# APSM1385

# SFP+ 10Gbps Optical Transceiver 550m DDM

## 1. Feature:

- SFP+ package with LC connector
- 850nm VCSEL Laser and PIN photo detector
- Up to 300m transmission on 2000MHz-km MMF
- Power dissipation < 1W
- LVPECL compatible data input/output interface
- Low EMI and excellent ESD protection
- Laser safety standard IEC-60825 compliant
- Compatible with RoHS
- Compatible with SFF8472

## 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 | +3.6 | V |
| Operating Relative Humidity | RH | 0 | 85 | % |

## 4. Operation Environment：

| Parameter | | Symbol | Min | Typical | Max | Units |
|---|---|---|---|---|---|---|
| Supply Voltage | | Vcc | 3.15 | | 3.45 | V |
| Operating Case Temperature | Commercial | Tc | 0 | | +70 | °C |
| | Industrial | | -40 | | +85 | |
| Power Dissipation | | | | | 1 | W |
| Data Rate | | | | 10.3125 | | 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 | λo | 840 | 850 | 860 | nm |
| RMS Spectral Width | Δλ | - | - | 0.45 | dB |
| Average Output Power | Po | -5 | - | -1 | dBm |
| Extinction Ratio | Er | 3.0 | - | - | dB |
| Dispersion Penalty | | | | 3.9 | dB |
| Relative Intensity Noise | $RIN_{12}OMA$ | | | -128 | dB/Hz |
| Total jitter | Tj | IEEE 802.3ae | | | |
| **Receiver Section** | | | | | |
| Center Wavelength | λo | | 850 | | nm |
| Receiver Sensitivity | Rsen | | | -11.5 | dBm |
| Stressed Sensitivity | Rsen | | | -10.5 | dBm |
| Receiver Overload | Rov | 0 | | | dBm |
| Return Loss | | 12 | | | dB |
| LOS Assert | $LOS_A$ | -17 | | | dBm |
| LOS Dessert | $LOS_D$ | | | -15 | dBm |
| LOS Hysteresis | | 0.5 | | 4 | |

## 6. Electrical Characteristics

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

| Parameter | | Symbol | Min. | Typ. | Max. | unit |
|---|---|---|---|---|---|---|
| **Transmitter Section** | | | | | | |
| Input Differential Impedence | | Zin | 90 | 100 | 110 | Ohm |
| Data Input Swing Differential | | Vin | 180 | | 700 | 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 |
| **Receiver Section** | | | | | | |
| Output differential impedence | | Zout | | 100 | | Ohm |
| Data output Swing Differential | | Vout | 300 | | 800 | mV |
| Rx_LOS | Assert | | 2.0 | | Vcc | V |
| | Deassert | | 0 | | 0.8 | V |

## 7. Diagnostics

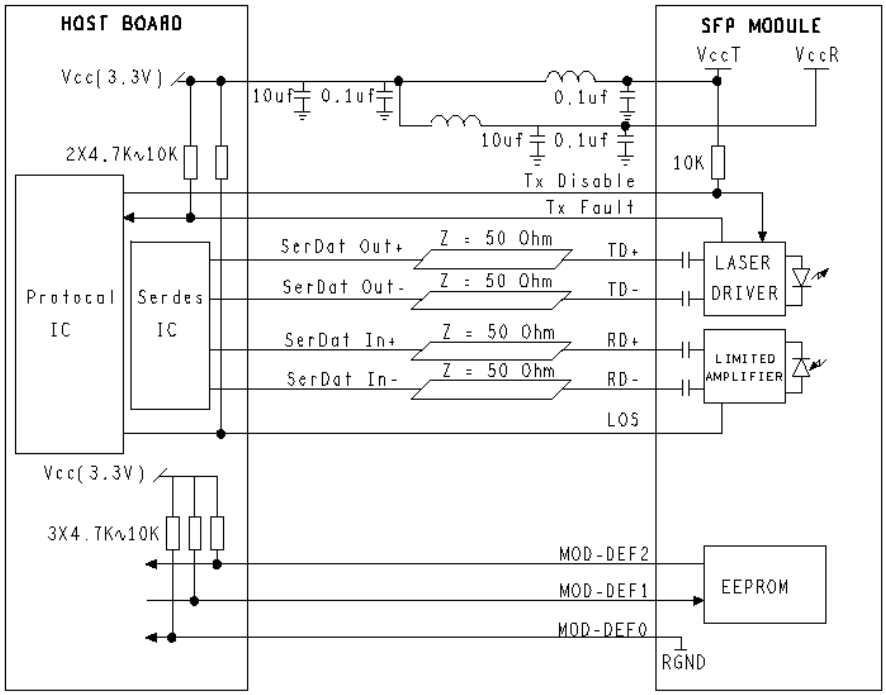
| Parameter | Range | Accuracy | Unit | Calibration |
|---|---|---|---|---|
| Temperature | -5 ~ 75 | ±3 | ºC | Internal |
| Voltage | 0 ~ VCC | 0.1 | V | Internal |
| Bias Current | 0 ~ 12 | 0.5 | mA | Internal |
| Tx Power | -8 ~ 1 | ±1 | dBm | Internal |
| Rx Power | -18 ~ 0 | ±1 | dBm | Internal |

