

## Specification

### Active Optical Cable 100G QSFP28 Product



**TQS-Qx4H8-X87xx**




1: 0~70C; J: 0~85C



Length (meter)

#### Ordering Information:

Model Name	TQS-Q14H8-X87xx	TQS-QJ4H8-X87xx	Note
Voltage	3.3V		
Device type	850nm VCSEL / GaAs PIN		
Interface	CML/CML		
Temperature	0°C ~ +70°C	0°C ~ +85°C	
Latch Color	 Beige		

## ■ Features

- Compliant with 100GBASE-SR4 and CAUI-4 specification per IEEE 802.3bm.
- Compliant to SFF-8665 (QSFP28 Solution) Revision 1.8
- Supports 103.1Gb/s aggregate bit rate
- Low power consumption of max 1.9W (Typ. 1.7W) per cable end
- Hot pluggable electrical interface
- RoHS Compliance
- Standard Optical Cable Type of OFNR

## ■ Applications

- Ethernet for 100GBASE-SR4
- Infiniband EDR

## ■ Absolute Maximum Rating

Not necessarily applied together. Exceeding these values may cause permanent damage. Functional operation under these conditions is not implied.

Parameter	Min	Max	Unit	Note
Storage Temperature	-40	85	°C	
3.3V Power Supply Voltage	-0.5	3.6	V	
Relative Humidity	0	85	%	

## ■ Recommended Operating Conditions

Parameter	Min	Typical	Max	Unit	Note
Case Operating Temperature	0		70	°C	TQS-Q14H8-X85xx
	0		85		TQS-QJ4H8-X85xx
Power Supply Voltage	3.135	3.3	3.465	V	
Data Rate per Channel			25.78125	Gbps	
Control Input Voltage High	2		Vcc	V	
Control Input Voltage Low	0		0.8	V	
Pre-FEC Bit Error Ratio (PRBS <sup>31-1</sup> )			5E-5		
Post-FEC Bit Error Ratio (PRBS <sup>31-1</sup> ) (Assumes FEC provided by host system)			1E-12		

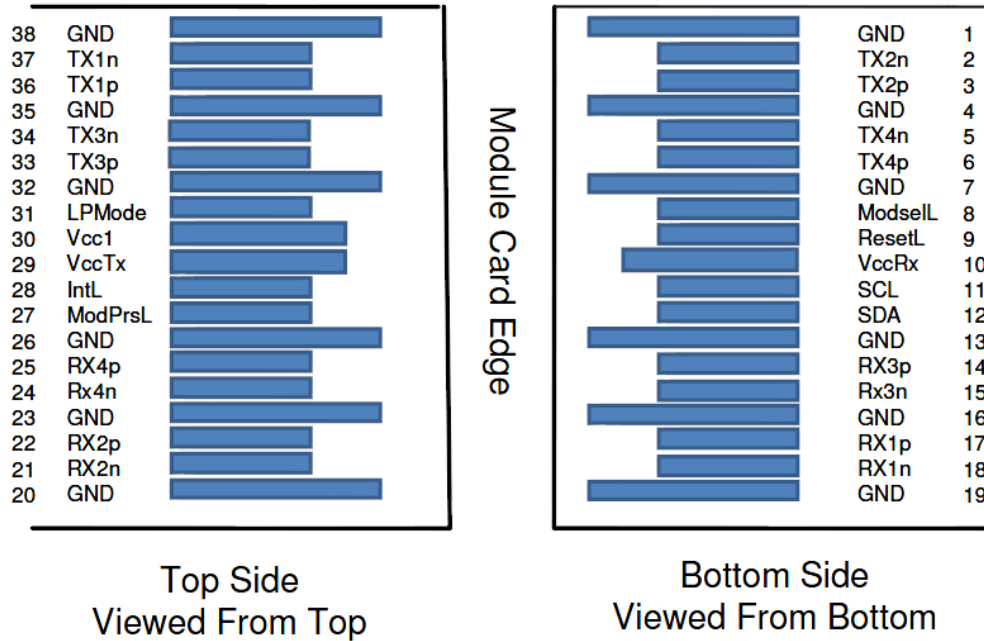
## ■ Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Note
<b>Transceiver Electrical Characteristics</b>						
Power Consumption (per cable end)			1.7.	1.9.	W	1
Supply Current				600	mA	1
<b>Transmitter</b>						
Overload Differential Voltage pk-pk	TP1a			1000	mV	
Differential Termination Resistance Mismatch	TP1			10	%	
Differential Return Loss (SDD11)	TP1			See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC11, SCD11)	TP1			See CEI-28G-VSR Equation 13-20	dB	
<b>Receiver</b>						
Differential Voltage, pk-pk	TP4			900	mV	
Differential Termination Resistance Mismatch	TP4			10	%	
Differential Return Loss (SDD22)	TP4			See CEI-28G-VSR Equation 13-19	dB	
Common Mode to Differential conversion and Differential to Common Mode conversion (SDC22, SCD22)	TP4			See CEI-28G-VSR Equation 13-21	dB	
Common Mode Return Loss (SCC22)	TP4			-2	dB	2
Transition Time, 20 to 80%	TP4	9.5			Ps	
Eye Width at $10^{-15}$ probability	TP4	0.57			UI	
Eye Height at $10^{-15}$ probability	TP4	228			mV	

