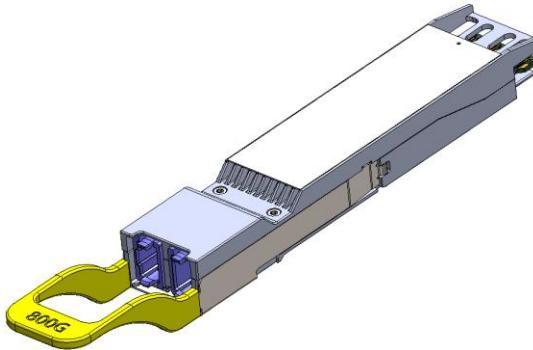

Product Specification

800G-DR8+ OSFP Optical Finisar® Transceiver

FTCE4527E1PxA

PRODUCT FEATURES

- Hot-pluggable OSFP form factor
- Supports 850Gb/s aggregate bit rate
- Power dissipation <17W (c-temp)
- Case temperature range of 20°C to +60°C (limited temp) or 0°C to +70°C (c-temp)
- Single 3.3V power supply
- Aligned with IEEE 802.3bs
- 8x100G PAM4 retimed 106.25Gb/s PAM4 electrical interface aligned to IEEE 802.3ck
- DUAL MPO-12, APC receptacles
- I2C management interface



APPLICATIONS

- 800G DR8+ applications with FEC
- 8 x 100GbE breakout applications
- 2 X 400 DR4+ applications with FEC
- NDR Infiniband

Finisar's FTCE4527E1PxA DR8+ OSFP transceiver modules are designed for use in 800 Gigabit Ethernet links on up to 500m of single mode fiber. They are compliant with the OSFP MSA, IEEE 802.3bs⁶ and IEEE P802.3ck⁷. Digital diagnostic functions are available via the I2C interface, as specified by the OSFP MSA. The transceiver is RoHS-6 compliant per Directive 2011/65/EU4 and Finisar Application Note AN-2038³.

PRODUCT SELECTION

E:	Ethernet protocol
P:	Pull-tab type release
x:	C = Commercial 70-0C or L = Limited 20-60C
A:	Dual MPO-12 receptacle, Closed Heatsink

