

10.3125Gb/s CSFP BIDI Transceiver

APCSPxxB33xDL10

■ Product Features

- ✓ Two Bi-Directional transceivers in one SFP package
- ✓ Up to 10.3125Gb/s data links
- ✓ Duplex LC connector
- ✓ Hot-pluggable SFP footprint
- ✓ Uncooled DFB laser transmitter
- ✓ RoHS compliant and Lead Free
- ✓ Up to 10Km on 9/125um SMF
- ✓ Metal enclosure for lower EMI
- ✓ Single +3.3V power supply
- ✓ Compliant with CSFP MSA 2.0 (Option 2)
- ✓ Commercial operating temperature optional



■ Applications

- ✓ 10GBASE-LR/LW
- ✓ 10G Fibre Channel

■ Product Selection

Part Number	Wavelength	Operating Case temperature
APCSP23B33CDL10	Tx-1270 / Rx-1330	Commercial
APCSP32B33CDL10	Tx-1330 / Rx-1270	Commercial
APCSP23B33IDL10	Tx-1270 / Rx-1330	Industrial
APCSP32B33IDL10	Tx-1330 / Rx-1270	Industrial

■ Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESD to the Single 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)



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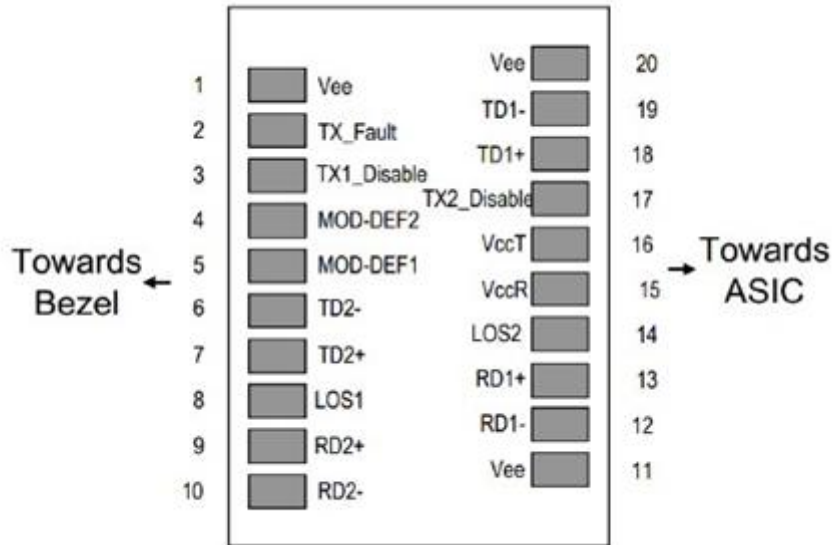
- RoHS compliant with RoHS 2 (2011/65/EU)

■ Pin Descriptions

Pin	Symbol	Name/Description	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground)	1
2	TX Fault	Transmitter Fault.	2
3	TX1_Disable	Transmitter Disable of Ch1; Turns off transmitter laser output of Ch1.	3
4	MOD_DEF(2)	2-wire Serial Interface Data Line (SDA).	
5	MOD_DEF(1)	2-wire Serial Interface Clock Line (SCL).	
6	TD2-	Inverted Transmit Data Input of Ch2.	
7	TD2+	Transmit Data Input of Ch2.	
8	LOS1	Loss of signal for Ch1.	4
9	RD2+	Received Data Output of Ch2.	
10	RD2-	Inverted Received Data Output of Ch2.	
11	VeeT	Transmitter Ground.	
12	RD1-	Inverted Received Data Output of Ch1.	
13	RD1+	Received Data Output of Ch1.	
14	LOS2	Loss of signal for Ch2.	4
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	Tx2_Disable	Transmitter Disable of Ch2; Turns off transmitter laser output of Ch2.	3
18	TD1+	Transmit Data Input of Ch1.	
19	TD1-	Inverted Transmit Data Input of Ch1.	
20	VeeT	Transmitter Ground.	

