

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco
(TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM
(TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM



Unlike common SFP transceiver, Bidirectional (BiDi) SFP transceiver is only with one port which uses an integral WDM coupler to transmit and receive signals over a single strand fiber.

1.25G Bidi SFP Optical transceiver module with DDM/DOM

Data Rate: 1.25Gb/s

Wavelength: 1310/1550nm (20KM/40KM) 1490/1550nm(80KM/120KM)

Distance: 20KM/40KM/80KM/120KM

Source: DFB+PIN(20KM/40KM/80KM) DFB+APD photo-detector(120KM)

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco
(TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM
(TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM

Description

ATZ BiDi SFP optical transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.063Gbps up to 120km transmission distance. The BiDi SFP transceiver consists of five sections: the LD driver, the limiting amplifier, the digital diagnostic monitor, the 1550nm DFB laser transmitter + PIN photodiode + APD photo-detector integrated with a trans-impedance preamplifier (TIA) and MCU control unit. The module data links up to 120KM on 9/125um single mode fiber. All modules satisfy class I laser safety requirements.

The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

Features

- Dual data-rate of 1.25Gbps/1.063Gbps operation
- 1550nm DFB laser + PIN photodetector + APD photo-detector up to 120km transmission
- Compliant with SFP MSA and SFF-8472 with simplex LC or SC receptacle
- Digital Diagnostic Monitoring (DDM)
- Internal Calibration or External Calibration
- Compatible with RoHS
- +3.3V single power supply

Operation conditions

Case operating temperature

Commercial: 0°C to +70°C

Extended: -10°C to +80°C

Industrial: -40°C to +85°C

Application

Switch to Switch Interface

Fast Ethernet

Switched Backplane Applications

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco
(TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM
(TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM

Router/Server Interface
Other Optical Links

I. Pin Descriptions

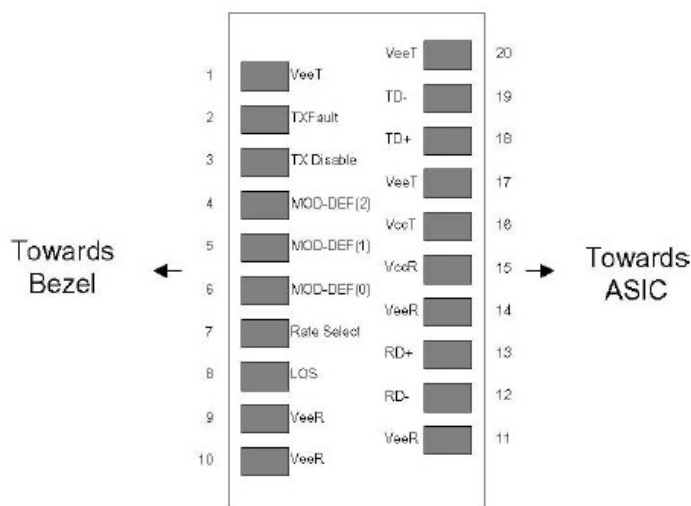
| Pin | Symbol | Name/Description | Ref. |
|-----|-------------|--|------|
| 1 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | TX Fault | Transmitter Fault | |
| 3 | TX Disable | Transmitter Disable. Laser output disabled on high or open. | 2 |
| 4 | MOD_DEF(2) | Module Definition 2. Data line for Serial ID. | 3 |
| 5 | MOD_DEF(1) | Module Definition 1. Clock line for Serial ID. | 3 |
| 6 | MOD_DEF(0) | Module Definition 0. Grounded within the module. | 3 |
| 7 | Rate Select | No connection required | |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. | 4 |
| 9 | VeeR | Receiver Ground (Common with Transmitter Ground) | 1 |
| 10 | VeeR | Receiver Ground (Common with Transmitter Ground) | 1 |
| 11 | VeeR | 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 | VeeR | Receiver Ground (Common with Transmitter Ground) | 1 |
| 15 | VccR | Receiver Power Supply | |
| 16 | VccT | Transmitter Power Supply | |
| 17 | VeeT | 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 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco (TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM (TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TX Disable >2.0V or open, enabled on TX Disable<0.8V.
3. Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is LVTTTL output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.



