



Solutions Guide

FINISAR[®]



Pluggable Optics
for the Data Center

Pluggable Optics for the Data Center

The data center ecosystem is going through unprecedented growth and innovation as new players, new business models and new technologies converge. One of the key trends is the growing importance and evolving landscape of fiber optic technologies enabling new architectures and enhanced levels of performance in the data center.

Fiber optics is no longer an optional technology, or only reserved for the toughest interconnect problems. Bandwidth, port density and low-power demands now require fiber optics. And fiber optics is now a pervasive, high-volume, low-cost set of technologies that make it an easy choice for switch interconnect and server I/O.

Finisar is investing heavily in the data center. Our 10G, 25G, 40G and 100G fiber optic products are enabling the highest bandwidth, highest density, lowest power and lowest total cost interconnect solutions on the market today. And we are already working on 200G, 400G and beyond. We are ready to partner with you to push optical interconnect technologies even further to enable unprecedented scale, bandwidth, flexibility and efficiency to the modern, highly-interconnected data center.

Extend Your Data Center Reach

Finisar optical products span all Ethernet data rates currently deployed, from 100Mb/s to 100Gb/s, and we're leading the market with our 25G Ethernet optical transceivers for next-generation servers and switches. Our QSFP products support link distances of up to 400 meters over multimode fiber, well beyond the IEEE Ethernet standard. We also support distances over single mode fiber of up to 20km on 100G QSFP28, 40km on 40G QSFP+ and 80km on 10G SFP+. And if you need to connect your data centers over metropolitan or regional networks, our OIF and CFP2-ACO modules can support distances beyond 500km.

Re-Utilize Your Legacy Multimode Fiber Plant

Most data centers today are still architected around 10G Ethernet, focused on 10GBASE-SR links over OM3/OM4 duplex multimode fiber. As data center operators migrate from 10G to 40G and 100G, they want to maintain that existing fiber infrastructure. However, SR4 interfaces require ribbon multimode fiber, and LR4 requires duplex single mode fiber, neither of which are present in the existing duplex multimode fiber plant. Finisar today is supplying QSFP+ LM4 transceivers which allow the use of duplex multimode fiber for 40G Ethernet links, and is introducing SWDM4 solutions which provide cost-effective duplex multimode fiber links for both 40G and 100G Ethernet.

Increase Density & Consume Less Power

Finisar understands the importance of heat management in the data center, and has been at the forefront of providing next-generation lower power dissipation optical products.

Our 100G QSFP28 optical transceivers (SR4, LR4, CWDM4, and SWDM4) support a maximum power dissipation performance of 3.5 Watts.

Our 40G and 100G Quadwire Active Optical Cables provide low-power dissipation settings which the host system can utilize.

We are the market leader in the supply of 12x10G and 12x25G on-board optical Tx/Rx modules, or BOAs. On-board optics enable increased port density while minimizing power dissipation.

Move beyond 100G to 200G / 400G

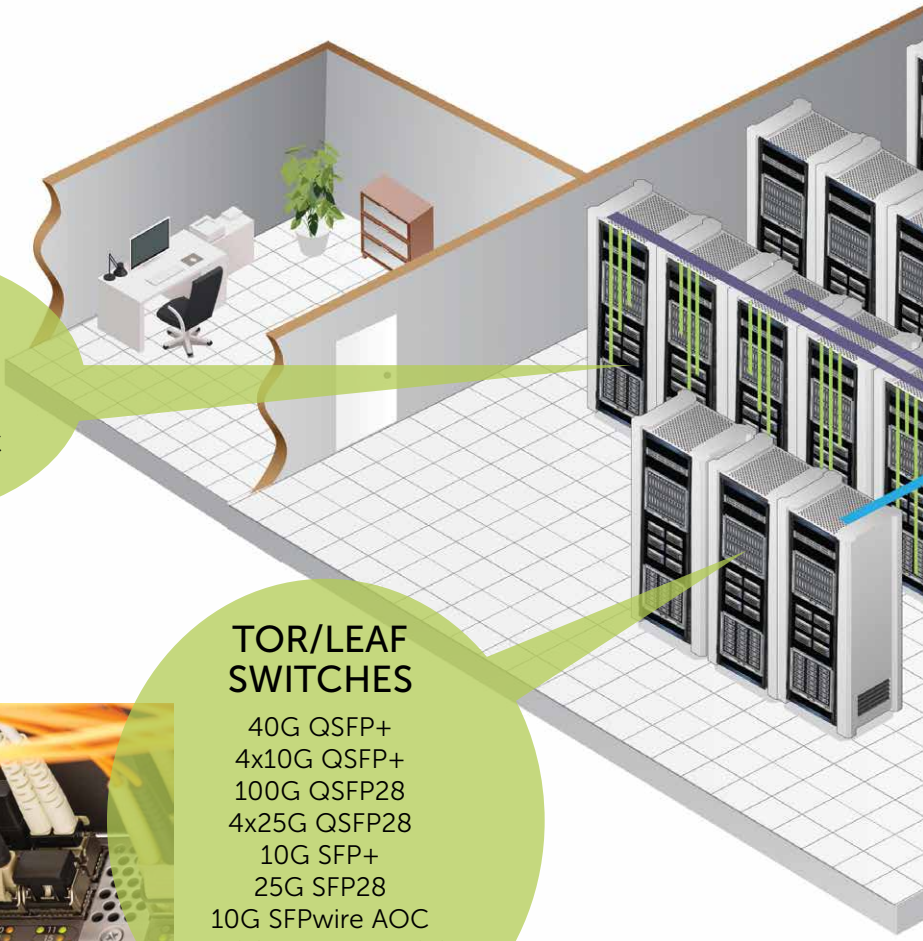
Finisar has been the market leader in 100G Ethernet modules, supplying CFP modules to service provider router and transport deployments since 2010. We have now expanded our 100G product offering to include various types of CFP2, CFP4, CXP and QSFP28 modules, for telecom and also the emerging data center and enterprise 100G applications.

