

200G QSFP56 Direct Attach Passive Copper Cable

Features

- Compatible with IEEE 802.3bj and IEEE 802.3cd
- In accordance with the paging function in the protocol SFF-8636, paging can be selected 00H or 02H in 127 bytes
- Supports aggregate data rates of 200Gbps(PAM4)
- Optimized construction to minimize insertion loss and cross talk
- Backward compatible with existing QSFP+ connectors and cages
- 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 compliant

Applications

- Switches, servers and routers
- Data Center networks
- Storage area networks
- High performance computing
- Telecommunication and wireless infrastructure
- Medical diagnostics and networking
- Test and measurement equipment

Compliance

- 200G Ethernet (IEEE 802.3cd)
- SFF-8665
- 108-32081 QSFP28 Copper Module Direct Attach Cable Assembly

Description

QSFP56 passive copper cable assembly feature eight differential copper pairs, providing four data transmission channels at speeds up to 56Gbps(PAM4) per channel, and meets 200G Ethernet requirements. Available in a broad range of wire gauges—from 26AWG through 30AWG—this 200G copper cable assembly features low insertion loss and low cross talk.

QSFP56 uses PAM4 signals for transmission, which doubles the rate. However, there are more stringent requirements for cable insertion loss. For detailed requirements, please see High Speed Characteristics.

Designed for applications in the data center, networking and telecommunications markets that require a high speed, reliable

cable assembly, this next generation product shares the same mating interface with QSFP+ form factor, making it backward compatible with existing QSFP ports.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Storage Temperature	TSTG	-40	-	+85	°C	
Operating Case Temperature	Tc	0		+70	°C	
Power Supply Voltage	VCC3	3.14	3.3	3.47	V	
Data Rate Per Lane		1	-	28	Gb/s	

High Speed Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Differential Impedance	TDR	90	100	110	Ω	
Insertion loss	SDD21	-16.06			dB	At 13.28 GHz
Differential Return Loss	SDD11 SDD22			See 1	dB	At 0.05 to 4.1 GHz
				See 2	dB	At 4.1 to 19 GHz
Common-mode to common-mode output return loss	SCC11 SCC22			-2	dB	At 0.2 to 19 GHz
Differential to common-mode	SCD11			See 3	dB	At 0.01 to 12.89 GHz

return loss	SCD22		See 4		At 0.01 to 12.89 GHz
Differential to common Mode	SCD21-IL		-10		At 0.01 to 12.89 GHz
Conversion Loss			See 5	dB	At 12.89 to 15.7 GHz
			-6.3		At 15.7 to 19 GHz

Notes:

Reflection Coefficient given by equation $SDD11(dB) \leq -16.5 + 2 \times \text{SQRT}(f)$, with f in GHz

Reflection Coefficient given by equation $SDD11(dB) \leq -10.66 + 14 \times \log_{10}(f/5.5)$, with f in GHz

Reflection Coefficient given by equation $SCD11(dB) \leq -22 + (20/25.78)*f$, with f in GHz

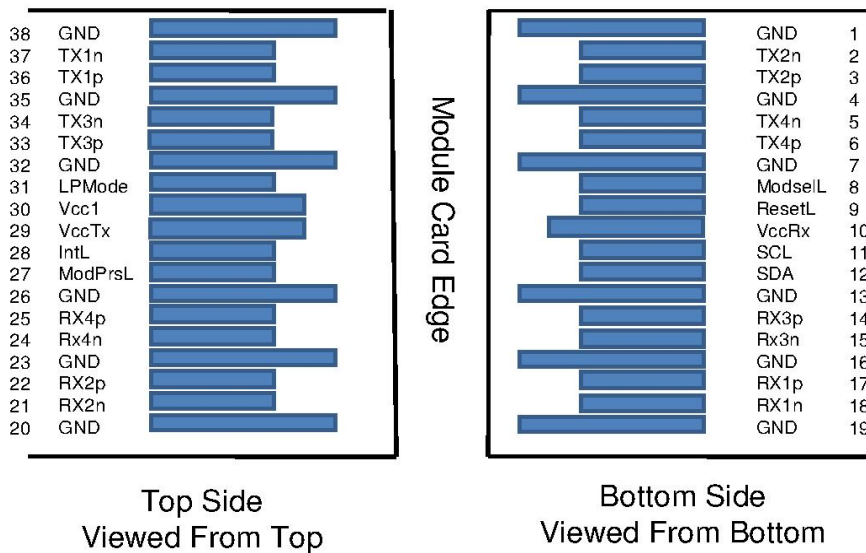
Reflection Coefficient given by equation $SCD11(dB) \leq -15 + (6/25.78)*f$, with f in GHz

Reflection Coefficient given by equation $SCD21(dB) \leq -27 + (29/22)*f$, with f in GHz

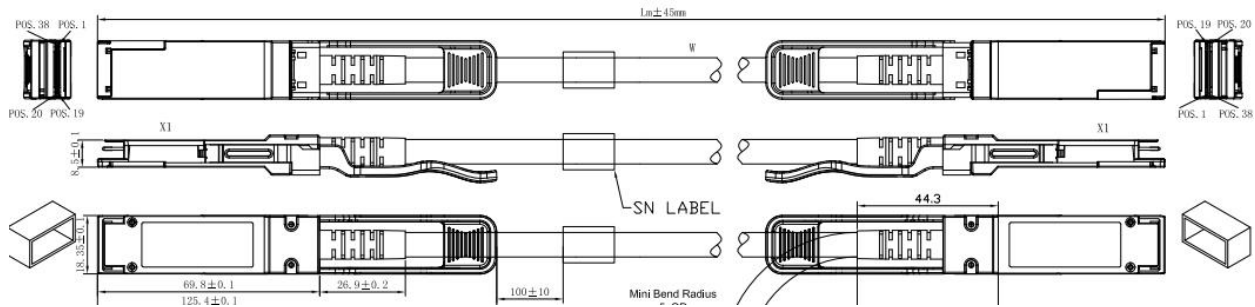
Pin Descriptions

Pin	Logic	Symbol	Description	Note
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	
7		GND	Ground	1
8	LVTTL-I	ModSelL	Module Select	
9	LVTTL-I	ModSelL	Module Select	
10		Vcc Rx	+3.3V Power Supply Receiver	2
11	LVC MOS-I/O	SCL	2-wire serial interface clock	
12	LVC MOS-I/O	SDA	2-wire serial interface data	
13		GND	Ground	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1p	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	

22	CML-0	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	
24	CML-0	Rx4n	Receiver Inverted Data Output	
25	CML-0	Rx4p	Receiver Non-Inverted Data Output Ground	
26		GND	Ground	1
27	LVTTL-0	ModPrsL	Module Present	
28	LVTTL-0	IntL	Interrupt	
29		Vcc Tx	+3.3V Power supply transmitter	2
30		Vcc1	+3.3V Power supply	2
31	LVTTL-I	LPMODE	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Input	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Input	
38		GND	Ground	1



Mechanical Specifications



Length (m)	Cable AWG
1	30
2	26/30
3	26

Regulatory Compliance

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883C Method 3015.7	Class 1(→2000 Volts)
Electromagnetic Interference(EMI)	FCC Class B	Compliant with Standards
	CENELEC EN55022 Class B	
	CISPR22 ITE Class B	
RF Immunity(RFI)	IEC61000-4-3	Typically Show no Measurable Effect from a 10V/m Field Swept from 80 to 1000MHz
RoHS Compliance	RoHS Directive 2011/65/EU and it's Amendment Directives 6/6	RoHS 6/6 compliant

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2. Nothing herein should be construed as constituting an additional warranty.

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