I. Pin Descriptions

The electrical pinout of the OSFP module is shown in Figure 1 below

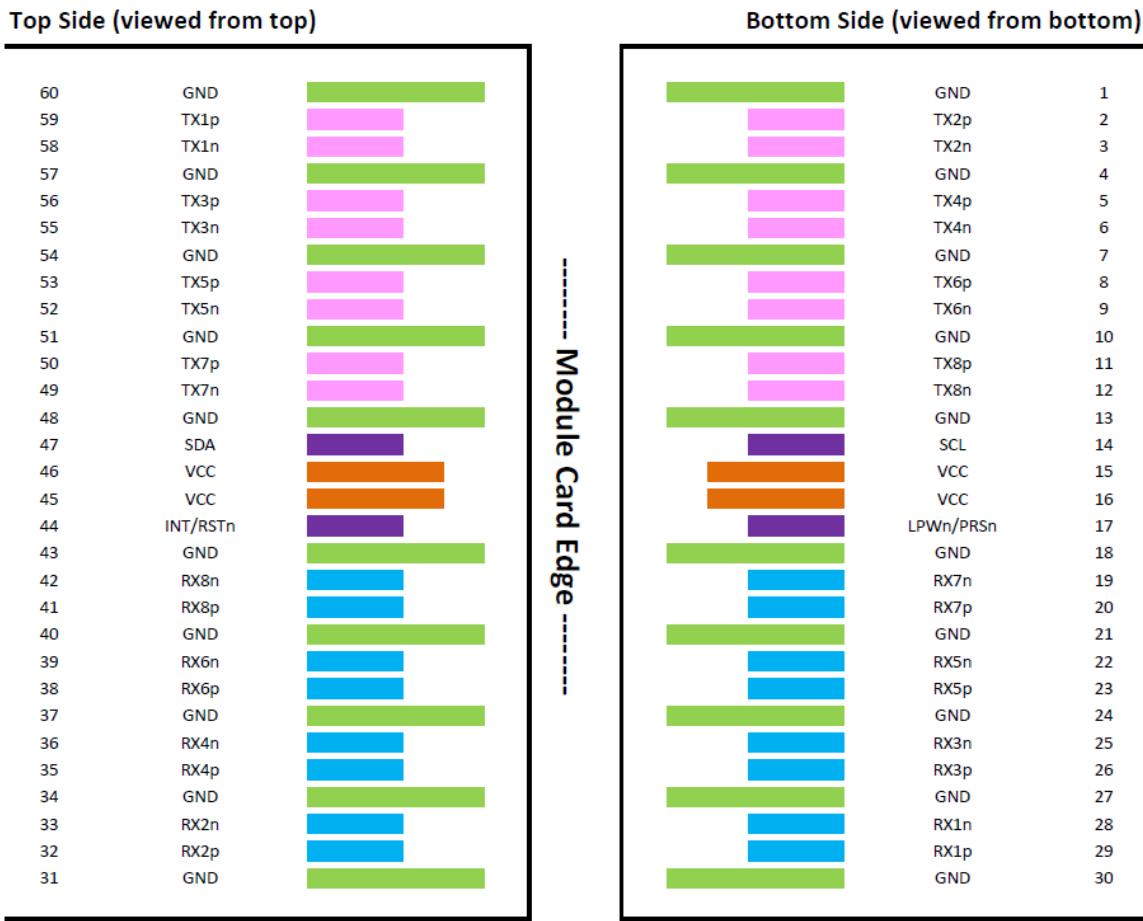


Figure 1 – OSFP Module Pinout (per OSFP MSA)

II. Absolute Maximum Ratings

Module performance is not guaranteed beyond the operating range (see Section VI). Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		4.0	V	
Storage Temperature	T _S	-40		+85	°C	
Case Operating Temperature	T _{OP}	0		+70	°C	c-temp
		20		+60		limited temp
Relative Humidity	RH	15		85	%	1
Receiver Damage Threshold, per Lane	P _{Rdmg}	5			dBm	

Notes:

1. Non-condensing.

III. Electrical Characteristics (EOL, $T_{OP} = 0$ to $+70$ °C, $V_{CC} = 3.135$ to 3.465 Volts)

Aligned to IEEE P802.3ck

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Supply Current	I_{CC}			tba	A	
Module total power	P			17	W	1
Transmitter						
Signaling rate per lane		53.125 ± 100 ppm.			Gbd	
Differential pk-pk input voltage tolerance		900			mV	
Differential to common mode input return loss		Per equation (120G-2) IEEE802.3ck			dB	
Effective return loss, ERL		8.5			dB	
Differential termination mismatch				10	%	
Module stress input test		Per 120G.3.4.1, IEEE802.3ck				2
Single-ended voltage tolerance range		-0.4		3.3	V	
DC common mode voltage		-350		2850	mV	3
Receiver						
Signaling rate per lane		53.125			Gbd	
AC common-mode output voltage (RMS)				17.5	mV	
Differential output voltage				900	mV	
Eye height, differential		15			mV	
Vertical eye closure				12	dB	
Common-mode to differential return loss		Equation (120G-1)			dB	
Effective return loss, ERL		8.5			dB	
Differential termination mismatch				10	%	
Transition time (min, 20% to 80%)		8.5			ps	
DC common mode voltage		-350		2850	mV	3,4

Notes:

1. Maximum total power value is specified across the full temperature and voltage range.
2. Meets BER specified in 120G.1.1.
3. DC common-mode voltage is generated by the host. Specification includes effects of ground offset voltage
4. The signaling rate range is derived from the PMD receiver input.

