

SFP-10GBASE-ER31-RX-AO

MSA Compliant 10GBase-ER SFP+ Transceiver (SMF, 1310nm, 40km, LC, DOM) Rx Only

Features:

- Supports 9.83Gbps to 11.3Gbps Bit Rates
- Compliant with 10G FC 1200-SM-LL-L
- Compliant with IEEE 802.3 10GBase-LR/LW
- Hot-Pluggable SFP+ footprint
- LC Connector
- Complaint with SFF-8431
- Single Power Supply 3.3V
- Built-In Digital Diagnostic Functions
- RoHS Compliant and Lead-Free
- Operating Temperature: 0 to 70 Celsius



Applications:

- 8x/10x Fibre Channel
- 10GBase-ER Ethernet
- Access, Datacenter and Enterprise
- Mobile Fronthaul CPRI/OBSAI

Product Description

This MSA compliant SFP+ transceiver provides 10GBase-ER throughput up to 40km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It can operate at temperatures between 0 and 70C. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn's transceivers are RoHS compliant and lead-free.

General Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate	DR	9.93	10.3125	11.3	Gbps	1
Bit Error Rate	BER			10 ⁻¹²		
Operating Case Temperature	Tc	0		70	°C	2
Storage Temperature	Tstg	-40		85	°C	3
Input Voltage	Vcc	3.14	3.3	3.46	V	
Power Dissipation	PC		0.4	0.8	W	
Maximum Voltage	Vmax	-0.5		4	V	4

Notes:

1. IEEE 802.3.
2. Case temperature.
3. Ambient temperature.
4. For the electrical power interface.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver						
Differential Data Output Swing	VOUT,pp	300		850	mV	
Data Output Rise/Fall Time (20-80%)	Tr/Tf	28			ps	
LOS Assert	VLOS_A	2		Host_Vcc	V	
LOS-De-Assert	VLOS_D	Vee		Vee+0.5	V	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver						
Optical Center Wavelength	λ_C	1260		1600	nm	
Average Receive Power	PRX	-15.0		0.5	dBm	
Receiver Sensitivity @10.3Gbps	Rx_Sen			-15.0	dBm	1
Receiver Reflectance	TRRX			-12	dB	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-17	dBm	
LOS Hysteresis	LOSH	.51			dB	

Notes:

1. Average Optical Power, measured with test signal at 10.31Gbps and PRBS 2³¹-1 for BER = 10⁻¹², and without fiber.

Digital Diagnostic Function

The module supports the 2-wire serial communication protocol defined in SFF-8472, which provides access to digital diagnostic information through a 2-wire interface. Digital diagnostics are internally calibrated, and the internal microcontroller provides real-time access to module operating parameters such as module temperature, laser bias current, transmit optical power, receive optical power and module supply voltage. The module implements the SFF-8472's alarm function, which alerts the user when specific operating parameters are out of normal range.

DDM Threshold Information

Parameter	Alarm Threshold		Warning Threshold	
	High Value	Low Value	High Value	Low Value
Temperature (°C)	90 (5A 00)	-10 (F6 00)	85 (55 00)	-5 (FB 00)
Vcc (V)	3.63(8D CC)	2.97 (74 04)	3.46 (87 28)	3.13 (7A 44)
Bias (mA)	100 (C3 50)	0 (00 00)	80 (9C 40)	0 (00 00)
TxPower (dBm)	1.3 (34 98)	-40.0 (00 01)	0.5 (2B D4)	-40.0 (00 01)
RxPower (dBm)	3.0 (4E 20)	-18.0 (00 9E)	0.0 (27 10)	-15.0 (01 3C)