### Notes:

1. Per terminal.
2. From 250MHz to 30GHz.

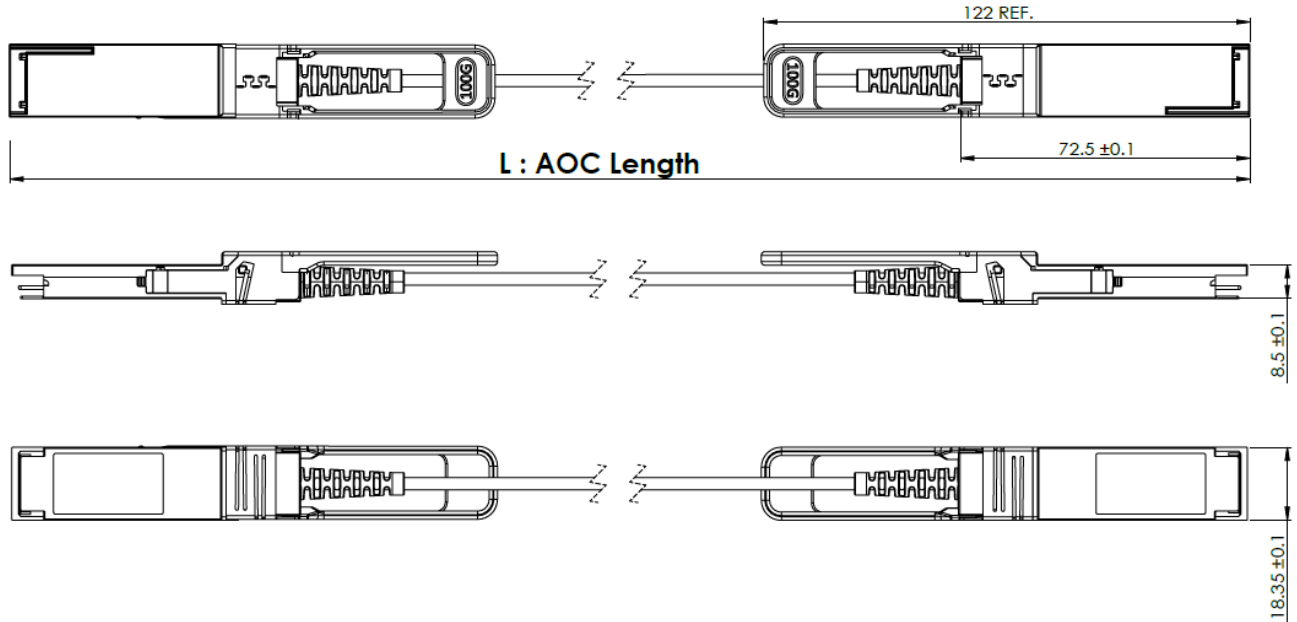
■ QSFP28 Module Pad Assignments and Descriptions



Pin	Logic	Symbol	Description	Plug Sequence	Notes
1		GND	Ground	1	
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3	
7		GND	Ground	1	
8	LVTTL-I	ModSelL	Module Select	3	
9	LVTTL-I	ResetL	Module Reset	3	
10		Vcc Rx	+3.3V Power Supply Receiver	2	
11	LVC MOS-I/O	SCL	2-wire serial interface clock	3	
12	LVC MOS-I/O	SDA	2-wire serial interface data	3	

13		GND	Ground	1	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	
20		GND	Ground	1	
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		Vcc Tx	+3.3V Power supply transmitter	2	
30		Vcc1	+3.3V Power supply	2	
31	LVTTL-I	LPMode	Low Power Mode	3	
32		GND	Ground	1	
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Input	3	
35		GND	Ground	1	
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Input	3	
38		GND	Ground	1	

