**E10GSFPER-DW40.56-AO**

Intel® E10GSFPER-DW40.56 Compatible TAA 10GBase-DWDM SFP+ Transceiver C-Band 100GHz (SMF, 1540.56nm, 40km, LC, DOM)

**Features:**

- SFF-8432 and SFF-8472 Compliance
- Temperature-stabilized EML transmitter and PIN receiver
- Duplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



**Applications:**

- 8x/10x Fibre Channel
- 10x Gigabit Ethernet over DWDM
- Access, Metro and Enterprise

**Product Description**

This Intel® E10GSFPER-DW40.56 compatible SFP+ transceiver provides 10GBase-DWDM throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1540.56nm via an LC 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 Intel®. 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

**Wavelength Guide (100GHz ITU-T Channel)**

| Channel # | Frequency (THz) | Center Wavelength (nm) |
|---|---|---|
| **17** | 191.7 | 1563.86 |
| **18** | 191.8 | 1563.05 |
| **19** | 191.9 | 1562.23 |
| **20** | 192.0 | 1561.42 |
| **21** | 192.1 | 1560.61 |
| **22** | 192.2 | 1559.79 |
| **23** | 192.3 | 1558.98 |
| **24** | 192.4 | 1558.17 |
| **25** | 192.5 | 1557.36 |
| **26** | 192.6 | 1556.55 |
| **27** | 192.7 | 1555.75 |
| **28** | 192.8 | 1554.94 |
| **29** | 192.9 | 1554.13 |
| **30** | 193.0 | 1553.33 |
| **31** | 193.1 | 1552.52 |
| **32** | 193.2 | 1551.72 |
| **33** | 193.3 | 1550.92 |
| **34** | 193.4 | 1550.12 |
| **35** | 193.5 | 1549.32 |
| **36** | 193.6 | 1548.51 |
| **37** | 193.7 | 1547.72 |
| **38** | 193.8 | 1546.92 |
| **39** | 193.9 | 1546.12 |
| **40** | 194.0 | 1545.32 |
| **41** | 194.1 | 1544.53 |
| **42** | 194.2 | 1543.73 |
| **43** | 194.3 | 1542.94 |
| **44** | 194.4 | 1542.14 |
| **45** | 194.5 | 1541.35 |
| **46** | 194.6 | 1540.56 |
| **47** | 194.7 | 1539.77 |
| **48** | 194.8 | 1538.98 |
| **49** | 194.9 | 1538.19 |

| | | |
|---|---|---|
| **50** | 195.0 | 1537.40 |
| **51** | 195.1 | 1536.61 |
| **52** | 195.2 | 1535.82 |
| **53** | 195.3 | 1535.04 |
| **54** | 195.4 | 1534.25 |
| **55** | 195.5 | 1533.47 |
| **56** | 195.6 | 1532.68 |
| **57** | 195.7 | 1531.90 |
| **58** | 195.8 | 1531.12 |
| **59** | 195.9 | 1530.33 |
| **60** | 196.0 | 1529.55 |
| **61** | 196.1 | 1528.77 |

## Absolute Maximum Ratings

| Parameter | Symbol | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|
| **Storage Temperature** | Tstg | -40 | | 85 | °C |
| **Supply Voltage** | Vcc | -0.5 | | 4.0 | V |
| **Operating Case Temperature** | Tc | 0 | 25 | 70 | °C |
| **Relative Humidity** | RH | 5 | | 95 | % |
| **Data Rate** | | | 10.3125 | | Gbps |