Pinout of Connector Block on Host Board

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco
(TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM
(TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM

II. Absolute Maximum Ratings

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|----------------------------|--------|------|-----|-----|------|------|
| Maximum Supply Voltage | Vcc | -0.5 | | 4.0 | V | |
| Storage Temperature | TS | -40 | | 100 | °C | |
| Case Operating Temperature | TOP | 0 | | 70 | °C | |
| Relative Humidity | RH | 0 | | 85 | % | 1 |

III. Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|-----------------------------------|------------|-----------|-----|----------|------|------|
| Supply Voltage | Vcc | 3.00 | | 3.60 | V | |
| Supply Current | Icc | | 180 | 300 | mA | |
| Transmitter | | | | | | |
| Input differential impedance | Rin | | 100 | | Ω | 2 |
| Single ended data input swing | Vin, pp | 250 | | 1200 | mV | |
| Transmit Disable Voltage | VD | Vcc – 1.3 | | Vcc | V | |
| Transmit Enable Voltage | VEN | Vee | | Vee+ 0.8 | V | |
| Transmit Disable Assert Time | | | | 10 | us | |
| Receiver | | | | | | |
| Single ended data output swing | Vout, pp | 300 | 400 | 800 | mV | 3 |
| Data output rise time | tr | | | 300 | ps | 4 |
| Data output fall time | tf | | | 300 | ps | 4 |
| LOS Fault | VLOS fault | Vcc – 0.5 | | VccHOST | V | 5 |
| LOS Normal | VLOS norm | Vee | | Vee+0.5 | V | 5 |
| Deterministic Jitter Contribution | RXΔDJ | | | 80 | ps | 6 |
| Total Jitter Contribution | RXΔTJ | | | 122.4 | ps | |

Notes:

1. Non condensing.
2. AC coupled.
3. Into 100 ohm differential termination.
4. 20 – 80 %
5. LOS is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
6. Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and ΔDJ.

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco
(TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM
(TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM

IV. Optical Characteristics (TOP=25°C, Vcc=3.3 Volts)

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|---|----------------|------|------|------|------|------|
| Transmitter | | | | | | |
| Output Opt. Power | PO | -2 | - | +3 | dBm | 1 |
| Optical Wavelength | λ | 1530 | 1550 | 1570 | nm | 2 |
| Spectral Width | σ | - | - | 1 | nm | 2 |
| Optical Rise/Fall Time | tr/ff | - | 170 | 260 | ps | 4 |
| Deterministic Jitter Contribution | TX Δ DJ | - | 20 | 56.5 | ps | 5 |
| Total Jitter Contribution | TX Δ TJ | - | - | 227 | ps | |
| Optical Extinction Ratio | ER | 9 | - | - | dB | |
| Receiver | | | | | | |
| Average Rx Sensitivity @ 1.25 Gb/s (Gigabit Ethernet) | RSENS2 | - | - | -25 | dBm | 6, 7 |
| Average Rx Sensitivity @ 1.06 Gb/s (1X Fibre Channel) | RSENS1 | - | - | -25 | dBm | 6, 7 |
| Maximum Received Power | RXMAX | 0 | | | dBm | |
| Optical Center Wavelength | λ C | 1260 | | 1360 | nm | |
| LOS De-Assert | LOSD | - | - | -25 | dBm | |
| LOS Assert | LOSA | -36 | - | - | dBm | |
| LOS Hysteresis | | 0.5 | - | - | dB | |

Notes:

- Class 1 Laser Safety.
- Also specified to meet curves in FC-PI-2 Rev. 10.0 Figure 18, which allow trade-off between wavelength, spectral width.
- Equivalent extinction ratio specification for Fibre Channel. Allows smaller ER at higher average power.
- Unfiltered, 20-80%. Complies with IEEE 802.3 (Gig. E) and FC 1x eye masks when filtered.
- Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and Δ DJ.
- Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.
- Measured with PRBS 2⁷-1 at 10⁻¹² BER.

