# 25G SFP28 SR Optical Transceiver
# PN: VS-25SR1IS-AA

## Product Overview

Vitex's VS-25SR1IS-AA is a high-performance optical transceiver. They are compliant with SFF-8431, and SFF-8472, providing a fast and reliable interface for 25G Ethernet applications. The product implements digital diagnostics via a 2-wire serial bus and is compliant with the SFF-8472 standard.

### Features

- 100m over OM4 MMF
- 70m over OM3 MMF
- VCSEL Laser and PIN receiver
- Metal enclosure, for lower EMI
- 2-wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable SFP28 footprint
- Build-in dual CDR
- Single 3.3V power supply
- Power dissipation < 1.2 W
- Operating temperature range:
    - (Industrial) -40 °C to 85 °C
- Compliant with SFF-8472 & 8431
- RoHS Compliant

### Applications

- 25GBASE-SR
- CPRI 10

## Ordering Information

| Part Number | Description |
|---|---|
| **VS-25SR1IS-AA** | 25G SFP28, SR, 100m MMF, 850nm, Duplex-LC, I-temp |

## General Specifications

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Storage Temperature | Ts | -40 | | 85 | °C | |
| Relative Humidity | RH | 5 | | 95 | % | |
| Power Supply Voltage (Maximum) | VCC | -0.3 | | 4 | V | |
| Signal Input Voltage | VSI | Vcc-0.3 | | Vcc+0.3 | V | |
| Rx Damage Threshold | PRdmg | 3 | | | dBm | |
| Case Operating Temperature | Tcase | -40 | | 85 | °C | |
| Operation Supply Voltage (Recommended) | VCC | 3.14 | 3.3 | 3.47 | V | |
| Operating Supply Current | ICC | | | 360 | mA | |
| Data Rate | BR | | 25.78 | | Gbps | Tx/Rx |
| Transmission Distance (OM4) | TD | | 100 | | m | |
| Transmission Distance (OM3) | | | 70 | | m | |

## Optical – Transmitter

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Signaling rate | DR | | 25.78125 ±100 ppm | | Gb/s | |
| Extinction Ratio | ER | 2.0 | | | dB | |
| Center Wavelength | λ | 840 | 850 | 860 | nm | |
| RMS Spectral Width | RSW | | | 0.6 | nm | |
| Average launch power | Pavg | -6 | | 2.4 | dBm | |
| Extinction ratio | ER | 2 | | | dB | |
| Optical Return Loss Tolerance | | | | 12 | dB | |
| Transmitter eye mask {X1, X2, X3, Y1, Y2, Y3} | | | {0.3,0.38,0.45,0.35,0.41,0.5} | | | 1 |

1. Hit ratio 1.5 x $10^{-3}$ hits/sample

## Optical - Receiver

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Receive Rate | DR | | 25.78125 ±100 ppm | | Gb/s | |
| Wavelength Range | λ | 840 | | 860 | nm | |
| Overload Input Optical Power | Pmax | 2.4 | | | dBm | |
| Average Receive Power | Pin | -10.3 | | 2.4 | dBm | |
| Rx Sensitivity@25.78 Gb/s | RSENS | | | -10 | dBm | 1 |
| Receiver Reflectance | REFLr | | | -12 | dB | |
| Los De-Assert | Pd | | | -11 | dBm | |
| Los Assert | Pa | -30 | | | dBm | |
| Loss Hysteresis | Pd-Pa | 0.5 | | | dBm | |

1. Measured with BER =< 5 x $10^{-5}$ @PRBS=$2^{31}$ – 1 NRZ

## Electrical – Transmitter

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Input differential impedance | Rin | | 100 | | Ω | 1 |
| Single ended data input swing | Vin,pp | 180 | | 700 | mV | |
| Transmitter Fault Output-High | VFaultH | 2 | | Vcc+0.3 | V | |
| Transmitter Fault Output-Low | VFaultL | 0 | | 0.8 | V | |
| Transmitter Disable Voltage- High | VDisH | 2 | | Vcc+0.3 | V | |
| Transmitter Disable Voltage- Low | VDisL | 0 | | 0.8 | V | |

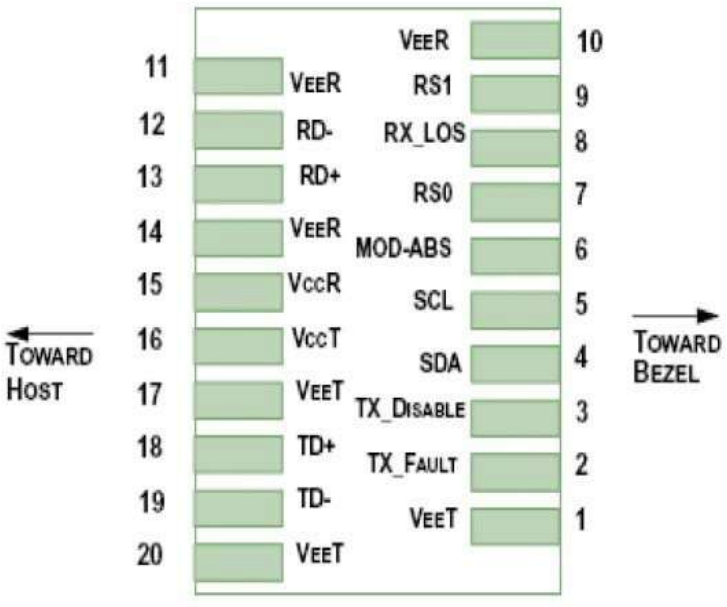
1. Connected directly to TX data input pins. AC coupled thereafter

