

25.78Gb/s SFP28 Short Wavelength Transceiver

APSP885B53xDL01

■ Product Features

- ✓ Duplex LC connector
- ✓ Hot-pluggable SFP28 footprint
- ✓ 850nm VCSEL laser
- ✓ RoHS compliant and Lead Free
- ✓ 100m over MMF (50/125 um OM4)
- ✓ 70m over MMF (50/125um OM3)
- ✓ Metal enclosure for lower EMI
- ✓ Power dissipation <1.2W (0~70°C)
- ✓ Commercial operating temperature optional



■ Applications

- ✓ 25GBASE-SR Ethernet

■ General

ATOP's APSP885B53CDL01 short wavelength transceiver is a single-Channel ,Pluggable, Fiber-Optic SFP28 for 25 Gigabit Ethernet and Infiniband EDR Applications. It is with the SFP+ 20-pin connector, Digital diagnostic functions are available via an I²C. It has built-in clock and data recovery (CDR). They are compliant to IEEE802.3by, SFF-8472 Rev 12.2 ^b and SFF-8402^g , and compatible with SFF-8432 ^a and applicable portions of SFF-8431 Rev4.1 ^c . This module incorporates Gigalight Technologies proven circuit and VCSEL technology to provide reliable longlife, high performance, and consistent service

■ Product Selection

| Part Number | Operating Case temperature | DDMI |
|-----------------------|----------------------------|------|
| APSP885B53CDL01 | Commercial(0~70°C) | Yes |
| APSP8B53EDL01*note1 | Extended(-20~85°C) | Yes |
| APSP831B53IDL10*note2 | Industrial(-40~85°C) | Yes |

Note1: E-temp not support now

Note2: I-temp not support now

■ Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESD to the Duplex LC Receptacle: compatible with IEC 61000-4-2



- Immunity compatible with IEC 61000-4-3
- EMI compatible with FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2
- RoHS compliant with RoHS 2 (2011/65/EU)

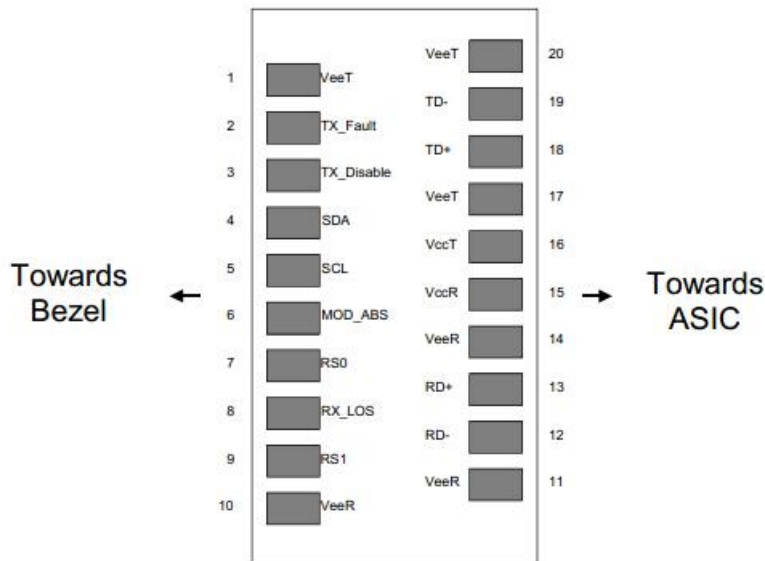
Pin Descriptions

| Pin | Symbol | Name/Description | Ref. |
|-----|------------|---|------|
| 1 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |
| 2 | TX Fault | Transmitter Fault. LVTTTL-O | 2 |
| 3 | TX Disable | Transmitter Disable. Laser output disabled on high or open. LVTTTL-I | 3 |
| 4 | SDA | 2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I/O | 2 |
| 5 | SCL | 2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTTL-I | 2 |
| 6 | Mod_ABS | Module Absent, Connect to VeeT or VeeR in Module. | 2 |
| 7 | RS0 | Rate Select 0, optionally controls SFP+ module receiver LVTTTL-I | 4 |
| 8 | LOS | Loss of Signal indication. Logic 0 indicates normal operation. LVTTTL-O | 5 |
| 9 | RS1 | Rate Select 1, optionally controls SFP+ module transmitter. LVTTTL-I | 4 |
| 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. CML-O | |
| 13 | RD+ | Receiver Non-inverted DATA out. AC Coupled. CML-O | |
| 14 | VeeR | Receiver Ground (Common with Transmitter Ground) | 1 |
| 15 | VccR | Receiver Power Supply | 6 |
| 16 | VccT | Transmitter Power Supply | 6 |
| 17 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |
| 18 | TD+ | Transmitter Non-Inverted DATA in. AC Coupled. CML- I | |

| | | | |
|----|------|--|---|
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled. CML- I | |
| 20 | VeeT | Transmitter Ground (Common with Receiver Ground) | 1 |

