25G SFP28 Passive Direct Copper Cables

ND-P2AXX-XXX

1. Applications

- 25G Ethernet
- InfiniBand, Fiber Channel 25G
- Sonet Multiplatform support
- High Performance Computing Clusters
- High End Servers
- Metro Network Switch/Cross Connect

2. Features

- Up to 25Gb/s data rate SFF-8402 Compliant
- Operating case temperature of 0-70 °C
- Single 3.3V supply voltage
- BER better than 10-15
- Hot pluggable
- RoHS-6 compliant
- IEEE P802.3 by compliant

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3. Description

The NEME ND-P2AXX-XXX passive copper cable is a high speed, cost-effective 25Gbp/s Ethernet connectivity solution designed to meet the growing needs for higher bandwidth in data centers.

The ND-P2AXX-XXX passive copper cable contains a single high-speed copper pair, operating at data rates of up to 25 Gb/s. The cables are compliant with IEEE P802.3by Ethernet standard and SFF-8402 SFP28 standard. Each SFP28 connector comprises an EEPROM providing product information which can be read by the host system

NEME's unique quality passive copper cable solutions provide efficient connectivity for short distance interconnects. It enables higher port bandwidth, density and configurability at a low cost and reduced power requirement in the data centers .Rigorous production testing ensures the best out-of -the-box installation experience, performance, and durability.

4. standard

- Compliant with SFF-8402 and SFF-8432
- Compliant with IEEE P802.3
- RoHS Compliant

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5. Performance Specifications

5.1. Absolute Maximum Ratings

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Table.1 Absolute maximum ratings

Parameter	Symbol	Min	Max	Unit
Maximum Supply Voltage	Vcc	0	3.6	V
Storage Temperature	Ts	-40	85	°C
Relative Humidity	RH	5	95	%

5.2. Recommended Operating Conditions

Table.2 Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard Tc	0	25	70	°C
Storage Temperature	Ts	-40		125	°C
Power Supply Voltage	Vcc	3.13	3.30	3.47	V
Power Supply Current	Icc	0.001			mA
Power Dissipation	PD			0.003	W
Relative Humidity	RH	5		95	%
Voltage on LVTTL Input	Vilvttl	-0.3		VCC3+0.2	V
Data Rate			25		Gbps

5.3. Frequency Domain

Table.3 Frequency Domain

Item	Test Parameter	IEEE802.3by Specification
1	Differential Insertion Loss (SDD21)	Maximum insertion loss at 12.8906Ghz -22.48dB Minimum insertion loss at 12.8906Ghz -8dB
2	Differential Insertion Loss (SDD21)	Maximum insertion loss at 12.8906Ghz -22.48dB Minimum insertion loss at 12.8906Ghz -8dB
3	Differential Return Loss (SDD22)	-16.5+2xSQRT(f) @ 0.01 to 4.1GHz -10.66+14xLog10(f/5.5) @4.1 to 19GHz
4	Differential Return Loss (SDD11)	-16.5+2xSQRT(f) @ 0.01 to 4.1GHz -10.66+14xLog10(f/5.5) @4.1 to 19GHz
5	Common Mode Reflection (SCC22)	-2dB @ 0.01 to 19GHz
6	Common Mode Reflection (SCC11)	-2dB @ 0.01 to 19GHz
7	Common Mode Conversion (SCD22)	-22+(20/25.78)*(f) @ 0.01 to 12.89GHz -15+(6/25.78)*(f) @ 12.9 to 19GHz
8	Common Mode Conversion (SCD11)	-22+(20/25.78)*(f) @ 0.01 to 12.89GHz -15+(6/25.78)*(f) @ 12.9 to 19GHz
9	Differential to Common Mode Conversion Loss (SCD12)	-10dB @ 0.01 to 12.89GHz -27+(29/22)*(f) @ 12.9 to 15.7GHz -6.3dB @ 15.71 to 19GHz
10	Differential to Common Mode Conversion Loss (SCD21)	-10dB @ 0.01 to 12.89GHz -27+(29/22)*(f) @ 12.9 to 15.7GHz -6.3dB @ 15.71 to 19GHz

