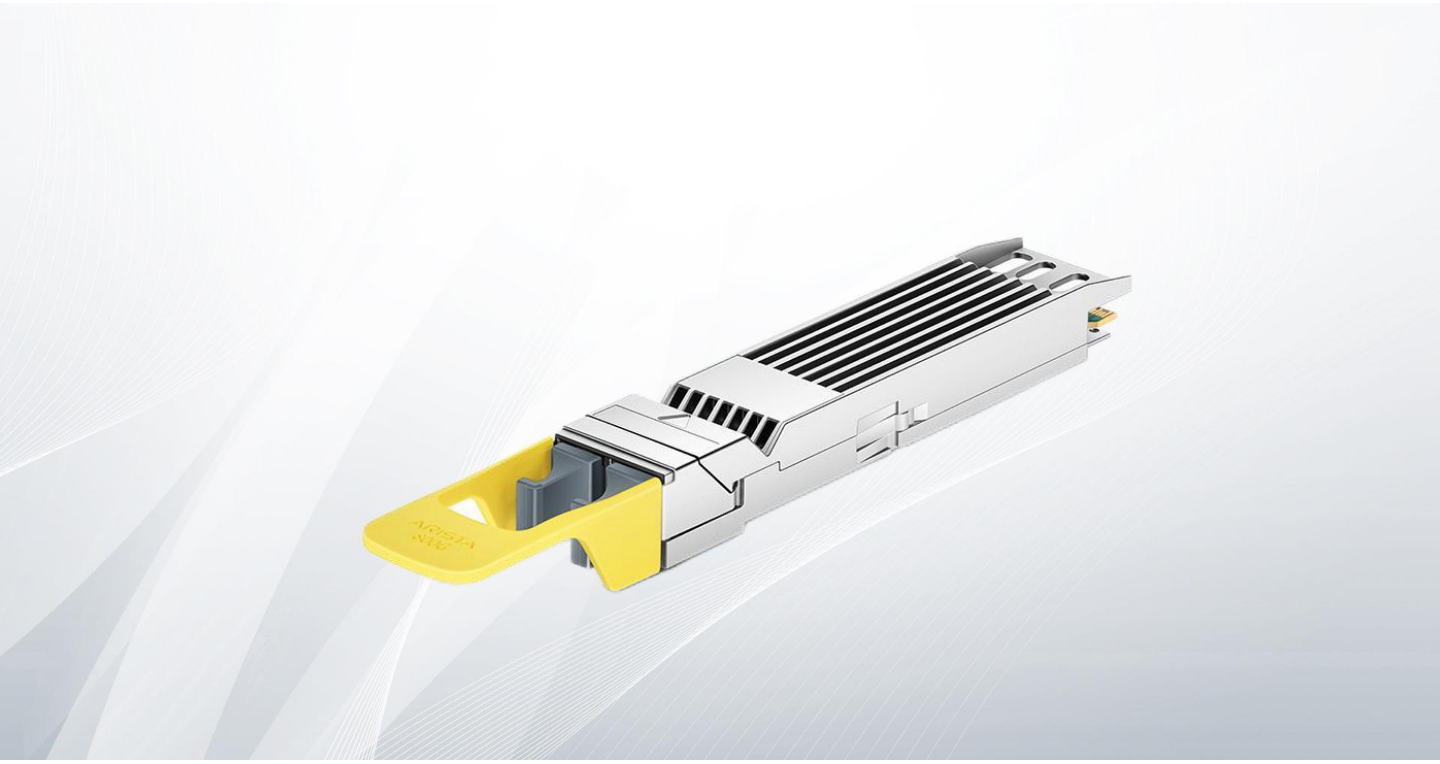
100% NVIDIA Compatible twin port transceiver, 800Gbps, 2xNDR, OSFP, 2xMPO, 1310nm SMF, up to 500m, finned 5 Year Warranty

