



SFP28 MWDM Transceiver

APS8MxxB5xDL10A



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ATOP's APS8MxxB5xDL10A single-mode transceiver is SFP28 module for duplex optical data communications support up to 25.78Gb/s. It is with the SFP+ 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I²C. It has built-in clock and data recovery (CDR). This module is designed for single-mode fiber.

Product Features

- ✓ Duplex LC connector
- ✓ Hot-pluggable SFP28 footprint
- ✓ Cooled MWDW DFB laser
- ✓ RoHS compliant and Lead Free
- ✓ Distance up to 10km on 9/125um SMF
- ✓ Metal enclosure for lower EMI
- ✓ Power dissipation <2 W
- ✓ Commercial and Industrial operating temperature optional

Applications

- ✓ eCPRI/ CPRI 10
- ✓ 25G Ethernet



Product Selection

Part Number	Operating Case temperature	DDMI
APS8MxxB5CDL10A	Commercial (0~70°C)	Yes
APS8MxxB5IDL10A	Industrial(-40~85°C)	Yes

Product Channel Selection

No.	Part Number	Center Wavelength(nm)
1	APS8M26B5xDL10A	1267.5
2	APS8M27B5xDL10A	1274.5
3	APS8M28B5xDL10A	1287.5

4	APS8M29B5xDL10A	1294.5
5	APS8M30B5xDL10A	1307.5
6	APS8M31B5xDL10A	1314.5
7	APS8M32B5xDL10A	1327.5
8	APS8M33B5xDL10A	1334.5
9	APS8M34B5xDL10A	1347.5
10	APS8M35B5xDL10A	1354.5
11	APS8M36B5xDL10A	1367.5
12	APS8M37B5xDL10A	1374.5

