

DATA SHEET

AOC-QSFP10-4SFP10-OM3-aaa.aaM

40Gb/s QSFP+ to 4xSFP+ Active Optical Cable Transceiver

AOC-QSFP10-4SFP10-OM3-aaa.aaM Overview

AOC-QSFP10-4SFP10-OM3-aaa.aaM QSFP+ to 4xSFP+ active optical cable are suitable for 1 to 300 meters MMF OM3 distances to connect QSFP+ and SFP+ equipments. This interconnect system is fully compliant with QSFP+ MSA and SFP+ MSA.

Product Features

- QSFP+ End: Compliant with QSFP+ MSA specifications
- SFP+ End: Compliant with SFP+ MSA specifications
- 4 independent duplex channels operating at 10Gbps
- Cable length up to 300 meters
- Hot-pluggable SFP footprint
- Reliable VCSEL array technology
- Small bend radius for easy installation and fiber management
- Single power supply 3.3V
- RoHS Compliant
- Operating temperature range: 0°C to 70°C

Applications

- 4x10G Ethernet

Ordering Information

Part Number	Description	Color on Clasp
AOC-QSFP10-4SFP10-OM3-aaa.aaM	40G QSFP+ to 4xSFP+ Breakout Active Optical Cable up to 300m	Blue
For More Information: SONGXIN TAIPEI TECH SOLUTIONS CO., LTD. Web: www.songxin.com.tw Email: oversea@songxin.com.tw		

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Bit Error Rate	BER			10^{-12}		
Operating Temperature	T _C	0		70	°C	1
Storage Temperature	T _{STO}	-10		75	°C	2
Input Voltage	V _{CC}	3.14	3.3	3.46	V	
Maximum Voltage	V _{MAX}	-0.5		3.6	V	3
Minimum bending radius	R	30			mm	

Notes:

1. Case temperature
2. Ambient temperature
3. For electrical power interface

AOC Electrical Input Requirements

Parameter	Symbol	Conditions	Min	Typ	Max	Unit	Remarks
Data Rate Per Channel	DR			10.3125	10.5	Gb/s	
Differential Input Amplitude	V_{IN_PP}		180		1200(QSFP)	mV	
			180		700(SFP+)	mV	
Input AC Common Mode Voltage	V_{CM}				25	mV	1
Eye Mask Coordinates	X1, X2	0.29, 0.5				UI	2
	Y1, Y2	150, 425				mV	2

Notes:

1. RMS
2. Hit ratio 5×10^{-5} . See Figure 1 for transmitter input eye mask definitions.

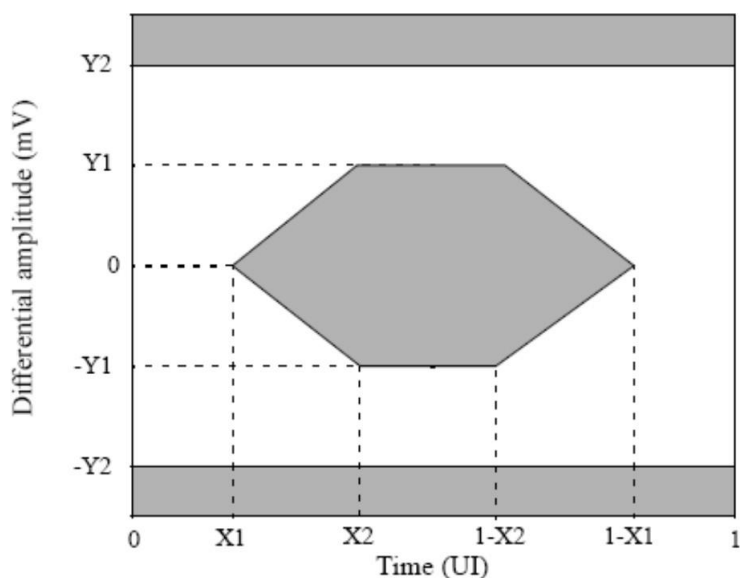


Figure 1

AOC Electrical Output Requirements

Parameter	Symbol	Conditions	Min	Typ	Max	Unit	Remarks
Data Rate Per Channel	DR			10.3125	10.5	Gb/s	
Differential Output Amplitude	V_{OUT_PP}		0		850	mV	
Output AC Common Mode Voltage	V_{CM}				15	mV	1
Data output Rise/Fall Time(20%-80%)	t_r/ t_f		24			ps	
Total Jitter (p-p)	TJ				0.7	UI	
Deterministic Jitter (p-p)	DJ				0.4	UI	
Eye Mask Coordinates	X1, X2	0.29, 0.5				UI	2
	Y1, Y2	150, 425				mV	2