PMS4X00-NM



Application

- 800G InifiniBand
- 2x 400GBASE-DR4
- Cloud Networks

Features

- Compliant with IEEE 802.3cu-2021: - 2x400GBASE-DR4 optical interface
- Compliant with IEEE P802.3ck D2.2 - 2x400GAUI-4 C2M electrical interface
- Compliant with OSFP MSA HW Rev 4.1 Type 2 housing with Dual MPO-12 connector
- Compliant with CMIS Rev 5.0
- Maximum Power Consumption 16.5W
- Operating Temperature Range: 0℃ ~ +70 ℃
- Two Wire Serial Interface with Digital Diagnostic Monitoring
- Class 1 Laser Safety

Description

The PNY for Mellanox MMS4X00-NM Compatible OSFP Optical Transceiver Module is designed for 800GBASE throughput up to 500m over single-mode fiber (SMF) with dual MTP/MPO-12 connectors. The OSFP-DR8-800G module can convert 8-channel 106.25Gb/s electrical data to 8-channel 106.25Gb/s optical signals. Similarly, it optically converts 8-channel 106.25Gb/s optical signals to 8-channel electrical data output on the receiver side. It has been designed to withstand the maximum range of external operating conditions including temperature, humidity and EMI. The OSFP-DR8-800G Optical Transceiver is a high performance, cost effective module for optical data communication applications supporting 800G InfiniBand.

Product Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature Range	TS	-40	85	ºC	
Supply Voltage	V_{CC}	-0.5	3.6	V	
Relative Humidity (non-condensing)	RH	5	95	%	
Data Input Voltage Differential	IV_{DIP}-$V_{DIN}I$		1	V	
Control Input Voltage	VI	-0.3	V_{CC}+0.5	V	
Control Output Current	I_O	-20	20	mA	

II. Recommended Operating Conditions

Parameter	Symbol	Min	Typ.	Max	Unit	Notes
Operating Case Temperature	T_{OPR}	0		70	ºC	1
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Instantaneous peak current at hot plug	I_{CC_IP}				mA	
Sustained peak current at hot plug	I_{CC_SP}				mA	
Maximum Power Dissipation	P_D			16.5	W	

Maximum Power Dissipation, Low Power Mode	P_{DLP}				W	
Signalling Speed per Lane	DRL		53.125		GBd	
Control Input Voltage High	V_{IH}	V_{CC}*0.7		V_{CC}+0.3	V	
Control Input Voltage Low	V_{IL}	-0.3		V_{CC}*0.3	V	
Two Wire Serial Interface Clock Rate				400	kHz	
Power Supply Noise 1 kHz - 1 MHz (p-p)				66	mVpp	
Operating Distance		2		500	m	

III. Optical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Notes
Wavelength	λ_C	1304.5	1311	1317.5	nm	
Transmitter (per Lane)						
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power, each lane	AOP_L	-2.9		4.0	dBm	1
Outer Optical Modulation Amplitude (OMAouter), each Lane	T_{OMA}	-0.8		4.2	dBm	
Launch Power in OMAouter minus TDECQ, each lane	$T_{OMA-TDECQ}$	-2.2			dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ			3.4	dB	
Average Launch Power of OFF Transmitter, each lane	T_{OFF}			-15	dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter transition time (max)	Tr			17	ps	

RIN21.4OMA (max)	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	ORL			21.4	dB	
Transmitter Reflectance	T_R			-26	dB	2
Receiver (Per lane)						
Wavelength L0	λ_{C0}	1304.5	1311	1317.5	nm	
Damage Threshold, each Lane	AOP_D	5			dBm	
Average Receive Power, each Lane	AOP_R	-5.9		4	dBm	
Receive Power (OMAouter), each Lane	OMA_R			4.2	dBm	
Receiver Reflectance	RR			-26	dB	
Receiver Sensitivity (OMAouter), each Lane	S_{OMA}			Max(–3.9, SECQ – 5.3)	dBm	3
Stressed Receiver Sensitivity (OMAouter), each Lane	SRS			-1.9	dBm	4
Conditions of stressed receiver sensitivity test						
Stressed eye closure for PAM4 (SECQ), lane under test	SECQ		3.4		dB	
OMAouter of each aggressor lane			4.2			

Notes:

1: Average launch power, each lane (min) is informative and not the principal indicator of signal strength

2: Transmitter reflectance is defined looking into the transmitter

3.Receiver sensitivity (OMAouter), each lane (max) is informative and is defined for a transmitter with a value of SECQ up to 3.4 dB.

