OSFP-400G-SR8-SKY

Arista Networks® Compatible 400GBase-SR8 OSFP-IHS Transceiver (MMF, 850nm, MPO-16, 100m, CMIS 4.0)

Product Description

This Arista Networks® OSFP-400G-SR8 compatible OSFP-IHS Transceiver provides 400GBase-SR8 throughput up to 100m over multi-mode fiber (MMF) using a wavelength of 850nm via an MPO-16 connector. It is guaranteed to be 100% compatible with the equivalent Arista Networks® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- Compliant with OSFP MSA Specifications
- Power Dissipation: 10W
- Single 3.3V Power Supply
- MPO-16 Connector APC
- Independent 8 Channels to Support Break-Out
- 8x26.5625GBd PAM4 Electrical Interface
- PIN and TIA Array on the Receiver Side
- VCSEL Transmitter
- RoHS Compliant and Lead-Free
- Operating Temperature: 0 to 70 Celsius

Applications:

- 400GBase Ethernet
- Access and Enterprise

For your product safety, please read the following information carefully before any manipulation of the transceiver:

ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.

LASER SAFETY

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

Absolute Maximum Ratings

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		Vcc	-0.5	3.3	3.6	V	
Storage Temperature		Tstg	-40		85	°C	
Operating Case Temperature		Tc	0		70	°C	
Relative Humidity (Non-Condensing)		RH	5		85	%	
Receiver Differential Data Output Load					100	Ω	
Data Rate Per Lane		DR		26.5625 ± 100ppm		GBd	
Modulation Format				PAM4			
Fiber Length	**OM3**				70	m	
	OM4				100	m	

Electrical Characteristics

Parameter	Symbol / Test Point	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Supply Noise				25	mVp-p	1
Power Consumption				10	W	
Power Supply Total Current			0.1		mA	
AC Coupling Internal Capacitor			0.1		µF	
Input Specifications						
Differential Pk-Pk Input Voltage Tolerance	TP1a	900			mV	2
Differential Input Return Loss	TP1	Equation (83E-5)			dB	3
Common- to Differential-Mode Conversion Return Loss	TP1	Equation (83E-6)				3
Differential Termination Mismatch	TP1			10	%	
Single-Ended Voltage Tolerance Range	TP1a	-0.4		3.3	V	
DC Common-Mode Output Voltage	TP1	-350		2850	mV	4
Module Stressed Input Test	TP1a					5
Eye Width			0.22		UI	
Applied Pk-Pk Sinusoidal Jitter			Table 120E-6			6
Eye Height			32		mV	
Output Specifications						
AC Common-Mode Output Voltage (RMS)	TP4			17.5	mV	
Differential Pk-Pk Output Voltage	TP4			900	mV	
Near-End Eye Symmetry Mask Width	TP4	0.265			UI	
Near-End Differential Eye Height	TP4	70			mV	
Differential Output Return Loss	TP4	Equation (83E-2)				3

Common- to Differential-Mode Conversion Return Loss	TP4	Equation (83E-3)				3
Differential Termination Mismatch	TP4			10	%	
Transition Time (20-80%)	TP4	9.5			ps	
DC Common-Mode Voltage	TP4	-350		2850	mV	4
SCL and SDA Pin						
SCL and SDA	VOL	0		0.4	V	
	VOH	Vcc-0.5		Vcc+0.3	V	
SCL and SDA	VIL	-0.3		Vcc*0.3	V	
	VIH	Vcc*0.7		Vcc +0.5	V	

Notes:

1. Power Supply Noise is defined as the peak-to-peak noise amplitude over the frequency range at the host supply side of the recommended power supply filter with the module and recommended filter in place. Voltage levels including peak-to-peak noise are limited to the recommended operating range of the associated power supply.
2. With the exception to 120E.3.1.2 that the pattern is PRBS31Q or scrambled idle.
3. Refers to IEEE 802.3-2018.
4. DC common-mode voltage is generated by the host. Specification includes the effects of offset voltage.
5. Meets BER specified in 120E.1.1 of IEEE 802.3-2018.
6. Table 120E-6 refers to IEEE 802.3-2018.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter @TP2 Test Point						
Center Wavelength	λ	840		868	nm	
RMS Spectral Width	ΔλRMS			0.6	nm	1
Average Launch Power Per Lane	Pavg	-6.5		4	dBm	
Outer Optical Modulation Amplitude (OMA_{outer}) Per Lane	POMA	-4.5		3	dBm	2
Launch Power in OMA_{outer} Minus TDECQ	OMA-TDECQ	-5.9			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ) Per Lane	TDECQ			4.5	dB	
TDECQ-$10\log_{10}(C_{eq})$ Per Lane	TDECQ – $10\log_{10}(C_{eq})$			4.5	dB	3
Average Launch Power of Off Transmitter Per Lane	Poff			-30	dBm	
Extinction Ratio Per Lane	ER	3			dB	
$RIN_{12}OMA$	$RIN_{12}OMA$			-128	dB/Hz	
Optical Return Loss Tolerance	ORL			12	dB	
Encircled Flux	EF		≥86% at 19μm ≤30% at 4.5μm			4

