GEARLINK

800GBASE-SR8 OSFP 850nm 50m Dual MTP/MPO-12/APC DOM Transceiver

Standards

- Compliant to OSFP MSA 5.0

- Compliant with CMIS 5.1

- 8x106. 25Gb/s Electrical Interface (800GAUI-8)

- Maximum Power Consumption 16W

- Single +3.3V Power Supply

- Case Temperature Range: 0 ~ +70℃

- RoHS 2.0 Complaint

Features

- Up to 106.25 Gbps Data Rate Per Channel by PAM4 Modulation

- Support 800GAUI-8 Electrical Interface

- Integrated 850nm VCSEL Array and PD Array

- DDM Function Implemented

- Hot-pluggable

- Single +3.3V Power Supply

Application

- Data Centers and Cloud

- Networks

Description

The 800GBASE-SR8 OSFP Optical Transceiver Module is designed for use in 800Gb/s systems throughput up to 30m over OM3 or   50m over OM4 multimode fiber (MMF) using a wavelength of 850nm via dual MTP/MPO-12 connectors.

Digital diagnostics functions are also available via the I2C interface, as specified by the OSFP MSA, to allow access to real-

time operating parameters. With these features,this easy to install, hot swappable transceiver is suitable to be used in various applications, such as data centers, high-performance computing networks, enterprise core and distribution layer applications.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TSTG	-40	85	℃
Supply Voltage	VCC	0	4	V
Relative Humidity (Non-condensing)	RH	5	85	%

Order Information

Table 1-Order Information

Part No.	Bit Rate (Gbps)	Laser (nm)	Distance note1	Fiber Type	DDMI	Connector	Tempnote2
400G QSFP-DD SR8	425	850	100m	MMF	YES	MPO 1x16 APC	0℃~+70℃

Note:
1.OM4 fiber, 70m for OM3 fiber, with KP4　FEC
2.Case Temperature

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Unit
Case Temperature- Operating	TCASE	0	70	℃
Supply Voltage	VCC	3.135	3.465	V
Power Consumption	PDISS		16	W
Pre-FEC Bit Error Ratio			2.4×10^{-4}	
Link Distance over OM3		0.5	30	M
Link Distance over OM4		0.5	50	M

III. Optical Characteristics

Parameter	Min.	Typical	Max.	Unit
Transmitter				
Signaling Rate, Each Lane	53.125 $\pm$ 100 ppm			GBd
Lane Wavelength Range		850		nm
RMS Spectral Width			0.6	nm
Modulation Format	PAM4			
Average Optical Power Per Lane	-4.6		4	dBm
Outer Optical Modulation Amplitude (OMAouter), Each Lane				
for TDECQ≤1.8dB	-2.6		3.5	dBm
for 1.8<TDECQ≤4.4dB	-4.4+TDECQ		3.5	dBm
Outer Optical Modulation Amplitude (OMAouter), Each Lane				
for TECQ≤1.8dB	-2.6		3.5	dBm
for 1.8<TECQ≤4.4dB	-4.4+TECQ		3.5	dBm
Transmitter and Dispersion Eye Closure for PAM4, Each Lane			4.4	dB
Transmitter Eye Closure for PAM4 (TECQ), Each Lane			4.4	dB
ExtinctionRatio	2.5			dB
Transmitter Excursion, Each Lane			2	dB
Transmitter Transition Time, Each Lane			17	ps
Parameter	Min.	Typical	Max.	Unit
Average Launch Power Per Lane @ TX Off State			-30	dBm
Relative Intensity Noise12 (OMA)			-131	dB/Hz
Optical Return Loss Tolerance			12	dB
Encircled Flux	>=86% at 19μm　<=30% at 4.5μm			dB

