# 1G SFP ER Transceiver
# VS-01ER1CS-AA

## Product Overview

Vitex VS-01ER1CS-AA offers seamless hot-pluggable integration and operates on a single 3.3V power supply. It facilitates reliable 40km transmission over single-mode fiber (SMF). The module ensures low power dissipation, minimized electromagnetic interference (EMI), and robust electrostatic discharge (ESD) protection. It adheres to SFP MSA and IEEE Std 802.3ah standards and operates at Commercial temperature grade (0-70 °C).

### Features

- SFP package with duplex LC Receptacle connector
- Supports up to 1.25Gb/s bit rates
- 1310nm DFB transmitter and PIN-TIA receiver
- Commercial operating case temperature: 0 to 70 °C
- Up to 40km distance with SMF
- Hot-pluggable capability
- Single 3.3V power supply
- Built-in Digital Diagnostic monitoring (DDM) function
- Low EMI and excellent ESD protection
- Class I laser safety standard IEC-60825 compliant
- RoHS-6 compliance
- Complies with SFP MSA
- Complies with IEEE Std 802.3ah
- Complies with SFF-8472
- Complies with FCC 47 CFR Part 15, Class B
- Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

### Applications

- CPRI 1.2288Gbps
- Gigabit Ethernet 1.25Gbps

## Ordering Information

| Part Number | Description |
|---|---|
| **VS-01ER1CS-AA** | 1.25G SFP ER, 40km SMF, 1310nm, Duplex-LC, C-temp |

## General Specifications

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Storage Ambient Temperature | $T_{STG}$ | -40 | | 85 | °C | |
| Operating Case Temperature | Tc | 0 | | 70 | °C | |
| Operating Humidity | OH | 5 | | 95 | % | |
| Power Supply Voltage (Max) | VCC | 0 | | 4 | V | |
| Power Supply Voltage (Recommended) | VCC | 3.13 | 3.3 | 3.47 | V | |
| Power Supply Current | ICC | | 200 | 300 | mA | |
| Date Rate | | | | 1.25 | Gbps | |
| Data Rate Drift | | -100 | | +100 | PPM | |

## Optical – Transmitter

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Centre Wavelength | λC | 1260 | 1310 | 1360 | nm | |
| Spectral Width (-20dB) | | | | 1 | nm | |
| Average Output Power | Po | -2 | | 3 | dBm | |
| Turn off Average Output Power | | | | -45 | dBm | |
| Extinction Ratio | ER | 9 | | | dB | |
| Side Mode Suppression Ratio | SMSR | 30 | | | dB | |
| Output Optical Eye | IEEE Std 802.3ah | | | | | PRBS $2^7$-1 @1.25Gbps |

## Optical - Receiver

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Operating Wavelength | λC | 1260 | | 1620 | nm | |
| Sensitivity | SEN | | | -24 | dBm | Source 1310nm, PRBS $2^7$-1 BER < 10E-12, ER=9dB |
| Saturation Optical Power | SAT | -3 | | | dBm | |
| Loss of Signal De-Assert Level | LOSD | | | -25 | dBm | |
| Loss of Signal Assert Level | LOSA | -40 | | | dBm | |
| Loss of Signal Hysteresis | | 0.5 | | 5 | dB | |

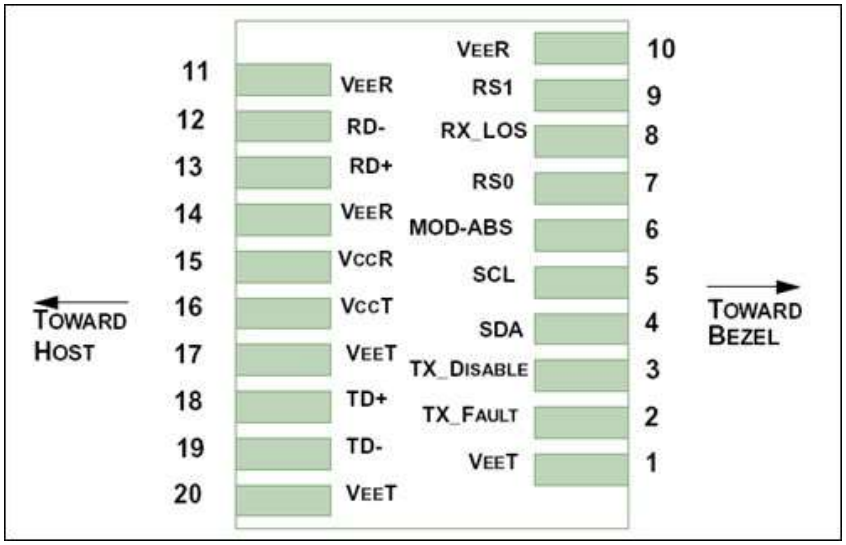
## Electrical – Transmitter

| Parameter | | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|---|
| Data Input Differential Swing | | | 500 | | 2000 | mV | |
| Input Differential Impedance | | | 85 | 100 | 115 | Ω | |
| TX Disable | Disable | | 2 | | VCC+0.3 | V | |
| | Enable | | -0.3 | | 0.8 | V | |
| TX Fault | Normal | | -0.3 | | 0.4 | V | |
| | Fault | | 2.4 | | $VCC_{HOST}$ | V | |

## Electrical – Receiver

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Data Output Differential Swing | | 400 | | 1200 | mV | |
| Loss of Signal - Low | | -0.3 | | 0.4 | V | |
| Loss of Signal - High | | 2.4 | | VCCHOST | V | |

## Electrical Connector Layout



## Electrical Pin Definition

| PIN # | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | VEET | Transmitter Ground | |
| 2 | TX_Fault | Transmitter Fault Indication | Low: normal; High: abnormal |
| 3 | TX_Disable | Transmitter Disable | Low: transmitter on; High: transmitter off |
| 4 | SDA | SDA | The data line of two wire serial interface |
| 5 | SCL | SCL | The clock line of two wire serial interface |
| 6 | MOD_ABS | Module Absent | Connected to VEET or VEER in the module |
| 7 | RS0 | Not Connected | |
| 8 | RX_LOS | Loss of Signal | Low: signal detected; High: loss of signal |
| 9 | RS1 | Not Connected | |
| 10 | VEER | Receiver Ground | |
| 11 | VEER | Receiver Ground | |
| 12 | RD- | Inv. Received Data Out | AC-coupled, CML |
| 13 | RD+ | Received Data Out | AC-coupled, CML |
| 14 | VEER | Receiver Ground | |
| 15 | VCCR | Receiver Power | |
| 16 | VCCT | Transmitter Power | |
| 17 | VEET | Transmitter Ground | |
| 18 | TD+ | Transmit Data In | AC-coupled, CML |
| 19 | TD- | Inv. Transmit Data In | AC-coupled, CML |
| 20 | VEET | Transmitter Ground | |

## Revision History

| Date | Rev | Description |
|---|---|---|
| 07/15/2024 | 1.0 | Release version |
| 03/07/2025 | 2.0 | New branding guidelines |

## For more information

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