MMA4Z00-NS400-AO

NVIDIA® MMA4Z00-NS400 Compatible TAA 400GBase-SR4 PAM4 OSFP112 RHS Transceiver (MMF, 850nm, 50m, MPO, DOM, CMIS 5.2)

Features:

- 4 x100Gbps MMF Optical Interface
- Up to 50m Link on OM4 Multi-Mode Fiber
- Each Electrical Channel Data Rate Up to 53.125Gbaud w/CDR
- CML Compatible Electrical I/O
- OSFP MSA Compliant
- 850nm VCSEL and PD Array Technology
- MPO-12 APC Optical Receptacle Type
- CMIS 5.2 Compliant
- Operating Temperature: 0 to 70 Celsius
- Hot-Pluggable
- RoHS Compliant and Lead-Free



Applications:

- 400GBase InfiniBand
- 400GBase Ethernet
- 1x Fibre Channel
- Access and Enterprise

Product Description

This NVIDIA® MMA4Z00-NS400 compatible OSFP112 RHS transceiver provides 400GBase-SR4 throughput up to 50m over multi-mode fiber (MMF) PAM4 using a wavelength of 850nm via an MPO 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 NVIDIA®. 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. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S.-made or designated country end products."

TAA COMPLIANT

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	Tstg	-40	+85	°C	
Relative Humidity – Storage	RHs	0	85	%	1
Relative Humidity – Operating	RHo	0	85	%	1
Module Supply Voltage	Vcc	-0.5	3.6	V	

Notes:

1. RH is a non-condensing condition.
2. Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	Tc	15	25	70	°C	1
Module Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Consumption	P			10	W	2
Module Supply Current	I_{IN}		2424		mA	
Electrical Signal Rate	Se		53.125		GBd	3
Optical Signal Rate	So		53.125		GBd	3

Notes:

1. Temperature range = C.
2. Power Class 5.
3. ±100ppm, each lane.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Signaling Rate	SR		53.125		GBd	1
Tx_Data Differential Input Voltage	VIN			900	mV	
Tx_Data Differential Input Impedance	ZIN		100		Ω	
Receiver						
Signaling Rate	SR		53.125		GBd	1
Rx_Data Differential Output Voltage	VOUT			900	mV	
Rx_Data Differential Output Impedance	ZOUT		100		Ω	

Notes:

1. ±100ppm, each lane.

Optical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter							
Signaling Rate		SR		53.125		GBd	1
Modulation Format		MF	PAM4				
Center Wavelength		λ	840		870	nm	
RMS Spectral Width		Δλ			0.65	nm	
Average Launch Power		POUT	-4.6		4	dBm	2
Outer Optical Modulation Amplitude	**For Max. (TECQ, TDECQ) ≤ 1.8dB**	OMAouter	-2.6		3.5	dBm	2
	For 1.8 ≤ Max. (TECQ, TDECQ) ≤ 4.4dB		-4.4 + Max. (TECQ, TDECQ)				
Transmitter and Dispersion Eye Closure for PAM4		TDECQ			4.4	dB	2
Transmitter Eye Closure for PAM4 (TECQ)		TECQ			4.4	dB	2
Over/Under-Shoot		O/Ushoot			29	%	2
Transmitter Power Excursion		TPE			2.3	dB	2
Extinction Ratio		ER	2.5			dB	2
Transmitter Transition Time		Time			17	ps	2
Average Launch Power of Off Transmitter		Poff			-30	dBm	2
$RIN_{14}OMA$		$RIN_{14}OMA$			-132	dB/Hz	
Optical Return Loss Tolerance		ORLT			14	dB	
Encircled Flux		EF	>=86% at 19μm <=30% at 4.5μm				

Receiver							
Signaling Rate		SR		53.125		GBd	1
Modulation Format		MF		PAM4			
Center Wavelength		λ	842		948	nm	
Damage Threshold		PDamage	5			dBm	
Average Receive Power		PIN	-6.3		4	dBm	3
Receive Power (OMAouter)		PIN(OMAouter)			3.5	dBm	2
Receiver Reflectance		RF			-15	dB	
Receiver Sensitivity (OMAouter)	**For TECQ ≤ 1.8dB**	Sens(OMAouter)			-4.4	dBm	4
	For 1.8B ≤ TECQ ≤ 3.4dB				-6.2+TECQ		
Stressed Receiver Sensitivity (OMAouter) Per Lane		Stressed-Sens (OMAouter)			-1.8	dBm	4

Notes:

1. ±100ppm, each lane.
2. Each lane.
3. Each lane. Average receive power, per lane (minimum), 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. Each lane. BER @ $2.4E^{-4}$.