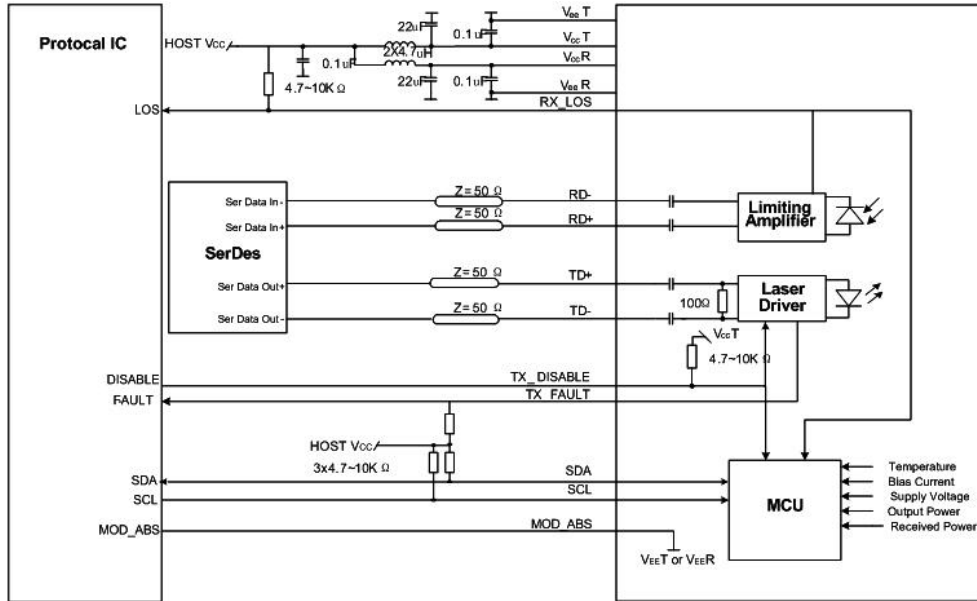
Notes:

1. Circuit ground is internally isolated from chassis ground.
2. TX Fault 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 TX Disable >2.0V or open, enabled on TX Disable<0.8V.
4. Internally pulled down per SFF-8431 Rev4.1.
5. LOS is open collector 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.
6. Internally connected



Pin-out of Connector Block on Host Board

■ **Recommend Circuit Schematic**



■ **Absolute Maximum Ratings**

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

■ **Recommended Operating Conditions**

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|-----------------------------|--------|------|-------|------|------|------------|
| Power Supply Voltage | Vcc | 3.13 | 3.30 | 3.47 | V | |
| Power Supply Current | Icc | | | 290 | mA | Commercial |
| Case Operating Temperature | Tc | 0 | | +70 | °C | Commercial |
| Data Rate(Gigabit Ethernet) | BR | | 25.78 | | Gbps | |
| 50/125 um OM4 MMF | Lmax | | | 100 | m | |

■ **Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)**

| Parameter | Symbol | Min | Typ | Max | Unit | Ref. |
|--------------------|--------|-----|-----|-----|------|------|
| Transmitter | | | | | | |



APSP831B53xDL10

| | | | | | | |
|--------------------------------|----------|-----------|-----|----------|----|---|
| Input differential impedance | Rin | 80 | 100 | 120 | Ω | 1 |
| Differential data input swing | Vin, pp | 150 | | 980 | mV | |
| TX Disable-High | | Vcc – 0.8 | | Vcc | V | |
| TX Disable-Low | | Vee | | Vee+ 0.8 | V | |
| TX Fault-High | | Vcc-0.8 | | Vcc | V | |
| TX Fault-Low | | Vee | | Vee+0.8 | V | |
| Receiver | | | | | | |
| Single ended data output swing | Vout, pp | 300 | | 900 | mV | 2 |
| LOS-High | | Vcc – 0.8 | | Vcc | V | |
| LOS-Low | | Vee | | Vee+0.8 | V | |

Notes:

1. AC coupled.
2. Into 100 ohm differential termination.

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

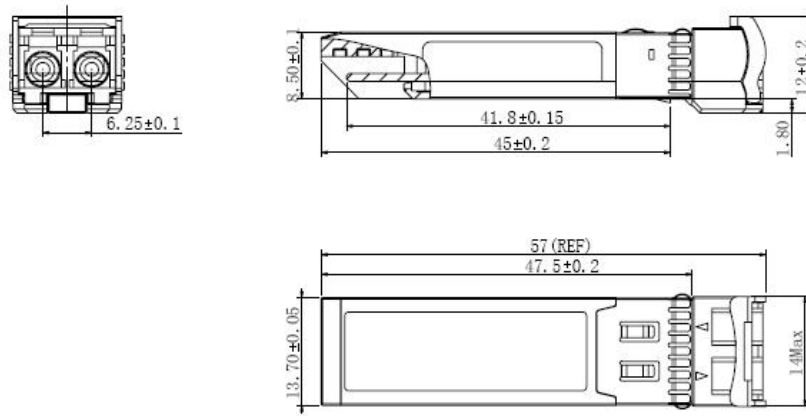
| Parameter | Symbol | Min | Typ | Max | Unit | Note |
|-----------------------------|--------|------|-----|------|------|------|
| Transmitter | | | | | | |
| Output Opt. Power | PO | -8.4 | | +2.4 | dBm | |
| Optical Wavelength | λ | 840 | 850 | 860 | nm | |
| Spectral Width (RMS)@25Gb/s | Δλ | | | 0.6 | nm | |
| Optical Extinction Ratio | ER | 2 | | | dB | |
| Receiver | | | | | | |
| Receiver Sensitivity (OMA) | SENS1 | | | -10 | dBm | 1 |
| Receiver Overload | | 3 | | | dBm | |
| Optical Center Wavelength | λC | 840 | | 860 | nm | |
| LOS De-Assert | LOSD | | | -13 | dBm | |
| LOS Assert | LOSA | -30 | | | dBm | |
| LOS Hysteresis | | 0.5 | | 5 | dB | |

Notes:

1. Measured with data rate at 25.78Gb/s, BER less than 5E-5 with PRBS 2³¹-1..

Mechanical Specifications

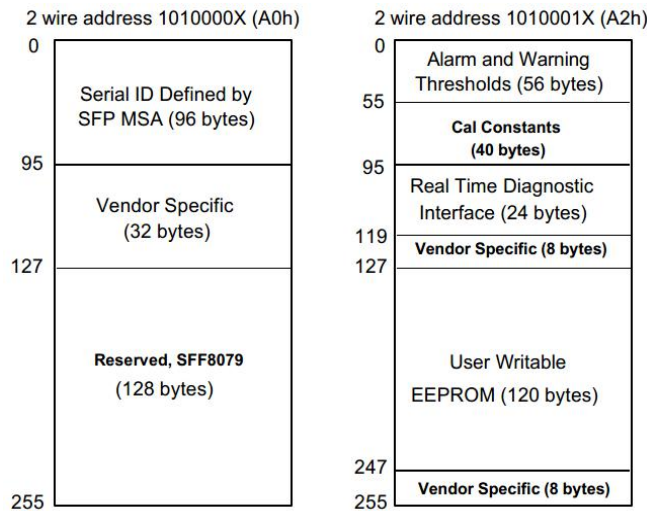
ATOP's Small Form Factor Pluggable (SFP28) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA), dimensions are in mm.



APSP885B53xDL01

■ EEPROM Information

EEPROM memory map specific data field description is as below:



■ Digital Diagnostic Monitoring Interface

Five transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

| Parameter | Range | Accuracy | Calibration |
|-------------|----------------|----------|-------------|
| Temperature | 0 to +70°C (C) | ±3°C | Internal |



| | | | |
|--------------|------------------|------|----------|
| | -20 to +85°C (E) | | |
| | -40 to +85°C (I) | | |
| Voltage | 2.97 to 3.63V | ±3% | Internal |
| Bias Current | 0 to 80mA | ±10% | Internal |
| TX Power | -8.4 to +2.4dBm | ±3dB | Internal |
| RX Power | -10 to 3dBm | ±3dB | Internal |

■ **Revision History**

| Revision | Initiated | Reviewed | Approved | DCN | Release Date |
|------------|------------|--------------|-----------|---------------|---------------|
| Version1.0 | Chuck.chen | Tangzhiqiang | Dingzheng | New Released. | Jul. 19, 2017 |

■ **For More Information**

ATOP Corporation

Tel: +86-755-86674946

Fax: +86-755-86296723

Email: sales@atoptechnology.com

Web: www.atoptechnology.com