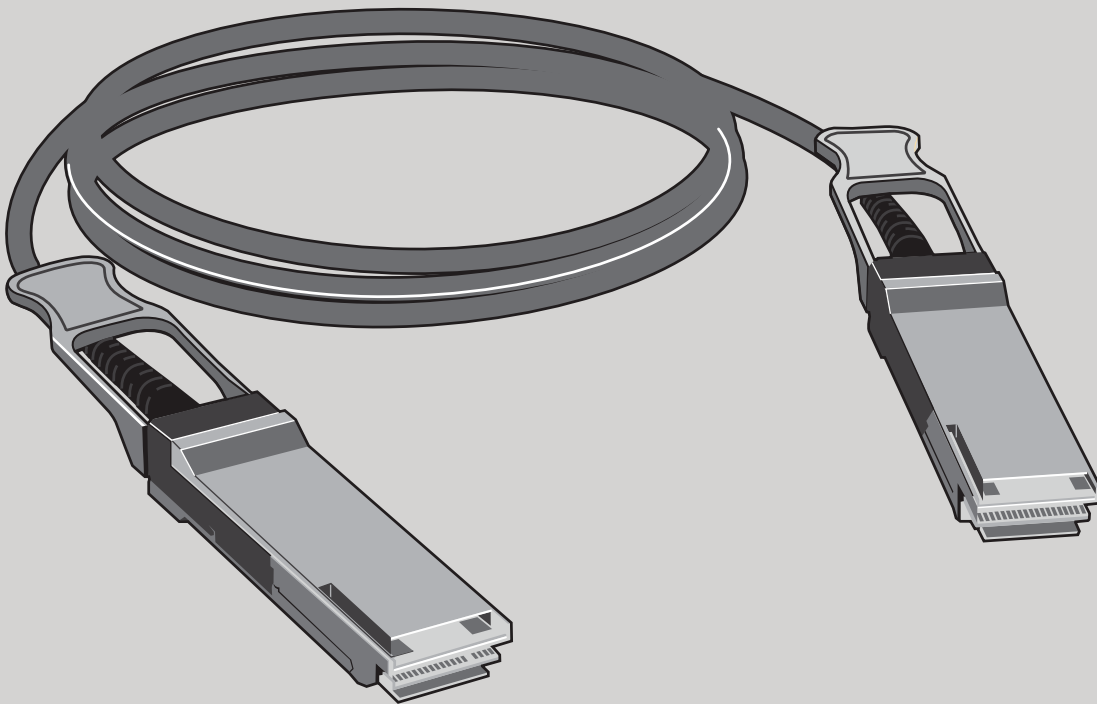QSFP-100G-AOCXM-BB SERIES

100G ACTIVE OPTICAL CABLE NETWORKING

24/7 TECHNICAL SUPPORT AT 877.877.2269 OR VISIT BLACKBOX.COM

BLACK BOX

OVERVIEW

100G ACTIVE OPTICAL CABLE FOR NETWORKING DATA SHEET

QSFP-100G-AOC3M-BB

INTRODUCTION

Black Box 100G Active Optical Cables provide premium, error-free performance for data, storage, and high-performance computing (HPC) interconnectivity. 100% compatible to Cisco QSFP-100G-AOCxM= Active Optical Cables, these cables connect your Cisco switches, routers and servers. Constructed for full compliance with the QSFP28 Multi-Source Agreement (MSA), SFF-8636, and SFF-8665 industry standards, you can also make connections among your non-Cisco, 100G compatible networking equipment. Programmed, tested and serialized to ensure compliance and functionality, Black Box Active Optical Cables are the ideal solution for 100G Ethernet, Infiniband (4xEDR, 4xFDR, 4xQDR), 4G/8G/16G/32G Fiber Channel applications and more.

Ultra-Thin and Light Design is Ideal for High-Density, High-Bandwidth Applications

Active Optical Cables are much thinner and lighter than their copper direct attach cable (DAC) counterparts, making them perfect for use in today's ultra-high density applications, where they take up less space and put less stress on equipment. The increase in space leads to increased air flow, saving you money on cooling overheated equipment. Also, optical technology provides significantly higher bandwidth than copper, allowing for ultra-fast data transmission at long distances, unlike DACs, which start to experience excessive bit error rates at over 16.4 feet (5 m).