Pin Descriptions

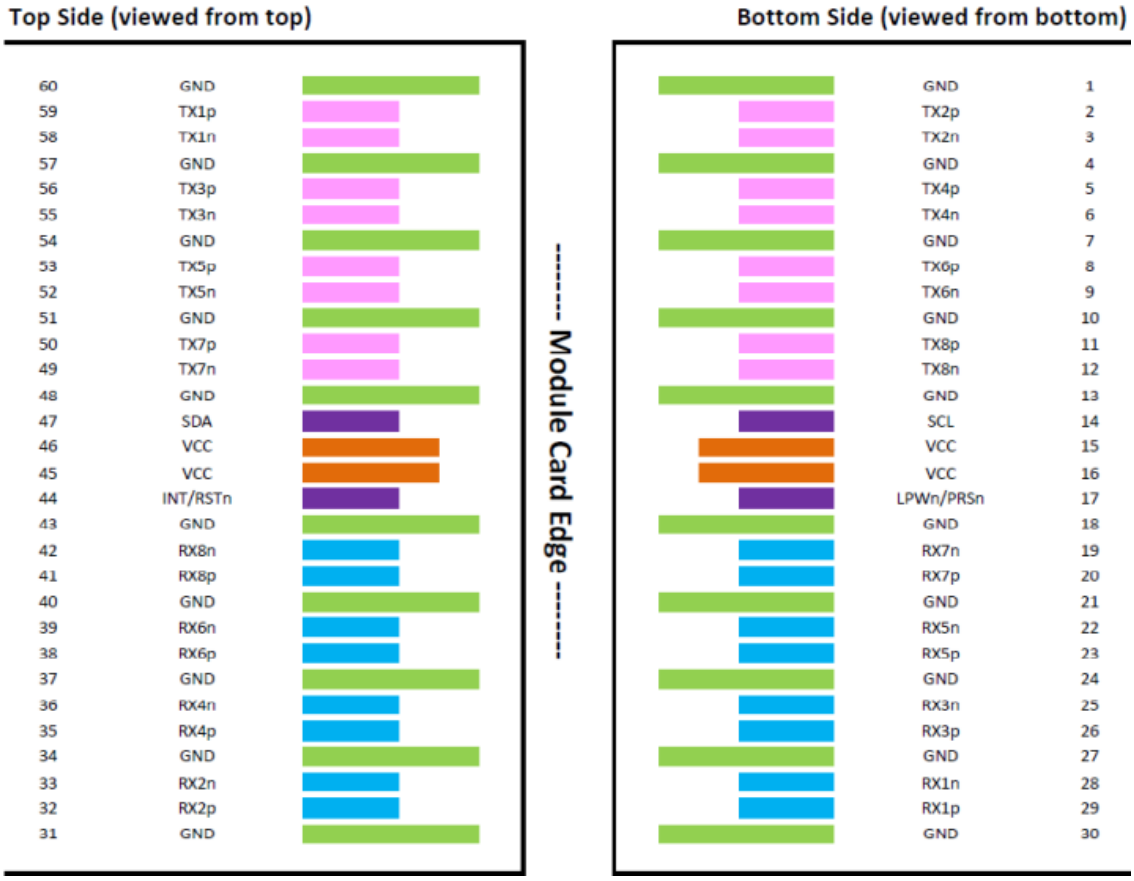
Pin	Logic	Symbol	Name/Description	Direction	Plug Sequence	Notes
1		GND	Module Ground.		1	
2	CML-I	Tx2p	CH2 Transmitter Non-Inverted Data.	Input from Host	3	
3	CML-I	Tx2n	Ch2 Transmitter Inverted Data.	Input from Host	3	
4		GND	Module Ground.		1	
5	CML-I	Tx4p	CH4 Transmitter Non-Inverted Data.	Input from Host	3	
6	CML-I	Tx4n	CH4 Transmitter Inverted Data.	Input from Host	3	
7		GND	Module Ground.		1	
8	CML-I	Tx6p	Not Connected.	Input from Host	3	
9	CML-I	Tx6n	Not Connected.	Input from Host	3	
10		GND	Module Ground.		1	
11	CML-I	Tx8p	Not Connected.	Input from Host	3	
12	CML-I	Tx8n	Not Connected.	Input from Host	3	
13		GND	Module Ground.		1	
14	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock.	Bi-Directional	3	1
15		Vcc	+3.3V Power Supply.	Power from Host	2	
16		Vcc	+3.3V Power Supply.	Power from Host	2	
17	Multi-Level	LPWn/PRSn	Low-Power Mode/Module Present.	Bi-Directional	3	2
18		GND	Module Ground.		1	
19	CML-O	Rx7n	Not Connected.	Output from Host	3	
20	CML-O	Rx7p	Not Connected.	Output from Host	3	
21		GND	Module Ground.		1	
22	CML-O	Rx5n	Not Connected.	Output from Host	3	
23	CML-O	Rx5p	Not Connected.	Output from Host	3	
24		GND	Module Ground.		1	
25	CML-O	Rx3n	CH3 Receiver Inverted Data.	Output from Host	3	
26	CML-O	Rx3p	CH3 Receiver Non-Inverted Data.	Output from Host	3	
27		GND	Module Ground.		1	
28	CML-O	Rx1n	CH1 Receiver Inverted Data.	Output from Host	3	
29	CML-O	Rx1p	CH1 Receiver Non-Inverted Data.	Output from Host	3	
30		GND	Module Ground.		1	
31		GND	Module Ground.		1	
32	CML-O	Rx2p	CH2 Receiver Non-Inverted Data.	Output from Host	3	
33	CML-O	Rx2n	CH2 Receiver Inverted Data.	Output from Host	3	
34		GND	Module Ground.		1	
35	CML-O	Rx4p	CH4 Receiver Non-Inverted Data.	Output from Host	3	

