



MATERIALS THAT MATTER®

100G QSFP28 Longwave Transceivers

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Optical Connections in Hyperscale Data Centers

Core Switch/Router to Spine Switch:

Deployed mostly 40GE LR4.

Deploying 100GE CWDM4/LR4 now

Roadmap is 400GE FR/LR next.

Spine Switch to Leaf Switch links:

Deployed mostly 40GE SR4/LR4.

Deploying 100GE CWDM4/eSR4/PSM4 now

Roadmap is 400GE or 200GE SR/FR next.

Leaf Switch to TOR Switch links:

Deployed mostly 40GE SR4.

Deploying 100GE SR4/AOC now

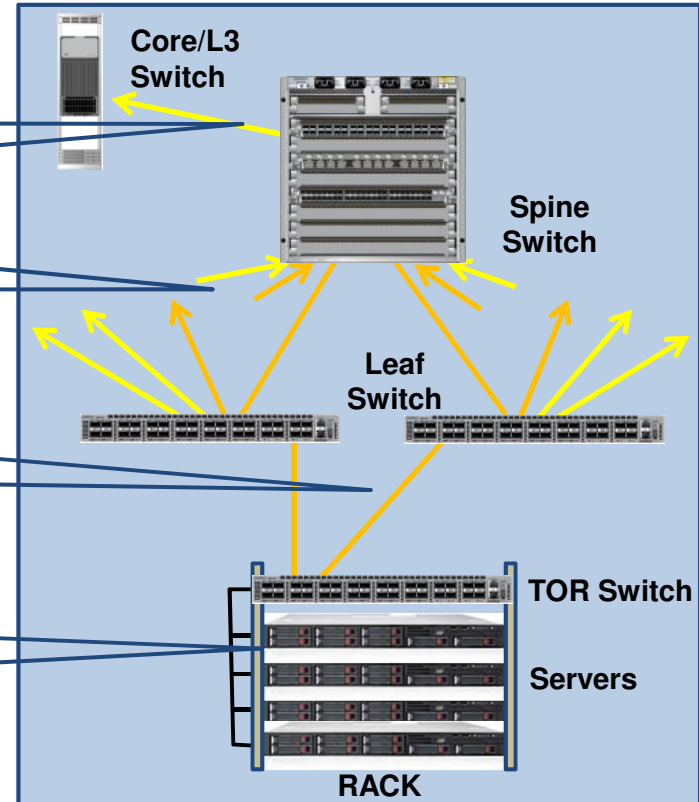
Roadmap is 400GE or 200GE SR next.

TOR Switch to Server links:

Deployed mostly 10GE SR/DAC.

Deploying 25GE SR/AOC/Octopus now

Roadmap is 50/100GE SR/AOC/Octopus next.



II-VI 100G QSFP28 Product Portfolio for Data Centers

- SFF-8436/8636
- Patented DD
- RoHS Compliant

InfiniBand



EDR
(100m)

quadwire®

Omni-Path



Omni-Path™
(100m)

quadwire®

Fibre Channel



128G SW
(70/100m)

128G LW
(10km)

OTN



OTU4 (9555)
(70/100m)

OTU4
(2km)

OTU4
(10km)

Ethernet



SR4 (No FEC)
(30/40/70/100m)

SR4 (9555)
(70/100m)

SR4 (9558)
(70/100m)

SWDM4
(75/100/150m)

CWDM4 Lite
(500m)

CWDM4
(2km)

100G
(100m)

quadwire®

4x25G
(30m)

quadwire®

eCWDM4
(10km)

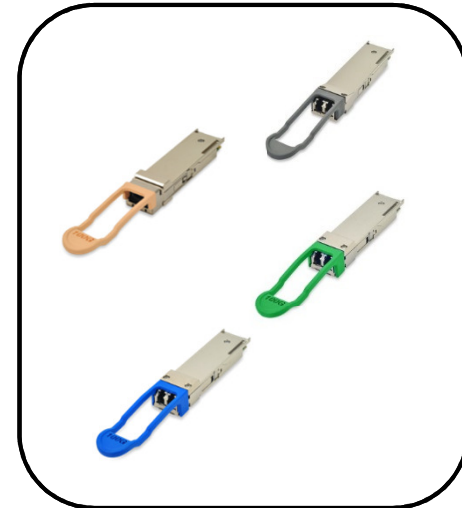
LR4
(10km)

eLR4
(20km)

