NTK592NVE5-C
Ciena® NTK592NVE5 Compatible TAA OC-3-CWDM SFP Transceiver (SMF, 1510nm, 150km, LC)

Features:

- Operating Data Rate up to 155Mbps
- 1510nm DFB Laser Transmitter
- Single 3.3V Power Supply
- Hot-Pluggable SFP Footprint Duplex LC Connector Interface
- Laser Safety Compliant
- Operating Temperature 0˚C to 70˚C
- Compliant with MSA SFP Specifications
- Compliant with SFF-8472
- RoHS compliant and Lead Free

Applications:

- Ethernet over CWDM
- Access, Metro and Enterprise

Product Description:
This Ciena® NTK592NVE5 compatible SFP transceiver provides OC-3 (155 mbs) CWDM transmission rates for up to 150km over single-mode fiber (SMF) using a wavelength of 1510nm via an LC connector. The listed reach has been determined using a link budget calculation and tested in a standard environment. Actual link distances achieved will be dependent upon the deployed environment. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Ciena®. 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. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

ProLabs' 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."

Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883E Method 3015.4.
- ESD to the LC Receptacle: compatible with IEC 61000-4-3.
- EMI/EMC: compatible with FCC Part 15 Subpart B Rules, EN55022:2010.
- Laser Eye Safety: compatible with FDA 21CFR, EN60950-1& EN (IEC) 60825-1, 2.
- RoHS: compliant with EU RoHS 2.0 directive 2015/863/EU.

CWDM Available Wavelengths

Wavelengths	Min.	Typ.	Max.
27	1264	1270	1277.5
29	1284	1290	1297.5
31	1304	1310	1317.5
33	1324	1330	1337.5
35	1344	1350	1357.5
37	1364	1370	1377.5
39	1384	1390	1397.5
41	1404	1410	1417.5
43	1424	1430	1437.5
45	1444	1450	1457.5
47	1464	1470	1477.5
49	1484	1490	1497.5
51	1504	1510	1517.5
53	1524	1530	1537.5
55	1544	1550	1557.5
57	1564	1570	1577.5
59	1584	1590	1697.5
61	1604	1610	1617.5

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0	25	70	°C	
Relative Humidity	RH	5		95	%	
Data Rate			155		Mbps	
Power Supply Current	Icc			300	mA	

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage		Vcc	3.15	3.3	3.45	V	
Link Budget			37			dB	
Data Rate				155		Mbps	
Transmitter							
LVPECL Inputs (Differential)		VIN	400		2000	mVp-p	1
Input Differential Impedance		ZIN	85	100	115	Ω	2
Tx_Disable	**Disable**		2		Vcc+0.3	V	
	Enable		0		0.8	V	
Tx_Fault	**Fault**		2		Vcc+0.3	V	
	Normal		0		0.8	V	
Receiver							
LVPECL Outputs (Differential)		VOUT	400		2000	mVp-p	3
Output Differential Impedance		ZOUT	85	100	115	Ω	
Tx_Disable Assert Time		Toff			10	us	
Rx_LOS	**Loss of Signal (LOS)**		2		Vcc+0.3	V	
	Normal Operation		0		0.8	V	
MOD_DEF(0.2)		VOH	2.5			V	4
		VOL	0		0.5	V	

Notes:

1. AC coupled inputs. Output is coupled into a 9/125µm single-mode fiber.
2. RIN>100kΩ @ DC.
3. AC coupled outputs. Output is coupled into a 9/125µm single-mode fiber.
4. With Serial ID.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λC	1504	1510	1517.5	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Average Output Power	POUT	2		7	dBm	1
Side-Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	10			dB	2
Rise/Fall Time (20-80%)	Tr/Tf			2	ps	
Total Jitter		TJ		4.5	UI	3
POUT @ Tx_Disable Asserted	POUT			-45	dBm	
Output Optical Eye	ITU-T G.957 Compliant					4
Receiver						
Center Wavelength	λC	1100		1650	nm	
Receiver Sensitivity	Pmin			-35	dBm	3
Receiver Overload	Pmax	-10			dBm	
LOS De-Assert	LOSD			-36	dBm	
LOS Assert	LOSA	-45			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Output power is measured by coupling into a 9/125mm single-mode fiber.
2. Filtered. Measured with a PRBS 2^{23}-1 test pattern @155Mbps.
3. Minimum average optical power is measured at BER less than $1E^{-10}$ with 2^{23}-1 PRBS and ER=10dB.
4. Filtered. Measured with a PRBS 2^{23}-1 test pattern @155Mbps. Eye pattern mask.

