

25 Gbps 1310 nm 80 km SFP28 ZR Transceiver

SFP+ Series



- Supports 25GBASE-ZR
- Supports 25.78G
- Up to 80km transmission on SMF
- High speed I/O electrical interface (25GAUI)
- Single +3.3V power supply
- Complies with EU Directive 2015/863/EU
- Power consumption 2.5 W

Ascent's SFP28-25LP-31-80 optical transceiver supports high-speed serial links over Single Mode (SM) optical fiber at signal rates up to 25.78 Gb/s. The product is compliant with Small Form Pluggable industry agreements SFP and SFP28 for mechanical and low-speed electrical specifications. It is intended for use in interconnect applications between data centers with switches, routers, storage equipment etc. The optical performance supports distances up to 80km.

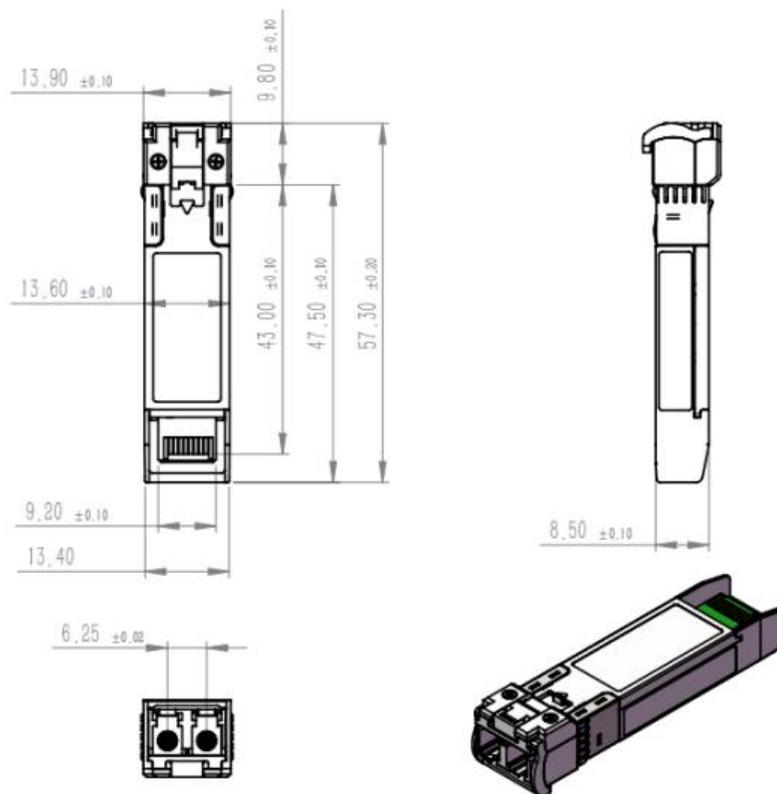
The transmitter side of the module incorporates one 1310 nm EML and CDR integrated with the EML driver to transport a 25G Ethernet signal and the receiver side is integrated with SOA and PIN- TIA followed by Rx CDR. As stipulated by the 25G Ethernet standards, Forward Error Correction (FEC) is required to be implemented by the host equipment to ensure reliable system operation. The optical parameters below will provide a bit error ratio (BER) of 5×10^{-5} for 25G Ethernet. FEC will provide the required quality for secure service. The electrical interface is according to 25GAUI specifications per IEEE 802.3cc.

Digital diagnostic monitoring information (DDMI) is present in this module per the requirements of SFF-8472, providing real-time monitoring information of transceiver laser, receiver, and environment conditions over an SFF-8419 2-wire serial interface.

