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## 1G SFP Bidi 80km Gigabit Ethernet Transceiver

### VS-01080xE2S-AA

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#### Product Overview

The VS-01080xE2S-AA is a Gigabit Ethernet Bidi SFP transceiver designed for single-mode fiber (SMF) connections, offering an 80km transmission distance. It utilizes a 1550nm DFB laser and a 1490nm PIN photodiode, operates on a single 3.3V power supply, and features hot-pluggable capability with an LC receptacle connector. It's available in both commercial (0 to 70°C) and industrial (-40 to 85°C) operating temperature ranges.

#### Features

- Operating Case Temperature
  - Commercial: 0 to 70°C
  - Industrial: -40 to 85°C
- SFP package with LC Receptacle connector
- Hot-pluggable capability
- Single 3.3V power supply
- 1550 DFB laser and 1490nm PIN photodiode
- 80km transmission distance with SMF
- CML compatible data input/output interface
- Low power dissipation
- Low EMI and excellent ESD protection
- Class I laser product, RoHS compliance

#### Applications

- Gigabit Ethernet application

#### Standards

- Compliant SFP MSA
- Compatible with IEEE 802.3ah
- Compliant with FCC 47 CFR Part 15, Class B
- Compliant with FDA 21 CFR 1040.10 and 1040.11, Class I
- Complies with FDA 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

#### Ordering Information

| Part Number     | Description                                                   |
|-----------------|---------------------------------------------------------------|
| VS-01080CE2S-AA | 1.25G SFP ZR, 80km SMF, 1550/1490nm, BiDi, Simplex-LC, C-temp |
| VS-01080IE2S-AA | 1.25G SFP ZR, 80km SMF, 1550/1490nm, BiDi, Simplex-LC, I-temp |

## General Specifications

| Parameter                          | Symbol           | Min  | Typical | Max  | Unit | Remarks         |
|------------------------------------|------------------|------|---------|------|------|-----------------|
| Storage Ambient Temperature        | T <sub>STG</sub> | -40  |         | 85   | °C   |                 |
| Operating Case Temperature         | T <sub>C</sub>   | 0    |         | 70   | °C   | VS-01080CE2S-AA |
|                                    | T <sub>C</sub>   | -40  |         | 85   | °C   | VS-01080IE2S-AA |
| Operating Humidity                 | OH               | 5    |         | 95   | %    |                 |
| Power Supply Voltage (Maximum)     | VCC              | -0.5 |         | 3.6  | 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 |                 |

## Optical – Transmitter

| Parameter                                   | Symbol      | Min          | Typical | Max  | Unit | Remarks                                   |
|---------------------------------------------|-------------|--------------|---------|------|------|-------------------------------------------|
| Centre Wavelength                           | $\lambda_C$ | 1530         | 1550    | 1570 | nm   |                                           |
| Spectral Width (-20dB)                      |             |              |         | 1    | nm   |                                           |
| Average Output Power                        |             | 0            |         | 5    | dBm  | Launched into SMF Fiber                   |
| Average Output Power@TX<br>Disable Asserted |             |              |         | -45  | dBm  |                                           |
| Extinction Ratio                            | ER          | 9            |         |      | dB   |                                           |
| Rise/Fall Time (20%~80%)                    | tr/tf       |              |         | 0.26 | ns   | Unfiltered PRBS2 <sup>7</sup> -1@1.25Gbps |
| Output Optical Eye                          |             | IEEE 802.3ah |         |      |      | PRBS 2 <sup>7</sup> -1 @1.25Gbps          |

## Optical – Receiver

| Parameter            | Symbol      | Min  | Typical | Max  | Unit | Remarks |
|----------------------|-------------|------|---------|------|------|---------|
| Wavelength Range     | $\lambda_c$ | 1450 | 1490    | 1510 | nm   |         |
| Receiver Sensitivity |             |      |         | -24  | dBm  |         |
| Receiver Overload    |             | -3   |         |      | dBm  |         |
| Return Loss          |             | 12   |         |      | dB   |         |
| LOS De-Assert        |             |      |         | -25  | dBm  |         |
| LOS Assert           |             | -35  |         |      | dBm  |         |
| LOS Hysteresis       |             | 0.5  |         | 6    | dB   |         |