5.4. Time Domain

Table.4 Time Domain

Item	Test Parameter	Specification (Proposal)
1	Intra-Skew*	
	1M	20ps Max
	1.5M~2M	25ps Max
	2.5M~3M	30ps Max
2	Differential Impedance Rise time：14ps (20%~80%)	100 +/- 10 Ohm
3	Insertion Loss* (SDD21) for 1M	a) 0.6GHz : -2.11 dB Max
		b) 1.25GHz : -2.88 dB Max
		c) 2.50GHz : -3.78 dB Max
		d) 3.25GHz : -4.95 dB Max
		e) 5.0GHz : -5.82 dB Max

3	Insertion Loss* (SDD21) for 1.5M	a) 0.6GHz : -2.13 dB Max
		b) 1.25GHz : -3.24 dB Max
		c) 2.50GHz : -4.44 dB Max
		d) 3.25GHz : -5.99 dB Max
		e) 5.0GHz : -6.90 dB Max
3	Insertion Loss* (SDD21) for 2M	a) 0.6GHz : -2.32 dB Max
		b) 1.25GHz : -3.76 dB Max
		c) 2.50GHz : -5.26 dB Max
		d) 3.25GHz : -7.20 dB Max
		e) 5.0GHz : -8.14 dB Max
3	Insertion Loss* (SDD21) for 2.5M	a) 0.6GHz : -2.58 dB Max
		b) 1.25GHz : -3.74 dB Max
		c) 2.50GHz : -5.27 dB Max
		d) 3.25GHz : -6.15 dB Max
		e) 5.0GHz : -8.38 dB Max
3	Insertion Loss* (SDD21) for 3M	a) 0.6GHz : -2.86 dB Max
		b) 1.25GHz : -4.24 dB Max
		c) 2.50GHz : -6.02 dB Max
		d) 3.25GHz : -6.99 dB Max
		e) 5.0GHz : -9.50 dB Max

Notes:

The item 1and 3, Different diameter and length requirements, Different specification