Receiver @TP3 Test Point						
Damage Threshold		5			dBm	5
Average Receiver Power Per Lane	OMA_{outer}	-8.4		4	dBm	6
Receiver Power Per Lane OMA_{outer}				3	dBm	
Receiver Reflectance				-12	dB	
Stressed Receiver Sensitivity (OMA_{outer}) Per Lane				-3.4	dBm	7
LOS Assert	LOSA	-17			dBm	
LOS De-Assert	LOSD			-11	dBm	
Receiver Sensitivity (OMA_{outer}) Per Lane			Max. (6.5, SECQ-7.9)		dBm	8
Stressed Eye Closure for PAM4 (SECQ) Per Lane Under Test			4.5		dB	
SECQ-$10log_{10}(C_{eq})$ Per Lane Under Test				405	dB	3
OMA_{outer} of Each Aggressor Lane			3		dBm	9
Conditions of Stressed Receiver Sensitivity Test						10

Notes:

1. RMS spectral width is the standard deviation of the spectrum.
2. Even if the TDECQ < 1.4dB, the OMA (minimum) must exceed this value.
3. C_{eq} is a coefficient defined in 121.8.5.3, which accounts for the reference equalizer noise enhancement.
4. If measured into Type A1a.2 or A1a.3, or A1a.5, 50µm fiber, in accordance with IEC61280-1-4.
5. 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.
6. Average receiver power, per lane (minimum), is informative and not the principle indicator of signal strength. A received power below this value cannot be complaint; however, a value above this does not ensure compliance.
7. Measured with conformance test signal at TP3 (see 138.8.10) for the BER specified in 138.1.1.
8. Receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 4.5dB with BER<$2.4x10^{-4}$ without FEC in PRBS 2^{31}-1.
9. Only applies to 100GBase-SR2, 200GBase-SR4, and 400GBase-SR8.
10. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