36	CML-O	Rx4n	CH4 Receiver Inverted Data.	Output from Host	3	
37		GND	Module Ground.		1	
38	CML-O	Rx6p	Not Connected.	Output from Host	3	
39	CML-O	Rx6n	Not Connected.	Output from Host	3	
40		GND	Module Ground.		1	
41	CML-O	Rx8p	Not Connected.	Output from Host	3	
42	CML-O	Rx8n	Not Connected.	Output from Host	3	
43		GND	Module Ground.		1	
44	Multi-Level	INT/RSTn	Module Input/Module Reset.	Bi-Directional	3	3
45		Vcc	+3.3V Power Supply.	Power from Host	2	
46		Vcc	+3.3V Power Supply.	Power from Host	2	
47	LVCMOS-I/O	SDA	2-Wire Serial Interface Data.	Bi-Directional	3	1
48		GND	Module Ground.		1	
49	CML-I	Tx7n	Not Connected.	Input from Host	3	
50	CML-I	Tx7p	Not Connected.	Input from Host	3	
51		GND	Module Ground.		1	
52	CML-I	Tx5n	Not Connected.	Input from Host	3	
53	CML-I	Tx5p	Not Connected.	Input from Host	3	
54		GND	Module Ground.		1	
55	CML-I	Tx3n	CH3 Transmitter Inverted Data.	Input from Host	3	
56	CML-I	Tx3p	CH3 Transmitter Non-Inverted Data.	Input from Host	3	
57		GND	Module Ground.		1	
58	CML-I	Tx1n	Ch1 Transmitter Inverted Data.	Input from Host	3	
59	CML-I	Tx1p	CH1 Transmitter Non-Inverted Data.	Input from Host	3	
60		GND	Module Ground.		1	