However, we're not stopping there. We currently have a leading role in standardization activities and are developing our next-generation Ethernet products, which will support 50G, 200G and 400G data rates. These products will meet the performance demands of high-performance data centers for many years to come.

The Modern Highly-Intercon



SERVERS
 10G SFP+
 25G SFP28
 10G SFPwire AOC



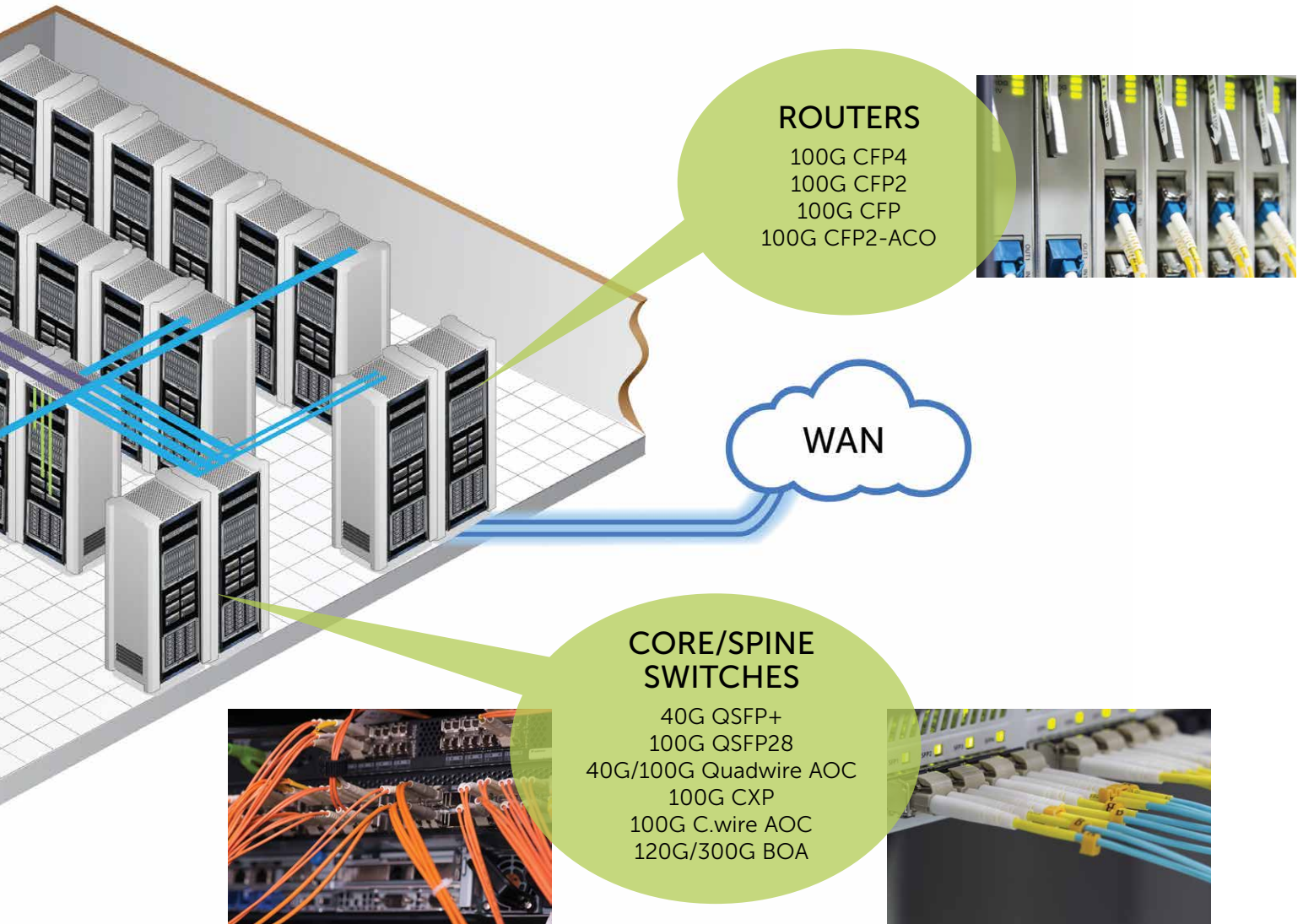
TOR/LEAF SWITCHES
 40G QSFP+
 4x10G QSFP+
 100G QSFP28
 4x25G QSFP28
 10G SFP+
 25G SFP28
 10G SFPwire AOC
 4x10G Breakout AOC
 4x25G Breakout AOC



