

## **XCVR-V40V31-AO**

Ciena® XCVR-V40V31 Compatible TAA 25GBase-ER SFP28 Transceiver (SMF, 1310nm, 40km, LC, DOM, -40 to 85C)

### **Features**

- SFF-8432 and SFF-8472 Compliance
- Duplex LC Connector
- Industrial Temperature -40 to 85 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### **Applications**

- 25GBase-ER Ethernet
- Access, Metro and Enterprise

### **Product Description**

This Ciena® XCVR-V40V31 compatible SFP28 transceiver provides 25GBase-ER throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is capable of withstanding rugged environments and can operate at temperatures between -40 and 85C. 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. 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.")



### 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

### Absolute Maximum Ratings

| Parameter                                       | Symbol | Min. | Typ.           | Max.               | Unit | Notes |
|-------------------------------------------------|--------|------|----------------|--------------------|------|-------|
| Maximum Supply Voltage                          | Vcc    | -0.5 |                | 4.0                | V    |       |
| Storage Temperature                             | TS     | -40  |                | 85                 | °C   |       |
| Operating Case Temperature                      | Tc     | -40  | 25             | 85                 | °C   |       |
| Operating Humidity                              | RH     | 5    |                | 95                 | %    |       |
| Receiver Power                                  | Rmax   |      |                | -4                 | dBm  |       |
| Data Rate                                       |        |      | 24.33<br>25.78 |                    | Gbps |       |
| Bit Error Rate                                  | BER    |      |                | $5 \times 10^{-5}$ |      | 1     |
| Supported Link Length on 9/125um SMF, 25.78Gb/s | L      |      | 40             |                    | km   | 2     |

### Notes:

1. Tested with a PRBS 2<sup>31</sup>-1 test pattern for 25.78Gb/s operation.
2. Distances are based on FC-PI-6 Rev. 3.1 and IEEE 802.3 standards.

## Electrical Characteristics

| Parameter                        |                      | Symbol                          | Min.  | Typ. | Max.    | Unit  | Notes |
|----------------------------------|----------------------|---------------------------------|-------|------|---------|-------|-------|
| Power Supply Voltage             |                      | V <sub>cc</sub>                 | 3.135 | 3.30 | 3.465   | V     |       |
| Power Supply Current             |                      | I <sub>cc</sub>                 |       |      | 545     | mA    |       |
| Power Dissipation                |                      | PD                              |       |      | 1800    | mW    |       |
| Transmitter                      |                      |                                 |       |      |         |       |       |
| Differential data input swing    |                      | V <sub>in,pp</sub>              | 180   |      | 700     | mVp-p |       |
| Input differential impedance     |                      | Z <sub>in</sub>                 |       | 100  |         | Ω     |       |
| TX_FAULT                         | Transmitter Fault    | VOH                             | 2.0   |      | VCCHOST | V     |       |
|                                  | Normal Operation     | VOL                             | 0     |      | 0.8     | V     |       |
| TX_DISABLE                       | Transmitter Disable  | VIH                             | 2.0   |      | VCCHOST | V     |       |
|                                  | Transmitter Enable   | VIL                             | 0     |      | 0.8     | V     |       |
| Receiver                         |                      |                                 |       |      |         |       |       |
| Differential data output swing   |                      | V <sub>out, pp</sub>            | 300   |      | 850     | mVp-p | 1     |
| Output differential impedance    |                      | Z <sub>o</sub>                  |       | 100  |         | Ω     |       |
| Data Output Rise Time, Fall Time |                      | t <sub>r</sub> , t <sub>f</sub> | 15    |      |         | ps    | 2     |
| RX_LOS                           | Loss of signal (LOS) | VOH                             | 2.0   |      | VCCHOST | V     | 3     |
|                                  | Normal Operation     | VOL                             | 0     |      | 0.8     | V     | 3     |

### Notes:

1. Internally AC coupled but requires an external 100Ω differential load termination.
2. 20 – 80 %.
3. LOS is an open collector output. Should be pulled up with 4.7kΩ on the host board.