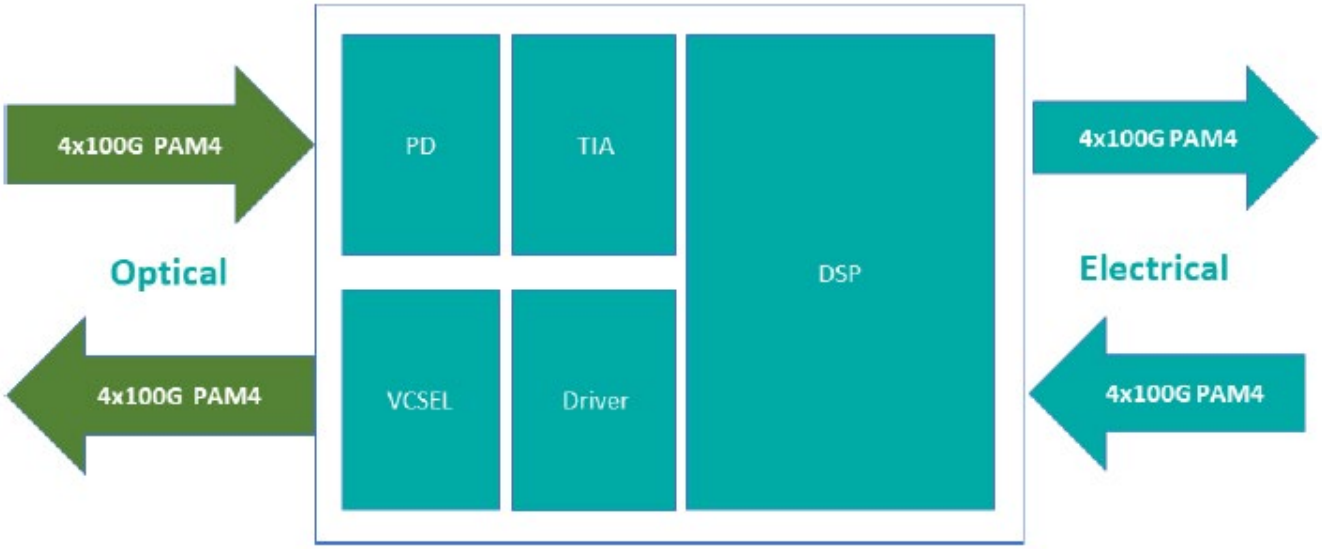
Notes:

1. Open-drain with pull-up resistor on the host.
2. LPWn/PRSn is a dual function signal that allows the host to signal low-power mode and allows the module to indicate that the module is present.
3. INT/RSTn is a dual function signal that allows the module to raise an interrupt to the host and allows the host to reset the module.

