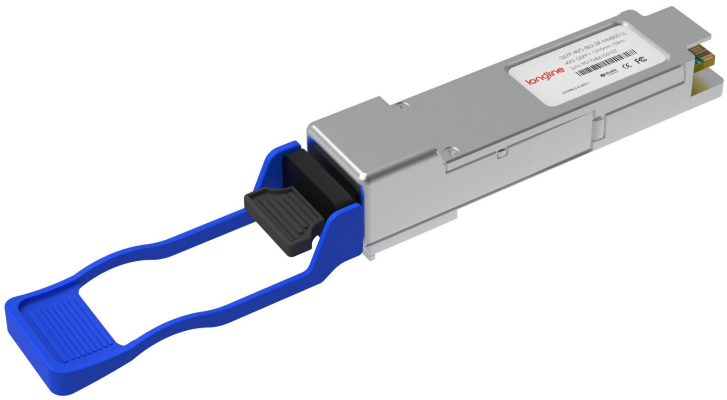
40GBASE-SR Bi-Directional QSFP+ LC Duplex Transceiver for MMF

QSFP-40G-BIDI-SR-MM850-LL



Application

- 40 Gigabit Ethernet interconnects
- Datacom/Telecom switch & router connections
- Data aggregation and backplane applications
- Proprietary protocol and density applications

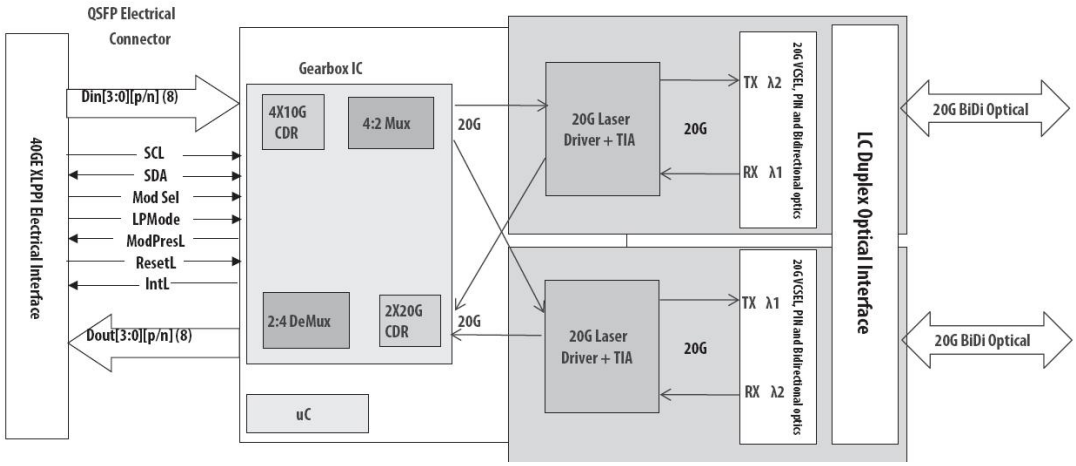
Features

- Compliant to the 40GbE XLPPI electrical specification per IEEE 802.3ba-2010
- Compliant to QSFP+ SFF-8436 Specification
- Aggregate bandwidth of > 40Gbps
- Operates at 10.3125 Gbps per electrical channel with 64b/66b encoded data
- QSFP MSA compliant
- Capable of over 100m transmission on OM3 Multimode Fiber (MMF)and 150m on OM4 MMF
- Single +3.3V power supply operating
- Built-in digital diagnostic functions
- Temperature range 0° C to 70° C
- RoHS Compliant Part
- Utilizes a standard LC duplex fiber cable allowing reuse of existing cable infrastructure

Description

It is a Four-Channel, Pluggable, LC Duplex, Fiber-Optic QSFP+ Transceiver for 40 Gigabit Ethernet Applications. This transceiver is a high performance module for short-range duplex data communication and interconnect applications. It integrates four electrical data lanes in each direction into transmission over a single LC duplex fiber optic cable. Each electrical lane operates at 10.3125 Gbps and conforms to the 40GE XLPPI interface.

The transceiver internally multiplexes an XLPPI 4x10G interface into two 20Gb/s electrical channels, transmitting and receiving each optically over one simplex LC fiber using bi-directional optics. This results in an aggregate bandwidth of 40Gbps into a duplex LC cable. This allows reuse of the installed LC duplex cabling infrastructure for 40GbE application. Link distances up to 100 m using OM3 and 150m using OM4 optical fiber are supported. These modules are de- signed to operate over multimode fiber systems using a nominal wavelength of 850nm on one end and 900nm on the other end. The electrical interface uses a 38 contact QSFP+ type edge connector. The optical interface uses a conventional LC duplex connector.