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5.5. Pin Definitions

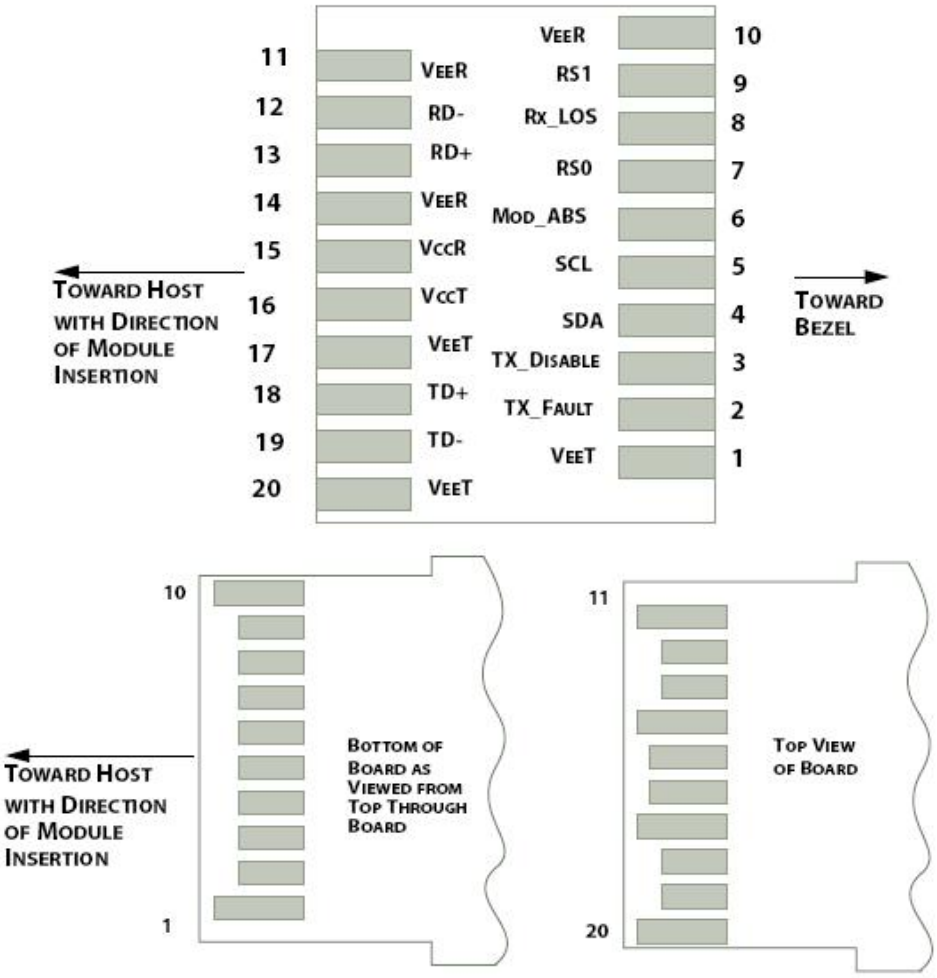


Table.5 Pin Definitions

PIN	Symbol	Description	Remarks
1	$V_{EE}T$	Transmitter ground (common with receiver ground)	Circuit ground is isolated from chassis ground
2	Tx_Fault	Transmitter Fault. Not supported	
3	Tx_Disable	Transmitter Disable. Laser output disable on high or open	Disabled: TDIS>2V or open Enabled: TDIS<0.8V
4	SDA	2-wire Serial Interface Data Line	Should Be pulled up with 4.7k – 10k ohm on host board to a voltage between 2V and 3.6V
5	SCL	2-wire Serial Interface Clock Line	
6	M_{OD}_ABS	Module Absent. Grounded within the module.	
7	RS0	No connection required	
8	RX_LOS	Loss of Signal indication. Logic 0 indicates	LOS is open collector output

		normal operation	
9	RS1	No connection required	
10	$V_{EE}R$	Receiver ground (common with transmitter ground)	Circuit ground is isolated from chassis ground
11	$V_{EE}R$	Receiver ground (common with transmitter ground)	
12	RD–	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	$V_{EE}R$	Receiver ground (common with transmitter ground)	Circuit ground is isolated from chassis ground
15	$V_{CC}R$	Receiver power supply	
16	$V_{CC}T$	Transmitter power supply	
17	$V_{EE}T$	Transmitter ground (common with receiver ground)	Circuit ground is isolated from chassis ground
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD–	Transmitter Inverted DATA in. AC coupled	
20	$V_{EE}T$	Transmitter ground (common with receiver ground)	Circuit ground is isolated from chassis ground

5.6. Wire Interface EEPROM

The EEPROM on the SFP28 passive cable assembly is designed for 256 addresses. The information for addresses 0 to 127 is listed below. This information can be tailored to any customer request. Any address can be altered to display customer specific information and more memory can be added if more addresses are needed. Addresses128 to 255 can be reserved for customer specific information that is in addition to the SFF 8431 specification.

