

DAOQSxxx400D – QSFP+ to 4X SFP+ AOC

1 to 100m / 40x Gigabit Ethernet / Active Optical Cable

For your product safety, please read the following information carefully before any manipulation of the cable:



ESD

This cable is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

1. Overview

DAOQSxxx400D is a high performance Active Optical Cable (AOC) for 40x Gigabit Ethernet data links. This cable merges four 10x Gigabit Ethernet SFP+ terminals to a single 40x Gigabit Ethernet QSFP+ terminal. Several cable lengths up to 10m are available,

This transceiver module is compliant with the Quad Small Form-factor Pluggable (QSFP+) and the Small Form-factor Pluggable (SFP+) Multisource Agreement (MSA) and hot pluggable. Always contact Skylane Optics' commercial agents for compatibility with different equipment platforms.

2. Features

- QSFP+ to 4x SFP+ Breakout cable
- Hot pluggable QSFP+ and SFP+ footprints
- QSFP+ Multi-Source Agreement compliant (SFF-8436)
- SFP+ Multi-Source Agreement compliant (SFF-8431)
- Four independent 10.3125Gbps full-Duplex Channels
- Cable Lengths up to 100m
- Low power dissipation <1.5 W for QSFP+ and <0.8W for each SFP+ terminal
- Operating Case Temperature 0°C to 70°C
- Digital Diagnostic Monitoring (DDM)
- RoHS Compliant

3. Applications

- 10/40GBASE Ethernet
- 8x Fibre Channel
- Infiniband QDR

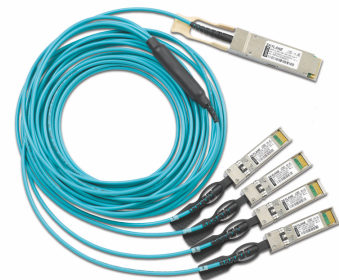


Figure 1. QSFP+ to 4x SFP+ Active Optical Cable (non-binding illustration)

4. Technical Parameters

4.1. Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit	Notes
Storage temperature	-40		85	°C	
Operating Case Temperature	0		70	°C	
Relative Humidity	0		85	%	Non condensing
Power Supply Voltage	3.135	3.3	3.465	V	
Power Supply Current			450	mA	QSFP+ terminal
			250		Each SFP+ terminal
Power Dissipation			1500	mW	QSFP+ terminal
			800		Each SFP+ terminal

4.2. General Specifications

Parameter	Min	Typ	Max	Unit	Notes
Data Rate		10.3125		Gbps	Each QSFP+ lane
		10.3125		Gbps	Each SFP+

4.3. High-speed Electrical Interfaces

QSFP+ Terminal	Min	Typ	Max	Unit	Notes
Transmitter Single Ended Input Voltage Tolerance	-0.3		4	V	
Transmitter Differential Input Voltage Swing	180		1200	mV _{pp}	CML-I
Receiver Single Ended Output Voltage Tolerance	-0.3		4	V	
Receiver Differential Output Voltage Swing	600		800	mV _{pp}	CML-O
SFP+ Terminal	Min	Typ	Max	Unit	Notes
Transmitter Single Ended Input Voltage Tolerance	-0.3		4	V	
Transmitter Differential Input Voltage Swing	180		700	mV _{pp}	CML-I
Receiver Single Ended Output Voltage Tolerance	-0.3		4	V	
Receiver Differential Output Voltage Swing	300		850	mV _{pp}	CML-O