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

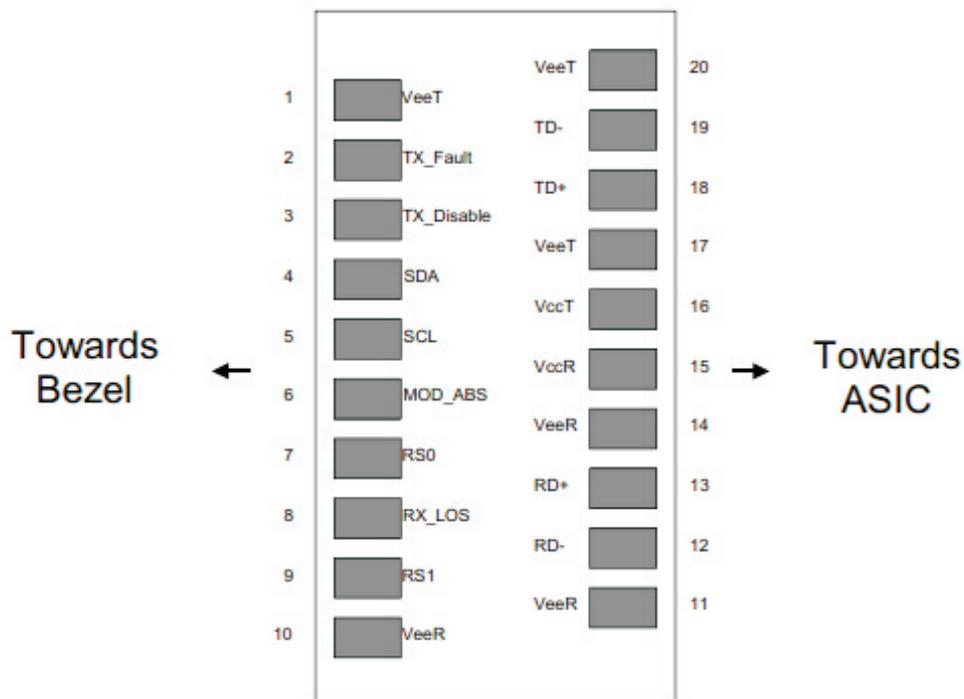
Pin Descriptions

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

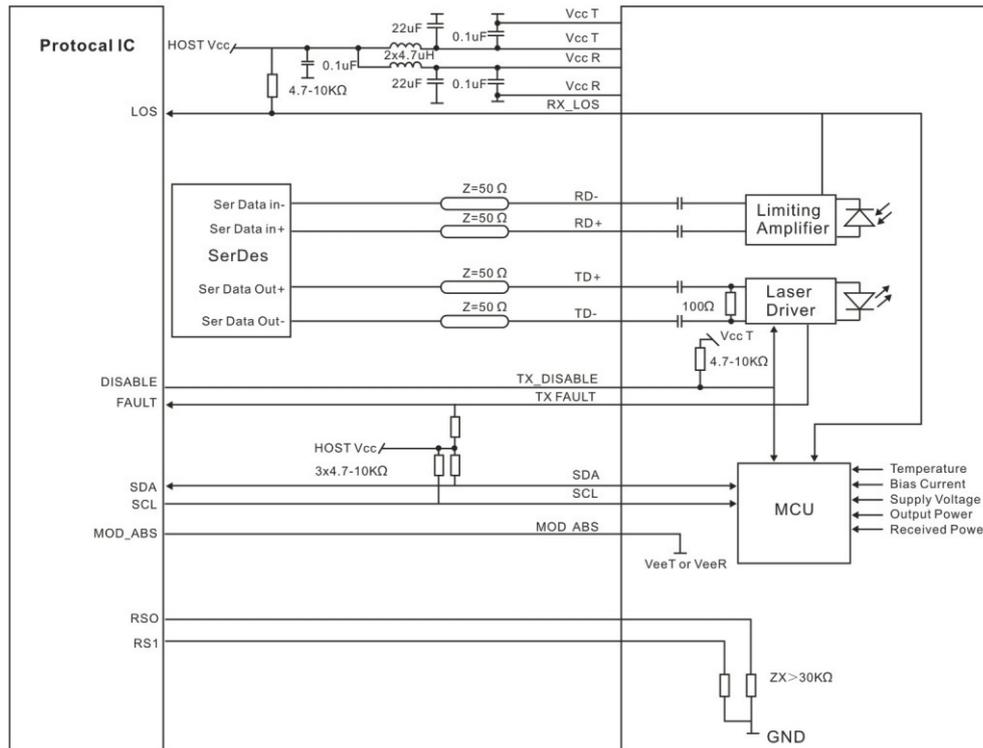
Note

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 <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			600	mA	
Case Operating Temperature	Tc	0		+70	°C	Commercial
	Ti	-40		+85	°C	Industrial
Data Rate	BR			25.78	Gbps	
9/125um G.652 SMF	Lmax			10	km	

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	90		800	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	+2		+7	dBm	
Output Opt. Power OMA		+1			dBm	
Optical Wavelength	λ	λ-2.5	λ	λ+2.5	nm	1

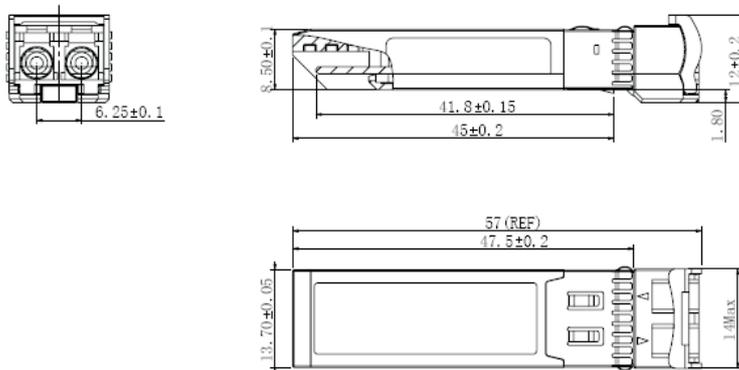
Side-Mode Suppression Ratio	SMSR	35		dB	
Spectral Width(-20dB)	σ		1	nm	
Optical Extinction Ratio	ER	3.5		dB	
Transmitter Dispersion Penalty of 25.78G	TDP		4.5	dB	2
Eye diagram{X1, X2, X3, Y1, Y2, Y3}	High Rate	0.31, 0.4, 0.45, 0.34, 0.38, 0.4			
	Low Rate	0.25, 0.4, 0.45, 0.25, 0.28, 0.4			
Receiver					
OMA RX Sensitivity @25.78Gb/s	SEN		-14	dBm	3
Receiver Overload @25.78Gb/s	Po	2		dBm	
Optical Center Wavelength	λ_C	1260	1620	nm	
LOS De-Assert	LOSD		-15	dBm	
LOS Assert	LOSA	-30		dBm	
LOS Hysteresis		0.5	6	dB	

Notes:

- $\lambda=1267.5\text{nm}, 1274.5\text{nm}, 1287.5\text{nm}, 1294.5\text{nm}, 1307.5\text{nm}, 1314.5\text{nm}, 1327.5\text{nm}, 1334.5\text{nm}, 1347.5\text{nm}, 1354.5\text{nm}, 1367.5\text{nm}, 1374.5\text{nm}.$
- 10km fiberlink over G.652 SMF, PRBS $2^{31}-1$ test pattern, BER = $5E-5$, The TDP value <1dB at 1267.5~1314.5nm, and TDP value <3dB at 1327.5~1334.5nm. TDP value <4.5dB at 1347.5~1374.5nm.
- Measured with a PRBS $2^{31}-1$ test pattern, ER=5.0dB, BER = $5*10^{-5}$. The value is informative and not the principal indicator of signal strength, A received power below this value cannot be compliant; however, a value above this does not ensure compliance.

Mechanical Specifications

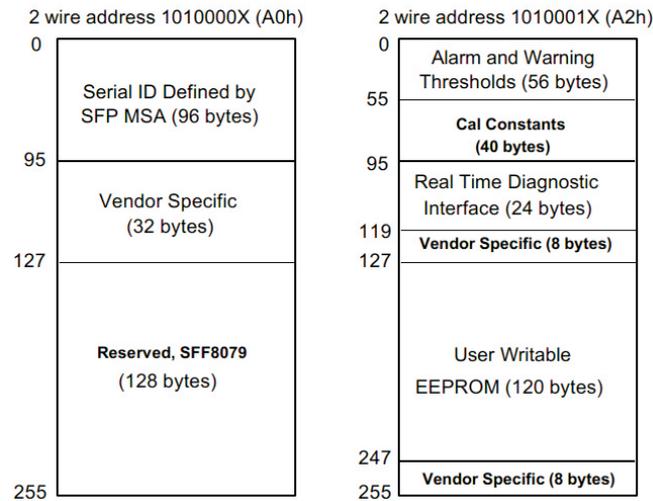
- ATOP's Small Form Factor Pluggable (SFP28) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA), dimensions are in mm.



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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 +75°C (C) -40 to +85°C (I)	±3°C	Internal
Voltage	3.13 to 3.47V	±3%	Internal
Bias Current	5 to 80mA	±10%	Internal
TX Power	+2 to +7dBm	±3dB	Internal
RX Power	-15 to +2dBm	±3dB	Internal

Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
Version1.0	Tang Zhiqiang	Xiong Weilin	Ding Zheng	New Released.	Aug 16,2020



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