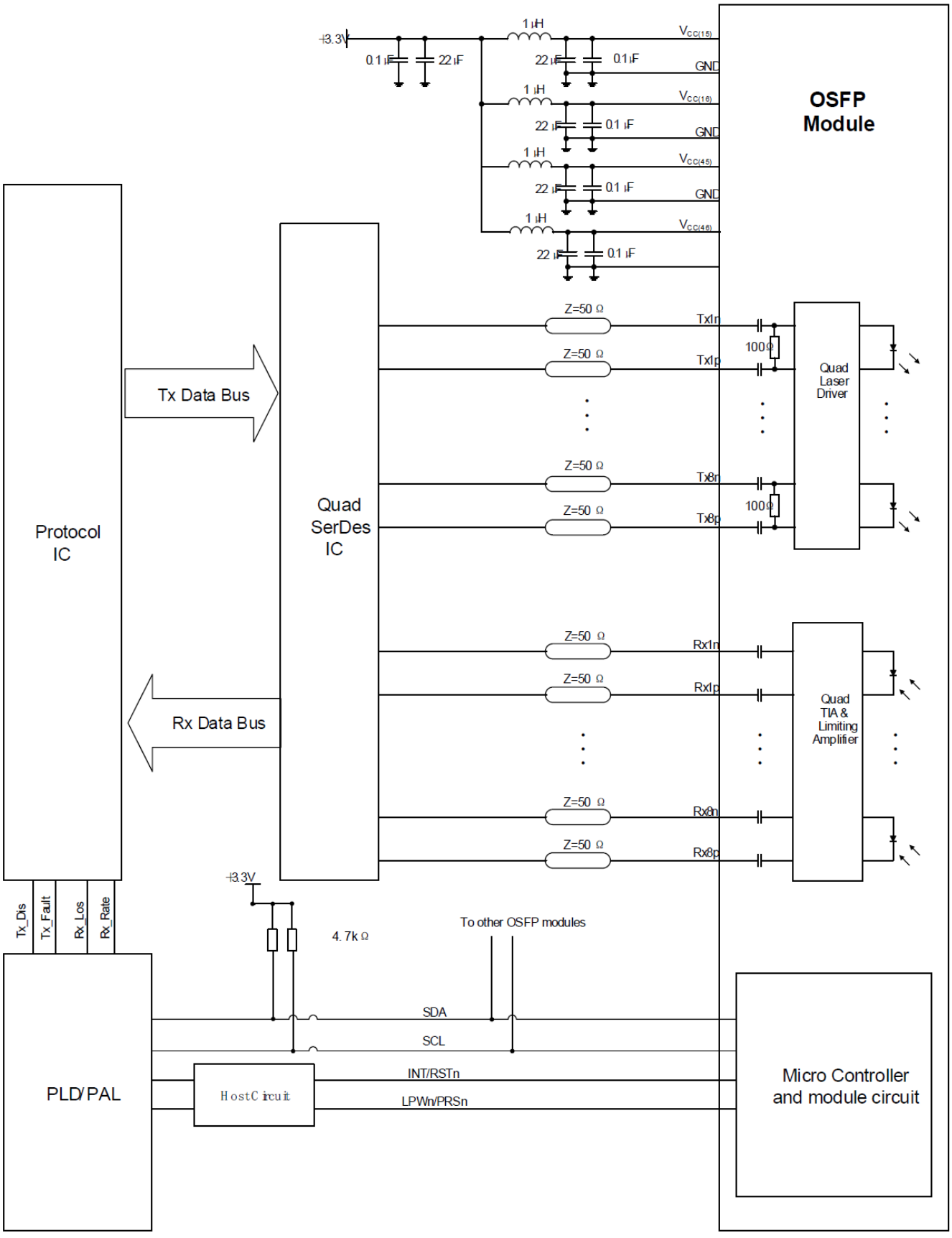
Pin Assignment



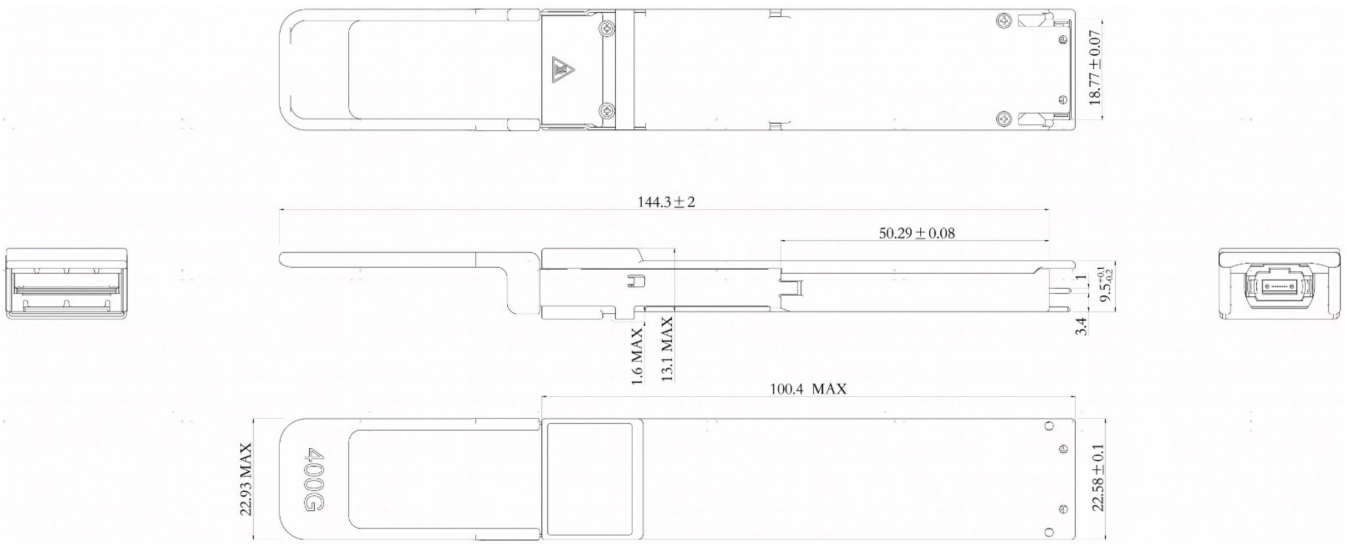
Transceiver Block Diagram



Electrical Interface



Mechanical Specifications



Notes:

1. Tolerance: ± 0.1mm.
2. Others according with OSFP MSA or customer specifications.
3. Optical port according to fiber connector specifications.

About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is ingrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications ranging from NEBS Level 3 to ISO 9001:2015 with every new development while maintaining the signature reliability of its products.



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