V. General Specifications

| Parameter | Symbol | Min | Typ | Max | Units | Ref. |
|--|--------|------|-----|-------------------|--------|------|
| Data Rate | BR | 1062 | | 1250 | Mb/sec | 1 |
| Bit Error Rate | BER | | | 10 ⁻¹² | | 2 |
| Max. Supported Link Length on 9/125 μ m SMF @ 1x Fibre Channel | LMAX1 | | | 40 | km | 3, 4 |
| Max. Supported Link Length on 9/125 μ m SMF @ Gigabit Ethernet | LMAX2 | | | 40 | km | 3, 4 |

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco (TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM (TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM

Notes:

1. Gigabit Ethernet and 1x Fibre Channel compliant.
2. Tested with a PRBS 2⁷-1 data pattern.
3. Dispersion limited per FC-PI-2 Rev. 10
4. Attenuation of 0.25 dB/km is used for the link length calculations. Please refer to the Optical Specifications in Table IV to calculate a more accurate link budget based on specific conditions in your application.

VI. Environmental Specifications

HD Commercial Temperature BIDI SFP transceivers have an operating temperature range from 0°C to +70°C case temperature.

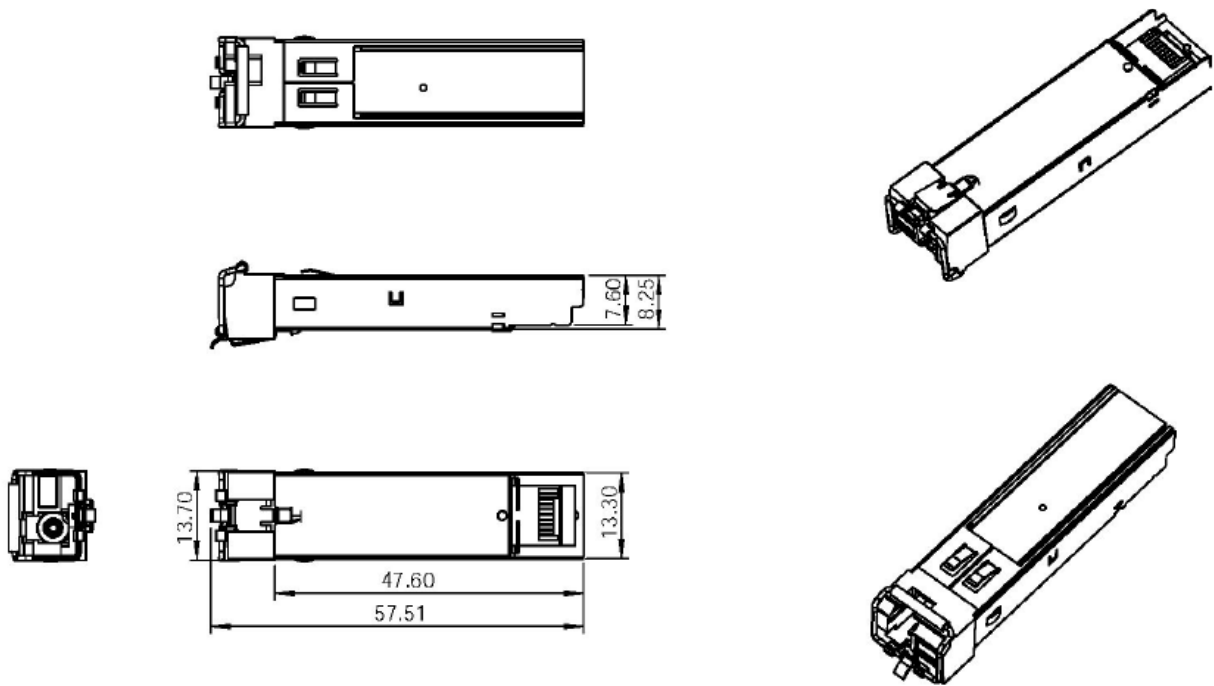
| Parameter | Symbol | Min | Typ | Max | Units | Ref. |
|----------------------------|--------|-----|-----|-----|-------|------|
| Case Operating Temperature | Top | 0 | | 70 | °C | |
| Storage Temperature | Tsto | -40 | | 100 | °C | |