Fiber Types	Maximum Reach	Speed	
		1G	10G
Active Optical Cables (AOC)	≤100m		SFPwire AOC (FCBG110SD1Cxx)
Duplex Multimode Fiber	≤100m		
	≤220m to 500m	SFP SX (FTLF8519P3BNL)	SFP+ SR (FTLX8574D3BCL) SFP+ LRM (FTLX1371D3BCL)
Parallel Multimode Fiber	≤100m		
	≤400m		QSFP+ 4xSR (FTL410QD3C)
Duplex Single Mode Fiber	≤1km to 2km		SFP+ LR-Lite (FTLX1374D3BCL)
	≤10km	SFP LX (FTLF1318P3BTL)	SFP+ LR (FTLX1471D3BCL) SFP+ CWDM (FTLX2471DC0xx)
	≤20km to 40km	SFP EX (FTLF1419P1BNL)	SFP+ ER (FTLX1672D3BCL)
Parallel Single Mode Fiber	≤500m to 2km		QSFP+ 4xLR-Lite (FTL4P1QL1C)
	≤10km		QSFP+ 4xLR (FTL4P1QE1C)

Please contact Finisar for products supporting other applications and protocols, including Fibre Channel, SONET/SDH/OTN, CPRI, InfiniBand, industrial

Connected Data Center



Ethernet Data Rates

25G	40G	100G	200G / 400G
	Quadwire AOC (FCBN410QB1Cxx) 4x10G Breakout AOC	Quadwire AOC (FCBN425QE1Cxx) 4x25G Breakout AOC	
SFP28 SR (FTLF8536P4BCL)	QSFP+ LM4 (FTL4C2QE1C)	QSFP28 SWDM4 (FTLC9152RGPL)	
SFP28 eSR (FTLF8540P4BCL)	QSFP+ SWDM4 (FTL4S1QE1C)		
QSFP28 4x25G-SR (FTLC9551REPM) CFP4 4x25G-SR (FTLC9141RENM)	QSFP+ SR4 (FTL410QE3C)	QSFP28 SR4 (FTLC9551REPM) CFP4 SR4 (FTLC9141RENM)	Coming Soon
Please contact Finisar	QSFP+ eSR4 (FTL410QD3C)	Please contact Finisar	
		QSFP28 CWDM4 (FTLC1152RGPL)	Coming Soon
SFP28 LR (FTLF1436P3BCL)	QSFP+ LR4 (FTL4C1QE1C)	QSFP28 LR4 (FTLC1151RDPL) CFP4 LR4 (FTLC1141RDNL)	Coming Soon
	QSFP+ ER4 (FTL4E1QE1C)	Please contact Finisar	
	QSFP+ 4xLR-Lite (FTL4P1QL1C)	Please contact Finisar	Coming Soon
	QSFP+ 4xLR (FTL4P1QE1C)		

l applications and many others. We have the broadest optical portfolio in the industry.

Finisar Products for the Data Center

Intra-rack

10G SFPwire®



10G SFP+ SR



25G SFP28 SR



4x10G QSFP+ SR



4x25G QSFP28 SR



BOA (optical engine)



4x10G Breakout AOC



4x25 Breakout AOC



Long span/Inter-building

10G SFP+
LR/Bidi/CWDM
10km SMF



25G SFP28 LR
10km SMF



40G QSFP+ LR4
10km SMF



100G QSFP28
CWDM4/LR4/eLR4
2/10/20km SMF



100G CFP4 LR4
10km SMF



100G CFP2 LR4
10km SMF



100G CFP LR4
10km SMF



CFP2-ACO
Metro/Long Haul
DWDM SMF



Inter-rack

10G SFP+ SR
400m OM4 MMF



10G SFPwire®
Up to 20m



25G SFP28 SR
100m OM4 MMF



40G QSFP+ SR4
400m OM4 MMF



40G Quadwire®
Up to 100m



100G QSFP28 SR4
100m OM4 MMF



100G Quadwire®
Up to 100m



100G CXP SR10
150m OM4 MMF



100G C.wire®
Up to 100m



About Finisar

Finisar is a global technology leader in optical communications components and subsystems. These products enable high-speed voice, video and data communications for networking, storage, wireless, and cable TV applications. For more than 25 years, Finisar has provided critical breakthroughs in optics technologies and has supplied system manufacturers with the production volumes needed to meet the expanding demand for network bandwidth. Finisar's industry-leading products include optical transceivers, optical engines, active optical cables, optical components, optical instrumentation, ROADM & wavelength management, optical amplifiers, and RF-over-Fiber.

As the market share leader and world's largest supplier of optical components and subsystems, Finisar achieved over \$1B revenue in FY2016 and currently has 14,000 employees across the globe.



Datacom Customers (partial list)



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