4. Measured with conformance test signal at TP3 for the BER = $2.4x10^{-4}$

IV. Electrical Characteristics(compliant with IEEE P802.3ck C2M))

Parameter	Symbol	Min	Typ.	Max	Unit	Notes
Transmitter (per Lane)						
AC common-mode output Voltage (RMS)				25	mV	
Differential peak-to-peak output voltage **Short mode** **Long mode**				600 900	mV mV	
Eye height, differential	EH	15			mV	
Vertical eye closure	VEC			12	dB	
Common-mode to differential return loss	RLDc		802.3ck 120G-1		dB	
Effective return loss, ERL	ERL	8.5			dB	
Differential termination mismatch				10	%	
Transition time (20% to 80%)		8.5			ps	
Receiver (per Lane)						
Differential pk-pk input Voltage tolerance		900			mV	
AC common-mode RMS voltage tolerance (TP1a)		25			mV	
Differential to common-mode return loss	RLcd		802.3ck 120G-2		dB	
Effective return loss, ERL	ERL	8.5			dB	
Differential termination mismatch				10	%	
Single-ended voltage tolerance range		-0.4		3.3	V	
DC common-mode Voltage		-0.35		2.85	V	

V. Electrical Specification Low Speed Signal

Parameter	Symbol	Min	Max	Unit	Condition
Module output SCL and SDA	V_{OL}	0	0.4	V	
Module Input SCL and SDA	V_{IL}	-0.3	V_{CC}*0.3	V	
	V_{IH}	V_{CC}*0.7	V_{CC}+0.5	V	
LPMode/TxDis, ResetL and ModSelL	V_{IL}	-0.3	0.8	V	
	V_{IH}	2	V_{CC}+0.3	V	
IntL/RxLos	V_{OL}	0	0.4	V	
	V_{OH}	V_{CC}-0.5	V_{CC}+0.3	V	