Receiver			
Signaling Rate Each Lane	53. 125±100ppm		GBd
Lane Wavelength Range		850	nm
Modulation Format	PAM4		
Damage Threshold	5		dBm
Average Receive Power, Each Lane	-6.4	4	dBm
Receiver Power, Each Lane (OMA)		3.5	dBm
Receiver Sensitivity Each Lane (OMAouter)			
for TECQ≤1.8dB		-4.6	dBm
for 1.8<TECQ≤4.4dB		-6.4+TECQ	dBm
Receiver Reflectance		-12	dB
Stressed Receiver Sensitivity (OMAouter), Each Lane		-2	dBm
Stressed Conditions for Stress Receiver Sensitivity			
Stressed Eye Closure for PAM4 (SECQ), Lane under Test	4.4		dB
OMAouter of Each Aggressor Lane	3.5		dBm

IV. High Speed Electrical Signals

Parameter	Min.	Typ.	Max.	Unit
Transmitter Electrical Input Characteristics at TP1				
Signaling Rate, Per Lane		53.125		GBd
Differential Pk-pk Input Voltage Tolerance	900			mV
Common-mode to Differential Return Loss	802.3ck Equation(120G-1)			
Effective Return Loss	TBD			
Differential Termination Mismatch			10	%
Module Stressed Input Test	See 120G.3.4.1			
Single-ended Voltage Tolerance Range	-0.4		3.3	V
DC Common-mode Voltage	-350		2850	mV
Receiver Electrical Output Characteristics at TP4				
Signaling Rate Per Lane		53.125		GBd
AC common-mode Output Voltage(RMS)			17.5	mV
Differential Peak-to-peak Output Voltage			900	dB
Near-end ESMW (Eye Symmetry Mask Width)		TBD		UI
Near-end Eyeheight, Differential	24			mV
Parameter	Min.	Typ.	Max.	Unit
Near-end Vertical Eye Closure			7.5	dB

Far-end ESMW (Eye Symmetry Mask Width)		TBD		UI
Far-end Eyeheight, Differential	24			mV
Far-end Vertical Eye Closure			7.5	dB
Far-end Pre-cursor ISI Ratio		TBD		UI
Common Mode to Differential Conversion Return Loss		802.3ck 120G-1		dB
Effective Return Loss	TBD			dB
Differential Termination Mismatch			10	%
Transition Time (min,20%to80%)		TBD		ps
DC Common Mode Voltage	-350		2850	mV

V. Low Speed Electrical Signals

Parameter	Symbol	Min.	Max.	Unit	Condition
SCL and SDA	VOL	0	0.4	V	IOL(max)=3.0mA for Fast Mode, 20mA for Fast-mode Plus
	VOH	Vcc-0.5	Vcc+0.3	V	
SCL and SDA	VIL	-0.3	Vcc*0.3	V	
	VIH	Vcc*0.7	Vcc+0.5	V	
Capacitance for SCL and SDA I/O Pin	Ci		14	pF	
Parameter	Symbol	Min.	Max.	Unit	Condition
Total Bus Cpacitive Load for SCL and SDA	Cb		100	pF	3.0k Ohms Pull up Resistor, Max
			200	pF	1.6k Ohms Pull up Resistor, Max
LPMode/TxDis, Reset and ModeSeIL	VIL	-0.3	0.8	V	|Iin| </= 125uA for Vin < VCC
	VIH	2	Vcc+0.3	V	
IntL/RxLOS	VOL	0	0.4	V	IOL=2.0mA
	VOH	VCC-0.5	VCC+0.3	V	10k Ohms Pull-up to Host Vcc
ModPrsL	VOL	0	0.4	%	IOL=2.0mA
	VOH			dB	ModPrsL can be implemented as a short-circuit to GND on the module

