



SFP28 Short Wavelength C-temp Transceiver

APSP885B53CDL01



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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 and SFF-8402 , and compatible with SFF-8432 and applicable portions of SFF-8431 Rev4.1.This module incorporates ATOP Technologies proven circuit and VCSEL technology to provide reliable longlife, high performance, and consistent service .

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
- ✓ CPRI Option 10



Product Selection

Part Number	Operating Case temperature	DDMI
APSP885B53CDL01	Commercial(0~70°C)	Yes

Regulatory Compliance

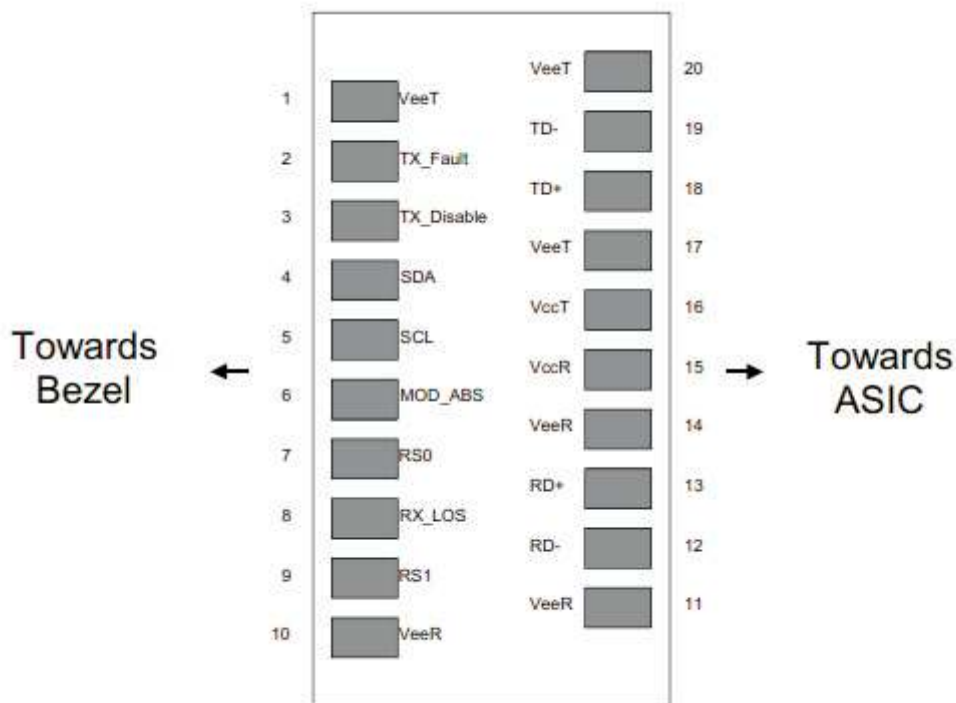
- ESD to the Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESD to the Duplex LC Receptacle: compatible with EN 61000-4-2
- Immunity compatible with EN 61000-4-3
- EMI compatible with FCC Part 15 Class B
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 IEC 60950, IEC60825-1,2
- RoHS compliant with RoHS 2.0(2015/863/EU)-amending

Pin Descriptions

Pin	Symbol	Name	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

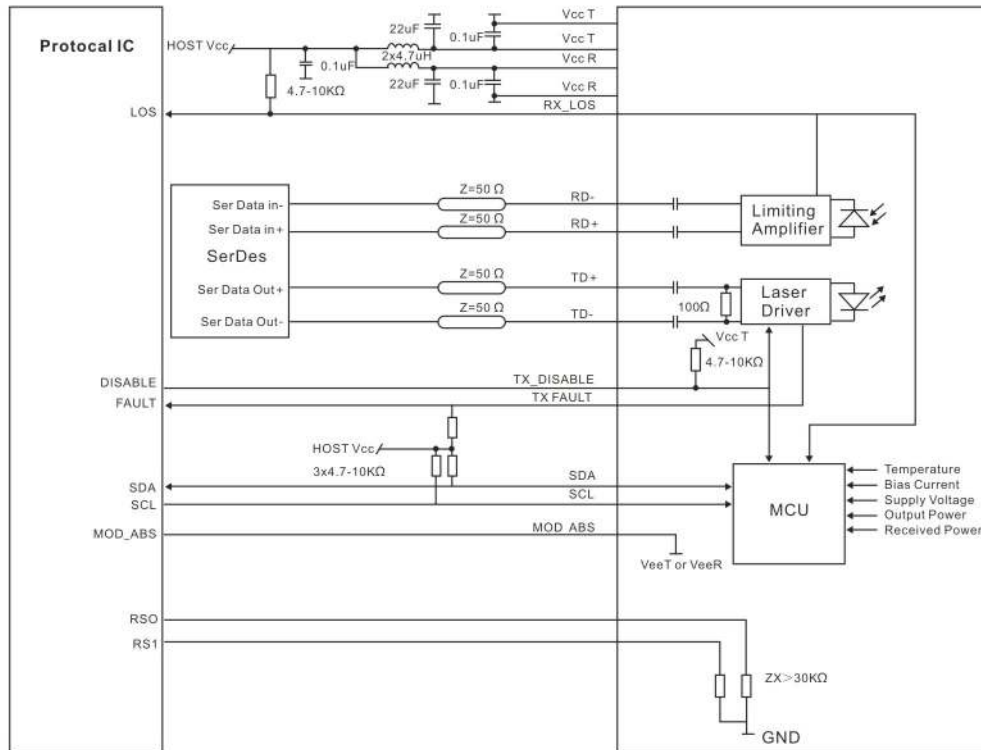
Note

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 <math><0.8V</math>.
3. Laser output disabled on TX Disable >2.0V or open, enabled on TX Disable<math><0.8V</math>.
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

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
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	185		425	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.