Products Specifications

I. Absolute Maximum Ratings

Data Rate Specifications	Symbol	Min	Typ.	Max	Unit
Storage Temperature	TS	-40		+85	° C
Supply Voltage	VCCT, R	-0.5		4	V
Relative Humidity	RH	0		85	%

II. Recommended Operating Environment

Parameter	Symbol	Min	Typ.	Max	Unit
Case operating Temperature	TC	0		+70	° C
Supply Voltage	VCCT, R	+3.13	3.3	+3.47	V
Supply Current	ICC			1000	mA
Power Dissipation	PD			3.5	W

III. Electrical Characteristics (TOP= 0 to 70 ° C, VCC = 3.15 to 3.45 Volts)

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Data Rate per Channel			10.3125	11.2	Gbps	
Power Consumption			2.5	3.5	W	
Supply Current			0.75	1.0	A	
Control I/O Voltage-High	Icc			Vcc	V	
Control I/O Voltage-Low	VIH	2.0		0.7	V	
Inter-Channel Skew	VIL	0		150	Ps	
RESETL Duration	TSK		10		Us	
RESETL De-assert time				100	ms	
Power On Time				100	ms	

Transmitter

Single Ended Output Voltage Tolerance		0.3		4	V	1
Common mode Voltage Tolerance		15			mV	
Transmit Input Diff Voltage	VI	120		1200	mV	
Transmit Input Diff Impedance	ZIN	80	100	120		
Data Dependent Input Jitter	DDJ			0.1	UI	
Data Input Total Jitter	TJ			0.28	UI	

Receiver

Single Ended Output Voltage Tolerance		0.3			4	V
Rx Output Diff Voltage	Vo		600		800	mV
Rx Output Rise and Fall Voltage	Tr/Tf				35	ps
Total Jitter	TJ				0.7	UI
Deterministic Jitter	DJ				0.42	UI

Note:

1. 20～80%

IV. Optical Characteristics (TOP = 0 to 70 ℃, VCC = 3.1 to 3.47 Volts)

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Transmitter						
Optical Wavelength CH1	λ	832	850	868	nm	
Optical Wavelength CH2	λ	882	900	918	nm	
RMS Spectral Width	Pm		0.5	0.65	nm	
Average Optical Power per Channel	Pavg	-4	-2.5	+5.0	dBm	
Laser Off Power Per Channel	Poff			-30	dBm	
Optical Wavelength CH1	ER	3.5			dB	
Relative Intensity Noise	Rin			-128	dB/HZ	1
Optical Return Loss Tolerance				12	dB	
Receiver						
Optical Center Wavelength CH1	λ	882	900	918	nm	
Optical Center Wavelength CH2	λ	832	850	868	nm	
Receiver Sensitivity per Channel	R		-6		dBm	
Maximum Input Power	PMAX	+0.5			dBm	
Receiver Reflectance	Rrx	30		-12	dB	
LOS De-Assert	LOSD			-14	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis	LOSH	0.5			dB	

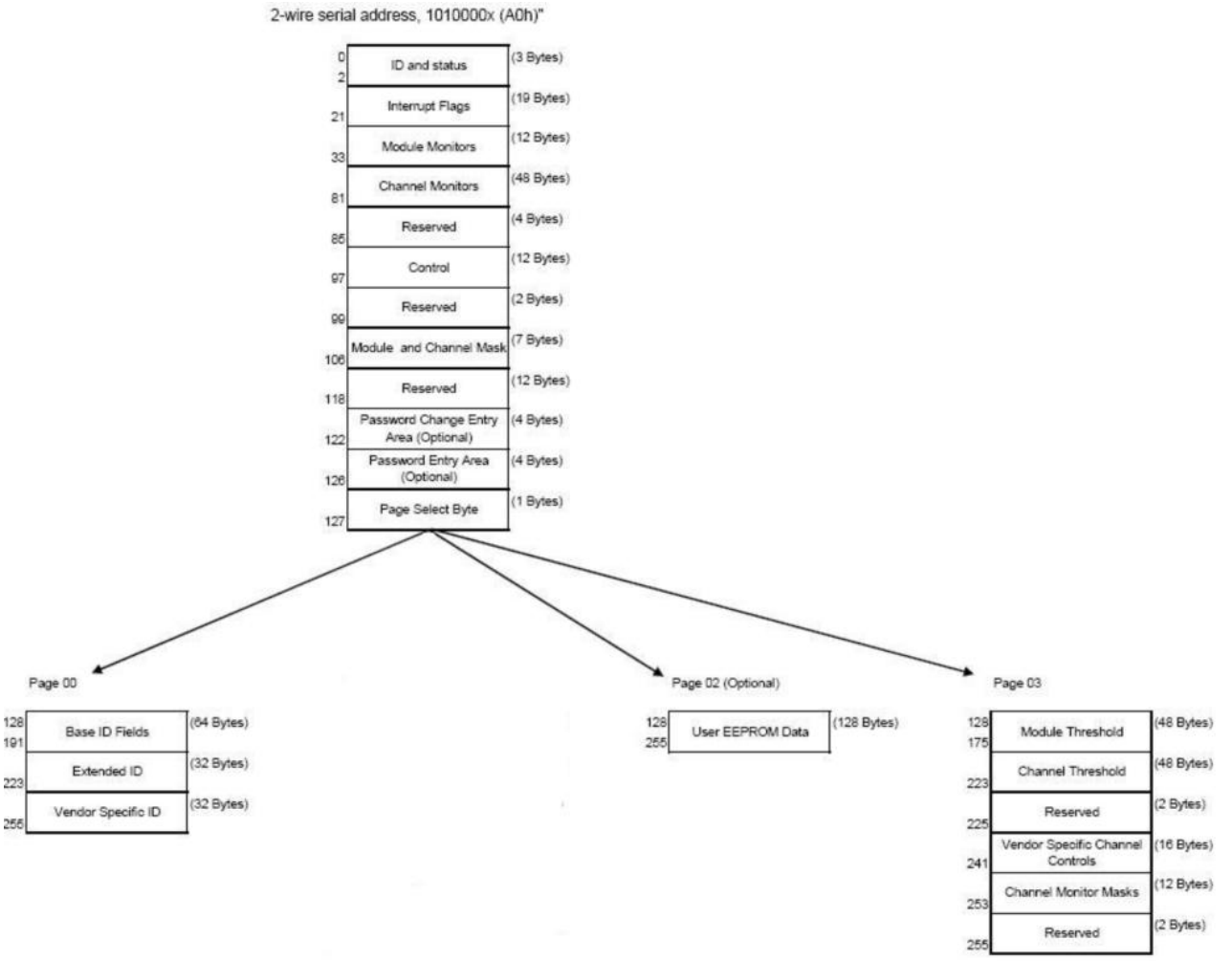
Note:

