Preliminary DATA SHEET

CFORTH-QSFP28-100G-AOCxM
100Gb/s QSFP28 Active Optical Cable Transceiver

CFORTH-QSFP28-100G-AOCxM Overview

CFORTH-QSFP28-100G-AOCxM QSFP28 active optical cable transceivers are 4-channel active optical cable for QSFP28 application. This full-duplex optical assembly offers 4 independent transmit and receive channels, each capable of up to 25Gbps for an aggregate bandwidth of 100Gbps.

QSFP28 AOC can be used as a direct replacement for traditional copper cables with the added benefit of a lighter weight and smaller diameter solution for cable lengths from 1 to 100 meters.

Product Features

- Hot-pluggable QSFP28 form factor
- 4 high-speed full duplex channels
- Supports 103.1Gb/s aggregate bit rate
- 4x25Gbps 850nm VCSEL laser
- QSFP28 MSA compliant
- Low power dissipation:<3.5W per cable end (<2.5W with CDRs off)
- Cable lengths from 1 to 100 meters
- RoHS Compliant
- Operating temperature range: 0℃ to 70℃.

Applications

- 100G Ethernet
- Infiniband interconnects

Ordering Information

Part Number	Description	Operating Temperature Range
CFORTH-QSFP28-100G-AOCxM	100G QSFP28 Active Optical Cable (length from 1m to 100m)	0℃ to 70℃

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Bit Error Rate	BER			10^{-12}		
Operating Temperature	T_{OP}	0		70	℃	1
Storage Temperature	T_{STO}	– 40		85	℃	2
Input Voltage	V_{CC}	3.14	3.3	3.46	V	
Maximum Voltage	V_{MAX}	– 0.5		3.6	V	3

Notes:

1. Case temperature
2. Ambient temperature
3. For electrical power interface

AOC Electrical Input Requirements

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate Per Channel	DR		25.78125		Gb/s	
Differential Input Amplitude	V_{IN_PP}			900	mV	
Input AC Common Mode Voltage	V_{CM}	– 300		2800	mV	
Differential Termination Resistance Mismatch				10	%	
Differential Return Loss	SDD22				dB	1
Common Mode to Differential conversion and Differential to Common Mode conversion	SDC22, SCD22				dB	1
Transition Time (20% to 80%)	T_R, T_F	10			ps	

Notes:

