

8.5 Gb/s 850 nm Multi-Mode SFP+ Transceiver



- Supports up to 8.5 Gb/s data rates
- Up to 150 m transmission distance on MMF
- Metal enclosure
- Hot-pluggable SFP+ footprint
- Compliant with SFF 8472
- Multi-rate 8x/4x/2x Fiber Channel
- RoHS Compliant

Ascent's SFPP-A8LP-85-015 transceivers are designed expressly for high-speed communication applications that require rates up to 8.5 Gb/s. They are designed to be compliant with the SFF-8472 SFP+ MSA. The module is suitable for data links up to 300 m in distance over multi-mode fiber.

ASCENT SFP+ transceivers provide a unique enhanced digital diagnostic monitoring interface which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power, and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags which alerts end users when particular operating parameters are outside of a factory set normal range.

Key Features

- Up to 8.5 Gb/s Data Links
- Up to 150 m transmission on MMF
- Power dissipation < 1.0 W
- VSCEL laser and PIN receiver
- Metal enclosure, for lower EMI
- 2-wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable SFP+ footprint
- Compliant with SFF8472
- Compliant with SFP+ MSA with LC connector
- Compliant with Fiber Channel FC-P1-4 800-SM-LC-L
- Compliant with 8G, 4G, and 2G Fiber Channel
- RoHS compliant
- Single + 3.3V power supply