1. 12dB Reflection

V. Diagnostic Monitoring Interface

Digital diagnostics monitoring function is available on all QSFP+ SRBD. A 2-wire serial interface provides user to contact with module. The structure of the memory is shown in flowing. The memory space is arranged into a lower, single page, address space of 128 bytes and multiple upper address space pages. This structure permits timely access to addresses in the lower page, such as Interrupt Flags and Monitors. Less time critical time entries, such as serial ID information and threshold settings, are available with the Page Select function. The interface address used is A0xh and is mainly used for time critical data like interrupt handling in order to enable a one-time-read for all data related to an interrupt situation. After an interrupt, IntL, has been asserted, the host can read out the flag field to determine the affected channel and type of flag.

Byte Address	Description	Type
0	Identifier(1 Byte)	Read Only
1-2	Status (2 Bytes)	Read Only
3-21	Interrupt Flags (31 Bytes)	Read Only
22-33	Module Monitors (12 Bytes)	Read Only
34-81	Channel Monitors (48 Bytes)	Read Only
82-85	Reserved (4 Bytes)	Read /Write
86-97	Control (12 Bytes)	Read /Write
98-99	Reserved (2 Bytes)	Read /Write
100-106	Module and Channel Masks (7 Bytes)	Read /Write
107-118	Reserved (12 Bytes)	Read /Write
119-122	Reserved (4 Bytes)	Read /Write
123-126	Reserved (4 Bytes)	Read /Write
127	Page Select Byte	Read /Write
128-175	Module Thresholds (48 Bytes)	Read Only
176-223	Reserved (48 Bytes)	Read Only
224-225	Reserved (2 Bytes)	Read /Write
226-239	Reserved (14 Bytes)	Read /Write
240-241	Channel Controls (2 Bytes)	Read /Write
242-253	Reserved (12 Bytes)	Read /Write
254-255	Reserved (2 Bytes)	Read /Write


2-wire serial address, 1010000x (A0h)"
0
2
ID and status
(3 Bytes)
21
Interrupt Flags
(19 Bytes)
33
Module Monitors
(12 Bytes)
81
Channel Monitors
(48 Bytes)
85
Reserved
(4 Bytes)
97
Control
(12 Bytes)
99
Reserved
(2 Bytes)
106
Module and Channel Mask
(7 Bytes)
118
Reserved
(12 Bytes)
122
Password Change Entry Area (Optional)
(4 Bytes)
126
Password Entry Area (Optional)
(4 Bytes)
127
Page Select Byte
(1 Bytes)
Page 00
128
191
Base ID Fields
(64 Bytes)
223
Extended ID
(32 Bytes)
255
Vendor Specific ID
(32 Bytes)
Page 02 (Optional)
128
255
User EEPROM Data
(128 Bytes)
Page 03
128
175
Module Threshold
(48 Bytes)
223
Channel Threshold
(48 Bytes)
225
Reserved
(2 Bytes)
241
Vendor Specific Channel Controls
(16 Bytes)
253
Channel Monitor Masks
(12 Bytes)
255
Reserved
(2 Bytes)