10G SFP+ ZR Transceiver



General Description

Accelight ASP10I-ZR is designed for use in 10 Gb/s links over single mode fibers(SMF). It is compliant with the SFP+ MSA and industry standard SFF-8472.

The module incorporates a 1550nm EML based transmitters and a receiver using APD and preamplifier in a highly integrated optical sub-assembly. It supports a data rate of up to 11.3 Gbps. The transmission distance is up to 80km using SMF.

The transceiver module uses a 20-contact electrical edge connector. Integrated with digital diagnostic monitors accessible via a Two Wire Serial interface (I²C), it is suitable for ultra-long reach 10G Ethernet links for both Telecom and Datacom.



Product Features

- Data rate up to 11.3 Gbps
- Maximum link length of 80km using single mode fiber
- EML transmitter and APD receiver
- Electrically hot-pluggable
- Digital diagnostic monitoring
- Compliant with SFP+ MSA with LC connector
- Case operating temperature range: -40°C to 85°C
- Single 3.3V power supply with power dissipation < 1.5W

Standards Compliance

- SFP+ MSA SFF-8431
- SFF-8472
- RoHS Compliant

Applications

- 10G Ethernet
- 10G SONET/SDH, OTU2/2e

Absolute Maximum Rating

Parameter	Symbol	Min.	Тур.	Max.	Unit	Note
Storage Temperature	Ts	-40	-	85	°C	
Relative Humidity	RH	5	-	95	%	
Power Supply Voltage	VCC	-0.3	-	4	V	
Signal Input Voltage		Vcc-0.3	-	Vcc+0.3	V	

Recommended Operating Conditions

Parameter	Symbol	Min.	Тур.	Max.	Unit	Note
Case Operating Temperature	Tcase	-40	-	85	°C	Industrial
Power Supply Voltage	VCC	3.14	3.3	3.47	V	
Power Supply Current	ICC	-		460	mA	
Data Rate	BR		10.3125	11.3	Gbps	
Transmission Distance	TD		-	80	km	9/125 SMF

Optical Characteristics

Parameter	Symbol	Min	Тур	Max	Unit	Ref.
Transmitter						
Average Launched Power	Роит	-1		4	dBm	1
Optical Wavelength	λ	1530	1550	1565	nm	
SMSR		30			dB	
Optical Extinction Ratio	ER	8.2			dB	
Spectral Width (-20dB)	σ			1	nm	
Transmitter OFF Output Power	POff			-30	dBm	
Transmitter and Dispersion Penalty	TDP			3.0	dB	
Output Eye Mask	Com					
Receiver						
Rx Sensitivity	Rsens			-23.0	dBm	2
Input Saturation Power (Overload)	Psat	-6.0			dBm	
Wavelength Range	λ _c	1270		1610	nm	
Receiver Reflectance	Rrx			-27	dB	
LOS De -Assert	LOSD			-26	dBm	
LOS Assert	LOSA	-35			dBm	
LOS Hysteresis		0.5			dB	

Notes:

 Launched power (avg.) is power coupled into a single mode fiber with master connector.
Measured with a PRBS=2³¹-1 NRZ test signal for BER = 10⁻¹² @10.3125Gbps; Optical source with worst ER, Wavelength between 1530nm and 1565nm; back to back.



Electrical Characteristics

Parameter	Symbol	Min	Тур	Max	Unit	NOTE
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	lcc			460	mA	1
Transmitter						
Input differential impedance	Rin		100		Ω	2
Single ended data input swing	Vin,pp	180		700	mV	
Transmit Disable Voltage	VD	2.0		Vcc	V	3
Transmit Enable Voltage	VEN	Vee		Vee+ 0.8	V	
Transmit Disable Assert Time				10	us	
Receiver						
Differential data output swing	Vout,pp	400		850	mV	4
Data output rise time	tr	28			ps	5
Data output fall time	tf	28			ps	5
LOS Fault	VLOS fault	2.0		VccHOST	V	6
LOS Normal	VLOS norm	Vee		Vee+0.8	V	6

Notes:

- 1. Measured with receive Pin=Psen, Vcc=3.3V, operation temperature range without air flow.
- 2. Connected directly to TX data input pins. AC coupled thereafter.
- 3. Or open circuit.
- 4. Into 100 ohms differential termination.
- 5. These are unfiltered 20-80% values
- 6. Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.



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Pin Assignment



Figure 1 Pin out of connector block on host board.

Pin	Symbol	Name/Description	NOTE
1	V	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	RSO	Rate Select 0	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	No connection required	1
10	V	Receiver Ground (Common with Transmitter Ground)	1
11	V	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	Receiver Ground (Common with Transmitter Ground)	1



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15	V	Receiver Power Supply	
16	V _{cct}	Transmitter Power Supply	
17	V	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	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 $4.7k\Omega 10 k\Omega$ 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 $T_{DIS} > 2.0V$ or open, enabled on $T_{DIS} < 0.8V$.
- 4. Should be pulled up with $4.7k\Omega$ $10k\Omega$ on host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
- 5. Internally pulled down per SFF-8431 Rev 4.1.
- 6. LOS is open collector output. It should be pulled up with $4.7k\Omega 10k\Omega$ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

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Mechanical Dimensions