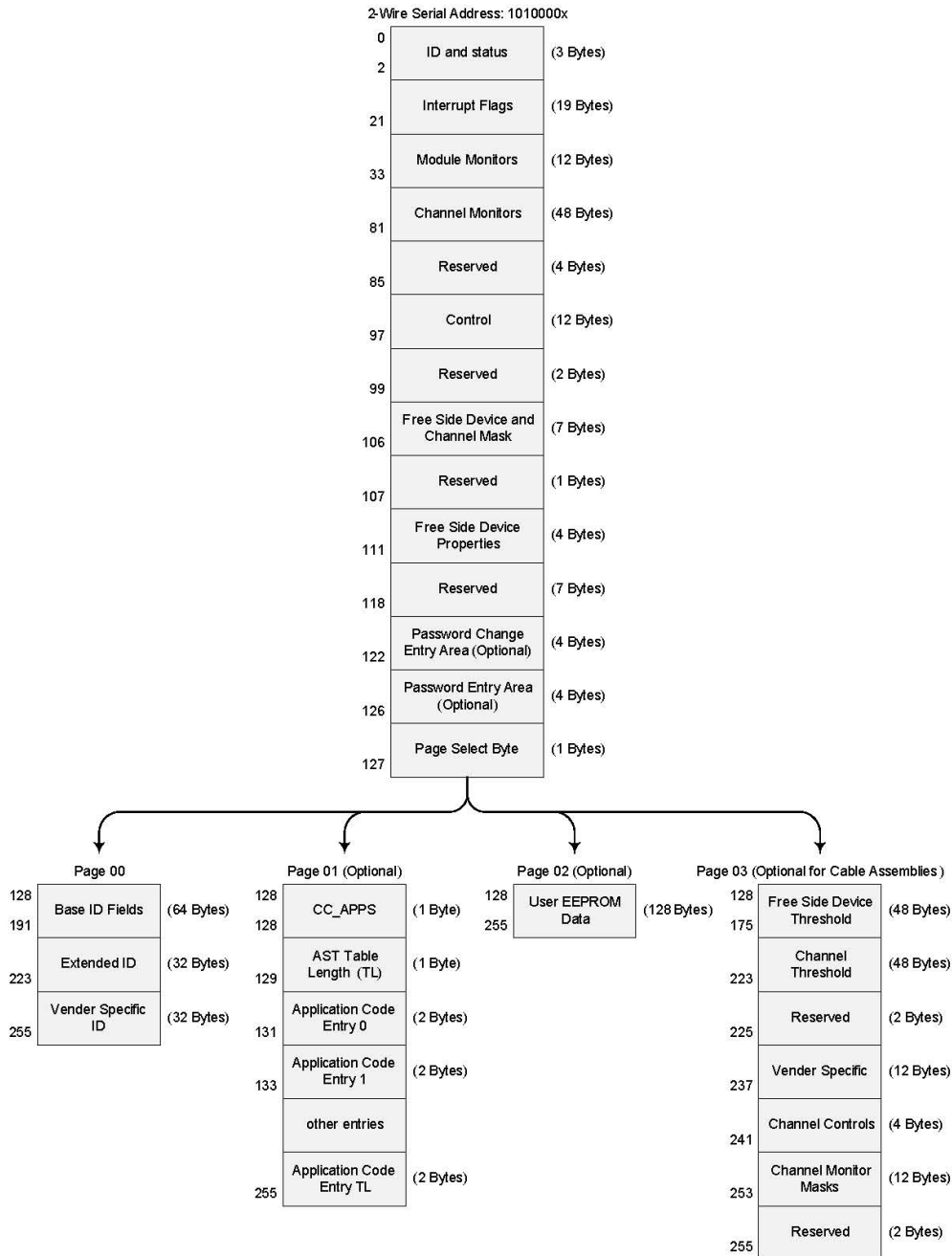
■ Module Outline (Unit: mm)



Model Name for 100G QSFP28 AOC of commercial temperature and extended temperature range types			
Length	Commercial temperature range (0~70°C)	Extended temperature range (0~85°C)	Comment
0.5m	TQS-Q14H8-X870H	TQS-QJ4H8-X870H	
1.0m	TQS-Q14H8-X8701	TQS-QJ4H8-X8701	
2.0m	TQS-Q14H8-X8702	TQS-QJ4H8-X8702	
3.0m	TQS-Q14H8-X8703	TQS-QJ4H8-X8703	
5.0m	TQS-Q14H8-X8705	TQS-QJ4H8-X8705	
7.0m	TQS-Q14H8-X8707	TQS-QJ4H8-X8707	
10.0m	TQS-Q14H8-X8710	TQS-QJ4H8-X8710	
20.0m	TQS-Q14H8-X8720	TQS-QJ4H8-X8720	

**Memory Map**

The memory map is structured as a single address and multiple page approaches, according to the QSFP28 SFF-8636 MSA specification as shown in the below. For more detailed description of this memory map or lower pages, please see our Memory Map document with flexible customization settings.



## ■ ESD

Normal ESD precautions are required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

## ■ LASER Safety

This is a Class 1 Laser Product according to IEC/EN60825-1:2014 (Third Edition). This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 56, MAY 8, 2019.

**Caution:**

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

**Attention:** L'utilisation de commandes ou de réglages ou l'exécution de procédures autres que celles spécifiées dans le document peut entraîner une exposition à des radiations dangereuses.

## ■ Contact Information

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## ■ Revision History

Date	Version	Description
01/26/2022	1.0	Initial release