All-in-One Solution Makes for Simple Connections with Low Latency

With an all-in-one, hot-swappable cable design, active optical cables provide you with an easy to connect solution that doesn't require purchasing multiple transceivers and cabling. The lack of additional connection points also means lower latency, so you can be confident of your data integrity. Hot-swappability makes upgrades and equipment replacements a breeze, minimizing downtime to your network connectivity. In addition, AOCs provide a cost-efficient, low-power solution (less than 2.5 W) that is essential in today's high data-rate applications.

Minimal EMI Profile

Active Optical Cables (AOC) feature a minimal EMI/RFI profile due to their fiber optic construction. Superior resistance to EMI/RFI interference ensures data integrity, which is essential in today's ultra-high density rackmount applications that cannot tolerate any signal downtime or interruption. And as security concerns continue to grow, fiber is well suited to protect against tapping of your data.

FEATURES

- 100% COMPATIBLE TO CISCO QSFP-100G-AOCXM
- COMPLIES WITH QSFP28 MULTI-SOURCE AGREEMENT (MSA), SFF-8636 AND SFF-8665 STANDARDS
- USES VCSEL TECHNOLOGY OVER 850-NM MULTIMODE FIBER FOR OPTIMAL PERFORMANCE
- ULTRA-THIN AND LIGHT OPTICAL CABLING IDEAL FOR HIGH-DENSITY NETWORKING APPLICATIONS
- LOW POWER USAGE (LESS THAN 2.5 W) IS EXTREMELY VALUABLE IN HIGH DATA RATE APPLICATIONS
- PERFECT FOR POINT-TO-POINT, INTRA-RACK AND RACK-TO-RACK CONNECTIONS OF 100G EQUIPMENT
- CONSTRUCTED USING LSZH LOW-SMOKE ZERO HALOGEN CABLING
- CASE SUPPORTS OPERATING TEMPERATURE RANGE OF 32 TO 158° F (0 TO 70° C)

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DIMENSIONAL DIAGRAMS AND SPECIFICATIONS

100G ACTIVE OPTICAL CABLE FOR NETWORKING DATA SHEET
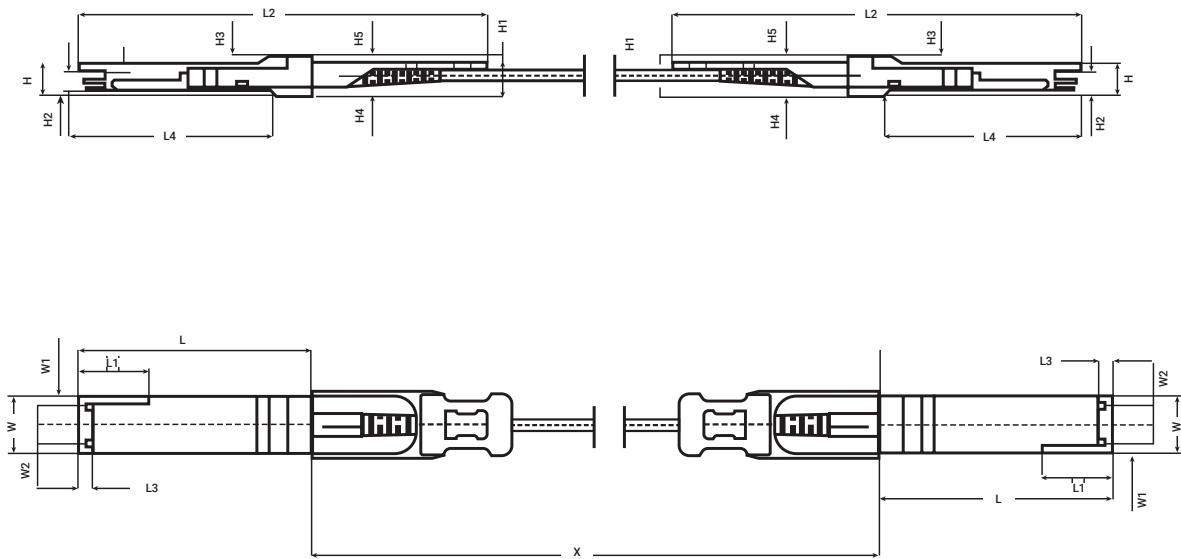
DIMENSIONS IN MILLIMETERS (MM)															
	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5	H6
MAXIMUM	72.2	—	128	4.35	61.4	18.45	—	6.2	8.6	12.4	5.35	2.5	1.6	2.0	—
TYPICAL	72.0	—	—	4.20	61.2	18.35	—	—	8.5	12.2	5.2	2.3	1.5	1.8	6.55
MINIMUM	68.8	16.5	124	4.05	61.0	18.25	2.2	5.8	8.4	12.0	5.05	2.1	1.3	1.6	—

NOTE: X is the cable length (3, 5, 7, 10, 15, or 30 meters [m]).