100G Ethernet QSFP28 Finisar® Transceivers

	Parallel (MPO)	Duplex (LC)
Multimode	SR4/OTU4 <ul style="list-style-type: none"> • 70/100m • FTLC9551xEPM SR4/OTU4/32G FC/wireless Gen 2 <ul style="list-style-type: none"> • 70/100m • FTLC9555xEPM SR4 GEN3 <ul style="list-style-type: none"> • 70/100m • FTLC9558REPM No-FEC SR4 <ul style="list-style-type: none"> • 30/40/70/100m • FTLC9555NEPM 	SWDM4 <ul style="list-style-type: none"> • 75/100/150m • FTLC9152RGPL
Single Mode		LR4/OTU4 <ul style="list-style-type: none"> • 10km • FTLC1154xDPL CWDM4 <ul style="list-style-type: none"> • 2km • FTLC1155RGPL DR/FR <ul style="list-style-type: none"> • FTLC4351RJPL eLR4 (4WDM-20) <ul style="list-style-type: none"> • 20km (w/FEC) • FTLC1154RDPLA eCWDM4 (4WDM-10) <ul style="list-style-type: none"> • 10km • FTLC1155RGPLA

Black = Production released
 Blue = In development



Multimode distances refer to OM3/OM4/OM5
 Single mode distances refer to SMF28

QSFP28 100G CWDM4 Transceiver – GEN 2

FTLC1155RGPL

FT: Finisar transceiver
LC: 100G product family
1: DFB laser type, OOK EML/DML Tx - STD Rx
1: 4 optical channels (MUX/DEMUX)
5: QSFP28 form factor
5: Product Generation 2.0
R: 103.1 Gb/s Ethernet
G: 4x25G CWDM
P: Flat top (no heatsink), pull-tab release
L: Straight LC receptacles

		Temperature Range			
		Standard	Limited	Extended	Industrial
Reach	Standard		2	3	4
	Lite	5	6	7	8
	Extended	A	B	C	D



PRODUCT BASICS

- ◆ QSFP28 module form factor, per SFF-8665
- ◆ Standard interfaces defined by IEEE 802.3bm & CWDM4 MSA
 - 4x25G/28G CWDM optical architecture per CWDM4 MSA
 - 4x25G/28G retimed electrical I/O (IEEE CAUI-4)
- ◆ 2km reach on SMF (500m reach for Lite)
- ◆ 5dB loss budget (Requires RS-FEC on host – same as 100GBASE-SR4)
- ◆ Maximum power dissipation < 3.5W for Limited and C-Temp
- ◆ Maximum power dissipation < 5W for E-Temp, I-Temp
- ◆ Operating case temperature ranges:
 - C-Temp: 0°C to 70°C
 - Lim Temp: 15C to 60°C
 - Ext Temp: -20C to 85°C
 - Ind Temp: -40C to 85°C
- ◆ Adaptive CTLE; I2C management interface (same as QSFP+)

COMPETITIVE ADVANTAGES

- ◆ Finisar BH DFB and PIN arrays to ensure high quality optics
- ◆ Very high volume manufacturing
- ◆ Full digital diagnostics capability
- ◆ Lower power consumption

AVAILABILITY

- Production Released (Ext. and Ind Temp Prod. Release May, 2020)

QSFP28 100G CWDM4 Transceiver – GEN 3

FTLC1157RGPL

FT: Finisar transceiver
LC: 100G product family
1: DFB laser type, OOK EML/DML Tx - STD Rx
1: 4 optical channels (MUX/DEMUX)
5: QSFP28 form factor
7: Product Generation 3.0
R: 103.1 Gb/s Ethernet
G: 4x25G CWDM
P: Flat top (no heatsink), pull-tab release
L: Straight LC receptacles

		Temperature Range			
		Standard	Limited	Extended	Industrial
Reach	Standard		2	3	4
	Lite	5	6	7	8
	Extended	A	B	C	D



PRODUCT BASICS

- ◆ QSFP28 module form factor, per SFF-8665
- ◆ Standard interfaces defined by IEEE 802.3bm & CWDM4 MSA
 - 4x25G/28G CWDM optical architecture per CWDM4 MSA
 - 4x25G/28G retimed electrical I/O (IEEE CAUI-4)
- ◆ 2km reach on SMF (500m reach for Lite)
- ◆ 5dB loss budget
- ◆ Requires RS-FEC on host – same as 100GBASE-SR4
- ◆ Maximum power dissipation < 3.5W for Limited and C-Temp
- ◆ Operating case temperature ranges:
 - C-Temp: 0°C to 70°C
 - Lim Temp: 15C to 60°C
- ◆ I2C management interface (same as QSFP+)