IV. Optical Characteristics (EOL, $T_{OP} = 0$ to $+70$ °C, $V_{CC} = 3.135$ to 3.465 Volts)

Meets 4x100GBASE-FR1 as defined by IEEE P802.3cu

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Signaling rate (each lane (range))		53.125 ± 100 ppm			GBd	
Modulation format		PAM4				
Lane wavelength (range)		1304.5 to 1317.5			nm	
Side-mode suppression ratio (SMSR)		30			dB	
Average launch power, each lane				4	dBm	
Average launch power, each lane		-3.1			dBm	1
Outer Optical Modulation Amplitude (OMAouter), each lane				4.2	dBm	
Outer Optical Modulation Amplitude (OMAouter) (min) ^b for TDECQ < 1.4 dB for 1.4 dB ≤ TDECQ ≤ 3.4 dB		-0.1 -1.5 + TDECQ			dBm	

Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane			3.4	dB	
TECQ			3.4		
TDECQ – TECQ			2.5		
Average launch power of OFF transmitter, each lane			-15	dBm	
Extinction ratio	3.5			dB	
Transmitter transition time			17	pS	
Transmitter over/under-shoot			22	%	
Transmitter peak-to-peak power			5	dBm	
RIN _x OMA, where x is the optical return loss tolerance			-136	dB/Hz	
Optical return loss tolerance			17.1	dB	
Transmitter reflectance			-26	dB	2

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Transmitter reflectance is defined looking into the transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Receiver						
Signaling rate (each lane (range))			53.125 ± 100 ppm		GBd	
Modulation format			PAM4			
Lane wavelength (range)			1304.5 to 1317.5		nm	
Damage threshold, each lane			5		dBm	1
Average receive power, each lane				4	dBm	
Average receive power, each lane		-7.1			dBm	2
Receive power (OMAouter), each lane				4.2	dBm	
Receiver reflectance				-26	dB	
Receiver sensitivity (OMAouter) for TECQ < 1.4 dB				-4.5	dBm	
for 1.4 dB ≤ TECQ ≤ 3.4 dB				-5.9 + TECQ		
Stressed receiver sensitivity (OMAouter), each lane				-2.5	dBm	3
Conditions of stressed receiver sensitivity test:						
Stressed eye closure for PAM4 (SECQ), lane under test			3.4		dB	4

Notes:

1. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level.
2. Average receive power, each lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
3. Measured with conformance test signal at TP3 (see 124.8.9) for the BER specified in 124.1.1.
4. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

V. General Specifications

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Bit Rate (all wavelengths combined)	BR			850	Gb/s	1
Bit Error Ratio	BER			2.4E-4		2
Maximum Supported Distances						
Fiber Type						
SMF per G.652	Lmax1			500	m	

Notes:

1. Supports 400GBASE-DR4 per IEEE P802.3bs.
2. As defined by IEEE P802.3bs.

VI. Environmental Specifications

Finisar FTCE4527E1Px A DR8+ OSFP transceivers have an operating case temperature range of 0°C to +70°C.

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Case Operating Temperature	T _{op}	0		+70	°C	
Storage Temperature	T _{sto}	-40		+85	°C	

VII. Regulatory Compliance

Finisar FTCE4527E1Px A DR8+ OSFP transceivers are Class 1 Laser Products. They are certified per the following standards:

Feature	Agency	Standard
Laser Eye Safety	FDA/CDRH	CDRH 21 CFR 1040 and Laser Notice 56
Laser Eye Safety	UL	IEC 60825-1:2014 IEC 60825-2: 2004+A1+A2
Electrical Safety	UL	IEC 62368-1:2018
Electrical Safety	UL/CSA	CLASS 3862.07 CLASS 3862.87

Copies of the referenced certificates are available at Finisar Corporation upon request.