Pin Descriptions

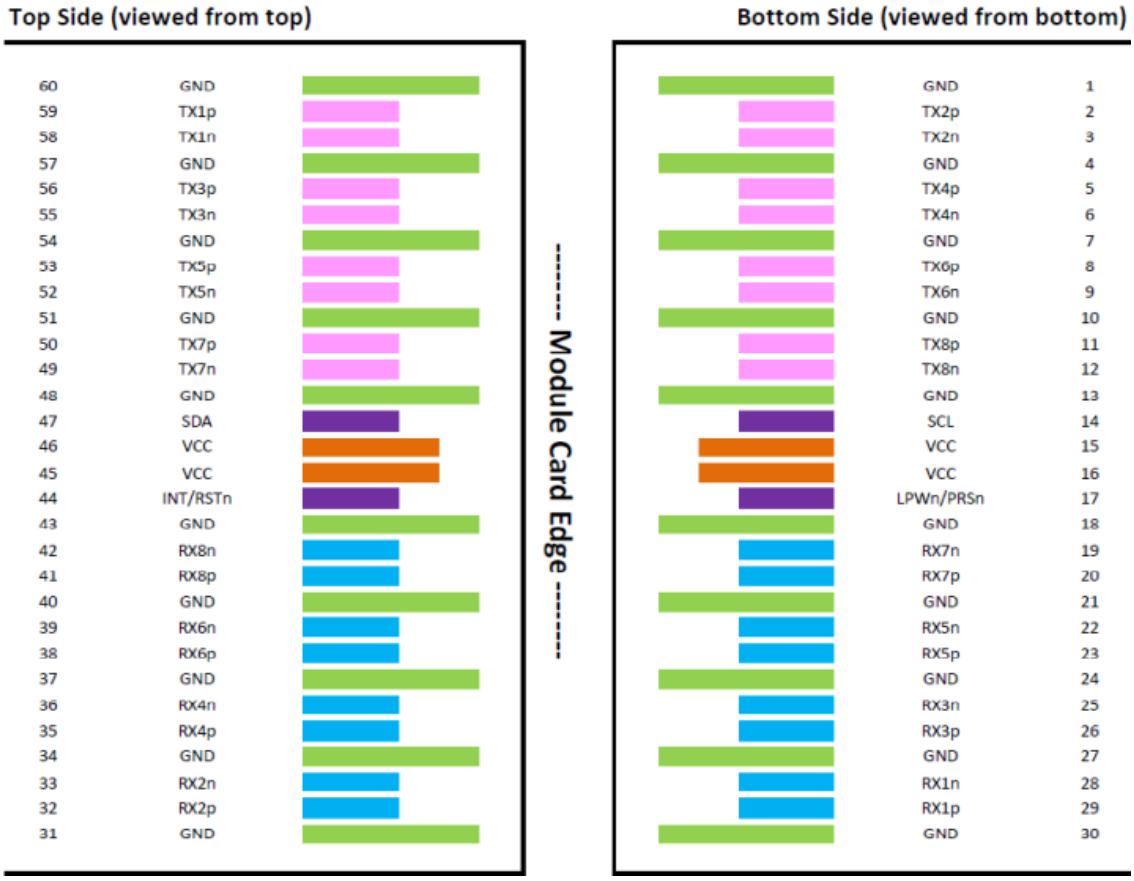
Pin	Logic	Symbol	Name/Description	Plug Sequence	Notes
1		GND	Module Ground.	1	1
2	CML-I	Tx2+	Transmitter Non-Inverted Data.	3	
3	CML-I	Tx2-	Transmitter Inverted Data.	3	
4		GND	Module Ground.	1	1
5	CML-I	Tx4+	Transmitter Non-Inverted Data.	3	
6	CML-I	Tx4-	Transmitter Inverted Data.	3	
7		GND	Module Ground.	1	1
8	CML-I	Tx6+	Transmitter Non-Inverted Data.	3	
9	CML-I	Tx6-	Transmitter Inverted Data.	3	
10		GND	Module Ground.	1	1
11	CML-I	Tx8+	Transmitter Non-Inverted Data.	3	
12	CML-I	Tx8-	Transmitter Inverted Data.	3	
13		GND	Module Ground.	1	1
14	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock.	3	2
15		Vcc	+3.3V Power Supply.	2	
16		Vcc	+3.3V Power Supply.	2	
17	Multi-Level	LPWn/PRSn	Low-Power Mode/Module Present.	3	
18		GND	Module Ground.	1	1
19	CML-O	Rx7-	Receiver Inverted Data.	3	
20	CML-O	Rx7+	Receiver Non-Inverted Data.	3	
21		GND	Module Ground.	1	1
22	CML-O	Rx5-	Receiver Inverted Data.	3	
23	CML-O	Rx5+	Receiver Non-Inverted Data.	3	
24		GND	Module Ground.	1	1
25	CML-O	Rx3-	Receiver Inverted Data.	3	
26	CML-O	Rx3+	Receiver Non-Inverted Data.	3	
27		GND	Module Ground.	1	1
28	CML-O	Rx1-	Receiver Inverted Data.	3	
29	CML-O	Rx1+	Receiver Non-Inverted Data.	3	
30		GND	Module Ground.	1	1
31		GND	Module Ground.	1	1
32	CML-O	Rx2+	Receiver Non-Inverted Data.	3	
33	CML-O	Rx2-	Receiver Inverted Data.	3	
34		GND	Module Ground.	1	1
35	CML-O	Rx4+	Receiver Non-Inverted Data.	3	
36	CML-O	Rx4-	Receiver Inverted Data.	3	
37		GND	Module Ground.	1	1