VII. Mechanical Specifications

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

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

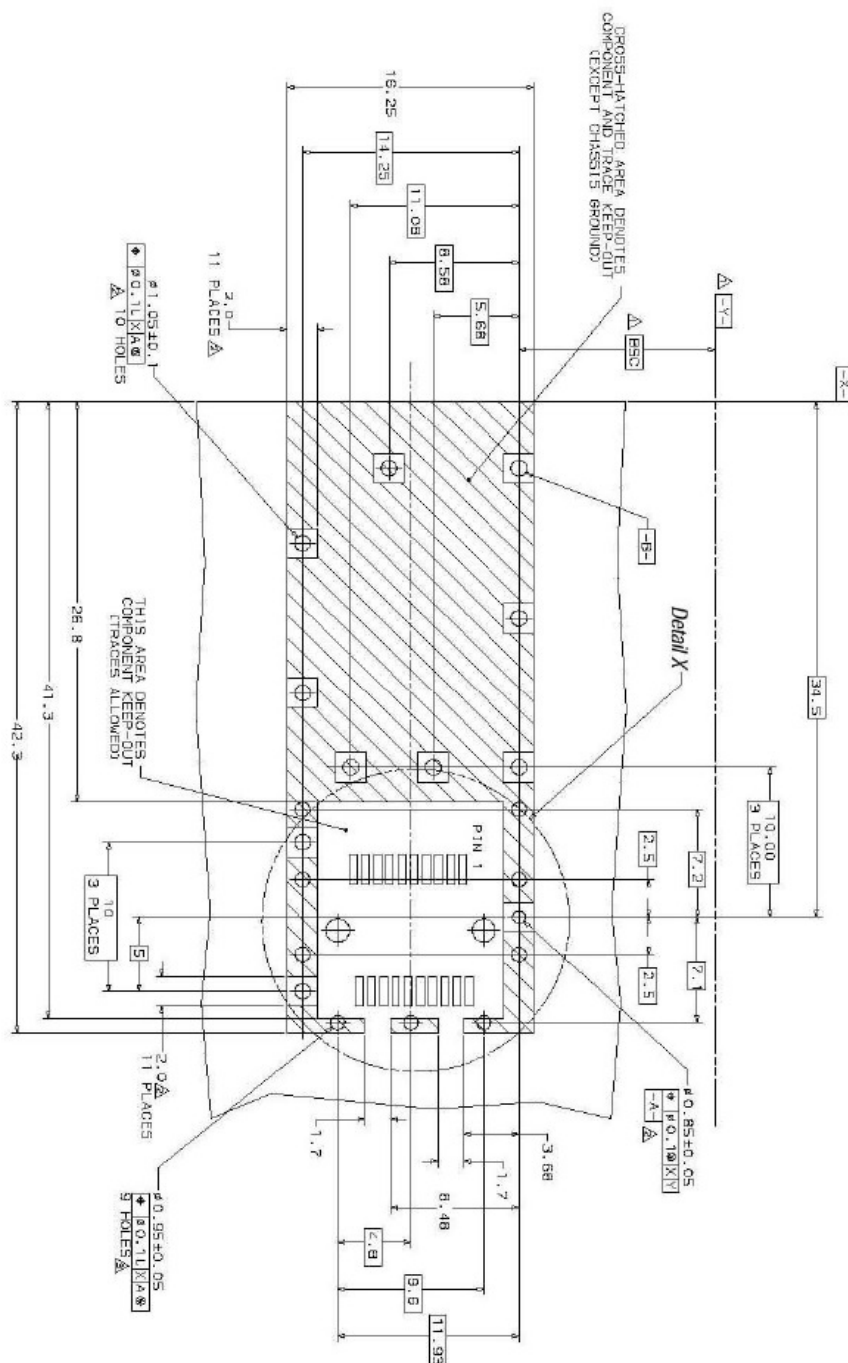
Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco
 (TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM
 (TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM



Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco (TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM (TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM

IX. PCB Layout and Bezel Recommendations



△ Datum and Basic Dimension Established by Customer

△ Rads and Vias are Chassis Ground, 11 Places

△ Through Holes are Unplated

Model : ATZ FO-SFP-SMBDxxK-LC/A_B (xx=Dist: 20/40/80/120)

Description: SFP Transceiver :1.25GSFP Bidirectional (TX1310nm/RX1550nm) SM,20km,LC Connector, DDM Function, Compatible with Cisco
(TX1310/RX1550nm)(TX1550/RX1310nm) – 20KM/40KM
(TX1490/RX1550nm)(TX1550/RX1490nm) – 80KM/120KM