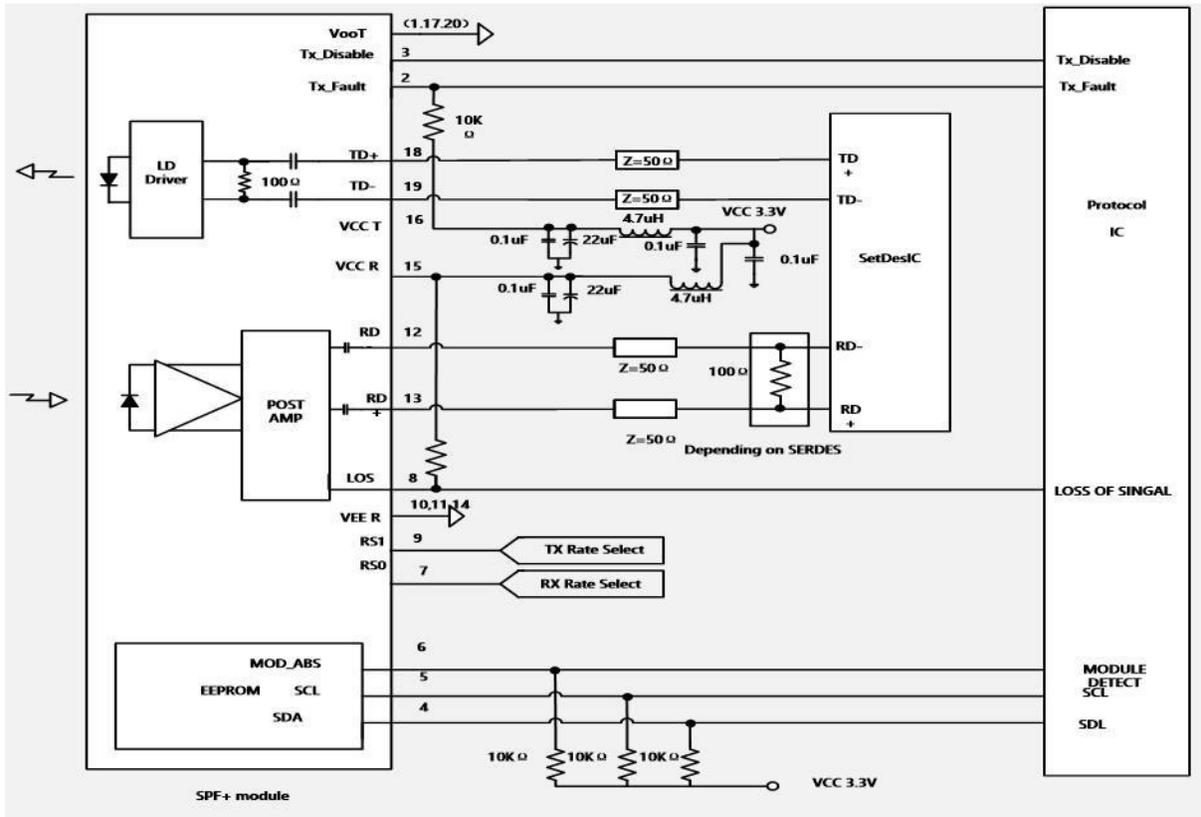
Key Features

- Supports 25GBASE-ZR
- Supports 25.78G
- Up to 80km transmission on SMF
- EML laser and Integrated SOA & PIN TIA rosa
- High speed I/O electrical interface (25GAUI)
- SFP28 MSA package with duplex LC connector
- Single +3.3V power supply
- Power consumption 2.5 W
- Compliant to IEEE 802.3cc, SFF-8472 ver12.4 and SFF-8431
- Complies with EU Directive 2015/863/EU
- Operating Temperature Range:
Commercial: 0°C to +70°C

Mechanical Dimension



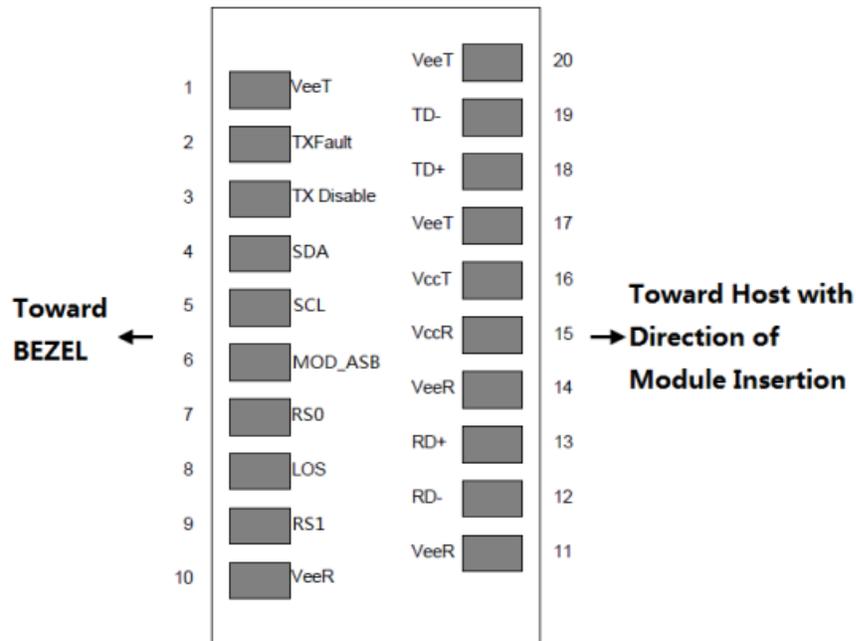
Recommended Interface Circuit



Digital Diagnostic Function

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	°C	Internal
Voltage	3.13 to 3.47	±3%	V	Internal
Tx Bias Current Per Lane	0 to 100	±10%	mA	Internal
Tx Output Power Per Lane	2 to 7	±3	dBm	Internal
Rx Power	-28 to -4	±3	dBm	Internal

