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**Product Specification**

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**800G (2x400 VR4) OSFP**  
**Finisar® Transceiver**

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**FTCE8627E1PCA**

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**PRODUCT FEATURES**

- Hot-pluggable OSFP Type2 form factor with closed top heat sink
- Support 2x425Gb/s aggregate bit rate
- Power dissipation <16W
- Laser Eye Class 1M
- Case temperature range of 0°C to +70°C (C-temp)
- Single 3.3V power supply
- Aligned with IEEE 802.3db
- 8x100G PAM4 retimed 106.25Gb/s PAM4 electrical interface aligned to IEEE 802.3ck
- Dual MPO-12 APC receptacles
- I2C management interface

**APPLICATIONS**

- InfiniBand NDR
- 2x400G VR4 applications with FEC
- 8 x 100GbE breakout applications

FTCE8627E1PCA 2x400G VR4 OSFP transceiver modules are designed for use in 2x400 Gigabit Ethernet or InfiniBand links up to 100m of multi-mode fiber. They are compliant with the OSFP MSA, IEEE802.3db<sup>6</sup> and IEEE802.3ck<sup>7</sup>. Digital diagnostic functions are available via the I2C interface, as specified by the OSFP MSA. The optical transceiver is RoHS compliant as described in Application Note AN-2038<sup>2,3</sup>.

**PRODUCT SELECTION**

<b>FTCE8627E1PCA</b>
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E:	Ethernet protocol
27:	2x400G-VR4
P:	Pull-tab type release
A:	Dual MPO-12 Receptacle

**I. Pin Descriptions**

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

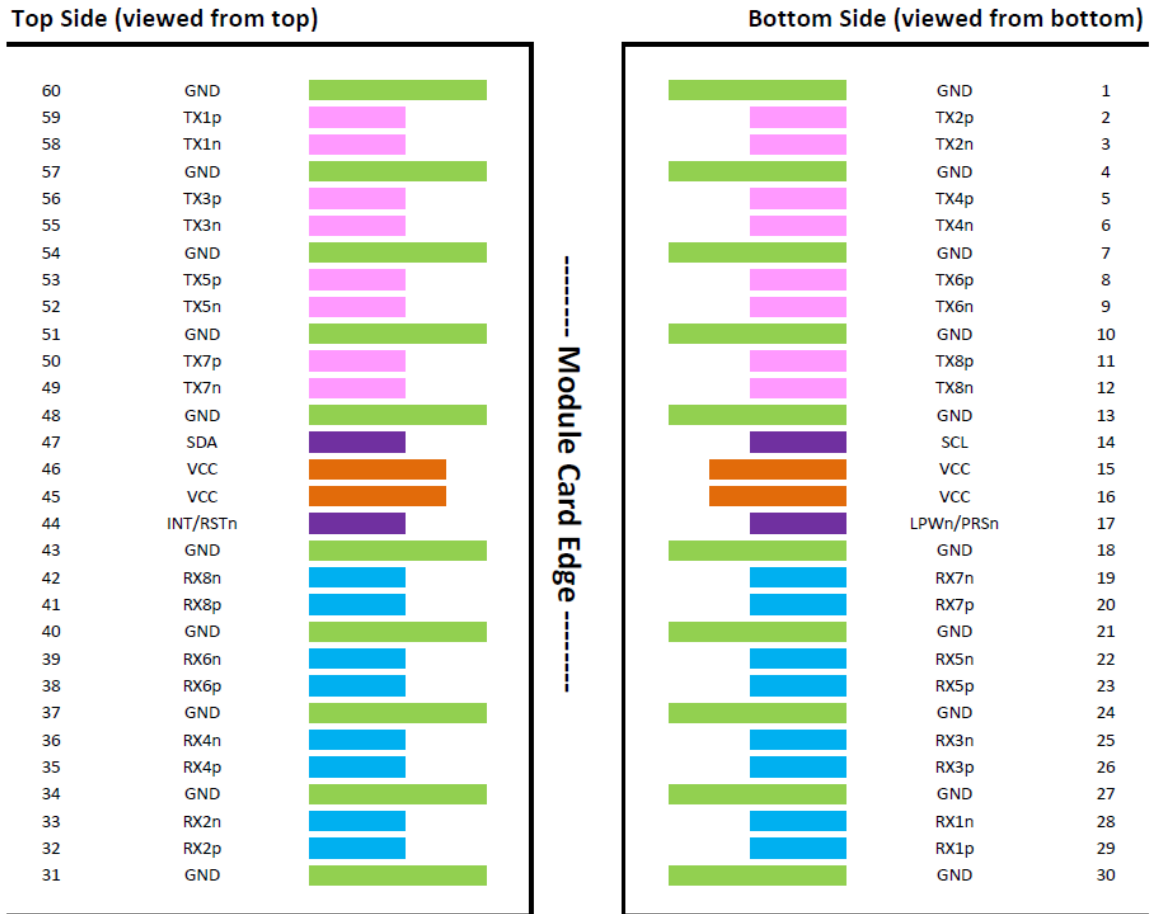


Figure 1 – OSFP Module Pinout (per OSFP MSA)

