1.25Gb/s CSFP BIDI Transceiver

APCS35123xxL20

Product Features

- ✓ Two Bi-Directional transceivers in one SFP package
- ✓ Up to 1.25Gb/s data links
- ✓ Duplex LC connector
- ✓ Hot-pluggable SFP footprint
- ✓ 1310nm FP laser transmitter
- ✓ RoHS compliant and Lead Free
- ✓ Up to 20Km on 9/125um SMF
- ✓ Metal enclosure for lower EMI
- ✓ Single +3.3V power supply
- ✓ Compliant with CSFP MSA 2.0 (Option 2)
- ✓ Commercial and industrial operating temperature optional
- ✓ SFP MSA SFF-8074i Compliant

Applications

- ✓ Gigabit Ethernet
- ✓ Fibre Channel

Product Selection

Part Number	Operating temperature	DDMI
APCS35123CDL20	Commercial	Yes
APCS35123IDL20	Industrial	Yes

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)

60825-1,2

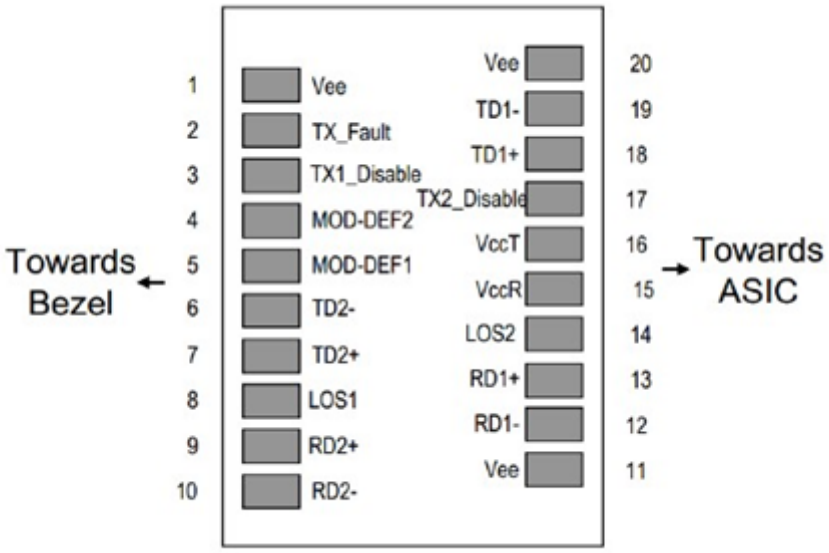
- RoHS compliant with RoHS 2 (2011/65/EU)

Pin Descriptions

Pin	Symbol	Name/Description	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground)	
2	TX Fault	Transmitter Fault.	1
3	TX1_ Disable	Transmitter Disable of Ch1; Turns off transmitter laser output of Ch1.	
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.	
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.	
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	Tx2_Disable	Transmitter Disable of Ch2; Turns off transmitter laser output of Ch2.	
18	TD1+	Transmit Data Input of Ch1.	
19	TD1-	Inverted Transmit Data Input of Ch1.	
20	VeeT	Transmitter Ground .	