38	CML-O	Rx6+	Receiver Non-Inverted Data.	3	
39	CML-O	Rx6-	Receiver Inverted Data.	3	
40		GND	Module Ground.	1	1
41	CML-O	Rx8+	Receiver Non-Inverted Data.	3	
42	CML-O	Rx8-	Receiver Inverted Data.	3	
43		GND	Module Ground.	1	1
44	Multi-Level	INT/RSTn	Module Input/Module Reset.	3	
45		Vcc	+3.3V Power Supply.	2	
46		Vcc	+3.3V Power Supply.	2	
47	LVCMOS-I/O	SCL	2-Wire Serial Interface Data.	3	2
48		GND	Module Ground.	1	1
49	CML-I	Tx7-	Transmitter Inverted Data.	3	
50	CML-I	Tx7+	Transmitter Non-Inverted Data.	3	
51		GND	Module Ground.	1	1
52	CML-I	Tx5-	Transmitter Inverted Data.	3	
53	CML-I	Tx5+	Transmitter Non-Inverted Data.	3	
54		GND	Module Ground.	1	1
55	CML-I	Tx3-	Transmitter Inverted Data.	3	
56	CML-I	Tx3+	Transmitter Non-Inverted Data.	3	
57		GND	Module Ground.	1	1
58	CML-I	Tx1-	Transmitter Inverted Data.	3	
59	CML-I	Tx1+	Transmitter Non-Inverted Data.	3	
60		GND	Module Ground.	1	1

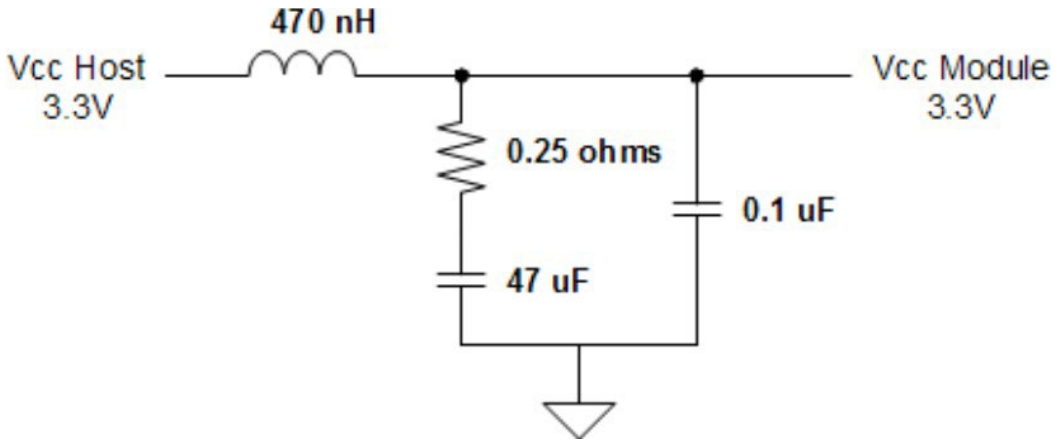
Notes:

1. OSFP uses common ground (GND) for all signals and supply (power). All are common within the OSFP module, and all module voltages are referenced to this potential unless otherwise noted.
2. Open-drain with pull-up resistor on the host.