CAUTION: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

III. Digital Diagnostics Functions

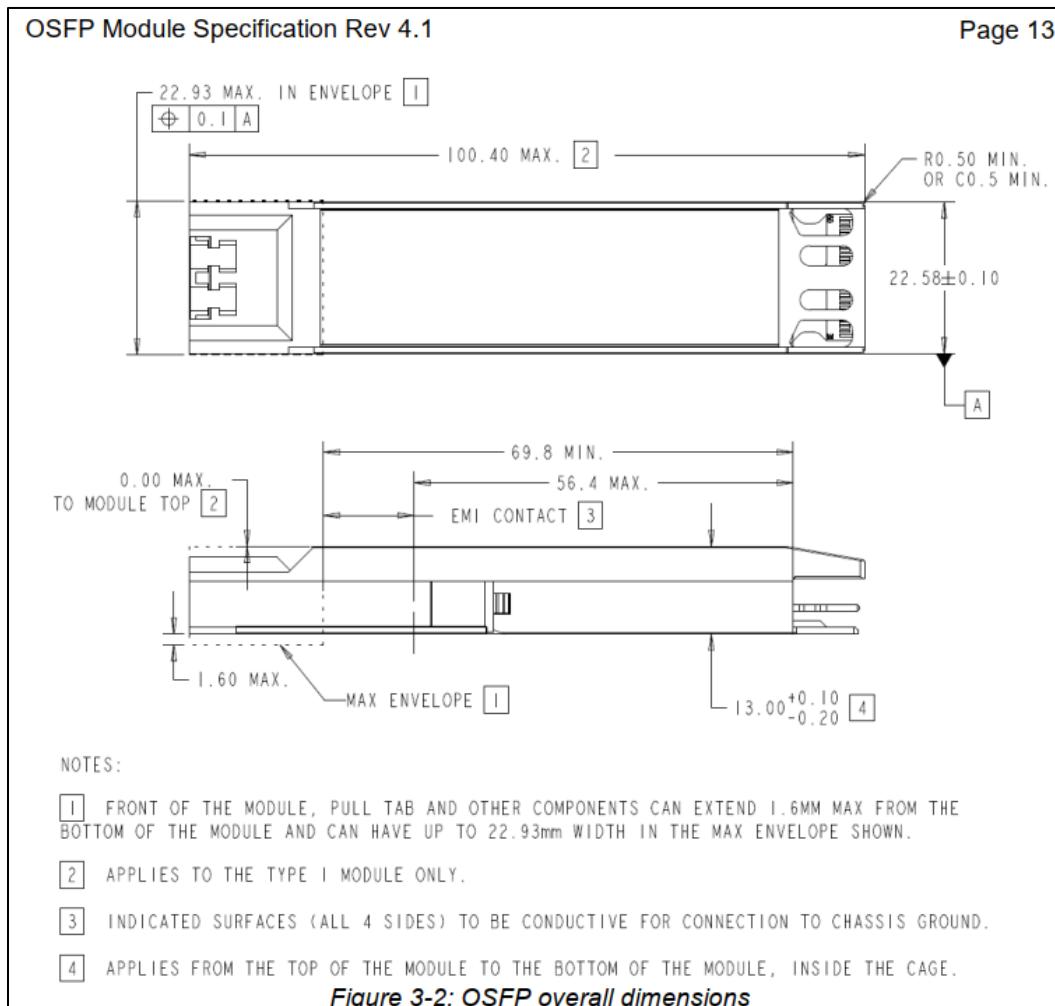
FTCE4527E1Px A DR8+ OSFP transceivers support the I2C-based diagnostics interface specified by the SFF Committee¹. See also Finisar Application Note AN-20xx (TBD).

IX. Memory Contents

CMIS 4.0 Per MSA. CMIS 5.X available upon request
Firmware upgrade Supported via CDB commands

XI. Mechanical Specifications

Finisar FTCE4527E1PxA DR8+ OSFP transceivers are compatible with the OSFP Specification for pluggable form factor **type 2** modules.



