LWO-DAC-QSFP28-xxM

100GBit QSFP28 to QSFP28 Direct Attach Cable

Features

- Compatible with IEEE 802.3bj and InfiniBand EDR
- In accordance with the paging function in the protocol SFF-8636
- Supports aggregate data rates of 100Gbps
- Optimized construction to minimize insertion loss and cross talk
- Pull-to-release slide latch design
- 26AWG through 30AWG cable
- Straight and break out assembly configurations available
- Customized cable braid termination limits EMI radiation
- Customizable EEPROM mapping for cable signature
- RoHS-6 compliant

Application

- Switches, servers and routers
- Data Center networks
- Storage area networks
- High performance computing
- Telecommunication and wireless infrastructure

General Description

The objective is to provide QSFP28 cable assemblies. This specification applies to the 4X size configurations. All materials and compounds used, meet the material restrictions of RoHS, (European Directive 2002/95/EC on the Restrictions of Hazardous Substances) as proposed by the RoHS Technical Adaptation Committee.

This specification is applicable to 100G QSFP28 external connector system which provides a high-speed cable to board interconnect.

Lighwin's Quad Small Form-factor to Quad Small Form-factor Pluggable solution achieving 100G transmission (hereafter referred to as QSFP28 to QSFP28) is designed for high-density applications. The hot-pluggable transceiver integrates 4 transmitting and 4 receiving channels.

Lighwin's QSFP28 to QSFP28 cable assemblies are high performance, high bandwidth and cost effective interconnect solutions which support 100G standards with different data rate applications.

Reference Documents

The following documents are forming a part of this specification to the extent specified.

- SFF8436: QSFP+ 10Gb/s 4X pluggable transceiver
- SFF8665: QSFP+ 28Gb/s 4X pluggable transceiver solution (QSFP28)
- SFF8679: QSFP+ 4X base electrical specification
- SFF8636: Common Management Interface
- SFF 8417: Multi Conductor Cable Flex Cycle Test Procedure
- IEEE 802.3bj: Physical Layer Specifications and Management Parameters for 100 Gb/s Operation Over Backplanes and Copper Cables

Absolute Maximum Ratings

Parameter	Symbol	Unit	Min.	Max.
Storage Temperature Range	TS	°C	-40	+85
Relative Humidity	RH	%	5	85
Power Supply Voltage	V_{CC}	V	3.135	+3.465
Operating Case Temperature Range	T_C	°C	0	+70

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Pin Assignment and Description

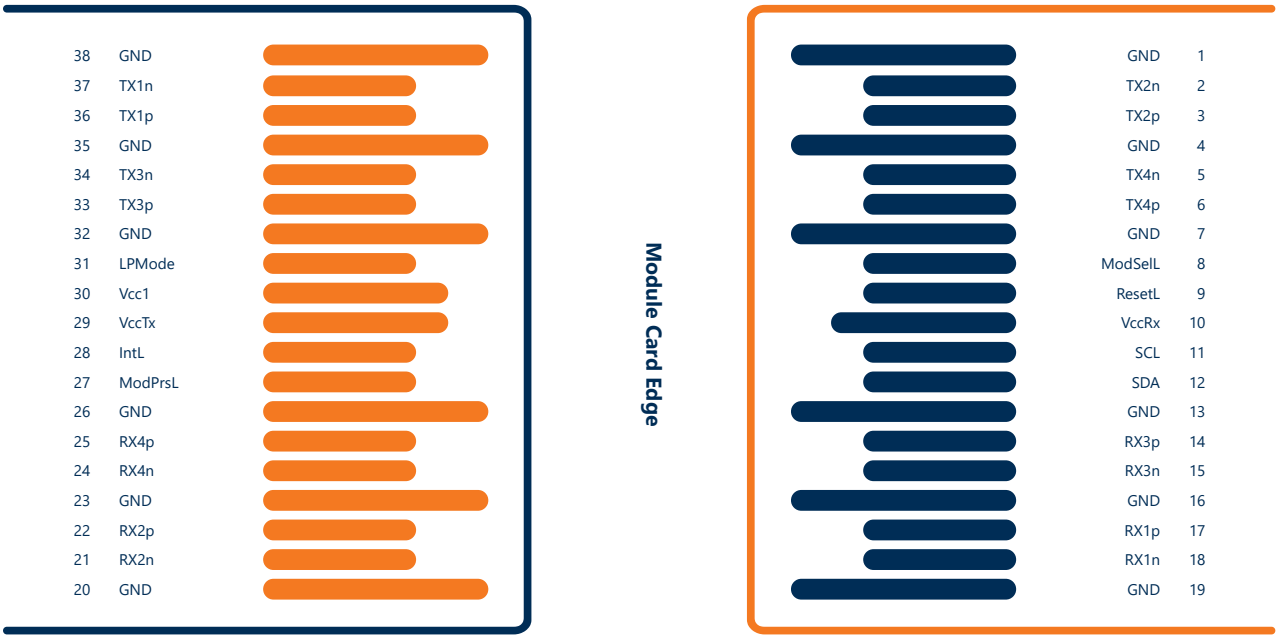

Figure 1: QSFP28 module pad layout

Pair No.	P1		P2	
	Pin	Signal	Pin	Signal
1	37	TX1n	18	RX1n
	36	TX1p	17	RX1p
2	2	TX2n	21	RX2n
	3	TX2p	22	RX2p
3	34	TX3n	15	RX3n
	33	TX3p	14	RX3p
4	5	TX4n	24	RX4n
	6	TX4p	25	RX4p
5	18	RX1n	37	TX1n
	17	RX1p	36	TX1p
6	21	RX2n	2	TX2n
	22	RX2p	3	TX2p
7	15	RX3n	34	TX3n
	14	RX3p	33	TX3p
8	24	RX4n	5	TX4n
	25	RX4p	6	TX4p

Table 1: Wire connection

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Electrical Characteristics

Test Items	Test Condition	Specification
Current		0.5A per contact
Voltage		30 vDC per contact
LLCR	EIA 364-23, 20mVdc, 100mA	less than 2 ohms
Insulation Resistance	100 Vdc	10 Mohms minimum between adjacent contacts
Dielectric Withstanding Voltage	300 VDC minimum for 1 minutes	No defect or breakdown between adjacent contacts
Temperature Rise	Measure the temperature rise at the rated current after 96 hours(45 minutes ON/15 minutes OFF per hour)	Temperature rise: +30°C MAX.
Continuity	Verify the continuous electrical path	No open, short, or high resistance.

