



Shenzhen Wintop Optical Technology Co., Ltd, (WinTop)

Address: 11F~12F, Senhainuo Kechuang Building, Shilong Community, Shiyan Street, Baoan District, Shenzhen

## APS1115-10

### APTEK SFP 1.25Gbps Bidi Optical Transceiver 10Km DDM

#### 1. Feature:

- SFP package with LC connector
- Wave length: TX1550nm / RX1310nm
- Up to 10Km transmission on SMF
- +3.3V single power supply
- LVPECL compatible data input/output interface
- Low EMI and excellent ESD protection
- Laser safety standard IEC-60825 compliant
- Compatible with RoHS
- Compatible 1000BASE-LX (IEEE 802.3z)
- Compliant with SFP Multi Source Agreement (SFF8472)
- Hot-plug SFP



#### 2. Application:

- Ethernet
- Telecom
- Fiber Channel

#### 3. Absolute Maximum Ratings:

| Parameter                   | Symbol | Minimum | Maximum | Units |
|-----------------------------|--------|---------|---------|-------|
| Storage Temperature         | Tst    | -40     | +85     | °C    |
| Supply Voltage              | Vcc    | 0       | +3.5    | V     |
| Operating Relative Humidity | RH     | 5       | 95      | %     |

#### 4. Operation Environment:

| Parameter                  | Symbol | Min   | Typical | Max | Units |
|----------------------------|--------|-------|---------|-----|-------|
| Supply Voltage             | Vcc    | 3.135 | 3.3     | 3.5 | V     |
| Supply Current             | Icc    |       | 180     | 300 | mA    |
| Operating Case Temperature | Tc     | 0     |         | +70 | °C    |
| Power Dissipation          |        |       |         | 1   | W     |
| Data Rate                  |        |       | 1.25    |     | Gbps  |



## 5. Optical Characteristics:

(Ambient Operating Temperature 0°C to +70°C, Vcc =3.3 V)

| Parameter                                                                                          | Symbol                                        | Min. | Typ. | Max. | Units |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------|------|------|------|-------|
| Transmitter Section                                                                                |                                               |      |      |      |       |
| Center Wavelength                                                                                  | $\lambda_o$                                   |      | 1550 |      | nm    |
| Spectral Width (RMS)                                                                               | $\Delta\lambda$                               | -    | -    | 4    | nm    |
| Average Output Power                                                                               | Po                                            | -8   | -    | -3   | dBm   |
| Extinction Ratio                                                                                   | Er                                            | 10   | -    | 15   | dB    |
| Rise/Fall Time (20%~80%)                                                                           | Tr/Tf                                         |      |      | 0.26 | ns    |
| Total jitter                                                                                       | Tj                                            |      |      | 0.43 | UI    |
| Optical Eye Diagram                                                                                | IEEE 802.3z and ANSI Fibre Channel Compatible |      |      |      |       |
| Receiver Section                                                                                   |                                               |      |      |      |       |
| Center Wavelength                                                                                  | $\lambda_o$                                   |      | 1310 |      | nm    |
| Receiver Sensitivity<br>(Measured at 1.25Gbps<br>PRBS $2^7 - 1$ , ER=9dB,<br>BER $\leq 10^{-12}$ ) | Rsen                                          |      |      | -24  | dBm   |
| Receiver Overload                                                                                  | Rov                                           | -3   |      |      | dBm   |
| Return Loss                                                                                        |                                               | 12   |      |      | dB    |
| LOS Assert                                                                                         | LOS <sub>A</sub>                              | -36  |      |      | dBm   |
| LOS Dessert                                                                                        | LOS <sub>D</sub>                              |      |      | -26  | dBm   |
| LOS Hysteresis                                                                                     |                                               | 0.5  |      | 5    |       |



