



OSFP-400G-FR4-SKY

Arista Networks® OSFP-400G-FR4 Compatible 400GBase-FR4 OSFP-IHS Transceiver (SMF, 1310nm, 2km, LC, DOM, 0 to 70C)

Product Description

This Arista Networks® OSFP-400G-FR4 compatible OSFP-IHS Transceiver provides 400GBase-FR4 throughput up to 2km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Arista Networks®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows 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:

- Supports 425Gbps
- Duplex LC connector
- Up to 2km over SMF
- Data Rate 106.25Gbps optical channel
- Operating Temperature: 0 to 70 Celsius
- 8x53.125GBD(PAM4) electrical interface
- SMF angled, polished LC simplex connector
- Power dissipation 10W
- RoHS Compliant and Lead-Free
- OSFP MSA compliant



Applications:

- 400GBase Ethernet

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
Maximum Supply Voltage	Vcc	-0.5	3.3	3.6	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	1
Relative Humidity	RH	5		85	%	
Power Dissipation	P			10	W	
Electrical Signal Rate Per Channel			26.5625		Gbps	2
Optical Signal Rate Per Channel			53.125		Gbps	3
Fiber Length		2			km	4

Notes:

1. Continuous operation at the maximum recommended operating case temperature should be avoided in order not to degrade reliability.
2. 400GAUI-8 operation with the host-generated FEC. The transmitter must receive pre-coded FEC signals from the host ASIC.
3. 400GFR8 operation with the host-generated FEC. The transmitter must receive pre-coded FEC signals from the host ASIC..
4. 9µm SMF. The maximum link distance is based on an allocation of 1dB of attenuation and 3dB total connection and splice loss. The loss of a single connection shall not exceed 0.5dB..

Electrical Characteristics

Parameter	Symbol/Test Point	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Signaling Rate, Per Lane	TR1		26.5625 ± 100 ppm		Gbps	
Data Input Voltage- Single Ended		-0.5		Vcc+0.5	V	
Data Input Voltage – Differential				0.8	V	1
In-Rush, Instantaneous Peak Current	I_Peak			4000	mA	
In-Rush Current (DI/Dt)	I_Inrush			100	mA/us	
Power Supply Noise				50	mVp-p	2
Receiver Differential Data Output Load		100			Ω	
Transceiver Power Consumption				10	W	
Transceiver Power Supply Total Current				3190	mA	
AC Coupling Internal Capacitor			0.1		uF	
Transmitter (Per Lane)						
Differential Peak-Peak Input Voltage Tolerance	TP1a	900			mV	
Differential Return Loss (Minimum)	TP1		Equation (83E-5)		dB	3
Common Mode Differential Return Loss (Minimum)	TP1		Equation (83E-6)		dB	3
Differential Termination Mismatch	TP1		10		%	
Single-Ended Voltage Tolerance Range	TP1a	-0.4		3.3	V	
DC Common-Mode Voltage	TP1	-350		2850	mV	4
Module Stressed Input Test	TP1a		120E.3.4.1			5
Eye Width			0.22		UI	
Applied Peak-Peak sinusoidal jitter			Table 120E-6			3
Eye Height			32		mV	
Receiver (Per Lane)						
AC Common-Mode Output Voltage (Maximum, RMS)				17.5	mV	
Differential Peak-to-Peak Output Voltage Tolerance	TP4			900	mV	
Near-end ESMW(Eye Symmetry Mask Width)	TP4		0.265		UI	
Near-End Eye Height (Differential)	TP4	90			mV	
Far-End ESMW (Eye Symmetry Mask Width)	TP4		0.2		UI	
Far-End Eye Height (Differential)	TP4	30			mV	
Differential Output Return Loss (Minimum)	TP4		Equation (83E-2)		dB	6
Common- to Differential-Mode Conversion Return Loss (Minimum)	TP4		Equation (83e-3)		dB	6

Differential Termination Mismatch	TP4		10		%	
Transition Time (20% to 80%)	TP4	9.5			ps	
DC Common-Mode Voltage	TP4	-0.35		2.85	V	

Notes:

1. This is the maximum voltage that can be applied across the differential inputs without damaging the input circuitry. The damage threshold of the module input shall be at least 1600mV peak-to-peak differential.
2. 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.
3. 802.3bs.
4. DC common-mode voltage is generated by the host. Specification includes effects of ground offset voltage.
5. Module stressed input tolerance is measured using the procedure defined in 120E-3.4.1. 802.3bs.
6. 802.3bm.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Wavelength Assignment	λ_{C0}	1264.5	1271	1277.5	nm	
	λ_{C1}	1284.5	1291	1297.5	nm	
	λ_{C2}	1304.5	1311	1317.5	nm	
	λ_{C3}	1324.5	1331	1337.5	nm	
Transmitter						
Side-Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	3.5			dB	
Average Launch Power		-0.3		3.7	dBm	1
OMA Per Lane		-3.3		3.5	dBm	
Launch Power in OMA Minus Transmitter and Dispersion Penalty (TDP) Per Lane		-1.7			dBm	
		-1.6				
TDECQ (PAM4)				3.1	dB	
SECQ				3.1	dB	
Rin16.5 OMA				-132	dB/Hz	
Average Launch Power Of OFF Transmitter				-30	dBm	
Optical Return Loss Tolerance				17.1	dB	
Transmitter Reflectance				-26	dB	
Transmitter Transition Time				17	ps	
Receiver						
Damage Threshold	Rxdmg	4.5			dBm	
Average Receiver Power Per Lane	Pavg	-7.3		3.5	dBm	
Receive Power (OMA) Per Lane	RxOMA			3.7	dBm	
Receiver Sensitivity (OMA) Per Lane	SenOMA			Max (-4.6, SECQ-6)	dBm	2
Stressed Receiver Sensitivity (OMA) Per Lane	SRS			-3.1	dBm	
Los Assert	LOSA	-30			dBm	
Los De-Assert	LOSD			-12	dBm	
Los Hysteresis	LOSH	0.5			dB	
RSSI Accuracy		-2		+2	dB	
Receiver Reflectance				-26	dB	

Notes:

1. Average launch power, each lane (minimum), 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. Receiver sensitivity. @<4.6dBm for Tx with TDECQ<1.4dB; @<SECQ-6 for Tx with 3.1dB≥TDECQ≥1.4dB.

Pin Descriptions

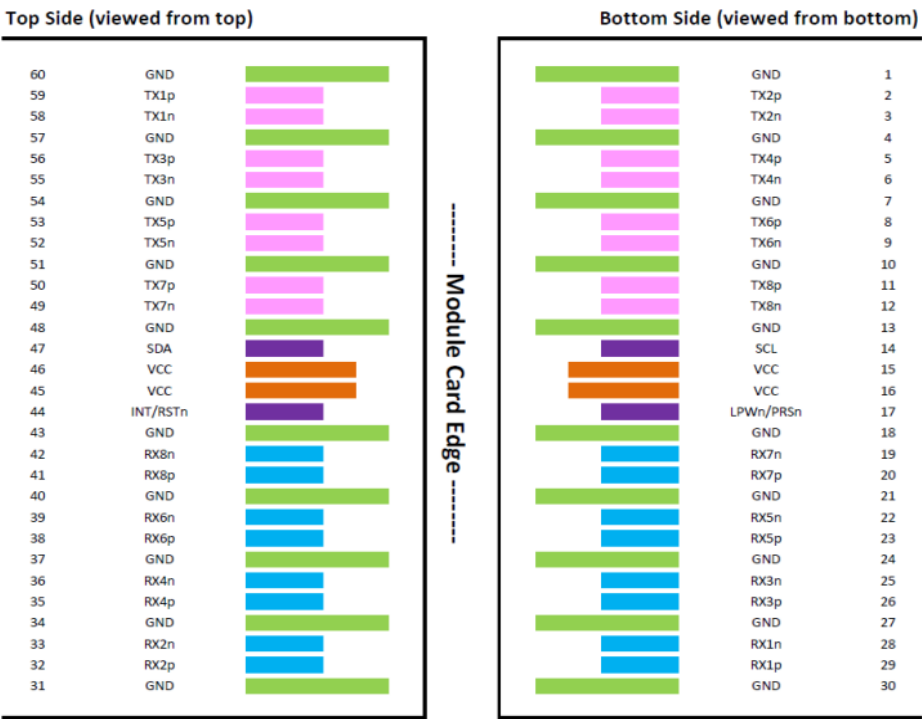
Pin	Logic	Symbol	Name/Descriptions	Plug Sequence	Notes
1		GND	Module Ground.	1	1
2	CML-I	Tx2+	Transmitter Data Non-Inverted.	3	
3	CML-I	Tx2-	Transmitter Data Inverted.	3	
4		GND	Module Ground.	1	1
5	CML-I	Tx4+	Transmitter Data Non-Inverted.	3	
6	CML-I	Tx4-	Transmitter Data Inverted.	3	
7		GND	Module Ground.	1	1
8	CML-I	Tx6+	Transmitter Data Non-Inverted.	3	
9	CML-I	Tx6-	Transmitter Data Inverted.	3	
10		GND	Module Ground.	1	1
11	CML-I	Tx8+	Transmitter Data Non-Inverted.	3	
12	CML-I	Tx8-	Transmitter Data Inverted.	3	
13		GND	Module Ground.	1	1
14	LVC MOS-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 Data Inverted.	3	
20	CML-O	Rx7+	Receiver Data Non-Inverted.	3	
21		GND	Module Ground.	1	1
22	CML-O	Rx5-	Receiver Data Inverted.	3	
23	CML-O	Rx5+	Receiver Data Non-Inverted.	3	
24		GND	Module Ground.	1	1
25	CML-O	Rx3-	Receiver Data Inverted.	3	
26	CML-O	Rx3+	Receiver Data Non-Inverted.	3	
27		GND	Module Ground.	1	1
28	CML-O	Rx1-	Receiver Data Inverted.	3	
29	CML-O	Rx1+	Receiver Data Non-Inverted.	3	
30		GND	Module Ground.	1	1
31		GND	Module Ground.	1	1
32	CML-O	Rx2+	Receiver Data Non-Inverted.	3	
33	CML-O	Rx2-	Receiver Data Inverted.	3	
34		GND	Module Ground.	1	1
35	CML-O	Rx4+	Receiver Data Non-Inverted.	3	

