10/25Gb/s SFP28 LR 1310nm 10km Optical Transceiver

Features

- Supports 25.78Gb/s Bit Rate
- 1310nm DFB Transmitter an PIN PD Receiver
- Up to 10 km Transmission Distance
- LC Duplex Connector
- Low Power Consumption ＜1.0W
- -45 to 85℃ Operating Temperature Range
- Single 3.3V±5% Power Supply
- Compliant with SFF-8472

Applications

- 25G BASE-LR Ethernet
- 10G Ethernet

Compliance

- SFF-8472
- SFF-8402
- SFF-8431
- SFF-8432
- CEI-28G-VSR

Description

The SFP-10/25G-LR is a 1310nm DFB laser based 25Gb/s SFP28 transceiver. It is designed to transmit and receiver optical data up to 10km over single mode fiber. The transceiver is compliant with SFF-8472, SFF-8402, SFF-8432 and applicable portions of SFF-8431. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

Absolute Maximum Ratings

Table1-Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature Range	TS	-45	85	°C
Relative Humidity	RH	0	85	%
Maximum Supply Voltage	VCC	-0.3	3.6	V

Recommended Operating Conditions

Table2-Recommended Operating Conditions

Parameter	Symbol	Unit	Min.	Typical	Max.
Operating Case Temperature Range	T_c	°C	-45		80
Power Supply Voltage	VCC	V	3.14	3.3	3.46
Bit Rate	BR	Gb/s		25.78	
Max. Supported Link Length	L	km			10

Electrical Characteristics

Table3-Electrical Characteristics

Parameter	Symbol	Unit	Min.	Typical	Max.	Note
Supply Voltage	VCC	V	3.14	3.3	3.46	
Supply Current	ICC	mA			360	@3.3V
Transmitter						
Input Differential Impedance	RIN	Ω		100		
Single Ended Data Input Swing	VIN	mVp-p	90		450	
Transmit Disable Voltage	VDIS	V	2		VCCHOST	
Transmit Enable Voltage	VEN	V	VEE		VEE+0.8	
Transmit Fault Assert Voltage	VFA	V	2.2		VCCHOST	
Transmit Fault De-Assert Voltage	VFDA	V	VEE		VEE+0.4	
Receiver						
Single Ended Data Output Swing	VOD	mV-p	200		450	
LOS Fault	VLOSFT	V	2.2		VCCHOST	
LOS Normal	VLOSNR	V	VEE		VEE+0.4	