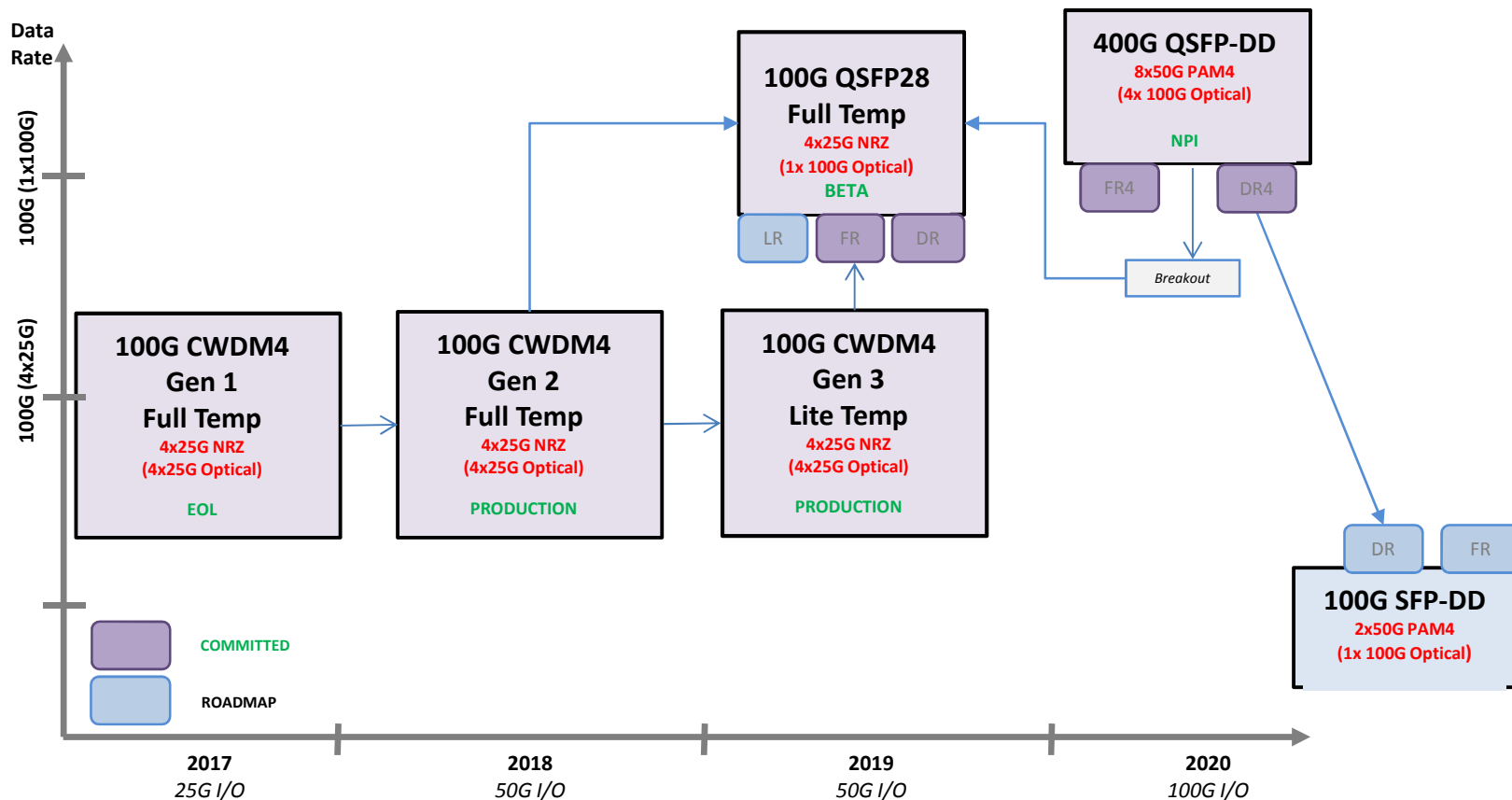
COMPETITIVE ADVANTAGES

- ◆ Finisar BH DFB and PIN arrays to ensure high quality optics
- ◆ Very high volume manufacturing
- ◆ Full digital diagnostics capability
- ◆ Lower power consumption