Pin Descriptions

Pin	Symbol	Name/Descriptions	Plug Seq.	Ref.
1	VeeT	Transmitter Ground.	1	5
2	Tx_Fault	Transmitter Fault Indication.	3	1
3	Tx_Disable	Transmitter Disable. Module disables on “high” or “open.”	3	2
4	MOD-DEF2	Module Definition 2. 2-Wire Serial ID Interface.	3	3
5	MOD-DEF1	Module Definition 1. 2-Wire Serial ID Interface.	3	3
6	MOD-DEF0	Module Definition 0. Grounded within the module.	3	3
7	Rate Select	Not Connected.	3	Function Not Available
8	LOS	Loss of Signal.	3	4
9	VeeR	Receiver Ground.	1	5
10	VeeR	Receiver Ground.	1	5
11	VeeR	Receiver Ground.	1	5
12	RD-	Inverse Received Data Out.	3	6
13	RD+	Received Data Out.	3	7
14	VeeR	Receiver Ground.	1	5
15	VccR	3.3 ± 5% Receiver Power.	2	7
16	VccT	3.3 ± 5% Transmitter Power.	2	7
17	VeeT	Transmitter Ground.	1	5
18	TD+	Transmitter Data In.	3	8
19	TD-	Inverse Transmitter Data In.	3	8
20	VeeT	Transmitter Ground.	1	5

Notes:

1. Tx_Fault is an open collector/drain output which should be pulled up with a 4.7kΩ–10kΩ resistor on the host board. When “high,” output indicates a laser fault of some kind. “Low” indicates normal operation. In the low state, the output will be pulled to <0.8V.

2. Tx_Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7kΩ–10kΩ resistor. Its states are:

   Low (0V – 0.8V): Transmitter On (>0.8, <2.0V): Undefined.

   High (2.0V – 3.465V): Transmitter Disabled Open: Transmitter Disabled.

3. MOD-DEF0, 1, and 2. These are the module definition pins. They should be pulled up with a 4.7kΩ–10kΩ resistor on the host board.

   MOD-DEF 0 is grounded by the module to indicate that the module is present.

   MOD-DEF 1 is the clock line of 2-wire serial interface for serial ID.

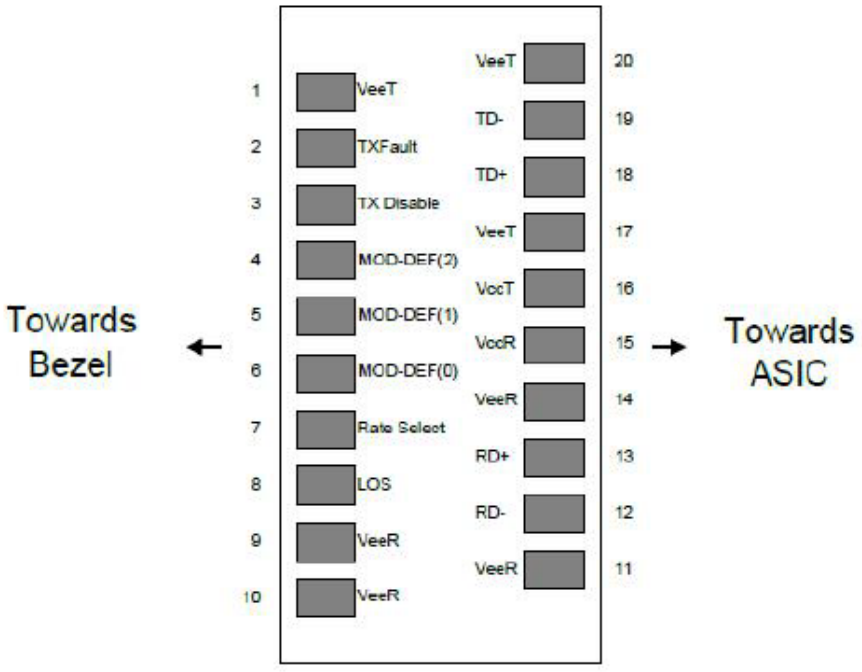
   MOD-DEF 2 is the data line of 2-wire serial interface for serial ID.

4. LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7kΩ–10kΩ

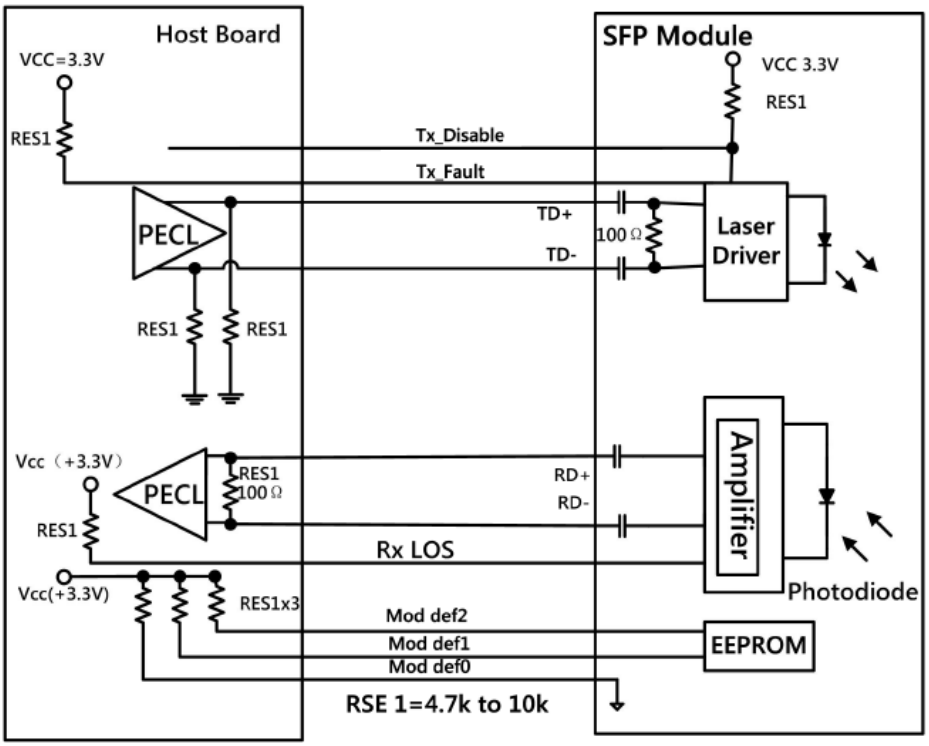
resistor. When “high,” this output indicates that the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). “Low” indicates normal operation. In the “low” state, the output will be pulled to <0.8V.

5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+: these are the differential receiver outputs. They are AC coupled 100Ω (differential) lines which should be terminated with 100Ω (differential) at the user SERDES. The voltage swing on these lines will be between 400mV and 2000mV differential (200mV –1000mV single-ended) when properly terminated.
7. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V±5% at the SFP connector pin. Maximum supply current is 300mA. VccR and VccT may be internally connected within the SFP transceiver module.
8. TD-/+: these are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential terminations inside the module. The inputs will accept differential swings of 400mV -2000mV (200mV – 1000mV single-ended).