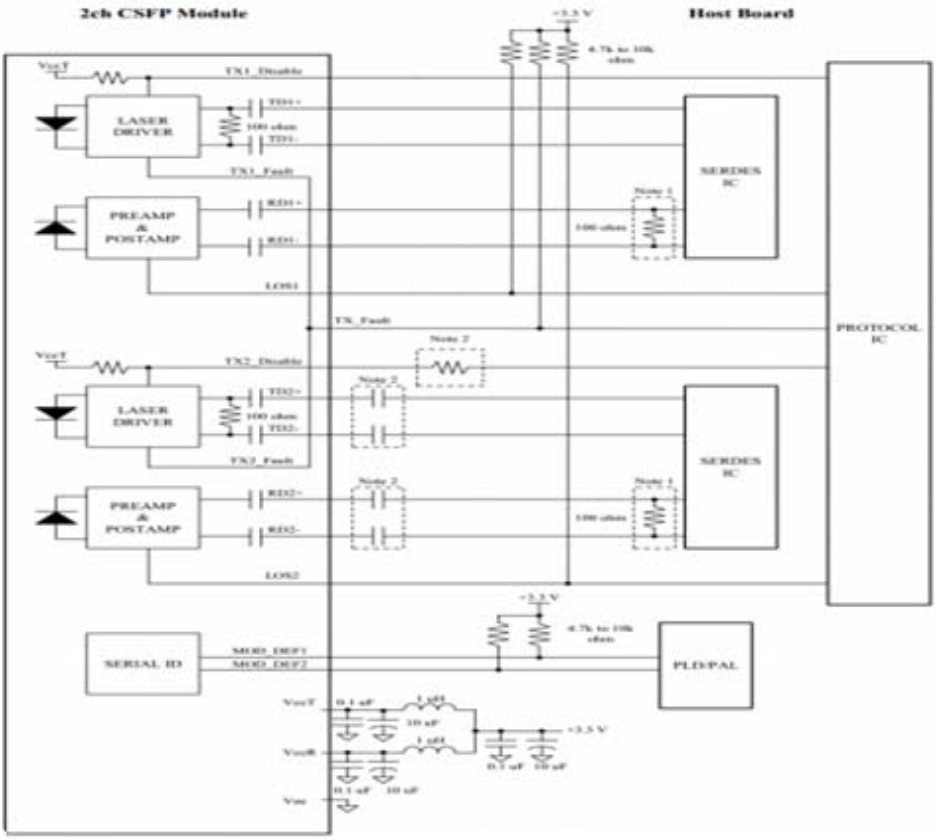
Notes:

1. 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 for



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	1
	TI	-40		+85		2
Data Rate(Gigabit Ethernet)			1.25		Gbps	
9/125um G.652 SMF	Lmax			20	km	

Notes:

1. For commercial class product.
2. For industrial class product.

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	250	-	1200	mV	
TX Disable-High	-	Vcc – 1.3	-	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	300	400	800	mV	2

Data output rise time	tr	-	-	300	ps	3
Data output fall time	tf	-	-	300	ps	3
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)

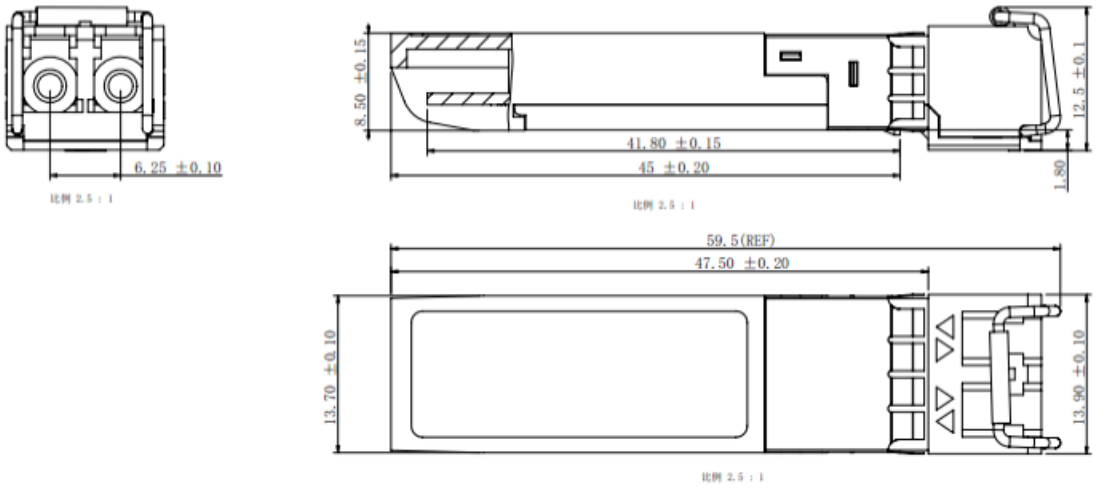
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Power	PO	-9	-	-3	dBm	1
Optical Wavelength	λ	1260	1310	1360	nm	
Spectral Width (RMS)	Δλ	-	-	3	nm	
Optical Rise/Fall Time	tr/tf	-	-	260	ps	2
Total Jitter	TJ	-	-	0.35	UI	
Optical Extinction Ratio	ER	6	-	-	dB	
Receiver						
RX Sensitivity @1.25Gb/s	SENS	-	-	-22.5	dBm	3, 4
Receiver Overload	-	-3	-	-	dBm	
Optical Center Wavelength	λC	1530	1550	1570	nm	
LOS De-Assert	LOSD	-	-	-25	dBm	
LOS Assert	LOSA	-40	-	-	dBm	
LOS Hysteresis	-	0.5	-	5	dB	