VI. Pin Definition
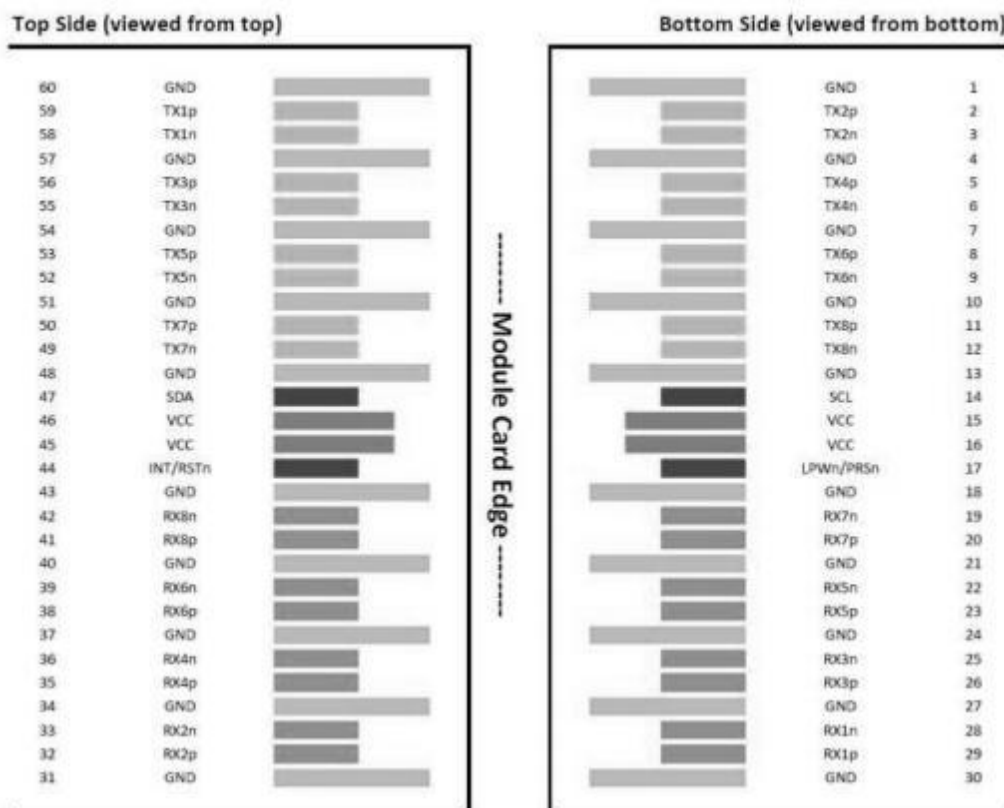
Figure1. OSFP800 800G Contact Assignment

VII. Pin Description

Pin	Symbol	Logic	Description	Note
1	GND		Ground	
2	TX2p	CML-I	Transmitted Data Non-Inverted	
3	TX2n	CML-I	Transmitted Data Inverted	
4	GND		Ground	
5	TX4p	CML-I	Transmitted Data Non-Inverted	
6	TX4n	CML-I	Transmitted Data Inverted	
7	GND		Ground	
8	TX6p	CML-I	Transmitted Data Non-Inverted	
9	TX6n	CML-I	Transmitted Data Inverted	
10	GND		Ground	
11	TX8p	CML-I	Transmitted Data Non-Inverted	
12	TX8n	CML-I	Transmitted Data Inverted	
13	GND		Ground	
14	SCL	LVCMOS-I/O	2-wire Serial Interface Clock	1
15	VCC		+3.3V Power	