Optical Characteristics

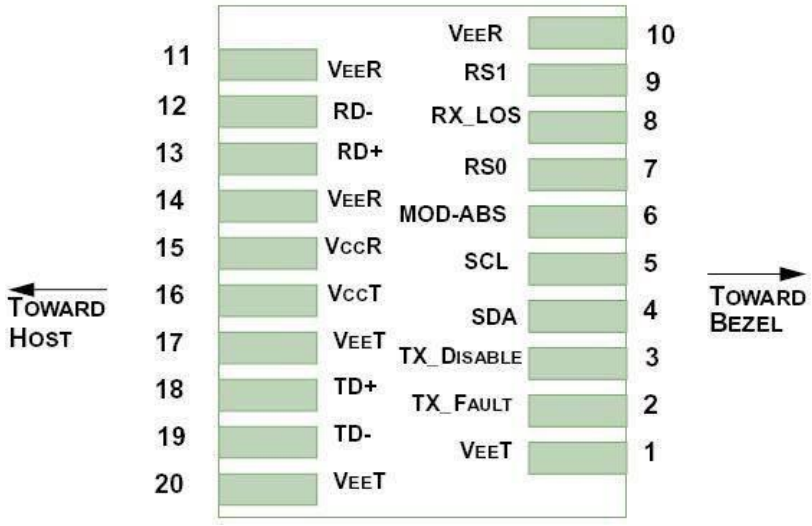
Table4-Optical Characteristics

Parameter	Symbol	Unit	Min.	Typical	Max.	Note
Transmitter						
Nominal Wavelength	λ	nm	1295	1310	1325	
Spectral Width	Dl	nm			1	
Optical Modulation Amplitude	POMA	dBm			-12	
Optical Output Power	Pav	dBm	-2		4	
Extinction Ratio	ER	dB	3			
Transmitter and Dispersion Penalty	TDP	dB			2.7	
Average Launch Power of OFF Transmitter	POFF	dBm			-30	
Receiver						
Center Wavelength	λ	nm	1260	1310	1360	
Average Receiver Power	PAVG	dBm	-7		2.5	1
Stressed Receiver Sensitivity (OMA)	RSENSE	dBm			-14	2
Receiver Reflectance	RREFL	dB			-12	
Assert LOS	LOSA	dBm	-30			
De-Assert LOS	LOSD	dBm			-15	
LOS Hysteresis		dB	0.5			

Note:

[1] Template:{0.31, 0.40, 0.45, 0.34, 0.38, 0.40}, Hit Ratio: 5E-5.

Pin Assignment



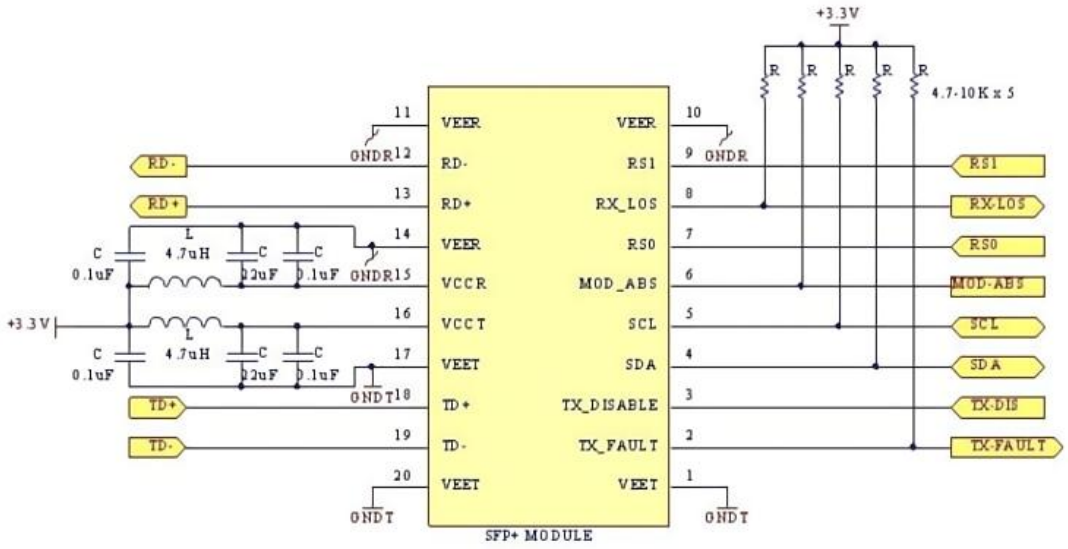
Pin Function Definitions

Table5-Pin Function Definitions

Pin	Symbol	Name	Description
1,17,20	VeeT	Transmitter Signal Ground	These pins should be connected to signal ground on the host board.
2	TX Fault	Transmitter Fault Out (OC)	Logic "1" Output = Laser Fault (Laser off before t_fault) Logic "0" Output = Normal Operation This pin is open collector compatible, and should be pulled up to Host Vcc with a 10kΩ resistor.
3	TX Disable	Transmitter Disable In (LVTTL)	Logic "1" Input (or no connection) = Laser off Logic "0" Input = Laser on This pin is internally pulled up to VccT with a 10 kΩ resistor.
4	SDA	Module Definition Identifiers	Serial ID with SFF 8472 Diagnostics Module Definition pins should be pulled up to Host Vcc with 10 kΩ resistors.
5	SCL		
6	MOD-ABS		
7	RS0	Receiver Rate Select (LVTTL) Transmitter Rate Select (LVTTL)	NA
9	RS1		
8	LOS	NA	5
10,11,14	VeeR	Receiver Signal Ground	These pins should be connected to signal ground on the host board.
12	RD-	Receiver Negative DATA Out (CML)	Light on = Logic "0" Output Receiver DATA output is internally AC coupled and series terminated with a 50Ω resistor.
13	RD+	Receiver Positive DATA Out (CML)	Light on = Logic "1" Output Receiver DATA output is internally AC coupled and series terminated with a 50Ω resistor.
15	VccR	Receiver Power Supply	This Pin Should Be Connected To A Filtered 3.3v Power Supply On The Host Board. See the Recommended Operating Conditions Table.
16	VccT	Transmitter Power Supply	This Pin Should Be Connected To A Filtered 3.3v Power Supply On The Host Board. See the Recommended Operating Conditions Table.
18	TD+	Transmitter Positive DATA In (CML)	Logic "1" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100Ω resistor.
19	TD-	Transmitter Negative DATA In (CML)	Logic "0" Input = Light on Transmitter DATA inputs are internally AC coupled and