1. Per OIF CEI-28G-VSR and CAUI-4 requirements

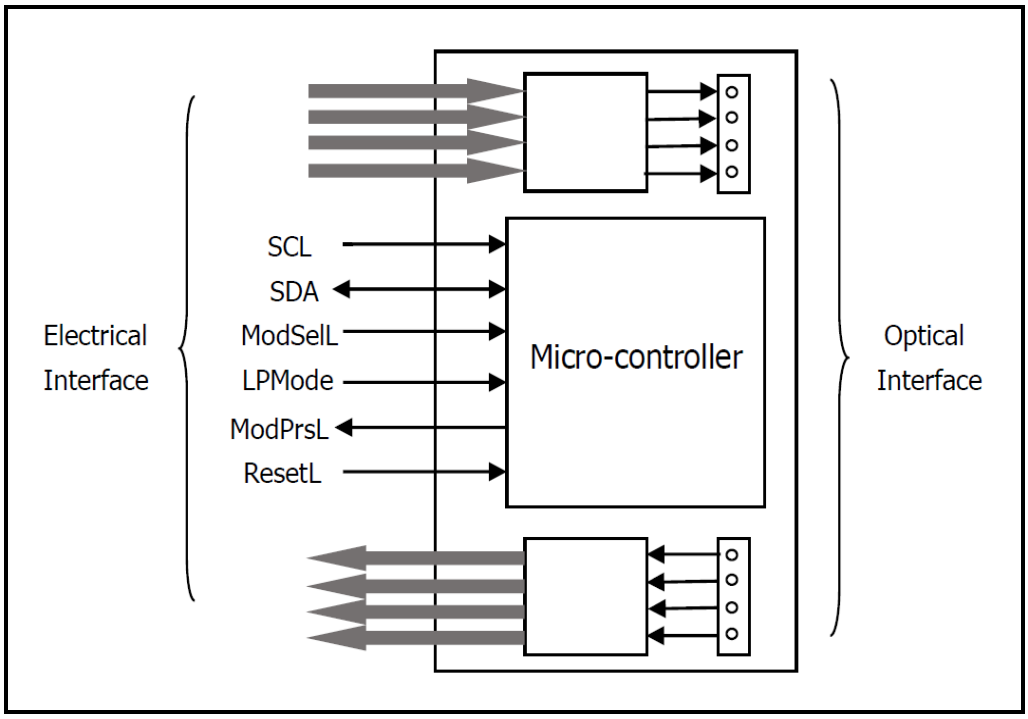
AOC Electrical Output Requirements

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Data Rate Per Channel	DR		25.78125		Gb/s	
Differential Output Amplitude	V_{OUT_PP}			900	mV	
Output AC Common Mode Voltage	V_{CM}	– 350		2850	mV	
Differential Termination Resistance Mismatch				10	%	
Differential Return Loss	SDD22				dB	1
Common Mode to Differential conversion and Differential to Common Mode conversion	SDC22, SCD22				dB	1
Transition Time (20% to 80%)	$T_{R,}$ T_F	9.5			ps	

Notes:

1. Per OIF CEI-28G-VSR and CAUI-4 requirements

Block Diagram of Transceiver



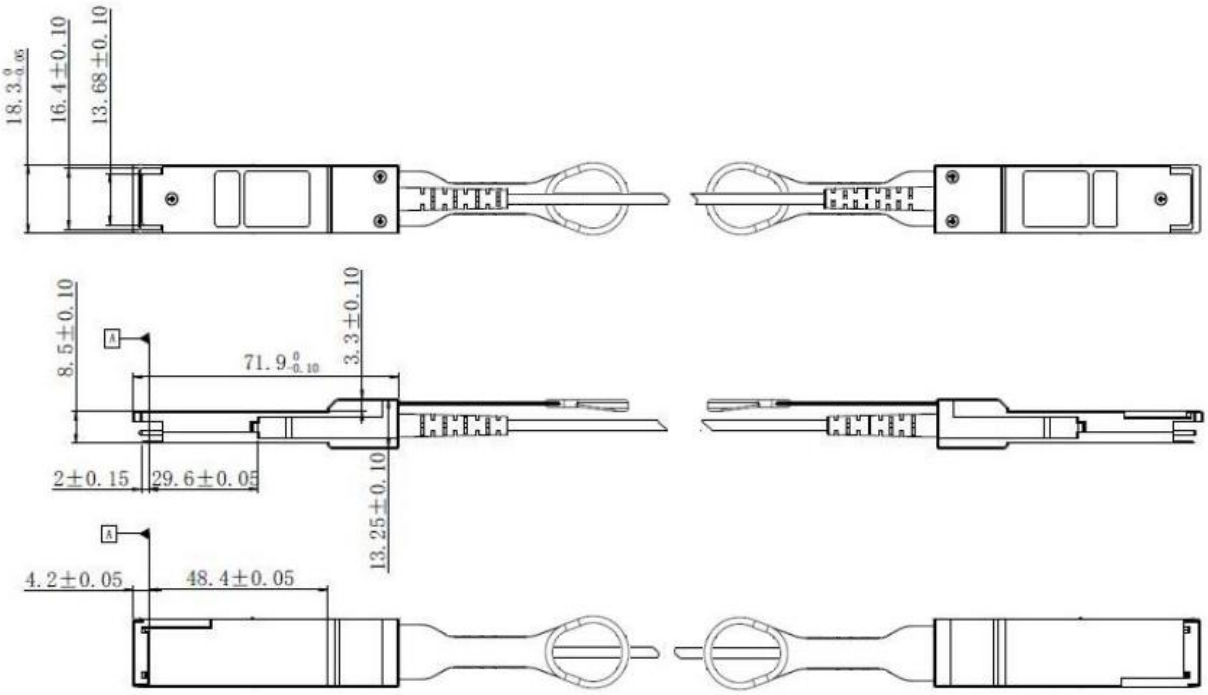
The QSFP28 AOC has miniature optical engine embedded into each end of the cable assembly. The engines interconnect 4 independent transmit/receive lanes.