Pin Descriptions

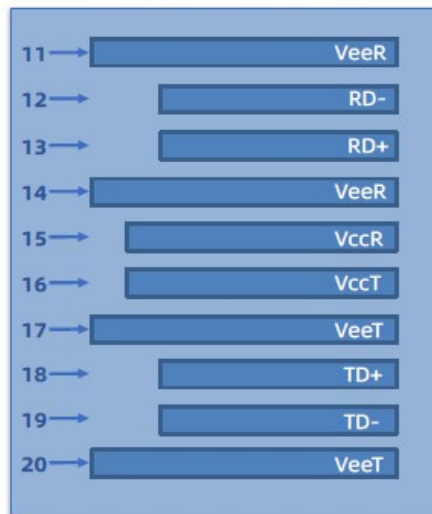
Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault. This function is not implemented.	
3	Tx_Disable	Transmitter Disable. This function is not implemented.	
4	SDA	2-Wire Serial Interface Data.	
5	SCL	2-Wire Serial Interface Clock.	
6	Mod_ABS	Module Absent. Grounded within the module.	
7	RS0	No Connection Required.	
8	Rx_LOS	Loss Of Signal Indication. Logic 0 indicates normal operation.	
9	RS1	No Connection Required.	
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.	
13	RD+	Receiver Non-Inverted Data Out. AC Coupled.	
14	VeeR	Receiver Ground (Common with Transmitter Ground).	1
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	VeeT	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	VeeT	Transmitter Ground (Common with Receiver Ground).	1

Notes:

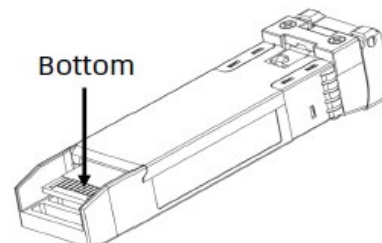
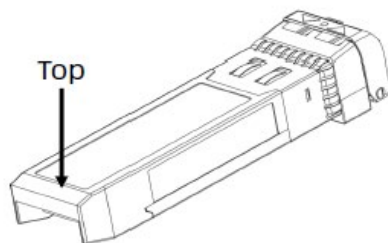
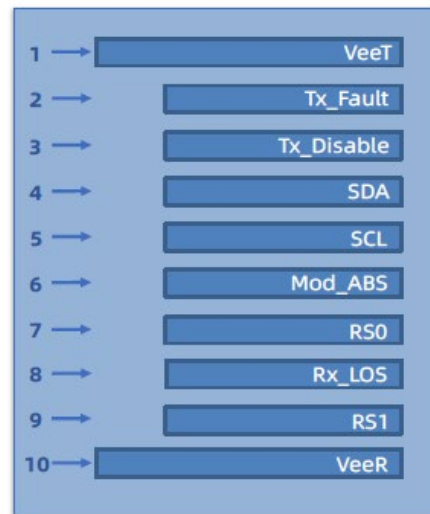
1. Circuit ground is internally isolated from case.