5. Transceiver Electrical Pad Layout

5.1. QSFP+ Terminal

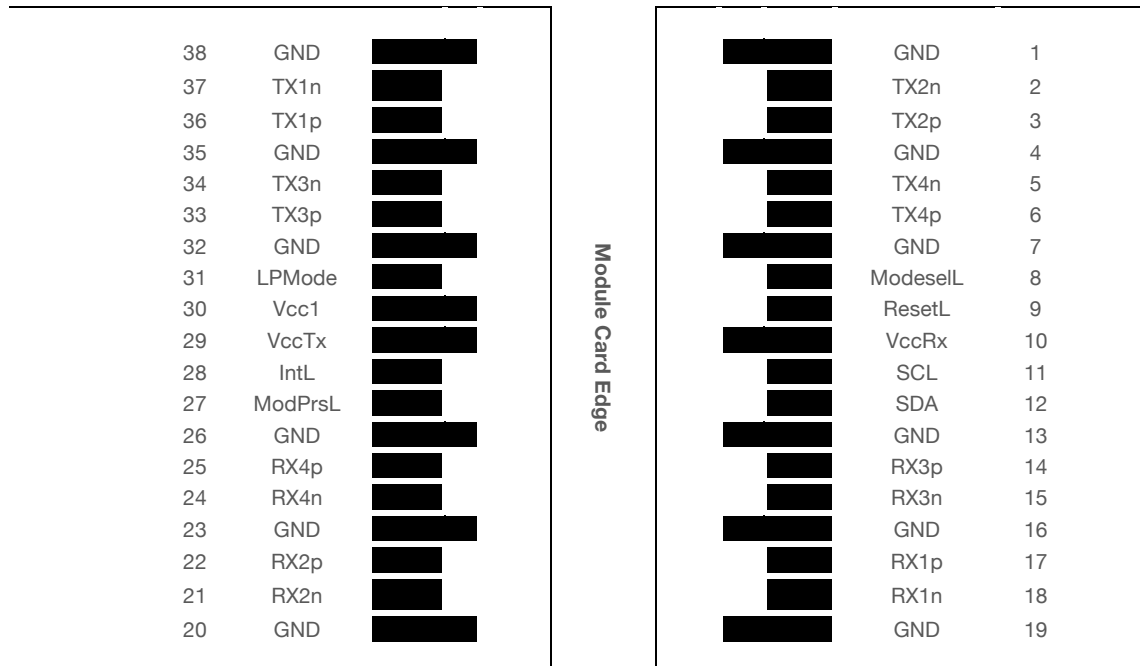


Figure 1. QSFP+ Transceiver Electrical Pad Layout

5.2. SFP+ Terminals

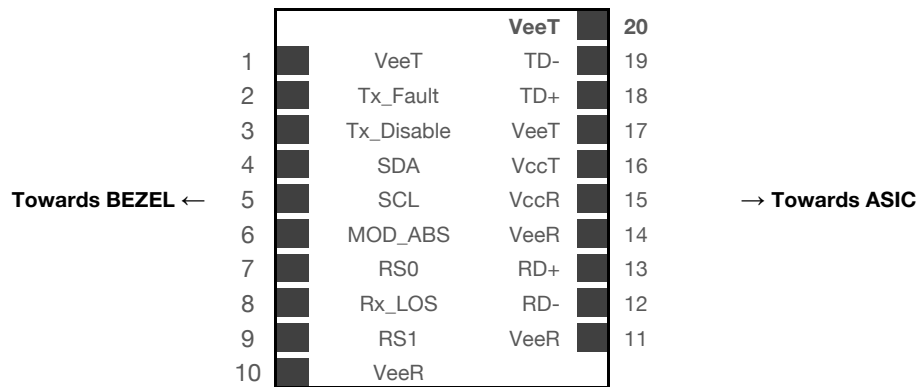


Figure 2. SFP+ Transceiver Electrical Pad Layout

6. Module Electrical Pin Definition

6.1. QSFP+ (1x)

QSFP+ MSA (SFF-8436)

Pin	Symbol	Description	Pin	Symbol	Description
1	GND	Ground	20	GND	Ground
2	TX2n	Transmitter Inverted Data Input	21	RX2n	Receiver Inverted Data Output
3	TX2p	Transmitter Non-Inverted Data Input	22	RX2p	Receiver Non-Inverted Data Output
4	GND	Ground	23	GND	Ground
5	TX4n	Transmitter Inverted Data Input	24	RX4n	Receiver Inverted Data Output
6	TX4p	Transmitter Non-Inverted Data Input	25	RX4p	Receiver Non-Inverted Data Output
7	GND	Ground	26	GND	Ground
8	ModSelL	Module Select	27	ModPrsL	Module Present
9	ResetL	Module Reset	28	Int	Interrupt
10	VccRx	Receiver Power Supply	29	VccTx	Transmitter Power supply
11	SCL	Two-Wire Serial Interface Clock (SCL)	30	Vcc1	Power supply
12	SDA	Two-wire Serial Interface Data (SDA)	31	LPMODE	Low Power Mode
13	GND	Ground	32	GND	Ground
14	RX3p	Receiver Non-Inverted Data Output	33	TX3p	Transmitter Non-Inverted Data Input
15	RX3n	Receiver Inverted Data Output	34	TX3n	Transmitter Inverted Data Input
16	GND	Ground	35	GND	Ground
17	RX1p	Receiver Non-Inverted Data Output	36	TX1p	Transmitter Non-Inverted Data Input
18	RX1n	Receiver Inverted Data Output	37	TX1n	Transmitter Inverted Data Input
19	GND	Ground	38	GND	Ground