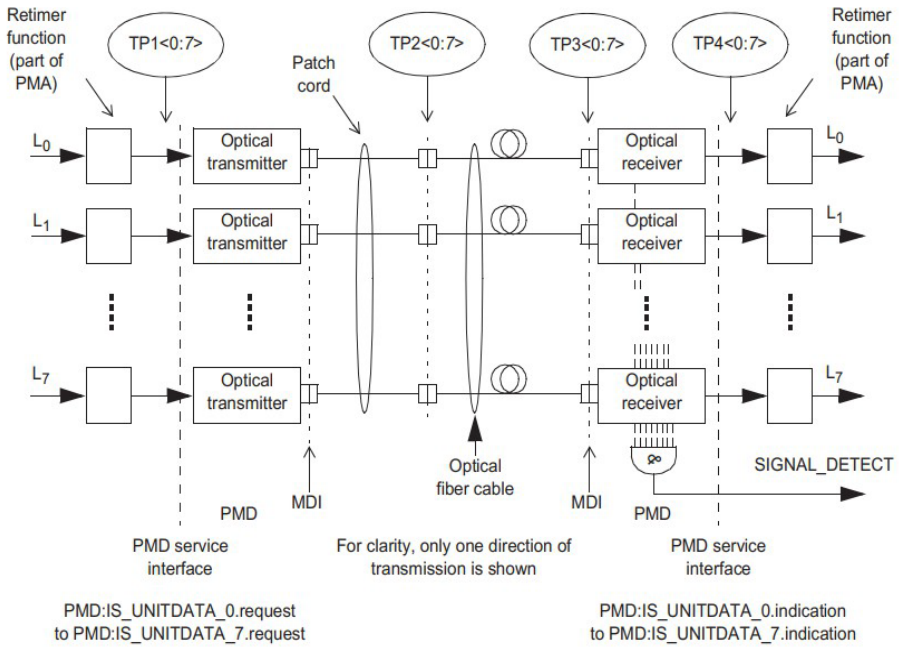
Electrical Pad Layout



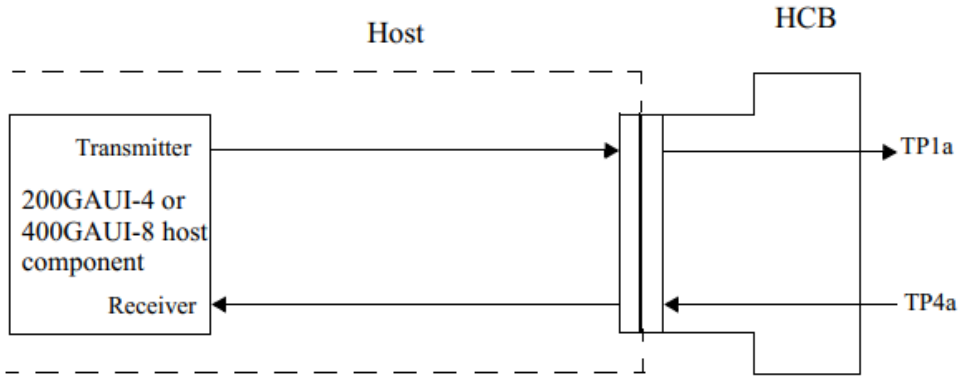
Recommended Host Board Power Supply Filter



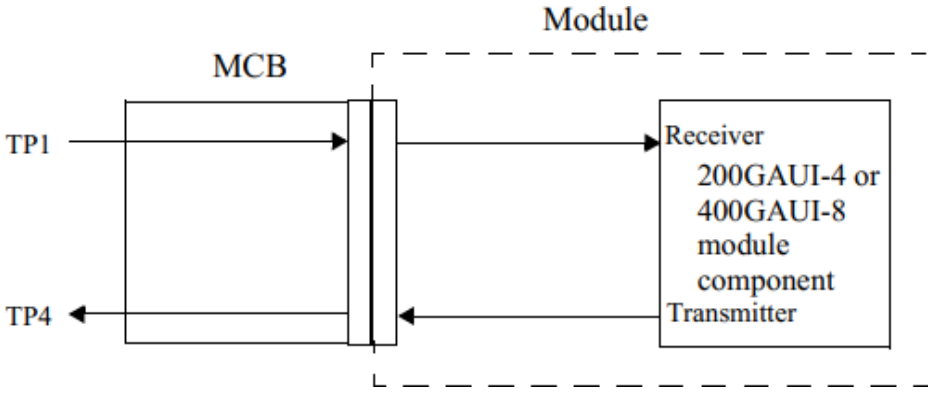
IEEE 802.3cm Block Diagram for 400GBASE-SR8 Transmit/Receive Paths