## 6. Electrical Characteristics:

(Ambient Operating Temperature 0°C to +70°C, Vcc =3.3 V)

| Parameter                     |          | Symbol | Min. | Typ. | Max. | unit |
|-------------------------------|----------|--------|------|------|------|------|
| <b>Transmitter Section</b>    |          |        |      |      |      |      |
| Input Differential Impendence |          | Zin    | 90   | 100  | 110  | Ohm  |
| Data Input Swing Differential |          | Vin    | 500  |      | 2400 | mV   |
| TX Disable                    | Disable  |        | 2.0  |      | Vcc  | V    |
|                               | Enable   |        | 0    |      | 0.8  | V    |
| TX Fault                      | Assert   |        | 2.0  |      | Vcc  | V    |
|                               | Deassert |        | 0    |      | 0.8  | V    |
| <b>Receiver Section</b>       |          |        |      |      |      |      |
| Output differential impedance |          | Zout   |      | 100  |      | Ohm  |
| Data Input Swing Differential |          | Vout   | 370  |      | 2000 | mV   |
| Rx_LOS                        | Assert   |        | 2.0  |      | Vcc  | V    |
|                               | Deassert |        | 0    |      | 0.8  | V    |

## 7. EEPROM INFORMATION (A0) :

| Addr  | Field Size (Bytes) | Name of Field   | HEX                                                | Description      |
|-------|--------------------|-----------------|----------------------------------------------------|------------------|
| 0     | 1                  | Identifier      | 03                                                 | SFP              |
| 1     | 1                  | Ext. Identifier | 04                                                 | MOD4             |
| 2     | 1                  | Connector       | 07                                                 | LC               |
| 3-10  | 8                  | Transceiver     | 00 00 00 02 12 00 0D 01                            | Transmitter Code |
| 11    | 1                  | Encoding        | 01                                                 | 8B10B            |
| 12    | 1                  | BR, nominal     | 0D                                                 | 1250Mbps         |
| 13    | 1                  | Reserved        | 00                                                 |                  |
| 14    | 1                  | Length (9um)-km | 14                                                 | 10km             |
| 15    | 1                  | Length (9um)    | 64                                                 |                  |
| 16    | 1                  | Length (50um)   | 00                                                 |                  |
| 17    | 1                  | Length (62.5um) | 00                                                 |                  |
| 18    | 1                  | Length (copper) | 00                                                 |                  |
| 19    | 1                  | Reserved        | 00                                                 |                  |
| 20-35 | 16                 | Vendor name     | 57 49 4E 54 4F 50 20 20<br>20 20 20 20 20 20 20 20 |                  |
| 36    | 1                  | Reserved        | 00                                                 |                  |
| 37-39 | 3                  | Vendor OUI      | 00 00 00                                           |                  |
| 40-55 | 16                 | Vendor PN       | xx xx xx xx xx xx xx xx                            | ASC II           |



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|        |     |                  |                                                    |                              |
|--------|-----|------------------|----------------------------------------------------|------------------------------|
|        |     |                  | xx xx xx xx xx xx xx xx                            |                              |
| 56-59  | 4   | Vendor rev       | 31 2E 30 20                                        | V1.0                         |
| 60-61  | 2   | Wavelength       | 05 1E/05 D2                                        | 1310nm/1550nm                |
| 62     | 1   | Reserved         | 00                                                 |                              |
| 63     | 1   | CC BASE          | XX                                                 | Check sum of byte 0~62       |
| 64-65  | 2   | Options          | 00 1A                                              | LOS, TX_DISABLE,<br>TX_FAULT |
| 66     | 1   | BR, max          | 32                                                 | 50%                          |
| 67     | 1   | BR, min          | 32                                                 | 50%                          |
| 68-83  | 16  | Vendor SN        | 00 00 00 00 00 00 00 00<br>00 00 00 00 00 00 00 00 | Unspecified                  |
| 84-91  | 8   | Vendor date code | XX XX XX 20                                        | Year, Month, Day             |
| 92-94  | 3   | Reserved         | 00                                                 |                              |
| 95     | 1   | CC_EXT           | XX                                                 | Check sum of byte 64~94      |
| 96-255 | 160 | Vendor specific  |                                                    |                              |

## 8. Diagnostics:

| Parameter    |   | Range       | Accuracy | Unit | Calibration |
|--------------|---|-------------|----------|------|-------------|
| Temperature  | C | -5 ~ 70     | ±3       | °C   | Internal    |
| Voltage      |   | 3.135 ~ 3.5 | 3        | %    | Internal    |
| Bias Current |   | 0 ~ 120     | 10       | %    | Internal    |
| Tx Power     |   | -8 ~ -3     | ±1       | dB   | Internal    |
| Rx Power     |   | < -3        | ±1       | dB   | Internal    |



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## 9. Outline drawing (mm):