## Optical Characteristics

| Parameter                                                                                        | Symbol           | Min.                               | Typ. | Max. | Unit  | Notes |
|--------------------------------------------------------------------------------------------------|------------------|------------------------------------|------|------|-------|-------|
| Transmitter                                                                                      |                  |                                    |      |      |       |       |
| Launch Optical Power (average)                                                                   | Pavg             | 0                                  |      | +6   | dBm   | 1     |
| Extinction Ratio                                                                                 | ER               | 4.0                                |      |      | dB    |       |
| Center Wavelength Range                                                                          | $\lambda_c$      | 1295                               |      | 1310 | nm    |       |
| Transmitter and Dispersion Penalty                                                               | TDP              |                                    |      | 2.7  | dB    |       |
| Spectral Width                                                                                   | $\Delta\lambda$  |                                    |      | 1    | nm    | 2     |
| RIN20OMA (max)                                                                                   | RIN              |                                    |      | -130 | dB/Hz |       |
| Optical Return Loss Tolerance                                                                    | ORLT             |                                    |      | 20   | dB    |       |
| Pout @TX-Disable Asserted                                                                        | Poff             |                                    |      | -30  | dBm   |       |
| Transmitter eye mask definition<br>{X1, X2, X3, Y1, Y2, Y3}<br>Hit ratio 5×10-5 hits per sample. |                  | {0.31, 0.4, 0.45, 0.34, 0.38, 0.4} |      |      |       |       |
| Receiver                                                                                         |                  |                                    |      |      |       |       |
| Center Wavelength                                                                                | $\lambda_c$      | 1295                               | 1310 | 1325 | nm    |       |
| Receiver Sensitivity(average)                                                                    | RxSENS1          |                                    |      | -21  | dBm   | 3     |
| Receiver Sensitivity (OMA)                                                                       | RxSENS2          |                                    |      | -19  | dBm   | 3     |
| Receiver Overload                                                                                | POL              | -4                                 |      |      | dBm   |       |
| Optical Return Loss                                                                              | ORL              | 26                                 |      |      | dB    |       |
| LOS De-Assert                                                                                    | LOS <sub>D</sub> |                                    |      | -21  | dBm   |       |
| LOS Assert                                                                                       | LOS <sub>A</sub> | -35                                |      |      | dBm   |       |
| LOS Hysteresis                                                                                   |                  | 0.5                                |      |      | dB    |       |

### Notes:

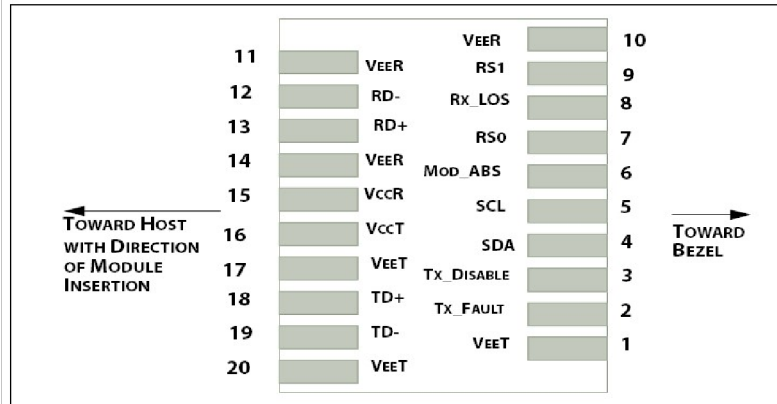
1. Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 regulations.
2. 20dB spectral width.
3. Measured @25.78Gbps, with PRBS  $2^{31}-1$  at  $5 \times 10^{-5}$  BER.