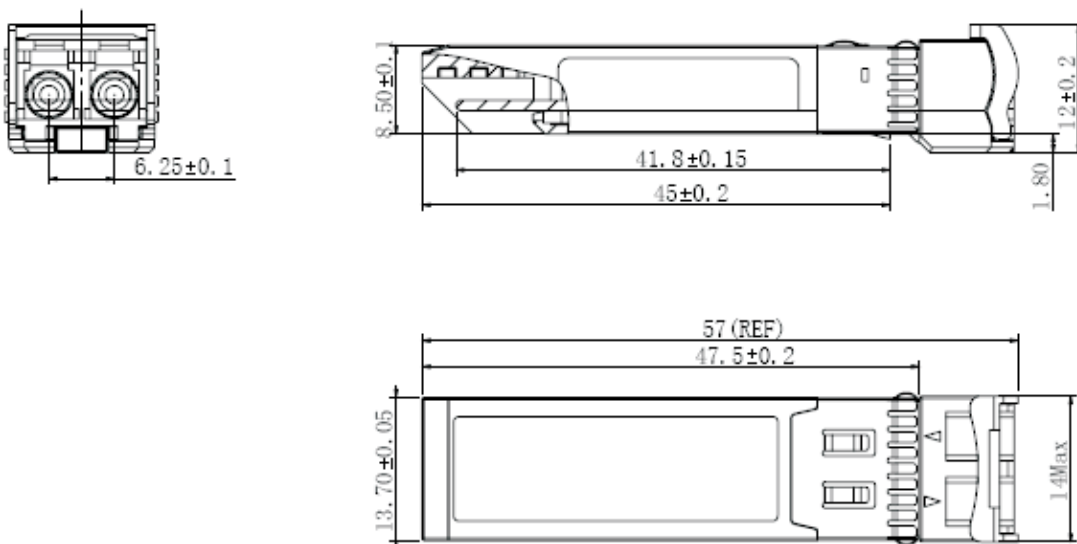
Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Power	PO	-8.4		+2.4	dBm	
Optical Wavelength	λ	840	850	860	nm	
Spectral Width (RMS)@25Gb/s	$\Delta\lambda$			0.6	nm	
Optical Extinction Ratio	ER	2			dB	
Receiver						
Receiver Sensitivity	SENS1			-10.3	dBm	1
Stressed Receiver Sensitivity(OMA)	Pmin			-5.2	dBm	
Receiver Overload		3			dBm	
Optical Center Wavelength	λ_C	840		860	nm	
LOS De-Assert	LOSD			-13	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5		5	dB	

Notes: Measured with data rate at 25.78Gb/s, BER less than $5E-5$ with PRBS $2^{31}-1$.

Mechanical Specifications

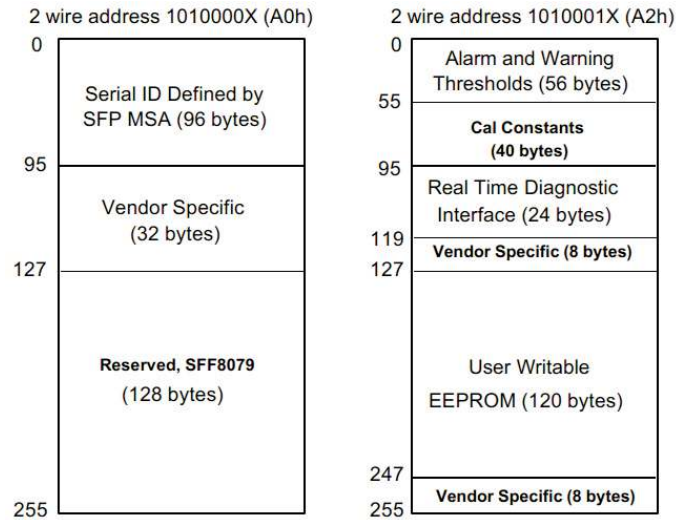
- ATOP's Small Form Factor Pluggable (SFP28) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA) , dimensions are in mm.



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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
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
Version2.1	Li Tao	Tang.Zhiqiang	DingZheng	Add CPRI Option 10	Jan. 15, 2019
Version2.2	Tang.Zhiqiang	Li Tao	DingZheng	Update the new template	Dec 19, 2019
Version2.3	Tang Rong	Li Tao	DingZheng	Update Recommend Circuit Schematic	June 30, 2020



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