VI. Pin Definitions

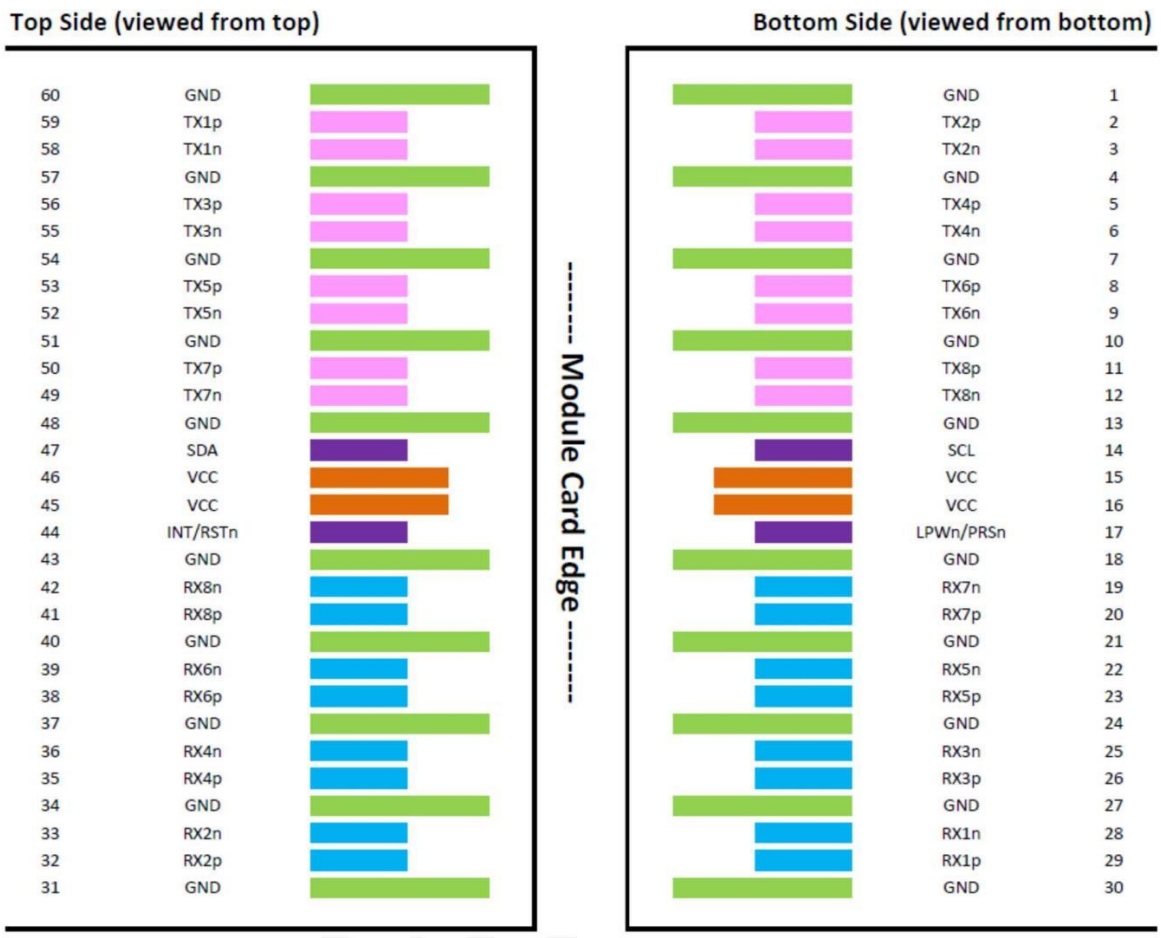


Figure 1 – Pinout definitions of OSFP module inputs/outputs

VII. Pin Definitions

PIN	Symbol	Description	Logic	Note
1	GND	Ground		
2	TX2p	Transmitter Data Non-Inverted	CML-I	
3	TX2n	Transmitter Data Inverted	CML-I	
4	GND	Ground		
5	TX4p	Transmitter Data Non-Inverted	CML-I	
6	TX4n	Transmitter Data Inverted	CML-I	
7	GND	Ground		
8	TX6p	Transmitter Data Non-Inverted	CML-I	
9	TX6n	Transmitter Data Inverted	CML-I	
10	GND	Ground		
11	TX8p	Transmitter Data Non-Inverted	CML-I	
12	TX8n	Transmitter Data Inverted	CML-I	
13	GND	Ground		
14	SCL	2-wire Serial interface clock	LVCMOS-I/O	
15	VCC	+3.3V Power		
16	VCC	+3.3V Power		
17	LPWn/P RSn	Low-Power Mode / Module Present	Multi-Level	
18	GND	Ground		
19	RX7n	Receiver Data Inverted	CML-O	
20	RX7p	Receiver Data Non-Inverted	CML-O	
21	GND	Ground		

22	RX5n	Receiver Data Inverted	CML-O	
23	RX5p	Receiver Data Non-Inverted	CML-O	
24	GND	Ground		
25	RX3n	Receiver Data Inverted	CML-O	
26	RX3p	Receiver Data Non-Inverted	CML-O	
27	GND	Ground		
28	RX1n	Receiver Data Inverted	CML-O	
29	RX1p	Receiver Data Non-Inverted	CML-O	
30	GND	Ground		
31	GND	Ground		
32	RX2p	Receiver Data Non-Inverted	CML-O	
33	RX2n	Receiver Data Inverted	CML-O	
34	GND	Ground		
35	RX4p	Receiver Data Non-Inverted	CML-O	
36	RX4n	Receiver Data Inverted	CML-O	
37	GND	Ground		
38	RX6p	Receiver Data Non-Inverted	CML-O	
39	RX6n	Receiver Data Inverted	CML-O	
40	GND	Ground		
41	RX8p	Receiver Data Non-Inverted	CML-O	
42	RX8n	Receiver Data Inverted	CML-O	
43	GND	Ground		
44	INT/RSTn	Module Interrupt / Module Reset	Multi- Level	
45	VCC	+3.3V Power		
46	VCC	+3.3V Power		
47	SDA	2-wire Serial interface data	LVCM OS-I/O	
48	GND	Ground		
49	TX7n	Transmitter Data Inverted	CML-I	
50	TX7p	Transmitter Data Non-Inverted	CML-I	
51	GND	Ground		
52	TX5n	Transmitter Data Inverted	CML-I	
53	TX5p	Transmitter Data Non-Inverted	CML-I	
54	GND	Ground		