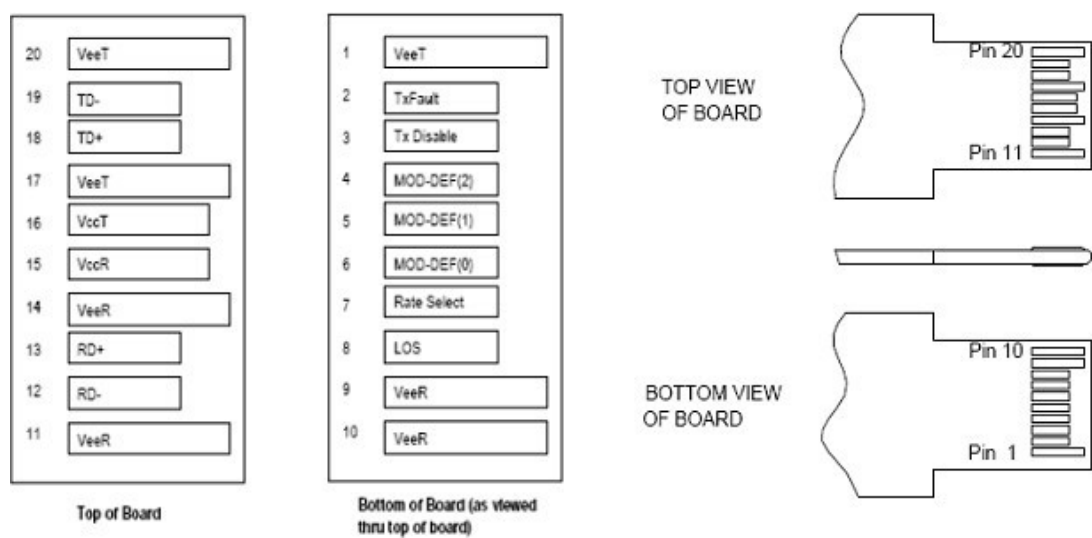
Electrical – Transmitter

| Parameter                     |         | Symbol          | Min | Typical | Max                  | Unit | Remarks |
|-------------------------------|---------|-----------------|-----|---------|----------------------|------|---------|
| Data Input Swing Differential |         | V <sub>IN</sub> | 600 |         | 2400                 | mV   |         |
| Input Differential Impedance  |         | Z <sub>IN</sub> | 90  | 100     | 110                  | Ω    |         |
| TX Disable                    | Disable |                 | 2.0 |         | V <sub>cc</sub>      | V    |         |
|                               | Enable  |                 | 0   |         | 0.8                  | V    |         |
| TX Fault                      | Fault   |                 | 2.4 |         | V <sub>cc</sub> +0.3 | V    |         |
|                               | Normal  |                 | 0   |         | 0.4                  | V    |         |

Electrical – Receiver

| Parameter                      |      | Symbol           | Min | Typical | Max                  | Unit | Remarks |
|--------------------------------|------|------------------|-----|---------|----------------------|------|---------|
| Data Output Swing Differential |      | V <sub>OUT</sub> | 600 |         | 1200                 | mV   |         |
| LOS                            | High |                  | 2.4 |         | V <sub>cc</sub> +0.3 | V    |         |
|                                | Low  |                  | 0   |         | 0.4                  | 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     | MOD-DEF2    | Module Definition 2          | The data line of two wire serial interface  |
| 5     | MOD-DEF1    | Module Definition 1          | The clock line of two wire serial interface |
| 6     | MOD-DEF0    | Module Definition 0          | Connected to GND in the transceiver         |
| 7     | Rate Select | Not Connected                |                                             |
| 8     | LOS         | Loss of Signal               | Low: signal detected; High: loss of signal  |
| 9     | VeeR        | Receiver Ground              |                                             |
| 10    | VeeR        | Receiver Ground              |                                             |
| 11    | VeeR        | Receiver Ground              |                                             |
| 12    | RD-         | Inv. Received Data Out       | AC-coupled                                  |
| 13    | RD+         | Received Data Out            | AC-coupled                                  |
| 14    | VeeR        | Receiver Ground              |                                             |
| 15    | VccR        | Receiver Power               |                                             |
| 16    | VccT        | Transmitter Power            |                                             |
| 17    | VeeT        | Transmitter Ground           |                                             |
| 18    | TD+         | Transmit Data In             | AC-coupled                                  |
| 19    | TD-         | Inv. Transmit Data In        | AC-coupled                                  |
| 20    | VeeT        | Transmitter Ground           |                                             |

## Revision History

| Date       | Rev | Description             |
|------------|-----|-------------------------|
| 07/15/2024 | 1.0 | Release version         |
| 01/24/2025 | 1.1 | New branding guidelines |

## For more information

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