

# QSFP+ AOC PRODUCTS

Driving Your Next Generation DataCenter

## QSFP+ Active Optical Cable

### APPLICATIONS

- InfiniBand 4X SDR, DDR, QDR and FDR
- Ethernet 10G, 40G
- FiberChannel 10G, 40G, SAN
- Rack-to-Rack, Shelf-to-Shelf Interconnect  
Top of Rack (TOR) Switch
- Networking, Storage
- Hubs, switches, routers, servers  
Supercomputer, HPC

### STANDARDS COMPLIANCE

#### QSFP+ End

- Electrical: IBTA V2 Revision 1.2.1 and 1.3
- IEEE 802.3ba
- SFF-8436

#### SFP+ End

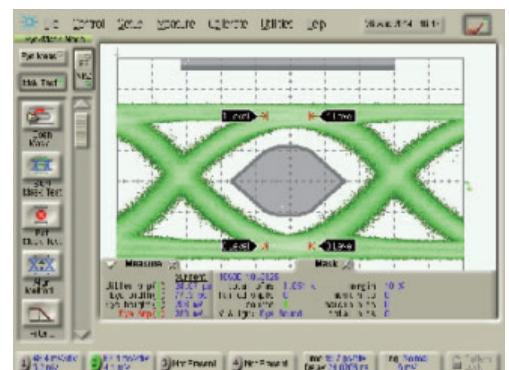
- SFF-8431
- SFF-8432
- SFF-8472

- RoHS

10Gtek Interconnect Solutions 40 Gb/s Low Power Active Optical Cable assemblies offer a cost-effective, extended reach option for high-speed data center interconnects. Using 850 nm VCSEL technology, 10Gtek QSFP+ cable is an assembly of 4 full-duplex lanes, where each lane is capable of transmitting data at rates up to 10Gb/s per direction, providing an aggregated rate of 40Gb/s. The cable is available in a number of standard lengths up to 100 meters.

The 10Gtek QSFP+ to four SFP+ 40Gbps fanout Active Optical Cable is an adaptor cable which provides connectivity between device using QSFP+ port on one end and SFP+ ports on the other end. The integrated cable transmits 4x10Gbps data on the QSFP+ side and 1x10Gbps data on the SFP+ side in duplex over a loose tube fiber with distance up to 100m. The fanout AOC is SFF-8431 (SFP+ side) and SFF-8436 (QSFP+ side) compliance.

Meeting or exceeding IBTA and IEEE standards, 10Gtek Certified cables are 100% tested to ensure optimal signal integrity and the best end to end performance. Active Optical Cable is much thinner and lighter than copper cable, which makes cabling easier and enables efficient system airflow and has no EMI issues, which is critical in high-density racks.



Typical Active Optical Cables Eye Pattern  
10 meters

# Performance Specifications:

## Electrical

Parameter	Symbol	Min	Type	Max
Input voltage(V)	Vcc	3.15	3.3	3.45
Clock frequency(kHz)	Fscl			400
QSFP+ Power Consumption(W)			0.8	1.2
SFP+ Power Consumption(W)			0.3	0.8
Data rate(Gbps)		1.25		12.5
Operating Temperature( °C)		0		70

## Transmitter Electrical

Input common mode	mVRMS	25		
Differential data swing	mVpp	500		1200
Differential input impedance	$\Omega$	80	100	120

## Receiver Electrical

Output common mode	mVRMS			15
Differential data swing	mVpp	200	650	1200
Differential output impedance	$\Omega$		100	
Deterministic Jitter	UI			0.38
Total Jitter	UI			0.64

## Cable

Fiber Type	OM3+, 50 $\mu$ m bend insensitive
Cable Length	Up to 100 m
Outer Cable Diameter	3 mm $\pm$ 0.15
Materials	OFNP/Multi-mode
Cable Type	Plenum
Assembly 90°Min Bend Radius	30mm
Bulk Min Bend Radius	30mm

## General

Module Form Factor(s)	QSFP+(SFF8436/SFF8472) SFP+(SFF8431/SFF8432)
Protocols supported	10G/40G Ethernet
Channels	4 channels bi-directional
Channel Data Rate	Up to 12.5G Gbps/channel
BER	< 10 <sup>-12</sup> BER
Operating Optical Wavelength	850 nm
Cable Length	Up to 100m
Fanout length	1m(0.5m for 1m less)
Management Interface	Serial, I2C(Supports SFF8472)
Compliance	FCC Class B and CE Emissions & Immunity EN 61000 4-3 RoHS 2011/65/EU Class 1 per IEC 60825-1/CDRH Telcordia GR-2866-CORE Telcordia GR-468-CORE

## Plug

Electrical Interface	QSFP+: 38-pin edge connector SFP+: 20-pin edge connector
Back shell Material	Nickel Plated Zinc Diecast
Contact Material	PCB with Gold-Plated Pads
Latch	Positive Latching w/Pull
Insertion Force	QSFP+: 40N Max. SFP+40N Max
Withdrawal Force	QSFP+: 30N Max. SFP+11.5N Max
Retention Force	90N Max
Durability	QSFP+: 250 Cycles Min. SFP+250 Cycles Min.

# Ordering Information:

## QSFP+ Active Optical Cable Assemblies

Length	Data Rate	P/N
5 m	40Gbps	QSFP-AOC-5M
10 m	40Gbps	QSFP-AOC-10M
15 m	40Gbps	QSFP-AOC-15M
20 m	40Gbps	QSFP-AOC-20M
30 m	40Gbps	QSFP-AOC-30M
50 m	40Gbps	QSFP-AOC-50M

## QSFP+ to 4x SFP+ Active Optical Cable Assemblies

Length	Data Rate	P/N
5 m	40Gbps	QSFP-4SFP-AOC-5M
10 m	40Gbps	QSFP-4SFP-AOC-10M
15 m	40Gbps	QSFP-4SFP-AOC-15M

## QSFP+ to 8LC Active Optical Cable Assemblies

Length	Data Rate	P/N
5 m	40Gbps	QSFP-8LC-AOC-5M
10 m	40Gbps	QSFP-8LC-AOC-10M