			terminated with a differential 100Ω resistor.

Typical Application Circuit



Regulatory Compliance

Table6-Regulatory Compliance

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883C Method 3015.7	Class 1 (> 1500 Volts)
Electrostatic Discharge (ESD) Immunity	Variation of IEC 61000-4-2	LV 4(Air discharge :15KV; Contact Discharge:8 KV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B EN55022 Class B FCC Class B	Compliant with Standards
Immunity	IEC61000-4-3 Class 2 EN55024	Typically Show No Measurable Effect From a 3V/m Field Swept From 80 to 1000MHz Applied to the Transceiver without a Chassis Enclosure.

Principle Diagram

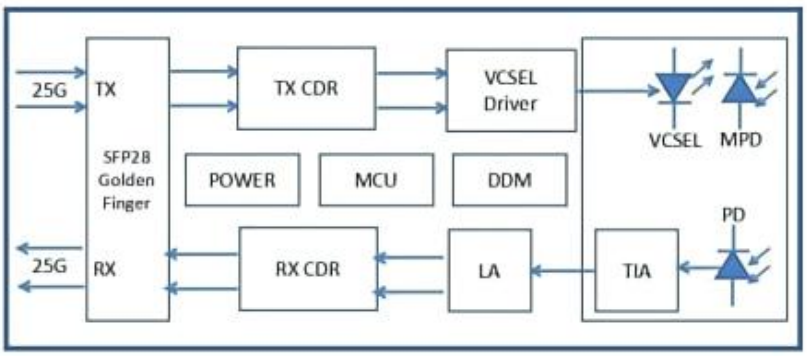
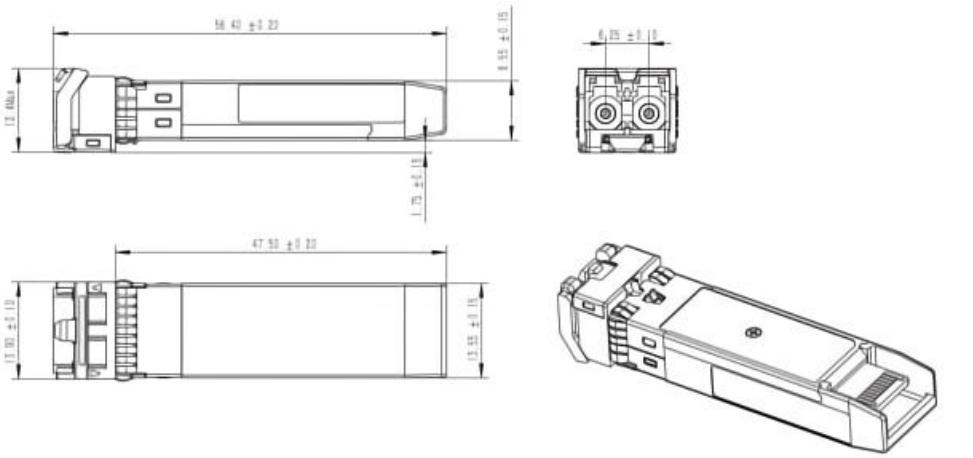


Diagram Mechanical Drawing



Unit: mm
Unspecified Tolerance: ± - mm

Further Information:

Web www.naddod.com

Email For order requirements: sales@naddod.com

For customer service: support@naddod.com

For technical support: tech@naddod.com

For cooperation: agency@naddod.com

For other informations: info@naddod.com

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