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	MIN.	TYPICAL	MAX	UNIT	NOTES
SUPPLY VOLTAGE	VCC3	-0.5	—	+3.6	V	—
STORAGE TEMPERATURE	Ts	-10	—	+70	°C	—
OPERATING HUMIDITY	TOP	+5	—	+85	%	1

NOTE1: No condensation.

SPECIFICATIONS

100G ACTIVE OPTICAL CABLE FOR NETWORKING DATA SHEET

RECOMMENDED OPERATING CONDITIONS						
PARAMETER	SYMBOL	MIN.	TYPICAL	MAX	UNIT	NOTES
OPERATING CASE TEMPERATURE	Tc	0	—	+70	°C	—
POWER SUPPLY VOLTAGE	Vcc	3.14	3.3	3.47	V	—
POWER DISSIPATION	Pd	—	—	2.5	W	—
BIT RATE	BR	10.3125	25.78125	—	Gbps	—

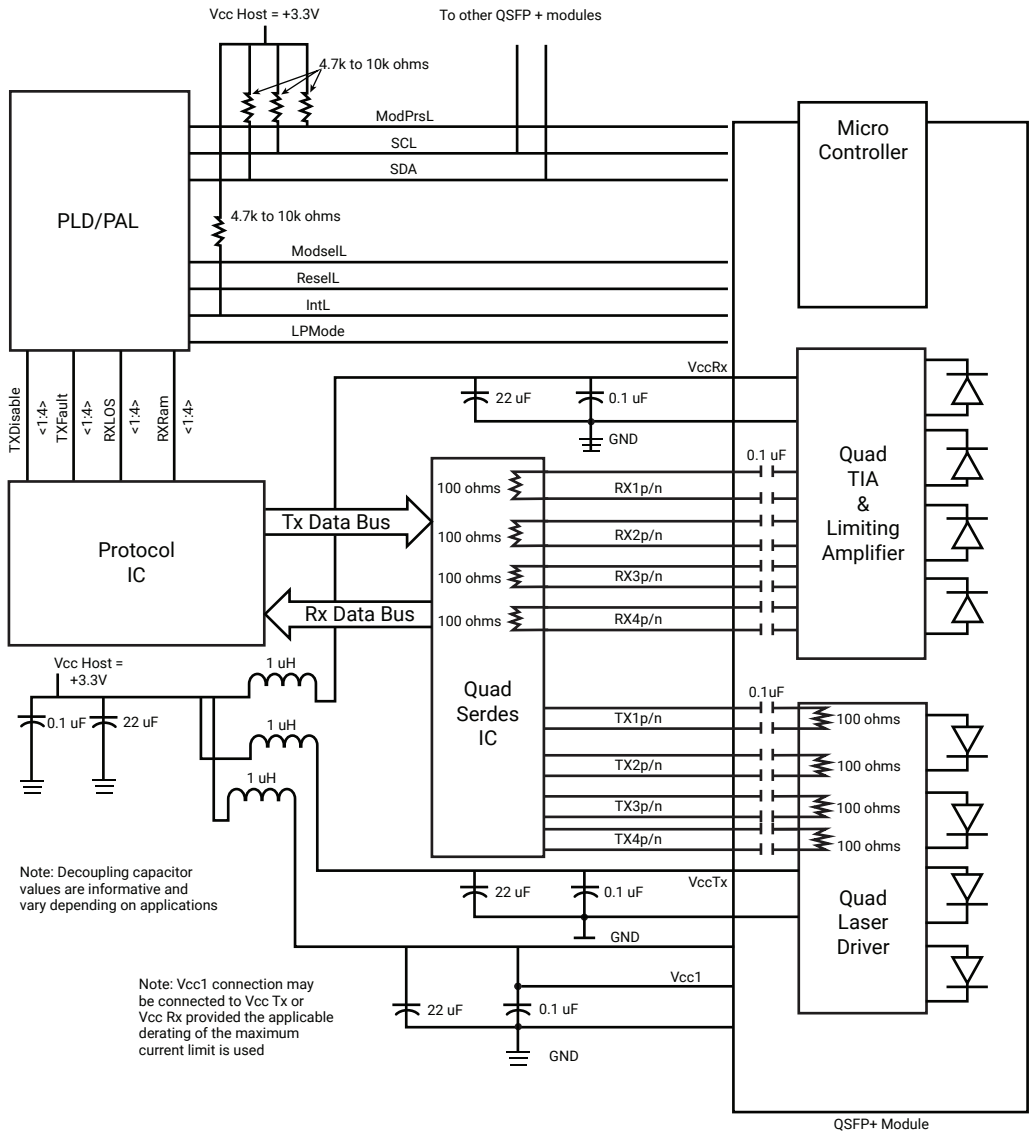| ELECTRICAL CHARACTERISTICS							
PARAMETER		SYMBOL	MIN.	TYPICAL	MAX	UNIT	NOTES
MOD SELL	MODULE SELECT	VOL	0	—	0.8	V	—
	MODULE UNSELECT	VOH	2.5	—	Vcc	V	—
LOW POWER	MODE LP MODE	VIL	0	—	0.8	V	—
	NORMAL OPERATION	VIH	2.5	—	Vcc±0.3	V	—
RESETL	RESET	VIL	0	—	0.8	V	—
	NORMAL OPERATION	VIH	2.5	—	Vcc±0.3	V	—
MODPRSL	NORMAL OPERATION	VOL	0	—	0.4	V	—
INTL	INTERRUPT	VOL	0	—	0.4	V	—
	NORMAL OPERATION	VOH	2.4	—	Vcc	V	—
TRANSMITTER							
DIFFERENTIAL DATA INPUT SWING		Vout	200	—	1600	mV	—
INPUT DIFFERENTIAL IMPEDANCE		ZD	90	100	110	Ohms	—
RECEIVER							
DIFFERENTIAL DATA OUTPUT SWING		VIN p-p	200	—	800	mVpp	—
OUTPUT DIFFERENTIAL IMPEDANCE		BER	—	—	E-12	—	1
INPUT DIFFERENTIAL IMPEDANCE		ZIN	90	100	110	Ohms	—