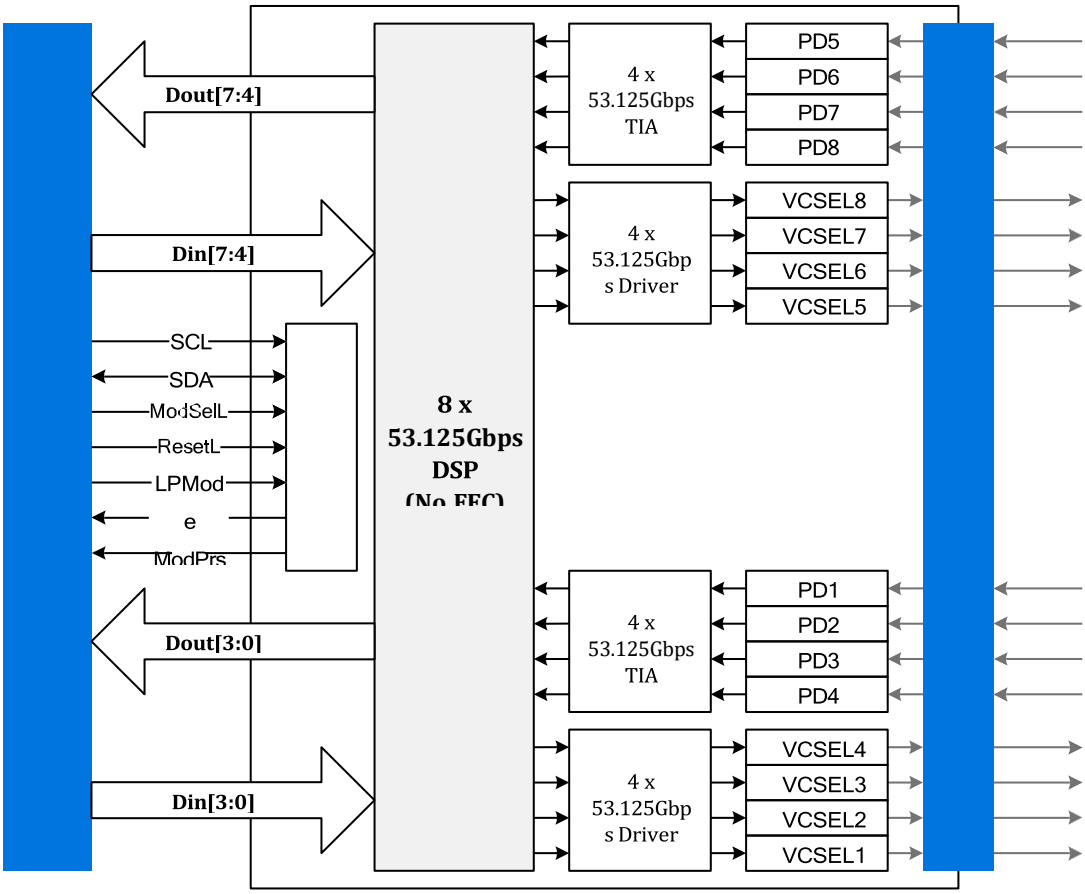
IEEE 802.3bs 400GAUI-4 Compliance Points (TP1a, TP4a)



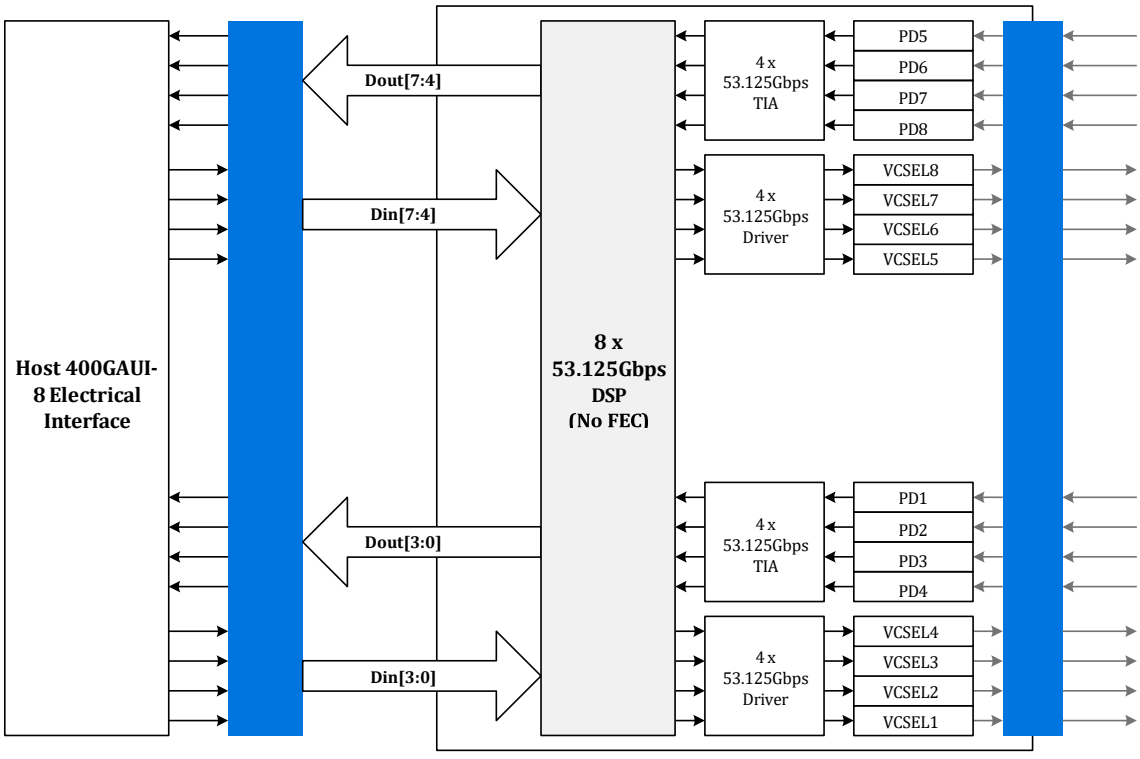
IEEE 802.3bs 400GAUI-8 C2M Compliance Points (TP1, TP4)