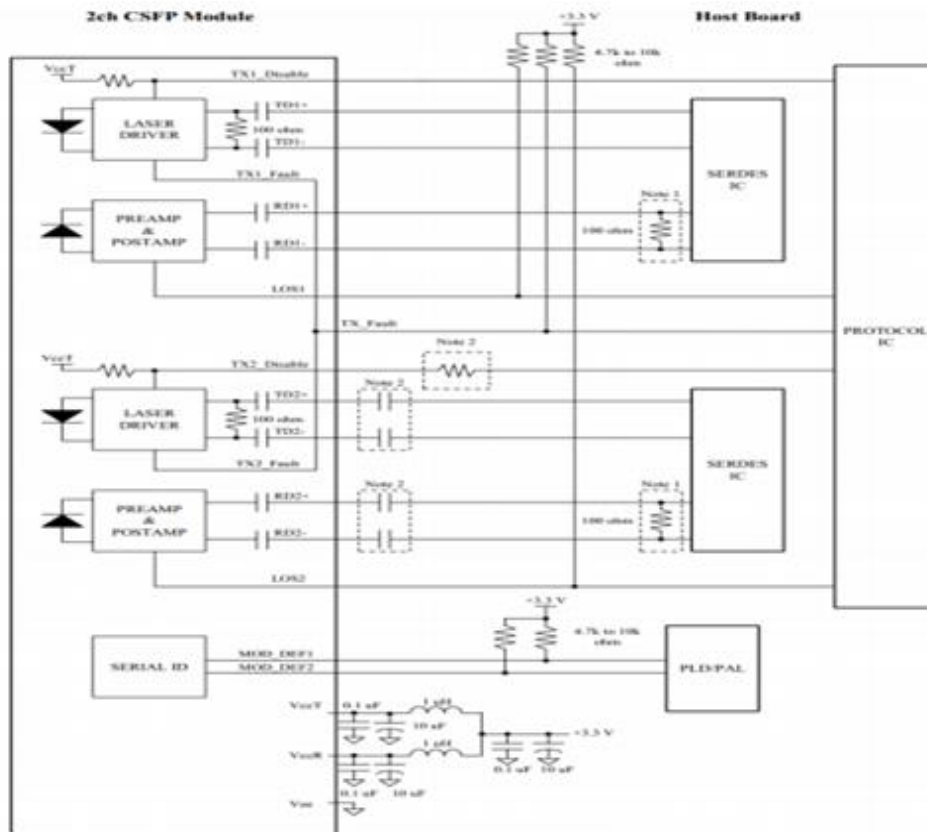
Notes:

1. Circuit ground is internally isolated from chassis ground.
2. TX_ Fault is internally OR output for TX fault conditions in either Channel 1 or Channel 2. In order to determine which channel is at fault, the Host can read the internal memory bits.
3. Laser output disabled on TX Disable >2.0V or open, enabled on TX Disable <0.8V.
4. 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.



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			500	mA	
Case Operating Temperature	Tc	0		+70	°C	
Case Operating Temperature	Ti	-40		+85	°C	
Data Rate			10.3		Gbps	
9/125um G.652 SMF	Lmax			10	km	

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

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Input differential impedance	Rin	-	100	-	Ω	1
Single ended data input swing	Vin, pp	120		850	mV	
TX Disable-High	-	Vcc – 0.8		Vcc	V	
TX Disable-Low	-	Vee		Vee+ 0.8	V	
TX Fault-High	-	Vcc-0.5	-	Vcc	V	
TX Fault-Low	-	Vee	-	Vee+0.5	V	
Receiver						
Single ended data output swing	Vout, pp	175		800	mV	2
LOS-High	-	Vcc – 0.5	-	Vcc	V	
LOS-Low	-	Vee	-	Vee+0.5	V	



Notes:

1. AC coupled.
2. Into 100 ohm differential termination.
3. 20 – 80 %

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

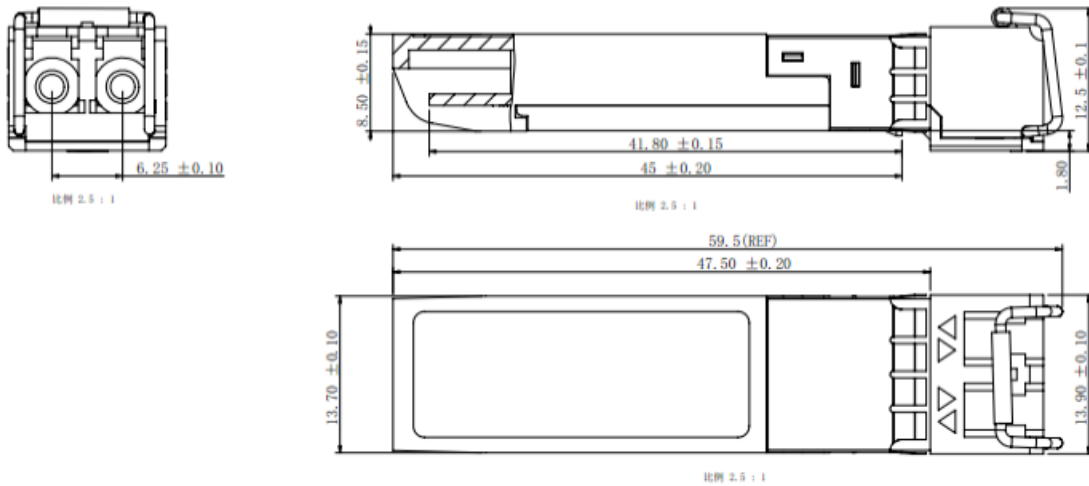
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Power	PO	-5	-	2	dBm	1
Optical Wavelength	λ	1260	1270	1280	nm	
		1320	1330	1340	nm	
Spectral Width(-20dB)	$\Delta\lambda$	-	-	1	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Optical Extinction Ratio	ER	3.5	-	-	dB	
Receiver						
RX Sensitivity @10.3125Gb/s	SENS	-	-	-12	dBm	2, 3
Receiver Overload	-	0.5	-	-	dBm	
Optical Center Wavelength	λ_C	1320	1330	1340	nm	
		1260	1270	1280	nm	
LOS De-Assert	LOSD	-	-	-14	dBm	
LOS Assert	LOSA	-40	-	-	dBm	
LOS Hysteresis	-	0.5	-	5	dB	

Notes:

1. Class 1 Laser Safety.
2. Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.
3. Measured with PRBS $2^{31}-1$ at 10^{-12} BER.

■ Mechanical Specifications

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

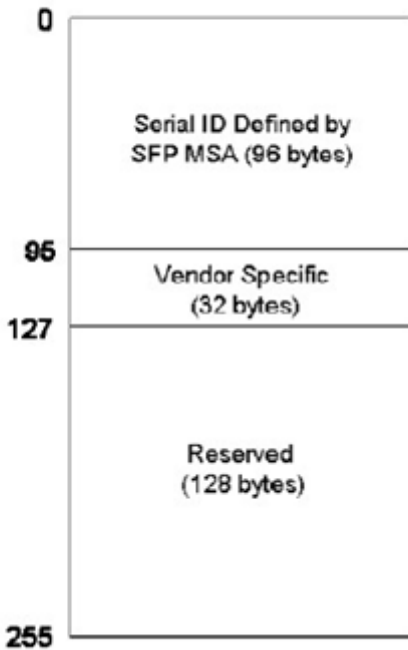


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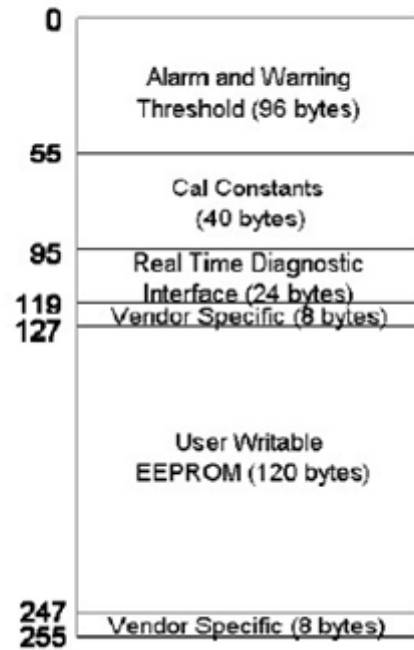
■ **EEPROM Information**

Memory map for 2ch Compact SFP (option 2) is illustrated in below figure. A0h (1010000X) and B0h (1011000X) are the Serial ID addresses for channel 1 and channel 2, respectively. A2h (1010001X) and B2h (1011001X) are the Digital Diagnostic addresses for channel 1 and channel 2.

Channel 1: 2 wire address 1010000X (A0h)
Channel 2: 2 wire address 1011000X (B0h)



Channel 1: 2 wire address 1010001X (A2h)
Channel 2: 2 wire address 1011001X (B2h)





■ 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
	-40 to +85°C (C)	±3°C	Internal
Voltage	2.97 to 3.63V	±3%	Internal
Bias Current	0 to 100mA	±10%	Internal
TX Power	-5 to +2dBm	±3dB	Internal
RX Power	-12 to +0.5dBm	±3dB	Internal

■ Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
V1.0	yangpeiyun	Dinzheng	Dinzheng	New Released.	Dec 19, 2016
V1.1	yangpeiyun	Dinzheng	Dinzheng	Update Tx power Spec	May 27, 2017

■ For More Information

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