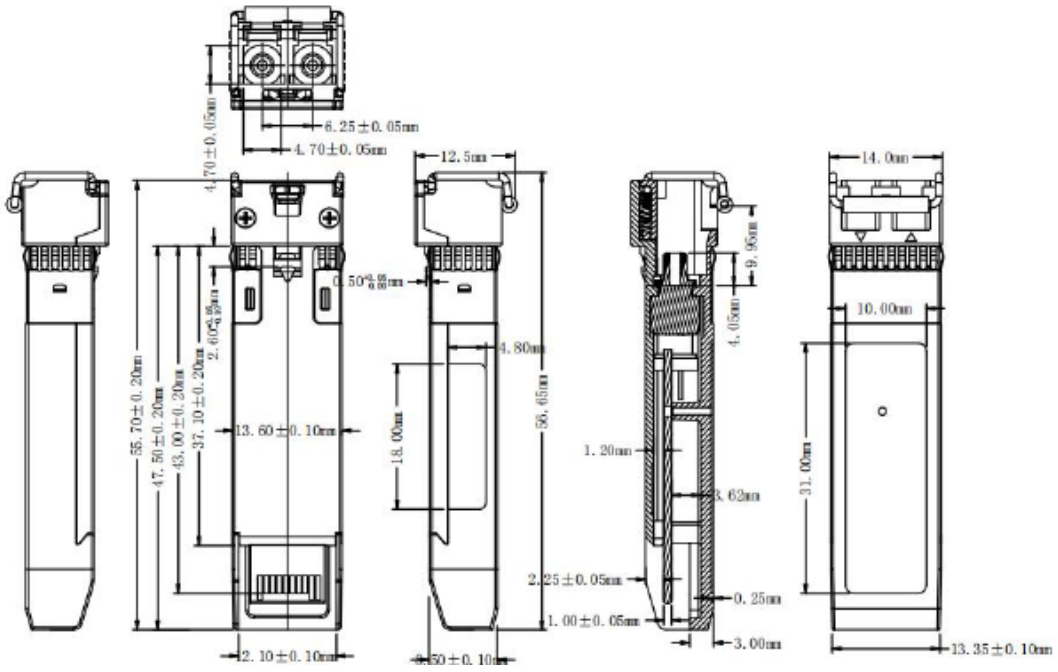
Electrical Pin-Out Details



Recommended Application Interface Block Diagram

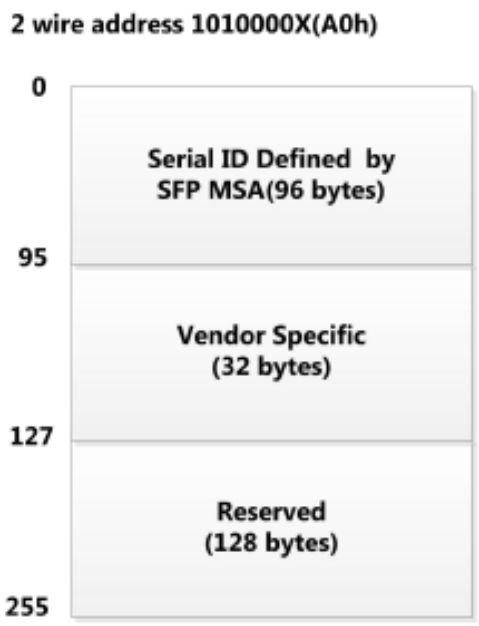


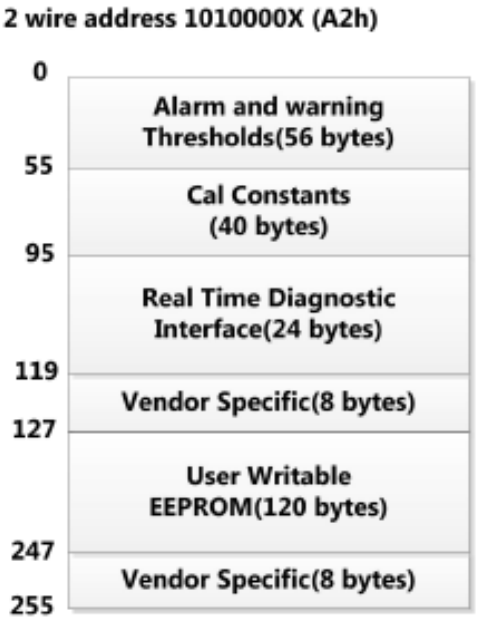
Mechanical Specifications



EEPROM Information

The serial interface uses the 2-wire serial CMOS EEPROM protocol defined for the ATMEL AT24c02/04 family of components. When the serial protocol is activated, the host generates the serial clock signal (SCL). The positive edge clocks data into those segments of the EEPROM that are not write protected within the SFP+ transceiver. The negative edge clocks data from the SFP+ transceiver. The serial data signal (SDA) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Calibration and alarm/warning threshold data is written during device manufacture. Received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring, and temperature monitoring all are implemented. If the module is defined as externally calibrated, the diagnostic data are raw A/D values and must be converted to real-world units using calibration constants stored in EEPROM locations 56‐95 at wire serial bus address A2h. The digital diagnostic memory map-specific data field defined as the following. For detailed EEPROM information please refer to the related document of SFF8472 Rev 10.2.





About ProLabs

Our experience comes as standard; for over 15 years ProLabs has delivered optical connectivity solutions that give our customers freedom and choice through our ability to provide seamless interoperability. At the heart of our company is the ability to provide state-of-the-art optical transport and connectivity solutions that are compatible with over 90 optical switching and transport platforms.

Complete Portfolio of Network Solutions

ProLabs is focused on innovations in optical transport and connectivity. The combination of our knowledge of optics and networking equipment enables ProLabs to be your single source for optical transport and connectivity solutions from 100Mb to 400G while providing innovative solutions that increase network efficiency. We provide the optical connectivity expertise that is compatible with and enhances your switching and transport equipment.

Trusted Partner

Customer service is our number one value. ProLabs has invested in people, labs and manufacturing capacity to ensure that you get immediate answers to your questions and compatible product when needed. With Engineering and Manufacturing offices in the U.K. and U.S. augmented by field offices throughout the U.S., U.K. and Asia, ProLabs is able to be our customers best advocate 24 hours a day.

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