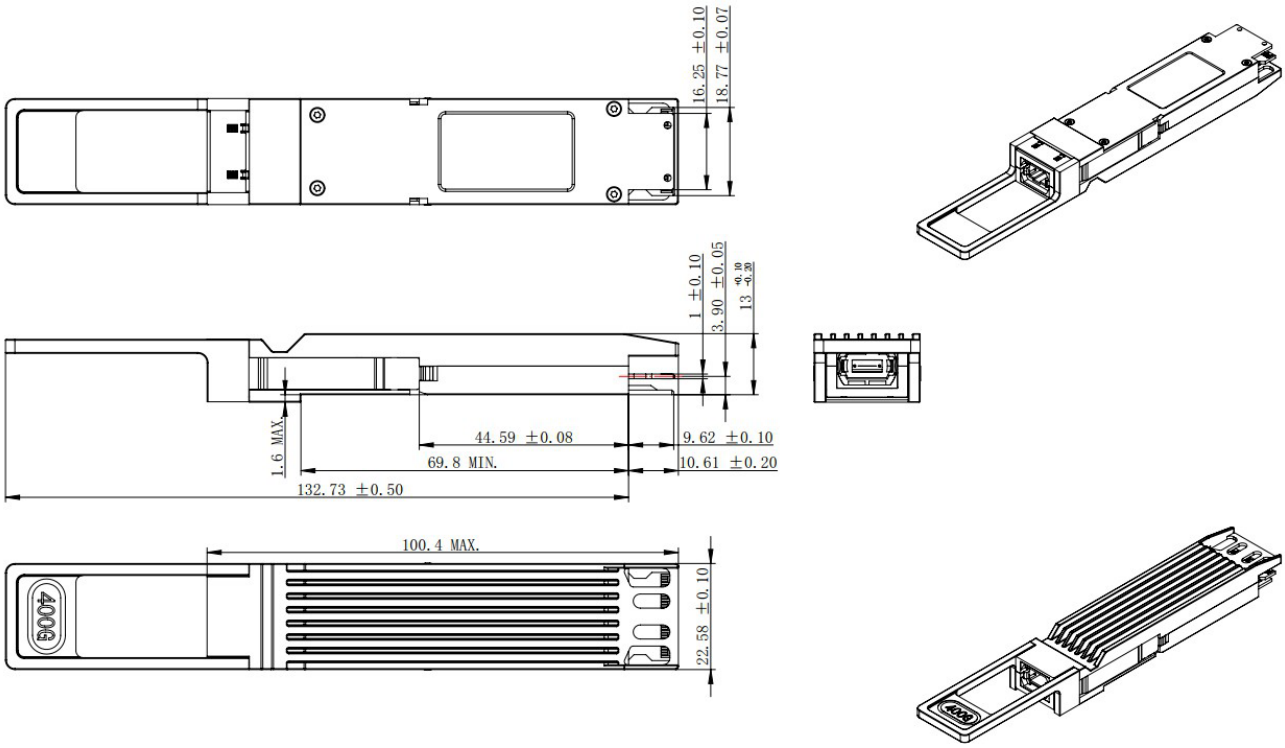
Transceiver Block Diagram



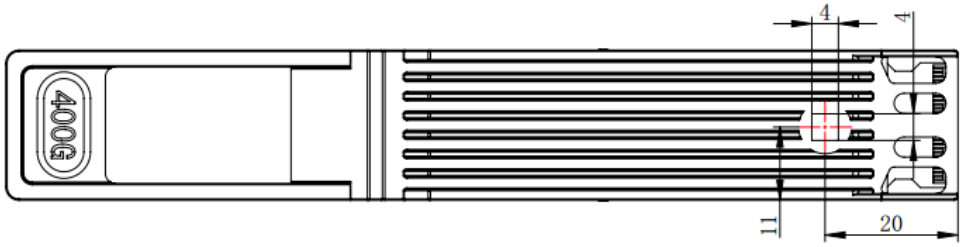
Application Reference Diagram



Mechanical Specifications



Case Temperature Measurement Point (All Dimensions in mm)



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.