## Pin Description

| PIN | Symbol     | Name / Description                                                     | Notes |
|-----|------------|------------------------------------------------------------------------|-------|
| 1   | VeeT       | Transmitter Ground                                                     | 1     |
| 2   | TX_Fault   | Transmitter Fault (LVTTTL-O) - High indicates a fault condition        | 2     |
| 3   | TX_Disable | Transmitter Disable (LVTTTL-I) – High or open disables the transmitter | 3     |
| 4   | SDA        | Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)            | 4     |
| 5   | SCL        | Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)           | 4     |
| 6   | MOD_ABS    | Module Absent (Output), connected to VeeT or VeeR in the module        | 5     |
| 7   | RS0        | NA                                                                     | 6     |
| 8   | RX_LOS     | Receiver Loss of Signal (LVTTTL-O)                                     | 2     |
| 9   | RS1        | NA                                                                     | 6     |
| 10  | VeeR       | Receiver Ground                                                        | 1     |
| 11  | VeeR       | Receiver Ground                                                        | 1     |
| 12  | RD-        | Inverse Received Data out (CML-O)                                      |       |
| 13  | RD+        | Received Data out (CML-O)                                              |       |
| 14  | VeeR       | Receiver Ground                                                        | 1     |
| 15  | VccR       | Receiver Power - +3.3V                                                 |       |
| 16  | VccT       | Transmitter Power - +3.3 V                                             |       |
| 17  | VeeT       | Transmitter Ground                                                     | 1     |
| 18  | TD+        | Transmitter Data In (CML-I)                                            |       |
| 19  | TD-        | Inverse Transmitter Data In (CML-I)                                    |       |
| 20  | VeeT       | Transmitter Ground                                                     | 1     |

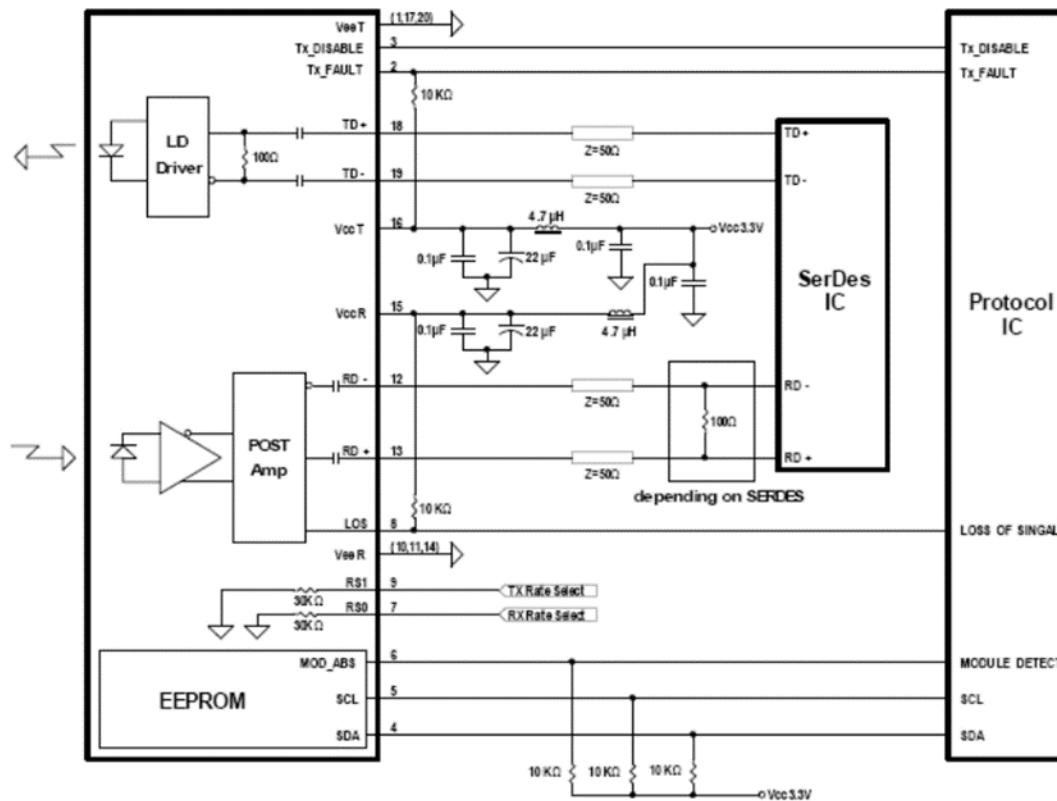
## Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.
3. This input is internally biased high with a 4.7KΩ to 10KΩ pull-up resistor to VccT.
4. Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.
6. Rate select can also be set through the 2-wire bus in accordance with SFF-8472 v. 12.1, Rx Rate Select is set at Bit 3, Byte 110, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.  
Note: writing a “1” selects maximum bandwidth operation. Rate select is the logic OR of the input state of Rate Select Pin and 2-wire bus.