6.2. SFP+ (4x)

SFP+ MSA (SFF-8431)

Pin Number	Name	Function
1	VeeT	Module Transmitter Ground
2	Tx_Fault	Module Transmitter Fault
3	Tx_Disable	Transmitter Disable
4	SDA	2-Wire Serial Interface Data
5	SCL	2-Wire Serial Interface Clock
6	Mod_ABS	Module Absent
7	RS0	Not Used
8	Rx_LOS	Receiver Loss of Signal
9	RS1	Not Used
10	VeeR	Module Receiver Ground
11	VeeR	Module Receiver Ground
12	RD-	Receiver Inverted Data Output
13	RD+	Receiver Non-Inverted Data Output
14	VeeR	Module Receiver Ground
15	VccR	Module Receiver 3.3V Supply
16	VccT	Module Transmitter 3.3V Supply
17	VeeT	Module Transmitter Ground
18	TD+	Transmitter Non-Inverted Data Input
19	TD-	Transmitter Inverted Data Input
20	VeeT	Module Transmitter Ground

7. EEPROM

7.1. QSFP+ (1x)

QSFP+ MSA (SFF-8436)

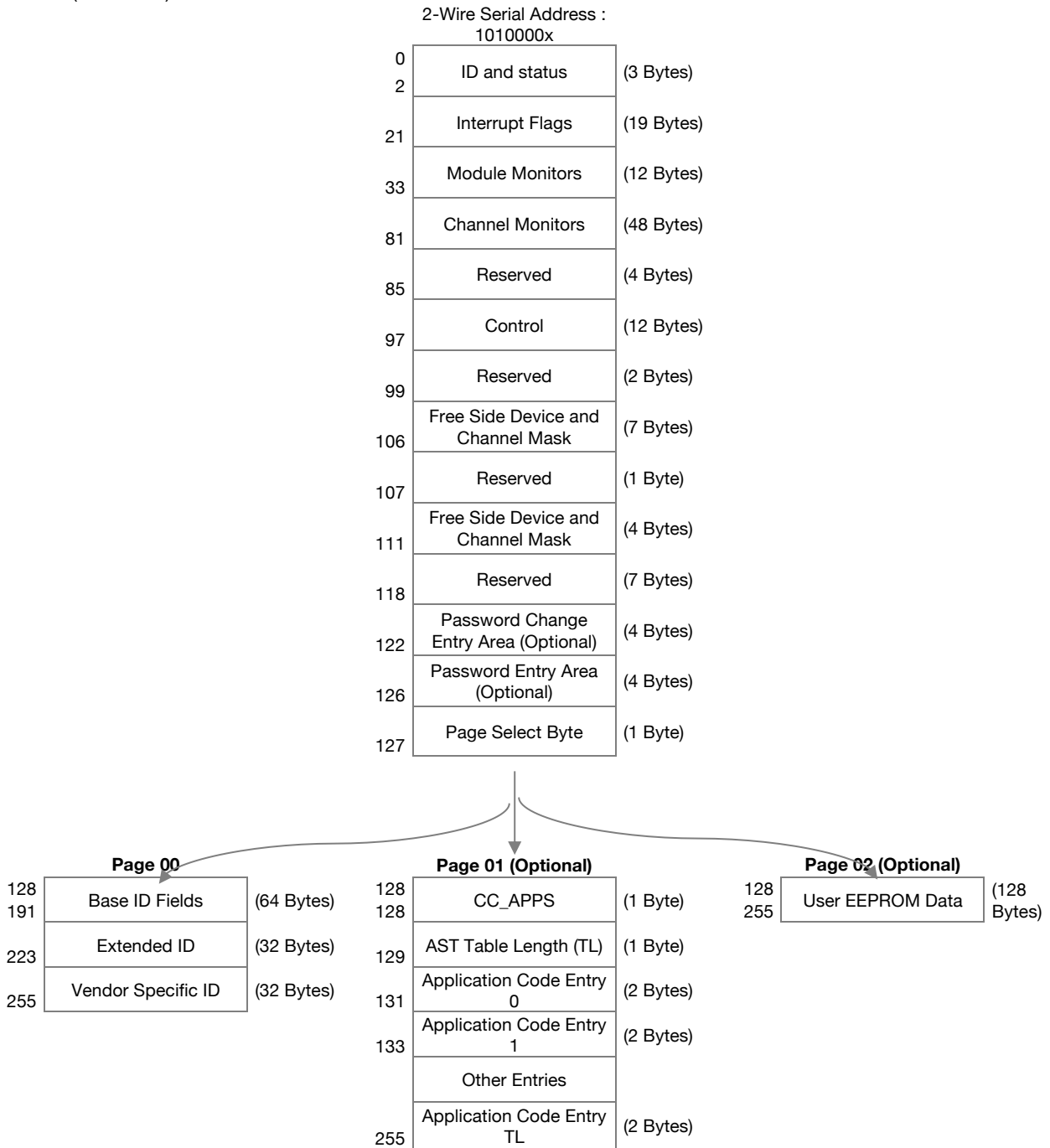


Figure 4. EEPROM of a QSFP+

7.2. SFP+ (4x)

SFP+ MSA (SFF-8472)

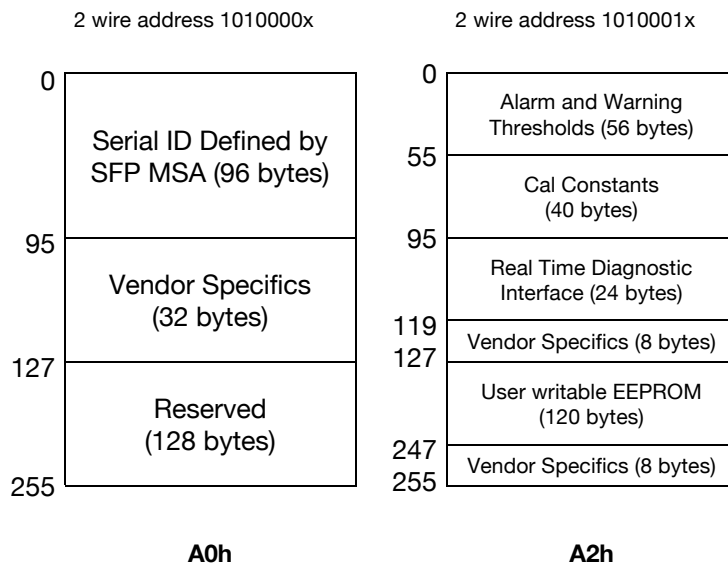


Figure 5. EEPROM of a SFP+

8. Ordering Information

Part Number	Description
DAOQSM01400D	QSFP+ to 4x SFP+ cable 40GBASE-AOC, 40x Gigabit Ethernet, 1m , 0°C to 70°C, DDM