Pin Assignment



Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground	1
2	Tx_Fault	Transmitter Fault - High indicates a fault condition	2
3	Tx_Dis	Transmitter Disable – High or open disables the transmitter	
4	SDA	2-wire Serial Interface Data Line (MOD-DEF2)	3
5	SCL	2-wire Serial Interface Clock (MOD-DEF1)	3
6	MOD_DEFO	Module Absent, connected to VeeT or VeeR in the module	
7	RS0	Rate Select 0	5
8	RX_LOS	Receiver Loss of Signal (LVTTL-O). Logic 0 indicates normal operation	4
9	RS1	Rate Select 1	5
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O), AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VeeR	Receiver Ground	1
15	VccR	Receiver 3.3V Supply	
16	VccT	Receiver 3.3V Supply	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VeeT	Transmitter Ground	1

Note:

- Module ground pins GND are isolated from the module case.
- Tx_Fault is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on Host board.
- Should be pulled up with 4.7k–10kohms on host board to a voltage between 2.0V and 3.6V.
- 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.
- RS0 and RS1 pins are pulled low to GND with a resistor > 30KΩ in module.

Specifications

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Storage Temperature	T_s	-40		85	°C
Operating Relative Humidity	RH	5		95	%
Supply Voltage	V_{CC}	-0.3		3.6	V

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	T_C	0	-	70	°C	
Power Supply Voltage	V_{CC}	3.13	3.3	3.46	V	
Power Supply Current	I_{CC}	-	-	750	mA	
Maximum Power Consumption	P_D	-	-	2.5	W	
Bit Rate	BR		25.78	-	Gb/s	
Transmission Distance	TD		-	80	km	Over SMF

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ	1295	-	1310	nm	
Average Launch Power	P_{AV}	2	-	7	dBm	1
Optical Modulation Amplitude	OMA	2	-	8	dBm	
Average Output Power (Laser Turn off)	$P_{OUT-OFF}$	-	-	30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
RIN_{20OMA}	RIN	-	-	-130	dB/Hz	
Extinction Ratio	ER	8	-	-	dB	
Transmitter and dispersion penalty (TDP)		-	-	2.7	dB	
Optical Eye Mask			IEEE 802.3 cc			2
Receiver						
Center Wavelength	λ_C	1295	-	1310	nm	
Receiver Sensitivity	R_{SEN}			-28	dBm	3
Receiver Sensitivity(OMA)	R_{SEN}			-26	dBm	3
Input Saturation Power(Overload)	P_{SAT}	-4			dBm	
LOS Assert	LOS_A	-40	-		dBm	
LOS De-assert	LOS_D	-	-	-29	dBm	
LOS Hysteresis	LOS_H	0.5	-	5	dB	

Note:

- The optical power is launched into SMF. Average launch power (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
- Measured with a PRBS 231-1 test pattern @25.78125, Hit ratio $\leq 5E-5$.
- Measured with a PRBS 231-1 test pattern @25.78125 Gb/s, BER $\leq 5E-5$.

Electrical Characteristics

High-Speed Signal: Compliant to CEI-28G-VSR

Low-Speed Signal: Compliant to SFF-8419

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter (Module Input)						
Differential Data Input Amplitude	$V_{IN,P-P}$	-	-	900	mVpp	
Differential Impedance		90	100	110	Ω	
Tx_Disable	Normal Operation	V_{IL}	-0.3	-	0.8	V
	Laser Disable	V_{IH}	2.0	-	$V_{CC}+0.3$	V
Receiver (Module Output)						
Differential Data Output Amplitude	$V_{OUT,P-P}$	-	-	900	mVpp	
Differential Termination Mismatch(1MHZ)		-	-	10	%	
Differential Impedance		90	100	110	Ω	
Rx_LOS	Normal Operation	V_{OL}	-0.3	-	0.4	V
	Loss Signal	V_{OH}	2	-	V_{CCHOST}	V

Ordering Information

Product Name	Product Description
SFP28-25LP-31-80	SFP28 plug-in, 25 Gbps, 80 km, TX=1310/RX, on two single mode fibres, LC/PC
S28-25LP-31-80A	SFP28 plug-in, 25 Gbps, 80 km, TX=1310/RX, on two single mode fibres, LC/PC, Industrial Temperature -40°C to +85°C

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