Electrical Pad Layout

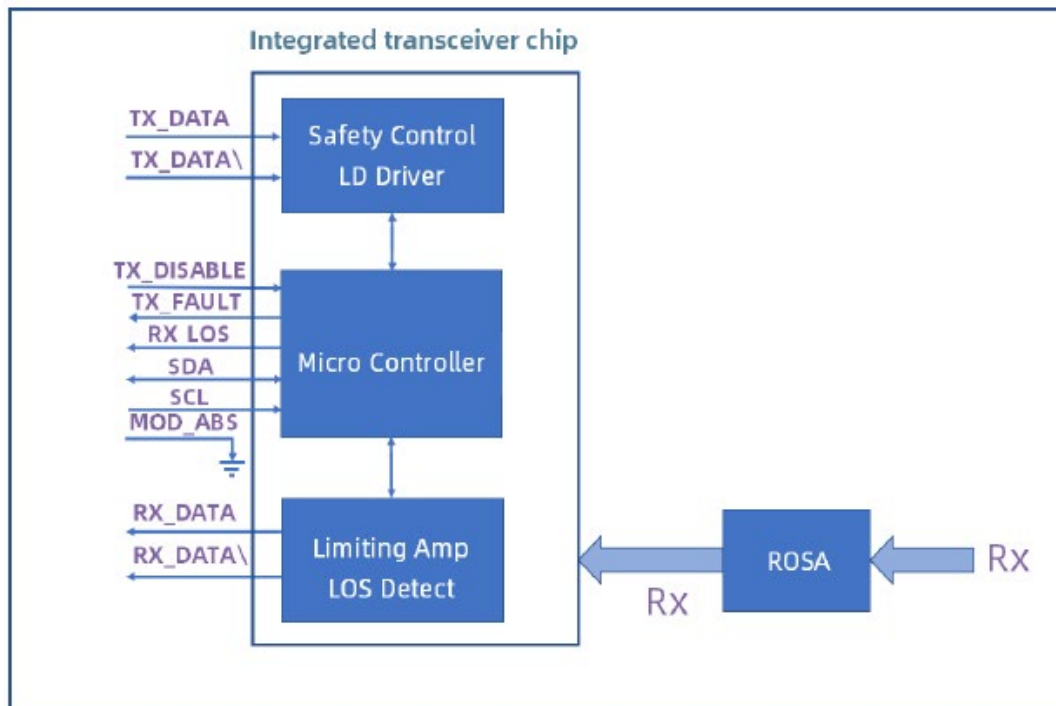
Top View of Board



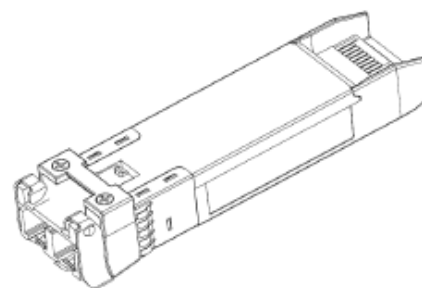
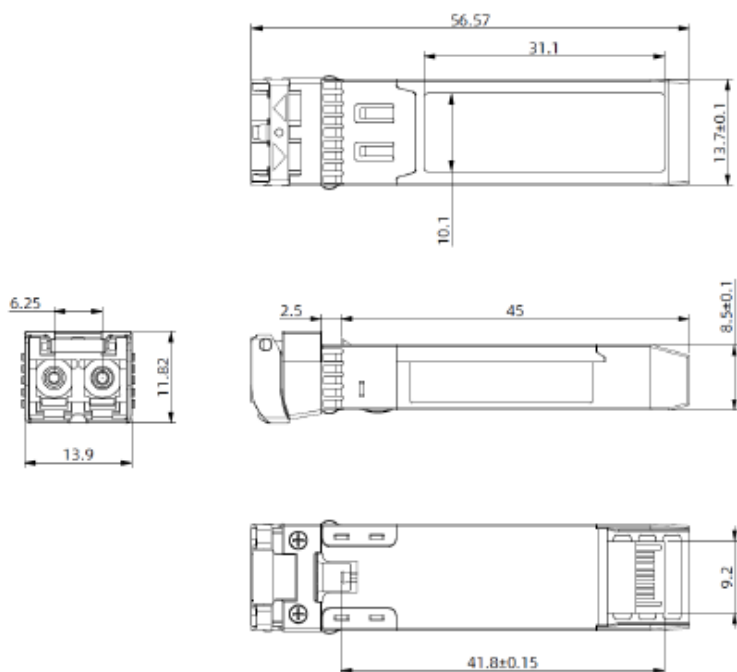
Bottom View of Board



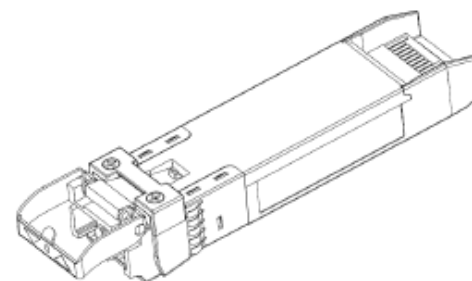
Block Diagram of Transceiver



Mechanical Specifications



LATCHED



UNLATCHED

All dimensions are ± 0.2 mm unless otherwise specified.

Unit: mm

Product Weight

Net weight of module: 15.0g/pcs

Net weight of dust cap: 0.9g/pcs

About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is ingrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications ranging from NEBS Level 3 to ISO 9001:2015 with every new development while maintaining the signature reliability of its products.



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