AVAILABILITY

- Production Released

QSFP28 CWDM4 High-Level Roadmap



QSFP28 100G LR4 Transceiver – GEN 2

FTLC1154RDPL

FT: Finisar transceiver
LC: 100G product family
1: DFB laser type, OOK EML/DML Tx - STD Rx
1: 4 optical channels (MUX/DEMUX)
5: QSFP28 form factor
4: Product Generation 2.0
R: 103.1 Gb/s Ethernet
D: 4x25G LAN-WDM
P: Flat top (no heatsink), pull-tab release
L: Straight LC receptacles

		Temperature Range			
		Standard	Limited	Extended	Industrial
Reach	Standard		2	3	4
	Lite	5	6	7	8
	Extended	A	B	C	D



PRODUCT BASICS

- ◆ QSFP28 module form factor, per SFF-8665
- ◆ Standard interfaces defined by IEEE 802.3bm
 - 4x25G/28G LAN-WDM optical architecture
 - 4x25G/28G retimed electrical I/O (IEEE CAUI-4)
- ◆ 10km reach on SMF (2km reach for Lite)
- ◆ Maximum power dissipation < 3.5W for Limited and C-Temp
- ◆ Maximum power dissipation < 5W for E-Temp, I-Temp
- ◆ Operating case temperature ranges:
 - C-Temp: 0°C to 70°C
 - Lim Temp: 15C to 60°C
 - Ext Temp: -20C to 85°C
 - Ind Temp: -40C to 85°C
- ◆ I2C management interface (same as QSFP+)
- ◆ Adaptive CTLE; Does not require FEC on the host

COMPETITIVE ADVANTAGES

- ◆ Finisar BH DFB and PIN arrays to ensure high quality optics
- ◆ Very high volume manufacturing
- ◆ Full digital diagnostics capability
- ◆ Lower power consumption; Available in single and dual rate

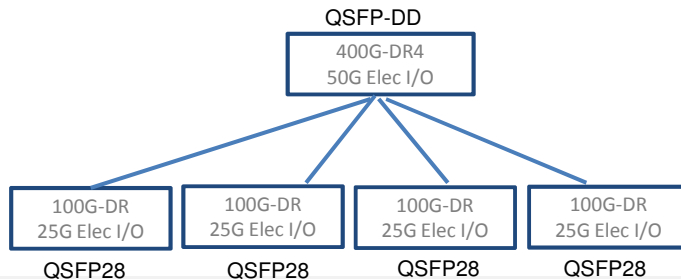
AVAILABILITY

- Production Released (Ext. and Ind Temp Prod. Release May, 2020)

QSFP28 100G DR/FR Transceiver

FTLC4351RJPL/FTLC4351RHPL

FT: Finisar transceiver
LC: 100G product family
4: 100G PAM4 EML Tx - STD Rx
3: 1 optical channel
5: QSFP28 form factor
1: Product Generation 1.0
R: 103.1 Gb/s Ethernet
J: 1x100G FR
H: 1x100G DR
P: Flat top (no heatsink), pull-tab release
L: Straight LC receptacles



* - Includes some part of CWDM4

PRODUCT BASICS

- ◆ QSFP28 module form factor, per SFF-8665
- ◆ 100G PAM4 DR serial lane interface per IEEE 802.3cd & 100G Lambda MSA
 - 1x100G Optical architecture
 - 4x25G retimed electrical I/O (IEEE CAUI-4)
- ◆ 2km reach on SMF (500m reach for DR)
- ◆ Maximum power dissipation < 4.5W for Limited and C-Temp
- ◆ Operating case temperature ranges:
 - C-Temp: 0°C to 70°C
 - Lim Temp: 15C to 60°C
- ◆ I2C management interface (same as QSFP+)

COMPETITIVE ADVANTAGES

- ◆ Finisar BH DFB and PIN arrays to ensure high quality optics
- ◆ Very high volume manufacturing
- ◆ Full digital diagnostics capability
- ◆ Lower power consumption; Available in single and dual rate