Note:

1. RMS
2. Hit ratio 5×10^{-5} . See Figure 2 for receiver output eye mask definitions.

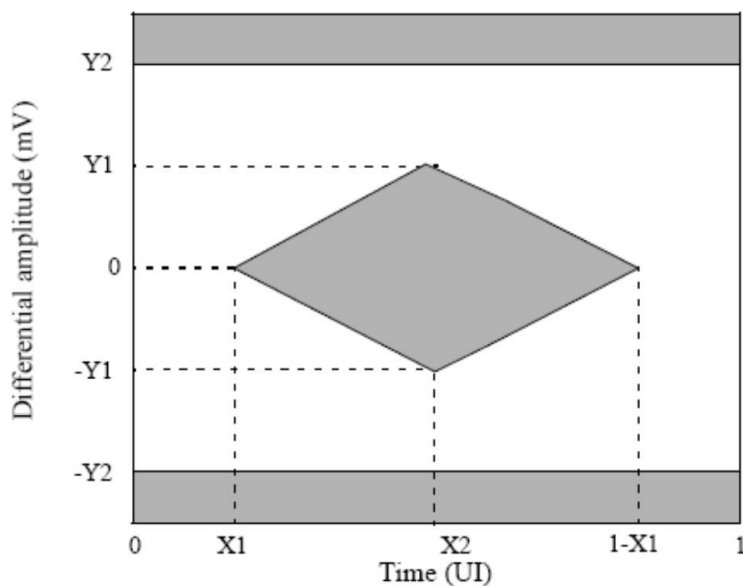
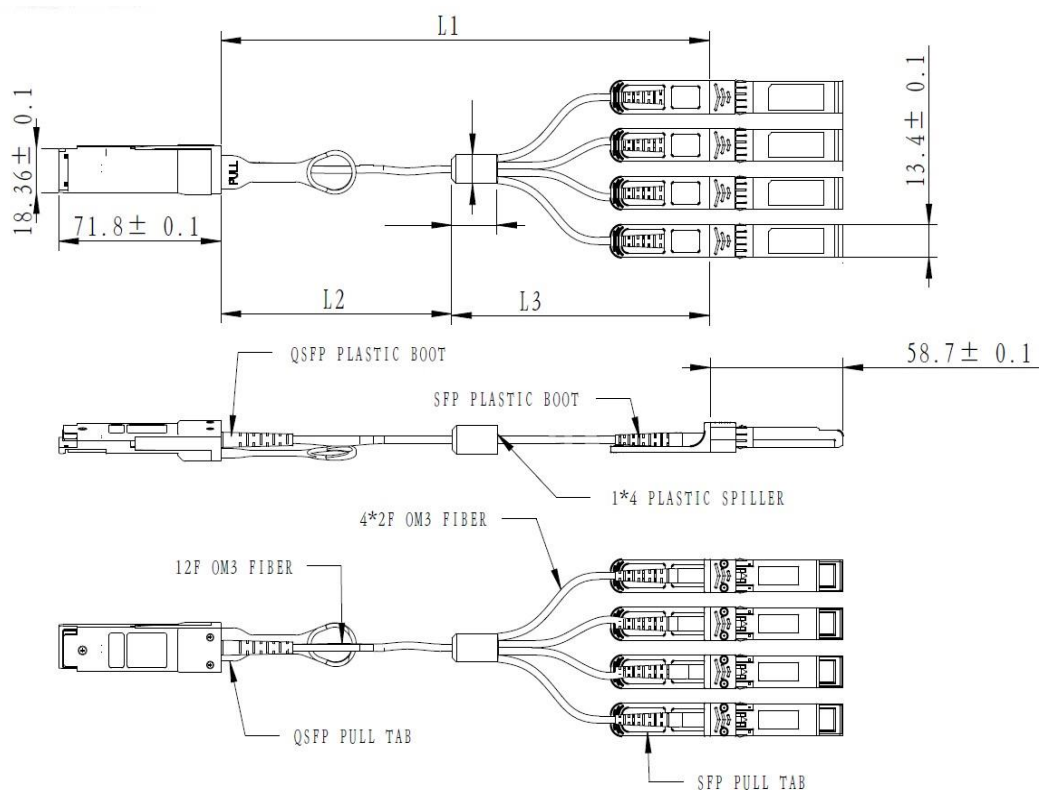