## 8. EEPROM INFORMATION（A0）:

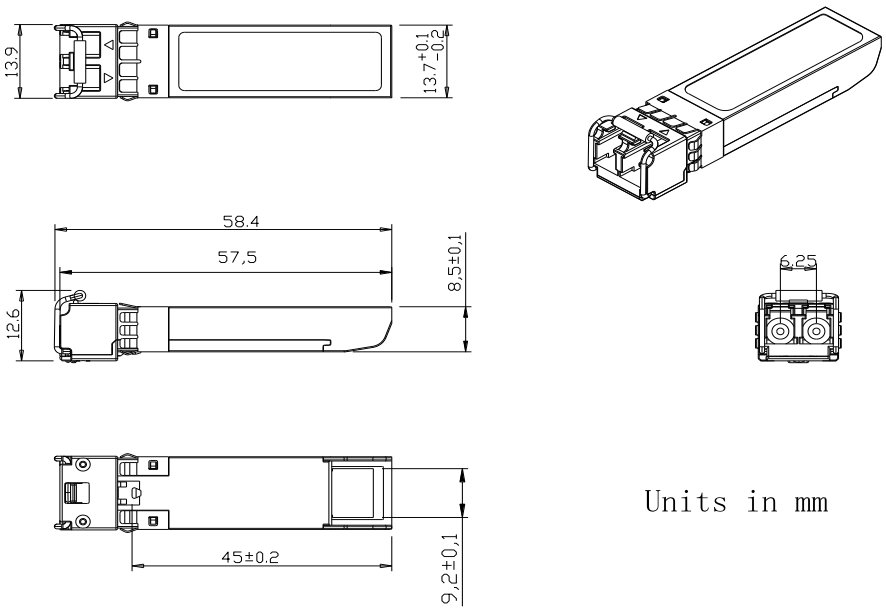
| Addr | Field Size (Bytes) | Name of Field | HEX | Description |
|---|---|---|---|---|
| 0 | 1 | Identifier | 03 | SFP |
| 1 | 1 | Ext. Identifier | 04 | MOD4 |
| 2 | 1 | Connector | 07 | LC |
| 3-10 | 8 | Transceiver | 10 00 00 00 00 00 00 00 | Transmitter Code |
| 11 | 1 | Encoding | 06 | 64B66B |
| 12 | 1 | BR, nominal | 67 | 10000Mbps |
| 13 | 1 | Reserved | 00 | |
| 14 | 1 | Length (9um)-km | 00 | |
| 15 | 1 | Length (9um) | 00 | |
| 16 | 1 | Length (50um) | 08 | |
| 17 | 1 | Length (62.5um) | 02 | |
| 18 | 1 | Length (copper) | 00 | |
| 19 | 1 | Reserved | 00 | |
| 20-35 | 16 | Vendor name | | APTEK |
| 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 xx xx xx xx xx xx xx xx | ASC II |
| 56-59 | 4 | Vendor rev | 31 2E 30 20 | V1.0 |
| 60-61 | 2 | Wavelength | 03 52 | 850nm |
| 62 | 1 | Reserved | 00 | |
| 63 | 1 | CC BASE | XX | Check sum of byte 0~62 |
| 64-65 | 2 | Options | 00 1A | LOS, TX_DISABLE, TX_FAULT |
| 66 | 1 | BR, max | 00 | |
| 67 | 1 | BR, min | 00 | |
| 68-83 | 16 | Vendor SN | | 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 | | |

## 9. Recommended Application Circuit




## 10. Outline drawing (mm):




Units in mm