55	TX3n	Transmitter Data Inverted	CML-I	
56	TX3p	Transmitter Data Non-Inverted	CML-I	
57	GND	Ground		
58	TX1n	Transmitter Data Inverted	CML-I	
59	TX1p	Transmitter Data Non-Inverted	CML-I	
60	GND	Ground		

VIII. Recommended OSFP Host Board Schematic

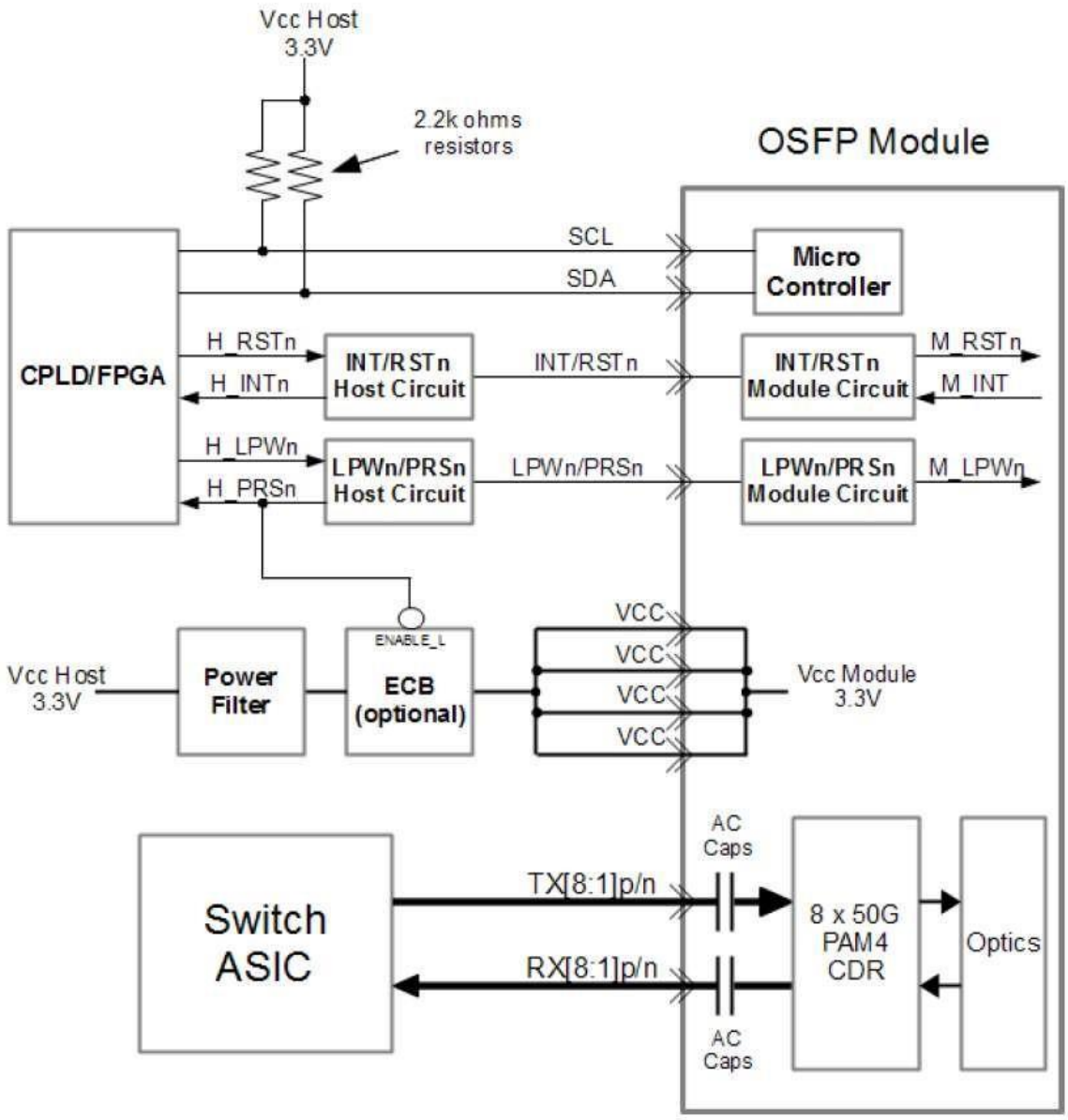
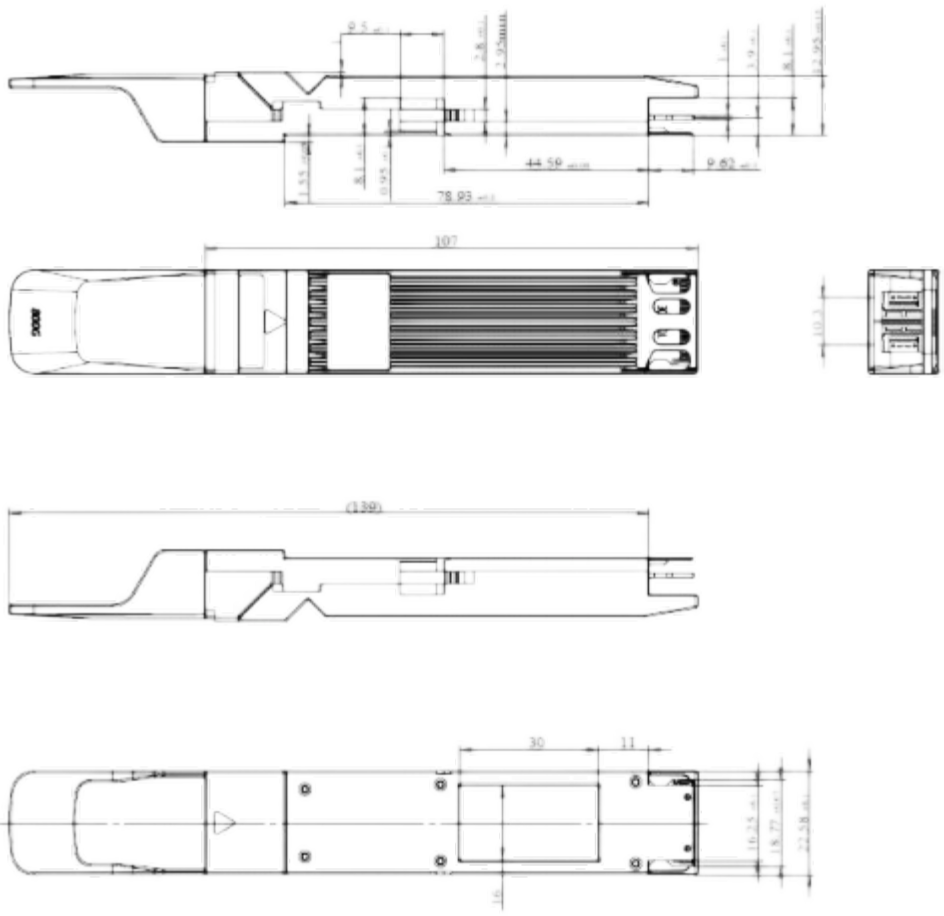


Figure 2. Recommended OSFP Host Board Schematic

IX. Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	ºC	Internal
Voltage	0 to V_{CC}	0.1	V	Internal
Tx Bias Current (Each Lane)	0 to 100	10%	mA	Internal
Tx Output Power (Each Lane)	-2.8 to +5.3	±3	dB	Internal
Rx Receive Power (Each Lane)	-9.1 to +5.3	±3	dB	Internal

X. Mechanical Diagram



Ordering Information

Part Number	Description
PMS4X00-NM	100% NVIDIA Compatible twin port transceiver, 800Gbps, 2xNDR, OSFP, 2xMPO, 1310nm SMF, up to 500m, finned 5 Year Warranty

Questions? Contact **GOPNY@PNY.COM**

PNY Technologies, Inc. 100 Jefferson Road, Parsippany, NJ 07054 | Tel 973-515-9700 | Fax 973-560-5590 | www.PNY.com