Figure 2

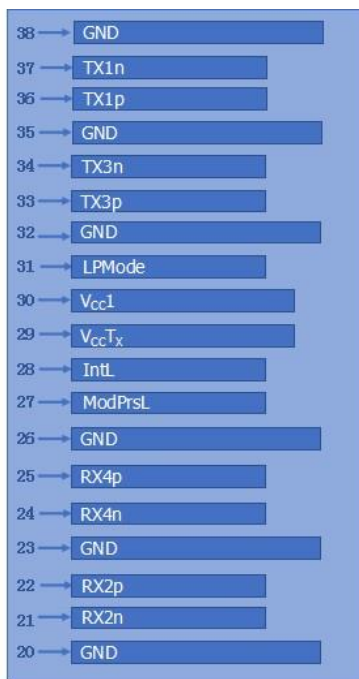
Dimensions



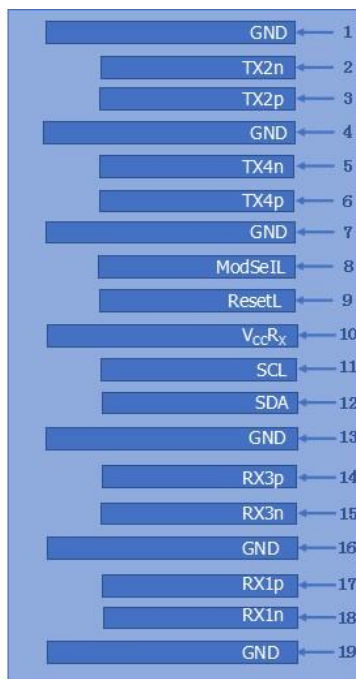
Length(L1)	Length(L2)	Length(L3)
1M	0.33M	0.67M
2M	0.67M	1.33M
3M	1M	2M
≥ 5M	L1-L3	3M

ALL DIMENSIONS ARE ±0.2mm UNLESS OTHERWISE SPECIFIED
UNIT: mm

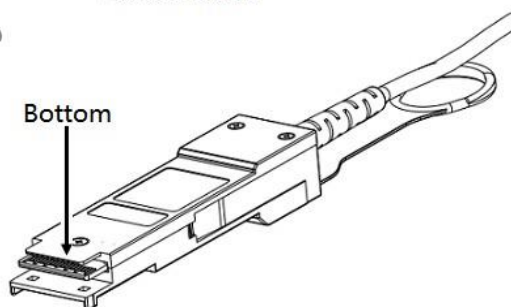
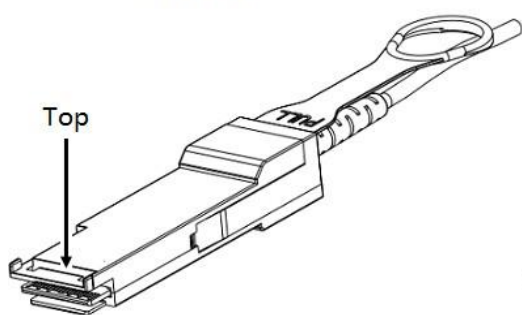
Electrical Pad Layout for QSFP+



