



## 25.78Gb/s SFP28 Short Wavelength Transceiver

### APSP885B53CDL01

#### ■ 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 <1W (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 I<sup>2</sup>C. It has built-in clock and data recovery (CDR). They are compliant to IEEE802.3by, SFF-8472 Rev 12.2 <sup>b</sup> and SFF-8402<sup>9</sup> , and compatible with SFF-8432 <sup>a</sup> and applicable portions of SFF-8431 Rev4.1 <sup>c</sup> . This module incorporates ATOP 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



■ **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)

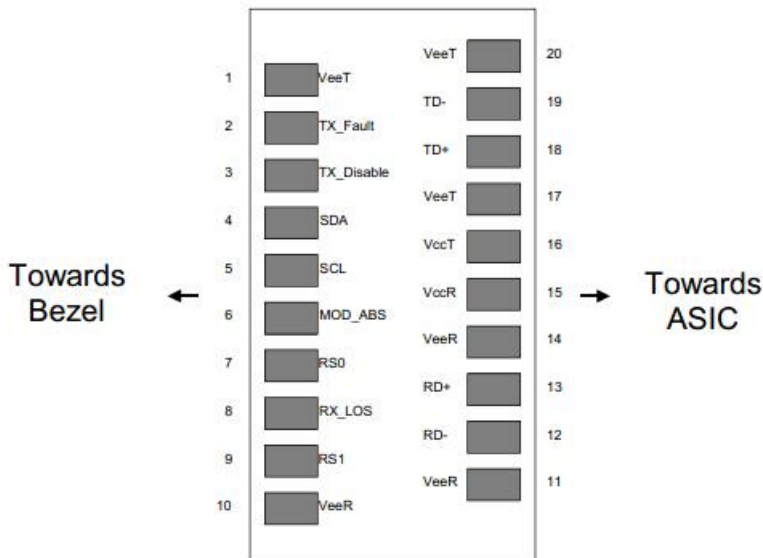
■ **Pin Descriptions**

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

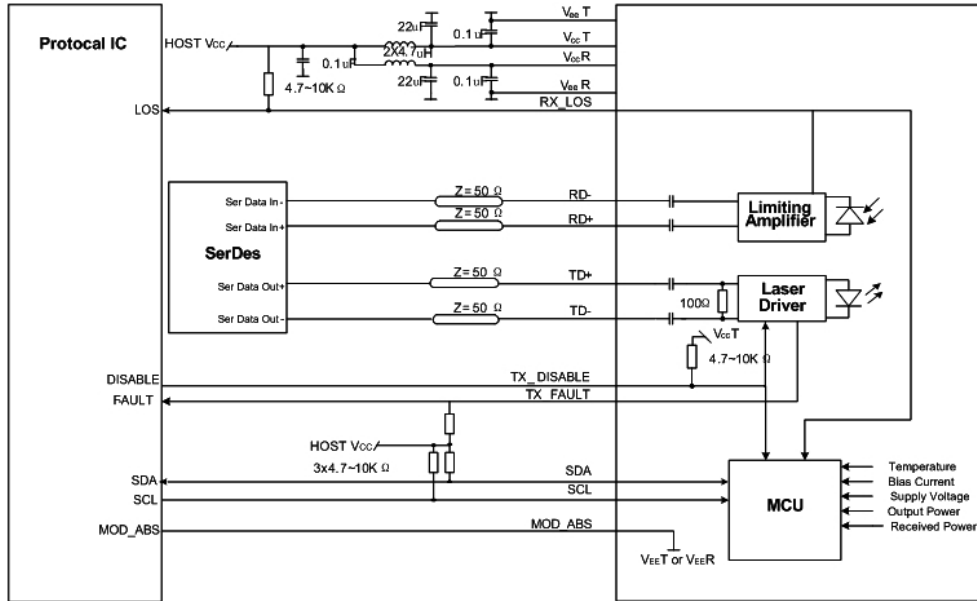
**Notes:**

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			300	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.
<b>Transmitter</b>						



# APSP885B53CDL01

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	
<b>Receiver</b>						
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)**

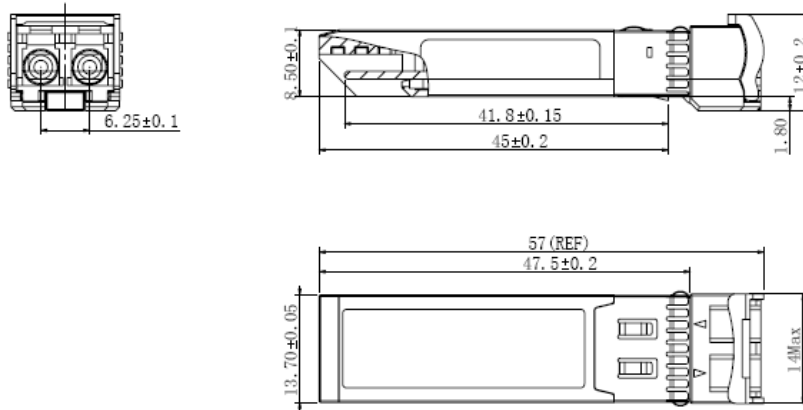
Parameter	Symbol	Min	Typ	Max	Unit	Note
<b>Transmitter</b>						
Output Opt. Power	PO	-8.4		+2.4	dBm	
Optical Wavelength	λ	840	850	860	nm	
Spectral Width (RMS)@25Gb/s	Δλ			0.6	nm	
Optical Extinction Ratio	ER	2			dB	
<b>Receiver</b>						
Receiver Sensitivity	SENS1			-10.3	dBm	1
Stressed Receiver Sensitivity(OMA)	Pmin			-5.2	dBm	
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 2<sup>31</sup>-1..

## ■ Mechanical Specifications

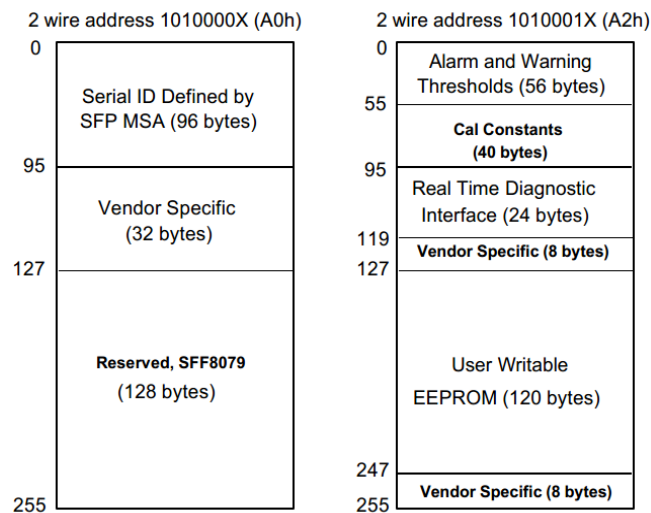
ATOP's Small Form Factor Pluggable (SFP28) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA), dimensions are in mm.



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## ■ 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	-11 to 3dBm	±3dB	Internal

■ **Revision History**

Revision	Initiated	Reviewed	Approved	DCN	Release Date
Version1.0	Chuck.chen	Sunbin	Dingzheng	New Released.	Jul. 19, 2017
Version2.0	Chuck.chen	Tang.Zhiqiang	Dingzheng	Change Power dissipation	Apr. 9, 2018

■ **For More Information**

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