## Electrical – Receiver

| Parameter | Symbol | Min | Typical | Max | Unit | Remarks |
|---|---|---|---|---|---|---|
| Differential data output swing | Vout,pp | 300 | | 850 | mV | 1 |
| LOS Output Voltage-High | VLOSH | 2 | | Vcc+0.3 | V | |
| LOS Output Voltage-Low | VLOSL | 0 | | 0.8 | V | |

1. Into 100 ohms differential termination

## Electrical Connector Layout

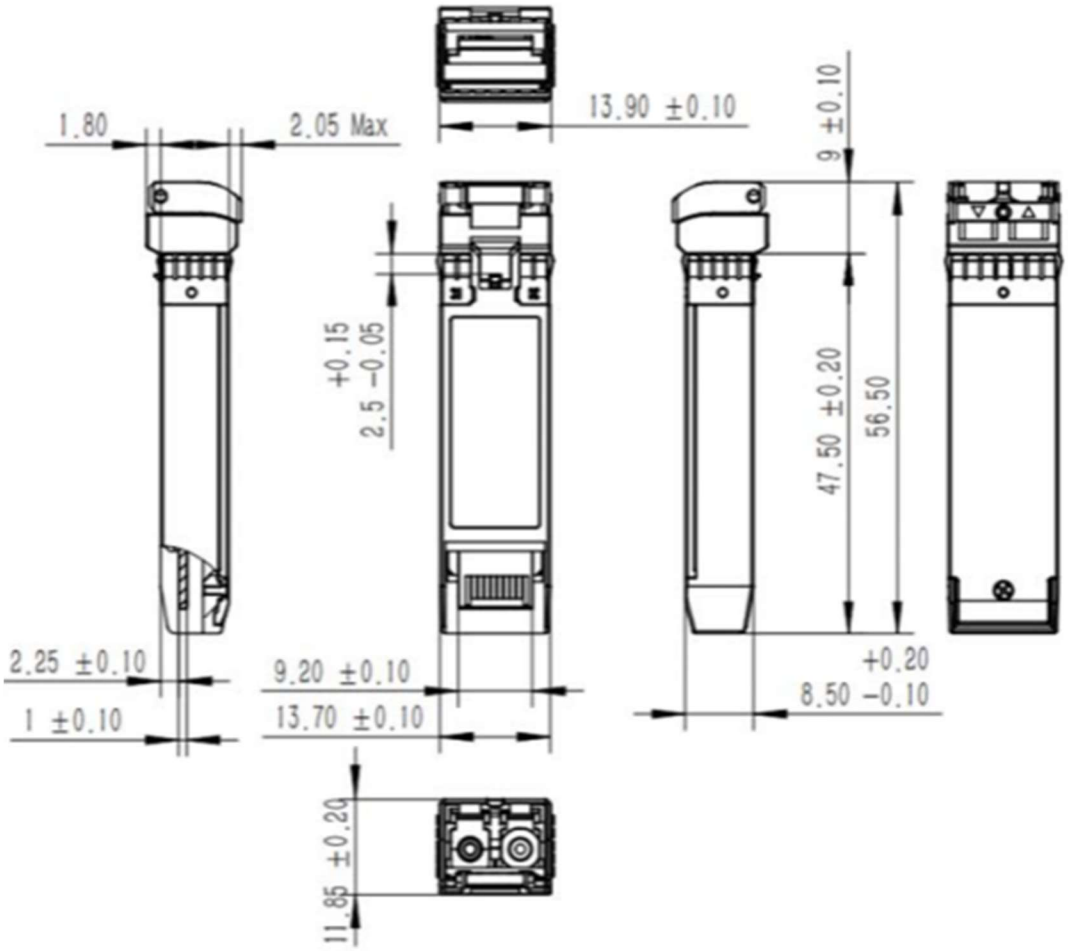


## Electrical Pin Definition

| PIN # | Symbol | Description | Remarks |
|---|---|---|---|
| 1 | VEET | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | TFAULT | Transmitter Fault. | 2 |
| 3 | TDIS | Transmitter Disable. Laser output disabled on high or open. | 3 |
| 4 | SDA | 2-wire Serial Interface Data Line | 4 |
| 5 | SCL | 2-wire Serial Interface Clock Line | 4 |
| 6 | MOD_ABS | Module Absent. Grounded within the module | 4 |
| 7 | RS0 | Rate Select 0, internal pull down | 5 |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. | 6 |
| 9 | RS1 | Rate Select 1, internal pull down | 5 |
| 10 | $V_{EER}$ | Receiver Ground (Common with Transmitter Ground) | 1 |
| 11 | $V_{EER}$ | Receiver Ground (Common with Transmitter Ground) | 1 |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled | |
| 13 | RD+ | Receiver Non-inverted DATA out. AC Coupled | |
| 14 | $V_{EER}$ | Receiver Ground (Common with Transmitter Ground) | 1 |
| 15 | $V_{CCR}$ | Receiver Power Supply | |
| 16 | $V_{CCT}$ | Transmitter Power Supply | |
| 17 | $V_{EET}$ | Transmitter Ground (Common with Receiver Ground) | 1 |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC Coupled. | |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled. | |
| 20 | $V_{EET}$ | Transmitter Ground (Common with Receiver Ground) | 1 |

1. Circuit ground is internally isolated from chassis ground.
2. TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on TDIS>2.0V or open, enabled on TDIS<0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

## Mechanical Dimensions




## Revision History

| Date | Rev | Description |
|---|---|---|
| 8/24/2019 | 1.0 | Initial Release |
| 5/26/2020 | 1.1 | Mechanical Dimensions update |
| 2/4/2025 | 2.0 | New branding guidelines |

## For more information

**Vitex LLC**
32 Mercer St.
Hackensack, NJ 07601
201-296-0145
info@vitextech.com
www.vitextech.com

CELEBRATING 20 YEARS OF COLLABORATION AND INNOVATION