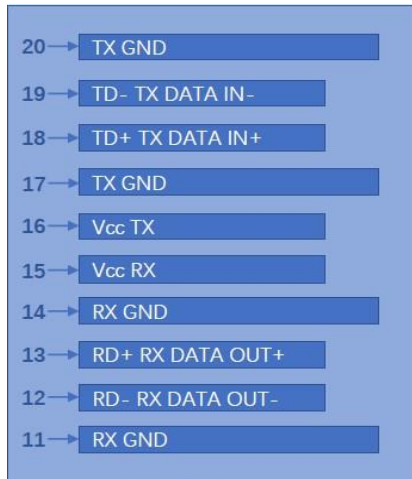
Top Board



Bottom Board



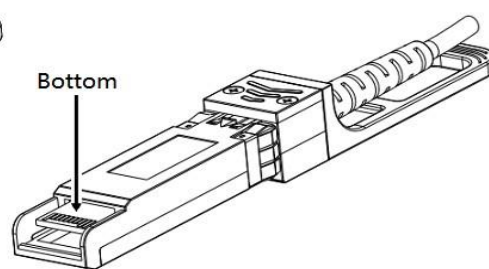
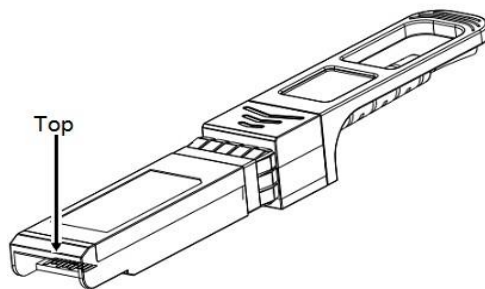
Electrical Pad Layout for SFP+



Top Board



Bottom Board



Pin Assignment for QSFP+

PIN #	Symbol	Description	Remarks
1	GND	Ground	5
2	TX2n	Transmitter Inverted Data Input	
3	TX2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	5
5	TX4n	Transmitter Inverted Data Input	
6	TX4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	5
8	ModSelL	Module Select	1
9	ResetL	Module Reset	2
10	V _{CC} R _X	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	5
14	RX3P	Ground	
15	RX3n	Receiver Inverted Data Output	
16	GND	Ground	5
17	RX1P	Receiver Non-Inverted Data Output	
18	RX1n	Receiver Inverted Data Output	
19	GND	Ground	5
20	GND	Ground	5
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	5
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	5
27	ModPrsL	Module Present	3
28	IntL	Interrupt	4
29	V _{CC} T _X	+ +3.3V Power Supply transmitter	
30	V _{CC} 1	+ +3.3V Power Supply	
31	LPMODE	Low Power Mode	5
32	GND	Ground	5
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	

35	GND	Ground	5
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	5

Notes:

1. ModSelL is the input pin. The module responds to 2-wire serial communication commands when it is held low by the host. ModSelL allows multiple QSFP modules to be used on a single 2-wire interface bus. If ModSelL is High, the module will not respond to any 2-wire interface communication from the host. ModSelL has internal pull-up resistors in the module
2. The module restart pin, when the low level on the ResetL pin lasts longer than the minimum pulse length, resets the module and restores all user modules to their default state. When performing reset device, the host should ignore all status bits. Until the module reset interrupt is completed, please note that during hot plugging, the module will issue this information to complete the reset interrupt without resetting
3. This pin is active high, indicating that the module is running under a low power module.
4. IntL is the output pin, which is the open collector output and must be pulled up to Vcc on the motherboard. When it is low, it indicates that the module may malfunction. The host uses a 2-wire serial interface to identify the interrupt source
5. Circuit ground is internally isolated from chassis ground.

Pin Assignment for SFP+

PIN #	Symbol	Description	Remarks
1	V _{EET}	Transmitter ground (common with receiver ground)	1
2	TX_FAULT	Transmitter Fault	
3	TX_DISABLE	Transmitter Disable. Laser output disable on high or open	2
4	SDA	Data line for serial ID	3
5	SCL	Clock line for serial ID	3
6	MOD_ABS	Module Absent. Grounded within the module	3
7	RS0	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation	4
9	RS1	No connection required	1
10	V _{EER}	Receiver ground (common with transmitter ground)	1
11	V _{EER}	Receiver ground (common with transmitter ground)	1
12	RD-	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	V _{EER}	Receiver ground (common with transmitter ground)	1
15	V _{CCR}	Receiver power supply	
16	V _{CCT}	Transmitter power supply	
17	V _{EET}	Transmitter ground (common with receiver ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD-	Transmitter Inverted DATA in. AC coupled	
20	V _{EET}	Transmitter ground (common with receiver ground)	1

Notes:

1. Circuit ground is isolated from chassis ground
2. Disabled: T_{DIS}>2V or open, Enabled: T_{DIS}<0.8V
3. Should Be pulled up with 4.7k -10k ohm on host board to a voltage between 2V and 3.6V
4. LOS is open collector output

References

1. IEEE standard 802.3ba. IEEE Standard Department, 2010. 2.
2. [QSFP+ 10Gbs 4X PLUGGABLE TRANSCEIVER -SFF-8436](#)
3. [Enhanced 8.5 and 10 Gigabit Small Form Factor Pluggable Module “SFP+”-SFF-8431](#)
4. [Digital Diagnostics Monitoring Interface for Optical Transceivers -SFF-8472.](#)