A functional block diagram of the engine is shown in the above Figure. The transmitter sections consist of a 4-channel VCSEL array, a 4-channel input buffer and laser driver.

An on board micro-controller provides control, diagnostic and monitoring for the cable functions, as well as the external I2C serial communication interface.

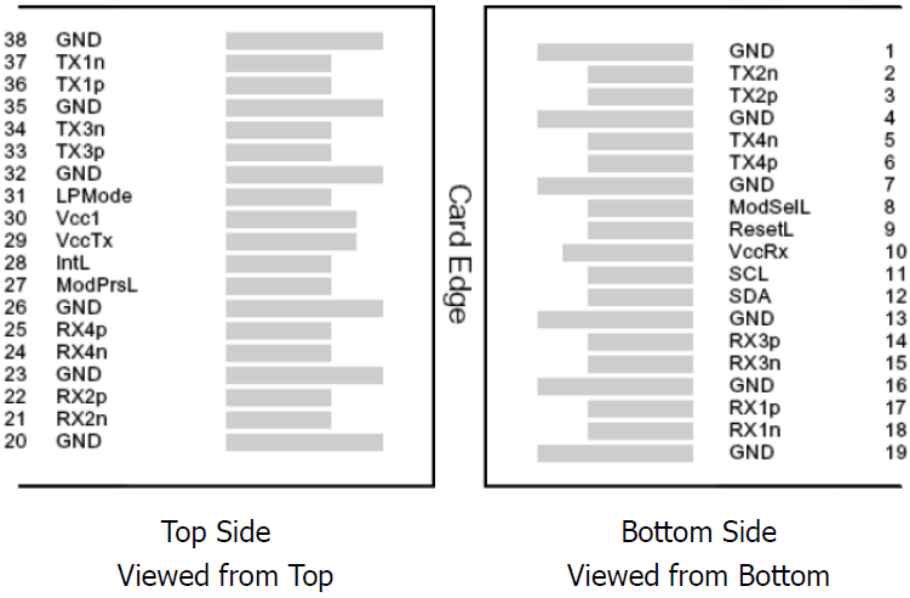
The Receiver section consists of a 4-channel PIN photodiode array, a 4-channel TIA array, and a 4-channel output buffer.

Dimensions



ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED
UNIT: mm

Electrical Pad Layout



Top Side
Viewed from Top

Bottom Side
Viewed from Bottom

Pin Assignment

PIN #	Symbol	Description	Remarks
1	GND	Ground	

2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data Input
4	GND	Ground
5	Tx4n	Transmitter Inverted Data Input
6	Tx4p	Transmitter Non-Inverted Data Input
7	GND	Ground
8	ModSelL	Module Select
9	ResetL	Module Reset
10	V_{cc} R_X	+3.3V Power Supply Receiver
11	SCL	2-wire serial interface clock
12	SDA	2-wire serial interface data
13	GND	Ground
14	Rx3p	Receiver Non-Inverted Data Output
15	Rx3n	Receiver Inverted Data Output
16	GND	Ground
17	Rx1p	Receiver Non-Inverted Data Output
18	Rx1n	Receiver Inverted Data Output
19	GND	Ground
20	GND	Ground
21	Rx2n	Receiver Inverted Data Output
22	Rx2p	Receiver Non-Inverted Data Output
23	GND	Ground
24	Rx4n	Receiver Inverted Data Output
25	Rx4p	Receiver Non-Inverted Data Output
26	GND	Ground
27	ModPrsL	Module Present
28	IntL	Interrupt
29	V_{cc} T_X	+3.3V Power Supply Transmitter
30	V_{cc1}	+3.3V Power Supply
31	LPMode	Low Power Mode
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Input
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input

38	GND	Ground

References

1. IEEE standard 802.3bm. IEEE Standard Department.
2. QSFP28 4X PLUGGABLE TRANSCEIVER – SFF-8665