## Electrical Characteristics

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Notes |
|---|---|---|---|---|---|---|---|
| **Supply Voltage** | | Vcc | 3.135 | 3.3 | 3.465 | V | |
| **Module Supply Current** | | Icc | | | 450 | mA | |
| **Power Dissipation** | | $P_D$ | | | 1500 | mW | |
| **Transmitter** | | | | | | | |
| **Input Differential Impedance** | | Zin | | 100 | | Ω | |
| **Differential Data Input Swing** | | Vin,p-p | 180 | | 700 | mVp-p | |
| **TX_FAULT** | **Transmitter Fault** | $V_{OH}$ | 2.0 | | VccHost | V | |
| | **Normal Operation** | $V_{OL}$ | 0 | | 0.8 | V | |
| **TX_DISABLE** | **Transmitter Disable** | VIH | 2.0 | | VccHost | V | |
| | **Transmitter Enable** | VIL | 0 | | 0.8 | V | |
| **Receiver** | | | | | | | |
| **Output Differential Impedance** | | Zo | | 100 | | Ω | |
| **Differential Data Output Swing** | | Vout,p-p | 300 | | 850 | mVp-p | 1 |
| **Data Output Rise Time, Fall Time** | | tr, tf | 28 | | | 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** | PO | -1 | | 4 | dBm | 1 |
| **Center Wavelength Range** | λc | 1528.77 | | 1563.86 | nm | |
| **Center Wavelength Spacing** | | | 100 | | GHZ | |
| **Center Wavelength Tolerance** | Δλc | -100 | | 100 | pm | |
| **Extinction Ratio** | EX | 8.2 | | | dB | |
| **Side Mode Suppression Ratio** | SMSR | 30 | | | dB | |
| **Transmitter and Dispersion Penalty** | TDP | | | 2.0 | dB | |
| **Relative Intensity Noise** | RIN | | | -128 | dB/Hz | |
| **Optical Return Loss Tolerance** | ORLT | | | 21 | dB | |
| **Pout @ TX-Disable Asserted** | Poff | | | -30 | dBm | |
| **Eye Diagram** | IEEE Std 802.3-2005 10Gb Ethernet 10GBASE-ER compatible | | | | | |
| **Receiver** | | | | | | |
| **Center Wavelength** | λc | 1528 | | 1565 | nm | |
| **Receiver Sensitivity ($P_{avg}$)** | S | | | -15 | dBm | |
| **Receiver Overload ($P_{avg}$)** | POL | -1 | | | dBm | |
| **Optical Return Loss** | ORL | 26 | | | dB | |
| **LOS De-Assert** | LOSD | | | -16 | dBm | |
| **LOS Assert** | LOSA | -35 | | | dBm | |
| **LOS Hysteresis** | | 0.5 | | | dB | |

**Notes:**

1. The optical power is launched into 9/125μm SMF.
2. Measured with a PRBS $2^{31}$-1 test pattern @10.3125Gbps.
3. Measured with PRBS $2^{31}$-1 test pattern, 10.3125Gb/s, BER<$10^{-12}$.
4. Comply with IEEE 802.3-2005.