DAOQSM02400D	QSFP+ to 4x SFP+ cable 40GBASE-AOC, 40x Gigabit Ethernet, 2m , 0°C to 70°C, DDM
DAOQSM03400D	QSFP+ to 4x SFP+ cable 40GBASE-AOC, 40x Gigabit Ethernet, 3m , 0°C to 70°C, DDM
DAOQSM05400D	QSFP+ to 4x SFP+ cable 40GBASE-AOC, 40x Gigabit Ethernet, 5m , 0°C to 70°C, DDM
DAOQSM10400D	QSFP+ to 4x SFP+ cable 40GBASE-AOC, 40x Gigabit Ethernet, 10m , 0°C to 70°C, DDM
DAOQSM30400D	QSFP+ to 4x SFP+ cable 40GBASE-AOC, 40x Gigabit Ethernet, 30m , 0°C to 70°C, DDM
DAOQSM50400D	QSFP+ to 4x SFP+ cable 40GBASE-AOC, 40x Gigabit Ethernet, 50m , 0°C to 70°C, DDM
DAOQSP10400D	QSFP+ to 4x SFP+ cable 40GBASE-AOC, 40x Gigabit Ethernet, 100m , 0°C to 70°C, DDM

9. Document Revision Information

Revision	Description
A	Initial release

Skylane Optics supplies a broad range of optical transceivers. Our engineers work closely with our customers to find the best solutions for every application. We are committed to provide high quality products and services to our customers.

For questions on this product please contact:
support@skylaneoptics.com

**Beyond
Quality**

**Reliable
Alliance**

**Performing
Smartly**