AVAILABILITY

- Beta Release: Now
- Production Release: May, 2020

QSFP28 Longwave NPI Schedule

- LW Modules currently in NPI

NPI Products					
100G QSFP28 Modules					
PRODUCT PART NUMBER	SHORT DESCRIPTION	DESCRIPTION	ALPHA PROTOTYPE AVAILABILITY⁽¹⁾	BETA UNIT AVAILABILITY⁽²⁾	PRODUCTION UNIT AVAILABILITY⁽³⁾
FTLC4351RJPL	1x100G FR 2KM 100G QSFP28	1x100G FR DFB, 1x28G PIN, 100G-FR, 100Gb/s, RoHS, single mode, QSFP28, 3.3V, 4.5W, 0/70°C operation, 2km	N/A	Now	May-20
FTLC4351RHPL	1x100G DR 500M 100G QSFP28	1x100G FR DFB, 1x28G PIN, 100G-FR, 100Gb/s, RoHS, single mode, QSFP28, 3.3V, 4.5W, 0/70°C operation, 500m	N/A	Now	May-20
FTLC4352RJPL	1x100G FR 2KM 100G QSFP28	1x100G FR DFB, 1x28G PIN, 100G-FR, 100Gb/s, RoHS, single mode, QSFP28, 3.3V, 4.5W, 0/70°C operation, 2km, Gen 2	N/A	Sep-20	Jan-21
FTLC4352RHPL	1x100G DR 500M 100G QSFP28	1x100G DR DFB, 1x28G PIN, 100G-FR, 100Gb/s, RoHS, single mode, QSFP28, 3.3V, 4.5W, 0/70°C operation, 500m, Gen 2	N/A	Sep-20	Jan-21
FTLC4352RKPL	1x100G LR 500M 100G QSFP28	1x100G LR DFB, 1x28G PIN, 100G-FR, 100Gb/s, RoHS, single mode, QSFP28, 3.3V, 4.5W, 0/70°C operation, 10km, Gen 2	N/A	Sep-20	Jan-21
FTLC1154RDPL4	4x25G LR4, I-Temp 10KM 100G QSFP28 Gen2	4x25G LR4 DFB, 4x28G PIN, 100G-LR4, 112Gb/s, RoHS, single mode, QSFP28, 3.3V, 4.5W, -40/85°C operation, 10km, Gen2	N/A	Now	May-20
FTLC1155RGPL4	4x25G CWDM4, I-Temp 2KM 100G QSFP28 Gen2	4x25G CWDM DFB, 4x28G PIN, 100G-CWDM4, 100Gb/s, RoHS, single mode, QSFP28, 3.3V, 4.5W, -40/85°C operation, 2km, Gen2	N/A	Now	May-20
FTLC1156RDPLx	4x25G LR4 10KM 100G QSFP28 Gen3	4x25G LR4 DFB, 4x28G PIN, 100G-LR4, 103Gb/s, RoHS, single mode, QSFP28, 3.3V, 3.5W, 0/70°C operation, 10km, Gen3	N/A	Aug-20	Dec-20
FTLC1156RDPLA,B	4x25G LR4 20KM 100G QSFP28 Gen3	4x25G LR4 DFB, 4x28G PIN, 100G-LR4, 103Gb/s, RoHS, single mode, QSFP28, 3.3V, 3.5W, 0/70°C operation, 20km, Gen3	N/A	Aug-20	Dec-20
FTLC1156SDPL	4x28G LR4 10KM 100G QSFP28 Gen3	4x28G LR4 DFB, 4x28G PIN, 100G-LR4, 112Gb/s, RoHS, single mode, QSFP28, 3.3V, 3.5W, 0/70°C operation, 10km, Gen3	N/A	Aug-20	Dec-20

II-VI

MATERIALS THAT MATTER®

Mouser Electronics

Authorized Distributor

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[II-VI:](#)

[FTLC1154RDPLC](#) [FTLC1154RDPLD](#) [FTLC1154SDPLD](#) [FTLC1155RGPL3](#) [FTLC1155RGPLC](#) [FTLC1155RGPLD](#)
[FTLC4351RHPL](#) [FTLC4351RJPL](#) [FTLC1156RDPLA](#) [FTLC1156RDPLB](#) [FTLC1156SDPL](#) [FTLC4352RHPL](#)
[FTLC4352RJPL](#) [FTLC4352RKPL](#) [FTLC4352RHPL-1Y](#) [FTLC4352RJPL-1Y](#) [FTLC4352RKPL-1Y](#) [FTLC9558REPM-1T](#)
[FTLC9558REPM-1Y](#)