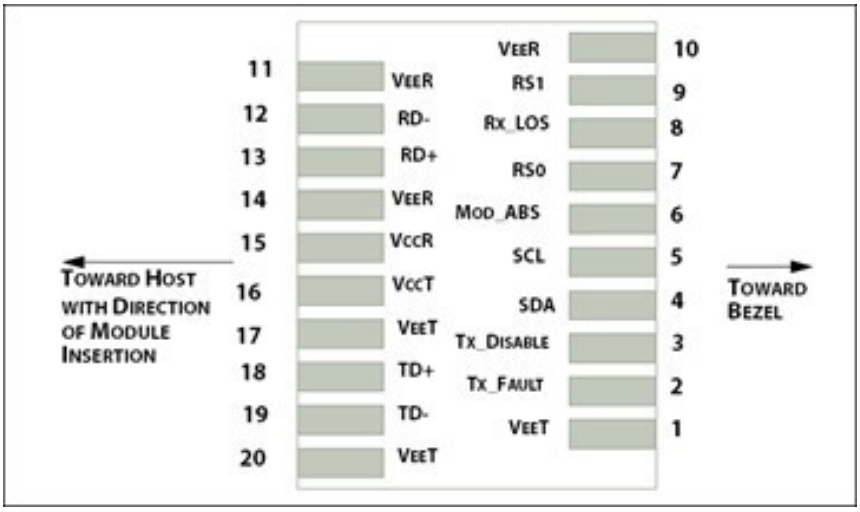
**Pin Descriptions**

| Pin | Symbol | Name/Descriptions | Ref. |
|---|---|---|---|
| **1** | VeeT | Transmitter Ground. | 1 |
| **2** | TX_Fault | Transmitter Fault (LVTTL-O) - High indicates a fault condition. | 2 |
| **3** | TX_Disable | Transmitter Disable (LVTTL-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 | Rate Select 0 – Not used, Presents high input impedance. | |
| **8** | RX_LOS | Receiver Loss of Signal (LVTTL-O). | 2 |
| **9** | RS1 | Rate Select 1 – Not used, Presents high input impedance. | |
| **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. | |
| **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 |

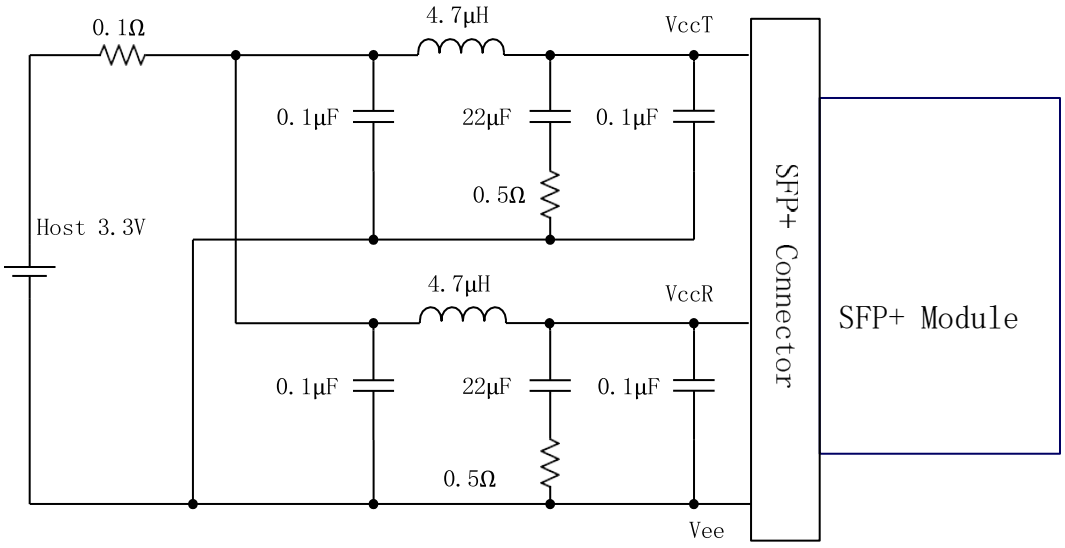
**Notes:**

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. 2-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.
5. This is the ground return that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to VccHost.