36	CML-O	Rx4-	Receiver Data Inverted.	3	
37		GND	Module Ground.	1	1
38	CML-O	Rx6+	Receiver Data Non-Inverted.	3	
39	CML-O	Rx6-	Receiver Data Inverted.	3	
40		GND	Module Ground.	1	1
41	CML-O	Rx8+	Receiver Data Non-Inverted.	3	
42	CML-O	Rx8-	Receiver Data Inverted.	3	
43		GND	Module Ground.	1	1
44	Multi-Level	INT/RSTn	Module Input/Module Reset.	3	
45		Vcc	+3.3V Power.	2	
46		Vcc	+3.3V Power.	2	
47	LVC MOS-I/O	SCL	2-Wire Serial Interface Data.	3	2
48		GND	Module Ground.	1	1
49	CML-I	Tx7-	Transmitter Data Inverted.	3	
50	CML-I	Tx7+	Transmitter Data Non-Inverted.	3	
51		GND	Module Ground.	1	1
52	CML-I	Tx5-	Transmitter Data Inverted.	3	
53	CML-I	Tx5+	Transmitter Data Non-Inverted.	3	
54		GND	Module Ground.	1	1
55	CML-I	Tx3-	Transmitter Data Inverted.	3	
56	CML-I	Tx3+	Transmitter Data Non-Inverted.	3	
57		GND	Module Ground.	1	1
58	CML-I	Tx1-	Transmitter Data Inverted.	3	
59	CML-I	Tx1+	Transmitter Data Non-Inverted.	3	
60		GND	Module Ground.	1	1

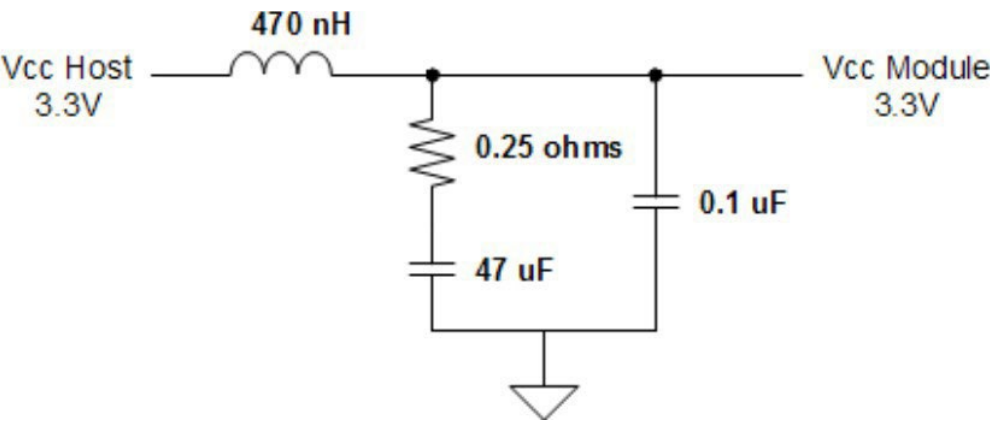
Notes:

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.

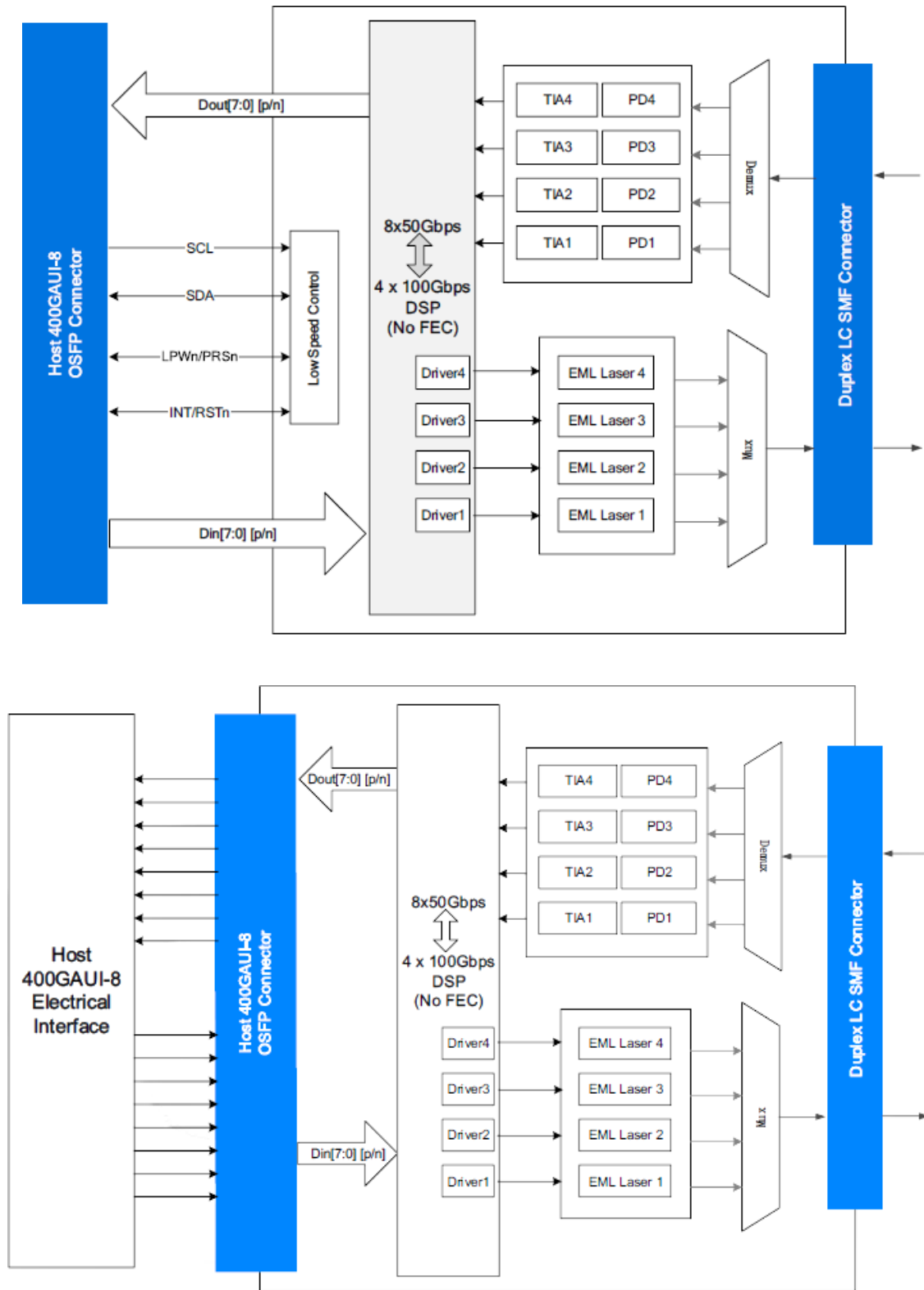
Electrical Pin-Out Details



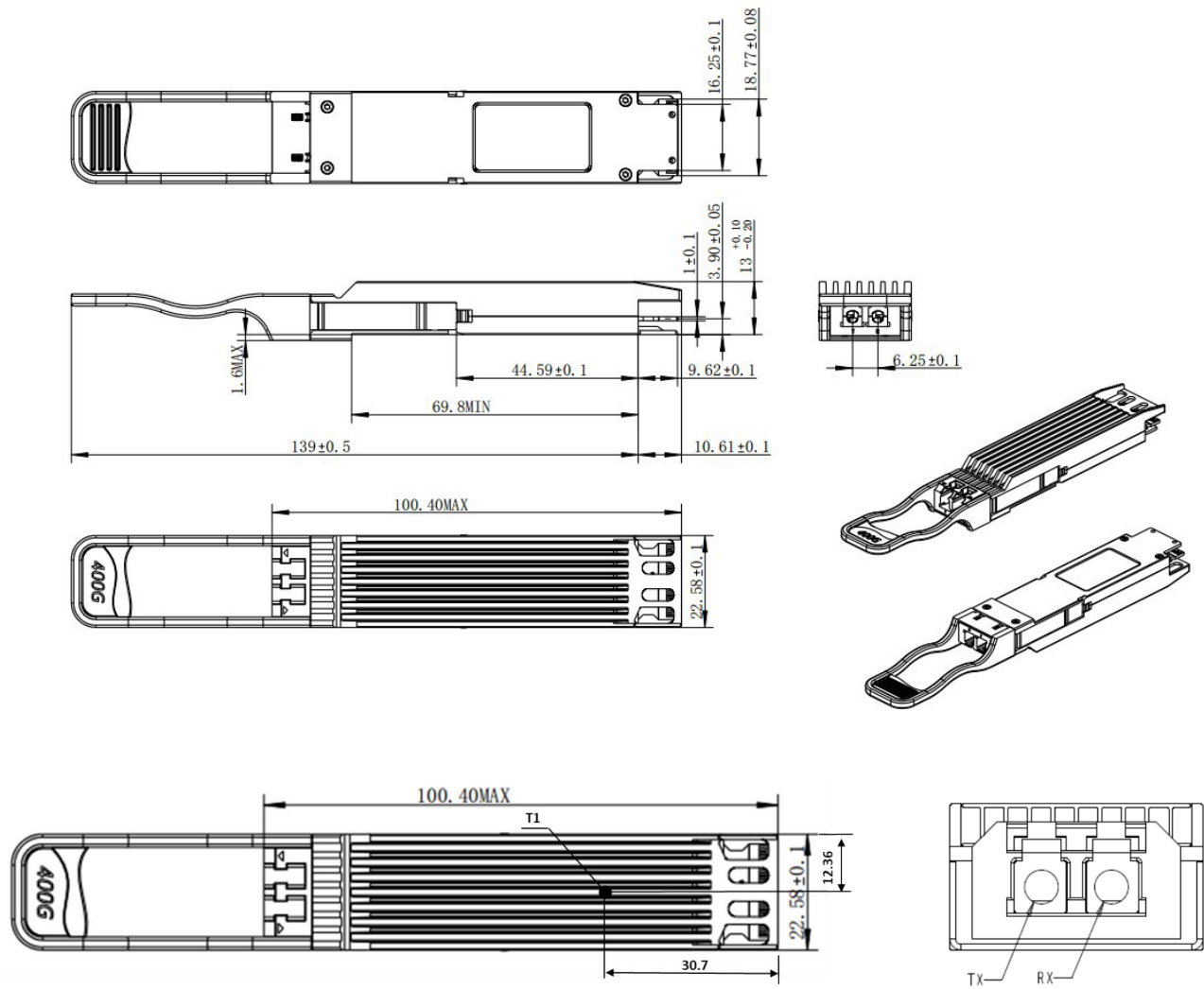
Recommended Power Supply Filter



Transceiver Block Diagram



Mechanical Specifications



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.