Pin	Symbol	Logic	Description	Note
16	VCC		+3.3V Power	
17	LPWn/PRSn	Multi-Level	Low-Power Mode / Module Present	2
18	GND		Ground	
19	RX7n	CML-O	Receiver Data Inverted	
20	RX7p	CML-O	Receiver Data Non-Inverted	
21	GND		Ground	
22	RX5n	CML-O	Receiver Data Inverted	
23	RX5p	CML-O	Receiver Data Non-Inverted	
24	GND		Ground	
Pin	Symbol	Logic	Description	Note
25	RX3n	CML-O	Receiver Data Inverted	
26	RX3p	CML-O	Receiver Data Non-Inverted	
27	GND		Ground	
28	RX 1n	CML-O	Receiver Data Inverted	
29	RX 1p	CML-O	Receiver Data Non-Inverted	
30	GND		Ground	
31	GND		Ground	
32	RX2p	CML-O	Receiver Data Non-Inverted	
33	RX2n	CML-O	Receiver Data Inverted	
34	GND		Ground	
35	RX4p	CML-O	Receiver Data Non-Inverted	
36	RX4n	CML-O	Receiver Data Inverted	
37	GND		Ground	
38	RX6p	CML-O	Receiver Data Non-Inverted	
39	RX6n	CML-O	Receiver Data Inverted	
40	GND		Ground	
41	RX8p	CML-O	Receiver Data Non-Inverted	
42	RX8n	CML-O	Receiver Data Inverted	
43	GND		Ground	
44	INT/RSTn	Multi-Level	Module Interrupt / Module Reset	2
45	VCC		+3.3V Power	
46	VCC		+3.3V Power	
47	SDA	LVCMOS-I/O	2-wire Serial Interface Clock	1
48	GND		Ground	
49	TX7n	CML-I	Transmitted Data Inverted	
50	TX7p	CML-I	Transmitted Data Non-Inverted	
51		GND	Ground	
52	TX5n	CML-I	Transmitted Data Inverted	

53	TX5p	CML-I	Transmitted Data Non-Inverted	
54		GND	Ground	
55	TX3n	CML-I	Transmitted Data Inverted	
56	TX3p	CML-I	Transmitted Data Non-Inverted	
57		GND	Ground	
58	TX 1n	CML-I	Transmitted Data Inverted	
59	TX 1p	CML-I	Transmitted Data Non-Inverted	
60		GND	Ground	

Notes:

1. Open-Drain with pull up resistor on Host.

2. See pin description for required circuit.
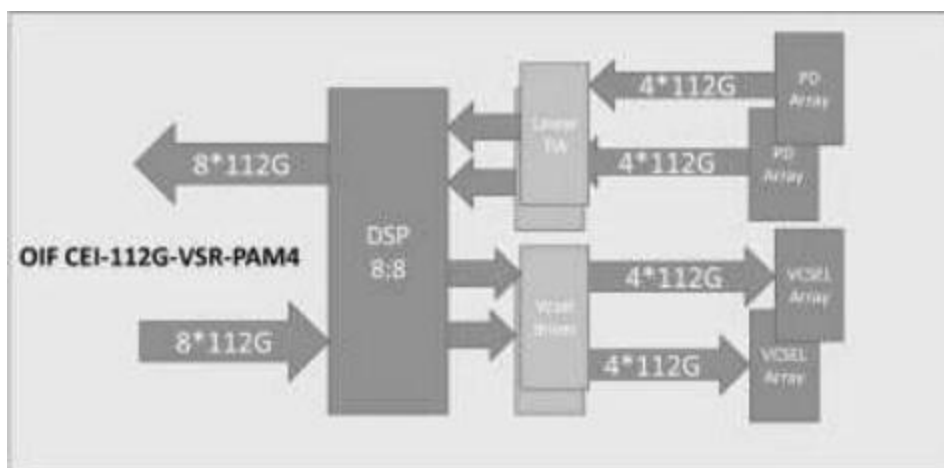
VIII. Principle Diagram

Figure 2.   Module Block Diagram

IX. Digital Diagnostic Monitoring Specifications

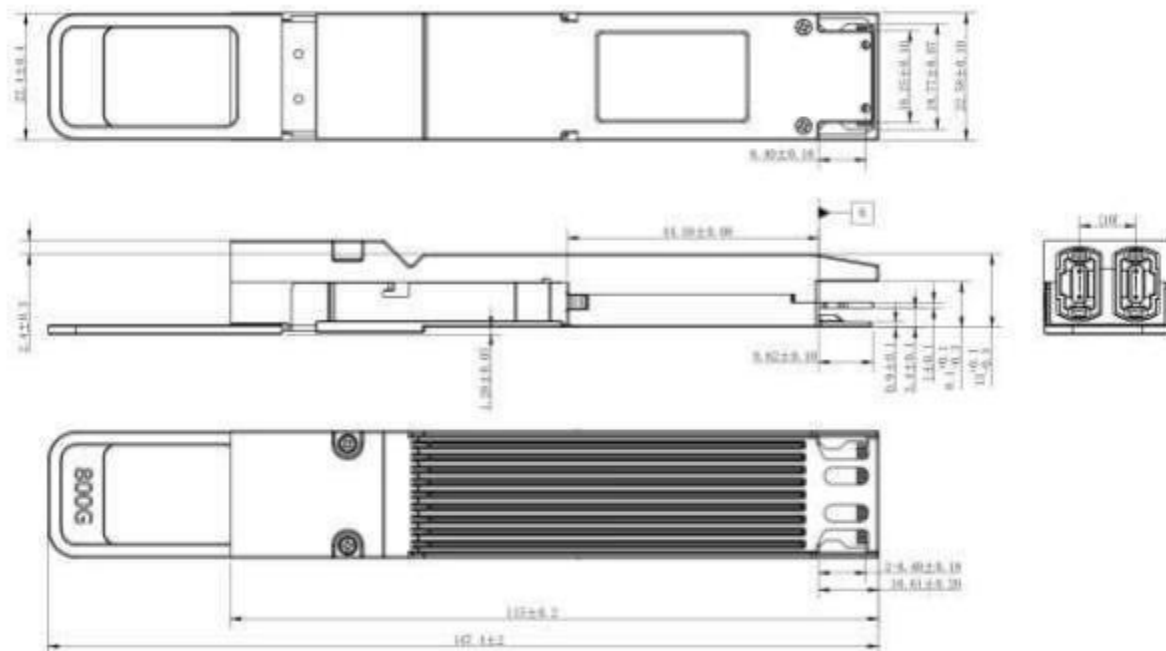| Parameter	Specification	Unit
Temperature Monitor Absolute Error	±3	℃
Supply Voltage Monitor Absolute Error	±5	%
I_Bias Monitor Absolute Error	±10	%
Received Power (Rx) Monitor Absolute Error	±3.0	dB
Transmit Power (Tx) Monitor Absolute Error	±3.0	dB

X. Mechanical Dimensions

Figure 3. Mechanical Dimensions

Order Information

Part Number	Description
QDD-SR8-800G	800GBASE SR8 QSFP-DD Transceiver, MTP/MPO-16, 50m over MMF
QDD-DR8-800G	800GBASE DR8 QSFP-DD Transceiver, MTP/MPO-16, 500m over SMF
QDD800-XDR8-B1	800GBASEXDR8 QSFP-DD Transceiver, MTP/MPO-16, 2km over SMF
QDD800-PLR8-B1	800GBASE PLR8 QSFP-DD Transceiver, MTP/MPO-16, 10km over SMF
OSFP-SR8-800G	800GBASE SR8 OSFP Transceiver, Dual MTP/MPO-12, 50m over MMF
OSFP-DR8-800G	800GBASE DR8 OSFP Transceiver, MTP/MPO-16, 500m over SMF
OSFP-DR8-800G	800GBASE DR8 OSFP Transceiver, MTP/MPO-12, 500m over SMF
OSFP-2FR4-800G	800GBASE 2FR4 OSFP Transceiver, Dual LC, 2km over SMF
OSFP800-XDR8-B2	800GBASEXDR8 OSFP Transceiver, MTP/MPO-12, 2km over SMF
OSFP800-XDR8-B1	800GBASEXDR8 OSFP Transceiver, MTP/MPO-16, 2km over SMF
OSFP800-2LR4-A2	800GBASE 2LR4 OSFP Transceiver, Dual LC, 10km over SMF
OSFP800-PLR8-B1	800GBASE PLR8 OSFP Transceiver, MTP/MPO-16, 10km over SMF
OSFP800-PLR8-B2	800GBASE PLR8 OSFP Transceiver, MTP/MPO-12, 10km over SMF