NOTE:

1. PRBS 2^{31} -1 @25.78125 Gbps

SPECIFICATIONS

100G ACTIVE OPTICAL CABLE FOR NETWORKING DATA SHEET

RECOMMENDED INTERFACE CIRCUIT

SPECIFICATIONS

100G ACTIVE OPTICAL CABLE FOR NETWORKING DATA SHEET

PIN DESCRIPTIONS

Pin	Signal			Signal	Pin
38	GND			GND	1
37	TX1n			TX2n	2
36	TX1p			TX2p	3
35	GND			GND	4
34	TX3n			TX4n	5
33	TX3p			TX4p	6
32	GND			GND	7
31	LP Mode			ModselL	8
30	Vcc1			ResetL	9
29	VccTx			VccRx	10
28	IntL			SCL	11
27	ModPrsL			SDA	12
26	GND			GND	13
25	Rx4p			Rx3p	14
24	Rx4n			Rx3n	15
23	GND			GND	16
22	RX2p			RX1p	17
21	RX2n			RX1n	18
20	GND			GND	19

Module Card Edge

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SPECIFICATIONS

100G ACTIVE OPTICAL CABLE FOR NETWORKING DATA SHEET

PIN FUNCTION DEFINITIONS			
PIN	**SYMBOL**	**NAME/DESCRIPTION**	**NOTES**
1	GND	Ground	1
2	TX2n	Transmitter Inverted Data Input	—
3	TX2p	Transmitter Non-Inverted Data Input	—
4	GND	Ground	1
5	TX4n	Transmitter Inverted Data Input	—
6	TX4p	Transmitter Non-Inverted Data Input	—
7	GND	Ground	1
8	ModSelL	Module Select	—
9	ResetL	Reset Select	—
10	Vcc RX	+3.3 V Power Supply Receiver	—
11	SCL	2-wire serial interface clock	—
12	SDA	2-wire serial interface data	—
13	GND	Ground	1
14	RX3p	Receiver Non-Inverted Data Output	—
15	RX3n	Receiver Inverted Data Output	—
16	GND	Ground	1
17	RX1p	Receiver Non-Inverted Data Output	—
18	RX1n	Receiver Inverted Data Output	—
19	GND	Ground	1
20	GND	Ground	1
21	RX2n	Receiver Inverted Data Output	—
22	RX2p	Receiver Non-Inverted Data Output	—
23	GND	Ground	1
24	RX4n	Receiver Inverted Data Output	—
25	RX4p	Receiver Non-Inverted Data Output	—
26	GND	Ground	1
27	ModPrsL	Module Present	—
28	IntL	Interrupt	—
29	Vcc TX	+3.3 V power supply transmitter	—
30	Vcc1	+3.3 V power supply	—
31	LPMode	Low power mode	—
32	GND	Ground	1
33	TX3p	Transmitter Non-Inverted Data Input	—
34	TX3n	Transmitter Inverted Data Input	—
35	GND	Ground	1
36	TX1p	Transmitter Non-Inverted Data Input	—
37	TX1n	Transmitter Inverted Data Input	—