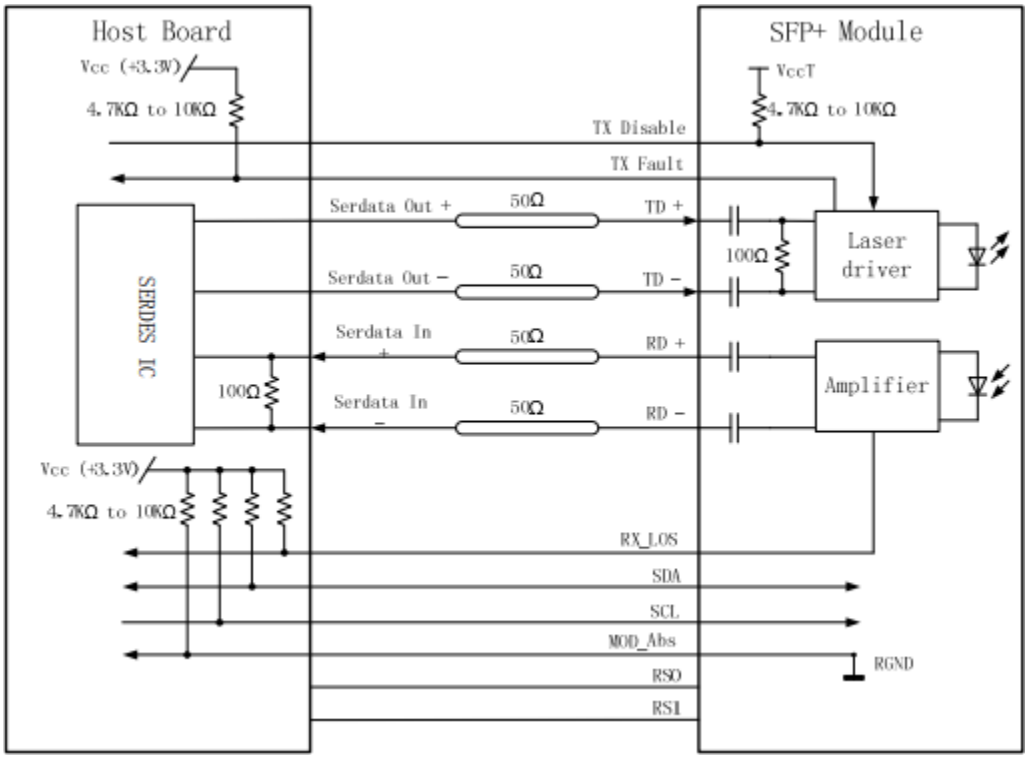
**Host PCB SFP+ Pad Assignment Top View**