SI Requirements

Test Items	Specification	Notes
SDD21&SDD12	-17.16 dB Min. @13.28 GHz	From 0.01 GHz-19GHz
SDD11&SDD22	-16.5+2*sqrt(f)dB Max. @0.05GHz~4.1GHz	From 0.01 GHz-19GHz
	-10.66+14*log(f/5.5)dB Max.@4.1GHz~10GHz	
SCD21-SDD21	-10 dB Max. @0.01 GHz~12.89 GHz	From 0.01 GHz-19GHz
	-27+(29/22)*f dB Max. @12.89 GHz~15.7 GHz	
	-6.3 dB Max. @15.7 GHz~19 GHz	

Mechanical Performance Requirements

Test Items	Test Condition	Specification
Mating Forces	A rate of 10mm per minute	QSFP-DD<90N
Un-mating Forces	A rate of 10mm per minute	QSFP-DD<50N
Latch strength	Pull to separate module from cage, Test with connector, cage & module (latch engaged)	Minimum of an 125N force
Bulk cable retention in module	Pull to separate bulk cable from module,Test with cable assembly only	Minimum of an 90N force
Wire Flex	Flex cable 180° for 10 cycles at X/Y axis, 20 times/minutes, with an 1kg suspended weight. Type C EIA 364-41, test condition I	No microsecond discontinuities are allowed
Durability	Perform 50 unplug/plug cycles	No evidence of physical damage
Cable Minimum Bend Radius	The cable is bent on time over the correct mandrel with 5 perpendicular, the Minimum bendRadius is 10x OD.	No physical damage, Verify continuity and SI

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Design and construction

Connector

The connector meets the various dimensional and physical requirements outlined in the SFF-8432 specification

Cable

Cable type is a 100 ohm twinax cable which consists of 2 parallel pairs. Printing on the cable is defined in the respective cable specification. Each pair consists of two signal conductors and two drains wire wrapped in a shield.

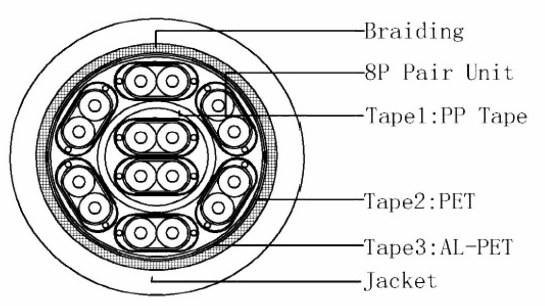

Figure 2: Cable

Cable Assembly

Cable Bulk shield is directly to be connected to the connector backshell to minimize EMI.
Each cable assembly is labelled with a unique identification label.

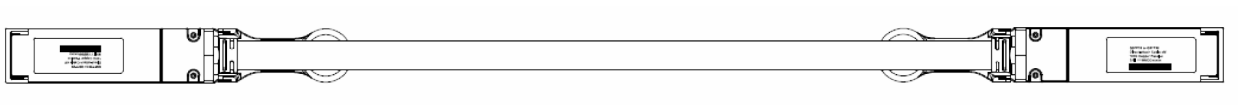

Figure 3: Cable Assembly

Mechanical Dimensions

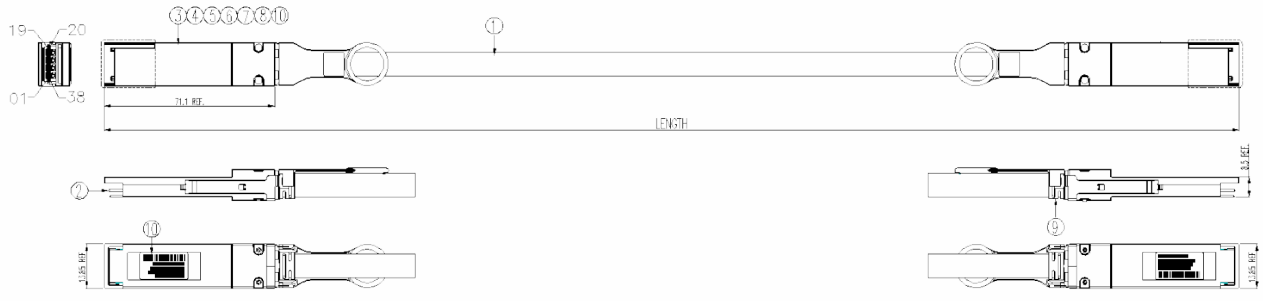

Figure 4. Mechanical Outline

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ESD

This transceiver is specified as ESD threshold 1kV for high-speed data pins and 2kV for all others electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22- A114-A (HBM). However, normal ESD precautions are still 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.

Ordering Information

Part Number	Cable length
LWO-DAC-QSFP28-0.5M	0.5 Meter
LWO-DAC-QSFP28-1M	1.0 Meter
LWO-DAC-QSFP28-3M	3.0 Meter