**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	V <sub>cc</sub>	-0.5		4.0	V	
Storage Temperature	T <sub>S</sub>	-40		+85	°C	
Case Operating Temperature	T <sub>OP</sub>	0		+70	°C	
Relative Humidity	RH	15		85	%	1
Receiver Damage Threshold, per Lane	P <sub>Rdmg</sub>	5			dBm	

Notes:

1. Non-condensing.

**III. Electrical Characteristics (EOL, T<sub>OP</sub> = 0 to +70 °C, V<sub>CC</sub> = 3.135 to 3.465 Volts)**

Aligned to IEEE P802.3ck

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	V <sub>cc</sub>	3.135	3.3	3.465	V	
Supply Current	I <sub>cc</sub>			5	A	
Module total power	P			16	W	1
<b>Transmitter</b>						
Signaling rate per lane		53.125± 100 ppm			GBd	
Differential pk-pk input voltage tolerance		750			mV	
Differential-mode to common mode return loss		Per equation (120G-2)			dB	
Effective return loss, ERL		8.5			dB	
Differential termination mismatch				10	%	
Module stressed input tolerance		Per 120G.3.4.3				2
Single-ended voltage tolerance range		-0.4		3.3	V	
DC common-mode voltage tolerance		-350		2850	mV	3
<b>Receiver</b>						
Signaling rate per lane		53.125			GBd	4
AC common-mode voltage				80	mV	
Differential pk-pk output voltage				845	mV	
Eye height		15			mV	
Vertical eye closure, VEC				12	dB	
Common-mode to differential-mode return loss		Per 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

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<sub>OP</sub> = 0 to +70 °C, V<sub>CC</sub> = 3.135 to 3.465 Volts)**

	2x400GBASE-VR4	Unit	Ref
<b>Transmitter</b>			
Signaling rate, each lane	53.125 ± 100 ppm	GBd	
Modulation format	PAM4		
Center wavelengths (range)	844 to 870	nm	
RMS spectral width (max)	0.65	nm	1
Average launch power, each lane (max)	4	dBm	
Average launch power, each lane (min)	-4.6	dBm	
Outer OMA, each lane (max)	3.5	dBm	
Outer OMA, each lane (min)		dBm	
For max (TECQ, TDECQ) ≤ 1.8dB	-2.6	dBm	
For 1.8 < max (TECQ, TDECQ) ≤ 4.4dB	-4.4 + max (TECQ, TDECQ)	dBm	
Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane (max)	4.4	dB	
Transmitter eye closure for PAM4 (TECQ), each lane (max)	4.4	dB	
Overshoot/undershoot (max)	29	%	
Transmitter power excursion, each lane (max)	2.3	dBm	
Extinction ratio, each lane (min)	2.5	dB	
Transmitter transition time, each lane (max)	17	ps	
Average launch power of OFF transmitter, each line (max)	-30	dBm	
RIN <sub>14</sub> OMA (max)	-132	dB/Hz	
Optical return loss tolerance (max)	18	dB	
<b>Receiver</b>			
Signaling rate, each lane	53.125 ± 100 ppm	GBd	
Modulation format	PAM4		
Center wavelengths (range)	842 to 948	nm	
Damage threshold (min)	5	dBm	2
Average receive power, each lane (max)	4	dBm	
Average receive power, each lane (min)	-6.3	dBm	3
Receive power, each lane (OMA <sub>outer</sub> ) (max)	3.5	dBm	
Receiver reflectance (max)	-15	dB	
Receiver sensitivity (OMA <sub>outer</sub> ) (max)		dBm	
For TECQ ≤ 1.8dB	-4.4	dBm	
For 1.8 < TECQ ≤ 4.4dB	-6.2 + TECQ	dBm	
Stressed receiver sensitivity (OMA <sub>outer</sub> ) (max)	-1.8	dBm	4
Conditions of stressed receiver sensitivity test			5
Stressed eye closure for PAM4 (SECQ), lane under test	4.4	dB	
OMA <sub>outer</sub> of each aggressor lane	3.5	dBm	

**Notes:**

1. RMS spectral width is the standard deviation of the spectrum.
2. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level on one lane. The receiver does not have to operate correctly at this input power.
3. Average receive power, each lane (min) is 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.
4. Measured with conformance test signal at TP3 for the BER specified in 167.1.1.
5. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

## V. General Specifications

Parameter	Symbol	2x400GBASE-VR4	Units	Ref.
Bit Rate per Lane	BR	53.125± 100 ppm	GBd	1
PRE-FEC Bit Error Ratio (max)	BER	2.4E-4		2
<b>Maximum Supported Distances</b>				
Fiber Type				
OM3 MMF	Lmax1	30	m	
OM4/OM5 MMF	Lmax2	50		

Notes:

1. Supports Ethernet and InfiniBand NDR
2. Tested with a PRBS  $2^{31}-1$  test pattern.

## VI. Environmental Specifications

Finisar FTCE8627E1PCA 2x400-VR4 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 <sub>op</sub>	0		+70	°C	
Storage Temperature	T <sub>sto</sub>	-40		+85	°C	

## VII. Regulatory Compliance

The FTCE8627E1PCA transceivers are RoHS compliant. Copies of certificates are available from Coherent Corp. upon request.