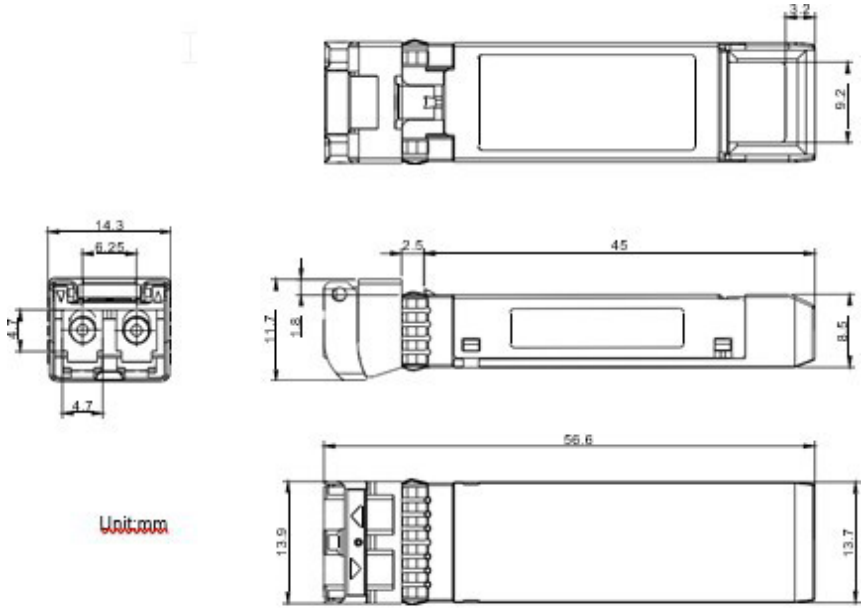

**Recommended Host Board Power Supply Filter Network**



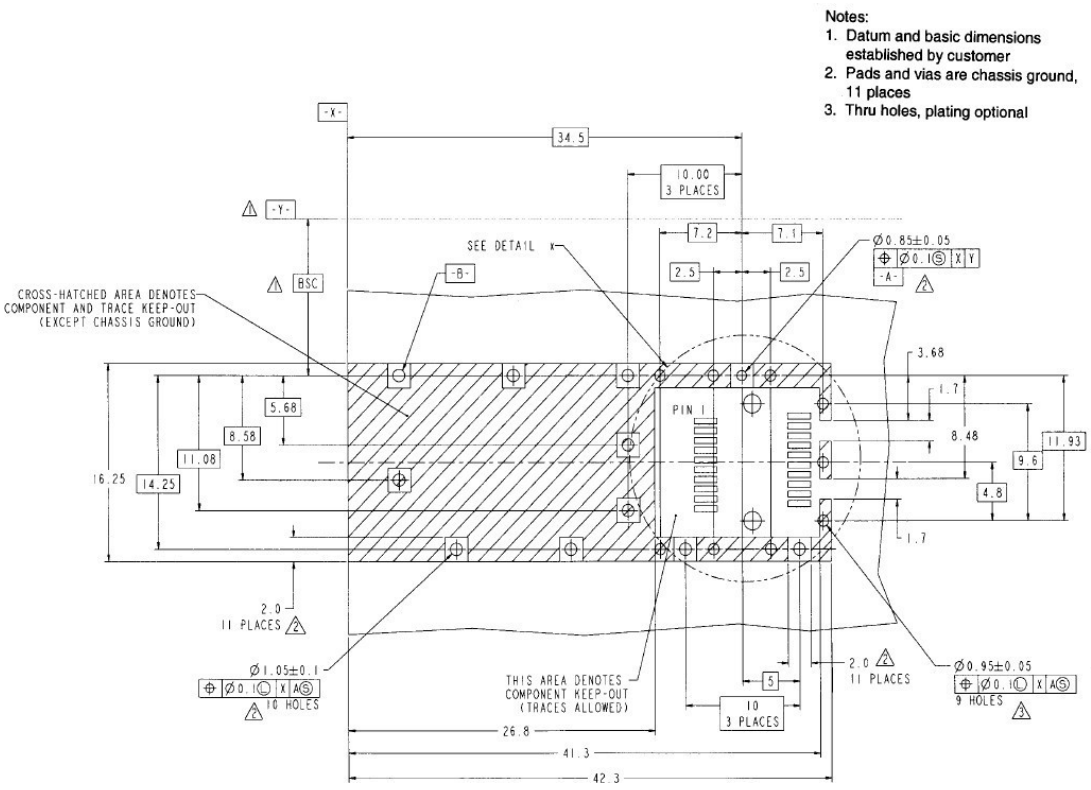
**Recommended Application Interface Block Diagram**

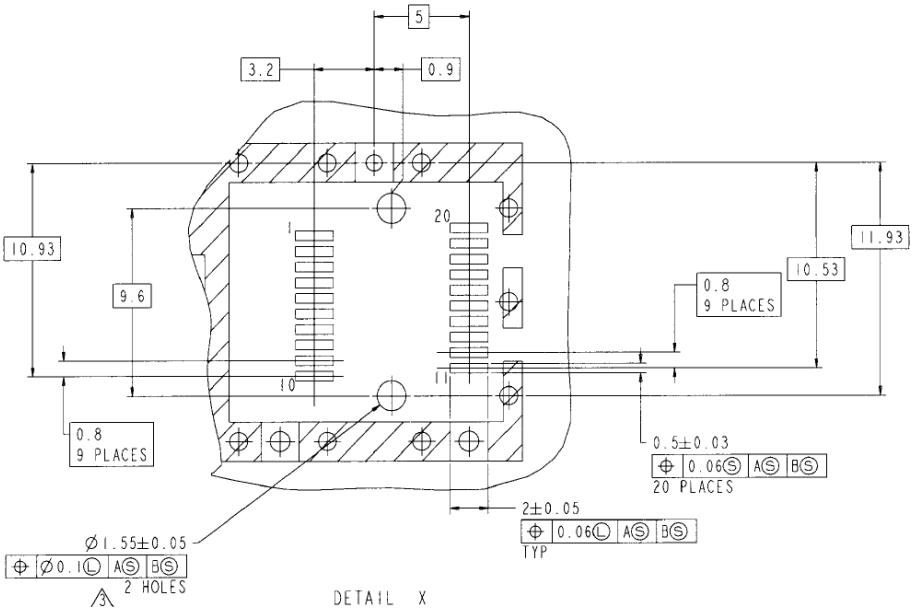



**Mechanical Specifications**



## PCB Layout Recommendation



**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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