6. Aplication Cautions

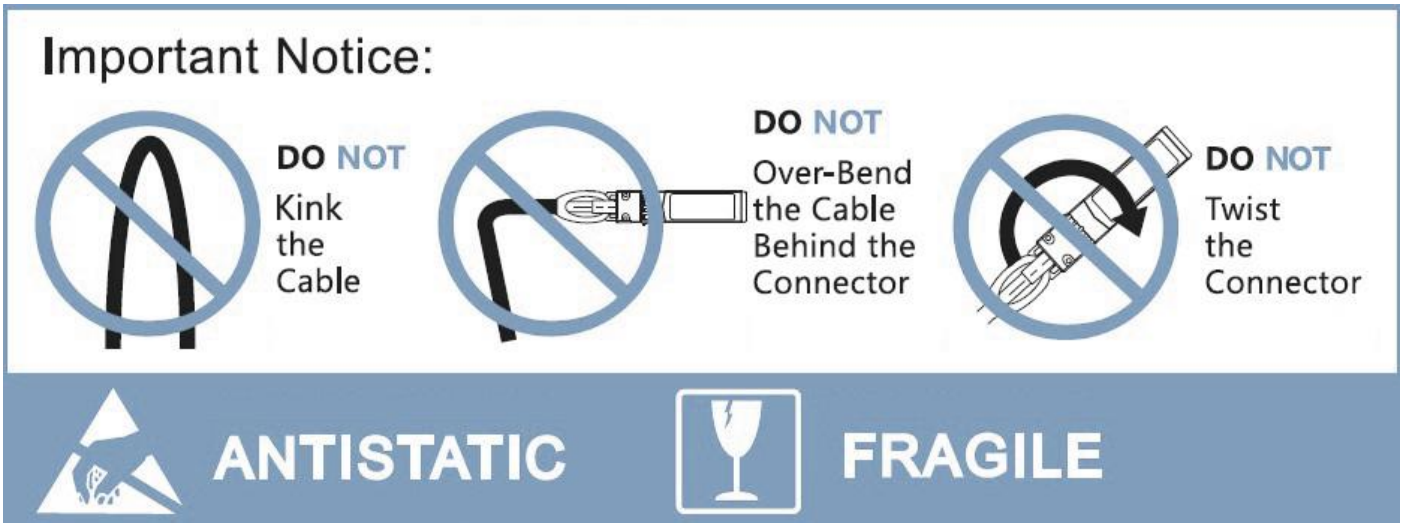
6.1. ESD

This transceiver is specified as ESD threshold 1kV for high speed pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

6.2. LASER SAFTY

This is a Class 1 Laser Product according to IEC 60825-1:1993:+A1:1997+A2:2001. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (July 26, 2001)

6.3. Important Notice



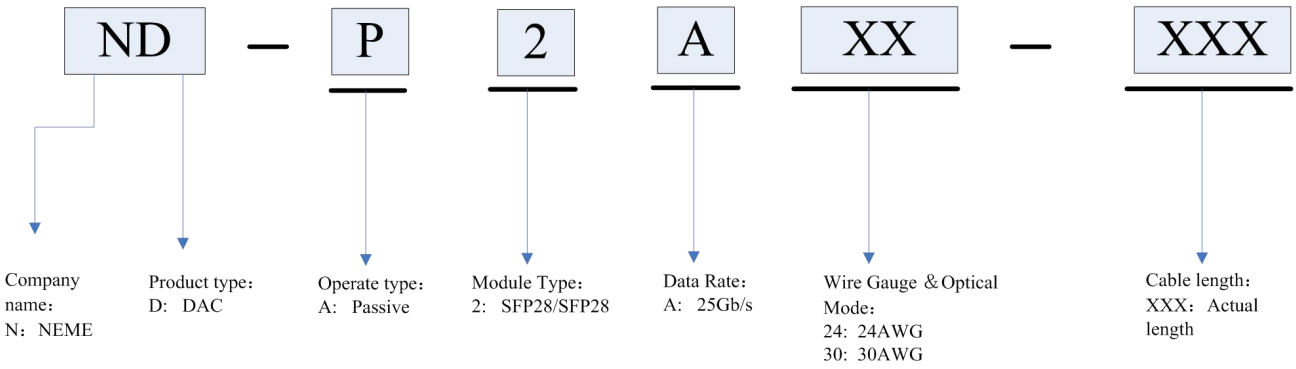
Note:

1)Copper type maximum length recommended at 15 meters;

2)Various cable lengths available for all types;

3)Latch/tab available”on top”or”bottom”position.

7. Order Information



Further Information

For further information, please contact NEME.

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