Pin Assignment

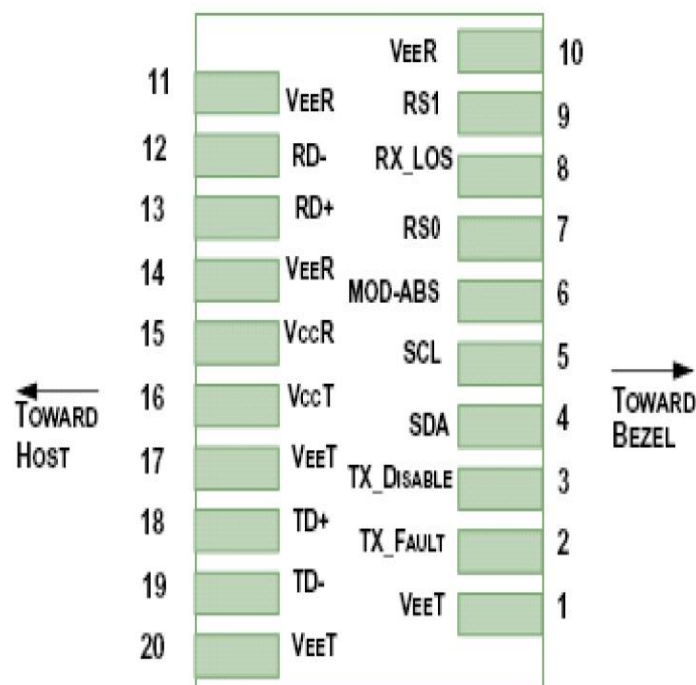


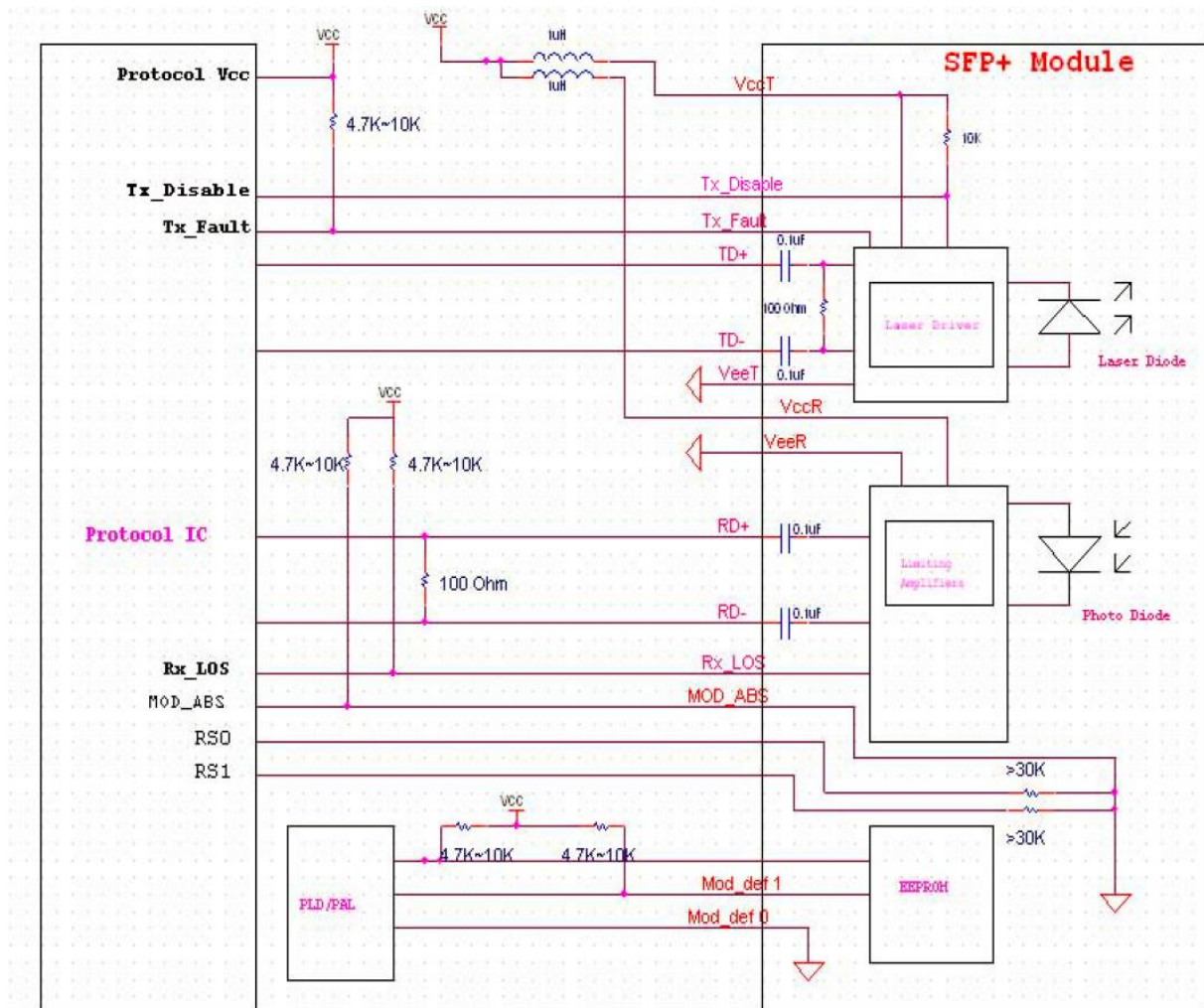
Diagram of Host Board Connector Block Pin Numbers and Name

Pin	Symbol	Name/Description	NOTE
1	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T _{FAULT}	Transmitter Fault.	2
3	T _{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	No connection required	1
10	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	
17	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1

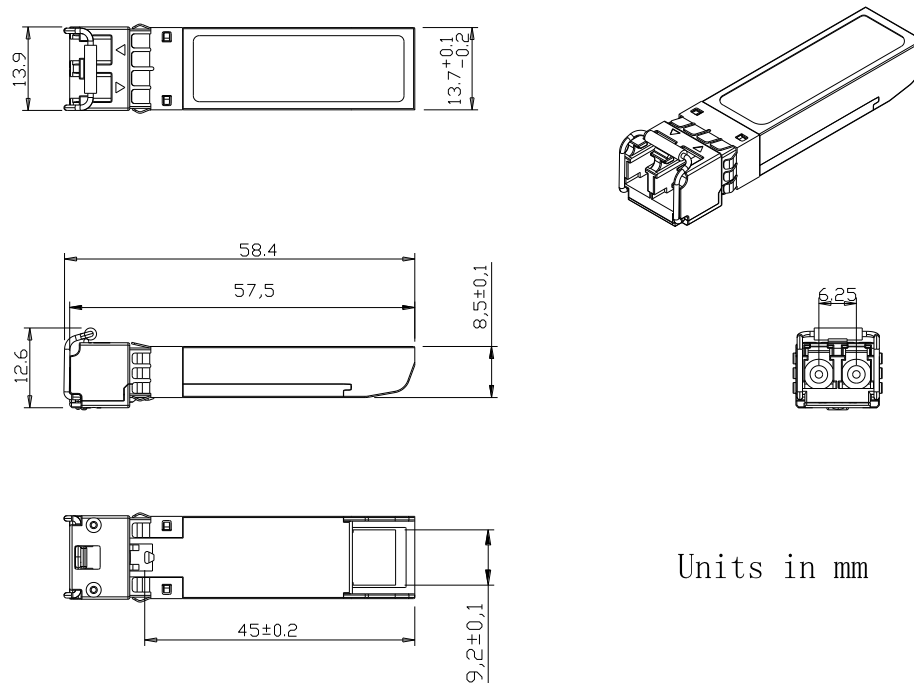
Notes:

1. Circuit ground is internally isolated from chassis ground.
2. T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7 kΩ to 10 kΩ resistor on the host board if intended for use. Pull up voltage should be between 2.0 V to V_{cc} + 0.3 V. 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 T_{DIS} > 2.0 V or open, enabled on T_{DIS} < 0.8 V.
4. Should be pulled up with 4.7 kΩ to 10 kΩ host board to a voltage between 2.0 V and 3.6 V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is an open collector output. It should be pulled up with 4.7 kΩ to 10 kΩ on the host board to a voltage between 2.0 V and 3.6 V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Host - Transceiver Interface Block Diagram



Outline Dimensions



Digital Diagnostic Functions

ASCENT SFPP-A8LP-85-015 transceivers support the 2-wire serial communication protocol as defined in the SFP+ MSA.

The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information.

Additionally, ASCENT SFP+ transceivers provide a unique enhanced digital diagnostic monitoring interface which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power, and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags which alerts end users when particular operating parameters are outside of a factory set normal range.

The SFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8-bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8-bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through a 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into the SFP transceiver into those

segments of the E2PROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

Specifications

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	T _S	-40	-	85	°C	
Relative Humidity	RH	5	-	95	%	
Power Supply Voltage	V _{CC}	-0.3	-	4	V	
Signal Input Voltage		V _{CC} - 0.3	-	V _{CC} + .3	V	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Case Operating Temperature	T _{CASE}	0	-	70	°C	Commercial
	T _{CASE}	-40	-	85	°C	Industrial
Power Supply Voltage	V _{CC}	3.14	3.3	3.47	V	
Power Supply Current	I _{CC}	-	-	360	mA	
Data Rate	BR	-	8.5	-	Gbps	
Transmission Distance	TD	-	-	300	km	
Coupled Fiber	Multi-mode fiber					50/125 μm SMF

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Optical Output Power	P _{OUT}	-6	-	-1	dBm	1
Optical Wavelength Range	λ	840	850	860	nm	
Optical Extinction Ratio	ER				dB	
RIN	RIN			-128	dB/Hz	
Output Eye Mask	Compliant with FC-PI-4					
Receiver						
Receiver Sensitivity	R _{SEN}	-	-	-10	dBm	2
Input Saturation Power (Overload)	P _{SAT}	0.5	-	-	dBm	
Wavelength Range	λ _C	770	850	860		
LOS Assert	LOSA	-	-	-14	dBm	
LOS De-assert	LOSD	-30	-	-	dBm	
LOS Detect Hysteresis	P _{HYS}	0.5	-	-	dB	

Notes:

1. T Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.
2. Measured with a PRBS 231-1 test pattern @8.5 Gb/s, BER<10⁻¹².

Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Notes
Supply Voltage	V_{CC}	3.14	3.3	3.146	V	
Supply Current	I_{CC}	-	-	300	mA	
Transmitter						
Input Differential Impedance	R_{IN}	-	100	-	Ω	1
Single-Ended Data Input Swing	$V_{IN,PP}$	180	-	700	mV	
Transmit Disable Voltage	V_D	$V_{CC} - 1.3$	-	V_{CC}	V	
Transmit Enable Voltage	V_{EN}	V_{EE}	-	$V_{EE} + 0.8$	V	2
Transmit Disable Assert Time		-	-	10	μs	
Receiver						
Differential Data Output Swing	$V_{OUT,PP}$	300	-	850	mVp-p	3
Data Output Rise/Fall Time	t_r/t_f	28	-	-	ps	4
LOS Fault	V_{LOS_FAULT}	$V_{CC} - 1.3$	-	V_{CCHOST}	V	5
LOS Normal	V_{LOS_NORM}	V_{EE}	-	$V_{EE} + 0.8$	V	5

Notes:

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Or open circuit.
3. Into 100 ohms differential termination.
4. These are unfiltered 20-80% values
5. Loss Of Signal is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Ordering Information

Model	Description
SFPP-A8LP-85-015	SFP+ Plug-in, 8G Fibre Channel 850nm 150m DOM Transceiver

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Specifications and product availability are subject to change without notice.

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