Notes:

1. Class 1 Laser Safety.
2. Unfiltered, 20-80%. Complies with Gigabit Ethernet eye masks when filtered.
3. Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.
4. Measured with PRBS 2^{7}-1 at 10^{-12} BER.

Mechanical Specifications

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



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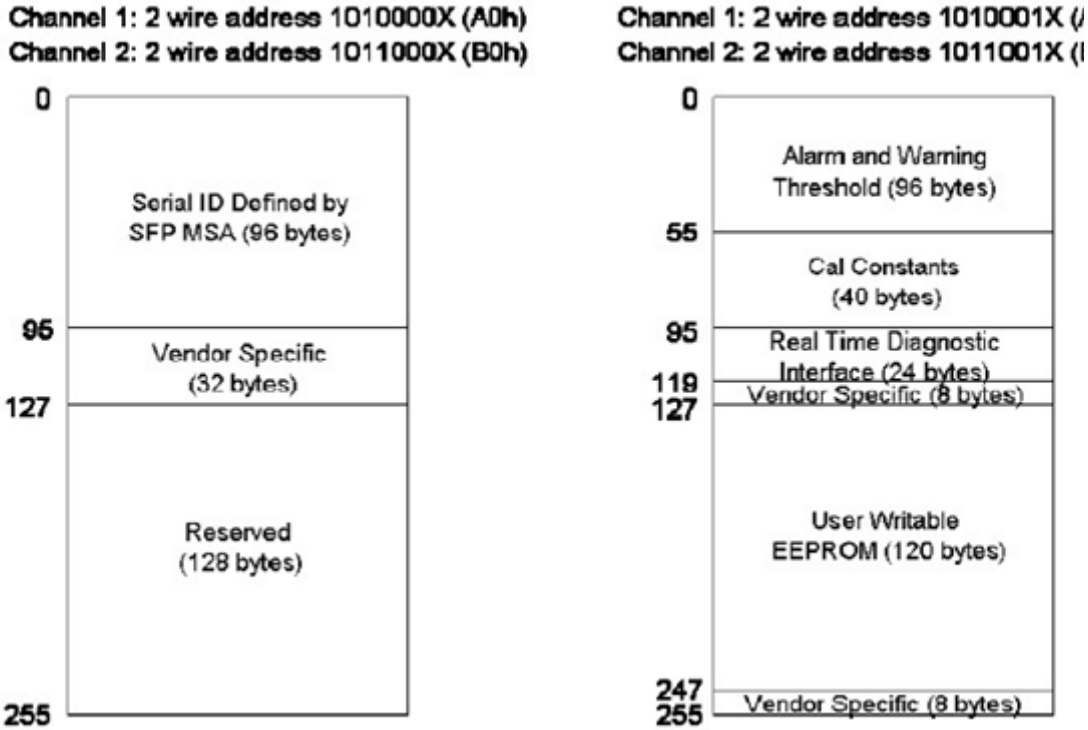
EEPROM Information

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.



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 (I)		
Voltage	2.97 to 3.63V	±3%	Internal
Bias Current	0 to 100mA	±10%	Internal
TX Power	-9 to -3dBm	±3dB	Internal
RX Power	-22.5 to -3dBm	±3dB	Internal

Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
Version1.0	yangpeiyun	sunbin	dingzheng	New Released.	July 29, 2016

For More Information

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