FTCE8627E1PCA transceiver modules are Class 1M 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

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

## VIII. Digital Diagnostics Functions

FTCE8627E1PCA 2x400G VR4 OSFP transceivers support the I2C-based diagnostics interface specified by the SFF Committee<sup>1</sup>.

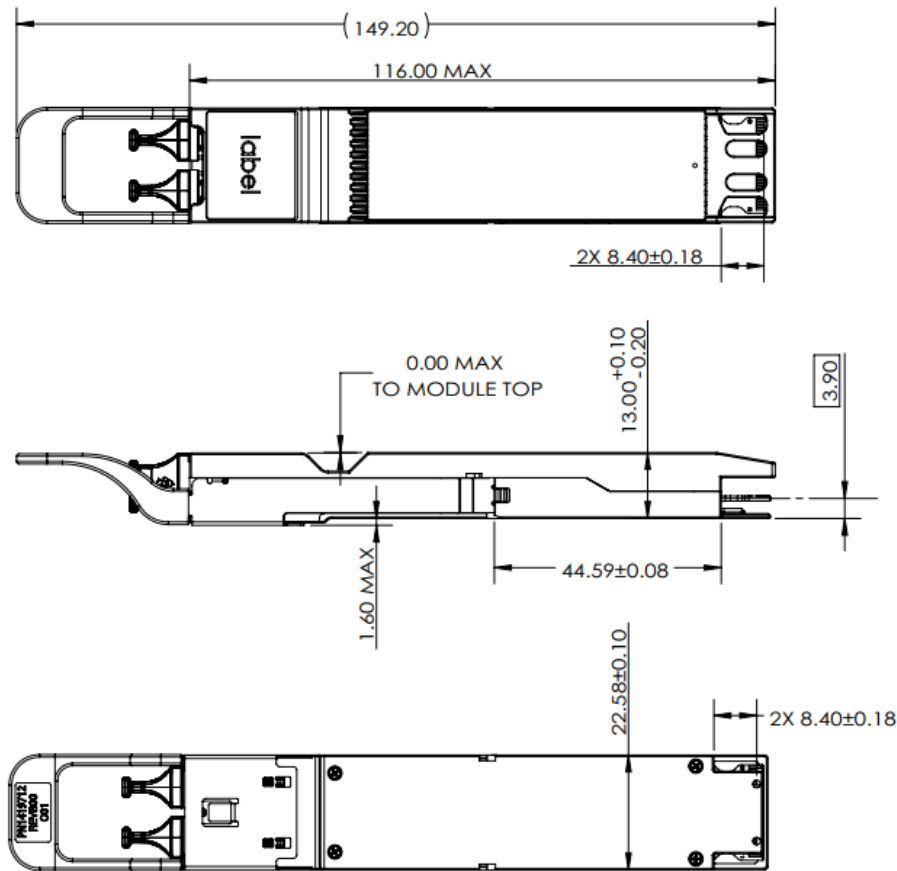
## IX. Memory Contents

CMIS 4.0 per MSA configured with 8x100G by default. CMIS 5.X are also available upon request.

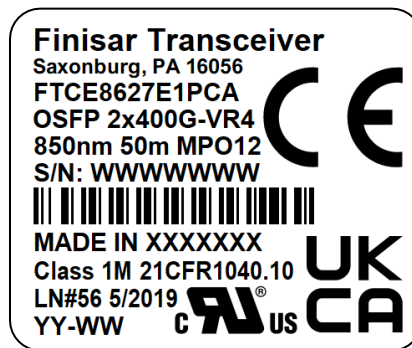
Firmware upgrade is supported via CDB commands.

**X. Mechanical Specifications**

FTCE8627E1PCA 2x400G VR4 OSFP transceivers are compatible with the OSFP Specification for pluggable form factor Type 2 modules.



**Figure 2. FTCE8627E1PCA Mechanical Dimensions.**



**Figure 3. Product Label (20.5MMx17MM)**

## **XI. 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 P802.3db-2022, Physical Layer Specifications and Management Parameters for 100 Gb/s, 200 Gb/s, and 400 Gb/s Operation over Optical Fiber using 100Gb/s Signaling.
7. IEEE P802.3ck-2022, 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.

## **XII. For More Information**

Coherent Corp.  
375 Saxonburg Blvd.  
Saxonburg, PA 16056  
[photonics.sales@coherent.com](mailto:photonics.sales@coherent.com)  
[www.coherent.com](http://www.coherent.com)