OSFP Module Specification Rev 4.1

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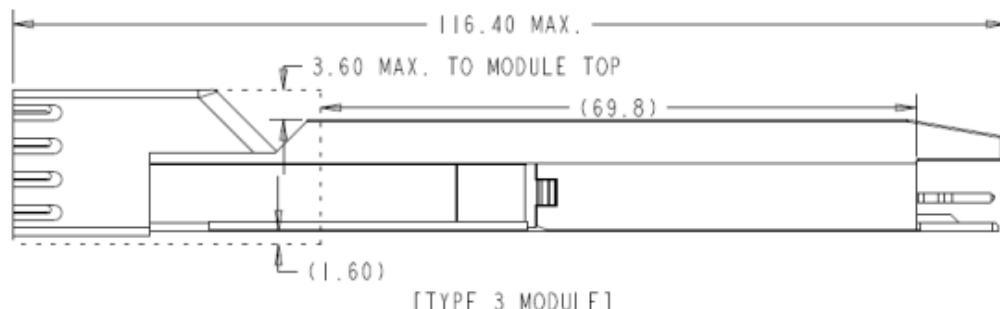
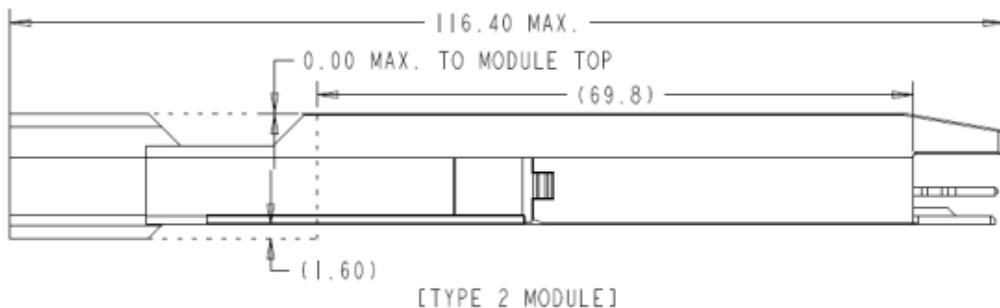
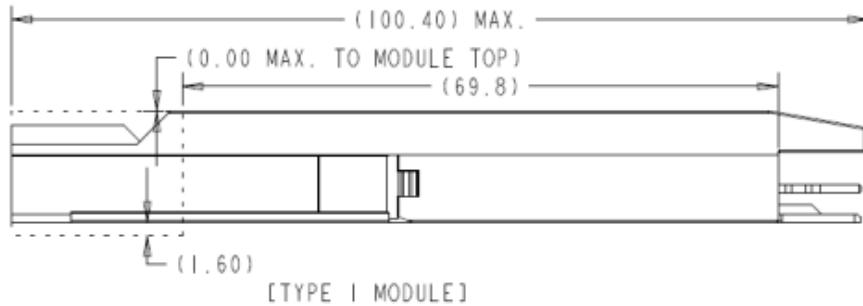


Figure 3-3: Size of module front, for Type 1, Type 2 and Type 3 OSFP

Figure 2. FTCE4527E1PxA Mechanical Dimensions.



Figure 3. Product Label

XII. References

1. OSFP Specification for OSFP Octal small form factor pluggable module
2. Directive 2011/65/EU of the European Parliament and of the Council, “on the restriction of the use of certain hazardous substances in electrical and electronic equipment,” July 1, 2011.
3. “Application Note AN-2038: Finisar Implementation Of RoHS Compliant Transceivers”, Finisar Corporation, January 21, 2005.
4. Application Note AN-2153, Initialization, Finisar Corporation.
5. Application Note AN-2154, EEPROM Map, Finisar Corporation.
6. IEEE P802.3bs, 400GBASE-DR4
7. IEEE P802.3ck Physical Layer Specifications and Management Parameters for 100 Gb/s, 200 Gb/s, and 400 Gb/s Electrical Interfaces Based on 100 Gb/s Signaling, 400GAUI-4 C2M

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