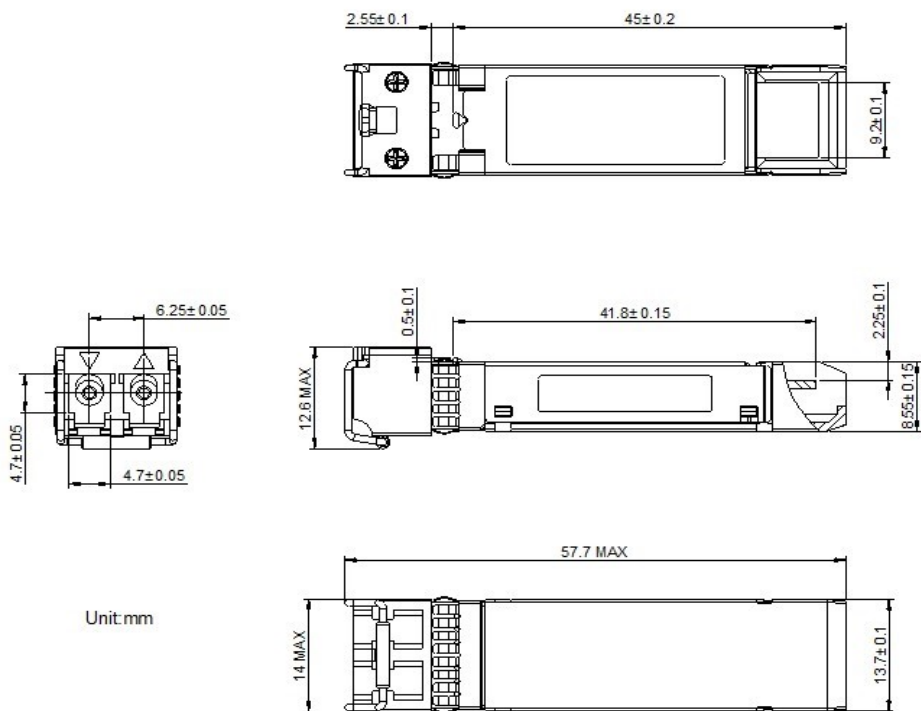
Pin-out of connector Block on Host board

### Recommended Circuit Schematic



Mechanical Specifications

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



EEPROM Information

EEPROM memory map specific data field description is as below:

| 2 wire address 1010000X (A0h) |                                         | 2 wire address 1010001X (A2h) |                                           |
|-------------------------------|-----------------------------------------|-------------------------------|-------------------------------------------|
| 0                             | Serial ID Defined by SFP MSA (96 bytes) | 0                             | Alarm and Warning Thresholds (56 bytes)   |
| 55                            |                                         | 55                            | Cal Constants (40 bytes)                  |
| 95                            |                                         | 95                            | Real Time Diagnostic Interface (24 bytes) |
| 127                           | Vendor Specific (32 bytes)              | 119                           | Vendor Specific (8 bytes)                 |
| 127                           | Reserved, SFF8079 (128 bytes)           | 127                           | User Writable EEPROM (120 bytes)          |
| 255                           |                                         | 247                           |                                           |
|                               |                                         | 255                           | Vendor Specific (8 bytes)                 |

## 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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