38	GND	Ground	1

# SPECIFICATIONS

100G ACTIVE OPTICAL CABLE FOR NETWORKING DATA SHEET

MECHANICAL DESIGN DIAGRAM MEMORY MAP

2-wire Serial Address 1010000x
Lower Page 00h
0 Identifier
1–2 Status
3–21 Interrupt Flags
22–33 Free Side Device Monitors
34–81 Channel Monitors
82–85 Reserved
86–98 Control
99 Reserved
100–104 Hardware Interrupt Pin Masks
105–106 Vendor Specific
107 Reserved
108–110 Free Side Device Properties
111–112 Assigned for use by PCI Express
113 Free Side Device Properties
114–118 Reserved
119–122 Password Change Entry Area (Optional)
123–126 Password Entry Area (Optional)
127 Page Select Byte
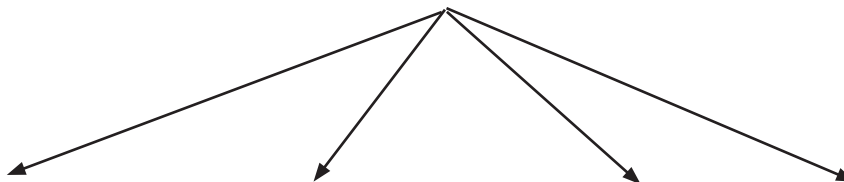
Upper Page 00h	Optional Page 01h	Optional Page 02h	Optional Page 03h
128 Identifier	128 CC_APPS	128–255 User EEPROM Data	128–175 Free Side Device Thresholds
129–191 Base ID Fields	129 AST Table Length (TL)		
	130–131 Application Code Entry 0		
	132–133 Application Code Entry 1		
	134–253 other entries		176–223 Channel Thresholds
192–223 Extended ID			224 TX EQ and RX Emphasis Magnitude ID
224–255 Vendor Specific ID			225 RX output amplitude Indicators
			226–241 Channel Controls
			242–251 Channel Monitor Masks
	254–255 Application Code Entry TL		252–255 Reserved

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SPECIFICATIONS AND ORDERING INFORMATION

100G ACTIVE OPTICAL CABLE FOR NETWORKING DATA SHEET

100G ACTIVE OPTICAL CABLE FOR NETWORKING	
CONNECTOR A	QSFP28 male
CONNECTOR B	QSFP28 male
CABLE JACKET TYPE	LSZH (Low-Smoke Zero Halogen)
COLOR	Aqua
FIBER GLASS TYPE	OM3
DATA TRANSFER RATE	100 Gbps
OPERATING TEMPERATURE	32 to 158° F (0 to +70° C)
STORAGE TEMPERATURE	14 to +158° F (-10 to +70° C)
POWER CONSUMPTION	Less than 2.5 W
STANDARDS	QSFP28 MSA, SFF-8636, SFF-8665
APPROVALS	RoHS, CE, FCC

LENGTH	MODEL
3-m	QSFP-100G-AOC3M-BB
5-m	QSFP-100G-AOC5M-BB
7-m	QSFP-100G-AOC7M-BB
10-m	QSFP-100G-AOC10M-BB
15-m	QSFP-100G-AOC15M-BB
30-m	QSFP-100G-AOC30M-BB

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