LVTTL-O	RX_LOS	Receiver Loss of Signal indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver inverted data output	
18	CML-O	RD+	Receiver non-inverted data output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply - Not required	

21	LVTTTL-I	P_Down/RST	PowerDown; Whenhigh,placethemoduleinthelowpowerstand- bymodeandonthefallingedgeofP_Downinitiatesamodulereset Reset;Thefallingedgeinitiatesacompleteresetofthemodule includingthe2-wireserialinterface,equivalenttoapowercycle.	
22		VCC2	+1.8VPowerSupply– Notrequired	
23		GND	ModuleGround	1
24	PECL-I	RefCLK+	ReferenceClocknon-invertedinput,ACcoupledonthehostboard– Notrequired	3
25	PECL-I	RefCLK-	ReferenceClockinvertedinput,ACcoupledonthehostboard– Notrequired	3
26		GND	ModuleGround	1
27		GND	ModuleGround	1
28	CML-I	TD-	Transmitterinverteddatainput	
29	CML-I	TD+	Transmitternon-inverteddatainput	
30		GND	ModuleGround	1

Notes:

1. Modulecircuitgroundisisolatedfrommodulechassisgroundwithinthemodule.
2. Opencollector;shouldbepulledupwith4.7k–10kohmsonhostboardtoavoltagebetween3.15Vand3.6V.
3. AReferenceClockinputisnotrequiredbytheXFBL-XXYY96-60D.Ifpresent,itwillbeignored.

VI.DigitalDiagnostic Functions

AsdefinedbytheXFPMSA,XGIGAXFPtransceiversprovidedigitaldiagnosticfunctionsviaa2-wireserialinterface,whichallowsreal-timeaccesstothefollowingoperatingparameters:

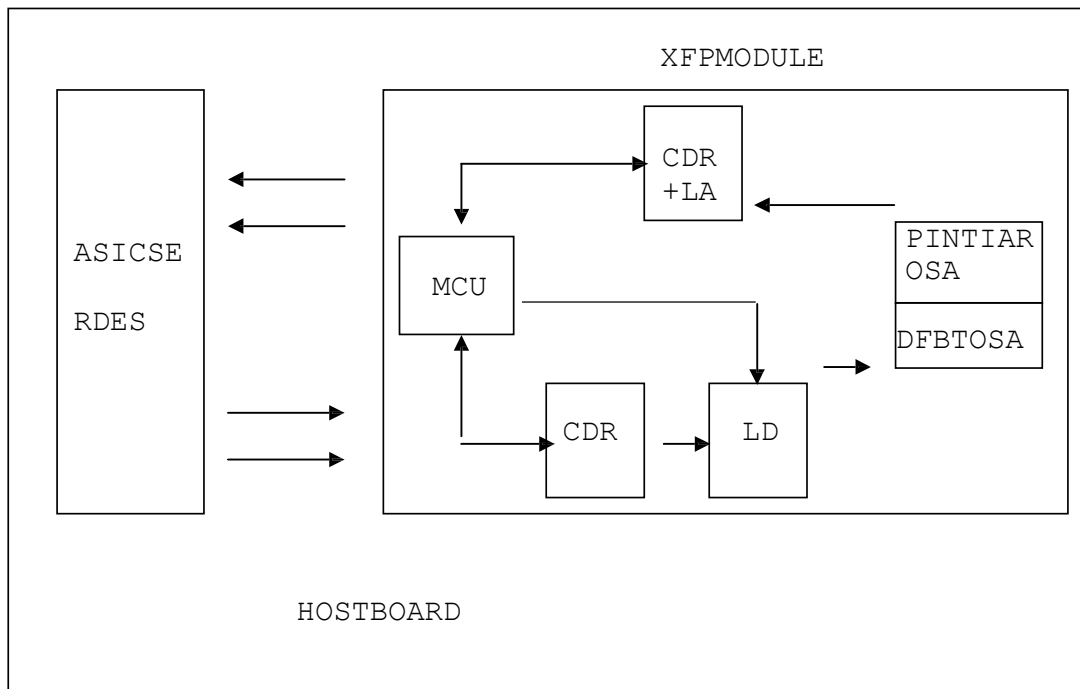
- Transceivertemperature
- Laserbiascurrent
- Transmittedopticalpower
- Receivedopticalpower
- Transceiversupplyvoltage

Italsoprovidesasophisticatedsystemofalarmandwarningflags,whichmaybeusedtoalertend-userswhenparticularoperatingparametersareoutsideofafactory-setnormalrange.

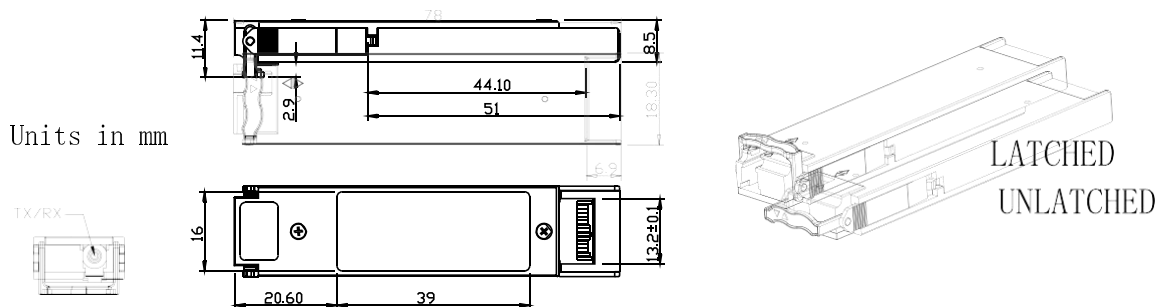
TheoperatinganddiagnosticsinformationismonitoredandreportedbyaDigitalDiagnosticsTransceiverController(DDTC)insidethetransceiver,whichisaccessedthroughthe2-wireserialinterface. Whentheseialprotocolisactivated,theserialclocksignal(SCLpin)isgeneratedbythehost. ThepositiveedgeclocksdataintotheXFPtransceiverintothosesegmentsofitsmemorymapthatarenotwrite-protected. ThenegativeedgeclocksdatafromtheXFPtransceiver. Theserialdatasignal(SDApin)isbidirectionalforserialdatatransfer. ThehostusesSDAinconjunctionwithSCLtomarkthestartandendofserialprotoc

oactivation. Thememoriesareorganizedasaseriesof8-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. For more detailed information including memory map definitions, please see the XFPMSA Specification.

VII. Recommended Block Circuit



VIII. Outline Dimensions



IX. Regulatory Compliance

Feature	Reference	Performance
Electrostaticdischarge (ESD)	IEC/EN61000-4-2	Compatiblewithstandards
ElectromagneticInterference(EMI)	FCCPart15ClassBEN55022ClassB(CISP R22A)	Compatiblewithstandards
LaserEyeSafety	FDA21CFR1040.10,1040.11IEC/EN60825-1, 2	ClassI laserproduct
ComponentRecognition	IEC/EN60950, UL	Compatiblewithstandards
ROHS	2002/95/EC	Compatiblewithstandards
EMC	EN61000-3	Compatiblewithstandards

Appendix A. Document Revision

VersionNo.	Date	Description
1.0	2010-09-01	Preliminarydatasheet
2.0	2011-09-10	Updateformatandcompany'slogo

● Notice

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